

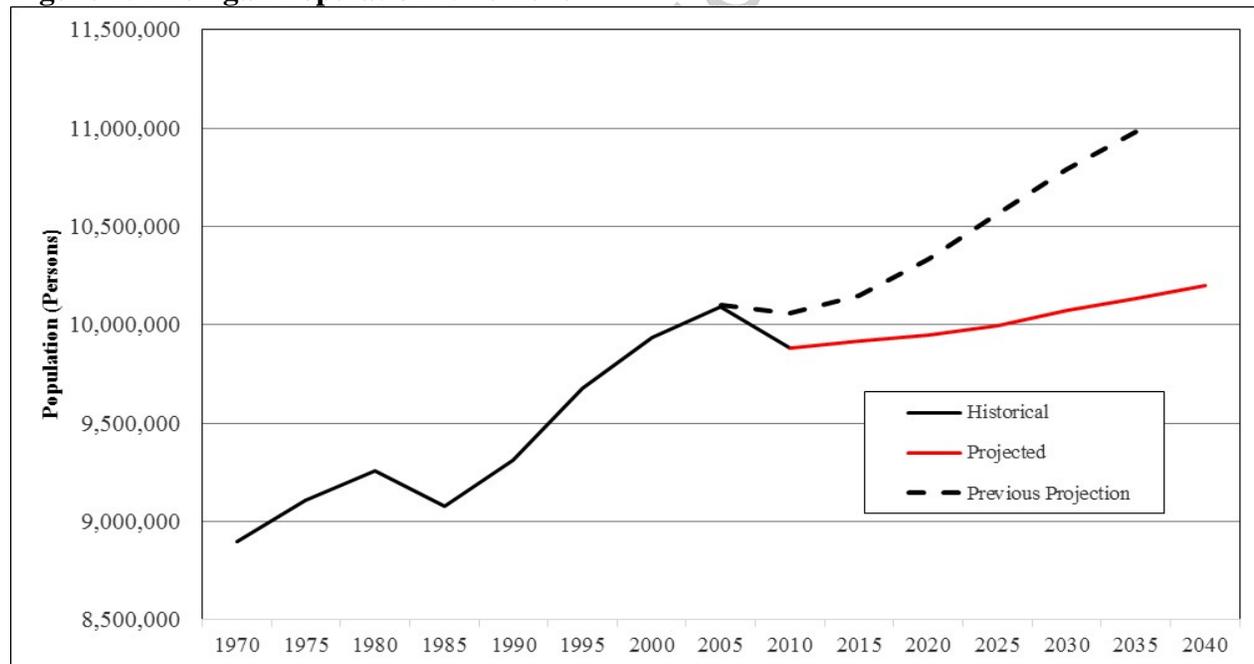
## Socioeconomic White Paper

The [\*Socioeconomic Technical Report White Paper\*](#) (Summer 2012) identified historical, existing, and projected conditions relative to population, employment, households, income, vehicle availability, migration, and environmental justice. The purpose of this white paper is to identify changes in trends and projections of state-level socioeconomic variables since the 2035 MI Transportation Plan (MITP) was completed. Specifically, this update will examine the forecast period 2010-2040. The outlook changed significantly between 2000 and 2010 as Michigan experienced a major recession that included a major restructuring of the domestic automobile industry, traditionally a mainstay of the Michigan economy. These changes resulted in dramatic employment losses. Although growth is still expected for the state in the future, the growth forecast remains lower now than our initial predictions for the 2035 MITP.

### Total Population

Census 2010 data listed a population of 9.88 million for Michigan. A recently completed Michigan Department of Transportation (MDOT) forecast estimates that population will grow 3.1 percent from 2010 to 2040 with a projected population of nearly 10.2 million in 2040 (Figure 1)<sup>1</sup>.

**Figure 1: Michigan Population 1970-2040**



Sources: US Census, MDOT

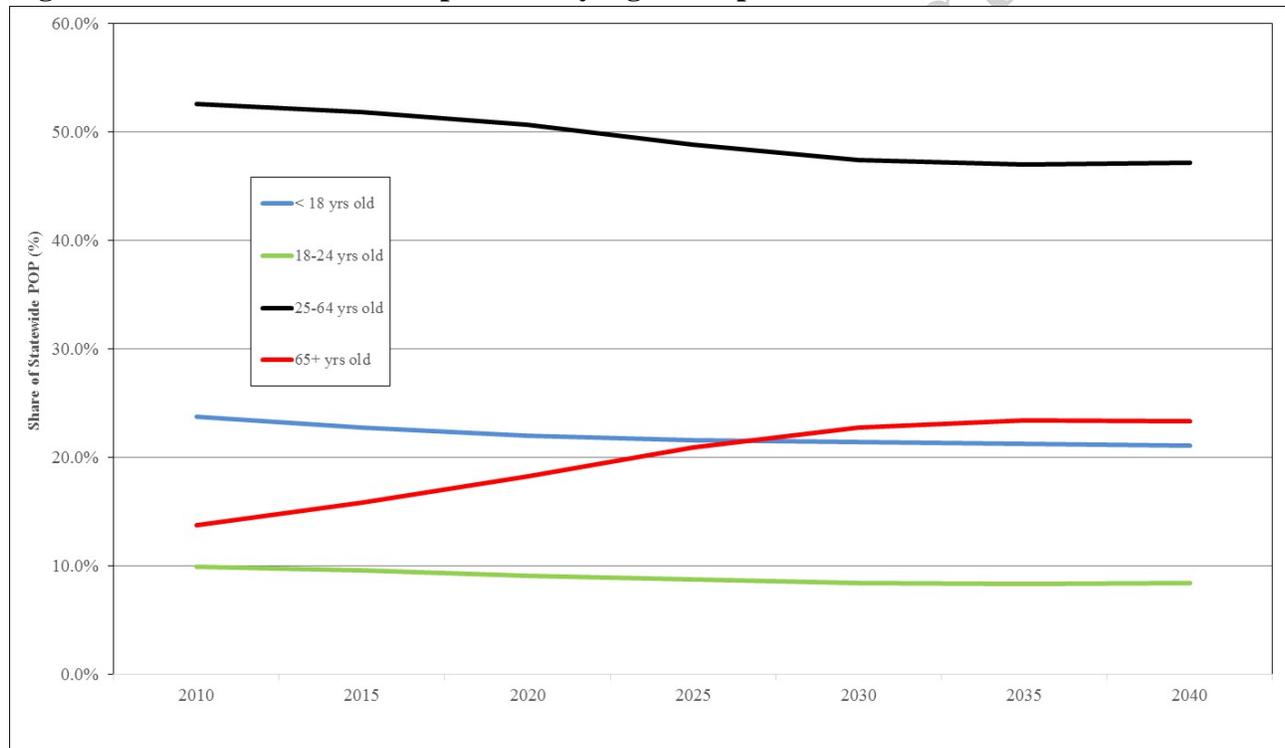
<sup>1</sup> The University of Michigan has produced five sets of long-term economic and demographic forecasts for the Statewide and Urban Travel Analysis Section at MDOT (1994, 1998, 2003, 2008, and 2012). The official forecasts used for the state long-range transportation plan (2005-2035 MITP) were from the 2012 forecasts.

After peaking in 2005, total population declined. The 2010 Census data shows that the state’s population decreased by approximately 55,000 people between 2000 and 2010. The estimated long-term population growth for the previous analysis was estimated to be about 9 percent between 2005 and 2035. This contrasts sharply with the revised 2040 projection, as the previous estimates did not foresee the economic recession of 2008-2010 and the related effect of population loss.

**Population by Age Group**

The population of Michigan in 2010 remained relatively young, with the majority (86 percent) of the population under the age of 65. As shown in Figure 2, about 53 percent of the population in 2010 was between 25 and 64 years old, and about 34 percent of the population was under the age of 25.

