Vehicle Miles Traveled

Background

Vehicle use in New Jersey is an indirect indicator of vehicle emissions, which contribute to the formation of ozone. Ozone is not emitted directly into the atmosphere. Rather, it is formed by a series of reactions between nitrogen oxides and volatile organic compounds in the presence of sunlight. Motor vehicles are the single largest source category of ozone precursor emissions in New Jersey.[1] In addition, motor vehicles directly emit fine particulates and several air toxic pollutants such as benzene.

One indicator of vehicle use is the total miles traveled on roads and highways by motor vehicles in the state, or vehicle miles traveled (VMT). The New Jersey Department of Transportation (DOT) estimates that, in 2013, more than 200 million miles were traveled per day on the state's roadways.[2] Although diesel fueled vehicle VMT is a small portion (less than 10%) of total VMT, emissions from diesel vehicles constitute about half of all the particulate matter and ozone precursors emitted from vehicles operating in the State (both onroad and nonroad).

The Highway Performance Monitoring System is a national highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the nation's highways. It is used to estimate VMT.[3] These estimates are used to monitor highway use and aid the Federal Highway Administration in allocating federal transportation funding to individual states. The data are a reasonable approximation of vehicle travel on New Jersey's roadways. These data do not provide estimates of other important indicators such as number of vehicle trips, or information regarding the origin and destination of a trip or the speed the vehicle is traveling during the trip. The number of trips may be more indicative of vehicle emissions than VMT because the emissions from a car are much greater for the first few minutes after start-up, when the catalytic converter is still cold and the engine is running with a richer mixture (higher gas to air ratio). However, trip data are not readily available. VMT data also do not consider the impacts of improved vehicle emissions control technology, which has resulted in reduced emissions of a number of pollutants. The lower emission standards of new vehicles are expected to continue the trend of reduced emissions due to the fleet turnover from older to newer vehicles. However, emissions could eventually level off and increase if VMT continues to rise.

Phot credit: http://www.public-domain-image.com/free-images/transportation-vehicles/cars-automobile/driving-rain-road-cars

Trends

Figure 1 shows a steady increase of 1.5% per year in VMT and a much slower relative increase of 0.73% per year in public road miles from 1991 through 2007.[4] Beginning in 2008, a general decline in VMT was observed for a couple of years and has since begun to increase again. The decline in VMT may be related to the relatively higher cost of gasoline and diesel fuel during that period. Road construction continued to grow during the period of record. The trend of vehicle miles traveled per capita (Figure 2) is similar to that of total vehicle miles traveled.

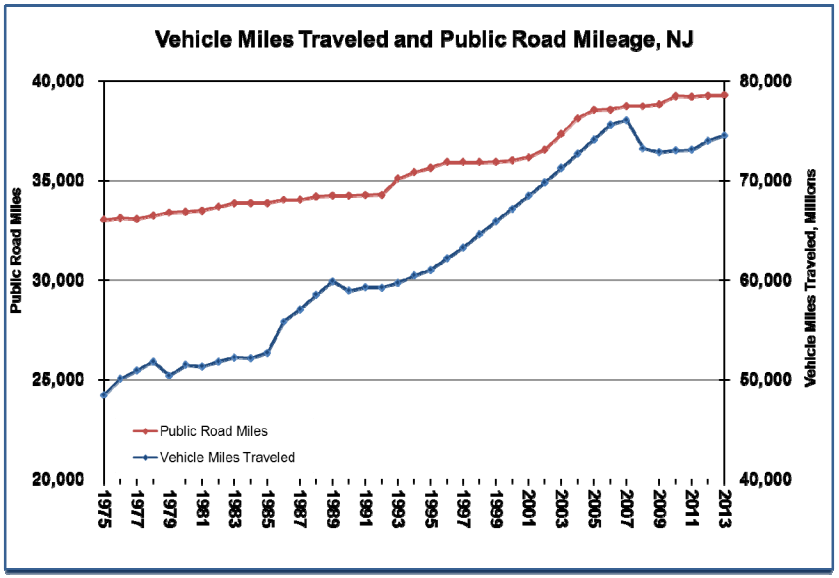

Figure 1. Public road miles and estimated vehicle miles traveled.

