# *Virginia: The State of Transportation in 2010*

June 2010

The Thomas Jefferson Institute for Public Policy

Virginia Economic Forecast 2010-2011

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## *The Thomas Jefferson Institute for Public Policy*

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# *Foreword*

The Thomas Jefferson Institute for Public Policy is proud to present its eleventh annual report on the economy of the United States and Virginia. It is part of the foundation's efforts to offer well-researched studies for our state leaders to assist them in better preparing for the future.

This year's annual *Virginia Economic Forecast* was again researched and written by Dr. Christine Chmura and her team at Chmura Economics & Analytics (Chmura) headquartered in Richmond. Dr. Chmura founded Chmura Economics & Analytics in 1999 after serving as Chief Economist at Crestar Bank (purchased by SunTrust) for seven years. Chmura has since grown into a leading member of its industry, specializing in quantitative research, traditional economics, workforce and economic development, and software design.

***"Virginia Economic Forecast: 2010–2011"*** is made available to our state's elected leaders, business leaders, and the media in order to assist them in better understanding the economic reality facing our state. This year's edition, titled "Virginia: The State of Transportation in 2010," includes an analysis of the overburdened transportation system in the state and potential fixes. The economic forecast also describes the ebbing of the recession in 2009 and expectations about the unfolding recovery.

Last year's *Virginia Economic Forecast* anticipated the depth of the economic contraction. In 2009, real gross domestic product contracted at a 2.5% pace compared with Chmura's forecast of 3.1%. The forecast last year called for consumer spending to decline by 0.6% in 2009 which was right on target. Chmura's forecast of a 20.8% drop in residential investment was very close to the actual 20.5% decline, though the sharp 17.7% contraction in nonresidential investment was unforeseen as it was expected to expand 1.6%. The job decline in Virginia was more severe than anticipated, falling 3.2% in 2009 compared to a projected 1.6% decline. Retail sales in the state were forecast to fall 4.2% and sales actually fell a larger 5.4%.

We once again thank SunTrust for sponsoring this year's ***"Virginia Economic Forecast: 2010– 2011."*** Nothing in this report should be construed as supporting or opposing any legislation. The opinions are those of the authors and not necessarily those of the Thomas Jefferson Institute, its Board of Directors, or SunTrust as the sponsor of this report.

**Michael W. Thompson**
*Chairman and President*
Thomas Jefferson Institute for Public Policy
June 2010

## The Nation

❧ By mid-2009, the dramatic contraction in the national economy was abating and signs were emerging that economic growth was around the corner: the employment contraction slowed in July 2009, the Dow Jones Industrial Average turned upward in March 2009, and initial unemployment claims started to decline in April 2009. The "cash for clunkers" program boosted the industrial sector which became one of the driving forces of the recovery.

❧ While a deep recession is often followed by a sharp V-shaped recovery, that is not expected in this recovery because of the headwinds that remain: tight credit, lower housing prices, additional foreclosures, and high unemployment. The severity of the recession and potential for slow employment gains will likely hamper growth for a few years. From December 2007 to January 2010, 8.4 million people lost their jobs in the nation. If employment expands by a moderate 200,000 a month, it will take 3.5 years to reach pre-recession employment levels.

❧ The Chmura Economics & Analytics forecast expects real GDP to grow 2.9% in 2010 and 3.2% in 2011. Employment, however, is expected to contract 0.3% in 2010 before growing 1.4% in 2011. Although consumer spending in the first quarter of 2010 was a strong annualized 3.6%, slow employment growth and relatively depressed home prices will likely put a damper on growth over the rest of the year. Residential real estate is starting to grow again while investment in commercial structures is forecast to contract in 2010 and 2011 before growing again in 2012. With inflation remaining under control, interest rates are forecast to remain fairly low.

## Transportation

❧ Virginia's highway network is straining to cope with an ever increasing and more mobile population. The Washington metropolitan area (including Northern Virginia) is the fourth most congested area in the nation. It is estimated that the average motorist in the Washington metro area experienced 62 hours of delay in 2007. The average motorists in the Hampton Roads and Richmond metro areas lost 29 and 20 hours, respectively, due to traffic delays.

❧ Demand-side options to fix Virginia's transportation problems aim to reduce the number of motorists on Virginia's highways. One approach is to improve the public transit system with subways, light-rail, and buses to reduce the demand for highways. Supply-side options for increasing road capacity include HOV lanes, HOT lanes, and toll roads.

❧ Financing capacity expansion can require an enormous capital investment. Beside increasing taxes statewide or regionally or charging tolls, other options include public-private partnerships and the sale or lease of specific assets.

## Virginia

❧ From peak to trough (April 2008 to February 2010), employment in Virginia dropped by 197,000 jobs, a 5.2% contraction compared with a 6.1% decline in the nation. Among Virginia's eleven metropolitan areas, seven recorded new employment troughs in the first quarter of 2010. On an annual average basis, employment in the state is projected to expand 0.4% in 2010 after receding 3.2% in 2009. Employment growth is expected to accelerate to 1.9% in 2011, though these job gains would still be the recovery of losses from the recession rather than expanding beyond pre-recession levels.

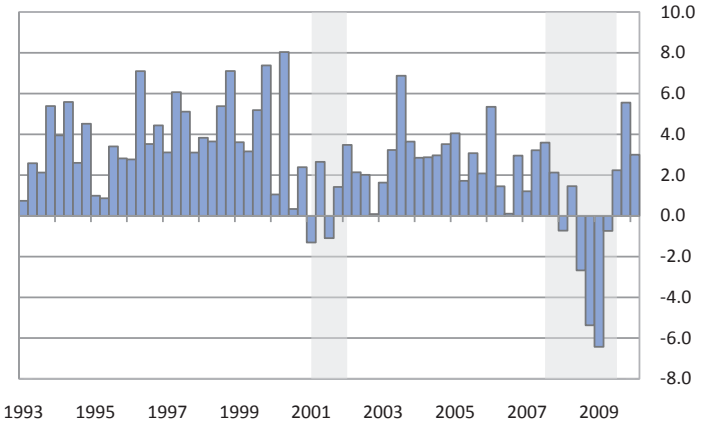
❧ Over the year ending March 2010, the construction sector shed 16,500 jobs in Virginia while manufacturing declined by 15,800 jobs. Health care added 17,400 jobs over the same period. High-tech firms shed 7,200 jobs in the state over the year ending with the third quarter of 2009 (the latest available data).

❧ The extended decline in home sales in Virginia has finally come to a close. The Virginia Association of Realtors reported 86,609 homes sold in the state in 2009, a 1.6% increase from 2008 and the first expansion since 2005. According to the Federal Housing Finance Agency's House Price Index, home prices fell 4.5% in Virginia in the fourth quarter of 2009 on a year-over-year basis, the ninth consecutive quarterly decline. Single-family building permits in Virginia (based on a six-month moving average) climbed to 1,230 per month in March 2010, up nearly 10% over the preceding year, but still much lower than the peak of 3,886 permits per month attained in December 2004.

## Recovery in Progress

The National Bureau of Economic Research, the official arbiter of recessions, has not yet declared the end date to the recession that began in December 2007. However, most economics believe the recession ended in the third quarter of 2009. Real gross domestic product (GDP) increased at an annualized 2.2% pace in the third quarter of 2009 followed by annualized gains of 5.6% in the fourth quarter and 3.0% in the first quarter of 2010.[1] Other signs that the recession is over include declining initial unemployment claims, rising income, and advancing industrial production.

### Real Gross Domestic Product Quarterly Annualized Percent Change



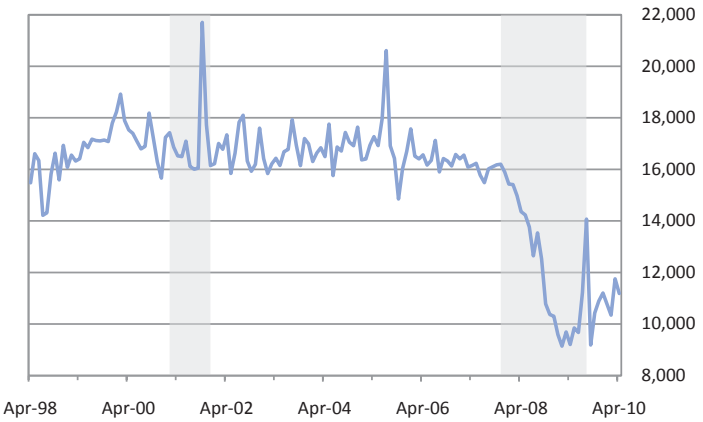

Source: Bureau of Economic Analysis

By mid-2009, the dramatic contraction in the national economy was abating and signs were emerging that economic growth was around the corner. In July, employment contracted by only 346,000 compared with the average 732,000 drop each month from November 2008 through March 2009. The Dow Jones Industrial Average decidedly turned upward in March 2009—a sign that historically means the recession will end in about four to six months. In addition, initial unemployment claims started to decline in April 2009—another positive sign pointing to improvement in the job market.

