Hospital Construction Projects in New Hampshire

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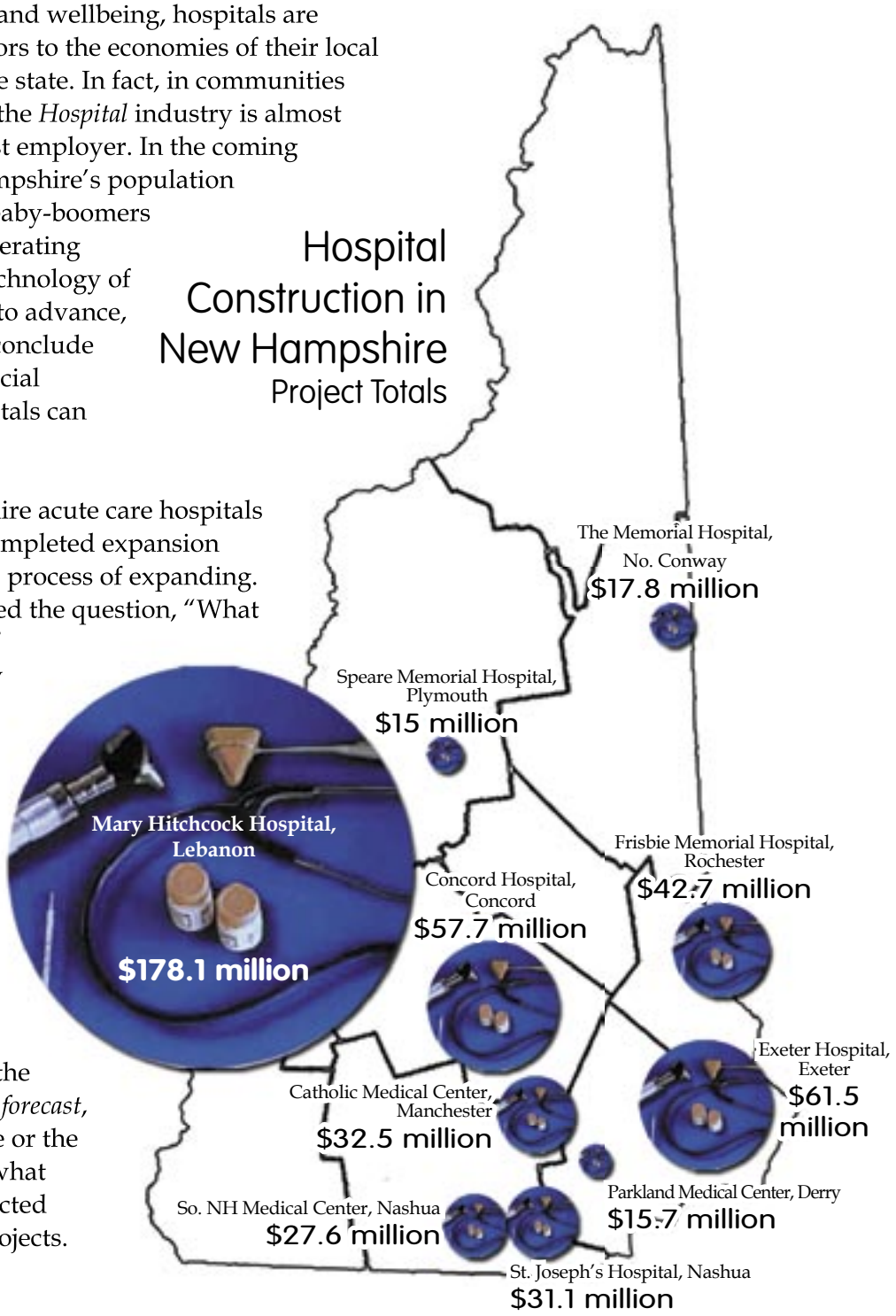
Executive Summary

In addition to their contribution to the general population's health and wellbeing, hospitals are important contributors to the economies of their local communities and the state. In fact, in communities that have hospitals, the *Hospital* industry is almost invariably the largest employer. In the coming decade, as New Hampshire's population continues to grow, baby-boomers reach age 60 in accelerating numbers, and the technology of medicine continues to advance, it would be easy to conclude the economic and social significance of hospitals can only increase.

Many New Hampshire acute care hospitals have just recently completed expansion projects or are in the process of expanding. Initially, we examined the question, "What is the total impact of the *Hospital* industry growth on the state's economy?" To accomplish this, we held statewide hospital employment constant at 2004 levels in an improbable *no growth simulation*. Then we compared the results to the *control forecast*, which is the baseline or the original forecast of what the economy is expected to do without the projects.



The overall results, compared to what would have been projected to occur in the absence of these projects, showed:

- Total employment levels would experience 15,600 fewer workers by 2015.
- The labor force would be lacking 6,900 by 2015.
- *Healthcare and social assistance* is the industry most affected by the "no growth" condition, to the tune of 9,400 jobs.
- Population, related to the changes in the labor force plus families and dependents, would be reduced by 9,000 people from expected levels by 2015.
- State revenues would feel the pinch of $63.9 million less by 2015. State expenditures would take a hit in the initial years, increasing by $4.1 million in 2007, before turning around. As population drops in the state, the expenditure reductions would only reach $27.0 million, less than half of the losses to the revenue side of the house.
- By 2015, the state is $858.5 million behind its expected GRP levels and personal income drops by $905.6 million.

Then the study looks at acute care hospitals that have had significant expansion projects ($15 million or more) initiated or in progress since the beginning of 2004, or have a Certificate of Need (CON) approved by the New Hampshire Health Services Planning and Review Board for such a project not yet started. The $15 million level was used because it included construction projects that involved significant expansion to buildings and not simply new equipment acquisitions.[1]

There were ten hospitals, in six counties, which met the criteria.

Original Certificate of Need (CON) Application Amounts

Hospital	Location	County	CON Amount (millions)
The Memorial Hospital	North Conway	Carroll	$17.8
Mary Hitchcock Hospital	Lebanon	Grafton	$165.0
Speare Memorial Hospital	Plymouth	Grafton	$15.0
Catholic Medical Center	Manchester	Hillsborough	$32.5
St. Joseph Hospital	Nashua	Hillsborough	$31.1
Southern NH Medical Center	Nashua	Hillsborough	$26.6
Concord Hospital	Concord	Merrimack	$57.7
Exeter Hospital	Exeter	Rockingham	$51.5
Parkland Medical Center	Derry	Rockingham	$15.7
Frisbie Memorial Hospital	Rochester	Strafford	$42.7

For each hospital, we extracted information from the applications, implementation reports, and other Certificate of Need documents, including projected and actual detailed construction expenses. We also obtained from the hospitals, information on projected (or actual) employment and sales changes resulting from these projects.

[1] Current thresholds for required Health Services Planning and Review Board's review are: $2,150,891 for any acute care facility; $1,433,928 for any nursing home, ambulatory surgical facility or specialty hospital project; and $400,000 for equipment. <www.dhhs.nh.gov/DHHS/HSPR/default.htm> The NH Health Services Planning and Review Board is charged with regulating large hospital improvement projects through the Certificate of Need process.

The information gathered was put into a model. The results represented what would happen to the economy with each of these hospitals' projects in their local areas (counties).[2] These results were compared to a *baseline* or original projection of what the local economy would have done without the projects. In every county the economic impact of the expansions followed similar patterns.

- *Hospital* employment had increased prior to the physical plant expansions, so there is no measurable change to the employment levels in the *Hospital* industry.
- Because the hospital expansions are primarily construction projects, most employment changes are temporary – and the increases are primarily seen as *Construction* workers. The increases in job levels typically do not last longer than the project itself. However, at the high point of these projects, they add anywhere between 700 and 800 more jobs.

Total Employment (changes from baseline)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Carroll	0	0	71	138	70	3	-1	-4	-4	-5	-4	-4
Grafton	453	288	34	-6	-10	-10	-10	-9	-7	-6	-5	-3
Hillsborough	227	310	78	133	130	58	-7	-7	-7	-5	-4	-2
Merrimack	0	131	248	140	22	2	0	-0	-0	0	1	1
Rockingham	100	135	247	114	29	-2	-4	-5	-4	-4	-3	-2
Strafford	0	0	100	191	93	2	0	-1	-1	-1	-1	-1
Total	**779**	**865**	**778**	**710**	**333**	**52**	**-22**	**-25**	**-24**	**-21**	**-16**	**-12**

- The *Construction* industry sector creates the majority of the jobs. Secondary industries, those that support *Construction* like *Trade* and *Services* were beneficiaries of lower job increases.
- During the actual construction periods, gross regional product (GRP) of the counties received a boost, only to fall back to expected levels as the project reached completion.
- The effects on personal income in the counties were positive and, in most counties, stayed above original levels for extended periods past the completion of the project.

Gross Regional Product in millions (changes from baseline)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Carroll	$0	$0	$1.8	$3.5	$1.7	$0.0	-$0.1	-$0.2	-$0.2	-$0.2	-$0.2	-$0.1
Grafton	$14.6	$9.2	$0.9	-$0.5	-$0.6	-$0.6	-$0.5	-$0.5	-$0.4	-$0.3	-$0.2	-$0.2
Hillsborough	$10.4	$14.3	$4.1	$6.2	$5.9	$2.5	-$0.6	-$0.6	-$0.5	-$0.4	-$0.3	-$0.2
Merrimack	$0	$5.4	$10.2	$5.8	$1.0	$0.1	$0.0	-$0.0	-$0.0	$0.0	$0.0	$0.1
Rockingham	$4.1	$5.6	$10.4	$4.8	$1.1	-$0.3	-$0.3	-$0.4	-$0.3	-$0.3	-$0.2	-$0.2
Strafford	$0	$0	$3.4	$6.6	$3.2	$0.0	-$0.0	-$0.1	-$0.1	-$0.1	-$0.1	-$0.1
Total	**$29.0**	**$34.5**	**$30.9**	**$26.3**	**$12.3**	**$1.8**	**-$1.6**	**-$1.6**	**-$1.5**	**-$1.2**	**-$0.9**	**-$0.6**

Certificate of Need (CON) applications are being submitted on a regular basis, so these projects should be seen as examples of a continuum of hospital construction projects. Although our study did not include all CON applications, this continuum of projects contributes at least 700 to 800 additional jobs annually to the New Hampshire economy.

[2] We us
CONs as demand for goods and services.

Introduction

Since the 1960s, New Hampshire's population has more than doubled. The wave of baby boomers is aging and this fact is driving an increasing demand on medical care facilities in the state. A growing trend of health insurance plans shifting from point of service to managed care and health maintenance organizations has called for changes in the way medical facilities provide patient care. Inpatient stays for care are declining. National data show that the average length of a hospital stay in 1988 was 7.3 days and that dropped to 5.0 days by 1999.[3] Cost management controls, alternative forms of health care organizations and payments, improvements to pharmaceutical treatments, and the increase in ambulatory or same-day surgeries all contribute to the growing demand for outpatient services.[4] Also, technological innovation has dramatically expanded patient expectations for diagnostic equipment and services, which require additional space. Changes in privacy laws, especially the Health Insurance Portability and Accountability Act of 1996, HIPAA, set national standards for electronic health care transactions and national identifiers for providers, health plans, and employers. It also addressed the security and privacy of patients and their health records.[5] These new policies have motivated facilities to provide treatment in secure settings, to the benefit of addressing both privacy issues as well as reducing infection rates, for example housing inpatients in private rooms rather than semi private rooms.

Inpatient Surgeries vs. Outpatient Surgeries in New Hampshire

Source: New Hampshire Hospital Association

In recent years, hospital facilities and surrounding physicians' offices have combined resources to better serve the communities with their expanded capabilities.[6] The current healthcare environment has many administrative stipulations and documentation requirements. Because of these requirements for maintaining the high level of medical services as well as handling the volumes of paperwork, medical providers have found that combining healthcare facilities is becoming more effective and efficient than functioning independently.[7] This process merged the capabilities and expanded the service areas of many of the smaller offices and hospitals, as well as reducing some of the mountains of paperwork and documentation for smaller physicians' offices.

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3 National Center for Health Statistics, 2001 News Release- Hospital Stays Grow Shorter Heart Disease Leading Cause of Hospitalization. Tuesday, April 24, 2001. <www.cdc.gov/nchs/pressroom/01news/99hospit.htm>. Accessed 8/26/2006.

4 IBID

5 U.S. Department of Health and Human Services. Centers for Medicare and Medicaid Services. HIPAA – General Information. <www.cms.hhs.gov/HIPAAGenInfo/>. Accessed 9/1/2006.

6 LRGHealthcare, <www.lrgh.org/>. Accessed 8/26/2006.

7 LRGHealthcare – Media Center, Laconia Clinic and Lakes Region General Hospital Announce New Affiliation. September 30, 2004. <www.lrgh.org/media_center/pr_10012004.htm>. Accessed 9/1/2006.

