# Travel Patterns and Characteristics of Low-Income Population in New York State: 2017 Update

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## ACKNOWLEDGEMENTS

# EXECUTIVE SUMMARY

This study examines the key characteristics of low-income people, focusing on New York State populations and households and their comparison with the rest of the United States. The characteristics include their demographics, trip activities, accessibility, travel attitudes, and equity. The major data source used is 2017 National Households Travel Survey (NHTS). Supplemental data sources are also used such as American Community Survey and Census Transportation Planning Products for a more comprehensive analysis. The key findings are summarized below.

## Characteristics of Low-Income Populations

In 2017, a lower percentage of low-income households in New York State had one vehicle (36%) compared to their counterparts in the rest of the United States (49%). Similarly, the share of two-vehicle households among low-income households in New York State was lower (10%) than their counterparts in the rest of the United States (19%). When comparing number of drivers and vehicle ownership, low-income New York State households are less likely (about 4%) to own more vehicles than the number of drivers in their households, both in 2009 and 2017. In contrast, their not low-income counterparts have a higher proportion (13%) of households with more vehicles than drivers in 2017.

Compared to 2009, the proportion of zero-vehicle low-income households in New York City has decreased from 73% to 69% in 2017. However, in regions outside of New York City, there was an increase in the share of zero-vehicle low-income households, such as in non-urban areas, where it rose from 20% in 2009 to 32% in 2017. Furthermore, about 26% of zero-vehicle households in Manhattan were classified as low-income in 2017, which is the lowest among all the New York State regions. This finding aligns with the understanding that many Manhattan residents choose not to own vehicles, regardless of their income status. In contrast, in other regions such as Putnam, Rockland, and Westchester, a significant majority (89%) of zero-vehicle households were classified as low-income in 2017.

## Mobility of Low-Income Households

New York State residents from a low-income household traveled significantly fewer miles as measured by person miles traveled, compared to trips made by a not low-income household. New York State drivers from low-income households took significantly fewer trips than their counterparts that are not from low-income households. Compared to 2009 and 2001, the average daily person trips in 2017 in New York State was lower for both income groups. This change was more significant for the not low-income group, with a 14% percentage decrease in 2017 from the average daily person trips in 2009. The average daily person trips in 2017 were also lower for both income groups in New York City compared to 2009 and 2001. When considering person trip length, low-income Manhattan residents traveled shorter distances than their counterparts from other areas in 2017. Not low-income Manhattan residents traveled an average of 12 miles, while low-income residents traveled only 3 miles.

Family and personal business trips account for 44% of the person trips for low-income New York State residents and 36% for a not low-income New York State resident in 2017. The share of family and personal business decreased in 2017 for both income groups compared to 2009; 3% decrease for the low-income group and 6% for the not low-income group.

Low-income New York State resident had fewer POV (i.e., privately-owned vehicle or privately-operated vehicle) trips, but more walking and transit trips compared to their counterpart that was not low-income based on NHTS 2017. Notably, the percentage of walking trips for low-income residents rose from 29% in 2009 to 34% in 2017, while POV trips decreased from 46% in 2009 to 42% in 2017. Low-income New York State drivers who drove on their travel day spent, on average, 77 minutes per day in

their vehicles, compared to 83 minutes for their counterparts from higher-income households in 2017. Compared to 2009, both income categories spent more time in a vehicle on travel days in 2017.

**Transportation Accessibility**

About 93% of New York State low-income households surveyed in 2017 NHTS lived within a one-mile radius, calculated based on great circle distance, of transit stops. Not low-income individuals take more public transit trips during morning and afternoon peaks, as these time periods (7 to 8 am and 5 to 6 pm) account for approximately 12% of daily trips. Conversely, low-income individuals exhibited a greater frequency of transit trips throughout the day, with no discernible morning or afternoon peaks. For family and personal business, social and recreational trips, low-income individuals had a higher proportion of transit use around noon, while not low-income individuals had a greater share of transit trips during the late afternoon, between 4 pm and 7 pm.

      Not low-income commuters made more daily trips than their low-income counterparts during weekdays in New York State. On average, low-income commuters in New York State traveled shorter distances in POV for their commute trips compared to their counterparts from not low-income households. However, there was an exception in highly populated urban areas (with a population density of 25,000 or more), where low-income commuters traveled an average of one mile farther by POV than their non-low-income counterparts.

      Regardless of population density, low-income commuters generally had shorter travel times compared to their not low-income counterparts. For instance, in the most densely populated area of New York State, low-income commuters spent an average of 32 minutes on their POV, while their not low-income counterparts spent an average of 42 minutes.

**Travel Cost and Internet Accessibility of Low-Income Households**

According to 2017 NHTS, low-income people care more about travel costs compared to their not low-income counterparts. A greater share of low-income people agree that gas price affect their travel compared to their higher-income counterparts. Furthermore, low-income residents in non-urban areas are more inclined to believe that gas prices affect their travel (41%) compared to their counterparts in New York City, the rest of New York State, and the rest of the United States. Among the three transportation modes being considered, walk and public transit were more likely to be used than bike, as an alternative mode by low-income people to save travel costs regardless of where they lived. Over 50% of low-income people in New York City agree (38% agree and 27% strongly agree) that they walk to save money, a proportion surpassing their counterparts in both the rest of New York State and the other regions of the country.

**Equity Analysis**

Comparing the Disadvantaged Communities (DACs) criteria, the one developed by the Massachusetts Executive Office of Energy and Environmental Affairs identified more DACs from the northern part of New York State, such as Franklin County, Clinton County, and St. Lawrence County than the criteria developed by the New York State Climate Justice Working Group. When comparing the DACs identified by the Delaware criteria, New York State criteria identified more DACs in the Ulster and Dutchess County. Analyzing the commute origin-destination flows using Census Transportation Planning Products data, it is found that a higher share of trips originating from DACs were made by walking, biking, public transportation or carpool while a higher share of trips originating from non-DACs was made by cars. Moreover, a larger share of individuals from DACs were found to spend more time on their daily commutes.

# 1. INTRODUCTION

## 1.1 BACKGROUND

The United States' poverty rate stood at 11.6%, affecting a staggering 37.9 million lives according to 2021 Census data. This underscores the vital importance of examining the mobility patterns of low-income populations (Liu & Uddin, 2023; US Census Bureau, 2022b). Research has indicated that households in poverty face greater challenges in their daily travel compared to higher-income households, especially in urban and suburban areas. This leads to more severe consequences such as missed appointments and difficulties in managing illnesses, even when healthcare is readily available. Previous studies have also highlighted that workers from low-income households who rely on public transit have limited employment opportunities and reduced access to the regional economy (Ferguson et al., 2012; Pasha et al., 2020).

Low-income households face higher energy cost burdens. In the United States, the working poor spend twice the proportion of their earnings (6.1%) compared to the non-poor (3.8%) on commuting to their jobs (Roberto, 2008). American households, on average, allocate around 7.0% of their total income to gasoline expenses. For low-income households earning less than 200% of the federal poverty level, this percentage ranges from 13.8% to 14.1% (Vaidyanathan et al., 2021). While public transit is assumed to effectively connect unemployed individuals without personal vehicles to suitable job locations, the high cost of land near employment centers, transit services, and amenities often leads affordable housing developers to select sites on the outskirts of cities. Consequently, residents in these areas are compelled to rely on personal vehicles for transportation, posing a challenge for the 18% of households earning less than $35,000 that do not own a vehicle (Center for Transit-Oriented Development, 2014).

This report comprehensively examines the travel behaviors and patterns of low-income populations in New York State (NYS). The study primarily utilizes travel and demographic data from the 2017 National Household Travel Survey and the associated add-on sample households purchased by the New York State Department of Transportation. Unlike many studies that focus on national-level statistics, this research specifically investigates travel-related issues faced by low-income travelers in NYS. Additionally, this study explores various methodologies that are used to identify disadvantaged communities on state and regional scales.

By utilizing the 5-year American Community Survey (ACS) data for 2013-2017, the median household income for all counties in NYS was analyzed. Figure 1-1 shows the median income, Figure 1-2 shows the upper bound and Figure 1-3 shows the lower bound of the ACS income estimate. The findings reveal that the median incomes of counties within the New York Metropolitan Transportation Council (NYMTC)[1] region are significantly higher than those of other NYS counties, except for Bronx and Kings counties. It should be noted that NYMTC region is home for over 60% of NYS population including the county with highest median income (Nassau) and the lowest median income (Bronx). In upstate NYS, the income level of Saratoga is more similar to the higher-income NYMTC counties than its neighboring counties. Outside of NYMTC, in general, rural counties have lower median household incomes.

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[1] NYMTC consists of 10 counties in New York State. These include the 5 counties of New York City (Kings, Queens, New York, Bronx, and Richmond), Nassau, Suffolk, Westchester, Putnam, and Rockland counties.
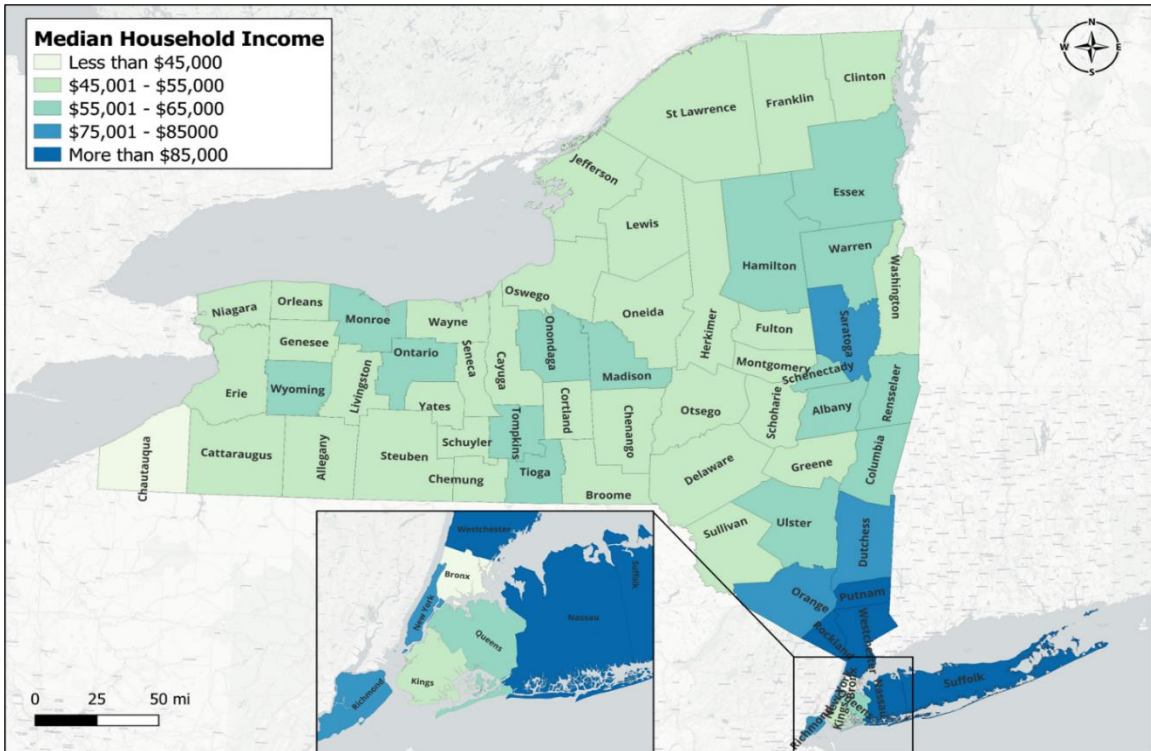
**Figure 1-1. Median household income in NYS counties (ACS 2013-2017 data)**
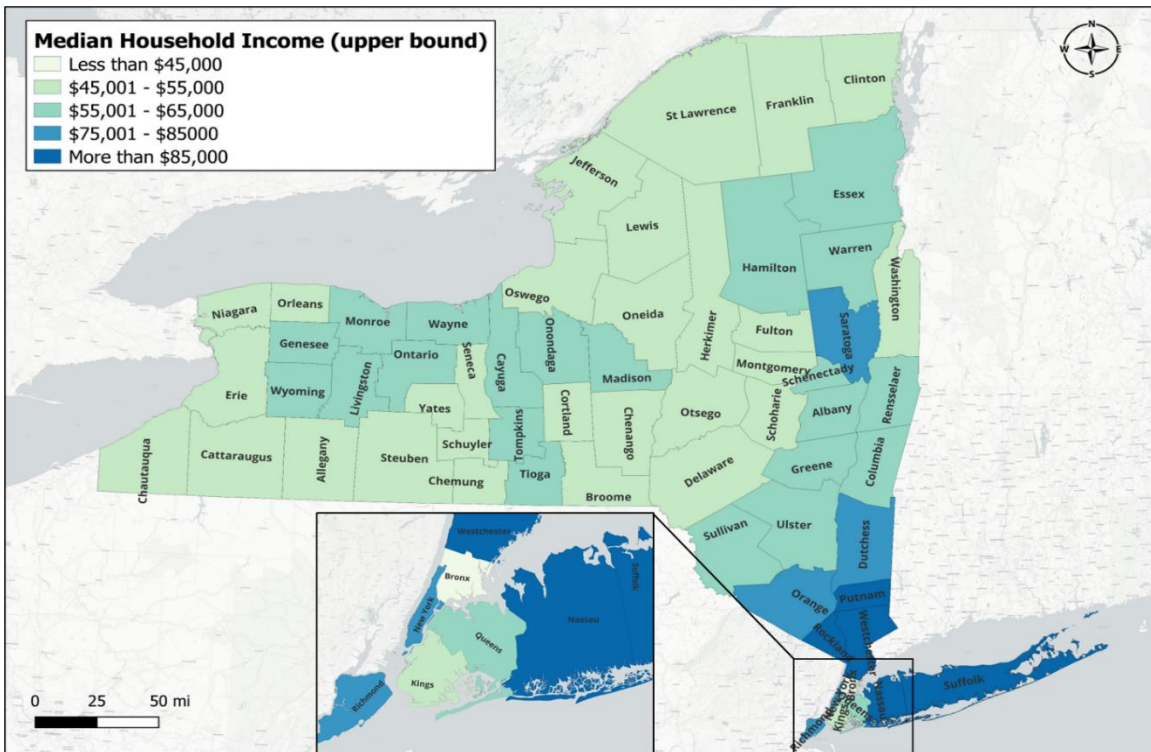


**Figure 1-2. Upper bound of the median household income in NYS counties (ACS 2013-2017 data)**
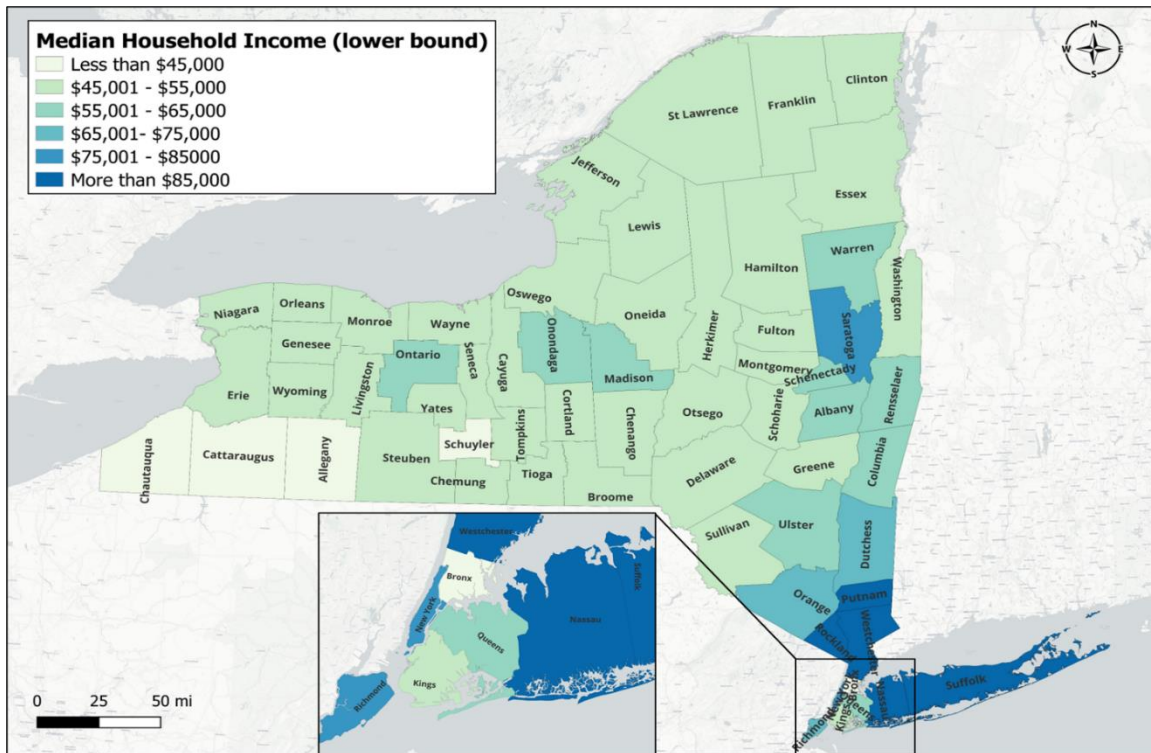
**Figure 1-3. Lower bound of the median household income in NYS counties (ACS 2013-2017 data)**

## 1.2    PURPOSE OF THIS STUDY

This study addresses several key research questions, including:

- Are there notable differences in traveler demographics between the low-income and not low-income populations residing in different regions of NYS, such as New York City, other urban areas within NYS, or other parts of the country?
- How do these demographics of low-income travelers compare to the general population?
- Are there significant regional variations in travel characteristics, for instance, between urban and rural areas?
- Are there any distinct travel characteristics or patterns specific to low-income households?
- How comparable the methodologies that are used for identifying disadvantaged communities in NYS and other regions?

By addressing the above questions, the study aims to provide comprehensive insights into the demographics, travel behaviors, and characteristics of low-income populations in NYS, as well as to highlight any unique considerations in identifying disadvantaged communities compared to other regions or nationally.

## 1.3    ORGANIZATION OF REPORT

This report presents the findings of analysis conducted on travel patterns of low-income households in NYS. The analysis primarily focuses on various aspects such as traveler demographics and mode-specific

summary statistics (including trip frequency, mode choice, trip distance, trip duration, and trip purpose) within the low-income population of NYS.

Section 2 describes the data sources and the criteria for defining low-income populations. Section 3 provides an overview of the characteristics of the low-income population in NYS, including their population size, demographic profiles, vehicle ownership, and vehicle age. Section 4 delves into the travel characteristics specific to the low-income population, examining their travel patterns and behaviors. Section 4 also addresses the topic of transportation accessibility and equality, mobility patterns of commuters, individuals without access to private vehicles, and children living in poverty. Their patterns of public transit use, including departure times and trip purposes, are explored in Section 5. Additional analyses including views on travel cost of the low-income population and their internet access are presented in Section 6. Section 7 conducts an equity analysis by comparing different criteria for identifying disadvantaged communities, including the criteria applied in NYS. Lastly, the report concludes with a summary of the key findings derived from this research in Section 8.

## 2. DATA SOURCES

The characteristics and travel behaviors of low-income households were analyzed using the 2017 National Household Travel Survey (NHTS) data as the primary source. Data from the US Census Bureau and other sources were used as appropriate. A brief description of the data sources is provided below.

### 2.1 NATIONAL HOUSEHOLD TRAVEL SURVEY

The National Household Travel Survey (NHTS) is a national travel survey of U.S. households, and it is sponsored by Federal Highway Administration (FHWA). The website for NHTS mentions it as the authoritative source on the travel behavior of the American public (Federal Highway Administration, 2017). The survey collects daily travel information that is linked to individual personal and household characteristics, and vehicle attributes. The information on travel includes trip frequency, travel distance and time, mode of transportation, and trip purpose.

The 2017 NHTS surveyed over 129,000 households; of these, 26,000 households were from a national sample and the rest were from add-on samples purchased by thirteen State or MPO partners. The add-on samples enriched the national set; without these, the use of NHTS would be extremely limited for detailed analyses of travel behavior. Note that U.S. Territories were not included in the sampling frame and populations under 5 years old were excluded.

The New York State Department of Transportation (NYSDOT) was an add-on partner in the 2017 NHTS. Consequently, NYSDOT received travel data for over 17,000 households in the State. With this more robust sample size, NYSDOT analysts can perform in-depth analyses of their resident's travel behaviors and address transportation planning issues related to geographic areas that are smaller than what the national NHTS data intended (Liu et al., 2022; Uddin et al., 2023).

The 2017 NHTS data were used as the primary data source to generate travel statistics in this study. Data from previous NHTS surveys (i.e., 2009 and 2001) were also considered, especially when trends or changes over time were analyzed.

### 2.2 AMERICAN COMMUNITY SURVEY

The American Community Survey (ACS) from the U.S. Census Bureau contacts over 3.5 million households each year (approximately 295,000 per month). The survey selects random households where each has about a 1-in-480 chance of being selected. It is also subject to the constraint that no households should be surveyed more than once every 5 years. Due to these, ACS is very intensive, and compared to NHTS, it is 27 times big (3.5 million versus 129 thousand). The ACS is geographically more uniform than the NHTS as well. For example, each year's ACS sample includes, on average, over 40 households per Census Tract and about 15 households per Block Group. The ACS collects data on demographics, social, and economic characteristics of all ages of populations living in the U.S. It also collects data on commuting (i.e., journey to work) that includes travel time and mode of transportation to work.

### 2.3 HOUSING AND URBAN DEVELOPMENT DATA

The US Department of Housing and Urban Development (HUD) data on income limits were used in this study to frame the population of interest. The purpose of HUD income limits is to determine the eligibility for assisted housing programs that include Public Housing. The income limits are set based on HUD estimates of median family income (MFI) at each fiscal year. The latest income limits for the Public Housing and Section 8 Programs became effective on May 15, 2023 (US Department of Housing and

Urban Development, 2023). This notice by HUD mentioned the following "most important statutory provisions relating to income limits:

- <u>very low-income family</u> is defined as low-income families whose incomes do not exceed 50 percent of the median family income for the area, subject to specified adjustments for areas with unusually high or low incomes relative to housing costs;
- <u>low-income family</u> is defined as those families whose incomes do not exceed 80 percent of the median family income for the area, subject to adjustments for areas with unusually high or low incomes or housing costs;
- <u>extremely low-income family</u> is defined as a very low-income family whose income does not exceed the higher of the poverty guidelines as determined by the Department of Health and Human Services or 30 percent of the median family income for the area;
- where the area income limit is less than those derived from the state nonmetropolitan median, income limits are based on the state nonmetropolitan median; and,
- income limits are adjusted for family size so that larger families have higher income limits."

## 2.4 DEFINITIONS FOR LOW-INCOME HOUSEHOLDS

This section discusses several general approaches for defining low-income households that are found in a literature search.

### 2.4.1 Simple Cutoff Value or Category

The use of a simple cutoff value, which defines a low-income household as one with income below a pre-determined cutoff dollar amount, is one of the most common approaches seen in the literature. This method is straightforward and thus easy to apply. In most cases, household incomes are categorized into several buckets (ranges of income level), with the lowest one being classified as the "low-income" group. For example, Moniruzzaman and co-authors used a monthly household income of $2,333 / $2,517 as the cutoff value for single / a couple to define low-income households (Moniruzzaman et al., 2015). Similarly, Lou and co-authors used $30,000 personal annual income as the cutoff value for the lowest income group (Lou et al., 2020). A 2019 FHWA report, entitled *Travel Behavior Trends Analysis of Workers and Non-workers* (Federal Highway Administration, 2019), used $35,000 as its cutoff value for the low household annual income category using 2017 NHTS data.

### 2.4.2 Census Bureau Poverty Threshold

Census Bureau poverty measure—generally referred to as the official poverty measure—was developed in the early 1960s when President Lyndon Johnson declared war on poverty. It has remained mostly unchanged since the mid-1960s. The current poverty measure is defined as three times the cost of a minimum food diet from 1963 considering the inflation (based on the Consumer Price Index for All Urban Consumers). According to the information posted on *How the Census Bureau Measures Poverty* webpage (US Census Bureau, 2023a), the poverty measure is a set of money income thresholds that vary by household size and composition (e.g., number of children in the household). If a household's income falls below the household's threshold, then the household as well as every individual in it is considered in poverty. Census publishes the official poverty thresholds annually in dollars (US Census Bureau, 2023b). The thresholds are the same throughout the United States without considering any geographic differences for the cost of living. Table 2-1 shows the official Census poverty thresholds for 2017. For families with one or two persons, poverty thresholds are provided considering family members' elderly status (age 65 and over). For families with three and more persons, thresholds vary with family size and number of children in the family.

**Table 2-1.  Census poverty thresholds for 2017 by size of family and number of related children under 18 years**

| Size of Family Unit | Weighted Average Thresholds | Related Children Under 18 Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | None | One | Two | Three | Four | Five | Six | Seven | Eight or more |
| **One person** (unrelated individual) | **12,488** | | | | | | | | | |
|   Under 65 years | 12,752 | 12,752 | | | | | | | | |
|   65 years and over | 11,756 | 11,756 | | | | | | | | |
| **Two people** | **15,877** | | | | | | | | | |
|   Householder under 65 years | 16,493 | 16,414 | 16,895 | | | | | | | |
|   Householder 65 years and over | 14,828 | 14,816 | 16,831 | | | | | | | |
| **Three people** | **19,515** | 19,173 | 19,730 | 19,749 | | | | | | |
| **Four people** | **25,094** | 25,283 | 25,696 | 24,858 | 24,944 | | | | | |
| **Five people** | **29,714** | 30,490 | 30,933 | 29,986 | 29,253 | 28,805 | | | | |
| **Six people** | **33,618** | 35,069 | 35,208 | 34,482 | 33,787 | 32,753 | 32,140 | | | |
| **Seven people** | **38,173** | 40,351 | 40,603 | 39,734 | 39,129 | 38,001 | 36,685 | 35,242 | | |
| **Eight people** | **42,684** | 45,129 | 45,528 | 44,708 | 43,990 | 42,971 | 41,678 | 40,332 | 39,990 | |
| **Nine people or more** | **50,681** | 54,287 | 54,550 | 53,825 | 53,216 | 52,216 | 50,840 | 49,595 | 49,287 | 47,389 |

Note: The poverty thresholds are updated each year using the change in the average annual Consumer Price Index for All Urban Consumers.

### 2.4.3    Census Bureau Poverty Guidelines

The poverty guidelines are issued each year in the Federal Register by the Department of Health and Human Services (HHS) (US Department of Health and Human Services, 2023b). Poverty Guidelines are a simplification of the poverty thresholds for use for administrative purposes – for instance, determining financial eligibility for certain federal programs. Some examples of federal programs that use the poverty guidelines in determining eligibility include Head Start, the Low-Income Home Energy Assistance Program, the Supplemental Nutrition Assistance Program (SNAP, formerly Food Stamp Program), the National School Lunch Program, and Job Corps. Detailed documentation of the differences between the poverty guidelines and the Census poverty thresholds can be found on HHS Website (US Department of Health and Human Services, 2023a). Table 2-2 summarizes the key differences.

**Table 2-2. Key differences between Census thresholds and HHS guidelines**

| Category | Poverty Thresholds | Poverty Guidelines |
|---|---|---|
| Issuing Agency | Census Bureau | Department of Health and Human Services |
| Purpose/Use | Statistical − calculating the number of people in poverty | Administrative − determining financial eligibility for certain programs |
| Characteristics by Which They Vary | Detailed (48-cell) matrix of thresholds varies by family size and composition. There is no geographic variation; the same figures are used for all 50 states and Washington, DC | Guidelines vary by family size. In addition, there is one set of figures for the 48 contiguous states and Washington, DC; one set for Alaska; and one set for Hawaii. |

### 2.4.4    Census Bureau Supplementary Poverty Measure

In 2010, an Interagency Technical Working Group—included representatives from the Bureau of Labor Statistics (BLS), the Census Bureau, the Economics and Statistics Administration, the Council of Economic Advisers, HHS, and the Office of Management and Budget—issued a series of suggestions to the Census Bureau and BLS on how to develop a Supplemental Poverty Measure (SPM). Their

suggestions drew on the recommendations of a 1995 National Academy of Science report and the extensive research on poverty measurement conducted over the past 15 years.

The SPM is a more complex statistic incorporating additional items such as tax payments, noncash benefits from government programs, and work expenses in its family resource estimates. Thresholds used in the SPM are derived from Consumer Expenditure Survey expenditure data on basic necessities (food, shelter, clothing, and utilities) and are adjusted for geographic differences in the cost of housing. SPM has been released annually by the Census Bureau since 2011. A detailed comparison and explanation of the difference between the official poverty measures and SPM can be found on the Census Bureau website (US Census Bureau, 2022a).

The supplemental poverty thresholds vary by region, household size & composition, and housing-tenure status (i.e., homeowners with a mortgage, homeowners without a mortgage, and renters). Depending on the region, thresholds for units that have owners without mortgages are lower than for units that have owners with a mortgage. Table 2-3 displays NYS-specific thresholds for two adult two child families in 2017. The poverty thresholds for other household sizes & compositions can be obtained by applying adjustment factors to the thresholds for two adult two child families.

**Table 2-3. Supplementary Poverty Thresholds for Two Adult Two Child Families (2017)**

| Type | Area | Homeowners with Mortgage ($) | Homeowners without a Mortgage ($) | Renters ($) |
|------|------|------------------------------|-----------------------------------|-------------|
| MSA | Albany-Schenectady-Troy, NY MSA | 27,902 | 23,848 | 27,818 |
| MSA | Binghamton, NY MSA | 23,291 | 20,536 | 23,230 |
| MSA | Buffalo-Cheektowaga-Niagara Falls, NY MSA | 24,400 | 21,333 | 24,334 |
| MSA | Glens Falls, NY MSA | 26,078 | 22,538 | 26,003 |
| MSA | New York-Newark-Jersey City, NY-NJ-PA MSA | 33,053 | 27,547 | 32,943 |
| MSA | Rochester, NY MSA | 26,209 | 22,632 | 26,134 |
| MSA | Syracuse, NY MSA | 25,407 | 22,056 | 25,335 |
| MSA | Utica-Rome, NY MSA | 24,167 | 21,165 | 24,101 |
| MSA | Watertown-Fort Drum, NY MSA | 27,639 | 23,659 | 27,557 |
| | Other NYS Metro | 24,181 | 21,175 | 24,116 |
| | Other NYS Non-Metro | 23,904 | 20,976 | 23,840 |

Note: MSA represents Metropolitan Statistical Area

### 2.4.5 Lower Living Standard Income Level Guidelines

Developed by the US Department of Labor (DOL), the Lower Living Standard Income Level (LLSIL) reflects the cost of living increases for the regions and major metro areas by calculating the percentage change in the most recent Consumer Price Index for All Urban Consumers for an area then applying this calculation to each of the previous year's LLSIL figures. LLSIL guidelines are used by state and local workforce investment areas to determine income eligibility for the Workforce Innovation and Opportunity Act programs for youth and certain adult services, in addition to the Work Opportunity Tax Credit.

LLSIL considers geographical differences and defines income levels in different regions as well as major metropolitan areas. According to the definition, New York State is divided into three regions, separately New York-Northern NJ-Long Island, NY/NJ/CT/PA metro area (or New York metropolitan area), other metro areas, and non-metro areas. The low-income line in each area varies by family size as shown in Table 2-4.

**Table 2-4. LLSIL for New York State**

| Area Name | Threshold by Family Size ($) | | | | | |
|---|---|---|---|---|---|---|
| | One | Two | Three | Four | Five | Six |
| New York-Northern NJ-Long Island, NY/NJ/CT/PA | 11,469 | 18,797 | 25,801 | 31,852 | 37,586 | 43,963 |
| Metro | 10,831 | 17,752 | 24,363 | 30,075 | 35,495 | 41,507 |
| Non-Metro | 10,679 | 17,505 | 24,031 | 29,659 | 35,004 | 40,930 |

### 2.4.6    HUD Very Low-Income

As discussed in the above, HUD sets income limits to determine the eligibility for assisted housing programs such as Public Housing and housing for persons with disabilities. The income limits are developed from estimating MFI using Fair Market Rent (FMR) area definitions, which means that income estimates are developed for each metropolitan area, parts of some metropolitan areas, and each non-metropolitan county. How these regions are defined in 2017 can be founded in the FY 2017 Final FMR documentation system (US Department of Housing and Urban Development, 2017). Using the MFI-based approach, the differences in housing markets and costs of varying regions can be accounted for.

Table 2-5 presents a partial list of HUD's FY 2017 very low-income limits for NYS in Metropolitan Statistical Areas (MSAs) and parts of some metropolitan areas (AREA as shown in the table). A full list of HUD FY 2017 very low-income limits for all regions including non-metropolitan counties can be found in Appendix A-1. HUD's 2017 limits were selected in order to better align with the 2017 NHTS data used in this study.

The highlighted rows in Table 2-5 show two regions with the highest and the lowest very low-income limits among all the regions listed. The one shaded in red is Utica-Rome, NY MSA, which has the lowest very low-income limits. The one shaded in light green is Westchester County, NY Statutory Exception Area, which consists of only one county, Westchester County, and has the highest very low-income limits. The one-person household threshold in Westchester County, NY Statutory Exception Area is 78% higher than the threshold in Utica-Rome, NY MSA for the same household size. Clearly, the geographic difference is an important factor that needs to be considered, so that very low-income households among the NYS residents can be accurately identified and their travel behaviors can be properly examined.

**Table 2-5.  Example of HUD very low-income cutoff by MSA and county in NYS for 2017**

| Type | Name | FY17 MFI | Number of Persons | | | | | | | |
|------|------|----------|-----|-----|-------|------|------|-----|-------|-------|
| | | | One | Two | Three | Four | Five | Six | Seven | Eight |
| MSA | Albany-Schenectady-Troy, NY MSA | 83,100 | 29,100 | 33,250 | 37,400 | 41,550 | 44,900 | 48,200 | 51,550 | 54,850 |
| MSA | Binghamton, NY MSA | 65,700 | 23,000 | 26,300 | 29,600 | 32,850 | 35,500 | 38,150 | 40,750 | 43,400 |
| MSA | Buffalo-Cheektowaga-Niagara Falls, NY MSA | 68,200 | 23,900 | 27,300 | 30,700 | 34,100 | 36,850 | 39,600 | 42,300 | 45,050 |
| MSA | Elmira, NY MSA | 64,600 | 22,650 | 25,850 | 29,100 | 32,300 | 34,900 | 37,500 | 40,100 | 42,650 |
| MSA | Glens Falls, NY MSA | 64,100 | 22,450 | 25,650 | 28,850 | 32,050 | 34,650 | 37,200 | 39,750 | 42,350 |
| MSA | Ithaca, NY MSA | 75,600 | 26,500 | 30,250 | 34,050 | 37,800 | 40,850 | 43,850 | 46,900 | 49,900 |
| MSA | Kingston, NY MSA | 78,500 | 27,500 | 31,400 | 35,350 | 39,250 | 42,400 | 45,550 | 48,700 | 51,850 |
| MSA | Syracuse, NY MSA | 68,000 | 23,800 | 27,200 | 30,600 | 34,000 | 36,750 | 39,450 | 42,200 | 44,900 |
| MSA | Utica-Rome, NY MSA | 62,100 | 21,900 | 25,000 | 28,150 | 31,250 | 33,750 | 36,250 | 38,750 | 41,250 |
| MSA | Watertown-Fort Drum, NY MSA | 62,400 | 22,350 | 25,550 | 28,750 | 31,900 | 34,500 | 37,050 | 39,600 | 42,150 |
| AREA | Nassau-Suffolk, NY HUD Metro FMR Area | 110,800 | 38,800 | 44,350 | 49,900 | 55,400 | 59,850 | 64,300 | 68,700 | 73,150 |
| AREA | New York, NY HUD Metro FMR Area | 66,200 | 33,400 | 38,200 | 42,950 | 47,700 | 51,550 | 55,350 | 59,150 | 63,000 |
| AREA | Poughkeepsie-Newburgh-Middletown, NY HUD Metro FMR Area | 89,400 | 31,300 | 35,800 | 40,250 | 44,700 | 48,300 | 51,900 | 55,450 | 59,050 |
| AREA | Rochester, NY HUD Metro FMR Area | 68,600 | 24,050 | 27,450 | 30,900 | 34,300 | 37,050 | 39,800 | 42,550 | 45,300 |
| AREA | Rockland County, NY HUD Metro FMR Area | 103,600 | 36,300 | 41,450 | 46,650 | 51,800 | 55,950 | 60,100 | 64,250 | 68,400 |
| AREA | Westchester County, NY Statutory Exception Area | 111,400 | 39,000 | 44,600 | 50,150 | 55,700 | 60,200 | 64,650 | 69,100 | 73,550 |
| AREA | Yates County, NY HUD Metro FMR Area | 63,600 | 22,300 | 25,450 | 28,650 | 31,800 | 34,350 | 36,900 | 39,450 | 42,000 |

Data source: Information extracted from HUD published 2017 data for New York State.

### 2.4.7  New York State Climate Justice Working Group Disadvantaged Communities Criteria

The Climate Act charged the New York State Climate Justice Working Group (CJWG) with the task of formulating criteria to identify disadvantaged communities, with the aim of ensuring that frontline and other underserved communities reap the benefits of the state's monumental shift towards cleaner, more sustainable energy sources, lower pollution levels, improved air quality, and enhanced economic prospects.  On March 27, 2023, the CJWG released the final disadvantaged communities criteria (Climate Act, 2023).

Income is one of the metrics/indicators considered by the CJWG as part of the population characteristics and health vulnerabilities criteria to identify disadvantaged communities in NYS. Two income thresholds were considered by the CJWG to capture both deep poverty and more general poverty:

- Poverty Rate – below 100% federal poverty line (poverty guidelines), and
- Population earning less than 80% of Area Median Income (AMI).

Below 100% federal poverty level was included to capture deeply entrenched while population earning less than 80% AMI was included to capture more general poverty across communities. The AMI is obtained from HUD 2020 family median income by regions (i.e., metropolitan areas and counties) (US Department of Housing and Urban Development, 2020). The associated income metrics for each Census Tract is developed based on the two thresholds. Combined with other indexes, such as environmental burden and climate change risk score, disadvantage communities were identified.

In addition to Disadvantaged Communities (DACs), the CJWG included low-income households for the purpose of state agencies investing or directing clean energy and energy efficiency investments. Households that report total income at or below 60% of State-Median Income (SMI) or are otherwise categorically eligible for low-income programs (e.g., Home Energy Assistance Program and Weatherization Assistance Program) are defined as low-income households. The 60% of SMI is approximated using 200% of Federal Poverty Level. This additional criterion allows investments in individual households outside of Census Tracts identified as DACs making at or below 60% SMI to be included in the accounting process. Table 2-6 summarizes the above three low-income thresholds adopted by CJWG.

**Table 2-6.  Low-income thresholds adopted by CJWG for the identification of DACS and low-income households**

| Criteria | Disadvantaged Communities | | Households |
| --- | --- | --- | --- |
| | Poverty Rate | 80% AMI | Low-income Households |
| Geographical Resolutions | Community | Community | Households |
| Thresholds | 100% of Federal Poverty Level | 80% of AMI based on 2020 HUD published median income | 200% of Federal Poverty Level or eligible for low-income programs |

### 2.4.8  United For ALICE

United For ALICE (Asset Limited, Income Constrained, Employed) is an initiative dedicated to fostering innovation, conducting research, and taking concrete steps to enhance the quality of life for both ALICE and the broader population (UnitedForALICE, 2023). ALICE represents the growing segment of families who find it challenging to cover the fundamental expenses associated with six crucial aspects of a household budget: housing, childcare, food, transportation, healthcare, and technology. While ALICE's income surpasses the Federal Poverty Level, it falls short of meeting the costs necessary to sustain a

household with these six essential elements. United For ALICE drew upon various data sources, including but not limited to the HUD Fair Market Rent for housing, the relevant State governmental department overseeing childcare regulations for childcare, and the BLS Consumer Expenditure Survey for transportation and healthcare, to establish the budget for these elements.

Within the set of ALICE measurements designed to assess the expenses associated with a fundamental household budget, three metrics focusing on household income are outlined below:

- The *ALICE Household Survival Budget* represents the absolute essential costs required to sustain a household in the modern economy. Additionally, the Project presents the ALICE Household Stability Budget as a companion, offering an estimate that includes a slightly higher standard than the Survival Budget, incorporating a 10% savings category.
- The *ALICE Senior Survival Budget* adjusts the Survival Budget to account for reduced expenditures on food and transportation, as well as heightened health needs for senior adults.
- The *ALICE Threshold* denotes the minimum income level crucial for the survival of a household. It consists of two distinct sets of limits: one for households led by individuals under 65 years of age and another for households led by individuals 65 years and older. This threshold remains constant regardless of family size and is utilized to classify ALICE households.

Given the substantial regional disparities, particularly in expenses like housing and transportation, the ALICE metrics are tailored to specific counties. In contrast to the Federal Poverty Level, which primarily factors in food expenses as essential needs, the ALICE definition encompasses a broader spectrum of household necessities, consequently setting higher thresholds for household income. A quick comparison shows that, in 2018, the ALICE Survival budget for a 1-person household is consistently over 50% of the 1-person poverty threshold in NYS, while the Stability budget is consistently over 140% of the poverty threshold for the same household size.

Note that, United For Alice does not publish the measurements for all counties in the United States. Only those states partners with the project have publicly available ALICE thresholds data.

## 2.5    COMPARISON OF LOW-INCOME HOUSEHOLD THRESHOLDS

In this section, a comparison among low-income definitions as presented in the above is performed; Table 2-7 summarizes all these definitions. Except for the simple cut-off value, which is determined in the literature mostly based on expert judgments, all thresholds were published/determined by either government agencies, non-profit organizations or designated working groups. Five of the eight definitions consider the variation of cost of living in different regions across the United States—Census SPM, LLSIL, HUD very low-income, NYS DACs Criteria, and ALICE threshold. Among them, the threshold used by the CJWG to identify more general poverty across communities is based on HUD low-income definition.

A further comparison among these low-income definitions was performed in selected metropolitan areas in NYS as well as New York City. Because Poverty Guidelines and NYS DACs were derived from other thresholds presented in the table, they were excluded from the comparison. The simple cut-off value was excluded as well because it's generally determined based on expert judgments and there are no consistent thresholds used in the literature. The remaining low-income thresholds vary with household size (number of people in households); larger households tend to have higher thresholds. The thresholds for 4-person households were selected for comparison. Figure 2-1 illustrates the differences in income level for the four selected definitions:

- Census weighted average poverty thresholds, presented in Table 2-1.

- Census SPM as presented in Table 2-3. Unlike other measures, SPM varies with household composition as well as housing-tenure status. There is no single threshold for 4-person households. In this regard, the lowest SPM value for 4-person households (two adult two child families) and the highest SPM value (four adult zero child families) were extracted for comparison. Additionally, a single weight adjusted threshold for different household compositions is estimated based on the share of housing status. According to ACS 2020 5-year estimates (US Census Bureau, 2020), the share for households with owners who have mortgages, have no mortgages and rent their home are respectively 40.0%, 24.4%, and 35.6% for the entire nation. The single weight-adjusted threshold is then obtained by applying these shares to the threshold for each housing type and then recombining the resulting values.
- LLSIL NYS-specific thresholds, presented in Table 2-4.
- NYS-specific data for very low-income limits from HUD for selected metropolitan areas, presented in Table 2-5.

**Table 2-7. Summary of low-income definitions**

| Type | Publishing Agency | Geographical Differences | Household Properties | Note |
|---|---|---|---|---|
| Simple Cut-off Value | | No | No | |
| Census Poverty Threshold | Census Bureau | No | Household Size & Composition | |
| Poverty Guidelines | HHS | No | Household Size | A simplified version of Census Poverty Thresholds |
| Census SPM | Census Bureau | Yes | Household Size & Housing Tenure Status | |
| LLSIL | DOL | Yes | Household Size | |
| HUD Very Low-income | HUD | Yes | Household Size | |
| ALICE Threshold | United For ALICE | Yes | Household Composition | 24 out of 50 states (partner states) have publicly available ALICE thresholds |
| NYS DACs Criteria | CJWG | One of the three thresholds considers geographic differences | Household Size | Defined based on Poverty Guidelines and HUD low-income |

Census Poverty Threshold is lower than most of the other thresholds for NYS except for weight-adjusted SPM thresholds for two adult two child households. This is somewhat expected because the Census Poverty Threshold is a national metric without considering the cost of living and housing market in NYS. Among the other three definitions that consider the variation in cost of living across the United States, LLSIL classifies NYS into three regions: the New York metropolitan area, other NYS metro areas, and NYS non-metro areas. Consequently, it cannot capture the variation within different metro/non-metro regions in NYS. Census SPM and HUD very low-income limits, on the other hand, consider the cost of living at higher geographical resolutions and establish income thresholds for different metro regions. Comparing SPM thresholds with HUD very low-income limits shows consistency of the definition among metro areas. For example, both SPM and HUD set the highest thresholds for households in New York City area, followed by those in the Albany-Schenectady-Troy metro area. In non-metro areas, however, SPM has one single threshold for all counties while HUD provides county-based thresholds. Therefore, the HUD-defined very low-income limits are considered more comprehensive and more realistic in

reflecting the cost of living and housing market in various non-metro regions compared to SPM. Additionally, as aforementioned, SPM varies with house ownership type; 2017 NHTS data do not have this information. Considering all these factors, the HUD very low-income limits were selected to frame the scope of this study, i.e., investigation of NYS low-income residents' travel behaviors and associated characteristics using the 2017 NHTS data. Similarly, HUD-defined very low-income limits are also applied to identify corresponding low-income households from outside of NYS (i.e., households from the rest of the United States) for all comparison purposes.
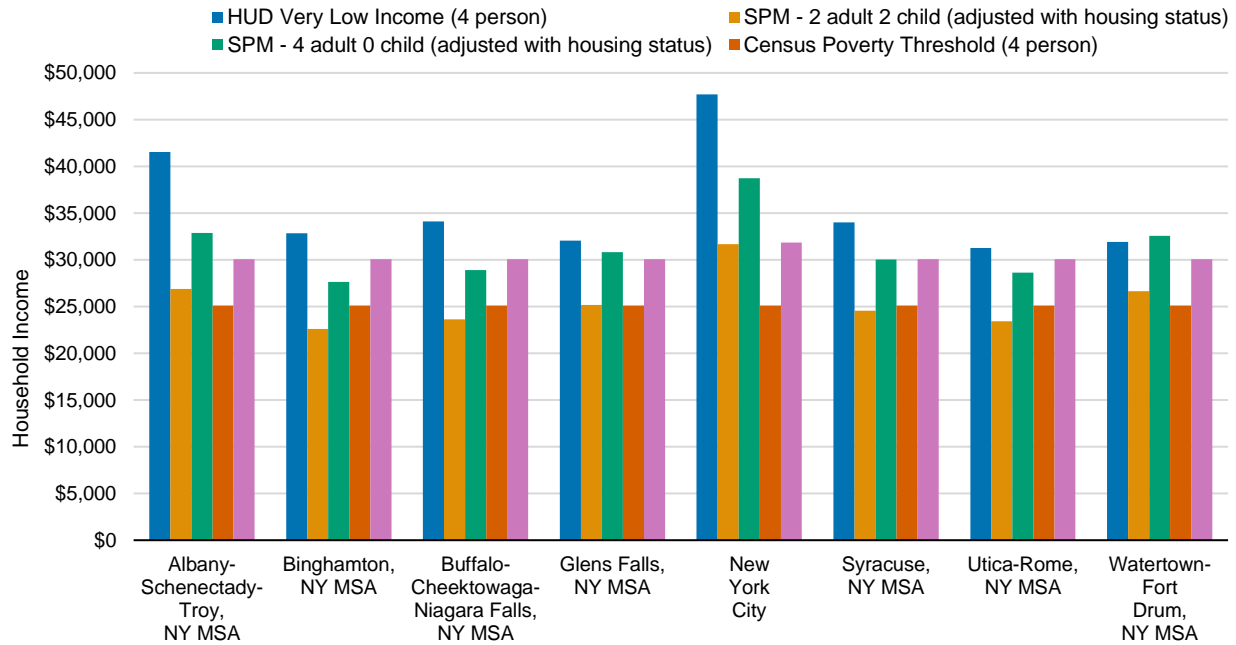


**Figure 2-1. Comparison of Census Poverty Threshold, SPM, LLSIL, and HUD very low-income limit for 4-person households from New York City and major metropolitan areas in NYS (2017)**

## 2.6 CURRENT STUDY AND ANALYSIS FOCUS

### 2.6.1 Geographical Region Considerations in Data Analysis

Typically, when sample size permits, statistics generated from analyses conducted under this study are presented by major geographical regions in the NYS. These areas are summarized in Table 2-8.

**Table 2-8. Geographical region definition**

| Region | Description |
|---|---|
| New York City (NYC) | Five counties/boroughs: New York County, Kings County, Queens County, Richmond County, and Bronx County |
| Manhattan | New York County only |
| Rest of NYC | Four boroughs of NYC excluding Manhattan |
| New York Metropolitan Transportation Council (NYMTC) | NYC, and Nassau, Suffolk, Putnam, Rockland, and Westchester counties |
| Rest of NYS | Includes all urban & non-urban areas outside the NYMTC as a whole |
| Other Urban Areas (excluding NYMTC) | All urban areas in NYS other than NYMTC |
| Non-Urban Areas | All non-urban areas in NYS |

| NYS Statewide | All areas in the NYS as a whole |
|---|---|
| Rest of U.S. | A combined geographic region when comparing behaviors from those who lived elsewhere in the United States (i.e., outside the NYS) |

### 2.6.2 Scope of Population and Households

Among all low-income thresholds, HUD-defined thresholds are found to be appropriate because they are established at higher geographical resolutions and consider housing expenditures in different regions. HUD defines two sets of thresholds, one for low-income households and one for very low-income households. The two thresholds were separately applied to NYS households based on household income from NHTS. The resulting low-income household share in each region is presented in Figure 2-2. The use of the low-income threshold classifies 44% of households in NYS into low-income groups while the very low-income threshold results in categorizing 31% of households in NYS into very low-income households. Consequently, using the HUD very low-income limits as the cutoff for "low income" in this study allows a better focus on the travel behaviors and mobility limitations of the most underprivileged NYS population.