1 First quarter GDP based on "second" estimate data from the BEA.

The "cash for clunkers" program was introduced in this environment where the contraction was slowing and signs of future growth were emerging. Automobile sales had fallen to 9.14 millions of units at an annualized rate (MUAR) in February 2009 but jumped to 14.1 MUAR in August 2009 as federal incentives to trade in clunkers for more energy-efficient new cars brought consumers into the showrooms. When the federal incentives ended in September, sales dropped to almost the low point before the program—not because consumers no longer wanted to buy cars; but apparently because inventories were depleted due to the better-than-expected sales. The replenishment of inventories drove vehicle manufacturers and suppliers to hire some of the previously laid-off workers sooner than expected. As a result, the industrial sector has been one of the driving forces in the recovery.

### Total Light Vehicle Sales, Thousand Units, SAAR




Source: Bureau of Economic Analysis

## Headwinds Remain

A deep recession is often followed by a sharp V-shaped recovery. That is not expected in this recovery because of the headwinds that remain. In particular, tight credit, lower housing prices, additional foreclosures, and high unemployment are putting downward pressure on economic growth.

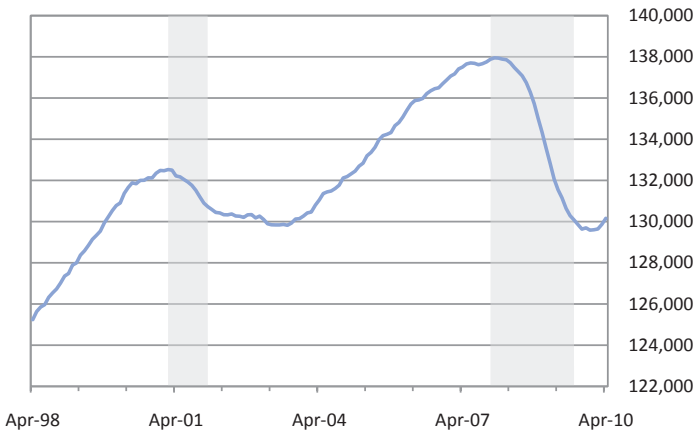
It is not unusual for banks to tighten their credit standards during recessions. Rising unemployment and contracting profits cause both consumers and businesses to miss loan payments which lead to higher delinquencies and defaults at banks. The loss of capital and an uncertain economic environment reduces the availability of funds that banks have to lend and cause them to tighten their lending standards such as requiring higher credit scores and/or larger down payments on home mortgages.

The sharp contraction in the financial industry during the recently ended recession has led to the worst credit crunch since the early 1980s. The Federal Reserve's April 2010 Senior Loan Officer Opinion Survey on Bank Lending Practices found that most banks were holding to the tighter credit stan-

dards that they implemented during the recession. However, a few large banks reported that they eased their credit standards in April. Until banks are more willing to lend, some businesses that need capital to expand and consumers who need loans to purchase durable goods will delay those expenditures thereby contributing to slower economic growth.

The contraction in home prices and rise in foreclosures during the recent recession directly reduces the wealth of households and their capacity to make purchases. Just as consumer spending was partially driven earlier in the decade by consumers who were borrowing and spending the increased equity in their homes, so will spending be restrained in the next few years because many consumers no longer have that home equity to tap.

### Employment Growth
### Monthly Change in Thousands




Source: Bureau of Economic Analysis

High unemployment is a third headwind that will slow economic growth because of the associated reduction in wages and spending. The severity of the recession that ended in late 2009, and potential for slow employment gains, will likely hamper growth for a few years. From December 2007 to January 2010, 8.4 million people lost their jobs in the nation. If employment expands by a moderate 200,000 a month, it will take 3.5 years to reach pre-recession employment levels.[2] Strong growth of 300,000 per month would be needed to reach pre-recession levels in 2.3 years. Based on evidence from international banking crises and the U.S. labor market trends that contribute to jobless recoveries,[3] Knotek and Terry concluded that "unemployment could remain high in the United States for a considerable time after the current downturn."[4] The Chmura forecast has the national unemployment rate at 9.5% in 2010, 8.4% in 2011, and 7.4% in 2012.

## Monetary Policy

The federal funds rate has been virtually 0% since December 2008. Moreover, as of April 2010, the Federal Open Market Committee (FOMC) press releases continued to indicate that:

> *The Committee will maintain the target range for the federal funds rate at 0 to 1/4 percent and continues to anticipate that economic conditions, including low rates of resource utilization, subdued inflation trends, and stable inflation expectations, are likely to warrant exceptionally low levels of the federal funds rate for an extended period.*

The FOMC also noted in its April press release that in light of the improved functioning of the financial markets, it closed all but one of the liquidity facilities it created to relax the credit crunch.

When the federal funds rate target was reduced to 0%, the Fed purchased agency securities and longer-term Treasury securities to increase liquidity and stimulate economic growth. The Fed will need to reduce the large quantity of reserves held by the banking system when the economy shows sufficient improvement. To accomplish this, Chairman Bernanke recently said:

> *...the Federal Reserve is also developing plans to offer to depository institutions term deposits, which are roughly analogous to certificates of deposit that the institutions offer to their customers. The Federal Reserve would likely auction large blocks of such deposits, thus converting a portion of depository institutions' reserve balances into deposits that could not be used to meet their very short-term liquidity needs and could not be counted as reserves... Reverse repos and the deposit facility would together allow the Federal Reserve to drain hundreds of billions of dollars of reserves from the banking system quite quickly, should it choose to do so.*[5]

## Forecast

The Chmura Economics & Analytics forecast expects real GDP to grow 2.9% in 2010 and 3.2% in 2011. Employment, however, is expected to contract 0.3% in 2010 before growing 1.4% in 2011.

2 Note that reaching pre-recession employment levels does not take into account growth in the labor market due to new job-seekers.

3 Two labor market trends that have contributed to jobless recoveries are (1) the increased proportion of permanent layoffs whereas in the past the higher number of temporary layoffs would be hired back sooner due to lower time costs in interviewing new workers and (2) the increased reliance on temporary workers allows a firm to wait until they absolutely need more workers to hire than the historical model where permanent workers were hired in anticipation of growth in demand for the firm's products or services.

4 Edward S. Knotek II and Stephen Terry, "How Will Unemployment Fare Following the Recession?" Federal Reserve Bank of Kansas City Economic Review, 3rd Quarter 2009, Volume 94, Number 3, page 26.

5 Federal Reserve Chairman Ben S. Bernanke, "Federal Reserve's Exit Strategy," Before the Committee on Financial Services, U.S. House of Representatives, Washington, D.C., February 10, 2010.

## Chmura Economic Forecast

| | Actual | | Forecast | | |
|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 |
| | Percent Change | | | | |
| Real Gross Domestic Product | 0.4 | -2.5 | 2.9 | 3.2 | 3.5 |
| Consumption Expenditures | -0.2 | -0.6 | 2.3 | 2.4 | 2.6 |
| Gross Private Domestic Investment | -7.2 | -23.2 | 11.2 | 8.1 | 12.1 |
| Residential Investment | -23.0 | -20.5 | -1.0 | 8.9 | 10.4 |
| Nonresidential Investment | 1.7 | -17.7 | 2.5 | 8.4 | 13.0 |
| Producer's Durable Equipment | -2.6 | -16.6 | 10.8 | 12.3 | 15.0 |
| Structures | 10.3 | -19.8 | -14.0 | -2.9 | 5.9 |
| Government Expenditures | 3.1 | 1.8 | 0.9 | 1.7 | 2.0 |
| | Trade Deficit (2000 Dollars; Billions) | | | | |
| Net Exports, Goods & Services | -493.8 | -354.9 | -360.6 | -353.8 | -408.7 |
| | Percent Change | | | | |
| Consumer Price Index | 3.8 | -0.3 | 2.3 | 3.0 | 3.4 |
| | Yields (%) | | | | |
| Federal Funds Rate | 1.9 | 0.2 | 0.2 | 1.5 | 3.3 |
| Prime Rate | 5.1 | 3.3 | 3.3 | 4.5 | 6.3 |
| 10-Year Treasury | 3.7 | 3.3 | 3.8 | 4.2 | 4.8 |
| 30-Year Conventional Mortgage | 6.0 | 5.0 | 5.2 | 5.5 | 6.0 |

Source: Chmura Economics & Analytics
Note: Yields reported for the average of the quarter.