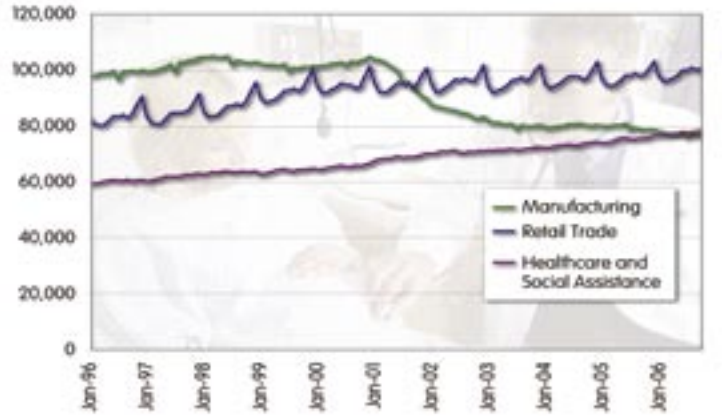
In light of improved technologies, aging equipment, and enhanced capabilities of drug therapies, combined with growing demands of the maturing population, facilities have to invest in capital improvements to maintain the increasing level of services demanded by their communities.

Covered Employment

The economic structure has steadily been shifting to an economy where employment in service-related industries is increasing faster than employment in goods-producing industries.

Employment in health care related industries, a service-providing anchor, has grown especially during the last decade and a half. Two industry subsectors in New Hampshire's *Health care and social assistance* sector are *Ambulatory health care services* and *Hospitals* in the North American Industry Classification System (NAICS).[8] Combined, these two subsectors have made up between 65 and 70 percent of the sector's employment from 1990 through 2005.

Manufacturing, Retail Trade, and Health Care and Social Assistance Employment in New Hampshire



From 1990 to 2004, hospital employment in the state grew 30.5 percent to roughly 24,000 workers. However, the *2004 - 2014 New Hampshire Employment Projections*[9] estimate that *Hospitals* should continue to grow by more than 4,000 jobs through 2014, a 17.3 percent increase.

North American Industry Classification System

Code	Industry
62	**Health Care and Social Assistance**
621	Ambulatory Health Care Services
622	Hospitals
623	Nursing and Residential Care Facilities

This employment increase comes in response to the growing needs of the communities. The physical growth of hospitals, although more visible than the expanding employment numbers, is typically the lagging result of the increasing medical demands of an area. Construction projects can be seen around the state as hospitals try to keep up with their expanding population and the associated needs that their communities represent.

[8] The North American Industry Classification System (NAICS) is a numbering system whereby each employer is assigned a NAICS subsectors, and industry groups.

[9] *New Hampshire Employment Projections, by Industry and Occupation, Base Year 2004 to Projected Year 2014,* New Hampshire Employment Security, Economic and Labor Market Information Bureau, July 2006

Counterfactual study of New Hampshire's economy in the absence of growth from hospitals

Later, each of the six counties involved in the study will be reviewed comparing the difference between economic growth each was expected to have in the absence of any additional hospital construction projects and the growth that it experienced with the projects.

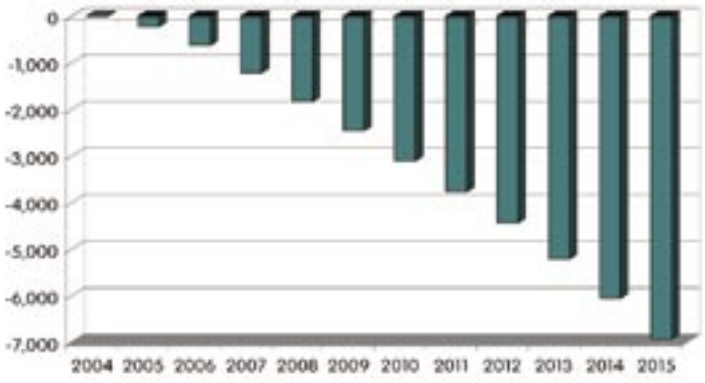
Input for New Hampshire

So what would happen in the state's economy if these and other hospital expansions did not take place? To get a statewide perspective of the importance of hospitals to New Hampshire's economy, a simulation was created which held statewide employment in hospitals at the 2004 level for the entire period of the study. This artificially created condition eliminates any new employment growth that would normally be experienced in the *Hospital* industry. These results are measured in comparison to how the state's economy would normally have grown with expected hospital increases.

Impact of a "No-Growth condition in Hospitals" on New Hampshire

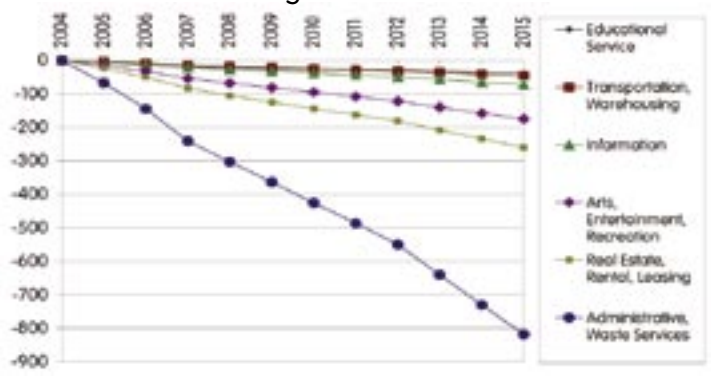
If *Hospital* growth were to be frozen, then the labor force would be affected. The lack of growth is slow to start, with 222 fewer people in the labor force in the second year (2005). This magnifies each year, resulting in a reduction of more than 6,900 by 2015.

Change in Labor Force



The distinguishing element between the labor force and employment levels is that employment is not restricted by residence and includes people who commute into the area. While *Healthcare and social assistance* is the industry most affected by the "no growth" condition (with almost 9,400 fewer jobs by 2015), the industries effected extend far beyond just health-related industries. *Construction* felt the effects, having 1,200 fewer jobs by 2015. Some of these reduced levels can be from the lack of projects to expand hospital

Change in Industries

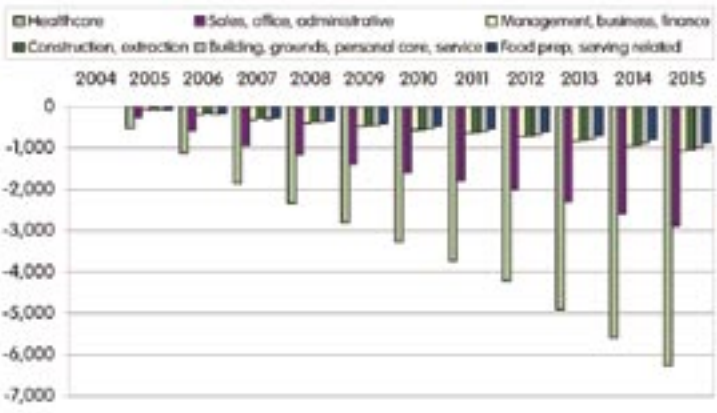


facilities. Other industries are secondary, related not only to the lack of growth in hospitals but closely tied to related changes in population. *Retail trade* would expect to shrink by over 800 positions, while *Administrative and support and waste management* companies would reduce their forces in response to a smaller demand for services.

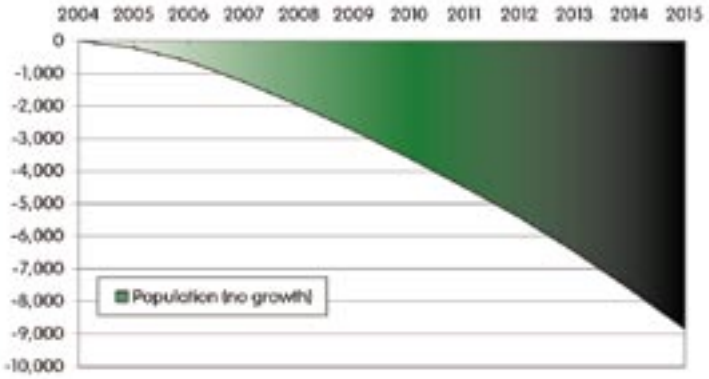
Healthcare occupations lost a chunk of the employment, 6,200 fewer workers by 2015, from a lack of growth in healthcare related industries. Additionally, almost 2,900 workers are lost in *sales, office and administrative* occupations, and there will not be a need for over 1,000 workers in *management, business, and financial* occupations as well as *construction and extraction* occupations. Subsequent reductions in population would result in *buildings and grounds and personal care service* occupations and *food preparation and serving related* occupations also scaling back by about 900 workers in each field.

Population would also change differently. Even though the labor force is based on place of residence, the effects on population are expanded because people in the labor force have dependents and family members not included in the labor force. For this reason, the reductions in population are initially similar to the labor force, 211 people in 2005. But as people leave to find employment outside of the state, they take their families with them, causing the losses of population to overtake those in the labor force, reducing the population by almost 9,000 people by 2015.

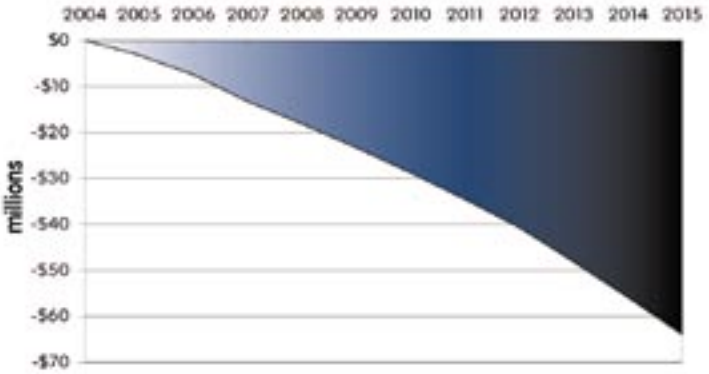
Change in Occupations



Change in Population

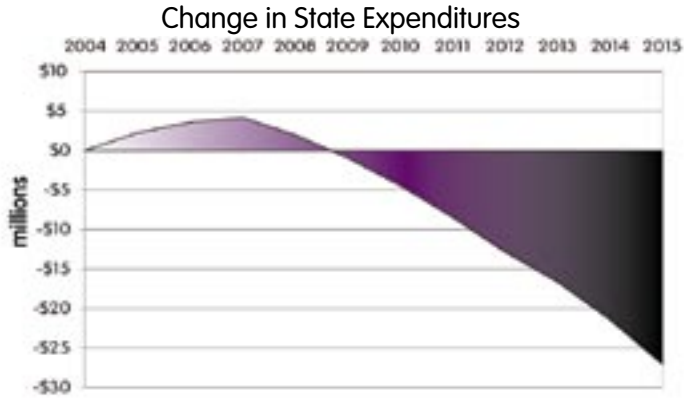


Change in State Revenues



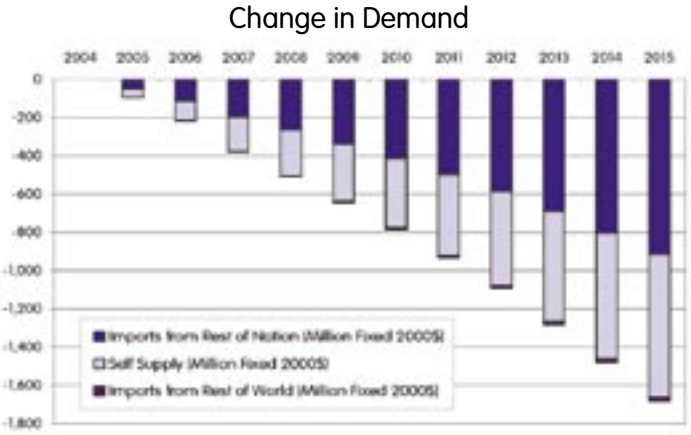
On a broader scale, hospitals are a business, as such they contribute to the state's comprehensive annual financial report (CAFR). If hospital growth were to stagnate at the 2004 level, along with related reductions in other industries, state revenues would also be negatively affected. The losses would start at $3.1 million in 2005, and each year would lose more until by 2015 the loss for the year would reach $63.9 million.

Likewise state expenditures would take a hit. Initially, as those without work require public assistance, the expenditures would rise $2.2 million, and the increase in expenditures the following year, 2006, would be over $3.5 million. The increases peak above $4.1 million in 2007 before they start to subside. These reductions then follow the same pattern as the reductions in population.



The losses statewide change the *demand* for goods and services in the state. For this study, demand is met through three components:

- Self supply – meaning the goods and services that are readily available within the state borders.
- Imports from the rest of the nation – defines those products that come from outside of the state, but within the nation.
- Imports from the rest of the world – which covers everything else.



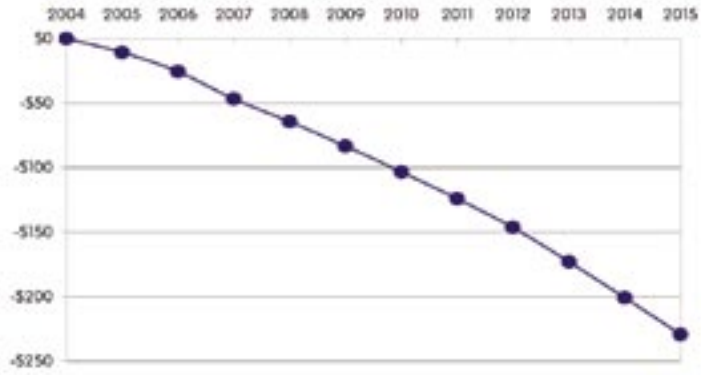
The lack of growth in employment and the related diminishing population will also require fewer products. The levels of *self supply* and *imports from the nation* are close to parallel until around 2007. The lack of growth in hospitals, over time, will magnify the lack of *imports from the rest of the nation*. At that point, with employment and population levels declining, the imports decline faster (partly because there is less need to purchase/import equipment) than the demand on goods and services provided in the state.

