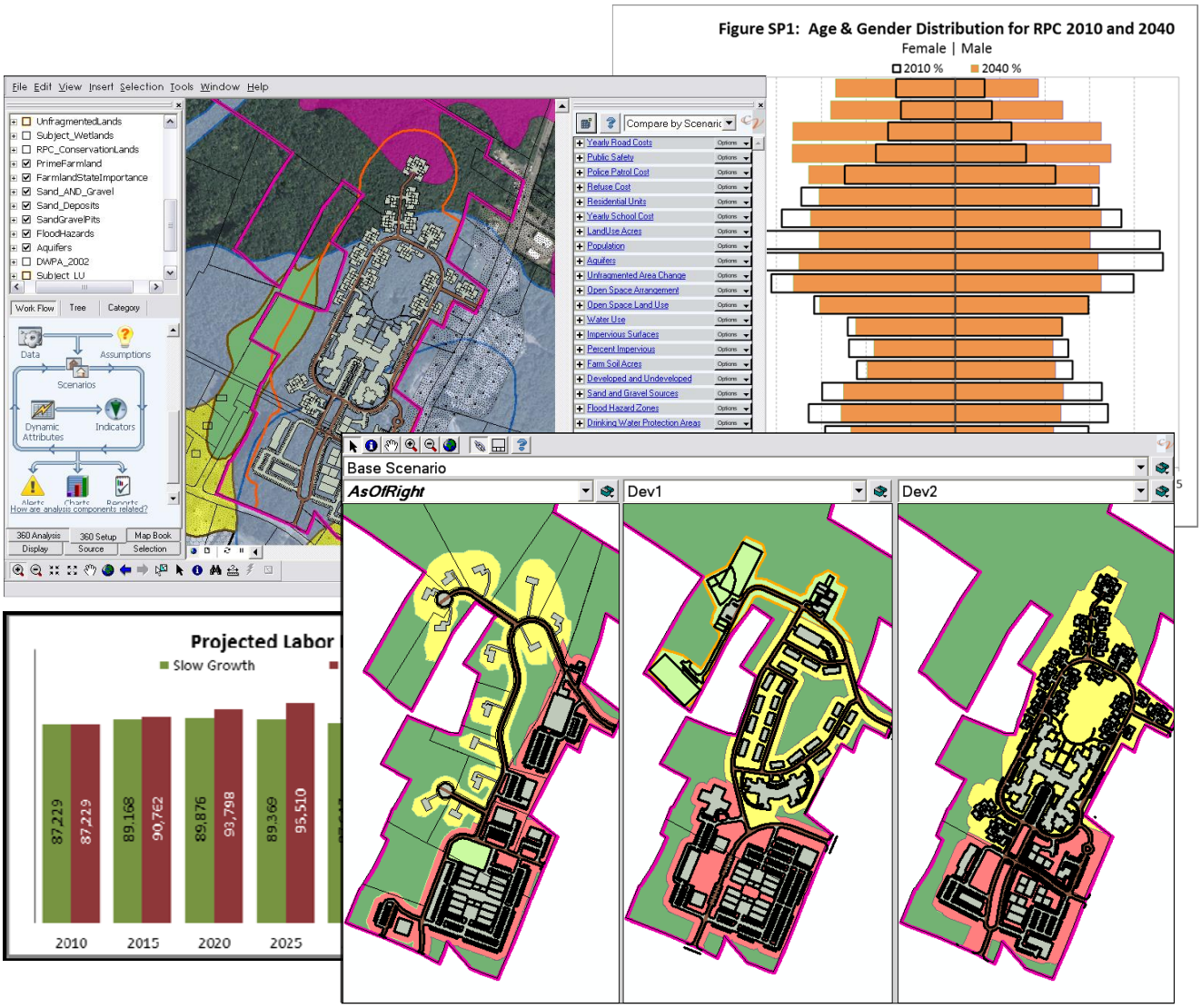



# SCENARIO PLANNING CHAPTER

## 2015 REGIONAL MASTER PLAN

For the Rockingham Planning Commission Region

# Scenario Planning

## Contents

# Scenario Planning

## Introduction to Scenario Planning

Scenarios, in the realm of transportation and land use planning, are organized sets of assumptions that explore the ways in which a region might change and grow (USDOT, 2011). They provide a structure to envision potential needs as well as possible future policy and investment options. Scenario planning is a process that planners utilize to create this framework for looking into the future. By analyzing various community and regional demographic and land-use changes, stakeholders can better understand how these forces may potentially impact the overall scale and distribution of development in a region; through that, the impacts on transportation networks, housing needs, and the environment. There are many ways to implement scenario planning, however, there are several key elements that should be included in all cases:

- Use of scenarios to compare and contrast interactions between multiple factors, such as transportation, land use, and economic development.
- Analysis of how different land-use, demographic, or other types of scenarios could impact transportation networks or other systems.
- Identification of possible strategies that lead toward achieving desired elements of the future conditions examined.
- Public engagement throughout the process.

## Vision and Objective

The regional vision for the future, as established in the Regional Master Plan, indicates a desire for a strong regional economy, preservation of community character, and maintenance of the region's natural and recreational resources. Further, the regional vision states a desire to strengthen community centers and maintain traditional landscapes, provide a variety of housing choices, invest in supportive infrastructure, and provide improved services for residents and businesses. Scenario planning supports the regional vision by identifying and comparing the benefits and impacts of multiple, differing futures. It also can help decision-makers understand how policy choices may impact achieving a desired future condition. In this case, the RPC is utilizing three related planning and forecasting tools to gauge two prospective alternatives for the magnitude of growth in the region (slow or strong growth), and two alternatives for the pattern of that change on the landscape (dispersed or concentrated growth).

**Scenario planning supports the regional vision by identifying and comparing the benefits and impacts of multiple differing futures.**

## Basis in Projections

Independently developed population and employment projections, shown in ***Table SP 1***, offer different visions of change over the next 30 years in the region. The population is expected to remain relatively flat with a growth rate of about 0.27 percent per year. However, employment has a different trajectory, growing at slightly over 1 percent per year. Examining these different expectations of growth, as well as where people live and work around the region, can help decision makers understand what it means for each of those projections to be an accurate prediction of the future. From that understanding, recommendations can be developed that point the communities and region towards achieving the desired outcomes, or in some cases, away from unwanted outcomes.

**Population Projections**

The New Hampshire Office of Energy and Planning (OEP) is responsible for producing population projections at the state, county, regional planning commissions, and community levels every five years. The most recent set of projections was completed in 2013 utilizing 2010 census data as the basis. OEP worked directly with the regional planning commissions to deriving planning commission and community level projections from estimates completed at the county and state level. These projections show a very low growth rate (0.27 percent per year) with the region increasing from 178,000 to 193,000 residents. This is primarily due to slowing natural population growth (slightly more births than deaths) and continued small positive migration into the region. ***Table SP 1*** shows how the distribution of the population by age and gender is expected to change between 2010 and 2040. It is expected that the population aged 65 and over will be increasing substantially while decreases are expected in most other younger age groups over that period. This has implications for the labor force in that even though the population is increasing, most of this increase is in the portion of the population that does not participate in the labor force in large numbers.

**Labor Force**

Labor force size is calculated based on the current composition of the population by gender and five year age cohorts using labor force participation rates from the Bureau of Labor Statistics (BLS, 2013). The 2010 labor force is approximately 92,800 workers, of which about 46 percent are female and 54 percent are male. The bulk of the labor force is between 25 and 64 (84 percent). As the population ages and changes between now and 2040 it is expected there will be shifts in the labor force composition as well. Overall this means a shrinking labor force as the aging "Baby Boomers" begin to enter retirement age in large numbers, and the cohorts of younger residents entering the labor force are much smaller than those leaving it (***Figure SP1***). The expectation is there will be a substantial increase in the number of individuals aged 65 and older that remain in the labor force. This is offset by smaller groups in younger cohorts, particularly the 45-54 age group which is significantly smaller in size in 2040 than the current group that age. While this demographic shift is important for many different reasons, it is used in this analysis only to help derive the overall size of the regional labor pool.

*Table SP 1: Summary of Population and Employment projections used as the basis for scenario planning exercise. Source: See table footnotes.*

| | 2010 | 2020 | 2030 | 2040 | CAGR[1] |
|---|---|---|---|---|---|
| Projected Population (OEP)[2] | 178,383 | 184,646 | 191,986 | 193,290 | 0.27% |
| Estimated Labor Force[3] | 92,794 | 95,313 | 93,271 | 90,467 | -0.08% |
| Employed Labor Force[4] | 87,229 | 89,876 | 87,647 | 85,402 | 0.07% |
| Live & Work in Region[5] | 48,358 | | | | |
| Work outside of Region[5] | 38,871 | | | | |
| Estimated Employment (ELMI)[6] | 112,612 | 125,054 | 139,279 | 155,981 | 1.09% |
| Live in Region[5] | 48,358 | | | | |
| Commute from Outside Region[5] | 64,254 | | | | |

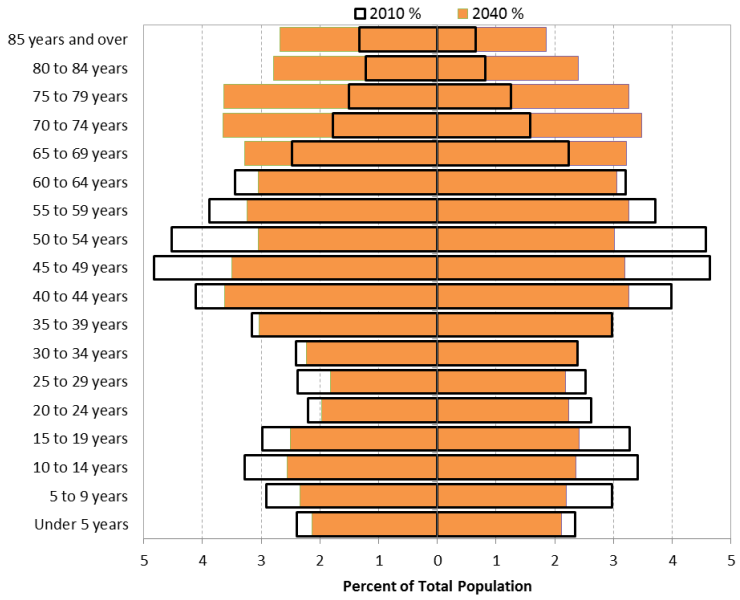
1 – Compound Annual Growth Rate (% per year)
2 – Regional totals derived from State and County Estimates
3- Estimated from NH Employment Security Quarterly Employment & Wages, Bureau of Labor Statistics projections for labor force participation
4 – Based on NH Employment Security Quarterly Employment & Wages Data
5 – Based on American Community Survey 5-Year Estimates
6 – From NH Employment Security 2010-2020 RPC 10 Year Projections

### Commuting Patterns

Of the nearly 93,000 workers residing in the RPC region, it is assumed that 6 percent are currently unemployed based on recent employment data from NH Employment Security (NH Employment Security, 2014), and that for future years, the unemployment rate has declined to 5 percent by 2020. The remaining labor force is split into those that work within the region (55 percent) and those that work elsewhere (45 percent), based on Journey to Work data from the American Community Survey five year data (US Census Bureau, 2013).

Currently, 43 percent of employment in the RPC region is filled by workers who also live within the region. The remaining 57 percent of employees commute into the region from other areas, predominately Strafford County, Southern Maine, and the Manchester and Nashua regions. For the purposes of this analysis, this distribution is assumed to remain constant at the 43/57 percent rate for all future scenarios.

**Figure SP1: Age & Gender Distribution for RPC 2010 and 2040**




### Employment Projections

Long-term (ten year) employment projections are developed on a biennial basis by the New Hampshire Department of Employment Security Economic and Labor Market Information Bureau (ELMI) for the state, counties, and regional planning commissions (ELMI, NHES, 2014) and are provided (categorized by industry). The latest set of projections available for the RPC region anticipates steady growth in overall employment (about 1 percent per year) between 2010 and 2020. This ten year projection is extended to the 2040 planning horizon and this increases total employment in the region by approximately 43,000 jobs over that 30 year timeframe (See ***Table SP1***). Individual industry growth rates were utilized at the regional level to tabulate employment increases (or decreases) for each. Employment was then distributed to each community based on the historic share of each industry. Industries were then summed to estimate total employment for each community and checked against available data for reasonableness. It should be noted that these are estimates of employment and should be considered as such as some data is not available at the community level and is inferred from regional totals or other information. For additional detail, community level employment estimates by industry can be seen in ***Appendix A*** of this section.

## Scenarios

Assuming that current commuting patterns remain the same, employment gains as projected to 2040 using the growth rate developed by Employment Security (taller bars in ***Figure SP2***) are greater than can be supported by the regional labor force that is anticipated based on the OEP/RPC population projections (shorter bars in ***Figure SP2***). This difference presents two potential pictures of the future RPC region based around economic and population growth. One assumes that the population projections are the accurate gauge of the region's future, and the smaller labor force predicted would support a smaller increase (or even a decrease) in employment in the region (slow growth). The other assumes that the employment projections are the accurate gauge of the future region and that the population would need to increase much faster to provide the labor force to fill the jobs (strong growth). While there are many different variations of this analysis that could be considered, for the purpose of this exercise, the scenarios have been limited to these two overall visions of growth in the region.

At the same time as the magnitude of growth is considered, the distribution of that growth can be examined as well. The modern pattern of development in the region has shown population increases occurring primarily in the more rural communities in the region while the majority of job growth remains in the larger centers. The impacts and benefits of continuing the current pattern or shifting into a more concentrated growth model are examined as part of the strong growth scenarios. All of these are considered against the 2010 baseline data that is available for the region of a starting population of 178,000, an employed labor force of 87,229, and 112,612 jobs as shown in ***Figure SP1***. The paragraphs that follow describe the general vision presented by each scenario and this is supplemented by ***Figures SP2*** and ***SP3***. ***Figure SP2*** shows the change in population, labor force, and employment for the slow growth vs strong growth scenarios while ***Figure SP3*** is a more detailed look at the specifics of each scenario.