Hereafter in this report, all "low-income" refer to the households with an income below the HUD-defined, area-specific, very low-income limits. People from these low-income households are considered to be low-income population. For reference, HUD's very low-income limits used in this study are provided by region of residence and listed in Appendix Tables A-1, A-2, and A-3.
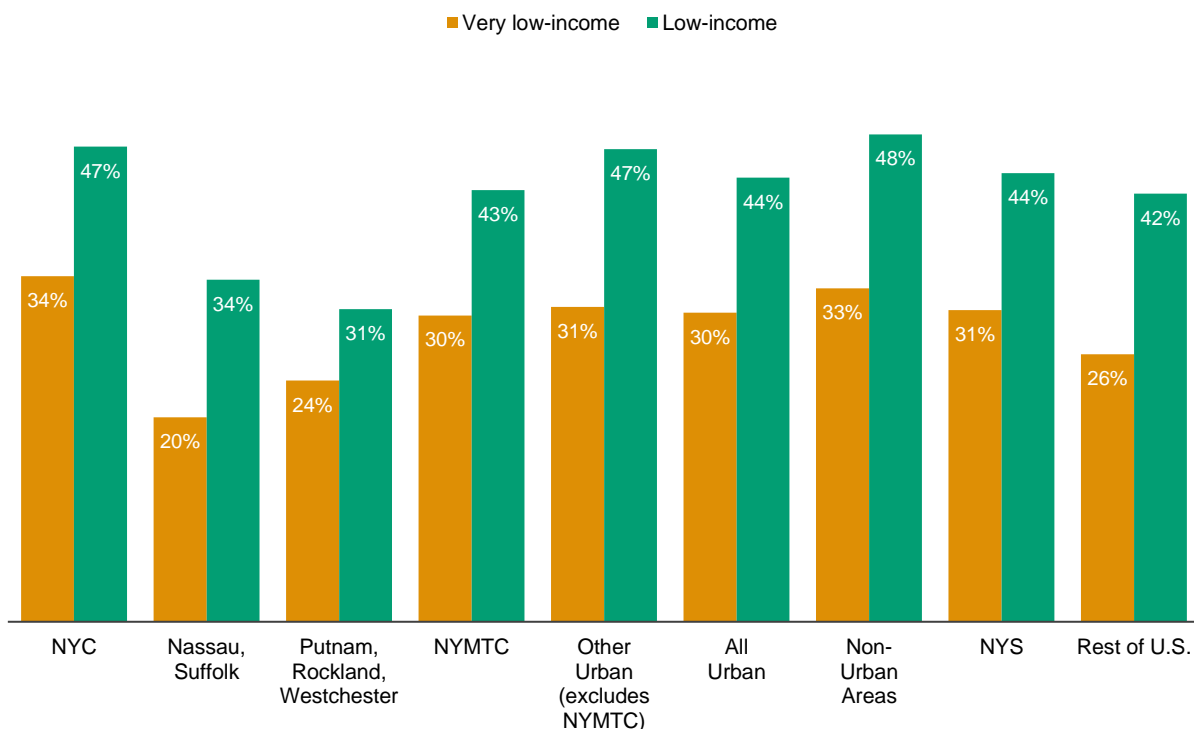


**Figure 2-2. Percent of households in HUD-defined very low-income vs. low-income groups (2017 NHTS)**

# 3. CHARACTERISTICS OF LOW-INCOME POPULATION

## 3.1 OVERVIEW

Based on the analysis of NHTS data from the three survey years (2001, 2009, and 2017), Figure 3-1 illustrates that the share of low-income residents in both New York State (NYS) and the rest of the United States in 2017 remains similar to the levels observed in 2009. Furthermore, NYS residents have a higher rate of being in low-income households than residents outside of state, about 4 to 5% higher.
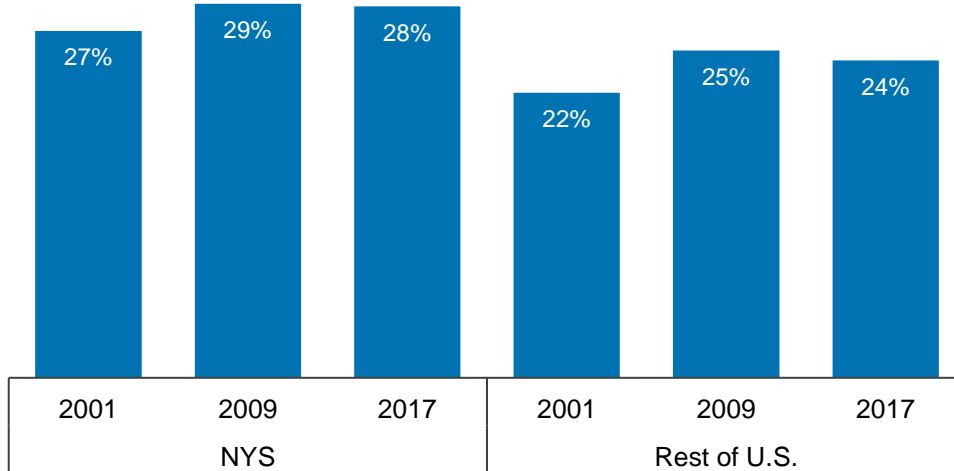


**Figure 3-1. Share of population age 5 years and older in low-income households (NHTS data)**

In regard to the proportion of households classified as having low-income status, NYS had a slight increase from 29% in 2009 to 31% in 2017. On the other hand, the share of low-income households in the rest of the United States remained comparable between 2009 and 2017. Comparing regions in 2017, 31% of NYS households are low-income while 26% of the households located outside of NYS are low-income.
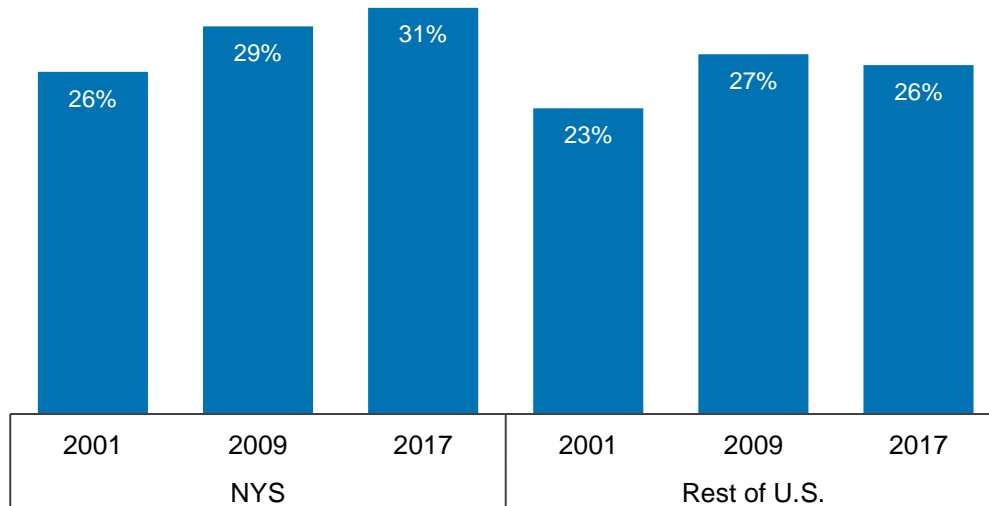


**Figure 3-2. Shares of households with low-income status (NHTS data)**

## 3.2 GEOGRAPHIC DISTRIBUTION OF LOW-INCOME NYS HOUSEHOLDS

Due to limited number of samples, the NHTS data are not extensive enough to provide an accurate representation of the proportions of low-income households at the county level for NYS. To address this, Figure 3-3 utilizes the 5-year ACS data for 2013-2017, highlighting the percentage of populations living below the poverty line in each county within NYS; Figure 3-4 presents the upper bound of the estimates, while Figure 3-5 presents the lower bound of the estimates. It is worth noting that Bronx County has the highest percentage of the populations residing below the poverty line.
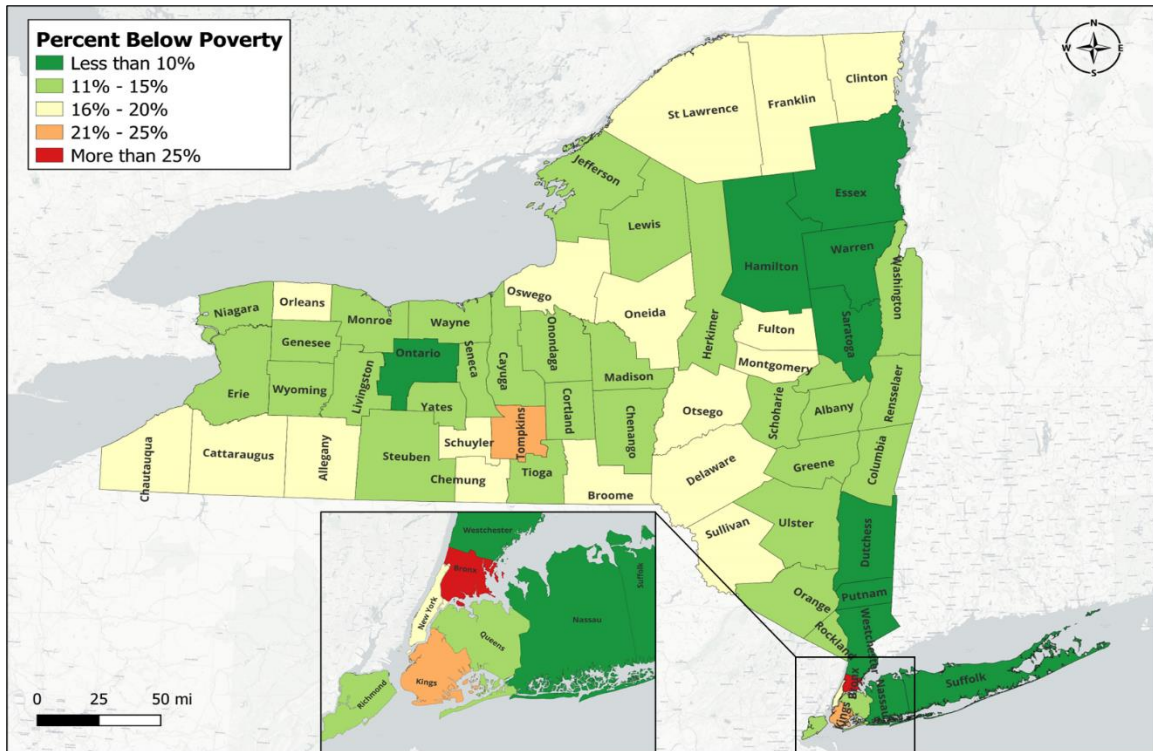


**Figure 3-3. Percent of population below poverty level in NYS counties (ACS 2013-2017 data)**
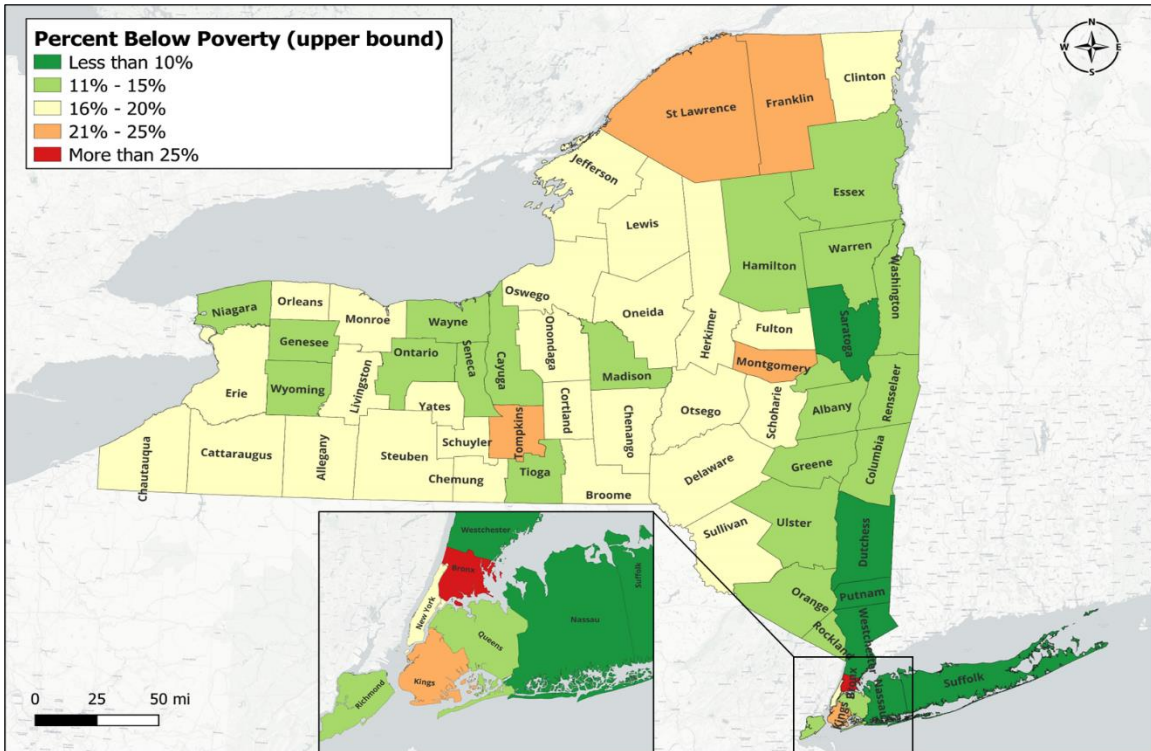
**Figure 3-4. Upper bound of the percent of population below poverty level (ACS 2013-2017 data)**
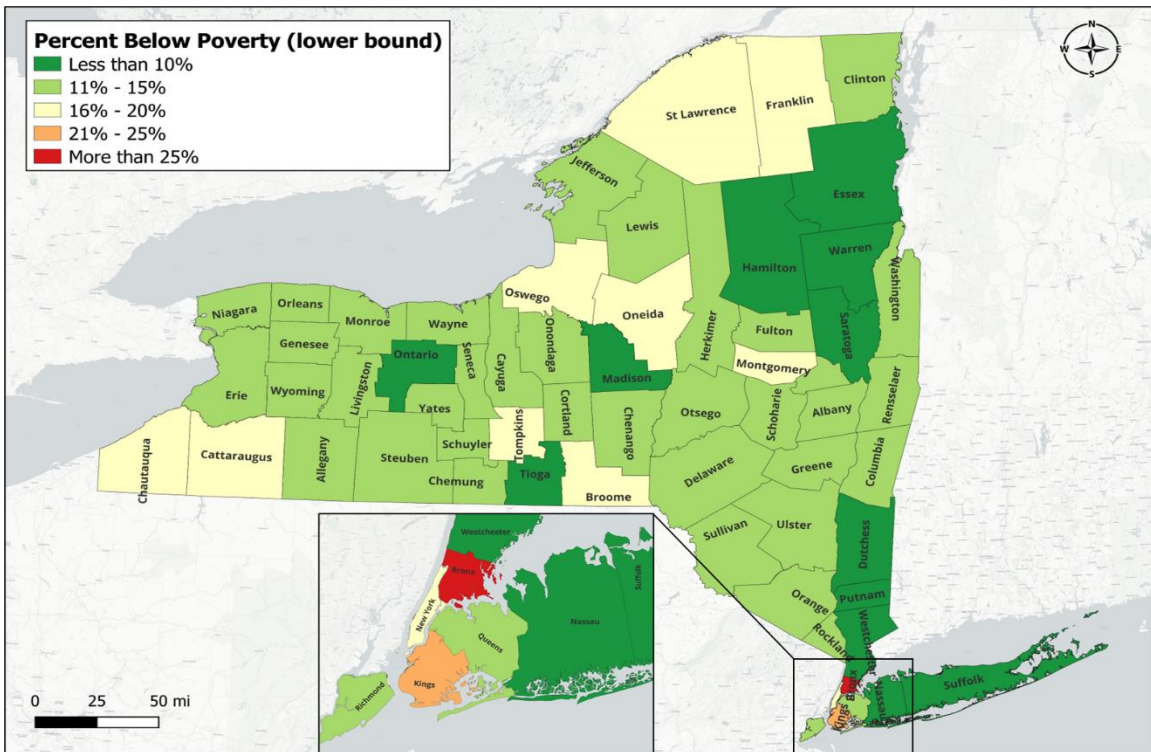


**Figure 3-5. Lower bound of the percent of population below poverty level (ACS 2013-2017 data)**

Table 3-1 provides insights into the population (age 5 years and older) residing in low-income households based on NHTS data. The data highlight a notable concentration of low-income households within the New York City (NYC) area, i.e., Manhattan and rest of NYC. In particular, rest of NYC had the highest percentage of population in low-income households in 2017, approximately 36%. Note that Bronx and Kings counties are part of rest of NYC and contributed significantly to the high proportion of low-income households in the region.

**Table 3-1. Low-income households by region (2001, 2009, and 2017 NHTS)**

| Household location | 2001 | | 2009 | | 2017 | |
|---|---|---|---|---|---|---|
| | Population in low-income households | Percent population in low-income households | Population in low-income households | Percent population in low-income households | Population in low-income households | Percent population in low-income households |
| Manhattan | 335,804 | 26.6% | 360,337 | 24.9% | 304,435 | 20.0% |
| Rest of NYC | 2,190,996 | 39.5% | 2,548,724 | 43.7% | 2,199,675 | 35.6% |
| Nassau, Suffolk | 346,927 | 15.2% | 523,147 | 20.9% | 452,982 | 17.9% |
| Putnam, Rockland, Westchester | 240,798 | 22.3% | 333,477 | 28.3% | 235,370 | 18.4% |
| Other Urban (excludes NYMTC) | 753,235 | 19.2% | 1,082,988 | 24.1% | 1,394,760 | 29.7% |
| Non-Urban Areas | 375,350 | 19.4% | 392,321 | 24.0% | 518,459 | 30.1% |
| NYS | 4,243,110 | 26.5% | 5,240,993 | 30.6% | 5,105,681 | 28.5% |
| Rest of U.S. | 48,410,575 | 21.6% | 66,417,900 | 26.4% | 67,086,969 | 24.3% |

Note: The population percentage calculation excludes households that did report income in the NHTS survey.

To facilitate a comparison across regions and over time periods, Figure 3-6 depicts the population shares of low-income households. A clear trend emerges from the chart, indicating a growing proportion of low-income population share across the three NHTS years in other urban areas (i.e., non-NYMTC urban areas) and non-urban areas of NYS. Conversely, a decreasing trend can be observed in most other regions. Notably, Manhattan showcases a consistent decrease in low-income population share since 2001. Rest of NYC clearly contributed to the higher percent of population in low-income households for NYS compared to the rest of the United States regardless of years.
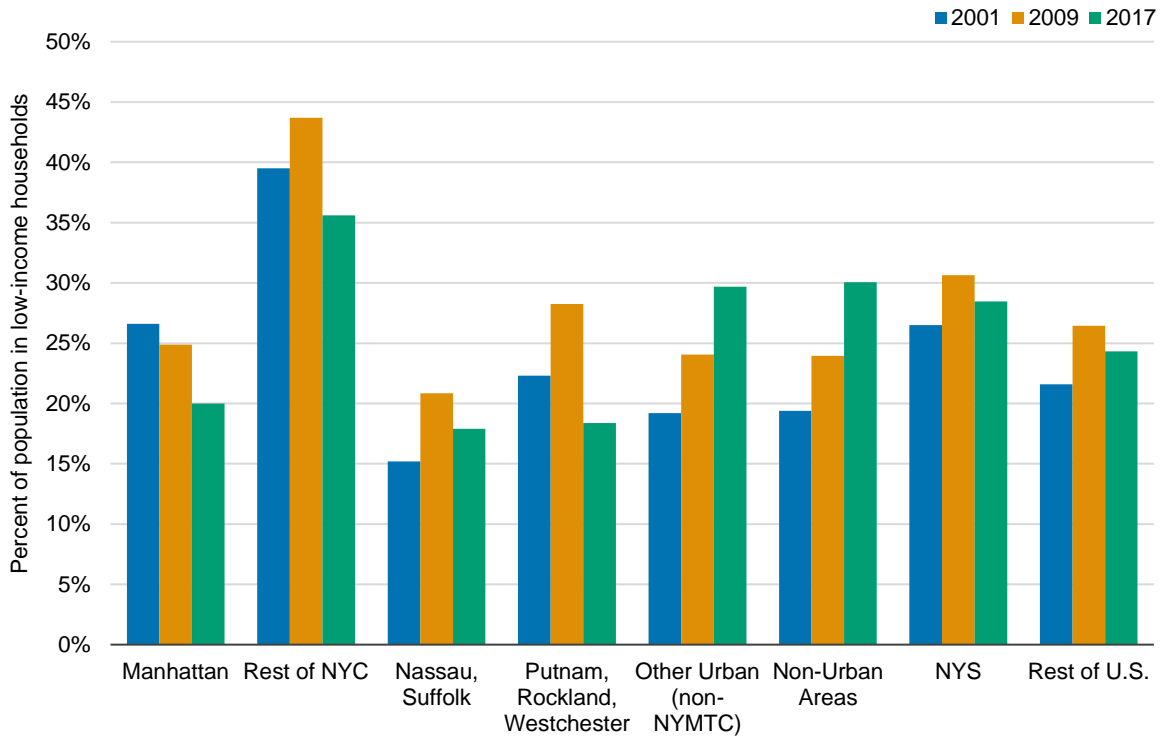
**Figure 3-6. Population shares of low-income households by region (2001, 2009, and 2017 NHTS)**

## 3.3 NHTS-BASED DEMOGRAPHIC PROFILE OF NYS LOW-INCOME POPULATION

### 3.3.1 Impacts of Race

Figure 3-7 shows that percent of population with low-income is significantly higher for African-American and Hispanics compared to other races among NYS residents for all three NHTS years. When comparing 2009 and 2017, it is evident that the percentage of Hispanics within the low-income population has decreased in both NYS and the rest of the United States. In 2017, NYS witnessed a lower share of African-American populations with low-income compared to 2009 (from 49% to 45%). Conversely, the rest of the United States experienced an increase in the share of African-American populations with low-income in 2017 (45%) compared to 2009 (41%).

### 3.3.2 Driver Availability

Figure 3-8 visualizes the relationship between household income level and the probability of being a driver. It is evident that regardless of whether an individual resides in New York City, the rest of NYS, or the rest of the United States, the likelihood of being a driver increases as their household income level rises. Unsurprisingly, the likelihood of being a driver for a NYC resident is lower compared to residents from the other regions. This can be attributed to the extensive availability and convenience of public transit options within NYC. Interestingly, the likelihood of being a driver for residents from the rest of NYS is quite similar to those from the rest of the United States.

About 51% of the driving age population from the lowest household income group (under $25,000) that lived outside of NYC were drivers in 2017 compared to only about 28% of their NYC counterparts. For the respondents that did not answer the income question, about 75% of the driving age populations are drivers living outside of NYC while about 40% of their NYC counterparts are drivers.
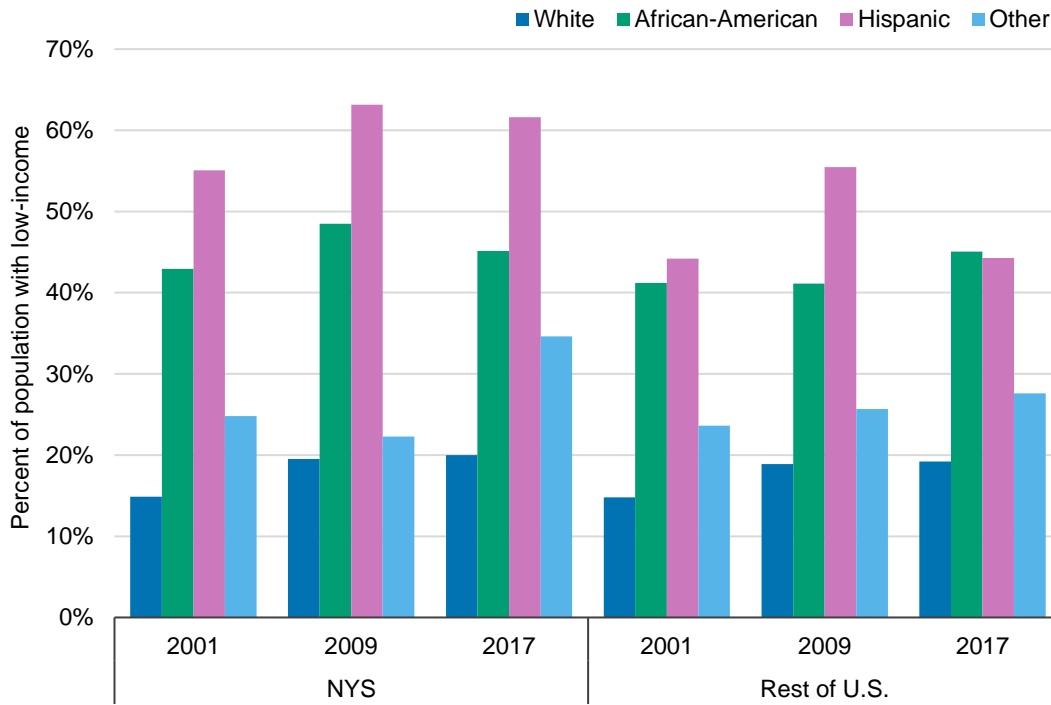
**Figure 3-7. Percent of population with low-income by race (2001, 2009, and 2017 NHTS)**
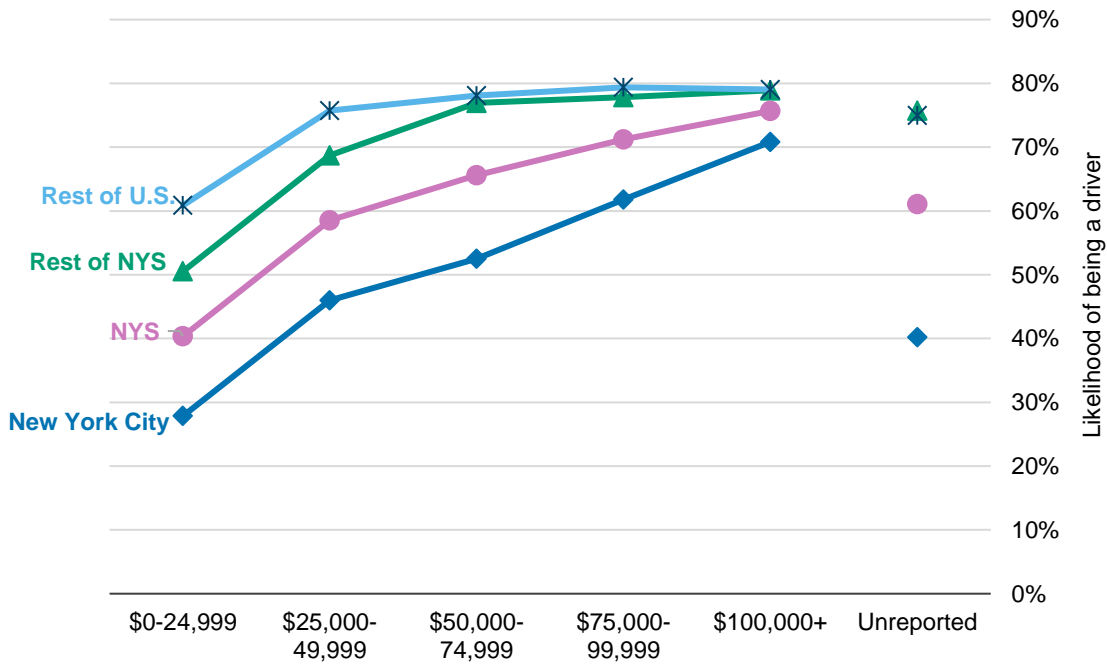


**Figure 3-8. Likelihood of being a driver by household income (2017 NHTS)**

Figure 3-9 highlights the increasing percentage of low-income households without a driver across the three years in NYS. In 2017, a higher proportion of low-income households (35%) were observed to have

no driver compared to 2009 (22%). Similarly, a slightly higher percentage of households without a driver among not low-income households was observed in 2017 (7%) compared to 2009 (3%). Additionally, the share of households with two drivers was higher among not low-income households (47%) than among their low-income counterparts (18%) in 2017.
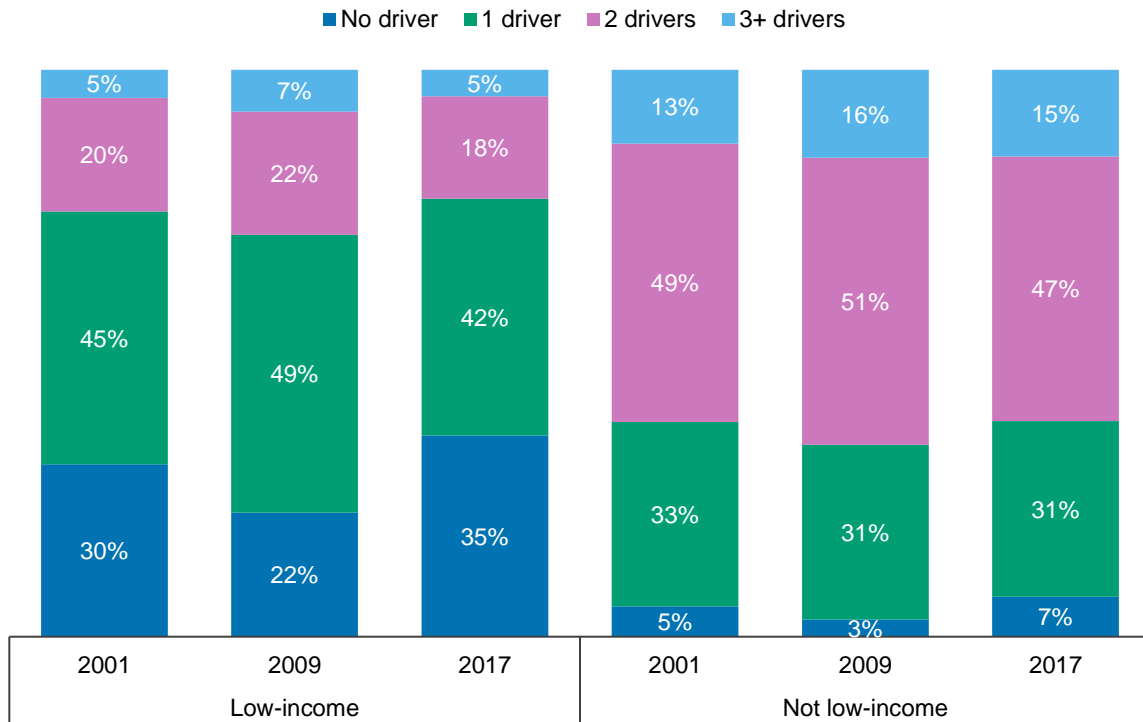


**Figure 3-9. Distribution of households by number of drivers and income status for NYS (2001, 2009, and 2017 NHTS data)**

Figure 3-10 displays the percentage of low-income households without a driver, categorized by region based on 2009 and 2017 NHTS. Across most regions, an upward trend can be observed in the proportion of households without a driver, with the exception of Nassau and Suffolk. Notably, in Manhattan, the share of no driver households increased significantly from 24% in 2009 to 64% in 2017. When comparing these data to those of not low-income households (Figure 3-11), it becomes evident that a lower proportion of households without a driver is observed in all regions.
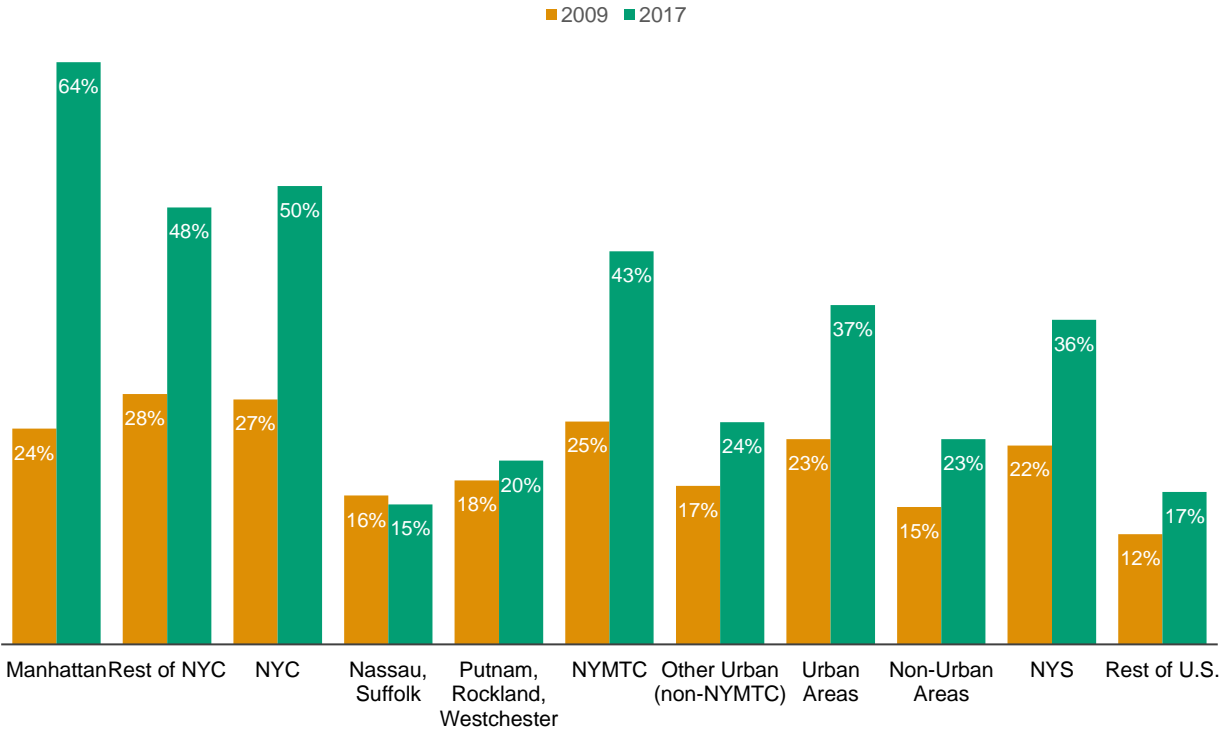
**Figure 3-10. Percent of low-income households without a driver by region (2009 and 2017 NHTS)**
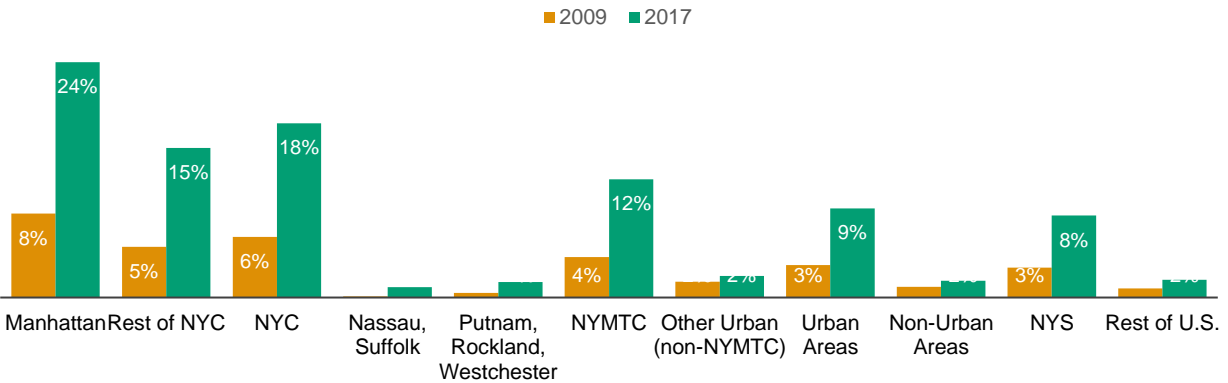


**Figure 3-11. Percent of not low-income households without a driver by region (2009 and 2017 NHTS)**

### 3.3.3 Household Size

It can be observed that there is a greater proportion of low-income households consisting of only one person compared to not low-income households in both 2009 and 2017 (Figure 3-12). Particularly in 2017, the share of one-person households among low-income households (44%) is about twice as high as that among not low-income households (23%). Conversely, the share of two-person households among low-income households (24%) is lower than that among not low-income households (34%). Comparing across NHTS years, there is roughly a 5% increase in the share of single occupant low-income households, from 39% in 2009 to 44% in 2017.
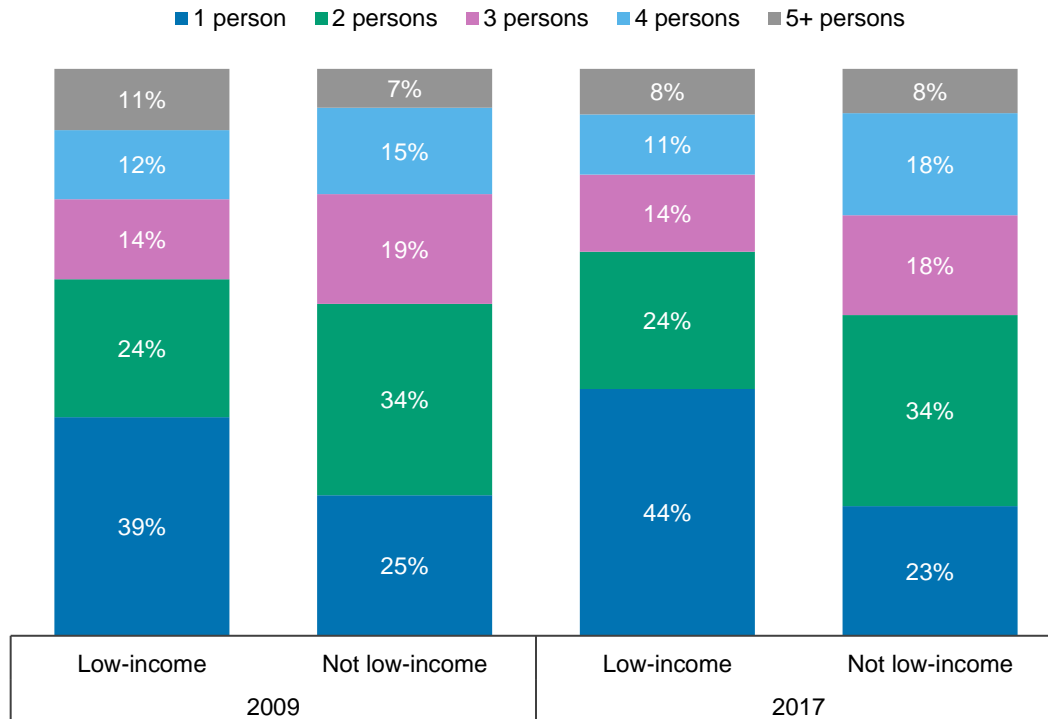
**Figure 3-12. Percent of NYS households by household size and income status (2009 and 2017 NHTS)**

### 3.3.4 Vehicle Ownership

Upon examining vehicle ownership, it becomes evident that low-income households in NYS are more likely to be without a vehicle compared to their counterparts with higher incomes. As depicted in Figure 3-13 , nearly half of the low-income households did not possess any vehicles in 2017. In contrast, only 18% of not low-income households were without vehicles. While both income groups had a similar proportion of households with one vehicle in 2017, low-income households had a lower percentage of households with two vehicles (10%) compared to their not low-income counterparts (30%).

A further comparison was conducted between NYS and the rest of the United States (Figure 3-14). Regardless of income groups, it was observed that NYS had a higher proportion of zero-vehicle households compared to the rest of the United States. In 2017, a lower percentage of low-income households in NYS had one vehicle (36%) compared to their counterparts in the rest of the United States (49%). Similarly, the share of two-vehicle households among low-income households in NYS was lower (10%) than their counterparts in the rest of the United States (19%). For not low-income households, NYS exhibited a higher share of one-vehicle households, but a lower share of two-vehicle households compared to their counterparts in the rest of the United States.
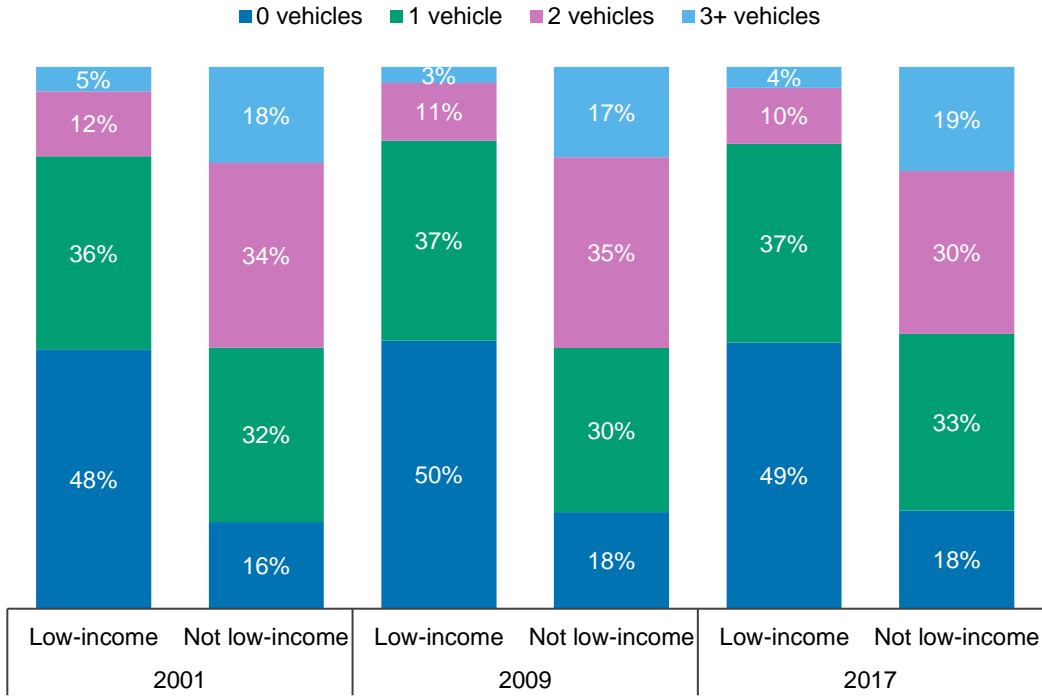
**Figure 3-13. Distributions of NYS households by vehicle ownership and income status (2001, 2009, and 2017 NHTS)**
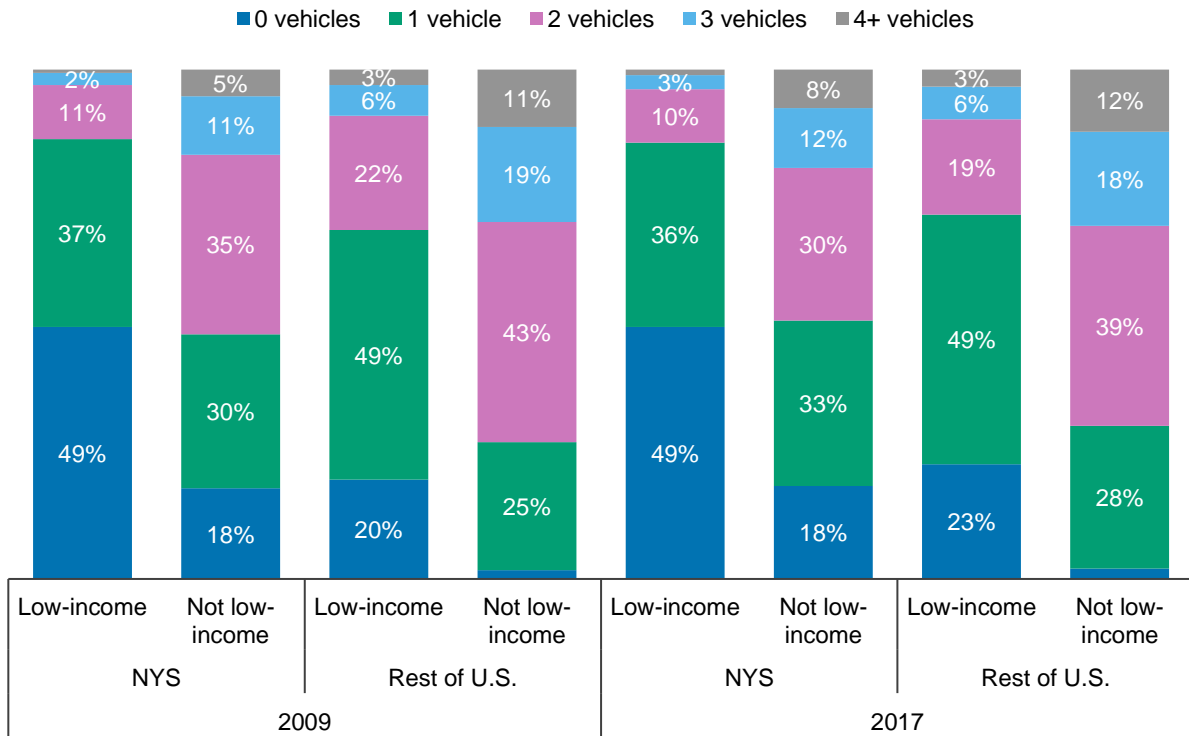


**Figure 3-14. Distributions of NYS and rest of the United States households by vehicle ownership and income status (2009 and 2017 NHTS)**

25

Furthermore, based on 2017 NHTS data, Figure 3-15 illustrates the relationship between the likelihood of being a zero-vehicle household and household income category. The likelihood of being a zero-vehicle household decreases as the household income increases, which is true for households in all regions. Clearly, the likelihood of being a zero-vehicle household in New York City is higher than areas outside of New York City, regardless of income level for household. Shares of zero-vehicle households with income less than $25,000 are significantly higher than those with income of $25,000 or more, regardless of where the household is located. Lastly, among households that did not report their income, about 64% of those that lived in New York City did not own a vehicle in 2017, while it was only 11% of those that lived outside the New York City area.
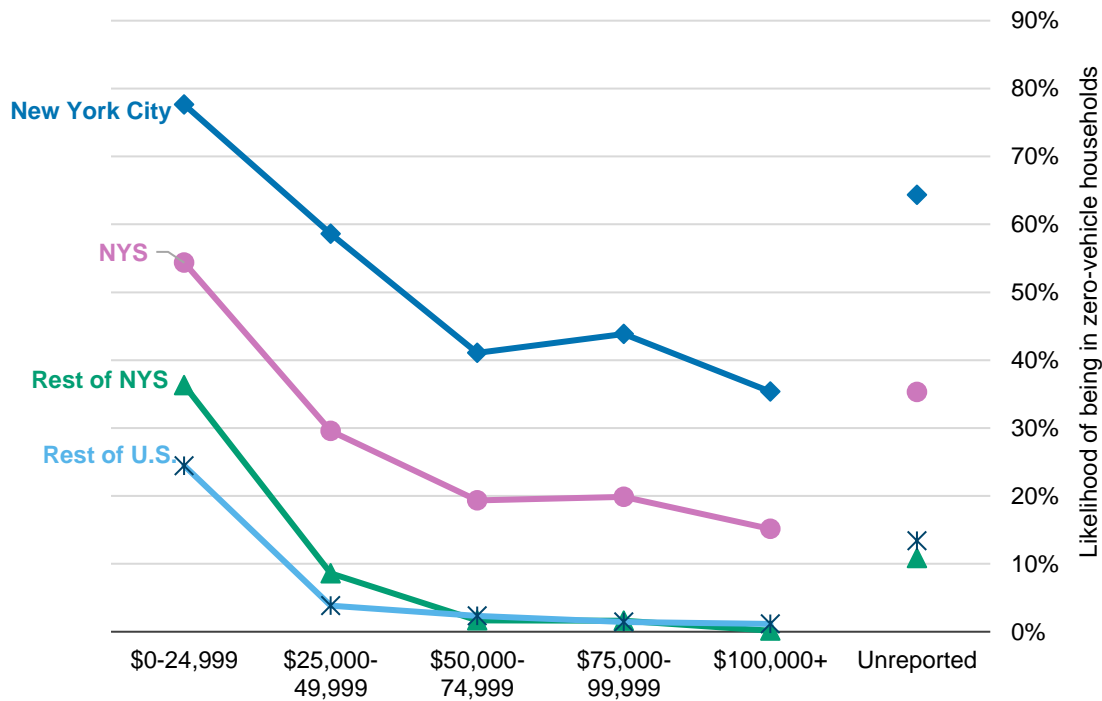


**Figure 3-15. Likelihood of being a zero-vehicle household by income category and region (2017 NHTS data)**

### 3.3.5 Relationship between Number of Drivers and Vehicle Ownership

Upon examining the relationship between the number of drivers in a household and the number of vehicles owned, it becomes evident that the majority of households in NYS have an equal number of drivers and vehicles throughout the three years, irrespective of their income status. However, low-income NYS households are less likely (about 4%) to own more vehicles than the number of drivers in their households, both in 2009 and 2017. In contrast, their not low-income counterparts have a little higher proportion (13%) of households with more vehicles than drivers in 2017.
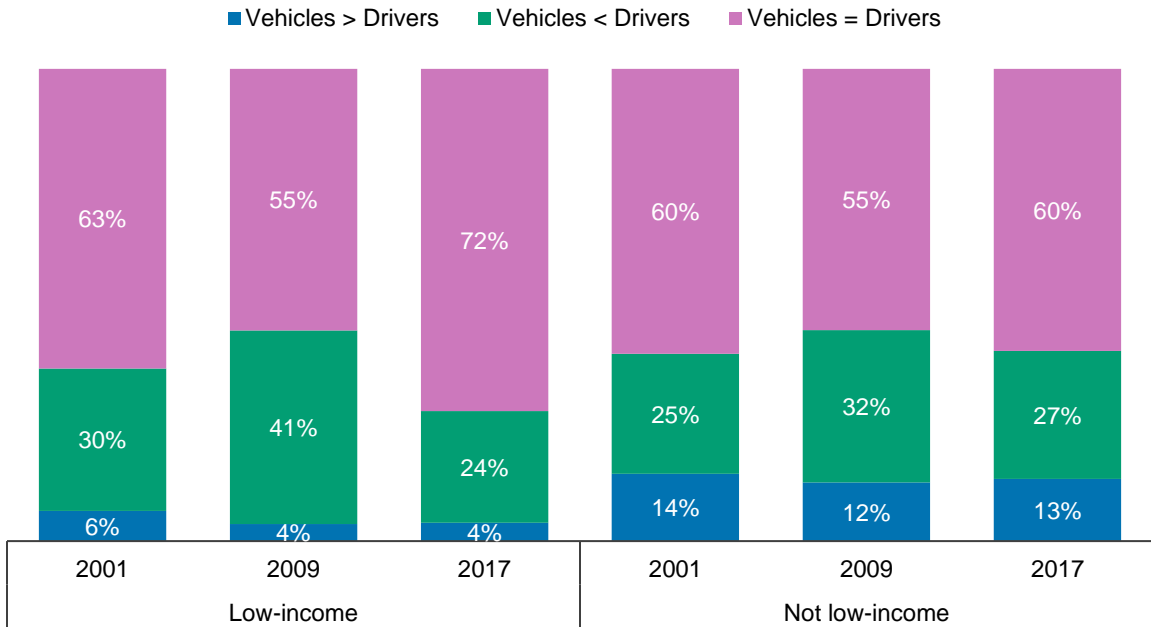
**Figure 3-16. Distribution of NYS households by number of vehicles with respect to number of drivers, and income status (2001, 2009, and 2017 NHTS)**

### 3.3.6 Vehicle Age

Vehicle age was analyzed and compared based on income status, as depicted in Figure 3-17. The findings reveal that, on average, vehicles owned by low-income households in NYS tend to be approximately two years older than vehicles owned by households in other income levels across all three years. For instance, in 2017, the average vehicle age for a low-income household is 10.3 years, while it is 8.1 years for their not low-income counterparts.
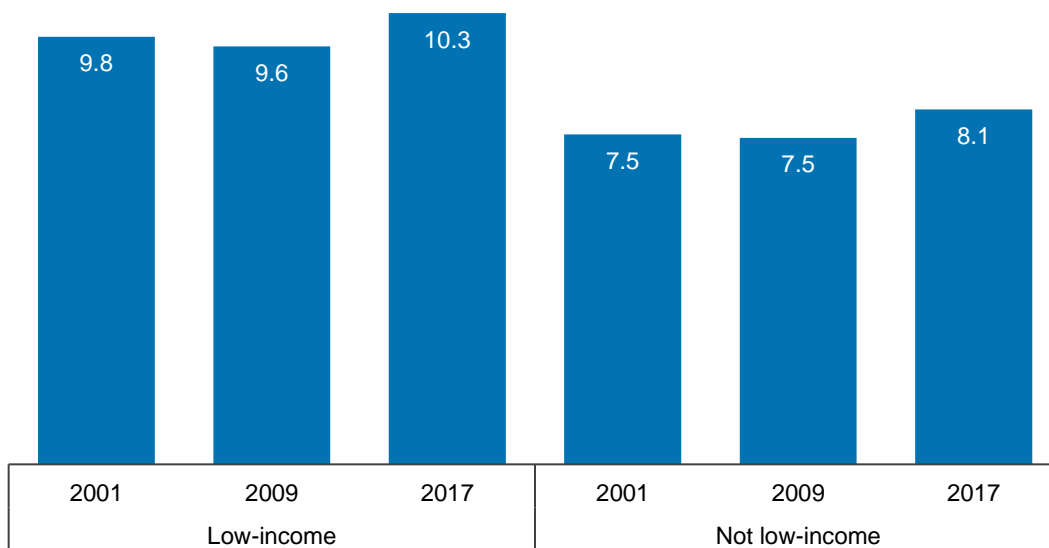


**Figure 3-17. NYS resident's average vehicle age by income status (2001, 2009, and 2017 NHTS)**

### 3.3.7 Worker Status

Figure 3-18 illustrates the percentage of employed populations in various regions of NYS and the rest of the United States. Regardless of the region, not low-income households consistently exhibit a higher proportion of employed individuals compared to their low-income counterparts. The disparity is most pronounced in Manhattan, where 71% of not low-income households are employed, nearly twice the percentage of employed individuals in low-income households (38%). In general, shares of employed population for NYS are similar to those of the rest of United States.
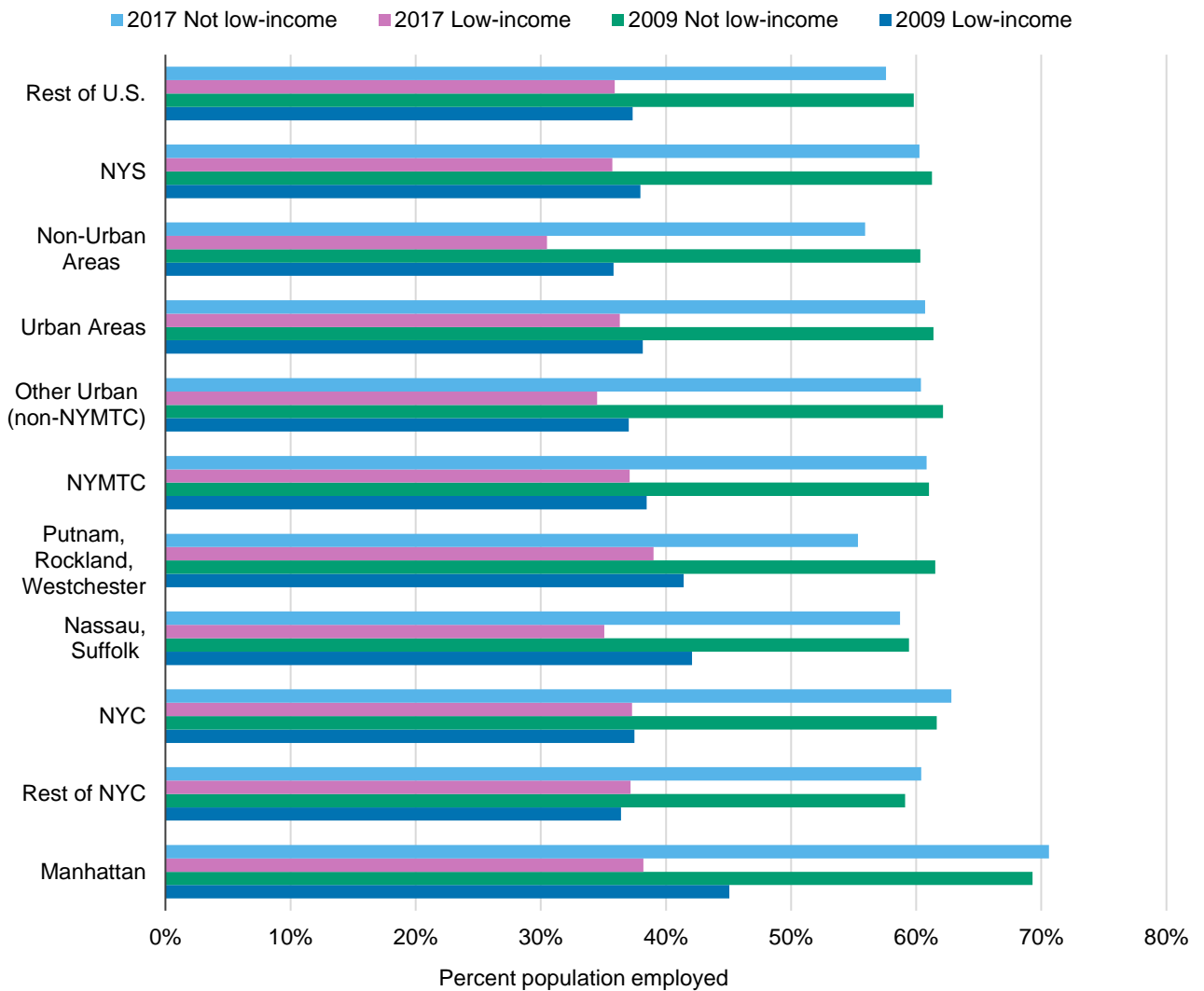


**Figure 3-18. Percent of population employed by income status (2009 and 2017 NHTS)**

### 3.3.8 Life Cycle

A comparison of life cycle categories between the two income groups was also conducted. It was found that the proportion of two adult households without children among not low-income households is twice as high as that among low-income households throughout all the years. For instance, in 2017, over 25% of not low-income households consisted of two or more adults without children, while only about 12% of low-income households had this composition. On the other hand, low-income households had a higher

proportion of households composed of one adult with the youngest child under 15. In 2017, about 3% of low-income households were comprised of one adult with their youngest child under 5, compared to only about 1% of their not low-income counterparts. Additionally, low-income households had a higher percentage of households with a single retired adult.