Individuals in the state would see a difference in their average annual wage as a result of "no growth" from hospitals. The reductions, compared to what would be expected to be earned

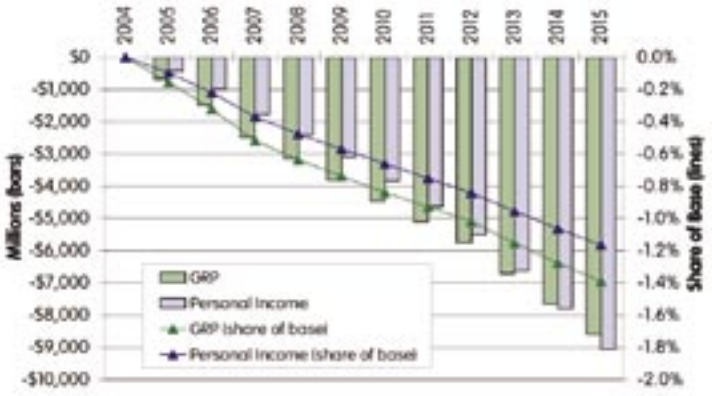
with normal hospital activity, are slow to begin with, just over $10 in 2005. That difference to their annual pay may not be noticed by everyone. However, that reduction grows to over $50 by 2008, and doubles to $100 by 2010. By 2015, people may notice they are getting nearly $230 less per year on average.

The financial losses on an individual basis may not be remarkable, but when those are considered collectively, it has a much bigger impact. In the first year, 2005, of "no growth" from hospitals, the state would have $67.4 million less in the local economy. That marks just the beginning in the reduction of the state's gross regional product, as the level continues to decline, dipping $147.8 million below what would have been expected to be earned with normal hospital activity in the next year. By 2015, the state will be more than $858.5 million below its expected GRP levels. Personal income, an element included in GRP, follows a similar trend. The reductions in personal income were initially slower, $42.1 million the first year, however the losses exceeded those of GRP by 2014 at $780.1 million, reaching $905.6 million by 2015, because of the lack of growth in population.

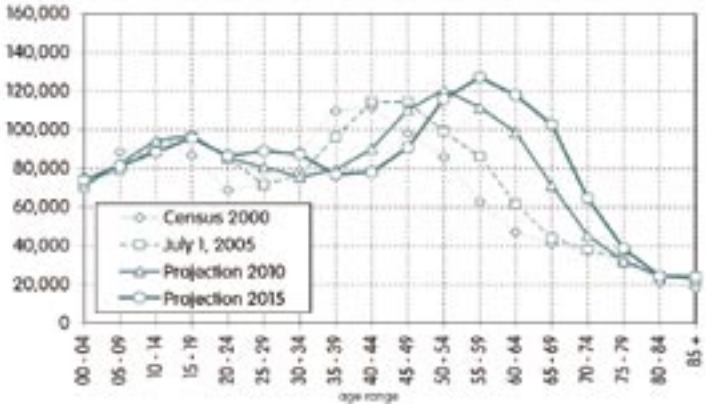
Change in Annual Average Wage



Change in Gross Regional Product and Personal Income



Population by Age Range



How does the growth of hospital construction impact the regional economy?
Six case studies in New Hampshire

Certificate of Need (CON) Applications

In early 2003, a survey conducted by *Business NH Magazine* showed $415 million was dedicated to hospital construction projects throughout the state.[10] When medical facilities want to expand or invest capital funds toward improvements they must submit a certificate of need (CON) application to the State.[11]

Approval must be obtained before hospitals can initiate projects that require capital expenditures above certain dollar thresholds, introduce new services, or expand beds or services.[12] In New Hampshire the standards established are intended to improve:

- the quality of care,
- access and availability to services, and
- preserve the cost effectiveness of services provided.

These all have to be done without causing a detrimental effect on the surrounding health care system of the area serviced by the CON applicant facility.[13]

The current expense thresholds, established by New Hampshire statute, and enforced by the Health Services Planning and Review administration, the board responsible for reviewing and approving CON applications in New Hampshire,[14] are:

- $2,150,891 for any acute care facility project,
- $1,433,928 for any nursing home, ambulatory surgical facility or specialty hospital project, and
- $400,000 for equipment.

According to the Health Services Planning and Review administration, hospitals have to show a need for expansion that does not increase their New Hampshire market share. Therefore the hospitals describe these physical expansions in terms of service improvements rather than growth. Improved technologies and enhanced diagnostic capabilities of new equipment are essentially expected in the health care environment.

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10 NH Public Radio, <www.nhpr.org/node/4460>, The Certificate of Need Process. February 5, 2003. Accessed August 2, 2006.

11 A Certificate of Need is required for a licensed health care facility to proceed with large and often expensive construction or renovation projects that exceed a threshold amount established by NH Statutes. <www.dhhs.nh.gov/DHHS/HSPR/default.htm>. Accessed September 6, 2006.

12 Department of Public Health and Human Services, <www.dphhs.mt.gov/aboutus/divisions/qualityassurance/certificateofneed/index.shtml>. Accessed August 2, 2006.

13 State of New Hampshire Administrative Rules, He-Hea 1001 Acute Care Facilities, <www.gencourt.state.nh.us/rules/he-hea1000.html>. Accessed August 3, 2006.

14 New Hampshire Department of Health and Human Services, Welcome to Health Services Planning & Review, <www.dhhs.nh.gov/DHHS/HSPR/default.htm>, Accessed August 3, 2006.

When hospitals want to expand, they need to show the Board essentially three things:

- They will not be increasing their market share or develop an unfair advantage over another hospital in their region.
- They will not be duplicating services of neighboring facilities.
  - This part of the CON application process tries to preserve the cost effectiveness of the services being provided.
    - *For example, assume a hospital decided to invest in the same expensive piece of equipment that a neighboring facility has. Typically the expertise of those operating the equipment increases with practice or frequent use. So, if there were two neighboring facilities with the same equipment each of these users would develop only half as much expertise. Also, the cost of the equipment would be spread over the volume of patients. So, the demand at the two facilities for the new service and equipment would need to be enough to support that equipment in both locations to justify the cost and preserve the efficiency of having it in both locations.*
- The residents of the area will not go without services, either short term or long term, if the expansion occurs.

How improvements were measured

We selected several large CON requests that are currently on file with Health Services Planning and Review, housed at New Hampshire Department of Health and Human Services.[15] We chose CON applications that were at least $15 million because these applications had large construction components. This eliminated requests for only equipment which generally do not create any additional jobs. Typically the CON applications for less than $15 million were only for equipment purchases or did not include substantial building renovations. In order to gauge the most current improvements, we selected significant expansion projects in progress since the beginning of 2004, or those having an approved Certificate of Need for such a project not yet started.

Certificate of Need (CON) Applications

Hospital	Location	County	CON Amount (millions)	Employees
The Memorial Hospital	North Conway	Carroll	$17.8	352
Mary Hitchcock Hospital	Lebanon	Grafton	$165.0	7,100
Speare Memorial Hospital	Plymouth	Grafton	$15.0	320
Catholic Medical Center	Manchester	Hillsborough	$32.5	1,700
St. Joseph Hospital	Nashua	Hillsborough	$31.1	1,200
Southern NH Medical Center	Nashua	Hillsborough	$26.6	1,254
Concord Hospital	Concord	Merrimack	$57.7	2,757
Exeter Hospital	Exeter	Rockingham	$51.5	1,257
Parkland Medical Center	Derry	Rockingham	$15.7	634
Frisbie Memorial Hospital	Rochester	Strafford	$42.7	827

This study criteria yielded projects for ten acute care hospitals in six counties. The intent of the study was to evaluate the economic impact such projects have on the economy, locally and statewide. To assess the changes to the local economy, we used our REMI econometric model[16] that incorporates all the statistical formulas for forecasting change.

[15] The Health Services Planning Review Board is administratively attached to DHHS. NH Statutes define an administratively attached agency such as HSPR as an "independent agency linked to a department for purposes of reporting and sharing support services." Thus, while the HSPR Board exercises its powers independently from DHHS, HSPR staff members are DHHS employees

[16] Re
model.

Interviews with representatives from some of the hospitals selected for the study indicated that most of the changes expected would be to the physical footprint of buildings on the hospital campuses.[17] According to these representatives, most hospital employment changes had already taken place in response to increased demand. Therefore, the primary economic impact of these projects is the temporary boost to *Construction* employment and the effect of the capital expenditures in building materials and equipment, and how these ripple through the local economy.

Construction's unique quality of being transient makes it challenging to include in the forecasting process, especially when studying specific areas like counties. For example, a spike and decline in *Construction* in a certain area, region or county, would not necessarily mean that the statewide *Construction* sector would experience a spike or decline, but more that it moved from one site to another. This is one of the reasons the *Construction* industry is susceptible to frequent employment shifts, more so than other industries.

Additional conditions that may affect *Construction* employment levels would be the availability of construction workers and the weather. A shortage of construction workers translates to delays, and the weather can impact construction schedules and therefore employment levels.

[17] Telephone interviews conducted 6/29/2006 with Lisa Drouse, Director of Planning, Catholic Medical Center; Scott Westover, Planning, Southern New Hampshire Medical Center, 7/6/2006 Kathleen Proulx, Administrative Dir. Clinical and Professional Services, Parkland Medical Center.

Specific Hospital Improvements by County

Hillsborough County

Certificate of Need

Hillsborough County is home to three of the ten acute care facilities with projects selected for this study. Three of the five acute care hospitals located in the county (Catholic Medical Center, St. Joseph's Hospital, Southern New Hampshire Medical Center) have undergone or will undergo major renovation or new construction between 2004 and 2009.

Catholic Medical Center, Manchester (CMC)

At the time this expansion began in 2003, the projected cost was $19.6 million. However, CMC applied for a *Change of Scope*[18] in 2006, increasing the total project cost to $32.5 million.

The original application included the construction of a four-story addition, including renovation of

- the emergency department,
- intensive care unit,
- diagnostic imaging department, and
- cardiac support services.

These plans included 14,800 square feet of shell space to be available for future development.

The *Change of Scope* expressed the need to renovate the hospital's current 10 operating rooms, which average 430 square feet each. According to these revised documents, new equipment requires the average operating room size be a minimum of 600 square feet. Instead of renovating the existing operating space it was determined to be more efficient, safe, and cost effective to build 10 new, modern operating rooms in the 14,800 square foot "shell" space, planned in the original application. No determination of future use has been made for the vacated space from the existing 10 operating rooms.

St. Joseph's Hospital, Nashua Area

There are a couple of different projects being done here, the largest of which began in 2004 and has an approved total project cost of $31.1 million.

This project included:

- the construction of a two-story 74,400 square foot ambulatory care facility,
- renovation of the hospital's first floor,
- building a parking deck.

Ninety-five percent of this project had been completed by April 2006, accounting for $18.4 million.

[18] Change of Scope is part of the Certificate of Need process. This is an amendment to the original Certificate of Need including additional costs and changes to construction projects and/or equipment.

In the second project, St. Joseph's expanded and relocated its "Surgi-Center" in order to meet the high demand for ambulatory surgery services. The final cost of this second project was $3.5 million and it was completed in February 2006. The CON stressed that the reasoning for both of these expansions was to better serve the growing and aging population of Greater Nashua and to provide a state-of-the-art facility.

Additionally, St. Joseph's Hospital applied for a fixed MRI unit in their diagnostic imaging department with an approved cost of $2.7 million. The planned completion date for this project was stated as December 2006. Per the CON, the purchase of a fixed MRI to replace the existing mobile MRI unit is to meet the increased demand for MRI services.

Southern New Hampshire Medical Center, Nashua

The planned expansion and renovation at this facility is expected to begin in summer 2007 and be completed by summer 2009. The total project cost is estimated at $27.6 million. According to the CON application, the hospital is faced with an aging facility that was not designed to meet current standards in medical care. This project addresses the need for expanded space to accommodate current standards for service delivery and meet the requirement of patient privacy under HIPAA.

Expansions and renovations planned include:

- endoscopic services,
- surgical intensive care services,
- laboratory services,
- neonatal intensive care unit,
- labor delivery and recovery unit,
- and kitchen facility.

Total input for Hillsborough County

From the project details provided in the CONs for facilities in Hillsborough County, the costs were assigned according to the industries they would effect.

- Total construction expenses: $75.2 million.
- Domestic trade flow patterns from the econometric model indicate that 16.6 percent of construction in Hillsborough County gets distributed to firms outside the county.[19]
    - That means that for every $100 spent on construction in that county only $83.40 actually stays in the county.

According to those proportions, the total construction cost that was used in the model was $62.8 million over the period 2004 to 2009. This was the proportion of construction distributed to firms in the county.

[19] REMI Domestic Trade Flows is a market share distribution matrix in the econometric model.

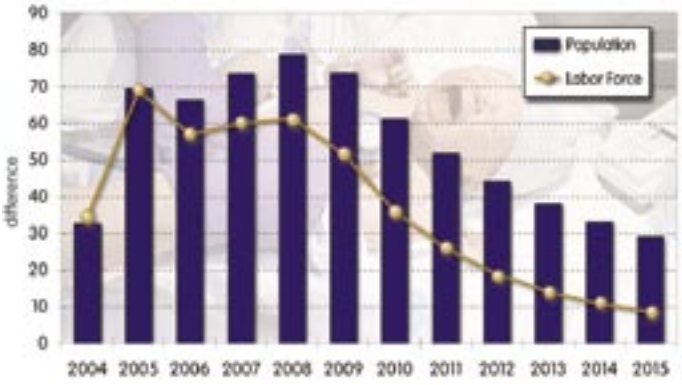
Additionally, $8.8 million was used for *Medical equipment manufacturing* from 2004 to 2009 and $2.7 million as *Navigational, measuring, electromedical, and control instruments manufacturing* in 2006. These purchases did not create jobs in the county and contributed little to the local economy.