**Figure 2: Share of Statewide Population by Age Group 2010-2040**



Source: MDOT

Michigan has a disproportionately large share of people aged 45 to 64 (the so-called *baby boomer* generation, those born between 1946 and 1964) accounting for 28 percent of the population in 2010. Those under 45 make up 58 percent of the state’s population. The baby boom effect on long-term senior population is projected to result in an 82 percent increase in people aged 65-plus from 2010 to 2040. The age profile for the state is expected to change significantly during the next 25 years; however, unlike the forecast for population growth, the current forecast of changes in age distribution remains consistent with those in the 2012 report:

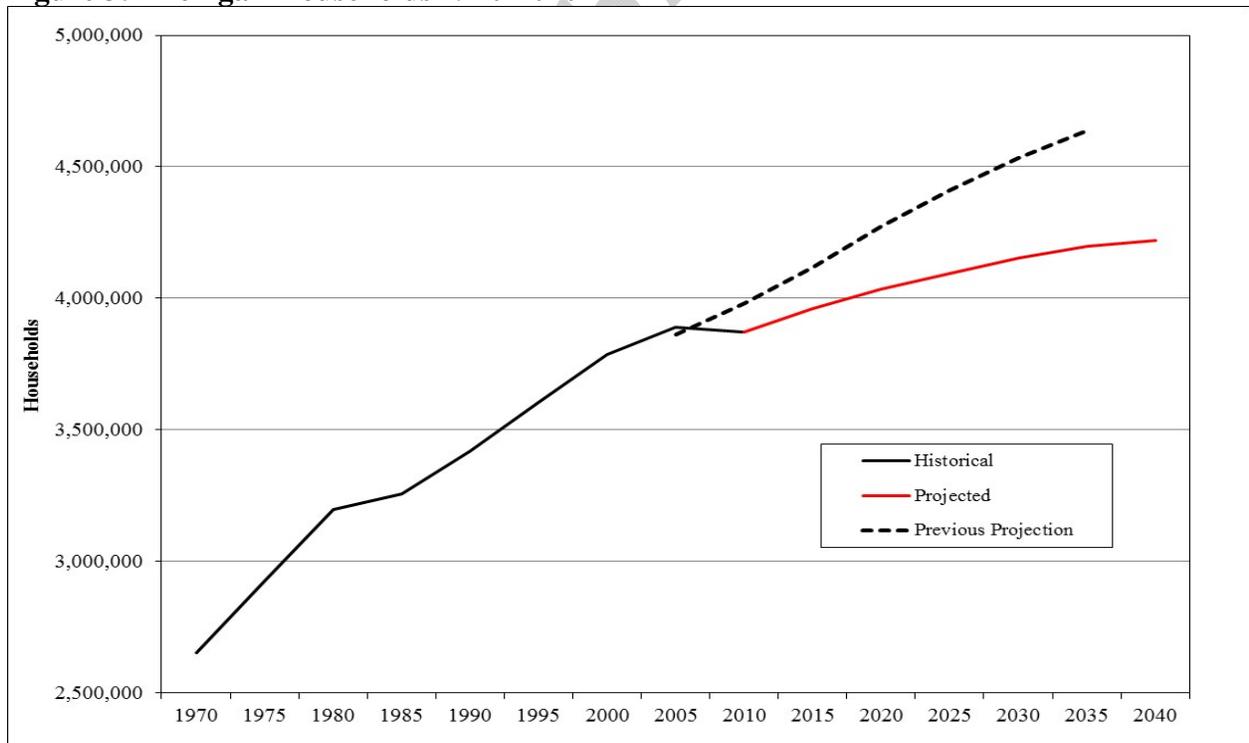
- The share of senior population (age 65-plus) will dramatically increase from 14 percent (2010) to 23 percent of the population by 2040 (1.36 million in 2010 to 2.47 million in 2040).
- The share of prime working age population (25-64) will shrink from 53 percent (2010) to 49 percent of the population by 2040 (5.20 million in 2010 to 5.37 million in 2040).
- The share of population under age 25 will slightly decrease from 34 percent (2010) to 28 percent by 2040 (3.32 million in 2010 to 3.08 million in 2040).

**Households**

Census 2010 data shows a count of 3.87 million households for Michigan. Overall, the number of households is projected to increase 8.9 percent from 2010 to 2040 (Figure 3). This sharply contrasts with the previous estimated long-term household growth rate, which was 20 percent between 2005 and 2035. This difference is also likely attributable to the state’s economic recession during 2008-2010.

The fastest growth is expected to occur in one-person households, which are projected to increase 26 percent during the 2010-2040 forecast period, whereas two-person households are projected to increase about 13 percent between 2010 and 2040. Conversely, the number of relatively larger households (those with four or more persons) is projected to decline by about 3 percent between 2010 and 2040. All of these changes are consistent with previous projections for 2005-2035.

**Figure 3: Michigan Households 1970-2040**

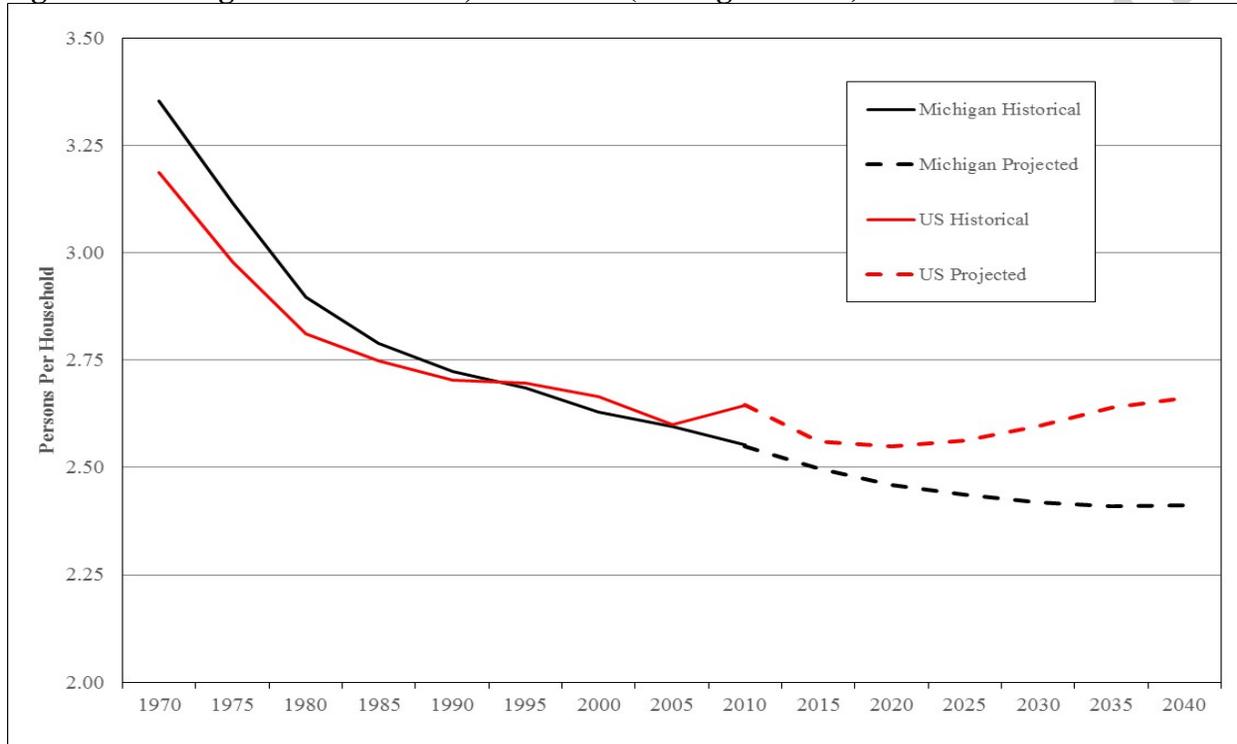


Sources: US Census, MDOT

### Household Size

The average number of persons per household in Michigan has declined significantly over time, from about 3.3 in 1970 to about 2.55 in 2010. This historical trend generally mirrors what has occurred nationally (Figure 4). Moreover, average household size is expected to continue declining long-term, largely due to the aging of the population and the tendency of older residents to have smaller households. This is consistent with previous MITP projections.