**Table 3-2. NYS household distribution by life cycle category and income status (2001, 2009, and 2017 NHTS)**

| Life cycle category of households | 2017 NHTS | | 2009 NHTS | | 2001 NHTS | |
|---|---|---|---|---|---|---|
| | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income |
| 1 Adult, No Children | 24.4% | 17.5% | 17.5% | 18.8% | 16.3% | 18.1% |
| 2+ Adults, No Children | 12.6% | 25.4% | 10.2% | 24.3% | 12.9% | 23.0% |
| 1 Adult, Youngest 0-5 | 3.1% | 0.7% | 1.8% | 0.5% | 6.6% | 0.7% |
| 2+ Adults, Youngest 0-5 | 8.7% | 12.1% | 10.9% | 9.9% | 12.5% | 14.8% |
| 1 Adult, Youngest 6-15 | 5.1% | 1.9% | 5.4% | 1.2% | 6.2% | 2.2% |
| 2+ Adults, Youngest 6-15 | 7.5% | 13.4% | 10.5% | 15.0% | 9.8% | 15.3% |
| 1 Adult, Youngest 16-21 | 1.9% | 1.3% | 2.3% | 1.1% | 1.5% | 1.0% |
| 2+ Adults, Youngest 16-21 | 3.2% | 5.9% | 3.0% | 7.0% | 4.1% | 5.2% |
| 1 Adult, Retired, No Children | 19.1% | 5.4% | 21.0% | 6.0% | 18.8% | 6.0% |
| 2+ Adults, Retired, No Children | 14.5% | 16.4% | 17.3% | 16.2% | 11.2% | 13.4% |
| Unreported | | | | | 0.3% | 0.3% |

Figure 3-19 presents an aggregated four-group life-cycle distribution of households in NYS. It is evident that low-income households generally have a higher proportion of households consisting of one adult without children across all years. However, when comparing 2017 to other NHTS years, the difference in the share of households with adults without children becomes smaller. In 2009, the difference was more substantial, standing at 15%. However, in 2017, the variation narrows to just 7%.

## 3.4 ZERO-VEHICLE LOW-INCOME HOUSEHOLDS

### 3.4.1 Geographic Distribution of Zero-Vehicle Low-Income Households

An analysis of the geographical distribution of low-income households without vehicles was conducted (Figure 3-20). It was found that more than half of these households (54%) are located outside of Manhattan but within the five-county New York City region. Also, about two-thirds of NYS's low-income households that do not own a vehicle were from New York City. A relatively higher proportion of these households can be found in other urban areas (19%) as well.
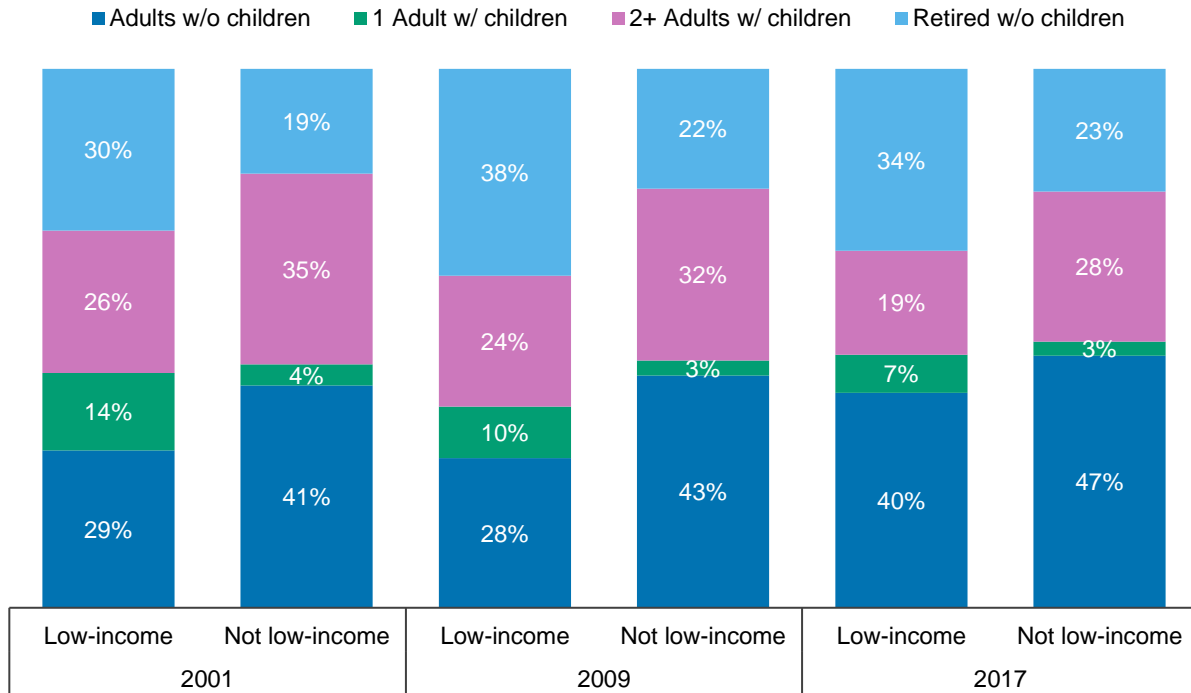
**Figure 3-19. Distributions of NYS households by life cycle category (2001, 2009, and 2017 NHTS)**
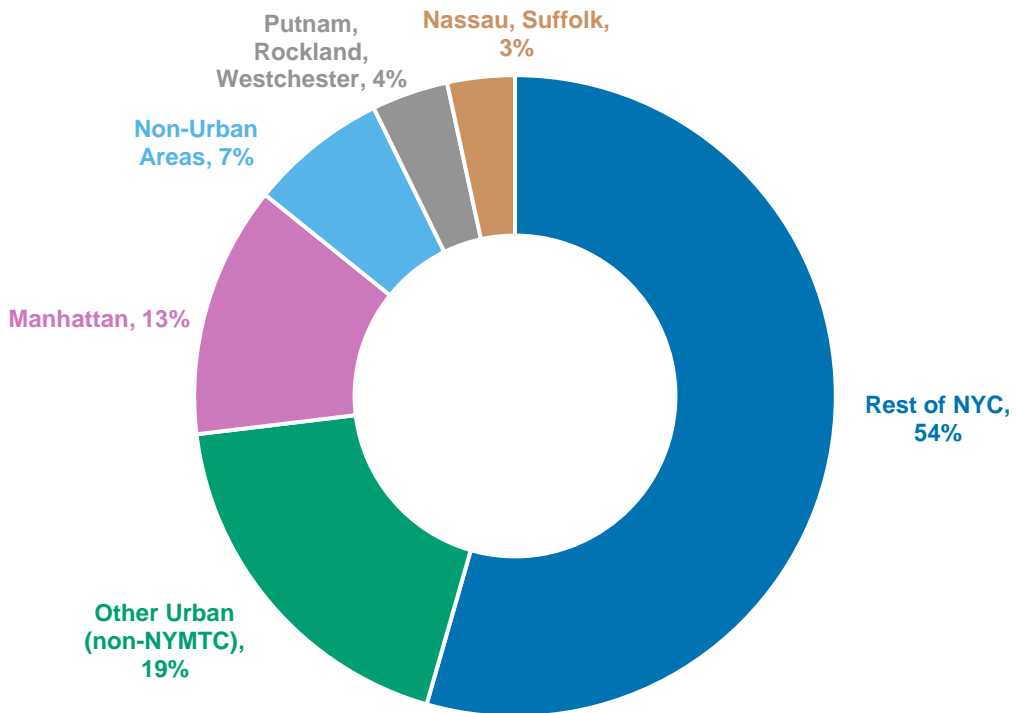


**Figure 3-20. Distribution of zero-vehicle low-income households in NYS (2017 NHTS)**

Figure 3-21 provides a visual representation of the share of zero-vehicle households among low-income households across regions in 2009 and 2017. It shows that the proportion of zero-vehicle households in New York City has decreased from 73% in 2009 to 69% in 2017. However, in regions other than the NYMTC, there has been an increase in the share of zero-vehicle household among low-income households. For instance, in non-urban areas, the percentage of zero-vehicle households among low-income households rose from 20% in 2009 to 32% in 2017. Considering New York State as a whole, the share remained the same.
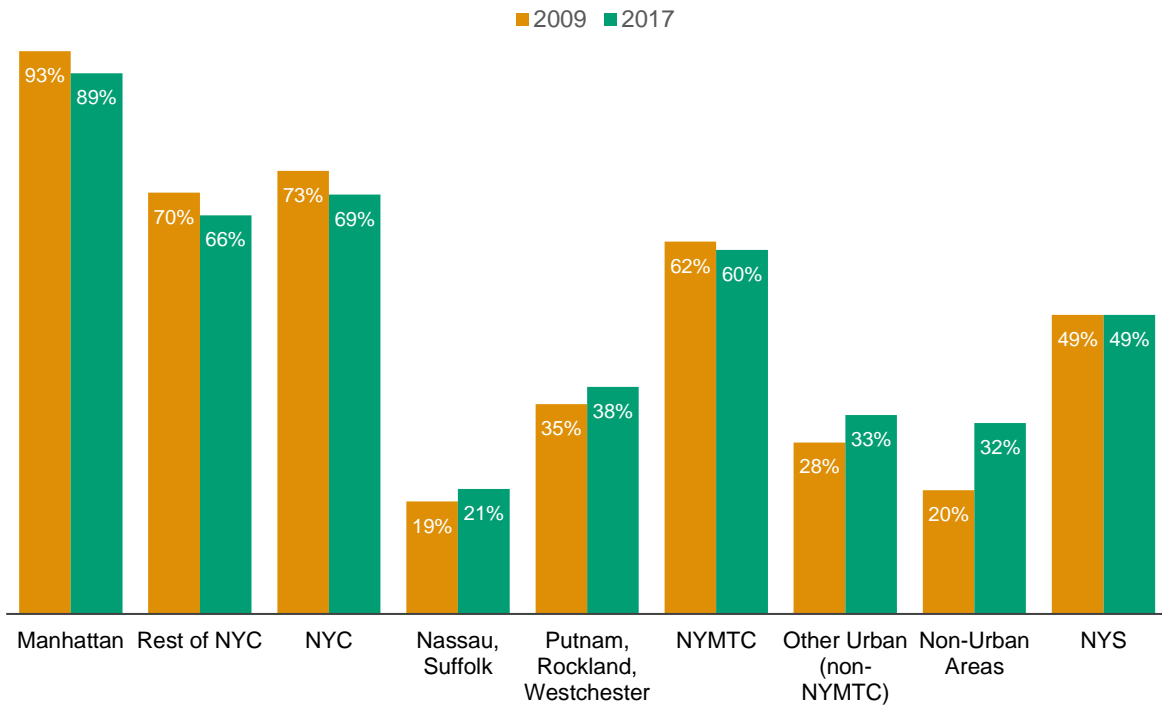


**Figure 3-21. Share of zero-vehicle households among low-income households by region (2009 and 2017 NHTS)**

### 3.4.2 Share of Low-Income among Households Owning Zero Vehicles

Figure 3-22 provides a different perspective on the share of zero-vehicle households. The data reveals that in 2017, about 26% of zero-vehicle households in Manhattan were classified as low-income, which is the lowest among all the regions. This finding aligns with the understanding that many Manhattan residents choose not to own vehicles, regardless of their income status. In contrast, in other regions such as Putnam, Rockland, and Westchester, a significant majority (89%) of zero-vehicle households were classified as low-income in 2017. This indicates a higher dependence on public transportation or other means of transportation among low-income households in these areas. Comparing 2009 to 2017, a decrease in the proportion of low-income households with zero vehicles can be observed in most regions, except for non-NYMTC and non-urban areas in NYS.
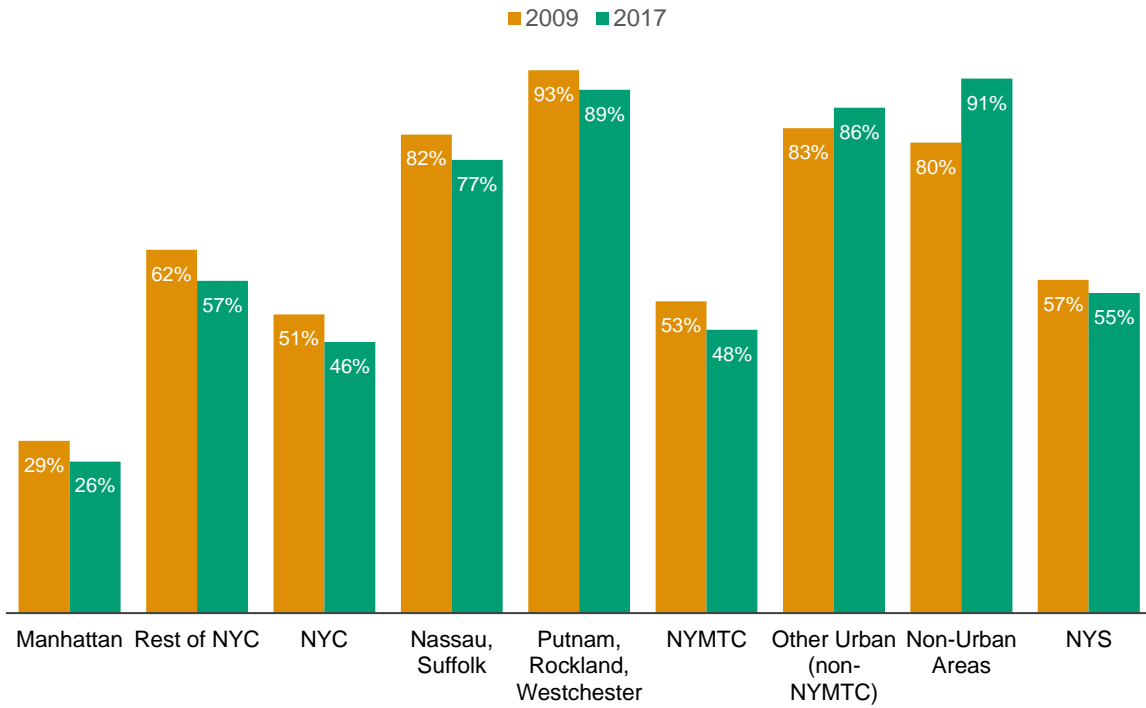
**Figure 3-22. Share of low-income households with zero vehicles by region (2009 and 2017 NHTS)**

# 4 MOBILITY OF LOW-INCOME HOUSEHOLDS

## 4.1 TRAVEL OVERVIEW

### 4.1.1 Impact of Income on NYS Resident's Travel

Table 4-1 summarizes the population sizes and the shares of persons who did not travel on their assigned travel day by household income classifications during 2001, 2009, and 2017 based on NHTS data. In 2017, 23% of the New York State (NYS) low-income residents did not travel on travel day, compared with 15% of their counterparts from not low-income households. One common characteristic of the non-travel pattern is that a person from a low-income household is less likely to travel on the NHTS-assigned travel day, as compared with their counterparts from not low-income households. Compared with the statistics in 2001 and 2009, the percentage of persons who did not travel on travel day is significantly higher in 2017.

**Table 4-1. Travel summary for NYS residents by income status (2001, 2009, and 2017 NHTS data)**

| NYS residents | 2001 | 2009 | 2017 |
|---|---|---|---|
| **Total number of Persons** | | | |
| Low-income | 4,576,332 | 5,240,993 | 5,120,295 |
| Not low-income | 12,633,491 | 11,868,063 | 12,925,212 |
| **Number of persons did not travel on travel day** | | | |
| Low-income | 804,116 | 896,091 | 1,189,075 |
| Not low-income | 1,425,899 | 1,425,899 | 1,943,584 |
| **Percent of persons did not travel on travel day** | | | |
| Low-income | 17.6% | 17.1% | 23.2% |
| Not low-income | 11.8% | 12.0% | 15.0% |

The share of low-income population by travel status is summarized in Figure 4-1. Low-income population accounts for 28% of the total population. The share among the total population in 2017 decreased by 3% compared with 2009 and increased by 1% compared with that of 2001. A similar pattern can also be observed from the share of low-income persons among traveled and not traveled persons. The share among traveled persons in 2017 decreased by 3% compared with that of 2009 and increased by 1% compared with that of 2001. The share among not traveled persons in 2017 decreased by 1% compared with 2009 and increased by 3% compared with 2001.
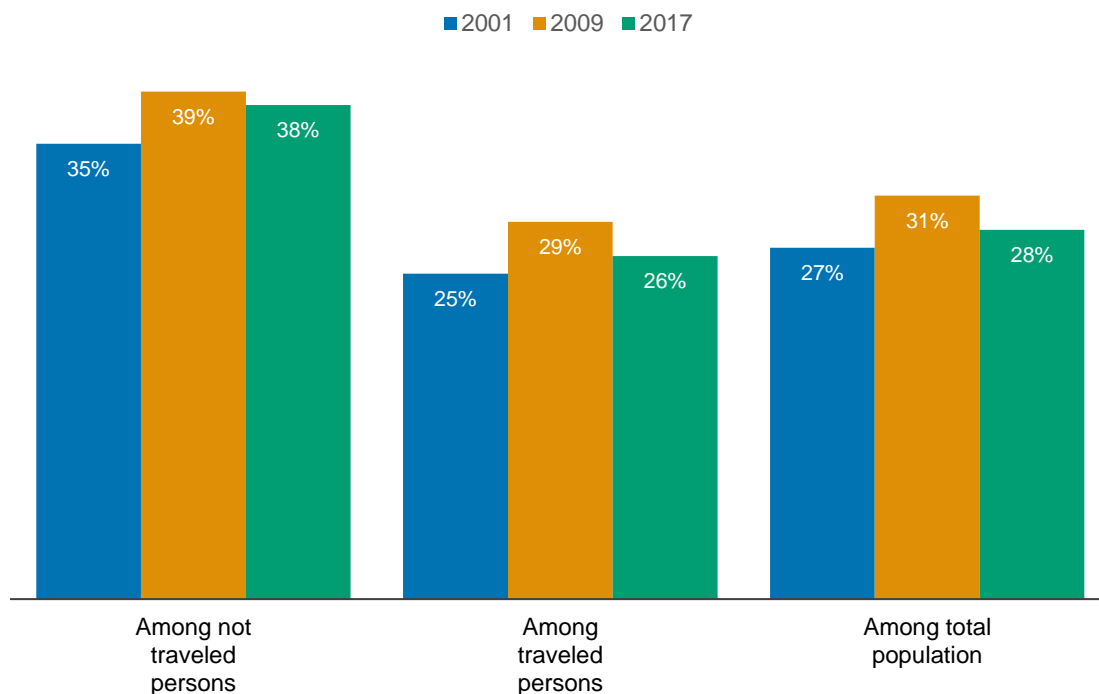
**Figure 4-1. Share of low-income population in NYS by travel status on NHTS-assigned travel day**

### 4.1.2    Impact of Income on Vehicle Travel

According to the 2017 NHTS, the share of drivers not driving on a given day is higher for low-income households than their counterparts that are not low-income. This shows that low-income NYS driver is less likely to drive on a given day as compared to their counterparts who are not low-income. This pattern is consistent with the findings in Table 4-1.

When compared to 2009, the proportion of low-income drivers who did not drive on a travel day declined from 56.9% to 52.2% in 2017. This means that low-income drivers are slightly more likely to drive on a given day in 2017 compared with 2009. On the other hand, the share of not low-income drivers who did not drive increased in 2017 compared with both 2001 and 2009.

**Table 4-2. Travel summary for NYS drivers by income status (2001, 2009, and 2017 NHTS data)**

| NYS Residents | 2001 | 2009 | 2017 |
|---|---|---|---|
| **Total number of drivers** | | | |
| Low-income | 1,833,428 | 2,859,924 | 2,243,138 |
| Not low-income | 8,514,340 | 9,186,841 | 9,291,598 |
| **Number of drivers that did not drive on travel day** | | | |
| Low-income | 895,106 | 1,627,778 | 1,170,457 |
| Not low-income | 2,731,085 | 3,390,798 | 3,735,764 |
| **Percent of drivers that did not drive on travel day** | | | |
| Low-income | 48.8% | 56.9% | 52.2% |
| Not low-income | 32.1% | 36.9% | 40.2% |

Figure 4-2 shows the share of low-income drivers by travel status. Nearly one-fourth of the drivers who did not drive were low-income in 2017. This share of low-income drivers is the lowest compared with 2001 and 2009. About 16% of low-income drivers drove on the travel day in 2017, which is comparable to 2001 and 2009. This means that low-income drivers were less likely to drive compared with their counterparts that were not low-income. Explicitly, NHTS data show that mobility for people from low-income households were more limited than that of their counterparts from not low-income households, regardless of how mobility was measured (i.e., focusing on drivers only or on all residents in NYS).
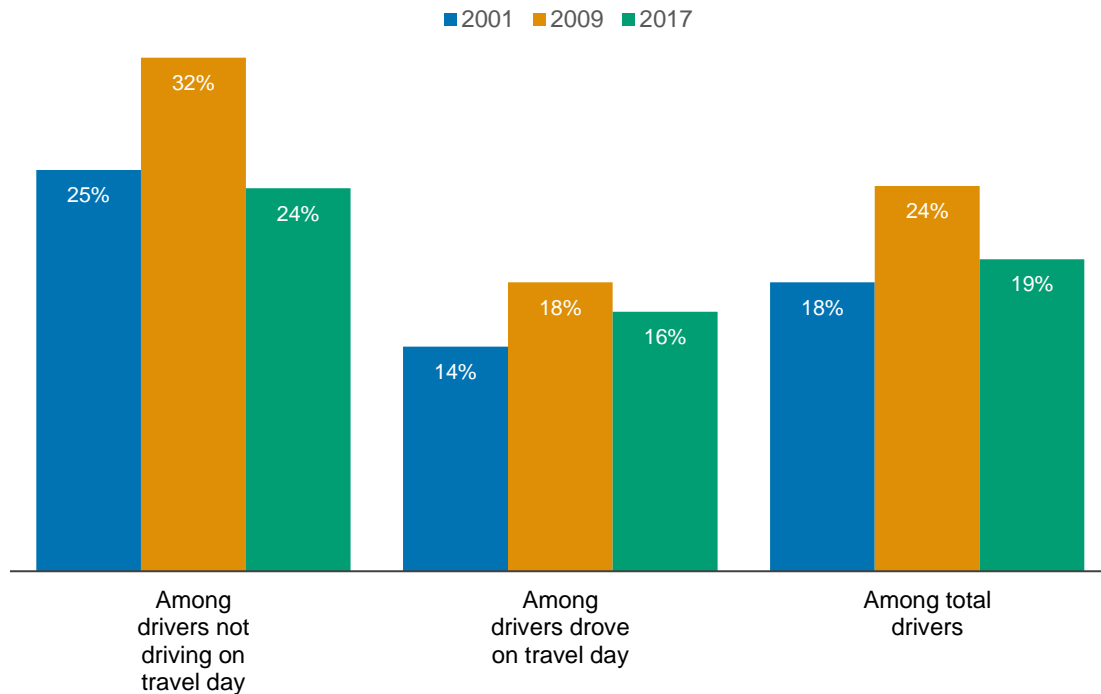


**Figure 4-2. Share of low-income NYS drivers by travel status on NHTS-assigned travel day**

## 4.2 TRAVEL FREQUENCIES BY PERSON TRIP

### 4.2.1    Average Daily Person Trips

Figure 4-3 shows the average daily person trips by income status, region, and year using the NHTS data from 2001, 2009, and 2017. Low-income people took fewer trips compared to their counterparts from not low-income households. For example, a NYS resident from a low-income household took an average of 2.9 trips in 2017, which is around 17% lower than their counterpart from a not low-income household, an average of 3.5 trips. The gap of daily person trips between the two income groups was slightly smaller in New York City in 2017. A New York City resident from a low-income household took an average of 2.9 trips in 2017, which is around 14% lower than their counterpart from a not low-income household, an average of 3.4 trips. Density of the urban area also has an impact on the daily travel. In the densest area (2000+ population density) in NYS, a resident from a low-income household took an average of 2.8 trips in 2017, which is around 26% lower than their counterpart from a not low-income household. This gap was higher than that of other urban density areas in NYS in 2017.

The average daily person trips in 2017 in NYS was lower for both income groups compared to 2009 and 2001. This change was more significant for the not low-income group, with a 14% percentage decrease

from the average daily person trips in 2009. The average daily person trips in 2017 were also lower for both income groups in New York City compared to 2009 and 2001.
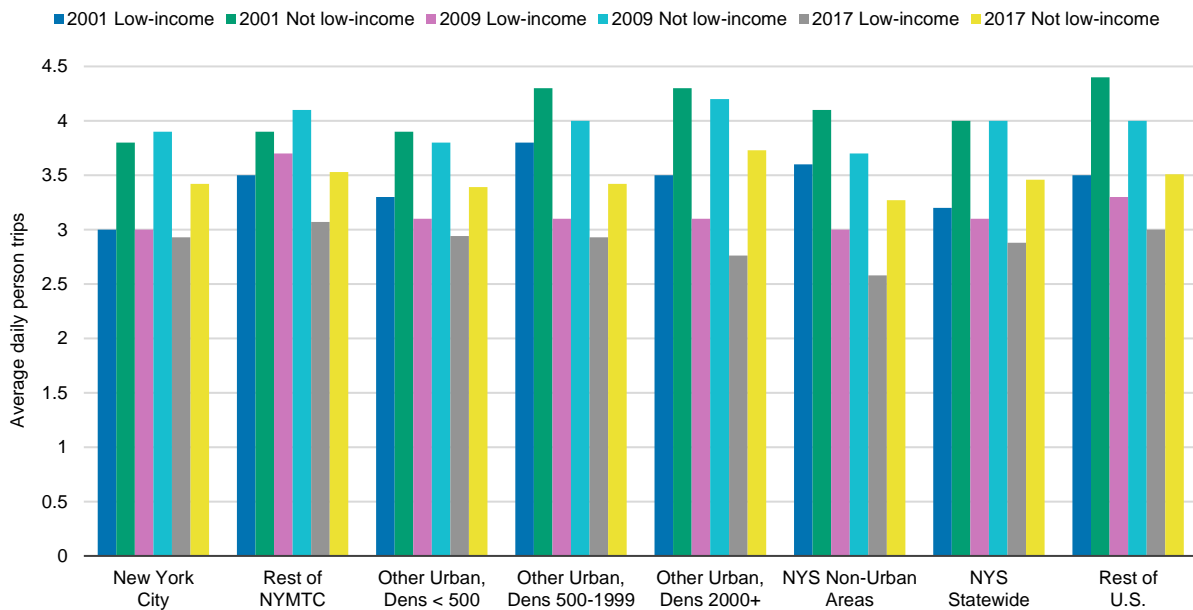


**Figure 4-3. Average daily person trips by income status, region, and NHTS years**

### 4.2.2    Share of Daily Person Trips by Purpose and Income

Figure 4-4 shows the daily person-trip distributions by trip purpose and income status. The highest percentage of trips are for family and personal business in all years. In 2017, family and personal business trips account for 44% of the person trips for low-income NYS residents and 36% for a not low-income NYS resident. A sizable portion of person trips are also made up of social and recreational trips for both income groups. These trips account for 24% of the person trips for a low-income resident and 30% for a not low-income NYS resident.

The share of family and personal business decreased in 2017 for both income groups compared to 2009. This share decreased by 3% for the low-income group and 6% for the not low-income group. Since 2001, the proportion of social and recreational trips taken by not low-income NYS residents has grown. Compared to 2001, this share increased by 4% in 2017. When compared to 2009, this percentage did not change for residents with low-income in 2017. These patterns show that a not low-income NYS resident decreased their family and personal business trips while increasing their social and recreational trips in 2017.

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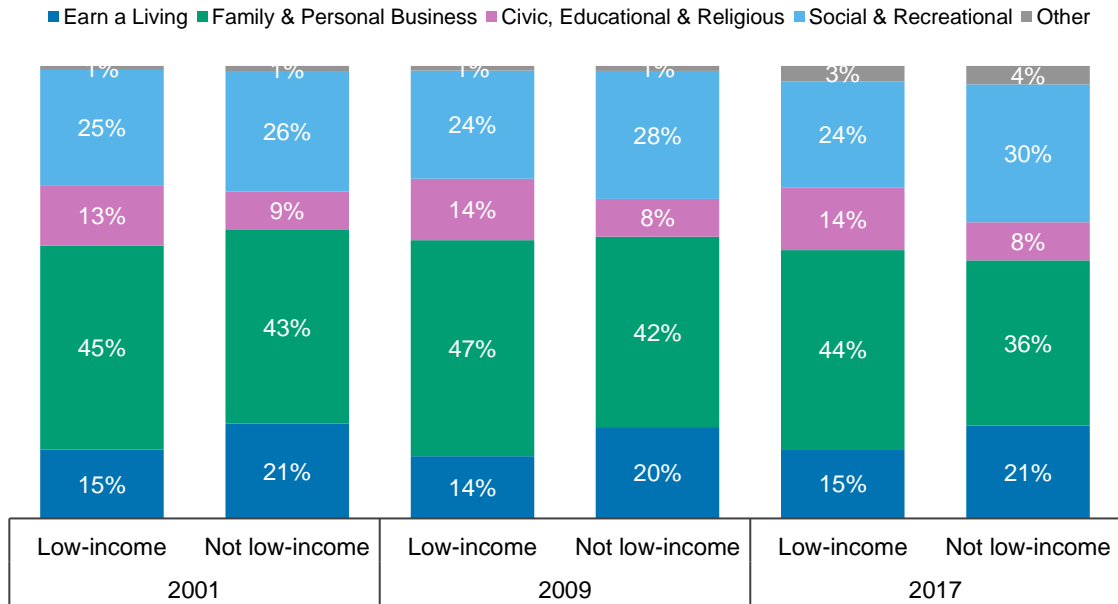
**Figure 4-4. Distributions of person trips by trip purpose and income status**

### 4.2.3    Share of Daily Person Trips by Mode and Income

Figure 4-5 shows the distributions of daily person trips by transportation mode and income status. Based on 2001, 2009, and 2017 NHTS, most of the trips were made in a privately owned vehicle (POV), either as the driver or as a passenger. This share is significantly higher for not low-income residents than their low-income counterparts. While around 65% of the trips were made in POV by a not low-income NYS resident, only 42% of the trips were made in POV by a low-income NYS resident in 2017. A low-income NYS resident had a higher percentage of walking trips (34%) compared to their counterpart that was not low-income (20%). A low-income NYS resident also had a higher percentage of public transit trips (17%) compared to their counterpart that was not low-income (10%). Based on the above, a low-income NYS resident had fewer POV trips but more walking and transit trips compared to not low-income counterpart in 2017.

A higher percentage of walking trips of low-income NYS residents can be observed in 2017 than 2009 (34% vs 29%). The trips made by POV for a low-income NYS resident decreased from 46% in 2009 to 42% in 2017. For a not low-income NYS resident, this share decreased slightly from 68% in 2009 to 65% in 2017. However, the percentage of their public transit trips increased from 8% in 2009 to 10% in 2017.
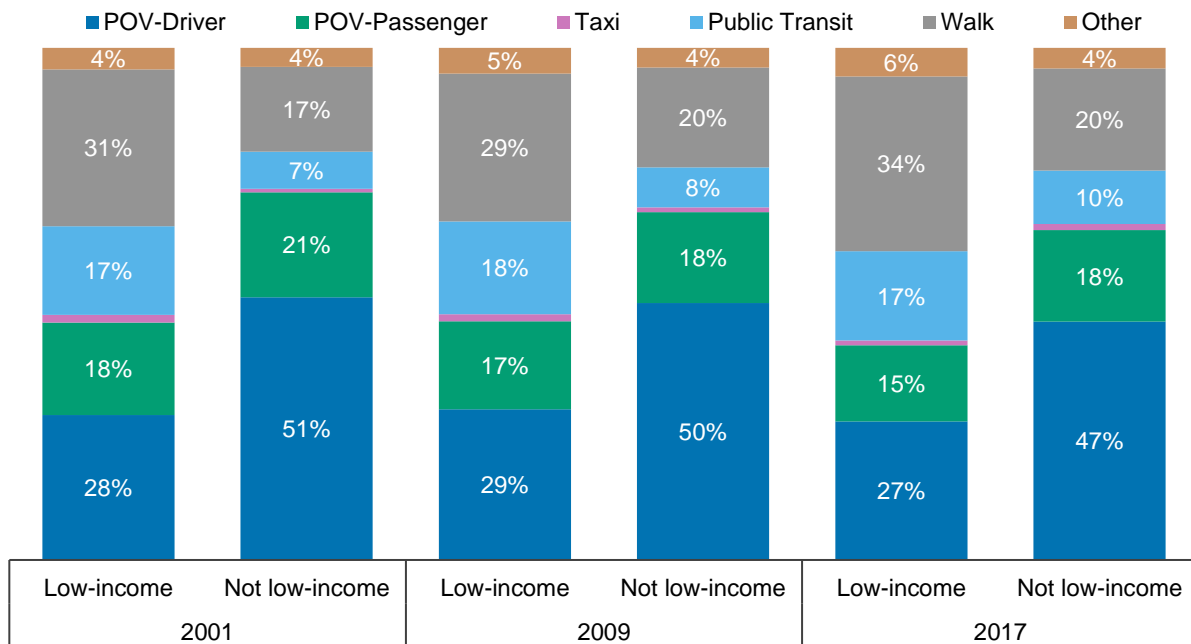
**Figure 4-5. Distributions of person trips by transportation mode and income status**

### 4.2.3.1    Regional differences

Figure 4-6 shows the comparison of mode shares by income status for selected areas in NYS and the rest of United States. Similar to the pattern in Figure 4-5, a low-income NYS resident was less likely to travel by POV and more likely to travel by public transit or walking compared to their counterpart that was not low-income. This pattern can also be observed in NYS areas as well as rest of the United States. For example, a low-income Manhattan resident had slightly higher percentage of trips made by transit (27%) than their counterpart that was not low-income (23%).

A Manhattan resident had a higher percentage of trips made by walking compared to their counterpart in rest of New York City for both income groups. The low-income group in Manhattan had a lower share of trips made by transit (27%) compared to the rest of New York City (30%), while the two regions had a similar share of transit trips for the same income group. This indicates that a Manhattan low-income resident was more likely to travel by walking and less likely to travel by public transit or POV compared to the rest of New York City. A higher share of walking trips can also be observed for both income groups in other NYS urban areas (excluding New York City) than in non-urban areas.
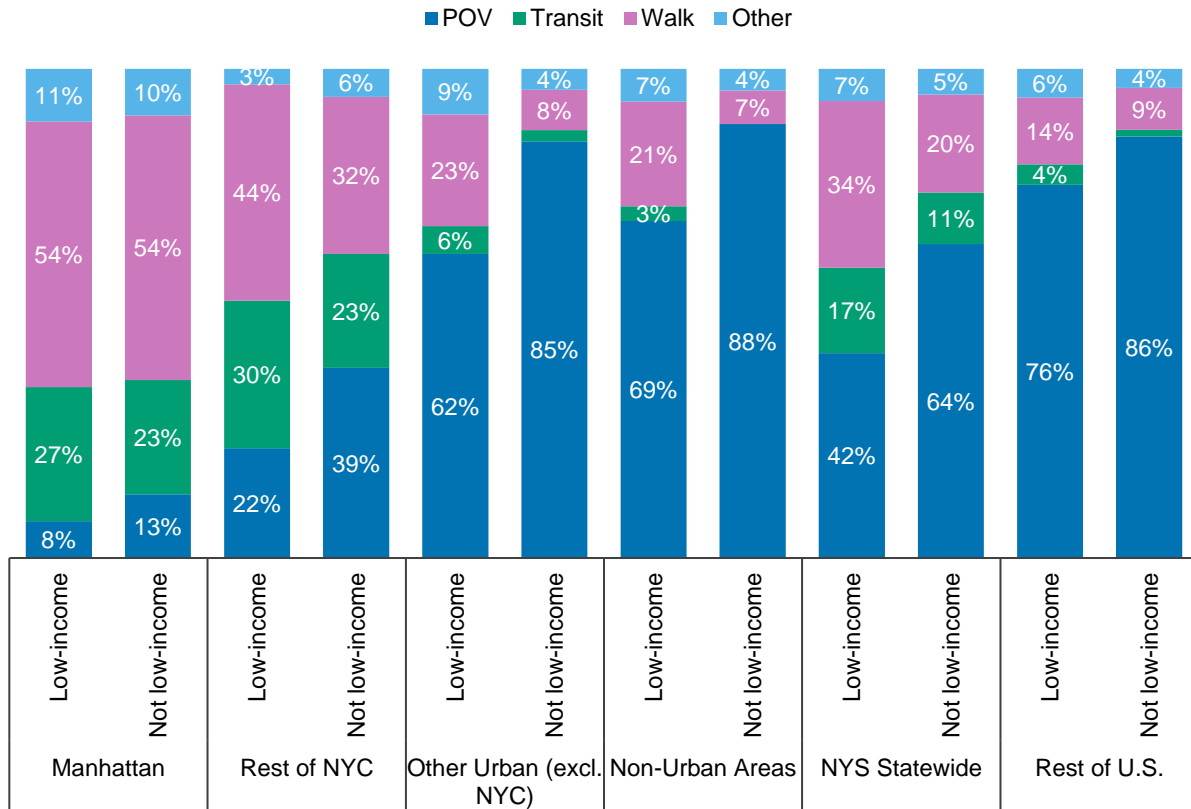
**Figure 4-6. Comparison of mode shares by income status for selected areas in NYS and rest of the United States (2017 NHTS)**

Figure 4-7 presents the mode share distribution using 2009 NHTS data. Comparable distributions can be observed by comparing Figure 4-6 against Figure 4-7. In Manhattan, the share of POV increased (from 3% in 2009 to 8% in 2017) for low-income people, while the share of POV decreased (from 22% in 2009 to 13% in 2017) for not low-income people. The share of walking trips decreased (from 64% in 2009 to 54% in 2017) for low-income people in Manhattan, but not for the rest of New York City. The difference between the share of POV trips between the two income groups was lower in 2009 compared to 2017 for other urban areas and non-urban areas in NYS. For example, in non-urban areas, the share of POV trips is 80% for low-income people and 88% for not low-income people in 2009. However, the share of POV trips for low-income people in the same region reduced to 69% in 2017.
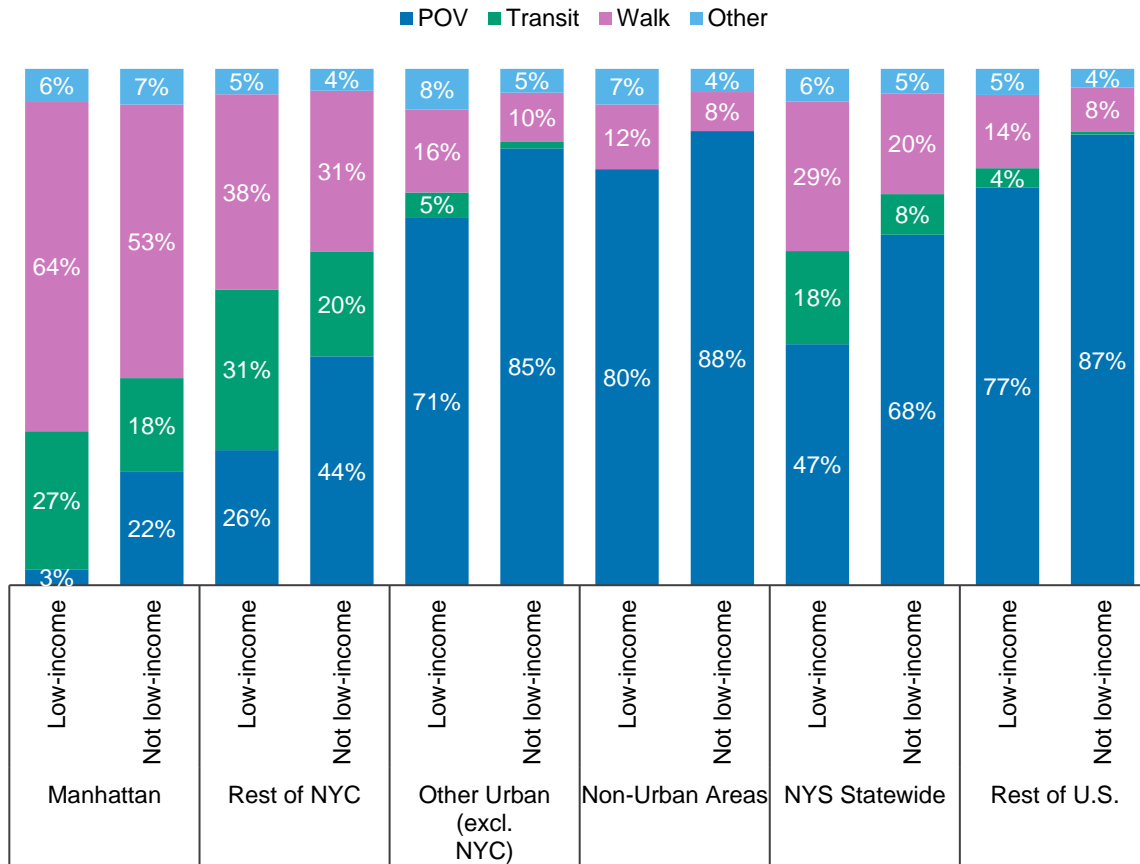
**Figure 4-7. Comparison of mode shares by income status for selected areas in NYS and rest of the United States (2009 NHTS)**

### 4.2.3.2　Impacts of trip purpose

To illustrate whether mode use differs between income categories and among various travel activities, Table 4-3 summarizes daily person trips by mode, trip purpose, and income level, for NYS resident trips taken during the last three NHT (2001, 2009, and 2017). For not low-income NYS resident, POV was more likely to be selected as the travel mode regardless of the trip purpose in all years. For low-income NYS resident, POV was also the most chosen mode when making a trip to work (earning a living) or for visiting family and conducting personal business. NYS's low-income people clearly utilized public transit and walking more frequently for all trip purposes than their counterparts who were not low-income. For a low-income NYS resident traveling for personal reasons and family visits in 2017, walking trips account for the highest percentage of trips (36%) among all other modes.

**Table 4-3. Daily person trips by mode, purpose, and income status for NYS residents (2001, 2009, and 2017 NHTS)**

| | Earn a Living | | Family & Personal Business | | Civic, Educational & Religious | | Social & Recreational | | Other | | All Purposes | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income |
| **2001** | | | | | | | | | | | | |
| **Average PT/person** | **0.49** | **0.83** | **1.45** | **1.7** | **0.43** | **0.34** | **0.82** | **1.05** | **0.03** | **0.05** | **3.23** | **3.98** |
| POV-Driver | 38.7% | 65.6% | 33.5% | 58.0% | 11.4% | 23.2% | 22.5% | 39.8% | 16.0% | 26.3% | 28.3% | 51.3% |
| POV-Passenger | 12.0% | 5.9% | 18.2% | 19.4% | 14.5% | 29.6% | 23.1% | 30.4% | 14.2% | 20.7% | 18.0% | 20.5% |
| Taxi | 1.1% | 1.2% | 1.7% | 0.4% | 1.0% | 0.6% | 1.4% | 0.8% | *1.2%* | 0.9% | 1.5% | 0.7% |
| Public Transit | 31.2% | 17.0% | 12.7% | 3.6% | 20.8% | 9.3% | 15.2% | 4.5% | 17.1% | 11.9% | 17.3% | 7.2% |
| Walk | 14.2% | 8.3% | 32.2% | 17.7% | 37.0% | 15.9% | 33.9% | 21.2% | 46.3% | 27.0% | 30.6% | 16.6% |
| Other | 2.7% | 2.0% | 1.7% | 1.0% | 15.0% | 21.3% | 3.7% | 3.3% | 4.7% | 12.8% | 4.2% | 3.7% |
| Unreported | *0.1%* | 0.1% | | 0.0% | *0.4%* | 0.0% | 0.2% | 0.0% | 0.6% | 0.50% | *0.10%* | 0.1% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **2009** | | | | | | | | | | | | |
| **Average PT/person** | **0.42** | **0.79** | **1.47** | **1.65** | **0.42** | **0.33** | **0.73** | **1.11** | **0.03** | **0.04** | **3.1** | **3.95** |
| POV-Driver | 42.6% | 64.8% | 35.1% | 57.1% | 13.1% | 25.3% | 20.9% | 38.0% | 3.9% | 13.2% | 29.4% | 50.1% |
| POV-Passenger | 12.7% | 5.6% | 17.4% | 16.4% | 14.9% | 27.7% | 20.4% | 25.1% | 20.1% | 23.0% | 17.2% | 17.7% |
| Taxi | 1.3% | 0.9% | 1.9% | 0.5% | *0.5%* | *1.0%* | 0.9% | 1.2% | | *7.5%* | 1.4% | 0.9% |
| Public Transit | 30.7% | 16.6% | 13.0% | 4.9% | 21.9% | 10.1% | 18.2% | 4.9% | 18.1% | 21.2% | 18.1% | 7.8% |
| Walk | 9.1% | 9.8% | 30.7% | 20.1% | 30.0% | 12.1% | 34.9% | 27.4% | 55.1% | 25.1% | 28.9% | 19.5% |
| Other | 3.2% | 2.2% | 1.7% | 0.8% | 18.9% | 23.9% | 4.6% | 3.1% | 2.8% | 10.1% | 5.0% | 3.8% |
| Unreported | 0.0% | 0.1% | 0.1% | *0.2%* | 0.2% | 0.1% | | 0.1% | | | 0.2% | 0.1% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **2017** | | | | | | | | | | | | |
| **Average PT/person** | **0.44** | **0.71** | **1.26** | **1.27** | **0.40** | **0.29** | **0.68** | **1.06** | **0.10** | **0.14** | **2.87** | **3.47** |
| POV-Driver | 38.6% | 57.6% | 30.3% | 55.7% | 9.1% | 21.6% | 24.9% | 35.9% | 20.5% | 40.7% | 27.1% | 46.6% |
| POV-Passenger | 6.2% | 4.9% | 16.0% | 16.9% | 13.5% | 31.0% | 19.3% | 24.2% | 13.8% | 17.5% | 14.8% | 17.9% |
| Taxi | 0.6% | 1.5% | 1.3% | 0.3% | *0.2%* | *0.2%* | 1.1% | 1.9% | *0.6%* | 3.8% | 0.9% | 1.2% |
| Public Transit | 34.7% | 24.3% | 13.7% | 5.2% | 18.5% | 11.8% | 12.5% | 7.3% | 18.7% | 7.9% | 17.5% | 10.4% |
| Walk | 16.9% | 8.8% | 35.7% | 20.9% | 38.8% | 16.0% | 39.2% | 27.5% | 36.9% | 18.1% | 34.1% | 19.9% |
| Other | 2.8% | 2.8% | 3.0% | 1.0% | 19.9% | 19.4% | 3.0% | 3.2% | 10.2% | 12.0% | 5.6% | 4.0% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Note: Italicized numbers are estimated based on small sample size (less than 5 samples).

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Figure 4-8 shows the percentage of person trips made on public transit by trip purpose and income status. Low-income NYS residents made more trips with public transit compared to their counterparts that were not low-income, regardless of the trip purposes. There was a higher percentage of working trips (earning a living) made by both income groups in 2017.
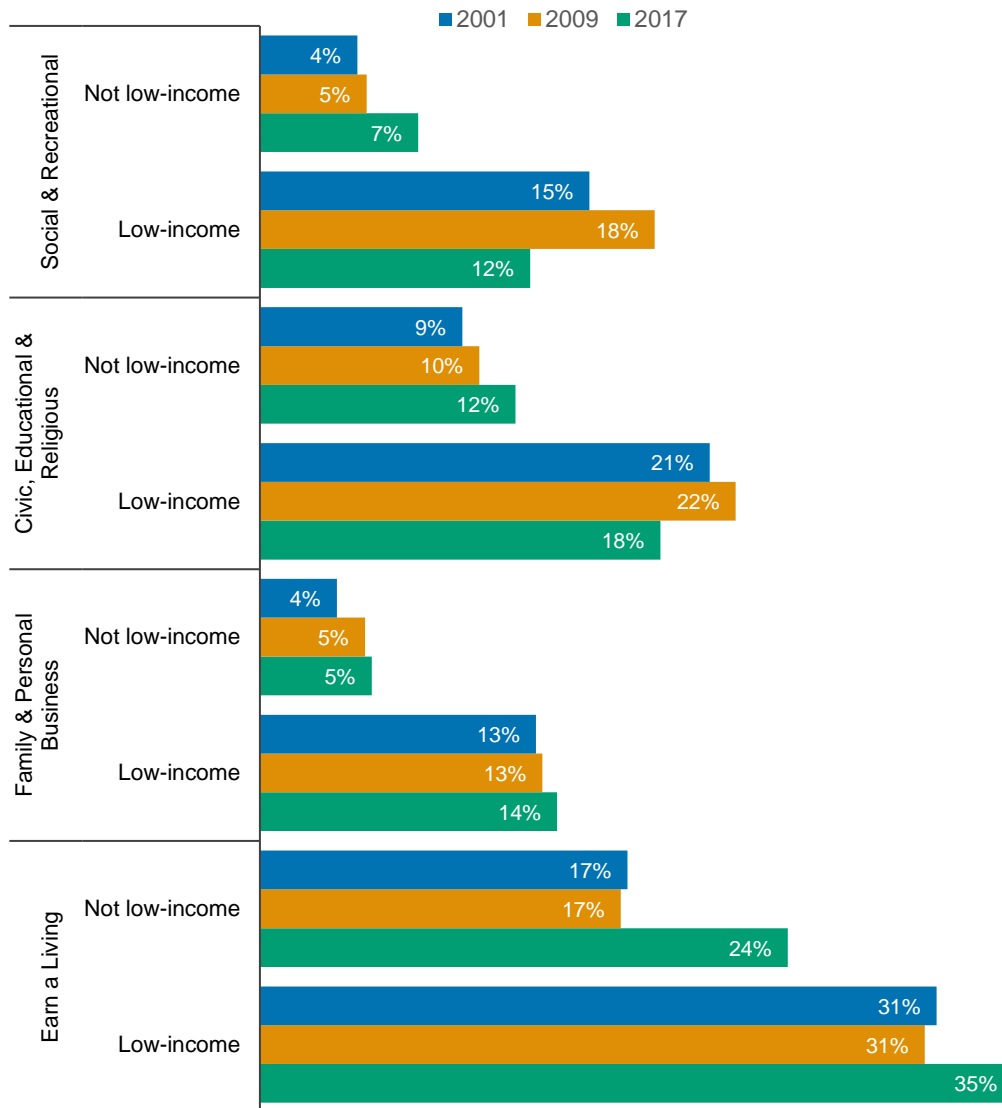


**Figure 4-8. Percent of person trips made on public transit by purpose and income status**

The distributions of public transit by trip purpose in 2017 are illustrated in Figure 4-9. When a not low-income NYS resident used public transit, there was a 48% chance that it was for commuting (earning a living). However, public transit was more likely to be utilized by a low-income NYS resident for family and personal business trips.
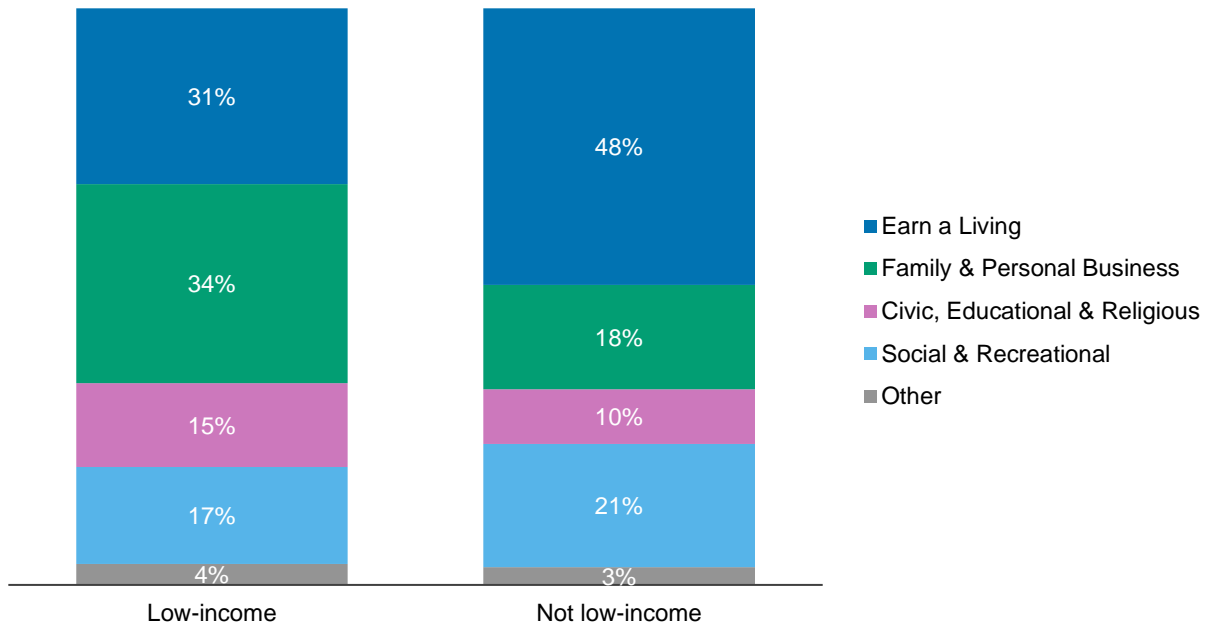
**Figure 4-9. Distributions of public transit trips by purpose (2017 NHTS)**

Figure 4-10 shows the percentage of walking trips by trip purpose and income status. Low-income NYS residents made more trips by walking compared to their counterpart that are not low-income, regardless of the trip purposes. Low-income NYS residents are more likely to make non-work trips by walking.