Consumers, who contribute about two-thirds of GDP, pulled back on spending in 2008 (-0.2%) and 2009 (-0.6%). Although their spending in the first quarter of 2010 was a strong annualized 3.6%, slow employment growth and relatively depressed home prices will likely put a damper on growth over the rest of the year—consumer spending is forecast to rise 2.3% in 2010 and 2.4% in 2011.

Although still struggling in some regions, residential real estate is starting to grow again while nonresidential structures are expected to contract further in 2010. Residential investment grew in the third and fourth quarters of 2009, partially due to support from the first-time homebuyers tax credit. Activity fell off in the first quarter of 2010 but is expected to resume in the second quarter and reach double-digit growth in the first quarter of 2011. In contrast, the contraction in employment from the recession and slow rebound in the recovery reduces the need for additional commercial real estate. Investment in commercial structures is forecast to contract 14.0% in 2010 and 2.9% in 2011 before growing again in 2012.

With inflation remaining under control, interest rates are forecast to remain fairly low. The consumer price index contracted 0.3% in 2009 because of the sharp drop off in demand and is forecast to rise 2.3% in 2010. The Fed is expected to hold the federal funds rate target at essentially zero through the third quarter of 2010 until stronger economic growth becomes apparent. The federal funds rate is forecast to rise to an average 1.5% in 2011. Longer-term yields are expected to continue to edge up with the 10-year Treasury yield averaging 3.8% in 2010 and 4.2% in 2011.

## Virginia: The State of Transportation in 2010

The transportation network is one of the most essential infrastructures for the American economy. The efficient movement of people and commodities enables businesses to access new markets and reach new customers. It also gives people the mobility to seek better opportunities.

The framework of the U.S. transportation network, with interstate highways as its backbone, came into being after World War II.[6] The Federal-Aid Highway Act of 1956 is traditionally considered the launching point of the interstate highway system.

The interstate-centered transportation system transformed the American economy. It provided "one of the most important foundations for America's phenomenal growth after World War II."[7] It achieved this goal by significantly reducing transportation and distribution costs while contributing to productivity growth.

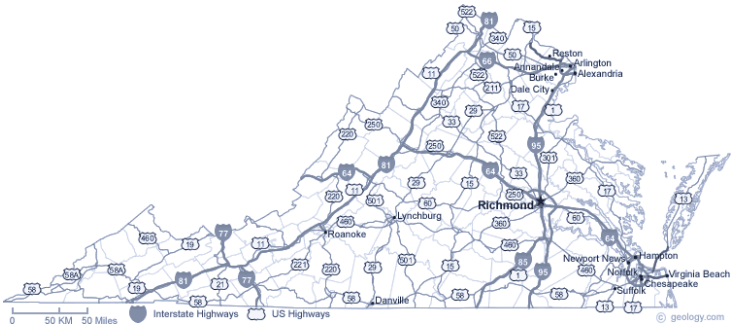
American lives were transformed by the expanding transportation network. Rapid suburbanization followed as the highway system allowed people to travel further to work. The economies of urban centers and rural communities that were bypassed by the interstates declined, while communities clustered around interstate highways flourished.

While the interstate highway has been celebrated as a foundation for economic growth, it is also a poignant reminder that we are relying on highway networks built over half a century ago. Due to limited new construction since the 1970s, the same highways have carried the nation's expanding population and business traffic. These conditions have contributed to growing congestion, particularly in urban areas. Traffic congestion exerts its toll as businesses and customers bear enormous costs in the form of "delivery delays, poor transportation reliability, and few potential employees within commuting distance."[8]

6 See John Fisher, From Interstate to an Uncharted Future—A Short History of the Modern Federal-Aid Highway Program, in 21st Century Highways, edited by Wendell Cox, Alan Pisarski, and Ronald Utt, The Heritage Foundation.
7 See The Interstate Highway System: Fifty Years and Looking Forward, American Association of State Highway and Transportation Officials.
8 See David Hartgen, M Gregory Fields, Robert Poole, Building Roads to Reduce Traffic Congestion in America's Cities: How Much and at What Cost? The Reason Foundation, 2006.

## Strain in Virginia's Network

Virginia's highway system covers 59,515 miles, with 1,118 miles of interstate highways, 8,111 miles of primary roads, and the remaining mileage among secondary roads.[9] Most of Virginia's main population centers are linked by the following six interstate highways: Interstate 95 (I-95), I-81, I-85, I-77, I-64, and I-66. Large cities not on interstate highways (such as Lynchburg and Danville) are connected to other parts of the state through U.S 29, U.S. 460, and U.S. 58.

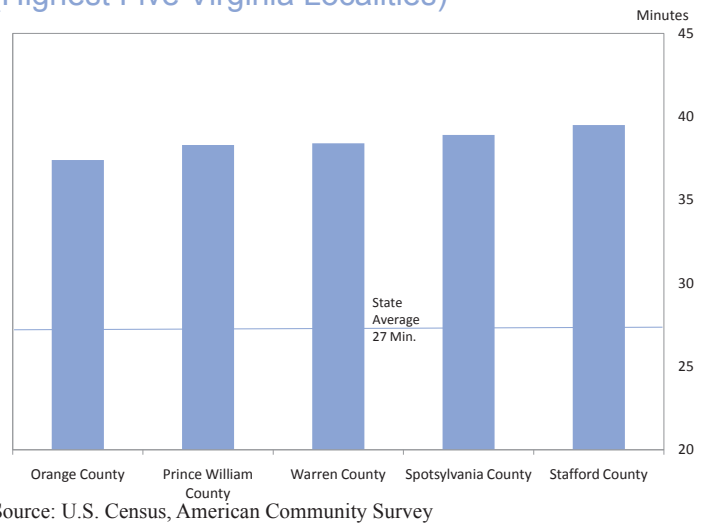



Virginia's road system has significantly contributed to the economic development of the Commonwealth. In the past few decades, I-81 has emerged as an important logistic center with clustered distribution centers. Interstates 64, 81, and 95 link the Port of Virginia to the Northeast and Midwest,[10] making it one of the largest ports on the east coast. The construction of the Capital Beltway (I-495) and the expansion of I-66 fueled the rapid suburbanization of the once rural Northern Virginia, helping it grow into a major center for high-technology and defense industries. Other industries such as tourism and manufacturing have also benefited from the road system.

Like the rest of the nation, Virginia's highway network is straining to cope with an ever increasing and more mobile population. Traffic congestion in Northern Virginia is notorious. The Washington metropolitan area (including Northern Virginia) is one of the most congested areas in the nation, ranking fourth (behind Los Angeles, Chicago, and San Francisco) based on the Travel Time Index (TTI).[11] In 2007, the TTI for the Washington metro area was 1.39, meaning it takes 39% more time to travel in the region during peak travel times compared with the time in a free-flowing environment. It is also estimated that the average motorist in the Washington metro area experienced 62 hours of delay in 2007. For the Hampton Roads and Richmond metro areas, the TTI was 1.18 and 1.09 respectively for 2007. The average motorists in those two areas lost 29 and 20 hours, respectively, due to traffic delays.

9 Source: Virginia Department of Transportation.
10 While the port is also linked to the South, the Midwest is the more important market since other ports are also available to serve southern states.
11 See David Schrank and Tim Lomax, 2009 Urban Mobility Report, Texas Transportation Institute, July 2009.

## Mean Travel Time to Work 2006-2008 (Highest Five Virginia Localities)




Source: U.S. Census, American Community Survey

According to 2006 through 2008 U.S. Census data, localities with the longest average commute times were all in the Northern Virginia region (with the exception of Orange County, just west of Fredericksburg), with Stafford County having the longest time at 40 minutes each way, followed by Spotsylvania County (39 minutes), Warren County (38 minutes), and Prince William County (38 minutes). Anecdotal stories abound that the traffic congestion has affected the business environment and the quality of life in this region. Congestion makes it harder to schedule meetings or receive supplies. Some businesses in Northern Virginia have lost talented employees due to congestion.[12]

### Virginia Travel Time Index

| Metro Areas | 1995 | 2003 | 2030 Forecast |
|---|---|---|---|
| Washington DC (including Northern Virginia) | 1.40 | 1.51 | 1.87 |
| Hampton Roads | 1.26 | 1.21 | 1.37 |
| Richmond | 1.11 | 1.09 | 1.27 |
| Roanoke | 1.03 | 1.05 | 1.10 |
| Lynchburg | 1.03 | 1.04 | 1.09 |
| Charlottesville | 1.03 | 1.04 | 1.09 |
| Winchester | 1.02 | 1.04 | 1.08 |
| Blacksburg | 1.02 | 1.04 | 1.08 |
| Harrisonburg | 1.02 | 1.04 | 1.08 |
| Bristol | 1.02 | 1.04 | 1.08 |
| Danville | 1.02 | 1.04 | 1.07 |

Source: Texas Transportation Institute and the Reason Foundation.

