U.S. Department
of Transportation

National Highway
Traffic Safety
Administration

Research Note

PB98-163702

September 21, 1995

Revised Vehicle Miles of Travel for Passenger Cars and Light Trucks, 1975 to 1993

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Background

The Federal Highway Administration (FHWA) historically has supplied registered vehicle and vehicle miles of travel (VMT) data for use with the National Center for Statistics and Analysis (NCSA) motor vehicle injury and fatality data. Over the last several years, though, the boom in light truck sales (especially minivans and sport utility vehicles) did not appear to be reflected in the FHWA registered light truck numbers. When FHWA's figures for registered cars and light trucks were compared with R.L. Polk data for these vehicles, large variations were found (See Table 1). The explanation for the majority of the differences in the two sources of registered vehicles was different definitions for cars and light trucks. FHWA classifies minivans and utility vehicles as passenger cars, whereas Polk and NHTSA classify these vehicles as light trucks. Starting with the **1993 Traffic Safety Facts Report**, NCSA began using Polk registered vehicle data for calculating fatality and injury rates per registered vehicle. Although Polk data were readily available, some data manipulation was required and a complete description of this effort has been published in a NHTSA technical report, **Registered Passenger Cars and Light Trucks** (DOT HS 808 235).

Table 1: Percent Registered Passenger Cars and Light Trucks, 1975 to 1993

Year	FHWA		R.L. Polk	
	Cars	Light Trucks	Cars	Light Trucks
1975	84%	16%	82%	18%
1976	83%	17%	81%	19%
1977	83%	17%	80%	20%
1978	82%	18%	79%	21%
1979	81%	19%	78%	22%
1980	81%	19%	78%	22%
1981	81%	19%	77%	23%
1982	81%	19%	77%	23%
1983	80%	20%	77%	23%
1984	80%	20%	76%	24%
1985	80%	20%	76%	24%
1986	80%	20%	75%	25%
1987	79%	21%	74%	26%
1988	79%	21%	73%	27%
1989	79%	21%	72%	28%
1990	79%	21%	71%	29%
1991	78%	22%	70%	30%
1992	78%	22%	69%	31%
1993	78%	22%	68%	32%

Investigation of VMT

The discrepancies discovered in FHWA's registered car and light truck counts precipitated a review of FHWA's classification of light vehicles (passenger cars and light trucks) for VMT. The VMT for light trucks appeared to follow the FHWA's registered light truck numbers and not the Polk light truck numbers. FHWA's VMT figures are derived from traffic count and vehicle distribution information provided annually by each state. For a complete description of the recommended collection procedures, refer to the **Traffic Monitoring Guide** (FHWA-PL-95-031). Due to collection and reporting differences in the states, passenger car VMT may or may not include VMT for small vehicles in addition to cars, such as compact pickups, small utility vehicles, and minivans. The extent of the problem is not easily discernible. A method to distribute total light vehicle VMT to reflect NHTSA's vehicle classification was necessary.

Alternative Sources for VMT Data

Two data sources were considered for distributing light vehicle VMT between cars and light trucks. The first data source considered was the Residential Transportation Energy Consumption Survey (RTECS), a national survey of households conducted by the Energy Information Administration of the Department of Energy. The purpose of the survey is to collect information on the use of energy in residential vehicles in the United States. To qualify as a residential vehicle, the vehicle could be owned or used by household members for personal transportation or the vehicle could be a company vehicle that is kept at home and available for household members. For each vehicle in the sample, the RTECS collects a beginning-of-year and
an end-of-year odometer reading. Average miles traveled per year are calculated by vehicle type, including car, pickup, utility, minivan and standard van. RTECS data were available for 1980, 1983, 1985, 1988, and 1991.

The other source of VMT data considered was FHWA's Nationwide Personal Transportation Survey (NPTS), a telephone survey of households in the nation. The primary objective of the NPTS is to collect trip-based data on the nature and characteristics of personal travel. The NPTS estimates of vehicle miles traveled are based on the survey respondent's estimate of miles each household vehicle was driven during the previous year. Estimates are available for different vehicle types, but the vehicle classifications used by FHWA are followed. For example, utility vehicles have been included with the passenger cars.

RTECS was chosen as the best available source of miles traveled data to distribute light vehicle VMT between cars and light trucks. The primary reasons for this selection were that odometer readings are considered more reliable than a person's recollection of miles driven, and the vehicle classifications in RTECS could be made to resemble NHTSA's vehicle classifications.

Revision Methodology

The goal was to redistribute total light vehicle VMT from FHWA for all years that VMT and data from the Fatal Accident Reporting System (FARS) are available--1975 to 1993. The ratio of the average annual miles per car and light truck were obtained from RTECS for as many years as possible:

1980 RTECS: Average miles per car is 8% higher than light truck average.

1983 RTECS: Average miles per car is 7% higher than light truck average.

1985 RTECS: Average miles per car is 4% higher than light truck average.

1988 RTECS: Average miles per car is 4% higher than light truck average.

1991 RTECS: Averages are the same.

Three separate average adjustment factors were calculated for the 1975 to 1993 VMT recalculations. These adjustment factors were applied to the percentage of registered cars and light trucks based on the total number of registered cars and light trucks from Polk with the result being a revised percentage of VMT for cars and light trucks of the total car and light truck VMT. The factors were:

- For data from 1975 to 1984, a 7.5% adjustment factor was applied.
- For data from 1985 to 1990, a 4% adjustment factor was applied.
- For data from 1991 to 1993, no adjustment factor was applied.