### 4.2.3.3   Influence of urban size (with population density)

The person-trip mode shares by urban size and income status are presented in Table 4-4. The data show that the percentage of person-trips made by New York City's low-income people using POV (13.2%) is much lower than their counterparts that are not low-income (20.7%) in 2017. Low-income people also make more trips using walking and public transit than their counterparts that are not low-income.

Figure 4-11 shows that New York City has the highest transit person-trip share than that of the rest of NYS for both income groups. NYS also has a higher transit person-trip share than that of the rest of the United States for both income groups. Low-income New York City residents have a higher transit mode share than their low-income counterparts. A similar pattern can also be observed in NYS. This difference is the most significant in the urban areas of NYS with population density higher than 2000. However, there is a slight decrease in transit mode share among low-income New York City residents and increase among not low-income residents in 2017 compared to 2009.

43
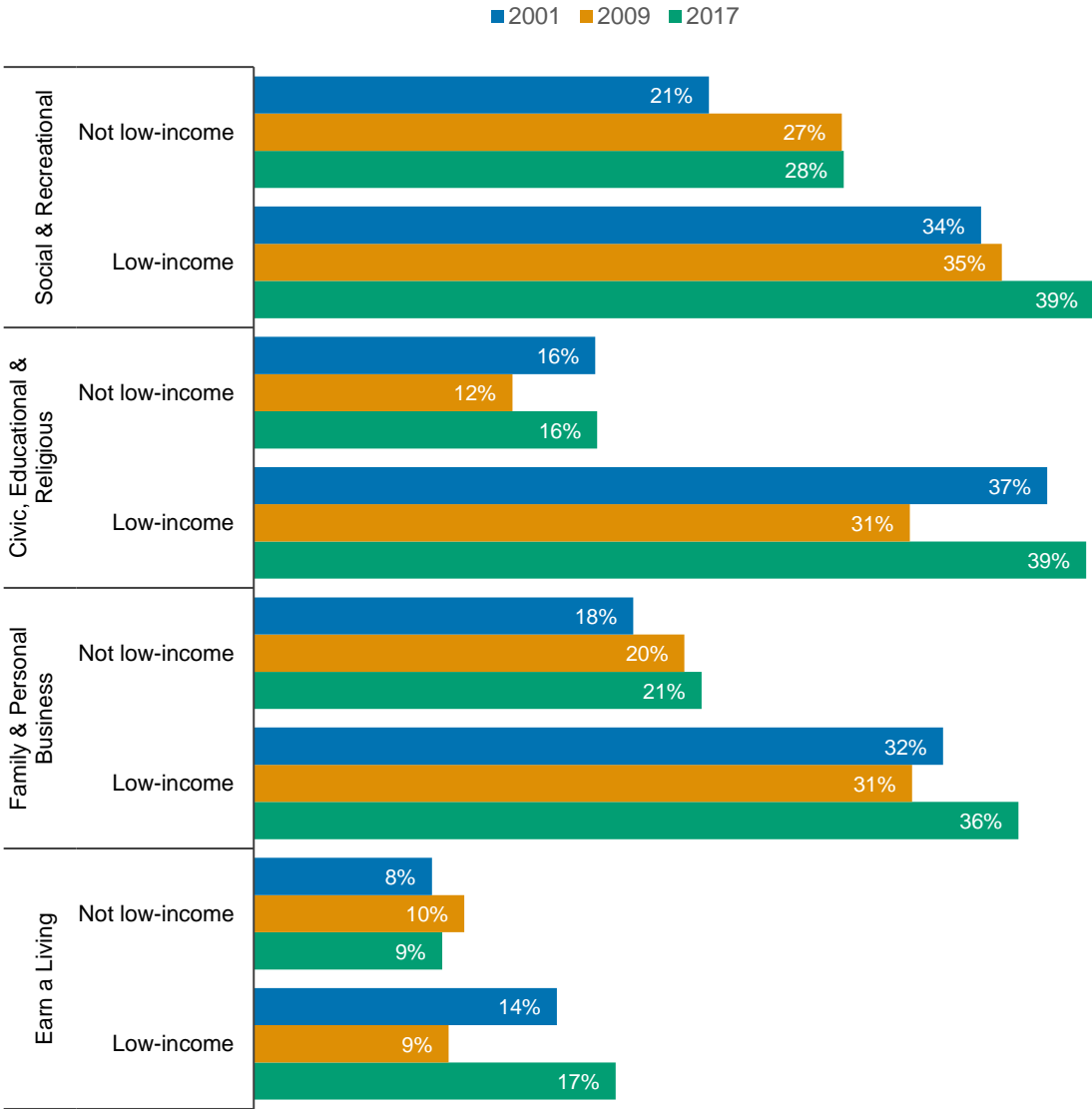
**Figure 4-10. Percent of walking person trips by trip purpose and income status**

**Table 4-4. Daily person trips by mode, urban size (population density), and income status (2001, 2009, and 2017 NHTS)**

| | New York City | | Rest of NYMTC | | Other Urban, Dens < 500 | | Other Urban, Dens 500-1999 | | Other Urban, Dens 2000+ | | Non-Urban Areas | | NYS Statewide | | Rest of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Not Low | Not Low | Low | Not Low | Low |
| **2001** | | | | | | | | | | | | | | | | |
| **Average PT/person** | 3.8 | 3.0 | 3.9 | 3.5 | 3.9 | 3.3 | 4.3 | 3.8 | 4.3 | 3.5 | 4.1 | 3.6 | 4.0 | 3.2 | 4.4 | 3.5 |
| POV-Driver | 29.1% | 12.0% | 61.7% | 50.7% | 64.4% | 56.0% | 65.3% | 55.1% | 63.4% | 42.4% | 62.9% | 50.1% | 51.3% | 28.3% | 64.0% | 50.5% |
| POV-Passenger | 14.2% | 10.7% | 22.2% | 27.1% | 24.6% | 28.0% | 23.1% | 29.9% | 23.7% | 23.6% | 26.4% | 30.8% | 20.5% | 18.0% | 25.3% | 30.3% |
| Taxi | 1.7% | 1.7% | 0.3% | 0.4% | 0.0% | | 0.1% | 0.1% | 0.2% | 2.8% | 0.1% | 0.8% | 0.7% | 1.5% | 0.1% | 0.1% |
| Public Transit | 18.7% | 28.8% | 2.4% | 3.6% | 0.2% | 0.4% | 0.4% | 0.4% | 0.7% | 5.3% | 0.1% | 0.3% | 7.2% | 17.3% | 0.6% | 3.1% |
| Walk | 33.5% | 43.2% | 9.4% | 12.8% | 5.8% | 8.6% | 6.3% | 9.9% | 7.9% | 22.0% | 6.7% | 12.4% | 16.6% | 30.6% | 6.9% | 11.9% |
| Other | 2.8% | 3.5% | 3.8% | 5.3% | 5.0% | 6.9% | 4.8% | 4.5% | 3.9% | 4.0% | 3.9% | 5.7% | 3.7% | 4.2% | 3.1% | 3.9% |
| Unreported | 0.1% | 0.2% | 0.1% | 0.1% | 0.0% | 0.1% | 0.1% | 0.1% | 0.1% | | 0.0% | | 0.1% | 0.1% | 0.1% | 0.1% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **2009** | | | | | | | | | | | | | | | | |
| **Average PT/person** | 3.9 | 3.0 | 4.1 | 3.7 | 3.8 | 3.1 | 4.0 | 3.1 | 4.2 | 3.1 | 3.7 | 3.0 | 4.0 | 3.1 | 4.0 | 3.3 |
| POV-Driver | 25.4% | 11.0% | 62.4% | 46.6% | 65.9% | 58.6% | 65.5% | 50.2% | 64.9% | 49.1% | 65.6% | 53.7% | 50.1% | 29.4% | 63.9% | 49.3% |
| POV-Passenger | 12.5% | 12.4% | 20.1% | 23.7% | 21.8% | 26.2% | 20.4% | 22.4% | 20.2% | 16.8% | 22.3% | 26.6% | 17.7% | 17.2% | 23.3% | 27.5% |
| Taxi | 2.4% | 1.8% | 0.1% | 1.4% | 0.0% | *0.0%* | *0.1%* | 0.5% | 0.1% | 1.5% | *0.1%* | *0.2%* | *0.9%* | 1.4% | 0.1% | 0.3% |
| Public Transit | 19.7% | 30.6% | 2.1% | 6.0% | 0.3% | 0.4% | 0.3% | 3.8% | 0.7% | 5.0% | 0.1% | *0.3%* | 7.8% | 18.1% | 0.7% | 3.8% |
| Walk | 37.3% | 40.9% | 10.9% | 16.5% | 6.9% | 8.7% | 8.2% | 13.9% | 9.9% | 18.9% | 7.6% | 12.5% | 19.5% | 28.9% | 8.5% | 14.2% |
| Other | 2.6% | 3.4% | 4.3% | 5.2% | 4.9% | 5.9% | 5.3% | 9.4% | 3.8% | 8.7% | 4.4% | 6.7% | 3.8% | 5.0% | 3.6% | 4.7% |
| Unreported | *0.1%* | 0.0% | 0.1% | 0.6% | 0.2% | *0.2%* | 0.2% | | 0.3% | *0.0%* | 0.1% | *0.1%* | 0.1% | 0.2% | 0.2% | 0.2% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **2017** | | | | | | | | | | | | | | | | |
| **Average PT/person** | 3.4 | 2.9 | 3.5 | 3.1 | 3.4 | 2.9 | 3.4 | 2.9 | 3.7 | 2.8 | 3.3 | 2.6 | 3.5 | 2.9 | 3.5 | 3.0 |
| POV-Driver | 20.7% | 13.2% | 60.5% | 43.0% | 63.8% | 51.6% | 67.9% | 49.6% | 67.3% | 33.4% | 64.5% | 43.8% | 46.4% | 27.1% | 63.2% | 50.6% |
| POV-Passenger | 11.3% | 7.2% | 22.9% | 25.1% | 22.7% | 25.5% | 21.0% | 24.7% | 18.5% | 18.0% | 24.0% | 25.1% | 17.7% | 14.9% | 23.0% | 25.7% |
| Taxi | 2.7% | 0.9% | 0.5% | 0.9% | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 1.3% | 0.1% | 1.1% | 1.2% | 1.0% | 0.4% | 0.5% |
| Public Transit | 23.3% | 29.8% | 3.7% | 6.0% | 0.5% | 1.6% | 0.7% | 2.2% | 1.6% | 7.2% | 0.3% | 3.0% | 10.5% | 17.5% | 1.3% | 4.2% |
| Walk | 38.0% | 45.6% | 9.0% | 20.3% | 6.5% | 13.3% | 5.9% | 12.9% | 9.1% | 29.3% | 6.9% | 21.4% | 20.0% | 34.1% | 8.6% | 13.7% |
| Other | 4.0% | 3.3% | 3.4% | 4.7% | 6.4% | 7.9% | 4.4% | 10.5% | 3.4% | 10.8% | 4.3% | 5.6% | 4.0% | 5.6% | 3.5% | 5.3% |
| Unreported | | | | | | | | | | | | | | | 0.0% | 0.0% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Note: Italicized numbers are estimated based on a small sample size (less than 5 samples).

Not Low represents Not low-income and Low represents Low-income.

**Figure 4-11. Transit person-trip mode shares by urban size (in population density) and income status**

## 4.3 MOBILITY STATISTICS RELATED TO TRIP LENGTH

### 4.3.1 Average Person Miles Traveled

Based on NHTS data, NYS residents from a low-income household traveled significantly fewer miles (i.e., shorter trip distances) as measured by person miles traveled (PMT) compared to trips made by a not low-income household (Figure 4-12). Specifically, in 2017, low-income NYS residents traveled an average of 14.7 miles while the not low-income NYS residents traveled an average of 38.7 miles. There was an increase in the PMT of not low-income NYS residents in 2017 compared to 2009 (from 31.8 miles to 38.7 miles).
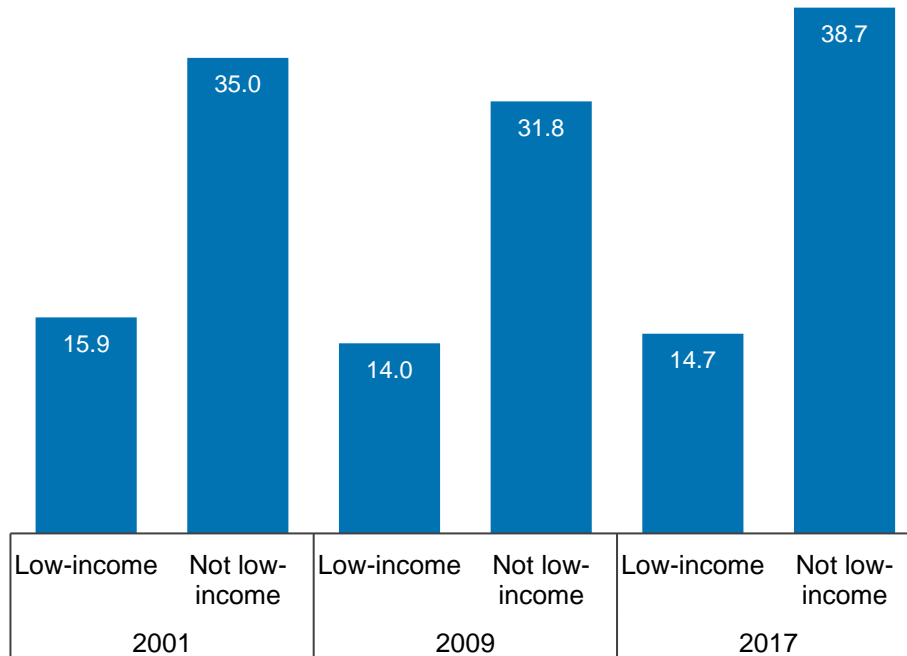


**Figure 4-12. Average person miles traveled by income status for NYS residents**

### 4.3.2 Distributions of PMT by Trip Purpose

Figure 4-13 shows the distributions of PMT by trip purpose and income status for NYS residents. In 2017, around 35% of the trips of a low-income NYS resident were for family and personal business purpose, while PMT for a not low-income NYS resident was more evenly distributed among work, family/personal, and social/recreational purposes. There was a decrease in the share of family and personal business of low-income NYS residents in 2017 compared to 2009, from 41% to 35%. Furthermore, a significantly lower PMT of low-income NYS residents can be observed compared to that of their not low-income counterparts for work, family and personal business, and social and recreational trips.

| | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income |
|---|---|---|---|---|---|---|
| | 2001 | | 2009 | | 2017 | |
| ■ Earn a Living | 3.3 | 10.6 | 3.4 | 8.8 | 3.6 | 8.8 |
| ■ Family & Personal Business | 6.0 | 10.2 | 5.6 | 8.7 | 5.2 | 8.9 |
| ■ Civic, Educational & Religious | 1.4 | 1.6 | 1.3 | 1.6 | 1.4 | 1.9 |
| ■ Social & Recreational | 5.0 | 10.2 | 3.4 | 9.8 | 3.6 | 10.3 |
| ■ Other | 0.2 | 1.8 | 0.1 | 1.6 | 1.0 | 8.8 |
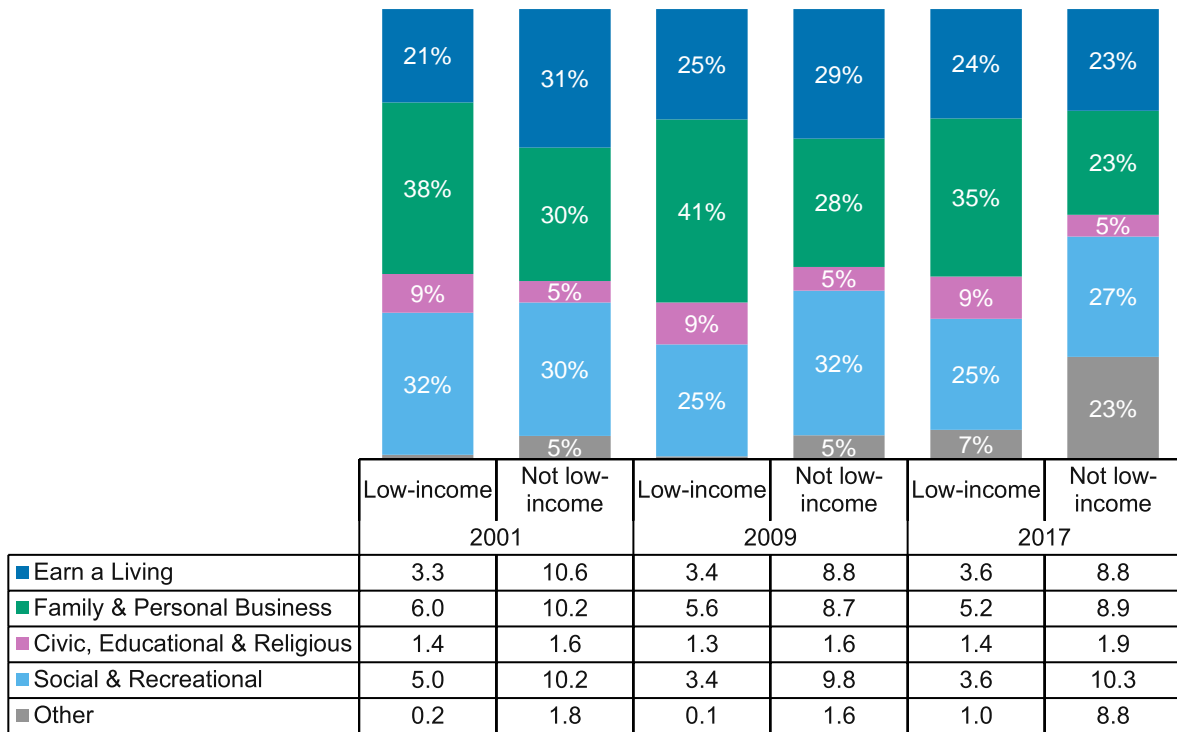
**Figure 4-13. Distributions of PMT by trip purpose and income status for NYS residents**

### 4.3.3    Impacts of Income on Average Person Trip Length

Manhattan residents who were low-income traveled fewer miles than low-income residents from other areas (Figure 4-14). Not low-income Manhattan residents traveled longer distances compared to their low-income counterparts in 2017. Furthermore, Manhattan residents who were low-income traveled fewer miles (3 miles) than their counterparts who were in other areas of New York City (4 miles). On the contrary, Manhattan residents who were not low-income traveled more miles (12 miles) than their counterparts who were in other areas of New York City (8 miles).

The PMT of New York City residents increased in 2017 for both income groups compared to 2009, especially for those who lived in Manhattan. In non-urban areas of NYS, PMT decreased in 2017 for low-income residents but increased for not low-income residents.
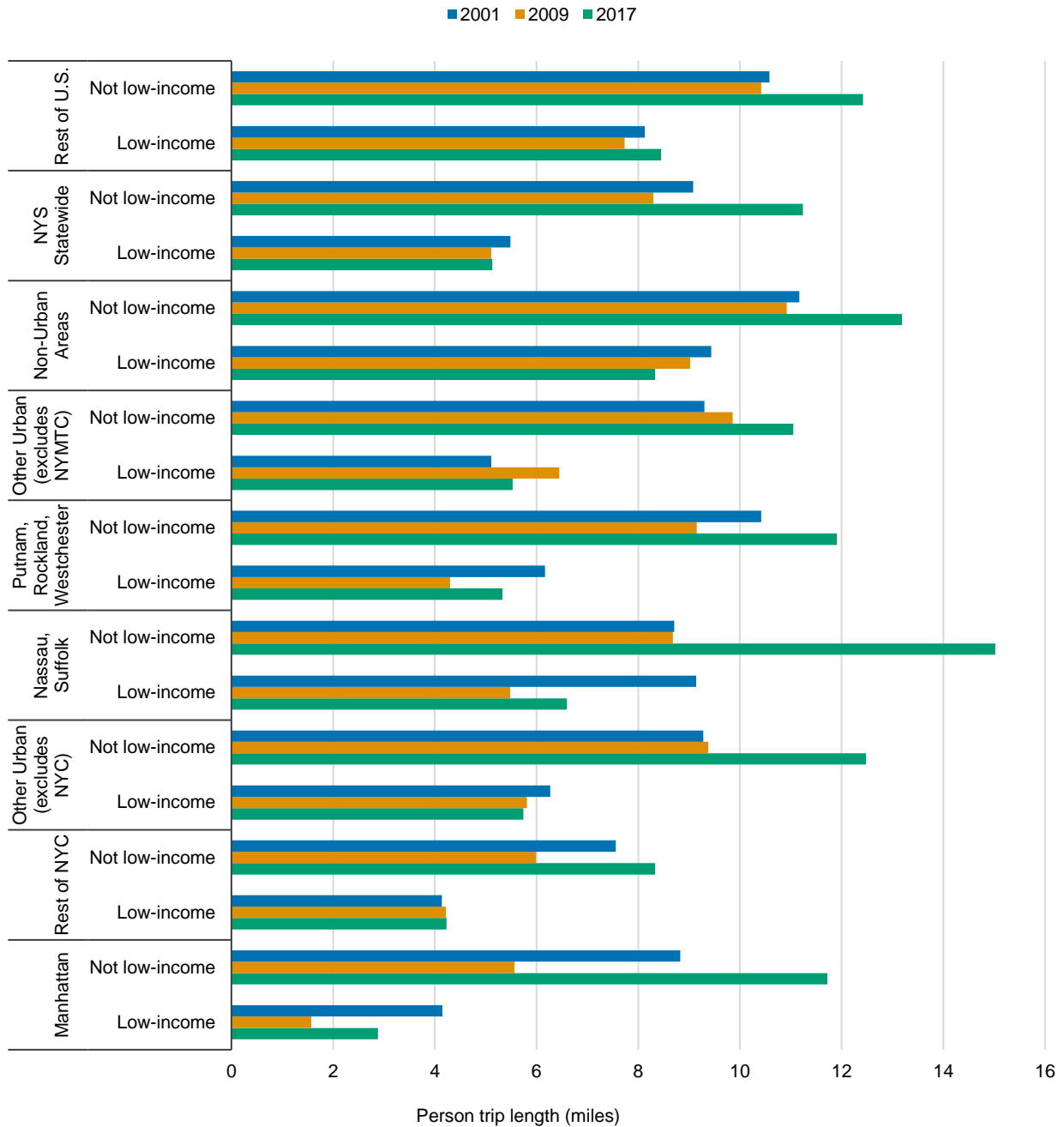
**Figure 4-14. Average daily person trip length (miles) by region and income status**

## 4.4 VEHICLE TRAVEL TRIP FREQUENCIES

### 4.4.1    Average Daily Vehicle Trip Rate

NYS drivers from low-income households took fewer trips than their counterparts that are not from low-income households (Figure 4-15). Low-income NYS drivers took an average of 1.8 vehicle trips per day in 2017 while not low-income NYS drivers took an average of 2.2 vehicle trips per day. The vehicle trip rates did not change significantly for low-income households in 2017 compared to 2009. The vehicle trip

rates slightly decreased for not low-income households in 2017 compared to 2019, from 2.6 trips per day to 2.2 trips per day.
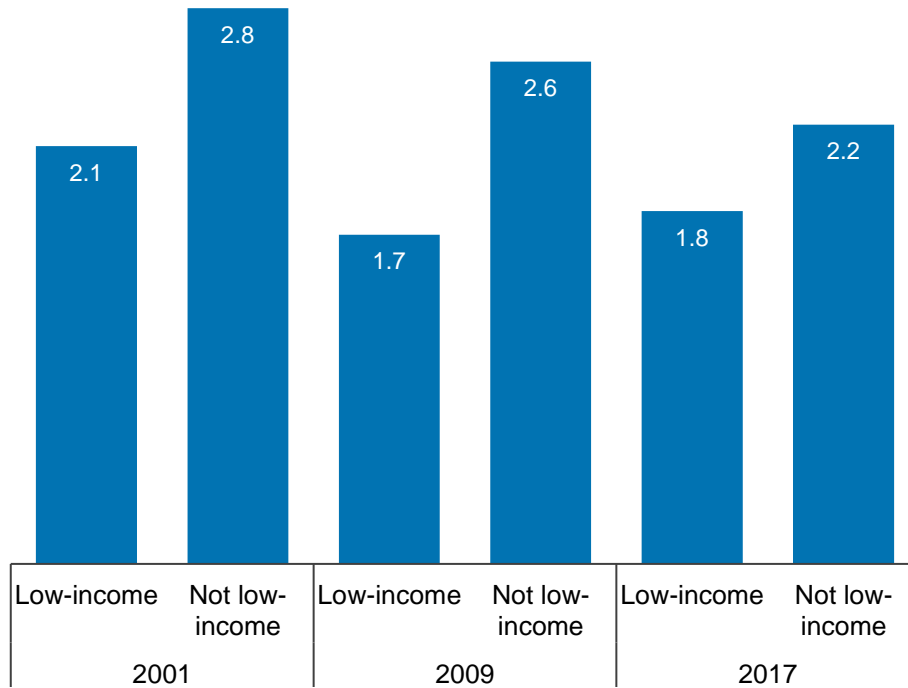


**Figure 4-15. Average vehicle trip rate by income status for NYS households**

### 4.4.2    Regional Differences in Vehicle Trip Rates

Figure 4-16 shows the average number of vehicle trips per driver (i.e., vehicle trip rate) by region and income status. Vehicle trip rates in New York City were the lowest among all regions in 2017, including areas within and outside of NYS. Vehicle trip rates for both income groups in New York City were comparable in 2017. Vehicle trip rates of low-income households were lower than that of their counterparts that were not low-income in all regions of NYS and rest of the United States.

Vehicle trip rate of low-income households in New York City increased in 2017 (1.1) compared to 2009 (0.7), while vehicle-trip rates of not low-income households in New York City decreased in 2017 (1.1) compared to 2009 (1.4).
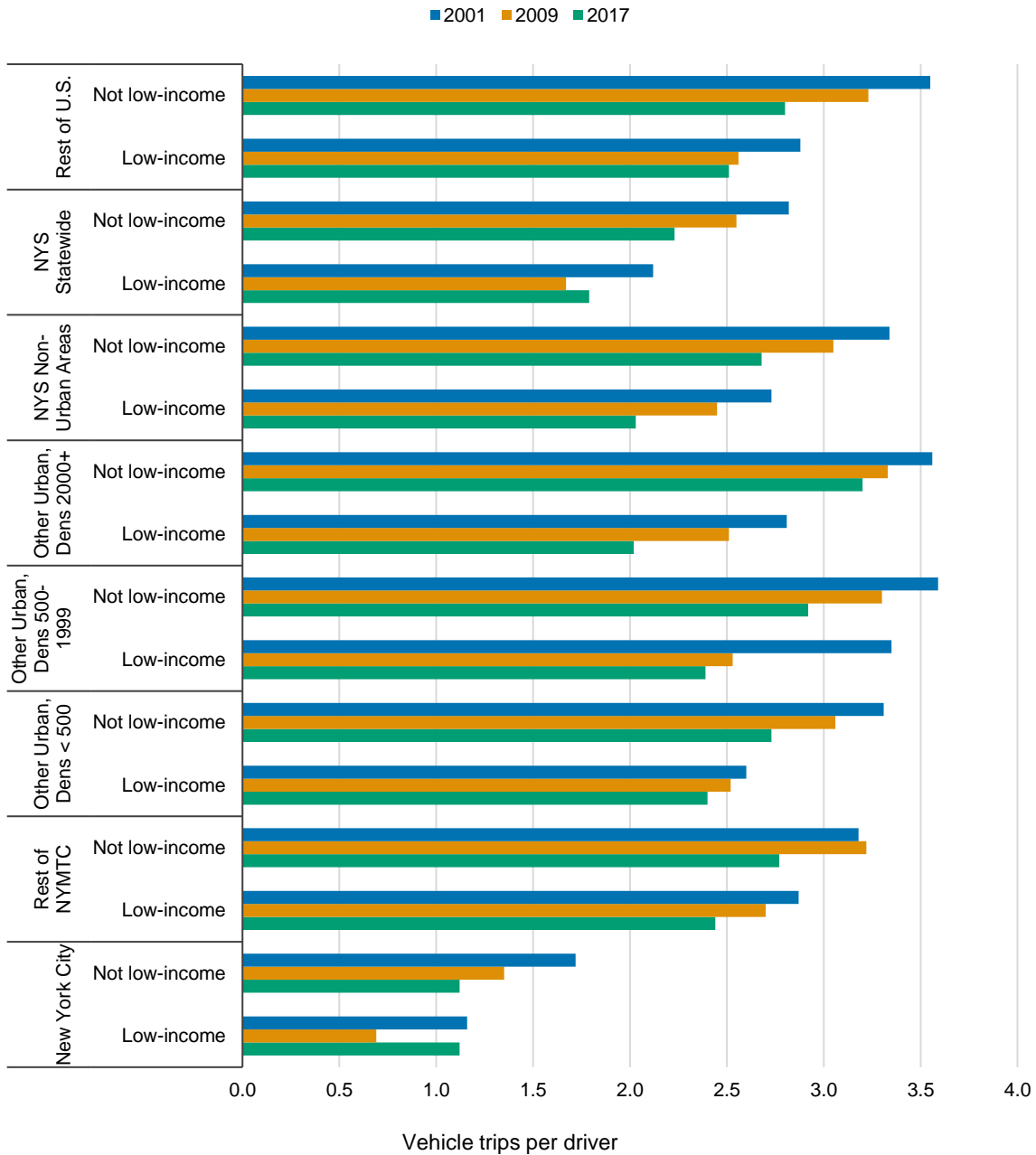
**Figure 4-16. Average number of vehicle trips per driver by region and income status**

### 4.4.3    Share of Vehicle Trips per Driver by Trip Purpose

A low-income NYS driver had a lower share of earn a living trips compared to a not low-income driver in 2017 (Figure 4-17). In addition, a low-income NYS driver had a higher share of vehicle trips that were for family and personal business purposes compared to counterpart that was not low-income in 2017. Low-income NYS drivers had a lower share of vehicle trips that are for family and personal business purposes in 2017 compared to 2009.

A low-income NYS driver made about half vehicle trips per day for earn a living trip purpose than their counterpart that were not low-income in 2001 and 2009. In 2017, however, this gap decreased slightly. Low-income drivers made about two-thirds vehicle trips per day than their counterparts that were not low-income.

| | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income |
|---|---|---|---|---|---|---|
| | 2001 | | 2009 | | 2017 | |
| ■ Earn a Living | 0.4 | 0.8 | 0.3 | 0.7 | 0.4 | 0.6 |
| ■ Family & Personal Business | 1.1 | 1.4 | 0.9 | 1.2 | 0.9 | 1.0 |
| ■ Civic, Educational & Religious | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| ■ Social & Recreational | 0.4 | 0.6 | 0.3 | 0.5 | 0.4 | 0.5 |
| ■ Other | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |

Chart values (stacked bars, top to bottom):
- Low-income 2001: 21%, 53%, 6%, 20%
- Not low-income 2001: 27%, 48%, 4%, 21%
- Low-income 2009: 20%, 57%, 6%, 17%
- Not low-income 2009: 26%, 48%, 4%, 21%
- Low-income 2017: 22%, 49%, 4%, 22%, 3%
- Not low-income 2017: 25%, 43%, 4%, 24%, 4%

**Figure 4-17. Distributions of average vehicle trips for NYS drivers by trip purpose and income status**

Table 4-5 shows the average number of vehicle trips per driver by trip purpose, region, and income status. When compared to their counterparts who were not low-income, a typical low-income driver was more likely to use a vehicle for family and personal business. This is consistent across all regions (including outside of NYS). Also, in both 2001 and 2009, drivers from the same region who were low-income made fewer vehicle-trips for work than their counterparts who were not low-income. This tendency, though, was different in 2017. Low-income drivers in New York City drove for work slightly more frequently (25.7%) than their higher-income counterparts (22.8%) in 2017.

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**Table 4-5. Average number of vehicle trips per driver by trip purpose, region, and income status (2001, 2009, and 2017 NHTS)**

| | New York City | | Rest of NYMTC | | Other Urban, Dens < 500 | | Other Urban, Dens 500-1999 | | Other Urban, Dens 2000+ | | Non-Urban Areas | | NYS Statewide | | Rest of U.S. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low | Low | Not Low |
| **2001** | | | | | | | | | | | | | | | | |
| **Total VT/Driver** | **1.2** | **1.7** | **2.9** | **3.2** | **2.6** | **3.3** | **3.4** | **3.6** | **2.8** | **3.6** | **2.7** | **3.3** | **2.1** | **2.8** | **2.9** | **3.6** |
| Earn a Living | 25.6% | 25.8% | 21.3% | 26.2% | 16.3% | 29.3% | 12.7% | 26.7% | 16.2% | 25.7% | 23.1% | 27.6% | 20.7% | 26.6% | 21.0% | 27.4% |
| Family & Personal Business | 56.1% | 49.7% | 48.3% | 47.9% | 55.1% | 47.0% | 53.3% | 47.7% | 52.4% | 48.9% | 55.4% | 47.8% | 52.9% | 48.3% | 52.4% | 47.1% |
| Civic, Educational & Religious | 3.8% | 3.7% | 6.7% | 3.9% | 3.9% | 3.2% | 7.6% | 4.7% | 6.6% | 4.2% | 4.0% | 3.3% | 5.4% | 3.9% | 6.3% | 4.7% |
| Social & Recreational | 14.4% | 19.4% | 22.8% | 21.2% | 22.9% | 20.0% | 25.9% | 20.3% | 24.1% | 20.7% | 17.1% | 20.8% | 20.3% | 20.5% | 20.0% | 20.2% |
| Other | *0.0%* | 1.3% | *0.9%* | 0.6% | *1.2%* | 0.4% | *0.3%* | 0.5% | 0.7% | 0.5% | *0.3%* | 0.3% | 0.5% | 0.6% | 0.3% | 0.5% |
| Unreported | *0.1%* | 0.1% | | 0.2% | *0.6%* | 0.1% | *0.3%* | 0.1% | *0.0%* | 0.1% | *0.1%* | 0.3% | 0.1% | 0.2% | 0.1% | 0.1% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **2009** | | | | | | | | | | | | | | | | |
| **Total VT/Driver** | **0.7** | **1.4** | **2.7** | **3.2** | **2.5** | **3.1** | **2.5** | **3.3** | **2.5** | **3.3** | **2.5** | **3.1** | **1.7** | **2.6** | **2.6** | **3.2** |
| Earn a Living | 14.3% | 19.1% | 21.6% | 25.7% | 21.4% | 29.0% | 21.4% | 28.7% | 20.6% | 26.6% | 20.1% | 29.4% | 19.7% | 25.8% | 20.9% | 27.4% |
| Family & Personal Business | 67.5% | 52.7% | 54.5% | 48.5% | 54.8% | 45.2% | 52.7% | 44.6% | 52.5% | 45.7% | 54.6% | 45.1% | 56.6% | 47.6% | 53.2% | 45.2% |
| Civic, Educational & Religious | 3.8% | 3.4% | 7.8% | 4.8% | 3.9% | 3.6% | 4.7% | 4.3% | 7.4% | 4.6% | 5.6% | 3.8% | 6.0% | 4.2% | 5.6% | 4.8% |
| Social & Recreational | 13.3% | 23.1% | 15.7% | 20.1% | 18.6% | 21.1% | 20.6% | 21.3% | 18.7% | 22.5% | 19.3% | 20.5% | 16.9% | 21.3% | 19.0% | 21.5% |
| Other | *0.0%* | 0.2% | *0.4%* | 0.6% | *0.2%* | 0.3% | *0.0%* | 0.2% | *0.0%* | 0.1% | *0.0%* | 0.1% | 0.1% | 0.3% | 0.3% | 0.3% |
| Unreported | *1.1%* | 1.6% | *0.1%* | 0.4% | 1.2% | 0.9% | *0.7%* | 1.0% | 0.8% | 0.5% | *0.3%* | 1.1% | 0.6% | 0.8% | 1.1% | 0.8% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **2017** | | | | | | | | | | | | | | | | |
| **Total VT/Driver** | **1.1** | **1.1** | **2.4** | **2.8** | **2.4** | **2.7** | **2.4** | **2.9** | **2.0** | **3.2** | **2.0** | **2.7** | **1.8** | **2.2** | **2.5** | **2.8** |
| Earn a Living | 25.7% | 22.8% | 22.2% | 23.2% | 23.4% | 29.1% | 19.1% | 28.3% | 19.3% | 27.2% | 20.3% | 28.7% | 21.9% | 25.6% | 20.7% | 27.5% |
| Family & Personal Business | 46.4% | 44.2% | 46.5% | 44.8% | 49.0% | 41.1% | 51.0% | 41.6% | 50.3% | 42.1% | 54.9% | 42.6% | 49.1% | 43.3% | 50.0% | 41.5% |
| Civic, Educational & Religious | 3.5% | 3.5% | 5.4% | 3.8% | 5.7% | 4.4% | 3.3% | 5.2% | 5.9% | 4.1% | 3.9% | 3.5% | 4.7% | 4.0% | 5.9% | 5.1% |
| Social & Recreational | 22.0% | 25.1% | 23.5% | 24.5% | 20.1% | 22.7% | 22.4% | 21.6% | 22.6% | 23.7% | 17.4% | 21.2% | 21.7% | 23.6% | 19.8% | 22.4% |
| Other | 2.4% | 4.5% | 2.4% | 3.6% | 1.8% | 2.8% | 4.3% | 3.4% | 2.0% | 2.9% | 3.5% | 4.0% | 2.6% | 3.6% | 3.5% | 3.5% |
| All | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Note:  Italicized numbers are estimated based on a small sample size (less than 5 samples).

Not Low represents Not low-income and Low represents Low-income.
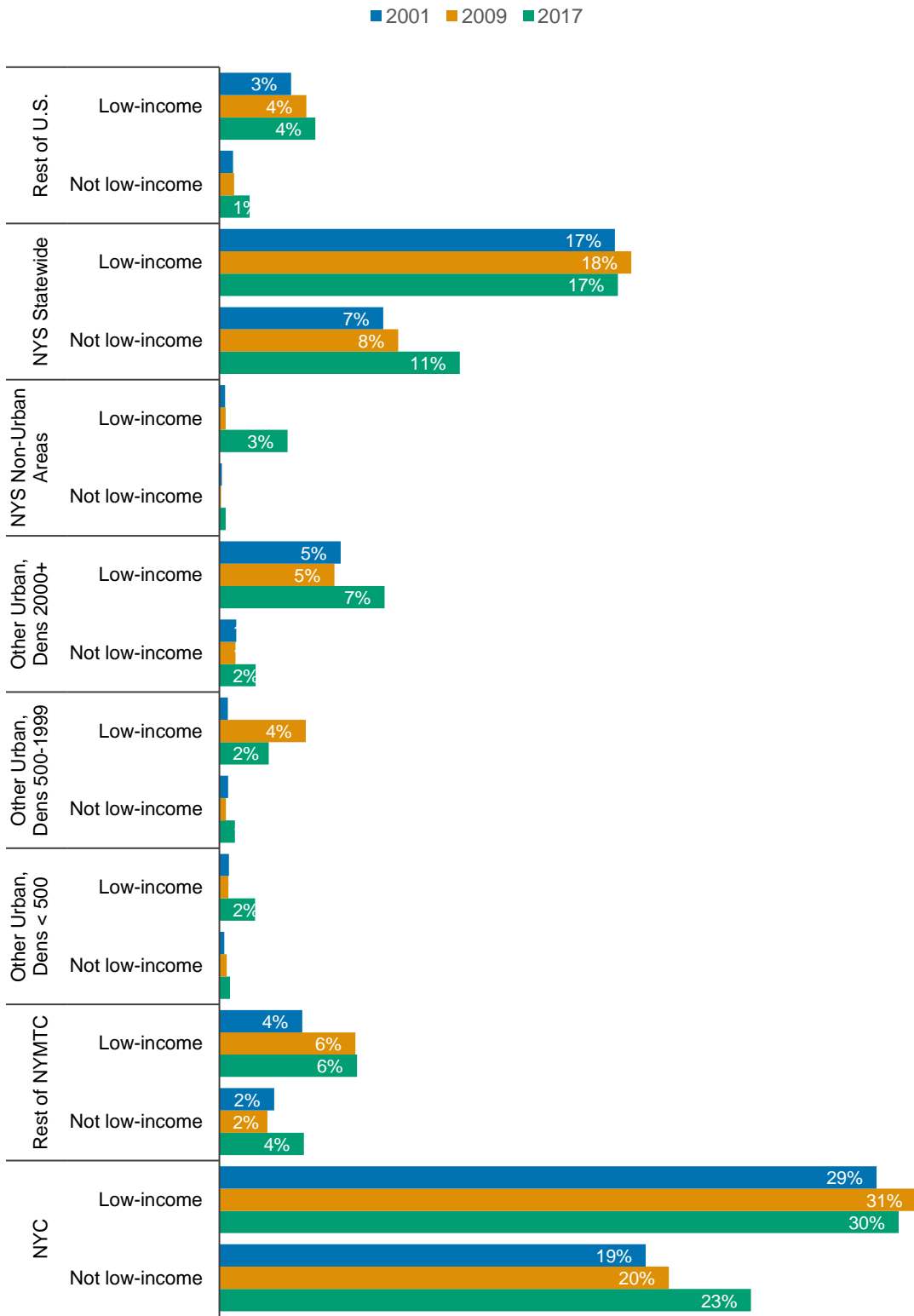
## 4.5 INFLUENCE OF INCOME ON VEHICLE TRIP LENGTH

### 4.5.1    Vehicle Miles Traveled per Driver

Figure 4-18 shows the average daily vehicle miles traveled (VMT) by income status for NYS drivers. A low-income NYS driver traveled about 13.4 miles daily in 2017 which is significantly lower than their counterparts that were not low-income (22.7 miles). This pattern also holds true for previous NHTS years, although the gap in VMT between two income groups was smaller.
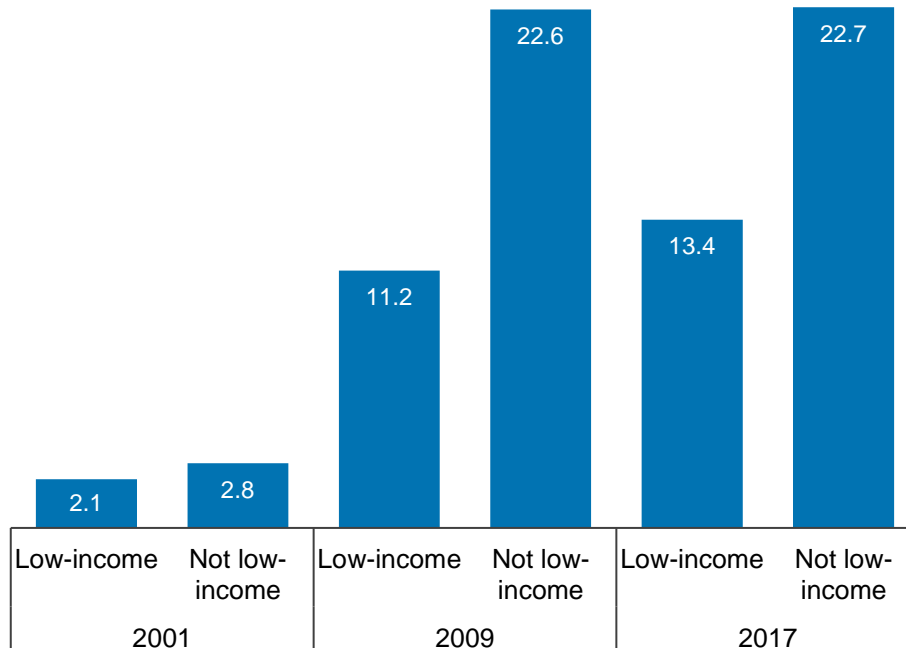


**Figure 4-18. Average daily VMT by income status for drivers in NYS**

Figure 4-19 shows the distributions of average daily VMT by trip purpose and income status. Low-income NYS drivers had a higher share of VMT that were for family and personal business (40%) than not low-income residents (32%) in 2017. Low-income NYS drivers had a lower share of VMT that were for social and recreational trips (22%) than not low-income residents (28%) in 2017. Regardless of the purpose of the trip, the average VMT for low-income NYS drivers was lower in 2017 than it was for their non-low-income counterparts. In particular, the average VMT for social and recreational trips of not low-income NYS drivers were twice as many as that of low-income NYS drivers.

Compared to 2009, VMT for low-income NYS drivers for social and recreational activities and family and personal business was higher in 2017. Low-income NYS drivers had a higher share of VMT for commute trips in 2017 compared to 2009.

| | Low-income | Not low-income | Low-income | Not low-income | Low-income | Not low-income |
|---|---|---|---|---|---|---|
| | 2001 | | 2009 | | 2017 | |
| ■Earn a Living | 4.1 | 9.2 | 2.8 | 8.0 | 4.0 | 7.0 |
| ■Family & Personal Business | 6.3 | 8.8 | 5.2 | 7.3 | 5.4 | 7.3 |
| ■Civic, Educational & Religious | 0.6 | 0.8 | 0.6 | 0.7 | 0.6 | 0.9 |
| ■Social & Recreational | 4.4 | 6.6 | 2.5 | 5.7 | 3.0 | 6.4 |
| ■Other | 0.1 | 0.2 | 0.0 | 0.1 | 0.5 | 1.2 |
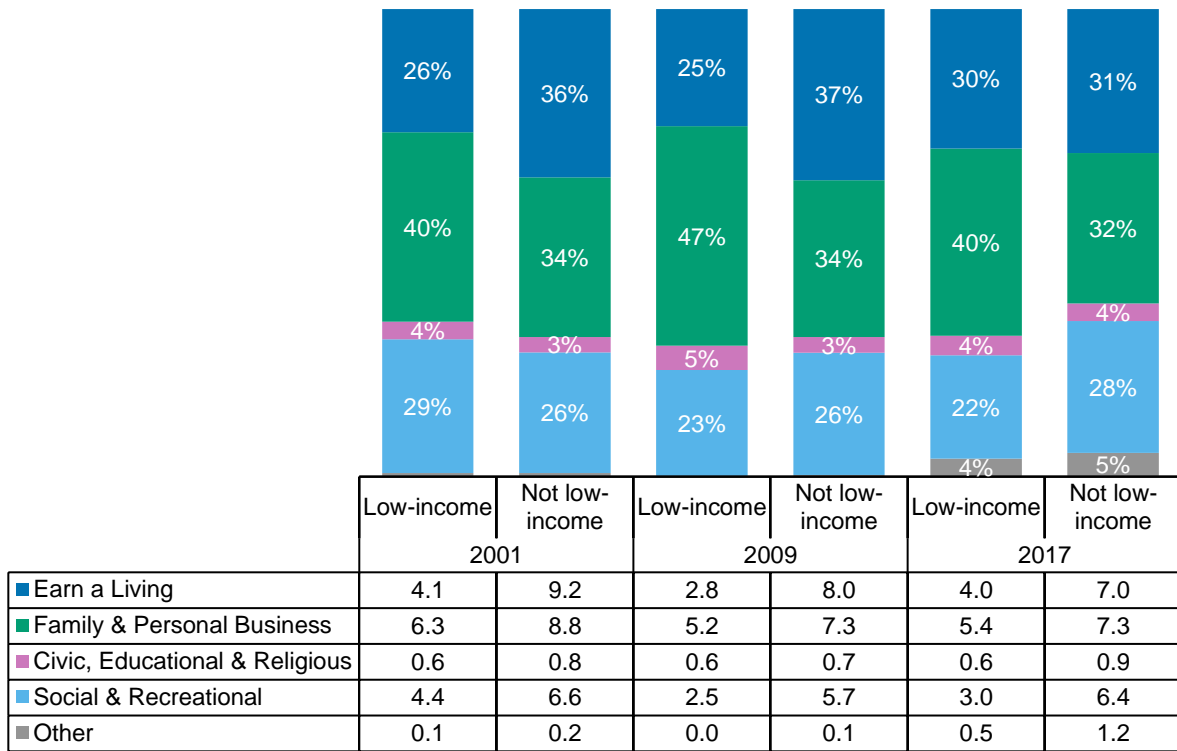
**Figure 4-19. Distributions of daily VMT by trip purpose and income status**

### 4.5.2 Average Vehicle Trip Distance

Low-income NYS drivers made shorter vehicle trips than their counterparts that were not low-income (Figure 4-20). Drivers from a low-income household in NYS traveled about 7.6 miles per vehicle-trip on a typical day in 2017, while drivers from higher income group traveled an average of 2.5 miles farther for each vehicle-trip taken during the same year. The average travel distance increased in 2017 compared with that of 2009 for both income groups.
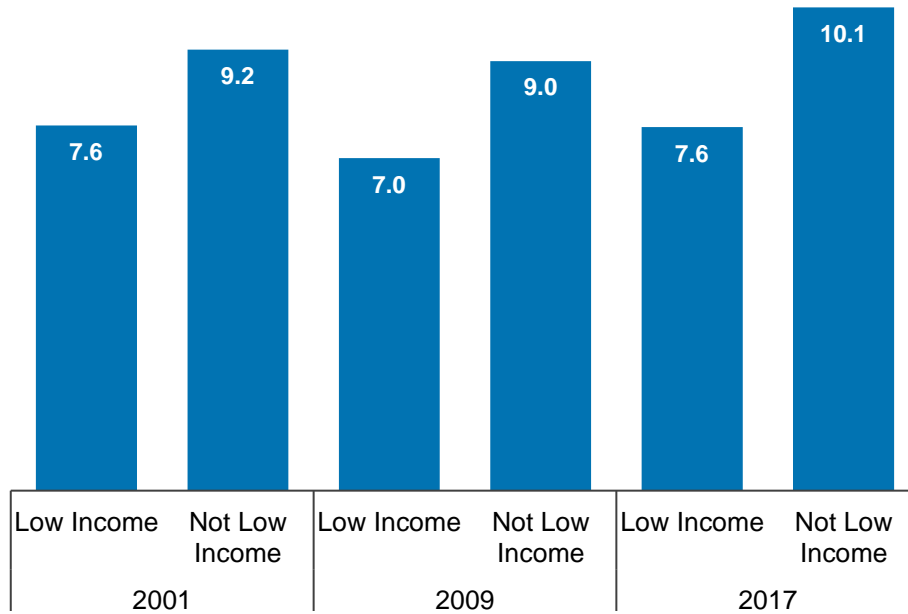
**Figure 4-20. Average travel distance (miles) per vehicle-trip made by NYS drivers**