Impact of Hospital expansion on Hillsborough County

Since the majority of project expenses are for renovations and construction purposes, this is where the most significant economic changes are experienced. The labor force in the county did not experience a large shift during the first year of the projects, increasing by only 34 people. That increase peaked at 69 in 2005 then gradually fell off. Over the next four years, the levels ranged between 60 and 51.

Hillsborough County has typically had the fastest growing population in the state, highly affected by its proximity to the Massachusetts boarder. Even with this continued population expansion, the level is boosted with the availability of additional construction jobs at medical facilities. The first year, 2004, showed an additional increase of 33 people. The next five years attract around 70 more people each year. The increases gradually taper off, but remain in the range of 30 people above originally projected levels by the end of the projected period in 2015.

Hillsborough County Difference in Labor Force and Population



Hillsborough County Difference in Employment

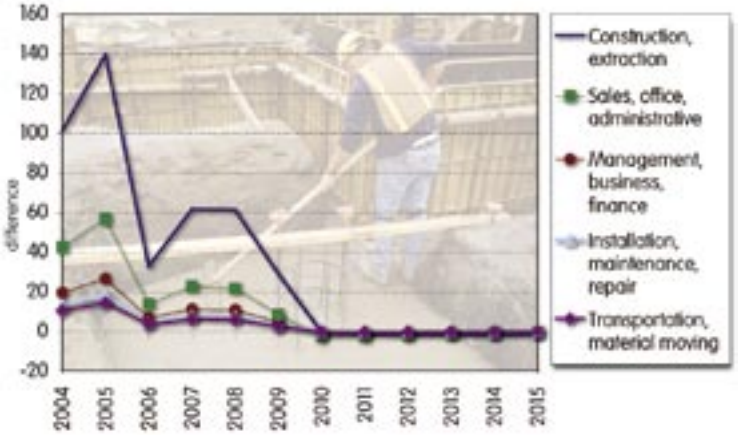
Employment levels, not restricted to residence like the labor force, increased at a slightly higher level. And with the new projects, it can be assumed that the unemployment rate will decline as a result of the additional available work. These projects supported 227 more jobs in 2004 and 310 jobs in 2005. As the different stages of the project are completed from 2006 to 2009, the job levels will range from 58 to 133 jobs.

Two of every five added jobs are *construction and extraction* occupations, which grew by 100 and 140 jobs in the first two years. As is the nature of the beast (construction being the beast), while employment levels rise initially, they decline as the projects get closer to completion. The same holds true for three occupational groups that support construction activity: *sales, office and administrative* occupations, *installation, maintenance and repair occupations*, and *transportation and material moving* occupations.

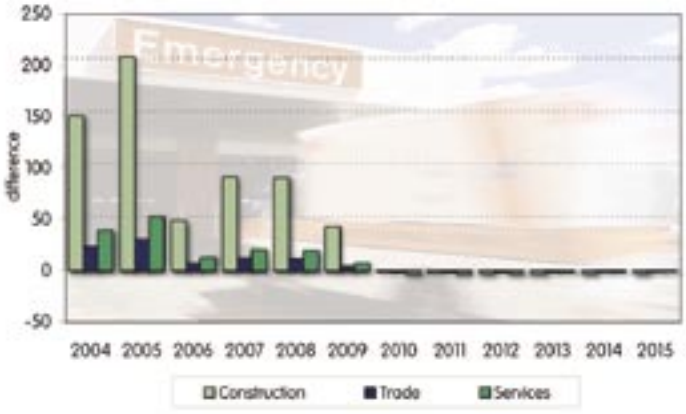
Approximately 68 percent of the jobs created are in the *Construction* industry sector with most of the remaining new jobs being in *Services* and *Trade*. Some of the construction costs support jobs in *Professional and technical services*. The rest of the jobs are created from the secondary effect of increased consumption in *Accommodation and food services* and *Retail trade*.

The improvements to these hospitals will contribute over $10.3 million to the county's gross regional product (GRP) in 2004 and $14.3 million in 2005. Personal income in the county also benefited from the new projects, growing by almost $8 million in 2004 and spiking the second year by more than $11 million. Personal income levels taper off over the next four years, with increases ranging between $6.4 and $3.5 million. The last years of the projected impact period show that personal income returns close to its originally forecasted levels.

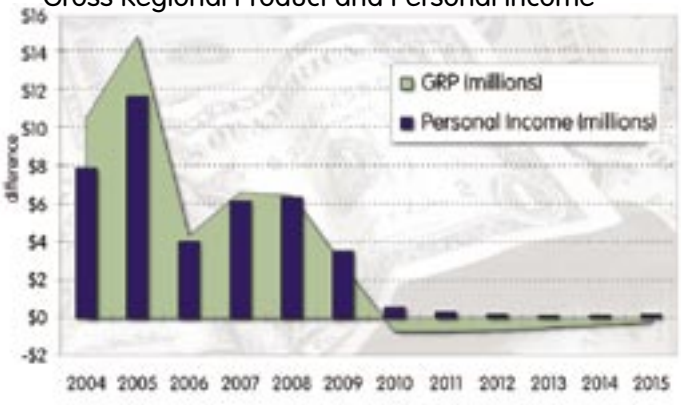
Hillsborough County Difference in Occupations



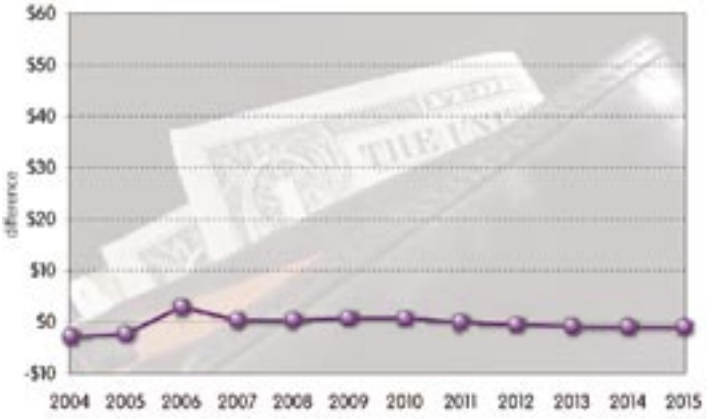
Hillsborough County Difference in Industries



Hillsborough County Difference in Gross Regional Product and Personal Income



Change in Hillsborough County Average Annual Wages



The GRP aggregate value is the result of the change in wages per worker. Average annual wages experienced only minimal pressure as the project began. The extra workers, drawn in by the projects, forced wages down, although the change to wages was negligible. In the first two years of the project, average annual wages dropped slightly by roughly $2 and $3 dollars. The third year balanced out, barely increasing by $3 before dropping the next couple years to less than $0.50. By the end of the study period average annual wages in the county were roughly $1 off of original levels. What this shows is that as the economy grows, along with the population, the average annual wage will stay at about the same level.

Grafton County

Certificate of Need

Grafton County has five acute care facilities. Two of these are among the ten acute care projects that met the criteria for this study. Those hospitals are Speare Memorial Hospital in Plymouth and Mary Hitchcock Hospital in Lebanon.

Speare Memorial Hospital, Plymouth

The narrative in this application describes new construction and renovations totaling 75,000 square feet. This includes an attached medical office building. According to the Certificate of Need, the reason for the project is to correct overcrowding because there is not enough room to handle current and projected patient demand volumes, compounding patient confidentiality concerns. Public accessibility is also very difficult given the current layout. Limited parking further aggravates this lack of access. The intended $15 million improvement includes purchasing surrounding properties, redesigning entrances for patient friendly access, and, improving staff efficiencies. Expansions and renovations account for two-thirds of the overall project cost (about $10 million).

Two expansions will take place:

- a clinical addition of 12,000 square feet, and
- a one-story addition off the northern side of the main hospital of 13,668 square feet, including a redesign to improve ease of patient traffic and adequate storage space.

Surgical suite and emergency department expansions will accommodate the increase in patient volume from population growth and seasonal tourists. Additional space increases will also impact the central sterile supply, radiology, pharmacy, cardiopulmonary, kitchen and nutrition, and administration departments.

Mary Hitchcock Memorial Hospital, Lebanon

One of the largest acute care facilities in the state, this hospital had the highest value Certificate of Need request. Their original CON was for $165 million, with construction starting in February 2002 and completion by January 2006.

These project costs covered several expansions:

- diagnostic and therapeutic facilities,
- addition of physician offices,
- addition of ambulatory exam space,
- patient parking garage,
- additional surface parking for staff.

By the time the implementation report was filed for project expenses incurred through March 2005, a *Change of Scope* was included for another $9,985,515 covering the addition of CATH/EP[20] services. Additionally, another CON was submitted to cover the costs of fixed PET/CT[21] equipment for $3.1

[20] Th
service capabilities.

[21] Tomography scanners are vital in detecting cancers and other ailments.

million. These services had previously been provided by a mobile unit that was far removed from the radiology department.

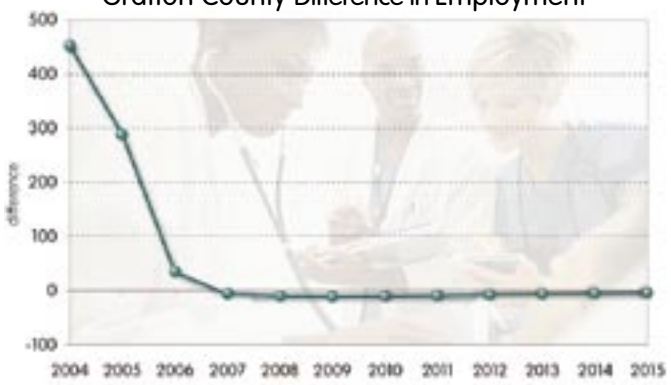
Total input for Grafton County

Since this study includes construction projects completed and planned from 2004 forward, work and costs associated with Mary Hitchcock's CON request that were completed prior to the end of 2003 are not included in this analysis. Specific costs associated with remaining construction projects in the combined CONs came to $65.0 million. As with almost all projects, not all construction monies spent stay within the county. Grafton County domestic trade patterns show that approximately $63 of every $100 of construction expenditures paid stay in the county. After this adjustment, $40.56 million of projected construction money was used in the model as the share contributed to the county's economy. Equipment costs – $15.9 million for *Medical equipment manufacturing* from 2004 forward, and $2.7 million for *Navigational, measuring, electromedical, and control instruments manufacturing* were assigned to final demand. This $18.6 million did little to add to the local economy in Grafton County and did not necessarily generate jobs in the county.

Impact of Hospital expansion on Grafton County

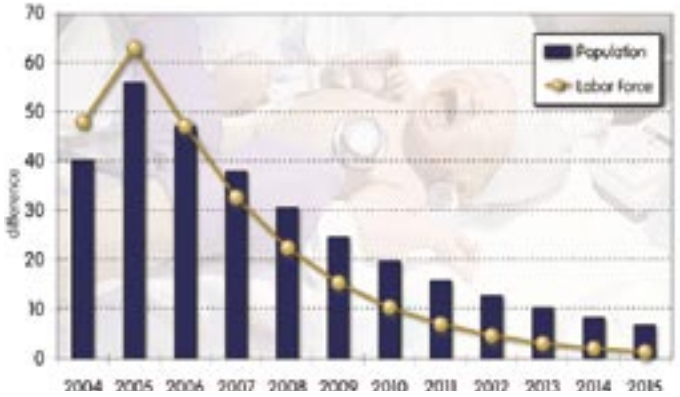
Because a large portion of the project for Mary Hitchcock Memorial Hospital had already been completed before the time frame of this study, most of the changes for this county are evident in only the first couple of years. However, in light of that, total employment levels in 2004 and 2005 showed an increase of 453 and 288 workers respectively. After that point the level of change declines to barely 34 workers before the increases drop off entirely.

Grafton County Difference in Employment



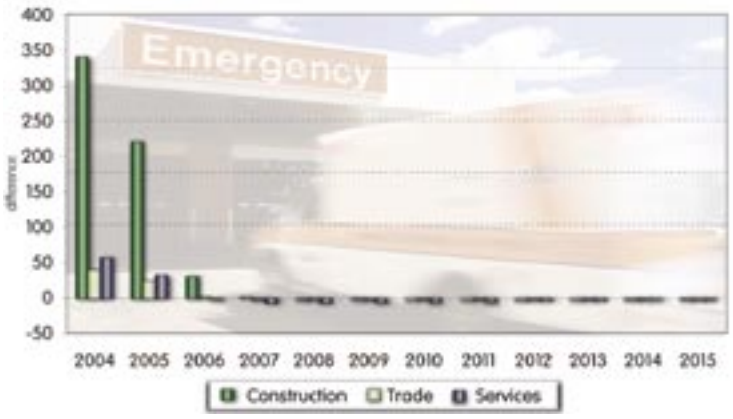
The population and labor force in the county are closely related in their response to the projects. Labor force increased a little faster than population during the first two years, 48 and 63 people in the labor force compared to 40 and 56 in population. By the third year the change is essentially the same for both at 47 people, but then as the projects reach completion, the labor force levels fall off faster than population.

