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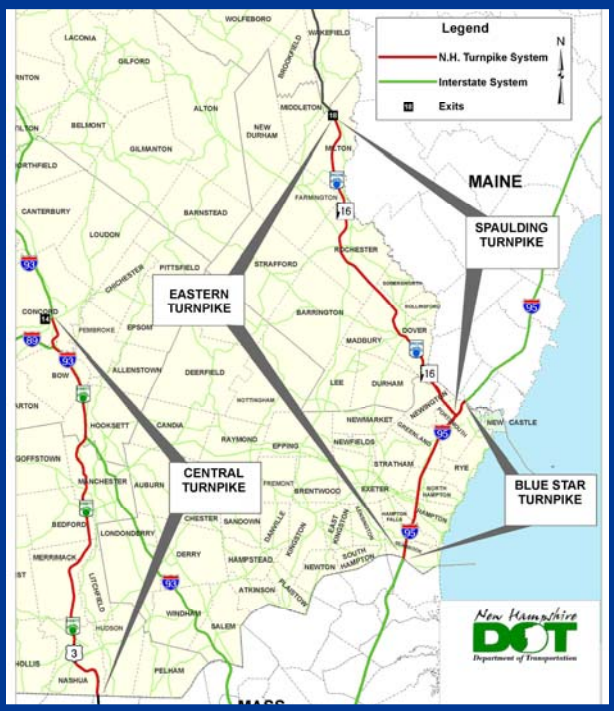

Submitted to:
New Hampshire Department of Transportation

New Hampshire Turnpike System Traffic and Revenue Study

August 14, 2012

Submitted by:

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Table of Contents

1 EXECUTIVE SUMMARY 1
2 INTRODUCTION 2
3 DESCRIPTION OF NEW HAMPSHIRE TURNPIKE SYSTEM 2
4 HISTORICAL TRAFFIC AND REVENUE 9
4.1 HISTORICAL TOLL TRANSACTIONS AND TOLL REVENUE TRENDS 9
4.2 TOLL TRANSACTION TRENDS 10
4.3 TOLL REVENUE TRENDS 14
4.4 COMPARISON OF ACTUAL TOLL REVENUES TO RECENT PROJECTIONS 18
5 REVIEW OF PROPOSED CAPITAL IMPROVEMENT PROGRAM 19
6 REVIEW OF HISTORICAL AND PROJECTED OPERATION, MAINTENANCE, RENEWAL AND REPLACEMENT, AND DEBT SERVICE EXPENDITURES 21
6.1 TOLL PROCESSING COSTS 22
6.2 OPERATING EXPENDITURES 23
6.3 DEBT SERVICE REQUIREMENTS 25
7 REVIEW OF REGIONAL AND NATIONAL SOCIOECONOMIC FACTORS 26
7.1 U.S. ECONOMIC OUTLOOK 26
7.1.1 Recent Macroeconomic Trends 26
7.1.2 Long-Term Structural Trends 29
7.1.3 Short-Term Economic Forecast 29
7.1.4 Industrial Production 30
7.1.5 Industrial Production Forecasts 32
7.1.6 Employment 33
7.1.7 Age of the Population 33
7.2 NATIONAL TRENDS IN VEHICLE MILES TRAVELED 33
7.2.1 Fuel Cost Impacts on Travel 34
7.2.2 Discretionary Travel, Telecommuting and the Internet 39
7.2.3 Age Groups and Travel 39
7.3 REVIEW OF NEW HAMPSHIRE SOCIOECONOMIC FACTORS 42
7.3.1 The New Hampshire Economy 42
7.3.2 Population 44
7.3.3 Employment 45
7.3.4 Income 47
7.3.5 Travel and Tourism 49
7.3.6 Commuting Trends 50
7.3.7 Age of the Population 51
7.4 HISTORICAL TRAFFIC AND ECONOMIC RECESSIONS 52
7.4.1 Comparative Recession Analysis 53
7.4.2 NH Forecasted Traffic and Its Relationship to Economic Recessions 54
8 TRANSPORTATION PROJECTS RELATIVE TO THE NH TURNPIKE SYSTEM 55

8.1 FEEDER ROADS 55
8.2 COMPETITIVE ROADS 55
8.2.1 Central Turnpike Parallel Routes - US Route 3 and NH 3A 56
8.2.2 Spaulding Turnpike Parallel Routes - Dover Point Rd / NH 9 / NH 108 58
8.2.3 Blue Star Turnpike Parallel Route - US Route 1 60
8.2.4 Summary of Alternate Routes 60
8.3 POTENTIAL FUTURE TRANSPORTATION PROJECTS 62
8.3.1 Central (Everett) Turnpike Region 62
8.3.2 Blue Star Turnpike Region 63
8.3.3 Spaulding Turnpike Region 63
9 TRAFFIC AND REVENUE PROJECTIONS, FY 2013-2022 65
9.1 TOLL RATES 65
9.1.1 Assumed Toll Rates 65
9.1.2 Reasonableness of Tolls / Comparison to Other Facilities 65
9.2 METHODOLOGY USED FOR PROJECTIONS 67
9.2.1 Correlation to Economic Factors 67
9.2.2 E-ZPass Market Shares 67
9.2.3 System Changes and Developments 68
9.3 TOLL TRANSACTION PROJECTIONS BY TURNPIKE 70
9.4 TOLL REVENUE PROJECTIONS BY TURNPIKE 72
9.5 E-ZPASS MARKET SHARE PROJECTIONS 74
10 FINANCIAL MODEL ANALYSIS 76
10.1 TOTAL TURNPIKE SYSTEM EXPENDITURES 76
10.2 TURNPIKE SYSTEM FUNDS 77
10.3 TURNPIKE COVERAGE RATIO ANALYSIS 78
10.4 LIMITS AND DISCLAIMERS 80

List of Figures

Figure 1: New Hampshire Turnpike System 3

Figure 2: NH Turnpike System Historical Toll Transactions and Toll Revenue Trends, FY 1950-2012.... 10

Figure 3: NH Turnpike System Historical Toll Transactions Trends, FY 1950 to 2012 12

Figure 4: Historical Toll Transaction Trends for the Central, Blue Star and Spaulding Turnpikes, FY 1991-2012 13

Figure 5: NH Turnpike System Historical Toll Revenues, FY 1950 to 2012 16

Figure 6: Historical Toll Transaction and Revenue Trends for the Central, Blue Star and Spaulding Turnpikes, FY 1991-2012 17

Figure 7: Funding Sources for Capital Improvement Program 20

Figure 8: Percent Change in Real GDP, 1960 - 2011 26

Figure 9: Duration of US Recessions, 1920-2012 27

Figure 10: S&P/Case-Shiller Home Price Index, 10-City Composite 28

Figure 11: Outstanding Consumer Credit 28

Figure 12: Forecast Change in Real GDP, 2012 and 2013 30

Figure 13: Percentage Change in Real GDP and IPI, 1989-2011 31

Figure 14: Capacity Utilization, 1990-2011 32

Figure 15: Forecast Change in the Industrial Production Index, 2012 and 2013 32

Figure 16: US Annual Vehicle Miles Traveled (VMT) 34

Figure 17: Historical and Projected US Gasoline and Crude Oil Prices, EIA 35

Figure 18: Historical and Projected Crude Oil Prices with Confidence Range, EIA 36

Figure 19: Historical Fuel Efficiency, 1975-2011 37

Figure 20: National VMT vs. Real Gas Prices, 12-Month Moving Average, 1990-2012 38

Figure 21: US Population Distribution by Age Group 40

Figure 22: Average VMT per Person by Age Range, 2009 41

Figure 23: Survey Respondents who Stated They Sometimes Choose to Spend Time with Friends Online Instead of Driving to See Them 42

Figure 24: Annual Percent Change in Real GDP, 1998-2011 43

Figure 25: Year-to-Year Percent Change in Manufacturing Exports, January 1998- January 2012 44

Figure 26: Total and the Annual Percent Change in Population, 1970-2030 45

Figure 27: Change in Total Year-to-Year Employment , January 1998 to January 2012 46

Figure 28: Unemployment Rate, 1998 - April 2012 47

Figure 29: Real Median Household Income, 1985-2010 (2010$) 48

Figure 30: Current Year Median Household Income, 1985-2010 49

Figure 31: Tourist Activity in New Hampshire, 2006-2011 50

Figure 32: NH Population Age Distribution, 1990 - 2010 52

Figure 33: Indexed VMT During Recent and Historical Recessions 53

Figure 34: Indexed VMT During 2008 and 1980s Recessions 54

Figure 35: Central Turnpike and Parallel Routes 57

Figure 36: Spaulding Turnpike and Parallel Routes 59

Figure 37: Blue Star Turnpike and Parallel Routes 61

Figure 38: Passenger Car Toll Rates per Mile on Select E-ZPass Toll Facilities as of August 2012 66

Figure 39: Commercial Vehicle Toll Rates on Select E-ZPass Toll Facilities as of August 2012 67

Figure 40: NH Turnpike System Historical and Projected Toll Transaction and Revenue Trends, FY 1950-2022 73

Figure 41: NH Turnpike System Historical and Projected E-ZPass Market Shares, FY 2008-2022 75

List of Tables

Table ES-1: FY 2012 and Projected Annual Toll Revenue, FY 2013-2022 (in millions) 1

Table 1: Major Events on the NH Turnpike System 4

Table 2: NH Turnpike System Annual Toll Transactions (in millions), FY 1991-2012 11

Table 3: NHDOT Annual Toll Revenues, FY 1991-2012 (in millions) 14

Table 4: Actual Toll Revenues vs. 2009 Projections, FY 2010-2012 (in millions) 18

Table 5: Historical and Proposed NHDOT Capital Expenditures, FY 2003-2022 (in millions) 19

Table 6: Toll Processing Costs, FY 2003-2022 (in millions) 22

Table 7: Historical and Projected NHDOT Operating Expenditures, FY 2003-2022 (in millions) 23

Table 8: Historical Lapse, FY 2003-2012 24

Table 9: Historical and Scheduled Debt Service Expenditures, FY 2003-2022 (in millions) 25

Table 10: New Hampshire Commuting Trends by County 51

Table 11: Toll Rates on the New Hampshire Turnpike System 65

Table 12: Estimated Losses in Average Daily Toll Transactions / Annual Revenues ($M) at Bedford/Merrimack Plazas due to Manchester Airport Access Road Interchange 69

Table 13: FY 2012 and Projected Annual Toll Transactions, FY 2013-2022 (in millions) 70

Table 14: Detailed Traffic and Revenue Projections, FY 2013-2022 (in millions) 71

Table 15: FY 2012 and Projected Annual Toll Revenue, FY 2013-2022 (in millions) 72

Table 16: Historical and Projected E-ZPass Market Shares, FY 2008-2022 74

Table 17: Historical and Projected Total NH Turnpike Expenditures, FY 2003-2022 (in millions) 76

Table 18: Historical and Projected NH Turnpike Funds, FY 2003-2022 (in millions) 77

Table 19: NH Turnpike Debt Coverage Analysis, FY 2013-2022 (in millions) 78

Table 20: Projected Cash Flow Analysis, FY 2013-2022 (in millions) 79

1 EXECUTIVE SUMMARY

Jacobs Engineering was retained by the New Hampshire Department of Transportation (NHDOT) to conduct this traffic and revenue study for the New Hampshire Turnpike System (the "Turnpike System"). Jacobs analyzed historical traffic and revenue data for the entire Turnpike System to determine historical trends, correlated traffic with key economic indicators, and researched demographic data and other factors that have affected recent traffic and will affect future traffic. In addition, Jacobs reviewed the historical and proposed Turnpike Capital Improvement Program as well as historical and projected expenditures for the Turnpike System related to operations, maintenance, renewal and replacement, and toll processing.

All of this information and analyses were then used to develop a traffic and revenue model to estimate annual traffic and toll revenue for the ten-year period from Fiscal Year 2013 (i.e., July 2012 – June 2013) through Fiscal Year 2022. Fiscal Year (FY) 2012 and projected annual toll revenue is summarized in Table ES-1. These forecasts assume no future toll increases. They take into account the estimated loss in Central Turnpike toll traffic due to the free Manchester Airport Access Road interchange which opened in November 2011, as well as growth in traffic from the Merrimack Premium Outlets which opened June 14, 2012 and the Spaulding Turnpike widening project.

Table ES-1: FY 2012 and Projected Annual Toll Revenue[1], FY 2013-2022 (in millions)

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Total
2012 (Actual)[2]	$ 43.2	$ 58.3	$ 14.6	$ 116.1
2013	$ 42.8	$ 58.6	$ 14.5	$ 115.9
2014	$ 43.1	$ 59.1	$ 14.5	$ 116.7
2015	$ 43.8	$ 59.6	$ 14.6	$ 118.0
2016	$ 44.4	$ 60.2	$ 15.0	$ 119.6
2017	$ 45.2	$ 60.8	$ 15.2	$ 121.1
2018	$ 45.9	$ 61.3	$ 15.5	$ 122.6
2019	$ 46.5	$ 61.8	$ 15.6	$ 123.9
2020	$ 47.2	$ 62.3	$ 15.7	$ 125.2
2021	$ 48.0	$ 62.8	$ 15.8	$ 126.5
2022	$ 48.7	$ 63.3	$ 15.9	$ 127.8

[1]Does not include administrative fees or violation revenue

[2]Unaudited; does not include violation revenue

Note: Data will not necessarily add to totals because of rounding

The study also included the use of a financial model to estimate net revenues, operating costs, debt service requirements, and bond coverage ratios and cash reserves for the Turnpike System. The analysis of the financial plan showed that sufficient revenues will be generated to fund the proposed capital plan and to meet both the state's bond resolution's minimum debt service coverage requirements as well as the Turnpike's internal minimum requirements for the ten-year forecast period, FY 2013-2022.

2 INTRODUCTION

Jacobs was retained by NHDOT to conduct a traffic and revenue study for the Turnpike System. In conducting this study, historical traffic and revenue data for the entire Turnpike System were collected and analyzed to determine historical trends and travel characteristics. Previous traffic and revenue projections made by others were reviewed and compared to actual traffic and revenue data recorded by NHDOT.

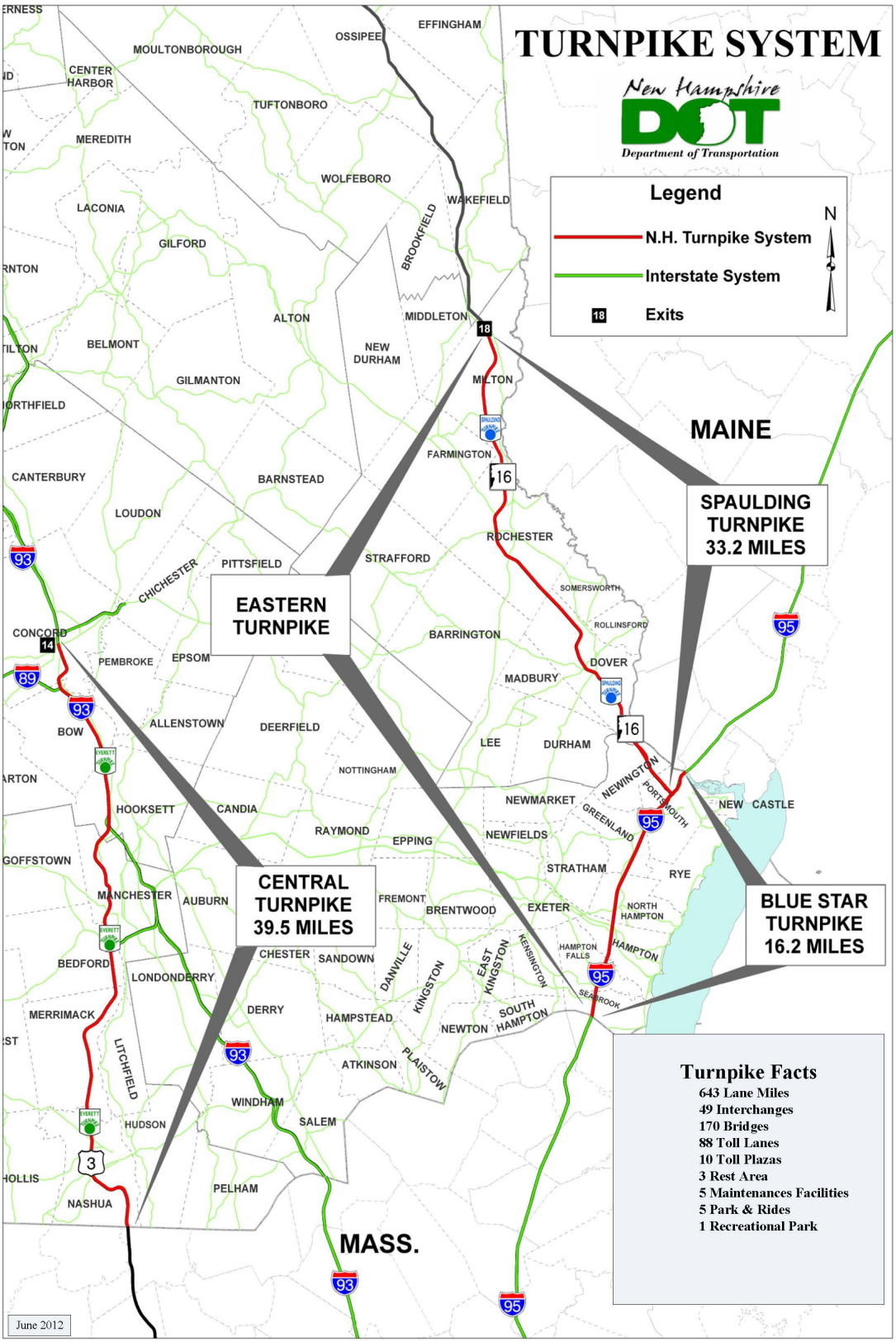
This study also included a review of the historical and proposed Turnpike Capital Improvement Program, as well as historical and projected expenditures for the Turnpike System related to operations, maintenance, renewal and replacement, and toll processing. An additional review was conducted for regional and national economic factors such as gross domestic product, fuel cost impacts, housing and employment. The study also examined feeder and competitive roads and their impact on traffic on the Turnpike System.

All of this information and analyses were then used to develop a traffic and revenue model to estimate annual traffic and toll revenue for Fiscal Years 2013 through 2022. The study also included the development of a financial model to estimate net revenues, operating costs, debt service requirements and bond coverage ratios. An assessment was made to determine whether the toll revenues would be sufficient to meet the Turnpike bond requirements.

3 DESCRIPTION OF NEW HAMPSHIRE TURNPIKE SYSTEM

The current Turnpike System is an open barrier toll system comprised of 48 interchanges, 10 toll plazas, 87 toll lanes, and approximately 89 linear miles. The system is composed of three independent turnpike systems; the Central (F.E. Everett) Turnpike, the Blue Star Turnpike and the Spaulding Turnpike, as shown in Figure 1.

Figure 1: New Hampshire Turnpike System



The Central Turnpike, also known as the F.E. Everett Turnpike (or "FEET") is the longest at 39.5 miles, extending from the Massachusetts state line in Nashua, New Hampshire to Exit 14 in Concord, New Hampshire. It comprises, in part, a portion of U.S. Interstate Highways 93 and 293 and connects the three largest cities in New Hampshire (Nashua, Manchester and Concord). The Central Turnpike also connects with major east-west highways such as NH 101, US 4 as well as Interstate 89. Currently there are two mainline toll plazas at Hooksett and Bedford, and 4 ramp plazas at Hooksett (I-93 Exit 11), Bedford Road (FEET Exit 12), Continental Boulevard (FEET Exit 11), and Merrimack Industrial Drive (FEET Exit 10).

The Blue Star Turnpike extends from the Massachusetts state line in Seabrook, New Hampshire to the Maine state line in Portsmouth, New Hampshire. It is 16.2 miles in length and constitutes a portion of Interstate 95. The Blue Star Turnpike connects with major highways that include NH 101 and US 4. There is a mainline toll plaza and an entry/exit ("side") toll plaza on the Blue Star Turnpike, both located in the Town of Hampton.

The Spaulding Turnpike is 33.2 miles long, extending from Portsmouth, New Hampshire, to Exit 18 in Milton, New Hampshire. It is the major north-south road in the eastern portion of the state, and connects the Blue Star Turnpike to NH 16, which is the major roadway to northern New Hampshire along the eastern border of New Hampshire. It also connects the three major cities in eastern New Hampshire (Portsmouth, Dover and Rochester) and connects to several major highways that include US 4, NH 16, NH 125 and Interstate 95. There are two mainline toll locations at Dover and Rochester. The Spaulding Turnpike and Blue Star Turnpike are also collectively known as the Eastern Turnpike.

The major events that occurred in the development of the Turnpike System are summarized in Table 1, as follows:

Table 1: Major Events on the NH Turnpike System

Date	Activity
1950 (Jun. 24)	First toll plaza opens - Hampton (toll was 20¢ for a passenger car).
1955	Completion of the Nashua to Manchester segment of the Central Turnpike.
1955 (Aug. 21)	Merrimack Toll Plaza opens. Toll was 25¢ for a passenger car.
1955	Tokens authorized providing a 1/3 discount. Two types of tokens were authorized. An "A" token had a trip fare value of 10¢ and a "B" token had a trip fare value of 15¢. Tokens could be used by any class of vehicle.
1956	The Portsmouth to Dover segment of the Spaulding Turnpike was completed.
1956 (Oct. 3)	Dover Toll Plaza opens. Toll was 10¢ for a passenger car.
1957	Increase in toll rate at Dover Toll to 15¢ for a passenger car.
1957	The Manchester to Concord segment of the Central Turnpike was completed.
1957	The Dover to Rochester segment of the Spaulding Turnpike was completed.
1957 (Aug. 29)	The Rochester Toll Plaza opens. Toll was 15¢ for a passenger car.
1957 (Aug. 30)	The Hooksett Toll Plaza opens. Toll was 25¢ for a passenger car.
1961	The rate decreased at Dover Toll to 10¢ for a passenger car.

Table 1: Major Events on the NH Turnpike System

Date	Activity
1961 (Jun. 21)	Toll rate increased at Hampton Toll to 25¢ for a passenger car.
1972	Initiated charge program for commercial accounts. A 1/3 discount was provided in the program.
1975 (Jul. 1)	Toll rate increase at Hampton Toll to 40¢ for a passenger car.
1977	Eastern Turnpike (I-95) widened from 4 to 8 lanes.
1977 (Feb. 1)	Reconstruction and relocation of Hampton Toll completed with new ramp and mainline plazas opened to traffic.
1977 (Apr. 1)	Toll rates at Hooksett and Merrimack Tolls increased to 40¢ for a passenger car. Discontinued the sale of "A" tokens. Tokens restricted to two axle or four tire vehicles. Eliminated the 1/3 discount for commercial charge accounts.
1979 (Aug. 23)	Tolls eliminated at the Hampton Ramp Toll Plaza.
1979	Central Turnpike widened from 4 to 6 lanes from the junction of I-93/I-293 in Hooksett to I-93/I-89 in Bow.
1979 (Dec. 3)	Reconstruction completed on new Hooksett Toll Plaza ramp and mainline barrier.
1979 (Dec. 3)	Toll rates increased as follows. Merrimack, Hooksett & Hampton (main) 50¢ for a passenger car. Dover 15¢ for a passenger car. Rochester 20¢ for a passenger car.
1979 (Dec. 3)	Discount for commuter tokens increased to 50%.
1981 (Jul. 1)	Toll reinstated on the Hampton Ramp Toll Plaza.
1981 (Aug. 20)	Spaulding Turnpike Extension opened from Rochester to Milton.
1986 (Dec. 1)	Automated truck charge system initiated.
1987 (Apr. 15)	Toll rates increased at Dover & Rochester Toll to 25¢ for a passenger car.
1987 (Jul. 1)	Toll increased at Hampton Toll (mainline to 75¢ and ramp to 40¢ for a passenger car).
1987 (Oct. 28)	Toll reduced at Hampton Toll (mainline to 50¢ and ramp to 25¢ for a passenger car).
1987	Exit 8 Interchange, Nashua, New Hampshire. The first project to be completed in the Ten Year Plan to expand and improve the New Hampshire Turnpike System (Chapter 203, Laws of 1986) was the Exit 8 Interchange in Nashua, New Hampshire that opened to traffic in June 1987.
1988 (Jan. 1)	Toll increased at Hampton Main Toll to 75¢ for passenger cars, Hampton Ramp remains at 25¢.
1989 (Jan. 4)	Merrimack Toll Plaza (Mainline and Ramps) closed. On this date, the Merrimack Toll Plaza discontinued collection of tolls and was dismantled.
1989 (Jan. 4)	Bedford Toll Plaza opened to traffic.
1989 (Jan. 4)	Exit 11 Ramp (Temporary) Toll Plaza opened to traffic. On this date, the Exit 11 Toll Plaza opened to traffic replacing the dismantled Merrimack Toll (Ramps).

Table 1: Major Events on the NH Turnpike System

Date	Activity
1989 (Oct. 16)	General toll rate increase for entire Turnpike System. Increase of 25 cents at each plaza for passenger cars. Substantial increase for commercial vehicles (to recognize weight on turnpike infrastructure). Discount for commercial charge program 5% to 30% graduated. Discount for commuters decreased from 50% to 40%.
1990 (Jul. 11)	Commuter discount (Tokens) revised from 40% to 50%. Change in commercial charge discount (5-30%) applies to total transactions monthly.
1990 (Oct. 2)	Merrimack Industrial Interchange Toll Plaza opened to traffic.
1990 (Nov. 29)	Bedford Road Interchange Toll Plaza opened to traffic.
1991 (Feb. 4)	"Honor System" Toll Collection Began at Exit 11 Toll Plaza. Initiated unattended toll collection at Exit 11 Toll Plaza between the hours of 9 PM and 5 AM daily.
1991 (May 15)	Hampton Main Toll Plaza expansion completed.
1991 (Aug. 30)	Cheshire Toll Bridge began operation by the Bureau of Turnpikes.
1991 (Oct. 1)	Bedford Toll Plaza Toll Collection System Conversion.
1991 (Nov. 18)	Exit 11 Interchange Toll Plaza opens to traffic.
1991 (Dec. 1)	Hampton Main Toll Plaza Toll Collection System Conversion.
1992 (Feb.)	Hampton Ramp Toll Plaza Toll Collection System Conversion.
1992 (Apr. 1)	Dover Toll Plaza Toll Collection System Conversion.
1992 (Jun. 1)	Rochester Toll Plaza Toll Collection System Conversion.
1992 (Aug. 3)	Cheshire Bridge closed for rehabilitation.
1992 (Nov. 14)	Exit 11 Toll Plaza Toll Collection System Conversion.
1993 (Aug. 9)	"Honor System" Toll Collection begins at Cheshire Toll Bridge.
1993 (Jul. 30)	Exit 11 Interchange (Merrimack) completed as part of the Capital Improvement Program.
1993 (Nov. 18)	Gosling Road Interchange on the Spaulding Turnpike opened.
1993 (Dec. 20)	"Honor System" Toll Collection begins at Exit 10 and Exit 12.
1994 (Jun.)	Two seasonal toll lanes added to Hooksett Main Toll Plaza.
1994 (Jun.)	Hampton Main Toll Plaza changed to all-attended operation.
1994 (Nov. 1)	Increased discount in Commercial Charge Program to 50%.
1995 (Jul. 30)	Changes at Hampton Main Toll Plaza adding one reversible lane (replacing standard ACM lane) allowing 10 operational lanes in one direction of travel for the first time.
1995 (Aug. 4)	Initiated Tandem Toll Collection at Hampton Main Toll Plaza.
1995 (Aug. 14)	"Honor System" Toll Collection began at Hooksett Ramp Toll Plaza.
1995 (Aug. 14)	"Bi-directional" Toll Collection began at Rochester Toll Plaza.

Table 1: Major Events on the NH Turnpike System

Date	Activity
1995 (Aug. 14)	"HOV" (High Occupancy Vehicle) Test began at Bedford Toll.
1995 (Oct.)	Reactivated Automatic Toll Lanes at Hampton Main Toll.
1995 (Nov. 1)	Truck charge card discount set at a flat 30% rate.
1996 (May)	Hampton Main Toll Plaza converted to entirely attended operation with all automatic lane equipment taken out of service.
1997 (Jun.)	Expanded Hampton Ramp Toll Plaza from 5 to 7 toll lanes.
1997 (Nov.)	Ended a two-year HOV Test at Bedford Toll Plaza.
2000 (Jul. 19)	Expansion of Dover Toll Plaza complete.
2001 (Jul. 1)	Toll collection ceased at Cheshire Toll Bridge - per legislation.
2002 (Apr. 5)	Rochester Toll Plaza staffing changed back to conventional staffing.
2002	Completed the 5th lane project at the Hampton Toll Plaza on I-95.
2003 (Jul. 23)	Opened an additional lane for the first time at the Hooksett Ramp toll facility.
2003 (Aug. 21)	One-way toll collection test initiated at the Hampton Toll Plaza.
2003 (Nov. 1)	Two-way tolling returns to Hampton Main Toll Plaza for the winter months.
2004 (Jan. 9)	Hampton Ramp Toll Plaza converted to all attended capability.
2004 (Jan. 29)	Two new toll lanes, one north and one south, at Bedford Toll Plaza, were opened to revenue collection.
2004 (Jun. 30)	One-way toll collection reinstated at the Hampton Toll Plaza.
2004 (Oct. 21)	Two way tolling returns to Hampton Main Toll Plaza.
2005 (Mar.)	Hampton Ramp converted to an all attended plaza just like Hampton Main.
2005 (Apr. 12)	Hooksett Ramp converted back to a 24/7/365 plaza.
2005 (Jul. 11)	The first NH toll facilities to be converted to ***E-ZPass*** – Hooksett Main, Hooksett Ramp and Bedford Toll. Cars with NH ***E-ZPass*** tags receive a 30% discount from cash (compared to a 50% discount for tokens) and trucks with NH ***E-ZPass*** receive a 10% discount from cash (compared to a 30% discount with the Commercial Charge program). Non-New Hampshire ***E-ZPass*** tagholders pay the cash rates.
2005 (Jul. 18)	Phase Two of ***E-ZPass*** conversion takes place: Merrimack Ramp Toll Plazas (Exits 10, 11 and 12).
2005 (Aug. 2)	Phase Three of ***E-ZPass*** deployed at Hampton Main and Hampton Ramp.
2005 (Aug. 3)	The price of transponders increased from $5.00 to $23.85 each.
2005 (Aug. 15)	Phase Four of ***E-ZPass*** deployed at Dover and Rochester Toll Plazas.
2005 (Sept. 1)	NH Turnpike Token Sales cease per HB 2 of the FY 2006/FY 2007 biennial budget.
2005 (Sept. 26)	Price of transponders increased – from $23.85 to $24.61 for flat packs

Table 1: Major Events on the NH Turnpike System

Date	Activity
2005 (Sept. 30)	Commercial Charge Program ends at 11:59:59. Magnetically encoded card system replaced by ***E-ZPass***.
2006 (Jan. 1)	NH Turnpike Tokens (B) are no longer accepted as valid toll fare payment per state law. Staffed ACM lanes from 1-1 through 1-9-2006 to ensure that motorists were aware that tokens are no longer accepted.
2007 (Oct. 22)	New toll rate implemented at Dover $0.50-$0.75; Rochester $0.50-$0.75, Hampton Ramp $0.50-$0.75; Bedford and Hooksett $0.75-$1.00; and Hampton Main $1.00-$1.50
2008 (May 1)	New terms, conditions, application and transponder price change went into effect. Price changed for interior tag from $24.61 to $20.95, and exterior tag from $31.83 to $33.04
2008 (Jun. 9 & 16)	Granite Street ramps open to traffic at Exit 5 in Manchester
2009 (Jun. 30)	HB 391 passes, authorizing the Turnpike Bureau to purchase the 1.6 miles of I-95 from the Portsmouth Traffic Circle to the Maine border, and authorizing the following projects: Hampton Open Road Tolling ("ORT"), Bedford ORT, Hooksett ORT, Portsmouth I-95 Soundwall, Seabrook NH 107 Bridge over I-95 and the Dover segment of the Newington –Dover Projects.
2009 (Jul. 1)	New toll rate implemented at Hampton Main $1.50 – $2.00
2010 (Jun. 17)	ORT lanes opened at Hampton Main plaza, allowing high-speed toll collection for ***E-ZPass*** customers
2011 (Nov. 11)	Manchester Airport Access Road opens, connecting to the Central Turnpike near the Bedford Main plaza. Vehicles using this road avoid all tolls in the Bedford/Merrimack area.
2012 (Apr. 1)	***E-ZPass*** transponder prices changed. Price dropped for interior tag from to $20.95 to $8.90, and exterior tag from $33.04 to $15.19.
2012 (Jun. 14)	Premium Outlets, with 100 stores and more than 400,000 square feet, opens adjacent to Exit 10 in Merrimack, increasing toll transactions at the Exit 10 ramp.

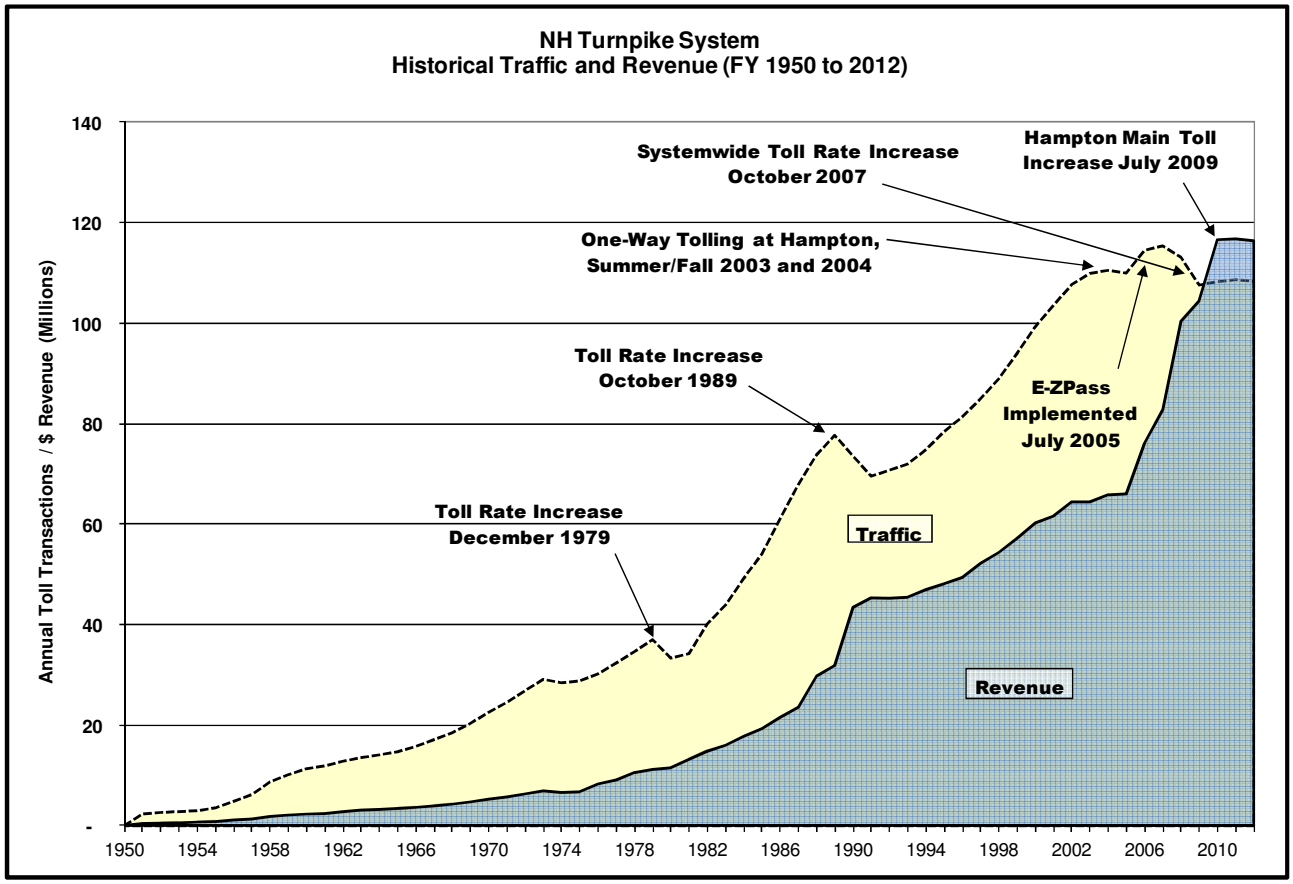
4 HISTORICAL TRAFFIC AND REVENUE

This section discusses historical traffic and toll revenue trends of the Turnpike System.

