

FHWA Forecasts of Vehicle Miles Traveled (VMT): May 2014

Office of Highway Policy Information

Federal Highway Administration

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Highlights

Long-Term Economic Outlook

- Under the IHS Baseline economic outlook, the U.S national economy is expected to grow at an average annual rate of 2.5% through 2042. Over that same time, real disposable income per capita is projected to grow 1.8% per year.
- Population growth is expected to average 0.7% annually through 2042, while employment is expected to increase at an annual rate of 0.9%.
- Global oil prices are expected to decline from their recent peak, and remain relatively stable beyond 2018. During the 30-year forecast period, petroleum prices are expected to average \$86 per barrel (in constant dollars).

Nationwide Vehicle Travel Outlook

- With this Baseline economic outlook, Table 1 shows that growth in total VMT by all types of vehicles is anticipated to average 1.04% annually over the next 20 years, and 0.75% annually over the next 30 years. This represents a significant slowdown from the growth in total VMT experienced over the past 30 years, which averaged 2.08% annually, although growth in motor vehicle travel was already slowing throughout most of that period.
- Under the Baseline outlook, Table 1 reports that travel by light-duty vehicles –the largest category of total motor vehicle travel – is forecast to grow at an average annual rate of 0.98% over the next 20 years. Over the next 30 years, light-duty VMT is expected to increase at an average rate of 0.67% per year.
- Truck VMT – including travel by both single-unit and combination trucks – is projected to grow at 1.64% and 1.44% annually over the 20-year and 30-year forecast periods under the Baseline economic outlook. As Table 1 reports, VMT by combination trucks is projected to grow at average annual rates of 1.75% over the next 20 years and 1.60% over the next 30 years, while growth in travel by single-unit trucks is projected to average 1.46% and 1.16% per year over those same periods.
- Table 1 also shows that under the alternative forecasts of U.S. economic growth reflected in the IHS Optimistic and Pessimistic economic outlooks (and incorporating statistical uncertainty in FHWA's VMT forecasting models), the 30-year forecast of growth in total VMT ranges from 0.69% to 0.82% per year.

Table 1. Projected Growth in Vehicle Miles Traveled (VMT): May 2014

Vehicle Class	Compound Annual Growth Rates					
	Pessimistic Economic Outlook*		Baseline Economic Outlook*		Optimistic Economic Outlook*	
	2012 - 2032 (20 Year)	2012 - 2042 (30 Year)	2012 - 2032 (20 Year)	2012 - 2042 (30 Year)	2012 - 2032 (20 Year)	2012 - 2042 (30 Year)
<i>Light-Duty Vehicles</i>	0.92%	0.65%	0.98%	0.67%	1.04%	0.71%
<i>Single-Unit Trucks</i>	0.65%	0.53%	1.46%	1.16%	2.06%	1.57%
<i>Combination Trucks</i>	1.39%	1.30%	1.75%	1.60%	2.06%	1.87%
<i>Total</i>	0.94%	0.69%	1.04%	0.75%	1.14%	0.82%

*See the following sections for detailed descriptions of the Baseline and alternative economic outlooks.

FHWA Forecasts of Vehicle Miles Traveled (VMT): May 2014

Overview

The Federal Highway Administration's May 2014 long-term forecasts of nationwide VMT are based on long-term economic and demographic forecasts produced by the economic forecasting firm IHS.¹ FHWA's national VMT forecasts are produced by statistical models that incorporate factors affecting historical variation in motor vehicle use through 2012; these models are then used to develop forecasts that begin in 2013 and extend through 2042. The following sections highlight the IHS Baseline forecasts of the key economic and demographic factors expected to influence future growth in passenger and freight travel, and discuss the resulting VMT forecasts. Following this is a brief discussion of the alternative forecasts of U.S. economic performance provided by IHS and their implications for future VMT growth.

Baseline Economic Outlook

Table 2 summarizes the IHS Spring 2014 long-term Baseline forecast of key measures of U.S. economic activity used in FHWA's VMT forecasting models. As it shows, the U.S. population is projected to increase by 0.7% annually over the 30-year forecast period, a rate well below its 1.0% annual growth over the previous 30 years. Aggregate economic output – as measured by constant-dollar GDP – is anticipated to increase 2.5% annually through 2042, which represents slightly slower growth than the U.S. economy has experienced in recent decades.