Figure 4-21 shows the average length of vehicle trips in miles by region and income status. Low-income drivers drove fewer miles than their counterparts that are not low-income across all regions. For both income levels across the years, drivers from other urban areas with higher population density traveled fewer miles than drivers from other urban areas with lower density. Regardless of the drivers' income status, there were no significant differences between the average length of a vehicle trip for drivers from New York City and those from the rest of the NYMTC.
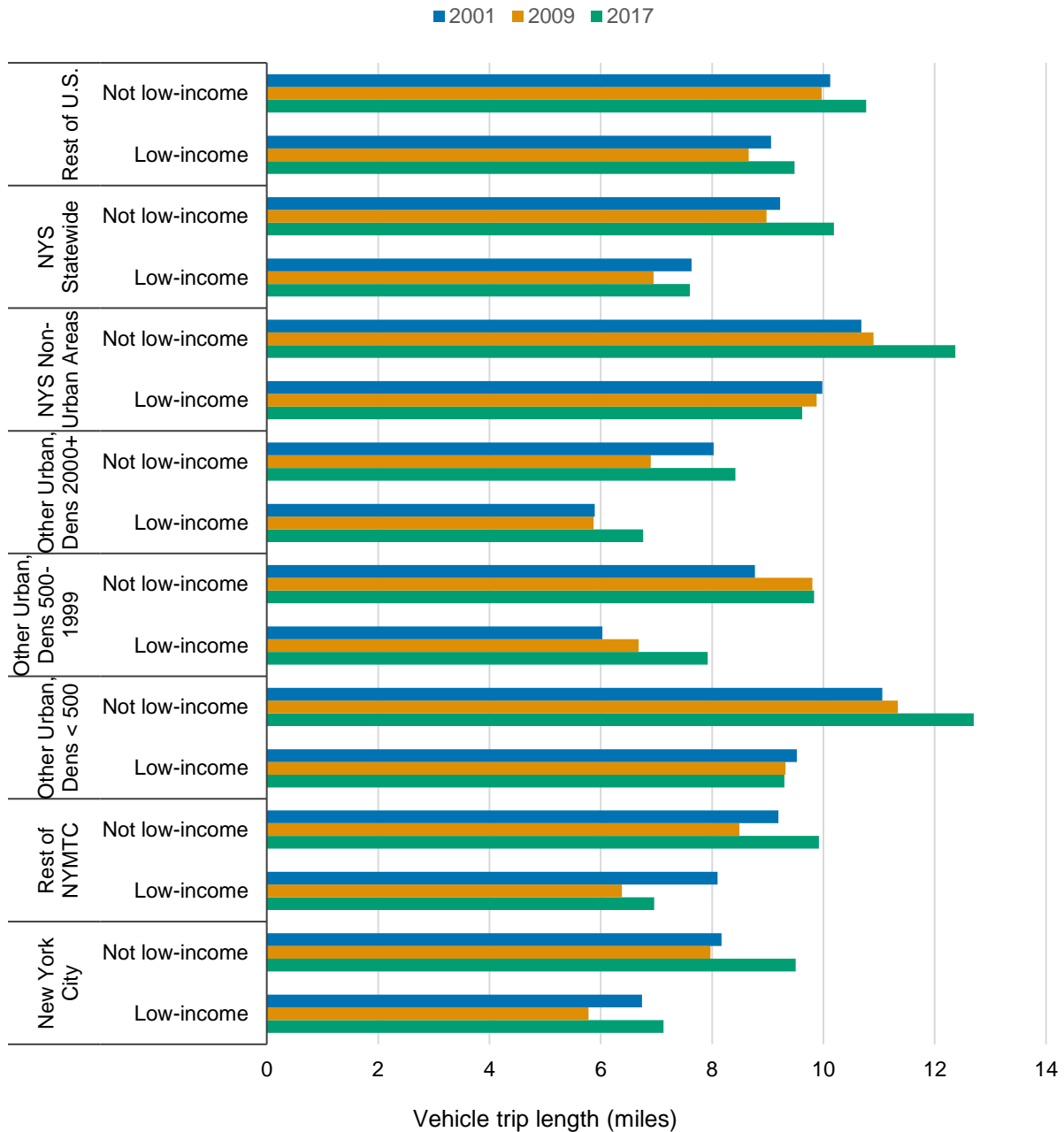
**Figure 4-21. Average length of vehicle trips by region and income status**

### 4.5.3 Effects of Income on Vehicle Trip Travel Time

Figure 4-22 illustrates the average time in minutes spent in vehicle per NYS-driver who drove on travel day. Low-income drivers who drove on their travel day spent, on average, 77 minutes per day in their vehicles in 2017, compared to 83 minutes for their counterparts from higher-income households. In comparison to 2009, both income groups spent more time in a vehicle on the travel day in 2017.
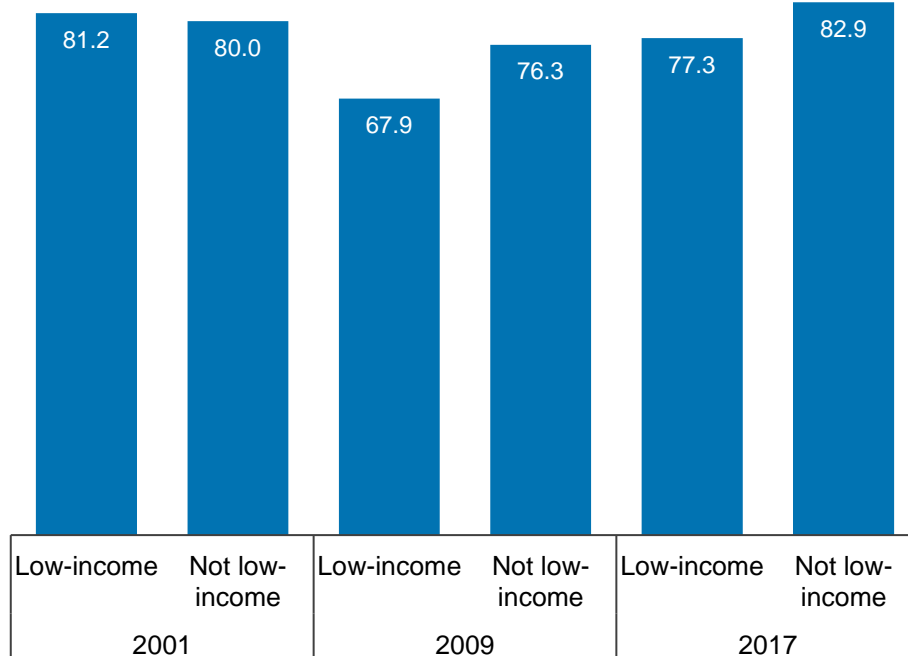
**Figure 4-22. Average time spent in vehicle per NYS-driver who drove on travel day (minutes)**

# 5 TRANSPORTATION ACCESSIBILITY

## 5.1 ACCESS TO PUBLIC TRANSPORTATION

Using 2017 NHTS data along with public transit stops, about 93% of New York State (NYS) low-income households surveyed lived within a one-mile radius (estimated based on great circle distance) of transit stops. The transit data was obtained in the General Transit Feed Specification (GTFS) format, containing the latest information up to 2023. To accurately reflect the services that were operational in 2017, online search was conducted and data was adjusted if necessary. For instance, Hudson Link, a bus service that operated between multiple locations in Rockland County and Westchester County, only commenced service in 2018. Consequently, this particular service was excluded from the data set. Additionally, ferry services were also removed from the analysis. Moreover, this section primarily relies on the 2017 NHTS data, given that comparing the 2009 or 2001 NHTS data directly may not be entirely comparable due to various factors such as changes in the transit network and overall traffic conditions in New York City.
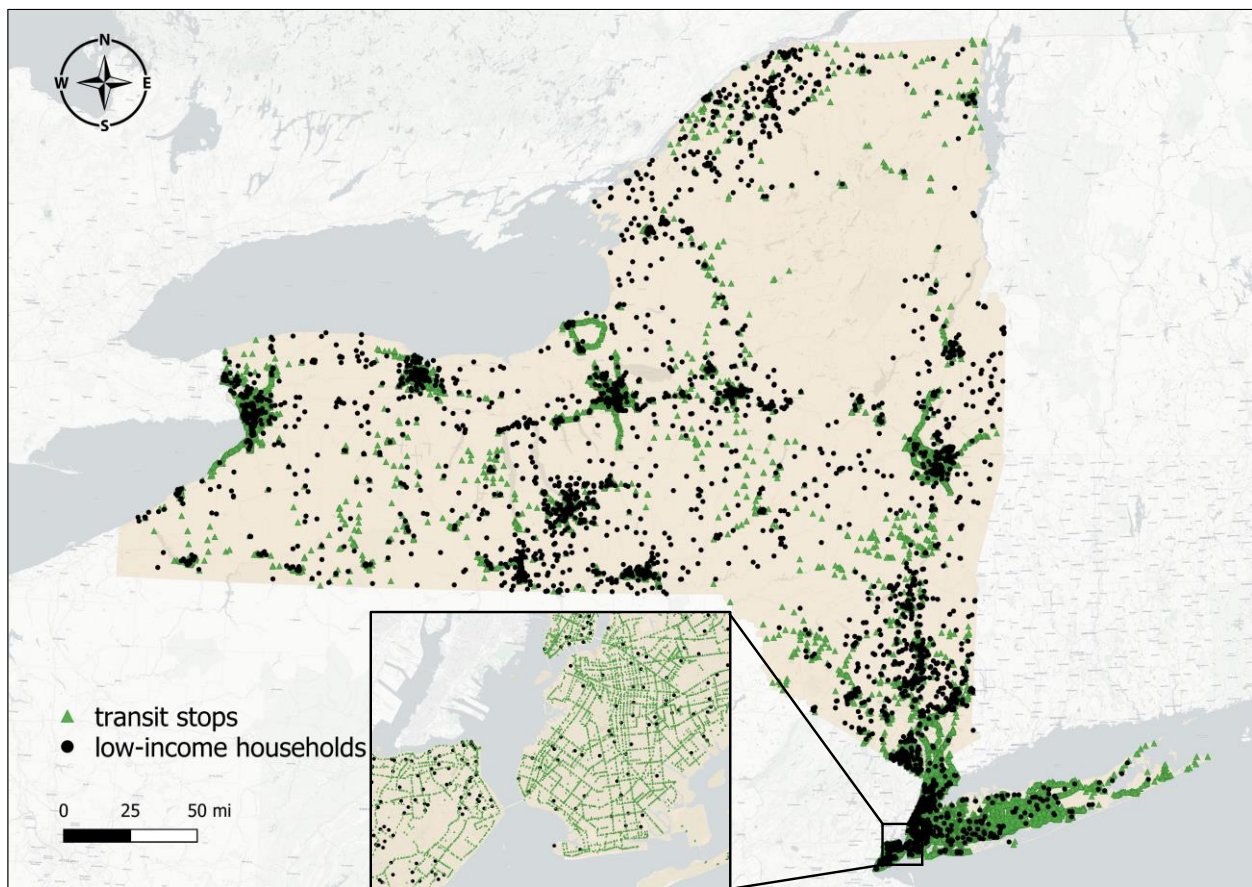


**Figure 5-1. Distributions of low-income households and public transit stops in NYS**

### 5.1.1 Influence of Income on Public Transit Uses

Based on the findings presented in Figure , there appeared to be an inverse relationship between an individual's household income and their utilization of public transportation when the household income is less than $74,999. It is worth noting, however, that in New York City, the proportion of person-trips utilizing public transit reached its peak (31%) among those belonging to the income bracket of $75,000 to

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$99,999. Similarly, in NYS, the public transit mode share was also higher (13%) among those belonging to the aforementioned income bracket, in contrast to the income bracket of $50,000 to $74,999, where public transit mode share was comparatively lower (11%).
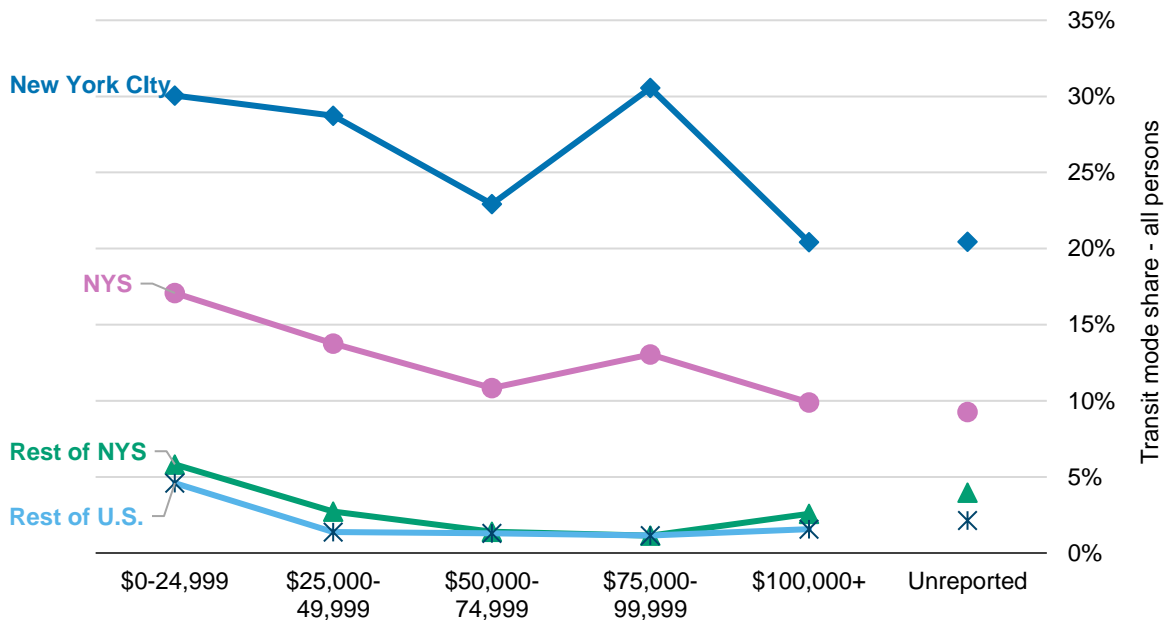


**Figure 5-2. Public transit share (all persons age 5 years and over) by income and region (2017 NHTS)**

Figure 5-3 revealed that children between ages 5-15, who are not yet eligible to legally drive, residing in households with incomes ranging between $75,000 and $99,999 in New York City had the highest share (28%) of public transit, as compared to children belonging to higher-income households. In contrast, children within the same age group from households with the lowest incomes (less than $25,000) in the rest of the United States and NYS had the highest share of public transit trips, relative to their higher-income counterparts, during the year 2017.

Based on Figure 5-4, elderly people in New York City from the lowest income households (earning less than $25,000 annually) exhibited the greatest proclivity (23%) towards utilizing public transit relative to those from households with income higher than $50,000. This trend was not exclusive to the NYS, but instead resonates across the rest of the United States.
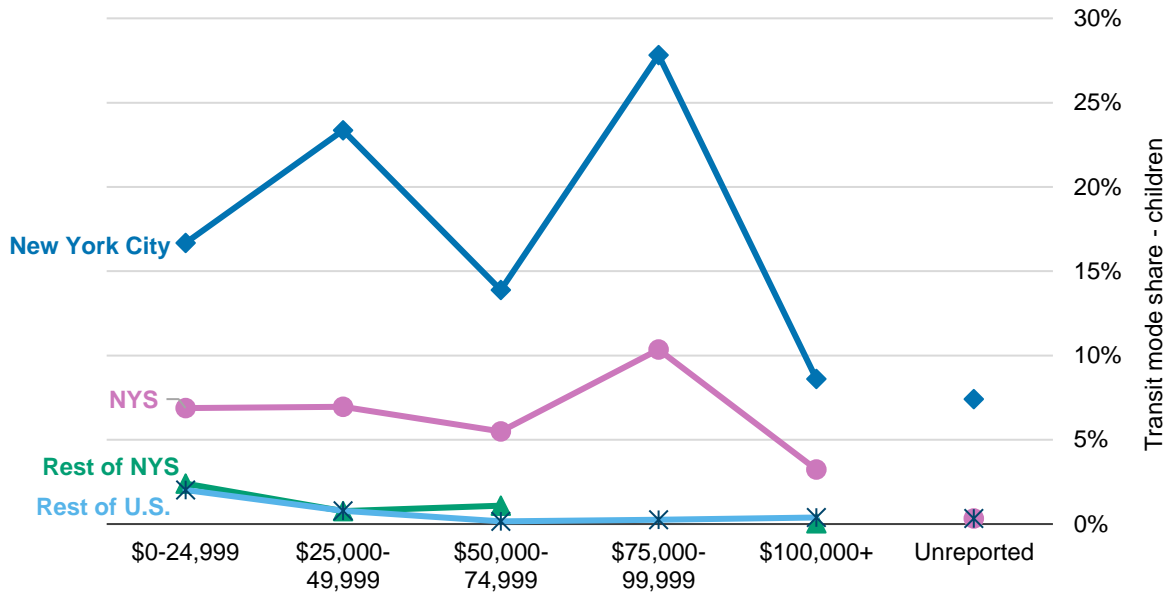
**Figure 5-3. Public transit share among children (ages 5-15) by household income and region (2017 NHTS).** Missing data points indicate sample size smaller than 5.
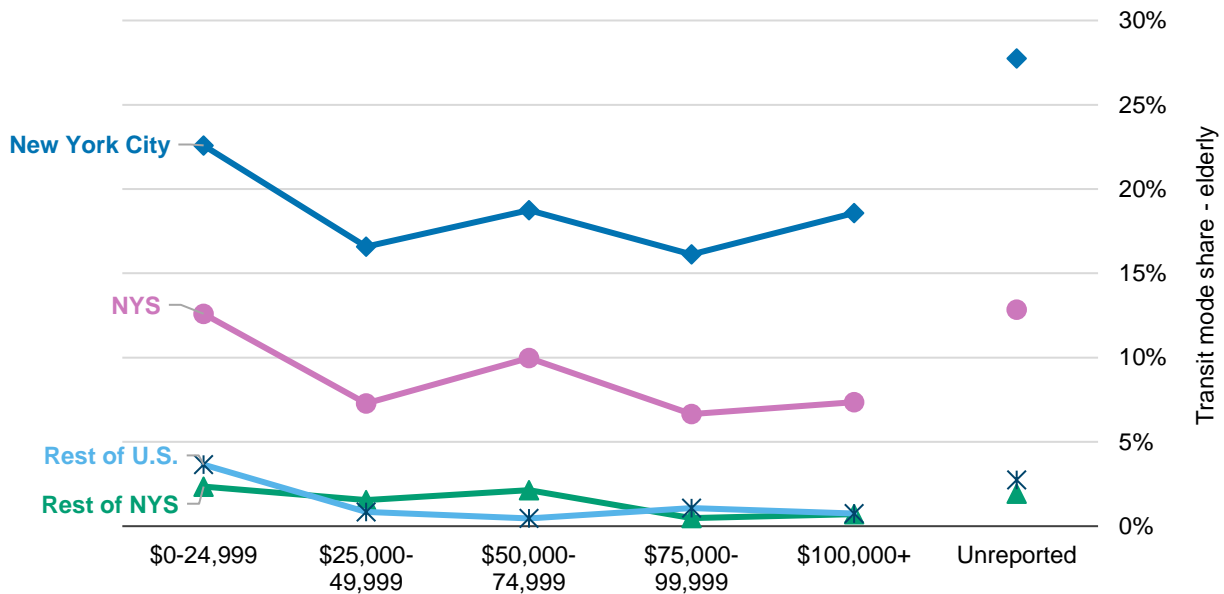


**Figure 5-4. Public transit share among elderly residents (65+) by income and region (2017 NHTS)**

### 5.1.2    Public Transit Use by Income Status and Trip Purpose

Based on the 2017 data (Figure 5-5), low-income individuals exhibited a lower share of public transit trips for work (31%) in comparison to their not low-income counterparts (48%). However, this discrepancy was less pronounced in 2009, where not low-income individuals had nearly twofold more work-related transit trips than their low-income counterparts. Not low-income individuals decreased their family and personal business transit trips from 26% to 18% between 2009 and 2017. This reduction increased the discrepancy between transit trips for family and personal business for the two income groups.
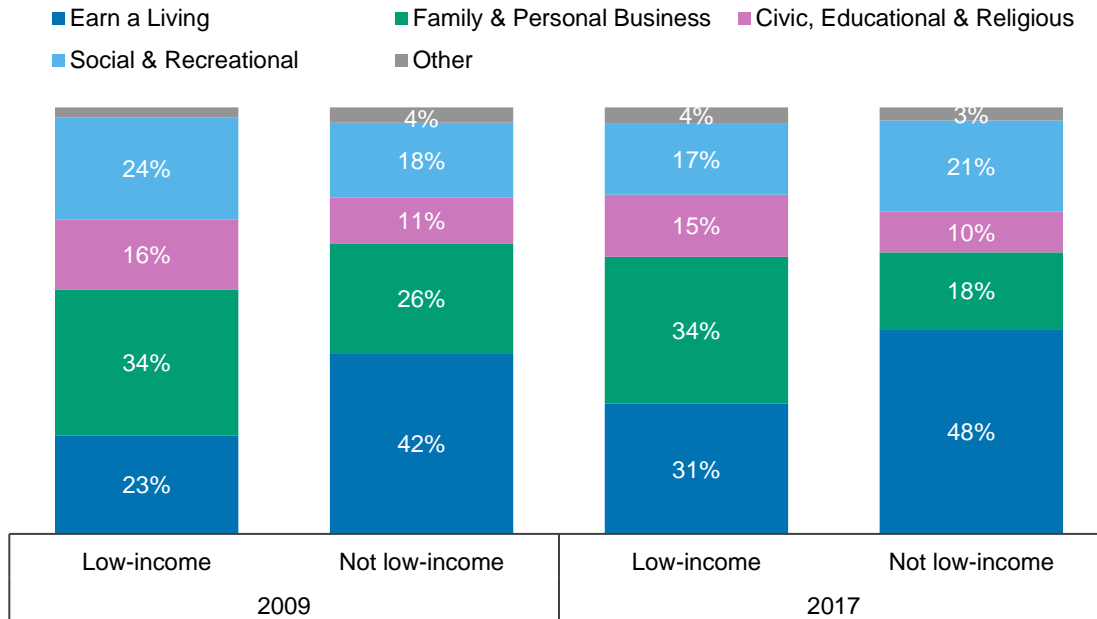
**Figure 5-5. Distribution of daily public transit trips by trip purpose and income level in NYS (2009 & 2017 NHTS)**

Figure 5-6 shows that in 2009, the distribution of daily public transit trips for non-work purpose was comparable across various income brackets (44% from low-income households vs 45% from not low-income households). However, in 2017, a noticeable disparity emerged, with individuals belonging to not low-income households exhibiting a reduced share (35%) of transit trips for family and personal business in contrast to their low-income counterparts (50%).
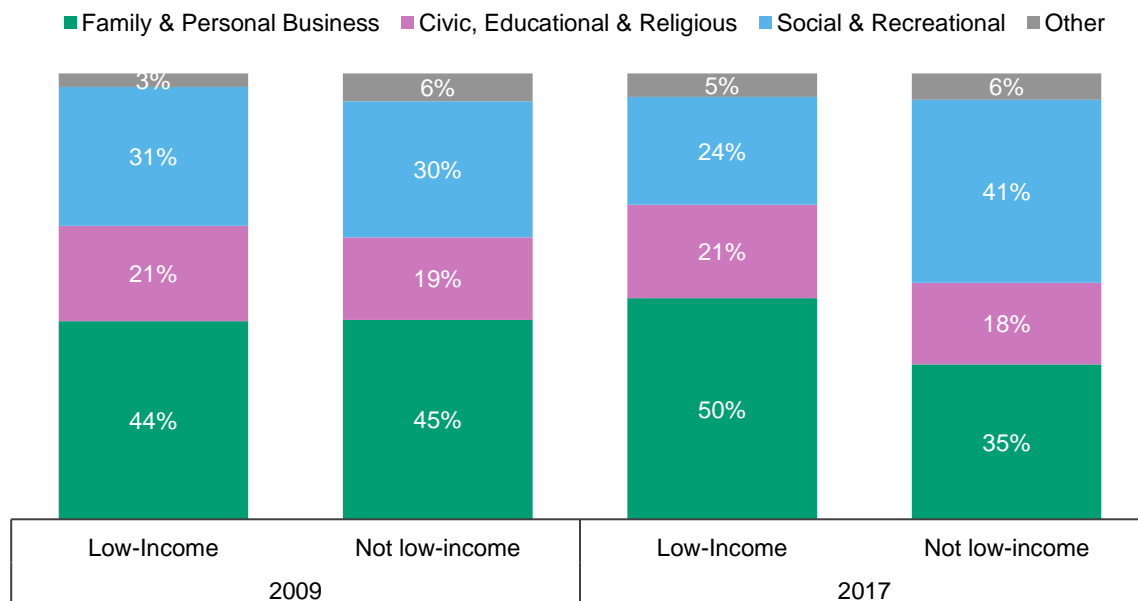


**Figure 5-6. Distribution of daily non-work transit trips by trip purpose and income level in NYS (2009 & 2017 NHTS)**

## 5.2    PUBLIC TRANSIT MOBILITY PATTERNS

### 5.2.1    Public Transit Trips by Time of Day

According to Figure 5-7, low-income individuals, regardless of their geographic region, were predisposed to undertake a greater number of off-peak hour (between 10 am and 4 pm) transit trips as compared to their not low-income counterparts. Not low-income individuals displayed a discernible commuting pattern with prominent morning and afternoon peaks, as approximately 12% of daily trips occur during the 7-8 am and 5-6 pm time windows. Conversely, low-income individuals exhibited a greater frequency of trips throughout the day, with no discernible morning or afternoon peaks. Notably, compared to low-income individuals in the rest of the United States, those in NYS manifested a slightly higher share of trips during the afternoon peak hours.
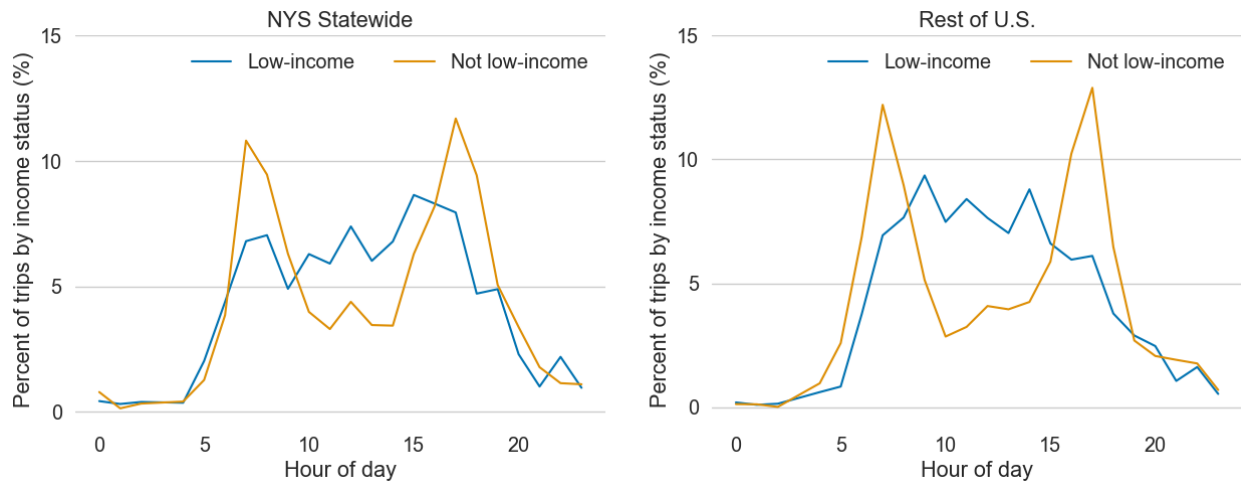


**Figure 5-7. Percent of transit trips by hour of day and income status.**

### 5.2.2    Public Transit Trips by Trip Purpose

According to Figure 5-8, for commute trips utilizing public transit in NYS, low-income individuals exhibited a slightly higher percentage of trips occurring prior to 6 am and after 8 pm relative to their not low-income counterparts. Furthermore, low-income individuals display a reduced proportion of trips during morning peak hours between 7 and 8 am, and a heightened proportion of trips around noon as compared to not low-income individuals. In the case of family and personal business trips and social and recreational trips, low-income individuals showcased a greater proportion of trips around noon while not low-income individuals exhibited a higher proportion of trips during the late afternoon between 4 and 7 pm.
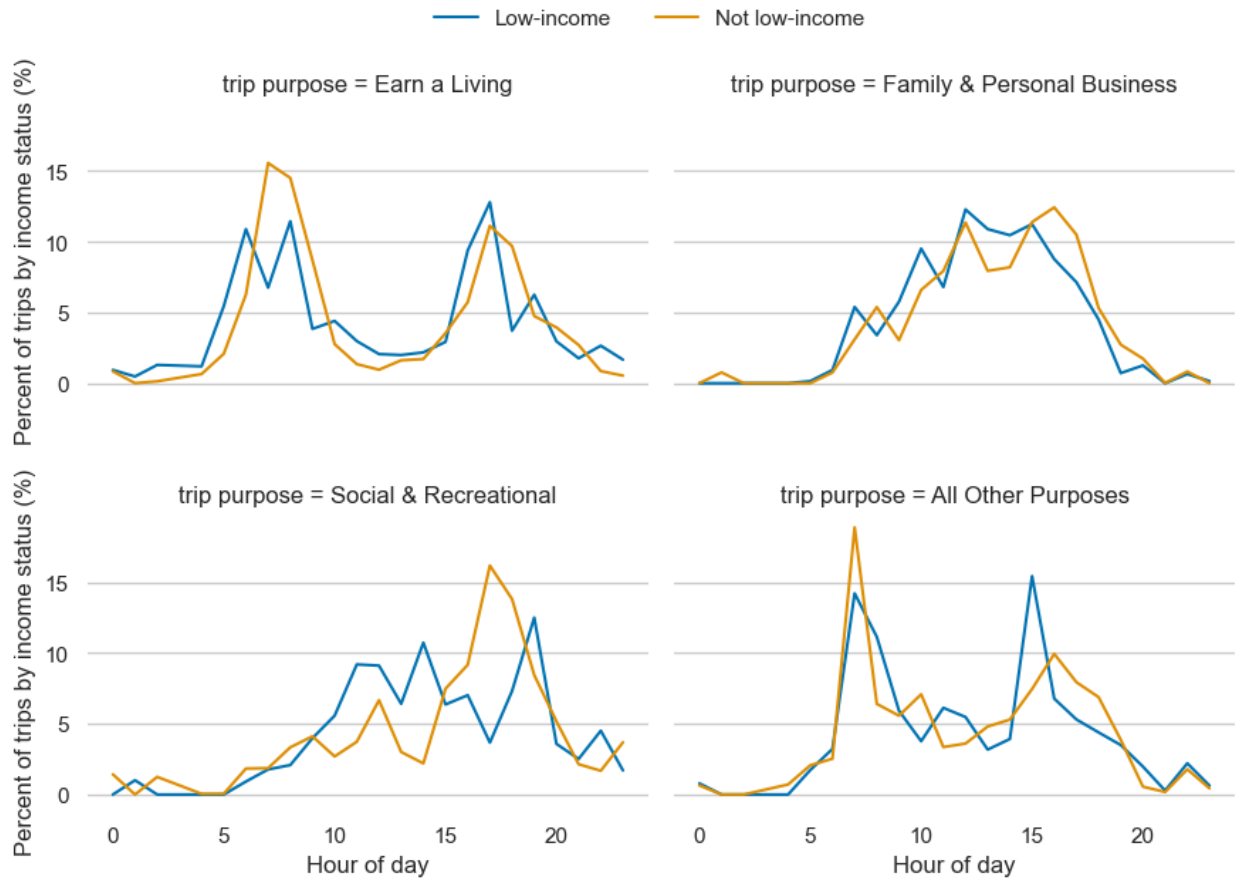
**Figure 5-8. Percent of trips by hour of day and trip purpose among each income group (NYS)**

With respect to Figure 5-9, a similar pattern was observed in the rest of the United States, whereby the disparity between low-income and not low-income individuals in their time-of-day pattern was considerably more prominent. Specifically, low-income individuals in the rest of the United States demonstrated a markedly reduced proportion of trips during morning and afternoon peak hours for commute trips. Moreover, low-income individuals in the rest of the United States exhibited a higher proportion of trips in the morning and a lower proportion of trips in the evening for family and personal business and social trips as compared to their not low-income counterparts.
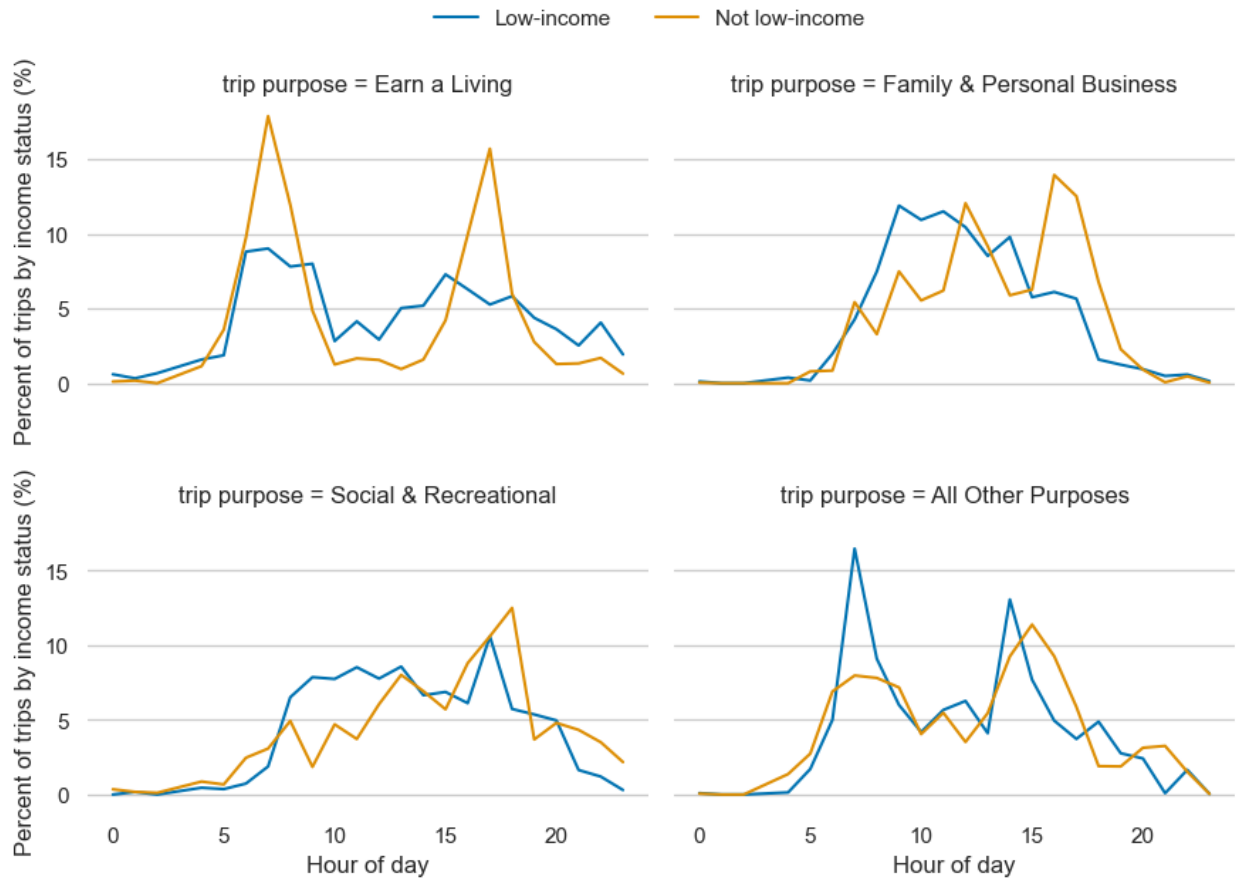
**Figure 5-9. Percent of trips by hour of day and trip purpose among each income group (rest of the United States)**

### 5.2.3    Public Transit Travel Time by Trip Purpose

The significant difference in travel time occurred primarily during mornings (Figure 5-10). Compared with not low-income people, low-income NYS residents had longer travel time in early mornings (i.e., 5-6 am) as well as late evenings (i.e., 10-11 pm) for both commute trips and family and personal business trips. This could potentially because people needed to start their trip earlier for long trips in order to arrive at their destination on time. Not low-income people had longer travel time during early mornings (i.e., 5-6 am) for social and recreational and other trip purposes.

**Figure 5-10. Average transit travel time by trip purpose (NYS)**

## 5.3    WORKER COMMUTE PATTERNS

### 5.3.1    Trip Frequency by Day of the Week Traveled

Based on Figure 5-11, it can be observed that not low-income commuters made more daily trips than their low-income counterparts during weekdays in NYS. Furthermore, low-income commuters made slightly more person trips on Fridays (4.2) compared to their not low-income counterparts (4.0). Low-income commuters made fewer trips on Saturdays (3.2) compared to their not low-income counterparts (3.6). However, focusing on just commute trips, as shown in Figure 5-12, low-income commuters made more trips on Fridays and weekends than their not low-income counterparts.
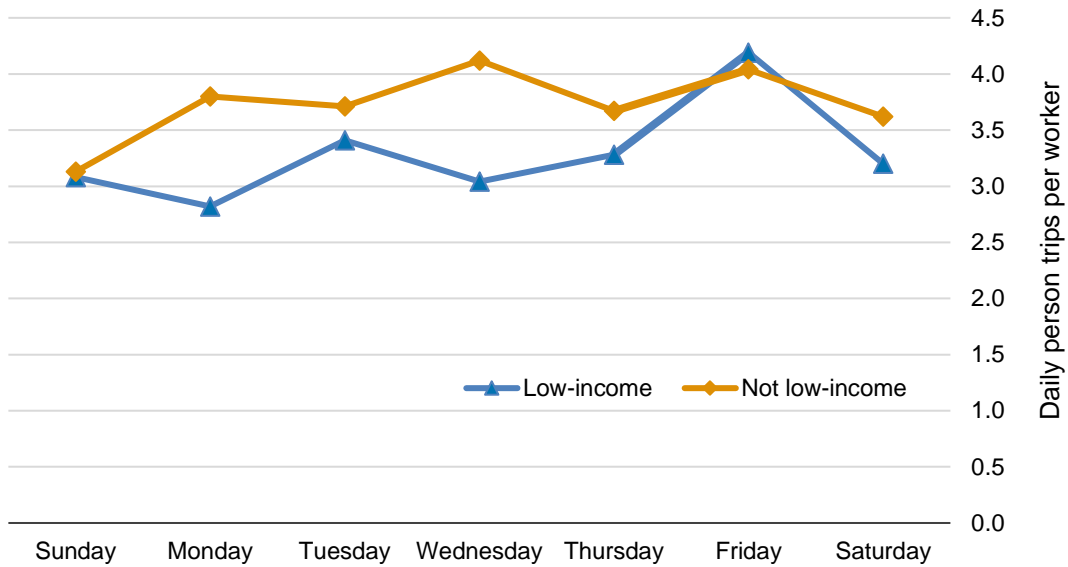
**Figure 5-11. Average daily person trips per worker by income status in NYS (2017 NHTS)**
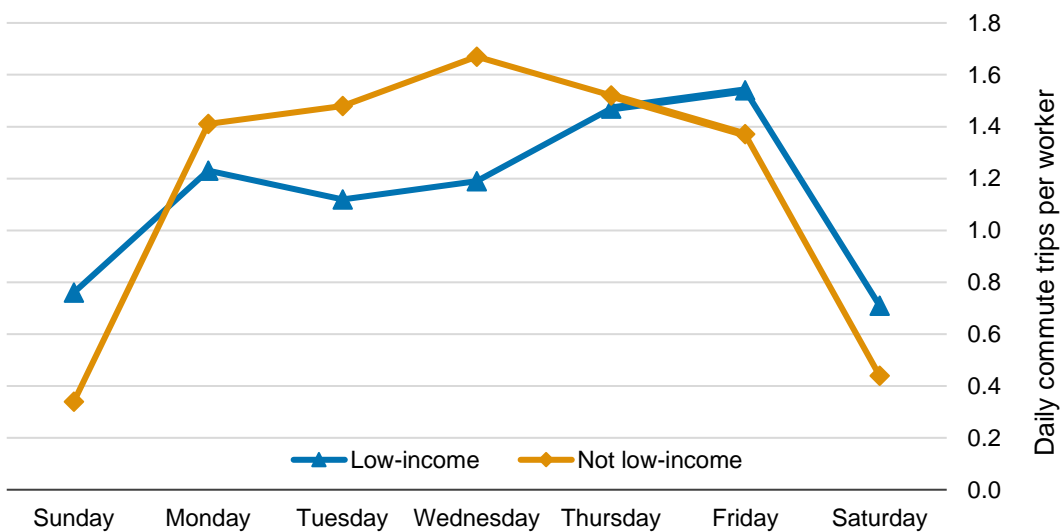


**Figure 5-12. Average daily commute trips per worker by income status in NYS (2017 NHTS)**

In Figure 5-13, it can be observed that low-income commuters tended to have slightly higher share of commute trips than their not low-income counterparts, with the exception of Tuesdays and Wednesdays. On average, commute trips make up 35% of the daily person trips for low-income people and 31% for their not low-income counterparts.
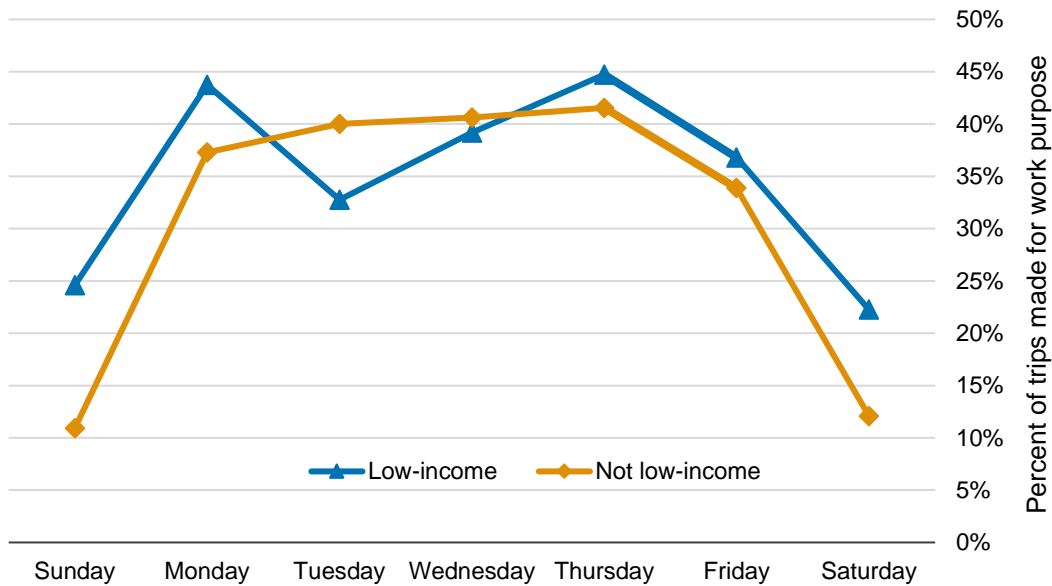
**Figure 5-13. Percent of daily person trips made for work purpose by income status in NYS (2017 NHTS)**

### 5.3.2 Work Trip Frequency by Time of Day

The data presented in Figure 5-14 indicate that individuals with low-income tended to travel more during off-peak hours and less during peak hours compared to their not low-income counterparts, as evidenced in both NYS and rest of the United States. The pattern observed suggested that low-income individuals might work in industries with non-traditional work hours.
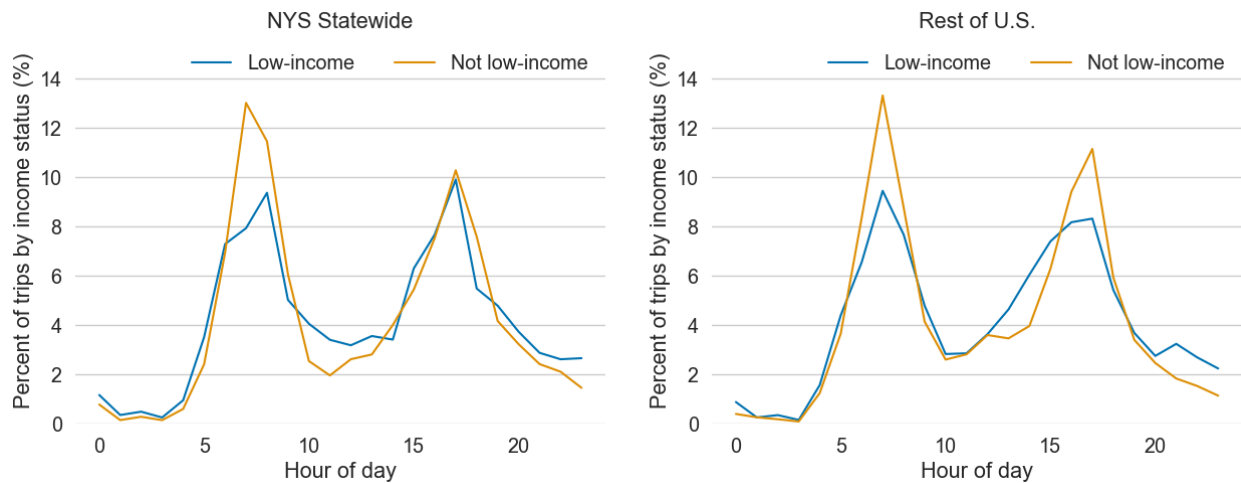


**Figure 5-14. Percent of commute trips by hour of day and income status (2017 NHTS)**

The American Community Survey (ACS) also gathered information on the time of day when people commute to work (US Census Bureau, 2017). Specifically, the ACS had data on commute trips during the morning hours between 5 am and 12 pm on a higher granularity, with data aggregated every 30 minutes. This allows for a more detailed analysis of morning commute patterns. Figure 5-15 presents the proportion of morning commute trips on a 30-minute interval of the total number of trips of the day.

When comparing the morning commute patterns from the ACS to the NHTS data, it was found that the morning peak proportion of commute trips daily in ACS was slightly higher for both NYS and the rest of the United States. Note that results presented based on ACS are an aggregate of all income groups.
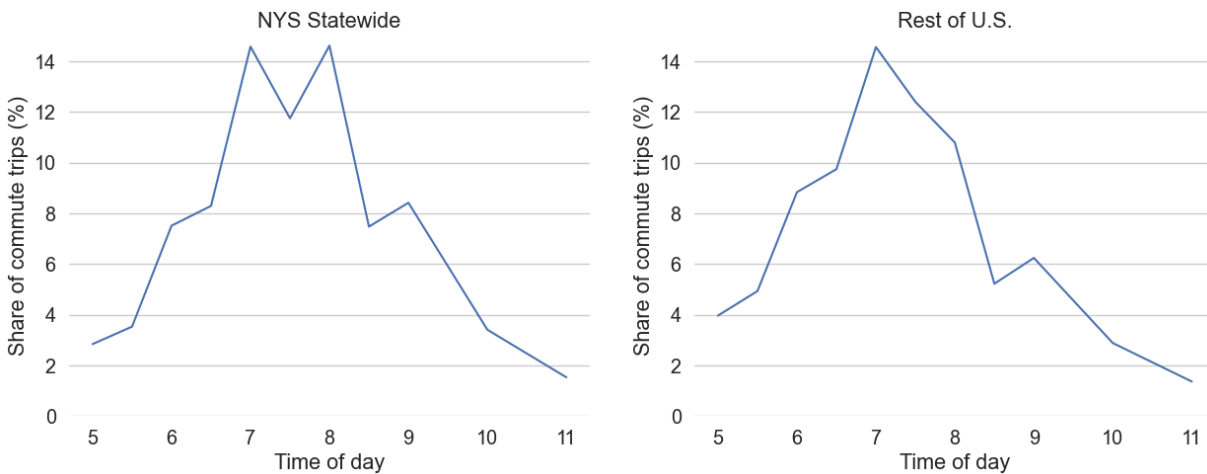


**Figure 5-15. Commute patterns in NYS and rest of the United States (ACS data)**

### 5.3.3    Length of POV Commute Trip by Population Density

The data presented in Figure 5-16 indicate that, on average, commuters from low-income households in NYS traveled shorter distances in POV compared to their counterparts from not low-income households. However, there was an exception in highly populated urban areas (with a population density of 25,000 or more), where low-income commuters traveled an average of one mile farther in POV than their not low-income counterparts. In the rest of the United States, low-income commuters traveled an average of two miles farther in POV compared to their not low-income counterparts in areas with a population density between 2,000 and 3,999. Moreover, for both income groups, commuters who live in areas with a population density higher than 2,000 tended to have lower POV distance.
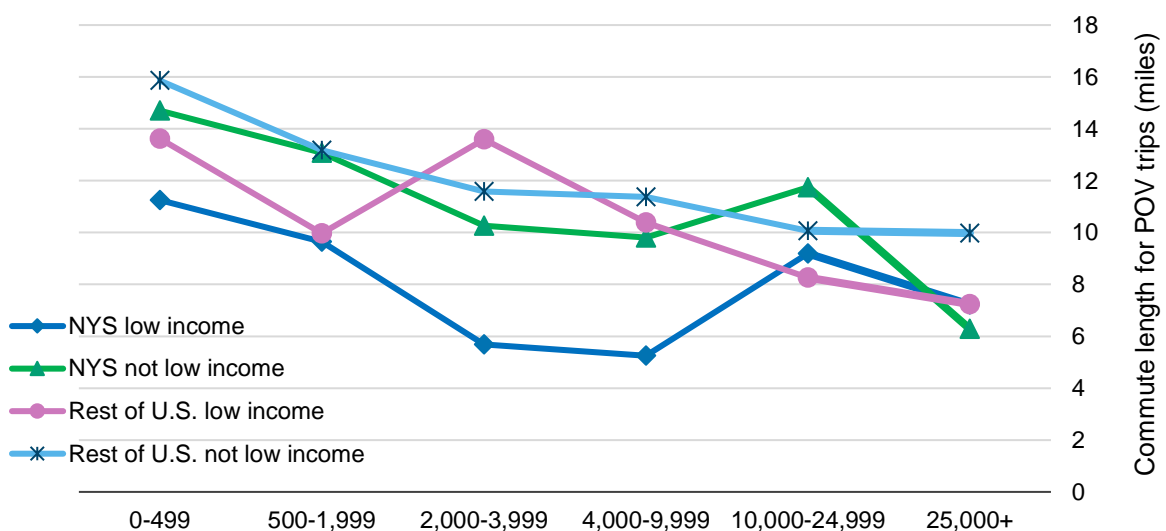


**Figure 5-16. Average POV commute trip length miles) by income status, population density, and region (NHTS 2017)**

Table 5-1 summarizes the daily commute length, travel time, and speed by mode for workers. The data indicate that, on average, workers from low-income households traveled fewer miles and had lower speeds than their not low-income counterparts for private vehicle and public transit in most regions. The difference in travel speed was smaller between the two income groups in regions with higher population density for private vehicle and public transit. For instance, in NYS where the population density was between 2,000-3,999, the average commute speed for public transit was 19.3 miles per hour for not low-income and 4.8 miles per hour for low-income. However, in regions with a population density higher than 25,000, the average commute speed for public transit was around 8 miles per hour for both income groups.

