Chapter 4

Demographic Overview

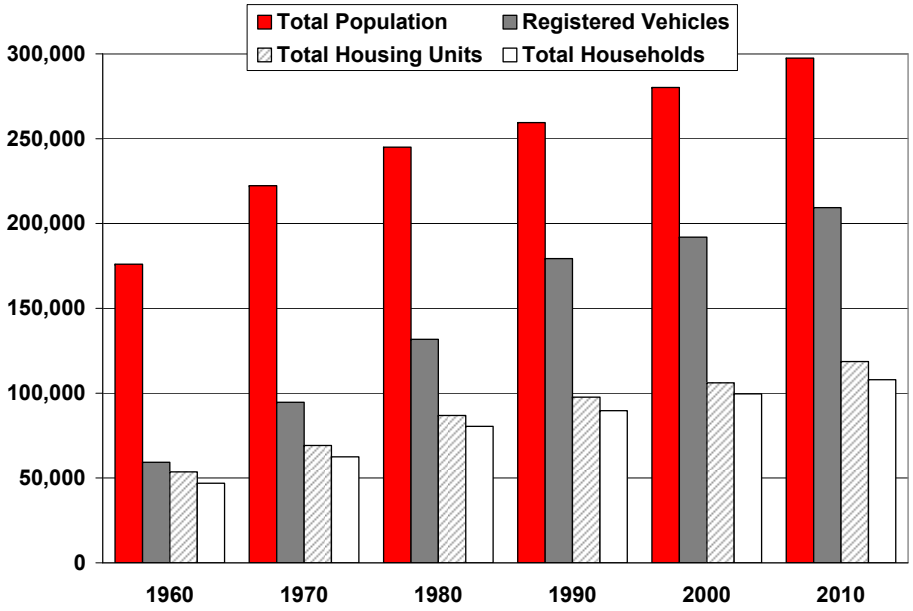
Though discussed in the language of funding and projects, a transportation system has more to do with people than infrastructure. Our transportation system has one simple, fundamental purpose: to serve people, whether for their own personal mobility or the mobility of the goods and services they require. Given the link between people and transportation, effective planning requires that we understand the nature of the population we serve, since they are the single most important influence on our transportation system. Where we choose to live, work, and shop, and how we choose to get there are the reasons we have roads, buses, and trains, and why the Transportation Council exists.

Population

People travel for work and play; by foot, car, bus, bike, and train; within their hometown, throughout the county, and across the region. Our transportation system provides people with the ability to live their lives, earn a living, and pursue their interests.

Dutchess County has experienced high rates of population growth during the past 60 years. From 1950 to 2010, the county's population grew by nearly 161,000 or 117 percent (see Figure 4-1).[1] This growth, most pronounced from 1950 to 1970, was spurred by a variety of factors, including high birth rates, economic growth, and regional migration.

Figure 4-1. Total Population, Registered Vehicles, Housing Units, and Households in Dutchess County (1960-2010)



Population and economic growth have greatly influenced the county's land use patterns and transportation system. The popularity of the private vehicle as a travel mode translated into high rates of vehicle ownership among those who had the means and ability to live farther from traditional urban centers. The economic centers of the county underwent a similar shift, with major manufacturing and commercial activities relocating near major highways and closer to the suburban work force.

Dutchess County had a 2010 population of 297,488, which was six percent higher than reported in 2000 (280,150).[2] This translated into an average increase of over 1,700 people per

year during the decade. The 2010 Census also showed that the Town of Poughkeepsie, with a population of 42,399, remained the most populated municipality in Dutchess; the City of Poughkeepsie followed with the second-highest population of 32,736. Combined, these two municipalities accounted for more than a quarter of the county's total population: a share that has remained consistent since the 1980's.

The rate of population change from 2000-2010 varied across the county's 30 municipalities, with 25 gaining population and five losing population. The Village of Fishkill had the largest percent change, increasing by 25 percent from 2000-2010. The Towns of Fishkill, East Fishkill, Pawling, and Red Hook, and Village of Wappingers Falls followed with population increases of 11 to 16 percent each. The Town of East Fishkill had the largest absolute growth, increasing by 3,440 people from 2000-2010; the City of Poughkeepsie and Town of Fishkill followed with increases of 2,865 and 2,415 respectively. Together, these three municipalities accounted for half of the county's population growth over the decade.

Not all municipalities grew from 2000-2010. The Towns of North East, Pine Plains, and Washington, and the Villages of Rhinebeck and Tivoli lost population. The Village of Rhinebeck's population decreased by 420 people or over 13 percent, the largest decrease in the county; the Town of Pine Plains followed with a decline of 96 people or almost four percent. Figure 4-2 shows the percent change in 2000-2010 population by municipality. A detailed map showing 2010 population densities is provided at the end of this chapter.

Figure 4-2. Percent Change in Population by Municipality (2000-2010)

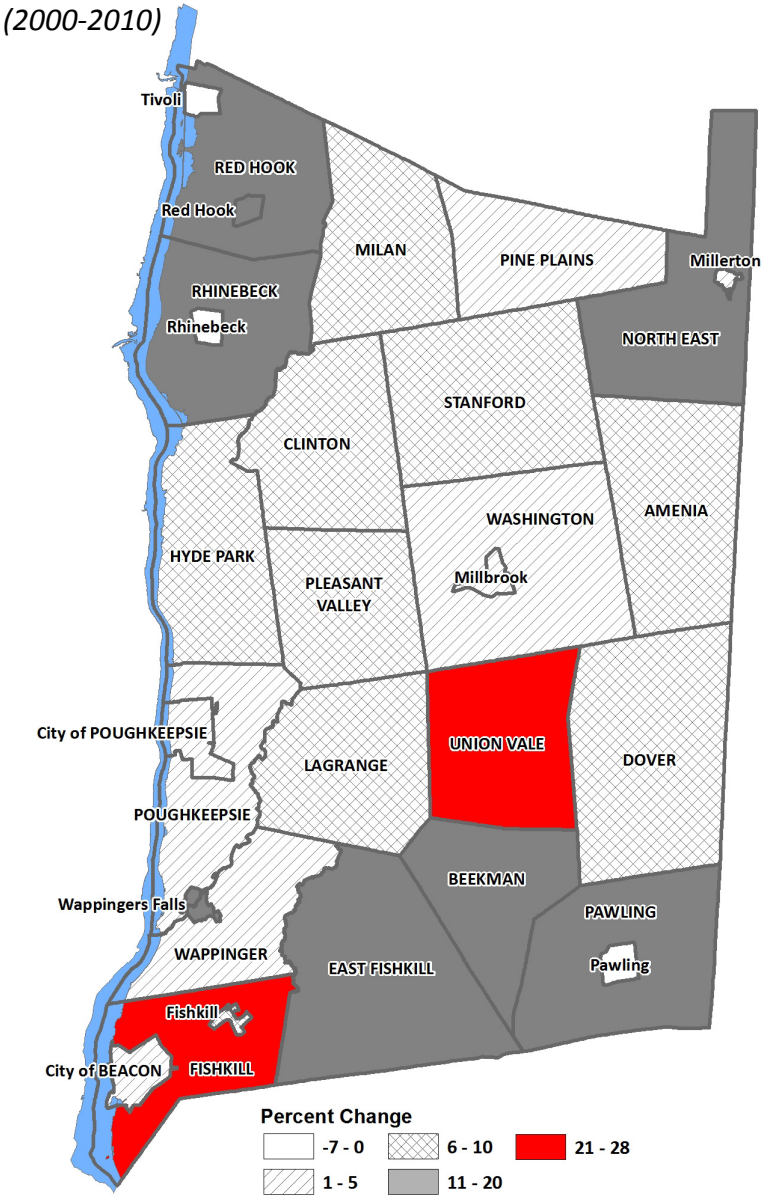
The 2010 Census also showed that Dutchess County had a household population of 277,523 living in 107,965 housing units. This equated to an average household size of 2.57 persons, which was lower than the 2.63 persons reported in 2000. This decline in average household size mirrored similar declines from 1960-1990, when average household size went from 3.23 to 2.69 persons. Figure 4-3 shows the percent change in households from 2000-2010.

Young & Elderly Populations

The young and elderly have different transportation needs than other population groups: they are less likely to drive, and therefore more likely to walk (both young and old), bicycle (young people), or in the case of the elderly, use special transit services such as Dial-a-Ride for transportation. The 2010 Census indicated that almost 57,000 residents were below the age of 16, representing 19 percent of the county's total population, while over 40,000 were aged 65 and over, representing 13.5 percent of total population. Together, these two groups represented a third of the county's population.

At the municipal level, the Town and City of Poughkeepsie had the highest number of elderly residents in the county, collectively totaling over 10,000 or 25 percent of all elderly residents in the county. The Village and Town of Rhinebeck had the highest percentages of elderly residents (27 and 26 percent respectively). In contrast, the Towns of East Fishkill, LaGrange, and Union Vale had the highest percentages of residents below 16, each ranging from 22-23 percent of total population.