The component of real economic output consisting of goods production is projected to grow somewhat faster than total GDP over the forecast period, reflecting a gradual change in the composition of U.S. economic output. The IHS baseline forecast also projects that growth in disposable personal income per Capita will average 1.8% annually over the 30-year forecast period, slightly lower than its growth over the past few decades. The long-term economic outlook also projects that fuel prices will decline gradually, but remain above their typical historical levels throughout the forecast period; energy prices are expected to be relatively stable over the longer term, particularly when compared to their recent extreme volatility.

¹ <http://www.ihs.com/index.aspx>

Table 2. IHS Baseline Long-Term Forecast: Spring 2014

Demographic and Economic Indicators	Historical Growth Rate	Forecast Growth Rate: 2012-42
U.S. Population	1.0%	0.7%
<i>GDP (constant dollars)</i>	2.9%	2.5%
<i>Real Goods Component of GDP (constant dollars)</i>	3.2%	3.1%
<i>Disposable Personal Income per Capita (constant dollars)</i>	2.0%	1.8%
<i>Gasoline Price per Gallon (constant dollars)</i>	1.2%	-0.3%

Growth in Vehicle Travel under the Baseline Outlook

Under the IHS Baseline economic outlook, steady growth in employment, business investment, and productivity lead to continuing gradual increases in real economic output (Gross Domestic Product) and personal income, while energy prices remain stable. These trends combine with relatively slow population growth to generate sustained growth in both passenger vehicle and truck travel, although at significantly slower rates than were experienced in recent decades.

In 2012, travel by light-duty vehicles amounted to 2.66 trillion miles, slightly more than 90% of total motor vehicle travel in the U.S. As Table 3 reports, growth in total VMT by light-duty vehicles – including automobiles and light-duty trucks used primarily for passenger travel – is projected to average 0.98% per year from 2012-2032. Over the following decade, growth in light-duty vehicle travel is expected to slow somewhat, so that over the entire 30-year forecast period, its growth is projected to average 0.67% per year.

Table 3. Baseline Forecasts of VMT Growth

Vehicle Class	Compound Annual Growth Rates	
	2012 – 2032 (20 Year)	2012 – 2042 (30 Year)
<i>Light-Duty Vehicles</i>	0.98%	0.67%
<i>Single-Unit Trucks</i>	1.46%	1.16%
<i>Combination Trucks</i>	1.75%	1.60%
<i>Total</i>	1.04%	0.75%

Truck travel in the U.S reached 268 billion miles in 2012, accounting for almost all of the remaining 10% of U.S. motor vehicle use.² Table 3 shows that truck travel is projected to grow more rapidly than light-duty vehicle travel under the Baseline economic outlook, but is also expected to slow gradually in the last decade of the forecast period. Growth in VMT by single-unit trucks is projected to average 1.46% per year from 2013-32, and 1.16% annually for the entire 30-year period from 2012-42.

VMT by combination trucks is expected to grow somewhat more rapidly, reflecting the outlook for sustained growth in U.S. goods manufacturing and international trade, but is also anticipated to slow gradually toward the end of the forecast period. Combination truck VMT is projected to increase by 1.75% annually for the 20 years from 2012-32, and by 1.60% per year over the complete 30 year forecast period.

Finally, Table 3 reports that aggregate VMT by all vehicle classes is projected to grow at an average annual rate of 1.04% over the 20 years from 2012-32. Reflecting the projected slowing of VMT growth for all vehicle classes, total VMT is expected to increase at an average annual rate of 0.75% for the entire 30-year forecast period. Because light-duty vehicles account for the dominant share of total motor vehicle travel in the U.S., the 30 year forecast growth rate in total VMT is only slightly above the 0.67% annual growth projected for light-duty vehicle travel through 2042.

