

FHWA Office of Highway Policy Information 2022/2023 Existing Research Activity Update

Bulk Vehicle Identification Number (VIN) & Licensed Driver Data Collection

The Motor Fuel and Highway Finance Division collects motor vehicle registration and licensed driver data annually from the States and disseminates it to partnering US DOT offices, industry stakeholders, and the public. States submit aggregated data to the FHWA by means of a series of reporting forms that provide a summary of active registrations and licenses at a given time. This data is used by the FHWA to determine highway investment needs, Federal-aid apportionment to the States, and to perform roadway safety/crash and vehicle fuel economy studies. This initiative focuses on the development of new requirements for States to assemble and submit, to FHWA, unprocessed vehicle identification number (VIN), other vehicle registration-related, and licensed driver data. The objectives are to: (1) address longstanding data quality concerns, and (2) collect disaggregated data that will support various analysis and research initiatives. As of December 2022, this effort is in the pilot data collection stage.

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Data Analytics and Modeling Methods for Tracking and Predicting Origin-Destination Travel Trends based on Mobile Device Data

The objective of this project is to develop data analysis and modeling methods for tracking and predicting origin-destination (OD) travel patterns and trends based on mobile device data. Algorithms for imputing missing information in mobile device data and for correcting sampling bias will be developed. Key products include 2016 passenger travel OD tables at the national (MSA-to-MSA for the U.S.) and metropolitan (TAZ-to-TAZ for Baltimore) levels by various modes, purposes, time periods, and socio-demographical groups based on three types of mobile device data sources: cell phones, GPS devices, and Smartphone apps.

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Data Assessment Team (D A T)

The purpose of the Data Assessment Team (D A T) is to ensure that the data that State DOT's annually submit to the HPMS meet FHWA business needs, accurately represents conditions, and are collected and reported correctly. The D A T will review documentation regarding the States' HPMS data and the processes used to generate this data to ensure consistency with the requirements, discover best practices, as well as identify any needed improvements that may be warranted to formal HPMS guidance and technical support activities. These reviews will be conducted remotely via MS Teams with the state DOT's by FHWA staff and supported with contractor assistance. Up to ten states will be reviewed annually.

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Developing Vehicle Occupancy Factors for Passenger Vehicles, Trucks and Buses

The objective of this research is to deliver vehicle occupancy factors for Passenger Vehicles, Buses and Trucks for the years 2017 through 2023 by following the currently developed methods with minor modifications and updates. The research will be focused on Interstate and Non-Interstate NHS for four time periods such as 1. Monday-Friday (6 AM – 10 AM), 2. Monday – Friday (10 AM – 4 PM), 3. Monday – Friday (4 PM- 8 PM) and 4. Saturday-Sunday (6 AM – 8 PM). The Vehicle Occupancy Factors will be specific to State, MPO Planning areas in a State and Census Urbanized area in a State. The VOF's for the years 2017-2019 have been delivered and the VOF's for the year 2020 will be delivered by March 2022.

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FHWA Data Governance

There is a growing need to improve the quality, consistency, and management of FHWA data to address programmatic needs and stakeholder concerns. FHWA Data Governance is a collaborative effort involving all functional areas within the organization and across the DOT. The focus is on the systems that are used to collect, store, analyze, and report data, as well as the users and uses of the data. This is an encompassing effort that includes all business units within FHWA. The Highway Data Council (HDC) has been working on standing-up the Data FLEx and developing a Data Funding Roadmap, Data Quality Management Plan, and Data Strategic Plan. The HDC will be working on updating the FHWA Data Element Dictionary which is available at: <https://www.fhwa.dot.gov/datagov/dataelements.cfm>.

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FHWA Data Visualization Center

The Data Visualization Center (DVC) produces data-based visualizations for FHWA staff. Products range from small charts and graphs to complex dashboards, maps, and web tools. With nearly 400 visualization projects complete to date, the Data Visualization Center (DVC) continues to play a key role in the communication of data with FHWA stakeholders. In addition, webinar training provided by the DVC supports FHWA staff with tools and resources to create visualizations on their own.