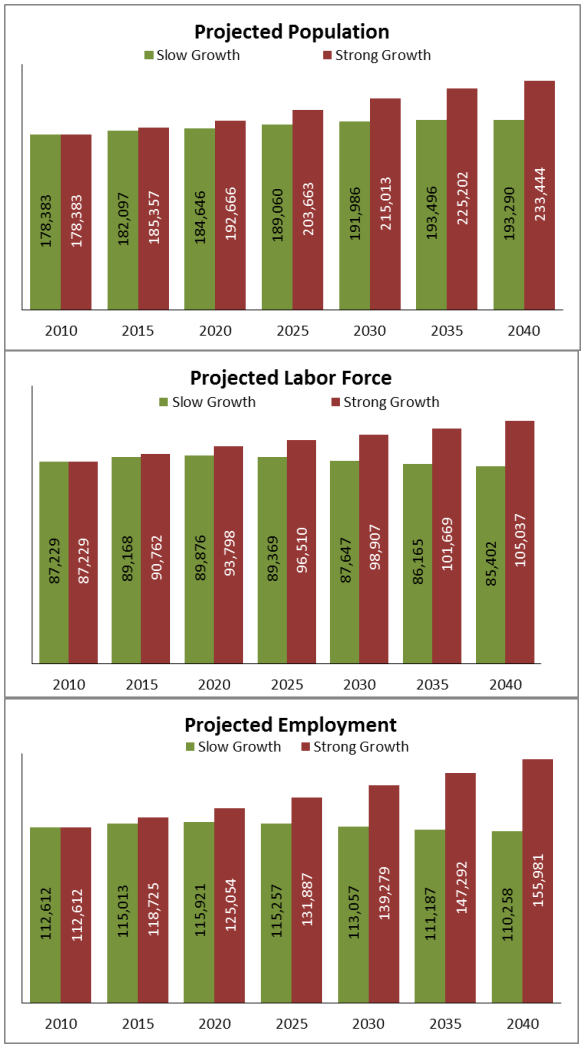



*Figure SP2: Population, Labor Force, and Employment Change for slow growth vs strong growth scenarios.*

## Scenario: Slow Growth

A future of slow population growth is anticipated by the population projections and the work force and employment are sized to fit that slow change (the shorter, lighter bars in ***Figure SP2***). Under this scenario, the population projections from OEP and the RPCs are utilized and employment growth is reduced to levels supported by the expected available labor force. In this scenario, there is little land use growth and so the distribution and amount stay generally the same as exists in the 2010 baseline.

## Scenario: Strong, Dispersed Growth

This concept moves towards the Regional Vision with strong population and economic growth. For this scenario NH Employment Security projections provide the employment growth rate and the population is increased to the point where the labor force is large enough to support the larger number of jobs. This scenario continues the current dispersed residential growth pattern and more rural communities grow faster than more urbanized ones. Employment is slowly diffused in some industry categories such as retail following current trends. In this growth pattern each community maintains roughly the percentage of regional population and employment that it currently has.

## Scenario: Strong, Concentrated Growth

The final alternative that is compared to the 2010 baseline has similar population and employment as the dispersed growth scenario. It differs in that it concentrates residential growth into the largest employment centers in the region and further focuses employment growth in those same areas. These areas currently host just under 50 percent of the population in the region and 74 percent of the employment. To facilitate a change in distribution, 80 percent of the new population and 90 percent of new jobs are directed to the regional employment centers of Portsmouth/Newington, Salem, Exeter, Hampton, and Seabrook.

# The Analysis Tools

The Planning Commission utilized three different tools to examine the future region scenarios from a land use perspective, an economic impact perspective, and from a transportation perspective. Each of these analyses was conducted independently but in a coordinated manner that allowed each to inform the others.

## Regional Buildout

A buildout is a tool that allows planners to estimate future development potential based on current or proposed zoning and in this case, is an analysis of existing adopted municipal policies. The buildout method can allow for the testing of single or multiple alternative land use regulation, open space planning, and major development scenarios. Comparing various scenarios allows planners to test the effects and consequences of new zoning ordinances as changing setbacks, densities, building restrictions, and other policy adjustments can significantly alter a buildout results. Questions that can be answered by a buildout scenario testing include:

**The buildout analysis shows the maximum growth that could occur in a community under current land use regulations (zoning).**

- Where do I want my community to be at buildout?
- How much open space will there be? What will the traffic patterns look like?
- What will the quality of our environmental resources be like?
- Where will people live and what will the development patterns look like?

This buildout was conducted using Geographic Information Systems (GIS) software. RPC primarily uses the industry standard of ArcGIS for GIS analyses. The CommunityViz program, developed by the Orton Family Foundation in order to provide communities with an affordable tool for community based GIS, is used in this instance to specifically perform some of the mundane data calculation tasks of the buildout process. The GIS data used in this study originates from several sources. The base shapefiles (road centerlines, conservation lands, wetlands, etc.) were provided by GRANIT, the official New Hampshire GIS data provider. The land use polygons were created through a prior CTAP project and is very detailed showing over 50 uses, using 2010 aerial images provided by the NH Department of Transportation. The current building points were also determined using the 2010 aerial images. Steep slopes were derived by the RPC using the recent 2011 LiDAR dataset for our region.

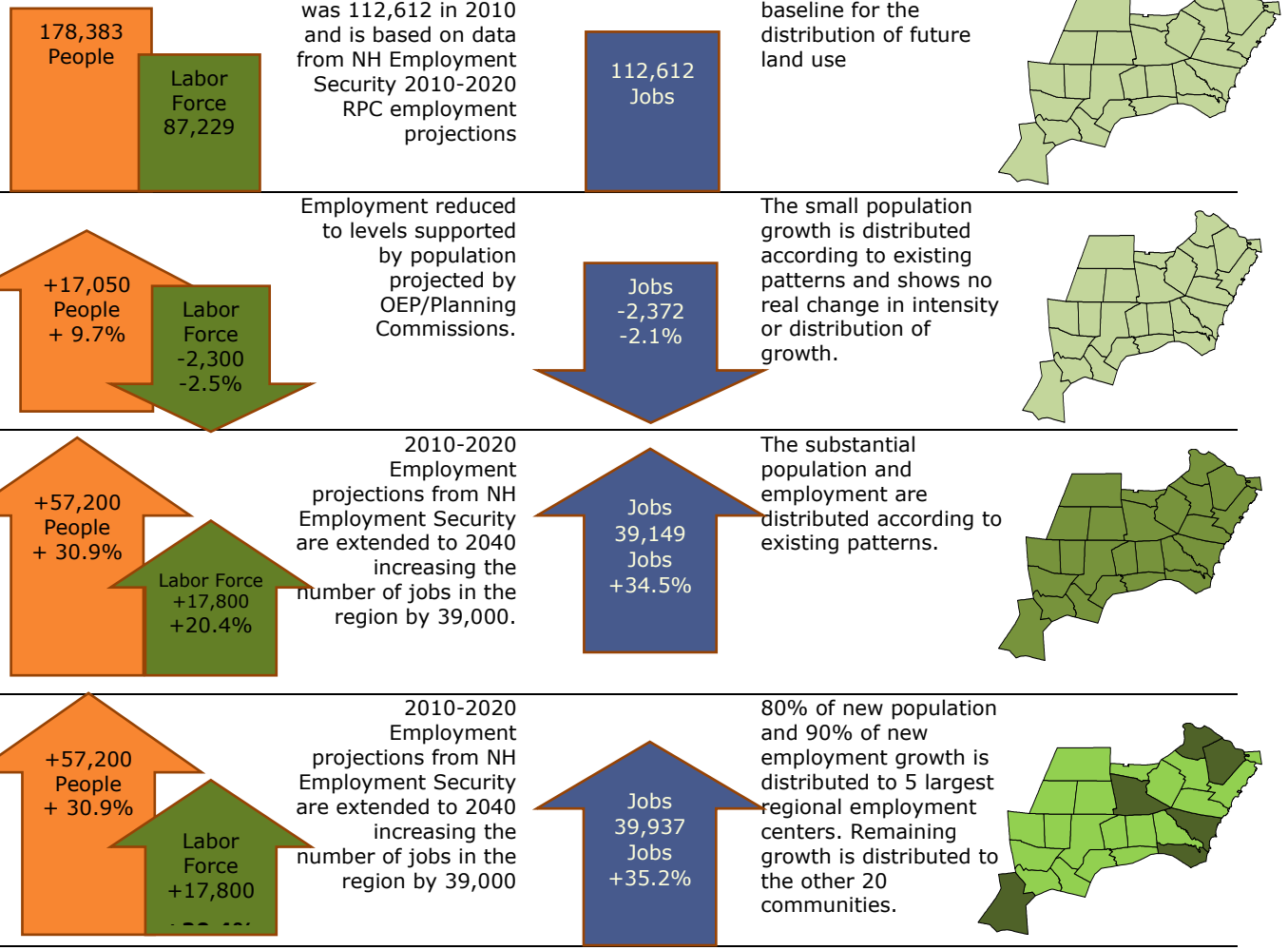
## New Hampshire Econometric Model

An impact analysis was conducted using the Economic and Labor Market Information Bureau's New Hampshire Econometric Model – A Regional Economic Models Inc. (REMI) Policy Insight+ software model. This is a structured economic forecasting and analysis tool that utilizes economic, demographic, and policy data and statistics to describe economic behavior and change. In this case, the model was utilized to estimate the impacts on gross domestic product, personal income, population, and secondary job loss related to differing levels of future employment in the region.

This analysis began with the assumption that the employment projections for 2020 generated by NH Employment Security and extended to 2040 by the RPC are the default. The alternative scenario examined is assessing the economic impact of not being able to fill the *projected demand* for workers at that level of employment in the region. This scenario estimates the value of 21,500 jobs, which is equivalent to the region being unable to meet the future demand for workers from the regional labor force. This employment gap can be alleviated by improving the transportation system in order to enhance commuting from outside the region however that analysis is not being considered as a scenario at this time. By showing the economic value of sustaining 21,500 jobs within the region, the return on investment that an average job generates in the local economy can be assessed in the context of what public investment in infrastructure and housing generates, with the goal of alleviating a future shortage of available local labor.

## Figure SP3: Summary of 2040 Scenario Attributes

| Scenario | Population | Employment | Distribution |
|---|---|---|---|
| Baseline | Population from 2010 Census. Labor Force calculated from Quarterly Employment and Wages data as well as age and gender 5 year cohorts from the Census. | Regional employment was 112,612 in 2010 and is based on data from NH Employment Security 2010-2020 RPC employment projections | The figure shows the baseline for the distribution of future land use |
| Slow Growth | The OEP/RPC population projection is utilized in this scenario leading to a small increase in population. Demographic changes lead to a slight shrinking of the labor force. | Employment reduced to levels supported by population projected by OEP/Planning Commissions. | The small population growth is distributed according to existing patterns and shows no real change in intensity or distribution of growth. |
| Strong, Dispersed Growth | Population is increased to levels that support NH Department of Employment Security based Employment Projection. This adds about 57,000 people to the region by 2040 and almost 18,000 to the labor force. | 2010-2020 Employment projections from NH Employment Security are extended to 2040 increasing the number of jobs in the region by 39,000. | The substantial population and employment are distributed according to existing patterns. |
| Strong, Concentrated Growth | Population is increased to levels that support NH Department of Employment Security based Employment Projection. This adds about 57,000 people to the region by 2040 and almost 18,000 to the labor force | 2010-2020 Employment projections from NH Employment Security are extended to 2040 increasing the number of jobs in the region by 39,000 | 80% of new population and 90% of new employment growth is distributed to 5 largest regional employment centers. Remaining growth is distributed to the other 20 communities. |



These 21,500 jobs were reduced from the REMI employment baseline in Rockingham County and distributed across industries based on the employment shares in the Rockingham Planning Commission Region using annual average covered employment data for 2013 (NH Employment Security, 2014). The covered employment data were adjusted to correspond to the REMI model's NAICS-based industry categories. NAICS is the North American Industry Classification System, used to classify business establishments according to type of economic activity (process of production) in Canada, Mexico and the United States. An establishment is typically a single physical location, though administratively distinct operations at a single location may be treated as distinct establishments. Each establishment is classified to an industry according to the primary business activity taking place there.

## Regional Travel Demand Model

The RPC uses a four step Transportation Model based on TransCad and utilizes a set of macros and routines prepared by Resource Systems Group to tailor the process to the region. The region is organized into more than 500 Traffic Analysis Zones (TAZ) into which land use inputs (employment and housing) are allocated. This is essentially loading each TAZ with housing units organized by size and number of vehicles available, and employment organized into 19 industry groupings. Spreadsheet models are utilized to derive community and TAZ housing and employment totals based on information from the Census Bureau, the Office of Energy and Planning (OEP), New Hampshire Employment Security, and the Bureau of Labor Statistics. This information then forms the basis for trip productions and attractions (population produces trips, jobs attract them) in the travel demand model and are used to generate traffic volumes, travel times, trip distances, and patterns based on the land use activity. Outputs of the model include overall numbers of trips by trip type, peak hour volume, and delay statistics, total vehicle miles of travel, congestion statistics for different types of roadways, number of non-motorized trips, and other data.

# Model Analyses and Results

The results of each analysis are included below with some basic conclusions reached regarding the impacts of different amounts and distribution of growth on the region over the next 30 years.

## Regional Buildout Results

The analysis of available land in the region leads to the conclusion that, given existing zoning restrictions and without considering the additional land made available through redevelopment of existing parcels, there is space for approximately 51,300 new housing units, defined as houses, apartments, and mobile homes intended as individual living quarters, in the region. The region currently has approximately 65,500 units and is built out to approximately 56 percent of capacity. Depending on the future scenario, the percent of residential land built on will increase to between 61 percent (slow growth scenario) and 74 percent (strong growth scenarios) in both the dispersed and concentrated patterns. In both strong growth scenarios there are communities that approach and exceed the calculated limit of housing units that are potentially available. However, the model does not account for the ability to redevelop properties at higher densities. Map SP5 shows the current level of buildout in the RPC, while map SP6 shows the remaining land suitable to build.