Alternative Economic Outlooks and VMT Forecasts

Changes in vehicle use over the past two decades, particularly during the 2008-09 recession and prolonged recovery, have highlighted the uncertainty that surrounds forecasts of future growth in motor vehicle travel. Important sources of such uncertainty include concerns about future prospects for economic growth, alternative interpretations of the causes and likely persistence of recent declines in vehicle ownership and use (particularly among younger Americans), and the potential effects on vehicle use of dramatic innovations in technology such as the advent of autonomous vehicles. FHWA provides a range of alternative forecasts for future VMT growth that reflects uncertainty about the outlook for future economic growth, and also incorporates statistical uncertainty in its VMT forecasting models.³

To develop these alternative forecasts, FHWA used projections of population growth, U.S. economic output and its composition, growth in personal income, and energy prices from the Optimistic and Pessimistic scenarios reported as part of IHS' April 2014 30-year economic outlook. FHWA's alternative forecast of higher VMT growth relies on IHS' Optimistic economic outlook, which projects stronger growth in productivity, labor force participation, employment, and business investment levels than under the Baseline outlook.

These factors combine with a more robust recovery in the housing sector and lower energy prices to produce stronger growth in real GDP, goods production, and disposable income than in the Baseline

² Motorcycles and buses, which are excluded from the forecasts reported in Table 3, together accounted for only about 1% of all U.S. motor vehicle travel during 2012.

³ Uncertainty about future VMT growth arising from the potential for fundamental changes in travel behavior or vehicle technology is likely to be resolved only with the passage of time, the availability of more detailed information about personal travel, and experience with real-world deployment of advanced vehicle technologies. Thus FHWA's forecasts of future VMT growth do not attempt to incorporate these sources of uncertainty.

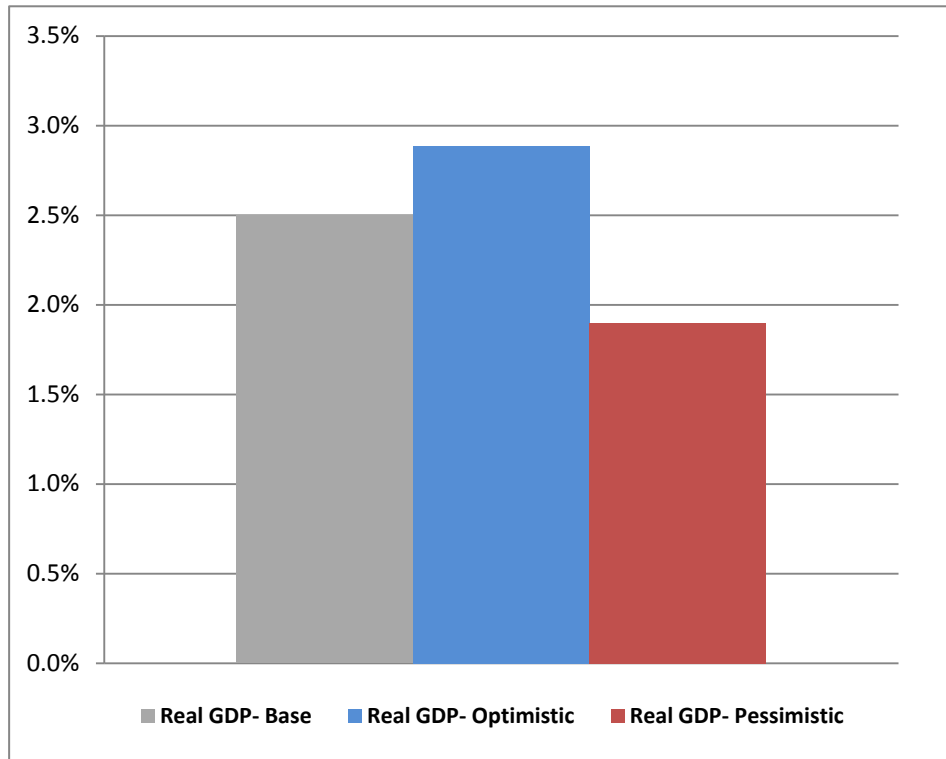
outlook. In turn, these developments produce slightly more rapid growth in personal travel and passenger vehicle use, and significantly faster growth in freight shipments and truck VMT under the Optimistic economic outlook.