Figure 4-3. Percent Change in Households by Municipality (2000-2010)

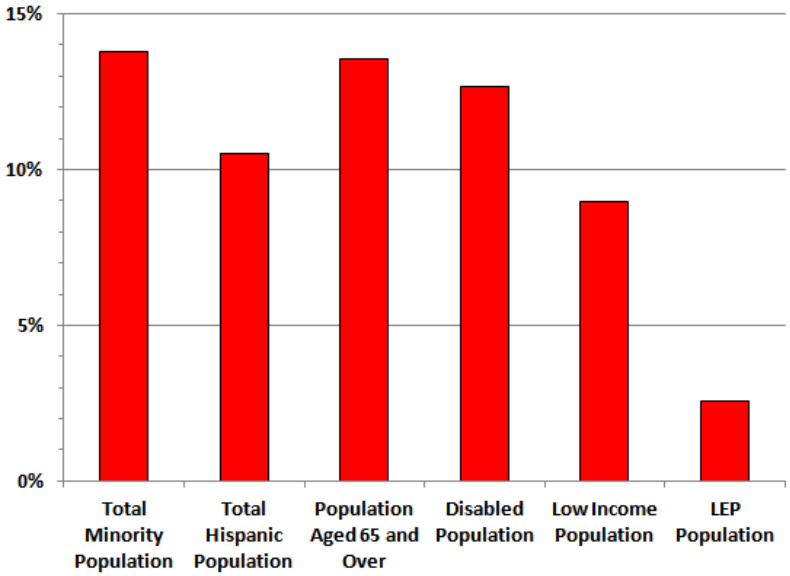


Title VI & Environmental Justice

As a recipient of federal funding, the Transportation Council must demonstrate its compliance with Title VI of the Civil Rights Act of 1964 and the Environmental Justice provisions set forth in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed in 1994. Title VI prohibits the discrimination by recipients of federal financial assistance, including federal transportation funds, on the basis of race, color, and national origin, or matters related to language access for Limited English Proficient (LEP)[3] persons, while Environmental Justice builds upon this by adding low income populations to the groups that should be protected from the adverse impacts of federally funded actions.[4] The Transportation Council assures that no person conducting business with it will be excluded from participating in, be denied the benefits of, or otherwise be subjected to discrimination on the grounds of race, color, national origin, sex, disability, age, language, or income.

Identifying the locations of minority, low income, and LEP populations is an important step in complying with Title VI and Environmental Justice requirements. The Transportation Council relied on guidance from the FTA to identify these populations.[5] For the Title VI and Environmental Justice analysis, the Council used 2010 Census block group data to identify block groups that were above-average for total minority and Hispanic populations, and the Census Bureau's 2010-2014 American Community Survey (ACS) 5-year Estimate to identify municipalities with above average low-income and LEP populations. Figure 4-4 shows Title VI and Environmental Justice populations as a percent of total county population.

Figure 4-4. Title VI & Environmental Justice Populations as a Percentage of Total County Population (2010)



Minority Population

The Transportation Council calculated total minority population by summing the Black/African-American, Asian, American Indian/Alaskan Native, and Native Hawaiian/Pacific Islander populations. In 2010 the county had a total minority population of 40,956 people, which was 13.8 percent of the county's total population. Using this average, 66 of 248 block groups were identified as being above-average for minority population. The Cities of Beacon and Poughkeepsie, Towns of Hyde Park, Fishkill, Poughkeepsie, and Wappinger, and Villages of Fishkill and Wappingers Falls contained block

groups that were above average for total minority population. Figure 4-5 shows the 2010 Census block groups that had an above-average percentage of minorities.

Hispanic Population

The Transportation Council calculated total Hispanic population by analyzing the Hispanic, non-white population. In 2010 the county had a total Hispanic population of 31,267 people, which was 10.5 percent of the county's total population. Using this average, 79 of 248 block groups were identified as being above-average for Hispanic population. The Cities of Beacon and Poughkeepsie, Towns of Amenia, Beekman, Dover, Hyde Park, Fishkill, Pawling, Poughkeepsie, and Wappinger, and Villages of Fishkill, Millerton, Pawling, and Wappingers Falls contained block groups that were above average for total Hispanic population. Figure 4-6 shows 2010 Census Block Groups that had an above-average percentage of Hispanics.

Low-Income Population

The Transportation Council identified low-income population areas using the estimated percent of the population living below poverty at the municipal level. Based on the Census Bureau's 2010-2014 ACS 5-year Estimates, 22,800 to 26,800 individuals in Dutchess County were living below the poverty level (approximately 8.1-9.5 percent of total population). These ranges represent the lower and upper bounds based on the reported margins of error for each estimate. Regardless, these numbers were higher than those reported in the 2000 Census, which found that 19,900 or 7.5 percent of the county's population was living in poverty.

For the Title VI and Environmental Justice analysis, the Transportation Council identified municipalities that had above average percentages of low income populations, defined as the percent of individuals below the poverty level, compared to the county average. The percentages were calculated as ranges (lower and upper bounds) that incorporated the reported margins of error for each municipality. Municipalities that had a lower bound above 9.5 percent were classified as being above-average for low-income population. The Council identified the City of Poughkeepsie (at 20.6-26.6 percent) as the only municipality that was above average for low income population, and it stands out as well above the county average. Figure 4-7 shows municipalities above average for low income population.

Limited English Proficiency (LEP) Population

The Transportation Council identified Limited English Proficiency (LEP) populations using the estimated number of LEP households in each municipality. Based on the Census Bureau's 2010-2014 ACS 5-year Estimates, 2.9 to 3.5 percent of the county's households were limited English speaking; this range represents the lower and upper bounds based on the estimate's margin of error (+/- 0.3 percent). Similar ranges were calculated at the municipal level based on the margins of error for each municipality. Those municipalities with a lower-bound above 3.5 percent were classified as being above-average for LEP households. Using this methodology, the

Figure 4-5. Census Block Groups Above-Average for Total Minority Population (2010 Census)

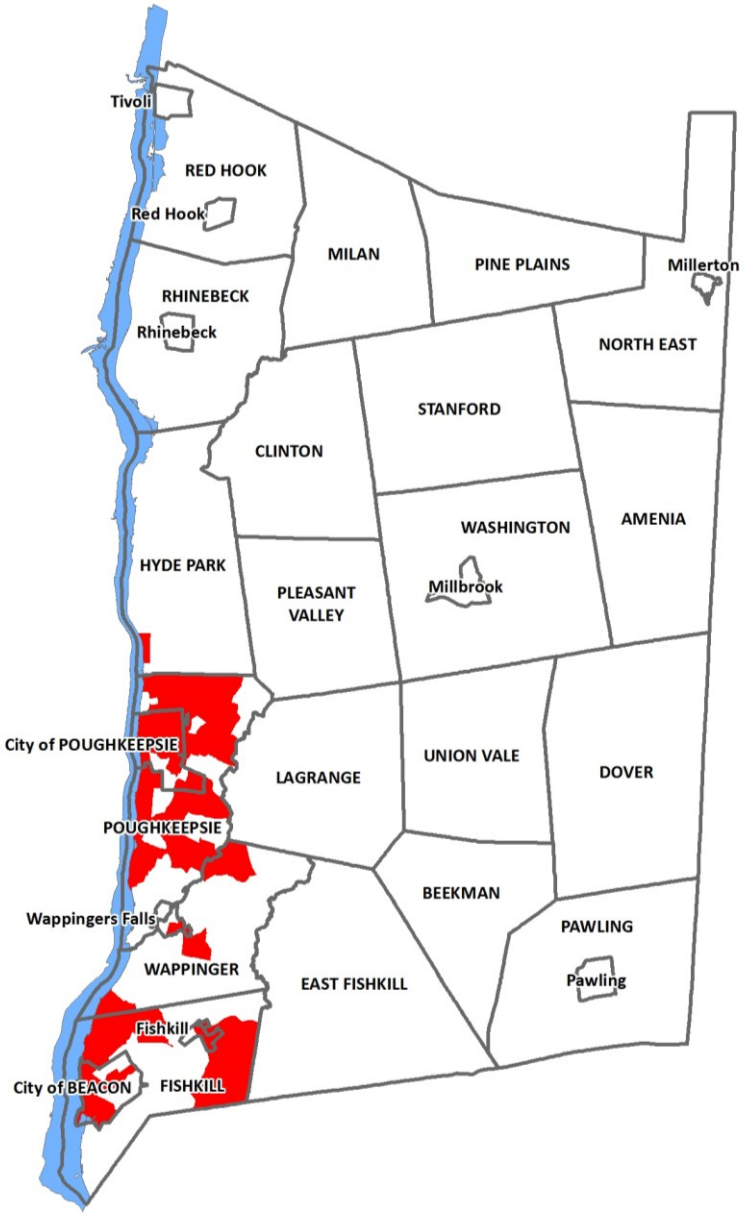


Figure 4-6. Census Block Groups Above-Average for Total Hispanic Population (2010 Census)