### 5.3.4    Average Commute Travel Time by Time of Day

Figure 5-17 illustrates the average travel time for all modes of transportation for commuters. The data show that, low-income individuals in NYS and rest of the United States had comparable travel time with their not low-income counterpart.
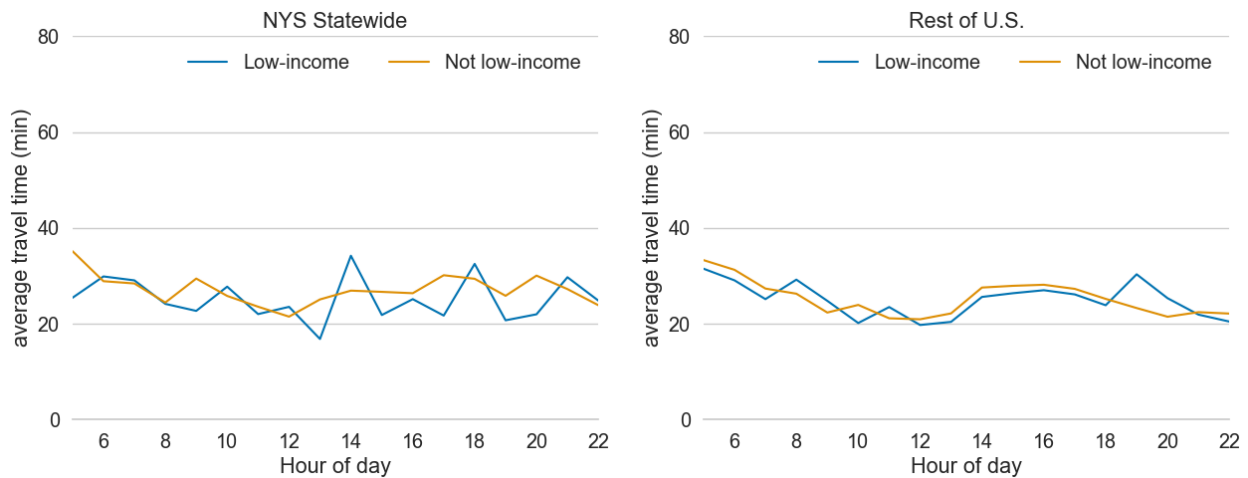


**Figure 5-17. Average travel time by time of day**

**Table 5-1. Commute trip statistics by mode, population density, and household income status (2017 NHTS)**

| Mode of Transportation for Commute Trips | Population Density (Population per square mile) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-499 | | 500-1,999 | | 2,000-3,999 | | 4,000-9,999 | | 10,000-24,999 | | 25,000+ | |
| | NYS | Rest of U.S. | NYS | Rest of U.S. | NYS | Rest of U.S. | NYS | Rest of U.S. | NYS | Rest of U.S. | NYS | Rest of U.S. |
| **Average Commute Length (miles)** | | | | | | | | | | | | |
| **Low-income** | | | | | | | | | | | | |
| Private Vehicle | 12.2 | 12.0 | 8.7 | 9.1 | 8.2 | 8.3 | 8.0 | 10.2 | 13.4 | 8.7 | 6.3 | 6.2 |
| Public Transit | 33.4 | 8.4 | 16.6 | 9.4 | 2.5 | 8.9 | 5.3 | 8.0 | 8.9 | 9.4 | 9.6 | 7.7 |
| Walk | 0.4 | 0.7 | 0.6 | 0.7 | 0.8 | 0.9 | 0.8 | 0.9 | 0.5 | 0.6 | 0.5 | 0.6 |
| Other | 9.6 | 28.2 | 1.0 | 9.3 | 1.5 | 3.1 | 2.4 | 2.9 | 33.2 | 3.8 | 5.2 | 7.4 |
| **Not low-income** | | | | | | | | | | | | |
| Private Vehicle | 15.2 | 15.3 | 11.9 | 13.0 | 11.1 | 11.6 | 9.7 | 10.9 | 11.6 | 10.9 | 10.8 | 12.9 |
| Public Transit | 37.6 | 20.0 | 27.1 | 25.4 | 27.0 | 21.3 | 23.3 | 14.6 | 12.4 | 8.4 | 8.0 | 5.8 |
| Walk | 0.5 | 0.7 | 1.0 | 0.8 | 0.6 | 0.7 | 0.7 | 0.6 | 0.5 | 0.6 | 0.6 | 0.7 |
| Other | 20.9 | 29.3 | 10.3 | 30.7 | 3.3 | 15.2 | 5.9 | 6.3 | 8.2 | 4.7 | 3.8 | 12.6 |
| **Commute Travel Time (minutes)** | | | | | | | | | | | | |
| **Low-income** | | | | | | | | | | | | |
| Private Vehicle | 22.3 | 23.4 | 23.4 | 22.4 | 21.6 | 22.4 | 19.5 | 24.6 | 30.6 | 25.5 | 32.5 | 21.7 |
| Public Transit | 80.4 | 46.0 | 82.7 | 60.4 | 30.7 | 53.6 | 44.9 | 66.2 | 58.4 | 67.8 | 63.1 | 53.7 |
| Walk | 6.2 | 11.8 | 13.6 | 19.3 | 15.5 | 19.7 | 19.5 | 18.7 | 12.2 | 16.0 | 16.2 | 14.2 |
| Other | 38.9 | 23.5 | 15.6 | 27.5 | 21.6 | 23.3 | 22.5 | 17.8 | 96.8 | 30.5 | 41.3 | 40.0 |
| **Not low-income** | | | | | | | | | | | | |
| Private Vehicle | 24.5 | 25.3 | 23.2 | 24.6 | 23.3 | 25.6 | 23.2 | 24.5 | 34.0 | 28.2 | 42.2 | 33.5 |
| Public Transit | 88.2 | 58.9 | 81.7 | 70.9 | 84.0 | 70.0 | 87.4 | 59.2 | 66.8 | 46.8 | 51.1 | 42.7 |
| Walk | 9.5 | 13.0 | 20.3 | 11.0 | 10.9 | 15.2 | 15.1 | 11.3 | 14.5 | 15.1 | 15.1 | 17.5 |
| Other | 24.8 | 48.0 | 44.2 | 51.0 | 20.3 | 25.0 | 30.2 | 25.9 | 71.2 | 25.4 | 25.1 | 20.2 |
| **Average Commute Speed (miles per hour)** | | | | | | | | | | | | |
| **Low-income** | | | | | | | | | | | | |
| Private Vehicle | 32.7 | 30.9 | 22.3 | 24.4 | 22.8 | 22.1 | 24.7 | 24.8 | 26.2 | 20.4 | 11.6 | 17.0 |
| Public Transit | 25.0 | 11.0 | 12.0 | 9.3 | 4.8 | 10.0 | 7.1 | 7.2 | 9.2 | 8.3 | 9.1 | 8.6 |
| Walk | 3.4 | 3.7 | 2.5 | 2.2 | 3.2 | 2.6 | 2.5 | 2.8 | 2.4 | 2.2 | 1.9 | 2.5 |
| Other | 14.8 | 71.8 | 3.9 | 20.3 | 4.1 | 8.0 | 6.3 | 9.6 | 20.6 | 7.4 | 7.5 | 11.2 |
| **Not low-income** | | | | | | | | | | | | |
| Private Vehicle | 37.2 | 36.3 | 30.7 | 31.6 | 28.5 | 27.1 | 25.1 | 26.7 | 20.5 | 23.1 | 15.4 | 23.2 |
| Public Transit | 25.6 | 20.4 | 19.9 | 21.5 | 19.3 | 18.2 | 16.0 | 14.8 | 11.2 | 10.8 | 9.4 | 8.2 |
| Walk | 2.9 | 3.4 | 2.8 | 4.4 | 3.0 | 2.9 | 2.6 | 2.9 | 2.1 | 2.4 | 2.4 | 2.3 |
| Other | 50.5 | 36.5 | 14.0 | 36.1 | 9.7 | 36.5 | 11.8 | 14.6 | 7.0 | 11.2 | 9.0 | 37.3 |

### 5.3.5 Average Commute Travel Time by Population Density

Figure 5-18 displays the average commute travel time for low-income and not low-income workers by population density. The data indicate that, on average, low-income workers had shorter commute travel times compared to their not low-income counterparts, regardless of population density. For example, in the most densely populated area of NYS, low-income workers spent an average of 32 minutes on POV commute, while their not low-income counterparts spent an average of 42 minutes. Moreover, the data suggest that people tended to have longer commute travel times in regions with higher population density.
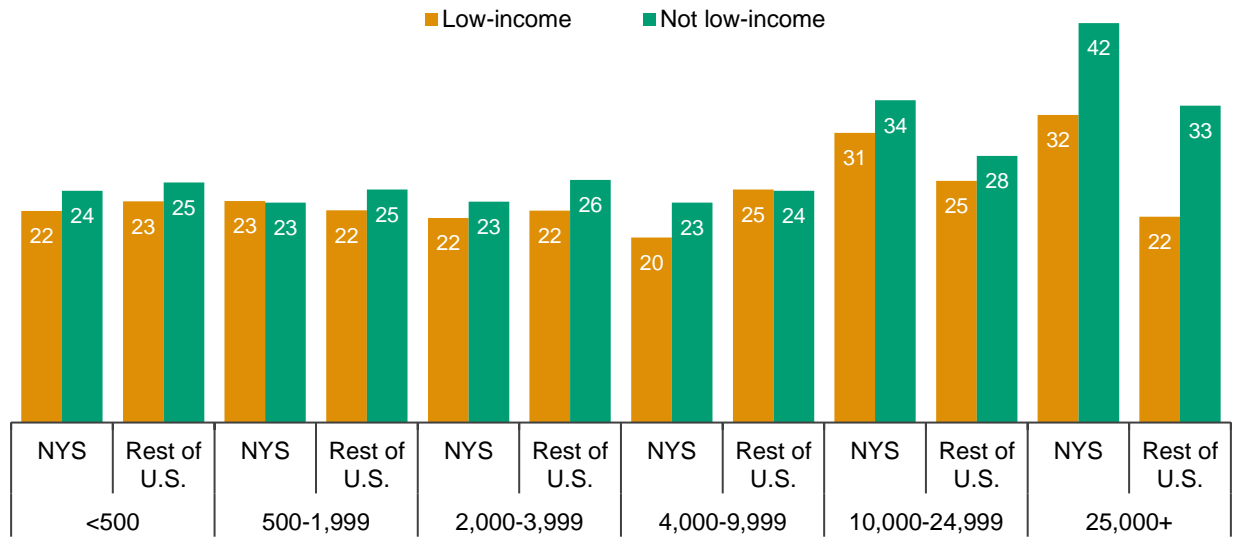


**Figure 5-18. Commute travel time per worker (minutes) for trips made using POV by income status and population density (2017 NHTS)**

The relationship between income and public transit commute time varies by region and population density (Figure 5-19). In regions with population density higher than 4,000 in the rest of the United States, low-income people experienced longer travel times compared to their not low-income counterparts when using public transit for commute. Conversely, in NYS, low-income people experienced shorter travel times compared to their not low-income counterparts using public transit for commute in regions where the population density was higher than 4,000 and lower than 25,000. For instance, in NYS where the population density was between 4,000 and 10,000, low-income people spent only around half the time on public transit for commute than their not low-income counterparts. In the most densely populated area (population density greater than 25,000), low-income people in both NYS and the rest of the United States spent longer on public transit for commute than their not low-income counterparts.
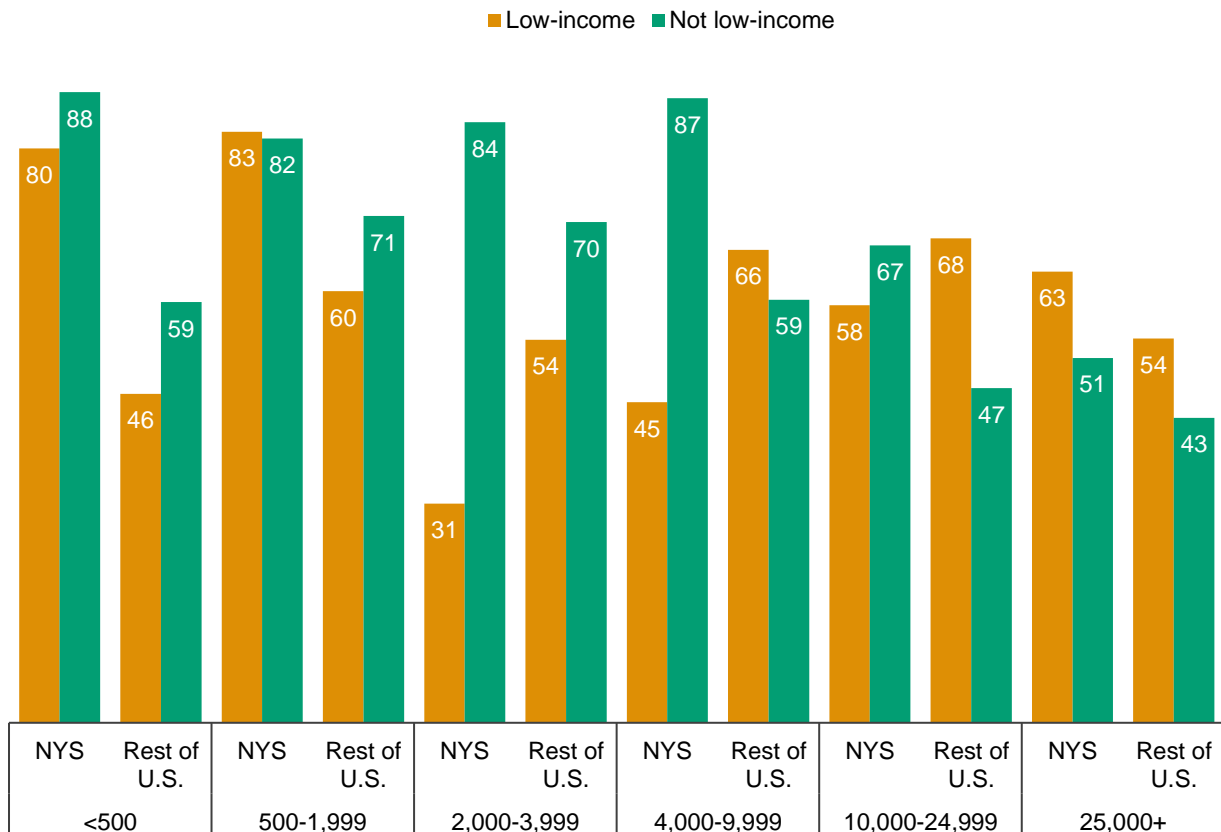
**Figure 5-19. Commute travel time per worker (minutes) for trips made using public transit by income status and population density (2017 NHTS)**

## 5.4    LOW-INCOME ZERO-VEHICLE HOUSEHOLDS

### 5.4.1    Effect on Mode Shares

Based on Table 5-2, there was a notable contrast in travel patterns between households with zero-vehicles and those with vehicles, and these distinctions persisted despite variations in income. Specifically, the data revealed that zero-vehicle households exhibited substantially lower PMT compared to their vehicle-owning counterparts, regardless of income level. For instance, the PMT for not low-income households with vehicles was approximately 2.3 times greater than that of their zero-vehicle counterparts. Furthermore, the disparities in travel behavior between low-income and not low-income groups were noteworthy, with low-income zero-vehicle households traveling about 47% less than not low-income zero-vehicle households in terms of PMT. The difference was even more pronounced for households with vehicles, where low-income households traveled about 55% fewer miles compared to their not low-income counterparts. In addition, the data showed that the average person trip length for low-income zero-vehicle households was about 34% less than not low-income zero-vehicle households.

Figure 5-20 provides insight into the mode share of person trips in zero-vehicle households by income status and region. Notably, the data revealed that low-income zero-vehicle households displayed a higher reliance on walking as a mode of transportation regardless of regions. For example, over half (51%) of all person trips were completed on foot in NYS non-urban areas. Meanwhile, POV utilization among this group amounted to only 25% of all person trips. On the other hand, among not low-income zero-vehicle

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households in non-urban areas in NYS, the use of POV still dominated as the most commonly utilized mode of transportation, accounting for 43% of all person trips.

**Table 5-2. Mobility statistics for NYS residents with/without access to vehicle (2017 NHTS)**

| | Zero-Vehicle Households | Households With Vehicles |
|---|---|---|
| **Percent person did not travel on travel day** | | |
| Low-income | 24.6% | 22.1% |
| Not low-income | 13.7% | 15.3% |
| **Average PT/person** | | |
| Low-income | 2.79 | 2.94 |
| Not low-income | 3.50 | 3.47 |
| % difference between income groups | -20.1% | -15.3% |
| **Average PMT/person (miles)** | | |
| Low-income | 9.30 | 19.08 |
| Not low-income | 17.57 | 42.09 |
| % difference between income groups | -47.1% | -54.7% |
| **Average Person trip length (miles)** | | |
| Low-income | 3.34 | 6.50 |
| Not low-income | 5.03 | 12.14 |
| % difference between income groups | -33.7% | -46.5% |
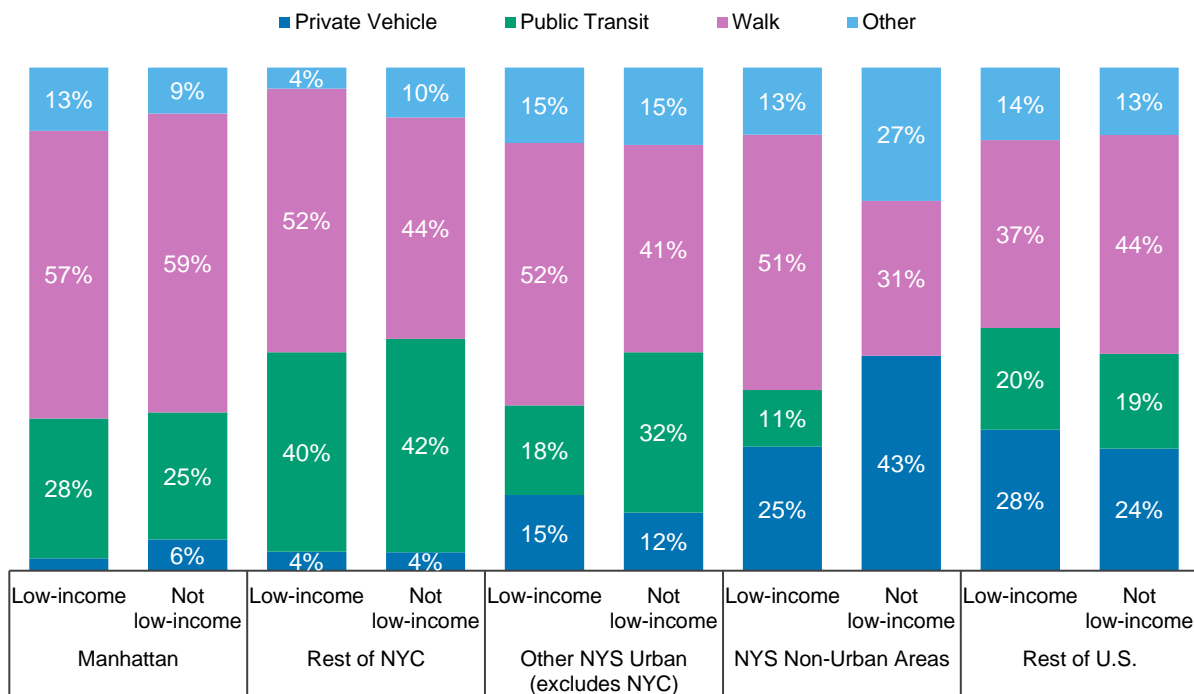


**Figure 5-20. Mode shares of person trips for zero-vehicle households by income status and region (2017 NHTS)**

The data presented in Figure 5-21 show the changes in travel behavior among low-income households with zero-vehicle between 2009 and 2017. The results indicated a notable decline in the proportion of private vehicle trips among low-income people residing in non-urban areas, decreasing from 40% to 25% from 2009 to 2017. Conversely, the proportion of public transit trips increased from 4% to 11% in non-

urban areas. Additionally, the data presented a slight decline in walking trips in both Manhattan and the rest of New York City, indicating a potential shift in travel mode among low-income individuals in these urban areas.
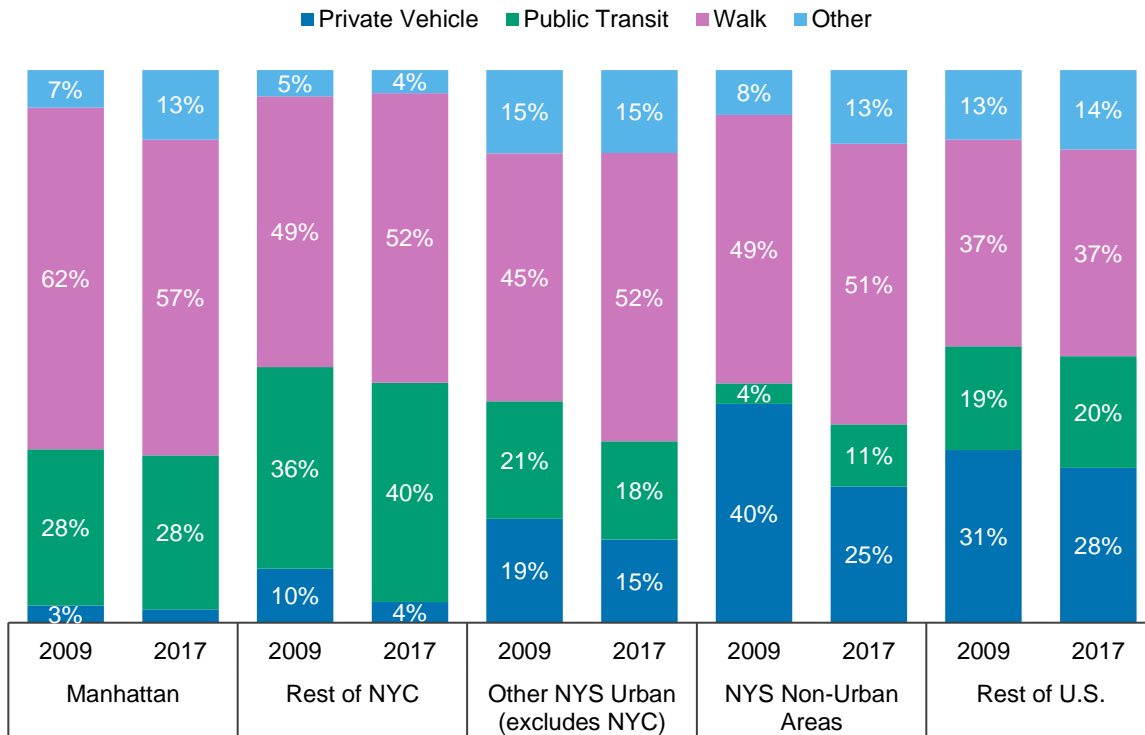


**Figure 5-21. Mode shares of person-trips for low-income with zero-vehicle households by region (2009 & 2017 NHTS)**

## 5.5    MOBILITY OF CHILDREN IN POVERTY

### 5.5.1    Person Trips

According to the 2017 NHTS, children (aged 5-15) from low-income households in NYS exhibited a lower number of daily person trips, with an average of 2.5 trips, in contrast to their not low-income counterparts who completed an average of 2.9 trips per day (Figure 5-22). Furthermore, the data indicate that regardless of income level, older adults (aged 16+) traveled more frequently than children. Moreover, a general decline in person trips was observed across all income and age groups in NYS from 2009 to 2017.

**Figure 5-22. Average daily person trips comparison between children (age 5-15 years old) and all others in NYS by income status (2009 & 2017 NHTS)**

### 5.5.2    Person Miles Traveled

As shown in Figure 5-23, children from low-income households in NYS traveled fewer person miles than their not low-income counterparts, completing an average of 9.6 miles in contrast to 23.4 miles per day in 2017. Moreover, the data show that children traveled fewer miles than adults, with an average of 9.6 miles for low-income children compared to 15.6 miles for low-income adults in 2017. The disparity in person miles traveled (PMT) was more significant for not low-income individuals, as children from these households completed 23.4 miles, whereas their adult counterparts traveled 1.8 times more, or 41.3 miles. Furthermore, an overall increase in PMT was observed across all income and age groups in NYS from 2009 to 2017. Specifically, not low-income adults exhibited the most substantial increase, completing 20% more miles in 2017 than in 2009.
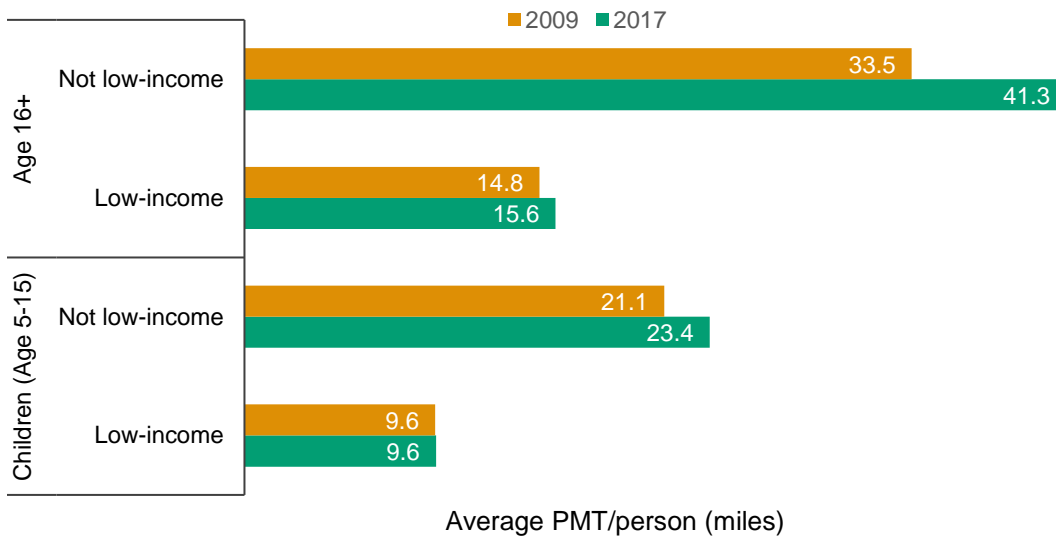


**Figure 5-23. Average daily PMT/person comparison between children (age 5-15 years old) and all others in NYS by income status (2017 & 2009 NHTS)**

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### 5.5.3 Average Person Trip Length

The average person-trip length for children and adults in NYS (Figure 5-24) followed a similar pattern to that of PMT (Figure 5-23). Specifically, on average, children from low-income households had shorter person-trip lengths than their not low-income counterparts, traveling 3.9 miles per trip compared to 8.1 miles per trip in NYS. While children from low-income households did not experience significant changes in their person trip length between 2009 and 2017, not low-income children saw a slight increase in their average person trip length.
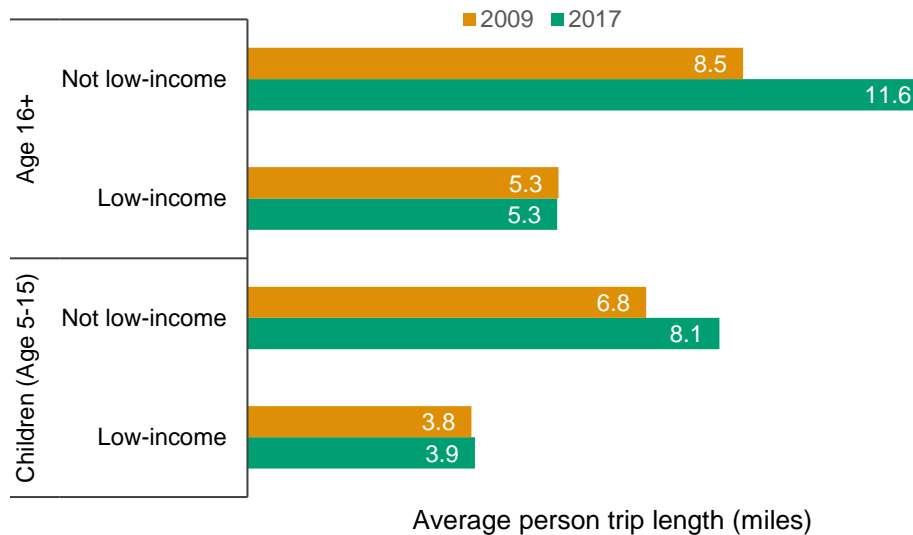


**Figure 5-24. Comparison of average person trip length in miles between children (ages 5-15 years old) and others in NYS by income status (2017 & 2009 NHTS)**

### 5.5.4 Mode Shares of Trips Made by Children (ages 5-15 years old)

Table 5-3 compares the mode share of person trips for children (ages 5-15 years old) in NYS with rest of the United States by income status. The results indicate that children from low-income households had a substantially lower proportion of private vehicle trips (38.5%) compared to their not low-income counterparts (61.2%) in NYS. Conversely, children from low-income households had a higher proportion of walking trips (31.5%) relative to their not low-income counterparts (17.9%). Moreover, children from low-income households in NYS had a significantly lower PMT of 9.6 miles, as opposed to their not low-income counterparts with a PMT of 23.4 miles. These findings are consistent with those from the rest of the United States.

**Table 5-3. Mobility statistics of children by mode of transportation and household income status (2017 NHTS)**

| Statistics | NYS | | Rest of the U. S. | |
|---|---|---|---|---|
| | Low-income | Not low-income | Low-income | Not low-income |
| **Among children under 16** | **30.4%** | **69.6%** | **26.7%** | **73.3%** |
| **Average person trips/person** | **2.5** | **2.9** | **2.5** | **2.9** |
| Private Vehicle | 38.5% | 61.2% | 62.2% | 77.3% |
| Public Transit | 7.7% | 4.9% | 1.7% | 0.4% |
| Walk | 31.5% | 17.9% | 15.9% | 8.7% |

| Statistics | NYS | | Rest of the U. S. | |
|---|---|---|---|---|
| | Low-income | Not low-income | Low-income | Not low-income |
| Other | 22.3% | 16.0% | 20.2% | 13.6% |
| **Average PMT/person** | **9.6** | **23.4** | **17.5** | **28.2** |
| Private Vehicle | 60.8% | 73.3% | 69.0% | 80.1% |
| Public Transit | 12.0% | 3.5% | 1.3% | 0.5% |
| Walk | 4.2% | 1.5% | 1.3% | 0.5% |
| Other | 23.1% | 21.6% | 28.5% | 18.9% |
| **Average person trip length** | **3.9** | **8.1** | **7.1** | **9.7** |

## 5.6    LOW-INCOME ELDERLY

As shown in Table 5-4, at the household level, a substantial proportion of elderly households comprise of single occupants, exceeding 50%. The prevalence of single occupant households was slightly higher in rest of the United States, with a ratio of 56%, than in New York City (54.3%) and the rest of NYS (54.3%). At the person level, however, the proportion of elderly individuals living alone is lower. In New York City, approximately 32% of the elderly population resided alone.

**Table 5-4. Low-income elderly households by household size and region (2017 NHTS)**

| Low-income elderly households (HHs) | Number of Households | | | Number of Persons | | |
|---|---|---|---|---|---|---|
| | 1-person HHs | 2+ person HHs | % live alone | 1-person HHs | 2+ person HHs | % live alone |
| New York City | 204,507 | 174,290 | 54.0% | 258,739 | 543,475 | 32.3% |
| Rest of NYS | 210,821 | 177,377 | 54.3% | 210,182 | 436,481 | 32.5% |
| Rest of U.S. | 5,627,741 | 4,427,484 | 56.0% | 5,690,874 | 12,467,158 | 31.3% |

In 2017, over half of the trips made by low-income elderly households were for family or personal business, regardless of regions (Figure 5-25). In addition, households with two or more occupants had more commute trips compared to single-occupant households, regardless of region. For instance, households with two or more occupants had more than three times the number of commute trips compared to single-occupant households in New York City. Overall, no significant regional differences were found.
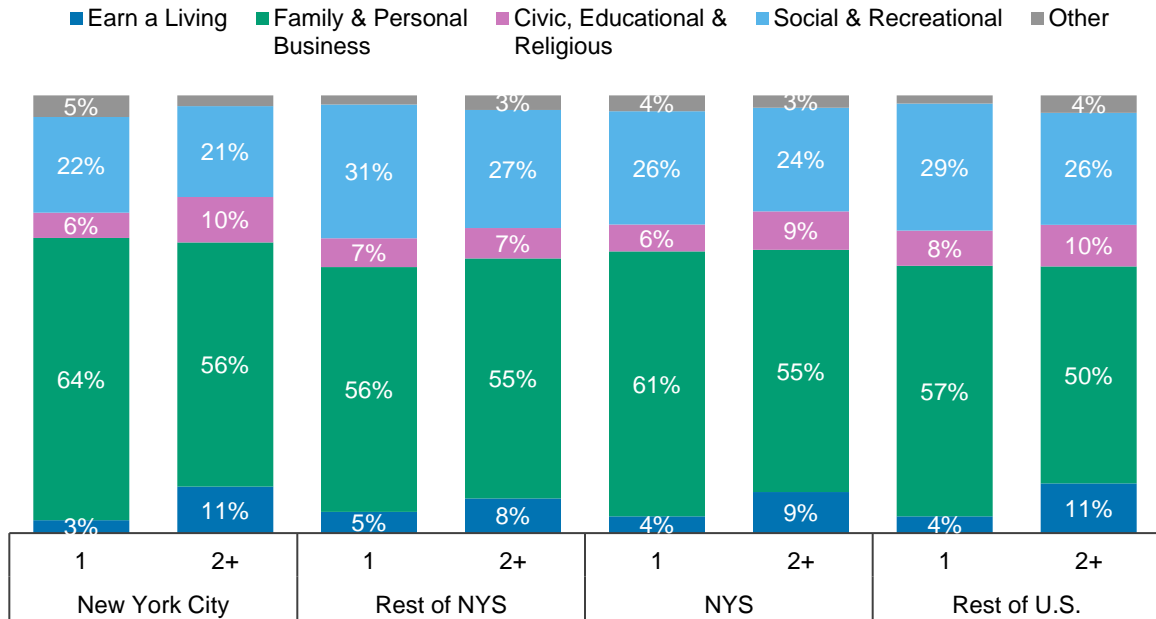
**Figure 5-25. Shares of person trips for low-income elderly households by trip purpose, household size, and region (2017 NHTS)**

Figure 5-26 shows that among elderly low-income households, those with 2 or more occupants had more POV passenger trips, regardless of the region. In contrast, households with only one occupant tended to make a higher proportion of trips by transit than their counterparts with 2 or more occupants. For instance, in New York City, 27% of trips made by households with a single occupant were by transit, whereas only 16% of trips made were by households with 2 or more occupants.
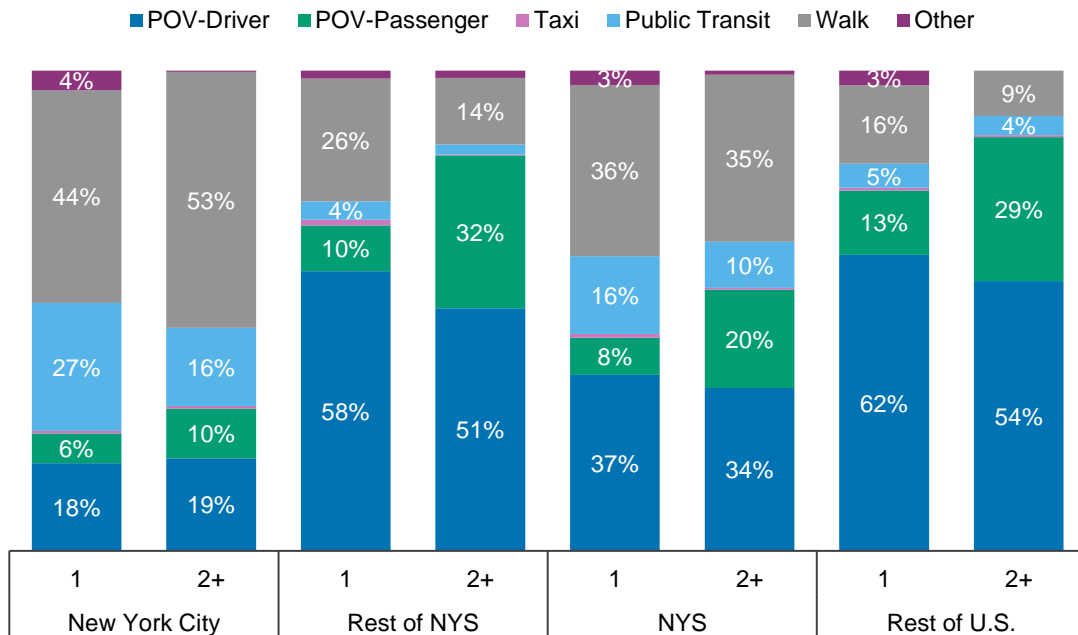


**Figure 5-26. Mode share of person trips made by individuals from low-income elderly households by household size and region (2017 NHTS)**

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Figure 5-27 provides an overview of mobility statistics, including person trips (PT), person miles traveled (PMT), and average PT length, for different household compositions and regions. The data show that low-income single elderly individuals in NYS had slightly higher PT compared to those in households with 2 or more occupants, regardless of the region. On the other hand, the PMT was higher for elderly households with 2 or more occupants than their single-occupant counterparts, and this difference was most significant in the rest of the NYS. Specifically, households with 2 or more occupants traveled an average of 20.6 miles per day, while households with a single occupant traveled an average of 15 miles per day in the rest of the NYS.
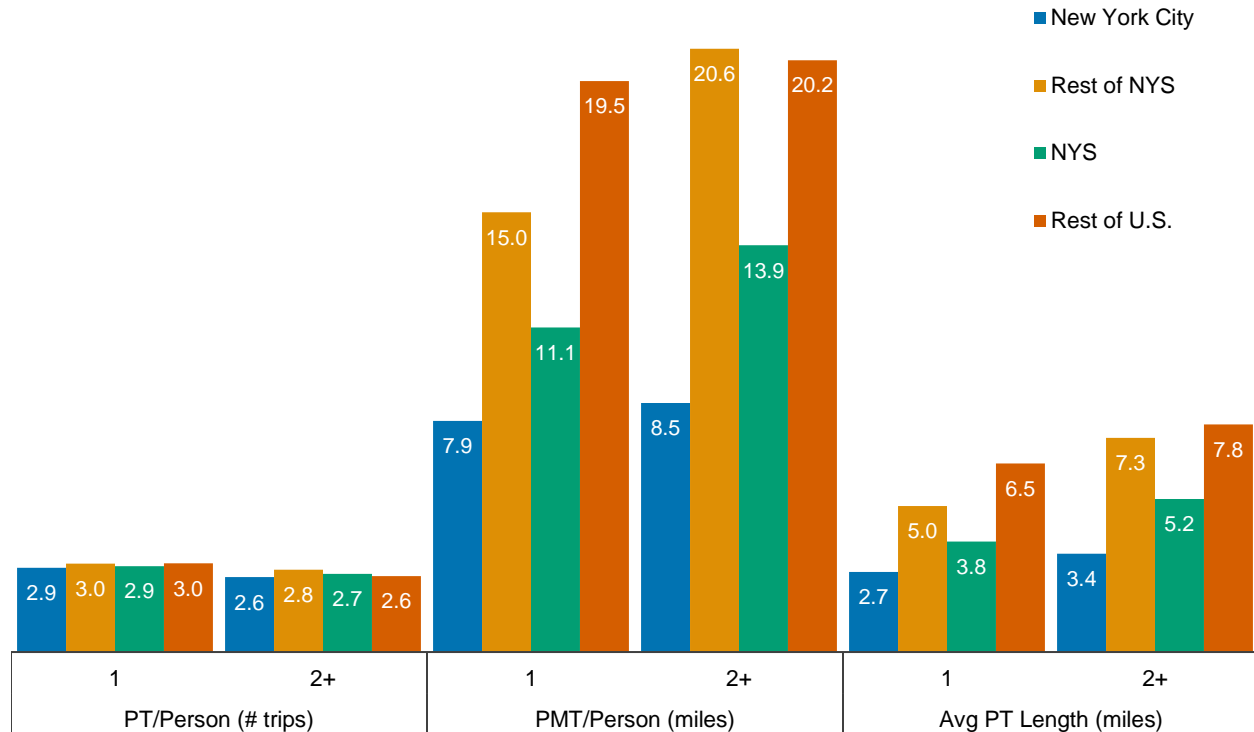


**Figure 5-27. Travel statistics for trips made by persons from low-income elderly households by size of household and region (2017 NHTS)**

Figure 5-28 presents travel statistics in terms of vehicle trips (VT), vehicle miles traveled (VMT), and average vehicle trip length for different household compositions and regions. The data indicate that single-occupant elderly households had slightly higher vehicle trips per driver compared to their counterparts with 2 or more occupants, regardless of the region. Furthermore, the rest of NYS had a higher number of vehicle trips than New York City, regardless of household size. However, the VMT did not differ significantly between the two groups of households.
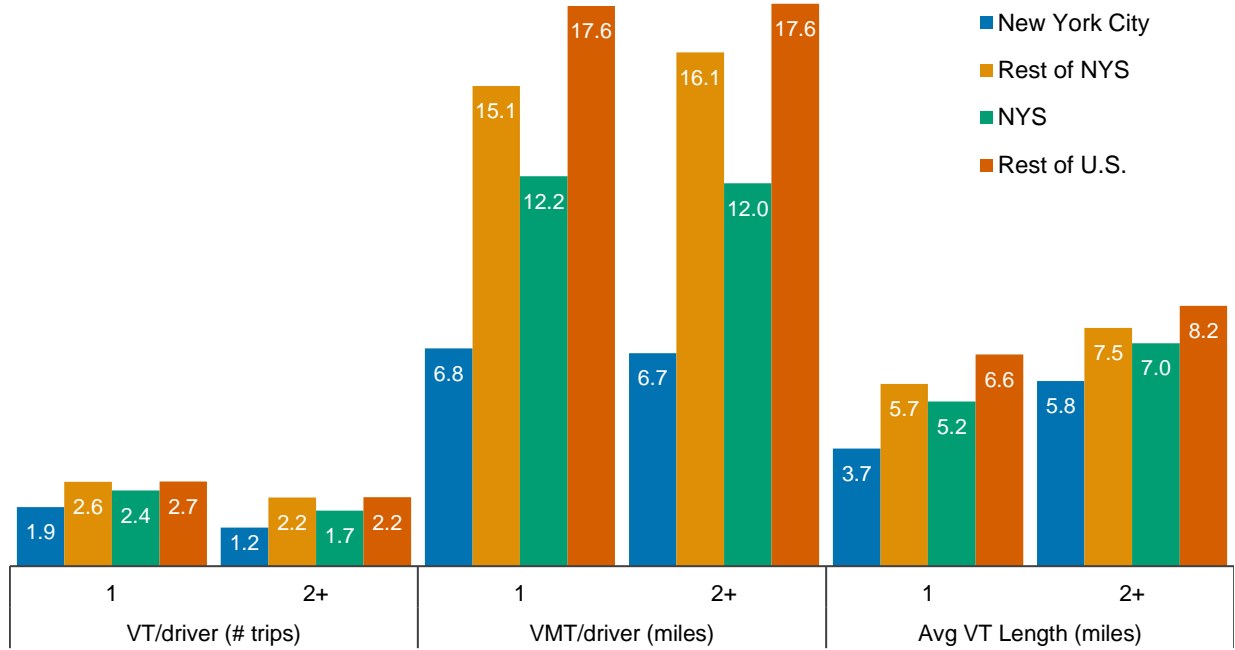
**Figure 5-28. Travel statistics for vehicle trips made by drivers from low-income elderly households by size and region (2017 NHTS)**

# 6. TRAVEL COST AND INTERNET ACCESSIBILITY OF LOW-INCOME HOUSEHOLDS

Under the 2017 NHTS recruitment survey, one adult from each participating household was asked to respond to questions about their travel experience on mode use and travel cost, as well as their frequency of internet access. Using information gathered from that recruitment survey, this section specifically examines low-income respondents' views on travel cost and their frequency of internet access.

## 6.1 VIEWS OF TRAVEL COST IMPACTS ON TRAVEL BEHAVIOR

Specifically, the recruitment survey asked the respondent from each surveyed household to answer the question "How much do you agree or disagree with each of the following?" This includes five parts as listed below:
- The price of gas affects the number of places I go.
- Getting from place-to-place costs too much.
- I walk to places to save money.
- I bike to places to save money.
- I use public transportation to save money.

For each part listed under the question, the survey respondent would select one option from the provided list of strongly agree, agree, neutral (neither agree or disagree), disagree, and strongly disagree. Note that the statistics presented in the following sections are person-based.

### 6.1.1  Price of Gas Affects Amount of Travel

Based on Figure 6-1, there is a notable difference in perception between low-income and not low-income people regarding whether gas prices affect travel, regardless of location. Specifically, a higher percentage of low-income people agree with this statement than their not low-income counterparts. Moreover, low-income people residing in non-urban areas are more likely to feel that gas prices impact their travel (41%) compared to their counterparts in New York City (NYC), the rest of NYS, and the rest of the United States A higher proportion of low-income people who live in NYC have neutral attitudes toward this statement (36%) than the rest of NYS and the rest of U.S.  For not low-income people, those who live in non-urban areas are also more likely to feel that gas price affects their travel than their counterparts in NYC (22% vs. 8%).
Further comparisons were made to determine whether households owning an alternative fuel vehicle showed a similar pattern. The results indicate that in NYS, 52% of low-income households that own at least one alternative fuel vehicle strongly agree or agree with the statement, while only less than half (23%) of their non-low-income counterparts do so. For households without alternative fuel vehicle, 65% of low-income households strongly agree or agree with the statement, while 42% of their non-low-income counterparts do so.

## Gas Price Affect Travel
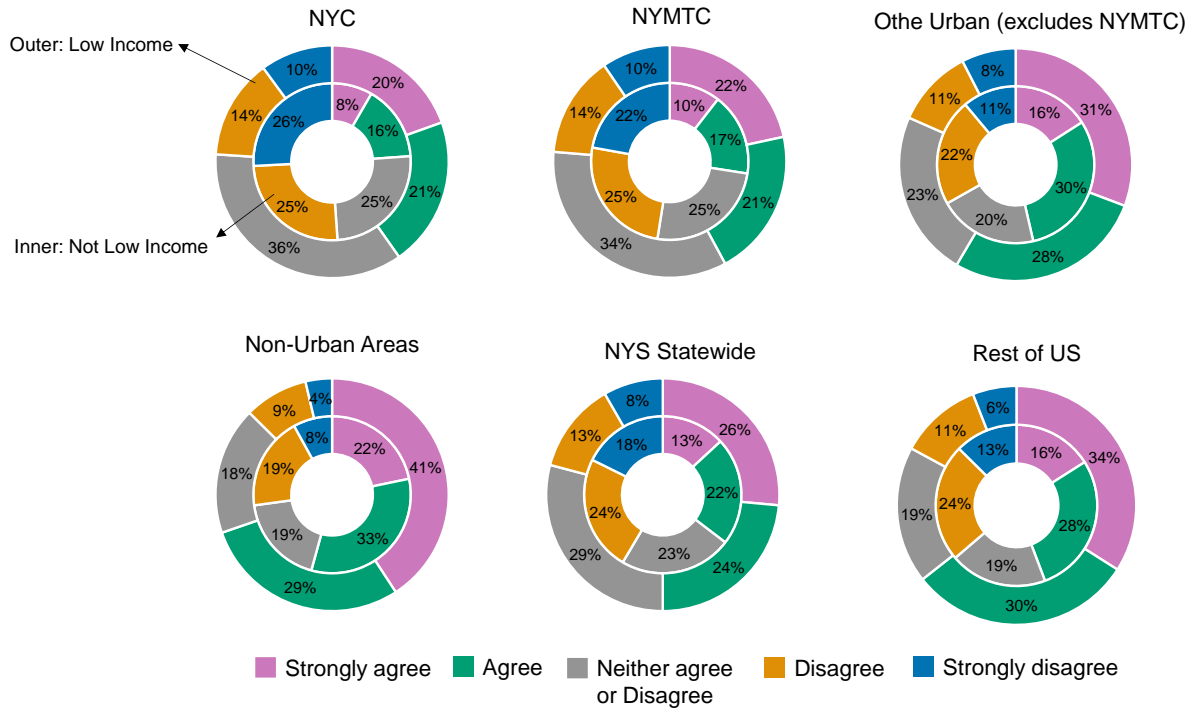


**Figure 6-1. Share of ratings on "The price of gas affects the number of places I go" by income status and region (2017 NHTS)**

### 6.1.2    Travel Costs Too Much

Figure 6-2 illustrates the perception distribution toward whether travel costs too much. A significantly higher percentage of low-income people agree with this statement than their not low-income counterparts, regardless of location. For low-income people, over half of those who live in NYC agree (39% agree, 32% strongly agree) that travel costs too much, which is higher than their counterparts in the rest of NYS and the rest of the United States Those who live in other urban areas (excluding NYMTC) and the rest of U.S. are more likely to disagree with this statement. For not low-income people, 17% of those who live in NYC strongly agree that travel costs too much and 33% agree with this statement. Those who live in the rest of the United States are more likely to disagree with this statement (23%).

**Getting from place to place costs too much**
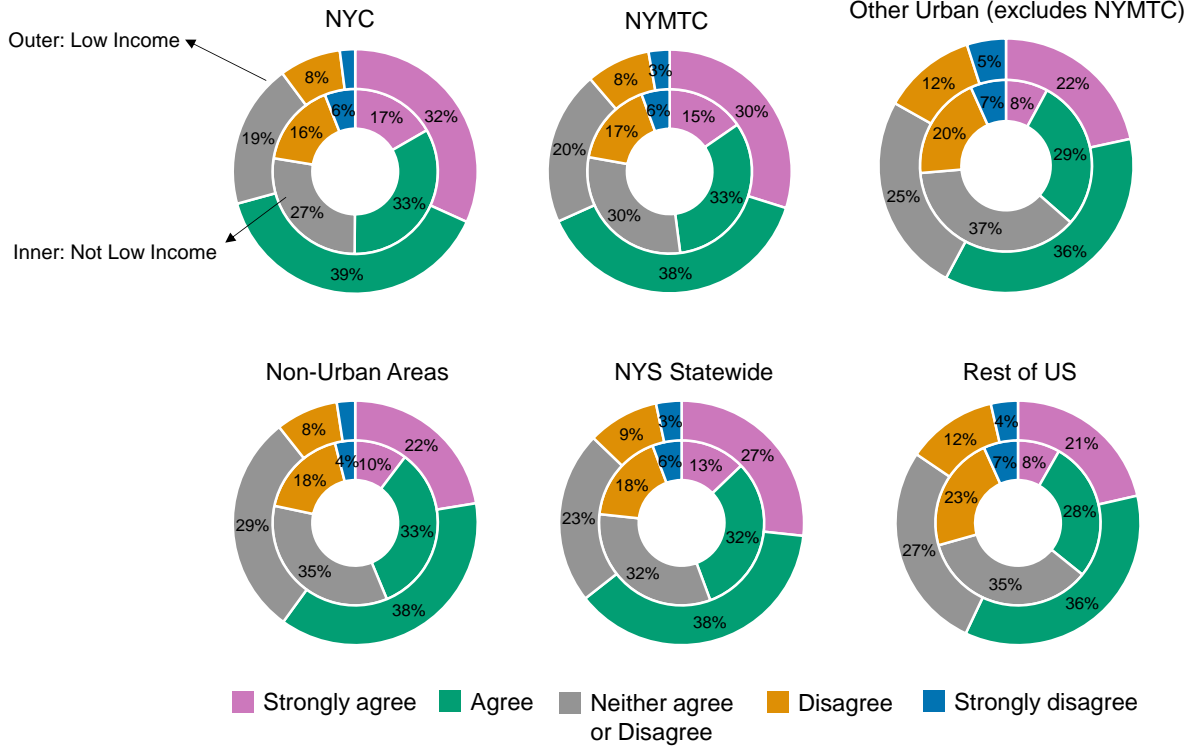


**Figure 6-2. Share of ratings on "Getting from place to place costs too much" by income status and region (2017 NHTS)**

### 6.1.3 Walk to Save Money

Figure 6-3 depicts the share of ratings on "I walk to places to save money" by income status and region. A higher percentage of low-income people strongly agree or agree with this statement than their not low-income counterparts, regardless of location. Over 50% of low-income people in NYC agree (38% agree, 27% strongly agree) that they walk to save money, a proportion surpassing their counterparts in both the rest of NYS and the U.S. This pattern can also be observed on not low-income people. For low-income people, a significantly lower share of the low-income people strongly disagrees (8%) with this statement compared to their counterparts in NYS (14%) and the rest of the United States (21%).

# I walk to places to save money
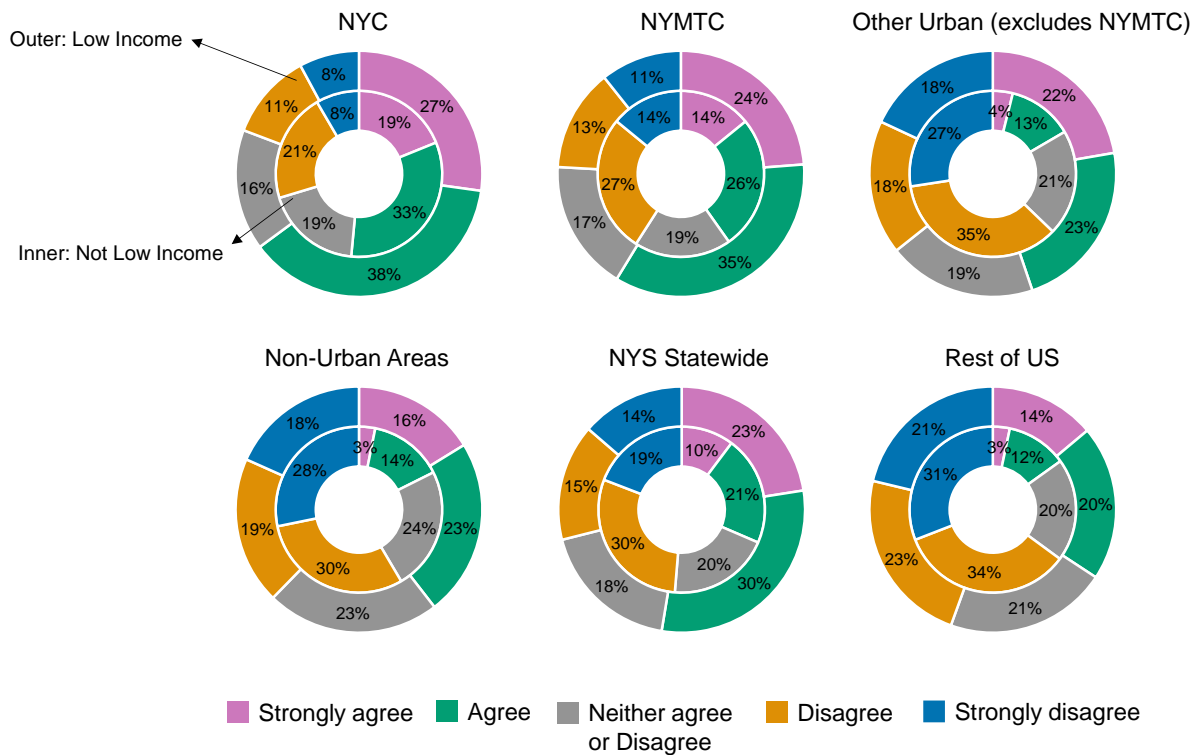


**Figure 6-3. Share of ratings on "I walk to places to save money" by income status and region (2017 NHTS)**

## 6.1.4    Bike to Save Money

In Figure 6-4, the percentage of ratings for the statement "I bike to places to save money" is shown by income status and region. It reveals that across all regions, there is a greater proportion of people with neutral or strongly disagree attitudes compared to other attitude groups. Low-income people have a smaller percentage of neutral attitudes compared to their not low-income counterparts. For example, there are 29% of the low-income people in NYC have neutral attitudes toward this statement while 34% of their counterparts have the same attitude. For low-income people, nearly 20% of those who live in NYC agree (11%) or strongly agree (8%) that they bike to places to save money, which is higher than their counterparts in the rest of NYS and the rest of the United States Nearly 40% of the low-income people in other urban areas (excluding NYMTC) strongly disagree with this statement, which is higher than their counterparts in the rest of NYS or the rest of the United States For not low-income people, over 30% of them strongly disagree with the statement, regardless of location. In particular, over 40% of the not low-income people in the rest of the United States strongly disagree that they bike to places to save money, which is higher than their counterparts in NYS.

