NATIONAL CENTER FOR UNDERSTANDING FUTURE
TRAVEL BEHAVIOR AND DEMAND

Final Project Report

# The Changing Composition of U.S. Vehicle Miles Traveled: Evidence from VIUS, NHTS, and FHWA Highway Statistics

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| **16. Abstract**<br>This project explores how the composition of vehicle miles traveled (VMT) shifted over the past two decades in the United States. The analysis integrates the Vehicle Inventory and Use Survey (VIUS) and the National Household Travel Survey (NHTS) to trace changes across household and non-household-related travel domains. Evidence shows that household VMT has declined while commercial activity has grown steadily over the last two decades. Household total VMT estimated from NHTS declined from 2.27 trillion miles in 2001 to 1.85 trillion miles in 2022. Over the same period, VIUS shows that between 2002 and 2021 vehicles with any reported business use increased by more than 6 million, pushing associated total VMT from 4.23 trillion to 5.38 trillion miles. These findings indicate a structural shift in the United States roadway demand. Household driving has contracted both in absolute terms and as a share of national travel, while commercial fleets have expanded and now account for a larger proportion of vehicle activity, though the increase in truck-related VMT has not fully offset the reduction in household mileage. Part of this shift likely reflects the lingering effects of the COVID-19 pandemic, which temporarily suppressed personal travel and may have accelerated freight and service activity, as the VIUS and NHTS data analyzed here are from 2021 and 2022. While upcoming data, such as the next NHTS, will help clarify these patterns, current evidence points to a lasting rebalancing between household and commercial travel. | | | |
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**TABLE OF CONTENTS**

## LIST OF TABLES



## LIST OF FIGURES

## EXECUTIVE SUMMARY

This project examines how the composition of U.S. vehicle miles traveled (VMT) has changed over the past two decades. The analysis integrates data from the 2002 and 2021 Vehicle Inventory and Use Survey (VIUS) and the 2001 and 2022 National Household Travel Survey (NHTS) to trace shifts in household and non-household travel. Together, these datasets provide a long-run view of how personal travel and business- or freight-related activity have evolved.

The 2021 VIUS provides registration-based estimates of truck counts and annual mileage for pickups, vans, sport utility vehicles (SUVs), and medium- and heavy-duty trucks. When expanded, the public-use microdata accounts for about 1.90 trillion miles, roughly 60 percent of the Federal Highway Administration (FHWA)'s 2021 VMT estimate of 3.13 trillion miles, which is consistent with the focus of VIUS on trucks, rather than all motor vehicles. NHTS offers a complementary benchmark of household-owned vehicles and their travel patterns.

Based on NHTS data, total household VMT decreased from 2.27 trillion miles annually in 2001 to 1.85 trillion miles in 2022. Over the same period, VIUS data show that the number of vehicles with any reported business use increased by more than six million, raising total commercial VMT from 423 billion miles in 2002 to 538 billion miles in 2021. The total VMT growth was concentrated in light-duty pickups, vans, and SUVs, which accounted for roughly one-half of the increase, while heavy trucks contributed just over one-third, and medium-duty vehicles the remainder. However, trucks with a gross vehicle weight rating (GVWR) above 10,000 pounds recorded the fastest growth over the 20-year period, with an increase of more than 40 percent. This redistribution of travel demand demonstrates that the commercial sector now accounts for a much larger share of national roadway demand, even as average miles per commercial vehicle remained essentially flat at around 18,000 miles per year.

The overlap across data sources is structurally consistent. The household-based NHTS and the registration-based VIUS converge most clearly in the overlapping body types of SUVs and pickups. VIUS records a larger number of vehicles in these categories because it represents the full registration base (both household-owned and commercially owned), while NHTS reports only household-owned vehicles (thus, a smaller number of vehicles in these categories). Notably, however, NHTS reports slightly higher average mileage per vehicle. Despite these differences, the two surveys report very similar totals for annual VMT: 977 billion miles (NHTS) versus 985 billion miles (VIUS) for SUVs and 512 billion (NHTS) versus 483 billion miles (VIUS) for pickups. This consistency indicates that the sources are aligned in aggregate outcomes, even though vehicle counts and per-vehicle intensities reflect their distinct sampling frames.

By contrast, comparison with FHWA's roadway estimates (Table VM-1) shows both convergence and gaps. The discrepancies were especially large in 2002, when FHWA totals for both single-unit and combination trucks exceeded VIUS by about one-half in terms of vehicle counts and total VMT. By 2021, the estimates had converged much more closely for single-unit trucks, but FHWA still reported substantially higher totals for combination trucks.

Together, these findings indicate a structural shift in U.S. roadway demand. Household driving has declined both in absolute terms and as a share of national travel, while commercial fleets have expanded and now account for a larger share of vehicle activity, though the added truck VMT has not fully offset reduced household mileage. Part of this shift likely reflects the lingering effects of the COVID-19 pandemic, which temporarily suppressed personal travel and may have accelerated freight and service activity, as the VIUS and NHTS data analyzed here are from 2021 and 2022. While future data (e.g., the next NHTS) will help clarify how persistent these trends are, current evidence points to a continued rebalancing between household and commercial travel.

## 1. INTRODUCTION

Understanding the future of travel demand requires careful attention to long-term trends in roadway activity and the role of commercial and non-household vehicles. Household travel has long accounted for a major fraction of roadway activity, but recent evidence points to a steady shift toward business-related and freight activity. Figure 1 plots aggregate national VMT trends in the United States from 1992 through 2024, using data from Table VM-1 of the FHWA's Highway Statistics Series (FHWA, 2024). Total VMT represents the aggregate number of vehicle-miles traveled annually on U.S. roadways, and VMT per capita is defined as total national VMT divided by the U.S. resident population in each year, providing an indicator of average driving intensity of all vehicles per person. Over this period, total VMT in the United States has continued to grow, though the pace of increase has slowed, particularly after the mid-2000s. Following steady expansion through the mid-2000s, both annual VMT and VMT per capita declined during the Great Recession and then resumed growth. The COVID-19 pandemic produced a sharp but temporary contraction in 2020, followed by a rebound in total VMT to new highs by 2024. VMT per capita, however, remains below prior peaks, underscoring that recent increases in overall VMT reflect population growth and a reallocation of roadway activity rather than a complete return to earlier household driving intensity (BTS, 2025).

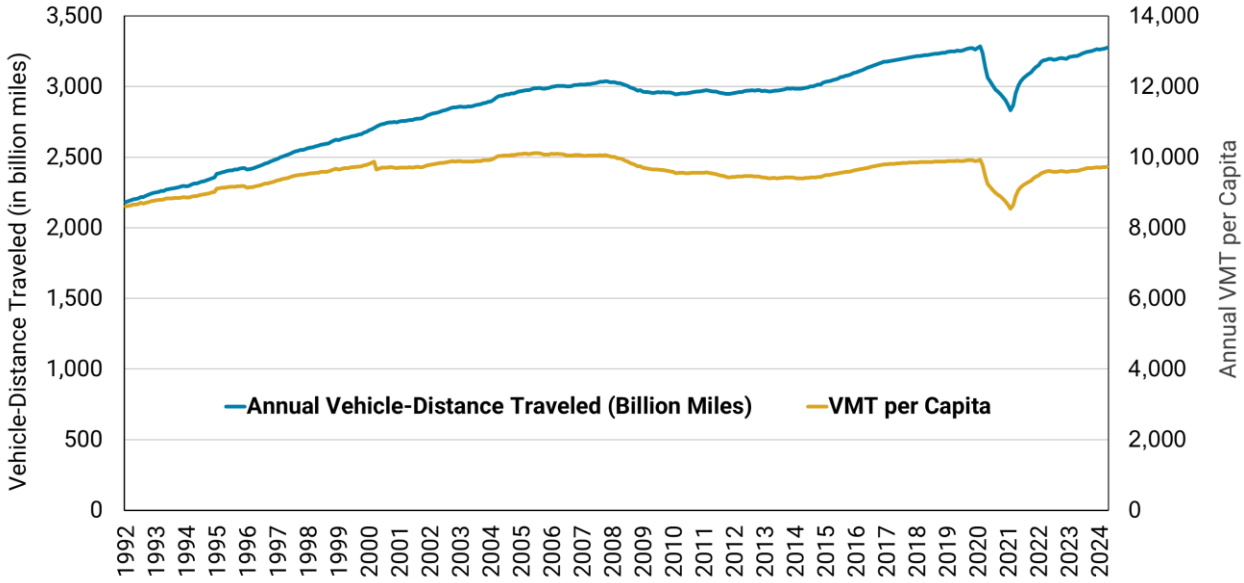



**Figure 1. National VMT Trends, 1992–2024 (Moving 12-Month Total; FHWA 2024)**

The FHWA Highway Statistics Series shows that aggregate national VMT has recovered to new highs while VMT per capita remains below prior peaks (FHWA, 2024). This raises an important question about the composition of total VMT: *if VMT per person has not fully rebounded, who is doing the additional driving now recorded on U.S. roads*?