12 For an example, see a recent story, titled "Virginia Commuters are in a Capital Jam" at American Public Media. http://marketplace.publicradio.org/display/web/2010/03/16/pm-va-roads/.

## Cost Comparison

| | Cost per Mile (Millions) | Peak Capacity per Hour | Avg Cost per Passenger (at Peak Capacity) |
|---|---|---|---|
| Light Rail | $20-40 | 18,000 | $1,667 |
| Heavy Rail | $40-80 | 86,400 | $694 |
| Highway | $2-10 | 8,000 | $750 |

## Mode of Transportation to Work (2006-08)

| | U.S | Virginia | Northern Virginia | Hampton Roads | Richmond |
|---|---|---|---|---|---|
| Car, Truck, Van (Alone) | 76% | 77% | 71% | 79% | 82% |
| Car, Truck, Van (Car Pool) | 11% | 11% | 12% | 10% | 10% |
| Public Transportation | 5% | 4% | 9% | 2% | 2% |
| Walk | 3% | 2% | 2% | 3% | 2% |
| Other | 2% | 1% | 1% | 2% | 1% |
| Work from Home | 4% | 4% | 5% | 5% | 4% |
| Population Density (Persons/Square Mile 2009 Estimate) | 86.8 | 193.2 | 867.7 | 709.9 | 382.0 |

Source: Cost calculations based on data from *Gridlock*. Transportation mode data from the U.S. Census, American Community Survey.

Outside the Northern Virginia, Hampton Roads, and Richmond metro areas, traffic congestion does not appear to be an issue. Based on estimates by the Reason Foundation, the 2003 TTI for all other metro areas in the state is less than 1.05, meaning it takes less than 5% more time to travel during peak hours than during a free-flowing traffic environment.[13] Residents in some of these other metro areas have the lowest commuting times. For example, residents of the city of Harrisonburg drove 15 minutes each way to work, followed by Charlottesville City (16 minutes) and Lynchburg City (16 minutes).[14] Even with continued population growth in Virginia, regions outside the three largest metros will likely experience limited congestion 20 years from now. The projected travel time index for the smaller metro areas is less than or equal to 1.1, meaning in 20 years, the travel time during peak travel hours will be no more than 10% higher when compared with travel time in a free-flowing traffic environment.

In one sense, Virginia's transportation issues are fundamentally regional and limited to Northern Virginia, and to a lesser degree, the Hampton Roads and Richmond metro areas. The following discussion on options and solutions focuses on these three regions.

13 Texas Transport Institute only measures TTI for the 90 largest metro areas in the region. The TTI for smaller areas were estimated by researchers at the Reason Foundation by extrapolating available TTI data.
14 Source: U.S. Census American Community Survey 2006-2008.

## Options and Solutions

Many proposals have been offered to fix Virginia's transportation problems. From an economist's point of view, there are two broad theoretical approaches that can reduce traffic congestion in Virginia: reduce the existing motorists that use highways or increase road capacity by building more highways. Some solutions lie beyond the conventional "transportation policy" arena and require strategies in economic and workforce development.

## Demand-Side Options

Demand-side options aim to reduce the number of motorists on Virginia's highways. One approach is to improve the public transit system. Subways, light-rail, and buses can effectively reduce the demand for highways when certain conditions are met. First, the public transit system has to be relatively close to where people live and work for easy access. Secondly, it needs to provide regular and frequent service. Therefore, public transit is automobile-competitive only in densely populated areas.[15]

The public transit systems operating in big American cities such as New York and Washington were designed to serve urban employment centers. Different lines spread out from city centers to surrounding suburbs. They have been effective in transporting workers from suburbs to city centers, but less so in today's environment where office parks are dotting suburban landscapes and suburb-to-suburb commuting has become the dominant traffic flow pattern.[16] Another issue with public transit occurs as access in the suburbs is very limited. Due to the low population densities of suburban residential neighborhoods, many more bus or train stations and train routes need to be built to make them effective and ideally they need to provide access within walking distance.

Only 4% of Virginia's workers used the public transit system as a means of commuting to work between 2006 and 2008. In Northern Virginia, 9% used public transit compared to just 2% in Hampton Roads and Richmond.[17] Realistically, rail transit has less promise and is expensive in relieving congestion except in Northern Virginia. For example, one mile of light rail[18] costs $20 to $40 million while double is needed to

15 See Transit's Limited Capability and Promise, by Wendell Cox, in 21st Century Highways, edited by Wendell Cox, Alan Pisarski and Ronald Utt, The Heritage Foundation, 2005.
16 For example, a worker who lives in Springfield, Virginia and works in Tyson's Corner will either have to first take the transit Blue Line to the District of Columbia and then switch to the Orange Line or use a direct bus line through Fairfax Connector, which takes over one hour according to the bus schedule. He or she may still need to take additional vehicle transportation to work because Tyson's Corner is not pedestrian friendly.
17 In New York City, 55% of residents used public transportation to commute in the same time period.
18 Light rail are usually vehicles powered by overhead wires that run in the street or in their own exclusive right of way. Heavy rail, including both subway and elevated trails, always use their own exclusive right of way.

construct one mile of heavy rail (subway or elevated rails). Since heavy rail can have a much larger capacity, the average cost per passenger is lower when used at capacity. The average cost of highways per passenger is comparable to heavy rail.

Whether rail transit is cost effective largely depends on the percentage of capacity it can reach. For urban areas where congestion occurs, highway capacity has been exceeded. But the peak capacity of rail transit is rarely reached outside of New York City.[19] In a low density area, where rail-transit cannot reach its full capacity, it can be much more expensive than building new highways.

Making public transit effective enough to reduce congestion requires considerable investment in new transit routes to serve suburban business centers and more stations closer to residential neighborhoods. Further, it may necessitate improvements to current roads to make them more walkable—including sidewalks and overpasses to cross busy highways. A bus rapid transit system (BRT) might be the most cost effective way to move commuters in some congested metropolitan areas; a well-designed BRT system can carry more people than light or heavy rail at a much less cost.[20]

In high-density and fast-growing areas such as Northern Virginia, public transit should be considered as part of the congestion solution. Recent trends bringing more mixed-use facilities and high-rise developments to Northern Virginia imply that dense neighborhoods should be the first to be linked to a public transit network in the future. To keep costs down, bus routes should first be established due to their flexibility and low cost operations. The sustained high volume of bus ridership might justify future light-rail and heavy-rail development.

Another way to reduce highway traffic is to establish tolls on congested roads. This could serve two objectives—reducing traffic congestion and increasing funds for transportation projects. However, this strategy will work only when the other area roads are able to take additional traffic. Otherwise, tolling one road only shifts congestion from that highway onto another. In addition, getting to work is not optional for most people. Therefore, they will drive to work regardless of tolls in the absence of other options, such as public transportation. There is a general consensus that, on average, transportation demand is fairly inelastic with respect to price; and the lowest values of toll elasticity are usually observed in highly congested metropolitan areas in the United States.[21] That means that demand for highways (especially commuting) will change little with increased toll price. As a result, unless tolls are very high, simply tolling in Northern Virginia without a combined effort to add capacity may not be an effective approach to reduce congestion.

Other ways to reduce road demand and traffic congestion can be accomplished with car pooling and working from home. Some businesses have encouraged both options. New communication technology makes the telecommuting option more feasible. If a significant number of workers telecommute, congestion would clearly decline. In addition, telecommuting reduces gas consumption and some employees say they are more productive when working from home.[22] So far, telecommuting has been mostly a grassroots effort generated by workers and businesses. Governments should have concerted efforts to promote new work arrangements or even offer incentives to businesses that provide these options.[23] One option to encourage telecommuting in Northern Virginia might be for the federal government to offer to pay for high speed internet connections on home computers similar to current subsidies paid for government employees to ride the subway.

## Supply-Side Options

On the supply side, building more highways can debottleneck traffic congestion in problem areas. The Reason Foundation estimated that to reduce congestion, 1,803 new lane-miles have to be built before 2030 in the Washington metro area. For the rest of Virginia, 988 lane-miles are needed with 567 lane-miles in Hampton Roads and 176 lane-miles in the Richmond metro area.[24] While the final goal is clear, debate continues on adding more roads to solve traffic congestion. Some argue that adding road capacity will simply entice more driving, leading to more congestion. To that end, state policies may be needed to control driver usage such as high occupancy vehicle (HOV) lanes and congestion pricing on HOT[25] lanes and toll roads. These strategies have been successful in California, Texas, Minnesota, and Colorado to ensure that new roads are not clogged with increased traffic.[26]

Northern Virginia uses HOV lanes, tolls (Dulles Toll Road and the Greenway), and is building HOT lanes with congestion

19 For example, the hourly peak capacity for subway is calculated based on 180 people per car for an 8-car train and 60 trains per hour. The peak capacity for light rail is calculated based on 160 people per car for a 4-car train, and 12 trains per hour. Source: Gridlock by Randy O'Toole, 2009. Cato Institute.