4.1 HISTORICAL TOLL TRANSACTIONS AND TOLL REVENUE TRENDS

Figure 2 illustrates toll transactions and revenue for the entire Turnpike System for FY 1950 through FY 2012. Both toll transaction and revenue graphs are generally upward sloping throughout time, indicating that toll transactions and revenues have generally increased consistently across the Turnpike System. The graph shows that there were some short periods where toll transactions decreased but later recovered, and these appear to coincide with economic recessions and toll rate increases. Revenues generally increased across the Turnpike System, although the growth was relatively flat for some short time periods. Tolls were last increased systemwide in October 2007; the toll increases prior to that were in October 1989 and December 1979. After the 1989 toll increase, both traffic and revenue increased steadily until 2005. In July 2005, ***E-ZPass*** was implemented on the Turnpike System, and the toll discount was lowered from 50 percent to 30 percent for passenger cars and from 30 percent to 10 percent for commercial vehicles. NHDOT stopped accepting tokens (which provided a 50 percent discount for passenger cars) in January 2006. The October 2007 toll increase – 25 cents for cars and 50 cents for trucks at most locations – brought about a small decline in traffic but a significant increase in toll revenue. In FY 2009, traffic continued to decrease but revenue increased over the previous year due to the October 2007 toll increase, though some of the traffic decrease could also be attributed to economic conditions, gas prices, and factors that caused traffic levels to flatten, then decrease, throughout the nation (as further discussed in Section 7.2). The Hampton Main Plaza saw a toll increase from $1.50 to $2.00 which had little effect on traffic but increased revenues at that location. In November 2011 the Manchester Airport Access Road opened, causing some losses in traffic and revenue at the Bedford Plaza primarily due to traffic to and from the south having free access into the airport; the FY 2012 losses are shown later in this report in Table 12 on page 69.

Figure 2: NH Turnpike System Historical Toll Transactions and Toll Revenue Trends, FY 1950-2012



4.2 TOLL TRANSACTION TRENDS

Table 2 summarizes the annual toll transactions between FY 1991 and FY 2012 for each of the three Turnpikes as well as the entire Turnpike System. Annual toll transactions have generally increased every year across the Turnpike System. However, Blue Star Turnpike transactions decreased in both FY 2004 and FY 2005 due to the inability to count southbound traffic data at the Hampton Toll Plaza during the one-way tolling experiments conducted by NHDOT in the summer/fall of 2003 and 2004. More recently, the diversion caused by the October 2007 toll increase contributed to both the FY 2008 and 2009 decrease in Turnpike traffic, and the Central Turnpike's new free interchange with the Manchester Airport Access Road contributed to some toll traffic loss in the Bedford area (also see Table 12 on page 69).

Table 2: NH Turnpike System Annual Toll Transactions (in millions), FY 1991-2012

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Total System
1991	32.5	23.4	13.7	69.6
1992	33.2	23.6	14.0	70.8
1993	33.5	24.0	14.5	72.0
1994	34.7	24.8	15.4	74.9
1995	35.9	26.1	16.5	78.5
1996	37.2	27.0	17.2	81.4
1997	38.9	28.1	18.0	85.0
1998	40.6	29.4	19.0	89.0
1999	42.6	31.4	20.0	94.0
2000	45.3	33.2	20.9	99.4
2001	47.6	34.0	22.0	103.6
2002	49.3	35.8	22.6	107.7
2003	50.5	36.4	23.1	110.0
2004[1]	52.2	34.6	23.8	110.6
2005[1,2]	53.9	32.2	23.9	110.0
2006[2]	54.6	36.6	23.3	114.6
2007	54.7	37.4	23.4	115.5
2008[3]	53.8	36.6	22.8	113.2
2009	51.5	34.7	21.4	107.7
2010[4]	51.9	35.3	21.1	108.3
2011	52.4	35.3	21.1	108.7
2012[5]	51.5	35.8	21.5	108.7

[1] One-way tolling at Hampton Main Toll Plaza

*[2] Conversion to new toll system and implementation of **E-ZPass***

[3] General toll Increase October 22, 2007

[4] Hampton Main toll Increase July 1, 2009

[5] FY 2012 toll transactions are preliminary estimates and are unaudited.

Notes:

Non-paying transactions (valid and violations) are included in these numbers.

Data will not necessarily add to totals because of rounding.

Between FY 1991 and FY 2003, total toll transactions across the entire Turnpike System increased annually by an average of 3.9 percent per year. After that time there was a period of flattened traffic for several years, through about 2007, followed by a 2.0 percent decrease in FY 2008. Traffic continued to decline another 4.9 percent in FY 2009 both as a result of the mid-FY 2008 toll increase and the economic downturn. This was followed by low growth rates of 0.6 percent in FY 2010 and 0.4 percent in FY 2011. There was no overall growth from FY 2011 to FY 2012, mainly due to usage of the free Manchester Airport Access Road interchange on the Central Turnpike. Toll transactions on the individual Turnpikes increased at an average annual rate of 2.2 percent on the Central Turnpike and Spaulding Turnpike, and 2.0 percent on the Blue

Star Turnpike during the FY 1991 to FY 2012 time period; however, from FY 1991 to FY 2006, these average annual growth rates had been 3.5, 3.0, and 3.6 percent, respectively.

Historical toll transaction trends between FY 1950 and FY 2012 are illustrated in Figure 3 with volumes indexed to FY 1991 values. From this graphic, we can observe that the three general toll rate increases occurred close to periods of economic recessions, and in all cases, toll traffic transactions decreased. Transaction growth also slowed down during the other economic recession periods.

Figure 3: NH Turnpike System Historical Toll Transactions Trends, FY 1950 to 2012

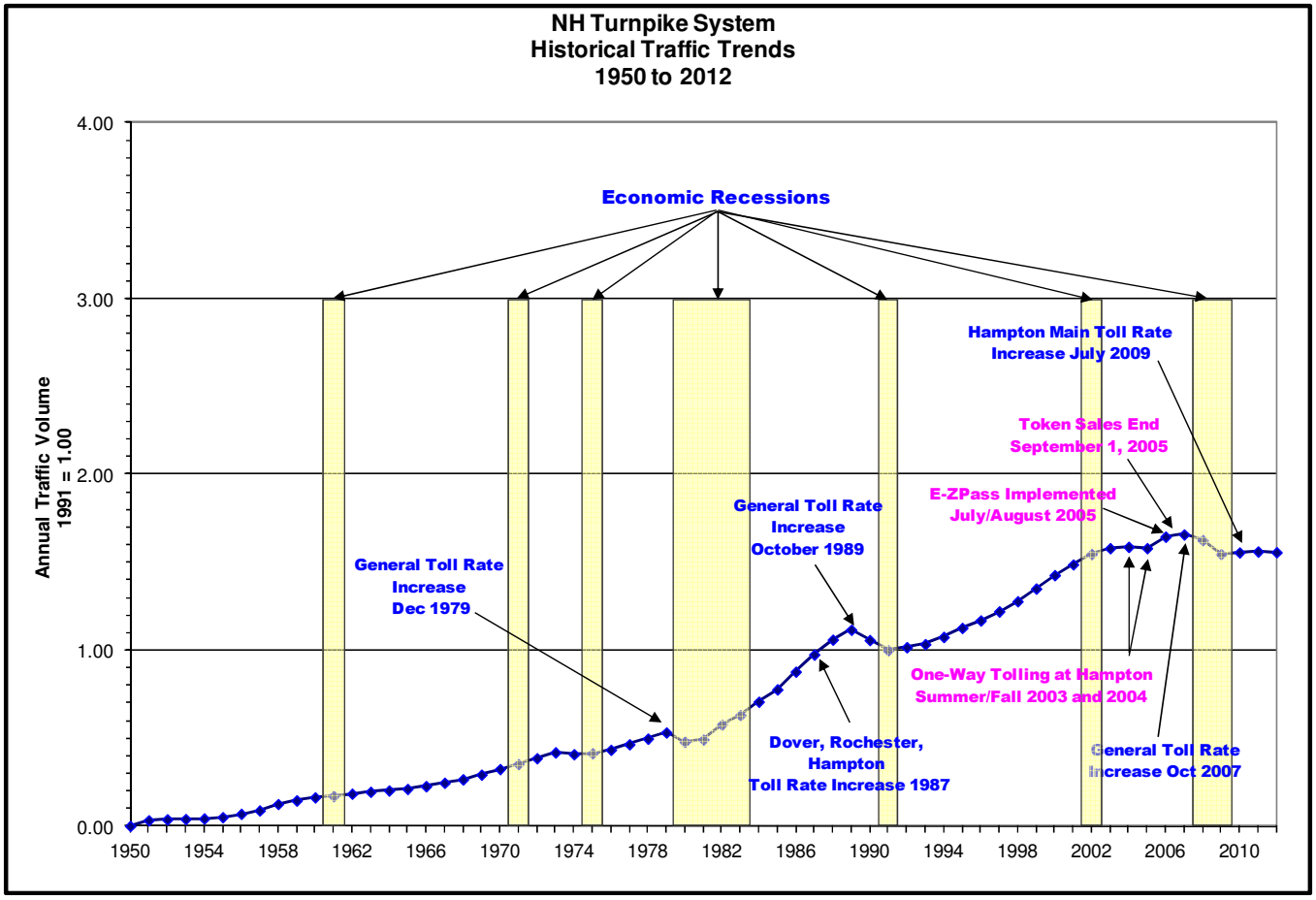
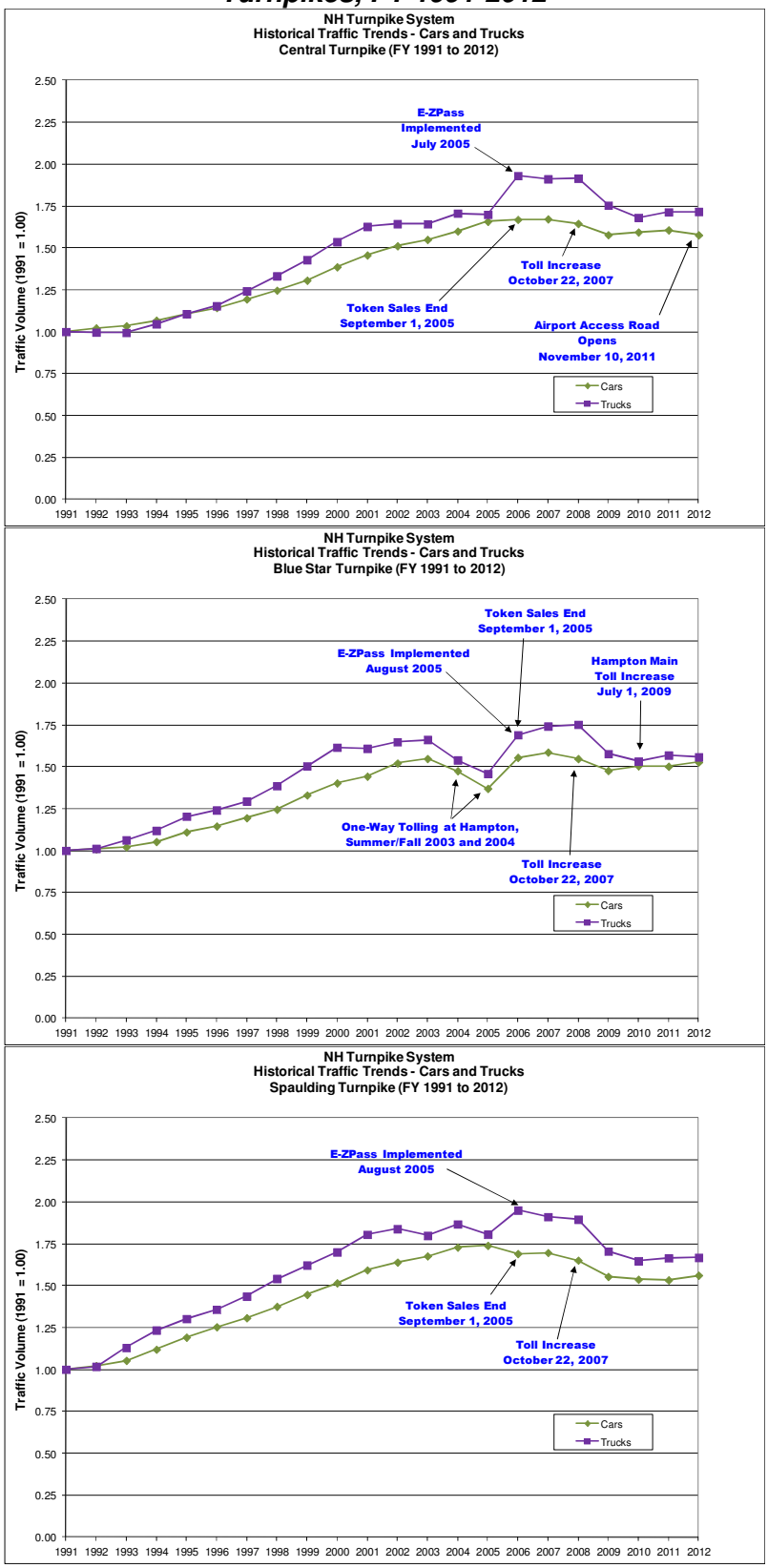


Figure 4 shows the historical toll transaction trends for cars and trucks on each of the three Turnpikes for the FY 1991-2012 period. The three turnpikes exhibited similar patterns in car traffic, growing steadily from FY 1991 through the early 2000s, followed by flat growth in FY 2006 and 2007 and declines in FY 2009 and 2010. Annual traffic between FY 2010 and FY 2012 remained virtually unchanged. The Central and Spaulding Turnpikes, both serving more local than long-distance traffic, had flat to declining truck growth in 2006 through 2008, while the Blue Star Turnpike – more of a long-haul route –had increasing truck traffic from FY 2006 through 2008. All three facilities had a sharp decline in trucks in FY 2009 due to the downturn in the economy and FY 2008 toll increases. Similar to the car traffic, the truck traffic has changed very little in the past three to four years.

Figure 4: Historical Toll Transaction Trends for the Central, Blue Star and Spaulding Turnpikes, FY 1991-2012



4.3 TOLL REVENUE TRENDS

Annual toll revenues for each of the three Turnpikes as well as the entire system are summarized in Table 3 for the period FY 1991 to FY 2012.

Table 3: NHDOT Annual Toll Revenues, FY 1991-2012 (in millions)

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Total System
1991	$18.9	$20.8	$5.5	$45.3
1992	$18.9	$20.7	$5.5	$45.2
1993	$18.8	$20.8	$5.7	$45.4
1994	$19.5	$21.4	$6.0	$46.9
1995	$19.8	$22.2	$6.2	$48.1
1996	$20.4	$22.5	$6.4	$49.3
1997	$21.6	$23.8	$6.7	$52.2
1998	$22.5	$24.8	$7.1	$54.3
1999	$23.6	$26.1	$7.4	$57.1
2000	$25.0	$27.5	$7.7	$60.2
2001	$26.0	$27.5	$8.0	$61.5
2002	$27.5	$28.6	$8.2	$64.4
2003	$27.3	$28.7	$8.4	$64.4
2004[1]	$28.1	$29.1	$8.6	$65.8
2005[1,2]	$28.7	$28.4	$8.8	$65.9
2006[2]	$33.6	$32.3	$10.1	$76.0
2007	$36.7	$34.8	$11.1	$82.6
2008[3]	$42.9	$43.4	$14.1	$100.3
2009	$43.5	$46.3	$14.7	$104.4
2010[4]	$44.0	$58.1	$14.5	$116.6
2011	$44.2	$58.2	$14.4	$116.7
2012[5,6]	$43.3	$58.8	$14.6	$116.6

[1] One-way tolling at Hampton Main Toll Plaza

*[2] Conversion to new toll system and implementation of **E-ZPass***

[3] General toll Increase October 22, 2007

[4] Hampton Main toll Increase July 1, 2009

[5] The free Manchester Airport Access Road interchange on the Central Turnpike opened November 11, 2011

[6] FY 2012 toll revenues are preliminary estimates and are unaudited.

Notes:

*FY 1991-2006 reported figures are derived from the Turnpike System's internal, monthly traffic and revenue report, which is prepared from information from the Turnpike System's **E-ZPass** and toll collection system vendors and does not include other income such as property sales. Fiscal Years 2006-2011 figures are derived from the Turnpike System's internal accounting system and do not include property sales or other income. FY 2012 figures are unaudited and are derived from the Turnpike System's internal, monthly traffic and revenue report. All revenue figures exclude charge account interest and miscellaneous income. Source: NHDOT.*

Data will not necessarily add to totals because of rounding.

The table shows that annual toll revenues have generally increased each year across the Turnpike System throughout the period shown. The first large increase in toll revenues occurred between FY 2005 and FY 2006 due to the implementation of ***E-ZPass*** on the Turnpike System and discontinuation of token usage, which coincided with a decrease in the toll discount rate. In FY 2008, there was another significant increase in revenues - $17.7 million or 21.4 percent over FY 2007– due to the October 2007 toll increase, and FY 2009 also saw a revenue increase of 4.1 percent due to this toll increase. The July 1, 2009 toll increase at the Hampton Main Plaza increased systemwide revenue by 11.6 percent in FY 2010 compared to the previous year. There has been little change in total system revenue between FY 2010 and FY 2012. While some revenue loss was experienced on the Central Turnpike in FY 2012 due to the opening of the free Manchester Airport Access Road interchange on November 11, 2011, most of this loss was absorbed by growth on the rest of the Turnpike System.

Between FY 1991 and FY 2012, toll revenues increased annually by an average of 4.6 percent across the entire Turnpike System. The individual turnpikes experienced annual revenue growth rates of 4.0 percent on the Central Turnpike, 4.7 percent on the Spaulding Turnpike, and 5.1 percent on the Blue Star Turnpike.

Figure 5 shows historical annual toll revenues between FY 1950 and FY 2012. This graphic shows that total systemwide toll revenues generally showed little to no growth during all periods of economic recession. The exceptions were the economic recession in the early 1980s when revenue actually increased, and the recent recession, due to the general toll increase in October 2007 and the Hampton Main toll increase in July 2009. Annual revenues were flat in FY 2002 through FY 2005, partially a result of the one-way tolling experiment conducted at the Hampton Main toll plaza during the summer/fall of 2003 and 2004. Annual revenues also remained flat from FY 2010 through FY 2012.

Figure 5: NH Turnpike System Historical Toll Revenues, FY 1950 to 2012

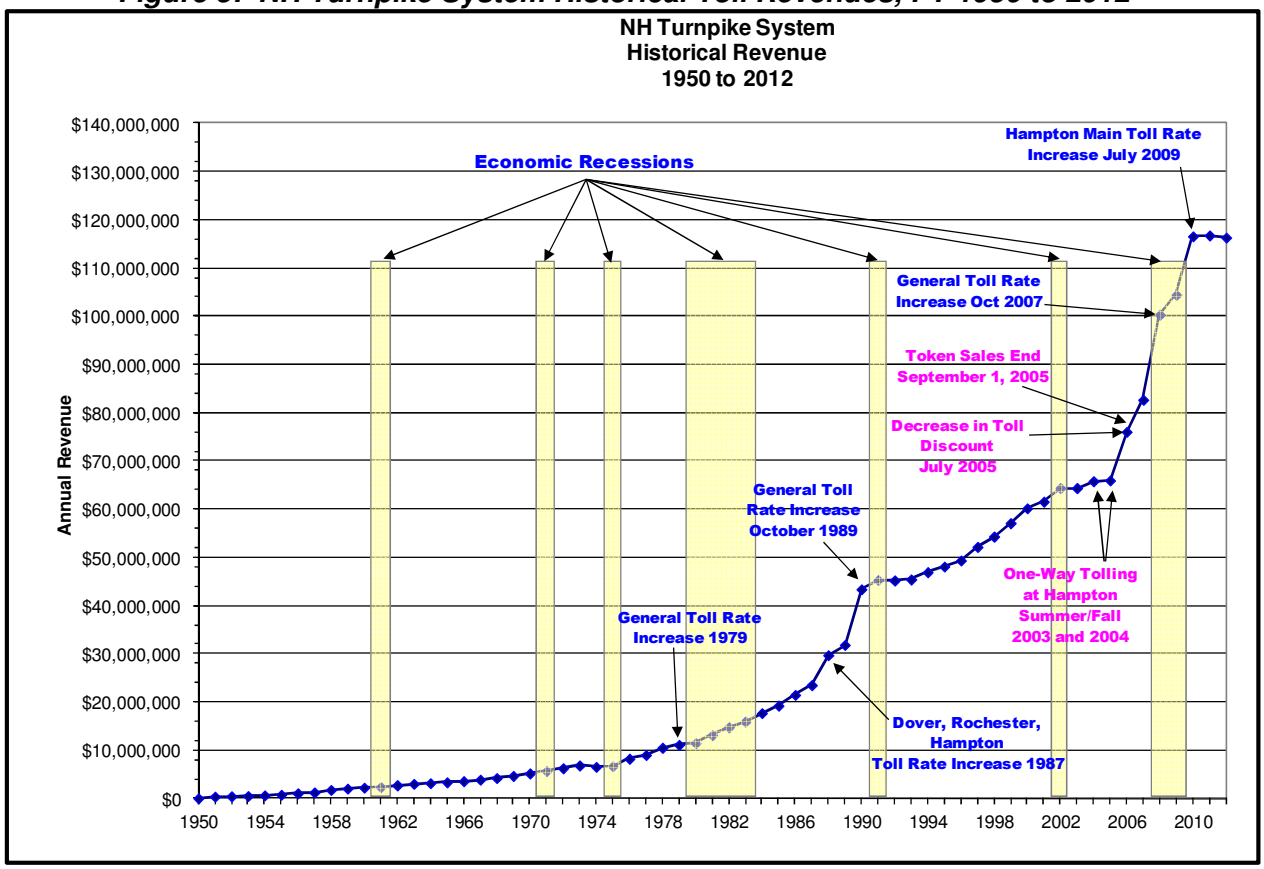
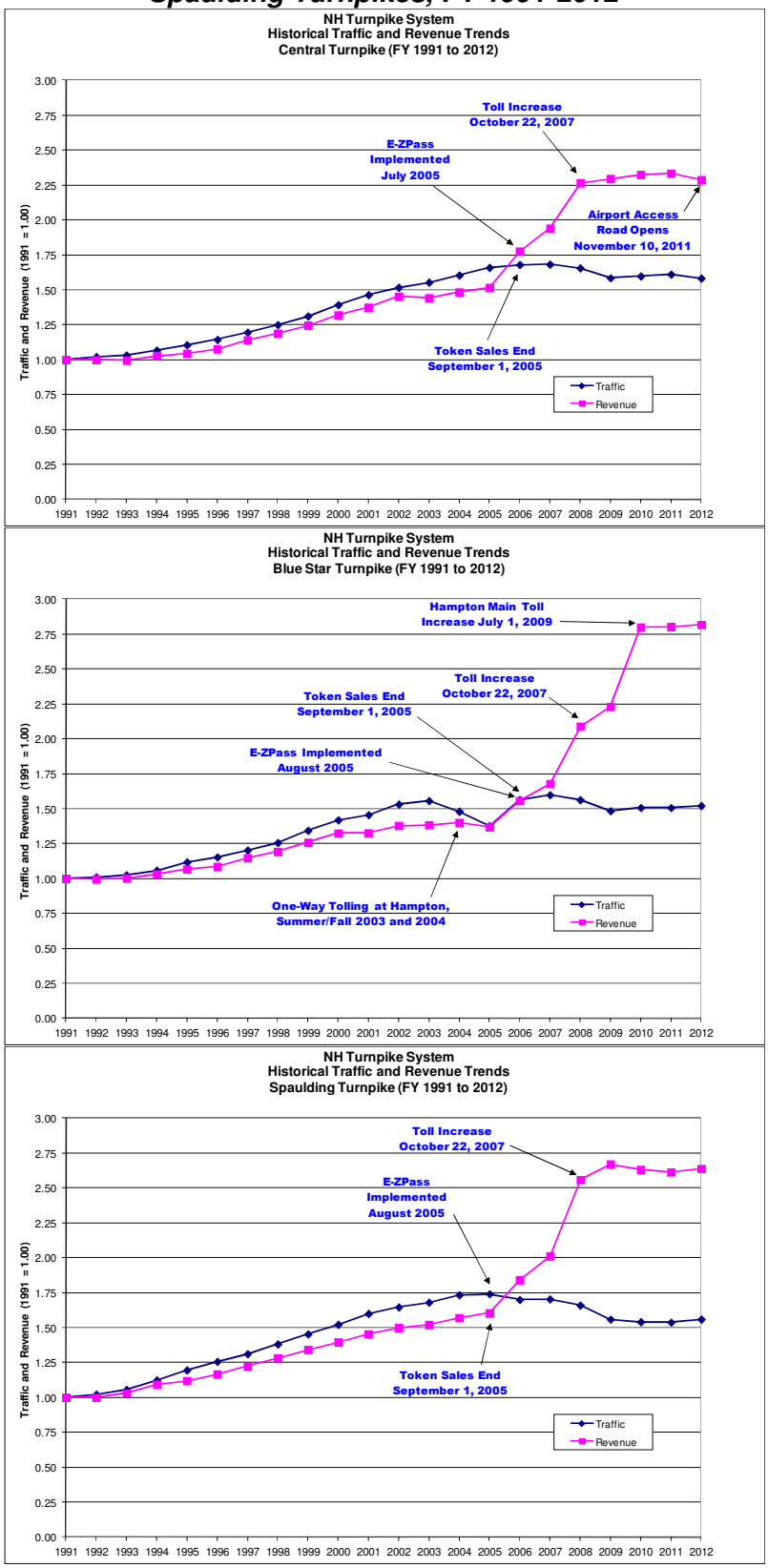


Figure 6 shows historical toll transaction and revenue trends for each of the three Turnpikes for the FY 1991 to FY 2012 period. For the first two-thirds of the time period shown, total toll revenue generally increased consistently on each turnpike, with a small decrease on the Blue Star Turnpike in FY 2005. Also, toll revenues on the Blue Star Turnpike experienced very little growth between FY 2002 and FY 2005, due in part to the one-way tolling experiment. Recently, all three Turnpikes experienced a flattening (FY 2005 or 2006 through 2007) and then a decline (FY 2008-2009) in traffic after the October 2007 toll increase. Traffic since FY 2009 has remained flat on all three turnpikes. Toll revenues grew at a greater rate than usual in the past half decade due to ***E-ZPass*** implementation and the end of token sales in FY 2006 (increasing the tolls for discounted trips), and the October 2007 toll increase. The Blue Star Turnpike saw another sharp increase in revenue when tolls at Hampton Main were increased again in July 2009.

Figure 6: Historical Toll Transaction and Revenue Trends for the Central, Blue Star and Spaulding Turnpikes, FY 1991-2012



4.4 COMPARISON OF ACTUAL TOLL REVENUES TO RECENT PROJECTIONS

Jacobs previously projected traffic and revenue on the Turnpike System for the November 2009 bond issuance. Table 4 compares Jacobs' projections against the actual toll revenues collected by the Turnpike System for the fiscal years 2010 through 2012. Note that both the actual and projected revenues below do not include adjustments for violation revenues, and are therefore slightly less than the revenue numbers shown previously in Table 3.

Table 4: Actual Toll Revenues vs. 2009 Projections, FY 2010-2012 (in millions)

Fiscal Year	Projected Revenue	Actual Revenue
2010	$111.7	$115.8
2011	$112.2	$116.3
2012	$113.4	$116.1

Note: Violation revenues not included in both projected and actual revenues

Actual toll revenues for FY 2010 and 2011 were 3.7 percent over the forecast. Jacobs had estimated a loss in traffic at the Hampton Main toll plaza due to the toll increase there at the beginning of FY 2010; in fact, there was no traffic loss. In 2012, the actual traffic was 2.4 percent over Jacobs' forecast.

Jacobs did not include the effects of the free Manchester Airport Access Road Interchange in the above forecast for FY 2012; at that point it had been anticipated that the interchange would open at the beginning of FY 2013. In these 2009 projections, Jacobs had estimated a toll revenue loss of $3.5M in FY 2013 due to the Airport Access Road. In actuality, the loss was about $1.6M for the partial year (233 days) the interchange was open in FY 2012. If the interchange were open for all of FY 2012, following the trend line of recent traffic losses at the Bedford/Merrimack toll plazas the revenue loss would have been about $2.7M. Jacobs had overestimated the revenue loss by some 30 percent. Since the Airport Access Road has now been open for more than eight months, Jacobs has more ability to project future revenue losses associated with this new interchange, as discussed in Section 9.2.3.

5 REVIEW OF PROPOSED CAPITAL IMPROVEMENT PROGRAM

This section presents a review of the Turnpike System's historical and proposed capital improvement program for the 20-year period FY 2003-2022 as shown in Table 5 below.

Table 5: Historical and Proposed NHDOT Capital Expenditures, FY 2003-2022 (in millions)

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Other Projects[1]	Total Turnpike	Unfunded Projects[2]
2003	$5.5	$1.2	$2.5	$1.0	**$10.2**	
2004	$12.0	$0.4	$4.0	$3.0	**$19.4**	
2005	$1.2		$0.2	$19.0	**$20.5**	
2006	$2.5		$1.9	$8.8	**$13.2**	
2007	$2.0			$6.5	**$8.5**	
2008	$0.4	$0.2	$7.4	$3.0	**$11.0**	
2009	$6.5	$0.2	$18.5	$0.5	**$25.8**	
2010	$9.8	$11.8	$42.0	$3.1	**$66.6**	
2011	$7.2	$4.3	$40.0	$1.3	**$52.9**	$0.02
2012	$12.9	$0.4	$33.4	$1.0	**$47.7**	$0.02
Total ('03-'12)	**$60.0**	**$18.5**	**$149.9**	**$47.3**	**$275.7**	**$0.0**
2013	$25.0	$1.8	$47.3	$11.7	**$85.8**	$0.15
2014	$20.9	$3.3	$23.2	$1.5	**$48.8**	$3.0
2015	$18.7	$2.3	$33.6	$0.5	**$55.1**	$19.0
2016	$14.8	$3.3	$21.8	$0.5	**$40.4**	$32.5
2017		$3.3	$0.6	$0.5	**$4.4**	$25.1
2018		$1.6		$0.5	**$2.1**	$12.0
2019					**$0.0**	
2020					**$0.0**	
2021					**$0.0**	
2022					**$0.0**	
Total ('13-'22)	**$79.3**	**$15.6**	**$126.5**	**$15.2**	**$236.6**	**$91.7**

[1] *Miscellaneous Turnpike System Projects funded with Federal Aid and matched with Turnpike funds, and/or Systemwide projects.*

[2] *Bedford ORT Project and a portion of the Newington-Dover Spaulding Turnpike Expansion Project.*

Notes:

-Central Turnpike Projects include: Souhegan River Bridge, Bow-Concord I-93 Bridge Redecking, Manchester Reconstruction Exit 4 Millyard Bridges, Bedford US 3 Bridge and Hooksett ORT

-Blue Star Turnpike Projects include: I-95 Taylor River, Hampton ORT, Seabrook I-95 Bridge Widening, and Portsmouth I-95 Soundwall

-Spaulding Turnpike Projects include: Rochester Roadway Expansion Exits 11-16, Newington-Dover Little Bay Bridges and Roadway Expansion Exits 3-6

-Data will not necessarily add to totals because of rounding.

Over the ten-year period FY 2003-2012, Turnpike System-funded capital expenditures totaled $275.7 million. The largest share of this - $149.9 million - was spent on Spaulding Turnpike projects. Funding sources for these projects include toll revenues, other Turnpike System revenues and Turnpike System bond proceeds. Turnpike System-funded capital expenditures are programmed at a total of $236.6 million over the FY 2013-2022 period, 0.86 times the

expenditures of the previous ten-year capital program. Not included in these numbers are a total of $41.4 million in federal funds ($31.4 million in federal earmark funds) designated for the Newington-Dover Little Bay Bridges project.

After the completion of the turnpike expansion in Nashua in the late 1990s, the ten-year capital improvement program had few major projects with the exception of the implementation of ***E-ZPass*** and the construction of the Granite Street interchange in Manchester. The toll rate increase in 2007, the first since 1989, has allowed the capital improvement program to move forward with the expansion of the Spaulding Turnpike in Rochester along with several other major turnpike projects. These are improvement projects that are considered to be priorities to address nineteen (19) red listed bridges and improve safety and congestion on the Turnpike System.

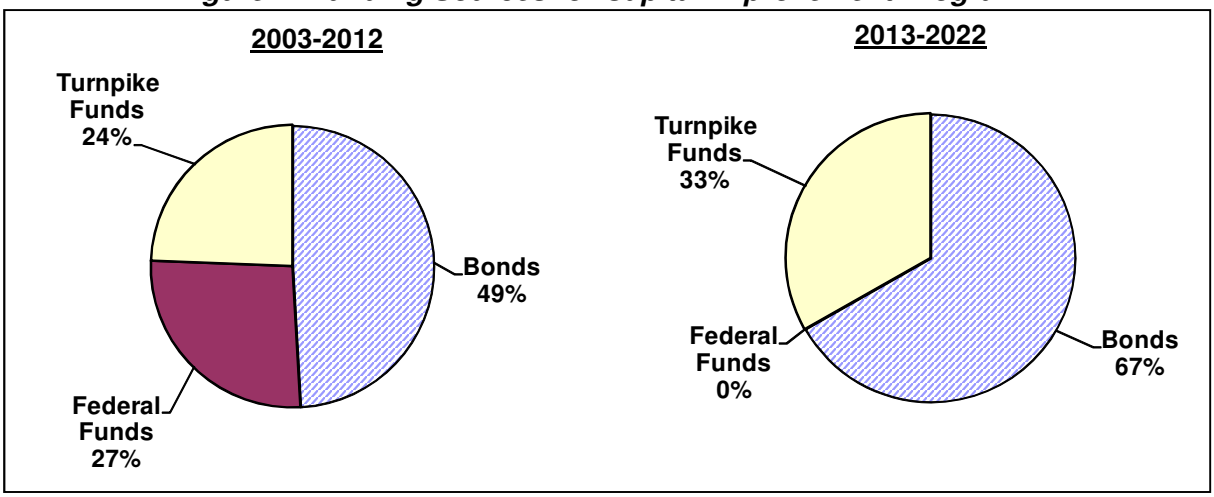
The majority of the Turnpike System capital expenditures over the next ten years – approximately 53 percent - will be for projects on the Spaulding Turnpike, including widening and improvements from Exits 3 to 6 and Exits 11 to 16, as well as Newington-Dover Little Bay Bridges (this is in addition to the federal funding).

Upcoming capital expenditures on the Central Turnpike include the Bow-Concord I-93 Bridge Replacement at Exit 12, Manchester Reconstruction of Exit 4 Millyard Bridges, Bedford US 3 Bridge Replacement and Hooksett ORT. Capital expenditures on the Blue Star Turnpike include the I-95 Taylor River Bridge project, Seabrook I-95 Bridge Widening, and the Portsmouth I-95 Soundwall.

A portion of the Spaulding Turnpike Newington-Dover Expansion Project as well as the Central Turnpike's Bedford ORT project are legislatively authorized but currently unfunded by Turnpike System revenues.

Figure 7 shows how the capital plan was funded in the past ten years versus how it will be funded over the next ten years. The shares of funding by Turnpike System bonds and Turnpike System funds are both expected to grow, while there will be no projects funded by federal funds in future years.

Figure 7: Funding Sources for Capital Improvement Program



6 REVIEW OF HISTORICAL AND PROJECTED OPERATION, MAINTENANCE, RENEWAL AND REPLACEMENT, AND DEBT SERVICE EXPENDITURES

This section presents a review of historical and projected Turnpike System operational expenditures that consist of administrative costs, toll operations costs, maintenance costs, state police enforcement costs, welcome centers and rest areas, renewal and replacement (R&R) costs, toll processing costs, and payment for the new section of the Blue Star Turnpike (I-95). It also includes a review of the Turnpike System's historical and projected debt service expenditures.

Administrative costs include administrative salaries, benefits, expenses, equipment, indirect costs, cleaning, utilities, travel costs and audit expenses.

Toll operations costs include toll operations salaries, benefits, expenses, utilities, toll system warranty, equipment and travel costs.

Maintenance costs include maintenance salaries, benefits, expenses, rents and lease costs, utilities, equipment and travel costs.

Renewal and replacement costs are construction projects to preserve, maintain and upgrade the existing infrastructure i.e. paving, signing, guardrail, bridge rehabilitation, building and toll plaza repairs, bridge painting etc.