## I bike to places to save money



NYC

NYMTC

Other Urban (excludes NYMTC)

Non-Urban Areas

NYS Statewide

Rest of US

Outer: Low Income
Inner: Not Low Income

Legend: Strongly agree — Agree — Neither agree or Disagree — Disagree — Strongly disagree
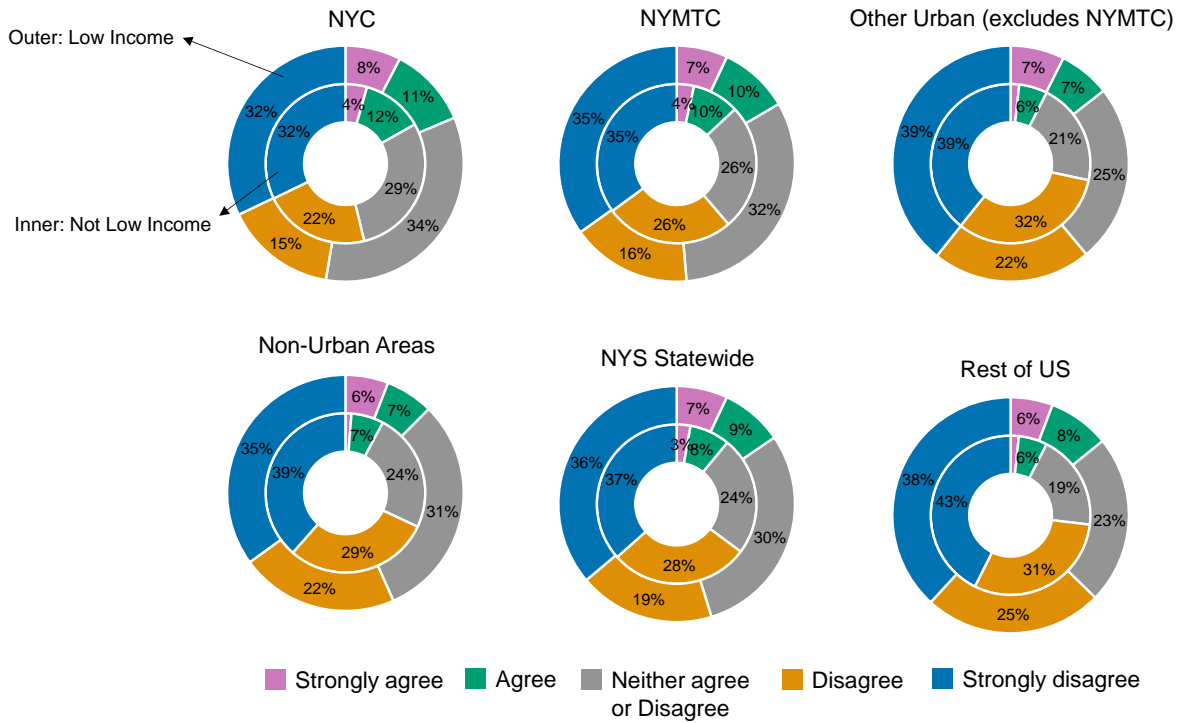
**Figure 6-4. Share of ratings on "I bike to places to save money" by income status and region (2017 NHTS)**

### 6.1.5 Use Public Transportation to Save Money

According to Figure 6-5, low-income people across all regions are more likely to strongly agree with the statement "I bike to places to save money" than their not low-income counterparts. For low-income people, over half of those who live in NYC agree (33%) or strongly agree (37%) that they use public transportation to places to save money, which is higher than their counterparts in the rest of NYS and the rest of the United States For not low-income people, 33% of them strongly agree and 32% agree that they use public transportation to places to save money, which is higher than the rest of NYS and the rest of the United States

# I use public transportation to save money



**NYC**

Outer: Low Income

Inner: Not Low Income

6%, 9%, 9%, 14%, 15%, 13%, 33%, 37%, 32%, 33%

**NYMTC**

11%, 15%, 10%, 19%, 17%, 16%, 24%, 32%, 27%, 31%

**Other Urban (excludes NYMTC)**

26%, 39%, 18%, 31%, 22%, 3%, 8%, 17%, 20%, 17%

**Non-Urban Areas**

9%, 5%, 11%, 24%, 31%, 43%, 20%, 26%, 30%

**NYS Statewide**

17%, 24%, 13%, 23%, 20%, 16%, 25%, 20%, 18%, 25%

**Rest of US**

30%, 41%, 21%, 27%, 21%, 4%, 9%, 13%, 15%, 19%

■ Strongly agree  ■ Agree  ■ Neither agree or Disagree  ■ Disagree  ■ Strongly disagree
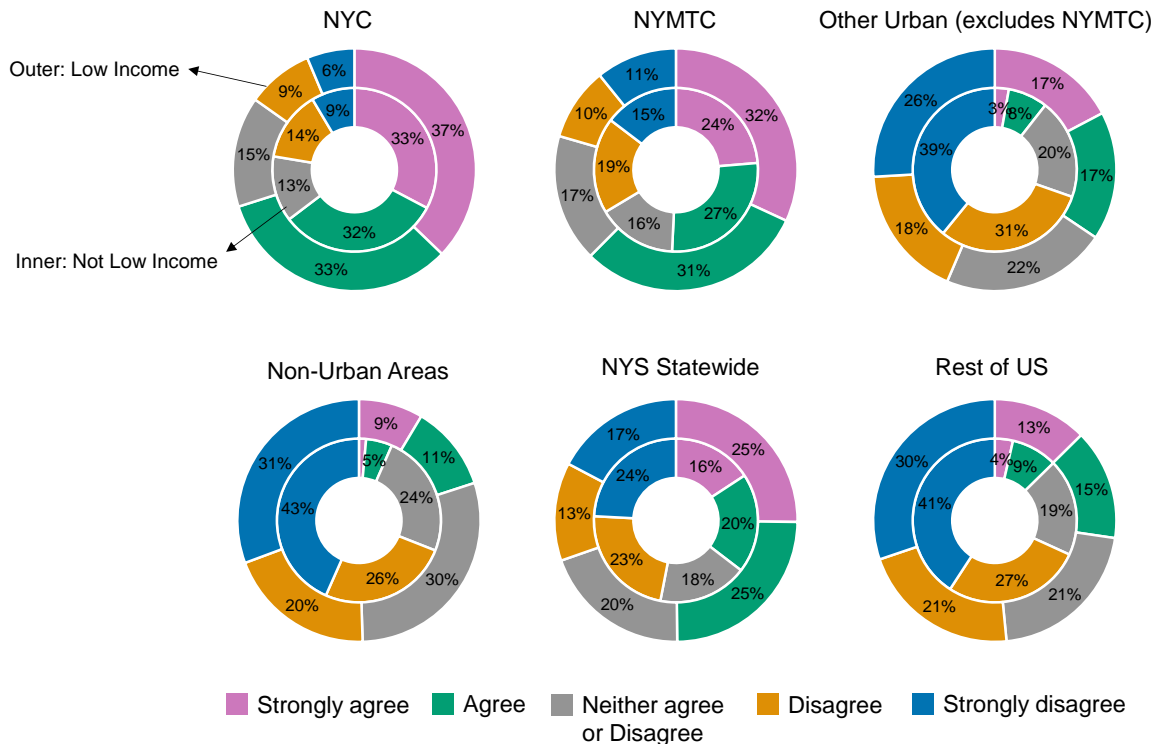
**Figure 6-5. Share of ratings on "I use public transportation to save money" by income status and region (2017 NHTS)**

## 6.1.6 Overall Travel Costs Concerns

The share of respondents who indicated "strongly agree" or "agree" with each of the five statements was further summarized by respondent income status and region. Figure 6-6 presents the overall price concerns and different alternative modes to save travel expenditure. Low-income people care more about travel costs compared to their not low-income counterparts. Among the three transportation modes being considered, walk and public transit were more likely to be used than bike, according to the responses, as an alternative mode by low-income people to save travel costs regardless of where they lived. The difference of opinions on mode choice behavior, between low-income and not low-income people in each region, was most noticeable for walk.
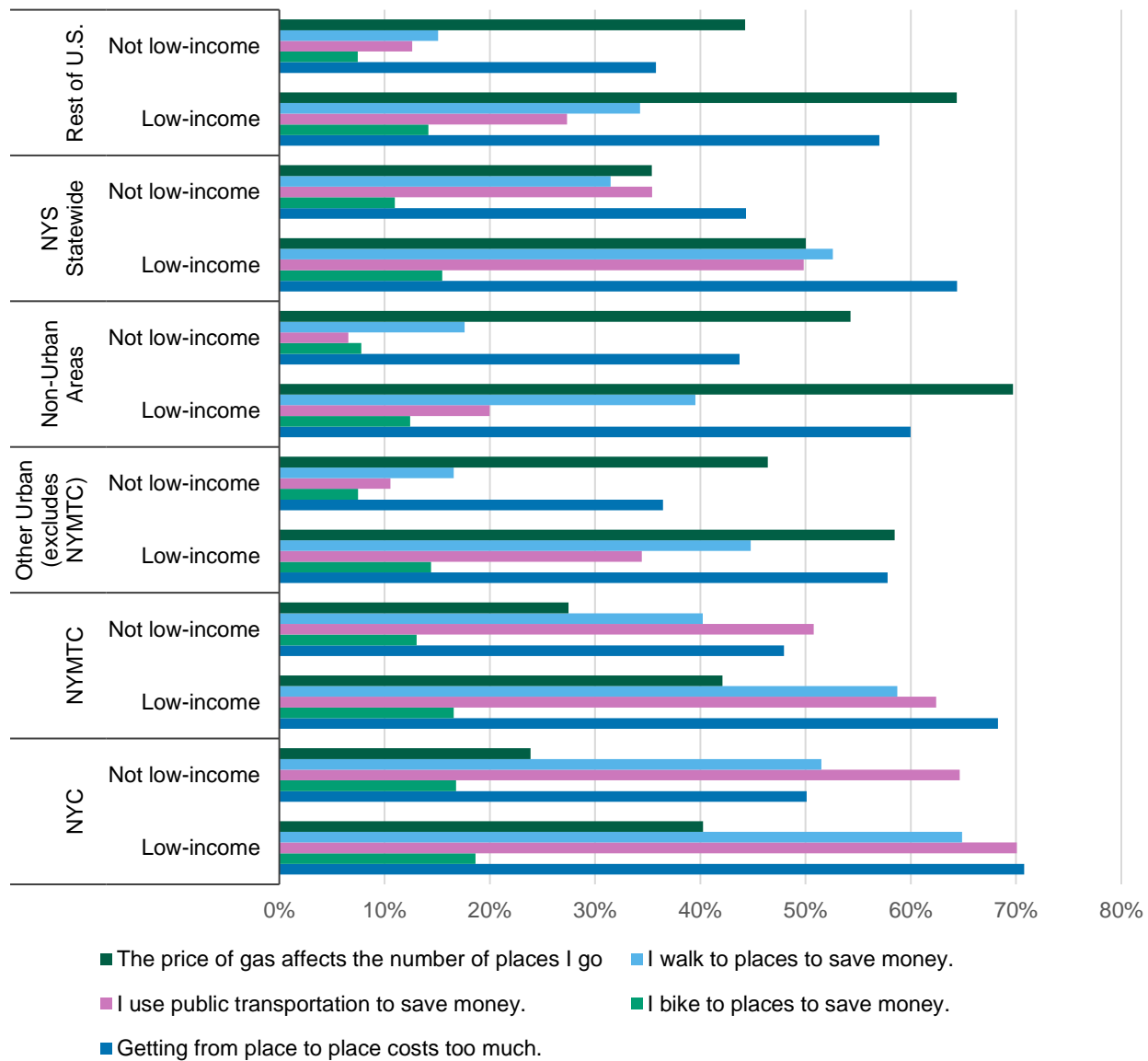
**Figure 6-6. Issues associated with travel concerns (2017 NHTS)**

## 6.2 ACCESS TO THE INTERNET BY TECHNOLOGY

Figure 6-7 shows the frequency of desktop or laptop computer use to access the Internet. Low-income people have a lower frequency of using desktop or laptop computer to access the Internet than their not low-income counterparts, regardless of location. At least 70% of the not low-income people use desktop or laptop computer to access the Internet on a daily basis regardless of location, while only less than 50% of low-income people do that on a daily basis. Low-income people are more likely to use desktop or laptop computers to access the Internet infrequently, compared to their not low-income counterparts. Specifically, 10% of low-income people in NYC use these devices only a few times a month, while only 3% of not low-income people do. Additionally, a higher proportion of low-income people never use desktop or laptop computers to access the Internet, regardless of their geographic location, compared to their not low-income counterparts.
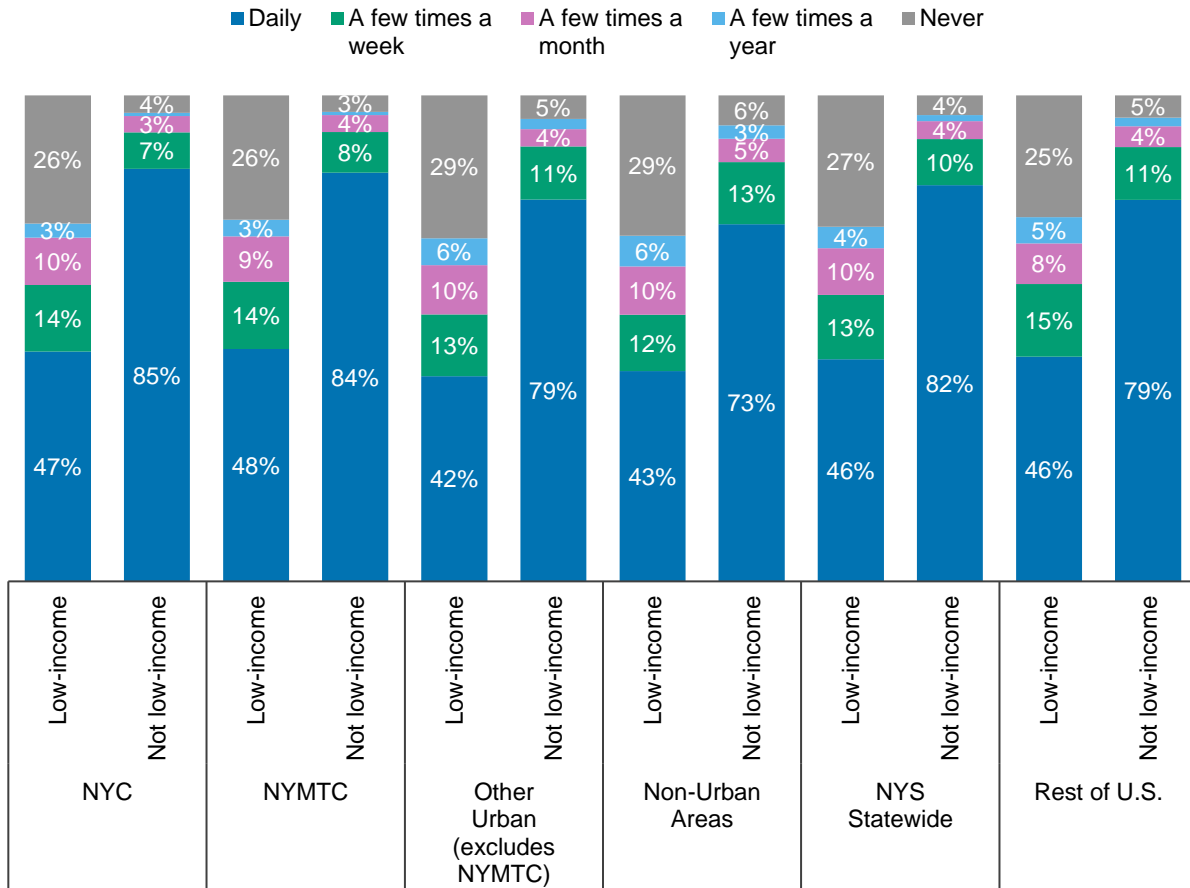
**Figure 6-7. Frequency of Desktop or Laptop Computer use to access the Internet**

Figure 6-8 shows the frequency of smartphone use to access the Internet. Low-income people have a lower frequency of using smartphone to access the Internet than their not low-income counterparts, regardless of location. Over 80% of the not low-income people use smartphone to access the Internet on a daily basis regardless of location, while only around 60% of low-income people do that on a daily basis. Furthermore, there is a significantly higher proportion of low-income people who never used a smartphone to access the Internet in non-urban areas (38%) than their not low-income counterparts (23%). Low-income people tend to use smartphones less frequently than their higher-income counterparts to access the Internet, regardless of geographic region. To illustrate, in NYS, 32% of low-income people report never using a smartphone to access the Internet, compared to only 12% of their higher-income peers.

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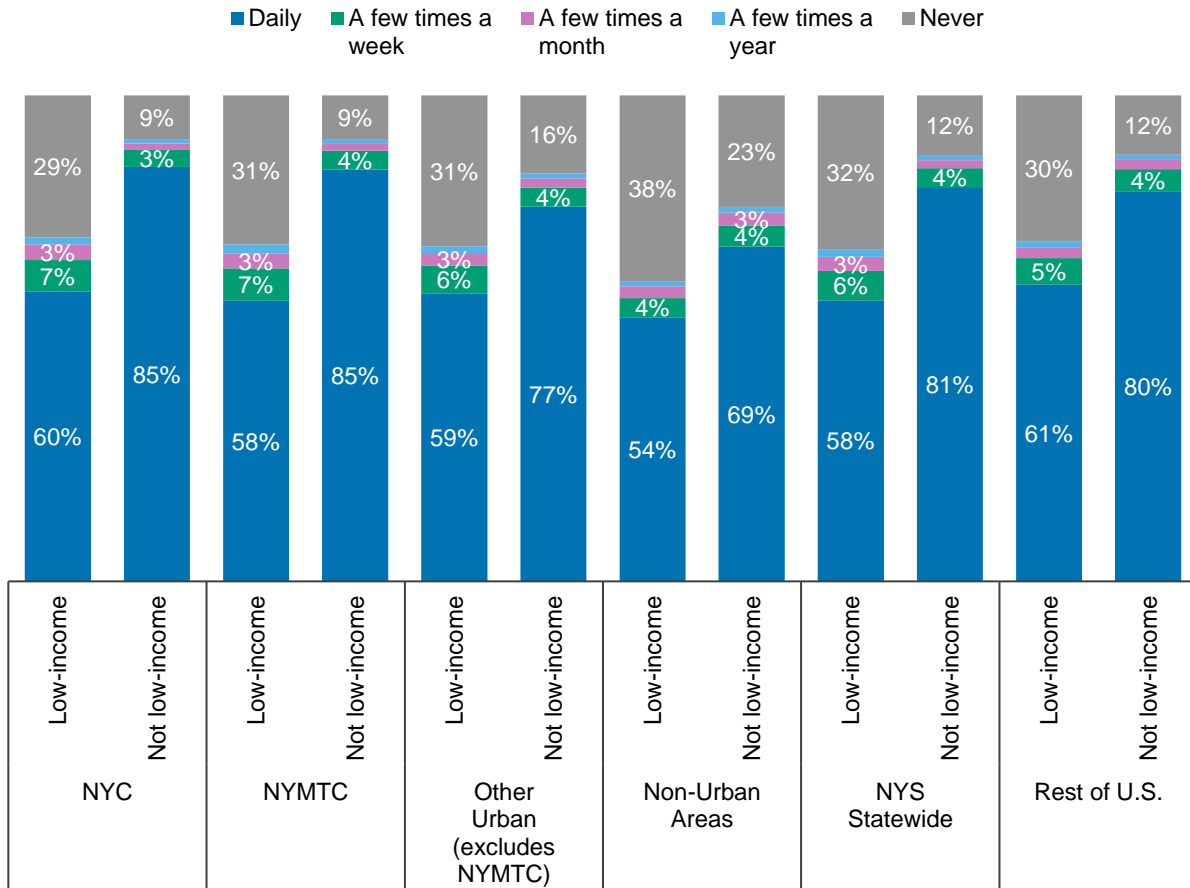
**Figure 6-8. Frequency of Smartphone use to access the Internet**

Figure 6-9 shows the frequency of tablet use to access the Internet. Low-income people have a lower frequency of using tablet to access the Internet than their not low-income counterparts, regardless of location. There is a higher proportion of people in non-urban areas in NYS never used a tablet to access the Internet than other areas for both income groups. For example, nearly 60% of low-income people never used a tablet to access the Internet in non-urban areas of NYS, while half of that proportion of the not low-income people never used a tablet to access the Internet in the same region. Low-income people tend to use tablets less frequently than their higher-income counterparts to access the Internet, regardless of geographic region. To illustrate, in NYS, 49% of low-income people report never using a tablet to access the Internet, compared to only 28% of their higher-income peers.
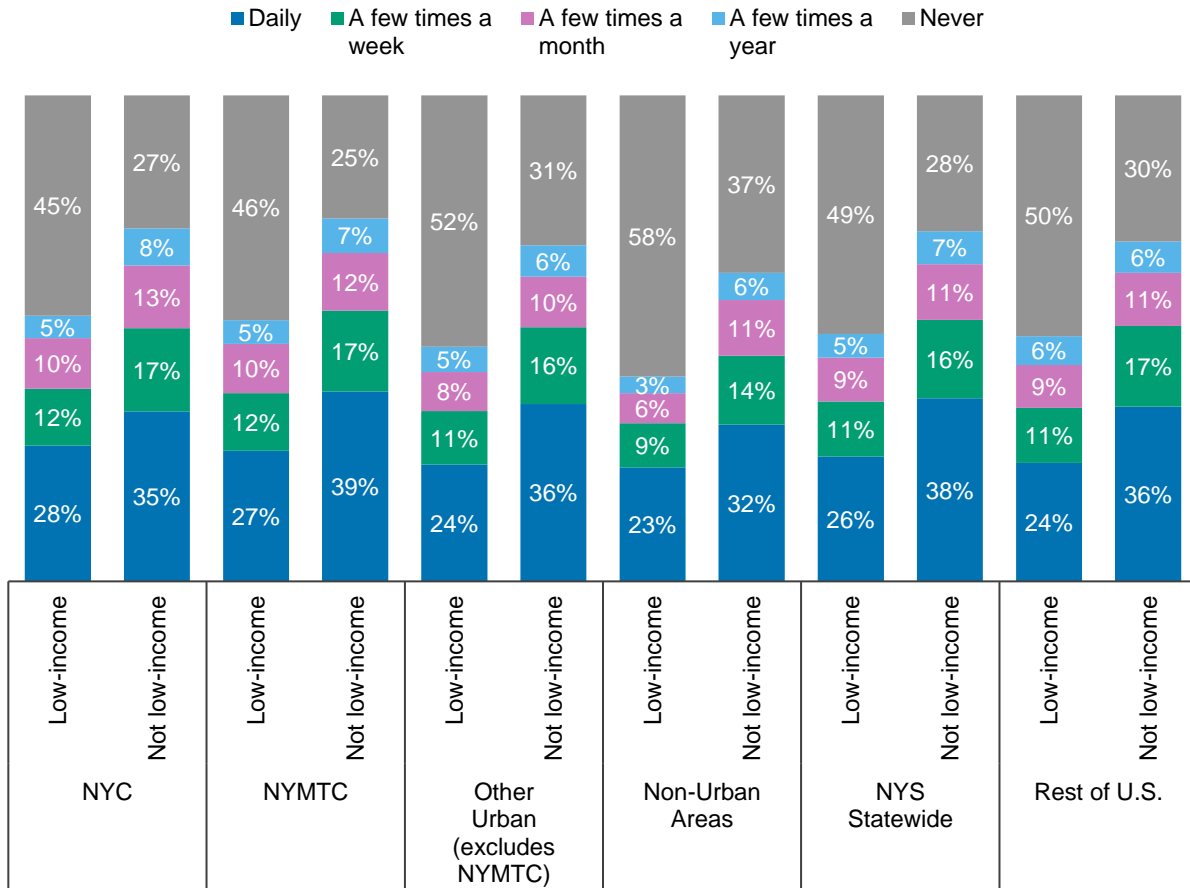
**Figure 6-9. Frequency of Tablet use to access the Internet**

# 7. EQUITY ANALYSIS

This section examines various methods for identifying disadvantaged communities developed by regional and national agencies, focusing on their application in New York State (NYS). First, three regional methods were employed to identify Environmental Justice (EJ) populations in NYS: the Massachusetts environmental justice method (Massachusetts Executive Office of Energy and Environmental Affairs (EEA), 2022), the Wilmington Area Planning Council (WILMAPCO) method (Wilmington Area Planning Council, 2019), and the Delaware Department of Transportation (DelDOT) method (Delaware Department Of Transportation, 2023). These methods categorized the identified zones as Environmental Justice Block Groups (EJ BGs) since they were identified at the Block Group (BG) level. Using the 2021 American Community Survey (ACS) data, these criteria were applied to determine the EJ BGs in NYS.

Additionally, at the national level, the criteria established by the Council on Environmental Quality (CEQ) (Council on Environmental Quality, 2022) and the US Department of Transportation (USDOT) (US Department of Transportation, 2023) were examined. The zones identified using these criteria are referred to as Disadvantaged Communities (DACs). These communities were identified at the Census Tract level. The CEQ developed an online tool known as the Climate & Economic Justice Screening Tool, while the USDOT created the Equitable Transportation Community Explorer (ETCT) online tool. The maps based on the two national criteria were reproduced using publicly available shapefiles.

According to the 2021 Census data, NYS comprises a total of 16,070 BGs and 5,411 Census Tracts. The EJ BGs or DACs identified through these methods were also compared to those identified by the criteria developed by the New York State Climate Justice Working Group (CJWG) (New York State Climate Justice Working Group, 2022).

**Table 7-1. Summary of the EJ criteria**

| Study Scope | Data Resolution | |
| --- | --- | --- |
| | **Census Block Group** | **Census Tract** |
| **Nation** | | • Council on Environmental Quality (Climate & Economic Justice Screening Tool)<br>• US DOT (Equitable Transportation Community Explorer) |
| **Region** | • Massachusetts Executive Office of Energy and Environmental Affairs (EEA)<br>• Delaware DOT<br>• Wilmington Area Planning Council | • New York State Climate Justice Working Group (CJWG) |

## 7.1 ENVIRONMENTAL JUSTICE CRITERIA AT REGIONAL LEVEL

### 7.1.1 Wilmington Area Planning Council

Wilmington Area Planning Council (WILMAPCO) has established specific criteria for classifying moderate and significant EJ BGs based on ACS data. The criteria for a moderate EJ BG are as follows:

*"Poverty >Regional Average (RA), and Blacks or Hispanics or Asians 3x RA, or Racial/ethnic minorities 2x RA, or Poverty 2x RA"*

Significant EJ BGs are further selected among the moderate EJ BGs. The criteria for a significant EJ BG are as follows:

*"Poverty 2x >Regional Average (RA), and Blacks or Hispanics or Asians 3x RA, or Racial/ethnic minorities >90%, or Poverty 3x RA"*

Altogether 36.4% of the BGs (5,855 out of 16,070) were identified as moderate EJ BG and 23.5% of the block groups (3,771 out of 16,070) were identified as significant EJ BG in NYS, illustrated in Figure 7-1.
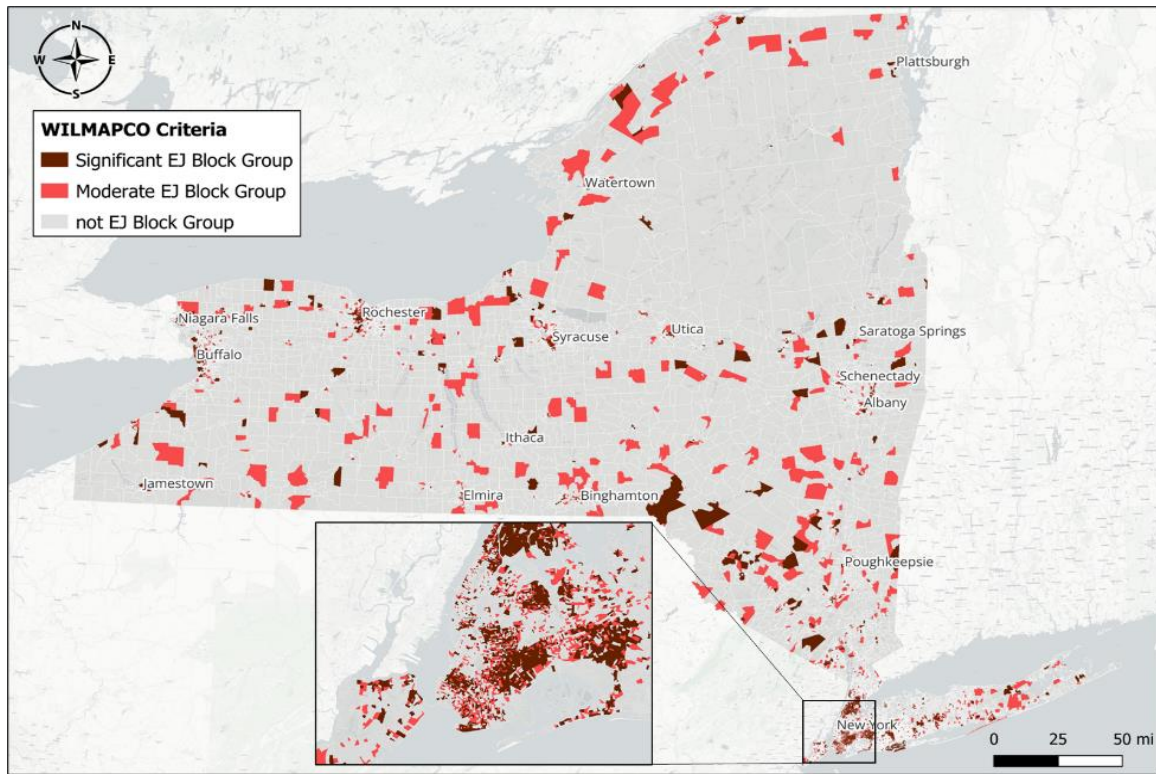


**Figure 7-1. Moderate and Significant EJ BGs identified by WILMAPCO criteria**

### 7.1.2    Massachusetts Executive Office of Energy and Environmental Affairs

According to the Massachusetts EJ Method, to be classified as an EJ BG, the criteria are as follows:

*"(i) the annual median household income is not more than 65 percent of the statewide annual median household income; (ii) minorities comprise 40 percent or more of the population; (iii) 25 percent or more of households lack English language proficiency; or (iv) minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income."*

Altogether 54.3% of the BGs (8,729 out of 16,070) were identified as EJ BG in NYS, illustrated in Figure 7-2.
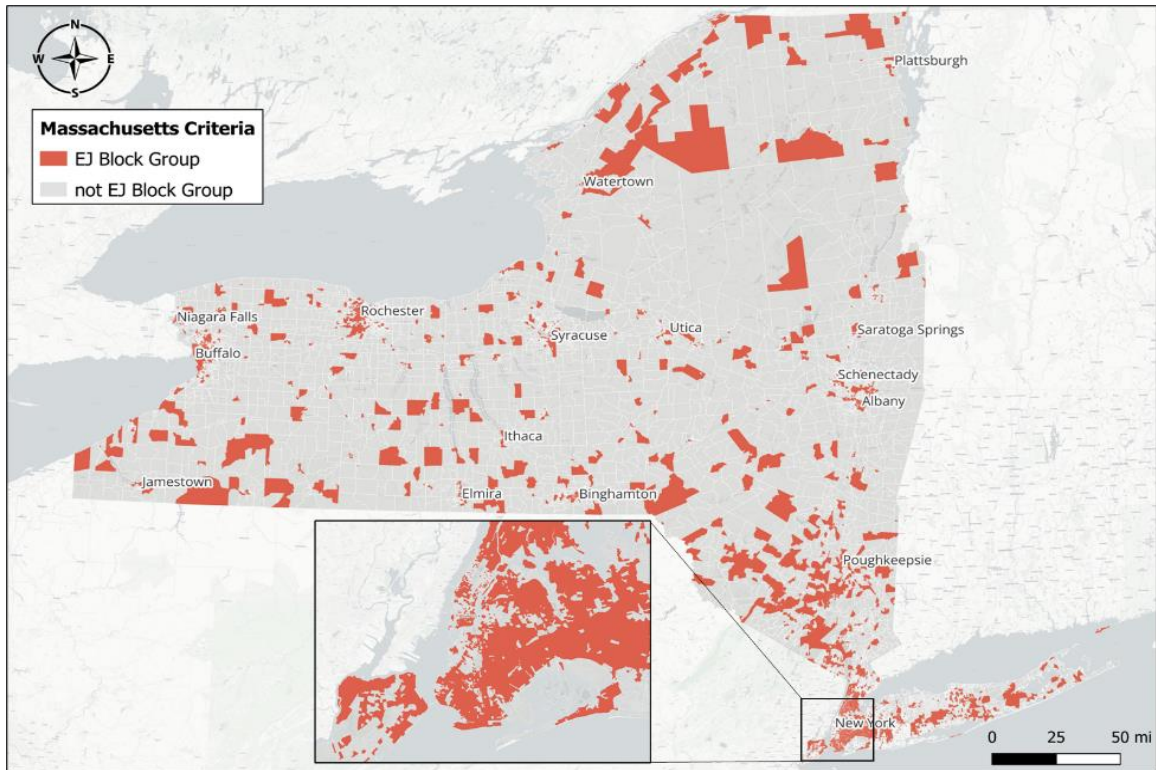
**Figure 7-2. EJ BGs identified by Massachusetts criteria**

### 7.1.3 Delaware Department of Transportation

DelDOT has adopted specific criteria for identifying moderate and significant EJ BGs. The criteria for a moderate EJ BG are as follows:

*"Percentage of Population in Poverty is greater than the State Average, AND Blacks or Hispanics or Asians or American Indians, are greater than 3x the State Average, OR Combined Population Percentage of Blacks, Hispanics, Asians, and American Indians is greater than 2x the State Average, OR Percentage of Population in Poverty is greater than 2x the State Average, OR MHHI is less than or equal to $45,958 (65.49% of State MHHI), OR Language Isolation is greater than or equal to 15% & less than 25%"*

The criteria for a significant EJ BG are as follows:

*"Percentage of Population in Poverty is greater than 2x the State Average, AND Blacks or Hispanics or Asians or American Indians, are greater than 3x the State Average, OR Combined Population Percentage of Blacks, Hispanics, Asians, and American Indians is greater than 90%, OR Percentage of Population in Poverty is greater than 3x the State Average, OR MHHI less than or equal to $28,070 (40.0% of State MHHI), OR Language Isolation is greater than or equal to 25%"*

Altogether 40.4% of the BGs (6,499 out of 16,070) were identified as moderate EJ BG and 24.3% of the BGs (3,913 out of 16,070) were identified as significant EJ BG in NYS (Figure 7-3).

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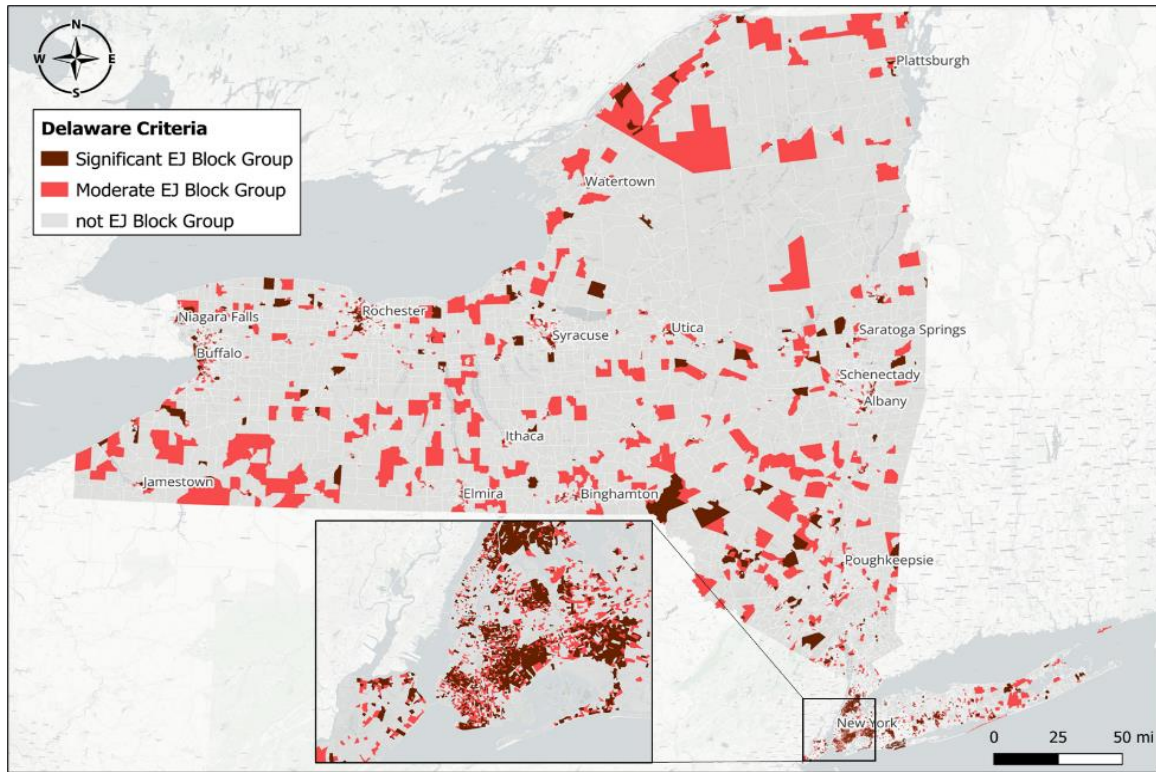
**Figure 7-3. Moderate and Significant EJ BGs identified by DelDOT criteria**

### 7.1.4    New York State Climate Justice Working Group

In accordance with New York's Climate Act, the Climate Justice Working Group (CJWG) was tasked with developing criteria to identify Disadvantaged Communities (DACs). The purpose of this initiative was to ensure that communities on the frontlines and those that have been historically underserved benefit from the state's significant shift towards cleaner and more sustainable energy sources, as well as from reduced pollution levels, improved air quality, and new economic opportunities. To accomplish this, the CJWG devised a comprehensive Environmental Justice (EJ) indicator that drew upon 45 variables from a diverse range of data sources. The DACs were defined based on two primary factors: "Environmental and Climate Change Burdens and Risks" and "Population Characteristics and Health Vulnerabilities." Altogether 1,736 out of 5,411 Census Tracts (32.1%) were identified as DACs (Figure 7-4).
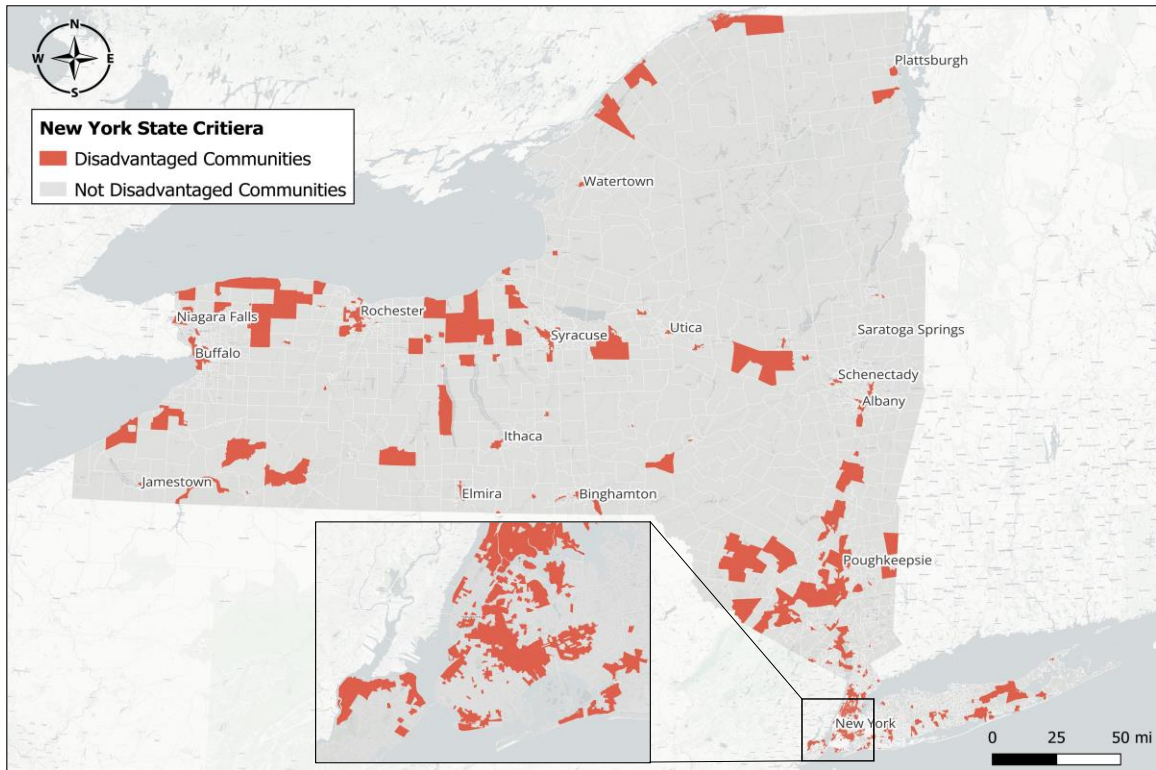
**Figure 7-4. DACs identified by NYS CJWG criteria**

## 7.2 EJ CRITERIA AT NATIONAL LEVEL

### 7.2.1 Council on Environmental Quality

The Biden-Harris Administration introduced the Justice40 Initiative with the aim of addressing the long-standing issue of underinvestment in disadvantaged communities. For analysis purposes, the most recent version of the Justice40 map, updated in March 2023 and released by the Council on Environmental Quality (CEQ), was utilized. The goal of the Justice40 Initiative is to provide 40% of the overall benefits of certain Federal investments in eight key areas to disadvantaged communities. These eight key areas are: climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, the remediation and reduction of legacy pollution, health burdens and the development of critical clean water infrastructure. Communities are identified as transportation disadvantaged were examined in this section. The zones will be identified as transportation disadvantaged if they are in Census Tracts that:

- Are at or above the 90th percentile for diesel particulate matter exposure OR transportation barriers OR traffic proximity and volume, AND
- Are at or above the 65th percentile for low-income.

Among the 5,411 Census Tracts in NYS, 873 (16.1%) Census Tracts were identified as transportation-disadvantaged areas (Figure 7-5).
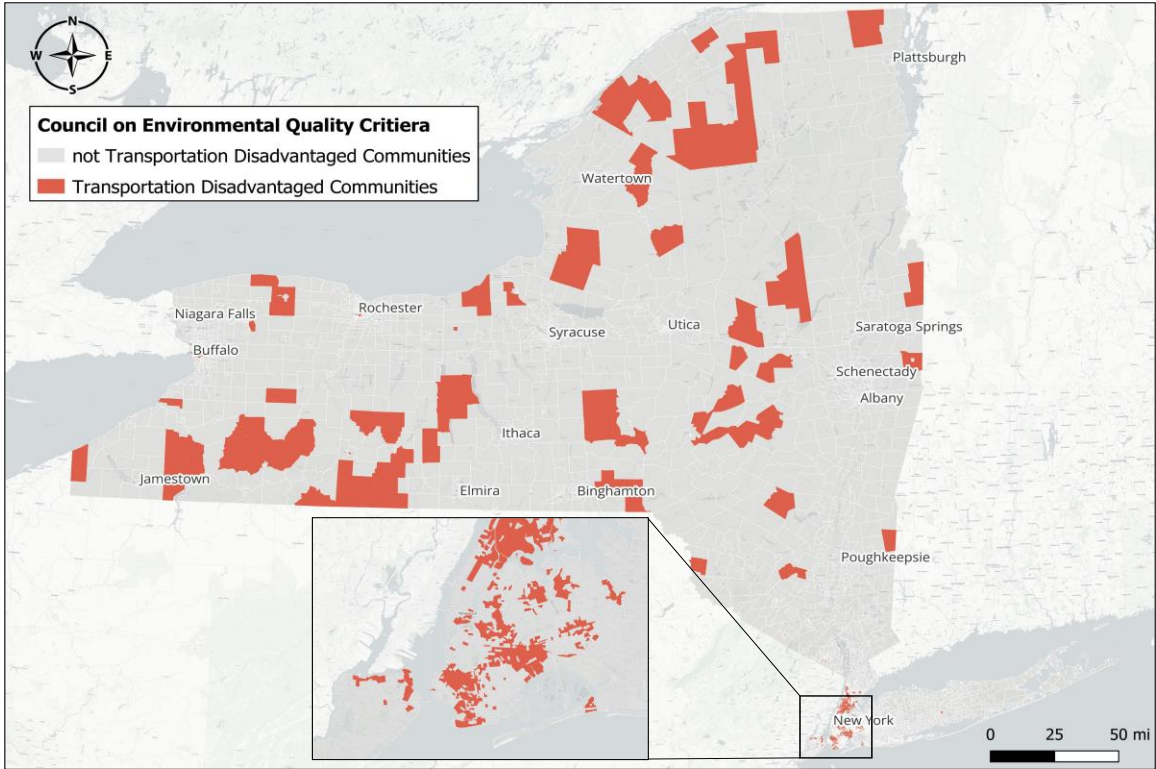
**Figure 7-5. DACs identified by CEQ criteria**

### 7.2.2 USDOT Equitable Transportation Community

The USDOT Equitable Transportation Community (ETC) Explorer is an interactive web application that delve into the collective hardships endured by communities due to inadequate investment in transportation. It focuses on five key aspects: Transportation Insecurity, Climate and Disaster Risk Burden, Environmental Burden, Health Vulnerability, and Social Vulnerability. This tool serves as a valuable complement to CEQ's Justice40 map, offering users a deeper understanding of the transportation disadvantage component. Moreover, the ETC Explorer's Transportation Insecurity component aids in ensuring that the DOT's investments effectively address the transportation-related sources of inequality.
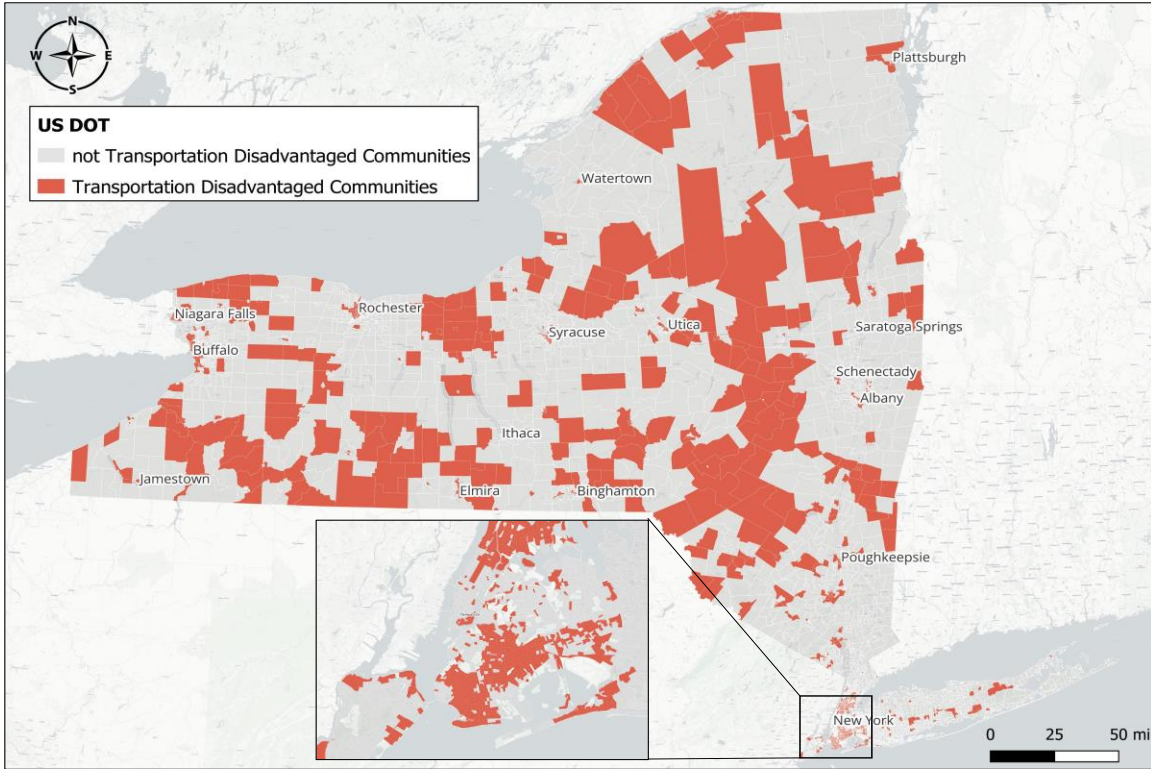
**Figure 7-6. DACs identified by USDOT criteria**

## 7.3 DAC COMPARISON

The two state-level and two national-level criteria were compared against the one developed by NYS CJWG. Table 7-2 provides a summary of the EJ BGs identified using various criteria, as well as the overlapping BGs identified by CEQ criteria. The final column of the table presents the percentage of EJ BGs identified by each criterion and Justice40 among the EJ BGs identified by that specific criterion. Among the different criteria, the Massachusetts criteria identifies the largest number of EJ BGs. Conversely, the WILMAPCO criteria and DelDOT criteria identify only a limited number of significant EJ BGs, but they exhibit the highest proportion of overlap with Justice40.

**Table 7-2. Summary of the EJ BGs and overlapping with CJWG**

| Criterion | Type | Number of EJ BGs/Census Tracts | Percentage of EJ BGs/Census Tracts | Number of EJ BGs/Census Tracts also identified by CJWG | Percentage of EJ BGs/Census Tracts also identified by CJWG |
|---|---|---|---|---|---|
| Massachusetts Criteria | BG | 8729 | 54.3% | 4173 | 82.2% |
| DelDOT Criteria | Moderate BG | 6499 | 40.4% | 3501 | 69.0% |
| | Significant BG | 3913 | 24.3% | 2510 | 49.4% |
| CEQ | Census Tract | 873 | 16.1% | 662 | 38.1% |
| USDOT | Census Tract | 1857 | 34.3% | 1,086 | 62.5% |

The maps displaying the identified areas are shown in Figure 7-7, Figure 7-8, Figure 7-9, and Figure 7-10. A notable observation can be made in Kings and Bronx County areas, where a greater overlap of DACs between CEQ and CJWG is evident. CJWG identified more Census Tracts near Dutchess and Ulster counties.
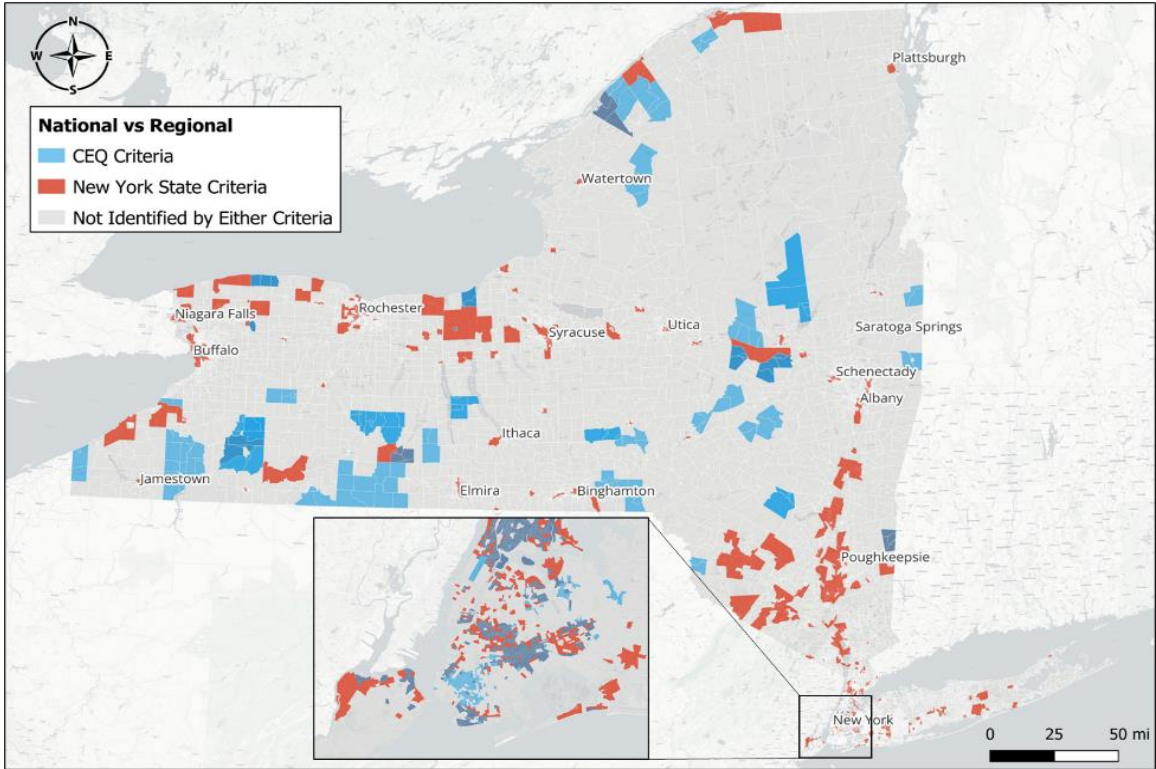
**Figure 7-7. Overlapping Census Tracts based on CEQ and CJWG criteria**

A higher overlap can be observed when comparing to the DACs identified by USDOT criteria (Figure 7-8). The DACs identified by USDOT have more zones in the Schoharie and Delaware counties as well as the northern part of the State.