20 http://www.thomasjeffersoninst.org/pdf/articles/Rail_at_any_cost.pdf

21 See Demand Elasticity on Tolled Motorways, by Anna Matas and Jose-Luis Raymond, Journal of Transportation and Statistics.

22 http://www.virginiabusiness.com/index.php/opinion/article/does-telecommuting-really-work/148342/

23 Virginia's telecommuting policy (Number: 1.61 – Telecommuting) is found at http://www.dhrm.state.va.us/hrpolicy/web/pol1_61.html

24 See David Hartgen, M Gregory Fields, Robert Poole, *Building Roads to Reduce Traffic Congestion in America's Cities: How Much and at What Cost?* The Reason Foundation, 2006.

25 HOT stands for High Occupancy Toll.

26 See States Look to Toll Lanes for Congestion Relief, by Sarah Karush, Associated Press.

pricing built into the model. These measures help to relieve congestion in that region. Both Hampton Roads (Chesapeake Expressway) and Richmond (Downtown Expressway, Powhite Parkway, and Pocahontas Parkway) also have toll roads. With the state government lacking transportation funding, toll roads are realistic options to increase the road capacity in Virginia.

## Finance Options

The next key question is where will the money come from to expand capacity? Whether public transit is expanded or new highways built, enormous capital investment is needed. As the economy emerges out of recession, Virginia's state and local governments are facing sizable budget shortfalls. Therefore, it is unlikely that the current revenue framework will generate sufficient funds to solve these transportation issues. There are discussions about diverting sales tax revenue in Northern Virginia or utilizing future budget surpluses for transportation projects. The first will impact other services currently supported by the state sales tax, such as education and health care. Hoping for a budget surplus is unreliable under the current economic climate. New revenue sources need to be identified to solve the bulk of the transportation issues.

One way to raise additional revenue is to impose new taxes or raise current taxes. Governor Kaine, for example, proposed an increase in the state gas tax for a transportation plan. That tax increase was not enacted.[27]

A state-wide tax increase to solve congestion issues in Northern Virginia or Hampton Roads will encounter resistance from other parts of the state and will be difficult to get through the General Assembly—as evidenced by the failed attempt to increase the state gas tax in 2006. Local governments in Northern Virginia or Hampton Roads imposing a regional tax has proven unpopular; in November 2002, voters in those metros rejected a sales tax increase proposal to fund transportation by large margins.[28]

Another option to supplement transportation projects is user fees such as tolls. New technologies—such as video and global positioning system (GPS) billing—have made booth-less toll collection possible, enabling tolls to be charged with less interruption in traffic flow. Recently, Governor McDonnell proposed tolls to be imposed at the North Carolina border of I-95 to pay for much needed repairs.[29]

Public-private partnerships (PPPs) are another option for bringing private investment to transportation issues. Examples are seen in Chicago and Indiana where toll roads are leased to private companies. HOT lanes and the Greenway in Northern Virginia and the Pocahontas Parkway in Richmond are examples of PPPs, and each has its own economic model. Revenue from the leases can be used to expand road capacity and private firms benefit from the tolls. Public-private partnerships also have additional benefits in reducing road maintenance costs for the state. For a PPP to be successful, the project needs a high enough return to meet the conditions of the private partners. PPPs aren't limited to road building and can be used with a public transit system to increase efficiencies and raise funds for expansion. In addition, private maintenance of Virginia's primary and secondary roads could save the state over $100 million a year which could be recycled toward additional long-overdue maintenance needs on our roads.[30]

Another option to fund immediate transportation construction needs is the sale or lease of specific assets. For instance, Governor McDonnell has suggested that the state's liquor stores be sold to the private sector. It is estimated that at least $500 million can be generated from such a sale and that those funds could be poured into needed congestion relief. This issue will be brought to the General Assembly in a few months. Other assets can be leased to the private sector in a way that maintains long-term state ownership while producing significant sums for transportation. For instance, there are companies willing to lease such state assets as the highway rest stops or the land under the Virginia Port on a long-term basis. A large check—hundreds of millions of dollars—will be given to the state and then the state will "buy back" the asset over 30 to 40 years or more at a set payment.

## Summary

The solutions to Virginia's transportation problems are varied. In high density areas, expanded road capacity could be coupled with improved public transit if full capacity can be reached. New technologies and public-private partnerships provide financing options other than tax increases.

Aside from "transportation" policy, state leaders need to view the transportation issue from a broader perspective. Allowing and promoting flexible work schedules can reduce traffic

27 Under Governor Kaine, the Virginia Senate proposed a 5% increase on wholesale gasoline purchases in 2006. This failed in 2006. As a result, the 2007 transportation plan called for regional authority to collect regional taxes and fees. But that law was challenged in court and the Virginia Supreme Court rejected regional tax authority.

28 Source: *Hampton Roads Transportation: Its Problems and Its Future*. Available at: http://www.lwv-shr.org/files/transportation-report.pdf.

29 Source: Virginia Seeks I-95 Tolls near North Carolina Border. USA Today, May 13, 2010. Available at: http://www.usatoday.com/travel/destinations/2010-05-12-virginia-i95-tolls_N.htm

30 Source: There Are Many Ways Left to Save Taxpayer Dollars, Richmond Times-Dispatch, April 18, 2020. Available at: http://www2.timesdispatch.com/rtd/news/opinion/commentary/article/ED-THOMP18_20100416-210103/337908/.

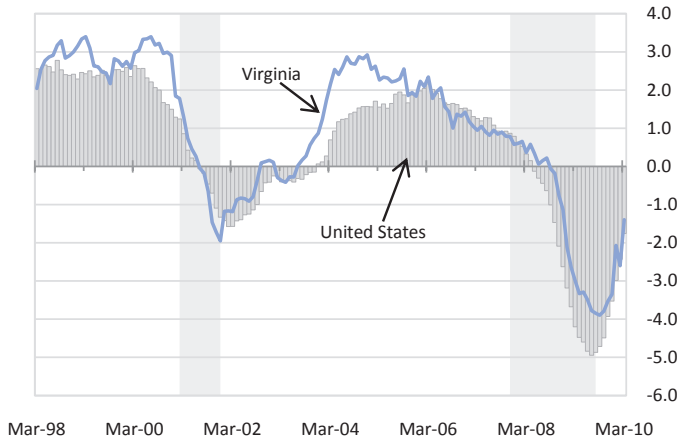
demand. Incentives for car-pooling and commuting via public transportation will also achieve this goal.

The transportation issue is directly related to economic development. Traditional zoning practices should be revisited. Though Americans prefer single-family houses with big yards, local metro area governments could encourage more mixed-use and transit-oriented development to minimize auto traffic. Expanded use of telecommuting will reduce congestion and should be encouraged by all employers. Despite different views on how to solve Virginia's transportation issues, it is widely agreed that the traffic issues in Virginia require innovative solutions and bold leadership.

## Virginia Economy

Virginia was performing better than the nation before the recession and the same is true for the recession and current recovery. But in no way does that mean Virginia was not hit hard by the recession or that Virginia should not expect lingering after-effects.

### Employment Growth
### Percent Change, Year-Over-Year




Source: Bureau of Labor Statistics

One of the most prominent impacts from the recession, for example, is a dampened labor market; and based on the last two recessions, hardship in the labor market reaches its peak after the official end date of a recession. In the nation, the peak pace of employment decline on a year-over-year basis occurred in July 2009, when the number of jobs was falling at a 4.9% pace. In Virginia, the peak pace of decline was recorded in September 2009 with employment contracting at a 3.9% rate. As indicated earlier, it is estimated that the national recession ended around July.