A growing body of evidence indicates a reallocation toward commercial and freight activity, suggesting a long-run shift in the balance between household and non-household travel. To examine this structural rebalancing, the analysis integrates three complementary data sources: (i) the 2002 and 2021 editions of the Vehicle Inventory and Use Survey (VIUS), a registration-based microdata product covering the U.S. truck fleet, including pickups, vans, SUVs, and medium/heavy trucks; (ii) the National Household Travel Survey (NHTS) editions from 2001 to

2022, which measure travel by household vehicles, including cars and light trucks; and (iii) FHWA Table VM-1, which reports roadway-level VMT and provides an external benchmark for national totals. Using these three data sources, this project undertakes the following tasks:

- *Document household travel trends:* Based on NHTS (2001–2022), establish national household VMT levels and shares, and assess changes in total household VMT and per-person VMT relative to overall roadway activity (as reported in FHWA Table VM-1).
- *Measure changes in commercial-use truck activity:* Using VIUS 2002 and 2021, produce survey-weighted estimates of commercial-use truck counts, total annual VMT, and VMT per vehicle, and quantify how commercial trucks' contribution to national VMT has shifted relative to household travel.
- *Describe the composition of commercial VMT:* Summarize commercial VMT by truck class and body type and identify the segments driving growth in commercial mileage.
- *Assess consistency across data sources:* Compare overlapping light-truck categories in VIUS and NHTS and benchmark the survey-based estimates of heavy-truck VMT in VIUS against FHWA Table VM-1 to assess alignment with FHWA's roadway VMT estimates.

Through these analyses, the report offers descriptive insights into the structure, intensity, and evolution of commercial vehicle travel in the U.S. The findings help bridge the gap between household-based travel surveys and freight statistics, while supporting the U.S. Department of Transportation's priority to harness advanced data resources for evidence-based decision-making.

## 2. DATA

This section describes the data sources used in the analysis, which include two survey microdata sets (NHTS and VIUS) and one administrative statistical series (FHWA Table VM-1). NHTS expands sampled households to national totals and reports vehicle ownership and household-available travel, including autos and light trucks (SUVs and pickups). It provides the basis for household VMT and per-capita indicators. VIUS covers pickups, vans, SUVs, and medium- and heavy-duty trucks registered across the United States, and reports vehicle characteristics, annual mileage, and whether each vehicle is used for any commercial purpose. For broader benchmarking, FHWA Highway Statistics Table VM-1 provides national roadway VMT totals by vehicle class.

To examine changes over the past two decades in a methodologically consistent and comparable way, this analysis draws on NHTS 2001 and 2022 and VIUS 2002 and 2021, with FHWA VM-1 providing national roadway VMT totals for context. Each dataset represents a distinct segment of the vehicle and travel landscape – household-available vehicles in NHTS, the registered truck fleet spanning personal, mixed, and commercial-use operation in VIUS, and roadway-based VMT aggregates in VM-1. Although these datasets describe different segments of the vehicle fleet and travel ecosystems, they overlap in ways that support cross-source validation of VMT trends. Light trucks, including SUVs and pickups, are captured in both NHTS and VIUS, allowing direct comparison of vehicle counts and patterns of use. Similarly, VIUS estimates for single-unit and combination trucks can be benchmarked against corresponding totals reported in VM-1.Each of these data sources is described next, together with their overlaps with one another.

### 2.1. National Household Travel Survey

The National Household Travel Survey (NHTS) focuses on household travel behavior in the

United States and is administered by the Federal Highway Administration (FHWA). Historically, the survey has been conducted roughly every 6–8 years and uses a probability sample of U.S. residential addresses to collect daily passenger travel information. NHTS includes expansion weights that scale the sample to national estimates of households, persons, vehicles, and trips. The most recent wave was fielded in 2022 as part of FHWA's "NextGen NHTS" effort, which modernizes the survey's design and fielding approach (Bricka et al., 2024).

NHTS public-use microdata are typically released in four related files: household, person, vehicle, and trip files. Each file contains one record per household, person, vehicle, or travel-day trip, respectively. For this study, the vehicle file is the primary focus as it identifies vehicles available to each household, including autos and light trucks such as SUVs and pickups. It should be noted that even though NHTS does not report vehicles belonging to business or government fleets, company- or agency-owned vehicles may appear in the vehicle file if used non-exclusively for household travel also.

This analysis primarily uses two NHTS waves: 2001 and 2022. The 2001 dataset includes 129,696 households and 139,382 vehicles, while the 2022 dataset includes 7,893 households and 14,684 vehicles. The smaller sample size in 2022 reflects the updated survey design and results in higher sampling variability, an important distinction to consider when interpreting estimates from that year.

This analysis draws on the vehicle files from these two waves. Key variables include the household expansion weight (*WTHHFIN*), reported annual vehicle mileage (*ANNMILES*), the best estimate of annual mileage (*BESTMILE*), and the vehicle type identifier (*VEHTYPE*), which distinguishes cars, vans, SUVs, and pickups. It is important to note that ANNMILES reflects the self-reported annual mileage for each vehicle, whereas *BESTMILE* integrates information from multiple sources, including odometer-based estimates. In 2001, both *ANNMILES* and *BESTMILE* are available, and the analysis uses BESTMILE as the preferred measure as it provides a more comprehensive estimate of annual mileage[1]. In contrast, the 2022 public-use microdata do not include *BESTMILE*, so *ANNMILES* is used for that year. Using these variables, household total annual VMT is computed as the weighted sum of annual vehicle mileage across household-available vehicles. Annual VMT per person is obtained by dividing this total by the weighted household population.

### 2.2. Vehicle Inventory and Use Survey

The Vehicle Inventory and Use Survey (VIUS) is the nation's primary data source for understanding how the truck fleet is composed and used across the United States. VIUS is a registration-based survey jointly conducted by the U.S. Census Bureau and the Bureau of Transportation Statistics (BTS), with support from the Federal Highway Administration (FHWA) and the U.S. Department of Energy (DOE). Its target domain consists of vehicles that manufacturers classify as trucks, minivans, vans, and SUVs, and that are registered in the 50 states and the District of Columbia. Notably, the survey excludes government-owned vehicles and other out-of-scope categories such as passenger cars, buses, motorcycles, motor homes, farm tractors,

[1] In 2001, using ANNMILES instead of BESTMILE produces broadly similar but slightly lower estimates of annual mileage. ANNMILES understates mileage by roughly 10 percent, likely due to higher rates of missing or inconsistent self-reported values; BESTMILE appears to incorporate additional processing to correct these issues.

and unpowered trailer units. Using state registration records as its sampling frame, VIUS produces national and state-level estimates of truck-fleet vehicle counts and annual VMT, which serve as the basis for the truck-related component of total VMT analyzed in this study.

VIUS reports detailed information on vehicle configuration, size, weight class, fuel type, annual mileage, primary uses, and whether a vehicle is used solely for personal purposes or for mixed (personal and commercial) use. Classification of usage is recorded as a vehicle-level attribute, also noting whether the truck had any commercial use during the reference year. However, VIUS does not report how annual mileage is divided between personal and commercial purposes. Consequently, in this analysis, commercial VMT is computed by summing the total annual mileage of vehicles identified as having any commercial use.

Two VIUS survey waves fall within the period relevant to this project: the 2002 survey, which was the last administration before a nearly two-decade hiatus, and the 2021 survey, which marked the program's relaunch. Taken together, these two editions provide a consistent reference point for assessing long-term changes in fleet composition, vehicle-use intensity, and the distribution of truck travel between personal-only and mixed (commercial plus personal) operation.