Toll processing costs include banking and credit card fees, ***E-ZPass***-related costs (customer service center expenses, walk-in center expenses, Interagency Group (IAG) organizational dues, violation processing expenses, and vehicle registration look-up fees), toll system maintenance expenses through a vendor, and transponder purchases and replacement.

6.1 TOLL PROCESSING COSTS

Table 6 summarizes historical and projected NHDOT toll processing expenses for the period FY 2003 through 2022.

Table 6: Toll Processing Costs, FY 2003-2022 (in millions)

Fiscal Year	Banking/ Credit Card Fees	E-ZPass CSC Costs	Toll Maintenance Costs	E-Zpass Transponder Expenses	Total Toll Processing Costs
2003	$0.8		$0.5		$1.3
2004	$0.8		$0.5		$1.3
2005	$0.9	$0.7	$0.5	$1.6	$3.7
2006	$1.5	$3.7	$0.1	$5.5	$10.8
2007	$1.4	$3.8	$1.2	$1.0	$7.4
2008	$1.7	$4.3	$1.0	$0.8	$7.8
2009	$1.8	$5.1	$1.3	$0.7	$8.9
2010	$2.1	$5.3	$1.6	$0.8	$9.8
2011	$2.2	$5.8	$1.8	$0.8	$10.6
2012[1]	$2.1	$5.7	$1.5	$0.5	$9.8
Total ('03-'12)	$15.3	$34.4	$10.0	$11.7	$71.4
2013	$2.3	$6.9[2]	$1.8	$3.3[2]	$14.3
2014	$2.4	$5.1	$1.7	$0.8	$10.0
2015	$2.5	$5.3	$2.1	$0.6	$10.5
2016	$2.6	$5.5	$2.1	$0.6	$10.8
2017	$2.6	$5.6	$2.2	$0.6	$11.0
2018	$2.7	$5.7	$2.2	$0.6	$11.3
2019	$2.8	$5.8	$2.3	$0.6	$11.5
2020	$2.8	$6.0	$2.3	$0.6	$11.8
2021	$2.9	$6.2	$2.4	$0.6	$12.1
2022	$3.0	$6.4	$2.5	$0.6	$12.4
Total ('13-'22)	$26.6	$58.6	$21.7	$8.9	$115.7

[1] Amounts are preliminary and unaudited

[2] Includes tag swap costs which may be deferred to FY 2014 and FY 2015

Note: Data will not necessarily add to totals because of rounding

Turnpike System toll processing costs increased relatively slowly from $1.3 million in FY 2003 to $3.7 million in FY 2005 primarily due to $1.6 million in ***E-ZPass*** transponder purchases. In FY 2006, toll processing costs further increased to $10.8 million mainly due to $5.5 million in ***E-ZPass*** transponder purchases and $3.7 million in ***E-ZPass*** customer service center costs. Transponder purchase costs dropped to $0.5-$0.8 million in the FY 2009-2012 period as the market became more saturated.

NHDOT estimates that approximately $115.7 million will be spent on toll processing between FY 2013 and FY 2022, with ***E-ZPass*** customer service center costs accounting for $58.6 million or 51 percent. Approximately $8.9 million in transponder purchases is estimated over the ten-year period FY 2013-2022; this includes transponder replacement costs. NHDOT recovers the

transponder costs from selling the transponder to the customer at cost: private cars are charged $8.90 for an interior or $15.19 for an exterior ***E-ZPass*** tag. A "tag swap" to replace transponders that will have reached the end of their useful life is budgeted to occur in FY 2013 but may be deferred to fiscal years 2014 and 2015 as evidence is showing that the transponders purchased in 2005 are lasting 8.5 to 9 years.

6.2 OPERATING EXPENDITURES

Table 7 summarizes historical and projected NHDOT expenses for the 20-year period FY 2003 through FY 2022.

Table 7: Historical and Projected NHDOT Operating Expenditures, FY 2003-2022 (in millions)

Fiscal Year	Admin.	Toll Ops.	Maint-enance	State Police Enforce-ment	Toll Process-ing	Welcome Centers & Rest Areas[1]	Turnpike Funding of DOT - HWY	O&M Lapse[2]	Total O & M	R&R[3]	I-95 Payments from General Reserve	I-95 Advance Payment	Add'l R&R	Total Operating Expenses
2003	$4.4	$8.5	$7.2	$3.8	$1.3				$25.2	$7.3				$32.5
2004	$4.7	$8.7	$6.5	$3.9	$1.3				$25.1	$5.1				$30.2
2005	$4.4	$9.3	$7.5	$4.1	$3.7				$29.0	$3.3				$32.3
2006	$4.8	$9.6	$8.8	$4.5	$10.8				$38.5	$4.3				$42.8
2007	$5.0	$9.8	$8.0	$5.0	$7.4		$0.9		$36.1	$8.6				$44.7
2008	$4.1	$10.3	$8.8	$5.2	$7.8		$0.9		$37.1	$11.8				$48.9
2009	$4.5	$10.5	$9.8	$5.4	$8.9		$1.2		$40.3	$7.8				$48.1
2010	$5.7	$10.9	$7.6	$5.0	$9.8		$1.1		$40.1	$7.8	$30.0			$77.9
2011	$6.3	$10.9	$8.6	$4.9	$10.6		$1.0		$42.3	$14.3	$20.0			$76.6
2012[4]	$8.5	$9.7	$6.8	$5.0	$9.8	$1.2	$0.8		$41.8	$7.3	$5.9	$20.1		$75.1
Total ('03-'12)	$52.4	$98.2	$79.6	$46.8	$71.4	$1.2	$5.9	$0.0	$355.5	$77.6	$55.9	$20.1	$0.0	$509.1
2013	$8.5	$12.0	$9.7	$5.6	$14.3	$1.2	$2.1	-$2.5	$51.0	$9.8	$5.9	$20.1	$4.7	$91.5
2014	$8.4	$12.4	$10.0	$5.7	$10.0	$1.3	$2.1	-$2.5	$47.4	$10.0	$5.9			$63.3
2015	$8.4	$12.7	$10.3	$5.8	$10.5	$1.3	$2.2	-$2.5	$48.7	$8.9	$5.9			$63.5
2016	$8.3	$13.1	$10.6	$5.9	$10.8	$1.3	$2.2	-$2.5	$49.8	$9.7	$5.9			$65.4
2017	$8.1	$13.5	$11.0	$6.1	$11.0	$1.3	$2.3	-$2.5	$50.8	$12.2	$5.9			$68.9
2018	$8.0	$13.9	$11.3	$6.2	$11.3	$1.4	$2.3	-$2.5	$51.9	$12.3	$5.9			$70.1
2019	$7.9	$14.3	$11.7	$6.3	$11.5	$1.4	$2.4	-$2.5	$53.0	$10.1	$2.2			$65.3
2020	$8.1	$14.6	$11.9	$6.4	$11.8	$1.4	$2.4	-$2.5	$54.2	$10.4				$64.6
2021	$8.2	$14.9	$12.1	$6.6	$12.1	$1.5	$2.5	-$2.5	$55.4	$10.7				$66.1
2022	$8.4	$15.2	$12.4	$6.7	$12.4	$1.5	$2.5	-$2.5	$56.6	$11.0				$67.7
Total ('13-'22)	$82.3	$136.6	$111.0	$61.3	$115.7	$13.7	$23.0	-$25.0	$518.6	$105.2	$37.6	$20.1	$4.7	$686.2

[1] Included in Maintenance through 2011

[2] O&M lapse is a self-imposed reduction in operating expenditures (both budgeted and projected) due to savings projected from the lean staffing initiative in toll operations

[3] Does not include $4.7M carry-forward of additional R&R available for expenditure

[4] FY 2012 amounts are preliminary and unaudited

Notes:

The dollar values shown from 2003 to 2012, provided by Finance & Contracts, are on the GAAP basis (General accepted accounting principles), and the dollar values from 2013 to 2022, from the Bureau of Turnpike's O&M model, are on a cash basis.

All numbers are tied to the Operating and Maintenance Report (Bureau of Turnpikes), except for certain financial categories which tie to the Comprehensive Annual Financial Reports.

Data will not necessarily add to totals because of rounding.

The Turnpike System total annual operating expenditures (Operating and Maintenance, Renewal and Replacement and I-95 Payments Costs) over the past ten years ranged from a low of $30.2 million in FY 2004 to a high of $77.9 million in FY 2010; FY 2012 operating expenditures were $75.1 million. Total operating expenditures amounted to $509.1 million over the ten-year period FY 2003-2012 and about 19 percent or $98.2 million was spent on toll operations. The large increase in operating expenses in FY 2006 was largely due to implementation of ***E-ZPass***. Total annual operating expenditures increased by $10.5 million or about 33 percent from FY 2005 to 2006, with $5.5 million due to the purchase of new ***E-ZPass*** transponders and by $29.8 million or some 62 percent from FY 2009 to FY 2010 due to payments from the Bureau of Turnpikes' General Reserve Fund for the acquisition of a portion of I-95 into the Blue Star Turnpike.

Turnpike System renewal and replacement expenditures also increased in recent years, from a low of $3.3 million in FY 2005 to a high of $14.3 million in FY 2011.

Total operating expenditures for the period FY 2013-2022 are projected to total $686.2 million, about 1.35 times the expenditures of the previous ten year period. Factors that contribute to this projected increase include more lane miles to maintain due to the recent acquisition of an additional part of I-95, the purchase of new and replacement ***E-ZPass*** transponders, a more robust renewal and replacement program, and higher fuel, maintenance, and operation costs.

Operation and maintenance expenditures are budgeted to provide for unforeseen costs; the amount not spent - the lapse - is shown in Table 8 over the ten-year period from FY 2003 through 2012. The net lapse has ranged from $2.3 million in FY 2005 to $8.3 million in FY 2011. Over the last three years, the Bureau of Turnpikes averaged a net lapse of $6.8 million. Of these funds, Turnpike System renewal and replacement funds are carried forward to the following year; all other lapses for operating expenses return to retained earnings or the Bureau of Turnpikes' General Reserve Account.

Table 8: Historical Lapse, FY 2003-2012

Fiscal Year	Lapse	Transfer to Retained Earnings	Net
2003	$3,000,124		$3,000,124
2004	$3,085,133	$1,044,000	$2,041,133
2005	$2,317,726	$1,518,500	$799,226
2006	$2,648,078	$2,015,000	$633,078
2007	$3,068,083	$2,058,500	$1,009,583
2008	$4,719,937	$1,008,950	$3,710,987
2009	$4,735,298		$4,735,298
2010	$6,048,294		$6,048,294
2011	$8,267,563		$8,267,563
2012	$6,218,459	$75,000	$6,143,459
Total ('03-'12)	$44,108,695	$7,719,950	$36,388,745

6.3 DEBT SERVICE REQUIREMENTS

Table 9 presents historical and scheduled debt service requirements for the period FY 2003-2022.

Table 9: Historical and Scheduled Debt Service Expenditures, FY 2003-2022 (in millions)

Fiscal Year	Existing Revenue Bonds[1]	FY 2013 Revenue Bonds	FY 2015 Revenue Bonds	Total Revenue Bond Debt Service	BABs Interest Subsidy	Net Total Revenue Bond Debt Service	General Obligation Bonds
2003	$24.7			$24.7	$0.0	$24.7	$5.2
2004	$23.9			$23.9	$0.0	$23.9	$4.8
2005	$27.0			$27.0	$0.0	$27.0	$4.3
2006	$25.8			$25.8	$0.0	$25.8	$4.2
2007	$28.1			$28.1	$0.0	$28.1	$3.0
2008	$25.7			$25.7	$0.0	$25.7	$1.7
2009	$25.9			$25.9	$0.0	$25.9	$1.6
2010	$30.9			$30.9	-$1.3	$29.6	$0.7
2011	$36.9			$36.9	-$3.1	$33.8	$0.6
2012	$36.4			$36.4	-$3.1	$33.3	
Total ('03-'12)	$285.3	$0.0	$0.0	$285.3	-$7.6	$277.7	$26.1
2013	$35.8	$3.5		$39.3	-$3.1	$36.2	
2014	$35.4	$6.9		$42.3	-$3.1	$39.2	
2015	$35.4	$6.9	$1.4	$43.7	-$3.1	$40.6	
2016	$35.4	$6.9	$2.9	$45.2	-$3.1	$42.1	
2017	$33.7	$6.9	$2.9	$43.5	-$3.1	$40.4	
2018	$29.4	$6.9	$2.9	$39.2	-$3.1	$36.1	
2019	$29.4	$6.9	$2.9	$39.2	-$3.1	$36.1	
2020	$28.1	$6.9	$2.9	$37.9	-$3.1	$34.8	
2021	$20.3	$6.9	$2.9	$30.1	-$3.1	$27.0	
2022	$20.6	$6.9	$2.9	$30.4	-$3.1	$27.3	
Total ('13-'22)	$303.5	$65.6	$21.7	$390.8	-$31.3	$359.5	$0.0

[1] Assumes 2012 Series B bonds are delivered on Nov 5, 2012

Note: Data will not necessarily add to totals because of rounding.

Historical total revenue bond debt service payments ranged from a low of $23.9 million in FY 2004 to a high of $36.9 million in FY 2011. Over the ten-year period FY 2003-2012, the cumulative total revenue bond debt service was $285.3 million. The historical BABs interest subsidy over this ten-year period totaled $7.6 million, resulting in a net total revenue bond debt service of $277.7 million. Furthermore, there were $26.1 million in general obligation bonds paid during FY 2003-2012.

Scheduled total revenue bond debt service expenditures are projected to range over the period FY 2013-2022 from $30.1 million in FY 2021 to $45.2 million in FY 2016. The cumulative total revenue bond debt service payment over this period is estimated to be $390.8 million or about 37 percent more than the previous ten-year period. The majority of this amount will be for existing revenue bond payments. Over the ten year forecast period FY 2013-2022, the total BABs interest subsidy is estimated to total $31.3 million, resulting in a net total revenue bond debt service of $359.5 million.

The proposed revenue bond terms are: 30-year bond, 4.00 percent interest and a semi-annual fixed payment amortization schedule.

7 REVIEW OF REGIONAL AND NATIONAL SOCIOECONOMIC FACTORS

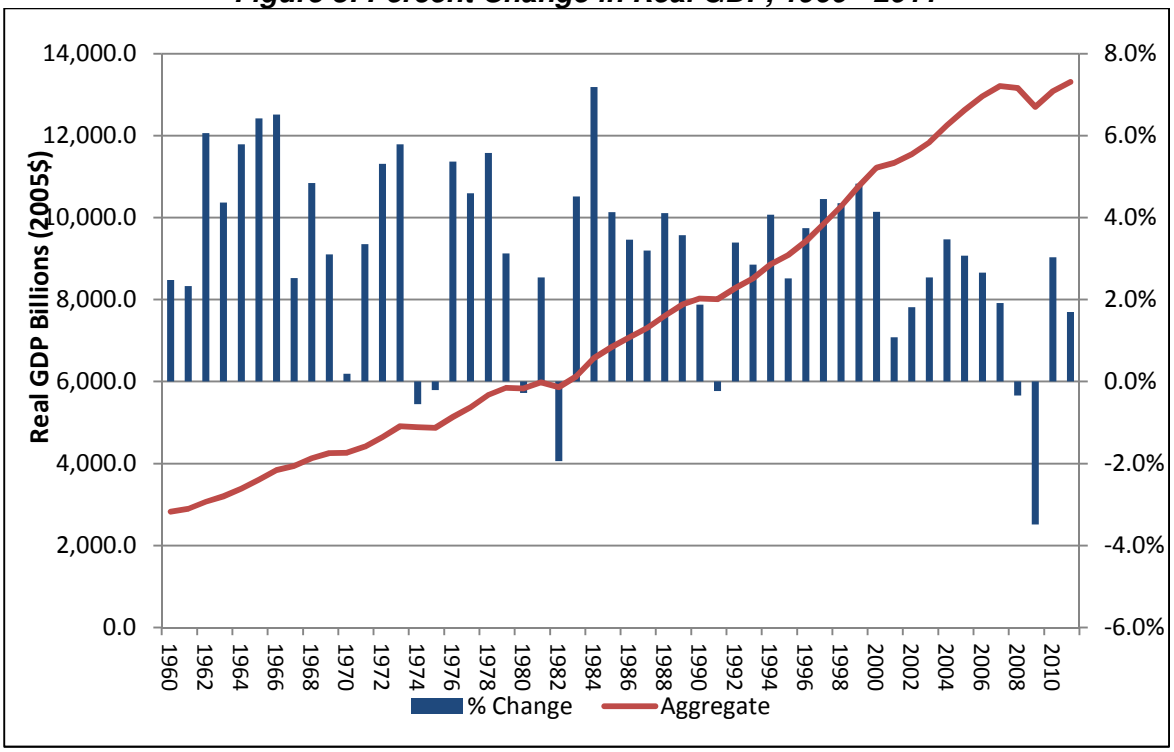
During the course of this study, Jacobs analyzed key socioeconomic factors related to the growth in traffic and toll revenues for the New Hampshire Turnpike. Factors that are relevant to the long term background growth of traffic on the facilities were studied, as was the relationship of traffic to specific economic indices for passenger car and truck traffic. Jacobs also researched the possible causes of why people in the U.S. are driving less, and what this means for the future of road travel. In addition, Jacobs conducted extensive background research into the specific dynamics of past economic recessions in order to better understand the current phenomenon and to aid in giving context to the most recent economic downturn when compared with past recessions. The analyses are summarized in the following sections.

7.1 U.S. ECONOMIC OUTLOOK

7.1.1 Recent Macroeconomic Trends

From 2000 to 2010, real Gross Domestic Product (GDP) and industrial production in the U.S. increased by an average of 1.8 percent and 0.6 percent per year, respectively. This includes the recession that began and ended in 2001 and the most recent recession, which began in December 2007 and officially ended in June 2009. This recession has been more severe compared to previous recessions, resulting in zero growth in real GDP and a 3.3 percent decrease in industrial production in 2008. Real GDP decreased by 2.6 percent in 2009, but recovered in 2010 with a 2.9 percent annual increase. Due to a lag in economic activity, industrial production index decreased by 13.5 percent in 2009, but rebounded solidly in 2010. Real GDP increased by 1.7 percent in 2011. During the first quarter of 2012, real GDP increased at annualized rate of 1.9 percent. Figure 8 compares year-over-year changes in real GDP since 1960.

Figure 8: Percent Change in Real GDP, 1960 - 2011

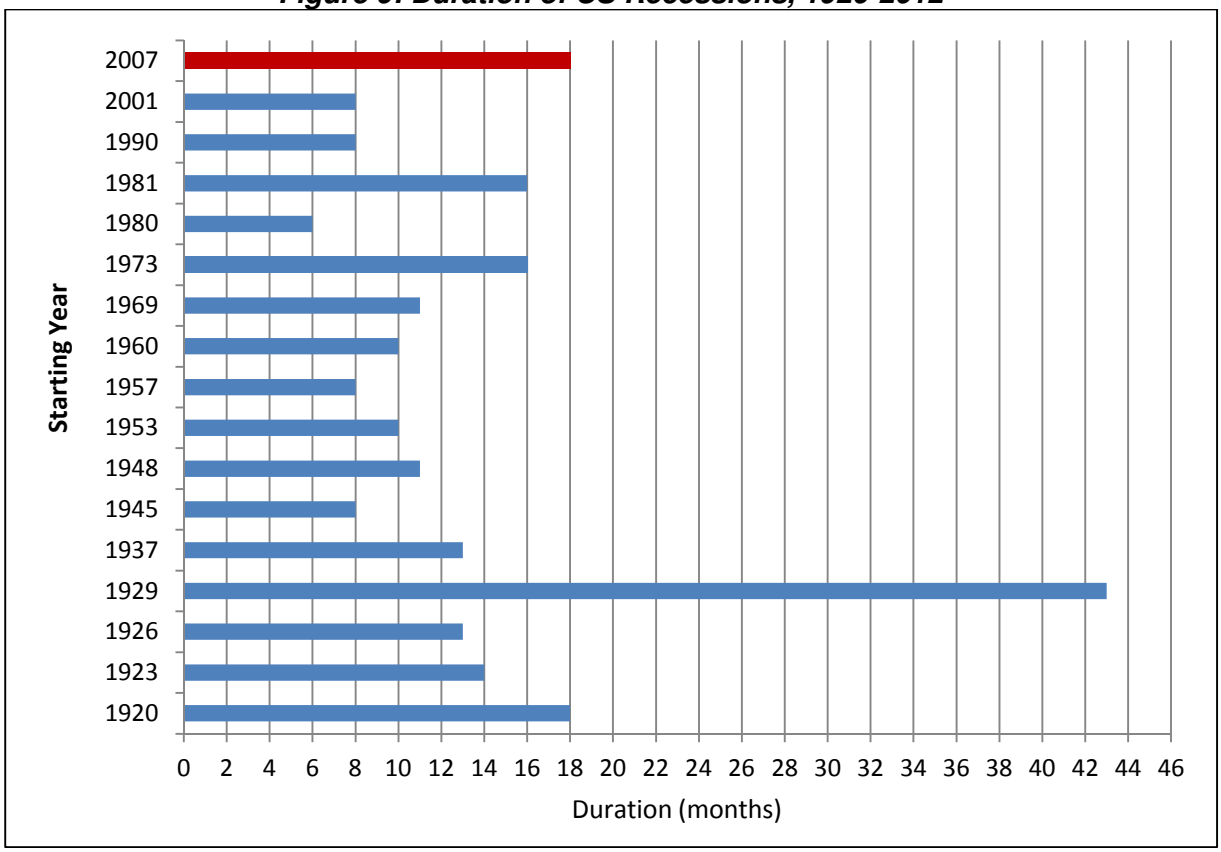


Source: U.S. Bureau of Economic Analysis (BEA)

Recessions are technically defined as two consecutive quarters of negative growth. In determining whether a recession has taken place, the National Bureau of Economic Research (NBER) can include other factors in its analysis. According to the NBER, the most recent recession lasted 18 months, making it the longest economic downturn since the Great Depression, as shown in Figure 9. Additionally, this recession is comparable to and may possibly exceed the recessions of the early 1970s and early 1980s in duration and severity. Economic downturns that have occurred after the Great Depression have typically been triggered by a contracting monetary supply (typified by higher interest rates) or an external shock (e.g. sudden rise in oil prices, political turmoil, etc.) resulting in a decrease in consumer confidence, economic growth, and employment. Once expansionary conditions are in place, then post-recessionary periods have been characterized by rapid, strong and sustained increases in GDP and employment.

In contrast, the recent recession was caused by the near collapse of the financial sector, the lack of available credit, the end of the asset price "bubble" in real estate, and high consumer debt levels. During 2008 and 2009, housing prices within the S&P/Case-Shiller 10-City Index decreased by 11 percent and 19 percent, respectively (see Figure 10). Due to a lag, outstanding consumer credit declined by 6 percent from $2.6 trillion to $2.4 trillion from 2009 to early 2011, as shown in Figure 11. In particular, securitized asset pools decreased precipitously—from $682 billion to $127 billion from 2008 to 2011.

Figure 9: Duration of US Recessions, 1920-2012

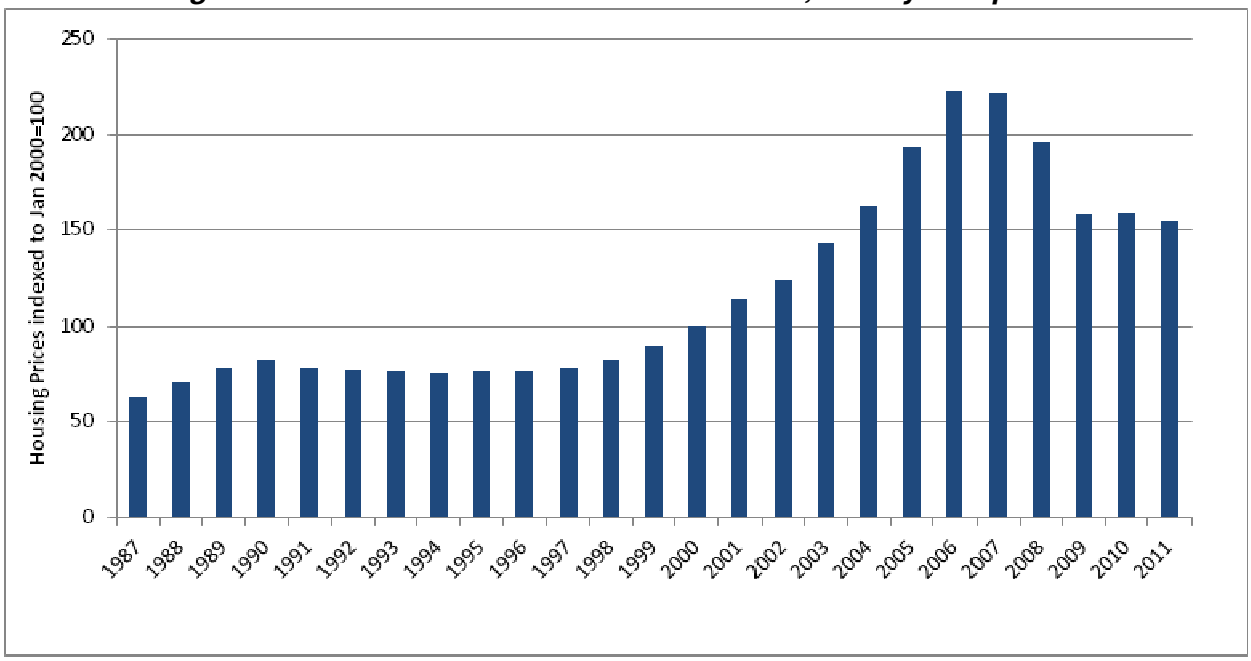


Source: National Bureau of Economic Research (NBER)

These conditions relating to the market for credit are more similar to the underlying causes of the Great Depression. Recent economic research indicates that the root causes of these

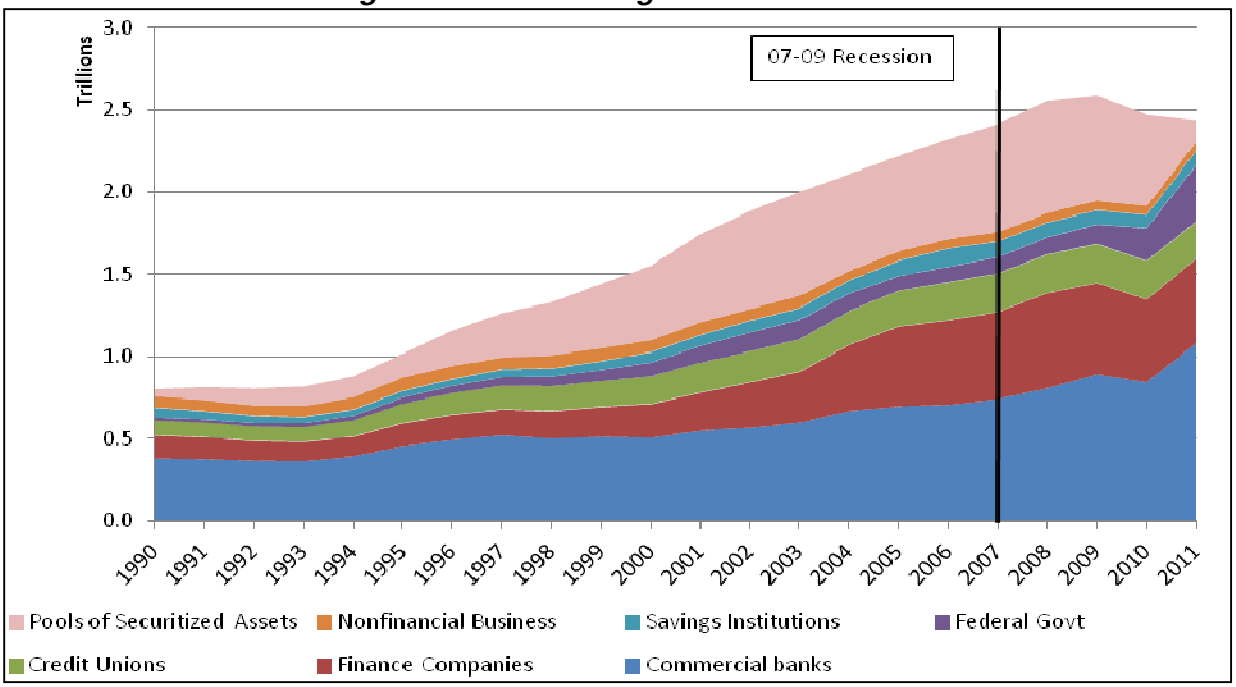
contractions lead to weaker and fragile recoveries until the financial sector stabilizes, asset prices recover, and deleveraging by consumers and businesses is concluded. Consequently, economic growth is expected to be relatively sluggish with high unemployment over longer periods of time.

Figure 10: S&P/Case-Shiller Home Price Index, 10-City Composite



Source: S&P Indices and Fiserv

Figure 11: Outstanding Consumer Credit



Source: U.S. Federal Reserve Bank

7.1.2 Long-Term Structural Trends

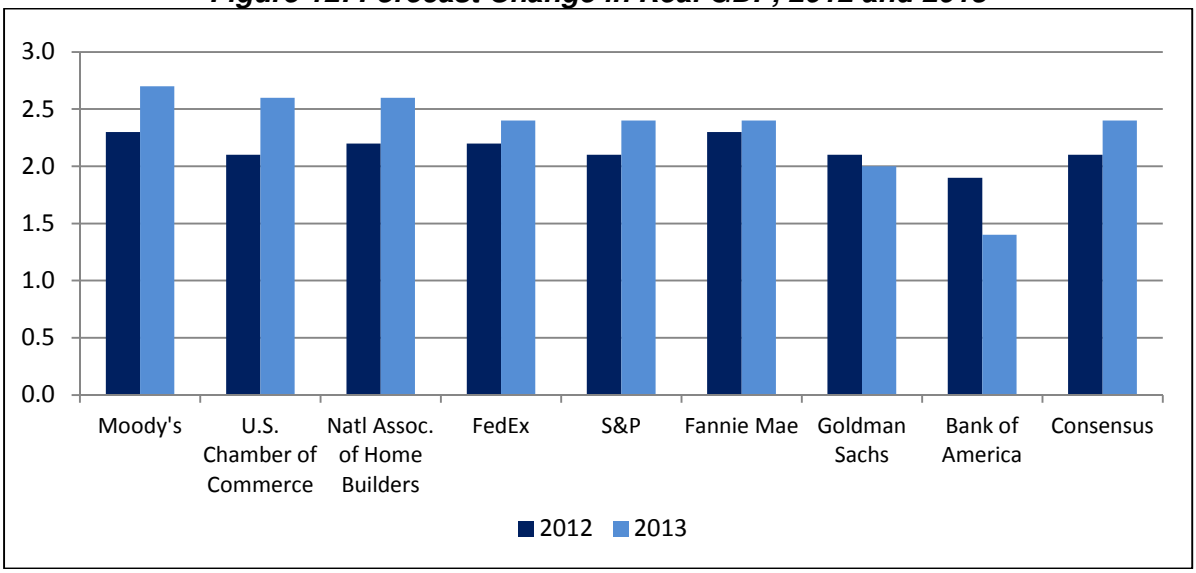
Even prior to the recent recession, there have also been a number of long-term structural trends in the U.S. and internationally which have encumbered economic growth and employment creation. First, there have been significant productivity improvements in the form of advances in information technology, computing power, transportation, and communications. Initially, these advances encouraged the transfer of manufacturing facilities and jobs to areas with higher unemployment and lower wages. This also shifted the engine for economic growth from manufacturing (from 31 percent of GDP in 1970 to 23 percent GDP in 2010) to services (from 32 percent of GDP in 1970 to 47 percent of GDP in 2010). These trends intensified after the technology boom of the 1990s and the subsequent bust that took place during the early 2000s, which encouraged the rapid and widespread expansion of inexpensive communications technologies and further flattened factor and wage costs. Increasingly, this has led to the outsourcing of professional services. For example, X-rays can be evaluated or financial statements can be prepared cheaply and rapidly almost anywhere in the world where technical capacity exists. It is expected that this structural trend will continue in the medium term.

Second, there has been a restructuring of the international economy with traditional trading partners (Europe and Japan) generating a decreasing share of global GDP, while other economies including Brazil, Russia, India and China ("the BRIC countries"), comprising a larger share of the global economy. For the U.S., this has resulted in greater competition not just in manufacturing, but also in professional services. A third trend has been the aging of the U.S population—the median age has increased from 29.5 in 1960 to 37.2 in 2010. This trend has also taken hold in Europe and Japan and is expected to eventually impact China due to its one-child policy. Finally, there has been a rapid and significant expansion in consumer credit, which has reached unsustainable levels during the previous decade. These factors tend to further dampen economic growth and employment over the short-term.

7.1.3 Short-Term Economic Forecast

In early 2012, there was modest enthusiasm with respect to economic growth and employment, which has decreased slightly as the year has progressed. Forecasts prepared in June 2012 have captured a slight reduction in forecasts in real GDP. The median of selected economic forecasts provided by financial institutions and industry analysts for real GDP in June 2012 (see Figure 12) was 2.1 percent, down from 2.2 percent median estimated at the start of the year. The spread among forecasts (50+ observations) is relatively small, ranging from 1.8 percent to 2.5 percent. For 2013, the consensus forecast was that real GDP would increase by 2.4 percent, albeit with a wider range—1.4 percent to 3.4 percent. Factors that may negatively impact real GDP in the short-term include the following: (1) recessionary conditions in Europe due the weak fiscal position of Greece, Portugal, Spain, and Italy; (2) signs of decreased economic growth in Brazil and China; (3) currently scheduled budget cuts and/or tax increases at the end 2012; and (4) increased tensions in the Middle East.

Figure 12: Forecast Change in Real GDP, 2012 and 2013



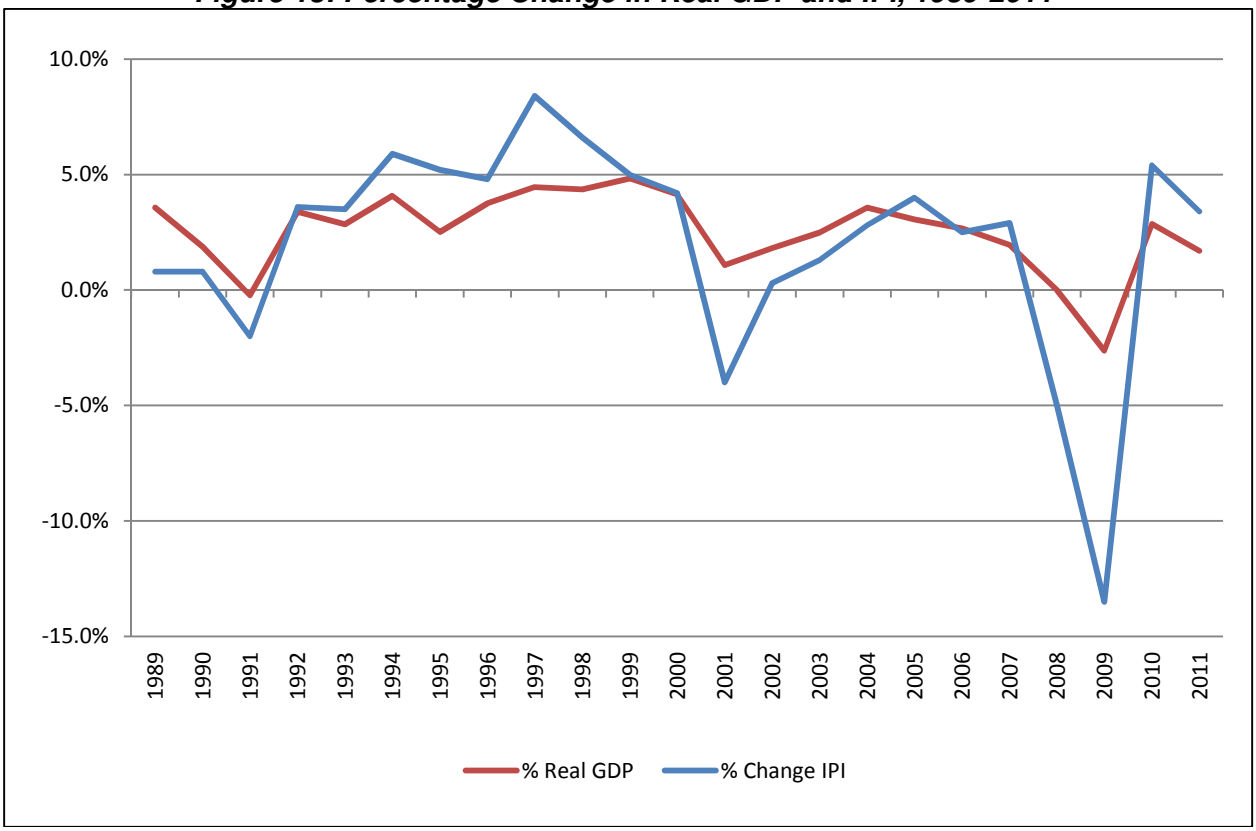
Source: Blue Chip Economic Indicators (BCIE)

The yield curve remains positive with short term interest rates (0-12 months) on U.S. Treasuries trading at or near zero and the interest rates on 10-year U.S. Treasuries trading at 2.69 percent (as of July 2, 2012). The market for crude oil remains strong with the $/barrel price at just below $84/barrel, representing a decrease from $106/barrel in March 2012. Barring an unforeseen event in the international political environment, the Energy Information Administration (EIA)'s forecast prepared in June 2012 anticipates that crude oil price will fluctuate between $88/barrel to $98/barrel from July 2012 through 2013.