Grafton County Difference in Labor Force and Population



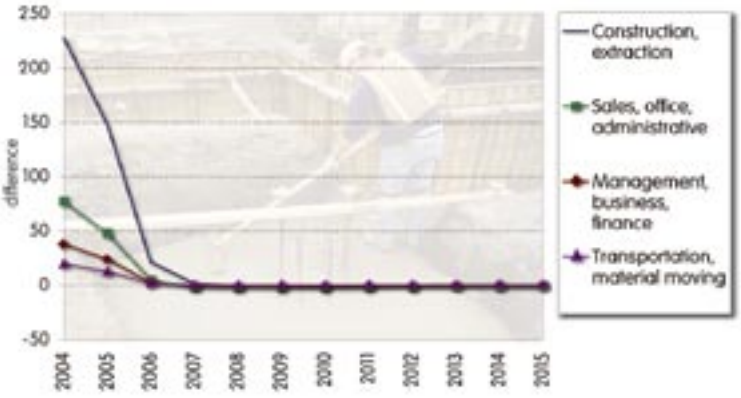
Among the industries most affected by the projects, *Construction* made up the lions share with over three-quarters of additional jobs created in the first years. During the first two years, *Services* and *Trade* employment levels were also elevated. By the third year, the employment level in *Construction* was the only industry sector that had not returned to its original level or below.

Grafton County Difference in Industries



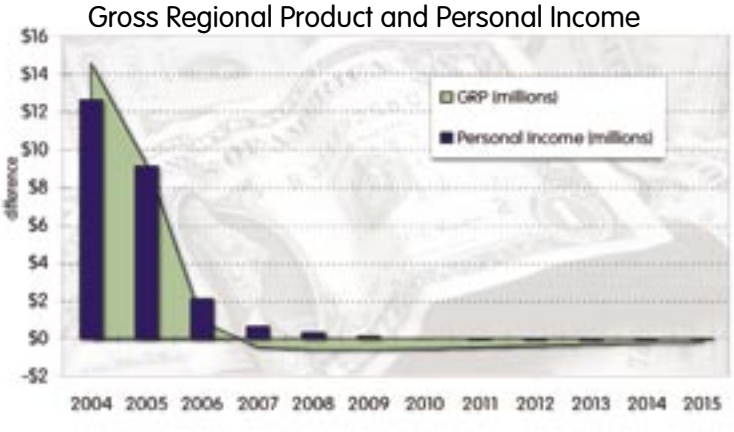
The occupations related to the industries showed the most change in the initial years. *Construction and extraction* occupations made up more than half of those additional jobs. Related occupations that either support or spring up from excess demand were seen in the increases in *sales, office and administrative* occupations. To a lesser degree, *management, business, and finance* occupations and *transportation and material moving* occupations also experienced employment level increases in the initial years, only to have the increased levels subside with the completion of the projects.

Grafton County Difference in Occupations



The projects at the medical facilities contribute $14.6 million to the gross regional product (GRP) of the county in the first year of the study. Because the projects are closer to the completion stage this tapers off quickly with the passing of the second year, reducing the additional contributions to $9.2 million. After the third year, the GRP of the county falls below what was originally expected for the county. Personal income

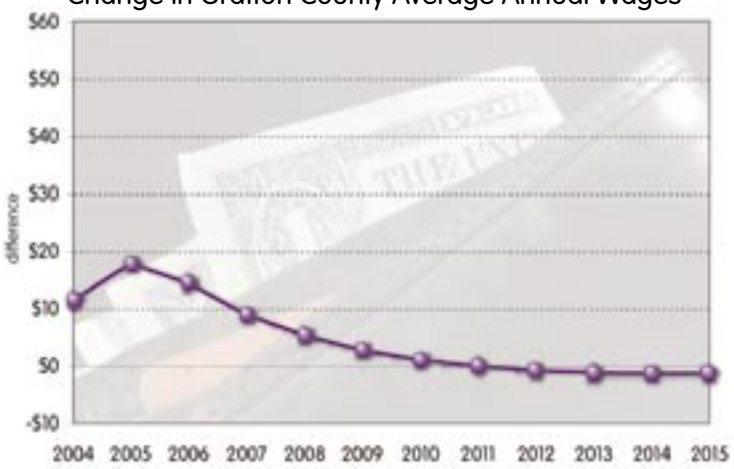
Grafton County Difference in
Gross Regional Product and Personal Income



in the county experiences the same pattern of change, spiking initially and declining to the original levels, only the personal income doesn't go below originally expected levels until the projected eighth year of the study.

The average annual wage can be the per capita measurement of the GRP. Average annual wages in the county followed the same trend. The first year included in the study had a slight increase of $11.54, that did peak the next year just shy of $18.00. A gradual reversal took place as wages slowly returned to their normal levels during the next five years.

Change in Grafton County Average Annual Wages



Merrimack County

Certificate of Need

Only one of the acute care hospitals in Merrimack County fit the criteria of this study.

Concord Hospital

This hospital began an extensive reconstruction project that started in August 2005 and is scheduled to continue into summer 2008.

Their initial Certificate of Need, submitted for $52.6 million, included construction of a four-story addition to expand:

- emergency department,
- intensive care unit,
- operating room complex (including central sterile supply), and
- add ten medical surgical beds in the new east wing, as well as
- ten observation beds adjacent to the emergency department.

To better address infection control and privacy concerns, and reduce chance of medical errors, the renovations will include converting semi-private rooms to private rooms.

A *Change of Scope* was submitted to add another $5.1 million to satisfy the need for additional private rooms. The hospital administration expects these additional rooms can be completed within the timeframe of the original CON request.

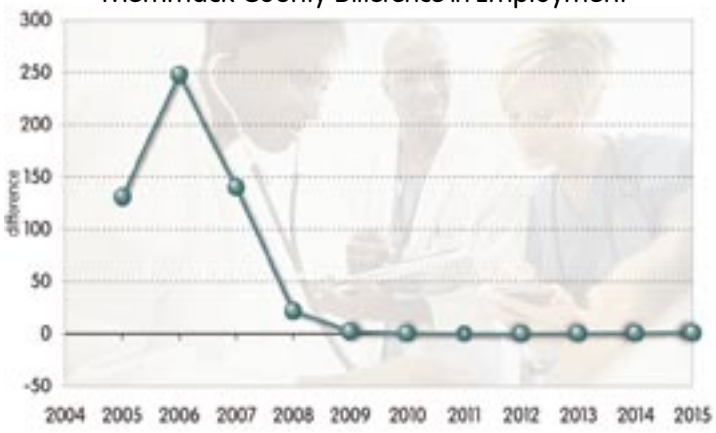
Total input for Merrimack County

The total CON application for Merrimack County had a price tag of $57.7 million. The construction expenses listed came to $53.1 million. Merrimack County typically experiences just shy of 27 percent of construction expenses going to firms and jobs from outside the county, so the construction amount used in the study was adjusted to $38.8 million. Another $4.6 million is assigned to final purchases for equipment which would not typically generate additional jobs in the local economy.

Impact of Hospital expansion on Merrimack County

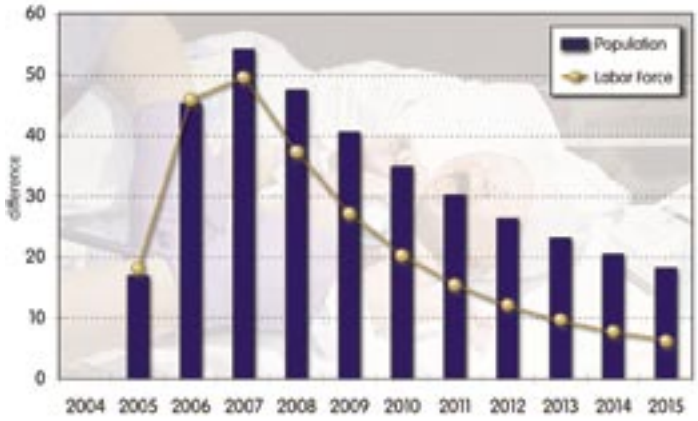
Much of Merrimack County's construction costs goes to companies outside the county (per the domestic trade patterns), so there is a smaller effect on total employment. Also this project didn't start until a year into this study (2005), deferring any changes an additional year. During the initial year of the project, 2005,

Merrimack County Difference in Employment



total employment rose by 130 workers. The following year the level shot up by 248, the next year, 2007, the increase was 140. Completion of the project is estimated to be within those two years. So, total employment is only 22 jobs above expected levels by 2008 before dropping off entirely.

Merrimack County Difference in Labor Force and Population

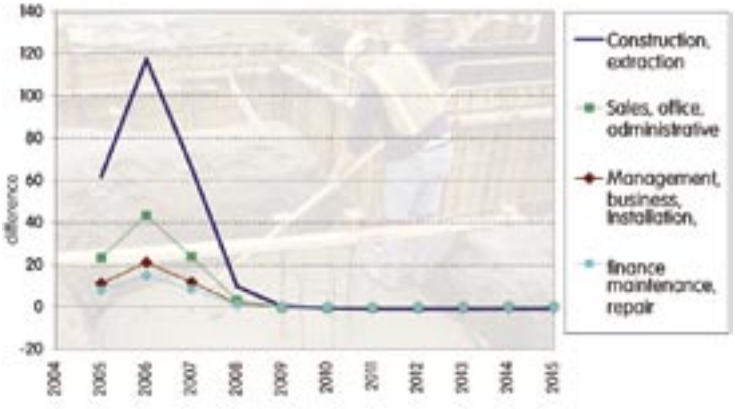


The additional growth in the county's population and labor force in 2005 and 2006 were virtually equal. Population increased by 17 in 2005 and labor force by 18, the next year the additional growth was 45 and 46 respectively. In the initial years of the project, labor force growth barely nosed out population increases because of the draw to more work as a result of the project. However when the project is complete, the available services become the draw as more people move into the area. At that point, because population includes families and dependants, it increases at twice the level of the labor force.

Almost half of all additional workers in the county were in *construction and extraction* occupations. It can be presumed that these people were drawn to the county by the hospital expansion project. Employment expanded the first year by over 60 jobs, 115 in the second year, then 60 in 2007. Combined with the length of the project, the influence from this group will be short-lived and gone by completion in 2009.

Sales, office, and administrative jobs followed a similar cycle as they required more than 20 additional workers in 2005, 45 by 2006 and then 24 before dropping back down to normal levels. Additional professionals and finance people will also be necessary during the first years, as *management, business, and finance* occupations will increase an additional ten to twenty jobs, returning to normal levels by 2009. These extra people in the area cause greater demand for other occupations which is answered by temporary additional *Construction* jobs created in three areas: *installation*, *maintenance*, *and repair*;

Merrimack County Difference in Occupations



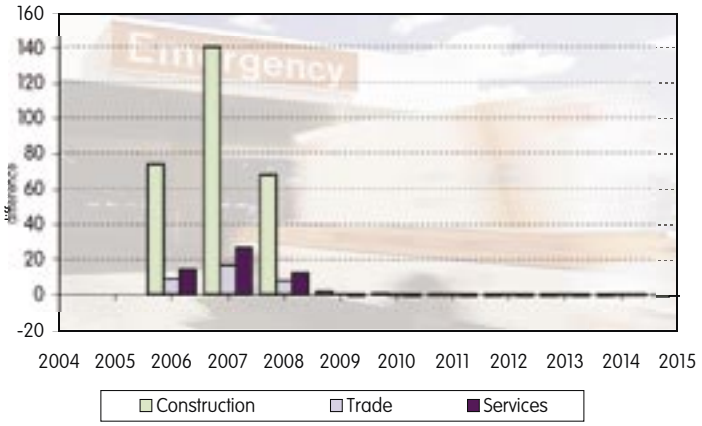
transportation and material moving; and *food preparation and serving related occupations*.

The changes in industry employment were also fleeting. The rise and fall of employment started in 2005 and was gone by 2009 in three industry sectors, *Construction*, *Trade*, and *Services*.

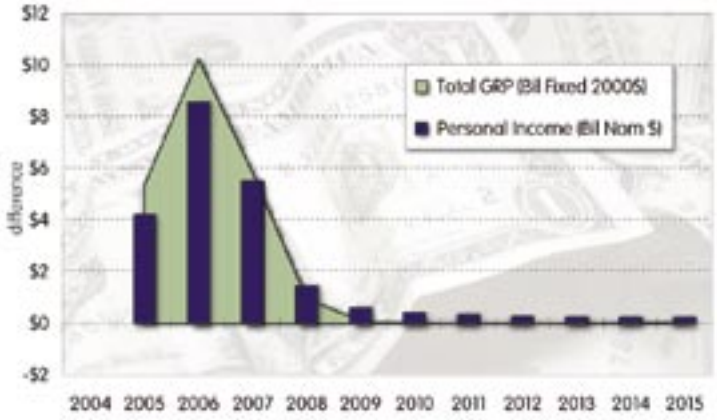
In 2005, the project contributed an additional $5.4 million to the local economy. That amount almost doubles the second year, and falls back to within normal ranges by 2011. Personal income experiences similar fluctuations over the short time frame, increasing by $4.2 million the first year, peaking in 2006 with an additional $8.6 million, only to fall back within normal ranges by 2009.

Average annual wages can be considered the amount added to the local economy evaluated on a per worker basis. The average annual wages shifted slightly over the project period. The year the project started, 2005, average annual wages had a slight increase of $5.29 and peaked the following year at $12.15, when wages start to wane the following years to $10 and $4 before returning to normal levels. By 2011 the level of annual average wages fall below originally expected levels.