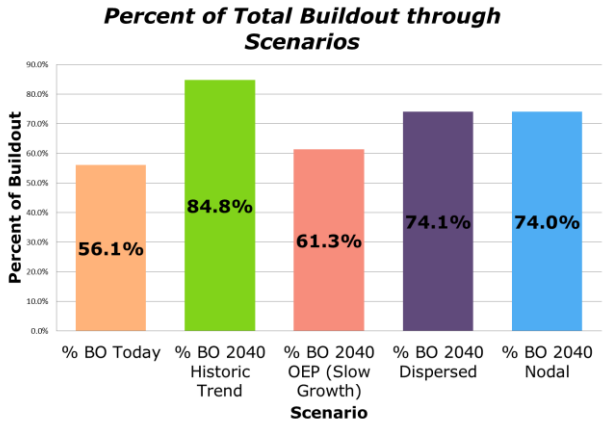



*Figure SP4: Percentage Buildout under each Scenario*

## New Hampshire Econometric Model Results

The following summarizes the results of an assessment of the value of 21,500 jobs in the RPC region. The full analysis conducted by NH Employment Security is documented as ***Appendix B*** and provides additional information about the assumptions and results from the New Hampshire Econometric Model. The analysis discusses the impacts of both direct job growth as well as the secondary (indirect and induced) jobs dependent on the presence of the approximately 21,500 jobs in the region that differentiate the slow and strong growth scenarios. It is important to note that while the *future employment gap* is being modeled by removing 21,500 jobs from the REMI model baseline, the results are expressed in positive terms of value added to the region. Applying statistical analysis to a model of the regional economy indicates that:

- In 2015, total impact in the RPC region would be 827 fewer jobs, including direct, indirect and induced employment. By 2040, the total value of 21,500 jobs left unfilled (in other words, not meeting the future employment gap) would be 34,972 direct, indirect and induced jobs.

- In 2015, the total value of the jobs to the local economy expressed in terms of Gross Domestic Product (GDP) would be $91.7 million (in fixed 2005 dollars). This impact would grow over time and by 2040, GDP in the region would be impacted by $4.2 billion (in fixed 2005 dollars).

- The economic activity created by the 827 jobs would account for 0.6 percent of total GDP in RPC in 2015. By 2040, the value of the 21,500 jobs would represent 14.0 percent of the region's GDP.

- The impact of the 827 jobs on total real personal income would be $40 million (in fixed 2005 dollars) in 2015. By 2040, the full impact on total real personal income from not meeting the future demand for 21,500 workers would have grown to $2.5 billion (in fixed 2005 dollars).
- In 2015, 827 direct jobs sustain 201 persons in the region's population. In 2040, the 21,500 jobs would directly or indirectly sustain the region's population with close to 35,000 persons, representing 8.6 percent of the projected population baseline for the county.

## Regional Travel Demand Model Results

The future growth scenarios have been analyzed utilizing the regional travel demand model and the results are available showing the impacts of growth and development patterns on travel in the region. There are a number of factors to consider when looking at the results and the most important are the following:

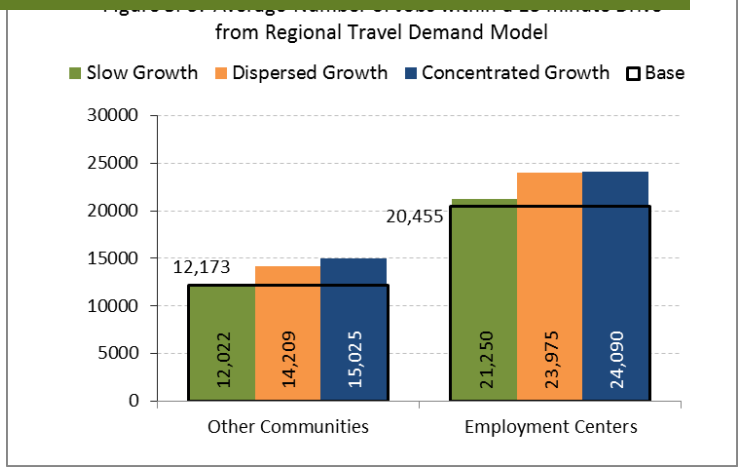
1. Shifts in employment or population distribution are only accounted for at the community level. Land use is allocated to each community and then derived to the zone level based on historic amounts of housing and employment.

2. The Transit Network is not changed for the future year analysis, which limits the shift of trips from cars to transit to only locations where it is currently available. Future analyses will attempt to modify the transit network and estimate viability of expanded systems.

3. The percentage of non-motorized trips is held constant and the values for 2010 are utilized in all scenarios. This likely under-reports the number of non-motorized trips in high density areas, especially in the concentrated growth scenario.

Given the caveats, there is still information that can be extracted based on the various scenarios. ***Tables SP2, SP3***, and Figure SP5 detail the land use and transportation measures that have been examined and the differences between the 2010 baseline and the three different future year scenarios. The differences between the Dispersed and Concentrated growth patterns is particularly interesting as it indicates that growth in a more concentrated manner will have transportation benefits for the region.

**Table SP2: Population and Employment Statistics from the Four Scenarios**




### Land Use and Employment

The land use related outputs from the travel demand model show much that would be expected and at least one counter-intuitive outcome as well. As expected, the slow growth scenario has the lowest population and employment levels and due to the net loss of employment over the 30 years, has a lower employment density than the 2010 baseline. This scenario des result in further distribution of the population to more rural areas of the region but the overall population change is very small. Also as expected, the concentrated growth pattern shows the highest population and employment densities for the employment centers while the dispersed pattern shows the highest densities for all other communities.

An unexpected outcome from this analysis is the indication that the concentrated growth pattern locates more jobs within a 15 minute drive of more people and communities in the region than the dispersed pattern. While the dispersed growth scenario places a greater number of jobs directly into more communities, the concentrated pattern produces a higher regional average for employment available within that 15 minute commute. ***Figure SP5*** indicates that the Slow Growth scenario has a slightly higher employment accessibility than the 2010 baseline overall for the regional employment centers but that other communities see a slight drop in the number of jobs available close by. The dispersed growth scenario shows increased accessibility for both centers and other communities over the baseline. The concentrated growth pattern shows the greatest employment accessibility for both the employment centers and the other communities however the difference is most striking for the other communities who see a much greater increase than the centers. ***Figure SP6*** takes this analysis to the individual community level and indicates that under almost all communities see employment gains over the baseline in the concentrated development scenario while most communities see a loss under the slow growth scenario compared to 2010 values. The dispersed growth scenario also shows employment accessibility gains however they tend to be somewhat less than those seen in the concentrated growth scenario in most cases.

### Transportation Impacts

The transportation related outputs from the scenario models are shown in ***Table SP3*** as well as in ***Maps SP1 through SP4 l***ocated at the end of this document. The data in ***Table SP3*** points to increased travel times and distances for all growth scenarios over the current baseline condition. Some of the interesting data from this comparison are:

- The slow growth scenario has the longest work trip distances and times, followed by the dispersed growth scenario. The Concentrated development pattern, capitalizes on both the focus of employment and housing as well as the geographic distribution of the employment centers to produce the shortest work trips.
- The dispersed development pattern produces the longest shopping trips in both time and distance.
- The concentrated development pattern produces the shortest "Other" trips (recreational for instance) as well as trips that are not home based (such as from work to a restaurant). This indicates that this type of growth configuration places destinations in closer proximity to origination points than other patterns.
- The slow growth pattern produces the least increase in Vehicle Miles of Travel (VMT) and the lowest VMT per capita of all scenarios. This is likely due to the reduced level of activity in the region from the small population increase and decrease in the work force and employment.

| Measure | 2010 Baseline | Low Growth | Dispersed Growth | Concentrated Growth |
|---|---|---|---|---|
| *Population* | *176,241* | *193,291* | *233,442* | *233,442* |
| Population in Regional Employment Centers | 87,257 | 92,811 | 112,784 | 132,878 |
| Population in All Other Communities | 88,984 | 100,480 | 120,658 | 100,565 |
| *Percent Pop in Regional Centers/All Other Communities* | *49.5%/50.5%* | *48.0%/52.0%* | *48.3%/51.7%* | *59.9%/43.1%* |
| *Population Density (persons/mi$^2$)* | *489.1* | *536.4* | *647.8* | *647.8* |
| Population Density in Regional Centers | 882.5 | 938.6 | 1,140.6 | 1,343.9 |
| Population Density in All Other Communities | 340.3 | 384.3 | 461.4 | 384.6 |
| *Housing Units (estimated based on persons/household)* | *71,926* | *78,594* | *94,992* | *96,327* |
| Housing Density in Regional Centers (units/acre) | 6.4 | 6.8 | 8.3 | 9.8 |
| Housing Density in All Other Communities (units/acre) | 2.15 | 2.4 | 2.9 | 2.4 |
| *Employment* | *113,393* | *111,021* | *152,542* | *153,330* |
| Employment in Regional Employment Centers | 83,915 | 82,214 | 112,919 | 120,152 |
| Employment in All Other Communities | 29,478 | 28,807 | 39,623 | 33,178 |
| *Percent Employment in Regional Centers/All Other Communities* | *74.0%/26.0%* | *74.1%/25.9%* | *74.0%/26.0%* | *78.4%/21.6%* |
| *Employment Density (employees/mi$^2$)* | *314.7* | *308.1* | *423.3* | *423.3* |
| Employment Density in Regional Employment Centers | 848.7 | 831.5 | 1142.0 | 1215.2 |
| Employment Density in All Other Communities | 112.7 | 110.2 | 151.5 | 126.9 |
| *Labor Force* | *87,229* | *85,402* | *105,037* | *105,037* |
| Average Employment within 15 minute auto commute | 14,084 | 14,152 | 16,463 | 17,117 |
| Regional Employment Centers | 20,455 | 21,250 | 23,975 | 24,090 |
| All other Communities | 12,173 | 12,022 | 14,209 | 15,025 |

- Strong growth will increase traffic over the volumes seen today and result in moderate increases in travel times in most cases. Aggregate delay, or total delay experienced by all drivers during peak travel times will increase significantly.

Overall, results indicate that the concentrated development pattern provides significant efficiency gains compared to the dispersed pattern. Shorter automobile trip lengths and times are seen for all trip purposes when compared to the dispersed development scenario indicating that more desired destinations are closer to where people live when land use is more concentrated into urban centers. Vehicle Miles of Travel statistics help to support that notion, as travel under congested conditions is decreased both in volume and in hours of delay during both the morning and evening peak periods when comparing the concentrated pattern to the dispersed pattern.

The Maps showing congestion on the regional roadways indicate that despite efficiency gains, the concentrated growth pattern does not significantly change the location or magnitude of congestion compared to the dispersed development pattern. ***Map SP1*** shows the baseline conditions of congestion during the AM

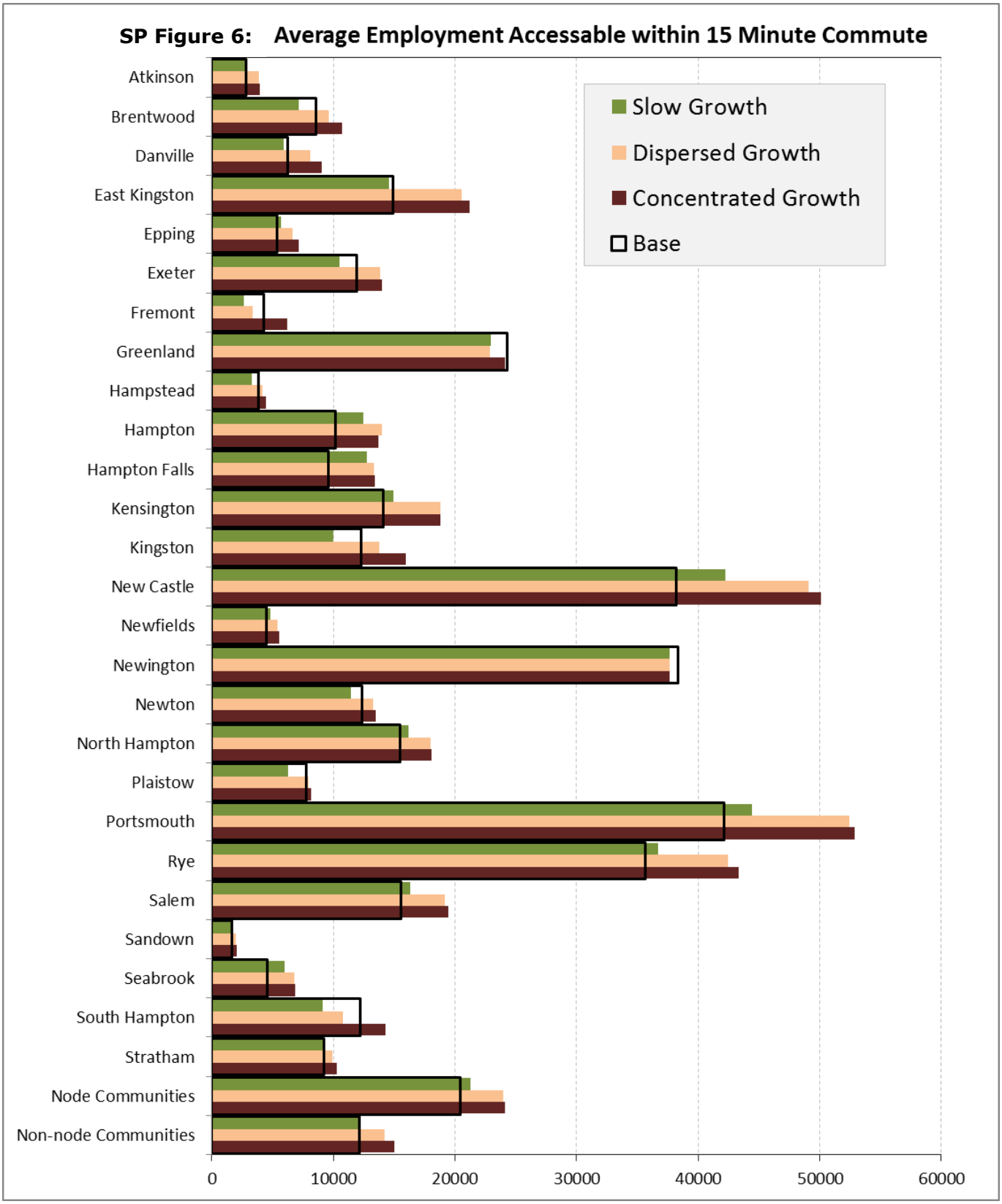
and PM peak periods in the region and this was discussed in the Transportation Chapter as well. ***Map SP2***, ***SP3, and SP4*** show the modelled 2040 condition for the slow growth, dispersed growth, and concentrated growth scenarios respectively and each of those shows an increase in congested driving over what is being experienced currently. ***Map SP2*** shows increased congested roadways during the AM peak period and specifically on NH 125, NH 11 and other roadways in the central and western portion of the region. ***Map SP3*** indicates greater impact during the PM peak period and shows a jump in traffic on the roadways in Map SP2 as well as I-95, US Route 1, and NH 108 in the eastern portion of the region. ***Map SP4*** shows very similar impacts as Map SP3 with slightly less impact on NH 111 and NH 125, especially during the AM peak.