In contrast, FHWA's alternative forecast of lower growth in vehicle use reflects the Pessimistic economic outlook from IHS' April 2014 forecast. This alternative outlook predicts weaker growth in productivity, labor force participation, and business investment, and together with higher interest rates and more rapid price inflation these developments produce sluggish economic growth over most of the 30-year forecast period.

These developments combine with less robust activity in the housing sector and higher energy prices to dampen projected future growth in real GDP and personal income compared to the Baseline economic outlook. Under this scenario, demand for personal travel and passenger vehicle use increase primarily as a result of U.S. population growth, while slower growth in goods manufacturing, freight shipments, and construction activity dampen growth in truck use significantly from the levels projected in the Baseline forecasts of vehicle use.

To illustrate the important differences in future economic trends affecting vehicle use among the alternative economic outlooks, Figures 1-3 below compare forecast growth in real GDP, personal disposable income, and gasoline prices in the Pessimistic and Optimistic scenarios to the Baseline outlook. As Figure 1 shows, real GDP is anticipated to grow about 2.8% per year over the 30-year forecast period under the Optimistic outlook, compared to 2.5% annual growth projected for the Baseline scenario, but is projected to average only about 1.8% annually in the Pessimistic scenario.

**Figure 1. Real GDP Growth under Alternative Economic Outlooks
(30-Year Average Annual Growth)**



Similarly, Figure 2 shows that growth in real personal disposable income per person is forecast to average just under 2.0% per year in the Optimistic scenario, only slightly above its projected annual growth of 1.8% in the Baseline outlook, but well above the 1.5% annual rate projected under the Pessimistic economic outlook. Figure 3 illustrates that inflation-adjusted retail gasoline prices are expected to decline at a rate averaging 0.7% annually under the Optimistic scenario, somewhat faster than the 0.3% average yearly decline expected under both the Baseline and Pessimistic economic outlooks.

Figure 2: Growth in Real Personal Disposable Income per Capita under Alternative Economic Outlooks (30-Year Average Annual Growth)