As shown in Figure 7-9, Massachusetts criteria identified more DACs from the northern part of the State, such as Franklin, Clinton, and St. Lawrence counties.
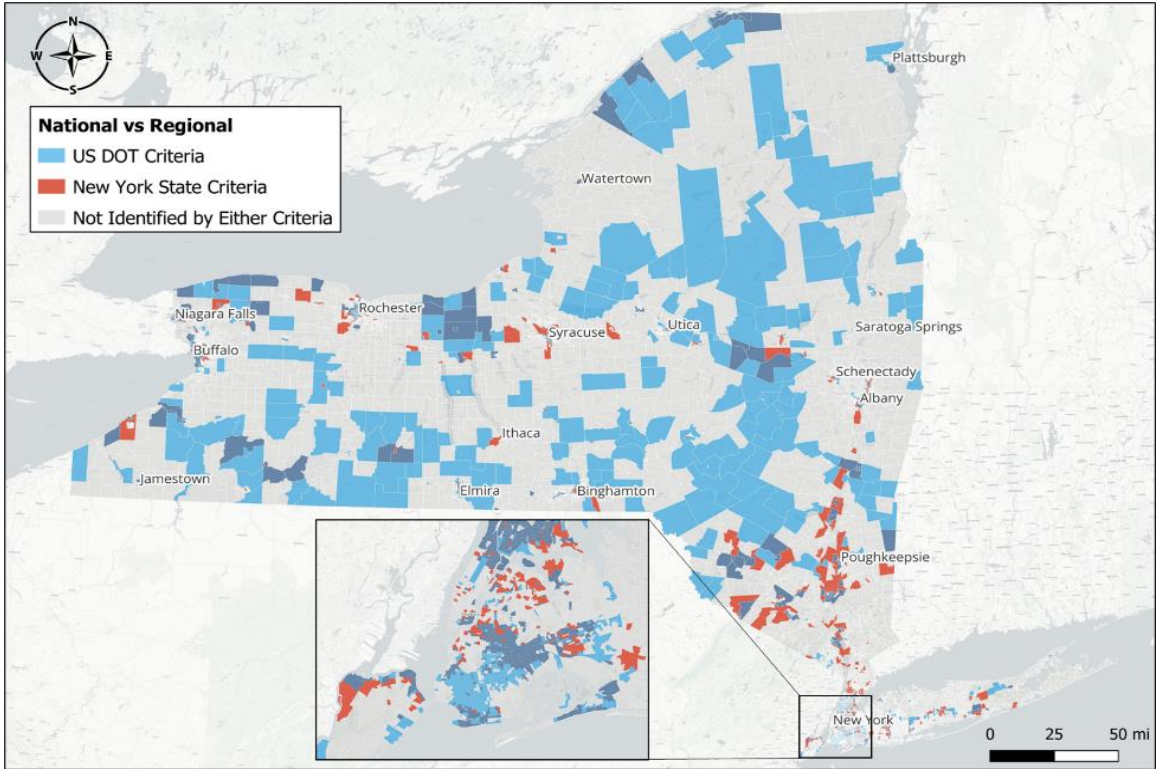
**Figure 7-8. Overlapping Census Tracts based on based on USDOT and CJWG criteria**
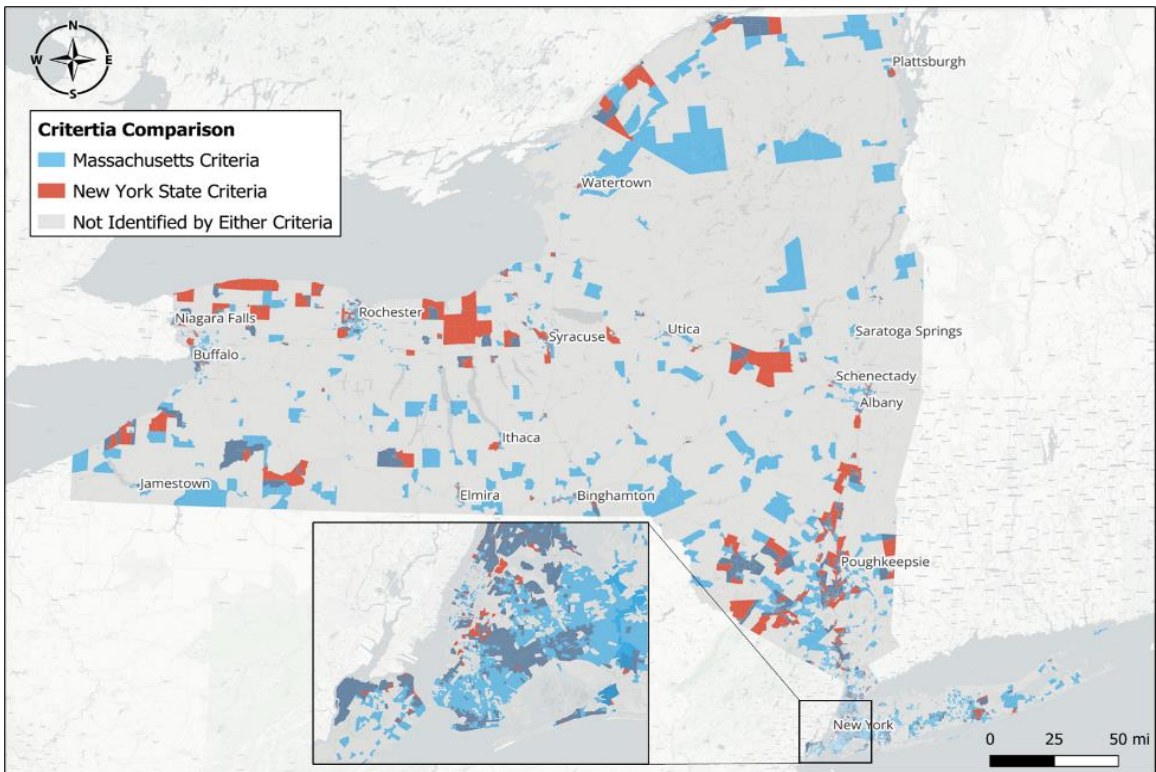


**Figure 7-9. Overlapping BGs based on Massachusetts and CJWG Criteria**

When comparing the DACs identified by the Delaware criteria, CJWG identified more DACs in the Ulster and Dutchess counties.
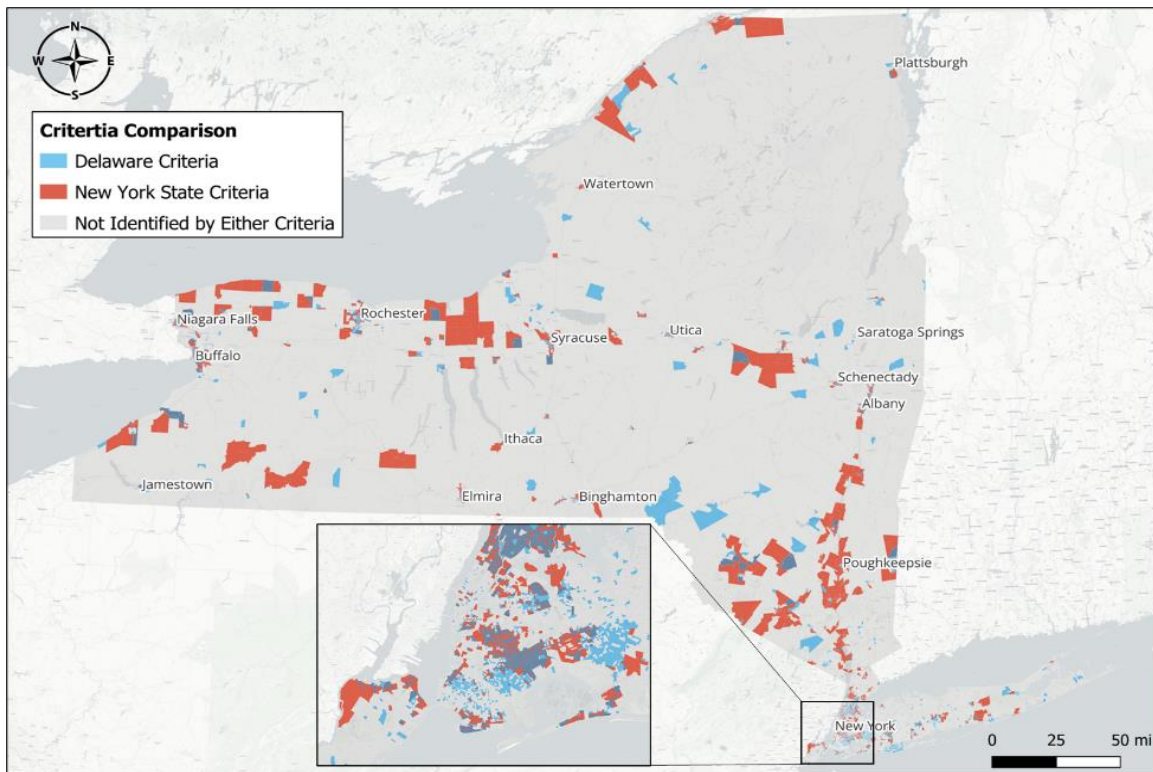


**Figure 7-10. Overlapping BGs based on Delaware Moderate and CJWG criteria**

## 7.4 COMMUTE PATTERNS OF TRANSPORTATION DACs

The Census Transportation Planning Products (CTPP) program is a Technical Service Program of American Association of State Highway and Transportation Officials (AASHTO), funded by member state transportation agencies (AASHTO, 2016). The CTPP data is a set of special tabulations from ACS data, designed for transportation community. The CTPP data has been a valuable resource for transportation planners and researchers, and it has been utilized for various transportation planning subject areas including, but not limited to, travel demand modeling, descriptive statistics, policy and planning strategies, environmental analyses, and survey and sampling methods. The CTPP provides information about where people live and work, their journey-to-work commuting patterns and their means of transportation to work (Vo et al., 2017).

This section focuses on analyzing the daily commute trips of the workers age 16 years or older from the latest CTPP data (base on 2012-2016 ACS) considering travel time, transportation mode, and industry. The residence or origin of these trips is categorized based on whether it meets the criteria outlined by the NYS CJWG as a DAC.

Figure 7-11 shows the share of daily OD trips by travel time categories and Table 7-3 reports the associated absolute value of the number of daily OD trips. Workers in DACs have a higher share of trips that are over 45 minutes. ACS includes a question specifically targeting individuals aged 16 and over who were employed and at work in the previous week. They are asked about their usual mode of transportation used to commute to work. Home-based workers refer to those who reported "work from home" as their

mode of commuting. The data indicates that DACs have a lower proportion of workers who work from home compared to other areas.
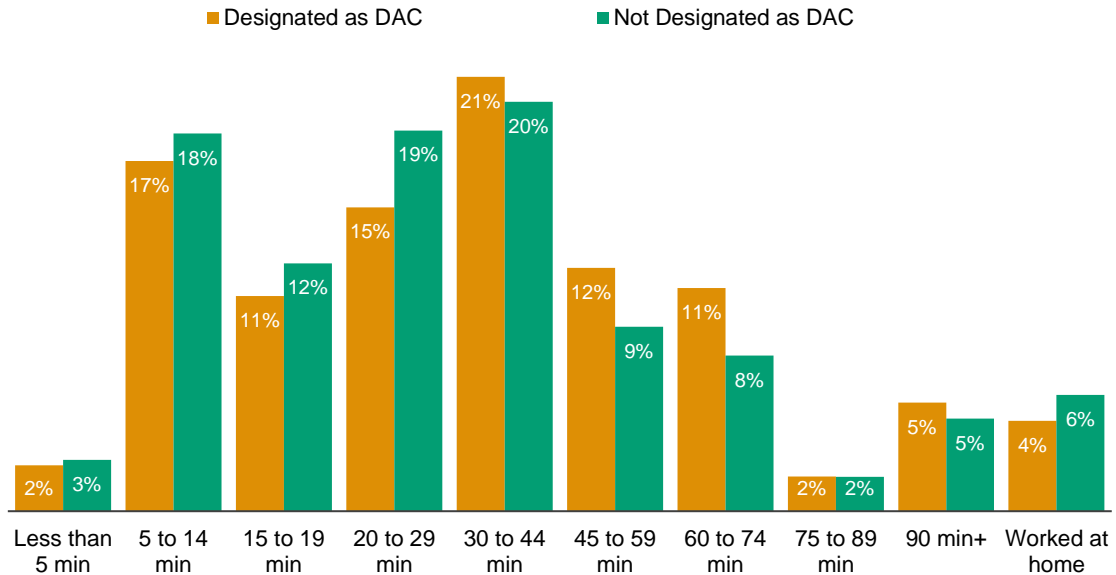


**Figure 7-11. Share of daily OD trips by travel time**

**Table 7-3. Total daily OD trips by travel time**

| Travel Time | Number of daily OD trips | |
| --- | --- | --- |
| | **Designated as DAC** | **Not designated as DAC** |
| Less than 5 min | 47,459 | 119,962 |
| 5 to 14 min | 361,715 | 883,710 |
| 15 to 19 min | 222,475 | 579,708 |
| 20 to 29 min | 313,904 | 890,878 |
| 30 to 44 min | 448,920 | 957,699 |
| 45 to 59 min | 251,543 | 431,283 |
| 60 to 74 min | 230,481 | 363,986 |
| 75 to 89 min | 35,744 | 80,132 |
| 90 min+ | 112,300 | 216,557 |
| Worked at home | 93,294 | 272,228 |

Figure 7-12 shows the share of daily OD trips by transportation mode; Table 7-4 presents the absolute number of daily OD trips. A higher share of trips originating from DAC areas are made by walking or biking, public transportation or carpool while a higher share of their counterparts was made by cars (drive alone).
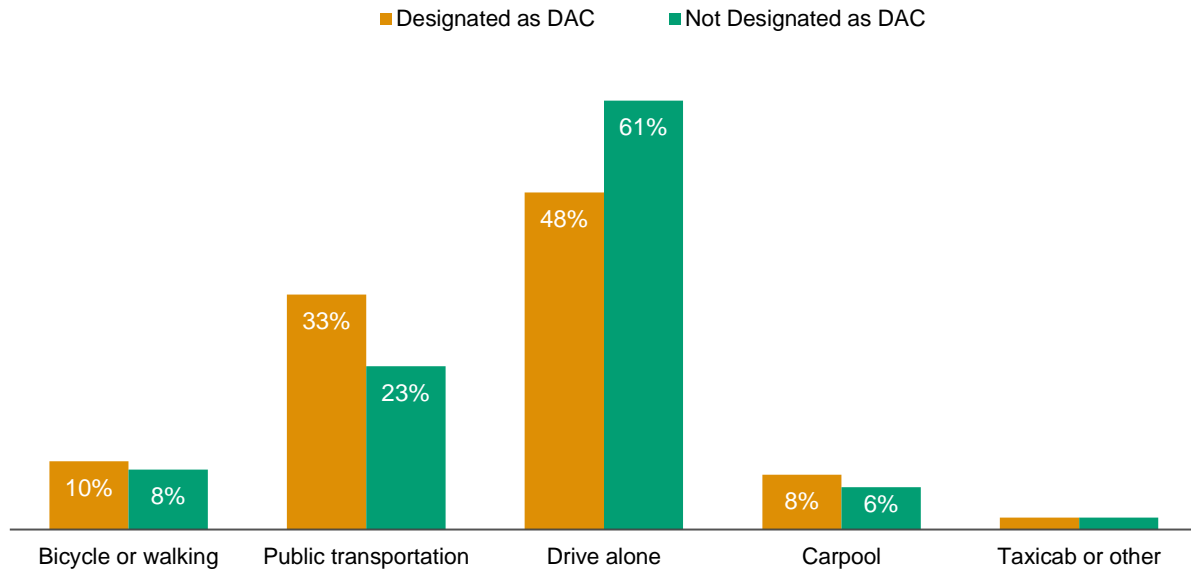
**Figure 7-12. Share of daily OD trips by transportation mode**

**Table 7-4. Total daily OD trips by transportation mode**

| Transportation Mode | Number of daily OD trips | |
| --- | --- | --- |
| | Designated as DAC | Not designated as DAC |
| Bicycle or walking | 83,975 | 181,876 |
| Public transportation | 289,353 | 495,834 |
| Drive alone | 415,312 | 1,302,159 |
| Carpool | 67,367 | 128,750 |
| Taxicab or other | 14,679 | 36,621 |

Figure 7-13 shows the share of daily OD trips by industry; Table 7-5 presents the absolute number of daily OD trips. Non-DAC areas have a higher number of originating trips than that of DAC areas regardless of industry. When comparing the industry workers belong to, a higher share of trips of those originating from DAC areas are for education industry or retail industry.
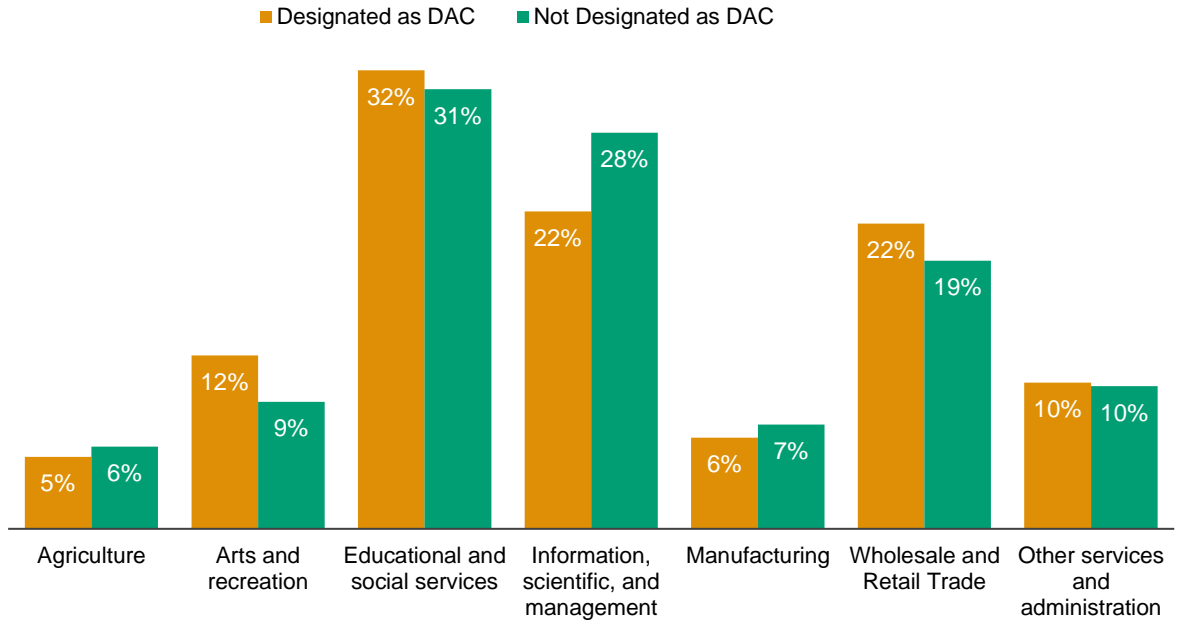
**Figure 7-13. Share of daily OD trips by industry**

**Table 7-5. Total daily OD trips by industry**

| Industry | Number of daily OD trips | |
| --- | --- | --- |
| | **Designated as DAC** | **Not designated as DAC** |
| Agriculture | 97,626 | 252,942 |
| Arts and recreation | 234,895 | 390,723 |
| Educational and social services | 620,772 | 1,351,386 |
| Information, scientific, and management | 429,994 | 1,216,974 |
| Manufacturing | 123,233 | 320,772 |
| Wholesale and Retail Trade | 413,440 | 824,493 |
| Other services and administration | 198,152 | 438,738 |

Figure 7-14 shows the share of daily OD trips by travel time and transportation mode; Table 7-6 presents the absolute number of daily OD trips. The "Other modes" encompasses the combined trips using public transportation, bicycles, walking, taxicabs, motorcycles, or any other alternative methods, as well as those who work from home. Upon analyzing the data, among DAC, a notably higher proportion of trips are observed among trips by other modes for all the travel time categories. This suggests that a larger share of individuals from the DAC group do not commute to work by driving, and as a result, they spend more time on their daily commutes. In contrast, for those not identified as DAC, the "drive alone" mode remains the predominant choice across all travel time categories. In particular, there is a greater share of trips in the 5-44 minutes travel time range, indicating a consistent preference for the "drive alone" mode in this group.
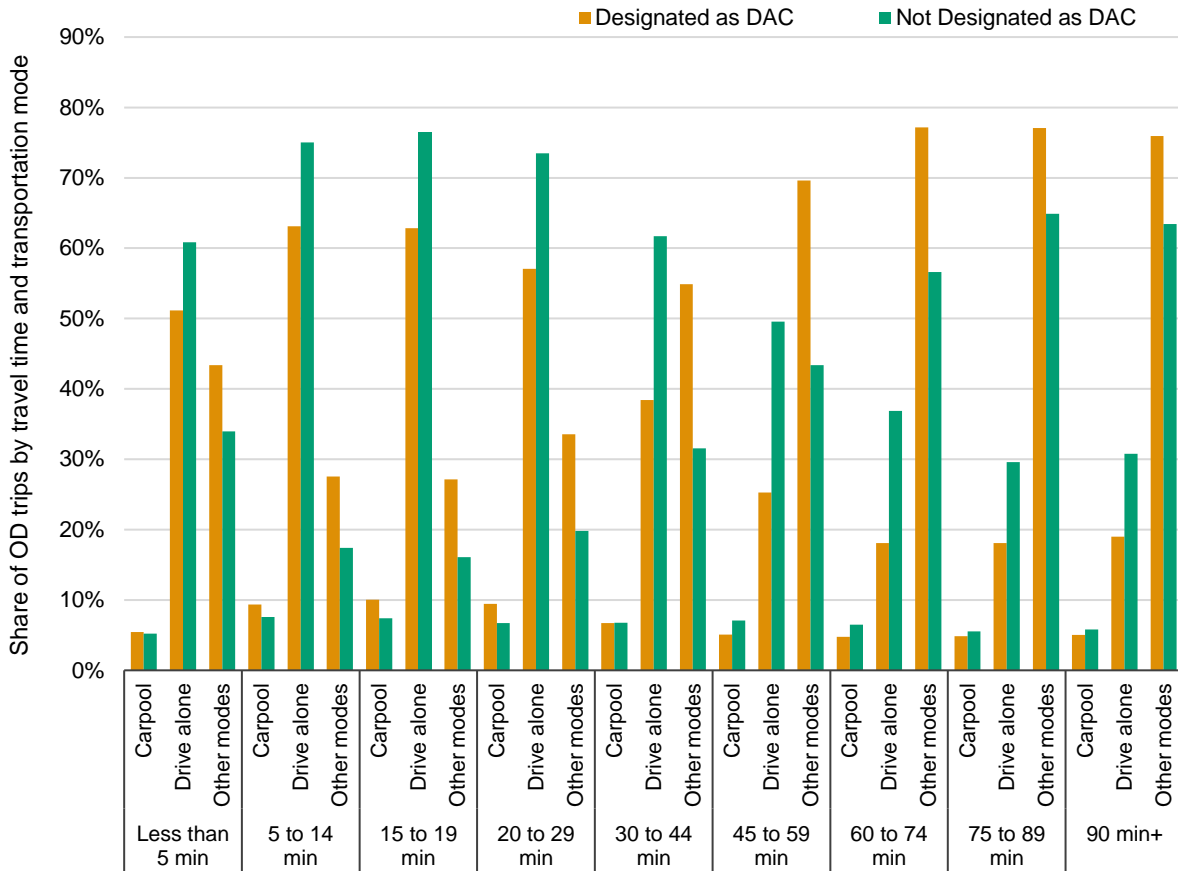
**Figure 7-14. Share of daily OD trips by travel time and transportation mode**

**Table 7-6. Total OD trips by travel time and transportation mode**

| Travel Time | Transportation Mode | Number of daily OD trips | |
|---|---|---|---|
| | | Designated as DAC | Not designated as DAC |
| Less than 5 min | Carpool | 2,588 | 6,225 |
| | Drive alone | 24,255 | 72,890 |
| | Other modes | 20,577 | 40,711 |
| 5 to 14 min | Carpool | 33,892 | 66,939 |
| | Drive alone | 228,120 | 663,047 |
| | Other modes | 99,500 | 153,710 |
| 15 to 19 min | Carpool | 22,320 | 42,956 |
| | Drive alone | 139,629 | 443,455 |
| | Other modes | 60,300 | 93,309 |
| 20 to 29 min | Carpool | 29,591 | 59,845 |
| | Drive alone | 179,064 | 654,469 |
| | Other modes | 105,235 | 176,280 |
| 30 to 44 min | Carpool | 30,124 | 64,695 |
| | Drive alone | 172,386 | 590,797 |
| | Other modes | 246,323 | 302,205 |

105

| | | | |
|---|---|---|---|
| | Carpool | 12,790 | 30,497 |
| 45 to 59 min | Drive alone | 63,610 | 213,738 |
| | Other modes | 175,118 | 187,092 |
| | Carpool | 10,925 | 23,653 |
| 60 to 74 min | Drive alone | 41,724 | 134,202 |
| | Other modes | 177,795 | 206,101 |
| | Carpool | 1,735 | 4,417 |
| 75 to 89 min | Drive alone | 6,461 | 23,717 |
| | Other modes | 27,555 | 51,997 |
| | Carpool | 5,674 | 12,591 |
| 90 min+ | Drive alone | 21,335 | 66,589 |
| | Other modes | 85,286 | 137,311 |

Figure 7-15 shows the share of daily OD trips by vehicle availability and transportation mode; Table 7-7 presents the absolute number of daily OD trips. Individuals who have zero vehicles available tend to rely more heavily on public transportation, as indicated by a higher share of such trips in this group. Conversely, among those who possess at least one vehicle, both for DAC and non-DAC groups, drive alone emerges as the predominant mode of transportation.
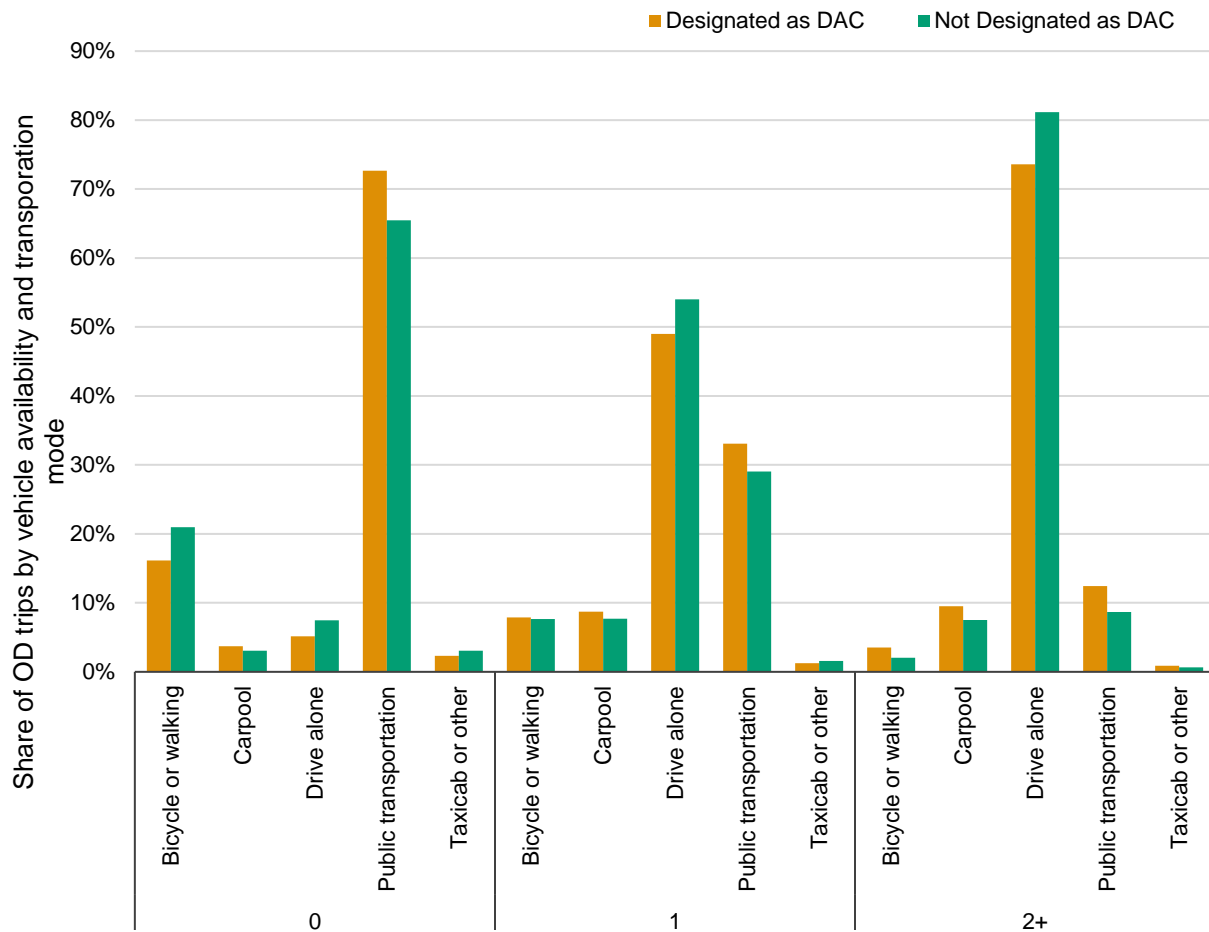


**Figure 7-15. Share of daily OD trips by vehicle availability and transportation mode**

**Table 7-7. Total daily OD trips by vehicle availability and transportation mode**

| Number of Vehicles Available | Transportation Mode | Number of daily OD trips | |
| --- | --- | --- | --- |
| | | Designated as DAC | Not designated as DAC |
| 0 | Bicycle or walking | 105,974 | 143,149 |
| | Carpool | 24,469 | 20,921 |
| | Drive alone | 33,898 | 50,954 |
| | Public transportation | 477,323 | 447,124 |
| | Taxicab or other | 15,319 | 20,921 |
| 1 | Bicycle or walking | 49,574 | 78,117 |
| | Carpool | 54,798 | 78,325 |
| | Drive alone | 307,202 | 549,722 |
| | Public transportation | 207,530 | 295,623 |
| | Taxicab or other | 7,917 | 16,236 |
| 2+ | Bicycle or walking | 25,687 | 57,125 |
| | Carpool | 69,011 | 208,578 |
| | Drive alone | 533,601 | 2,257,149 |
| | Public transportation | 90,313 | 240,797 |
| | Taxicab or other | 6,355 | 17,744 |

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**APPENDIX A. SUPPLEMENTAL TABLES**

# APPENDIX A. SUPPLEMENTAL TABLES

## Table A-1.  2017 HUD very low-income cutoffs, New York State

| Type | Name | FY17 MFI | Number of Persons | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | One | Two | Three | Four | Five | Six | Seven | Eight |
| MSA | Albany-Schenectady-Troy, NY MSA | 83100 | 29100 | 33250 | 37400 | 41550 | 44900 | 48200 | 51550 | 54850 |
| MSA | Binghamton, NY MSA | 65700 | 23000 | 26300 | 29600 | 32850 | 35500 | 38150 | 40750 | 43400 |
| MSA | Buffalo-Cheektowaga-Niagara Falls, NY MSA | 68200 | 23900 | 27300 | 30700 | 34100 | 36850 | 39600 | 42300 | 45050 |
| MSA | Elmira, NY MSA | 64600 | 22650 | 25850 | 29100 | 32300 | 34900 | 37500 | 40100 | 42650 |
| MSA | Glens Falls, NY MSA | 64100 | 22450 | 25650 | 28850 | 32050 | 34650 | 37200 | 39750 | 42350 |
| MSA | Ithaca, NY MSA | 75600 | 26500 | 30250 | 34050 | 37800 | 40850 | 43850 | 46900 | 49900 |
| MSA | Kingston, NY MSA | 78500 | 27500 | 31400 | 35350 | 39250 | 42400 | 45550 | 48700 | 51850 |
| MSA | Syracuse, NY MSA | 68000 | 23800 | 27200 | 30600 | 34000 | 36750 | 39450 | 42200 | 44900 |
| MSA | Utica-Rome, NY MSA | 62100 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| MSA | Watertown-Fort Drum, NY MSA | 62400 | 22350 | 25550 | 28750 | 31900 | 34500 | 37050 | 39600 | 42150 |
| AREA | Nassau-Suffolk, NY HUD Metro FMR Area | 110800 | 38800 | 44350 | 49900 | 55400 | 59850 | 64300 | 68700 | 73150 |
| AREA | New York, NY HUD Metro FMR Area | 66200 | 33400 | 38200 | 42950 | 47700 | 51550 | 55350 | 59150 | 63000 |
| AREA | Poughkeepsie-Newburgh-Middletown, NY HUD Metro FMR Area | 89400 | 31300 | 35800 | 40250 | 44700 | 48300 | 51900 | 55450 | 59050 |
| AREA | Rochester, NY HUD Metro FMR Area | 68600 | 24050 | 27450 | 30900 | 34300 | 37050 | 39800 | 42550 | 45300 |
| AREA | Rockland County, NY HUD Metro FMR Area | 103600 | 36300 | 41450 | 46650 | 51800 | 55950 | 60100 | 64250 | 68400 |
| AREA | Westchester County, NY Statutory Exception Area | 111400 | 39000 | 44600 | 50150 | 55700 | 60200 | 64650 | 69100 | 73550 |
| AREA | Yates County, NY HUD Metro FMR Area | 63600 | 22300 | 25450 | 28650 | 31800 | 34350 | 36900 | 39450 | 42000 |
| COUNTY | Allegany County, NY | 53900 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Cattaraugus County, NY | 59300 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Cayuga County, NY | 65600 | 23000 | 26250 | 29550 | 32800 | 35450 | 38050 | 40700 | 43300 |
| COUNTY | Chautauqua County, NY | 56000 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Chenango County, NY | 56600 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Clinton County, NY | 69300 | 23800 | 27200 | 30600 | 34000 | 36750 | 39450 | 42200 | 44900 |
| COUNTY | Columbia County, NY | 74600 | 26150 | 29850 | 33600 | 37300 | 40300 | 43300 | 46300 | 49250 |
| COUNTY | Cortland County, NY | 64900 | 22750 | 26000 | 29250 | 32450 | 35050 | 37650 | 40250 | 42850 |
| COUNTY | Delaware County, NY | 59000 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Essex County, NY | 66200 | 23200 | 26500 | 29800 | 33100 | 35750 | 38400 | 41050 | 43700 |
| COUNTY | Franklin County, NY | 57600 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Fulton County, NY | 57300 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Genesee County, NY | 66600 | 23350 | 26650 | 30000 | 33300 | 36000 | 38650 | 41300 | 44000 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| COUNTY | Greene County, NY | 63800 | 22350 | 25550 | 28750 | 31900 | 34500 | 37050 | 39600 | 42150 |
| COUNTY | Hamilton County, NY | 63800 | 22350 | 25550 | 28750 | 31900 | 34500 | 37050 | 39600 | 42150 |
| COUNTY | Lewis County, NY | 57800 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Montgomery County, NY | 58100 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Otsego County, NY | 62200 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Schuyler County, NY | 61900 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Seneca County, NY | 64500 | 22600 | 25800 | 29050 | 32250 | 34850 | 37450 | 40000 | 42600 |
| COUNTY | St. Lawrence County, NY | 57700 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Steuben County, NY | 59400 | 21900 | 25000 | 28150 | 31250 | 33750 | 36250 | 38750 | 41250 |
| COUNTY | Sullivan County, NY | 64300 | 22050 | 25200 | 28350 | 31500 | 34050 | 36550 | 39100 | 41600 |
| COUNTY | Wyoming County, NY | 66700 | 23350 | 26700 | 30050 | 33350 | 36050 | 38700 | 41400 | 44050 |

**Table A-2. 2009 HUD Very low-income cutoffs, New York State**

| Type | Name | FY09 MFI | Number of Persons | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | One | Two | Three | Four | Five | Six | Seven | Eight |
| MSA | Albany-Schenectady-Troy, NY MSA | 74100 | 25950 | 29650 | 33350 | 37050 | 40000 | 43000 | 45950 | 48900 |
| MSA | Binghamton, NY MSA | 58600 | 20500 | 23450 | 26350 | 29300 | 31650 | 34000 | 36350 | 38700 |
| MSA | Buffalo-Niagara Falls, NY MSA | 63500 | 22250 | 25400 | 28600 | 31750 | 34300 | 36850 | 39350 | 41900 |
| MSA | Glens Falls, NY MSA | 59400 | 20800 | 23750 | 26750 | 29700 | 32100 | 34450 | 36850 | 39200 |
| MSA | Ithaca, NY MSA | 71300 | 25150 | 28700 | 32300 | 35900 | 38750 | 41650 | 44500 | 47400 |
| MSA | Kingston, NY MSA | 69700 | 24400 | 27900 | 31350 | 34850 | 37650 | 40450 | 43200 | 46000 |
| MSA | Poughkeepsie-Newburgh-Middletown, NY MSA | 81800 | 28650 | 32700 | 36800 | 40900 | 44150 | 47450 | 50700 | 54000 |
| MSA | Rochester, NY MSA | 66500 | 23300 | 26600 | 29950 | 33250 | 35900 | 38550 | 41250 | 43900 |
| MSA | Syracuse, NY MSA | 63700 | 22300 | 25500 | 28650 | 31850 | 34400 | 36950 | 39500 | 42050 |
| MSA | Utica-Rome, NY MSA | 55800 | 19550 | 22300 | 25100 | 27900 | 30150 | 32350 | 34600 | 36850 |
| AREA | Nassau-Suffolk, NY HUD Metro FMR Area | 101800 | 35650 | 40700 | 45800 | 50900 | 54950 | 59050 | 63100 | 67200 |
| AREA | New York, NY HUD Metro FMR Area | 61600 | 26900 | 30700 | 34550 | 38400 | 41450 | 44550 | 47600 | 50700 |
| AREA | Rockland County, NY HUD Metro FMR Area | 102000 | 35700 | 40800 | 45900 | 51000 | 55100 | 59150 | 63250 | 67300 |
| AREA | Westchester County, NY Statutory Exception Area | 105300 | 36850 | 42100 | 47400 | 52650 | 56850 | 61050 | 65300 | 69500 |
| COUNTY | Allegany County, NY | 50700 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Cattaraugus County, NY | 51000 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Cayuga County, NY | 58900 | 20600 | 23550 | 26500 | 29450 | 31800 | 34150 | 36500 | 38850 |
| COUNTY | Chautauqua County, NY | 51900 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Chenango County, NY | 53700 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Clinton County, NY | 60900 | 21300 | 24350 | 27400 | 30450 | 32900 | 35300 | 37750 | 40200 |
| COUNTY | Columbia County, NY | 65400 | 22900 | 26150 | 29450 | 32700 | 35300 | 37950 | 40550 | 43150 |
| COUNTY | Cortland County, NY | 56800 | 19900 | 22700 | 25550 | 28400 | 30650 | 32950 | 35200 | 37500 |
| COUNTY | Delaware County, NY | 51700 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Elmira, NY MSA | 55500 | 19450 | 22200 | 25000 | 27750 | 29950 | 32200 | 34400 | 36650 |
| COUNTY | Essex County, NY | 55200 | 19300 | 22100 | 24850 | 27600 | 29800 | 32000 | 34200 | 36450 |
| COUNTY | Franklin County, NY | 50200 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Fulton County, NY | 50900 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Genesee County, NY | 59200 | 21750 | 24850 | 27950 | 31050 | 33550 | 36000 | 38500 | 41000 |
| COUNTY | Greene County, NY | 57500 | 20150 | 23000 | 25900 | 28750 | 31050 | 33350 | 35650 | 37950 |
| COUNTY | Hamilton County, NY | 52100 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Jefferson County, NY | 51200 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Lewis County, NY | 50200 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Montgomery County, NY | 54400 | 22200 | 25400 | 28550 | 31750 | 34250 | 36800 | 39350 | 41900 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| COUNTY | Otsego County, NY | 54700 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Schuyler County, NY | 54500 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Seneca County, NY | 57200 | 20000 | 22900 | 25750 | 28600 | 30900 | 33200 | 35450 | 37750 |
| COUNTY | St. Lawrence County, NY | 49600 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |
| COUNTY | Steuben County, NY | 53800 | 20050 | 22900 | 25800 | 28650 | 30950 | 33250 | 35550 | 37800 |
| COUNTY | Sullivan County, NY | 59100 | 20700 | 23650 | 26600 | 29550 | 31900 | 34300 | 36650 | 39000 |
| COUNTY | Wyoming County, NY | 59300 | 20750 | 23700 | 26700 | 29650 | 32000 | 34400 | 36750 | 39150 |
| COUNTY | Yates County, NY | 53000 | 19200 | 21950 | 24700 | 27450 | 29650 | 31850 | 34050 | 36250 |

**Table A-3. 2001 HUD very low-income cutoffs, New York State**

| TYPE | NAME | FY01 MFI | Number of Persons | | | | | | | |
|------|------|----------|-----|-----|-------|------|------|-----|-------|-------|
| | | | One | Two | Three | Four | Five | Six | Seven | Eight |
| PMSA | Buffalo-Niagara Falls, NY | 48400 | 16950 | 19350 | 21800 | 24200 | 26150 | 28050 | 30000 | 31950 |
| PMSA | Dutchess County, NY | 63400 | 22200 | 25350 | 28550 | 31700 | 34250 | 36750 | 39300 | 41850 |
| PMSA | Nassau-Suffolk, NY | 78700 | 27550 | 31500 | 35400 | 39350 | 42500 | 45650 | 48800 | 51950 |
| PMSA | New York, NY | 59100 | 20700 | 23650 | 26600 | 29550 | 31900 | 34300 | 36650 | 39000 |
| PMSA | Newburgh, NY-PA | 55800 | 19550 | 22300 | 25100 | 27900 | 30150 | 32350 | 34600 | 36850 |
| MSA | Albany-Schenectady-Troy, NY | 53000 | 18550 | 21200 | 23850 | 26500 | 28600 | 30750 | 32850 | 35000 |
| MSA | Binghamton, NY | 44700 | 15650 | 17900 | 20100 | 22350 | 24150 | 25950 | 27700 | 29500 |
| MSA | Elmira, NY | 43200 | 15100 | 17300 | 19450 | 21600 | 23350 | 25050 | 26800 | 28500 |
| MSA | Glens Falls, NY | 44200 | 15450 | 17700 | 19900 | 22100 | 23850 | 25650 | 27400 | 29150 |
| MSA | Jamestown, NY | 39600 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| MSA | Rochester, NY | 52900 | 18500 | 21150 | 23800 | 26450 | 28550 | 30700 | 32800 | 34900 |
| MSA | Syracuse, NY | 47900 | 16750 | 19150 | 21550 | 23950 | 25850 | 27800 | 29700 | 31600 |
| MSA | Utica-Rome, NY | 40500 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| AREA | Rockland County, NY | 85400 | 29400 | 33600 | 37800 | 42000 | 45350 | 48700 | 52100 | 55450 |
| AREA | Westchester County, NY | 85800 | 30050 | 34300 | 38600 | 42900 | 46350 | 49750 | 53200 | 56650 |
| COUNTY | Allegany County | 37000 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Cattaraugus County | 38200 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Chenango County | 40000 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Clinton County | 44200 | 15450 | 17700 | 19900 | 22100 | 23850 | 25650 | 27400 | 29150 |
| COUNTY | Columbia County | 48700 | 17050 | 19500 | 21900 | 24350 | 26300 | 28250 | 30200 | 32150 |
| COUNTY | Cortland County | 44300 | 15500 | 17700 | 19950 | 22150 | 23900 | 25700 | 27450 | 29250 |
| COUNTY | Delaware County | 39000 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Essex County | 39000 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Franklin County | 37600 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Fulton County | 38700 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Greene County | 44200 | 15450 | 17700 | 19900 | 22100 | 23850 | 25650 | 27400 | 29150 |
| COUNTY | Hamilton County | 36900 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |

| COUNTY | Jefferson County | 38600 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
|--------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| COUNTY | Lewis County | 38000 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Otsego County | 42600 | 14900 | 17050 | 19150 | 21300 | 23000 | 24700 | 26400 | 28100 |
| COUNTY | St. Lawrence County | 38600 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Schuyler County | 38300 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |
| COUNTY | Seneca County | 44800 | 15700 | 17900 | 20150 | 22400 | 24200 | 26000 | 27800 | 29550 |
| COUNTY | Steuben County | 42000 | 14700 | 16800 | 18900 | 21000 | 22700 | 24350 | 26050 | 27700 |
| COUNTY | Sullivan County | 45100 | 15800 | 18050 | 20300 | 22550 | 24350 | 26150 | 27950 | 29750 |
| COUNTY | Tompkins County | 52400 | 18350 | 20950 | 23600 | 26200 | 28300 | 30400 | 32500 | 34600 |
| COUNTY | Ulster County | 44500 | 15600 | 17800 | 20050 | 22250 | 24050 | 25800 | 27600 | 29350 |
| COUNTY | Wyoming County | 41700 | 14600 | 16700 | 18750 | 20850 | 22500 | 24200 | 25850 | 27500 |
| COUNTY | Yates County | 39900 | 14500 | 16550 | 18650 | 20700 | 22350 | 24000 | 25650 | 27300 |

**APPENDIX B. GLOSSARY OF NHTS TERMS**

# APPENDIX B. GLOSSARY OF NHTS TERMS

This glossary provides the most commonly used terms in the National Household Travel Survey (NHTS) as well as terms used in this report along with definitions of those terms. These definitions are provided to assist the user in the interpretation of the NHTS data.

| | |
|---|---|
| **Adult** | For NHTS, this is defined as a person 18 years or older. |
| **Block Group** | A subdivision of a Census Tract that contain 600 to 3,000 people. The source used for the 2017 NHTS was the United States Census Bureau 2014 TIGER/Line Shapefiles (derived from Census 2010 definition). |
| **Census Tract** | A small subdivision of a county, generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people. The geographic size of the tract may vary considerably, depending on population density. Tracts were designed to be homogeneous in regard to population characteristics, economic status and living conditions when they were first delineated. Since the first tracts were delineated for the 1890 Census, today's tracts may be far from homogeneous. The source used for the 2017 NHTS was the United States Census Bureau 2014 TIGER/Line Shapefiles (derived from Census 2010 definition). |
| **Destination** | For travel day trips, the destination is the point at which there is a break in travel, except if the break is only to change vehicles or means of transport. |
| **Driver** | A driver is a person who operates a motorized vehicle. If more than one person drives on a single trip, the person who drives the most miles is classified as the principal driver. |
| **Elderly** | A person 65 years or older. |
| **Elderly Household** | Households with one or more persons aged 65 years or older. |
| **Employed** | A person is considered employed if (s)he worked for pay, either full time or part time, during the week before the interview. This includes persons who work at home or persons who have more than one job. |
| **Household** | A group of persons whose usual place of residence is a specific housing unit; these persons may or may not be related to each other. The total of all US households represents the total civilian non-institutionalized population. A household does not include group quarters (i.e., 10 or more persons living together, none of whom are related). |

| | |
|---|---|
| **Household Income** | Household income is the money earned by all family members in a household, including those temporarily absent. Annual income consisted of the income earned 12 months preceding the interview. Household income includes monies from all sources, such as wages and salary, commissions, tips, cash bonuses, income from a business or farm, pensions, dividends, interest, unemployment or workmen's compensation, social security, veterans' payments, rent received from owned property (minus the operating costs), public assistance payments, regular gifts of money from friends or relatives not living in the household, alimony, child support, and other kinds of periodic money income other than earnings. Household income excludes in-kind income such as room and board, insurance payments, lump-sum inheritances, occasional gifts of money from persons not living in the same household, withdrawal of savings from banks, tax refunds, and the proceeds of the sale of one's house, car, or other personal property. |
| **Household Members** | Household members include all people, whether present or temporarily absent, whose usual place of residence is in the sample unit. Household members also include people staying in the sample unit who have no other usual place of residence elsewhere. |
| **Household Vehicle** | A household vehicle is a motorized vehicle that is owned, leased, rented or company-owned and available to be used regularly by household members during the two-week travel period. Household vehicles include vehicles used solely for business purposes or business-owned vehicles, as long as they are driven home and can be used for the home to work trip (e.g., taxicabs and police cars). Household vehicles include all vehicles that were owned or available for use by members of the household during the travel period, even though a vehicle may have been sold before the interview. Vehicles excluded from household vehicles are those which were not working and were not expected to be working within 60 days, and vehicles that were purchased or received after the designated travel day. |
| **Journey-to-Work Trips (Commute Trips)** | Includes travel to and from a place where one reports for work. Does not include any other work-related travel. Does not include any trips for persons who work at home. |
| **Means of Transportation** | A mode of travel used for going from one place (origin) to another (destination). A means of transportation includes private and public transit modes, as well as walking.

The following transportation modes, grouped by major mode, are included in the NHTS data.

**Active Modes** – include modes where a person must actively move from one place to the next.

   1. Walk: This category includes walking and jogging.

   2. Bicycle: This category includes bicycles of all speeds and sizes that do not have a motor.

**Private Vehicle** – a stipulation for being a private vehicle is that the vehicle is privately operated, including rental cars. |

3. Car. Includes cars and station wagons. Leased and rented cars are included if they are privately operated and not used for picking up passengers in return for fare.

4. Sport Utility Vehicle. Includes vehicles that are a hybrid of design elements from a van, a pickup truck and a station wagon. Examples include a Ford Explorer, Jeep Cherokee, or Nissan Pathfinder.

5. Van. Includes vans or minivans designed to carry 5 to 13 passengers, or to haul cargo.

6. Pickup Truck. Includes vehicles with an enclosed cab that usually accommodates 2-3 passengers and has an open cargo area in the rear. Late model pickups often have a back seat that allows for total seating of 4-6 passengers. Pickup trucks usually have the same size of wheel-base as a full-size station wagon. This category also includes pickups with campers.

7. Motorcycle/Moped: This category includes large, medium, and small motorcycles and mopeds.

8. RV (Motor Home, ATV, snowmobile): An RV or motor home includes a self-powered recreational vehicle that is operated as a unit without being towed by another vehicle (e.g., a Winnebago motor home). This category also includes ATVs and snowmobiles.

18. Rental Car: Includes Zipcar and Car2Go, in addition to commercially rented cars for private use.

9. Golf Cart/Segway: This includes all electric or gas operated vehicles designed for use on a golf course, but whose use has recently extended to use within smaller, often gated, communities. NOTE: Travel taken via golf cart is NOT included in vehicle trips and vehicle miles of travel.

**Public Transportation**, as used in FHWA publications and analysis of NHTS data, typically includes the following, that are indicated in bold below, public or commuter bus, commuter rail, and subway/elevated rail/light rail/streetcar.

Bus: This category includes:

11. **Public or Commuter Buses**, these are local public transit buses that are available to the general public and buses used for short-distance public transport purposes (e.g., city bus or public bus), school buses,

13. Private/Charter/Tour/Shuttle Buses, these are private buses operating on a fixed schedule between population centers, and are buses that shuttle passengers from one fixed place to another (e.g., airport shuttles), and

14. City-to-City Buses, these are buses that run from one urban center to the other (e.g., Greyhound).

Train: This category includes:

15. **Amtrak/Commuter Rail** that run from one urban center to another,

16. **Subway/Elevated Rail/Light Rail/Street Car** (also known as rail rapid transit) is a high capacity system operated on a fixed rail or guide way system on a private right of way, and vehicles that run on a fixed rail system powered by electricity obtained from an overhead power distribution system.

**Other Modes**

10. School Buses.

12. Paratransit /Dial-A-Ride.

17. Taxi/limo. Taxis include the use of a taxicab by a passenger for fare, including limousines. In 2017, this category also includes ridesharing such as Uber and Lyft.

19. Airplane. Airplanes include commercial airplanes and smaller planes that are available for use by the general public in exchange for a fare. Private and corporate planes and helicopters are also included.

20. Boat/Ferry/Water Taxi. This includes travel by passenger line ferries.

97. Something else. Includes any type of transportation not previously listed (skate boards, roller blades, sailboats, cruise ships, etc.).

| | |
|---|---|
| **Metropolitan Statistical Area (MSA)** | Except in the New England states, a metropolitan statistical area is a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more, or "twin cities" with a combined population of at least 50,000. In addition, contiguous counties are included in an MSA if, according to certain criteria, they are socially and economically integrated with the central city. In the New England states, MSA's consist of towns and cities instead of counties. The source used for the 2017 NHTS was the United States Census Bureau 2014 TIGER/Line Shapefiles (derived from Census 2010 definition). |
| **Motorized Vehicle** | Motorized vehicles are all vehicles that are licensed for highway driving. Snow mobiles and minibikes are specifically excluded. |
| **New York City (NYC)** | New York City is defined in this report as the five county area: Bronx, Kings, Queens, New York (Manhattan), and Richmond. |
| **Occupancy** | Occupancy is the number of persons, including driver and passenger(s) in a vehicle. |
| **Occupancy Rate** | NHTS occupancy rates are generally defined as the mileage-weighted averages of the number of persons on a vehicle trip. |
| **Origin** | Origin is the starting point of a trip. |

| | |
|---|---|
| **Passenger** | For a specific trip, a passenger is any occupant of a motorized vehicle, other than the driver. |
| **Person Miles of Travel (PMT)** | PMT is a primary measure of person travel. When one person travels one mile, one person mile of travel results. Where 2 or more persons travel together in the same vehicle, each person makes the same number of person miles as the vehicle miles. Therefore, four persons traveling 5 miles in the same vehicle results in 20 person miles (4 x 5 = 20). |
| **Person Trip** | A person trip is a trip by one or more persons in any mode of transportation. Each person is considered as making one person trip. For example, four persons traveling together in one auto are counted as four person trips. |
| **Privately Owned Vehicle (POV)** | A privately-owned vehicle or privately-operated vehicle. Either way, the intent here is that this is not a vehicle available to the public for a fee, such as a bus, subway, and taxi. |
| **Travel Day** | A travel day is a 24-hour period from 4:00 a.m. to 3:59 a.m. designated as the reference period for studying trips and travel by members of a sampled household. |
| **Travel Day Trip** | A travel day trip is defined as any time the respondent went from one location to another by private motor vehicle, public transportation, bicycle, walking, or other means during the NHTS assigned reporting travel day. However, a separate trip is not counted in two instances: |

1. When the sole purpose for the trip is to get to another vehicle or mode of transportation in order to continue to the destination.

2. Travel within a shopping center, mall or shopping areas of 4-5 blocks is to be considered as travel to one destination.

| | |
|---|---|
| **Vehicle** | In the 2017 NHTS, the term vehicle includes autos, passenger vans, sport utility vehicles, pickups and other light trucks, RVs, motorcycles and mopeds owned or available to the household. |
| **Vehicle Miles of Travel (VMT)** | VMT is a unit to measure vehicle travel made by a private vehicle, such as an automobile, van, pickup truck, or motorcycle. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle. |
| **Vehicle Occupancy** | Vehicle occupancy is the number of persons, including driver and passenger(s) in a vehicle; also includes persons who did not complete a whole trip. |
| **Vehicle Occupancy Rate** | NHTS occupancy rates are generally calculated as person miles divided by vehicle miles. |
| **Vehicle Trip** | A trip by a single POV regardless of the number of persons in the vehicle. |

**Work-Related Travel**   These are trips related to business activities except travel to the place of work: for example, a plumber drives to a wholesale dealer to purchase supplies for his business or a company executive travels from his office to another firm to attend a business meeting. Business, out-of-town trips, and professional conventions are also included.

**Worker**   See "Employed."