**Figure 4: Average Household Size, 1970-2040 (Michigan vs US)**



Sources: US Census, MDOT

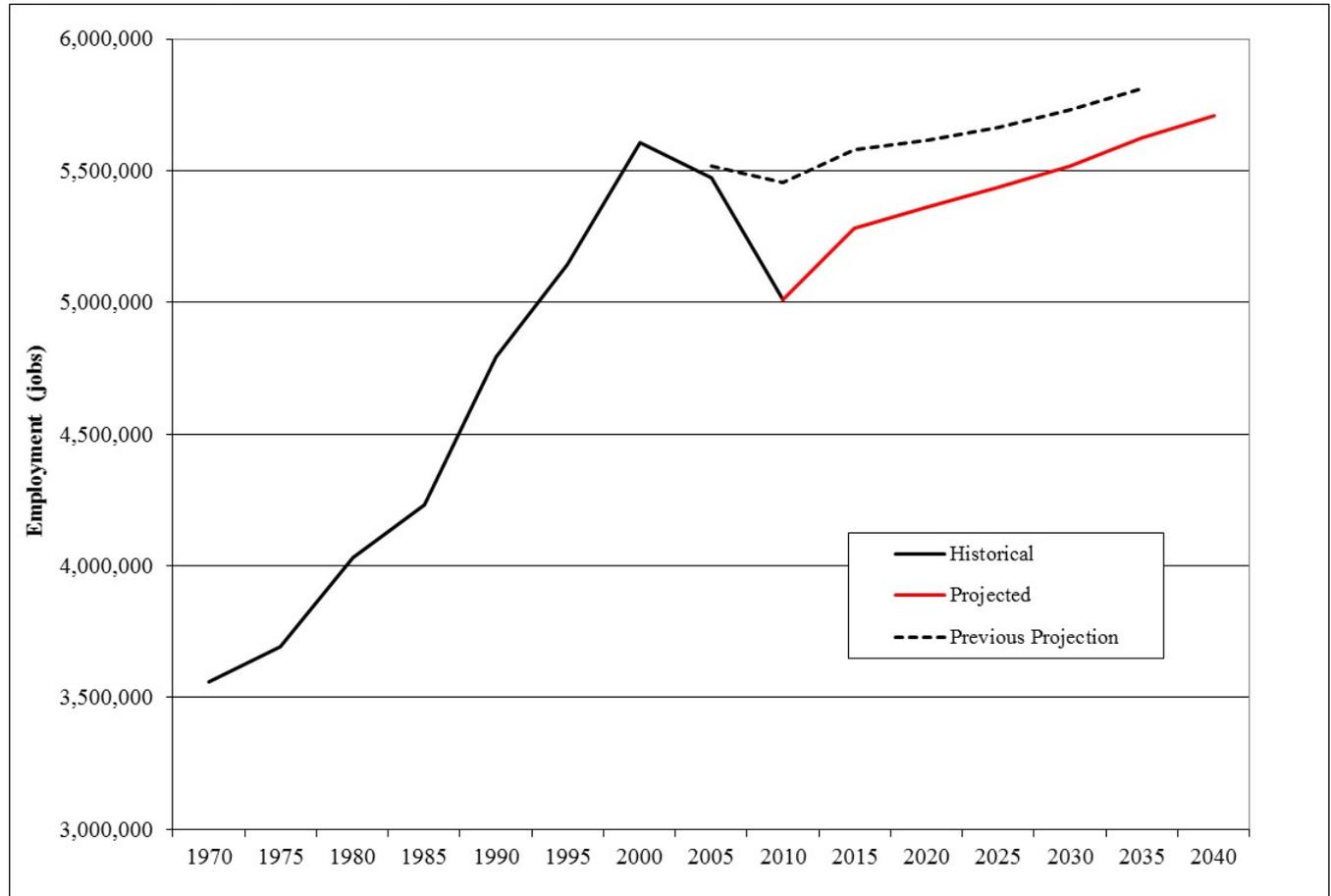
### Total Employment

As shown in Figure 5, employment growth from 1970 to 2000 was relatively strong at 57 percent with an average annual growth rate of 1.9 percent for the period. Of course, that trend changed significantly between 2000 and 2010 as Michigan experienced a major recession that resulted in dramatic employment losses of about 464,000 jobs. This is in contrast to the previous MITP that forecasted only a *slight* decline from 2000 to 2010 followed by relatively slow, gradual growth beyond 2010. Obviously, the previous forecasts could not foresee the full extent of the recent recession and its related employment losses between 2000 and 2010.

Employment for the state is expected to rebound from the decline of 2000-2010 with a projected average annual growth rate of 0.7 percent during 2010-2020. After 2020, this increase is expected to slow to about 0.3 percent per year as sluggish labor force growth becomes a constraint on employment gains. Overall, Michigan is projected to return to 2000 peak employment levels by 2034, with expected employment growth of 14 percent during the 2010-2040 forecast period.

Measured in the number of jobs, employment climbs from 5.01 million in 2010 to 5.71 million in 2040, an addition of about 700,000 jobs.

**Figure 5: Michigan Total Employment, 1970-2040**



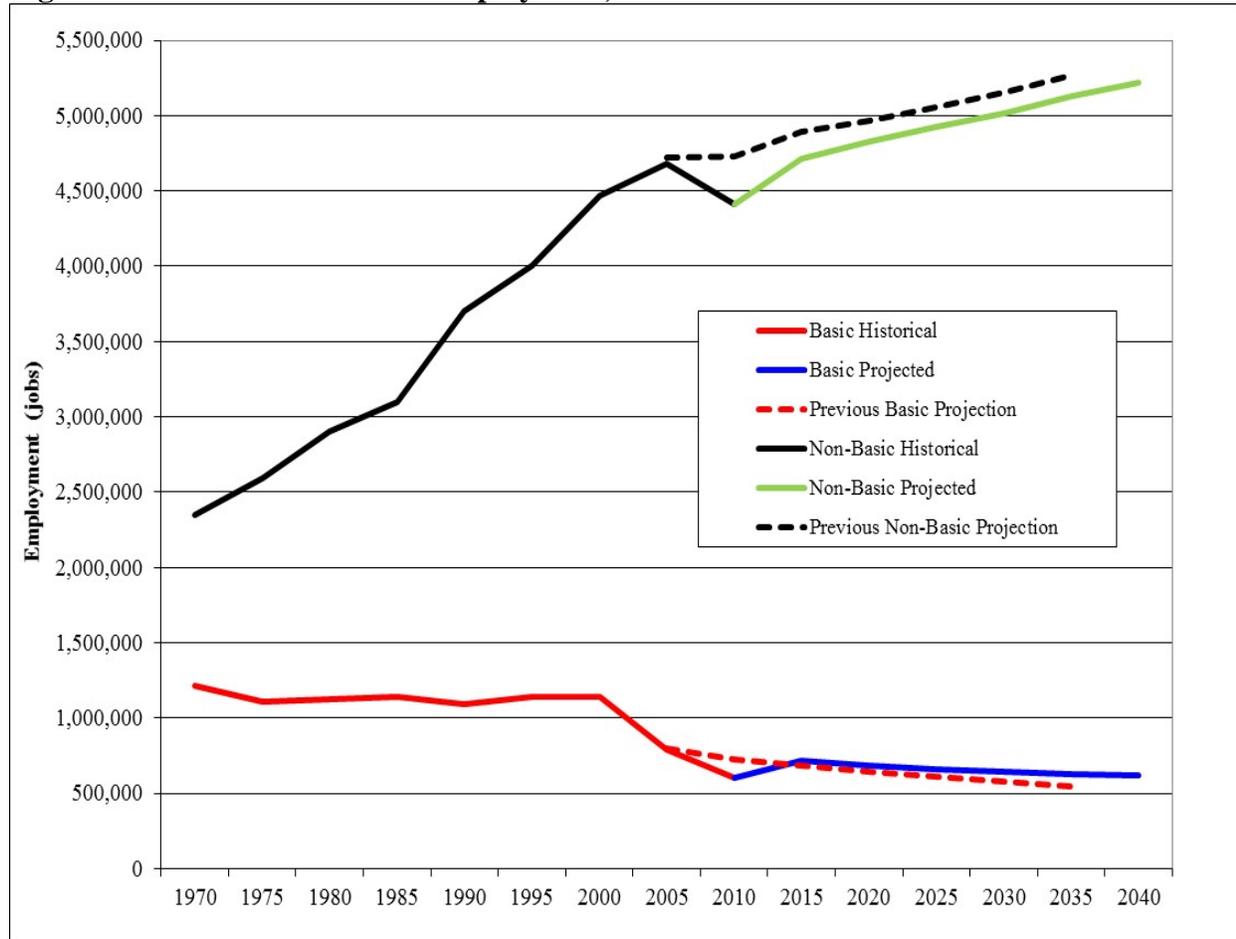
Sources: US Bureau of Economic Analysis (USBEA), MDOT

**Basic and Non-Basic Employment**

One way to examine employment growth is to consider it in terms of basic and non-basic growth. Basic industries include manufacturing, farming/agriculture, mining, forestry, and fishing, while non-basic industries include retail, construction, services, government, wholesale, transportation and public utilities, and finance/insurance/real estate. As noted in our previous report, basic employment has been relatively flat to declining during the past 40 years and the same trend is projected for the next 25 years, despite a brief short-term recovery during 2010-2015.