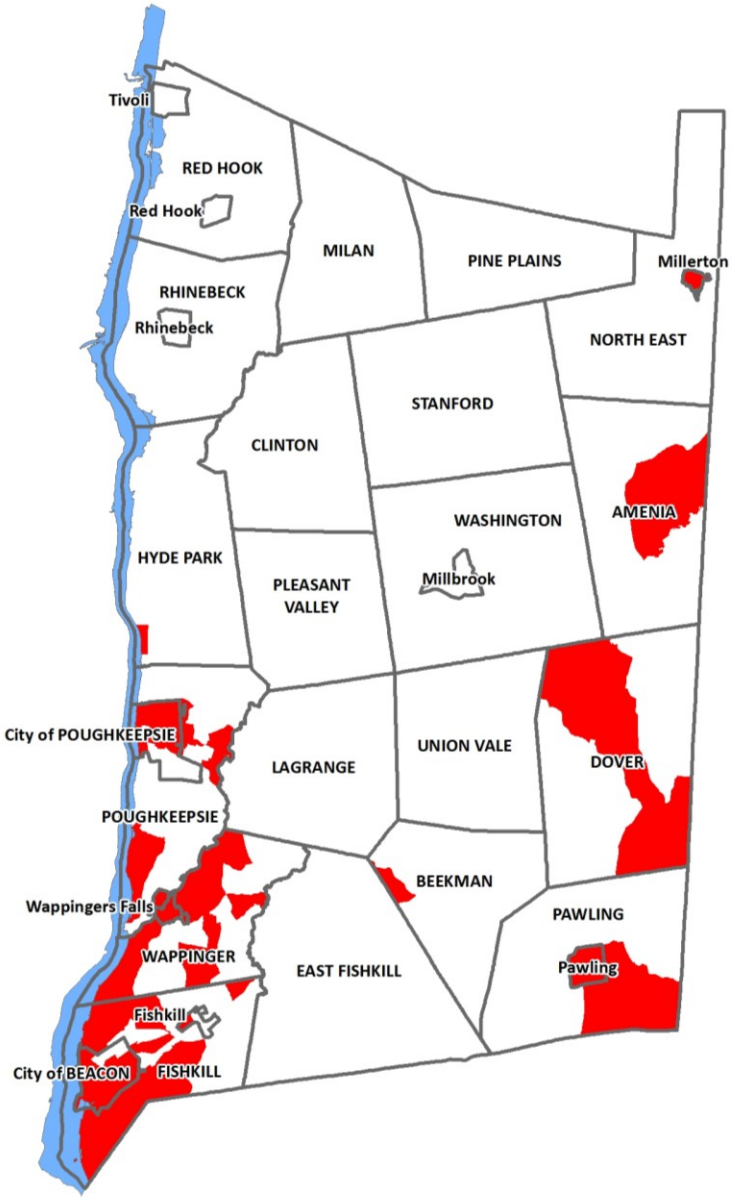


Figure 4-7. Municipalities Above-Average for Low Income Population (U.S. Census 2010-2014 ACS 5-year Estimate)

Figure 4-8. Municipalities Above-Average for Limited English Proficiency (LEP) Households (U.S. Census 2010-2014 ACS 5-year Estimate)

Cities of Beacon and Poughkeepsie had above-average percentages of LEP households. Figure 4-8 shows municipalities above average for LEP households.

Housing and Development

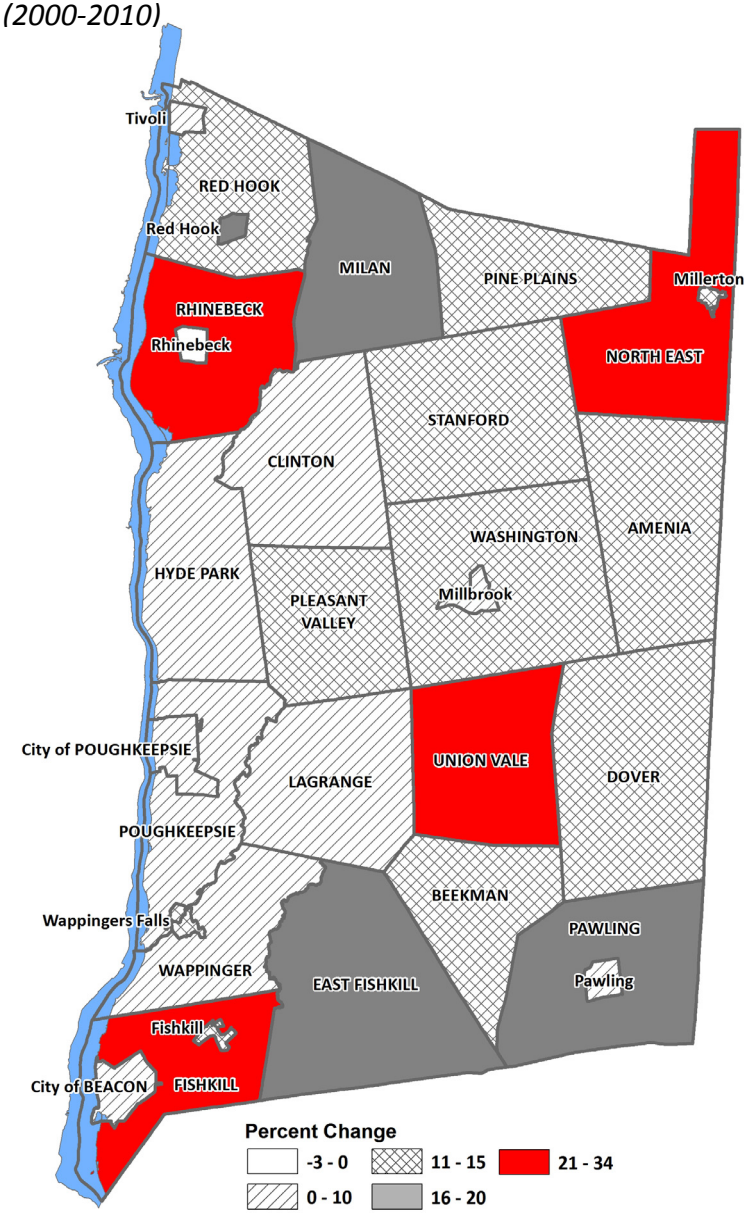
The 2010 Census reported a total of 118,638 housing units in Dutchess County, which was an 11.8 percent increase from 2000; this rate outpaced the six percent population increase from 2000 to 2010. The 12,535 new housing units built during the decade translated into an average increase of 1,250 new units per year, or a 1.2 percent annual increase. Over the decade, 29 municipalities saw increases in total housing units, with only the Village of Rhinebeck losing units. The Towns of Fishkill and Union Vale had the largest percent increases in housing, with 31.4 percent and 30.5 percent respectively (see Figure 4-9). Areas that saw the largest increases in population also saw sharp increases in the number of housing units. The Towns of Fishkill and East Fishkill experienced the largest increases in total housing units, with 2,210 and 1,544 new units respectively.

The Transportation Council maintains a Major Projects database that tracks significant development projects across the county. The database tracks projects of 25 or more residential units or more than 25,000 square feet of non-residential gross floor area. For rural municipalities, the threshold is ten or more residential units or more than 10,000 square feet of non-residential floor space. The 2013 Major Projects Report identified over 12,000 proposed housing units and almost seven million square feet in non-residential development in the county. Compared to 2012, these totals represent a 21 percent decrease in planned housing units and a three percent decrease in non-residential square footage.[6]

The Major Projects Report noted that the southern and central portions of the county saw the most development proposals. The Towns of Dover, East Fishkill, Hyde Park, and LaGrange each had over 1,000 proposed housing units, accounting for over 54 percent of all proposed residential units in the county. Non-residential development proposals were also concentrated in the southern and central parts of the county. The Towns of East Fishkill and Hyde Park led with a combined total of over 3.9 million square feet, 56 percent of the county total. The City of Beacon and Towns of Dover, Fishkill, LaGrange, Pawling, and Poughkeepsie each had more than 200,000 square feet of proposed non-residential space proposed.

