



INDOT Research

TECHNICAL *Summary*

Technology Transfer and Project Implementation Information

TRB Subject Code: 13-4 Forecasting Passenger and Freight Movement
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Final Report

Updating Procedures To Estimate And Forecast Vehicle-Miles Traveled

Introduction

VMT estimates have been required by various legislation for planning purposes, highway fund allocation, and environmental monitoring, among other uses. The Transportation Equity Act for the 21st Century (TEA-21) allocates apportionment funds under various programs, such as the National Highway System (NHS), the Interstate Maintenance Program (IMP), and the Surface Transportation Program (STP), based on the ratio of the total VMT traveled on a state's public roads to the total nationwide VMT traveled on the same functional classes of roads.

The Federal Highway Administration (FHWA) and the Environmental Protection Agency (EPA) recommend the use of ground count-based

programs for the estimation of vehicle-miles traveled. The Highway Performance Monitoring System (HPMS), which is being used by State DOTs, is a program developed by the FHWA for the monitoring of the nation's highway infrastructure. INDOT is not able to achieve its target 3-year periodic count program on all public roads in the state and is uncomfortable with statewide VMT estimates generated by this program.

The objective of this study was to generate simple and effective alternative VMT estimation procedures to augment or supplement current ground count-based methods.

Findings

The methods adopted in this study are based on driving characteristics of licensed drivers and households in Indiana for the estimation of total annual personal travel VMT. The annual VMT generated by buses and trucks, which represents commercial vehicles, is estimated from fuel tax records.

The statewide personal travel VMTs calculated for the year 2000 were lower than INDOT's estimates by about five percent. The statewide personal travel VMT calculated from the household-based model was lower than the INDOT estimate by 26 percent because of the exclusion of non-household vehicles. The commercial vehicle VMT exceeded INDOT's estimate for the year 2000 by 36 percent.

Because of the exclusion of non-household vehicles from the household-based method, the licensed driver-based VMT estimation method is recommended for the calculation of total annual personal travel VMT. The total statewide VMT obtained from this study is about 0.3 percent higher than INDOT's estimate for the year 2000. Because of the low difference between the VMT estimates obtained by INDOT and this study, there is no reason to revise INDOT's current method of VMT estimation, however, the negative impact of trucks on the highway pavement and the environment may require a review of the vehicle classification program to better estimate the volume of trucks on Indiana public roads.

Implementation

Three separate procedures are developed in this study for the estimation of personal travel and commercial vehicle VMT:

- a licensed driver-based method
- household-based methods
- a method based on fuel tax reports

The Nationwide Personal Transportation Survey (NPTS) is the data source for the first two methods. The third method produces an estimate of VMT by commercial vehicles, namely, all buses and trucks. Neither data source (NPTS or fuel tax reports) permits the estimation of VMT by highway functional class.

Because the household-based method's data source does not include non-household vehicle trips, the licensed driver-based method is recommended for the estimation of the personal travel component of the total statewide VMT. The licensed driver-based model was programmed into a Microsoft Excel spreadsheet,

called LIC_VMT. The user's manual for LIC_VMT can be found in Chapter 7 of this report.

Because certain trucks are excluded from the fuel tax reports, the commercial vehicle VMT calculated in this study represents the lower bound of the statewide VMT generated by all buses and trucks. The data for the calculation of annual commercial vehicle VMT were obtained from the Motor Carrier Services Division of the Indiana Department of Revenue. INDOT can contact the Motor Carrier Services Division at (317) 615-7203 for the annual IFTA (International Fuel Tax Agreement) and MCFT (Motor Carrier Fuel Tax) reports. These reports are described in Section 3.6 of the report. The annual statewide commercial vehicle activity data can be estimated directly from these reports, as described in Sections 4.5 and 5.4 of this study's final report.

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