The growth in Michigan’s employment has been driven primarily by non-basic industries and this growth is expected to continue during the next 25 years. Non-basic employment has grown historically (1970-2010) at about 2.2 percent per year and is projected to slow to a pace of 0.4 percent annually after 2015. This projection is relatively consistent with the previous MITP report. Basic and non-basic employment trends and projections are shown in Figure 6.

**Figure 6: Basic and Non-Basic Employment, 1970-2040**

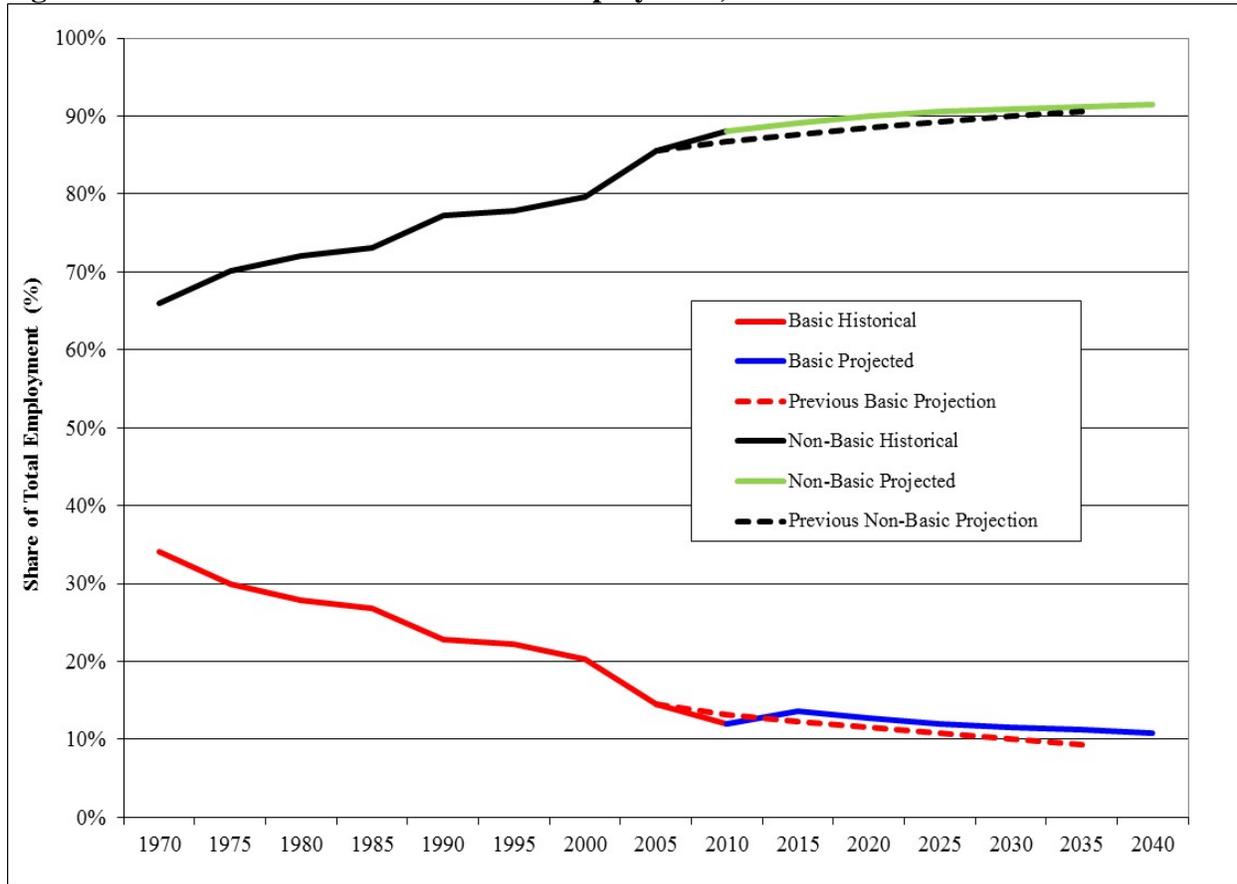


Sources: USBEA, MDOT

**Note:** In 2000-2001, USBEA changed its industry coding from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS). This change did not significantly influence the overall trends above.

Declining basic and increasing non-basic employment will influence changes in the share of basic versus non-basic jobs. From 1970 to 2010, the non-basic employment share grew from about 66 percent to 88 percent. As Michigan slowly recovers from its recent economic recession, this share is projected to increase to about 91 percent by 2040, as shown in Figure 7. The continuing national shift from a manufacturing economy to an increasingly service-oriented economy will accentuate the role of non-basic jobs, markets, and activities in Michigan to the year 2040. This trend was also identified in the previous report and the currently projected changes are consistent with those earlier projections.