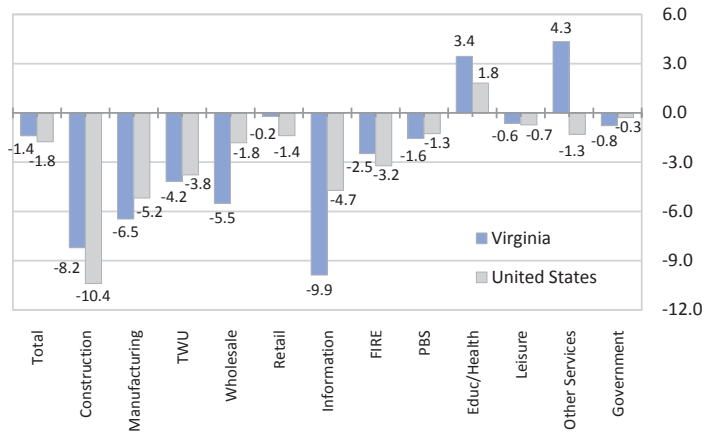
From peak to trough (April 2008 to February 2010), employment in Virginia dropped by 197,000 jobs, a 5.2% drop compared with a 6.1% decline in the nation. Among Virginia's metro areas, only Northern Virginia (-3.1%) had a smaller peak-to-trough job decline than the nation. Seven of the eleven metro areas had job declines between 6.0% and 7.0% as of March 2010, with the three largest contractions occurring in Bristol (-7.3%), Danville (-8.7%), and Winchester (-11.8%). With the most recent data available being March 2010 as of this writing, it is not certain that employment will not drop further in Virginia and the nation. Among Virginia's eleven metropolitan areas, seven recorded new employment troughs in the first quarter of 2010.

Looking ahead, Virginia's job base is expected to show tangible improvement before the end of the year. On an annual average basis, employment in the state is projected to expand 0.4% in 2010 after receding 3.2% in 2009. Employment growth is expected to accelerate to 1.9% in 2011, though these job gains would still be the recovery of losses from the recession rather than expanding beyond pre-recession levels.

## Recent Growth

Over the twelve months ending March 2010, employment fell 1.4% (-51,100 jobs) in the Commonwealth compared to a sharper 1.8% decline in the nation. Ten of Virginia's eleven metro areas posted job losses over this period with the remaining metro, Harrisonburg, being essentially flat based upon preliminary data.

### Employment Growth by Sector
### Percent Change, Year Ending March 2010




Source: Bureau of Labor Statistics

Only two sectors expanded in the state over the year ending March 2010, the education and health services sector and the other services sector. Education and health services is the only major sector to have consistently posted year-over-year gains since 1991. This sector added 15,400 jobs over the year ending March 2010 with all the gains attributable to health care which added 17,400 jobs while education contracted. Over the same period, 8,100 jobs were added in the other services sector

## High-Technology Growth in Virginia

| | | Employment | | | | Wages and Salaries Thousands of Dollars* | | | |
|---|---|---|---|---|---|---|---|---|---|
| NAICS | Industry | 2008Q3 | 2009Q3 | Change | % Change | 2008Q3 | 2009Q3 | Change | % Change |
| | **Total Employment** | **3,657,733** | **3,514,547** | **-143,186** | **-3.9** | **41,782,833** | **41,049,346** | **-733,487** | **-1.8** |
| | **Total High Technology** | **593,091** | **585,842** | **-7,249** | **-1.2** | **12,482,752** | **12,630,624** | **147,872** | **1.2** |
| | **Level 1** | **278,562** | **274,404** | **-4,158** | **-1.5** | **5,996,744** | **6,005,788** | **9,044** | **0.2** |
| **3254** | Pharmaceutical and Medicine Manufacturing | 3,613 | 3,476 | -137 | -3.8 | 64,672 | 63,876 | -796 | -1.2 |
| **3341** | Computer and Peripheral Equipment Manufacturing | 791 | 714 | -77 | -9.8 | 11,212 | 10,414 | -798 | -7.1 |
| **3342** | Communications Equipment Manufacturing | 3,119 | 2,988 | -131 | -4.2 | 71,665 | 66,115 | -5,550 | -7.7 |
| **3344** | Semiconductor and Other Electronic Component Manufacturing | 6,568 | 4,137 | -2,432 | -37.0 | 104,896 | 62,144 | -42,752 | -40.8 |
| **3345** | Navigational, Measuring, Electromedical, and Control Instruments Manufacturing | 5,152 | 5,089 | -63 | -1.2 | 106,870 | 108,366 | 1,496 | 1.4 |
| **3364** | Aerospace Product and Parts Manufacturing | 1,408 | 1,484 | 77 | 5.4 | 23,116 | 23,149 | 33 | 0.1 |
| **5112** | Software Publishers | 5,197 | 4,846 | -351 | -6.7 | 146,490 | 129,783 | -16,706 | -11.4 |
| **5182** | Data Processing, Hosting, and Related Services | 12,662 | 11,470 | -1,192 | -9.4 | 234,045 | 216,207 | -17,838 | -7.6 |
| **5191** | Other Information Services | 8,545 | 7,855 | -690 | -8.1 | 103,347 | 93,068 | -10,278 | -9.9 |
| **5413** | Architectural, Engineering, and Related Services | 70,590 | 67,358 | -3,231 | -4.6 | 1,371,358 | 1,343,299 | -28,059 | -2.0 |
| **5415** | Computer Systems Design and Related Services | 135,016 | 138,743 | 3,727 | 2.8 | 3,169,202 | 3,277,109 | 107,906 | 3.4 |
| **5417** | Scientific Research and Development Services | 25,901 | 26,244 | 342 | 1.3 | 589,872 | 612,258 | 22,386 | 3.8 |
| | **Level 2** | **168,636** | **172,062** | **3,426** | **2.0** | **3,749,119** | **3,971,630** | **222,512** | **5.9** |
| | **Level 3** | **145,893** | **139,376** | **-6,517** | **-4.5** | **2,736,889** | **2,653,205** | **-83,684** | **-3.1** |

* Includes some stock options that were exercised.
Note: Data in this table include both privately-owned and government-owned high-tech operations. Figures may not sum due to rounding.
Source: Chmura Economics & Analytics and Virginia Employment Commission

*An industry is defined as **high-tech** in this publication if, at the national level, it possesses at least double the percentage of employment in technology-oriented occupations compared to the average for all industries. Level one high-tech industries possess at least five times the average of technology-oriented occupations, level two employ 3.0 to 4.9 times the average, and level three at least 2.0 times the average.*

which includes civic, professional, and similar organizations; automotive repair and maintenance; and personal care services.

The largest job losses by sector in Virginia over this period were posted in construction (-16,500 jobs) and manufacturing (-15,800). The construction sector (which also includes mining) has been shedding jobs in the state on a year-over-year basis since October 2006. Though a decline in residential construction certainly has come into play in this slump, all construction industries have been shedding jobs over the past several years, including nonresidential building construction and highway, street, and bridge construction. Manufacturing has been in continuous decline even longer, shedding jobs on a year-over-year basis since January 2005. The manufacturing job losses have not been restricted to the smaller, manufacturing-heavy metro areas in the state. Over the year ending March 2010, nearly half the manufacturing job losses in the state were in the Northern Virginia, Hampton Roads, and Richmond metro areas.

The variety of sectors with job losses in Virginia shows the breadth of the recently ended recession. The next-largest losses over the year ending March 2010 were posted in professional and business services (-10,000 jobs), information (-8,200), and wholesale (-6,300). Government contracted by 5,400 jobs over this period due to a 15,100-job loss in local government—federal government added 7,500 jobs over this period while state government added 2,200. The remaining contracting sectors were transportation, warehousing, and utilities (-4,800); finance, insurance, and real estate (-4,500); leisure (-2,200); and retail (-800).

## Technology

Employment in high-tech industries in Virginia slipped into decline along with the rest of the economy. Over the year ending with the third quarter of 2009, high-technology industries shed approximately 7,200 jobs for a 1.2% contraction. Every Virginia metro area lost high-tech jobs over this period. However, Northern Virginia, which has by far the most high-tech industry employment, had just a slight decline. In the third quarter of 2009, Northern Virginia had close to 332,500 jobs in high-tech—over a quarter of high-tech jobs statewide—but lost just 0.1% of high-tech employment (-300 jobs) over the preceding twelve months.

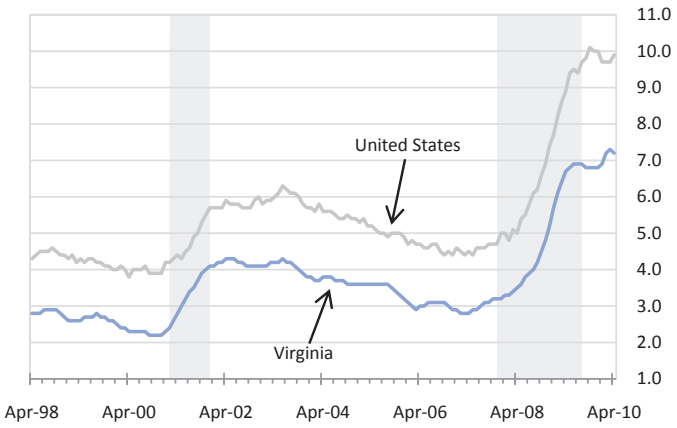
High-tech industries provide higher average annual wages compared to all industries and have historically offered better growth prospects. Average annual wages in Virginia's high-tech industries were $89,898 as of the third quarter of 2009 compared to $47,810 in all industries. From 1998 to 2008, overall employment averaged 1.3% annualized growth in Virginia while high-tech employment grew at a quicker 1.8% pace.