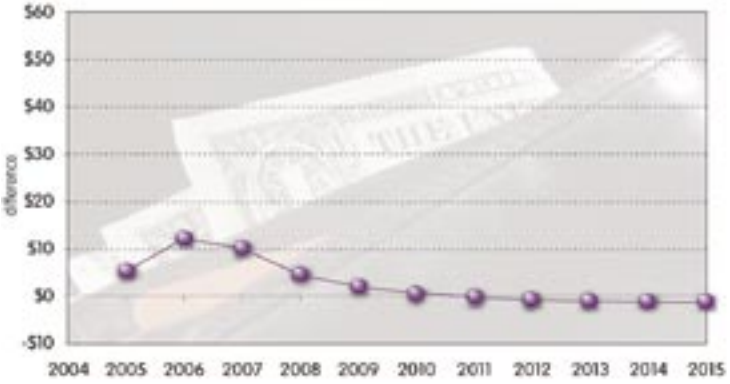
Merrimack County Difference in Industries



Merrimack County Difference in
Gross Regional Product and Personal Income



Change in Merrimack County
Average Annual Wages



Strafford County

Certificate of Need

Frisbie Memorial Hospital, Rochester

The only facility in Strafford County represented in this study is an 88-bed acute care community hospital founded in 1919.[22] The hospital serves from Rochester and the greater Strafford County to Southern Maine areas. This hospital has the third lowest employment level in the study, but the value of its projects was the fourth highest. A Certificate of Need for the value of $42.67 million was approved in April 2006. The application states that renovations are needed because of the age of the facility and the hospital service area's rapidly growing population.

The proposed project includes:

- 88,700 square feet of expansion and renovation of 22,600 square feet.
  The expansion includes four goals:
  - increase in the number of available beds, with a large percentage of private rooms;
  - moving endoscopy and expanding it from two to four rooms;
  - expansion of cardiology as well as integrating related services including diabetes and nutrition, pulmonary lab, and the phlebotomy lab; and
  - improving the front entrance space for the public.

Planned renovations are aimed at creating direct access for walk-in emergency patients so they don't have to go through public areas; expanding and reconfiguring the pharmacy from 1,500 square feet to 2,900 square feet, and converting 12 double rooms to private rooms.

Total input for Strafford County

About $2.5 million of the total Certificate of Need request is to acquire major medical equipment which will not create jobs or contribute significantly to the local economy of the county. The greater part remaining of $40.2 million from the CON application was specifically for construction and renovation projects at the facility. Because Strafford County has a smaller concentration of the *Construction* industry, more than 40 percent of all construction costs paid are to companies from outside the county. So of the $40.2 million appropriated for construction in this Frisbee Memorial Hospital's CON only $23.45 million will stay in Strafford County to produce jobs and support the economy.

Impact of Hospital expansion on Strafford County

This project didn't begin until the second year into the study. In the first year of the project, 2006, for this county, the total employment level increased 100 jobs above expected levels. The following year, there were 191 additional jobs. The estimated completion date was in 2008, just two years after the project's start time, so most of the effects directly related to the project dissipate after that point. Total employment increases fell back to 93 additional jobs in

[22] Frisbie Memorial Hospital, <www.frisbiehospital.com> , Accessed August 3, 2006

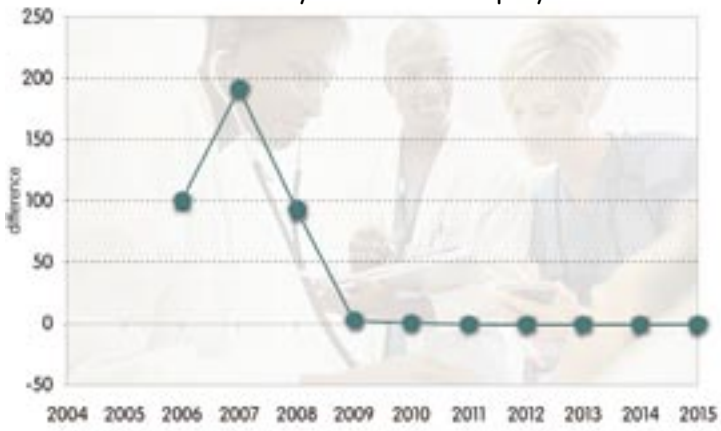
2008 then only two jobs different from original levels by 2009. After that point, there was less than a two-person variance from normal employment levels.

Even though a large portion of the construction costs are allocated to companies outside of the county, the *Construction* industry sector is the primary beneficiary of additional jobs created by the project, accountable for three-quarters of the increases during the three years of the project. The *Service* and *Trade* industries gained as a result of the *Construction* industry.

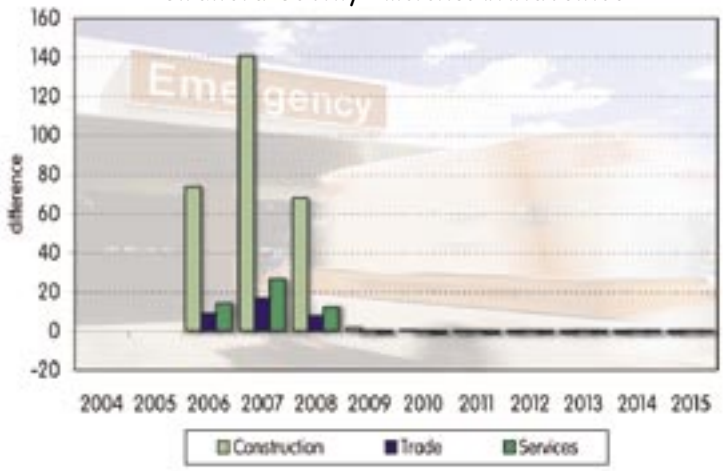
Construction and extraction occupations held almost half of the added positions during the three years of the project, adding 49, 94 and 46 jobs each of the respective years before returning to normal employment levels. As a result of the increase in *Construction*, other occupations increased, such as *sales, office and administrative* occupations, contributing just shy of 20 percent of the annual increases with 17, 32, and 15 jobs.

The project gave an immediate boost to the county's gross regional product (GRP), adding over $3.4 million to the local economy in 2006. That level expanded to $6.5 in 2007 and receded to $3.1 the last year of the project. The GRP returned to within its normal level by 2009, and was projected to be about half a million dollars below

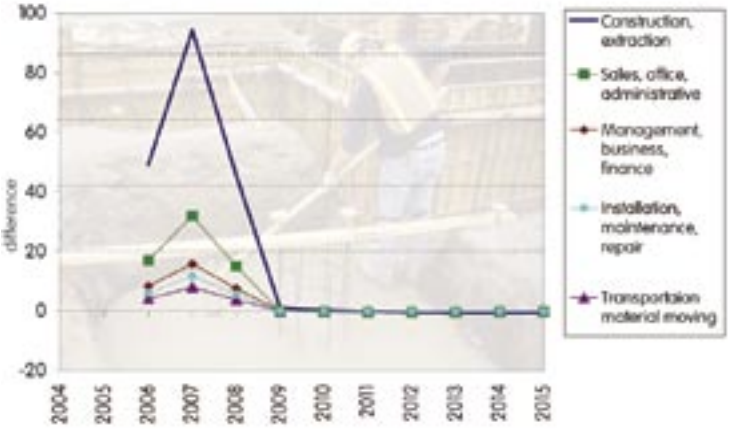
Strafford County Difference in Employment



Strafford County Difference in Industries



Strafford County Difference in Occupations

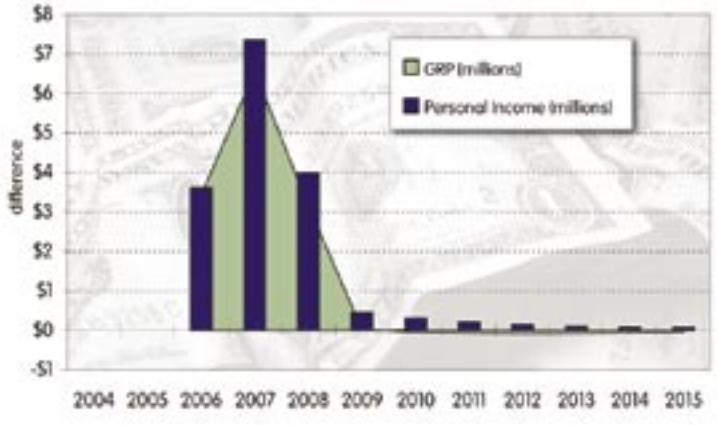


normal levels by the end of the study period in 2015. While following the same rise and fall pattern, personal income fared slightly better hitting higher levels, continuing to have a positive effect through the entire study period.

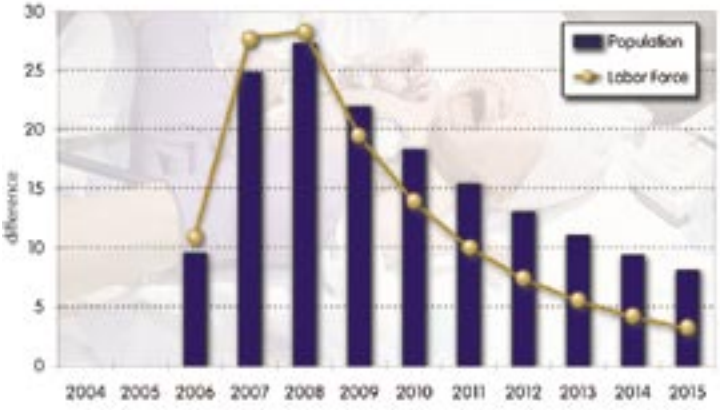
During the first years of this project, labor force and population both experience increases. As the project comes to a quick completion, and the fact that much of the construction costs go to firms outside the county, the effects on the labor force subside while population is higher because of families and dependants. The peak increase in the level of both the labor force and population varied from original expectations by fewer than thirty people.

There is a gradual increase in average annual wages in the county. The first year of the project, 2006, the wage level was $4.44 above the normal amount. The peak came the following year at $10.98 and this slid to $9.19 above expected levels by 2008. The difference from the project was halved in 2010 to $4.26 than halved again the next year to $2.72. After that point the positive difference was measured in pennies until it fell slightly below original levels (still in penny measurements) in 2014 and 2015.

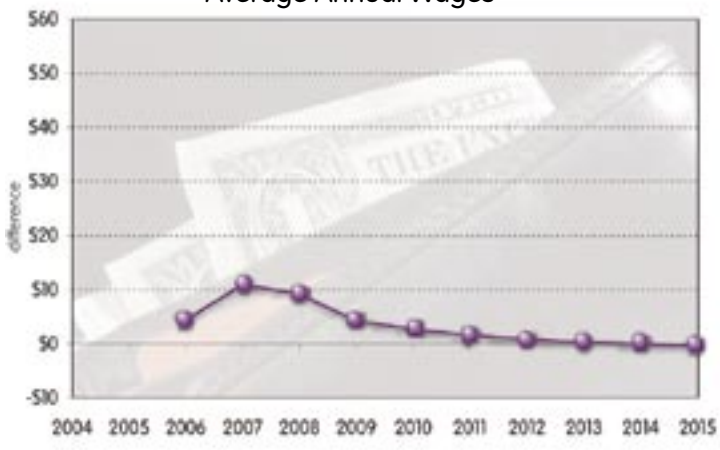
Strafford County Difference in
Gross Regional Product and Personal Income



Strafford County Difference in Labor
Force and Population



Change in Strafford County
Average Annual Wages



Carroll County

Certificate of Need

Carroll County has the third smallest population among the counties in the state. The Memorial Hospital, in North Conway, is the second smallest unit among the ten hospitals included in this study, having barely 30 more employees than the smallest facility (Speare Memorial Hospital). The hospital submitted a Certificate of Need application for $17.8 million. Just over half of that will be for renovation and the remainder is for new construction.

The goals of the project include:

- building a new medical/surgical wing with a 5-bed observation unit near the emergency department,
- relocating imaging into a single area, and
- enlarging many units within the facility.

There will also be significant upgrades to the sprinkler system and cooling apparatus.

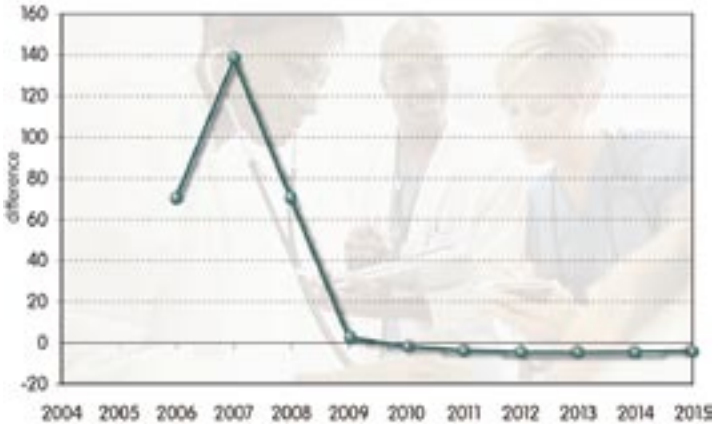
Total input for Carroll County

The renovations and new construction combine for a total of nearly $17.0 million in construction expenses. In Carroll County, 56 percent of construction expenses paid typically stay within the county. Adjusting for this, $9.6 million can be expected to remain in the county, contributing toward the local economy. Over $800 thousand are earmarked for major movable equipment purchases. These purchases are taken into account as final demand expenditures which do little to create jobs in the county.