**Figure 7: Share of Basic and Non-Basic Employment, 1970-2040**

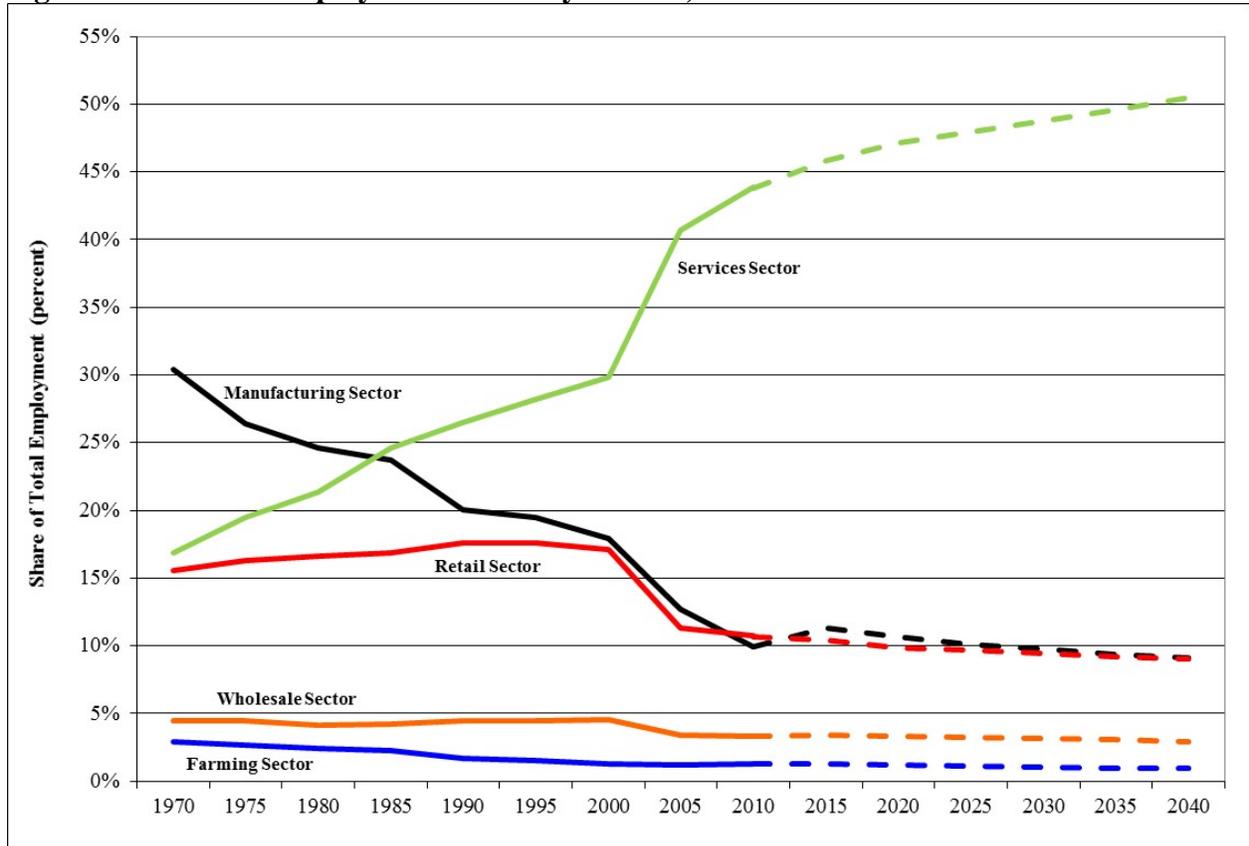


Sources: USBEA, MDOT

### Employment by Sector

The composition of employment in Michigan has changed significantly during the last 40 years and will continue to change during the 2010-2040 forecast period (Figure 8). The manufacturing sector’s share of the employment base has dropped sharply and steadily, from 30 percent in 1970 to just 10 percent by 2010, and it is expected to continue to decline slowly to about 9 percent by 2040. The services sector, however, has increased dramatically, from about 17 percent in 1970 to about 44 percent in 2010, and it is expected to continue to grow to almost 50 percent by 2040. Although the retail sector saw slight growth during 1970-2000, it experienced a sharp drop during the 2008-2010 recession and it is expected to continue a slight, though steady decline to 2040. Meanwhile, the wholesale and farming sectors of the state’s employment base have remained relatively stable to declining (historically) and both are expected to slightly decline in the long term. All of these sectoral patterns are consistent with the previous forecasts for the 2035 MITP update.

**Figure 8: Share of Employees in Five Key Sectors, 1970-2040**



Sources: USBEA, MDOT

### Labor Force

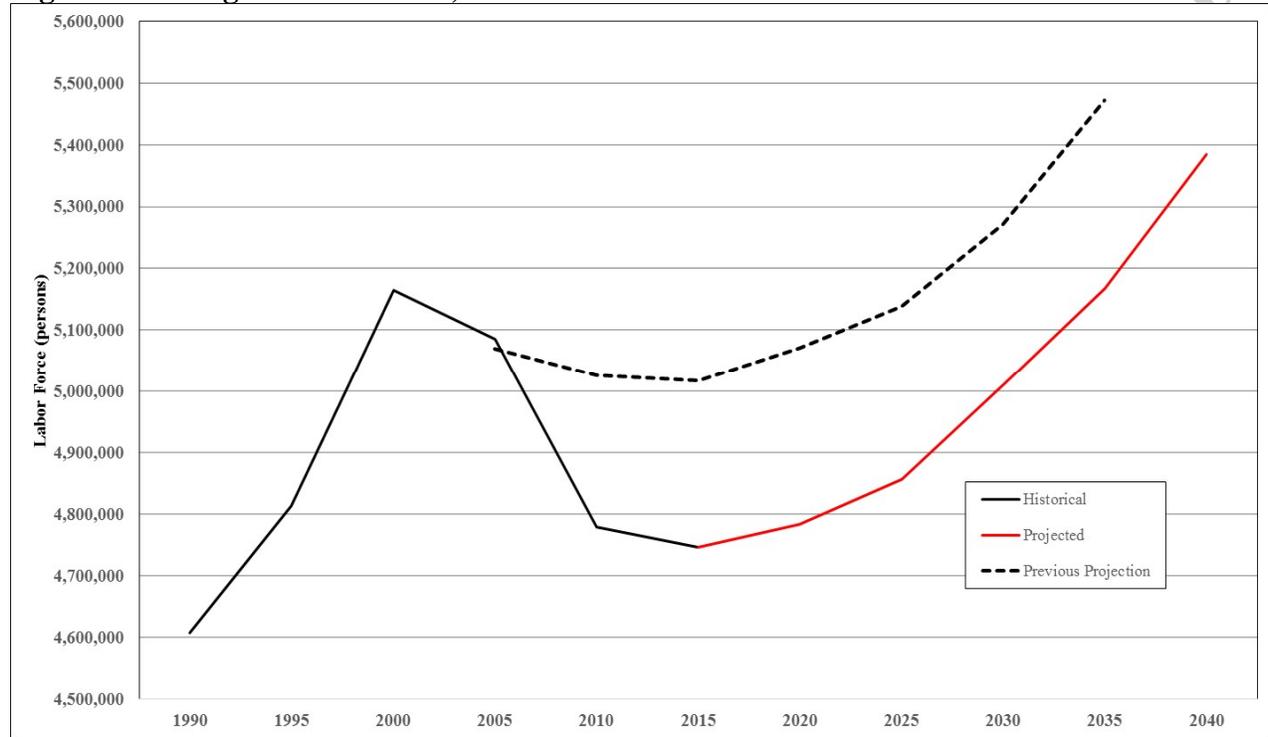
As shown in Figure 9, the state’s labor force<sup>2</sup> grew by about 558,000 between 1990 and 2000 (about 1.2 percent annually). However, during the subsequent decade (2000-2010), the labor force experienced a major decline (~386,000) which was aligned with the state’s decade-long economic stagnation capped by the 2008-2010 recession. The currently forecasted labor force arc mirrors that of the 2035 MITP report, but at a much lower level because the previous report did not foresee the extent of the decline during 2005-2010 based on the data available at the time.

Compared to the relatively high growth of the labor force of the 1990s, and coming out of the recent economic recession, Michigan’s labor force growth is projected to recover by about 638,000 during 2015-2040 with an average annual growth rate of 0.5 percent. However, Michigan isn’t projected to return to 2000 peak labor force levels until 2035, with expected labor force growth of 13 percent over the 2015-2040 forecast period.

<sup>2</sup> Defined as all persons in the civilian non-institutional population classified as either employed or unemployed.

Therefore, this pattern is projected to result in a generally tighter labor force in the long-term. As noted in the previous report, these expected labor shortages will largely be due to the projected declines in the share of working-age population and in the share of population under 25. Relative to the latter, this is an important factor since that cohort is the age group from which employers recruit entry-level workers.