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FHWA Guide to Reporting Highway Statistics Update

To ensure that the business needs associated with the 500-Series data program are fulfilled, the Motor Fuel and Highway Finance Division completed a reassessment of the existing data collection and reporting requirements in December 2019. Additionally, the OHPI is developing an enhanced data collection system that will be used to collect, process, validate, analyze, store, and disseminate 500-Series data (i.e., motor fuel, highway funding, and driver licensing and vehicle registration data) reported by State agencies on a recurring basis. To advance and support these efforts, a new program guidance document is currently under development (as of September 2021). The existing guide for reporting 500-Series data, entitled the *"Guide to Reporting Highway Statistics"*, also referred to as *"The Guide"*, was last updated in 2014 and is available to users on the FHWA OHPI website. *"The Guide"* is an HTML document that consists of individual program chapters that provide an overview of the 500-Series programs, forms, and how to report the data to FHWA. The forthcoming guidance document is intended to enhance the user experience and overall effectiveness of the documentation by utilizing visual elements and intuitive navigation features in order to accommodate levels of familiarity, expertise, and experience for all stakeholders/partners. As of December 2022, the final draft version of the guide is nearing completion. After which, it will undergo mandatory internal reviews for legal sufficiency and 508 compliance, followed by external peer reviews by State agency partners. This project is slated to conclude on March 2nd, 2023.

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FHWA Traffic Monitoring Guide (TMG) Update

Traffic data enables the delivery of the Federal-aid highway program to state and local transportation agencies. The ability to collect, process and report quality traffic data in an efficient and cost-effective manner is vital to all transportation decision making. With the implementation of the transportation performance management per MAP-21 and FAST Act, new traffic data and timely data are needed to ensure public accountability and transparency. The 2022 TMG incorporates current standards and practices in the Traffic Monitoring Guide under the Policy Information Office's Initiative to provide timely and quality vehicle occupancy factor data and information for decision makers and data users.

[Traffic Monitoring Guide - Policy | Federal Highway Administration \(dot.gov\)](#)

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HPMS Version 9.0

The Office of Highway Policy Information will release Version 9.0 of the Highway Performance Monitoring System in January 2023. The new version will feature the transition of HPMS into a fully spatial database as part of the first step towards incremental data reporting and management.

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HPMS Scorecards (Data Quality Improvement)

Developed by the FHWA Data Visualization Center for the Office of Highway Policy Information. The Scorecards provide a broad picture of data quality and completeness of state HPMS submissions. Based on statistical analysis using the 'R' suite, the Scorecards illustrate data distributions and quality checks through various charts, graphs, and icons. Quality checks are based on a three-tier year to year, adjacent value and outlier detection. Efforts are currently underway to incorporate the HPMS Scorecards directly into the new HPMS 9.0 software.

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Infographics - Wow Wednesday Factoids

The Office of Highway Policy Information and the FHWA Data Visualization Center are leading an effort to communicate FHWA facts, initiatives, data releases and interesting tidbits through social media. Each week, staff from HPPI work with FHWA program offices and the Office of Public Affairs to publish a new infographic on Facebook, LinkedIn, Twitter and Instagram. Hundreds of unique graphics have been created to date. Interested parties are encouraged to follow FHWA on social media and 'like', share, or retweet graphics with colleagues.

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Integrated Transportation Information Platform (ITIP)

The Integrated Transportation Information Platform is transforming from a web application that integrated and visualized certain FHWA data, to a cloud-based data warehouse that centralizes FHWA's data to enable easier consumption of the data for analysis. ITIP will provide data consumers access to the agency's most critical data assets in one location, while minimizing the system performance burden on data collection applications that can be caused by data analytics. This solution will also enable data analysts to create their own data products, such as reports, dashboards, and maps on their own terms and as priorities change. As the data warehouse is more widely adopted throughout the agency to support data analytics, ITIP will work to develop a community where analysts can share data products, code, and workflows.

ITIP will continue to support the creation of standard highway statistics reporting and Transportation Performance Management (TPM) related infrastructure condition, safety, and system performance/congestion regulatory objectives.

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National Bicycle Network (NBN)

The preliminary study on establishing a NBN was completed in 2019. Follow on work is now being completed with Oak Ridge National Laboratory (ORNL) to complete methods used to gather national geospatial data in a consistent common format to represent bicycle travel facilities such as routes, trails, and shared use roadways including both bicycle routes and independent bicycle trails as part of a roadway system. The project completed in 2022 and is accepting data through the web portal. <https://nmtdev.ornl.gov/#/>

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National Road Network Pilot (NRNP) Program

The December 2019 Department of Transportation Appropriations Act, 2020, title I of division H, P.L. 116-94 and House Report 116-106 provided funding for a National Road Network Pilot Program. This project will develop an integrated, connected national road network based on state road networks submitted via the HPMS program. Eight States in a pilot area were awarded grants to assess network improvements in 2022. The project will identify tools for improved network edge matching and standardized reporting of data attached to linear road networks. In 2022 a draft U.S. Road Specification was developed. This specification will be shared with FGDC's Transportation Subcommittee for review in 2023. Target deadlines for state pilot projects are the end of calendar year 2023, with development of the connected road network to follow. More information on the project is available via the project's website:

<https://data.transportation.gov/nationalroadpilot>

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National Travel Demand Assessment - VMT Forecasting

The Office of Highway Policy Information of the FHWA is responsible for developing and delivering a wide range of transportation data to support the Federal-aid highway program. One of the most critical data components is the future travel demand as expressed in Vehicle Miles Travelled (VMT). The U.S. DOT's Volpe Transportation Research Center has been working with the Policy office in the developing, updating and running a national VMT projection model for the last 6 years. The FHWA relies on this VMT model for assessing national travel demand and publishes an annual outlook for future VMT growth information every year in late spring. For more information about the VMT Forecasting Model visit the FHWA Policy Special Tabulations page at: <https://www.fhwa.dot.gov/policyinformation/tables/index.cfm>.

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Next Generation National Household Travel Survey (Next Gen NHTS) – Nat. Core Data Component

The Next Generation National Household Travel Survey (NextGen NHTS) program includes two components, traditional household surveys (core data) and passively collected origin-destination data. Core data includes trips taken by all members of participating households over a 24-hour period. These data include information on trip purpose, when the trip was taken (time of day/day of week), travel time, length of trip, and mode(s) of travel. FHWA launched the 2022 core data collection in early 2022 which will conclude in early 2023. The survey includes 7,500 national households participating through an address-based sample approach. In addition, it includes 7,500 national households being surveyed through Ipsos' Knowledge Panel. Only the data collected by the address-based sample will be used by FHWA for official statistical purposes. The 2022 NHTS public core data sets should be available in mid-2023. FHWA has a contract to conduct an independent evaluation of the two data collection methods from a statistical perspective, and that evaluation should be complete in fall 2023. FHWA has started work for the 2024 core data collection procurement and we anticipate awarding this work by fall 2023.

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Next-Gen National Household Travel Survey (NextGen NHTS) – Nat. Origin-Dest. Data Component

In 2020, FHWA awarded a contract to compile the national origin-destination (OD) data component of the NextGen NHTS program. The OD data component will leverage in-vehicle and smartphone application-generated passive mobility data to provide a national summary of travel between 583 zones that include all metropolitan statistical areas (MSAs) and the non-MSA portions of each state and the District of Columbia. The OD tables will summarize annualized trip-making for passenger and truck travel with respect to the volume of travel, trip distance, and weekday vs. weekend travel. For passenger trips, algorithms will be used to impute traveler demographics, travel mode, and purpose. In addition, state and local government agencies participating in the Next Gen NHTS pooled fund study can purchase O-D flow data at more disaggregate geographic zones to better understand passenger and truck travel within their jurisdictions.

FHWA released 2020 National OD passenger and truck data products at [NHTS NextGen OD Data \(ornl.gov\)](https://www.nhts.gov/nextgen). 2021 National OD passenger and truck products will be available in early 2023. In addition, round 1 of add-ons (Austin MPO and Georgia DOT) has been delivered, and the team will produce round 2 of add-ons for several agencies in 2023.

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Non-traditional AADT Sources PF-5(384)

The Alternative AADT and Traffic Data Source Method Exploration project is a pooled fund research activity where FHWA and 19 State DOTs (~\$1.5 m) pooled resources together to: a) explore the theoretical and practical basis for a series of new traffic data gathering methods based on none-traditional data and b) conduct data quality and method reliability evaluation associated with such methods. The first part of the contract (development) was awarded to StreetLight Data, Inc. (<https://www.streetlightdata.com/>) through the competitive small business set-aside program per FHWA's acquisition office. Verification and validation of the results were completed Cambridge Systematics/TTI team under the Policy IDIQ and the National Renewable Energy Lab (NREL) under an IAA. Battelle Memorial Institute also completed a statistical analysis of the traffic data set. Follow on informational workshops for only PF members and direct agency support open to any agency is now being done. The project will complete in 2025.

