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Vehicle Miles Traveled (VMT): An Environmental Metric?

The Wall Street Journal has reported on the role the environmental lobby will play in the transportation debates regarding the 2009 expiration of SAFETEA-LU. As Joseph B. White said “the next phase of the debate over cars will force us to learn another piece of technical jargon: VMT, or vehicle miles traveled.”¹ So, now, I wonder whether those using VMT as an environmental indicator (ie. “reduce VMT”² or “cut VMT growth by half”³) understand the statistic?

Breaking down Vehicle Miles Traveled (VMT)

VMT is a driving statistic. It tells us how much cars move. VMT tells us the amount of driving Americans do. However, driving, in and of itself, does not cause emissions. This is no longer a theoretical point: there are emission-free vehicles (sometimes called “zero-emissions vehicles”, ZEVs) being produced today.

But, of course, our environmental problems are more serious than waiting 20, 30, or 50 years for the entire fleet of vehicles to roll over to ZEVs. So, maybe VMT is the best we can do? No. The problems for VMT as an environmental statistic are numerous.

The VMT index itself is flawed—critically, and fundamentally flawed—for the purpose of analyzing impacts on the environment. To say that “VMT needs to be reduced”, or even to say “the growth rate in VMT needs to be reduced” is simplistically arbitrary, on multiple levels—best shown by examining “Vehicle Miles Traveled” word-by-word:

1. Vehicle: As stated, vehicles do not in-and-of-themselves cause emissions. But given the fact that 99.99% of vehicles on the road today *do* cause emissions, let’s examine in more detail. The better point to make, given today’s situation, is to start with a simple fact: **Each vehicle causes a different amount of emissions**. So the range of results from 1 vehicle mile traveled can be wide just on the basis of which type of vehicle traveled that mile; *but also where that vehicle mile of travel occurred*. If it occurred in the city, with lots of stop lights, a hybrid car may be much better for the environment. However, on an open road highway, an opposite point could be made—your typical car performs much better than it’s average when it is on an open, free-flowing highway.
2. Miles: This word can be universally applied, whether it be different cars, different pollution rates, or even different modes of travel—a mile is a mile. Yet, as stated above, vehicles in and of themselves don’t cause emissions. A vehicle *that can*

¹ Wall Street Journal, February 5, 2008; page D2

<http://online.wsj.com/article/SB120190455899936509.html>

² The State of Washington is considering legislation to “reduce vehicle miles traveled”

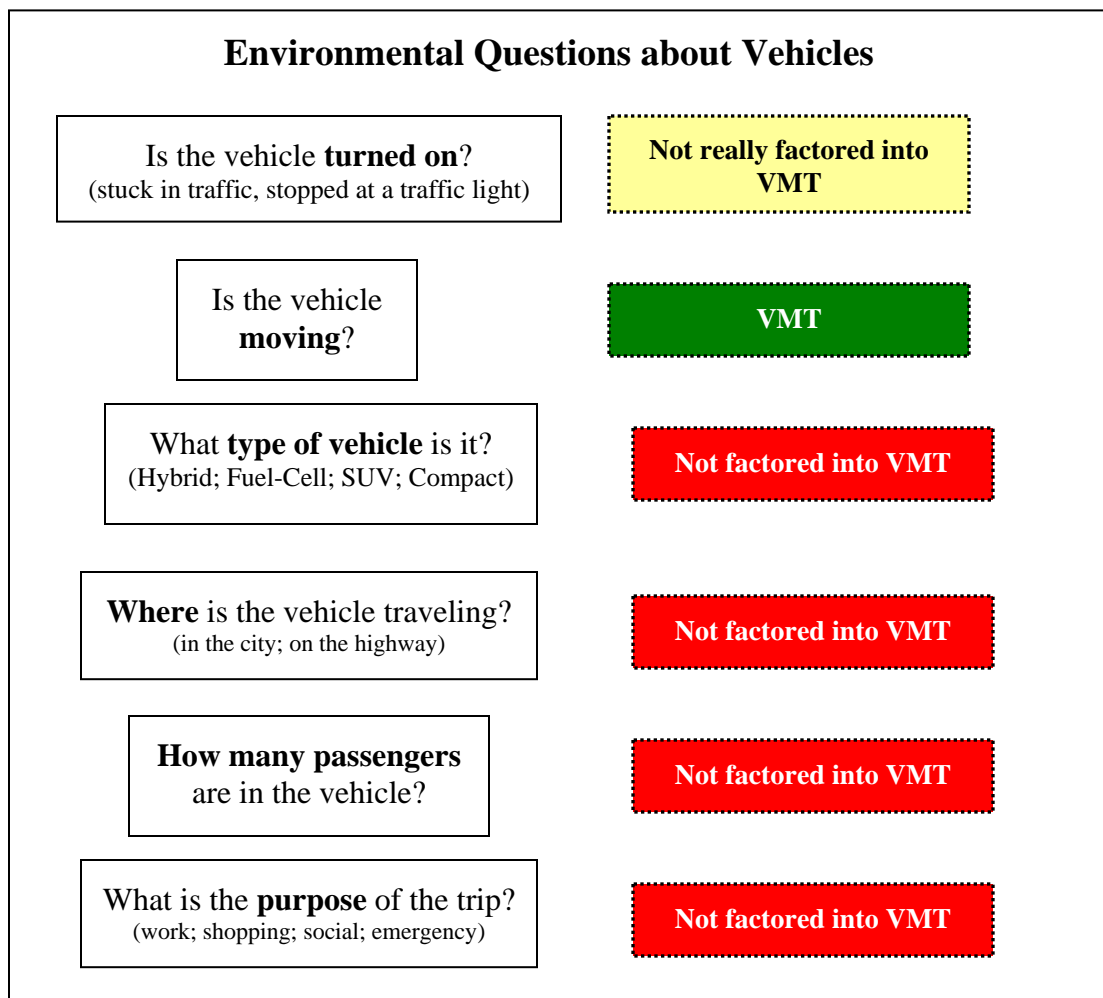
<http://apps.leg.wa.gov/billinfo/summary.aspx?bill=3154&year=2007>