**Figure 9: Michigan Labor Force, 1990-2040**



Sources: US Bureau of Labor Statistics (USBLS), MDOT

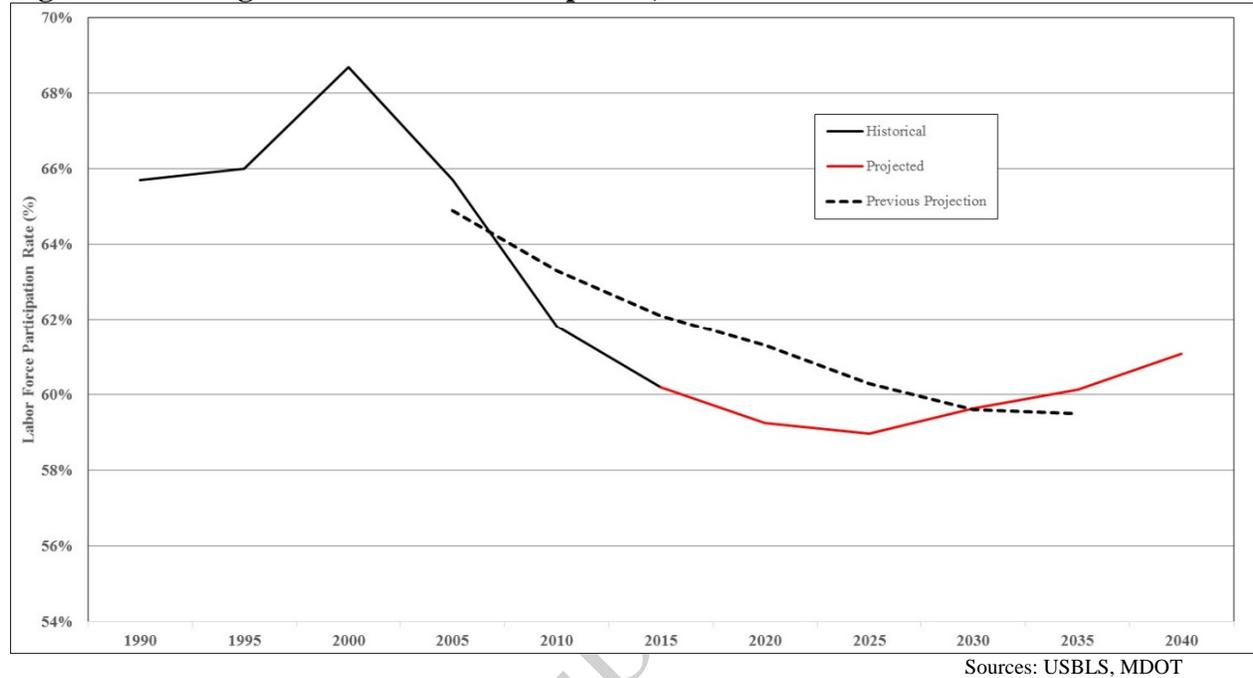
### Labor Force Participation

During the past 25 years, labor force participation<sup>3</sup> rates in Michigan fluctuated between 60 percent and 65 percent and generally paralleled recent patterns of economic growth (1990-2000) and decline (2000-2010). In the long-term (2010-2040), however, labor force participation rates are expected to continue declining until about 2025, then reverse to an increasing pattern out to 2040 (Figure 10). This contrasts somewhat with previous estimates that foresaw participation rates declining steadily during 2005-2030 from 65 percent to 59 percent. One of the unanticipated consequences of the 2008-2010 recession was a major and rapid restructuring of the domestic automobile industry over several *months* instead of the slow and gradual restructuring over several years that was expected in the previous report. The currently projected short-term decline (to 2025) and long-term recovery (to 2040) of labor force participation is partially due to a major reshaping of the Michigan economy that occurred during the 2008-2010 recession and may also, in part, be

<sup>3</sup> Labor Force Participation Rate = Labor Force / Civilian Non-Institutionalized Population

due to speculation that a greater than usual share of the aging baby boomer population will choose to remain active in labor markets after reaching traditional retirement years.

**Figure 10: Michigan Labor Force Participation, 1990-2040**



### Migration

As shown in Table 1, Michigan lost 571,200 people to net migration during the 1980s, gained back 59,300 in the 1990s, then lost 479,195 people during the 2000-2010 recession period. The latter decade’s net migration loss is significantly higher than what the 2030 MITP<sup>4</sup> estimated due to the dismal economy of that period; the previous analysis could not have foreseen the full extent of the 2000-2010 recession and its related effects of population and employment loss.

The economic downside of 2000-2010 has also generated a significantly different forecast of the state’s migration patterns relative to the previous 2030 estimates. Whereas the former MITP forecasts expected overall net migration to be positive after 2010, this update projects that net migration will remain negative until 2030, with a slight positive recovery afterwards. Specifically, net domestic migration remains negative over the long run, but at a slower rate over the decades. Net international migration continues to show moderate growth during the forecast period. As a response to forecasted labor shortages, international migration is offsetting the out-migration of the work force-age population. Without international migration, Michigan’s population would be declining at an accelerating rate during the next 25 years, which would also result in a weaker employment profile.

<sup>4</sup> The 2040 update for migration is compared to the 2030 MITP report because there has been no updated migration forecast data available since the 2035 MITP report.

**Table 1: Domestic and International Migration: Michigan, 1980s-2030s**

	1980s	1990s	2000s	2010s	2020s	2030s
International Migration	100,700	113,600	256,213	235,405	294,921	364,405
Domestic Migration (aged 65+)	-13,400	-20,400	-45,307	-35,091	-46,768	-44,172
Domestic Migration (aged < 65)	-658,500	-33,900	-690,100	-421,174	-291,795	-231,655
<b>Total Net Migration</b>	<b>-571,200</b>	<b>59,300</b>	<b>-479,195</b>	<b>-220,860</b>	<b>-43,642</b>	<b>88,578</b>

Source: MDOT

### Statewide Environmental Justice Populations

An environmental justice (EJ) analysis at the statewide level should examine the total negative and positive outcomes of the transportation program of projects to see whether there is a disproportionate effect in EJ areas. This process involves establishing a baseline, geographic representation of the location of EJ populations, and then examining MDOT's program as a whole as it relates to these areas. (Please refer to the [Environmental Justice Guidance for Michigan Transportation Plans, Programs and Activities](#) for background on MDOT's EJ requirements.)

As noted in previous reports, in Michigan, the EJ population and application in the metropolitan areas are defined by the metropolitan planning organizations (MPO)<sup>5</sup>. The non-MPO EJ populations and applications are defined by MDOT.<sup>6</sup> This report focuses only on the MDOT areas.<sup>7</sup>

Based on the U.S. Census Bureau's American Community Survey (ACS) 2009-2013 data<sup>8</sup>, this section displays updated baseline EJ maps (at the block group level) relative to the 2035 MITP report. The following Figures 11 through 14, respectively, show the four minority populations as they relate to EJ: Asian-American, Hispanic, African-American, and Native American. Figure 15 shows the distribution of low-income populations based on the share of population below the poverty line.

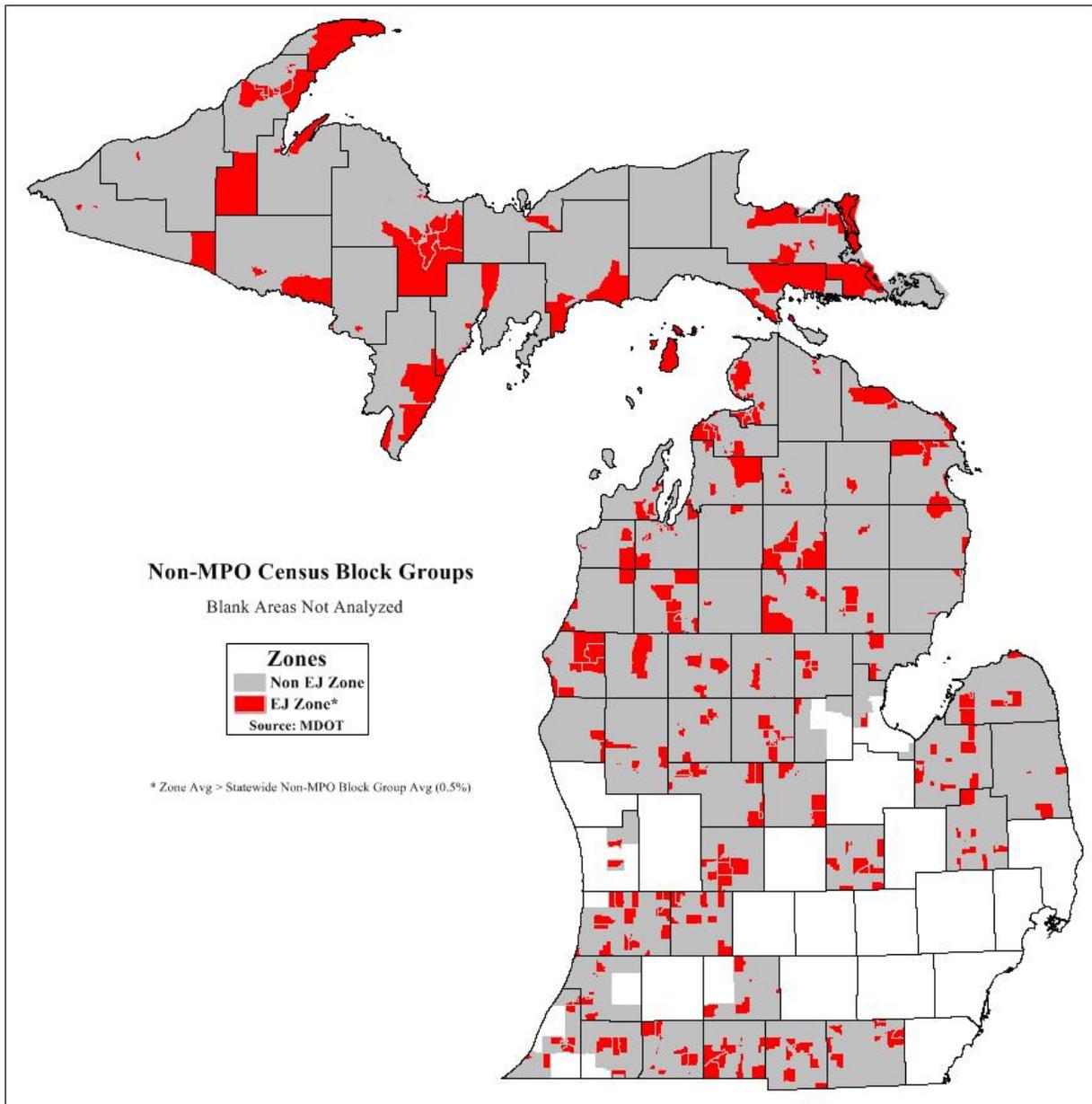
<sup>5</sup> A list of state MPOs can be found at: <http://www.mtpa-mi.org/members.asp>. Also, compared to the maps used in the 2035 MITP, the maps shown in Figures 11-15 include an extension of the Kalamazoo MPO into Van Buren County and a new MPO in Midland County.