Impact of Hospital expansion on Carroll County

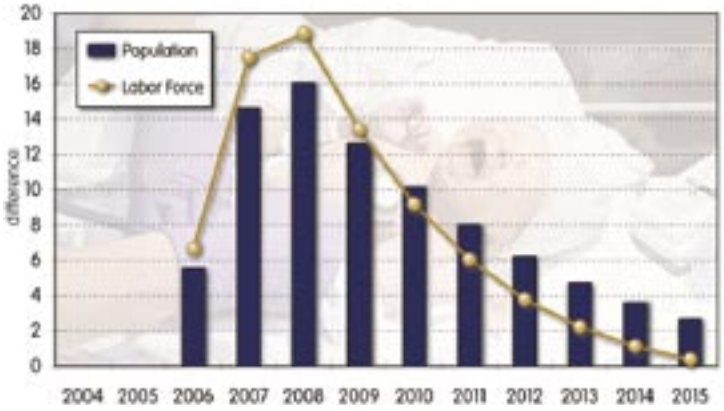
The project approval in March 2006 allowed for the project to begin in May 2006, with completion by June 2008. Total employment expanded by 71 additional workers in 2006 and almost doubled to 138 at the peak time of the project in 2007. By 2008, the project was winding down toward completion and employment started to follow suit and coming back to 70 jobs above expected levels in 2008. By the next year, benefits to the employment levels had all but vanished, with the level only 3 jobs ahead of the norm, before the levels dip below expected levels by up to 5 people between 2010 and 2015.

Carroll County Difference in Employment



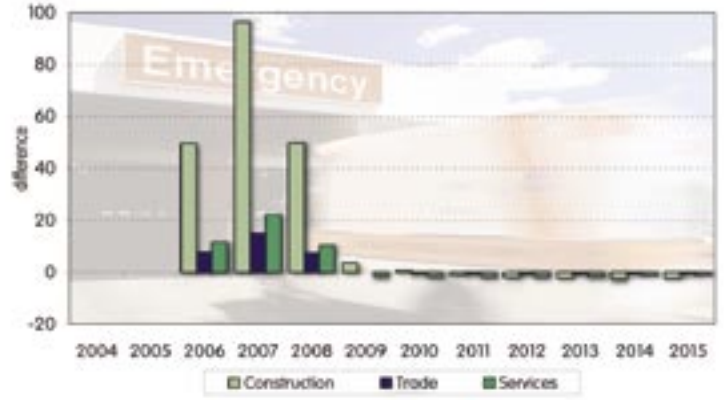
During the first four years of the project, 2006 through 2009, the project attracted more people to the county labor force as levels were upwards of 18 and 19 people. These levels did taper off after the project completed, but unlike the effects of some other county projects, Carroll County's labor force remains above original levels during the entire span of the study (through 2015). Population in the county follows a similar trend, although starting out more slowly and not declining as quickly.

Carroll County Difference in Labor Force and Population



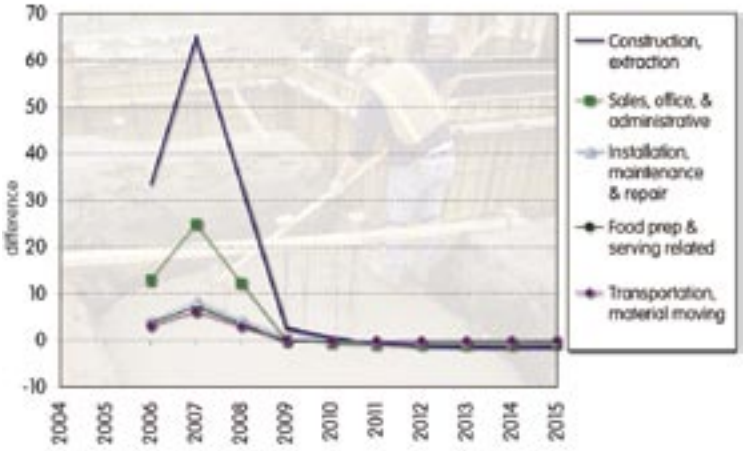
Fifty of the 71 jobs created by the project in 2006 were in the *Construction* industry sector. That represented 70 percent of the jobs. The share of additional *Construction* jobs created continued in 2007 and 2008, with the remainder of jobs being generated by *Trade* and *Services*. By the fourth year, additional *Construction* jobs drop to barely 4 jobs, but *Trade* and *Services* fall below original levels.

Carroll County Difference in Industries



The majority of jobs supporting the *Construction* industry employment levels are in *construction and extraction* occupations, with the wave of jobs rolling in at 33 jobs in 2006, 65 jobs in 2007 and starting to roll out again with 33 jobs in 2008. These jobs drop to a single digit before falling below normal levels by 2011. *Construction* work also supports *sales, office, and administration* occupations, whose levels increase by 13, 25 and 12 jobs above original levels during the first

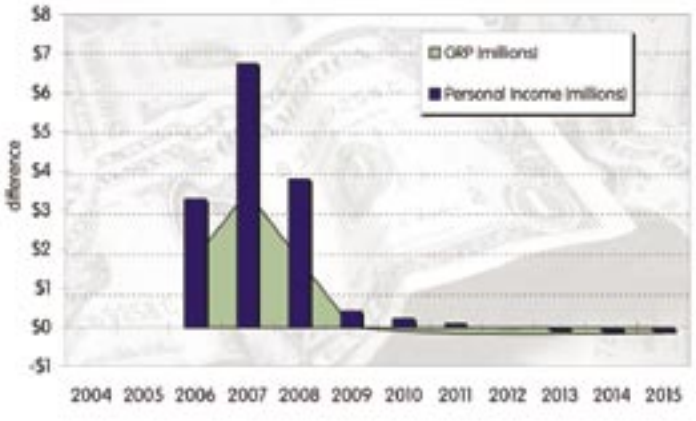
Carroll County Difference in Occupations



three years of the project. Other occupations that benefit from the project include *installation, maintenance and repair* occupations, *food preparation and serving related* occupations, and *transportation and material moving* occupations.

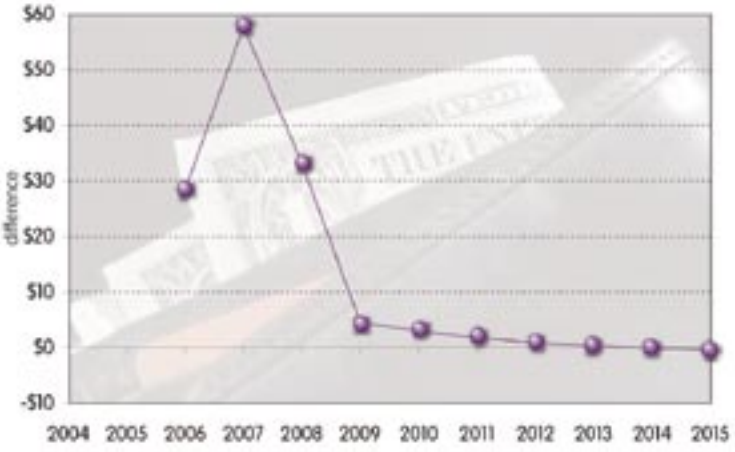
This project contributed an additional $1.78 million to the gross regional product of the county during its first year (2006), the third year of the study. That nearly doubled in the next year to almost $3.5 million. As the project approaches the completion phase those contributions start to decline in 2008 to $1.7 million. Personal income followed the same pattern, at almost double the value. In 2006, personal income was $3.3 million above normal levels, that increased the second year of the project to an additional $6.8 million. The third year signaled the culmination of the project as personal income levels find their levels $3.8 million above normal, and continue to fall back in the following years. Between 2012 and 2015, personal income levels in the county will be slightly below levels that had been projected if the project had not been done.

Carroll County Difference in
Gross Regional Product and Personal Income



The consequential years of the project on average annual wages in Carroll County are 2006, 2007, and 2008. These added $28, $58, and $33 in each of the respective years. At that point, the difference in average annual wages drops to less than $5 for the next seven years. Part of the reason that average annual wages in Carroll County did not feel the same pressure from competition as Hillsborough County, is because only slightly more than half of the money spent actually stays in the county, compared to more than 83 percent in Hillsborough County.

Change in Carroll County Average Annual Wages



Rockingham County

Certificate of Need

Rockingham County, the second most populous county in the state, is the location of the final two acute care facilities included in the study: Parkland Medical Center in Derry, and Exeter Hospital in Exeter.

Parkland Medical Center, Derry

Parkland Medical Center submitted a Certificate of Need application for $18.9 million with the main focus of the project being:

- enlargement of the emergency department and
- replacement of the equipment in the hospital's power plant.

It also included:

- expanding and/or renovating the surgical suite (upgrading four operating rooms and rebuilding another),
- upgrading central sterile unit, and
- creating a new lobby entrance.

A *Change of Scope* was submitted to cover expenses not covered because of inflation as well as moving the endoscopy department back into the main hospital, which was later removed from the CON because of a subsequent request from an affiliate hospital facility in Derry. This resulted in reducing the amount of the approved CON by $1.9 million in construction costs and $332,329 in equipment costs, for a total reduction of $2.3 million. The revised total cost of the project (including a second *Change of Scope* for only construction costs in June 2005) was $15.7 million.

Exeter Hospital

Exeter Hospital had several steps in its Certificate of Need process. Their first CON application was for $30.7 million to construct a new medical office building, and resolve space shortages for ambulatory care.

Several *Changes of Scope* were filed:

- one to remove the ambulatory surgery unit, reducing costs by $3.8 million, and
- one to change ownership of the facility.
- The next one added a 4th floor to the medical office building and added $3.3 million, so the total project cost stood at $30.37 million
- The most recent change in 2005 added $21.2 million to the project costs,
  - improving sequencing of renovations for continuity of operations
  - providing additional space for growth.

The revised cost for the whole project was $51.5 million, plus a variance of 15 percent to cover inflation.

Time for the initially approved application expired, so an additional CON needed to be submitted for an extra $9.89 million to complete the project. That put the final cost of the project over $61.5 million.[23]

Total input for Rockingham County

Combining the Certificate of Need requests from the two facilities brought the total values of the CONs in Rockingham County to $79.6 million. Of that, $26.8 million worth of work had been completed during 2003.

This study is from 2004 forward so only the remaining $52.8 million was used in this analysis.

The combined equipment costs came to $6.4 million. Of that, *Navigational, measuring, electromedical, and control instruments manufacturing* had $2.6 million, and *Medical equipment manufacturing* had $3.8 million. These purchases did not produce jobs for the local economy.

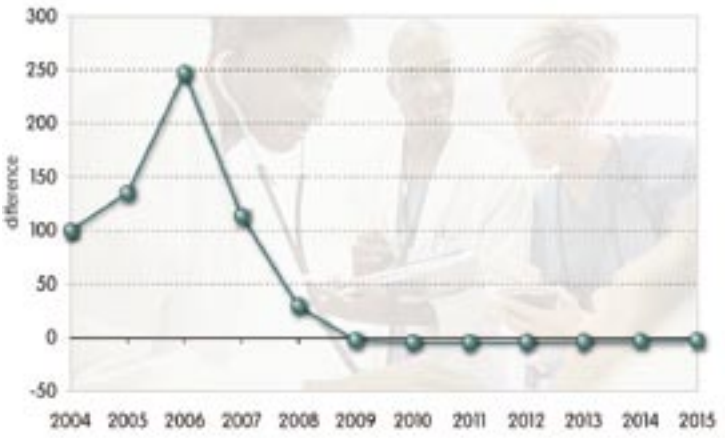
The remaining bulk of $46.6 million was assigned for construction expenses. There is a strong presence of construction in Rockingham County with over 80 percent of construction payments remaining in the county. Based on this, an adjustment calculated that $37.7 million stayed in the local economy.

Impact of Hospital expansion on Rockingham County

As mentioned earlier, a portion of the projects in this county had been completed prior to the beginning of this study. However, the time period for completing these projects extended beyond the two and three year time frames of many of the other areas. Total employment reflected this, picking up in 2004 at 100 jobs ahead of the normal level.

- The following year showed a continued increase of 135 jobs.
- In the third year, employment expanded 247 jobs above the normal levels.
- Then, the levels started to descend to 114 jobs above expected levels in 2007.
- The next year the difference in employment levels was an increase of barely 29.
- Finally, during the remaining years of the study it falls between 2 and 5 jobs below normal levels.

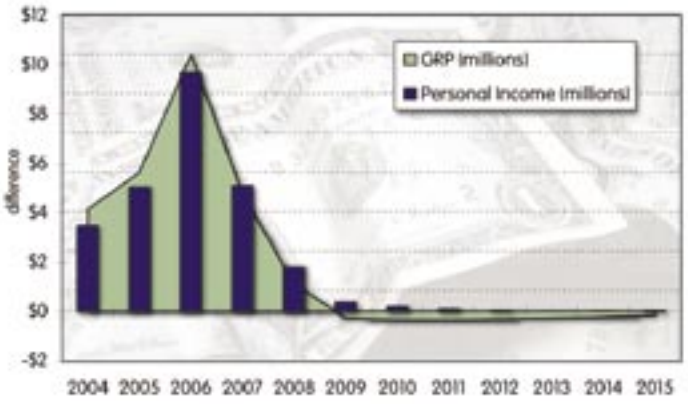
Rockingham County Difference in Employment



[23] At the time of this study, the Certificate of Need and Change of Scope requests for this project overran proposed expenses. Figures used in the study were from the periodically submitted Implementation Reports which stated actual expenses. Therefore, Rockingham total amounts may vary.