The 2002 VIUS, conducted as part of the 2002 Economic Census, provides the pre-hiatus benchmark for the U.S. truck fleet. Data collection was carried out through mailed questionnaires linked to state registration files. Key features of the 2002 VIUS data are as follows:

- Public Use File (PUF): 98,682 vehicle records and 244 variables
- Published weighted totals:
    - 85.36 million vehicles
    - 1.12 trillion miles annually
    - 13,064 average miles per vehicle
- Key variables used for this study: annual mileage (*MILES_ANNL*), gross vehicle weight codes (*ADM_GVW*), body type (*BODYTYPE*), truck type (*TRUCKTYPE*), axle count (*AXLESTOTAL*), operator and commercial-use classification (*OPCLASS*).

The 2002 VIUS reported annual mileage values directly, without disclosure noise or top coding, making it especially valuable as a clean historical benchmark of vehicle use. The survey also distinguished operator categories in greater detail, including private, for-hire, owner-operator, rental, and personal use, and also offered more disaggregated cargo classifications, enabling richer analysis of business models and goods movement patterns (BTS, 2004).

After nearly two decades, VIUS was relaunched in 2021, using the same truck-fleet universe described above. The 2021 sampling frame excluded New Hampshire, with the remaining 49 states and D.C. forming 50 geographic strata in the sample design. Key features of the 2021 VIUS data are as follows:

- Public Use File (PUF): 67,952 vehicle records with 168 variables.
- Published weighted totals:
    - 179.82 million vehicles
    - 1.90 trillion annual miles
    - 10,550 average miles per vehicle
- Key variables used for this study: annual mileage (*MILESANNL*), gross vehicle weight rating (*GVWR_CLASS*), body type (*BTYPE*), cab type (*CABDAY*), axle configuration (*PAXLECONFIG*), number of tires on the rear axle (*REARAXLETIRES*), and commercial-use indicator (*BUSRELATED*).

To protect confidentiality, the 2021 PUF applied disclosure controls such as noise infusion on mileage and weights, top-coding of extreme values, rounding, and category coarsening (e.g., collapsing "5+ axles") (BTS, 2023). These adjustments make the 2021 file particularly suited for analyzing relative structures and patterns, such as commercial versus personal splits, vehicle use intensity, and fleet composition.

### 2.3. Overlap and Integration of VIUS and NHTS

This subsection describes how VIUS and NHTS relate to one another, the areas in which their coverage overlaps, and how the two sources can be collectively analyzed. Although the two surveys differ in their target universes, they provide complementary information on vehicle activity within certain vehicle types and use categories in the United States. VIUS represents the population of registered trucks and identifies whether a vehicle had any commercial use during the year. NHTS, by contrast, represents household-available vehicles and primarily reflects personal travel reported by sampled households.

Despite these differences in design, the surveys contain several comparable variables, including body type, weight class, and annual mileage. These common elements allow their estimates to be aligned on a consistent basis. The VIUS classifications for pickups, vans, and SUVs correspond directly to their NHTS counterparts, which enables harmonized vehicle definitions and the use of survey expansion weights to produce nationally representative VMT estimates. Specifically, the VIUS variables *BODYTYPE*/BTYPE and *MILES_ANNL*/*MILESANNL* correspond closely to the NHTS variables *VEHTYPE* and *ANNMILES* (or *BESTMILE*).

Table 2 summarizes how these vehicle types and use domains are represented in each survey and highlights their areas of overlap. The overlap between the two surveys lies in light-duty trucks that are available for household use in NHTS and registered to individuals in VIUS, most notably SUVs and pickups. Although the two surveys do not provide a strict one-to-one match (because some vehicles available to households in NHTS may be owned by businesses, organizations, or governments), this overlapping segment is sufficiently similar to allow meaningful comparison of vehicle use patterns. In VIUS, these vehicles are recorded as trucks registered to individuals, with their use ranging from exclusively personal to mixed commercial and personal operation. In NHTS, the same vehicle types appear as part of household-available fleets and primarily reflect personal travel. This shared segment enables comparison of annual mileage estimates across the two data sources, supports cross-validation of household and non-household travel activity, and offers insight into the evolving boundary between personal and commercial vehicle use.

**Table 1. Coverage of Vehicle Types by Ownership and Use Domains in NHTS and VIUS**

| Vehicle Types | Ownership / Availability | NHTS | VIUS | |
|---|---|---|---|---|
| | | Personal use* | Personal use only | Mixed use (commercial + personal) |
| **Autos** | Household-owned (or available) | Y | — | — |
| | Business owned | — | — | — |
| | Government owned | — | — | — |
| **SUVs** | Household-owned (or available) | Y | Y | Y |
| | Business owned | — | — | |
| | Government owned | — | — | — |
| **Pickups** | Household-owned (or available) | Y | Y | Y |
| | Business owned | — | — | |
| | Government owned | — | — | — |
| **Trucks (mid/heavy)** | Household-owned (or available) | — | Y | Y |
| | Business owned | — | — | |
| | Government owned | — | — | — |

Note: (*) NHTS includes vehicles that are *available* to households, which may be used for personal or business purposes. Y = Included in survey scope; — = Not applicable or out of survey scope.

### 2.4. FHWA Highway Statistics (Table VM-1)

FHWA's *Highway Statistics* series, specifically Table VM-1, "Annual Vehicle Distance Traveled in Miles and Related Data," provides an administrative, roadway-based accounting of VMT on U.S. public roads. VM-1 reports VMT disaggregated by highway category (such as rural and urban Interstates, other arterials, and other roads) and by vehicle type. It also includes related indicators such as the number of registered vehicles, average miles per vehicle, fuel consumption, and other fleet-level metrics. This series underlies Figure 1 in this report and serves as the national benchmark against which NHTS- and VIUS-based VMT estimates are interpreted.

VM-1 is constructed from state-reported Highway Performance Monitoring System (HPMS) data combined with other administrative sources and modeling procedures. FHWA aggregates travel across functional systems using HPMS traffic counts and segment lengths to produce total VMT by highway category and then allocates those totals across vehicle types using HPMS vehicle-classification summaries.

On the vehicle side, VM-1 groups traffic into a small set of mutually exclusive classes. Light-duty vehicles are split into short- and long-wheelbase categories, based on a 121-inch wheelbase threshold; this combined category includes passenger cars, light trucks, vans, and SUVs. Single-unit trucks are defined as single-frame trucks with at least two axles and six tires or a gross

vehicle weight rating (GVWR) above 10,000 pounds, while combination trucks consist of truck tractors pulling one or more trailers. Motorcycles and buses are reported separately. These classifications are independent of ownership, so VM-1 totals include travel by household, business, and government vehicles alike. For example, police and fire vehicles, refuse trucks, school buses, and public utility trucks are included in the appropriate categories to the extent they operate on public roads.

In this study, VM-1 is used purely as a published administrative benchmark rather than as a microdata source. National "Total Rural and Urban" VMT for all motor vehicles serves as the denominator for quantifying household and non-household shares of roadway travel, allowing NHTS-based household VMT and VIUS-based truck or commercial-related VMT to be interpreted relative to total national travel. In addition, the VM-1 single-unit and combination truck totals for 2002 and 2021 provide an external check on VIUS-based estimates of truck counts and VMT.

### 2.5. Overlap and Integration of VIUS and FHWA

Because VM-1 measures roadway activity rather than self-reported vehicle use, its totals encompass all travel occurring on public roads, including mileage accumulated by household, business, and government fleets. This makes VM-1 well-suited as an external benchmark for evaluating whether the survey-based totals in VIUS are broadly consistent with the national scale of truck travel. The comparison is therefore at the level of aggregate vehicle counts and VMT for single-unit and combination trucks, rather than by detailed vehicle attributes or use domains.

This overlap is possible because VIUS includes substantially more detailed information on truck configuration than VM-1, including body type, gross vehicle weight rating, axle configuration, rear-axle tire type, and cab or tractor type. Using these variables, VIUS microdata can be mapped into categories consistent with VM-1 definitions of single-unit and combination trucks. Once this harmonization is applied, VIUS delivers survey-based estimates of vehicle counts and annual mileage for the same broad truck classes that appear in VM-1. These aligned totals can then be benchmarked against VM-1's roadway-based counts and VMT, allowing the analysis to assess whether a registration-based survey produces results that are (largely) consistent with FHWA's administrative accounting of national truck travel, even though VM-1 contains no information on ownership or the division between personal and commercial use.

