



Caltrans Division of Research,  
Innovation and System Information

# Research



# Results



Planning, Policy,  
and Programming

## Traffic Volume and Economic Activity: Implications for Taking the Pulse of the US Economy

Examine the incremental relevance of aggregate Vehicle Miles Traveled (VMT) data for forecasting current quarter Gross Domestic Output (GDP) growth and employment growth.

### WHAT IS THE NEED?

What is the current state of the U.S. economy? The answer to this question is the “holy grail” for macroeconomists and a wide range of decision makers. Indeed, GDP adjusted for inflation is the key summary statistic of economic activity and the most important variable in analyses of economic growth. It is used by the White House and Congress to prepare the Federal Budget, by the Federal Reserve to formulate monetary policy, by Wall Street as an indicator of economic activity, and by the business community as a key input for production, investment, and employment decisions. Although prior research in transportation and urban planning has identified a positive, bidirectional link between traffic volume and economic activity, there is a dearth of evidence on the relevance of traffic volume information for gauging the state of the U.S. economy in real time. This is because, by and large, macroeconomics research has evolved independently from research in other disciplines. Our study breaks new ground for interdisciplinary research in macroeconomics and transportation by focusing on the relevance of real-time traffic volume data for gauging fluctuations in the U.S. economy.

### WHAT WAS OUR GOAL?

Traffic volume data can be used to construct long time-series of indices not only at the state-level but also at the federal-level. Our research questions focus on the potential of such aggregate indices to serve as coincident indicators of overall economic activity. A contemporaneous link between aggregate traffic volume data and overall economic activity would suggest that such data can be relevant for nowcasting GDP growth. A related goal of our investigation of the link between aggregate traffic

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Caltrans provides a safe, sustainable,  
integrated and efficient transportation  
system to enhance California's  
economy and livability.

volume data and macroeconomic activity was to inform professional macro forecasters stuffing the U.S. Government, which routinely uses GDP growth forecasts when developing the Federal Budget, and the Federal Reserve, which considers GDP growth forecasts as central for monetary policy making. If aggregate traffic data embed information relevant for forecasting GDP growth in real time, then it is possible such data can be used to improve consensus forecasts of current quarter GDP growth and, in turn, employment growth. Given that consensus GDP forecasts are central for policy making any evidence of improvability based on our indices becomes de facto important.

## WHAT DID WE DO?

The starting point in our investigation of the link between traffic volume data and overall economic activity are the Traffic Volume Trends (TVT) reports—a monthly publication by the Federal Highway Administration (FHWA) Office of Highway Policy Information, U.S. Department of Transportation. The TVT reports include information about VMT on all U.S. public roads on a monthly basis. The reports are based on traffic data from the Highway Performance Monitoring System and on data submitted to the FHWA by State highway agencies throughout the entire U.S. Using data from the TVT reports, we construct a real-time index of VMT growth and investigate its incremental relevance for gauging fluctuations in the U.S. economy, in terms of real GDP growth and employment growth.

## WHAT WAS THE OUTCOME?

Using our real-time index of VMT growth, we deliver three main messages. First, we show that seasonally adjusted VMT growth is closely related to employment growth and real GDP growth. Second, this relation strengthens as we move from the initial estimates of economic activity to

more recent vintages, which are closer to the true state of the U.S. economy. Third, our index of VMT growth has incremental predictive content for the revisions in the initial estimates of employment growth and real GDP growth. Our analysis of the granular origins of aggregate VMT fluctuations highlights the importance of state of California for gauging fluctuations at the federal level. Indeed, we find that on a stand-alone basis California VMT growth explains as much as 64% of the time-series variability of aggregate VMT growth. This result is striking given that California VMT accounts for 11% of the aggregate VMT level. Our analysis also shows evidence of diminishing marginal benefits from adding more states in the aggregation process beyond the top10 states in the aggregation process.

## WHAT IS THE BENEFIT?

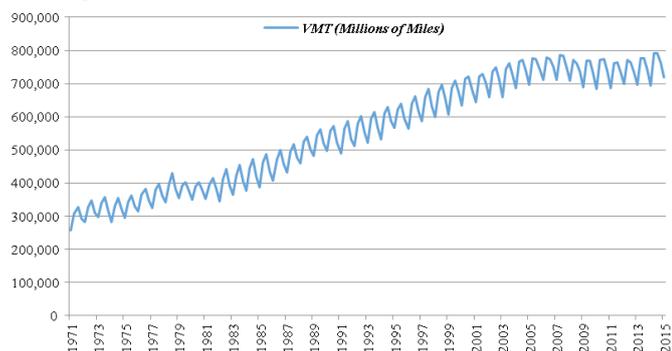
Our findings have important implications for a wide array of decision makers, including the Federal Reserve when formulating monetary policy, the White House when setting the Federal Budget, businesses when making investment decisions, and capital market participants when setting asset prices. Our findings can inform the BEA of the U.S. Department of Commerce and the Bureau of Labor Statistics when measuring the U.S. economy. We are also excited about the potential of our study to address key issues that are relevant to California. First, our real-time indices of traffic volume data when aggregated at the state-level can be used for forecasting current economic activity in California. Second, given that economic activity is inexorably linked to labor market conditions, our study is poised to shed new light on the link between traffic volume growth, employment growth, and unemployment rates in California. Third, our study can address the question whether traffic conditions in California can serve as a “bellwether” indicator for economic activity in other states as well as for taking the pulse of the entire U.S. economy.

**LEARN MORE**

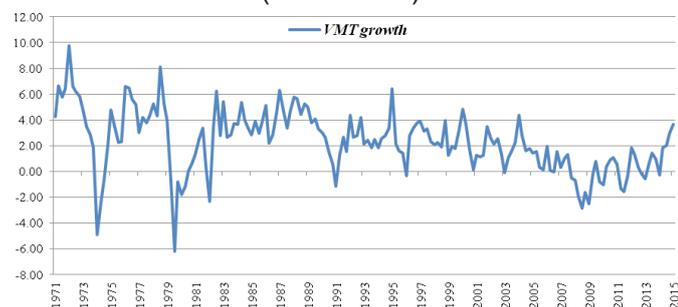
Review the complete report.

[http://www.dot.ca.gov/research/researchreports/dri\\_reports.htm](http://www.dot.ca.gov/research/researchreports/dri_reports.htm)

**IMAGES**



**FIGURE 1: Time-series of aggregate VMT level (1971-2015)**



**FIGURE 2: Time-series of seasonally adjusted aggregate VMT growth**

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