The differences between the growth scenarios in terms of impacts on congestion may be understated as the model currently relies on static transit routes and proportions of non-motorized trips. Further efforts in scenario planning will investigate the impacts of additional transit routes and increased non-motorized trip percentages for more densely settled areas.

**Table SP3: Transportation Network Statistics from the Four Scenarios**

| Measure | 2010 Baseline | 2040 Slow Growth | *Change from 2010* | 2040 Dispersed Growth | *Change from 2010* | 2040 Nodal Growth | *Change from 2010* | *Nodal vs. Dispersed Growth*[1] |
|---|---|---|---|---|---|---|---|---|
| Daily Vehicle Miles of Travel (VMT) | 6,374,567 | 6,681,490 | *4.8%* | 8,590,876 | *34.8%* | 8,525,502 | *33.7%* | *-0.8%* |
| Per Capita VMT | 36.2 | 34.6 | *-4.4%* | 36.8 | *1.7%* | 36.5 | *1.0%* | *-0.8%* |
| Home-Work Ave Trip Time (min) | 28.4 | 34.6 | *22.1%* | 32.9 | *16.1%* | 31.0 | *9.1%* | *-5.8%* |
| Home-Work Trip Ave Length (mi) | 11.8 | 12.6 | *6.8%* | 12.0 | *1.6%* | 11.7 | *-0.9%* | *-2.5%* |
| Home-Shopping Trip Time | 14.2 | 15.2 | *6.7%* | 17.2 | *20.7%* | 15.9 | *12.1%* | *-7.6%* |
| Home-Shopping Ave Length | 5.7 | 5.7 | *-0.2%* | 6.1 | *7.4%* | 5.8 | *3.0%* | *-4.9%* |
| Home-Other Ave Time | 13.8 | 18.0 | *30.2%* | 17.8 | *29.3%* | 16.2 | *17.1%* | *-9.0%* |
| Home-Other Ave Length | 5.9 | 6.6 | *11.9%* | 6.5 | *9.6%* | 6.1 | *3.4%* | *-6.2%* |
| Non-Home Based Ave Trip Time | 8.1 | 9.1 | *11.2%* | 8.7 | *6.3%* | 8.3 | *1.8%* | *-4.6%* |
| Non-Home Based Ave Length | 3.9 | 4.0 | *2.6%* | 3.8 | *-2.3%* | 3.7 | *-5.4%* | *-2.6%* |
| AM VMT | 497,610 | 520,026 | *8.4%* | 665,645 | *38.8%* | 658,755 | *37.4%* | *-1.0%* |
| AM VMT with V/C>.80 | 118,110 | 156,523 | *32.5%* | 283,056 | *139.7%* | 278,207 | *135.5%* | *-1.7%* |
| AM VMT with V/C>1.2 | 50,393 | 56,271 | *11.7%* | 129,199 | *156.4%* | 119,010 | *136.2%* | *-7.9%* |
| AM Delay (hours) | 14,504 | 16,294 | *12.3%* | 51,167 | *252.8%* | 49,680 | *242.5%* | *-2.9%* |
| PM VMT | 631,378 | 666,551 | *5.6%* | 894,408 | *41.7%* | 889,937 | *41.0%* | *-0.5%* |
| PM VMT with V/C>.8 | 294,579 | 304,753 | *3.5%* | 296,056 | *0.5%* | 292,040 | *-0.9%* | *-1.4%* |
| PM VMT with V/C>1.2 | 91,664 | 99,116 | *8.1%* | 405,992 | *342.9%* | 396,909 | *333.0%* | *-2.2%* |
| PM Delay (hours) | 24,490 | 25,247 | *3.1%* | 107,094 | *337.3%* | 105,970 | *332.7%* | *-1.0%* |

**SP Figure 6: Average Employment Accessable within 15 Minute Commute**



## Support of the Regional Vision and Goals

As this exercise is intended to examine how policies and development patterns impact the future of the region, the support of the regional vision and goals can be looked at as an outcome of the different scenarios. Instead of looking at individual policy and action recommendations however we look at what each scenario does in relation to the regional vision and goals. ***Table SP4*** provides a matrix showing how each scenario relates to the Livability Principles and ***Table SP5*** relates the scenarios to different aspects of the regional goals. The strong, concentrated growth scenario shows the most consistent support for each while the slow growth scenario shows the least.

**The Slow Growth scenario** implies a "status quo" situation with stagnant employment and very slow population growth. It helps to maintain the traditional settlement pattern and high quality natural environment by minimizing new growth and development. At the same time, this also seems to indicate a region that might be economically stagnant which will suppress the opportunities for greater housing and transportation choices. The unchanged settlement pattern does little to reduce risk for climate related disasters and does not indicate that energy would be conserved more than today however, because of the very small amount of growth, it doesn't make them any worse either.

**The Dispersed Growth scenario** expects strong employment and population growth which helps to support economic vitality however the continuation of a sprawling development pattern challenges traditional settlement patterns, transportation choices, the quality of natural resources, and does not aid in reducing natural hazards risks or improve energy efficiency. Community character is partially supported in that the dispersed growth places pressure on smaller communities, but is not so great as to transform any community into something different than it is now.

**Table SP4 - Scenarios in Relation to New Hampshire Livability Principles**

| | New Hampshire Livability Principles | | | | | |
|---|---|---|---|---|---|---|
| Scenario | Traditional Settlement Patterns & Development Design | Housing Choices | Transportation Choices | Natural Resources Function and Quality | Community and Economic Vitality | Climate Change and Energy Efficiency |
| Slow Growth | P | P | TBD | P | TBD | P |
| Strong, Dispersed Growth | P | P | TBD | P | S | P |
| Strong, Concentrated Growth | S | S | S | S | S | P |

S = Scenario supports the NH Livability Principle
P = Scenario partially supports NH Livability Principle
TBD = Scenario applicability to support the NH Livability Principle is not yet known
N/A = Scenario does not apply to the NH Livability Principle.

**The Concentrated Growth scenario** is similar to the dispersed growth scenario, in that this alternative supports economic vitality. However, the more focused development pattern supports maintaining community character more fully as well as maintaining the natural resources in the region by keeping most development in already urbanized areas. Each community grows in population and employment and overall access to employment is improved and traffic congestion and delay reduced. The more concentrated pattern supports transportation choices by enabling more trips to be made by foot or bicycle as well as providing a basis for expanded transit. Additional housing in urbanized areas provides more opportunity for housing choice, the ability to live close to where you work which in turn all aids in improving energy efficiency.

**Table SP5– Scenarios in Relation to the Regional Goal**

| Scenario | Creates a high quality built environment while protecting important natural and cultural resources. | Promotes positive effects of development and minimizes adverse impacts. | Promotes economic opportunities and community vitality. | Enhances the coordination of planning between land use, transportation, housing and natural resources. | Considers and incorporates climate change into local and regional planning efforts |
|---|---|---|---|---|---|
| Slow Growth | P | P | TBD | P | P |
| Strong, Dispersed Growth | S | P | P | P | P |
| Strong, Concentrated Growth | S | S | S | S | S |

S = Scenario supports the Regional Goal
P = Scenario partially supports the Regional Goal
TBD = Scenario applicability to support the Regional Goal is not yet known
N/A = Scenario does not apply to the regional goal.

## Conclusions

This scenario planning exercise is an initial effort at looking at potential regional futures and is intended to provide a structure through which needs can be identified and options explored. It is not intended to cover all possible outcomes or to select a desired alternative. Instead, this should be used as a tool to inform policy decisions at the local and regional levels and to consider how the amount and location of development in the region impacts the transportation system, housing and employment needs, as well as environmental resources. That being said, there are some conclusions that can be drawn from this effort.

In most measures, the "low growth" scenario produces the smallest impacts on the transportation system with the lowest delay and amounts of congestion. However, the economic implications of that scenario would also indicate that it is not a desired future for the region. Some of those impacts by 2040 are:

- Overall lower employment than 2010
- Smaller work force than in 2010.
- The NH Econometric model suggests that there would be $4.2 billion per year less in the regional economy due to the smaller amount of employment in the region compared to the higher growth scenarios.
- $2.5 billion less in personal income in the region.
- Fewer jobs within a 15 minute commute than exists now in many communities.

The two scenarios that measure substantial growth were not compared directly in the econometric model as it looks at the level of economic activity at a regional level and not the geographic distribution within the region. However, the concentrated population and employment pattern results in the best outcomes in terms of efficient use of land and the transportation system as modelled in the Regional Buildout and the Regional Travel Demand Model.

- The concentrated development scenario fits generally within densities and development levels allowed by current zoning standards in the region.
- The concentrated development scenario produces population and population densities in both the regional employment centers and in all other communities that are higher than they are today.

- The concentrated development scenario shows modest growth in the more rural communities which allows them to better maintain their character without sacrificing economic growth.
- Focusing 90 percent of all new employment into the five employment centers increases the share of regional employment that those areas have by only four percent (74 to 78 percent).
- Focusing 80 percent of the new residential growth to the employment centers substantially increases the share of population that those communities have from 49.5 percent to almost 60 percent. This may have further benefits for the region from expanded services and economies of scale.
- Benefits of concentrated employment and housing as compared to a dispersed growth pattern:
    - Less Vehicle Miles of Travel overall.
    - Decreased Vehicle Miles of Travel on a per capita basis
    - Shorter trips of all purposes in both time and distance
    - Increased numbers of non-motorized trips
    - Less congestion and delay during peak hours

Future efforts will look to refine the tools available for the region, primarily the buildout model and regional travel demand model, to enable a more complete understanding of what different alternative growth scenarios imply for change. An expanded set of metrics will be utilized to better translate the results of the models into applicable measures and a more dynamic land use allocation modelling effort will be undertaken.

# References

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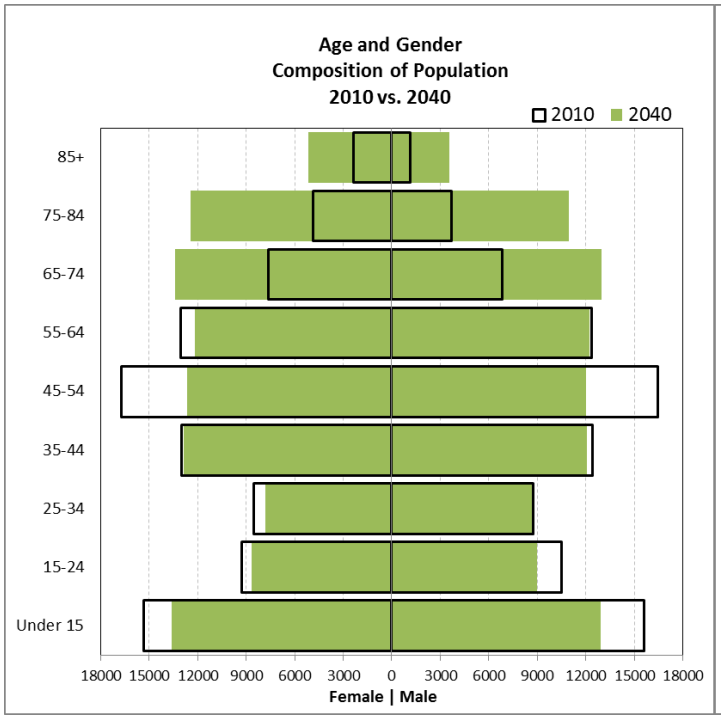
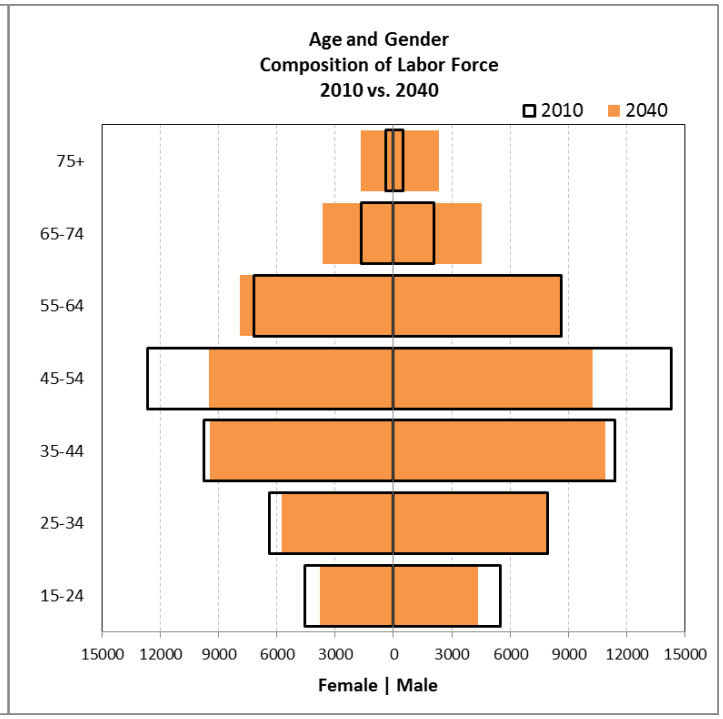
# Appendix A

**Labor Force Calculation**

Labor force, the people in a region 16 and older who are working or are willing to work, is calculated based on age and gender cohort distribution of the population as delineated in the 2010 Census and as projected by the OEP/RPC 2040 Population Projections. Labor force participation rates developed by the Bureau of Labor Statistics and projected rates for 2022 as shown in the table below are applied to the population to determine the number of workers in the region. BLS is projecting that overall participation in the labor force will continue to decline for younger workers as well as those in prime age groups. At the same time, older worker participation is projected to increase but still remain substantially lower than the prime age groups. For the purposes of this analysis, BLS participation rates were utilized for the future year analysis.