These areas of overlap are illustrated in Figure 2. The figure shows how VIUS-configured truck classes map onto VM-1 single-unit and combination categories, providing a common basis for comparing and benchmarking totals across the two data systems.

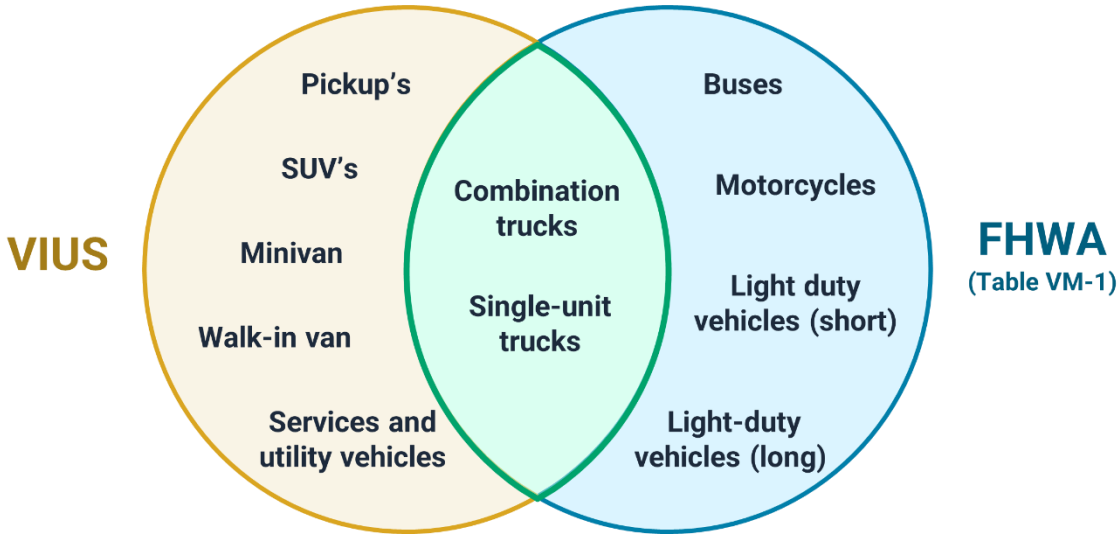


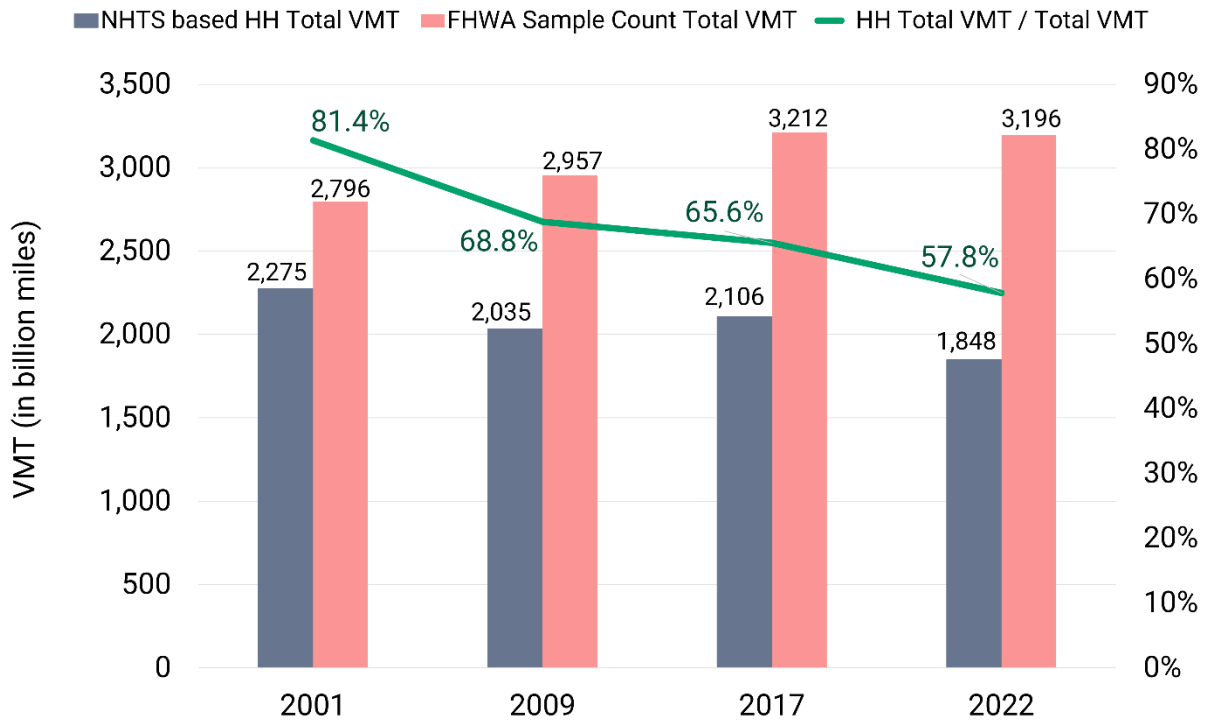

**Figure 2. Coverage of Vehicle Types by VIUS and FHWA Table VM-1**

## 3. RESULTS

This section presents empirical results on how overall VMT and its share of household and commercial travel have changed over the past two decades in the United States. Drawing on three national data sources (the household-based NHTS, the registration-based VIUS, and FHWA's roadway totals from VM-1), the analysis examines VMT trends in four dimensions: the evolution of household VMT and its share of national travel, the scale and growth of vehicles with any reported commercial use, the composition of commercial VMT across truck classes, and the resulting shifts in the distribution of roadway activity between personal and commercial domains. To place these trends in context, the results incorporate cross-source comparisons where appropriate.

### 3.1. Evolution of Household VMT and Its National Share (2001–2022)

Figure 3 depicts how household VMT and its share of national roadway travel have evolved over the past two decades. Household total VMT values are taken from the NHTS Summary of Travel Trends report (Bricka et al., 2024), and national VMT totals are drawn from FHWA's VM-1; notably, the 2009 and 2017 NHTS waves are included to provide continuity between the 2001 and 2022 surveys. The figure shows a steady decline in household VMT over this period, from approximately 2,275 billion miles in 2001 to 2,106 billion miles in 2017 and 1,848 billion miles in 2022. National roadway totals, in contrast, have continued to grow, rising from roughly 2,775 billion miles in 2001 to more than 3,190 billion miles in 2022. As a result, the household share of national VMT has fallen more sharply, declining from about 81 percent in 2001 to 69 percent in 2009, 66 percent in 2017, and 58 percent in 2022.




Note: NHTS based HH Total VMT is retrieved from Table 2-5 of NHTS report (BTS, 2025); FHWA Sample Count Total VMT is retrieved from FHWA's Table VM-1 (FHWA, 2024); Years are selected to correspond with available NHTS survey waves

**Figure 3. Household VMT and Share of National Roadway Travel (2001–2022)**

While it is entirely possible that the decline in household travel, especially during and after the COVID-19 pandemic, may have impacted the 2022 NHTS household VMT estimates, and that respondent fatigue or carelessness may have contributed to underreported mileage, these factors alone are unlikely to explain the full magnitude of the observed decline. As a result, the 58 percent household share in 2022 may modestly overstate the growth in non-household travel. Even so, the broader pattern across all available evidence, including the VIUS results presented in the following subsections, points to a meaningful shift in the composition of national roadway activity.

### 3.2. Commercial-Related VMT Growth in the VIUS Truck Fleet (2002–2021)

The VIUS provides a consistent basis for examining the size of the truck fleet registered in the United States, as well as how these vehicles are used. The survey distinguishes trucks used for personal purposes only from those that report any commercial activity, with the latter group including vehicles used partly or entirely for business purposes. In the 2021 edition, commercial use is identified through the variable BUSRELATED, where a value of 1 denotes some commercial activity. For 2002, a comparable measure is reconstructed from the Operator Classification variable (OPCLASS), treating any positive share of miles in Private, Motor Carrier, Owner-Operator, or Rental categories as commercial use and excluding vehicles reported as entirely personal use or not in use. This harmonization provides a consistent definition of trucks with any commercial use, along with comparable measures of their total annual VMT and average mileage in 2002 and 2021.