Level-one high-tech industries are those employing a higher percentage of technology-oriented occupations compared with level two or level three industries. Among level-one industries in Virginia, the largest job gain over the year ending with the third quarter of 2009 was posted in computer systems design and related services (+3,727 jobs). Over the same period, most of the level-one industries shed jobs, led by architectural, engineering, and related services (-3,231); semiconductor and other electronic component manufacturing (-2,432); and data processing, hosting, and related services (-1,192).

## Labor Market

While the pace of increase in the unemployment rate has slowed in Virginia, it has continued to trend upward in the beginning of 2010. From December 2007 to June 2009, the seasonally adjusted unemployment rate in the Commonwealth more than doubled from 3.2% to 6.9%. After hovering around 6.8% and 6.9% in the second half of 2009 and into January 2010, Virginia's unemployment rate turned upward again and was 7.2% in April. The national unemployment rate was 9.9% in April 2010, below the 10.1% peak in October 2009.

### Unemployment Rate



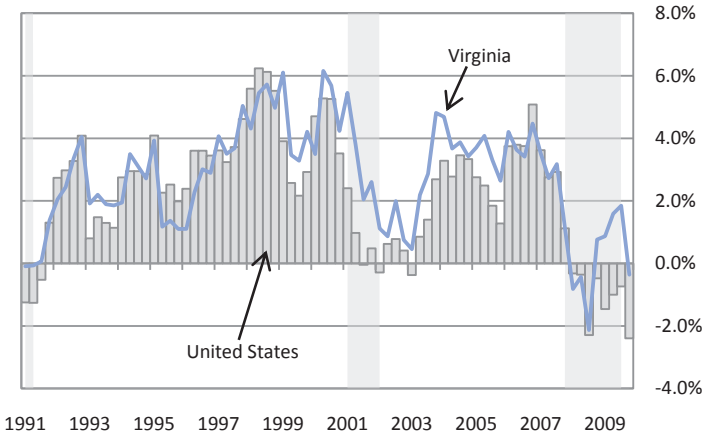

Source: Bureau of Labor Statistics

The six-month moving average of initial unemployment claims more than doubled from 21,770 per month in December 2007 to a peak of 47,806 per month in July 2009. From the peak to March 2010, initial claims pulled back 27.1% to 34,860, a strong indicator that the labor market turned the corner—though the relatively high rate of initial claims serves as a caution that the labor market is still not well.

## Income

From 2008 to 2009, real personal income advanced 1.0% in Virginia compared to a 1.4% decline in the nation—Virginia's pace of growth ranking 4th among the fifty states. Personal income is made up of (1) net earnings; (2) dividends, interest, and rent; and (3) transfer receipts. Virginia's total income growth in 2009 exceeded that of the nation primarily due to better growth in net earnings—which expanded 0.3% in the state while contracting 3.7% in the nation. This decade, Virginia averaged 2.4% annualized growth in real personal income, outpacing the 1.3% annualized growth in the nation.

### Real Personal Income Growth
### Percent Change, Year-Over-Year




Source: Bureau of Economic Analysis

The proportion of income supplied by net earnings decreased in both the state and the nation in 2009. Net earnings consist of wage and salary disbursements, other labor income, and proprietor's income. From 2008 to 2009, the proportion of income from net earnings fell in Virginia from 71.1% to 70.8% while dropping in the nation from 66.6% to 65.3%. The percentage of income supplied by transfer payments (social security,

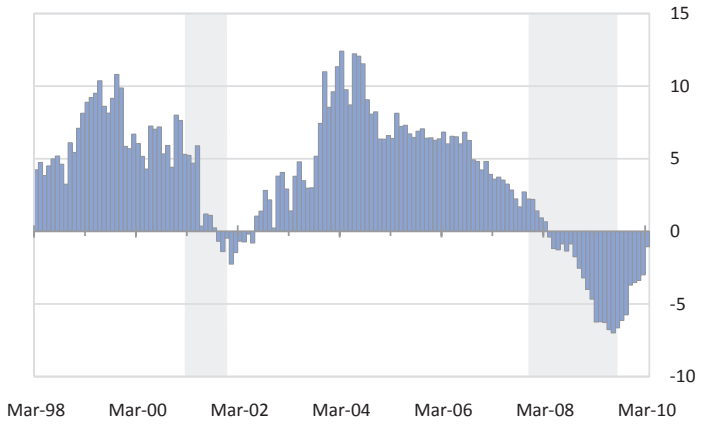
unemployment compensation, welfare, disability payments, etc.) increased in both the state and the nation as one would expect during a period of slow and contracting growth. From 2008 to 2009, the proportion of income provided by transfer payments increased from 11.7% to 13.0% in Virginia and from 15.3% to 17.5% in the nation.

Total wages and salaries in Virginia dropped 1.9% in 2009, but are forecast to rebound with 2.7% growth in 2010 as the business cycle is on the upswing, accelerating to 5.9% in 2011. All of the metro areas in Virginia posted a decline in wages and salaries over the past year except Bristol (+4.6%).[31] In 2010, each of the metro areas is expected to see wages and salaries rise—with Bristol again being the exception where wages and salaries are expected to fall slightly.

## Retail Sales

Consumer spending in Virginia slowed significantly in 2008, slowed even further in 2009, and was still in decline in the beginning of 2010. Over the twelve months ending March 2010, the six-month moving average of nominal retail sales in the state fell 1.1%. Northern Virginia was the only metro area to post a gain over this period, expanding a modest 0.1%. The largest declines over the same period were in Harrisonburg (-7.1%), Blacksburg (-8.0%), and Roanoke (-8.0%).

### Retail Sales, Percent Change Year-Over-Year, Six-Month Moving Average



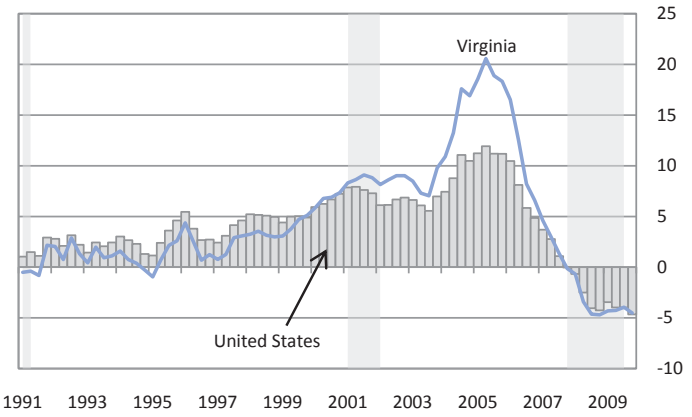

Source: Virginia Department of Taxation

On an annual average basis, real retail sales fell 5.4% in 2008 and 5.4% further in 2009. Real retail sales are expected to improve 1.3% in 2010 and continue to regain ground with a 5.1% expansion in 2011. While all of the metro areas are projected to see growth in sales by 2011, some of the metros are expected to remain in decline in 2010 (Bristol, Danville, Hampton Roads, Harrisonburg, Roanoke, and Winchester).

## Housing Market

The extended decline in home sales in Virginia has finally come to a close. The Virginia Association of Realtors reported 86,609 homes sold in the state in 2009, a 1.6% increase from 2008 and the first expansion since 2005. The median sales price in 2009 was $240,809, down 5.5% from the prior year. According to the Federal Housing Finance Agency's (FHFA) House Price Index,[32] home prices fell 4.5% in Virginia in the fourth quarter of 2009 on a year-over-year basis, the ninth consecutive quarterly decline. Home prices fell a similar 4.7% in the nation in the fourth quarter of 2009. Changes among Virginia's metro areas during this period varied from a 1.2% increase in Danville to a 10.7% drop in Winchester. All of the metro areas experienced one or more quarters of year-over-year decline within the past year.

### Home Price Appreciation Percent Change, Year-Over-Year




Source: Federal Housing Finance Agency

The continued slow housing market has been readily apparent in residential building permit activity. Single-family building permits in Virginia (based on a six-month moving average) climbed to 1,230 per month in March 2010, up nearly 10% over the preceding year, but still much lower than the peak of 3,886 permits per month attained in December 2004. While a return to housing boom levels is not expected any time soon, building permits in Virginia are expected to expand in the state and each metro area over the next two years. On an annual average basis, single-family building permits dropped 16.5% in Virginia in 2009 and are forecast to rise 10.7% in 2010 and 11.9% in 2011.

31 The wage increase in Bristol appears to have been due to a large spike in stock options or bonuses at one firm.

32 The FHFA House Price Index is a weighted repeat sales index and therefore is a true measure of price appreciation as it is not affected by changes in the size or quality of homes sold.