Related data from the Dutchess County Department of Planning and Development supports the observation that development activity continues to lag in Dutchess County. The Planning Department reviews local development applications under the authority of New York State General Municipal Law (Sections 239-l and m), which requires city, town, and village municipal boards to forward certain land use actions to the county planning agency for review. These actions, known as referrals, include area and use variances, site plans for locations within 500 feet of a state or county road, and zoning amendments. Comparing the number of referrals processed each year provides us with a general understanding of the level of development activity in the

Figure 4-9. Percent Change in Housing Units by Municipality (2000-2010)



county. Within the past ten years, 2005 and 2006 represented the peak years for referrals (683 and 643 respectively). The number of referrals declined after the 2007-2009 recession, reaching only 513 in 2010 and 447 in 2014. The number of referrals in 2014 represented 65 percent of the number of referrals processed in 2005, a decline of 35 percent.[7]

Economic Activity

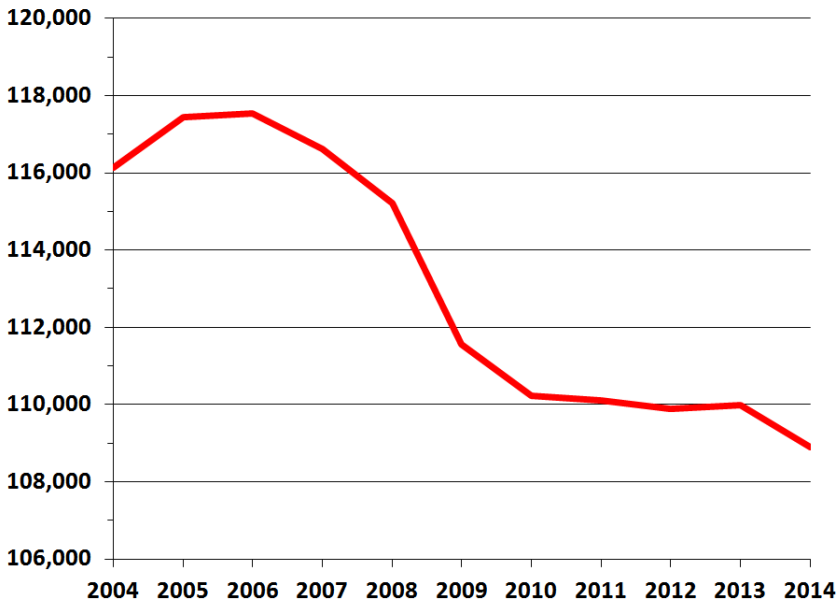
Economic factors such as employment and personal income directly influence people's travel behavior and how the transportation system is used. Measuring the economic health of a community allows us to better understand existing and future travel trends. Commuting to work is one reason people travel, so a significant change in employment will have a corresponding effect on the transportation system. Likewise, income affects people's transportation choices, including their access to a personal vehicle and their use of public transit, especially bus transit. The Transportation Council reviewed recent employment and income trends that provide insight into potential impacts on transportation. Overall economic activity in Dutchess County, whether measured by employment or income levels, has generally tracked national, state, and regional trends.

Total Employment

Data from the Bureau of Labor Statistics' (BLS) Quarterly Census of Employment and Wages shows that private and public sector employers in Dutchess County supported approximately 109,000 employees in 2014[8], with the private

sector accounting for almost 82 percent of total employment. Within the private sector, the health care and social assistance industries accounted for over 20 percent of private employment, followed by retail trade at almost 16 percent, and manufacturing at 11 percent. Combined, these three sectors constituted almost half of all private employment in Dutchess, a share that has been consistent throughout the past ten years. Within the public sector, local governments (including school districts) employed 13,200 workers, followed by State agencies with over 5,800 workers, and federal agencies with 1,200 workers.

Figure 4-10. Dutchess County Total Employment (2004-2014)



BLS employment data from the past ten years suggests that Dutchess County was not immune to the economic recession of 2008, and more importantly, has yet to fully recover from the downturn (see Figure 4-10). In Dutchess County, the total number of public and private sector employees in 2014 was the lowest reported for the eleven year period from 2004-2014 and six percent lower than the 2005 high of 117,500 employees. The effects of the recession were most evident in the dramatic drop in employment from 2008 to 2009, when the county's total employment decreased from 115,200 to 111,500, a loss of 3,700 jobs or three percent in one year. Employment data for 2010-2014 indicates that total employment in Dutchess remained flat until 2013, then dipped again in 2013-2014.

In addition to establishment employees reported by the BLS, the NYS Department of Labor (NYSDOL) notes that self-employed persons can make up a significant part of an area's total employment. Various estimates suggest that the number of self-employed persons can range from as little as six percent of total employment to as much as 25 percent.[9] Although the disparity in these estimates makes it difficult to pinpoint the exact number of self-employed persons in the county, we can presume that total employment is higher than what is reported in BLS data.

Mid-Hudson Valley TMA Employment

From a tri-county TMA perspective, the BLS data shows that Orange County experienced a higher rate of employment growth than Ulster and Dutchess during the past decade. Private and public employers in Orange County had a total of 126,300 employees in 2004 compared to 136,200 in 2014, an increase of almost eight percent. The same data showed that

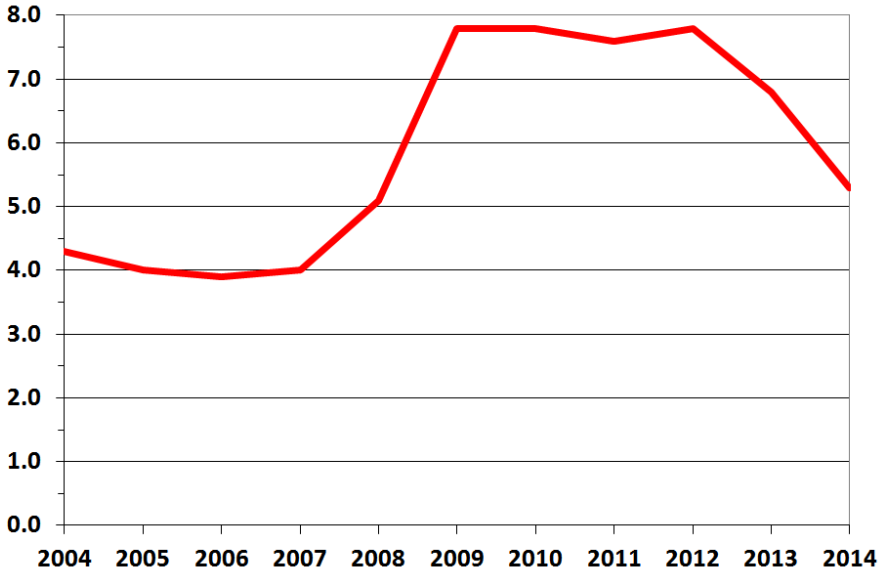
employment decreased slightly in Ulster County, where the public and private sectors employed 61,800 in 2004 compared to 58,600 in 2014, a decline of over five percent.

Measured as a share of total employees in the TMA, Orange County employers accounted for 45 percent of all regional employment, followed by Dutchess with 36 percent, and Ulster with 19 percent. These employment patterns suggest that Orange County may be a more attractive destination for workers in the three-county area, given its larger share of total employees and the employment growth it has experienced in the past decade. Beyond the TMA, employment in Rockland and Westchester counties remained steady from 2004 to 2014, which suggests that they retained their importance as regional employment centers, and in turn, their attractiveness to regional workers.

Total Unemployment

Unemployment data provides additional insight into the health of the local economy. The BLS Local Area Unemployment Statistics program showed that the unemployment rate in Dutchess County increased from 4.3 percent in 2004 to an estimated 5.3 percent in 2014 (see Figure 4-11).[10] Not surprisingly, the county's unemployment rate rose after the 2007-2009 recession, climbing to 7.8 percent in 2009 and 2010, while still not returning to pre-recession levels by 2014. Unemployment rates for Orange and Ulster counties followed similar trends, both spiking in 2010 at 8.3 percent and then falling to 5.5 and 5.8 percent respectively in 2014.

Figure 4-11. Dutchess County Unemployment Rate (2004-2014)



Labor Force

Additional data on labor is available from the U.S. Census Bureau. The Census Bureau's 2010-2014 ACS 5-year Estimates approximated that there were between 138,000 and 141,400 workers aged sixteen and older living in Dutchess County. Dutchess County was the most popular work destination for these workers, accounting for approximately 67 percent of all work destinations. This share was similar to the rates reported in the 2000 Census (69 percent) and the previous 2009-2013 ACS 5-year Estimates (67 percent). Similarly, 2010-2014 ACS 5-year Estimates showed that the share of county workers commuting out-of-state remained relatively constant at about four percent of the workforce. When the number of workers

in the county is compared to the total number of jobs in the county (the 109,000 employees reported by Dutchess County employers), the ACS estimates suggest that there is a shortfall of local jobs for the workforce, requiring some to travel to other counties and states for work.

Data from the latest iteration of the Census Transportation Planning Products (CTPP) program, derived from the Census Bureau's 2006-2010 ACS 5-year Estimates, indicated that Westchester, New York City, Putnam, Orange, and Ulster counties were still the most popular out-of-county work destinations for Dutchess County workers, and that Ulster and Orange counties provided the largest share of non-resident workers to Dutchess County.[11] Less recent, but more specific data from the 2000 Census showed similar work destinations for out-of-county workers to include their share of the workforce: Westchester County (12 percent), New York City (4.5 percent), Putnam County (3.5 percent), Orange and Ulster counties (three percent each), and Connecticut (three percent).[12]

Income & Transportation

Besides employment activity, household income also influences how the transportation system is used. Higher-income households tend to have more vehicles and are thus more inclined to travel by car, whereas lower-income households may have limited access to a private vehicle and are more likely to travel by public transit, particularly bus, and by walking and bicycling.