After identifying trucks that were partly or fully used for business purposes in the 2002 and 2021 VIUS editions, changes between these years are examined across several metrics, including

fleet size, total annual VMT, per-vehicle VMT, and VMT per capita. The per-capita indicator uses national population totals to illustrate how commercial-related truck activity has grown when normalized by population size. Figure 4 summarizes these patterns.

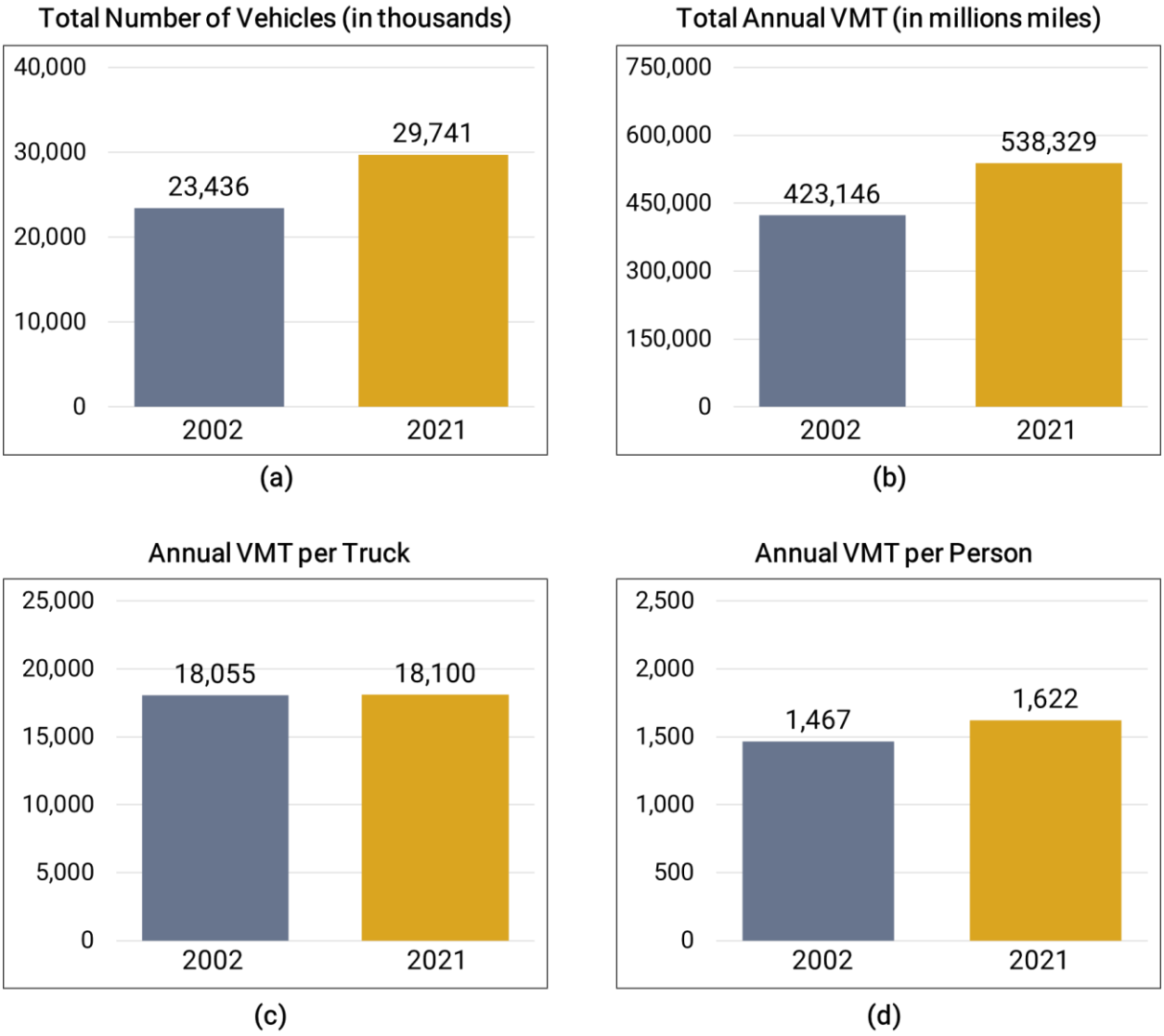



**Figure 4. Trends in Commercial Use Vehicle Travel, 2002–2021 in VIUS (Weighted)**

Figure 4(a) shows that the number of trucks with any commercial use increased from 23.4 million in 2002 to 29.7 million in 2021, a gain of 6.3 million trucks (26.9 percent) nationwide. Figure 4(b) shows a similar pattern for total annual VMT associated with this truck category, which rose from 423.1 billion miles in 2002 to 538.3 billion miles in 2021, an increase of 115 billion miles (27.2 percent). The close alignment between growth in the commercial-use vehicle fleet and growth in total VMT (26.9 percent versus 27.2 percent) indicates that the rise in commercial-related travel was driven primarily by fleet expansion rather than by increases in per-vehicle mileage. This is also supported by Figure 4(c), which shows that average annual VMT per commercial-use truck remained essentially unchanged between 2002 and 2021 (18,055 miles versus 18,100 miles). This suggests that the increase in overall VMT associated with commercial-

use trucks is virtually entirely attributable to fleet growth, not to higher utilization per vehicle. Figure 4(d) presents commercial-use truck VMT normalized by population, showing that commercial miles (related to this truck category) per person increased from 1,467 miles in 2002 to 1,622 miles in 2021 (an increase of 10.5 percent). This reflects the broader footprint of commercial activity in everyday travel demand, meaning that the average resident is now indirectly associated with a larger share of truck miles.

Table 3 helps place the VMT results of commercial-fleet usage in a broader context by comparing trucks with any reported commercial use against trucks used exclusively for personal purposes as reported in VIUS. While the commercial-use segment expanded from 23.4 million vehicles in 2002 to 29.7 million in 2021, with total annual VMT rising from 423.1 to 538.3 billion miles, the personal-use truck segment grew much more rapidly over the same period, increasing from 65.3 million to 139.8 million vehicles and from 766.6 to 1,358.7 billion miles annually. At the same time, the two segments followed different utilization patterns. Commercial-use trucks maintained nearly unchanged average mileage per vehicle (18,055 versus 18,100 miles), whereas personal-use trucks experienced a substantial decline in average annual mileage, from 11,733 to 9,720 miles per vehicle. This contrast suggests that commercial-related VMT growth was driven primarily by a larger business-use fleet with stable use intensity, while growth in the personal-use truck fleet was accompanied by lower mileage per vehicle, a trend consistent with the broader expansion of SUVs and pickups in household travel.

**Table 2. Commercial and Personal Use Truck Travel in VIUS, 2002–2021 (Weighted)**

| Attribute | *Commercial* | | | *Personal* | | |
|---|---|---|---|---|---|---|
| | **2002** | **2021** | **Delta** | **2002** | **2021** | **Delta** |
| Population (in thousands) | 288,369 | 331,894 | 15.1% | 288,369 | 331,894 | 15.1% |
| Vehicles (in thousand) | 23,436 | 29,741 | 26.9% | 65,343 | 139,775 | 113.9% |
| Vehicle miles (in millions) | 423,146 | 538,329 | 27.2% | 766,644 | 1,358,663 | 77.2% |
| Vehicles per capita | 0.08 | 0.09 | 12.5% | 0.23 | 0.42 | 82.6% |
| Vehicle miles per capita | 1,467 | 1,622 | 10.6% | 2,658 | 4,094 | 54.0% |
| Miles per vehicle | 18,055 | 18,100 | 0.2% | 11,733 | 9,720 | -17.2% |

Note: Delta is calculated as the percent change between 2002 and 2021 data.

Taken together, Figure 4 and Table 3 provide a clear picture of how commercial travel has grown over the past two decades. Between 2002 and 2021, the VIUS data shows that both the number of trucks reporting any commercial use and their aggregate mileage grew by more than a quarter, while VMT per truck remained essentially flat. This decomposition indicates that virtually all of the increase in commercial VMT captured by VIUS was driven by the growth in the number of vehicles engaged in business activity, rather than substantial changes in utilization per vehicle. When normalized by population, VIUS also shows that commercial miles per person increased, underscoring that the footprint of business-related travel has become more pronounced in the daily mobility profile of U.S. residents.