These projects contributed an additional $4.1 million to the county's economy in 2004. That grew to $5.6 million and $10.4 million in the following years of the study. As project completion neared, the additional money added to the economy started to decline to an extra $4.8 million in 2007 and only $1.1 million in 2008. Finally, the positive contributions cease leaving a slight reduction in the expected GRP levels in the county.

Rockingham County Difference in
Gross Regional Product and Personal Income



Personal income also experienced increases above the normal levels.

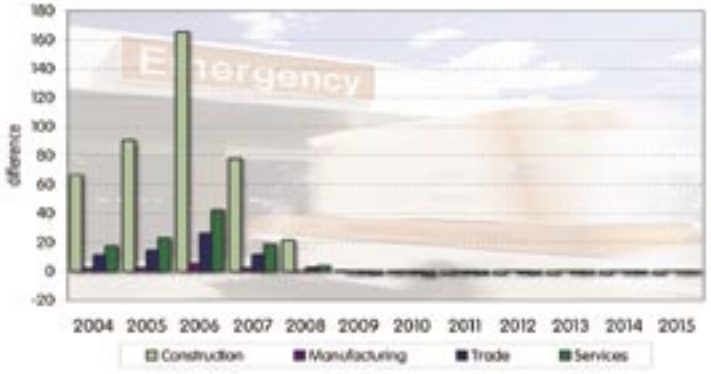
- The first year it grew by $3.5 million, and
- the level expanded further the next year to $5.0 million above normal.
- The third year (2006), the additional personal income rose to $9.7 million.
- By 2007, as the projects conclude, personal income was $5.1 million above expected levels and then $1.8 million the next year.

During the remaining years, personal income remained slightly higher than expected.

Change in Rockingham County
Average Annual Wages

Average annual income barely changed as a result of the projects being completed. The differences from expected levels range from an inconsiderable $2.67 to a reduction of only $0.34.

Rockingham County Difference in Industries

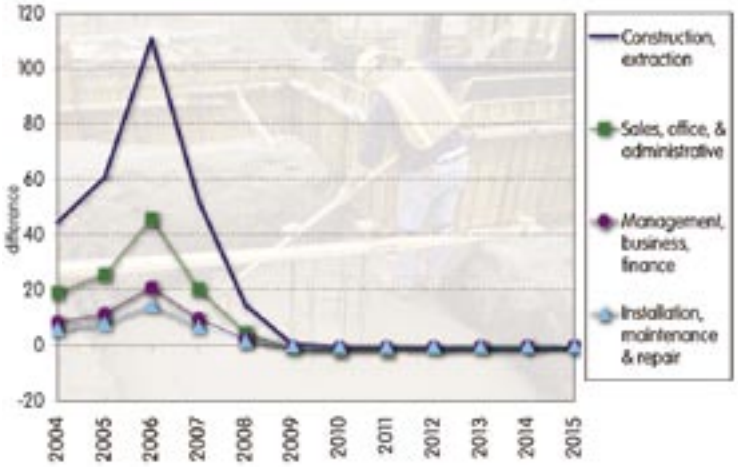


The industry primarily affected by the projects was *Construction*. The first year, it gets 67 additional workers, then 91 and 165 in the following two years. The industry starts to return to normal employment levels as the project

approaches completion and the surplus worker levels decline to 70 and 22 workers in the final years. The *Services* industry also grew to help support the demand created by the increase of *Construction* jobs. *Services* employment levels peaked at an increase of 42 jobs in the third year. The economic ripple of the project extends to *Trade* which sees additional growth from 11 to 26 jobs during the construction period.

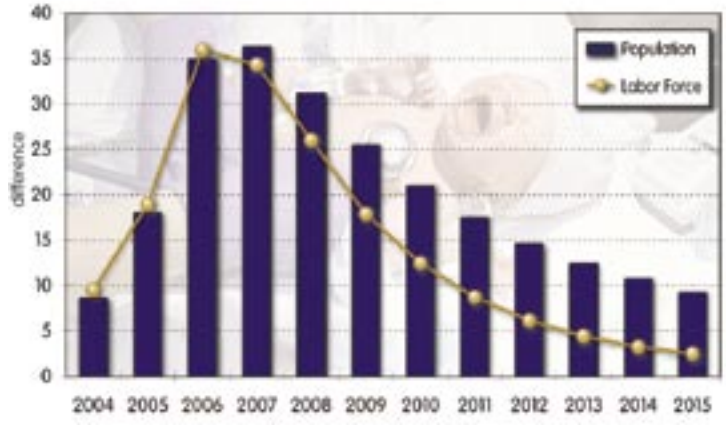
Construction and extraction occupations made up between 45 and 50 percent of the additional jobs in the timeframe of the project. This represented anywhere from 15 to 111 workers at any point in time. *Sales* occupations were also created as a result of the project, comprising just under 20 percent or 5 to 46 of the added jobs. Jobs in *management, business, and financial* occupations also grew to help support the *construction and extraction* occupations, as did *installation, maintenance, and repair* occupations.

Rockingham County Difference in Occupations



Like Hillsborough County, Rockingham County also experiences a lot of population growth, partly because of its prime seacoast properties and its location and proximity to Boston. The attraction of expanded construction jobs related to medical expansions which add to the population growth in the county. Between 2006 and 2009 population will see roughly 35 more new residents each year. The appeal of the area does not dissolve with the project's completion, as population will continue to remain above normal levels for the remaining years through 2015. The labor force will also expand in relation to the population increases.

Rockingham County Difference in Labor Force and Population



Conclusion

Research, innovation and technological advances continue to change the way health care services are provided. The aging bubble of baby boomers in the population has the reputation of expecting and receiving the most up-to-date services and will require additional services as they continue to age. Medical facilities in the state are clamoring to obtain state-of-the-art equipment to serve their communities.

Holding the employment constant at the same level it was in 2004 brings the economic importance of hospitals forward. Although holding hospital employment constant is an improbable scenario, it demonstrates the overall impact in employment, even beyond healthcare. Aside from the 15,500 fewer jobs in the state, the negative impact would be personal income not growing by over $850 million and there would be over $900 million less contributed to the state's economy by 2015.

Health care and social assistance industry employment has been growing steadily. New Hampshire employment projections show that these employment levels should continue to rise. According to some of the hospital representatives interviewed, employment has been growing in line with demand, regardless of the physical limitations of the facilities. Expansions of hospital equipment and facilities generally occur after hospital employment expansions. This makes it difficult to model because a traditional economic development scenario would build the facility first and then expand employment. It is similar to that of a highway scenario, does the expansion of a highway increase the number of cars or is the expansion of the number of highway lanes built to accommodate the increased traffic that already occurred on the highway?

The changes that the hospital expansions brought were similar in each county. Those changes were temporary boosts to employment, primarily in the *Construction* industry and related occupations, and an attendant temporary hike in personal income and gross regional product levels in each county. In most cases there was also a long-term increase in population, however small. The six county studies represent a snapshot in time. Individually, the minimal economic impact of the construction dollars spent ceased after the completion of the projects.

Certificate of Need (CON) applications are being submitted on a regular basis, so these projects should be seen as examples of a continuum of hospital construction projects. Although our study did not include all CON applications, this continuum of projects contributes at least 700 to 800 additional jobs annually to the New Hampshire economy.

Appendix

The REMI Model [24]

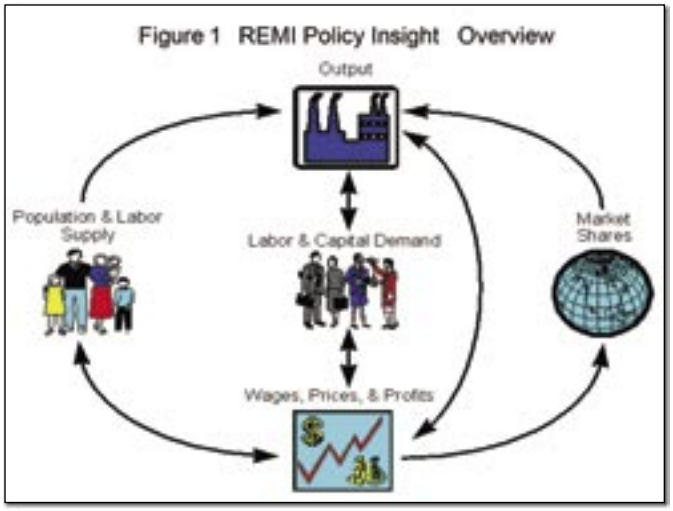
REMI Policy Insight® is a structural model, meaning that it clearly includes cause-and-effect relationships. the Model is based on two key underlying assumptions from mainstream economic theory: households maximize utility and producers maximize profits. Since these assumptions make sense to most people, lay people as well as trained economists can understand the Model.

In the Model, businesses produce goods to sell locally to other firms, consumers, investors, and governments, and to purchasers outside the region. The output is produced using labor, capital, fuel, and intermediate inputs. The demand, per unit of output, for labor, capital, and fuel depends on their relative costs, since an increase in the price of any one of these inputs leads to substitution away from that input to other inputs. The supply of labor in the Model depends on the number of people in the population and the proportion of those people who participate in the labor force. Economic migration affects the population size. People will move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

Supply and demand for labor determine the wage rates in the Model. These wage rates, along with other prices and productivity, determine the cost of doing business for each industry in the Model. An increase in the cost of doing business causes either an increase in prices or a cut in profits, depending on the market for the product. In either case, an increase in costs would decrease the share of the local and U.S. market supplied by local firms. This market share, combined with the demand described above, determines the amount of local output. Of course, the Model has many other feedbacks. For example, changes in wages and employment impact income and consumption, while economic expansion changes investment, and population growth impacts government spending.

Figure 1

Figure 1 is a pictorial representation of REMI Policy Insight®. The Output block shows a business that sells to all the sectors of final demand as well as to other industries. The Labor and Capital Demand block shows how labor and capital requirements depend both on output and their relative costs. Population and Labor Supply contribute to demand and to wage determination. Economic migrants in turn respond to wages and other labor market conditions. Supply and demand interact in the Wage, Prices, and Profits block. Prices and profits determine market shares. Output depends on market shares and the components of demand.



[24] The following discussion of the REMI model was taken from material prepared by Regional Economic Models, Inc., page 1.

The REMI model brings together all of the above elements to determine the value of each of the variables in the Model for each year in the baseline forecast. the Model includes all the interindustry interactions that are included in input-output models in the Output block, but goes well beyond an input-output model by including the linkages among all of the other blocks shown in Figure 1.

In order to broaden the Model in this way, it was necessary to estimate key relationships. This was accomplished by using extensive data sets covering all areas in the country. These large data sets and two decades of research effort have enabled REMI to simultaneously maintain a theoretically sound model structure and build a model based on all the relevant data available.

The Model has strong dynamic properties, which means that it forecasts not only what will happen but also when it will happen. This results in long-term predictions that have general equilibrium properties. This means that the long-term properties of general equilibrium models are preserved while maintaining accurate year-by-year predictions and estimating key equations using primary data sources.

Figure 2

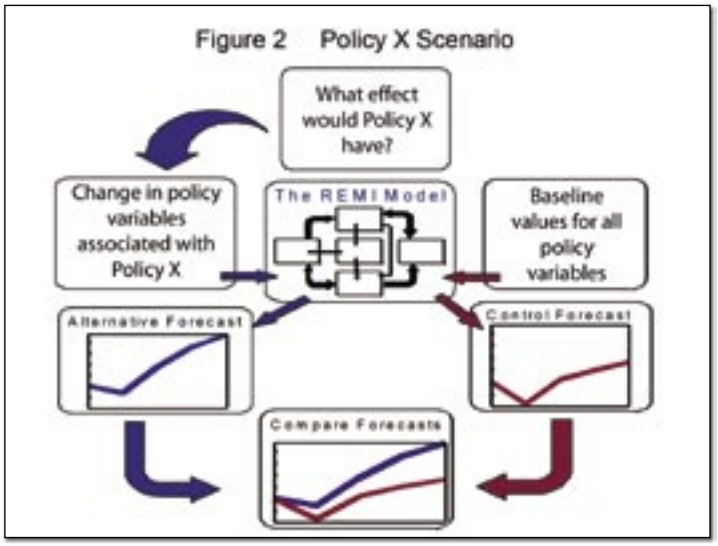


Figure 2 shows the policy simulation process for a scenario called Policy X. The effects of a scenario are determined by comparing the baseline REMI forecast with an alternative forecast that incorporates the assumptions for the scenario. The baseline REMI forecast uses recent data and thousands of equations to generate projected economic activity for a particular region. The policy variables in the Model are set equal to their baseline value (typically zero for additive variables and one for multiplicative variables) when solving for the baseline forecast. To show the effects of a given scenario, these policy variables are given values that represent the direct effects of the scenario. The alternative forecast is generated using these policy variable inputs.

For this study, Policy X is the purchases of construction and equipment for ten hospital expansion projects in six New Hampshire counties. We examined each county's projects in a separate simulation and analyzed the results separately. The results were summed for a cumulative total impact of the ten expansion projects. A separate counterfactual simulation was run to evaluate the projected impact of the growth of hospital employment throughout the state through 2015. This was done by holding hospital employment unchanged using, as Policy X, the removal of the projected employment increase, for the period of the simulation.