The Census Bureau's 2010-2014 ACS 5-year Estimates indicated that Dutchess County had a Median Household Income (MHI) range of $71,000 to $74,000. At the municipal level, the ACS data showed that households in the Town of Amenia ($49,800-$65,900) and City of Poughkeepsie ($36,900-$41,000) had Median Household Incomes well below the county average, while households in the Towns of Beekman ($87,500-$106,500), East Fishkill ($94,000-$107,500) and LaGrange ($94,900-$107,500) had the highest median incomes in the county.[13]

In terms of per capita incomes, the 2010-2014 ACS 5-year Estimates showed a range of $33,400 to $34,500 in Dutchess County, compared to $23,940 reported in the 2000 Census (1999 dollars), an increase of 40 to 44 percent. When adjusted by the Consumer Price Index (CPI), the increase was insignificant, with the current buying power of individuals and households in Dutchess County remaining the same as reported in 2000.[14]

Vehicle Ownership

Households without a vehicle are much more likely to seek alternative transportation. Based on data from the Census Bureau's 2010-2014 5-year ACS Estimates, between 8 and 9 percent of county households have no vehicle available. The Cities of Beacon (at 11-18 percent) and Poughkeepsie (at 24-29 percent) had the highest percentages of zero-vehicle households in the county. The 2009 NHTS estimated that 93 percent of surveyed households owned or had regular access to at least one vehicle, while seven percent had no vehicle. This distribution was almost identical to that reported in the

2001 NHTS (94 and six percent respectively). The 2009 National Household Travel Survey (NHTS) further noted that the majority of zero-vehicle households had annual household incomes below $25,000.

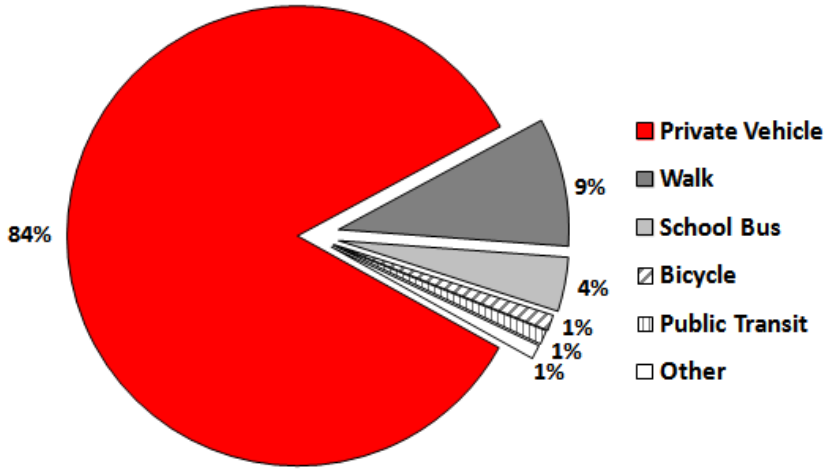
Transportation Related Expenses

Transportation-related purchases represent a significant investment for consumers. According to the BLS Consumer Expenditures Survey, in 2014 the average American consumer spent $9,073 on transportation, representing 17 percent of their total annual expenses.[15] This included average expenditures of $2,468 for gasoline and $581 for public transit. These amounts are considerably higher than the amounts reported in 2009 for *Moving Dutchess*. In particular, gasoline expenditures peaked in 2012 at $2,756, over twice the expenditure reported in 2003.

Travel Behavior

Factors related to demographics, economic conditions, and the housing market influence people's travel behavior. A number of surveys show that Dutchess County residents still rely primarily on the automobile for their transportation needs. The 2009 National Household Travel Survey (NHTS), which included data specific to Dutchess County, estimated that 84 percent of all surveyed trips in the county were made by personal vehicle, with the remaining trips made by walking (nine percent), school bus (four percent), public transit (one percent), bicycling (one percent), and other (one percent) (see Figure 4-12). Ninety percent of trips to work were made by a personal vehicle (83 percent as driver and seven percent as a passenger). This distribution is similar to the 2001 NHTS.

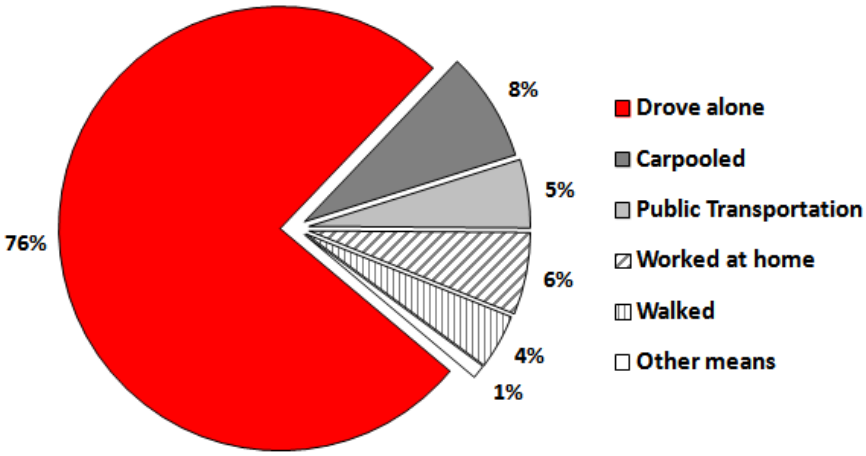
Figure 4-12. Average Daily Person Trips by Mode for Dutchess County (2009 NHTS)



The Census Bureau's 2010-2014 ACS 5-year Estimates further supported the observation that the automobile was the primary means of travel in Dutchess County, especially for work related travel. The ACS estimated that approximately 84 percent of work trips were made by a personal vehicle: approximately 76 percent of workers drove alone to work, with eight percent carpooling, five percent using public transit, and four percent walking. The ACS also estimated that over five percent of workers worked at home (see Figure 4-13). These shares were similar to data from the 2000 Census, which reported that 78 percent of workers drove alone to work, with ten percent carpooling, four percent using transit,

and another four percent walking. Three percent of workers worked at home in 2000.

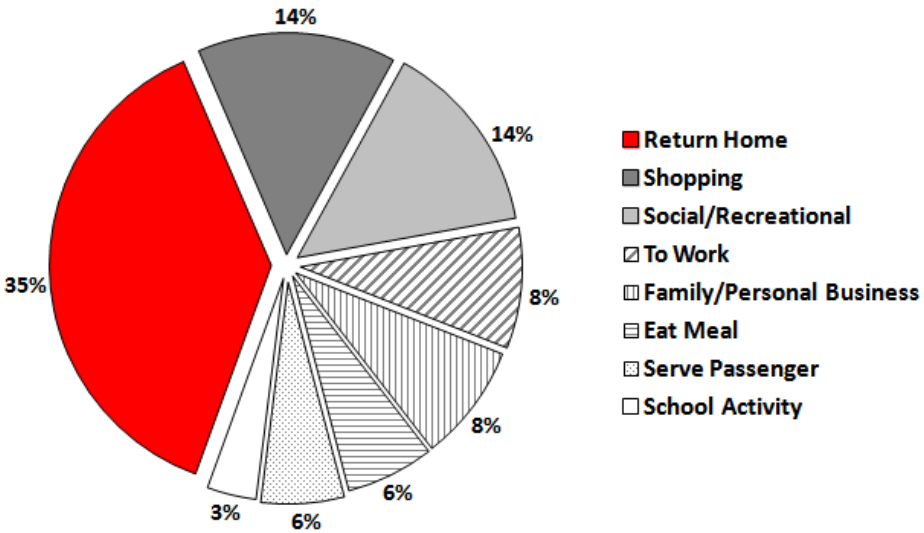
Figure 4-13. Means of Transportation to Work for Dutchess County Workers (2010-2014 ACS 5-year Estimate)



The 2009 NHTS provided data on why Dutchess County residents travel. The return trip home, whether from shopping, work, or other activities, represented 35 percent of all trips, the highest share of any trip purpose. Other trip purposes included shopping (13 percent), social/recreational (13 percent), family business (eight percent), and eating out (six percent). Work trips represented eight percent of all trips taken by county residents, which was the same share reported in the 2001 NHTS (see Figure 4-14).

The 2009 NHTS also indicated that different trip purposes had different travel characteristics. For example, the distance traveled by Dutchess County residents varies based on trip purpose. whole, the average trip length in Dutchess County was 11.2 miles; this is slightly higher than the 10.3 miles reported in the 2001 NHTS. Some transportation modes had longer trip lengths – for example, train trips to work averaged 59 miles, compared to 16 miles for vehicle-based work trips. Non-motorized trips had the shortest trip lengths, with walking trips to work averaging 0.5 miles and bicycling trips to work averaging 7.5 miles. These trip distances were consistent with the 2001 NHTS.

Figure 4-14. Residential Household Person Trips by Purpose for Dutchess County Household Population (2009 NHTS)



The 2009 NHTS estimated that people traveled an average of 13 miles for social/recreational purposes and 16 miles for work-related trips, whereas trips to school, shopping, or for family business were shorter than ten miles. Measured as a

The Census Bureau's 2010-2014 ACS 5-year Estimates for Dutchess County indicated that the mean travel time to work was between 31 and 32 minutes, with over half of work commutes taking 24 minutes or less. The ACS also found that 37 percent of workers in Dutchess County leave home for work between 7:00 and 8:30 a.m. These estimates were consistent with data from the 2000 Census and previous ACS estimates.