### 3.3. Commercial-Use Truck VMT by Weight Class in VIUS (2002–2021)

This subsection presents results on the composition of VMT from trucks with any commercial use

in VIUS and how these shares have changed from 2002 to 2021. The analysis classifies trucks into weight-based categories and calculates their shares of total commercial-use VMT. Trucks are grouped by Gross Vehicle Weight Rating (GVWR) into three harmonized bins for the 2021 dataset:

- Light-duty trucks (Classes 1, 2A, 2B; ≤10,000 lbs.), including pickups, vans, and SUVs when used for business purposes.
- Medium-duty trucks (Classes 3–6; 10,001–26,000 lbs.).
- Heavy-duty trucks (Classes 7–8; ≥26,001 lbs.).

In the 2002 dataset, gross vehicle weights were recorded using the variable ADM_GVW, which assigns codes 1 through 8 to represent GVWR classes. For comparability with the 2021 survey, Class 2 in ADM_GVW was aligned with Classes 2A and 2B. This harmonized classification enables consistent computation of commercial-use VMT shares for 2002 and 2021, as well as the associated changes over time.

Figure 5 shows the percentage of total VMT contributed by the three truck weight classes in 2002 and 2021, along with total annual VMT in each year. In 2002, light-duty trucks dominated commercial-use VMT, contributing 66.9 percent (approximately 282.9 billion miles), while medium-duty trucks accounted for 8.6 percent (approximately 36.4 billion miles) and heavy-duty trucks for 24.5 percent (approximately 103.7 billion miles). This composition underscores the central role of pickups, vans, and SUVs in business operations at the time, alongside a substantial but smaller share of heavy-duty mileage associated with freight carriers.

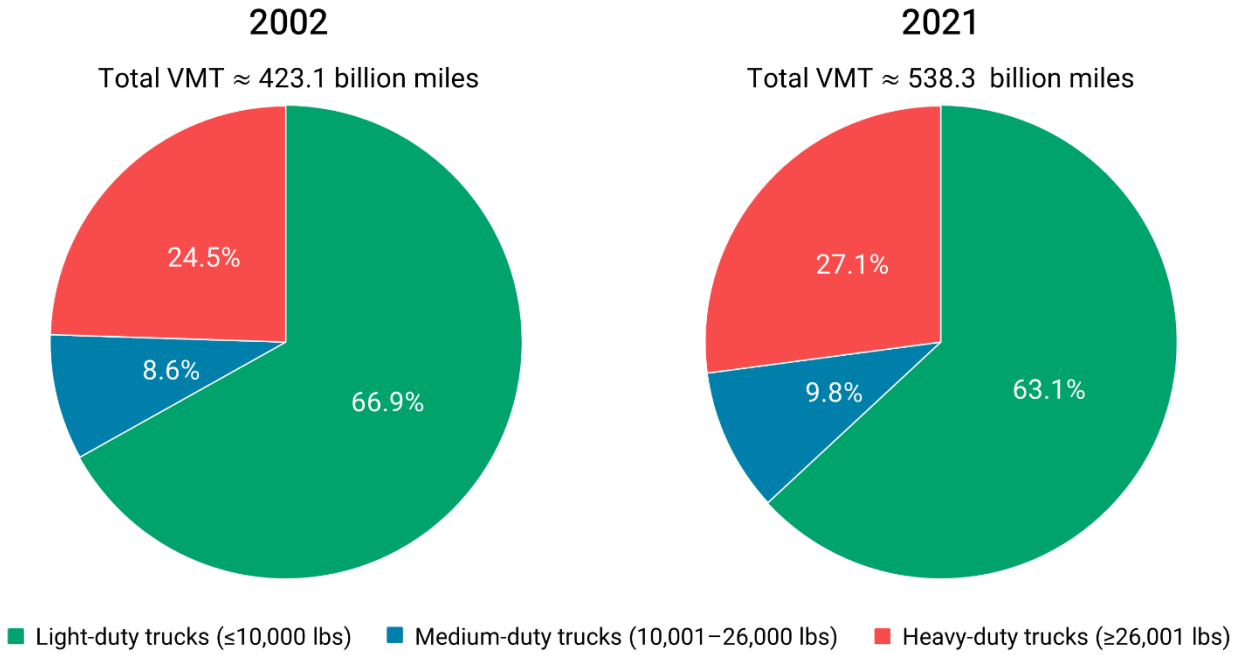



**Figure 5. Composition of Annual VMT from Commercial-Use Trucks by Weight Class in VIUS (2002 versus 2021; Weighted)**

In 2021, light-duty trucks continued to generate the largest share of commercial-use VMT at 63.1 percent (approximately 339.7 billion miles). Heavy-duty trucks increased their share to 27.1 percent (approximately 145.9 billion miles), and medium-duty trucks accounted for 9.8 percent (approximately 52.7 billion miles). Compared with 2002, these changes represent shifts of

–3.7 percentage points for light-duty trucks, +2.6 points for heavy-duty trucks, and +1.1 points for medium-duty trucks, indicating a modest shift in commercial travel toward heavier vehicles rather than a fundamental change in overall composition.

In absolute terms, light-duty trucks added the most commercial-use VMT over the period (+56.8 billion miles, +20.1 percent), followed by heavy-duty trucks (+42.2 billion miles, +40.7 percent) and medium-duty trucks (+16.3 billion miles, +44.8 percent). In other words, light-duty trucks accounted for about half of the total increase in commercial-use VMT since 2002, while heavy-duty trucks contributed just over one-third and medium-duty trucks the remainder. These findings indicate that light-duty trucks remain the backbone of commercial travel, yet heavier trucks have grown in relative importance, consistent with the expansion of long-haul and combination-truck operations alongside continued growth in service and delivery fleets.

### 3.4. Household VMT and Commercial-Use Truck VMT Over Time

This subsection examines how household VMT in NHTS and the VMT associated with mixed-use trucks in VIUS have changed over the past two decades. Before presenting results, several considerations are worth noting again. First, NHTS and VIUS were fielded in different years, although the survey waves are close enough in timing to support comparisons over roughly two decades. Second, NHTS VMT reflects all miles driven by household-available vehicles, including some vehicles that may not be owned by the household and that may occasionally be used for business purposes. Third, in VIUS, trucks reporting any business use are classified as mixed-use; these vehicles may also accumulate personal miles, and VIUS does not isolate strictly commercial mileage. As a result, the VIUS values reported here represent total annual mileage for mixed-use trucks, not commercial-only VMT. These distinctions should be kept in mind when interpreting the trends presented in this subsection. Table 4 summarizes the results.

**Table 3. Household VMT and Mixed-Use Truck VMT by Survey Year (Weighted)**

| Year | NHTS – Household VMT | | VIUS – Mixed-use VMT (commercial + personal) | |
|---|---|---|---|---|
| | Total Annual VMT (in million miles) | Annual VMT per Person (in miles) | Total Annual VMT (in million miles) | Annual VMT per Person (in miles) |
| 2001 | 2,274,769 | 7,978 | — | — |
| 2002 | — | — | 423,146 | 1,467 |
| 2009 | 2,035,051 | 6,634 | — | — |
| 2017 | 2,105,882 | 6,478 | — | — |
| 2021 | — | — | 538,329 | 1,622 |
| 2022 | 1,848,031 | 5,545 | — | — |

Note: NHTS values represent travel from any household-available vehicles (2001: self-reported distances; 2009, 2017, and 2022: network-calculated distances). VIUS values represent total annual mileage for trucks with any reported commercial use. — = Not applicable.

The table shows that household VMT fell from 2.28 trillion miles in 2001 to 1.85 trillion miles in 2022. A per-capita view reinforces this decline: household miles per person dropped from 7,978 miles in 2001 to 5,532 miles in 2022. This pattern is consistent with structural changes in travel demand, including the rise of telework, growth in e-commerce, and broader shifts in trip-

making before, during and after the pandemic. On the commercial side, VIUS indicates steady growth in VMT associated with mixed-use trucks. Trucks with any reported commercial use generated 423.1 billion miles in 2002 and 538.3 billion miles in 2021, a 27 percent increase over the period. On a per-capita basis, VMT from mixed-use trucks increased from 1,467 miles per person in 2002 to 1,622 miles in 2021. These findings point to a gradual rebalancing of roadway demand. Household travel has declined both in absolute terms and as a share of total national VMT (see Figure 3), while commercial and service-oriented trucking activity has expanded over the last two decades.