7.1.4 Industrial Production

Changes in U.S. industrial production have historically moved in tandem with GDP, albeit with steeper decreases during recessions and larger increases during recovery periods. During the lowest point of the 2001 recession, the Industrial Production Index (IPI) decreased by 4.0 percent, as shown in Figure 13. Due to the severity of the most recent recession, IPI declined 13.5 percent in 2009. Since then, IPI has recovered increasing by 5.4 percent and 3.4 percent during 2010 and 2011, respectively. Despite this recovery, the gross value of the IPI for "Final Products and Non-Industrial Supplies" is at 97 percent of its 2007 peak.

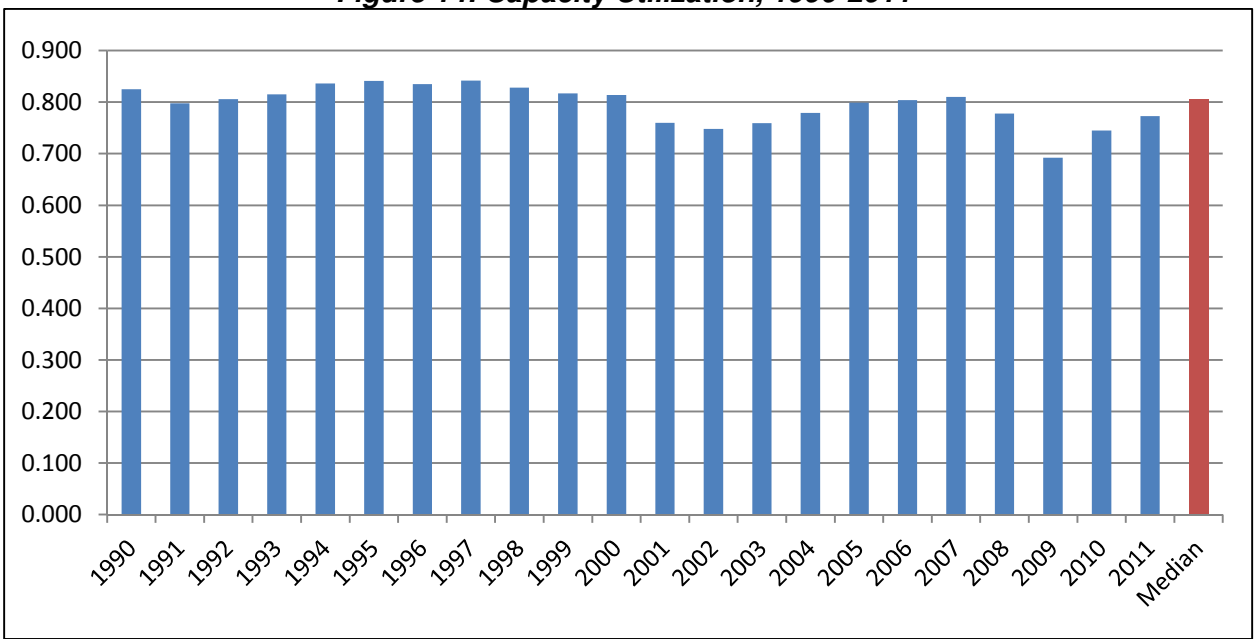
Figure 13: Percentage Change in Real GDP and IPI, 1989-2011



Source: U.S. Federal Reserve Bank

Similar to the IPI, the utilization of U.S manufacturing capacity also decreased significantly in 2009, as seen in Figure 14, declining to 0.692. Since then, capacity utilization has recovered to 0.773. Notwithstanding, capacity utilization is currently 95 percent of the historical median value, 0.805, from 1990 to 2011.

Figure 14: Capacity Utilization, 1990-2011

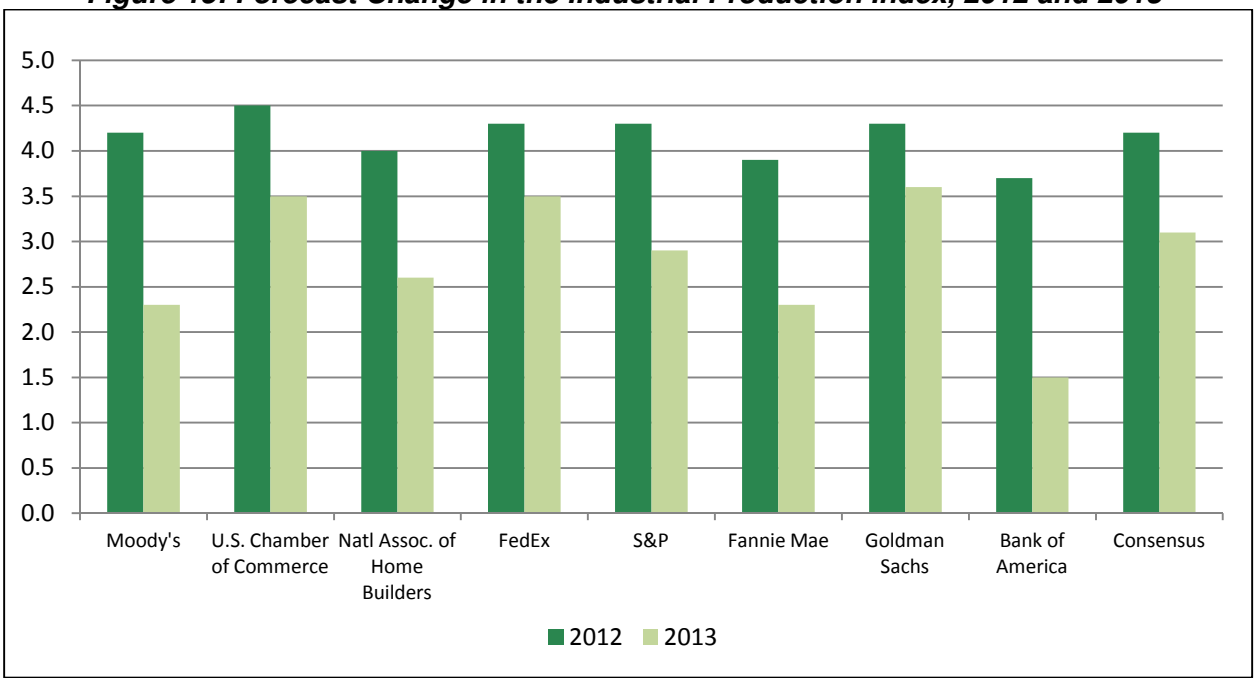


Source: U.S. Federal Reserve Bank

7.1.5 Industrial Production Forecasts

Based on forecasts developed by financial institutions and industry analysts, the Industrial Production Index (IPI) is forecasted to increase by 4.2 percent in 2012 and 3.1 percent in 2013. This slower forecast likely captures the decrease in exports due to the recessionary conditions in Europe and slower growth in emerging markets, including Brazil and China. Selected forecasts are shown in Figure 15.

Figure 15: Forecast Change in the Industrial Production Index, 2012 and 2013



Source: Blue Chip Economic Indicators (BCIE)

7.1.6 Employment

At the beginning of 2008, the national unemployment rate was 5.0 percent. By October 2009, unemployment peaked at around 10.0 percent. During 2008 and 2009, total employment decreased by 3.2 percent each year. Total employment started to recover in subsequent months with a 0.9 percent increase in 2010 and a 1.5 percent increase in 2011. The unemployment rate has decreased gradually to 8.2 percent by June 2012. Long-term forecasts of employment tend to differ, depending on varying considerations of the potential impact of long-term structural trends, such as advances in information technology, the outsourcing, an aging population, etc. The U.S. Congressional Budget Office (CBO) has forecasted that employment would return to historical levels by 2015. However, other institutions and economic analysts are predicting historically high levels of unemployment in the U.S. through 2015 and beyond. In any event, the most recent recession has had a more severe impact on employment, especially compared to previous downturns other than the Great Depression. Similar to the Great Depression, the decrease in employment levels has been steeper and the recovery has taken a relatively long time to take hold.

7.1.7 Age of the Population

Since 1960, the median age of the population in the United States has increased from 29.5 years to 37.2 years. As part of this general trend, there are following component trends:

- The non-adult population (0 to 17 years) decreased from nearly 36 percent of the total population in 1960 to 24 percent in 2010;
- The 18 to 44 age group, which has historically driven the most vehicle miles traveled (VMT) per capita, increased from 35 percent of the total population in 1960 to 43 percent in 1990. However, this age group comprised 37 percent of the total population in 2010;
- The 45 to 64 age group shrank slightly between 1960 and 1990 (from 20 percent to 19 percent), but increased to 26 percent of the population in 2010.
- The 65+ age group increased from 9 percent of the total population in 1960 to 13 percent in 2010.

The aging of the population is one of the major factors contributing to slower traffic growth; this is discussed further on page 39.

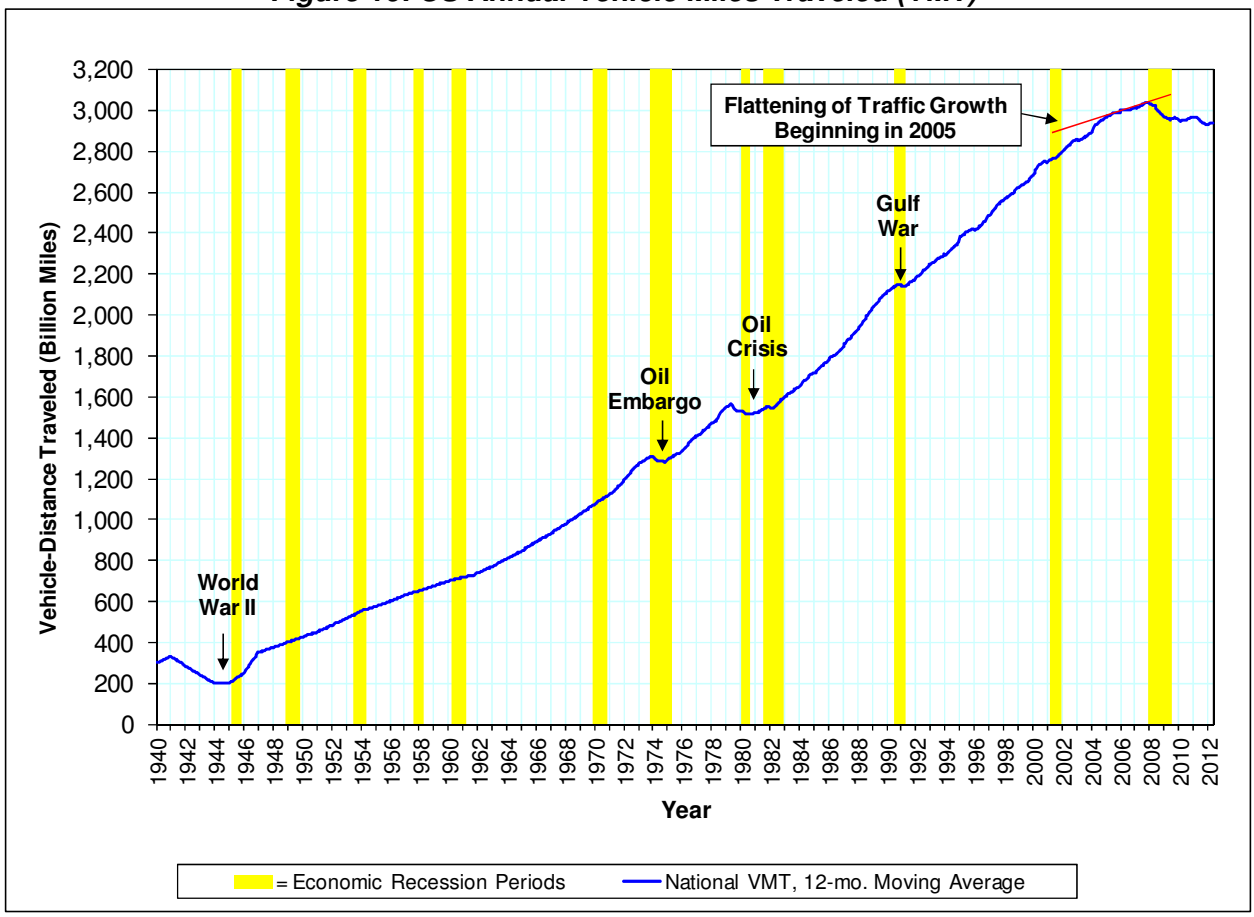
7.2 NATIONAL TRENDS IN VEHICLE MILES TRAVELED

The United States has experienced a never before seen flattening, then drop, in vehicle-miles traveled (VMT) on its highways over the past several years. A reduction in VMT means less revenue – in the form of gas tax or tolls - for funding transportation projects. Jacobs reviewed and compiled available reports and data to investigate the possible factors contributing to this phenomenon.

Figure 16 depicts the 12-month moving total of national travel mileage from 1940 through the spring of 2012 on all U.S. highways. As seen in this figure, there were temporary reductions in VMT during World War II, oil crises and economic recessions. Despite these temporary “dips”, the VMT continued to grow rapidly over the years. It shows that, in recent years, with the exception of short, flat periods during the 1991 and 2001 recessions (each less than one year), VMT grew at a steady pace through about 2005. VMT then grew at a much slower pace through 2008. The increase in gas prices and the downturn in economic activity that took hold

in late 2008 resulted in a significant reduction in total national travel mileage after December 2007 peak. While VMT declined throughout 2008, it has remained flat in 2009 until the summer months, when there was a slight increase over the previous year. This perceived growth was due in part to the large reduction in summer gas prices from 2008 to 2009. Since the recession ended, there have been slight increases and decreases in VMT from month to month that may have been caused by large fluctuations in gas prices.

Figure 16: US Annual Vehicle Miles Traveled (VMT)



Source: FHWA

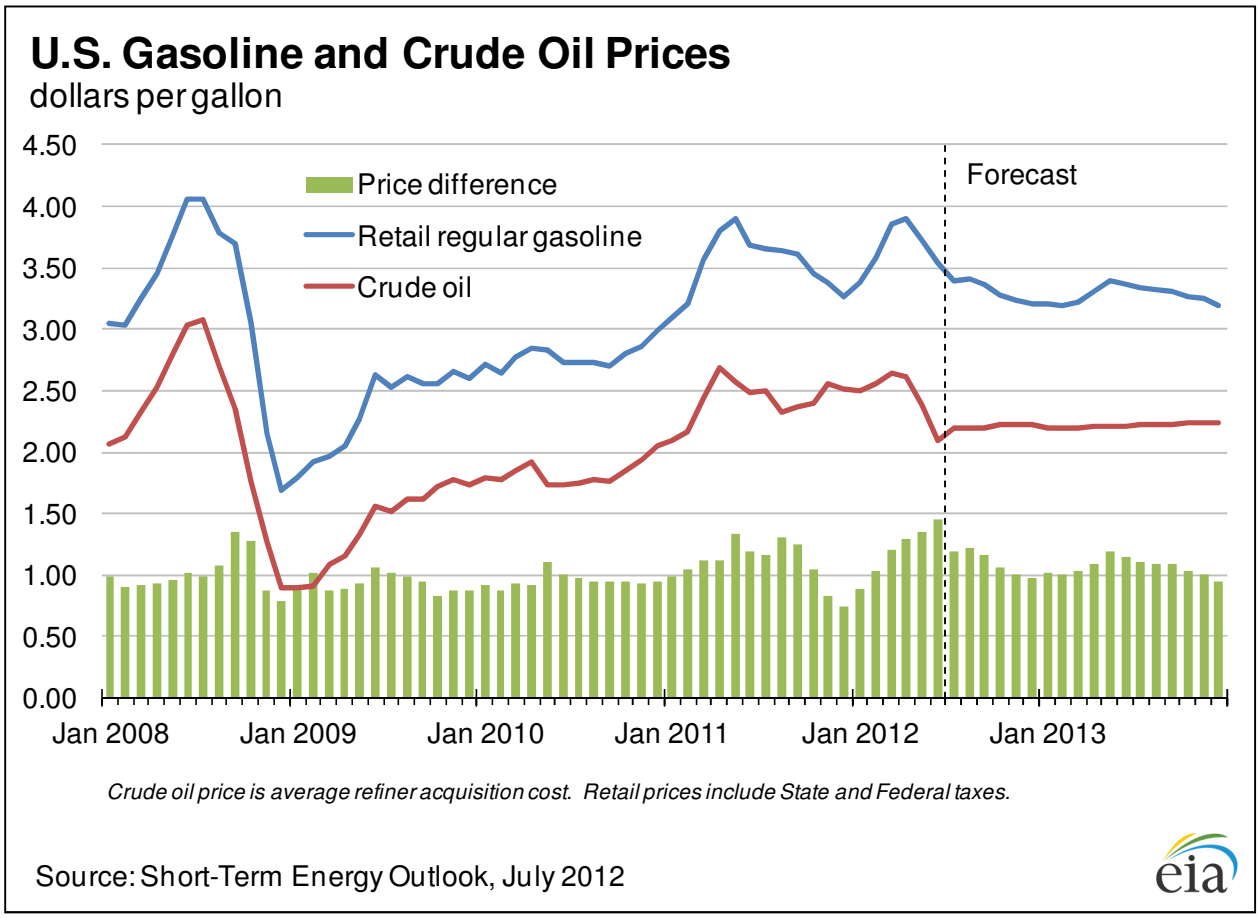
7.2.1 Fuel Cost Impacts on Travel

A number of factors may have caused the recent drop in VMT; the jump in gas prices is often cited as a key factor. During the period of rapid oil and gasoline price increases in the summer of 2008 experts in the toll forecasting field tried to bring some perspective to the phenomenon by formulating opinions as to how motorists would modify their driving habits in lock step with price escalations. This same exercise is currently being conducted once again as the wildly fluctuating prices take hold of the economy. This is particularly important to toll road agencies as they attempt to plan for the future. In this section, we will take a look at historical and forecasted gasoline prices, our view of the motorists' perception of the fluctuating prices, historical traffic data in the face of such fluctuations and finally what the future may hold for motorists and toll road operators.

Figure 17 presents the historical and projected gasoline and crude prices from the US Energy

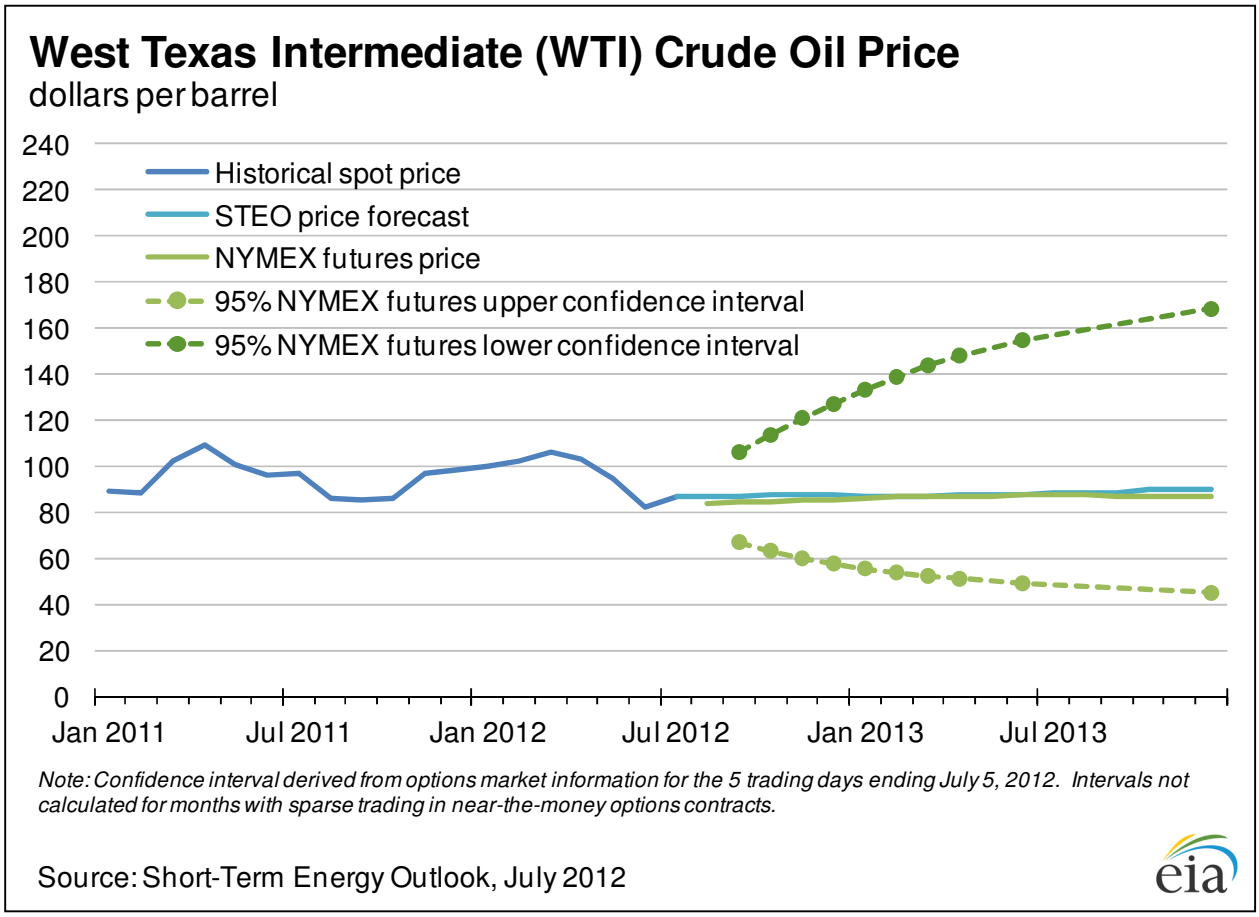
Information Administration (EIA). The graph illustrates the peaking of gasoline prices in the summer of 2008, the precipitous drop in late 2008, and the subsequent rise to another price spike in May 2011. Prices declined by throughout the summer and fall of 2011, reaching a low point in December 2011, followed by a sharp increase in April 2012. In recent months, prices have dropped again. In their July 2012 report, the U.S. Energy Information Administration projects prices to continue declining to about $3.25 in early 2013, peaking again in May 2013 at about $3.40, followed by a gradual decline, keeping in line with the typical seasonal fluctuations, but not reaching as high as the recent price spikes.

Figure 17: Historical and Projected US Gasoline and Crude Oil Prices, EIA



This relatively static forecast of future oil and gas prices may be reassuring, however, what this graph does not show is the level of uncertainty in these projections. Figure 18 presents the projection of West Texas Intermediate Crude Oil Price. The base projection is obviously similar to that of Figure 17, but it is the possible range of this price that is disconcerting. Based on the options markets the 95 percent confidence interval for WTI is between 92 percent more to 50 percent less than current estimates for January 2013. With a wide range of possible future prices of oil and gasoline, projecting traffic volumes has become an increasingly difficult task.

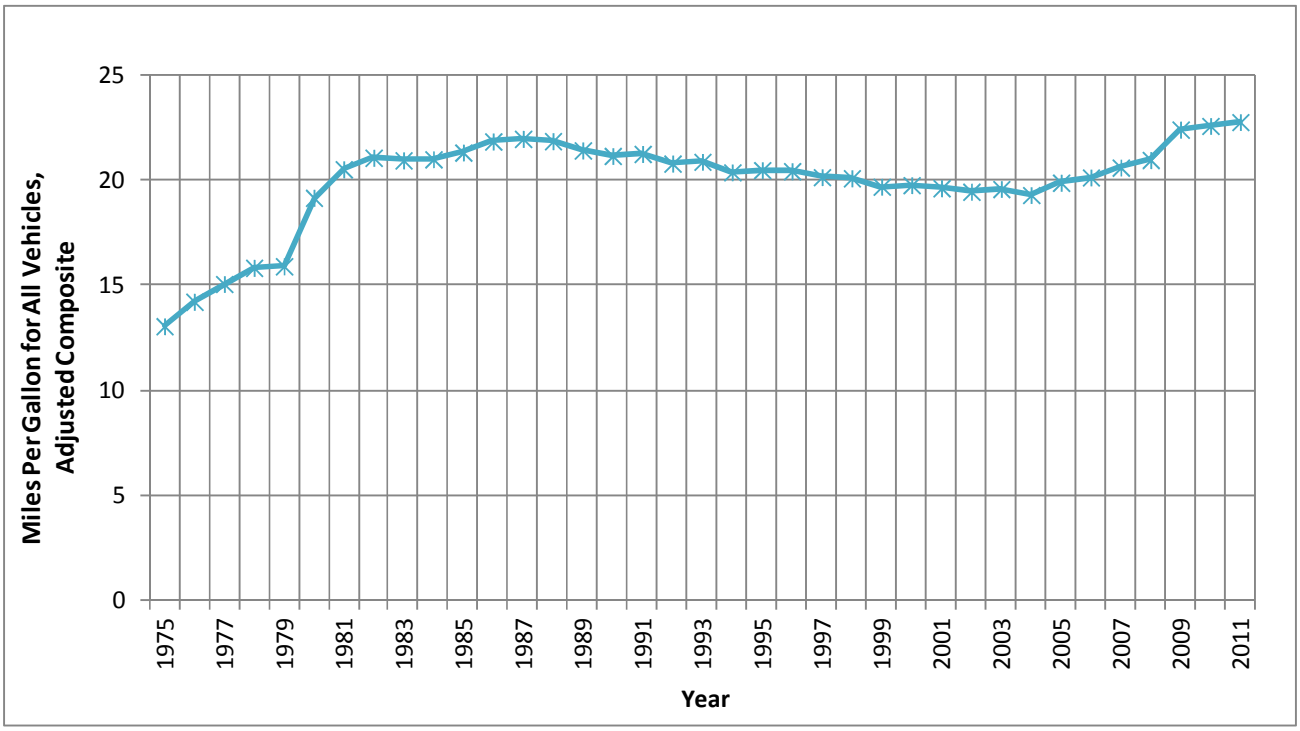
Figure 18: Historical and Projected Crude Oil Prices with Confidence Range, EIA



Another consideration is the decreasing reliance on oil and gasoline as the fuel for our vehicles with the increasing fuel efficiency of vehicles, as shown in Figure 19. The sharp increase in fuel efficiency in the late 1970s was caused by the oil crisis and the trend toward buying smaller, more fuel-efficient vehicles. A gradual decline in average MPG from 1987 through 2004 occurred as larger vehicles and SUVs became more popular. From 2005 through today that trend was again turned around, and today vehicles are more fuel-efficient than ever. This means that, generally speaking, gas prices today do not have as large an effect on drivers as it did ten years ago.

Also to consider in this discussion is the emergence and growth of hybrid and electric vehicles in the marketplace. These alternate fuel vehicles, while they of course rely on some sort of fuel source, may not be so dependent on oil in the future and a wider range of energy options from natural gas, coal, nuclear and possibly renewable sources such as solar and wind. It has been estimated that electric vehicles could constitute up to 35 percent of the market by 2025. Though these predictions vary widely by source, what is important to understand is the potential for mitigation of rising oil prices by motorists.

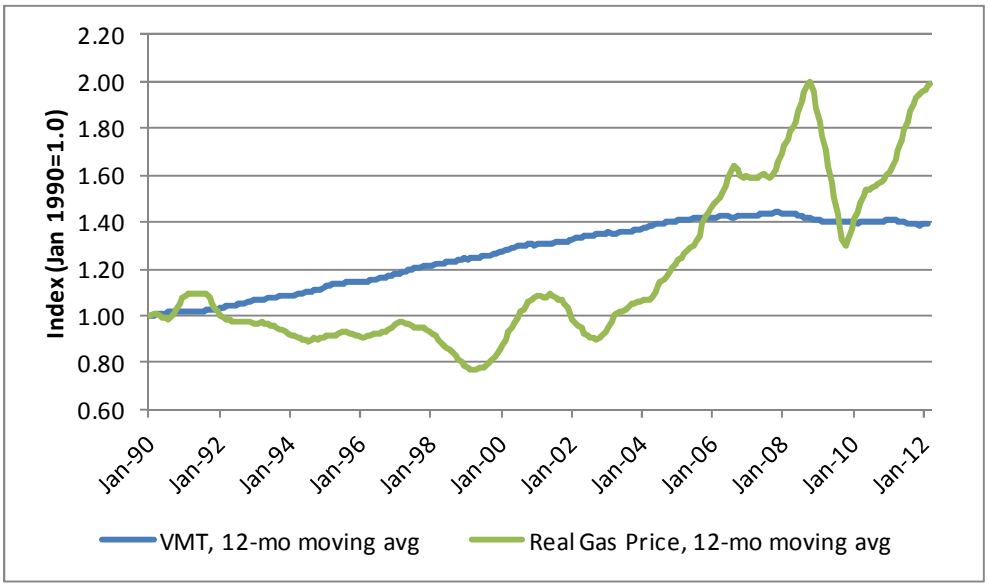
Figure 19: Historical Fuel Efficiency, 1975-2011



Source: epa.gov

To understand the potential impact of future gas prices on traffic we can look at historical reactions. Figure 20 presents historical VMT across the United States as compared to gasoline prices from 1990 through today. Both the VMT and real gas prices represent a 12-month moving average to remove any seasonality factors; all data are indexed to the 12 months ending January 1990. While the Great Recession began in the fall of 2008, there was still a flattening, then decline, in vehicle miles that started several years before. This may be partially attributed to rising gas prices. The continuation of the decline, post-fall 2008, would be more attributable to the economic meltdown, as gas prices dropped significantly by early 2009. Gas prices have generally increased since then, and VMT has slightly declined. Due to the recession and slow recovery period, it has been difficult to pinpoint the elasticity of travel as it relates to gas prices, however, we can roughly estimate about a 5 percent loss in VMT nationwide due to the doubling in gas prices from 2003 through today.

Figure 20: National VMT vs. Real Gas Prices, 12-Month Moving Average, 1990-2012



Continuously high gas prices could permanently modify the typical American's perception of our assumed right to drive our vehicles in the manner to which we are accustomed. There are, of course, a number of longer term strategies that could be undertaken to help offset the effects of oil/gasoline price peaking, including some of the following:

- Mandatory as well as voluntary increases in fuel efficiency
- Increased transportation mode choice shifts,
- Regulation of pricing
- Increased taxation
- Rationing
- Increased production and use of non-petroleum fuels.

In addition there are a number of new technologies that might help replace oil consumption in transportation thus mitigating the continued dependence on oil and the resultant price rises on gasoline. These include some of the following:

- The use of Ethanol and Biodiesel fuels,
- Coal and Biomass Gas-to-liquid (GTL)
- Natural Gas
- Advanced Vehicle Technologies which should include:
- increasing the efficiency of the internal combustion engine,
- continued proliferation of hybrid electric and plug-in hybrid electric vehicles,
- continued ongoing work to improve the efficiency of conventional vehicles, and
- continued work on the use of Hydrogen Fuel Cell Vehicles.

All of these envisioned efforts depend on the continued subtle changes in the market forces on the speculation of futures related to oil prices; gradual, less dramatic rises in the price of oil crude per barrel; already anticipated resources which dictate supply and demand, and finally, the mitigation of all the natural forces of weather and other "acts of God" on the availability of crude oil on which to run our economic engines. What is not envisioned, and cannot be

sustained for a very long period of time, is that nothing is done to mitigate our oil dependency while waiting for one or more of the changes mentioned above to become anything more than a "subtle change" and enter the realm of dramatic, unavoidable or unanticipated.

What is equally certain is that the future continues to be unknown, and that over the next few years increases in oil prices caused by disruptions to supply and demand, natural disaster or artificially speculative market forces, will not only change our driving behavior, but ultimately become a very significant challenge to an increasingly global economy. The measurement of how dramatically each rise in the price per barrel of oil makes on travel beyond the currently-known relationships is, of course, related to the specifics of individual markets.

7.2.2 Discretionary Travel, Telecommuting and the Internet

The advent and widespread usage of high-speed internet over the past fifteen years has brought about a whole new information age whereby many people now use it as the main tool for the retrieval and exchange of information, social communication, entertainment, and the purchase of goods and services. In theory, increased internet usage makes some vehicle trips unnecessary. According to the Federal Communications Commission (FCC), the share of U.S. households with broadband internet increased from 4 percent in 2000 to 64 percent in October 2009. According to Nielsen Online, Americans currently spend an average of nearly 60 hours per month on the internet or about two hours per day. A 2000 study by the Stanford Institute for the Quantitative Study of Society (SIQSS) included a survey of more than 4,000 adults nationwide, which sought to evaluate how the internet has affected society. This study revealed that with more time spent online, there is a decrease in social contact, time spent commuting, and time spent shopping. More recent studies indicate that people are often spending more time communicating with friends online or through text messaging rather than driving to see them (see Figure 23 on page 42). These studies suggest that increases in internet speed and usage have likely caused a decrease in discretionary travel.

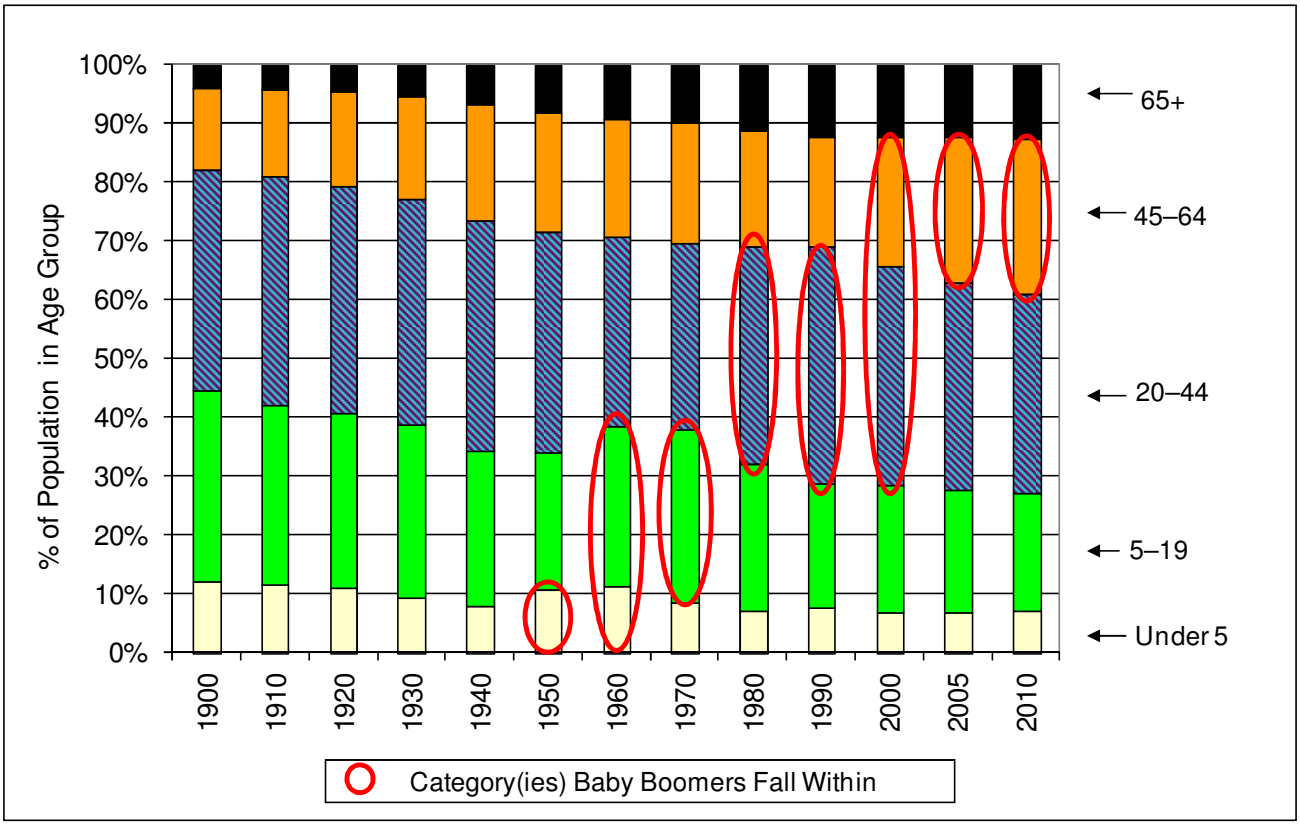
An increase in telecommuting may have also caused a small decrease in national VMT. Individuals who work from home save on the time and expense of commuting. With the widespread availability of cell phones, high-speed internet service, and laptop computers, it has become increasingly easier for work in certain employment sectors, e.g. sales, management, professional services, and information technology, to be conducted from home. The Dieringer Research Group, Inc. in their February 2009 survey brief, *"Telework Trendlines 2009,"* found that the number of employees telecommuting at least once a month doubled from 17 million in 2001 to 34 million in 2008. Nearly 14 million workers in 2008, which constituted 9 percent of the labor force, telecommuted almost every day. The decrease in trips to the office likely had a small effect on the decline in VMT.