The factors were applied to the Polk registered vehicle percentages for cars and light trucks as follows, where

PC = percentage of passenger cars based on Polk registered cars and light trucks, and

LT = percentage of light trucks based on Polk registered cars and light trucks.

For 1975 to 1984,
Revised VMT % for Cars =
$(PC*1.075)/(PC * 1.075 + LT)$

For 1985 to 1990,
Revised VMT % for Cars =
$(PC*1.04)/(PC * 1.04 + LT)$

For 1991 to 1993,
Revised VMT % for Cars = ***PC***

For all years,
Revised VMT % for Light Trucks
=
100% - Revised VMT % for Cars.

The VMT percentages before and after the revisions are shown in Table 2. As expected, the revised VMT figures mirror the Polk registration data very closely (see Table 1).

Table 2: Percent of VMT for Passenger Cars and Light Trucks, 1975 to 1993

Year	FHWA		Revised	
	Cars	Light Trucks	Cars	Light Trucks
1975	84%	16%	83%	17%
1976	83%	17%	82%	18%
1977	82%	18%	81%	19%
1978	80%	20%	80%	20%
1979	79%	21%	79%	21%
1980	79%	21%	79%	21%
1981	79%	21%	78%	22%
1982	79%	21%	78%	22%
1983	79%	21%	78%	22%
1984	77%	23%	77%	23%
1985	77%	23%	76%	24%
1986	77%	23%	75%	25%
1987	77%	23%	75%	25%
1988	76%	24%	74%	26%
1989	76%	24%	73%	27%
1990	76%	24%	72%	28%
1991	76%	24%	70%	30%
1992	77%	23%	69%	31%
1993	77%	23%	68%	32%

These revised percentages were then applied to the total car and light truck VMT from FHWA. The revised VMT figures and revised fatality rates are shown in Tables 3 and 4 on the next page.

Results

The most dramatic changes in VMT and fatality rates based on VMT are found in the light truck figures, especially in recent years. For example, in 1992 and 1993 the revised VMT was over one-third higher than what FHWA reported. The result of this revision is a 26% decrease in the fatality rate when compared to the fatality rate based on FHWA VMT. Changes in the VMT figures and rates for passenger cars are less dramatic, but are sizeable in the last few years. Car occupant fatality rates for 1992 and 1993 increased by 11% and 12%, respectively, compared to the rates based on FHWA VMT.

The revised VMT figures and rates will be published starting with the **1994 Traffic Safety Facts Report**. Rates in this report include vehicle involvement rates for cars and light trucks and injury and fatality rates for car and light truck occupants.

Table 3: Revised VMT and Occupant Fatality Rates for Passenger Cars, 1975 to 1993

Year	Revised VMT	Change From FHWA VMT	Occupant Fatality Rate*	Change From FHWA VMT Rate
1975	1,030,376	-0%	2.52	0%
1976	1,070,667	-1%	2.44	1%
1977	1,102,726	-1%	2.43	1%
1978	1,136,459	-1%	2.48	1%
1979	1,111,705	-0%	2.50	0%
1980	1,107,056	-0%	2.48	0%
1981	1,120,126	-1%	2.38	1%
1982	1,149,375	-1%	2.03	1%
1983	1,190,076	-1%	1.93	1%
1984	1,224,812	-0%	1.93	0%
1985	1,245,837	-1%	1.86	1%
1986	1,274,668	-2%	1.96	2%
1987	1,326,907	-2%	1.89	2%
1988	1,381,270	-3%	1.87	3%
1989	1,411,131	-5%	1.78	5%
1990	1,424,615	-6%	1.69	6%
1991	1,410,934	-8%	1.59	9%
1992	1,436,449	-10%	1.49	11%
1993	1,445,592	-11%	1.49	12%

*Per 100 million VMT

Table 4: Revised VMT and Occupant Fatality Rates for Light Trucks, 1975 to 1993

Year	Revised VMT	Change From FHWA VMT	Occupant Fatality Rate*	Change From FHWA VMT Rate
1975	204,274	2%	2.38	-2%
1976	233,382	3%	2.33	-3%
1977	257,108	3%	2.32	-3%
1978	289,463	4%	2.33	-3%
1979	293,840	1%	2.44	-1%
1980	295,475	2%	2.53	-2%
1981	307,044	4%	2.31	-3%
1982	323,022	6%	1.97	-5%
1983	335,590	2%	1.85	-2%
1984	358,106	0%	1.81	-0%
1985	387,800	4%	1.72	-4%
1986	415,593	7%	1.76	-6%
1987	443,872	7%	1.82	-6%
1988	487,450	11%	1.70	-10%
1989	520,977	15%	1.64	-13%
1990	554,661	19%	1.55	-16%
1991	595,619	26%	1.41	-21%
1992	642,583	34%	1.26	-26%
1993	675,581	36%	1.26	-26%

*Per 100 million VMT

Summary

Based on the methodology described in this note, total VMT for cars and light trucks as reported by FHWA has been redistributed. This revision affects the fatality and injury rates based on VMT for these vehicle types back to 1975. No changes have been made to VMT for any other vehicle types, such as large trucks and motorcycles. Fatality and injury rates for all vehicle types combined will be based on total VMT from FHWA, which has not been revised.

This method for revising VMT may not be applicable in future years. FHWA and NHTSA are working together to improve the registered vehicle and VMT data that are used by both agencies. As more data become available, such as data from the 1994 RTECS and 1995 NPTS, the revision method will be re-evaluated. Also, as states continue to use more sophisticated traffic equipment, better VMT data will become available.