<sup>6</sup> MDOT uses the federal standard for EJ zone assessment where any readily identifiable group of minority persons, and/or group of individuals with median household incomes below federal poverty guidelines, reside at a higher percentage than the state average.

<sup>7</sup> It is acknowledged that although some EJ zones may appear counter-intuitive to the casual observer, the population of many block groups (BG) is so small (e.g., the Upper Peninsula) that the presence of any minority population puts many BG shares of minority population over the statewide, non-MPO BG average threshold. Also, for census purposes, many island BGs are actually linked to mainland BGs (e.g., Grand Island and Munising), so they reflect the ACS data for the mainland BG. The EJ assessment methods used here will be revised in future MITPs.

<sup>8</sup> The ACS is a national survey that uses continuous measurement methods. In this survey, a series of monthly samples produce annual estimates for the same small areas (census tracts and block groups) formerly surveyed via the decennial census long-form sample. The five-year estimates from the ACS are *period* estimates (not averages) that represent data collected over a period of time, compared to *counts* data collected in the decennial census.

**Figure 11: Asian-American EJ Population (2009-2013)**

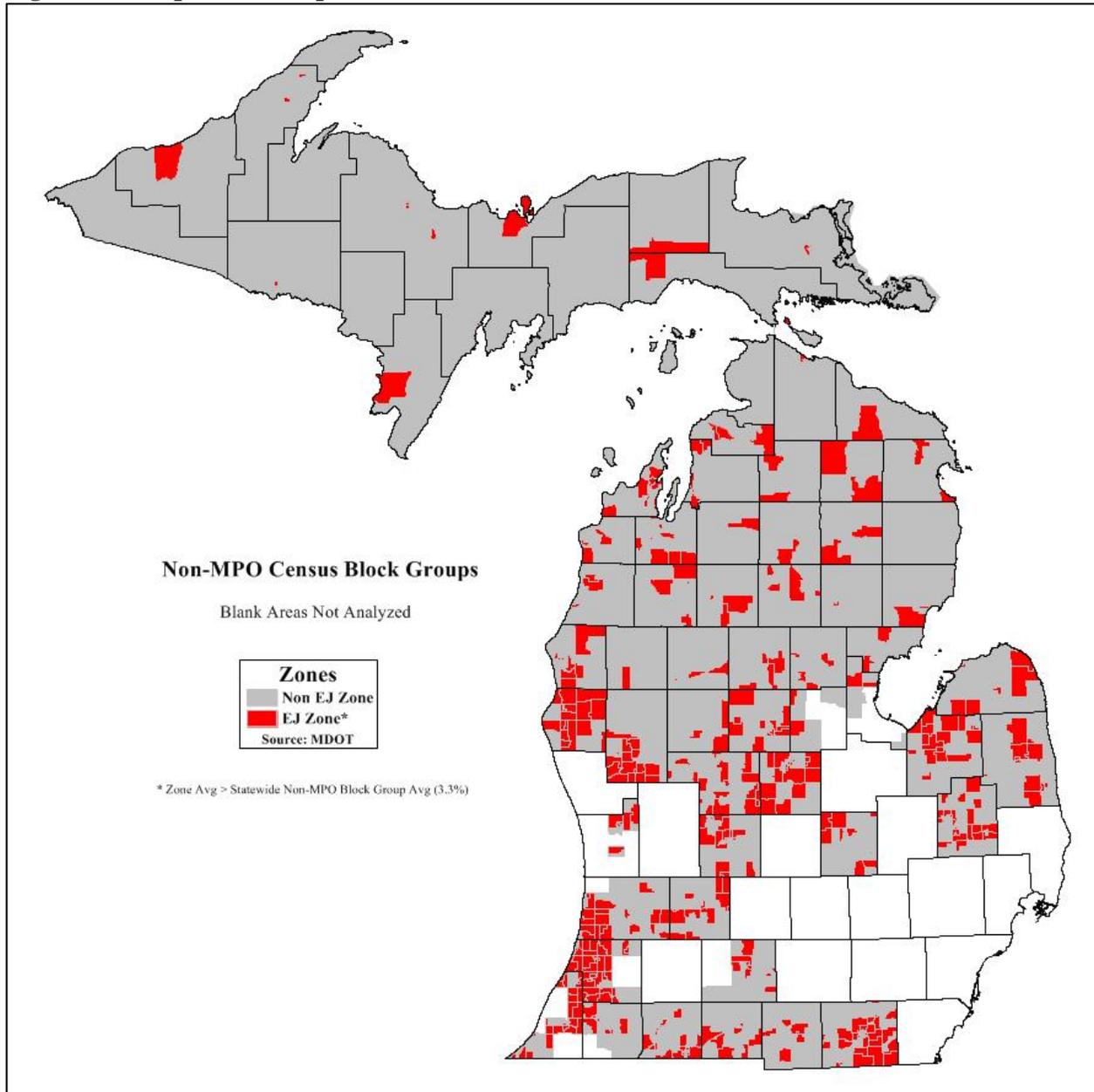


Source: U.S. Census Bureau, American Community Survey 2009-2013 Five-Year Period Data

The distribution of Asian-American EJ zones has changed very little from the previous plan, except in the Upper Peninsula where there are relatively larger EJ concentrations.<sup>9</sup> Otherwise, a fairly random pattern of EJ concentrations remains in the Lower Peninsula as it did in the previous report. Moreover, MDOT’s block group threshold for Asian-American EJ designation (0.5 percent) has not changed since 2010.

<sup>9</sup> This is likely due to differences in data collection methods between the decennial census and the ACS.