Technology has also made it possible to use public transportation more effectively; smartphone applications allow people to determine when the next bus or train will arrive.

7.2.3 Age Groups and Travel

Changing demographics are also affecting VMT growth. Figure 21 shows how the population within each U.S. age group changed from 1900 to 2010. The post-World War II baby boom brought about a significant spike in birth rates between 1946 and 1964. However, the percentage of the population in the 20 to 44 age group, which typically produces the most VMT, has declined since 1990. At the same time, the 45 to 64 age group and the 65+ age groups have steadily increased in size.

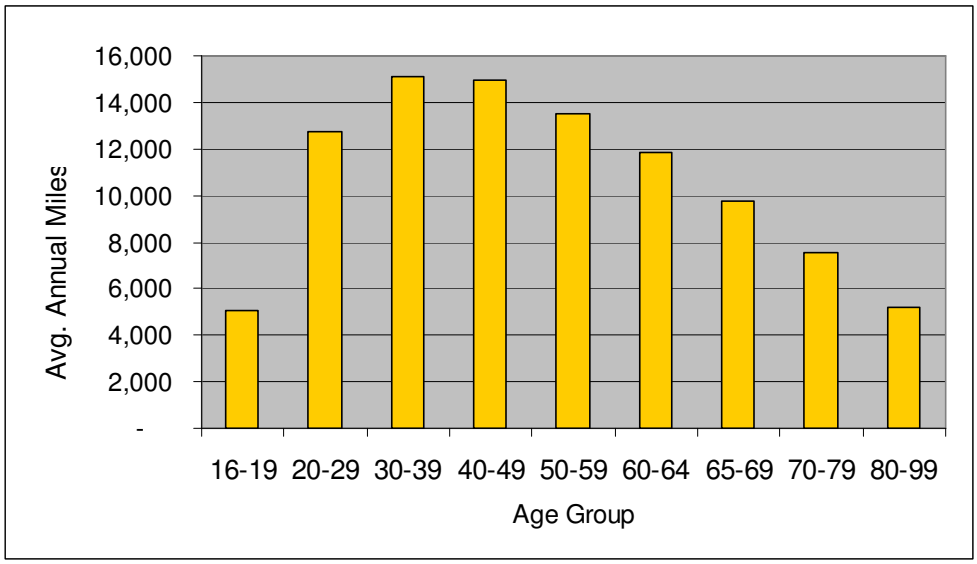
Figure 21: US Population Distribution by Age Group



Source: US Census

Based on previous studies, individuals tend to gradually drive less as they age, especially after the age of 40. Figure 22 summarizes the results from the 2009 National Household Travel Survey on the average VMT per person by age group. With the aging of the population as shown in the previous charts, the average VMT per person had been decreasing over the past decade. This, plus increased longevity, is expected to have a long-term effect on VMT; traffic growth is not expected to return to the rates achieved in the 1980s and 1990s.

Figure 22: Average VMT per Person by Age Range, 2009

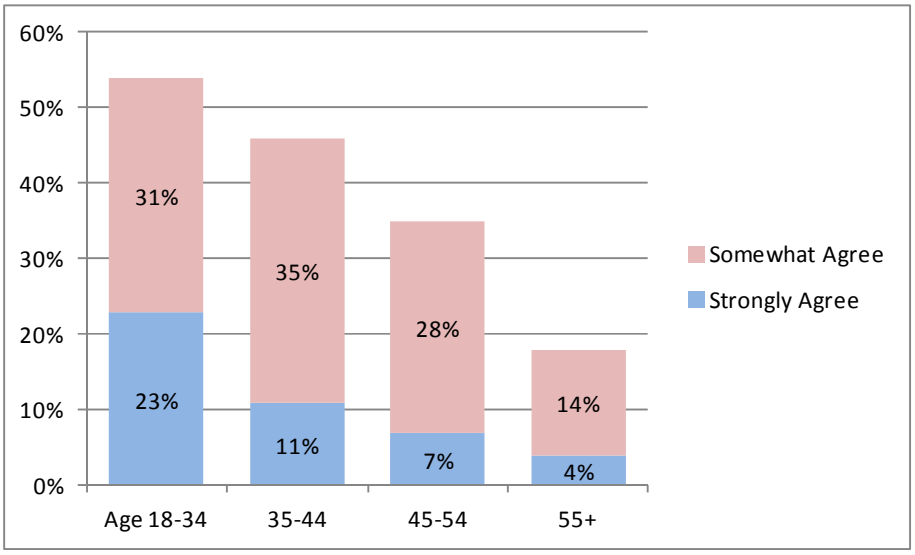


Source: 2009 National Household Travel Survey, U.S. Department of Transportation

The figure also shows that teenagers and 20-somethings (aka, the "Millennial Generation") drive fewer miles per capita than people in their 30s, 40s, and 50s. As numerous studies have been conducted in the couple of years in an attempt to understand the decline in nationwide VMT, it has become more and more apparent that younger people – those in their teens and 20s – are also driving significantly less than their age group did in years past. According to a recent study by the University of Michigan Transportation Institute, a significantly smaller proportion young people have a driver's license today than their counterparts in the early 1980s.

As previously stated in this section, technology has made many driving trips unnecessary, and nowhere is that more apparent than with the younger generation. Results of a 2010 survey conducted by KRC Research for Zipcar (see Figure 23) show that nearly a quarter of people age 34 and under strongly agree with the statement "With access to social networking sites such as Facebook and Twitter, text messaging and online gaming, I sometimes choose to spend time with friends online instead of driving to see them." Another 31 percent of this age group agrees somewhat with this statement. As the age of the surveyed group increases, fewer people agree with this statement.

Figure 23: Survey Respondents who Stated They Sometimes Choose to Spend Time with Friends Online Instead of Driving to See Them



Source: Survey by KRC Research and Zipcar

In addition, the survey showed that Millennials have made a conscious effort to drive less and take public transportation more than older generations. A higher percentage of Millennials stated that they drive less to protect the environment, and prefer to live in walkable, smart-growth communities compared to their older counterparts.

Another demographic factor affecting VMT is female participation in the workforce. It rose dramatically from 38 percent in the mid-1960s to a maximum of about 60 percent in 2000. This was a contributor to the large growth in VMT over this time period, but because it is no longer increasing, its effects on VMT will no longer be seen.

These demographic factors, combined with higher, more volatile gas prices and the reduced necessity of travel due to internet access, imply that VMT growth in general will not return to the levels it had reached in the 1980s and 90s. However, at specific locations there may be periods of higher growth due to local development or other economic activities.

7.3 REVIEW OF NEW HAMPSHIRE SOCIOECONOMIC FACTORS

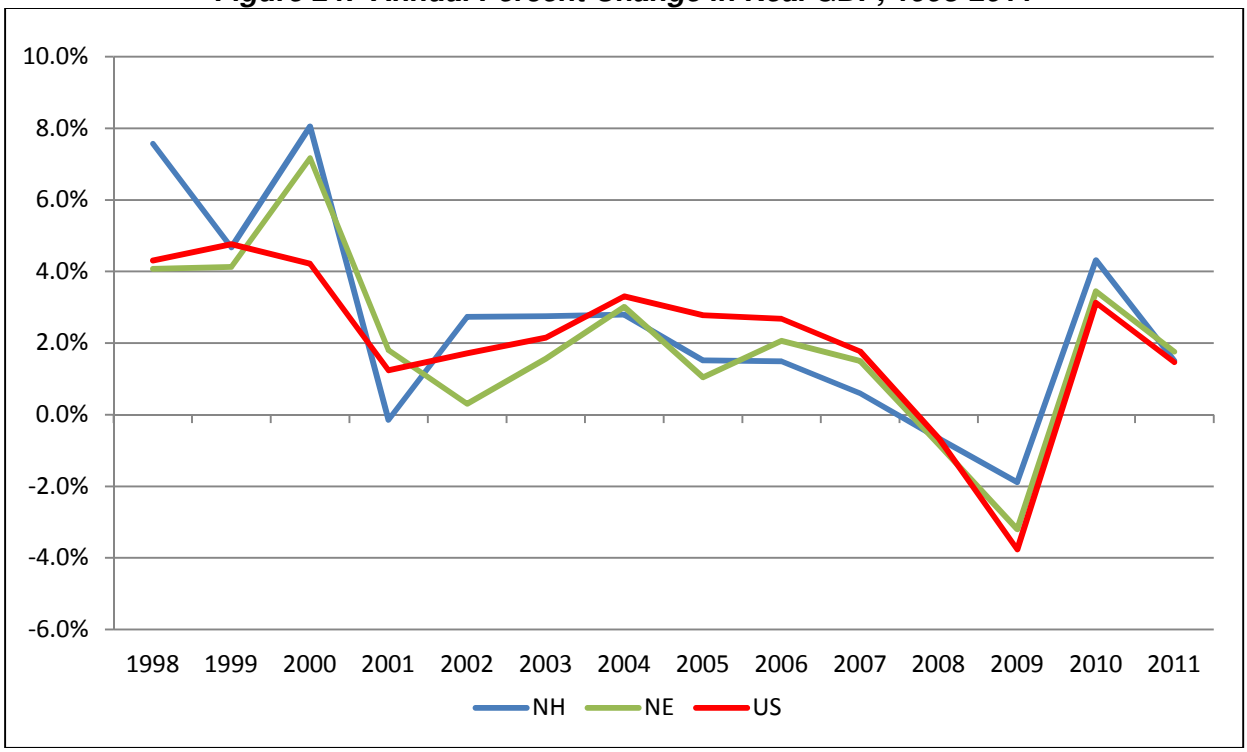
This section discusses historical and forecasted economic conditions for the state of New Hampshire, including population and employment trends, income, housing, tourism, commuter trends, and the age of the population.

7.3.1 The New Hampshire Economy

Changes in economic growth in New Hampshire and in the New England region have largely mirrored the U.S. as a whole. The economic downturn in early 2001 impacted the state's economy more severely and for a longer duration compared to the rest of the U.S. In the years between recessions, economic output in New Hampshire increased by an average of 2 percent from 2002 to 2007. Real GSP (Gross State Product in 2005$) decreased by 0.7 percent in 2008 and 1.9 percent in 2009. Economic activity began to recover in 2010, outpacing the New England region and the rest of the U.S. Real GSP increased by 4.3 percent in 2010 and 1.5

percent in 2011. Figure 24 compares the changes in GDP among New Hampshire, New England, and the entire U.S.

Figure 24: Annual Percent Change in Real GDP, 1998-2011

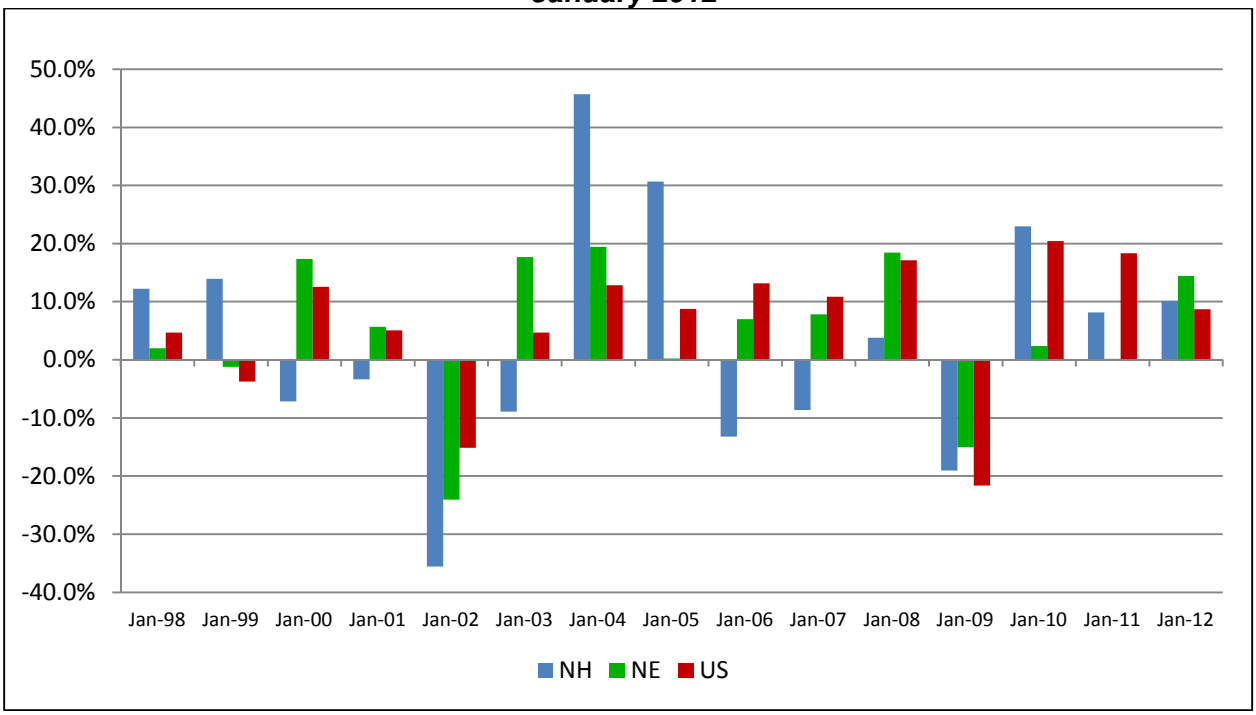


Source: U.S. Bureau of Economic Analysis, U.S. Department of Commerce

Leading sectors of New Hampshire's economy include finance, insurance, and real estate (25 percent of real GSP), manufacturing (17 percent), wholesale and retail trade (16 percent), health care (10 percent), government (10 percent) professional and management services (9 percent), and information services (4 percent). These sectors account for over 90 percent of New Hampshire's economy. Manufactured goods produced in New Hampshire include computer and electronic components, appliance and electrical components, paper products, fabricated metal products, machinery, chemicals and chemical products, textiles, and food products.

Because industrial production data at the state level is not readily available, manufacturing exports produced in New Hampshire and in the New England region were used as a proxy. Manufacturing activity in New Hampshire generally follows regional and national patterns as Figure 25 shows. Manufacturing exports from New Hampshire declined in 2006 and 2007 prior to the recent recession. Consequently, manufacturing employment decreased by an average annual rate of 3.2 percent from 2006 to 2011. Manufacturing exports from New Hampshire increased slightly in 2008 before decreasing by 19.0 percent during 2009. However, the value of year-to-year manufacturing exports has recovered, increasing by 23.0 percent, 8.2 percent, and 10.1 percent in 2009, 2010, and 2011, respectively. In its May 2012 forecast, the New England Economic Partnership (NEEP) forecasted that manufacturing employment is expected to increase by an annual average growth rate of 0.4 percent per year through 2016.

Figure 25: Year-to-Year Percent Change in Manufacturing Exports, January 1998-January 2012



Source: U.S. Federal Reserve Bank of Boston

Another important trend in recent years has been the modest in-flow migration of residents with relatively high levels of educational attainment, driving growth and employment in the hi-tech manufacturing and health care industries. In 2009, the New Hampshire Center for Public Policy studies found that hi-tech manufacturing accounted for 19 percent of wages in the state. Hi-tech manufacturing has historically been clustered in the Seacoast area (including Portsmouth) and near Dartmouth University, but is also starting to take hold in Cheshire and Hillsborough counties. Additionally, the Seacoast and Dartmouth College areas are also major centers for biomedical research. Another important sector of the state's economy is tourism, as New Hampshire attracts visitors from neighboring states and Canada throughout the year. New Hampshire is a popular location for second homes, which can increase the level of seasonal employment.

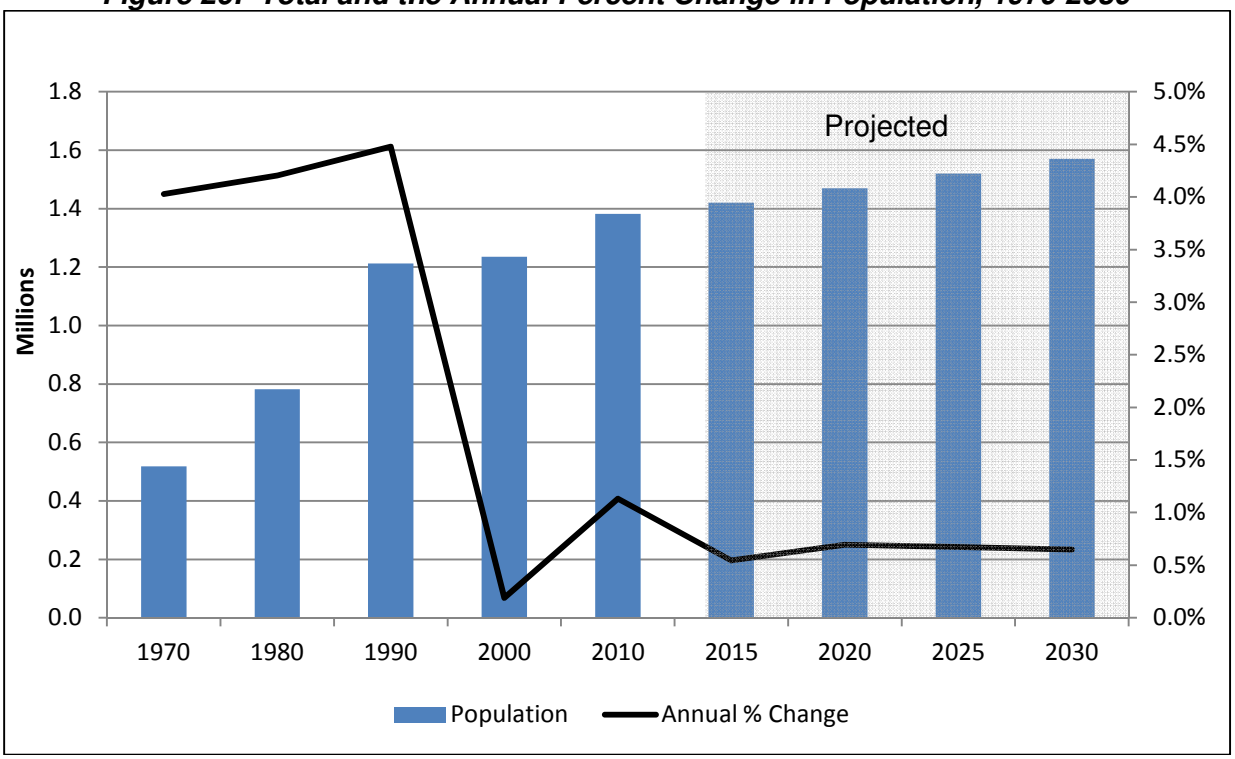
The short-term economic outlook for New Hampshire is for stronger economic growth relative to the U.S., as a whole. Forecasts for real GSP prepared by the New England Economic Partnership (NEEP) in May 2012 estimate that statewide GSP will increase by an annual average rate of 3.4 percent per annum from 2012 to 2016. Additionally, NEEP forecasts that real economic output will increase by 2.8 percent per annum for the New England region. A review of statewide trends relating to population, employment, income, commuting patterns, and tourism activity are described in greater detail in the subsequent paragraphs.

7.3.2 Population

From 1970 to 1990, total population in New Hampshire increased from 512,000 residents to 1,212,000, representing an average annual increase of 4.3 percent or 35,000 new residents per year. From 1990 to 2010, population increased by average of 0.1 percent per year, adding roughly 9,000 residents each year. Historically, population growth has been driven by in-state

migration to New Hampshire from neighboring states, particularly Massachusetts. During the 1990s and the 2000s, in-state migration slowed, while out-of-state migration, (e.g. to Sunbelt states) increased. Population forecasts developed by the New Hampshire Office of Energy and Planning (OEP) and Garth Fletcher estimate that the State's total population will increase to 1,570,000 by 2030, representing an annual average growth rate of 0.5 percent/annum. Based on this forecast, it is estimated that the New Hampshire will add an average of 9,400 residents each year. Historic and future projected population growth is presented in Figure 26.

Figure 26: Total and the Annual Percent Change in Population, 1970-2030



Sources: U.S. Census Bureau, New Hampshire Office Energy and Planning, and Garth Fletcher

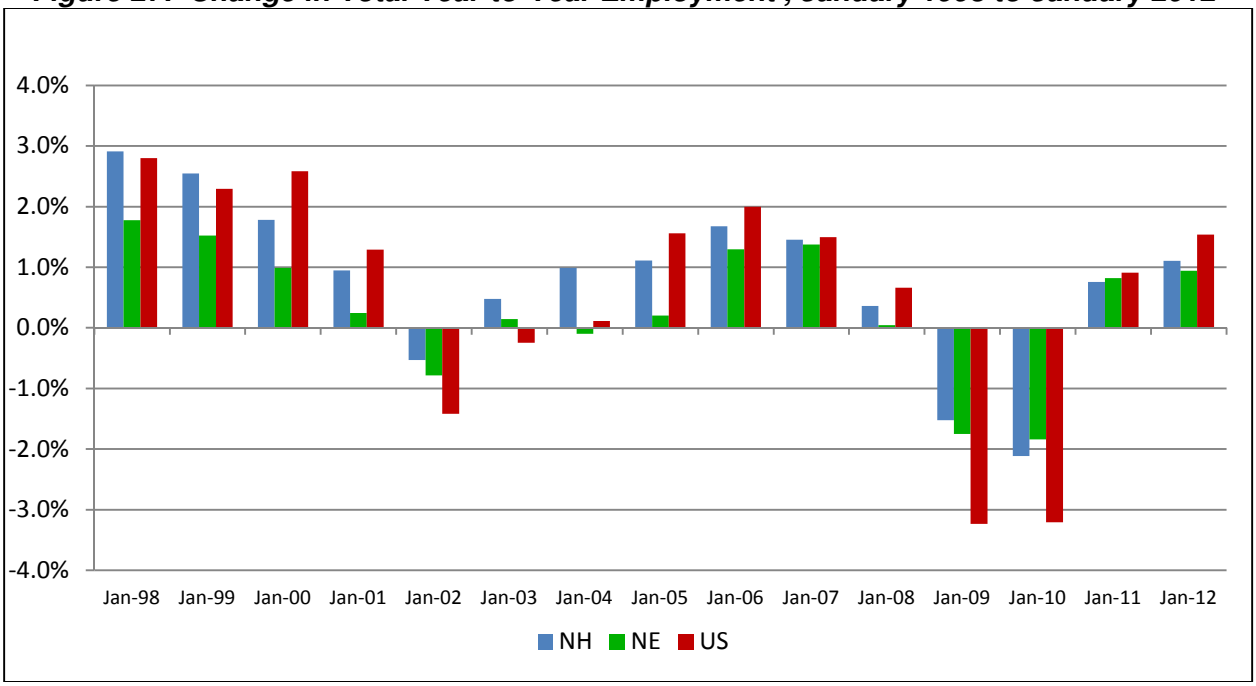
7.3.3 Employment

Population growth and national economic conditions have had a strong influence on employment levels in New Hampshire. Total employment increased by an average annual growth rate of 1.0 percent from 1992 to 2012. This overall growth rate factors in the impact of the early 1990s recession and recovery, the dotcom boom and bust, the events of 9/11, the 2007-09 recession, and the subsequent slow recovery period. Total statewide employment increased by approximately 151,000 jobs from 1992 to 2008, representing an average growth rate of 1.2 percent. During this period, employment growth in New Hampshire outpaced that of the New England region, which recorded an average annual growth rate of 0.7 percent. Nationally, total employment increased by annual average rate of 1.4 percent during this period.

Mirroring national conditions, total employment in New Hampshire decreased by 25,000 jobs from 2008 to 2010. Employment levels decreased at commensurate levels throughout New England with a 1.8 percent decrease in total employment in both 2008 and 2009, resulting in a reduction of roughly 260,000 jobs. Total employment in the State and in the region began to recover in 2010 with approximately 13,000 new jobs added in New Hampshire from January 2010 to May 2012. In percentage terms, total employment in the State increased by 0.8 percent

in 2010 and 1.1 percent in 2011. Figure 27 compares the year-to-year employment growth among New Hampshire, New England, and the U.S. as a whole.

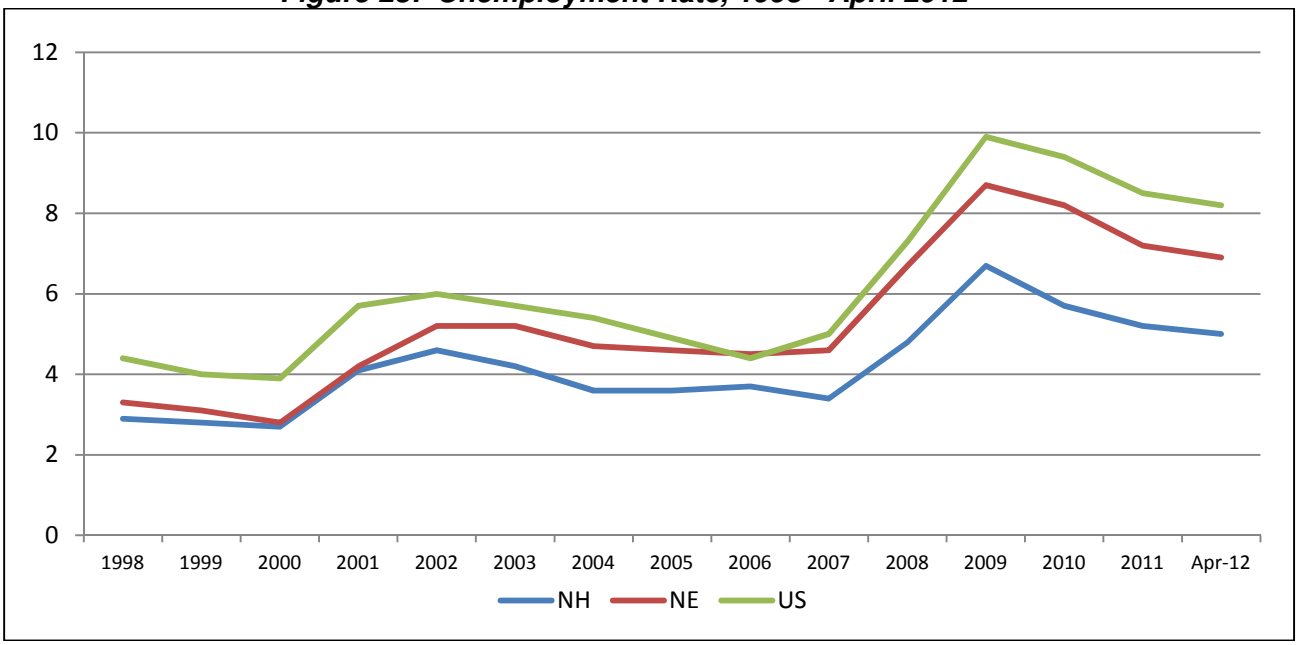
Figure 27: Change in Total Year-to-Year Employment , January 1998 to January 2012



Sources: Bureau of Labor Statistics, U.S. Department of Labor

Despite tracking closely with national trends, the statewide and regional unemployment rates have remained below the national average. In the months leading up to the recent recession, the unemployment rate in New Hampshire was 3.4 percent, which was below the regional rate of 4.6 percent and the national rate of 5.0 percent. In 2009, the statewide and regional unemployment rates peaked at 6.7 percent and 8.7 percent, respectively. Since then, unemployment levels in New Hampshire and in the region have decreased steadily. As of April 2012, the statewide unemployment rate was 5.0 percent, the regional rate was 6.9 percent, and the national rate was 8.2 percent. Comparisons are shown in Figure 28.

Figure 28: Unemployment Rate, 1998 - April 2012



Source: Bureau of Labor Statistics (BLS), U.S. Department of Labor

In 2011, the trade, transportation, and utility sectors accounted for 21 percent of total employment in the State. The next largest sectors for employment were health and education (18 percent of total employment), government (15 percent), professional and management services (11 percent), and manufacturing (11 percent). Although comprising a relatively small percentage of total employment, the construction sector was especially impacted by the recent recession. After declining by an average annual rate of 5.7 percent from 2006 to 2011, construction employment is expected to rebound due to a forecasted increase in new housing permits—from 2,200 permits per year to the historical average of 6,000 permits per year. Professional and health care services are also expected to increase in the short term.

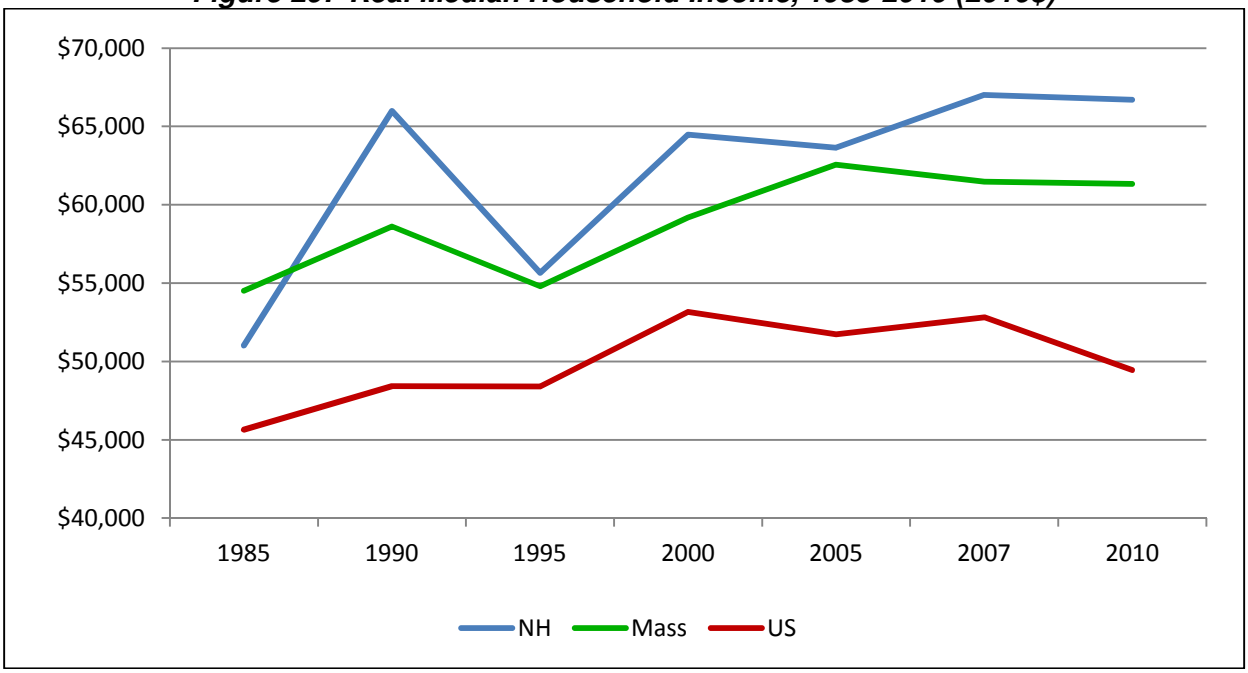
Recent projections published by the New England Economic Partnership (NEEP) in May 2012 anticipate that total employment in New Hampshire will increase by 1.6 percent annum from 2012 to 2016. Regionally, NEEP forecasts that employment will increase by 1.2 percent per year during this period. The Economic and Labor Market Information Bureau within the New Hampshire Employment Security (NHES) office predicts that employment growth will be concentrated in the service sectors. Professional, scientific and technical services, health care services, educational services, and wholesale trade are expected to increase during forecast period. Outside of the services sector, the construction is expected to rebound with an increase of 4,200 jobs. However, manufacturing employment is expected to decrease by roughly 4,000 jobs.

7.3.4 Income

New Hampshire consistently ranks relatively high in the United States in terms of income. In 2010, New Hampshire ranked first with a median household income with $66,707. In real terms, median household income increased by an average annual rate of 1.1 percent from 1985 to 2010. This growth rate takes into account the decline in real household income at the state level during the mid-1990s as well as national economic trends. The annual change in median household income in New Hampshire exceeded neighboring Massachusetts (0.5

percent/annum) and the United States as a whole (0.3 percent/annum) during this period. Real household income has declined in New Hampshire since the onset of the recent recession. Nationally, real median household income has decreased steadily since 2000. Figure 29 compares New Hampshire real median household income to Massachusetts and the entire U.S.

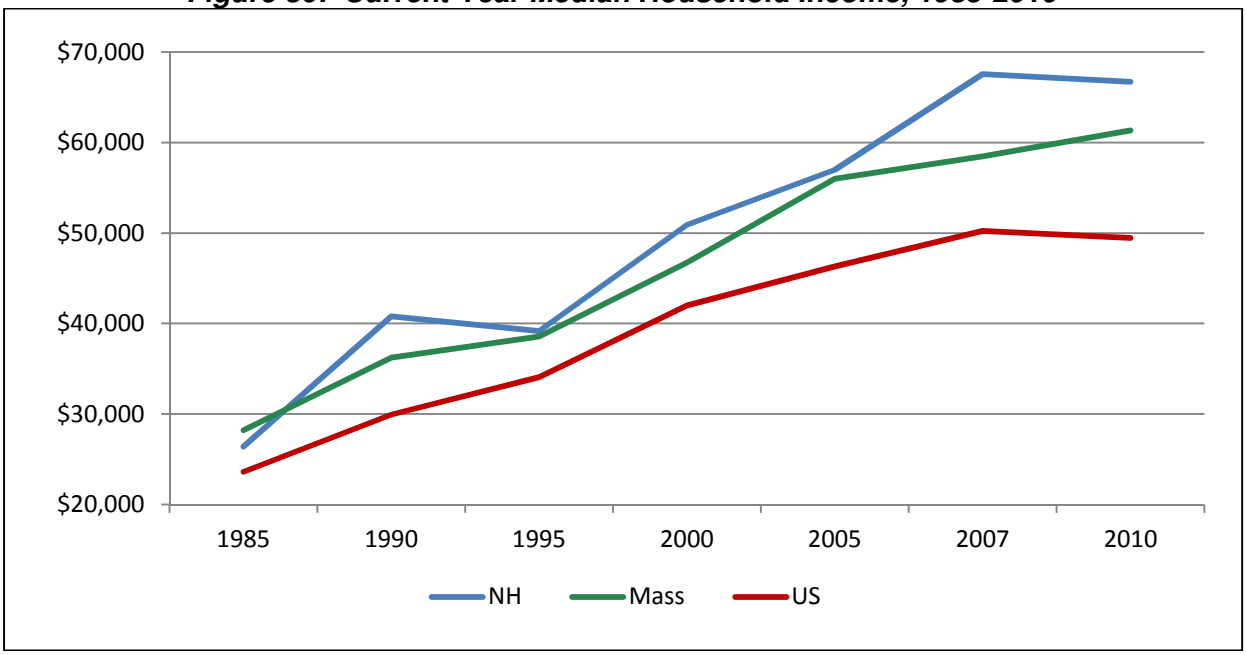
Figure 29: Real Median Household Income, 1985-2010 (2010$)



Source: U.S. Census Bureau

In current year (i.e., nominal) dollars, median household income in New Hampshire increased by 3.8 percent per year from 1985 to 2010, which also exceeded that of nearby states and the national average. During this period, median household income in Massachusetts and in the U.S. increased by 3.2 percent and 3.0 percent per annum, respectively. Since the start of the recent recession, median household income in current year dollars decreased slightly in New Hampshire and in the United States, but increased somewhat in Massachusetts. Figure 30 compares New Hampshire household income in current year dollars to that of Massachusetts and the entire U.S.