The New York Metropolitan Transportation Council (NYMTC)'s 2010-2011 Regional Household Travel Survey (RHTS) also included information on local travel behavior. Based on a sample of 463 Dutchess County residents, the survey found that 85 percent of all trips taken by county residents were by automobile, while 6 percent were made by walking and other non-motorized modes[16], 6 percent by bus, 2 percent by rail or ferry, and 0.7 percent by other modes. With regard to trip purposes, the NYMTC Travel Survey indicated that 27 percent of all trips were work related, with 14 percent for social reasons, nine percent for shopping, and seven percent for school ("other" trip purposes make up the remaining 43 percent of trips). The survey also found that the average trip duration for all trips (by all modes) was about 21 minutes. These ranged from 25 minutes for trips home, 23 minutes for school trips, 20 minutes for trips to work, and 18 minutes for other trips.[17]

Transportation Activity

Travel activity remains closely tied to the economy. The 2007-2009 recession not only affected employment and housing, but also the amount of travel on our roads. Traffic volume data from FHWA showed that nationally, the number of vehicle miles traveled in 2009 was lower than reported from 2004 through 2007, and in 2008, total annual travel actually fell (by approximately 1.8 percent) for the first time since 1988.[18] Although traffic volumes have increased in recent years, most notably from 2011-2013, they still have not reached the levels seen in 2007, when traffic volume peaked at over 3,031 billion vehicle miles - the highest recorded total from 1988-2013. In 2013 national traffic volume stood at 2,972 billion vehicle miles, 1.9 percent lower than 2007. Preliminary data from 2014 indicates that national travel continues to increase slowly, possibly reaching 3,000 billion vehicles miles for the year.

Travel activity in New York State has mostly followed national trends. The number of vehicle miles traveled in the state decreased for five consecutive years from 2007-2011, and by 2012, total vehicle miles travelled in the state remained 4.4 percent lower than 2006, when travel peaked at 141 billion miles in the state.[19] In 2012 total miles travelled in New York State roughly equaled the same amount observed 12-years earlier in 2000.

The recent decline in miles travelled differs from the steady growth observed in previous years: during 1980-2006 vehicle miles travelled grew by 82 percent across New York State. When compared to population growth, the growth in miles travelled far outpaced growth in the state's population. From 1980-2010, vehicle miles travelled grew by 69 percent while the state's population grew by only ten percent. However, this

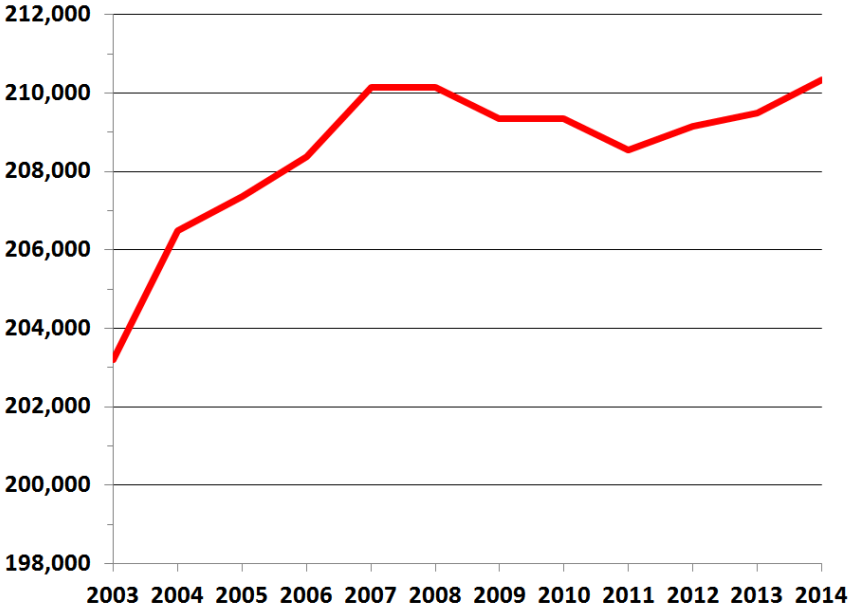
trend appears to be waning; the decade of 2000-2010 saw miles travelled and population each increase by two percent.

Vehicle Registrations & Drivers Licenses

Vehicle registration data from the NYS Department of Motor Vehicles (DMV) affirms that the private vehicle is ubiquitous in Dutchess County. From 2003 to 2014, the number of standard vehicle registrations in the county increased by 3.5 percent, from 203,212 to 210,336 vehicles. Most of this increase occurred before the 2007-2009 recession, with the number of standard registrations rebounding after 2011 (see Figure 4-15). 2014 saw the highest number of vehicle registrations in the county's history. However, the number of commercial vehicle registrations in the county declined by 15 percent from a high of 15,765 in 2007 to 13,354 in 2014.[20]

NYS DMV data on the number of driver licenses in-force generally tracked with the changes in vehicle registrations. During 2003-2014, the number of driver licenses in Dutchess County peaked at 214,028 in 2007, declined from 2008-2012, and then rebounded to 213,452 by 2014. Through the past decade, the number of driver licenses in-force in the county has increased by only 1.8 percent, averaging about 210,700 per year. The changes in miles travelled, vehicle registrations, and licenses point to the speed at which economic conditions can change travel activity and behavior. It appears evident that the 2007-2009 recession affected how we travelled, whether it was due to changes in household income, employment, or the costs associated with transportation.

Figure 4-15. Dutchess County Vehicle Registrations (2003-2014)



Future Population, Employment, & Housing

Moving Dutchess 2 recommends projects and policies to preserve and improve the county's transportation system over the next 25 years. To accomplish this, the Transportation Council must understand how the area will change, particularly with regard to population, employment, and housing. Demographic forecasts and projections inform our understanding of potential trends and allow us to better assess the potential impacts of change on the transportation system. The Council recognizes that forecasts are imprecise, and unforeseen events, whether international or national in scope, can quickly alter future conditions and affect how

people use the transportation system. Nonetheless, the Council must identify future trends based on the best available data, in order to satisfy its planning mission.

Prior to developing its own estimates of future population and housing, the Transportation Council reviewed demographic forecasts and projections from three sources: the New York State Department of Labor (NYSDOL), the New York State Department of Transportation (NYSDOT), and the New York Metropolitan Transportation Council (NYMTC). All three provided future population data at the county level, which the Transportation Council used to benchmark its own build-out estimate.

NYSDOL Population Projections

The NYSDOL projections were prepared in 2011 through a collaborative effort with the Cornell Program on Applied Demographics. The projections relied on historic data to estimate future conditions and spanned the 30-year period from 2010 to 2040. Unlike forecasts, the NYSDOL projections are meant to gain insight into what might happen if the future mirrors previous trends. The NYSDOL projections estimated that Dutchess County's population could grow to approximately 326,000 by 2040 – a total increase of 9.7 percent or 0.3 percent annually. The projection estimated that the population aged 65 and over could increase by 51 percent or 1.7 percent annually. When measured as a share of the total population, the projection estimated that the 19 and under age group could represent 24 percent of the population, compared to 19 percent for those aged 65 and over. The labor force, defined as those between the ages 20 and 64, was projected to increase by nine percent.[21]

NYSDOT Population & Employment Forecasts

In 2012 NYSDOT contracted with IHS Global to prepare population and employment forecasts for New York counties for the 30-year period from 2012 to 2042. The forecast estimated that Dutchess County's population would grow to approximately 334,700 by 2040, an increase of 12.5 percent or 0.4 percent annually from 2010. Not surprisingly, growth rates differed by age group. The forecast estimated that the population aged 65 and over would increase by 88 percent, representing 22 percent of the county's 2040 population. In contrast, the forecast estimated that the 24 and under age group would decrease by two percent by 2040 – though this age group would still represent over 28 percent of the county's population, compared to 22 percent for those aged 65 and over. The civilian labor force, defined as those between the ages of 25 and 64, was forecast to increase by only 2.9 percent by 2040. The forecast also estimated that total non-farm employment in the county would increase by 20 percent from 2010-2040, with the education, health, information services, and professional business sectors growing the fastest.[22]

NYMTC 2050 Socio-Economic Demographic Forecast

Prepared in 2015, the NYMTC forecast spans the period from 2010 to 2050 and provides county-level estimates for total population and employment. For Dutchess County, the