*Comparing the age and gender distribution for 2010 (black outline) with the projected age and gender distribution in 2040 (shaded bars). Much larger groups of citizens aged 60+ are anticipated.*




*Comparing the composition of the labor force in 2010 to that projected for 2040. There is a marked growth in the number of workers older than 65 but this is offset by smaller younger cohorts in the 15-29 years and 45-54 for a smaller total workforce in 2040 (90,500 vs 92,800 in 2010)*

**Labor Force Distribution**

Utilizing the Journey to Work data developed from the American Community Survey (ACS), the distribution of the labor force to jobs inside and outside the region was derived. The ACS data is a 5 year sample set (2006-2010) and is aggregated to determine the percent of workers from each community that are employed within their community, within the RPC region, in other areas of New Hampshire, within the States of Massachusetts and Maine, and any other areas outside of those

follow are

**Labor Force Participation Rates by Age/Gender Cohort**

| | Female | | | | | | | Male | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
| 15 to 19 years | 0.350 | 0.346 | 0.267 | 0.267 | 0.267 | 0.267 | 0.267 | 0.349 | 0.340 | 0.278 | 0.278 | 0.278 | 0.278 | 0.278 |
| 20 to 24 years | 0.683 | 0.674 | 0.647 | 0.647 | 0.647 | 0.647 | 0.647 | 0.745 | 0.745 | 0.699 | 0.699 | 0.699 | 0.699 | 0.699 |
| 25 to 29 years | 0.747 | 0.741 | 0.734 | 0.734 | 0.734 | 0.734 | 0.734 | 0.903 | 0.895 | 0.888 | 0.888 | 0.888 | 0.888 | 0.888 |
| 30 to 34 years | 0.747 | 0.741 | 0.734 | 0.734 | 0.734 | 0.734 | 0.734 | 0.903 | 0.895 | 0.888 | 0.888 | 0.888 | 0.888 | 0.888 |
| 35 to 39 years | 0.752 | 0.748 | 0.733 | 0.733 | 0.733 | 0.733 | 0.733 | 0.915 | 0.907 | 0.904 | 0.904 | 0.904 | 0.904 | 0.904 |
| 40 to 44 years | 0.752 | 0.748 | 0.733 | 0.733 | 0.733 | 0.733 | 0.733 | 0.915 | 0.907 | 0.904 | 0.904 | 0.904 | 0.904 | 0.904 |
| 45 to 49 years | 0.757 | 0.747 | 0.749 | 0.749 | 0.749 | 0.749 | 0.749 | 0.868 | 0.861 | 0.851 | 0.851 | 0.851 | 0.851 | 0.851 |
| 50 to 54 years | 0.757 | 0.747 | 0.749 | 0.749 | 0.749 | 0.749 | 0.749 | 0.868 | 0.861 | 0.851 | 0.851 | 0.851 | 0.851 | 0.851 |
| 55 to 59 years | 0.584 | 0.673 | 0.733 | 0.733 | 0.733 | 0.733 | 0.733 | 0.785 | 0.780 | 0.778 | 0.778 | 0.778 | 0.778 | 0.778 |
| 60 to 64 years | 0.507 | 0.504 | 0.556 | 0.556 | 0.556 | 0.556 | 0.556 | 0.600 | 0.605 | 0.643 | 0.643 | 0.643 | 0.643 | 0.643 |
| 65 to 69 years | 0.270 | 0.276 | 0.354 | 0.354 | 0.354 | 0.354 | 0.354 | 0.365 | 0.371 | 0.416 | 0.416 | 0.416 | 0.416 | 0.416 |
| 70 to 74 years | 0.147 | 0.154 | 0.198 | 0.198 | 0.198 | 0.198 | 0.198 | 0.220 | 0.242 | 0.288 | 0.288 | 0.288 | 0.288 | 0.288 |
| 75 to 79 years | 0.053 | 0.079 | 0.116 | 0.116 | 0.116 | 0.116 | 0.116 | 0.104 | 0.159 | 0.190 | 0.190 | 0.190 | 0.190 | 0.190 |
| 80 to 84 years | 0.053 | 0.050 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.104 | 0.113 | 0.139 | 0.139 | 0.139 | 0.139 | 0.139 |
| 85 years + | 0.053 | 0.050 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.104 | 0.113 | 0.139 | 0.139 | 0.139 | 0.139 | 0.139 |

Source: Bureau of Labor Statistics 2010 Labor Force Participation Rates and Projections for 2022. 2022 values extended to 2040.
http://www.bls.gov/opub/mlr/2013/article/labor-force-projections-to-2022-the-labor-force-participation-rate-continues-to-fall.htm

categories. The assumptions that that:

1. 55.4 percent of the current employed labor force works within the region while the remaining 44.6 percent commute to other parts of New Hampshire, Maine, Massachusetts, and elsewhere. This translates to approximately 48,000 resident workers staying within the region and about 39,000 residents that commute elsewhere.

**Population, Labor Force, and Employment Calculations for Strong Growth Scenarios**

| | 2010 | 2020 | 2030 | 2040 |
|---|---|---|---|---|
| Projected Employment (Employment Security Rate) | 112,612 | 125,054 | 139,279 | 155,981 |
| Labor Force from within region | 48,358 | 49,779 | 48,549 | 47,347 |
| Commuting into region at current rate (57%) | 64,254 | 71,353 | 79,470 | 88,999 |
| Gap in Labor Force | - | 3,922 | 11,260 | 19,635 |
| Additional RPC Residents to fill labor force gap | - | 8,020 | 23,027 | 40,154 |
| Resident labor Force to fill growth in jobs | 48,358 | 53,701 | 59,809 | 66,982 |
| Projected Population w/ Add. Growth | 178,383 | 192,666 | 215,013 | 233,444 |
| Employment supported by low growth | 112,612 | 115,921 | 113,057 | 110,258 |

| | | | | |
|---|---|---|---|---|
| Commuters with Low Growth | 64,254 | 66,142 | 64,508 | 62,911 |

2. The workers living within the region fill approximately 43 percent of the jobs available in the region. The rest are employees that live outside of the RPC region and currently comprise approximately 64,250 individuals from New Hampshire, Maine, Massachusetts and other areas.
3. For the purpose of this analysis, the rate of commuting into the region is being held constant at the current value of 57 percent. Holding that rate constant identifies the number of jobs that can be filled by the labor force residing in the region, assuming that it is large enough to do so.
4. Holding the population projections constant and adjusting the employment levels to what can be supported by the 57 percent of workers commuting into the region plus the 43 percent of workers that reside in the region creates the "slow growth" scenario. This shows a substantially different region with some
5. population employment when the labor in size to the there is less was in 2010.
6. The projections larger labor by the

**Population, Labor Force, and Employment Calculations for Low Growth Scenario**

| | 2010 | 2020 | 2030 | 2040 |
|---|---|---|---|---|
| Projected Population (OEP) | 178,383 | 184,646 | 191,986 | 193,290 |
| Estimated Employed Labor Force | 87,229 | 89,876 | 87,647 | 85,402 |
| Labor Force living and working in Region at current rate (55% of regional labor force & 43% of employment | 48,358 | 49,779 | 48,549 | 47,347 |
| Commuters with slow growth (57% of employment) | 64,254 | 66,142 | 64,508 | 62,911 |
| Employment supported by low growth | 112,612 | 115,921 | 113,057 | 110,258 |

growth and growth until 2020 force begins to decline point where in 2040 employment than there

employment indicate the need for a force than anticipated population projections.

Once the number of employees needed is identified, the population growth necessary to support a work force of that size is calculated. Given existing population and employment, there are slightly over 2 persons in the region for each member of the labor force. Applying this value to the gap in the labor force identifies the increased population necessary to support the number of jobs and to maintain the 43 percent of regional employment filled by residents.

7. Under both future year growth scenarios, Pease Tradeport will be built out to full employment. Current employment is approximately 8,300 employees and with limited land remaining for commercial development, the Pease Development Authority estimates that buildout under current land use will result in approximately 11,300 employees. In the slow growth scenario, employment is expected to drop slightly similar to the remainder of the RPC region.

**Buildout Inputs**

The outputs of the Buildout are only as accurate as the inputs. While GIS affords the user the ability to zoom in to site level or even more refined we have to remember that the input data is often created at a regional scale. This means the most refined we should look at outputs is at the town level. The base input to this Buildout is 2010 land use data, not parcels. This Buildout does not look at or consider redevelopment, if a lot is developed in 2010, it will remain developed to that same level into the future. The actual locations of future development from this Buildout are approximate; they will be located in the correct zoning district and in accord to zoning setbacks and dimensional requirements. From a modeling perspective, Communities in our region over-zone for non-residential, this leads to very unrealistic approximations of those uses.

**Data Inputs:**

- Land-use (RPC - 2010)
- Zoning (RPC -2011)
- 2010 Building locations (RPC – 2010)
- Roads (NHDOT -2011)
- Soils and slopes (NH Natural Resource Conservation Service)
- Conservation lands (GRANIT 2012)
- National wetlands inventory (US Fish and Wildlife)
- Hydric A soil set (NH NRCS)
- Well-head protection areas (NH DES)

| | Existing HU | New Dwelling Units @ BO | Total Units @ BO | % BO Today | Historic Annual Growth Rate[1] | Historic BO Year | Units @ 2040 Based on Historic BO | Total Units @2040 Slow | Total Units @ 2040 Dispersed | Total Units @ 2040 Nodal |
|---|---|---|---|---|---|---|---|---|---|---|
| Atkinson | 2616 | 875 | 3491 | 74.94% | 1.44% | 2030 | 3491 | 2919 | 3508 | 2934 |
| Brentwood | 1154 | 1651 | 2805 | 41.14% | 2.72% | 2043 | 2583 | 1755 | 2047 | 1457 |
| Danville | 1492 | 1570 | 3062 | 48.73% | 4.09% | 2028 | 3062 | 1664 | 1999 | 1675 |
| East Kingston | 850 | 1343 | 2193 | 38.76% | 2.47% | 2049 | 1765 | 1105 | 1296 | 954 |
| Epping | 2035 | 3707 | 5742 | 35.44% | 2.08% | 2060 | 3771 | 2416 | 2874 | 2284 |
| Exeter | 4317 | 2927 | 7244 | 59.59% | 0.87% | 2070 | 5602 | 4591 | 5586 | 6636 |
| Fremont | 1377 | 2392 | 3769 | 36.53% | 3.97% | 2036 | 3769 | 1707 | 2020 | 1561 |
| Greenland | 1259 | 1865 | 3124 | 40.30% | 1.72% | 2063 | 2099 | 1433 | 1718 | 1423 |
| Hampstead | 3055 | 2282 | 5337 | 57.24% | 2.74% | 2031 | 5337 | 3205 | 3893 | 3429 |
| Hampton | 6622 | 2821 | 9443 | 70.13% | 1.19% | 2040 | 9451 | 6861 | 8373 | 10084 |
| Hampton Falls | 791 | 1276 | 2067 | 38.27% | 1.64% | 2069 | 1289 | 954 | 1132 | 889 |
| Kensington | 731 | 1526 | 2257 | 32.39% | 1.59% | 2081 | 1174 | 836 | 1001 | 820 |
| Kingston | 2128 | 6213 | 8341 | 25.51% | 1.28% | 2117 | 3119 | 2235 | 2715 | 2390 |
| New Castle | 450 | 66 | 516 | 87.21% | 0.11% | 2132 | 465 | 436 | 537 | 505 |
| Newfields | 552 | 724 | 1276 | 43.26% | 2.43% | 2045 | 1135 | 611 | 736 | 619 |
| Newington | 295 | 443 | 738 | 39.97% | 0.17% | 2556 | 310 | 295 | 362 | 335 |
| Newton | 1488 | 1466 | 2954 | 50.37% | 1.36% | 2061 | 2232 | 1633 | 1967 | 1669 |
| North Hampton | 1886 | 1329 | 3215 | 58.66% | 0.76% | 2080 | 2368 | 1943 | 2368 | 2118 |
| Plaistow | 2181 | 993 | 3174 | 68.71% | 1.02% | 2047 | 2959 | 2176 | 2667 | 2448 |
| Portsmouth | 5357 | 1251 | 6608 | 81.07% | 0.7%[2] | 2040 | 6604 | 5825 | 7082 | 8384 |
| Rye | 2345 | 1196 | 3541 | 66.22% | 0.54% | 2087 | 2756 | 2475 | 3009 | 2661 |
| Salem | 9670 | 2851 | 12521 | 77.23% | 0.59% | 2054 | 11535 | 10140 | 12325 | 14566 |
| Sandown | 2185 | 3735 | 5920 | 36.91% | 3.62% | 2038 | 5920 | 2582 | 3073 | 2452 |
| Seabrook | 3109 | 1514 | 4623 | 67.25% | 1.29% | 2041 | 4568 | 3451 | 4146 | 4628 |
| South Hampton | 314 | 1216 | 1530 | 20.52% | 0.70% | 2237 | 387 | 307 | 377 | 353 |
| Stratham | 2397 | 1360 | 3757 | 63.80% | 3.61% | 2023 | 3757 | 2785 | 3324 | 2689 |
| Windham | 4872 | 2704 | 7576 | 64.31% | 2.96% | 2025 | 7576 | 5324 | 6434 | 6525 |
| **RPC** | **65528** | **51296** | **116824** | **56.09%** | **1.47%** | **2081** | **99085** | **71661** | **86571** | **86486** |

1 Growth rate is calculated using census data from 1980-2010

2 Portsmouth actually has a negative growth curve, we manually adjusted this to a 1/10 absolute value of the negative growth pattern.