Figure 30: Current Year Median Household Income, 1985-2010



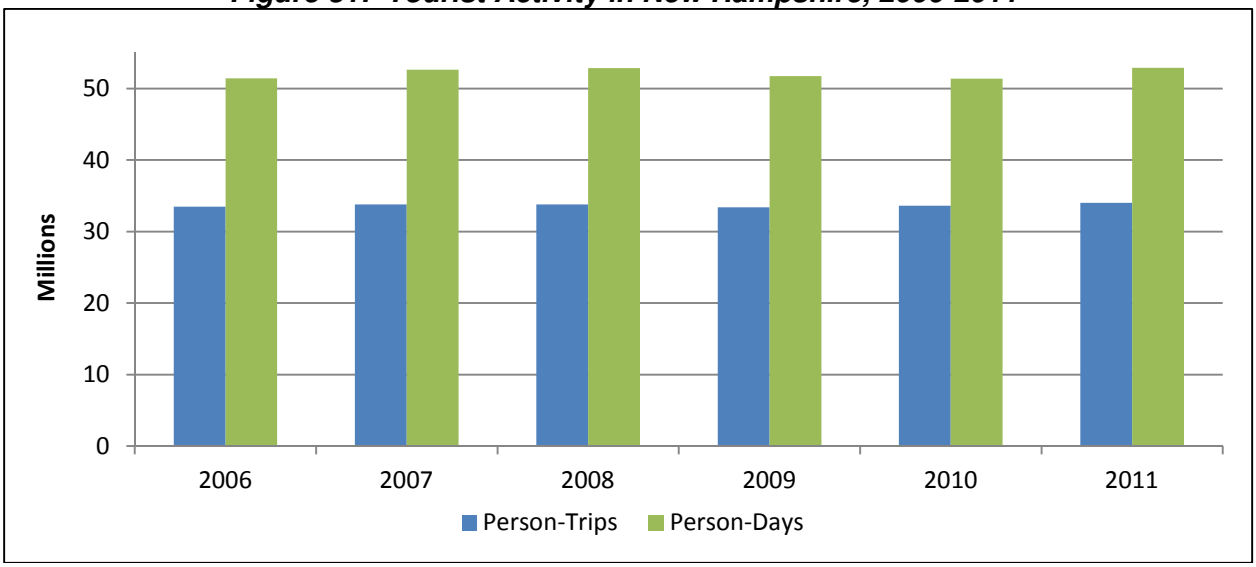
Source: U.S. Census Bureau

7.3.5 Travel and Tourism

According to the state's Division of Travel and Tourism Development, New Hampshire ranks as one of the top ten states with respect to the importance of tourism to the state economy. Visitors to New Hampshire were far more likely to be on a leisure trip, rather than on a business trip. Tourism is driven, in large part, by outdoor seasonal attractions, such as skiing during winter months. There are also periodic attractions, such as NASCAR races and Bike Week. Tourism levels are generally affected by prevailing economic conditions, fuel and travel costs, and weather conditions. Because New Hampshire has no sales tax, many residents from neighboring states often travel to New Hampshire for retail shopping; the newly-opened Merrimack Premium Outlets is attracting shoppers from nearby Massachusetts. The increase in the Canadian dollar relative to the US dollar also led to an increase in visitors from Canada.

The most recent recession had a moderate impact on tourist activity in New Hampshire, as seen in Figure 31. During FY09, there was a 1.2 percent decrease in the person-trips and 2.1 percent decrease in person-days. The number of person trips rebounded in FY10, while the number person-days continued to decline. This is indicative of shorter stays and reduced tourist spending as a result of weakened economic conditions. During FY11, there were 34.0 million trips, an increase of 1.2 percent from the previous year. Person-days also began to recover in FY11, increasing by 2.9 percent during the previous year. The seasonal breakdown in FY 11 was the following: summer, 39.5 percent of total visitor days; fall, 22.7 percent; winter, 18.4 percent; and spring, 19.3 percent.

Figure 31: Tourist Activity in New Hampshire, 2006-2011



Sources: New Hampshire Division of Travel and Tourism Development and Institute of New Hampshire Studies at the Plymouth State University

7.3.6 Commuting Trends

The Bedford mainline toll plaza and the three ramp toll plazas are located in Hillsborough County, while the Hooksett toll plazas are located in Merrimack County. The Hampton Main and Hampton Ramp toll plazas are located in Rockingham County, while the Dover and Rochester toll plazas are located in Strafford County. These areas have experienced a noticeable change in commuting trends, as shown in Table 10. Average commuting time in New Hampshire increased from 21.5 minutes in 1990 to 25.5 minutes in 2010. At the county level, there was a marked increase in average commuting time in most New Hampshire counties. From 1990 to 2000, there was also marked increase in the percentage of commuters that drove alone, especially in Hillsborough and Rockingham counties. Statewide, the percentage of commuters that drove alone was 81 percent in 2010.

Table 10: New Hampshire Commuting Trends by County

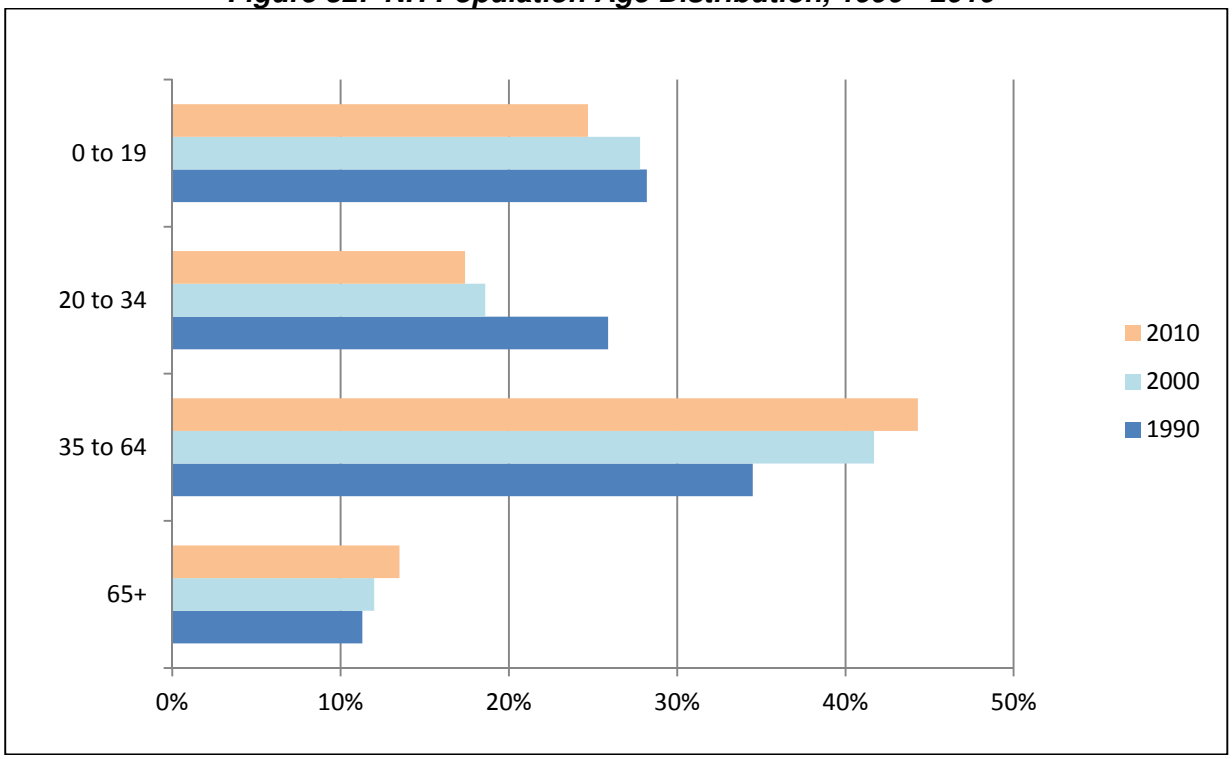
NH County	1990		2000		2010	
	% Drive Alone	Travel Time	% Drive Alone	Travel Time	% Drive Alone	Travel Time
Belknap	80	20.5	80	24.8	83	24.4
Carroll	77	19.6	80	26.0	81	24.9
Cheshire	80	18.1	80	22.3	77	21.4
Coos	70	14.5	80	19.3	78	22.0
Grafton	70	17.1	70	21.3	74	20.8
Hillsborough	66	22.5	83	25.5	82	25.6
Merrimack	N/A	21.5	81	24.3	83	25.0
Rockingham	67	25.5	85	28.6	81	28.8
Strafford	79	21.5	80	24.1	78	25.1
Sullivan	N/A	18.9	N/A	23.2	79	24.3
New Hampshire	N/A	21.5	81	25.3	81	25.5

Sources: U.S. Census Bureau and the New Hampshire Employment Security (NHES) office

7.3.7 Age of the Population

Similar to national trends, the median age of the population in New Hampshire is aging, albeit at a faster rate. In 1990, the median age in New Hampshire was 32.8 years, increasing to 37.1 years in 2000. By the 2010 Census, New Hampshire had a median age of 41.1 years, making it 4th oldest state in the U.S. behind Maine (42.7 years), Vermont (41.5 years), and West Virginia (41.3 years). Florida, which is typically associated with having a high elderly population, had a median age of 40.7 years. Figure 32 shows the proportion of New Hampshire population in each of the four main age groups for the years 1990, 2000 and 2010. The 0-19 age group has declined from 28 percent of the total population in 1990 to 25 percent in 2010. More dramatically, the 20-34 age group has decreased from 26 percent in 1990 to 17 percent in 2010. During this period, the 35-64 age group has increased from 35 percent to 44 percent and 65+ age group has increased from 11 percent to 14 percent from 1990 to 2010.

Figure 32: NH Population Age Distribution, 1990 - 2010



Sources: U.S. Census Bureau and the Southern New Hampshire Planning Commission

7.4 HISTORICAL TRAFFIC AND ECONOMIC RECESSIONS

The recent recession in the United States lasted from December 2007 to June 2009. This recession is reflected in all transportation and economic indicators, but is seen most clearly in the number of vehicle-miles traveled (VMT) on highways. This is explicitly visible in Figure 16, (shown earlier on page 34), which shows the flattening of the VMT curve around 2005 with a significant drop in 2008. Though the recession has officially been declared over in 2009, the U.S. remains in a state of flat economic growth, which has been reflected in the flat VMT over the past three years.

Jacobs has analyzed the current economic situation as it compares to major historical recessions in the past century. The most significant declines in historical VMT during the past half-century were at three (3) points in time: during the 1970s and 1980s oil crises and in the early 1990s during the Gulf War. In 2006 and 2007, VMT remained nearly the same as late 2005 levels, peaking slightly in November 2007, and by March 2008 it began to decline. By early 2009 traffic was 2.3 percent below the previous year's, and by late summer of 2009 some improvement was seen; September 2009 numbers were down just 0.9 percent from the previous year. As stated previously, some of this improvement may be due to the large reduction in gas prices from the summer of 2008 to the summer of 2009. The year-over-year VMT continued to decline until October 2010, with slight increases thereafter through May 2011. Since then, VMT has begun another slow decline. The low levels of VMT in April 2012 have not been seen since 2004.

December 2007 officially marked the beginning of the most recent economic recession, herein

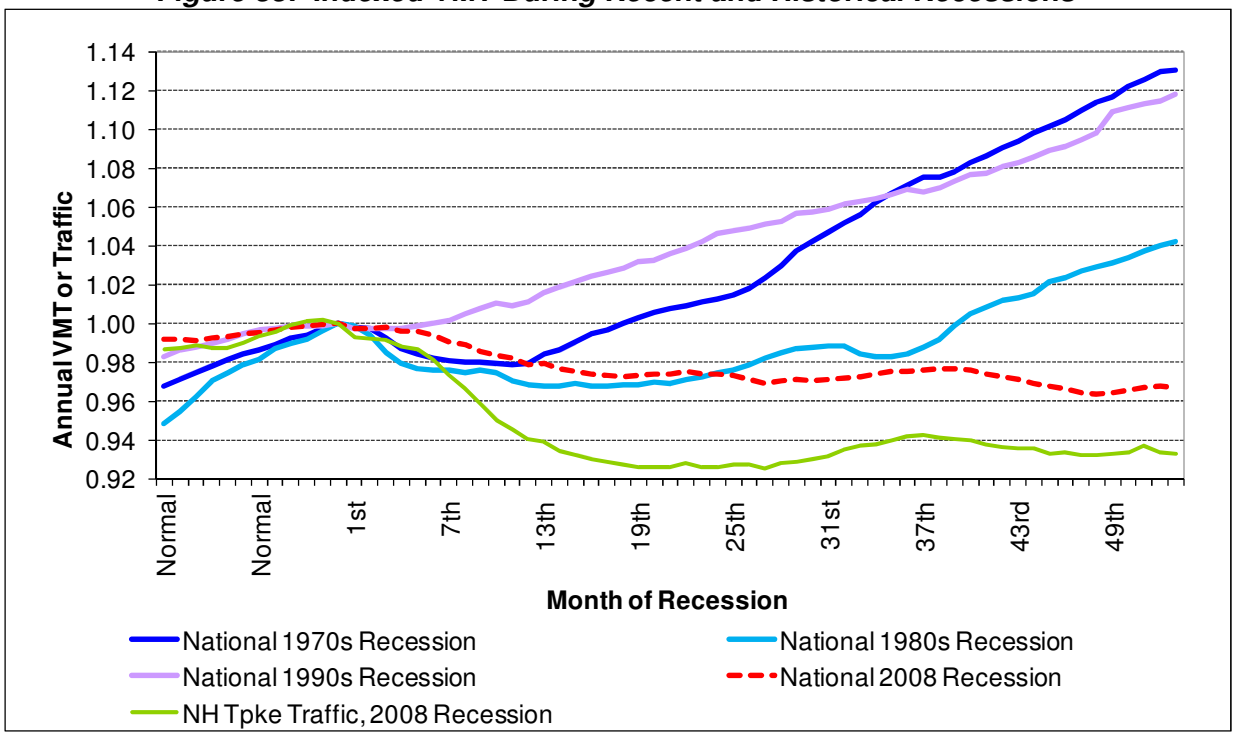
referred to as the "2008 recession". The 2008 recession VMT is illustrated as the dashed trend line in Figure 33 and Figure 34, which was indexed from November 2007. The New Hampshire monthly transactions, based on an average of the previous twelve months to remove seasonality, have also been indexed to November 2007; these are represented by the thin green line in the charts. New Hampshire transactions have historically followed national VMT trends, however, due to the overlap of the October 2007 toll increase and the onset of the recent economic recession, the graphs illustrate that New Hampshire has seen a deeper dive in Turnpike traffic than the national VMT trends over the first year or so after the toll increase. After this point, NH transactions followed national VMT trends.

7.4.1 Comparative Recession Analysis

Jacobs reviewed traffic characteristics exhibited during past economic recessions to the most recent recession on a national level. The purpose of these comparisons is to develop additional guidance in forecasting future traffic growth trends as the economy improves. We have selected the recessions of the 1970s, 1980s and 1990s for comparison purposes. Other recessions like that of 2001/2002 were much smaller in duration and magnitude than the current recession and were not included in the analysis. The three (3) recessionary periods were indexed based on their respective peak points so that they could be compared against the VMT during and after the most recent recession.

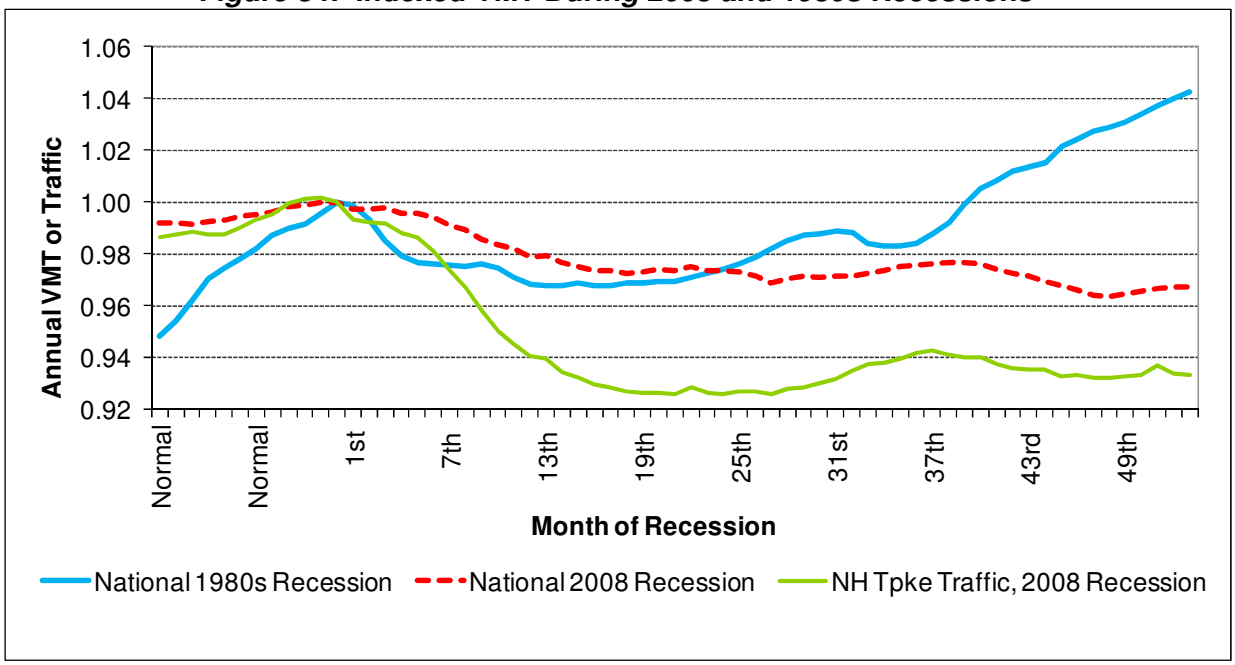
Figure 33 is a plot of traffic indexed to the first month of the four most recent significant national recessions. National traffic is based on VMT at the national level. The trend of the recent recession most closely matches that of the 1980's recession.

Figure 33: Indexed VMT During Recent and Historical Recessions



Examining traffic trends from the early 1980s recession, shown in Figure 34, it can be seen that traffic in the 1980s began its final recovery after about 36 months. The period of recent economic weakness (2008 recession), represented by the dotted line, indicates a significantly longer recovery period for VMT than during the early 1980s recession, as it has been more than 53 months without apparent signs of recovery.

Figure 34: Indexed VMT During 2008 and 1980s Recessions



7.4.2 NH Forecasted Traffic and Its Relationship to Economic Recessions

There is still a great deal of uncertainty in the direction that the current economy is heading. While almost three years 'officially' out of the recession, the economy continues to lag expectations, with recent continual downgrading of expected GDP growth in the near term. In fact, in a consensus of economic opinions from *Blue Chip Economic Indicators*, a clearinghouse of over 50 economic forecasting entities, it is now anticipated that the GDP growth for 2012 to be 2.1 percent and for 2013 to be 2.4 percent, lower than what had been forecasted during the previous several months. Additionally, unemployment rates continue to come in at or over those projected by a majority of economists, with little to no betterment forecast for the remainder of 2012 or into 2013.

Concerning VMT, examining traffic trends during and after the 1970's, 1980's, and 1990's recessions, it can be seen that traffic began its final recovery between 20 and 36 months after the beginning of each respective recession. The current period of recent economic weakness (the 2008 recession), indicates that even after more than 50 months, that there still has been no turnaround to positive VMT growth. In fact, current VMT levels are at the same level as in 2004.

Therefore, while the economy is, by definition, in recovery, it is important to understand the slowness of this recovery and its impact on traffic. This continued recovery has been so-far jobless, with slow GDP growth, and with very delayed VMT growth.

8 TRANSPORTATION PROJECTS RELATIVE TO THE NH TURNPIKE SYSTEM

This section identifies the existing feeder and competitive (diversionary) roads to the New Hampshire Turnpike System and includes future transportation projects slated for New Hampshire that may affect traffic on the System.

8.1 FEEDER ROADS

Several roadways direct traffic, or feed, into the Turnpike System. The classification of these roadways varies from interstate highways to arterials and collectors. Some of the feeder roads to the Central Turnpike are:

- US Route 3 from Massachusetts
- I-93
- I-293
- I-89
- NH Route 101A
- NH Route 130
- NH Route 111
- Somerset Parkway
- Industrial Drive
- Continental Boulevard
- Bedford Road
- East Dunstable Road
- Manchester Airport Access Road (Raymond Wieczorek Drive)

For the Blue Star Highway, some of the feeder roads are:

- I-95 from Massachusetts
- I-95 from Maine
- NH Route 107
- NH Route 101
- NH Route 33
- Spaulding Turnpike
- Market Street

For the Spaulding Turnpike, some of the feeder roads are:

- I-95, the Blue Star Highway
- US Route 4
- NH Route 108
- NH Route 55
- NH Route 125
- US Route 202
- NH Route 11

8.2 COMPETITIVE ROADS

Several roadways compete with the Turnpike System, varying from arterials to collectors. We identified the following parallel routes as the most likely free alternatives for each New Hampshire Turnpike segment:

- Central Turnpike – US Route 3 / NH 3A
- Spaulding Turnpike – Dover Point Rd / NH 9 / NH 108
- Blue Star Turnpike – US Route 1

8.2.1 Central Turnpike Parallel Routes - US Route 3 and NH 3A

US Route 3 and NH 3A are parallel routes to the Central Turnpike (see Figure 35). From Nashua, US Route 3 is located west of the Merrimack River until it crosses the river via the Queen City Bridge in Manchester. US Route 3 then continues north along the east side of the river, cutting through downtown Manchester until the route crosses the river again in Concord to run through downtown Concord. NH 3A follows the Merrimack River along the eastern side from Massachusetts and joins I-293 at Exit 2 in Manchester where it crosses the river and continues north along I-293 until it diverges from I-293 at Exit 7. NH 3A then continues north along the west side of the river to Concord where it converges with US Route 3 when US Route 3 crosses back over from the Merrimack River.

The areas of congestion along US Route 3 are generally focused around Webster Street / Elm Street in downtown Manchester to the Budweiser Plant located in Merrimack (FEE Turnpike Exit 10, Merrimack Industrial). An alternative route to US Route 3 to bypass Manchester would be to take I-93 Exit 9 from the north to I-293 southbound and reconnect with US Route 3 at Exit 3.

US Route 3 intersects four times with the Central Turnpike along the route. The four turnpike exit interchanges are:

- Exit 13 – I-93 / FEE Turnpike in Concord
- Exit 4 – I-293 / FEE Turnpike in Manchester
- Exit 3 – I-293 / US Route 3 / NH 3A Interchange
- Exit 7 –FEE Turnpike / NH101A / US Route 3 split in Nashua

NH 3A intersects with the Central Turnpike along these turnpike junctions:

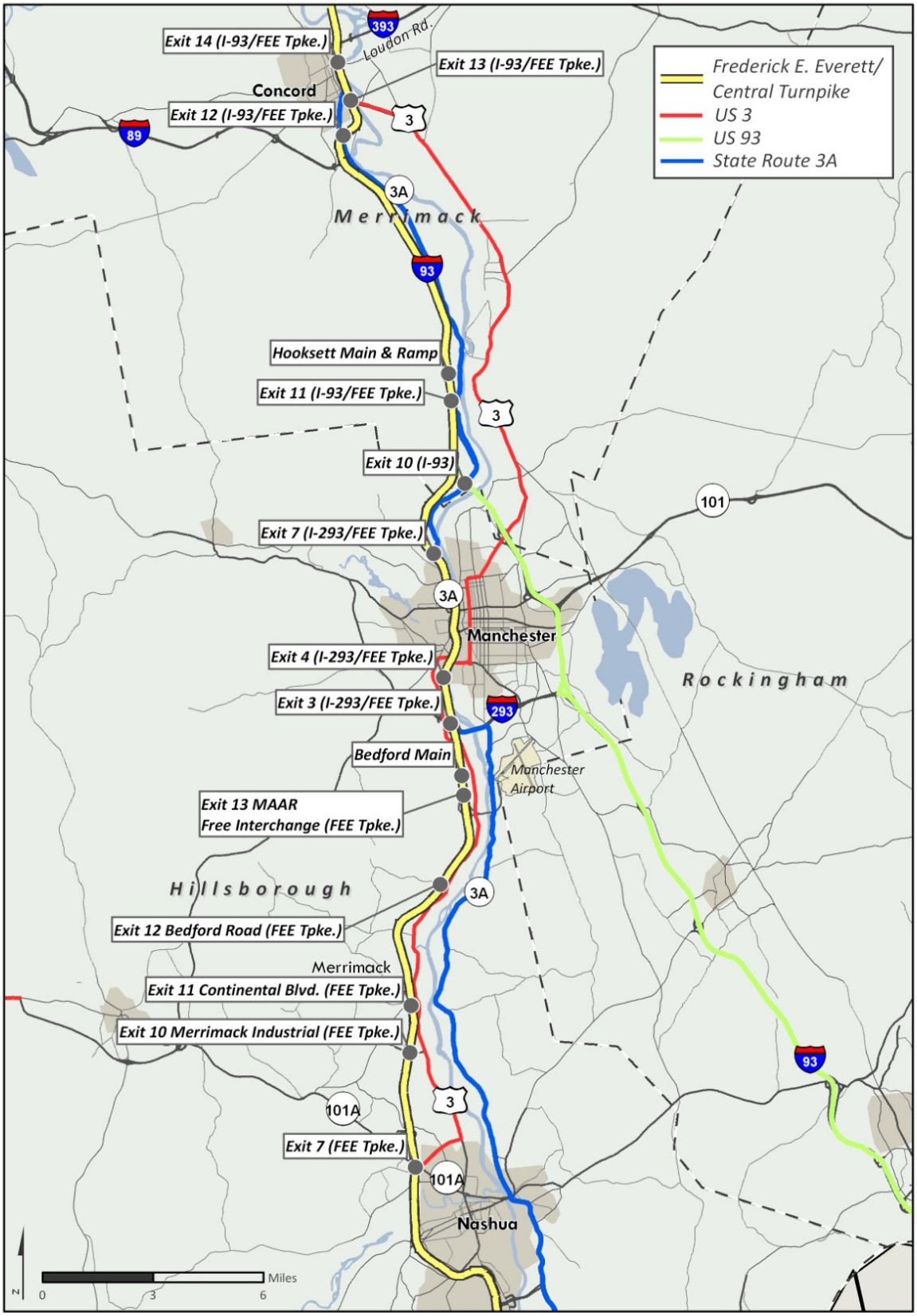
- Exit 12 – I-93 / FEE Turnpike in Concord
- Exit 11 – FEE Turnpike in Hooksett (Hooksett Ramp Toll Plaza)
- Exit 7 (NB Exit only) – I-293 / FEE Turnpike in Manchester
- Exit 3 – I-293 / US Route 3 / NH 3A Interchange

NH 3A intersects I-93 at Exit 10, which is just south of the I-93 junction with the FEE Turnpike.

US Route 3 runs parallel to the Central Turnpike from Nashua to Manchester and drivers going to or from Merrimack can use this alternate route to avoid the Merrimack ramp toll plazas (Merrimack Industrial, Exit 11 and Bedford Road). Drivers traveling on the Central Turnpike can avoid the Bedford Toll Plaza by using the recently built Manchester Airport Access Road (Raymond Wieczorek Drive, FEE Turnpike Exit 13). Drivers can easily take this exit (from both northbound and southbound directions), make a series of short turns, and re-enter the Turnpike, thus bypassing the Bedford Toll Plaza.

NH 3A runs parallel to the Central Turnpike and is an alternate route that can be taken to avoid the Hooksett Toll Plaza. The Central Turnpike is toll free between Exit 3 (FEE Turnpike junction with I-293) in Bedford and Exit 10 (FEE Turnpike junction with I-93) just north of Manchester. NH 3A connects to the Turnpike at Exit 11 in Hooksett, at Hackett Hill Road where the Hooksett Ramp Toll Plaza is situated as well as at Exit 12 in Concord.

Figure 35: Central Turnpike and Parallel Routes



A longer alternate route to the Central Turnpike would be a composite route consisting of the US Route 3 and NH 3A routes from the state line to Concord. Though toll-free, the US Route 3 / NH 3A option is a slower, more congested route than the Central Turnpike, with numerous signalized intersections.

A driver traveling between Exit 3 (FEE Turnpike at I-293) in Manchester and Exit 7 (FEE Turnpike at NH 101A / US Route 3) in the north Nashua area would take approximately 11 minutes on the Central Turnpike versus about 26 minutes on the parallel US Route 3.

In the Concord area, a driver traveling between Exit 14 (FEE Turnpike at Loudon Road) and Exit 10 (FEE Turnpike at I-93) on the Central Turnpike would take approximately 11 minutes whereas it would take about twice as long to make the trip on the parallel NH 3A (approximately 22 minutes).

Travel times runs were conducted to estimate the length of time it would take for a driver to bypass the Bedford Toll Plaza by using the Manchester Airport Access Road. Results show that this total movement would add approximately 3 to 4 minutes to the total travel time on the Central Turnpike. It takes less time to make this diversion when traveling northbound compared to traveling southbound.

8.2.2 Spaulding Turnpike Parallel Routes - Dover Point Rd / NH 9 / NH 108

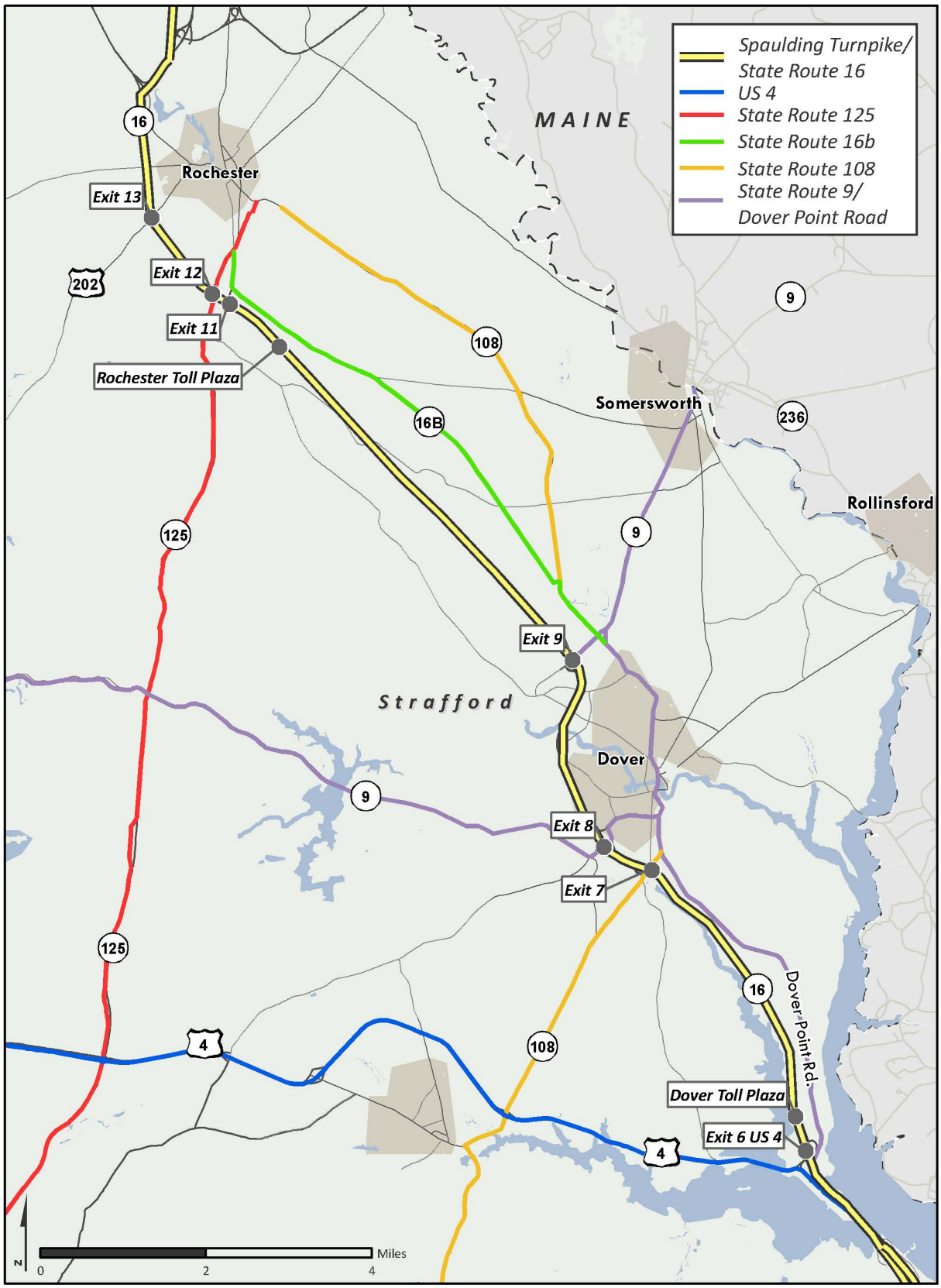
The combination of Dover Point Road, NH 9, and NH 108 make up a parallel route that can be used as an alternative to taking the Spaulding Turnpike (see Figure 36). Dover Point Road runs parallel with Spaulding Turnpike (NH 16) beginning just south of Exit 6 and ending at NH 108 in downtown Dover, where Exit 7 also intersects with NH 108. The Dover Mainline Toll Plaza is located between Exits 6 and Exit 7. The travel route path similarity to the Dover Toll Segment makes Dover Point Road a viable alternate route to bypass the toll plaza.

Travel time run comparisons in the Dover area between Exit 6 and Exit 8 showed that vehicles that use Dover Point Road would take approximately 2.5 to 3.5 minutes longer than if they used the Spaulding Turnpike (8.5 minutes on Dover Point Road versus 5 to 6 minutes on the Turnpike).

NH 108 traverses through downtown Dover and joins with NH 9, which leads to Spaulding Turnpike Exit 8. The two routes share the same travel path until they intersect with NH 16A and the Spaulding Turnpike at Exit 9. NH 108 continues to travel at a parallel path with the Rochester Toll Segment while NH 9 diverts away. NH 108, a major arterial through route in the region, runs along Rochester Hill Road and connects Dover with Rochester.

Travel time run comparisons in the Rochester area between Exit 8 and Exit 12 showed that vehicles that use the combined NH 9 / NH 108 route would take more than double the time than if they used the Spaulding Turnpike (21 to 22 minutes on NH 9 / NH 108 versus 8 to 9 minutes on the Turnpike).

Figure 36: Spaulding Turnpike and Parallel Routes



8.2.3 Blue Star Turnpike Parallel Route - US Route 1

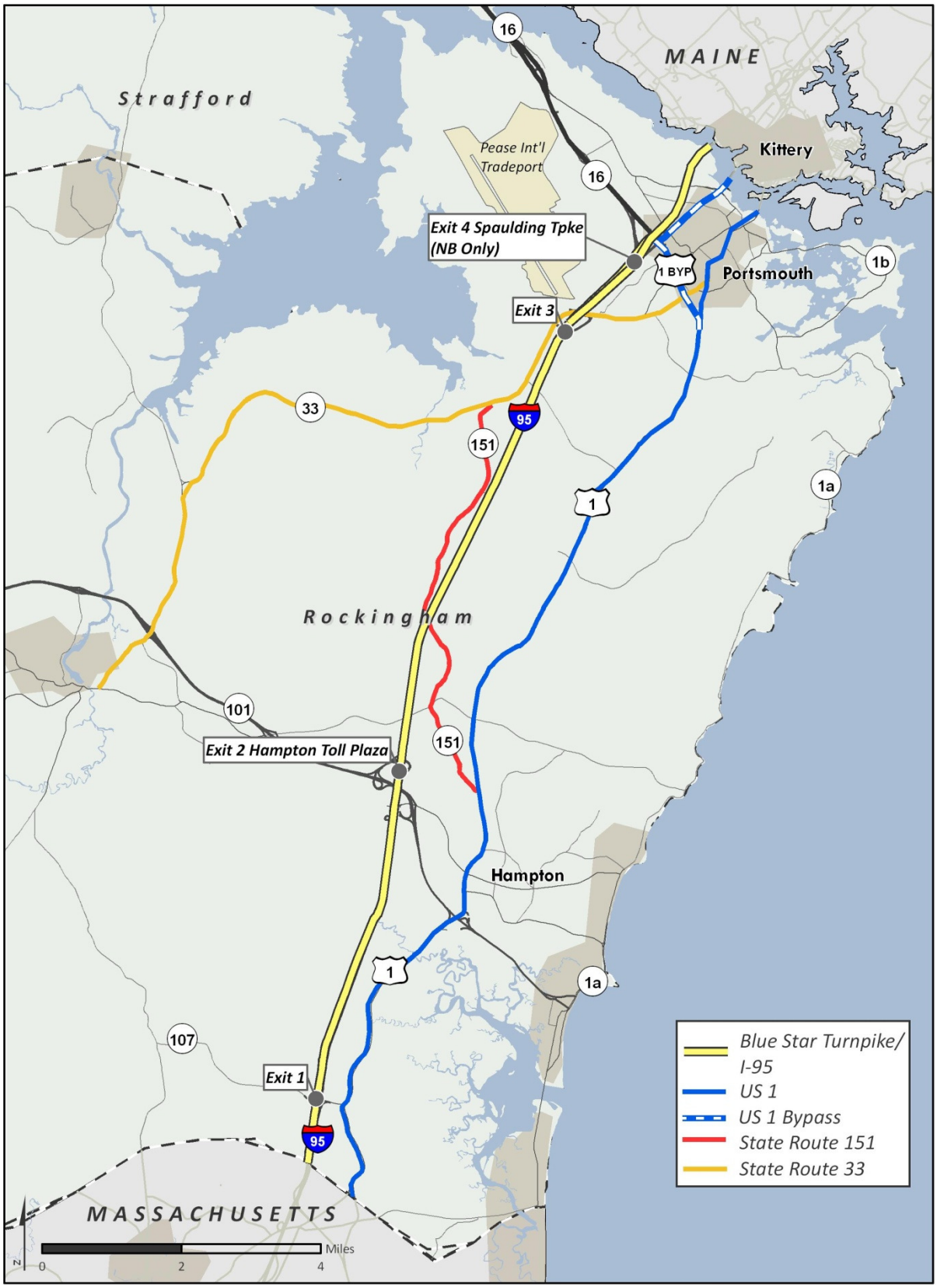
The best alternate route to the Blue Star Turnpike is US Route 1. Like US Route 3 in Merrimack, US Route 1 was the only major north-south arterial before the Turnpike was built. US Route 1 is the only accessible route that allows a bypass of the Hampton Toll Plaza (Exit 2) from Massachusetts (see Figure 37). Starting at Blue Star Turnpike Exit 1 Junction, US Route 1 runs parallel with the Turnpike and reconnects with the Blue Star and Spaulding Turnpikes at Portsmouth Circle. The next toll-free interchange access to the Blue Star Turnpike after the Hampton Main Toll Plaza is 6.9 miles, where NH 33 carries commercial traffic from the Pease International Tradeport.