³ <http://www.transportation1.org/tif5report/TIF5.pdf>

pollute; only pollutes when it is moving... *and*, technically, anytime the vehicle is *turned on*. Vehicles pollute while sitting at a stop light. So, the point is that even using miles can miss part of the story. Miles traveled, in the aggregate, can still give a fairly complete picture. It is the “miles” that really gives VMT any applicability for the environment.

3. Traveled: This word when referenced together with a vehicle, is not universal for the purpose of using VMT in an environmental context. The vehicle could have 1, 2, 3, or more people inside. And you can consider, together, both the number of people *and* the *type of* vehicle. You could be driving an environmentally-friendly 55 mpg Toyota Prius, but if the driver of the Toyota Camry next to you also has 3 passengers with them, then the Prius isn't all that efficient by comparison. The Prius driver can find solace in comparing to all the other cars and also by looking at the totality of their driving over the course of a time period, such as a year. But the point is made. The average vehicle trip has 1.63 people in the car.⁴

Below is a diagram showing the environmental questions we should be asking about vehicles when determining policies that can help the environment.



⁴ See the summary for the 2001 NHTS: <http://nhts.ornl.gov/2001/pub/STT.pdf>

What is the purpose of driving?

Where are people driving *to*? Policies aiming to impact VMT must start to consider the **purpose** of the trip. Is the vehicle traveling as part of a commute to/from work? Is the vehicle traveling for work in some other manner (such as a salesperson with an irregular travel schedule; or a plumber making house calls)? Is the vehicle going shopping? Is this an emergency trip? We need to **fully** understand the ramifications of reducing people's ability to move by vehicle before we start making arbitrary policies aiming to "reduce VMT" or "cut VMT growth rate by 50%"⁵. For example, there has been a strong correlation between the growth rate of VMT and the growth of our economy.⁶

Macro-Statistical Impacts

Macro-economic statistics are another major factor ignored by policies aiming to affect VMT. Targeting VMT is also indirectly targeting immigration, birth rates, and (again) economic growth. In other words, VMT can grow merely by having more people in the population. More people equals more driving. If the population is growing, say, 2.2% then VMT is likely going to grow.

VMT is not an environmental indicator

For all of these reasons, VMT is entirely the WRONG STATISTIC for improving the environment. A policy to "reduce VMT" is inappropriate because:

- VMT does not factor in **population growth** (birth rates, immigration, etc)
- VMT does not consider **economic growth**
- VMT does not account for the **purpose of the trip**? What is accomplished through VMT? Are there unintended consequences of curtailing these activities? Who determines what is, or is not, a valid purpose of VMT?
- VMT does not distinguish between **highway vs city driving**
- VMT does not distinguish which **type of car** is driving
- VMT does not account for the **number of passengers** in the vehicle.

Policies to "reduce VMT" are overly simplistic and full of unintended consequences. The bottom line is that VMT is not an environmental indicator. It would be helpful if well-intentioned environmental advocates would at least pause to think about the proper metric before declaring a new policy. Maybe it is difficult to consider all of these points in *one* statistic (Although I will cover this very topic in a coming policy paper. For example: "**Emissions per person mile of travel**". Now that is an environmental indicator). However, at least try to reflect one of these contingencies. How about "VMT per capita" or, as the 2001 NHTS refers to "Person Miles of Travel (PMT)"? The first idea is not always the best solution. The goal (improving the environment and/or reducing emissions) is clear and something a lot of people can agree on. **To improve the environment we need to reduce emissions** (places to start: R&D and new technology).

⁵ <http://www.transportation.org/sites/aashto/docs/Horsley-2008-01-14.pdf>

⁶ <http://www.interstate50th.org/docs/techmemo4.pdf>