**2010 Estimated Employment by Industry and Community[1]**

| Community | Agriculture | Business, Legal, Personal | Communications | Construction | Eating & Drinking Establishments | Educational Services | Financial Insurance Real Estate (FIRE) | Government | Health Services | Hotels & Lodging | Manufacturing | Mining | Non Classifiable | Retail Trade | Service (general) | Social Services | Transportation | Utilities | Wholesale Trade | Community Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atkinson | 12 | 58 | 5 | 245 | 39 | 56 | 36 | 61 | 38 | - | 163 | - | 101 | 118 | 188 | 78 | - | 4 | 76 | **1,278** |
| Brentwood | 15 | 133 | 3 | 126 | 36 | 212 | 11 | 657 | 104 | - | 199 | - | 185 | 70 | 3 | 4 | 253 | - | 294 | **2,305** |
| Danville | 16 | 34 | - | 12 | - | 57 | 13 | 43 | - | 1 | 22 | - | 21 | 10 | 3 | 12 | 11 | - | 1 | **256** |
| East Kingston | 14 | 26 | - | 9 | 5 | 60 | 5 | 48 | 5 | - | 24 | - | 22 | 6 | 6 | - | 11 | 5 | 23 | **269** |
| Epping | 15 | 151 | 94 | 96 | 369 | 264 | 44 | 142 | 19 | - | 21 | 5 | 222 | 1,089 | 65 | 44 | 29 | 23 | 123 | **2,815** |
| Exeter | 10 | 619 | 89 | 153 | 490 | 2,017 | 369 | 244 | 2,797 | 89 | 1,291 | - | 865 | 735 | 155 | 173 | 254 | - | 655 | **11,005** |
| Fremont | 18 | 32 | 1 | 33 | 19 | 128 | 4 | 44 | 110 | - | 70 | - | 48 | 13 | - | 25 | 25 | - | 40 | **610** |
| Greenland | 29 | 283 | 20 | 148 | 58 | 103 | 13 | 54 | 64 | - | 202 | - | 161 | 453 | 84 | 13 | 75 | - | 284 | **2,044** |
| Hampstead | 12 | 179 | - | 144 | 231 | 86 | 70 | 95 | 403 | 1 | 238 | - | 189 | 419 | 10 | 79 | 11 | - | 230 | **2,397** |
| Hampton | 17 | 855 | 36 | 99 | 889 | 303 | 303 | 575 | 251 | 289 | 631 | - | 455 | 399 | 168 | 57 | 74 | 14 | 332 | **5,747** |
| Hampton Falls | 37 | 59 | 4 | 19 | 13 | 90 | 35 | 34 | 5 | 26 | 20 | - | 45 | 83 | 8 | 40 | 12 | - | 39 | **569** |
| Kensington | 18 | 34 | - | 16 | 12 | 44 | 3 | 27 | - | - | 18 | - | 27 | 58 | 12 | - | 23 | 33 | 18 | **343** |
| Kingston | 15 | 133 | - | 74 | 123 | 221 | 31 | 89 | 31 | 3 | 33 | 5 | 127 | 144 | 43 | 121 | 195 | - | 215 | **1,603** |
| New Castle | 5 | 17 | - | - | - | 21 | 4 | 25 | - | 215 | - | - | 27 | 5 | 19 | - | - | - | 6 | **344** |
| Newfields | 10 | 51 | - | 22 | 10 | 64 | 4 | 29 | - | - | 246 | - | 47 | 23 | - | 29 | - | - | 72 | **607** |
| Newington | 8 | 302 | 57 | 47 | 728 | 20 | 105 | 75 | 76 | - | 879 | - | 375 | 1,639 | 38 | 83 | 1 | 59 | 274 | **4,766** |
| Newton | 12 | 23 | - | 16 | 11 | 141 | 4 | 76 | 1 | - | 88 | - | 45 | 30 | - | 54 | 4 | - | 59 | **564** |
| North Hampton | 11 | 337 | 11 | 167 | 232 | 121 | 115 | 78 | 81 | - | 33 | - | 216 | 703 | 45 | 19 | 258 | - | 308 | **2,735** |
| Plaistow | 26 | 311 | 18 | 215 | 269 | 480 | 223 | 103 | 100 | - | 227 | 4 | 359 | 1,679 | 22 | 69 | 179 | - | 280 | **4,564** |
| Portsmouth | 18 | 5,470 | 1,453 | 449 | 2,647 | 1,106 | 3,485 | 1,232 | 3,664 | 642 | 1,813 | 4 | 2,503 | 3,724 | 411 | 698 | 609 | 156 | 1,714 | **31,798** |
| Rye | 10 | 242 | - | 34 | 111 | 143 | 34 | 109 | 95 | 30 | - | - | 110 | 149 | 222 | 14 | 33 | - | 55 | **1,391** |
| Salem | 17 | 3,763 | 567 | 523 | 1,711 | 1,293 | 753 | 419 | 1,264 | 60 | 1,577 | - | 1,825 | 6,598 | 836 | 109 | 266 | 15 | 1,630 | **23,226** |
| Sandown | 12 | 17 | - | 35 | 29 | 87 | - | 62 | 19 | 5 | 11 | - | 32 | 6 | 3 | 17 | 25 | - | 39 | **399** |
| Seabrook | 12 | 438 | 8 | 370 | 563 | 131 | 125 | 382 | 13 | 49 | 689 | - | 519 | 1,894 | 218 | 6 | 86 | 699 | 380 | **6,582** |
| South Hampton | 12 | 8 | - | 26 | - | 24 | 4 | 17 | - | - | 18 | - | 12 | 10 | - | - | 5 | - | 10 | **146** |
| Stratham | 14 | 1,081 | 83 | 103 | 131 | 464 | 61 | 67 | 138 | - | 425 | - | 334 | 741 | 40 | 150 | 36 | - | 381 | **4,249** |
| **Industry Total** | **395** | **14,656** | **2,449** | **3,181** | **8,726** | **7,736** | **5,854** | **4,787** | **9,278** | **1,410** | **8,938** | **18** | **8,872** | **20,798** | **2,599** | **1,894** | **2,475** | **1,008** | **7,538** | **112,612** |

Source: NH Employment Security 2010-2020 RPC Employment Projections by Industry, Quarterly Employment and Wages, Community Profiles

1 - Very small employment totals (<5), or locations where a single business provides 70% or more of a total industry within a community, are not provided and employment numbers are estimated based on regional indusry totals

## Population, Housing Units, and Employment by Scenario

| | 2010 Baseline | | | | | | 2040 Slow Growth | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pop | HU | Area | Pop/mi$^2$ | Empl | Empl/mi$^2$ | Pop | HU | Area | Pop/mi$^2$ | Empl | Empl/mi$^2$ |
| Atkinson | 6,753 | 2,668 | 11.3 | 596.5 | 1,278 | 112.9 | 7,536 | 2,977 | 11.3 | 665.6 | 1,377 | 121.6 |
| Brentwood | 3,985 | 1,322 | 17.0 | 235.1 | 2,303 | 135.9 | 6,060 | 2,010 | 17.0 | 357.5 | 2,124 | 125.3 |
| Danville | 4,384 | 1,569 | 11.8 | 371.2 | 255 | 21.6 | 4,888 | 1,749 | 11.8 | 413.9 | 241 | 20.4 |
| East Kingston | 2,357 | 862 | 10.0 | 236.8 | 270 | 27.1 | 3,063 | 1,120 | 10.0 | 307.8 | 246 | 24.7 |
| Epping | 6,409 | 2,466 | 26.2 | 244.9 | 2,815 | 107.6 | 7,609 | 2,928 | 26.2 | 290.8 | 2,635 | 100.7 |
| Exeter | 13,965 | 6,114 | 20.0 | 699.4 | 11,080 | 554.9 | 14,851 | 6,502 | 20.0 | 743.8 | 11,284 | 565.2 |
| Fremont | 4,239 | 1,510 | 17.4 | 243.9 | 610 | 35.1 | 5,255 | 1,872 | 17.4 | 302.4 | 623 | 35.8 |
| Greenland | 3,522 | 1,371 | 13.3 | 263.9 | 2,045 | 153.2 | 4,008 | 1,560 | 13.3 | 300.3 | 2,037 | 152.6 |
| Hampstead | 8,519 | 3,396 | 14.1 | 605.9 | 2,398 | 170.6 | 8,938 | 3,563 | 14.1 | 635.7 | 2,478 | 176.2 |
| Hampton | 14,759 | 6,821 | 14.2 | 1,042.9 | 5,744 | 405.9 | 15,291 | 7,067 | 14.2 | 1,080.5 | 5,427 | 383.5 |
| Hampton Falls | 2,231 | 832 | 12.6 | 177.1 | 570 | 45.3 | 2,690 | 1,003 | 12.6 | 213.6 | 546 | 43.3 |
| Kensington | 2,124 | 761 | 12.0 | 177.7 | 343 | 28.7 | 2,430 | 871 | 12.0 | 203.3 | 313 | 26.2 |
| Kingston | 6,019 | 2,285 | 21.0 | 286.9 | 1,604 | 76.5 | 6,322 | 2,400 | 21.0 | 301.4 | 1,569 | 74.8 |
| New Castle | 968 | 449 | 2.1 | 459.8 | 344 | 163.4 | 937 | 435 | 2.1 | 445.0 | 310 | 147.2 |
| Newfields | 1,680 | 575 | 7.3 | 231.5 | 606 | 83.5 | 1,861 | 637 | 7.3 | 256.5 | 551 | 75.9 |
| Newington | 732 | 289 | 11.1 | 65.7 | 4,726 | 424.2 | 731 | 289 | 11.1 | 65.6 | 4,298 | 385.8 |
| Newton | 4,603 | 1,667 | 9.9 | 463.6 | 508 | 51.2 | 5,050 | 1,829 | 9.9 | 508.7 | 487 | 49.1 |
| North Hampton | 4,297 | 1,760 | 14.0 | 306.7 | 2,821 | 201.4 | 4,427 | 1,813 | 14.0 | 316.0 | 2,822 | 201.4 |
| Plaistow | 7,604 | 2,911 | 10.6 | 718.0 | 4,522 | 427.0 | 7,586 | 2,904 | 10.6 | 716.3 | 4,293 | 405.3 |
| Portsmouth | 20,368 | 10,026 | 18.0 | 1,128.7 | 32,563 | 1,804.4 | 22,146 | 10,901 | 18.0 | 1,227.2 | 32,532 | 1,802.7 |
| Rye | 5,238 | 2,244 | 13.2 | 396.9 | 1,390 | 105.3 | 5,528 | 2,368 | 13.2 | 418.9 | 1,374 | 104.1 |
| Salem | 28,669 | 11,145 | 25.8 | 1,109.2 | 23,222 | 898.5 | 30,063 | 11,687 | 25.8 | 1,163.1 | 22,677 | 877.4 |
| Sandown | 5,984 | 2,072 | 14.4 | 415.5 | 399 | 27.7 | 7,070 | 2,448 | 14.4 | 491.0 | 390 | 27.1 |
| Seabrook | 8,764 | 3,750 | 9.7 | 901.1 | 6,580 | 676.5 | 9,729 | 4,163 | 9.7 | 1,000.3 | 5,996 | 616.5 |
| South Hampton | 813 | 315 | 8.0 | 101.3 | 147 | 18.3 | 794 | 308 | 8.0 | 98.9 | 147 | 18.3 |
| Stratham | 7,255 | 2,746 | 15.5 | 469.4 | 4,250 | 275.0 | 8,428 | 3,190 | 15.5 | 545.3 | 4,244 | 274.6 |
| RPC | 176,241 | 71,926 | 360.4 | 11,949.6 | 113,393 | 7,031.4 | 193,291 | 78,594 | 360.4 | 13,069.1 | 111,021 | 6,835.8 |