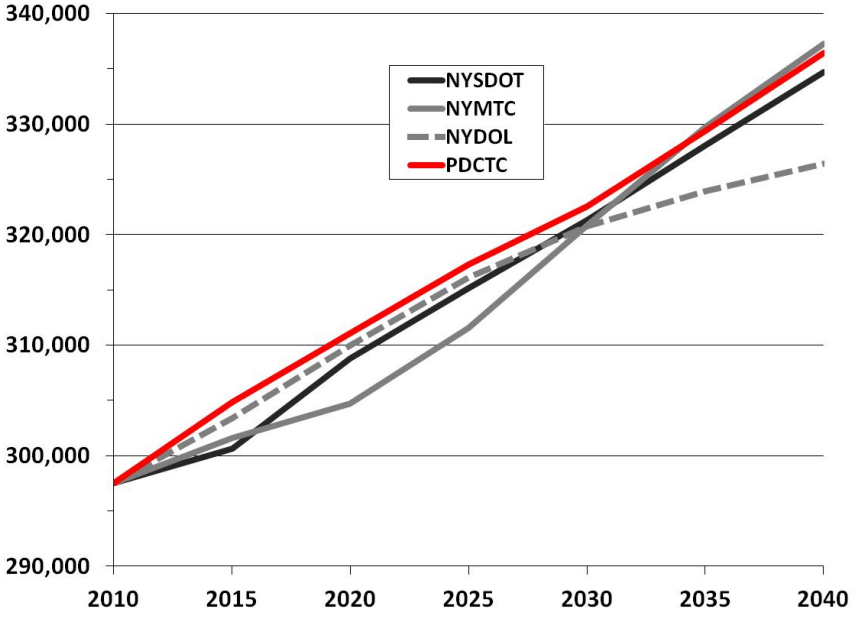
forecast estimated that total population would grow to 337,000 by 2040, an increase of almost 40,000 or 13.4 percent from 2010. Representing an annual increase of 0.4 percent, this growth rate compares favorably with the growth rates seen in the NYSDOT forecasts and NYSDOL projections. The NYMTC forecast also estimated that the number of households (i.e. occupied housing units) would increase by 20 percent from 2010-2040, with the higher growth rate reflective of the trend for smaller sized households. The NYMTC forecast estimated that the county's labor force would increase by almost ten percent from 2010-2040, while total employment would increase by 18.9 percent.[23]

The three futures offered by the NYSDOL, NYSDOT, and NYMTC forecasts and projections align closely with one another – they all agree that Dutchess County's population will increase by 10-12 percent over the next 25 years (see Figure 4-16). In particular, the three population estimates converge around 2030, where total population is expected reach 321,000. The estimates further agree that the 65 and over population will grow at a faster rate than other age groups, especially those 24 and under. Likewise, the estimates agree that total employment will increase in the county, possibly at a faster rate than total population. The similarities in the forecasts provided the Transportation Council with a solid benchmark to gauge the accuracy of the build-out analysis it completed for *Moving Dutchess 2*.

PDCTC Build-out Analysis – Scenario Planning

In addition to the population estimates described above, the Transportation Council performed its own estimate of future population, which was based on a build-out analysis completed by the Dutchess County Department of Planning and Development. The premise behind this approach was that the county has a finite capacity to support new housing units, and this capacity will affect the rate of population growth. By determining how many housing units could be built, we can better estimate future population based on historic occupancy rates and average household sizes.

Figure 4-16. Estimates of Future Total Population in Dutchess County (2010-2040)



Existing Zoning Build-out Scenario

The build-out analysis assumed that all undeveloped parcels that are currently zoned residential would be developed to

their full potential. For *Moving Dutchess 2*, it was assumed that this build-out would occur over 35-years (i.e. 2050). The analysis identified the number of possible new housing units that could be legally supported for over 7,200 individual parcels, based on local zoning and subdivision bulk regulations for the county's 30 municipalities. This gross build-out was then constrained based on environmental features such as floodplains, watersheds, steep slopes, protected lands, and agricultural lands that would limit the number of housing units on each parcel. An additional 15 percent of land area was set aside for roads and other infrastructure. This produced a net total of potential housing units by parcel, which was adjusted by the presence of any existing housing units.

The analysis estimated that over 30,000 new housing units could be developed on residential parcels, with an additional 13,000 housing units if residentially zoned agricultural lands were developed. Assuming that land being used for agricultural purposes would be protected, it was estimated that by 2050, almost 20,000 of the 30,000 new units could be developed. This scenario is illustrated in the 2040 Build-out Analysis: Existing Zoning Scenario map.

To estimate future population, the total number of potential future households (occupied housing units) was calculated by applying occupancy rates to the number of new housing units. The occupancy rates were based on average vacancy rates from 1980-2010 Census data by municipality. Future population was determined by multiplying the number of occupied housing units (i.e. households) by the average number of persons per household by municipality. This generated a total new population, which was added to 2010 Census data.

The pro-rated build-out analysis estimated that the county's population could total 336,000 by 2040, a 13 percent increase from 2010. As with the NYSDOT, NYSDOL, and NYMTC estimates, this represented annual growth rate of 0.4 percent. Overall, the Transportation Council's build-out analysis tracks with the level of population growth shown in the other three estimates (see Figure 4-16).

Centers & Greenspaces Build-out Alternative

In addition to the traditional build-out analysis, the Dutchess County Planning Department performed an alternative build-out analysis to measure how much development could be absorbed by the centers identified in the county's *Centers and Greenspaces* concept. This build-out assumed the same environmental constraints and 15 percent set-aside for infrastructure as the build-out based on existing zoning. Assuming a 10 unit per acre density within the 66 centers, undeveloped land within the centers could potentially absorb 55 percent of total build-out development. This build-out scenario would preserve all of the current agricultural parcels and 36 percent of the other residentially-zoned land projected to be developed under the existing zoning build-out. This scenario is illustrated in the 2040 Build-out Analysis: Centers & Greenspaces Scenario map.

Mid-Hudson Valley TMA Population Growth

The Transportation Council expects population growth to

occur unevenly across the Mid-Hudson Valley TMA, with Orange County growing faster than Dutchess or Ulster counties. The NYSDOL projections estimate that Orange County's population will grow to 444,000 by 2040, an increase of 19 percent or 0.6 percent annually, while the NYMTC forecasts show an even more aggressive growth rate, estimating that Orange County will grow by 32 percent, or one percent annually, to over 493,000 by 2040. The same estimates show slow to no growth in Ulster County. The NYMTC forecast estimates that Ulster County's population will grow to 196,000 by 2040, an increase of only eight percent, while the NYSDOL projection actually shows a 6.8 percent decline in population to approximately 170,000 by 2040.

Taken as a whole, the Mid-Hudson Valley TMA will experience some level of population growth by 2040. If we use the NYMTC forecasts, Dutchess, Orange, and Ulster counties could see a combined population of over one million by 2040, a 20 percent increase from 2010. Similarly, the NYSDOL projections show a 2040 three-county population of over 940,000, a 10.3 percent increase from 2010. These two estimates lead us to conclude that the TMA's population will increase by a range of 10 to 20 percent from 2010-2040. Given the likelihood of this population growth, the Transportation Council expects that additional pressure will be placed on regional infrastructure, public services, and natural resources.

Future Economic Activity

The Transportation Council relies on national, State, and regional data sources to understand economic activity in Dutchess County. Understanding how the economy may change allows us to better gauge future demands on the transportation system, since economic, employment, and income trends directly influence travel behavior.
The BLS Employment Projection Program estimated that national employment would grow by 10.8 percent from 2012-2022, or one percent annually. The projections indicated that two major employment sectors would experience the highest rates of growth: health care/social assistance and construction. The BLS projects that the health care/social assistance sector will grow by five million jobs or 2.6 percent annually from 2012-2022, which would account for nearly one-third of the total projected increase in jobs during the ten years. Not surprisingly, this growth reflects the need to care for an ever-aging population. The BLS also projects that the construction sector will grow by 1.6 million jobs or 2.6 percent annually from 2012-2022. Combined, these two sectors are expected to create almost half of all new jobs over the ten-year period. Other sectors such as educational services and leisure and hospitality will also experience high rates of growth. The manufacturing sector is projected to experience the highest rate of job loss, losing 0.5 percent annually from 2012-2022.[24]

Though the national, State, and regional economies will require time to regain their footing, it is reasonable to expect that there will be economic growth over the next 25-years. Employment forecasts completed in 2012 by IHS Global for NYSDOT estimated that the number of jobs in Dutchess County would increase by 43 percent between 2010 and 2040,

from 114,500 to over 163,000, while NYMTC's forecasts show employment reaching 225,000 by 2040.

The Dutchess County Planning Department, in conjunction with Orange and Ulster counties, completed a Regional Housing Needs Assessment (RHNA) in 2009 that included housing and economic forecasts for the three counties. For Dutchess County, the forecast indicated that non-farm employment would grow by 0.4 percent annually from 2010 to 2020, with most new jobs occurring in the education and health sectors.[25] The 2009 RHNA identified three major issues related to the region's future economy: 1) credit is expected to be more difficult to obtain in the near term, 2) energy prices are expected to remain elevated relative to historic prices, and 3) the struggling economy will likely further slow the relatively weak population growth forecasted in the region.

Future economic conditions, especially tighter credit lending practices, will make home ownership less likely for households and make it more difficult for businesses to expand. Higher energy prices will increase the cost of doing business and reduce discretionary household spending and a slowdown in the housing market will likely lead to slower population growth in the region. The 2009 RHNA noted that the demographic changes forecasted to occur in the area, particularly from 2010-2025, will be different than years prior due to slow economic growth.

The Transportation Council expects employment to grow gradually due to the lingering effects of the 2007-2009 recession. In *Moving Dutchess*, the Council noted that the NYSDOL had estimated that it would take five years for the State's economy to rebound from the recession, suggesting that employment would not reach pre-recession levels until 2015. Given the relatively flat rates of employment since 2011, it seems unrealistic that we will achieve pre-recession employment by 2015. Instead, the Council expects that employment may not fully rebound until the latter part of the decade, and then increase over the following 20-years. As indicated by the NYMTC forecasts, total employment in Dutchess County could reach 144,000 by 2040, which would be a 19 percent increase from 2010 or 0.6 percent annually. This would constitute a higher growth rate than estimated for future population.