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NPMRDS Data Program

The National Performance Management Research Data Set (NPMRDS) is a vehicle probe-based travel time data set acquired by the Federal Highway Administration (FHWA) for its use in various performance measurement programs, such as its Freight Performance Measures, Urban Congestion Report, and other programs. The NPMRDS is also provided to state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) for their performance management activities. The team consists of the University of Maryland (UMD), INRIX, the Texas A&M Transportation Institute (TTI), 1Spatial and KMJ Consulting. Data are available to registered users in weekly increments (11 days later). Access is available through the NPMRDS Massive Data Downloader (MDD), at <https://npmrds.ritis.org>. Individual users from eligible organizations will register for unique account credentials to access the NPMRDS.

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Policy Information Data Portal (PIDP) / Fuels & FASH v4.0

The PIDP is an integrated data collection system used by various data providers to transmit data to FHWA on a recurring basis (i.e., annually, and monthly). PIDP consists of several components, including the new Fuels and FASH (Financial Analysis System for Highways) (F&F) version 4.0, which commenced development in early 2021. F&F is a form-based system that States will use to submit their data pertaining to Monthly Motor Fuel Consumption, State and Local Highway Finance, Licensed Drivers, and Motor Vehicles. F&F v4.0 will support the same capabilities as its predecessor (v3.5) while increasing system functionality and providing the States with a user-friendly interface. The system will also consist of intelligent data analysis tools and validation checks to improve data quality and integrity. As of December 2022, this application development is nearing the completion of phase 1 (i.e., Licensed Driver and Motor Vehicle data modules development). After which, selected States will be conducting user acceptance testing to evaluate the application's structure, and usability, functionality. Final/production deployment for this phase of development is anticipated for Spring 2023. Once completed, phase 2 of this development effort (i.e., Motor Fuel data module development) will commence.

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Processing Transportation Performance Management Related Traffic Data

Traffic data enables the delivery of Federal-aid highway program to the State and local agencies. The ability to collect, process and report the quality traffic data in an efficient and cost-effective manner is vital to all transportation decision makings. With the implementation of the transportation performance management per MAP-21 and FAST ACT, new traffic data and timely data are needed to ensure public accountability and transparency. Currently FHWA is relying on the National Performance Management Research Datasets (NPMRDS) to carryout portions of the transportation performance management data needs. Activities under NPMRDS effort include the procuring and distributing data to State DOTs and

MPOs, providing specific technical assistance to data users, and developing new national information. On the vehicle occupancy factor data and information front, FHWA has been relying on the National Household Travel Survey for estimating national average passenger vehicle occupancy and the national transit data for bus occupancy information. With this research FHWA is planning to process the monthly NPMRDS data in a timely manner to provide quality and timely data to the community. Project was completed in May of 2021.

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Travel Monitoring Analysis System (TMAS) versions 3.0

The TMAS system offers the foundation for the FHWA to assess travel demand on all public roadways. The Office of Highway Policy Information strives to update offer appropriate new functionalities to meet new demands on the system.

- Version 2.8 is now live and includes: all processing and storage of non-motorized data (TMG 2016 non-motorized station and count formats) along with all VTRIS WGT 2 through 7 weight reports.
- Version 3.0 (expected completion in 2023) will include: the pavement design guide, both TMG speed and Individual Vehicle Record (IVR) data format processing and GIS capability along with other improvements.

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Weekly Traffic Volume Trends (TVT) and Gasoline Supplied Reports

As a result of the COVID-19 pandemic, HPPI was looking to find reports that would show the results of reduced travel in a more immediate fashion that available with the current processes. The traffic volume trends (TVT) monthly report was adapted to create a weekly version. For gasoline volumes, Energy Information Agency (EIA) data is being used to create a report of gasoline supplied to distributors, which is a proxy, perhaps delayed by several days, for the amount of gasoline being purchased at retail.

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Gasoline Supply – Michael Dougherty at 202-366-9234 or via email at michael.dougherty@dot.gov

National Highway Institute (NHI) Training Courses:

NHI - Highway Performance Monitoring System (HPMS): Concepts, Data Collection & Reporting Requirements Workshop

Course number 151056, a two-day workshop providing advanced, in-depth, hands-on understanding of data collection and reporting requirements for HPMS, is currently on hold due to ongoing revisions to the Field Manual and HPMS software application. Updates on HPMS training will be provided at a future date.

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NHI - Traffic Monitoring Programs: Guide and Procedures (TMG)

Course number 151050 is offered to states, contractors and local agencies as a two-day training course. This course covers all aspects of both motorized and nonmotorized travel monitoring. For more information about the course visit NHI website for upcoming courses, current costs, and registration:

http://www.nhi.fhwa.dot.gov/training/course_search.aspx?tab=0&key=Traffic+Monitoring&sf=0&course_no=151050.

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