## Population, Housing Units, and Employment by Scenario

| | 2040 Dispersed Growth | | | | | | 2040 Nodal Growth | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pop | HU | Area | Pop/mi$^2$ | Empl | Empl/mi$^2$ | Pop | HU | Area | Pop/mi$^2$ | Empl | Empl/mi$^2$ |
| Atkinson | 9,056 | 3,578 | 11.3 | 799.9 | 1,897 | 167.6 | 7,573 | 2,992 | 11.3 | 668.9 | 1,452 | 128.3 |
| Brentwood | 7,070 | 2,345 | 17.0 | 417.1 | 2,923 | 172.4 | 5,032 | 1,669 | 17.0 | 296.9 | 2,515 | 148.4 |
| Danville | 5,875 | 2,103 | 11.8 | 497.5 | 333 | 28.2 | 4,921 | 1,761 | 11.8 | 416.7 | 282 | 23.9 |
| East Kingston | 3,594 | 1,314 | 10.0 | 361.1 | 333 | 33.5 | 2,644 | 967 | 10.0 | 265.7 | 293 | 29.4 |
| Epping | 9,052 | 3,483 | 26.2 | 345.9 | 3,627 | 138.6 | 7,192 | 2,767 | 26.2 | 274.8 | 3,102 | 118.5 |
| Exeter | 18,071 | 7,912 | 20.0 | 905.1 | 15,503 | 776.5 | 21,468 | 9,399 | 20.0 | 1,075.2 | 16,375 | 820.1 |
| Fremont | 6,219 | 2,215 | 17.4 | 357.8 | 851 | 49.0 | 4,805 | 1,712 | 17.4 | 276.5 | 721 | 41.5 |
| Greenland | 4,807 | 1,871 | 13.3 | 360.1 | 2,801 | 209.9 | 3,981 | 1,550 | 13.3 | 298.3 | 2,305 | 172.7 |
| Hampstead | 10,856 | 4,328 | 14.1 | 772.1 | 3,412 | 242.7 | 9,561 | 3,811 | 14.1 | 680.0 | 2,860 | 203.4 |
| Hampton | 18,662 | 8,625 | 14.2 | 1,318.7 | 7,465 | 527.5 | 22,474 | 10,387 | 14.2 | 1,588.0 | 7,933 | 560.5 |
| Hampton Falls | 3,193 | 1,191 | 12.6 | 253.5 | 756 | 60.0 | 2,508 | 935 | 12.6 | 199.1 | 635 | 50.4 |
| Kensington | 2,908 | 1,042 | 12.0 | 243.2 | 429 | 35.9 | 2,383 | 854 | 12.0 | 199.3 | 362 | 30.3 |
| Kingston | 7,678 | 2,915 | 21.0 | 366.0 | 2,149 | 102.4 | 6,759 | 2,566 | 21.0 | 322.2 | 1,774 | 84.6 |
| New Castle | 1,155 | 536 | 2.1 | 548.6 | 426 | 202.3 | 1,086 | 504 | 2.1 | 515.8 | 369 | 175.3 |
| Newfields | 2,239 | 766 | 7.3 | 308.6 | 757 | 104.3 | 1,885 | 645 | 7.3 | 259.8 | 656 | 90.4 |
| Newington | 898 | 354 | 11.1 | 80.6 | 5,966 | 535.5 | 832 | 329 | 11.1 | 74.7 | 6,296 | 565.1 |
| Newton | 6,086 | 2,204 | 9.9 | 613.0 | 715 | 72.0 | 5,164 | 1,870 | 9.9 | 520.1 | 608 | 61.2 |
| North Hampton | 5,395 | 2,210 | 14.0 | 385.1 | 3,727 | 266.0 | 4,825 | 1,976 | 14.0 | 344.4 | 3,088 | 220.4 |
| Plaistow | 9,299 | 3,560 | 10.6 | 878.0 | 6,017 | 568.1 | 8,536 | 3,268 | 10.6 | 806.0 | 5,085 | 480.1 |
| Portsmouth | 26,927 | 13,255 | 18.0 | 1,492.1 | 44,501 | 2,465.9 | 31,876 | 15,691 | 18.0 | 1,766.3 | 47,117 | 2,610.9 |
| Rye | 6,721 | 2,879 | 13.2 | 509.3 | 1,895 | 143.6 | 5,943 | 2,546 | 13.2 | 450.4 | 1,599 | 121.2 |
| Salem | 36,540 | 14,205 | 25.8 | 1,413.7 | 31,229 | 1,208.2 | 43,183 | 16,787 | 25.8 | 1,670.7 | 33,407 | 1,292.5 |
| Sandown | 8,417 | 2,914 | 14.4 | 584.5 | 536 | 37.2 | 6,715 | 2,325 | 14.4 | 466.3 | 446 | 31.0 |
| Seabrook | 11,686 | 5,000 | 9.7 | 1,201.5 | 8,255 | 848.7 | 13,045 | 5,582 | 9.7 | 1,341.2 | 9,024 | 927.8 |
| South Hampton | 977 | 379 | 8.0 | 121.7 | 204 | 25.4 | 913 | 354 | 8.0 | 113.7 | 162 | 20.2 |
| Stratham | 10,061 | 3,808 | 15.5 | 650.9 | 5,835 | 377.5 | 8,139 | 3,081 | 15.5 | 526.6 | 4,864 | 314.7 |
| RPC | 233,442 | 94,992 | 360.4 | 15,785.7 | 152,542 | 9,399.1 | 233,443 | 96,327 | 360.4 | 15,417.7 | 153,330 | 9,322.8 |

**Employment Projections by Industry Classification**

| Industry Classification | 2010 | 2020 ELMI | 2040 ELMI |
|---|---|---|---|
| Agriculture/Forestry/Fishing | 395 | 417 | 466 |
| Mining | 18 | 17 | 16 |
| Construction | 3,181 | 4,302 | 7,917 |
| Manufacturing | 8,938 | 9,175 | 9,782 |
| Utilities | 1,008 | 943 | 836 |
| Wholesale Trade | 4,410 | 4,877 | 6,100 |
| Retail Trade | 20,798 | 22,610 | 26,821 |
| Transportation and Warehousing | 2,475 | 2,621 | 2,943 |
| Information | 2,449 | 2,628 | 3,039 |
| Finance and Insurance | 4,639 | 4,991 | 5,748 |
| Real Estate and Rental and Leasing | 1,215 | 1,378 | 1,784 |
| Professional and Technical Service | 6,138 | 7,512 | 11,151 |
| Management of Companies/Enterprises | 1,812 | 1,912 | 2,111 |
| Administrative and Waste Services | 6,706 | 7,951 | 11,012 |
| Educational Services | 7,736 | 8,276 | 9,388 |
| Health Care and Social Assistance | 11,172 | 13,842 | 21,044 |
| Arts, Entertainment, and Recreation | 2,599 | 2,865 | 3,489 |
| Accommodation and Food Services | 10,136 | 10,884 | 12,856 |
| Other Services Except Public Admin | 3,128 | 3,420 | 4,251 |
| Unclassified Establishments | 8,872 | 9,140 | 9,642 |
| Total Government | 4,787 | 5,058 | 5,585 |
| | 112,612 | 124,819 | 155,981 |

# Appendix B - Maps

**Map SP1: 2010 Base Year Congestion**

**Map SP2: 2040 Slow Growth Congestion**

**Map SP3: 2040 Dispersed Growth Congestion**

**Map SP4: 2040 Concentrated Growth Congestion**

**Map SP5: 2010 Percent Buildout**

**Map SP6: Remaining Buildable Area From Regional Buildout**

## Appendix C – REMI Report

# The Economic Impact of a Potential Employment Gap in the Rockingham Planning Commission Region of New Hampshire

prepared by

Economic and Labor Market Information Bureau
New Hampshire Employment Security

for

Rockingham Planning Commission

**Granite State Future**

October 2014

# Assessing the impact of not meeting the future demand for workers, or employment gap, in the Rockingham Planning Commission Region

This impact analysis was conducted using the Economic and Labor Market Information Bureau's New Hampshire Econometric Model – a REMI Policy Insight + ® model.[1]

By using this econometric model, we are able to estimate both the number of direct jobs reduced in Rockingham County as well as the indirect and induced jobs dependent on those direct jobs.

The inputs used were provided by Glenn Greenwood, Associate Director at the Rockingham Regional Planning Commission. With this scenario, the regional planning commission wanted to assess the economic impact of not being able to fill the *projected demand* for workers.

This scenario will estimate the value of 21,500 jobs, which is equivalent to the region being unable to meet the future demand for workers. This employment gap can be alleviated by improving the transportation system in order to enhance commuting from outside the region. Another option is to support measures to create more affordable housing. Lack of affordable housing in the seacoast area is viewed as an obstacle to younger workers' ability to live and work within the Rockingham Planning Region.[2] [See description on Workforce Demographics on page 8.] By showing the economic value to the region of sustaining 21,500 jobs within the region, the return on investment that an average job generates in the local economy can be assessed in the context of what public investment in infrastructure and housing generates, with the goal of alleviating a future shortage of available local labor.

These 21,500 jobs were reduced from the REMI employment baseline in Rockingham County and distributed across industries based on the employment shares in the Rockingham Planning Commission Region using annual average covered employment data for 2013.[3] The covered employment data were adjusted to correspond to the REMI model's NAICS-based industry categories. [4]

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[1] Product of Regional Economic Models, Inc. of Amherst, MA.

[2] According to the Center for Housing Policy, the Rockingham-Strafford, NH ranked 20 for most expensive Metro Area for Renting in Fiscal Year 2014, up from 30th place in FY2013. Please see http://www.nhc.org/MosttoLeastExpensiveRental1Q2014.pdf.

[3] Quarterly Census of Employment and Wages by Planning Commissions, 2013 Annual Average, http://www.nhes.nh.gov/elmi/statistics/documents/plancomm2013.pdf.

[4] NAICS is the North American Industry Classification System, used to classify business establishments according to type of economic activity (process of production) in Canada, Mexico and the United States. An *establishment* is typically a single physical location, though administratively distinct operations at a single location may be treated as distinct establishments. Each establishment is classified to an industry according to the primary business activity taking place there.

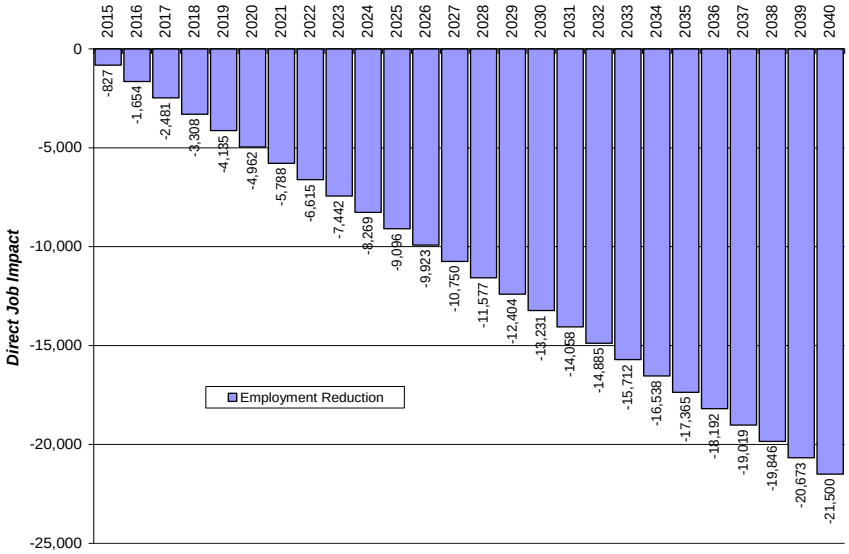
The scenario result will include both the direct jobs reduced in Rockingham County as well as the secondary (indirect and induced) jobs lost due to the ripple effect. The results include impacts on the region in terms of added gross domestic product, personal income, and population.

## The economic impact to the regional economy of being unable to meet the future demand for workers

### Inputs and assumptions

The estimated 21,500 jobs (*future employment gap*) were removed from the REMI baseline employment for Rockingham County, phased in over a time period from 2015 to 2040. This method of removing baseline employment in order to measure the value of jobs is called a counterfactual scenario.

*Figure 1: Removal of jobs from the projected employment baseline in Rockingham County to measure the value of these jobs to the regional economy*




| Top 30 REMI industries with largest direct jobs reduction | Employee Gap in 2040 |
|---|---|
| Retail trade | -4,362 |
| Food services and drinking places | -1,922 |
| *Local Government* | -1,645 |
| Wholesale trade | -898 |
| Hospitals | -662 |
| Employment services | -653 |
| Offices of health practitioners | -632 |
| Construction | -618 |
| Amusement, gambling, and recreation industries | -417 |
| Computer systems design and related services | -395 |
| Nursing and residential care facilities | -387 |

| | |
|---|---|
| Educational services | -371 |
| Monetary authorities, credit intermediation, and related activities | -366 |
| Business support services; Investigation and security services; Other support services | -321 |
| Accommodation | -303 |
| Insurance carriers | -293 |
| Management of companies and enterprises | -290 |
| Services to buildings and dwellings | -283 |
| Agencies, brokerages, and other insurance related activities | -275 |
| Individual and family services; Community and vocational rehabilitation services | -270 |
| Semiconductor and other electronic component manufacturing | -270 |
| *State Government* | -238 |
| Architectural, engineering, and related services | -220 |
| Accounting, tax preparation, bookkeeping, and payroll services | -203 |
| Transit and ground passenger transportation | -200 |
| Electric power generation, transmission, and distribution | -184 |
| Software publishers | -179 |
| Personal care services | -175 |
| Child day care services | -175 |
| Telecommunications | -169 |
| All Other REMI industries | -4,126 |
| **Total Employment Reduction** | **-21,500** |

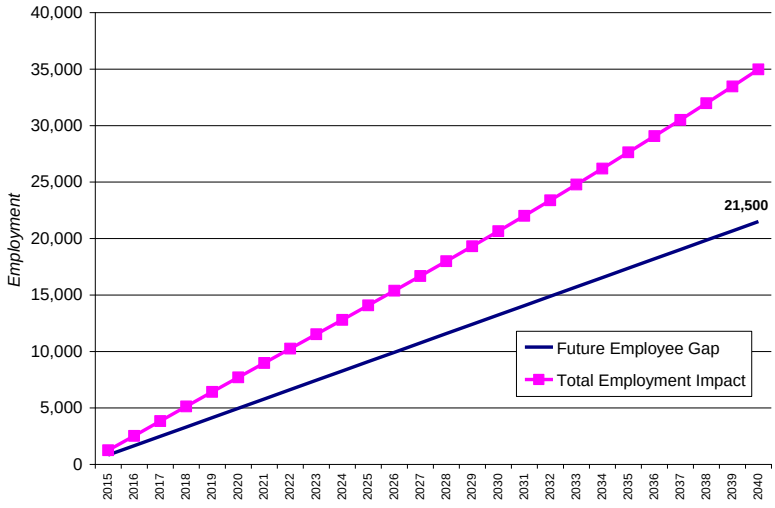
The reduction of 21,500 jobs was spread out over 119 REMI industries as well as government according to the 2013 employment share by industry in the Rockingham Planning Commission Region. Top industries with employment reduced were *Retail* and *Wholesale trade*, and *Food services and drinking places*. *Retail trade* and *Food services and drinking places* are industries with a high share of younger workers. *Health care* and *Local government* workers were also reduced in large numbers.

### Scenario Results: Economic value of 21,500 future jobs in Rockingham County

The following results are an assessment of the value of 21,500 jobs in Rockingham County. The results include both direct jobs currently located in the region as well as the secondary (indirect and induced) jobs depending on the presence of the 21,500 jobs in Rockingham County. [Despite that the *future employment gap* is being modeled by removing 21,500 jobs from the REMI model baseline, the results are expressed in positive terms of value added to the region.]