Future Housing

The Transportation Council used data from its 50-year build-out analysis to identify the number of future housing units and households. However, the 2009 RHNA also estimated the number of future housing units in Dutchess County. The RHNA estimated that the county would have a total of 119,600 units by 2020, which is slightly lower than the 125,000 housing units estimated by the Council's build-out analysis for 2020. The RHNA estimated a total of 116,500 households by 2020, which is similar to the 114,000 estimated by the build-out analysis.

The RHNA projected housing growth across the TMA, estimating that Orange and Ulster counties would reach 146,300 and 82,000 housing units respectively by 2020. These increases are similar to the growth rates projected for Dutchess County. Combined, the TMA is projected to have

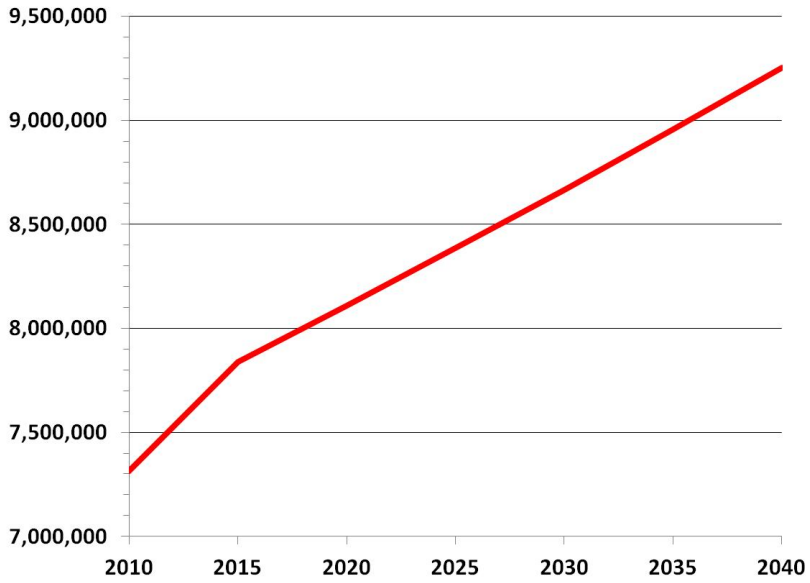
almost 348,000 housing units by 2020. By extrapolating each county's projected growth, the Transportation Council estimates that the TMA could have a total of over 400,000 housing units by 2040.

Future Travel

The Transportation Council maintains a travel demand model that simulates vehicle travel within Dutchess County. The model uses a three step process (trip generation, trip distribution, and trip assignment) to estimate trips and relies on GIS (Geographic Information Systems) mapping to simulate the highway network and land use patterns. The model measures the impact of demographic and land use changes on the transportation system, incorporating data about future population, employment, housing, and households within the county. The model measures this future travel in terms of Vehicle Miles Traveled (VMT), which represents the sum of miles driven by all vehicles in a given area over a specific period of time.

Updated in 2013 with base data from the 2010 Census, the Transportation Council's travel demand model estimated that the county's daily (i.e. 24-hour) VMT would grow from 7.8 million in 2015 to over 9.2 million by 2040, an increase of 1.4 million VMT or 18 percent over a 25-year period (see Figure 4-17). This equates to an annual growth rate of 0.7 percent, which is slightly higher than the estimated growth rates in population and employment for the same period (0.4 percent and 0.6 percent respectively).

Figure 4-17. Forecasted Daily Vehicle Miles Travelled (VMT) in Dutchess County (2010-2040)



Forecasting transit demand is less detailed. The two public bus systems (Dutchess County Public Transit and City of Poughkeepsie) maintain data on day-to-day passenger boardings. Although these agencies do not make passenger forecasts for their systems, the Transportation Council expects passenger levels to continue at current levels, potentially increasing if fuel prices rise, the systems expand, or transit-oriented development becomes more prevalent in urban areas. The Council also expects commuter demand for inter-county transit connections to remain at current levels and perhaps increase as employment grows, fuel prices rise, or improvements are made to the transit systems.

The Metropolitan Transportation Authority (MTA), as part of its Regional Strategic Review of operations, including Metro-North Railroad, assumes growth on the Hudson and Harlem lines, including new demand for off-peak and weekend service. The strategy supports MTA's 20-year Needs Assessment (2015-2034) and proposed five-year Capital Program (2015-2019).

Like demographic forecasts, travel forecasts are based on recent trends and do not account for global or national forces that may impact our transportation system, such as disruptions to the supply or price of fuel, a downturn in economic activity, public and private responses to global climate change, or other behavior-altering events.

Implications for the Transportation System

Irrespective of future changes in population, employment, or travel behavior, the challenge continues to lie in finding an acceptable balance between competing needs and limited resources. The Transportation Council seeks to promote projects that will satisfy Dutchess County's most pressing short, mid, and long-range transportation needs. Changes in regional and local population, employment, and land use all have an impact on travel behavior, as do external influences such as the economy and energy prices. The past decade saw the county's population and housing stock grow, while employment fell. These fluctuations in growth will likely continue, with economic conditions not fully rebounding until the latter part of this decade. Yet, even if no more growth occurs, our infrastructure will still age and require adequate investment to maintain acceptable levels of safety and mobility.

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[1] U.S. Census Bureau : 1950-2010 Census
[2] U.S. Census Bureau: 2000 and 2010 Census
[3] As per FTA C 4702.1B, Limited English Proficient (LEP) persons refers to persons for whom English is not their primary language and who have a limited ability to read, write, speak, or understand English. It includes people who reported to the U.S. Census that they speak English less than very well, not well, or not at all.
[4] As per FTA C 4702.1B, low-income person means a person whose median household income is at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines.
[5] FTA C 4702.1B dated October 1, 2012 and FTA C 4703.1 dated August 15, 2012.
[6] Poughkeepsie-Dutchess County Transportation Council, *2012 and 2013 Major Projects Reports*, 2012 and 2013, http://www.co.dutchess.ny.us/CountyGov/Departments/Planning/majorprojectsreport2013.pdf
[7] Dutchess County Department of Planning & Development, *2014 Zoning Referral Summary*, March 3, 2015.
[8] Bureau of Labor Statistics, *Quarterly Census of Employment and Wages*, 2013, http://www.bls.gov/data/. BLS data for 2013 showed that annual employment in Dutchess County totaled 109,991.
[9] New York State Department of Labor, *Employment in New York State*, August 2013, http://www.labor.ny.gov/stats/pdfs/enys0813.pdf
[10] Bureau of Labor Statistics, *Local Area Unemployment Statistics*, 2013, http://www.bls.gov/lau/
[11] Federal Highway Administration, *Census Transportation Planning Products*, 2013, http://www.fhwa.dot.gov/planning/census_issues/ctpp/
[12] Federal Highway Administration, *Census Transportation Planning Products 2000*, April 2, 2014, http://www.fhwa.dot.gov/planning/census_issues/ctpp/data_products/2000dataprod.cfm
[13] Note: the 2010-2014 ACS indicated that the City of Beacon MHI increased to $55,400-71,200, making it above the county average.
[14] Bureau of Labor Statistics, *CPI Inflation Calculator,* 2015, http://www.bls.gov/data/inflation_calculator.htm. Note: $23,940 in 2000

dollars equals $32,912 in 2014 dollars, which is within the range of the ACS estimate.

[15] Bureau of Labor Statistics, *Consumer Expenditure Survey*, 2014, http://www.bls.gov/cex/

[16] Non-motorized trips include walking, bicycle, wheelchair, mobility scooter, skates, skateboard, kick scooter, Segway, and others.

[17] New York Metropolitan Transportation Council (NYMTC), 2010/2011 Regional Household Travel Survey (RHTS), October 2014, http://www.nymtc.org/project/surveys/survey2010_2011RTHS.html

[18] Federal Highway Administration (FHWA), *Traffic Volume Trends,* December 2013, http://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm

[19] NYSDOT, *Historical Travel Trends in New York State*, July 2010, https://www.nysdot.gov/divisions/policy-and-strategy/darb/dai-unit/ttss/repository/Trends.pdf

[20] NYS Department of Motor Vehicles, *Drivers Licenses on File and Vehicle Registrations in Force,* 2013, http://www.nydmv.state.ny.us/stats.htm

[21] Cornell Program on Applied Demographics, *Dutchess County Population Projection Data*, 2014, http://pad.human.cornell.edu/counties/projections.cfm

[22] NYSDOT, *IHS Global Forecasts*, May 10, 2013.

[23] NYMTC, *2040 Socioeconomic and Demographic Forecasting*, August 2011, http://www.nymtc.org/project/forecasting/sed_products.html

[24] Bureau of Labor Statistics, *Employment Projections Program (EPP)*, 2012-22, December 19, 2013, http://www.bls.gov/emp/

[25] Dutchess, Orange, and Ulster County Planning Departments, *A Three-County Regional Housing Needs Assessment*, February 2009.