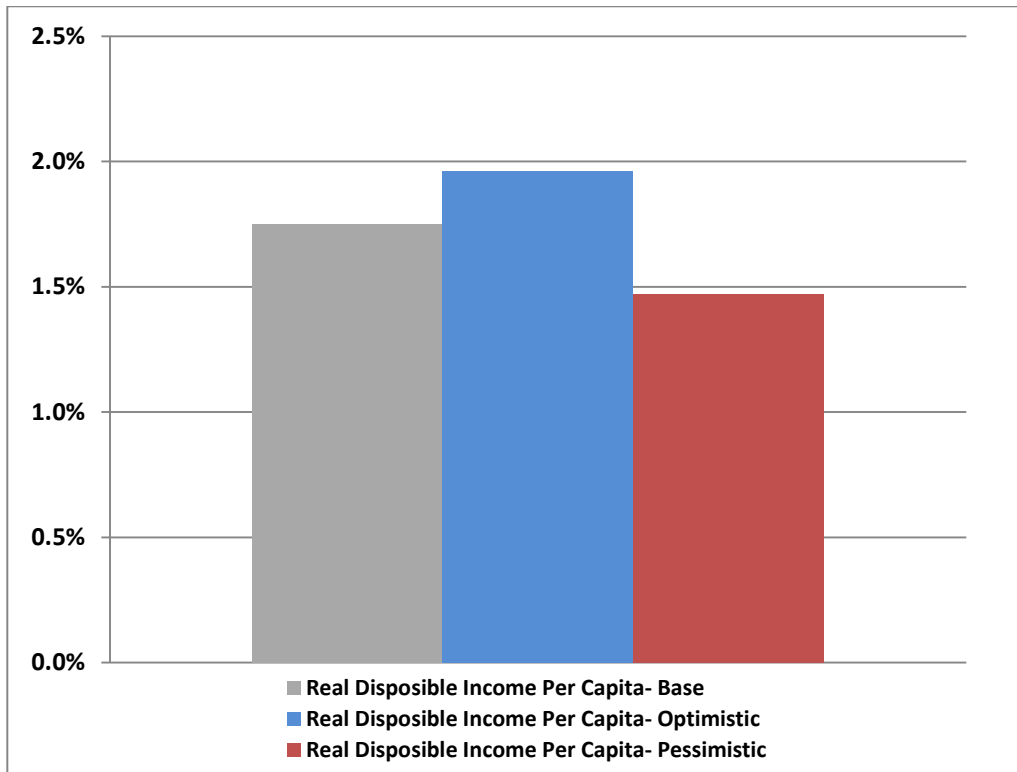


Figure 3: Changes in Real Gasoline Prices under Alternative Economic Outlooks (30-Year Average Annual Change)

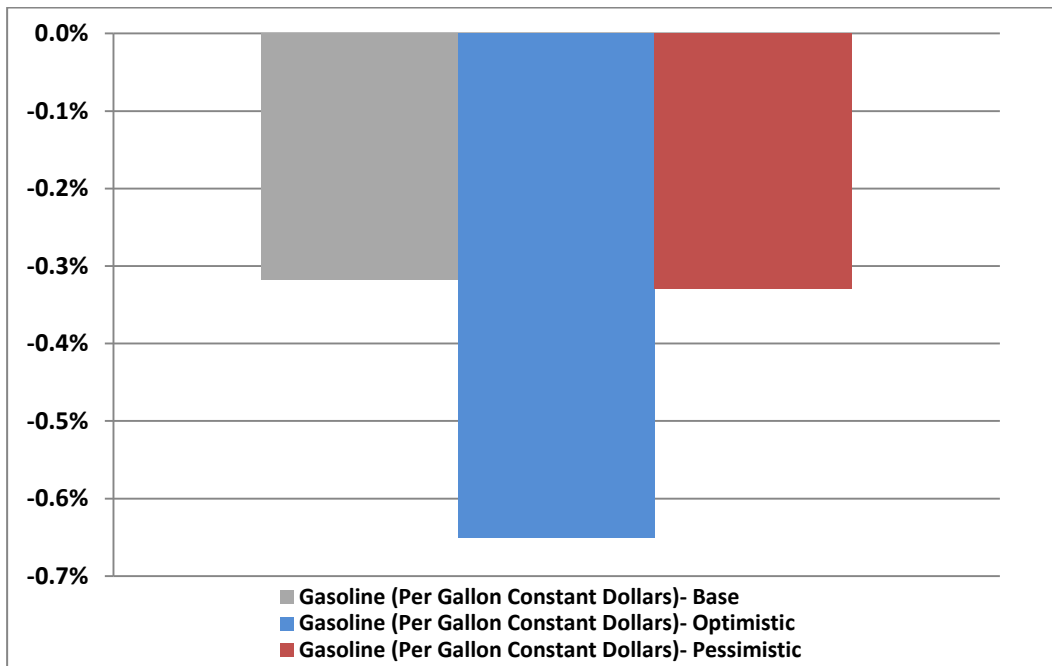


Table 4 reports alternative forecasts of future growth in VMT under the Optimistic and Pessimistic economic outlooks, which reflect the effect of uncertainty about future economic growth. As it shows, these alternative outlooks have little effect on the forecast of future growth in light-duty vehicle use, primarily because the forecasts of growth in disposable personal income and gasoline prices differ relatively little between the two. As Table 4 also shows, their effect on the forecasts of long-term growth in truck travel is much larger. Because light-duty vehicles account for by far the largest share of total VMT, however, the long-term forecast of total VMT varies only within a comparatively narrow range between the Optimistic and Pessimistic economic outlooks.

Table 4. Alternative Forecasts of VMT Growth

Vehicle Class	Compound Annual Growth Rates			
	Pessimistic Economic Outlook		Optimistic Economic Outlook	
	2012 - 2032 (20 Year)	2012 - 2042 (30 Year)	2012 - 2032 (20 Year)	2012 - 2042 (30 Year)
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Acknowledgement

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