### 3.5. NHTS–VIUS Overlap and Comparability

This subsection examines the extent to which NHTS and VIUS provide comparable estimates for the portions of the vehicle fleet they both capture, most notably SUVs and pickup trucks. Although these vehicle types appear in both surveys, their underlying universes differ: NHTS represents household-available vehicles, while VIUS represents the registered truck fleet. For this analysis, all SUVs and pickups in VIUS are included, regardless of whether they report personal-only or mixed use. In contrast, NHTS includes only those SUVs and pickups that are available to households and used largely for personal travel. As a result, VIUS includes vehicles (particularly pickup trucks) that are used exclusively for commercial purposes and therefore do not appear in NHTS. This distinction should be kept in mind when comparing the two sources. Table 5 presents side-by-side estimates of vehicle counts, total VMT, and annual miles per vehicle across matched survey years, along with *deltas* representing the percent difference between VIUS and NHTS.

**Table 4. Comparison of SUV and Pickup Coverage and Use in VIUS and NHTS (Weighted)**

| Attribute | SUV | | | Pickup Trucks | | |
|---|---|---|---|---|---|---|
| | VIUS | NHTS | Delta | VIUS | NHTS | Delta |
| ***VIUS 2002 vs. NHTS 2001*** | | | | | | |
| Annual Total VMT (million miles) | 314,349 | 286,823 | -8.8% | 432,680 | 395,004 | -8.7% |
| Vehicles (thousand) | 23,906 | 20,524 | -14.1% | 36,847 | 31,780 | -13.8% |
| Annual Miles per Vehicle | 13,149 | 13,975 | 6.3% | 11,742 | 12,429 | 5.9% |
| ***VIUS 2021 vs. NHTS 2022*** | | | | | | |
| Annual Total VMT (million miles) | 977,374 | 984,781 | 0.8% | 511,939 | 482,964 | -5.7% |
| Vehicles (thousand) | 91,114 | 69,125 | -24.1% | 53,758 | 36,799 | -31.5% |
| Annual Miles per Vehicle | 10,727 | 14,247 | 32.8% | 9,523 | 13,124 | 37.8% |

Note: Delta is calculated as the difference between NHTS and VIUS data, divided by the VIUS value.

In the 2002 versus 2001 comparison, VIUS reported more SUVs (23.9 million versus 20.5 million) and pickup trucks (36.8 million versus 31.8 million) than NHTS. Annual total VMT was about 9 percent higher in VIUS for both body types (314,349 versus 286,823 million miles for SUVs; 432,680 versus 395,004 million miles for pickups), while differences in average miles per vehicle were smaller in magnitude, or about 6% (13,149 versus 13,975 miles for SUVs; 11,742 versus 12,429 miles for pickups). These differences likely reflect, in part, that vehicles used exclusively for commercial purposes appear in VIUS but not in NHTS, and such vehicles may

differ in mileage intensity from household-available vehicles. Differences in sampling frames and weighting procedures potentially also contributes to the reported differences between vehicles and the VMT generated by them. Overall, the two surveys produced broadly consistent measures for these vehicle types, with no dramatic deviations observed.

In the 2021 versus 2022 comparison, total annual VMT reported by the two surveys is very similar, differing by only 0.8 percent for SUVs and 5.7 percent for pickup trucks. However, the difference in vehicle counts is much larger than in the early 2000s: VIUS reports 91.1 million SUVs and 53.8 million pickups, compared with 69.1 million and 36.8 million in NHTS. This widening gap likely reflects the substantial growth in SUVs and pickups used exclusively for commercial purposes over the past two decades, which appear in VIUS but not in NHTS. A different pattern emerges when comparing annual miles per vehicle. NHTS reports markedly higher per-vehicle mileage (32.8 percent higher for SUVs and 37.8 percent higher for pickups) than VIUS. Two factors possibly contributed to this difference. First, household vehicle fleets have shifted toward SUVs and pickups in recent decades as consumers prefer larger vehicles that are increasingly more affordable, fuel-efficient, and flexible. As a result, these vehicles now account for a greater share of household travel demand than in the early 2000s, and SUVs in particular exhibit annual use intensity that is comparable to or slightly higher than that of passenger cars (Bricka et al. 2024; BTS 2021; BTS 2025). Second, VIUS 2021 reflects travel conditions during a period when pandemic-related effects were still suppressing travel demand, whereas NHTS 2022 reflects a partial rebound in personal travel. However, NHTS also shows higher per-vehicle intensity (14,247 miles per SUV and 13,124 per pickup) than VIUS (10,727 and 9,523, respectively). Comparing this to FHWA's VM-1 reporting an average of around 10,700 miles per light-duty vehicle in 2021 (FHWA 2022), which aligns more closely with VIUS, potentially suggests that NHTS estimates may be somewhat elevated relative to the full registered fleet. Together, these factors help explain why NHTS reports higher mileage intensity while VIUS captures a larger and more commercially oriented fleet.

Because household vehicles in NHTS align most closely with the "personal use" category in VIUS as defined by the *BUSRELATED* variable, Table 6 disaggregates SUVs and pickups by use domain for both 2002 and 2021. Compared with NHTS 2001 from Table 5, VIUS 2002 personal-use SUVs were slightly more numerous (21.6 vs. 20.5 million) but recorded lower annual total VMT (274.1 vs. 286.8 billion miles). For pickups, VIUS personal use counts and VMT were already lower than NHTS (29.8 vs. 31.8 million vehicles and 324.7 vs. 395.0 billion miles). By 2021, even after excluding commercial use, VIUS personal-use SUVs and pickups still exceeded NHTS 2022 in vehicle counts (80.6 vs. 69.1 million SUVs and 42.1 vs. 36.8 million pickups) yet accumulated less annual total VMT. These results indicate that, within the personal-use domain, VIUS is closer to NHTS overall. However, VIUS consistently reports slightly more vehicles that are driven less intensively, whereas NHTS shows fewer vehicles with higher usage intensity.

In summary, NHTS reflects the household exposure of SUVs and pickups, emphasizing actively used vehicles with higher per-vehicle mileage. VIUS, by contrast, situates these body types in the broader registration base, distinguishing lightly used personal vehicles from high-intensity commercial units. The complementary nature of the two surveys provides a more complete picture: NHTS captures household activity, while VIUS clarifies how personal and commercial domains together shape the national SUV and pickup fleet.

**Table 5. Use Domain Distribution of SUVs and Pickups in VIUS (Weighted)**

| Attribute | SUV | | | Pickup Trucks | | |
|---|---|---|---|---|---|---|
| | Personal | Commercial | Unknown | Personal | Commercial | Unknown |
| ***VIUS 2002*** | | | | | | |
| Annual Total VMT (millions miles) | 274,101 | 40,247 | -- | 324,660 | 108,020 | -- |
| Vehicles (thousand) | 21,641 | 2,265 | -- | 29,807 | 7,039 | -- |
| Annual Miles per Vehicle | 12,666 | 17,771 | -- | 10,892 | 15,345 | -- |
| ***VIUS 2021*** | | | | | | |
| Annual Total VMT (millions miles) | 827,221 | 124,361 | 25,790 | 351,337 | 150,569 | 10,033 |
| Vehicles (thousand) | 80,606 | 8,393 | 2,113 | 42,075 | 10,398 | 1,283 |
| Annual Miles per Vehicle | 10,262 | 14,817 | 12,200 | 8,350 | 14,479 | 7,816 |

Note: Unknown indicates records in the VIUS 2021 dataset where the *BUSRELATED* variable does not specify personal or commercial use

### 3.6. FHWA–VIUS Overlap and Comparability

This section examines the comparability between FHWA's national estimates of truck travel, as reported in Highway Statistics Table VM-1, and the weighted results from VIUS. Unlike VIUS, which produces survey-weighted tabulations by expanding sampled vehicles to the national fleet, FHWA's VM-1 is a model-based administrative estimate. States report HPMS roadway segment lengths, traffic and vehicle-classification counts; FHWA converts these to VMT (e.g., AADT × segment length) and then stratifies/adjusts by vehicle type using auxiliary administrative sources (e.g., MV-1 registrations, MF-21 fuel consumption) to enforce national and state consistency. Thus, VM-1 is a top-down roadway accounting, not a microdata weighting exercise (FHWA, 2022).