Travel time runs in the Hampton area between Exit 1 (NH 107) and Exit 6 (NH 16) revealed that the use of the alternate route of US Route 1would take more than twice as long at 24 to 30 minutes compared to the Blue Star Turnpike which would take approximately 13 minutes.

8.2.4 Summary of Alternate Routes

A review of the alternate routes suggest that at all toll locations on the entire New Hampshire Turnpike System, there are often alternate routes for those choosing not to pay a toll. For longer trips, free alternative routes are not preferable, due to their slower speeds, varying degrees of congestion, and often, traffic signals. In the Merrimack area, however, there were only one to two minute variations in travel time on tolled and free routes for short, local trips. The local ramp toll facilities appear to be primarily used by long distance trips either beginning or terminating at locations in relatively close proximity to these exits.

Figure 37: Blue Star Turnpike and Parallel Routes



8.3 POTENTIAL FUTURE TRANSPORTATION PROJECTS

There are several potential highway projects scheduled for completion in the forecast period that may impact traffic volumes on the NH Turnpike System. These projects were drawn from the Turnpike System Priority Capital Program and the Ten-Year Improvement Plan for 2013 to 2022, as well as from regional Transportation Improvement Programs (TIPs) developed by the largest metropolitan planning organizations (MPOs) in the state. Projects from the Priority Capital Program are identified by the State Number in parentheses for clarification. Under the American Recovery and Reinvestment Act of 2009 (ARRA), New Hampshire received approximately $129 million for highway and road projects, which is commensurate to annual federal spending for highway infrastructure in New Hampshire. ARRA funding was provided for work related to the Manchester Airport Access Road and widening I-93. Potential future highway and rail projects that can potentially impact traffic on the NH Turnpike System are summarized in the following sections.

8.3.1 Central (Everett) Turnpike Region

Major transportation improvement projects programmed for funding or recently completed that could affect volumes on the Central Turnpike are:

- Manchester Airport Access Road – This new road connects the Central Turnpike with the Manchester Airport via Londonderry, and includes a new full interchange between the Central Turnpike and Route 3 in the vicinity of the Bedford Mainline Toll Plaza. This interchange is toll-free, providing a bypass around the Bedford Mainline Toll Plaza as well as toll-free access to the airport. This project has been completed and open to traffic since November 11, 2011, and the Bedford Mainline Toll Plaza, Bedford Road ramp (Exit 12), and Continental Blvd. (Exit 11) plazas are exhibiting losses in toll transactions that will continue to grow out into the future as knowledge of this toll-free option grows over the next couple of years.
- Interstate 93 Widening – This widening project will provide two additional travel lanes in each direction over the 20-mile segment between the Massachusetts State Line and Manchester, NH. When this project is completed, it is possible that traffic will increase on sections of the Central Turnpike north of Manchester and possibly decrease south of Manchester, due to congestion relief on I-93. Completion is currently expected in the year 2022 or after. The state recently received federal funding that will cover a portion of the project construction costs. However, a $250 million shortfall to complete the I-93 construction still exists.
- Manchester Interstate 293 Exit 4 Bridge Replacements (14966) – This project, located in Manchester, includes the reconstruction of I-293 between NH 101 and Granite Street as well as the rehabilitation or replacement of five bridges. Work is expected to begin in 2013. All construction is estimated to be completed in July 2016. This work could lead to a slight decrease in traffic during construction period.
- Nashua Commuter Rail and Park & Rides – This project consists of the development of two Park & Ride facilities in Nashua for van pool, car pool, and commuter rail activities. This project is part of the development and start-up of a commuter rail service between Lowell, MA and Nashua, NH—commuter rail service currently exists between Lowell, MA and Boston, MA. This service could potentially be extended to Manchester, NH. The effect of the commuter rail and park and rides on turnpike traffic would be negligible. At this time, the location of the facilities have not been finalized, but a location on Crown Street in downtown Nashua – a couple miles east of the southern terminus of the Turnpike – is under consideration. The start and completion dates for this project are undetermined as there are

several issues to be addressed prior to further development of the project; however funding is programmed as part of the Congestion Mitigation and Air Quality (CMAQ) Improvement Program from FHWA. Additionally, in April 2012 the City of Nashua resolved to accept the available funding under the "Local Project Administration" program to support the project in the future.

- Open Road Tolling (ORT) Implementation – ORT is planned at the Hooksett and Bedford mainline toll plazas. Hooksett ORT is currently under construction and is expected to be completed in the fall of 2013 (the ORT lanes are expected to be open to traffic by June 2013), while Bedford ORT is tentatively planned for FY 15. ORT at Bedford is currently unfunded. It is estimated that traffic will not be adversely affected because the Bureau will maintain the necessary number of toll plaza lanes in each direction during construction. Once completed, the Department of Transportation believes the Turnpike will be a more attractive alternative to motorists.
- Hooksett Rest Area Redevelopment – This project proposes to redevelop the existing northbound and southbound rest areas and State liquor stores, which are located north of the Hooksett Toll Plaza into new service area facilities with new State liquor stores. The Turnpike System purchased the rest area properties from the State Liquor Commission in 2010 and 2011 with the exception of the footprint of the future expanded liquor stores. A request for qualifications (RFQ) to procure a developer/operator through a ground lease arrangement was recently issued on July 17, 2012 with the new service areas envisioned to offer major branded and/or locally recognized food concepts and anchored with new State liquor stores. Although these facilities are expected to be an attractive option for travelers on the Turnpike, the project is not expected to have an effect on traffic or toll revenue.

8.3.2 Blue Star Turnpike Region

Future planned transportation improvement projects that could affect traffic volumes on the Blue Star Turnpike include:

- Hampton Falls – Hampton I-95 Bridge Replacement over Taylor River (13408B) – This project will replace the I-95 Bridge over the Taylor River near Hampton. Construction is expected to occur between November 2014 and October 2017. This project could temporarily decrease traffic on the Blue Star Turnpike as all traffic lanes would be impacted during construction.
- Route 1 and Route 1 Bypass Bridge Replacements – The Blue Star Turnpike (I-95), Route 1 Bypass and Route 1 serve as the only three crossings over the Piscataqua River between Portsmouth, NH and Kittery, ME. Route 1's Memorial Bridge was closed permanently to vehicle traffic on July 27, 2011, with a replacement to be built by July 2013. An RFP for the design of the Sarah Mildred Long Bridge replacement was recently issued; construction is targeted to begin in late 2014 and be completed in November 2017. These projects may divert traffic to the Turnpike temporarily during construction.

8.3.3 Spaulding Turnpike Region

Planned transportation improvement projects that could affect traffic volumes on the Spaulding Turnpike include:

- Rochester Turnpike Widening (10620G-L) – This project involves the widening of the Spaulding Turnpike between Exit 11 and Exit 16 in Rochester along with some bridge improvements. Construction began in December 2007 and the widening between Exits 11 and 13 is already complete. The full project is anticipated to be finished in October 2013.

Construction activities have resulted in only minor traffic losses in recent years, but this traffic is expected to return once the widening is complete. In addition, a small amount of traffic growth (and therefore revenue growth) is expected due to the widening.

- Newington-Dover Turnpike Widening (11238) – This project involves the widening of the Spaulding Turnpike between Exit 3 and Exit 6. While some of the bridgework is under construction, and construction begins on the Newington section in the fall of 2012, the full widening project has not been fully funded. It is currently contemplated that a future toll increase could be used to fund the remainder of the project and keep the project on schedule. The planned completion date for the widening is in 2017. Similar to the turnpike in Rochester, minor traffic losses are expected, recovering once construction is complete, and a small amount of traffic and revenue growth is expected after the roadway is fully widened.

Nearly $450 million in funded capital improvements that began in 2008 and extend over ten years will have a positive effect on the New Hampshire Turnpike System, in terms of customer satisfaction and safer, less-congested travel. In terms of traffic and revenue, the improvements will allow room for the growth that has been projected.

9 TRAFFIC AND REVENUE PROJECTIONS, FY 2013-2022

This section discusses the methodologies and assumptions used in projecting traffic and revenue for the New Hampshire Turnpike System. It presents the traffic and revenue projections for FY 2013 through 2022.

9.1 TOLL RATES

9.1.1 Assumed Toll Rates

No toll increases have been assumed during the forecast period. Table 11 shows the cash and ***E-ZPass*** toll rates for cars and Class 8 trucks.

Table 11: Toll Rates on the New Hampshire Turnpike System

Turnpike	Toll Plaza	Car (Class 1) Tolls		5-Axle Truck (Class 8) Tolls	
		Cash	E-ZPass	Cash	E-ZPass
Central Turnpike	Hooksett Main	$ 1.00	$ 0.70	$ 3.50	$ 3.15
	Hooksett Ramp	$ 0.50	$ 0.35	$ 2.50	$ 2.25
	Bedford Main	$ 1.00	$ 0.70	$ 3.50	$ 3.15
	Bedford Road	$ 0.50	$ 0.35	$ 2.50	$ 2.25
	Exit 11	$ 0.50	$ 0.35	$ 2.50	$ 2.25
	Exit 10/Merrimack Industrial	$ 0.50	$ 0.35	$ 2.50	$ 2.25
Blue Star Turnpike	Hampton Main	$ 2.00	$ 1.40	$ 5.50	$ 4.95
	Hampton Side	$ 0.75	$ 0.53	$ 3.00	$ 2.70
Spaulding Turnpike	Dover Toll	$ 0.75	$ 0.53	$ 3.00	$ 2.70
	Rochester Toll	$ 0.75	$ 0.53	$ 3.00	$ 2.70

9.1.2 Reasonableness of Tolls / Comparison to Other Facilities

Figure 38 compares the passenger car toll rates in cents per mile on the Blue Star, Spaulding and Central Turnpikes to other various ***E-ZPass*** toll roads in the northeastern U.S. Standard peak period rates are shown for each facility. A second rate is shown for facilities that offer discounted ***E-ZPass***. The Blue Star Turnpike has the highest passenger car per mile toll rate of the three New Hampshire Turnpikes, but there are still seven major ***E-ZPass*** toll facilities that have higher toll rates. The Central Turnpike and Spaulding Turnpikes are among the toll facilities with low passenger car toll rates. The neighboring Massachusetts Turnpike indicates a lower rate, but that includes some 50 free miles for passenger cars in Western Massachusetts. It can be said that the New Hampshire Turnpike passenger car toll rates are reasonable compared to rates at other ***E-ZPass*** toll facilities.

Figure 38: Passenger Car Toll Rates per Mile on Select E-ZPass Toll Facilities as of August 2012

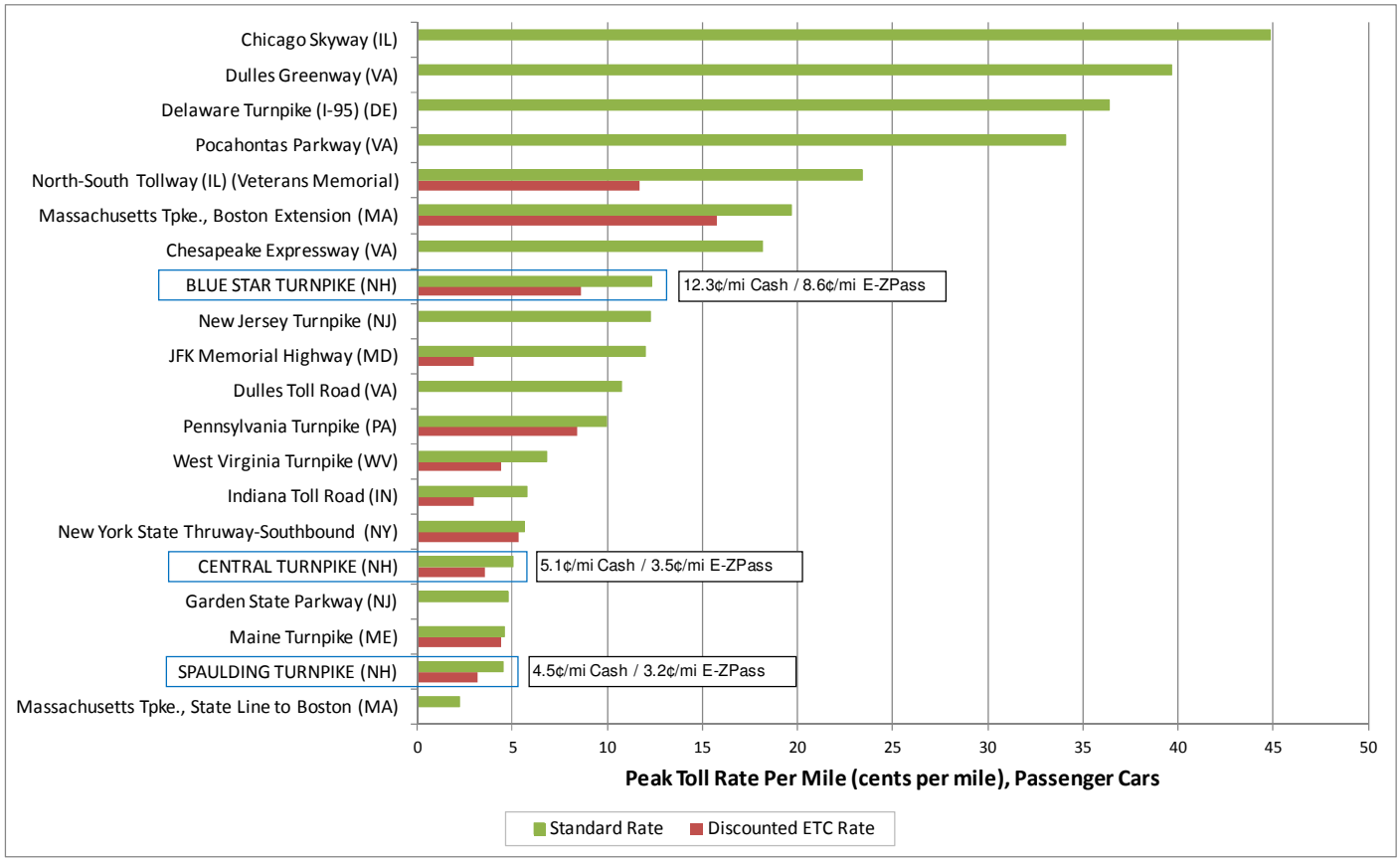
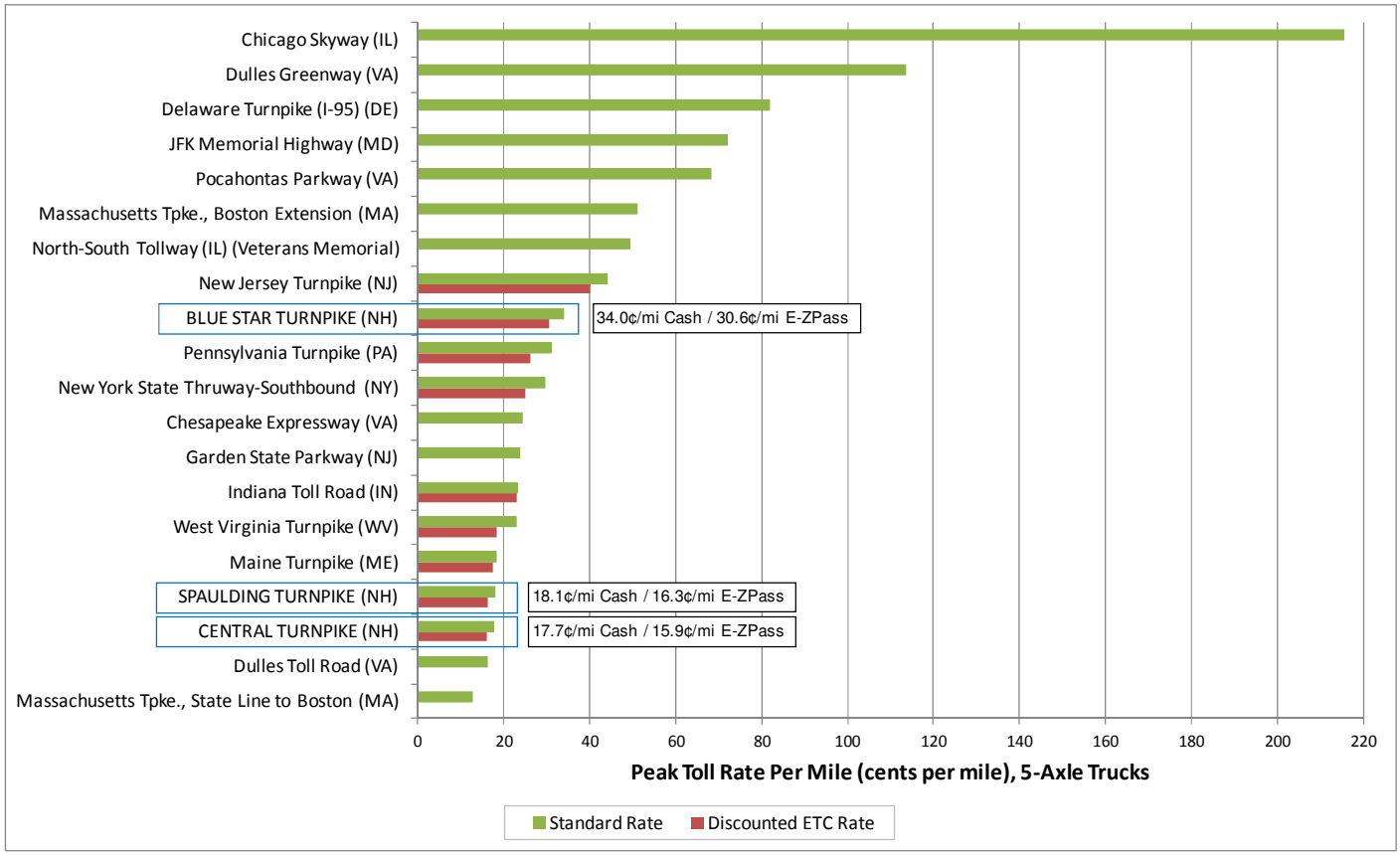


Figure 39 shows a similar comparison for 5-axle vehicles. Again, the Blue Star Turnpike has the highest toll rates of the three New Hampshire toll facilities; there are eight major ***E-ZPass*** toll facilities that have higher 5-axle truck toll rates. Both the Central and Spaulding Turnpikes are among the toll facilities with low commercial toll rates. It can be said that the New Hampshire Turnpike commercial vehicle toll rates are reasonable compared to other ***E-ZPass*** toll facilities.

Figure 39: Commercial Vehicle Toll Rates on Select E-ZPass Toll Facilities as of August 2012



9.2 METHODOLOGY USED FOR PROJECTIONS

9.2.1 Correlation to Economic Factors

The first step in developing the traffic and revenue projections was to develop a base of FY 2002 through FY 2012 toll transactions. Historical car toll transaction growth was then correlated to gross domestic product (GDP) and historical truck growth was correlated to increases in the U.S. total industrial production (IPI).

Future car and truck toll transactions were projected separately by applying the historical correlations to projected GDP and total IPI growth rates estimated by industry experts in the *Blue Chip Economic Forecasts*. It is expected that traffic growth throughout the forecast period will not be as high as it was from the 1990s through about 2003, due to such factors as Baby Boomers retiring, young people driving less and new technology making road travel less necessary, as discussed in Chapter 7 of this report. Therefore, some dampening was also applied to traffic growth rates over the forecast years.

9.2.2 E-ZPass Market Shares

E-ZPass market shares were then projected for each facility separately for cars and trucks, and these market shares were applied to obtain projected cash and ***E-ZPass*** transactions. The market share projections were based on observing the growth in ***E-ZPass*** market share over the past several years. A maximum market share for each facility was assumed to be reached

by FY 2018. Most of the growth in market share would be in the first few years of the forecast, with gradually less growth in market share in each subsequent year until the maximum is reached.

Additionally, as ***E-ZPass*** tags that are issued by the New Hampshire DOT ("Home") are assessed a lower toll rate than other ***E-ZPass*** tags ("Away"), it was necessary to estimate future "Home" versus "Away" ***E-ZPass*** customers to calculate toll revenue correctly. In recent years, the "Home" share of ***E-ZPass*** trips has declined slightly, as other states such as Ohio and Rhode Island installed electronic tolling technology at their facilities and began issuing ***E-ZPass*** tags. We assumed that the future ratio of "Home" to "Away" transactions would stay the same as it is today, and not continue to decline. This may be a slightly conservative assumption, as a declining "Home" share means an increasing "Away" share, and "Away" ***E-ZPass*** traffic is not charged the discounted rate.

The one exception to this assumption is the Exit 10/Merrimack Industrial plaza. Because of the recent opening of the Merrimack Premium Outlets, these south-facing ramps are seeing an influx of new traffic from areas to the south, especially Massachusetts, which is only about ten miles away. Though about 64 percent of ***E-ZPass*** transactions were made by drivers with "Home" tags for the whole of FY 2012, data after the outlets opened indicates that now only about 60 percent of ***E-ZPass*** transactions are "Home", likely due to an influx of shoppers from neighboring Massachusetts. Because "Home" ***E-ZPass*** transactions are charged $0.35 while "Away" transactions are $0.50, this has a small positive effect on toll revenue. The smaller share of "Home" vehicles was applied to the future year forecasts at Exit 10.

The average cash and ***E-ZPass*** toll rates were then applied to the projected annual cash and ***E-ZPass*** transactions, respectively, in order to determine total cash and ***E-ZPass*** toll revenues for the period FY 2013-2022.

9.2.3 System Changes and Developments

Some recent and future changes to the New Hampshire Turnpike System and its environs were also considered in the forecasts, including the opening of the Manchester Airport Access Road with its free interchange on the Turnpike, the opening of the Merrimack Premium Outlets, widening of the Spaulding Turnpike, and open-road tolling (ORT) at several plazas throughout the system.

The free Manchester Airport Access Road interchange on the Central Turnpike, which opened on November 11, 2011, allows some vehicles to avoid toll plazas by entering/exiting there instead. Drivers from the south entering from or exiting at this new interchange no longer pass through a toll plaza. Some drivers who formerly exited at Bedford Road (Exit 12) or Continental Boulevard (Exit 11) now exit at the new interchange to avoid the toll, and others have discovered that it is possible to avoid the Bedford Mainline toll by exiting the Turnpike, using the new ramp and a section of Route 3, and re-entering the Turnpike. Jacobs compiled weekly traffic data by plaza from the opening of the interchange through mid-June of 2012; this data shows that the traffic loss at each of the three toll plazas has been growing over time. This was expected, as more and more drivers discover that the new, free interchange exists. Jacobs compared traffic after the opening of the Airport Access Road to the previous year's, and used a trend-line formula to estimate future losses. It was assumed that traffic losses would continue at the same rate as they have been since the Airport Access Road opened through the start of FY 2014, and then they would flatten out. Table 12 shows the resulting average daily traffic and annual revenue losses by plaza resulting from the trend-line analysis. Note that these losses

are the difference between the current state – with the Manchester Airport Access Road interchange built – and a scenario without the interchange. The annual revenue losses due to the Airport Access Road are expected to increase from $1.6M in FY 2012 to $3.4M in FY 2013 and $3.9M in FY 2014. Since the interchange was only open for 233 days of FY 2012, the annual revenue loss is significantly less in FY 2012 than the following years.

Table 12: Estimated Losses in Average Daily Toll Transactions / Annual Revenues ($M) at Bedford/Merrimack Plazas due to Manchester Airport Access Road Interchange [1]

Fiscal Year	Continental Blvd. Exit 11	Bedford Road Exit 12	Bedford Main	Total Loss in Transaction/Revs
2012[2]	150 / $0.0	1,200 / $0.1	6,800 / $1.5	8,150 / $1.6
2013	700 / $0.1	1,800 / $0.3	8,900 / $3.0	11,400 / $3.4
2014-2022[3]	1,100 / $0.2	2,200 / $0.3	10,200 / $3.4	13,500 / $3.9

[1]Compared to a "No Airport Access Road" condition

[2]The 2012 estimate considers that the MAAR is only opened for part of the Fiscal Year (233 days).

[3]FY 2014 losses shown; in following years, after this point the losses are assumed to increase minimally, at the same rate as toll transaction and revenue growth at each toll plaza (i.e., about 1.5% per year).

Some of the loss in Central Turnpike toll transactions to the Airport Access Road is being mitigated by the gains in traffic from the new outlet center. The Merrimack Premium Outlets opened on June 14, 2012 adjacent to Exit 10 of the Central Turnpike. With over 100 stores, over 5 million visitors are anticipated annually. Initial weekly data since the outlets opened reveals an average increase of 4,200 car transactions per day over last year's traffic at the Exit 10 ramp tolls. Jacobs believes this traffic will ramp up to about 4,500 average cars per day in FY 2013 and 6,000 cars per day in FY 2014 and thereafter. For comparison, VHB, Inc. completed a traffic study for the outlets in 2007, estimating about 9,000 additional vehicles per day at Exit 10 due to the outlets. The Bedford Main and Bedford Road (Exit 12) plazas, while losing traffic due to the Manchester Airport Access Road, saw some of that traffic return after the outlets opened. At Bedford Main, it is estimated that the outlets will increase car traffic by about 950 per day in FY 2013 and 1250 per day in FY 2014. The Bedford Road (Exit 12) toll plaza's car traffic is estimated to increase by about 350 per day in FY 2013 and 450 per day in FY 2014 due to the outlets, based on recent trends. Jacobs is also estimating some reduction in trucks from FY 2012 to FY 2013 at the Bedford/Merrimack plazas since construction at the outlets is essentially completed, and it is expected that the number of delivery vehicles to the outlets will be less than the number of large vehicles during construction.

NHDOT is currently widening the Spaulding Turnpike by one lane per direction in the Rochester area, and will, in the next year or so, also begin widening the Turnpike and Little Bay Bridges in the Dover area. Jacobs has projected small losses in traffic (0.5 to 1.5 percent) during the construction phase at the nearby toll barriers, with traffic recovery soon after the project is completed. In addition, since the reconstructed roadway will have new capacity, Jacobs has forecasted modest additional increases in traffic at each barrier of totaling 3.5 percent over two to three years after construction is completed. While this project is not fully funded under current toll rates, this is not expected to have any impact on future revenues.

Open-road tolling (ORT) was completed at the Hampton Main Plaza in June of 2010, and has been planned for two other mainline toll plazas. ORT allows ***E-ZPass*** customers to drive at highway speeds without stopping or slowing down through the tolling zone. Traditional tollbooths are available off to the side for those customers preferring to pay their tolls via cash. ORT lanes are scheduled to open in June 2013 at the Hooksett Barrier. At the Bedford Mainline Plaza, ORT is planned in FY 2015 though this project is currently unfunded. While with ORT there is some "leakage" (i.e., uncollected revenue from unread ***E-ZPass*** tags, or violations), an analysis of Hampton Main data revealed that the leakage was negligible, and that there was likely enough growth in traffic due to a better level-of-service through the plaza to cover any leakage loss. Therefore, at the two other barriers where ORT is planned, the ORT was assumed to have no effects on traffic and revenue forecasts.

9.3 TOLL TRANSACTION PROJECTIONS BY TURNPIKE

The FY 2012 and projected annual toll transactions on the New Hampshire Turnpike System during the period FY 2013-2022 are presented in Table 13. For reference, historical annual toll transactions were shown earlier in Table 2. A detailed summary of traffic, revenue, and ***E-ZPass*** by facility is presented in Table 14.

Table 13: FY 2012 and Projected Annual Toll Transactions[1], FY 2013-2022 (in millions)

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Total
2012 (Actual)[2]	50.8	35.3	21.3	107.4
2013	51.0	35.6	21.2	107.7
2014	51.6	35.8	21.3	108.8
2015	52.5	36.2	21.5	110.3
2016	53.4	36.6	22.1	112.1
2017	54.4	36.9	22.4	113.7
2018	55.2	37.3	22.8	115.3
2019	56.1	37.6	22.9	116.6
2020	56.9	37.9	23.1	117.9
2021	57.8	38.2	23.2	119.2
2022	58.7	38.5	23.4	120.5

[1] Projections do not include non-revenue vehicles or violators

[2] Unaudited

Note: Data will not necessarily add to totals because of rounding

Table 14: Detailed Traffic and Revenue Projections, FY 2013-2022 (in millions)

Total Revenue Paying Traffic Volumes (millions)

Barriers/Ramps	2012 Actual	12-13 Projected Growth	2013 Projected	13-14 Projected Growth	2014 Projected	14-15 Projected Growth	2015 Projected	15-16 Projected Growth	2016 Projected	16-17 Projected Growth	2017 Projected	17-18 Projected Growth	2018 Projected	18-19 Projected Growth	2019 Projected	19-20 Projected Growth	2020 Projected	20-21 Projected Growth	2021 Projected	21-22 Projected Growth	2022 Projected
CENTRAL TURNPIKE																					
Hooksett Barrier	24.3	1.04%	24.6	1.43%	24.9	1.72%	25.4	1.72%	25.8	1.72%	26.2	1.62%	26.7	1.52%	27.1	1.52%	27.5	1.52%	27.9	1.52%	28.3
Hooksett Ramp	2.4	1.06%	2.4	1.44%	2.5	1.72%	2.5	1.72%	2.5	1.72%	2.6	1.62%	2.6	1.53%	2.7	1.53%	2.7	1.53%	2.7	1.53%	2.8
Bedford Barrier	16.4	-7.09%	15.2	-1.09%	15.1	1.71%	15.3	1.71%	15.6	1.71%	15.9	1.61%	16.1	1.52%	16.4	1.52%	16.6	1.52%	16.9	1.52%	17.1
Bedford Road Ramp	2.6	-8.80%	2.4	-3.69%	2.3	1.70%	2.3	1.70%	2.4	1.70%	2.4	1.60%	2.4	1.50%	2.5	1.50%	2.5	1.50%	2.5	1.50%	2.6
Exit 11 (Merrimack) Ramp	3.4	-5.79%	3.2	-3.01%	3.1	1.71%	3.1	1.71%	3.2	1.71%	3.2	1.61%	3.3	1.51%	3.3	1.51%	3.4	1.51%	3.4	1.51%	3.5
Exit 10 Merrimack Industrial Park Ramp	1.7	90.40%	3.2	18.29%	3.8	1.70%	3.9	1.70%	4.0	1.70%	4.0	1.60%	4.1	1.51%	4.2	1.51%	4.2	1.51%	4.3	1.51%	4.4
Subtotal	**50.8**	**0.46%**	**51.0**	**1.24%**	**51.6**	**1.71%**	**52.5**	**1.71%**	**53.4**	**1.71%**	**54.4**	**1.61%**	**55.2**	**1.52%**	**56.1**	**1.52%**	**56.9**	**1.52%**	**57.8**	**1.52%**	**58.7**
BLUE STAR TURNPIKE																					
Hampton Barrier	22.4	0.63%	22.5	0.81%	22.7	1.00%	22.9	1.00%	23.2	1.00%	23.4	0.90%	23.6	0.81%	23.8	0.81%	24.0	0.81%	24.2	0.81%	24.4
Hampton Ramp	13.0	0.62%	13.0	0.81%	13.1	1.00%	13.3	1.00%	13.4	1.00%	13.5	0.90%	13.7	0.81%	13.8	0.81%	13.9	0.81%	14.0	0.81%	14.1
Subtotal	**35.3**	**0.62%**	**35.6**	**0.81%**	**35.8**	**1.00%**	**36.2**	**1.00%**	**36.6**	**1.00%**	**36.9**	**0.90%**	**37.3**	**0.81%**	**37.6**	**0.81%**	**37.9**	**0.81%**	**38.2**	**0.81%**	**38.5**
SPAULDING TURNPIKE																					
Dover Barrier	13.0	-1.09%	12.9	0.01%	12.9	0.70%	13.0	2.75%	13.3	2.11%	13.6	2.60%	14.0	0.60%	14.1	0.60%	14.2	0.60%	14.2	0.60%	14.3
Rochester Barrier	8.2	0.41%	8.3	1.51%	8.4	1.70%	8.5	2.20%	8.7	0.61%	8.8	0.60%	8.8	0.60%	8.9	0.60%	8.9	0.60%	9.0	0.60%	9.0
Subtotal	**21.3**	**-0.51%**	**21.2**	**0.59%**	**21.3**	**1.10%**	**21.5**	**2.54%**	**22.1**	**1.51%**	**22.4**	**1.82%**	**22.8**	**0.60%**	**22.9**	**0.60%**	**23.1**	**0.60%**	**23.2**	**0.60%**	**23.4**
TOTAL:	**107.4**	**0.32%**	**107.7**	**0.97%**	**108.8**	**1.36%**	**110.3**	**1.64%**	**112.1**	**1.44%**	**113.7**	**1.42%**	**115.3**	**1.11%**	**116.6**	**1.11%**	**117.9**	**1.11%**	**119.2**	**1.11%**	**120.5**

Total Toll Revenue (millions)