### Employment Impacts

In 2015, total impact on Rockingham County would be 827 jobs, including direct, indirect and induced jobs.5 By 2040, the total value of 21,500 jobs left unfilled (in other words, not meeting the future employment gap) would be 34,972 direct, indirect and induced jobs. The REMI model is dynamic in the sense that migration responds to economic opportunities over time. If there are more economic opportunities, positive net migration into the region occurs and similarly, if economic opportunities decline, a net loss of residents occurs due to migration.




Direct and total employment impact on Rockingham County due to the future worker gap

In 2040, the distribution of the secondary jobs impacted would be as follows: 3,837 jobs would be impacted in Construction and 1,462 jobs would be impacted in Retail trade. Accommodation and food services and Health care and social assistance would be impacted by close to the same amount of secondary jobs; 1,375 and 1,359 secondary jobs, respectively. Another 1,798 jobs in *State and local government* would be impacted

| Table 1. Direct and Secondary Job Losses by Sector | 2040 | |
|---|---|---|
| | Direct Job Loss | Total Job Losses |
| Retail Trade | 4,362 | 5,824 |
| Construction | 618 | 4,455 |
| Health Care and Social Assistance | 2,346 | 3,705 |
| Accommodation and Food Services | 2,225 | 3,600 |

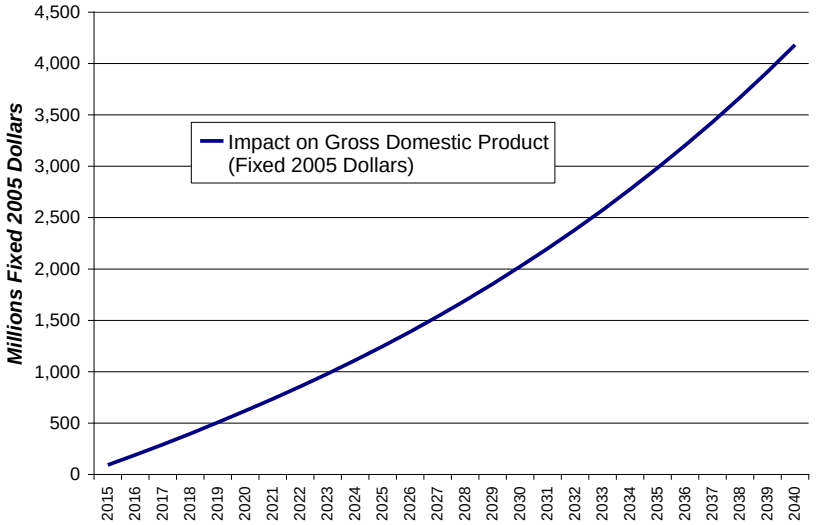
[5] The direct jobs are jobs that have been entered or removed from the regional economy in the REMI Model. The indirect jobs are those created from the ripple effect of the direct jobs from inter-industry purchases (business-to-business services). The induced jobs are those generated from an increase in consumer spending and from the increase in population. Indirect and induced jobs, combined are also referred to as secondary jobs. Jobs in the REMI model are based on Bureau of Economic Analysis (BEA) definition of employment. The BEA estimates of employment and wages differ from covered employment data because BEA makes adjustments to account for self-employment. So the employment count in the REMI model is larger than what is reported by the Economic and Labor Market Information Bureau (ELMIB), New Hampshire Employment Security. The REMI model does not distinguish between full-time and part-time jobs.

| | | |
|---|---|---|
| Administrative and Waste Management Services | 1,417 | 2,461 |
| Manufacturing | 2,109 | 2,148 |
| Professional, Scientific, and Technical Services | 1,349 | 1,799 |
| Wholesale Trade | 898 | 1,667 |
| Other Services, except Public Administration | 536 | 1,097 |
| Finance and Insurance* | 1,051 | 1,026 |
| Arts, Entertainment, and Recreation | 518 | 886 |
| Information | 585 | 613 |
| Real Estate and Rental and Leasing | 214 | 601 |
| Educational Services | 371 | 493 |
| Transportation and Warehousing* | 360 | 291 |
| Management of Companies and Enterprises | 290 | 249 |
| Utilities | 200 | 217 |
| Mining | 4 | 4 |
| State and Local Government | 1,883 | 3,681 |
| Federal Civilian | 158 | 158 |

* As the REMI model tries to simulate the efficiencies obtained in the real economy, some substitution of labor occurs when a simulation is produced. This is why direct jobs losses in Finance and insurance and Transportation and warehousing, in this scenario, are larger than total losses to the region

## Gross Domestic Product

- In 2015, the total value of the jobs to the local economy expressed in terms of Gross Domestic Product (GDP) would be $91.7 million (in fixed 2005 dollars). This impact would grow over time and by 2040, GDP in the region would be impacted by $4.2 billion (in fixed 2005 dollars).
- The economic activity created by the 827 jobs would account for 0.6 percent of total GDP in Rockingham County in 2015. By 2040, the value of the 21,500 jobs would represent 14.0 percent of the county's GDP.



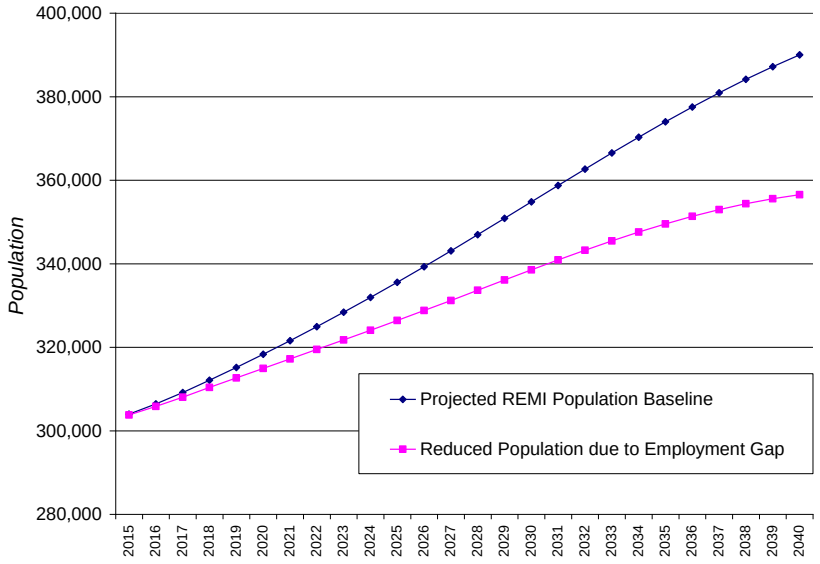

***The impact on GDP in Rockingham County due to not meeting the future employment demand***

### Personal Income

- The impact of the 827 jobs on total real personal income would be $40 million (in fixed 2005 dollars) in 2015. By 2040, the full impact on total real personal income from not meeting the future demand for 21,500 workers would have grown to $2.5 billion (in fixed 2005 dollars).

### Population

- In 2015, 827 direct jobs sustain 201 persons in Rockingham County's population. In 2040, the 21,500 jobs would directly or indirectly sustain Rockingham County's population with close to 35,000 persons, representing 8.6 percent of the projected population baseline for the county.




The impact on total population in Rockingham County due to *not* meeting the future demand for workers

### Job Multiplier

- The multiplier effect on Rockingham County of each job in this current scenario is between 1.5 and 1.6 jobs[6] — including the direct job created — annually over the entire simulation period.

### Summary

While this scenario of not meeting the future demand for workers is based on somewhat hypothetical assumptions, the results give insight into how *not* meeting the demand for workers in any industry have a negative impact on the overall economy.

What this scenario also describes is how there is an interdependency between the ability to attract or grow population, the supply of workers, and the ability to grow the local economy in terms of jobs, personal income and Gross Domestic Product (GDP) for the region.

[6] A job multiplier of more than <u>one</u> indicates that the new job created in the local economy have a ripple effect that generates more employment in the region. A multiplier of less than one indicates that some of the current employment in the region would be eliminated due to the competition from the expanding businesses.

In this scenario, removing 21,500 direct jobs by 2040 from the Rockingham Planning Commission Region had an impact of approximately 35,000 jobs in the region, would reduce GDP by $4.2 billion (in fixed 2005 dollars), and reduce personal income by $2.5 billion (in fixed 2005 dollars) for Rockingham County. This scenario created a job multiplier effect of 1.5 to 1.6 jobs (including the job originally removed), with the largest impact on jobs in *Retail trade* and *Construction*.

## Workforce Demographics

Quarterly Workforce Indicators depict a high concentration of younger workers in the Rockingham Planning Commission Region, employed in Retail trade and Accommodation and food services.

The Rockingham Planning Commission is concerned about the high median age in the region, as many businesses rely on the availability of younger workers. Businesses related to hospitality and tourism depend upon younger workers filling job vacancies in Retail trade and Accommodation and food services.

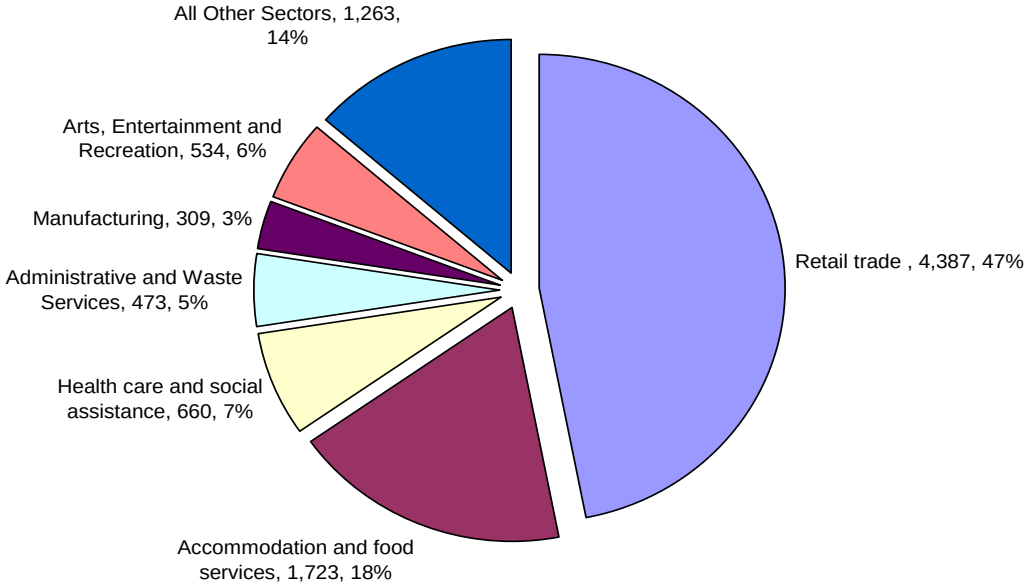
To evaluate the share of younger workers in Rockingham Planning Commission, workforce demographic data7 was extracted for two Local Office Areas —Portsmouth and Salem (Workforce demographic data for Rockingham Planning Commission is not available.) These two Local Office Areas were selected as they resemble the geographic area represented by the Rockingham Planning Commission better than county data. The map above depicts the RPC and the cities and towns in Portsmouth and Salem Local Office Areas.

Quarterly Workforce Indicators8 for the Portsmouth Local Office Area show that there is a high concentration of workers age 14-24 in Retail trade and Accommodation and food services. In the Salem Local Office Area, nearly half of all workers age 14-24 are employed in Retail trade.

[7] US Census Bureau, Local Employment Dynamics Program, Quarterly Workforce Indicators, 2012 Q3 -2013 Q2 Average.

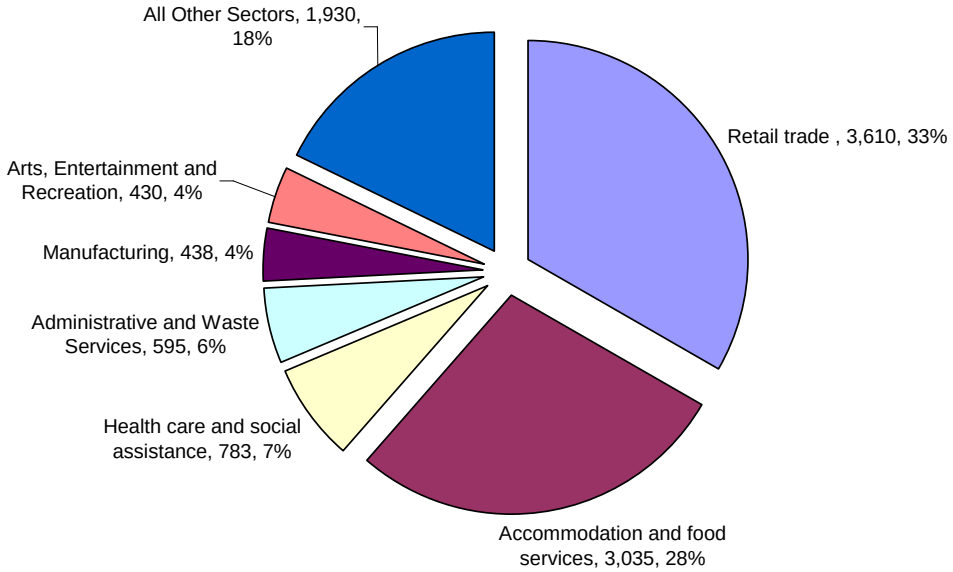
[8] Quarterly Workforce Indicators (QWI), a product of the U.S. Census Bureau's Local Employment Dynamics (LED) Partnership, are possible because of an innovative system that merges data already collected from various sources. The state Labor Market Information (LMI) agencies supply key data from unemployment wage records and from businesses each quarter. The Census Bureau merges the data from state LMI agencies with current demographic information to produce the data found in LED. By combining data from different administrative sources, censuses and surveys, the Census Bureau is able to produce local employment information.

**Younger workers (ages 14-24) in the Salem Local Office Area are mainly employed in *Retail trade* and *Accommodation and food services***




Source: 2012Q3-2013Q2 Quarterly Workforce Indicators, Local Employment Dynamics (Partnership between states and Census). Data extracted May 2014

**Younger workers (ages 14-24) in the Portsmouth Local Office Area are mainly employed in *Retail trade* and *Accommodation and food services***




Source: 2012Q3-2013Q2 Quarterly Workforce Indicators, Local Employment Dynamics (Partnership between states and Census). Data extracted May 2014