Comparing FHWA roadway estimates with VIUS's vehicle survey tabulations is valuable because it highlights how two fundamentally different methodologies converge or diverge in measuring truck travel, thereby providing complementary perspectives on the national freight system.

According to FHWA's VM-1, truck travel is separated into two broad classes. Single-Unit Trucks are defined as vehicles on a single frame with two axles and at least six tires or a GVWR above 10,000 lbs., while Combination Trucks are truck tractors with one or more trailers (FHWA 2022). To align with this definition, VIUS 2002 identifies combination units using *TRUCKTYPE* (1=tractor) with support from *TRAILER* and *AXLE_CONFIG* and defines single-unit trucks as non-tractors meeting a GVWR of 10,000 pounds or higher (*ADM_GVW*) or 2-axle 6-tire rule (*AXLESTOTAL*==2), excluding minivans, light vans, and SUVs. In VIUS 2021, truck tractors are identified using *CABDAY* and *TTYPE*, while single-unit trucks are non-tractors meeting a GVWR of 10,000 pounds or higher (*GVWR_CLASS*) or the 2-axle 6-tire rule (*PAXLECONFIG*, *REARAXLETIRES*), with the same exclusions applied. This yields categories consistent with VM-1 tabulations.

Table 7 compares weighted results from VIUS with FHWA's VM-1 estimates for Single-Unit and Combination Trucks in 2002 and 2021. In 2002, FHWA reported substantially higher

totals: annual total VMT was about 46.6 percent higher for single-unit trucks (75.9 vs 51.7 billion miles) and 53.9 percent higher for combination trucks (138.7 vs 90.2 billion miles), with corresponding vehicle counts roughly 50 to 60 percent greater. Despite these level differences, per-vehicle mileage was nearly identical across the two sources. By 2021, the discrepancies narrowed considerably for single-unit trucks, with FHWA's annual total VMT only 5.2 percent higher (131.6 vs 125.1 billion miles) and 2.7 percent higher in vehicle counts (10.7 vs 10.4 million), while per-vehicle averages remained within 3 percent. For combination trucks, however, FHWA still reported almost 38.9 percent more annual total VMT (195.4 vs 140.7 billion miles) and 8.2 percent more vehicles (3.1 vs 2.9 million), yielding per-vehicle mileage roughly 28 percent higher than VIUS. These contrasts highlight both the convergence and the persistent gaps between the survey-based VIUS tabulations and FHWA's administrative VM-1 estimates.

Overall, FHWA's VM-1 estimates are consistently higher than VIUS tabulations, both in terms of vehicle counts and total VMT. The gaps were especially large in 2002, when FHWA totals exceeded VIUS by roughly one-half. By 2021 the discrepancies narrowed, particularly for single-unit trucks, yet FHWA estimates remained noticeably higher, most prominently for combination trucks.

**Table 6. Comparison of Single-Unit and Combination Trucks: VIUS (Weighted) vs. FHWA**

| Attribute | Single-Unit Trucks | | | Combination Trucks | | |
|---|---|---|---|---|---|---|
| | VIUS | FHWA | Delta | VIUS | FHWA | Delta |
| ***VIUS 2002 vs. FHWA 2002 (Table VM-1)*** | | | | | | |
| Annual Total VMT (million miles) | 51,736 | 75,866 | 46.6% | 90,170 | 138,737 | 53.9% |
| Vehicles (thousand) | 3,777 | 5,651 | 49.6% | 1,422 | 2,277 | 60.1% |
| Annual Miles per Vehicle | 13,698 | 13,426 | -2.0% | 63,414 | 60,939 | -3.9% |
| ***VIUS 2021 vs. FHWA 2021 (Table VM-1)*** | | | | | | |
| Annual Total VMT (million miles) | 125,140 | 131,637 | 5.2% | 140,666 | 195,389 | 38.9% |
| Vehicles (thousand) | 10,408 | 10,687 | 2.7% | 2,898 | 3,135 | 8.2% |
| Annual Miles per Vehicle | 12,022 | 12,317 | 2.5% | 48,533 | 62,321 | 28.4% |

Note: Delta is calculated as the difference between FHWA and VIUS data, divided by the VIUS value. (Delta = (FHWA − VIUS) / VIUS)

## 4. CONCLUSIONS AND POLICY IMPLICATIONS

Using harmonized VIUS and NHTS evidence, this study documents a pronounced rebalancing of U.S. roadway demand over the past two decades. On the commercial side, vehicles with any business use increased from nearly 23.4 million in 2002 to 29.7 million in 2021, and total commercial miles rose from 423.1 billion to 538.3 billion. Average miles per commercial vehicle were essentially flat at about 18,000, showing that growth was driven almost entirely by an expanding commercially active fleet rather than higher intensity. Commercial miles per capita increased from about 1,467 to 1,622. On the household side, NHTS indicates sustained contraction in both absolute and per capita terms, lowering households' share of national total VMT from roughly four-fifths in 2001 to well under three-fifths by 2022. These findings point to a structural shift, with household travel decreasing in relative importance and commercial truck activity

gaining a greater presence.

Light-duty commercial trucks continue to generate the majority of commercial miles, accounting for about 67 percent in 2002 and 63 percent in 2021. In absolute terms, light-duty vehicles added 56.8 billion miles of travel over the period, the largest increase among all categories. Heavy-duty trucks recorded the highest growth rate, expanding by 40.7 percent, while medium-duty trucks grew even faster proportionally, by 44.8 percent. Together, these patterns highlight the continued centrality of pickups, vans, and SUVs in commercial operations, alongside the rising importance of heavier trucks whose role in long-haul and freight activity has expanded significantly.

Comparisons across data sources provide further insight. The overlap between VIUS and NHTS in shared body types such as SUVs and pickups shows strong consistency in aggregate mileage, even though NHTS reports fewer vehicles with higher per-vehicle intensity and VIUS covers a broader registration base with more lightly used units. Despite these framing differences, both surveys produce very similar totals for annual VMT: 977.4 versus 984.8 billion miles for SUVs, and 511.9 versus 483.0 billion miles for pickups, underscoring their complementarity. At the same time, comparison with FHWA's administrative VM-1 estimates shows that FHWA totals have consistently exceeded VIUS tabulations, especially in 2002 when differences for both single-unit and combination trucks approached 50 percent. By 2021 the gap narrowed substantially for single-unit trucks, but FHWA continued to report almost 39 percent more total VMT and 28 percent higher per-vehicle mileage for combination trucks. These contrasts highlight both convergence and persistent gaps, indicating the need for careful benchmarking when integrating survey and administrative sources.

Taken together, these findings confirm two central points. Household travel has contracted in both scale and share, while commercial fleets have expanded steadily and now account for a much larger portion of national roadway demand. At the same time, the structural consistency between VIUS and NHTS, together with benchmarking against FHWA's roadway totals, strengthens confidence in the robustness of these conclusions.

The next NHTS, currently being collected in 2025, should provide an important new data point for understanding how household travel and its share of total travel are changing over time. Further research that more clearly distinguishes vehicle use for work versus personal purposes would also improve understanding of household and work-related travel patterns. This is especially important for pickups and SUVs, which make up a large share of the vehicle fleet and are frequently used for both personal and work-related travel. Understanding such travel purposes is important because travel behavior, responsiveness to costs and congestion, vehicle choice decisions, and the propensity to shift to alternative modes differ substantially between business and personal travel. These differences also have broader implications for transportation system performance, since vehicles used in commercial and service activity are often larger and heavier, resulting in greater roadway wear, more severe crash consequences, higher energy use, and associated emissions impacts. Yet these segments of the travel market remain less well understood from a behavioral perspective. Important issues such as the drivers of demand growth, sensitivity to pricing, potential for mode or technology shifts, and responses to policy or investment initiatives have not been examined with the same depth as household travel. As non-household activity continues to expand, improving understanding of these dynamics will become increasingly important.

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