Barriers/Ramps	2012 Actual	12-13 Projected Growth	2013 Projected	13-14 Projected Growth	2014 Projected	14-15 Projected Growth	2015 Projected	15-16 Projected Growth	2016 Projected	16-17 Projected Growth	2017 Projected	17-18 Projected Growth	2018 Projected	18-19 Projected Growth	2019 Projected	19-20 Projected Growth	2020 Projected	20-21 Projected Growth	2021 Projected	21-22 Projected Growth	2022 Projected
CENTRAL TURNPIKE																					
Hooksett Barrier	$23.4	0.74%	$23.6	1.18%	$23.9	1.53%	$24.2	1.57%	$24.6	1.63%	$25.0	1.59%	$25.4	1.51%	$25.8	1.51%	$26.2	1.52%	$26.6	1.52%	$27.0
Hooksett Ramp	$1.2	0.84%	$1.2	1.25%	$1.2	1.58%	$1.3	1.61%	$1.3	1.64%	$1.3	1.57%	$1.3	1.49%	$1.3	1.47%	$1.4	1.53%	$1.4	1.53%	$1.4
Bedford Barrier	$15.2	-7.40%	$14.1	-1.36%	$13.9	1.50%	$14.1	1.55%	$14.3	1.61%	$14.6	1.57%	$14.8	1.49%	$15.0	1.48%	$15.2	1.52%	$15.5	1.52%	$15.7
Bedford Road Ramp	$1.1	-9.37%	$1.0	-4.19%	$0.9	1.29%	$1.0	1.38%	$1.0	1.47%	$1.0	1.48%	$1.0	1.40%	$1.0	1.63%	$1.0	1.50%	$1.0	1.50%	$1.1
Exit 11 (Merrimack) Ramp	$1.4	-6.41%	$1.3	-3.53%	$1.3	1.31%	$1.3	1.41%	$1.3	1.54%	$1.3	1.59%	$1.4	1.51%	$1.4	1.55%	$1.4	1.51%	$1.4	1.51%	$1.4
Exit 10 Merrimack Industrial Park Ramp	$0.8	94.74%	$1.6	18.18%	$1.9	1.40%	$1.9	1.45%	$1.9	1.47%	$2.0	1.40%	$2.0	1.34%	$2.0	1.38%	$2.0	1.51%	$2.1	1.51%	$2.1
Subtotal	**$43.2**	**-0.85%**	**$42.8**	**0.70%**	**$43.1**	**1.50%**	**$43.8**	**1.55%**	**$44.4**	**1.61%**	**$45.2**	**1.57%**	**$45.9**	**1.49%**	**$46.5**	**1.50%**	**$47.2**	**1.52%**	**$48.0**	**1.52%**	**$48.7**
BLUE STAR TURNPIKE																					
Hampton Barrier	$48.8	0.60%	$49.1	0.78%	$49.5	0.96%	$50.0	0.96%	$50.5	0.95%	$51.0	0.84%	$51.4	0.75%	$51.8	0.88%	$52.2	0.81%	$52.6	0.81%	$53.1
Hampton Ramp	$9.5	0.41%	$9.5	0.63%	$9.6	0.86%	$9.7	0.89%	$9.7	0.92%	$9.8	0.85%	$9.9	0.76%	$10.0	0.80%	$10.1	0.81%	$10.2	0.81%	$10.2
Subtotal	**$58.3**	**0.57%**	**$58.6**	**0.75%**	**$59.1**	**0.95%**	**$59.6**	**0.95%**	**$60.2**	**0.95%**	**$60.8**	**0.84%**	**$61.3**	**0.75%**	**$61.8**	**0.87%**	**$62.3**	**0.81%**	**$62.8**	**0.81%**	**$63.3**
SPAULDING TURNPIKE																					
Dover Barrier	$8.9	-1.34%	$8.8	-0.20%	$8.8	0.54%	$8.8	2.62%	$9.1	2.02%	$9.3	2.57%	$9.5	0.57%	$9.6	0.60%	$9.6	0.60%	$9.7	0.60%	$9.7
Rochester Barrier	$5.6	0.06%	$5.6	1.21%	$5.7	1.48%	$5.8	2.04%	$5.9	0.51%	$5.9	0.57%	$6.0	0.59%	$6.0	0.65%	$6.0	0.60%	$6.1	0.60%	$6.1
Subtotal	**$14.6**	**-0.80%**	**$14.5**	**0.35%**	**$14.5**	**0.91%**	**$14.6**	**2.39%**	**$15.0**	**1.42%**	**$15.2**	**1.79%**	**$15.5**	**0.58%**	**$15.6**	**0.62%**	**$15.7**	**0.60%**	**$15.8**	**0.60%**	**$15.9**
TOTAL:	**$116.1**	**-0.13%**	**$115.9**	**0.68%**	**$116.7**	**1.15%**	**$118.0**	**1.35%**	**$119.6**	**1.25%**	**$121.1**	**1.23%**	**$122.6**	**1.01%**	**$123.9**	**1.07%**	**$125.2**	**1.05%**	**$126.5**	**1.05%**	**$127.8**

E-ZPass Market Shares

Barriers/Ramps	2012 Actual	12-13 Projected Increase	2013 Projected	13-14 Projected Increase	2014 Projected	14-15 Projected Increase	2015 Projected	15-16 Projected Increase	2016 Projected	16-17 Projected Increase	2017 Projected	17-18 Projected Increase	2018 Projected	18-19 Projected Growth	2019 Projected	19-20 Projected Growth	2020 Projected	20-21 Projected Growth	2021 Projected	21-22 Projected Growth	2022 Projected
CENTRAL TURNPIKE																					
Hooksett Barrier	59.8%	2.00%	61.8%	1.63%	63.4%	1.19%	64.6%	0.88%	65.5%	0.50%	66.0%	0.07%	66.0%	0.00%	66.0%	0.00%	66.0%	0.00%	66.0%	0.00%	66.0%
Hooksett Ramp	61.0%	1.83%	62.9%	1.49%	64.3%	1.08%	65.4%	0.80%	66.2%	0.46%	66.7%	0.06%	66.8%	0.01%	66.8%	0.01%	66.8%	0.01%	66.8%	0.01%	66.8%
Bedford Barrier	67.7%	1.65%	69.3%	1.35%	70.7%	0.99%	71.7%	0.73%	72.4%	0.42%	72.8%	0.05%	72.9%	0.00%	72.9%	0.00%	72.9%	0.00%	72.9%	0.00%	72.9%
Bedford Road Ramp	75.2%	1.57%	76.7%	1.26%	78.0%	0.92%	78.9%	0.68%	79.6%	0.39%	80.0%	0.05%	80.1%	0.00%	80.1%	0.00%	80.1%	0.00%	80.1%	0.00%	80.1%
Exit 11 (Merrimack) Ramp	73.4%	2.12%	75.5%	1.72%	77.2%	1.26%	78.5%	0.93%	79.4%	0.53%	79.9%	0.07%	80.0%	0.00%	80.0%	0.00%	80.0%	0.00%	80.0%	0.00%	80.0%
Exit 10 Merrimack Industrial Park Ramp	74.2%	-13.27%	60.9%	1.39%	62.3%	1.18%	63.5%	0.86%	64.3%	0.63%	65.0%	0.41%	65.4%	0.00%	65.4%	0.00%	65.4%	0.00%	65.4%	0.00%	65.4%
Subtotal	**64.6%**	**1.02%**	**65.6%**	**1.38%**	**67.0%**	**1.12%**	**68.1%**	**0.82%**	**68.9%**	**0.48%**	**69.4%**	**0.09%**	**69.5%**	**0.00%**	**69.5%**	**0.00%**	**69.5%**	**0.00%**	**69.5%**	**0.00%**	**69.5%**
BLUE STAR TURNPIKE																					
Hampton Barrier	64.9%	2.19%	67.1%	1.78%	68.9%	1.30%	70.2%	0.96%	71.2%	0.55%	71.7%	0.07%	71.8%	0.00%	71.8%	0.00%	71.8%	0.00%	71.8%	0.00%	71.8%
Hampton Ramp	66.7%	1.40%	68.1%	1.13%	69.2%	0.83%	70.0%	0.61%	70.6%	0.35%	71.0%	0.04%	71.0%	0.00%	71.0%	0.00%	71.0%	0.00%	71.0%	0.00%	71.0%
Subtotal	**65.6%**	**1.90%**	**67.5%**	**1.54%**	**69.0%**	**1.13%**	**70.1%**	**0.83%**	**71.0%**	**0.47%**	**71.4%**	**0.06%**	**71.5%**	**0.00%**	**71.5%**	**0.00%**	**71.5%**	**0.00%**	**71.5%**	**0.00%**	**71.5%**
SPAULDING TURNPIKE																					
Dover Barrier	67.0%	1.19%	68.2%	0.96%	69.2%	0.70%	69.9%	0.52%	70.4%	0.30%	70.7%	0.04%	70.7%	0.00%	70.7%	0.00%	70.7%	0.00%	70.7%	0.00%	70.7%
Rochester Barrier	65.3%	1.66%	67.0%	1.35%	68.3%	0.99%	69.3%	0.73%	70.1%	0.42%	70.5%	0.05%	70.5%	0.00%	70.5%	0.00%	70.5%	0.00%	70.5%	0.00%	70.5%
Subtotal	**66.4%**	**1.37%**	**67.7%**	**1.11%**	**68.9%**	**0.81%**	**69.7%**	**0.60%**	**70.3%**	**0.35%**	**70.6%**	**0.04%**	**70.7%**	**0.00%**	**70.7%**	**0.00%**	**70.7%**	**0.00%**	**70.7%**	**0.00%**	**70.7%**
TOTAL:	**65.3%**	**1.38%**	**66.6%**	**1.38%**	**68.0%**	**1.06%**	**69.1%**	**0.78%**	**69.8%**	**0.45%**	**70.3%**	**0.07%**	**70.4%**	**0.00%**	**70.4%**	**0.00%**	**70.4%**	**0.00%**	**70.4%**	**0.00%**	**70.4%**

* Violation revenue and revenue from unclassified vehicles, etc.

Notes: FY 2012 figures are unaudited.
FY 2012 and forecast years do not include non-revenue vehicles, violations or violation revenues

For purposes of revenue projection, Jacobs removed non-revenue and violation (i.e., non-toll paying) transactions from the traffic and revenue analysis. Total toll transactions are projected to increase from 107.4 million toll-paying transactions in FY 2012 to 107.7 million in FY 2013, a gain of 0.3 percent. This increase is small because of continuing slow economic growth, construction on the Spaulding Turnpike, and ramp up in the use of the free interchange at the Manchester Airport Access Road. The number of transactions is expected to then increase 1.0 percent in FY 2014, with larger growth rates ranging from 1.4 to 1.6 percent per year over the following four years as the widening of the Spaulding Turnpike is completed. For the final four years of the forecast period, it is estimated that Turnpike toll traffic will grow 1.1 percent per year. Between FY 2012 and FY 2022, the projected average annual growth rates in paid toll transactions for the Central, Blue Star and Spaulding Turnpikes are 1.5 percent, 0.9 percent and 0.9 percent respectively, with the overall Turnpike toll transaction average growth rate at 1.2 percent.

9.4 TOLL REVENUE PROJECTIONS BY TURNPIKE

The actual and projected annual toll revenue on the New Hampshire Turnpike System during the period FY 2012-2022 is presented in Table 15. Detailed toll revenue projections for each toll plaza were presented previously in Table 14 (see Table 3 for toll revenues received in past years).

Table 15: FY 2012 and Projected Annual Toll Revenue[1], FY 2013-2022 (in millions)

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Total
2012 (Actual)[2]	$ 43.2	$ 58.3	$ 14.6	$ 116.1
2013	$ 42.8	$ 58.6	$ 14.5	$ 115.9
2014	$ 43.1	$ 59.1	$ 14.5	$ 116.7
2015	$ 43.8	$ 59.6	$ 14.6	$ 118.0
2016	$ 44.4	$ 60.2	$ 15.0	$ 119.6
2017	$ 45.2	$ 60.8	$ 15.2	$ 121.1
2018	$ 45.9	$ 61.3	$ 15.5	$ 122.6
2019	$ 46.5	$ 61.8	$ 15.6	$ 123.9
2020	$ 47.2	$ 62.3	$ 15.7	$ 125.2
2021	$ 48.0	$ 62.8	$ 15.8	$ 126.5
2022	$ 48.7	$ 63.3	$ 15.9	$ 127.8

[1] Does not include administrative fees or violation revenue

[2] Unaudited

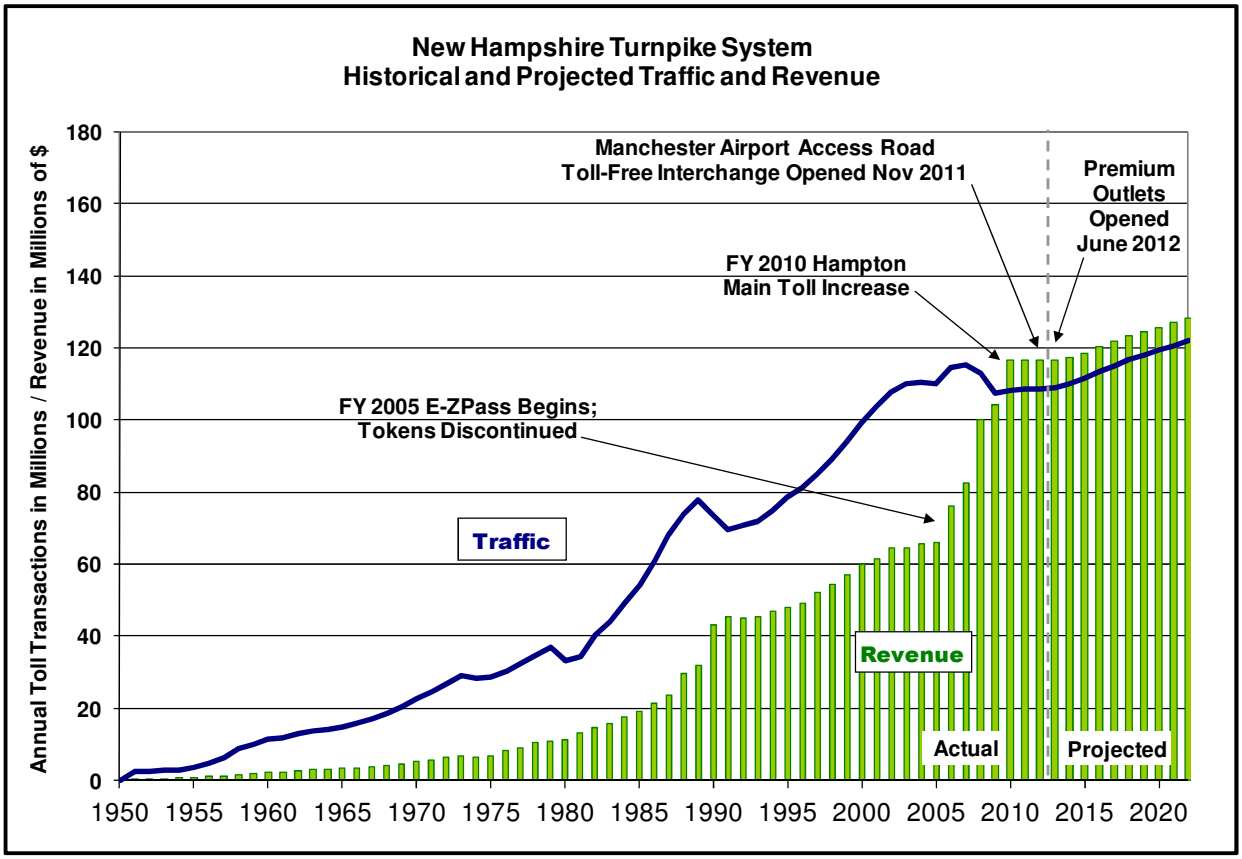
Note: Data will not necessarily add to totals because of rounding

Projected toll revenues for FY 2013 are $115.9 million – about a 0.1 percent decrease from FY 2012. Revenue losses from construction on the Spaulding Turnpike and increased use of the free Manchester Airport Access Road interchange on the Central Turnpike as a means of avoiding a toll are expected to outweigh any revenue gains from the June 2012 opening of the Merrimack Premium Outlets. Revenue is then expected to increase 0.7 percent from FY 2013 to FY 2014, and at slightly increasing rates over the following few years as construction concludes on the Spaulding Turnpike widening project; the largest annual percent increase is expected to be in FY 2016 (1.4 percent). For the final three years of the forecast period, annual revenue growth is expected to be 1.1 percent, similar to the traffic growth rate. Toll revenues on

the Central, Blue Star and Spaulding Turnpikes are expected to grow at an average annual rate of 1.2 percent, 0.8 percent and 0.8 percent respectively between FY 2012 and FY 2022, and the overall Turnpike annual revenue growth rate is estimated to be 1.0 percent.

Historical and projected toll transaction and revenue for the entire New Hampshire Turnpike System over the period FY 1950 to 2022 are presented in Figure 40.

Figure 40: NH Turnpike System Historical and Projected Toll Transaction and Revenue Trends, FY 1950-2022



9.5 E-ZPASS MARKET SHARE PROJECTIONS

Table 16 presents the historical and projected ***E-ZPass*** market shares on the New Hampshire Turnpike System for the period FY 2011-2022. Detailed ***E-ZPass*** market shares for each toll plaza were presented previously in Table 14.

Table 16: Historical and Projected E-ZPass Market Shares, FY 2008-2022

Fiscal Year	Central Turnpike	Blue Star Turnpike	Spaulding Turnpike	Total
2011[1]	63.1%	63.3%	64.2%	63.4%
2012[2]	64.6%	65.6%	66.4%	65.3%
2013	65.6%	67.5%	67.7%	66.6%
2014	67.0%	69.0%	68.9%	68.0%
2015	68.1%	70.1%	69.7%	69.1%
2016	68.9%	71.0%	70.3%	69.8%
2017	69.4%	71.4%	70.6%	70.3%
2018-2022	69.5%	71.5%	70.7%	70.4%

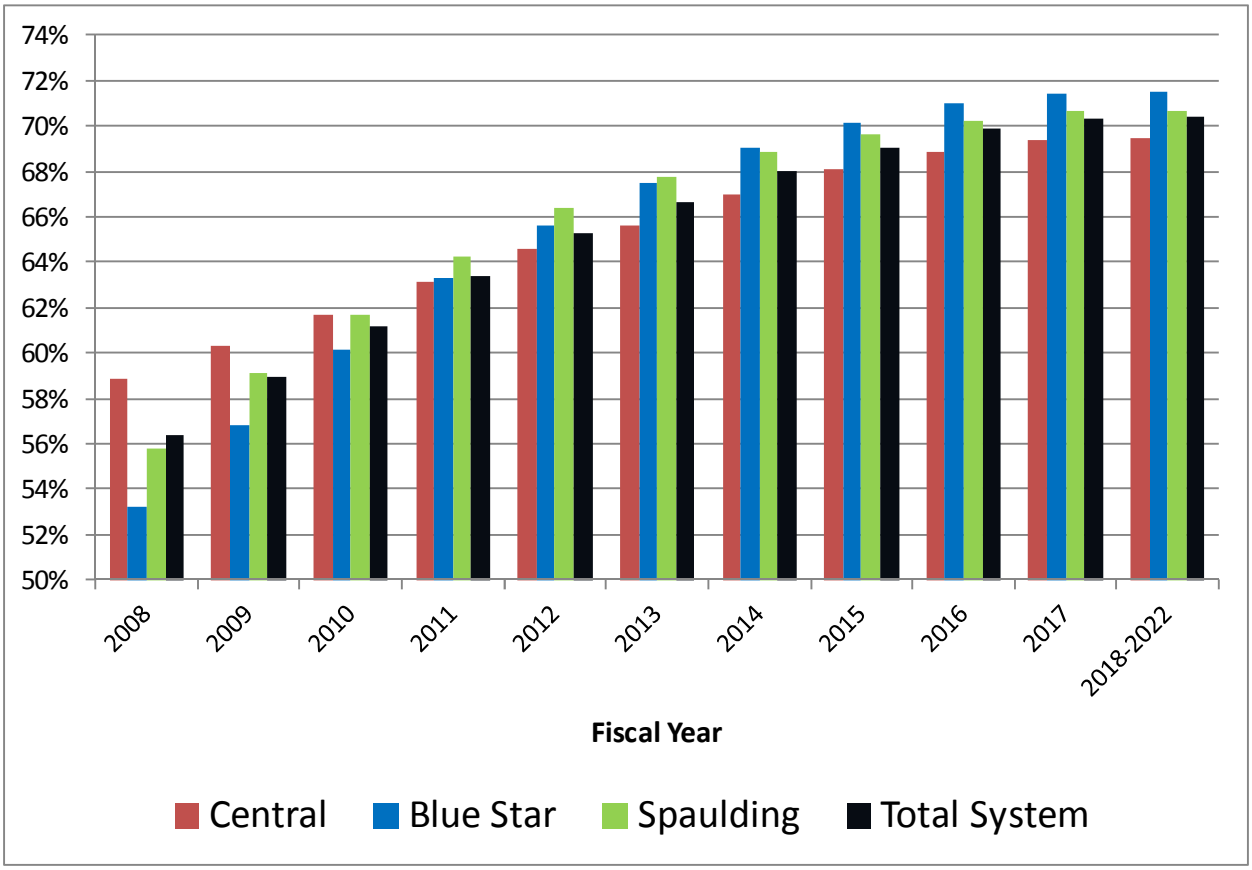
[1] *Actual*

[2] *Actual (Unaudited)*

Total New Hampshire ***E-ZPass*** market share increased from 63.4 percent in FY 2011 to 65.3 percent in FY 2012. Year-over-year growth in ***E-ZPass*** market share has slowed in recent years, and this trend is expected to continue out into the future. From FY 2011 to FY 2012, overall market share increased by 1.9 percentage points, and the market share from FY 2012 to FY 2014 is estimated to increase by 1.4 percentage points per year. Over the following years, the total ***E-ZPass*** market share growth rate is expected to slow down and flatten, and is assumed to reach an overall maximum share of about 70.4 percent in FY 2018. The market share will differ by plaza, as it does currently. The Blue Star Turnpike, which has fewer commuters and more long-distance travelers than the Central and Spaulding Turnpikes, is expected to have a slightly higher market share than the others because ***E-ZPass*** continues to grow among drivers from other states, as more and more agencies implement electronic toll collection.

Figure 41 shows the historical and projected ***E-ZPass*** market shares for the period FY 2008 to 2022.

Figure 41: NH Turnpike System Historical and Projected E-ZPass Market Shares, FY 2008-2022



10 FINANCIAL MODEL ANALYSIS

This section presents a financial analysis of the Turnpike System. The analysis considers Turnpike System capital expenditures, operating expenditures and debt service requirements as well as Turnpike System toll revenues and other revenues. The analysis also includes a cash flow analysis of the Turnpike System, as well as an analysis of the Turnpike System's debt service coverage ratios.

10.1 TOTAL TURNPIKE SYSTEM EXPENDITURES

Table 17 shows historical and projected capital, operating and debt service expenditures for the 20-year period FY 2003 to FY 2022.

Table 17: Historical and Projected Total NH Turnpike Expenditures, FY 2003-2022 (in millions)

Fiscal Year	Capital Expenditures	O&M Expenditures	Debt Service	Renewal & Replacement	I-95 Payments	Total Turnpike Expenditures	Unfunded Projects
2003	$10.2	$25.2	$29.9	$7.3		$72.6	
2004	$19.4	$25.1	$28.7	$5.1		$78.3	
2005	$20.5	$29.0	$31.3	$3.3		$84.0	
2006	$13.2	$38.5	$30.0	$4.3		$86.1	
2007	$8.5	$36.1	$31.1	$8.6		$84.3	
2008	$11.0	$37.1	$27.4	$11.8		$87.3	
2009	$25.8	$40.3	$27.5	$7.8		$101.4	
2010	$66.6	$40.1	$30.3	$7.8	$30.0	$174.8	
2011	$52.9	$42.3	$34.4	$14.3	$20.0	$163.9	$0.0
2012	$47.7	$41.8	$33.3	$7.3	$26.0	$156.0	$0.0
Total ('03-'12)	$275.7	$355.5	$303.8	$77.6	$76.0	$1,088.6	$0.0
2013	$85.8	$51.0	$36.2	$9.8	$26.0	$208.8	$0.2
2014	$48.8	$47.4	$39.2	$10.0	$5.9	$151.3	$3.0
2015	$55.1	$48.7	$40.6	$8.9	$5.9	$159.1	$19.0
2016	$40.4	$49.8	$42.1	$9.7	$5.9	$147.9	$32.5
2017	$4.4	$50.8	$40.4	$12.2	$5.9	$113.7	$25.1
2018	$2.1	$51.9	$36.1	$12.3	$5.9	$108.3	$12.0
2019		$53.0	$36.1	$10.1	$2.2	$101.3	
2020		$54.2	$34.8	$10.4		$99.3	
2021		$55.4	$27.0	$10.7		$93.1	
2022		$56.6	$27.3	$11.0		$94.9	
Total ('13-'22)	$236.6	$518.6	$359.5	$105.2	$57.7	$1,277.6	$91.7

Note: Data will not necessarily add to totals because of rounding

Historical total Turnpike System expenditures over the FY 2003-2012 period have ranged from a low of $72.6 million in FY 2003 to a high of $174.8 million in FY 2010. Cumulative Turnpike System expenditures for the ten-year period FY 2003-2012 totaled $1,088.6 million with 61 percent or $659.4 million accounting for the sum of operating expenses and debt service expenditures. Total Turnpike System expenditures are projected to vary in the ten-year FY 2013-2022 forecast period, ranging from a low of $93.1 million in FY 2021 to a high of $208.8 million in FY 2013. Cumulative Turnpike System expenditures over the ten-year forecast period FY 2013-2022 are projected to be $1,277.6 million or 1.17 times what was spent over the previous ten years. Some 41 percent or $518.6 million of this total amount is estimated to be for O&M expenditures and 28 percent or $359.5 million for Turnpike System debt service requirements. Some 19 percent, or $236.6 million, of total expenditures over this ten-year period are expected to be capital expenditures, while 8 percent, or $105.2 million, is expected

for renewal and replacement.

10.2 TURNPIKE SYSTEM FUNDS

Table 18 presents historical and projected toll revenues, other revenues, interest income, and bond proceeds for the Turnpike System over the 20-year period FY 2003-2022.

Table 18: Historical and Projected NH Turnpike Funds, FY 2003-2022 (in millions)

Fiscal Year	Toll Revenue[1]	Transponder Revenue	Other Revenue[2]	Interest Income[3]	Total Turnpike Revenues	Net Bond Proceeds for Construction[4]	Total Turnpike Funds
2003	$64.4		$2.6		$67.0		$67.0
2004	$65.8		$1.7		$67.5		$67.5
2005	$65.9		$2.4		$68.3		$68.3
2006	$76.0		$6.4		$82.4		$82.4
2007	$82.2	$1.2	$2.7	$3.3	$89.4		$89.4
2008	$100.4	$0.9	$3.2	$2.5	$107.0		$107.0
2009	$103.9	$0.7	$2.2	$0.8	$107.6		$107.6
2010	$116.0	$0.7	$1.8	$0.8	$119.3	$140.9	$260.2
2011	$116.7	$0.8	$1.2	$0.2	$118.9		$118.9
2012	$116.1	$0.7	$1.0	$0.2	$118.0		$118.0
Total ('03-'12)	$907.4	$5.0	$25.2	$7.8	$945.4	$140.9	$1,086.3
2013	$115.9	$3.3	$1.0	$0.6	$120.8	$112.0	$232.8
2014	$116.7	$0.8	$1.0	$0.6	$119.1		$119.1
2015	$118.0	$0.6	$1.0	$0.6	$120.3	$46.0	$166.3
2016	$119.6	$0.6	$1.1	$0.6	$121.9		$121.9
2017	$121.1	$0.6	$1.1	$0.6	$123.4		$123.4
2018	$122.6	$0.6	$1.1	$0.6	$124.9		$124.9
2019	$123.9	$0.6	$1.1	$0.6	$126.3		$126.3
2020	$125.2	$0.6	$1.1	$1.3	$128.2		$128.2
2021	$126.5	$0.6	$1.2	$1.5	$129.8		$129.8
2022	$127.8	$0.6	$1.2	$1.8	$131.4		$131.4
Total ('13-'22)	$1,217.3	$8.9	$10.9	$8.9	$1,246.1	$158.0	$1,404.1

[1] Future toll revenues does not include revenue from toll violators

[2] From Bureau of Turnpikes Financial Model Plan

[3] FY 2000 through 2006 Interest Income included in Other Revenue (includes claim reimbursement and sale of land)

[4] Does not include cost for issuance premiums or payments into restricted debt service accounts

Note: Data will not necessarily add to totals because of rounding

Historical annual Turnpike System revenues which include toll revenue, other revenue, and bond proceeds ranged from a low of $67.0 million in FY 2003 to a high of $119.3 million in FY 2010. Cumulative funds over the ten-year FY 2003-2012 period totaled $945.4 million with toll revenues accounting for 96 percent of this amount or $907.4 million. Over the forecast period FY 2013-2022, annual Turnpike System revenues are projected to range from a low of $119.1 million in FY 2014 to a high of $131.4 million in FY 2022. Total Turnpike revenues over the ten-year forecast period are $1,246.1 million or almost 32 percent more than revenues accumulated in the previous ten years.

Toll revenues are estimated to account for almost 87 percent or $1,217.3 million of the projected $1,404.1 in ten-year total Turnpike System funds, while net bond proceeds for construction are expected to account for 11 percent or $158.0 million of the projected total funds.

10.3 TURNPIKE COVERAGE RATIO ANALYSIS

Table 19 presents an analysis of the Bureau of Turnpikes' revenue bond debt service coverage ratios and all obligation bond coverage ratios for the forecast period FY 2013-2022.

Table 19: NH Turnpike Debt Coverage Analysis, FY 2013-2022 (in millions)

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Turnpike Revenues[1]	*$120.8*	*$119.1*	*$120.3*	*$121.9*	*$123.4*	*$124.9*	*$126.3*	*$128.2*	*$129.8*	*$131.4*
O&M Expenses[2]	*$51.0*	*$47.4*	*$48.7*	*$49.8*	*$50.8*	*$51.9*	*$53.0*	*$54.2*	*$55.4*	*$56.6*
Net Revenues (Sub-Total) (A)	*$69.8*	*$71.7*	*$71.6*	*$72.1*	*$72.6*	*$73.1*	*$73.3*	*$74.1*	*$74.4*	*$74.8*
Revenue Bond Debt Service (B)[3]	*$36.2*	*$39.2*	*$40.6*	*$42.1*	*$40.4*	*$36.1*	*$36.1*	*$34.8*	*$27.0*	*$27.3*
Revenue Bond Debt Service Coverage Ratio (A/B)	**1.93**	**1.83**	**1.76**	**1.71**	**1.80**	**2.03**	**2.03**	**2.13**	**2.76**	**2.74**
General Obligation Bond Debt Service	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*
Existing Turnpike R&R Expenses[4]	*$9.8*	*$10.0*	*$8.9*	*$9.7*	*$12.2*	*$12.3*	*$10.1*	*$10.4*	*$10.7*	*$11.0*
Payments from General Reserves for I-95 Acquisition	*$5.9[5]*	*$5.9*	*$5.9*	*$5.9*	*$5.9*	*$5.9*	*$2.2*			
I-95 Advanced Payment	*$20.1[5]*									
Additional R&R	*$4.7[5]*									
Other Obligations (Sub-Total) (C)[6]	$9.8	$15.9	$14.8	$15.6	$18.1	$18.2	$12.3	$10.4	$10.7	$11.0
All Obligation Coverage Ratio (A/(B+C))	**1.52**	**1.30**	**1.29**	**1.25**	**1.24**	**1.35**	**1.52**	**1.64**	**1.98**	**1.95**

[1] Includes Toll Revenue, Other Revenue, Transponder Revenue, and Interest Income.

[2] Includes Administrative Expenses, Toll Operations, Maintenance, Safety & Enforcement, Toll Processing, Welcome Centers and Rest Areas, and Turnpike Funding to Highway and O&M Lapses. R&R and I-95 Payments not included.

[3] Assumes an issuance of 2012 Series C Bonds and a $50 million issuance in FY2015. Future issue assumed to be structured for 30-year level debt service with an interest rate assumption of 4.00%.

[4] Renewal and Replacement expenditures are projected, budgeted R&R amounts from HNTB's Renewal and Replacement Program Assessment Report dated January 12, 2012 for FY 2014 through FY 2019, and were increased by 3% annually from FY 2019-2022.

[5] Items excluded from the all obligations coverage ratio in FY 2013. Payment from the General Reserve of $5.9M plus advanced payment of $20.1M for I-95 in FY 2013 will be made from sufficient general reserves held at the end of the prior fiscal year. Additional R&R of $4.7M is a carry-forward from the previous year and is available for expenditure, and therefore is not included in the all obligations coverage ratio.

[6] Other obligations include general obligation debt service, existing turnpike R&R and payments from general reserves for I-95 acquisition for FY2014 and beyond.

The analysis shows that the Bureau of Turnpikes' revenue bond debt service coverage ratio is expected to range from a high of 2.76 in FY 2021 to a low of 1.71 in FY 2016. The low 1.71 revenue bond debt service coverage ratio in FY 2016 satisfies both the bond resolution's minimum requirement of 1.2 as well as the Bureau of Turnpikes' internal minimum coverage requirement of 1.3.

In comparison, the all obligation coverage ratio is projected to range from a high of 1.98 in FY 2021 to a low of 1.24 in FY 2017. The low all obligation coverage ratio of 1.24 in FY 2017 satisfies the bond resolution's minimum requirement of 1.0 and the Bureau of Turnpikes' internal minimum requirement of 1.1.

Table 20 is a projected cash flow analysis of the Turnpike System. The analysis reveals that the projected Bureau of Turnpikes cash reserves will be positive throughout the ten-year forecast period. Cash reserves as a percentage of Bureau of Turnpikes toll revenues are projected to range from a high of 131 percent in FY 2022 to a low of 11 percent in FY 2016.

Table 20: Projected Cash Flow Analysis, FY 2013-2022 (in millions)

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Net Income[1]	$23.8	$16.6	$16.2	$14.4	$14.1	$18.8	$24.9	$28.9	$36.8	$36.5
Net Bond Proceeds for Construction (minus issuance and set aside reserve costs)	*$112.0*	*$0.0*	*$46.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*
Capital Expenditures	*-$85.8*	*-$48.8*	*-$55.1*	*-$40.4*	*-$4.4*	*-$2.1*	*$0.0*	*$0.0*	*$0.0*	*$0.0*
Hooksett Rest Area Acquisition										
Beginning Cash	$53.4	$72.7	$40.5	$47.7	$21.7	$31.4	$48.1	$73.0	$101.9	$138.7
Annual Capital Surplus/(Deficit)	*$50.0*	*-$32.2*	*$7.2*	*-$26.0*	*$9.7*	*$16.7*	*$24.9*	*$28.9*	*$36.8*	*$36.5*
I-95 Payments	$26.0									
Additional R&R	$4.7									
Deferred Revenue Acct - Prepaid Tolls (restricted)	$8.0	$8.0	$8.0	$8.0	$8.0	$8.0	$8.0	$8.0	$8.0	$8.0
Ending Cash	**$64.7**	**$32.5**	**$39.7**	**$13.7**	**$23.4**	**$40.1**	**$65.0**	**$93.9**	**$130.7**	**$167.2**
Percent of Toll Revenues	56%	28%	34%	11%	19%	33%	52%	75%	103%	131%

[1] *Net Revenues less Revenue Bond Debt Service less Other Obligations*

10.4 LIMITS AND DISCLAIMERS

It is Jacobs' opinion that the traffic and toll revenue estimates provided herein represent reasonable and achievable levels of traffic and toll revenues that can be expected to accrue on the Turnpike System over the forecast period and that they have been prepared in accordance with accepted industry-wide practice. However, as should be expected with any forecast, and given the uncertainties within the current economic climate, it is important to note the following assumptions which, in our opinion, are reasonable:

- This report presents the results of Jacobs' consideration of the information available as of the date hereof and the application of our experience and professional judgment to that information. It is not a guarantee of any future events or trends.
- The traffic and gross toll revenue estimates will be subject to future economic and social conditions, demographic developments and regional transportation construction activities that cannot be predicted with certainty.
- The estimates contained in this report, while presented with numeric specificity, are based on a number of estimates and assumptions which, though considered reasonable to us, are inherently subject to economic and competitive uncertainties and contingencies, most of which are beyond the control of any tolling authority and cannot be predicted with certainty. In many instances, a broad range of alternative assumptions could be considered reasonable. Changes in the assumptions used could result in material differences in estimated outcomes.
- Jacobs' traffic and gross toll revenue estimations only represent our best judgment and we do not warrant or represent that the actual gross toll revenues will not vary from our estimates.
- We do not express any opinion on the following items: socioeconomic and demographic forecasts, proposed land use development projects and potential improvements to the regional transportation network.
- The standards of operation and maintenance on all of the system will be maintained as planned within the business rules and practices.
- The general configuration and location of the system and its interchanges will remain as discussed in this report.
- Access to and from the system will remain as discussed in this report.
- No other competing highway projects, tolled or non-tolled are assumed to be constructed or significantly improved in the Turnpike System corridors during the forecast period, except those identified within this report.
- Major highway improvements that are currently underway or fully funded will be completed as planned.

- The system will be well maintained, efficiently operated, and effectively signed to encourage maximum usage.
- No reduced growth initiatives or related controls that would significantly inhibit normal development patterns will be introduced during the estimate period.
- There will be no future serious protracted recession during the estimate period.
- There will be no protracted fuel shortage during the estimate period.
- No local, regional, or national emergency will arise that will abnormally restrict the use of motor vehicles.

In Jacobs' opinion, the assumptions underlying the projections provide a reasonable basis for the toll revenue projections. However, any financial projection is subject to uncertainties. Inevitably, some assumptions used to develop the projections will not be realized, and unanticipated events and circumstances may occur. There are likely to be differences between the projections and actual results, and those differences may be material. Because of these uncertainties, Jacobs makes no guaranty or warranty with respect to the traffic and toll revenue projections in this Study.