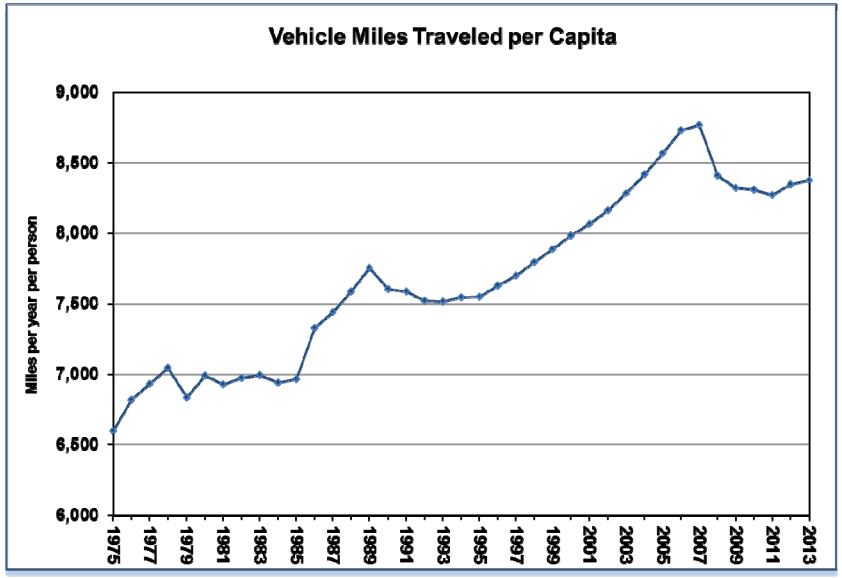

Figure 2. Vehicle mile traveled per person.

Outlook & Implications

Historic trends indicate that VMT declines that are associated with rising fuel prices will reverse themselves when fuel prices drop. Other indicators of changing VMT trends include economic growth, affordability of auto travel, sprawl and access to public transportation.

Even with the recent declines, the ratio of VMT to road mileage remains relatively high compared to earlier years. This higher ratio of VMT to road miles explains why traffic congestion has appeared to become more of a problem. However, it has been argued that the solution to congestion is not only to increase road miles, but to design effective congestion management solutions because expanded and new highways may simply generate more traffic.[5] Solutions to congestion include amending patterns of residential and commercial development to facilitate pedestrian and bicycle travel, electronic commerce and telecommuting as well as adding to and maintaining current roadways.

More Information

For more information, visit www.state.nj.us/transportation/refdata/roadway/vmt.shtm or www.fhwa.dot.gov/environment

References

[1]New Jersey Department of Environmental Protection. 2012 Air Quality Report. Available at http://www.njaqinow.net/App_Files/12rpt.htm. Accessed Nov. 2014.

[2]New Jersey Department of Transportation. 2013 Daily Vehlicle Miles of Travel (1000's). Available at http://www.state.nj.us/transportation/refdata/roadway/pdf/hpms2013/VMT_13.pdf. Accessed Nov. 2014.

[3]US Department of Transportation, Federal Highway Administration. Highway Performance Monitoring System (HPMS). Available at http://www.fhwa.dot.gov/policyinformation/statistics.cfm. Accessed Nov. 2014.

[4]New Jersey Department of Transportation. Public Roadway Mileage and Vehicle Miles Traveled. Data available at http://www.state.nj.us/transportation/refdata/roadway/vmt.shtm. Accessed Nov. 2014. Note 2003 road mileage value was averaged from 2002 and 2004 values. The value on the NJDOT site is apparently in error.

[5]Tri-State Transportation Campaign. Managing Congestion. Available at http://www.tstc.org/issues/congestion.php. Accessed Nov. 2014.