## Metro Areas

With the recovery from the national recession expected to strengthen in 2010, employment in Virginia is projected to post modest growth. On an annual average basis, employment plummeted 3.2% in 2009 and is forecast to advance 0.4% in 2010 and 1.9% in 2011.

While most Virginia metro areas are expected to see job gains in 2010, the exceptions are Roanoke and Winchester where further declines are forecast to continue until 2011. Both of these regions have also experienced especially sharp declines in retail sales.

Three metro regions are forecast to see job growth above 1.0% in 2010: Harrisonburg (+2.7%), Blacksburg (+1.5%), and Lynchburg (+1.3%). Lynchburg will be working to rebound from a heavy 4.1% job loss in 2009. Blacksburg recorded the third-highest unemployment rate in the state in March 2010 (9.0%), but benefits from the research-stimulating presence of Virginia Tech. Harrisonburg suffered a sharp decline in real retail sales in 2009 (-10.5%), but is forecast to see job growth, including an expansion from the software publisher Rosetta Stone.

Three metro areas are projected to grow slowly in 2010 but accelerate to 2.0%-plus job growth in 2011: Charlottesville, Northern Virginia, and Richmond. Charlottesville has a historically stable employment base due to the presence of the University of Virginia and is slated to receive a boost of 800 well-paying jobs when the Defense Intelligence Agency completes a move to the region by this fall. Northern Virginia is a perennial driver of growth in the state and this is expected to continue as the Commonwealth comes out of recession. The recession in Richmond was accentuated with major firm closings such as Circuit City and Qimonda as well as severe losses in its financial sector. Nevertheless, job growth in the capital is expected to be better than the state average in 2011.

The remaining three metro areas (Bristol, Danville, and Hampton Roads) are projected to experience slight 0.1% to 0.2% job gains in 2010 with only moderate acceleration in 2011. Bristol and Danville job growth expectations are typically slower than average since they have the slowest population growth among the state metro areas. From 2000 to 2008, population in Bristol averaged 0.38% annual average growth, Danville averaged a 0.31% decline, and the state averaged 1.12% growth per year. Employment is expected to expand in Hampton Roads but at a subdued pace through 2011; the region has exhibited slower-than-average growth over the last several years despite the continued expansion trend in its ship building industry.

### Chmura Virginia Forecast
### Most-Likely Scenario, Annual Average Change

| | | Actual | | Forecast | |
|---|---|---|---|---|---|
| Blacksburg | 2007 | 2008 | 2009 | 2010 | 2011 |
| Total Employment* | -0.4% | 0.6% | -4.0% | 1.5% | 2.3% |
| Wages and Salaries** | 2.8% | -0.4% | -3.7% | 2.0% | 4.4% |
| Real Retail Sales | 0.0% | -1.4% | -6.1% | 1.5% | 2.4% |
| Building Permits*** | N/A | N/A | N/A | N/A | N/A |
| Bristol | | | | | |
| Total Employment* | -0.1% | 0.6% | -4.4% | 0.1% | 1.1% |
| Wages and Salaries** | 2.3% | 3.9% | 4.6% | -0.4% | 1.2% |
| Real Retail Sales | 4.0% | -2.1% | -2.8% | -0.8% | 0.9% |
| Building Permits | -18.7% | -26.0% | -28.4% | 9.4% | 11.2% |
| Charlottesville | | | | | |
| Total Employment* | 2.8% | 0.0% | -2.7% | 0.4% | 2.3% |
| Wages and Salaries** | 6.7% | 2.1% | -1.3% | 2.9% | 6.9% |
| Real Retail Sales | 0.7% | -6.1% | -7.6% | 2.2% | 5.3% |
| Building Permits | -15.7% | -30.0% | -18.1% | 19.6% | 14.3% |
| Danville | | | | | |
| Total Employment* | -0.5% | -0.5% | -2.7% | 0.2% | 0.4% |
| Wages and Salaries** | 3.6% | 0.7% | -4.3% | 3.8% | 2.8% |
| Real Retail Sales | 4.7% | -6.2% | -5.1% | -0.6% | 0.0% |
| Building Permits | -32.8% | -41.9% | -21.3% | 13.8% | 15.7% |
| Hampton Roads | | | | | |
| Total Employment* | 1.0% | -1.1% | -3.7% | 0.1% | 0.2% |
| Wages and Salaries** | 5.2% | 2.1% | -2.2% | 1.2% | 3.6% |
| Real Retail Sales | 0.8% | -7.1% | -5.1% | -0.7% | 2.4% |
| Building Permits | -21.8% | -28.6% | -10.2% | 16.8% | 11.1% |
| Harrisonburg | | | | | |
| Total Employment* | -0.2% | -1.0% | -1.1% | 2.7% | 3.6% |
| Wages and Salaries** | 5.4% | 3.8% | -1.6% | 3.5% | 6.6% |
| Real Retail Sales | -2.1% | -2.1% | -10.5% | -0.5% | 7.2% |
| Building Permits | -13.4% | -38.4% | 2.6% | 8.4% | 12.4% |
| Lynchburg | | | | | |
| Total Employment* | 1.0% | 1.0% | -4.1% | 1.3% | 2.6% |
| Wages and Salaries** | 4.5% | 3.5% | -3.8% | 1.6% | 5.6% |
| Real Retail Sales | -1.0% | -0.1% | -9.8% | 1.9% | 4.0% |
| Building Permits | -17.6% | -41.2% | -34.5% | 9.2% | 19.2% |
| Northern Virginia | | | | | |
| Total Employment* | 1.2% | 0.3% | -1.7% | 0.7% | 2.6% |
| Wages and Salaries** | 5.5% | 3.1% | -0.6% | 3.7% | 6.8% |
| Real Retail Sales | -0.6% | -6.0% | -3.8% | 2.4% | 7.2% |
| Building Permits | -22.8% | -35.4% | -0.9% | 7.6% | 10.9% |
| Richmond | | | | | |
| Total Employment* | 1.2% | -0.4% | -4.1% | 0.1% | 2.1% |
| Wages and Salaries** | 6.3% | 1.4% | -5.5% | 2.4% | 6.8% |
| Real Retail Sales | 2.0% | -5.3% | -5.9% | 2.1% | 6.5% |
| Building Permits | -23.3% | -32.7% | -31.7% | 9.6% | 10.1% |
| Roanoke | | | | | |
| Total Employment* | 0.5% | -0.6% | -4.5% | -0.8% | 0.1% |
| Wages and Salaries** | 5.2% | 2.5% | -1.9% | 2.0% | 3.5% |
| Real Retail Sales | -1.6% | -2.8% | -10.9% | -0.4% | 3.6% |
| Building Permits | -24.0% | -16.8% | -44.5% | 13.5% | 12.6% |
| Winchester | | | | | |
| Total Employment* | -0.1% | -2.7% | -5.0% | -0.6% | 2.9% |
| Wages and Salaries** | 3.4% | 0.3% | -3.7% | 0.4% | 3.1% |
| Real Retail Sales | -6.6% | -9.3% | -11.2% | -1.6% | 4.3% |
| Building Permits | -48.3% | -35.7% | -13.3% | 9.0% | 15.6% |
| Non-MSAs | | | | | |
| Total Employment* | -0.4% | 3.5% | -5.5% | 0.5% | 1.8% |
| Wages and Salaries** | 5.6% | 2.8% | -2.1% | 2.0% | 5.9% |
| Real Retail Sales | 0.6% | -3.2% | -4.9% | 3.7% | 2.1% |
| Building Permits | -29.2% | -44.4% | -32.1% | 11.5% | 16.6% |
| VA-Totals | | | | | |
| Total Employment* | 0.9% | 0.1% | -3.2% | 0.4% | 1.9% |
| Wages and Salaries** | 5.5% | 2.5% | -1.9% | 2.7% | 5.9% |
| Real Retail Sales | 0.2% | -5.4% | -5.4% | 1.3% | 5.1% |
| Building Permits | -23.5% | -33.9% | -16.5% | 10.7% | 11.9% |

*Employment refers to nonagricultural employment **Wages and salaries include some options that were exercised. Actual data are through the 2nd quarter of 2007. ***Since 2005, building permits data are not reported for Blacksburg metro. All reported series are seasonally adjusted.

## *About Chmura Economics & Analytics*

***Chmura Economics & Analytics (Chmura) was founded by Christine Chmura in 1999. The firm specializes in applied economic consulting, quantitative research, and software solutions requiring the integration of advanced economic analysis.***

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*"...a wise and frugal government, which shall restrain men from injuring one another, shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned. This is the sum of a good government, and this is necessary to close the circle of our felicities."*

*- Thomas Jefferson, 1801*

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