**Figure 12: Hispanic EJ Population (2009-2013)**

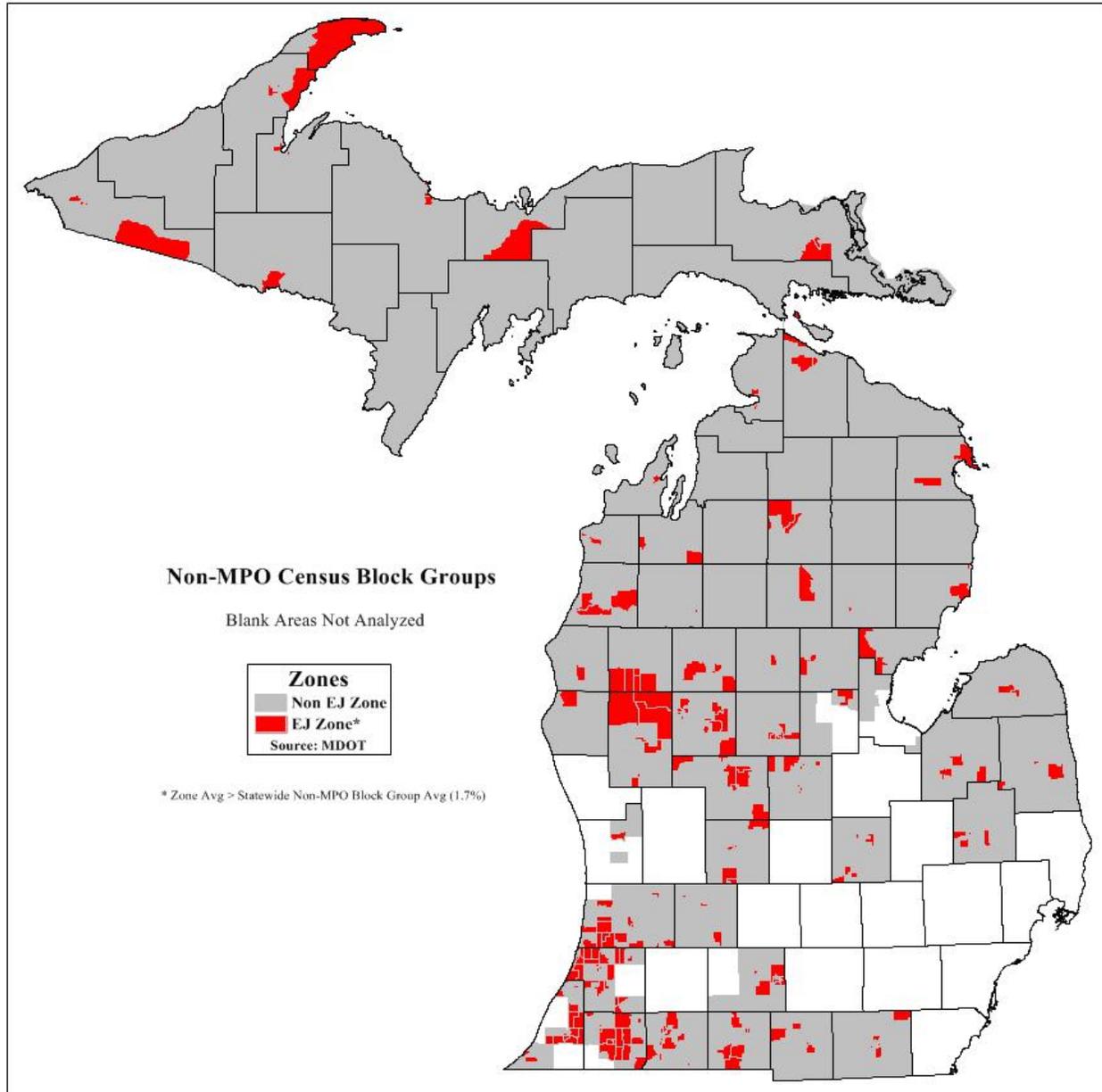


Source: U.S. Census Bureau, American Community Survey 2009-2013 Five-Year Period Data

The distribution of Hispanic EJ zones has changed significantly from the previous plan. This is most evident in the northern Lower Peninsula and in the Upper Peninsula where there are more numerous EJ concentrations, whereas in the 2035 MITP there were virtually none.<sup>10</sup> There has been a slight increase in MDOT’s block group threshold for Hispanic EJ designation (3.3 percent) compared to 2010 (2.8 percent).

<sup>10</sup> This is likely due to differences in data collection methods between the decennial census and the ACS.

**Figure 13: African-American EJ Population (2009-2013)**

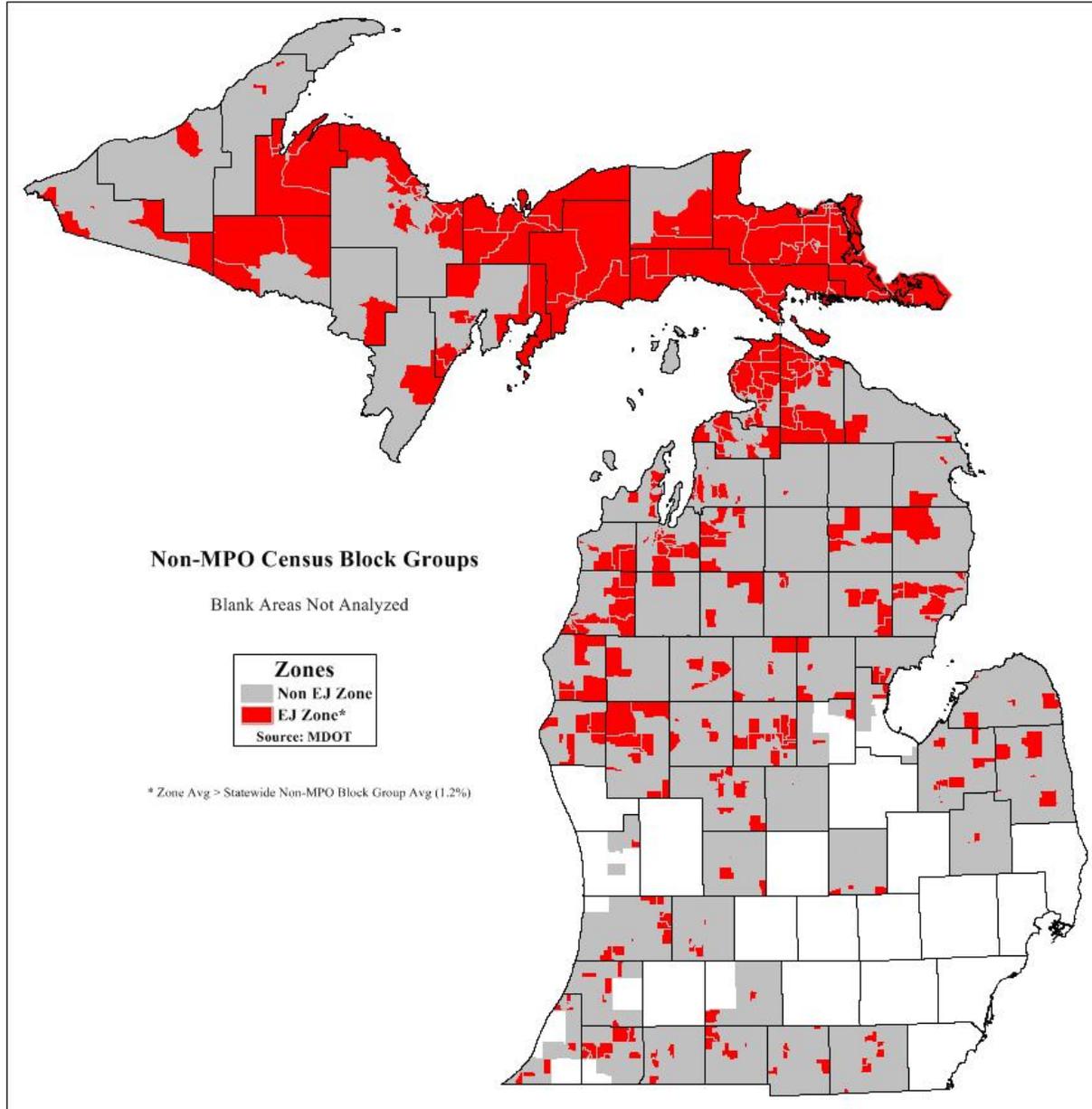


Source: U.S. Census Bureau, American Community Survey 2009-2013 Five-Year Period Data

The distribution of African-American EJ zones has changed very little from the previous plan, except in the Upper Peninsula, where there is an EJ concentration in the Keweenaw Peninsula.<sup>11</sup> There has been a slight increase in MDOT’s block group threshold for African-American EJ designation (1.7 percent) compared to 2010 (1.2 percent).

<sup>11</sup> This is likely due to differences in data collection methods between the decennial census and the ACS.

**Figure 14: Native American EJ Population (2009-2013)**

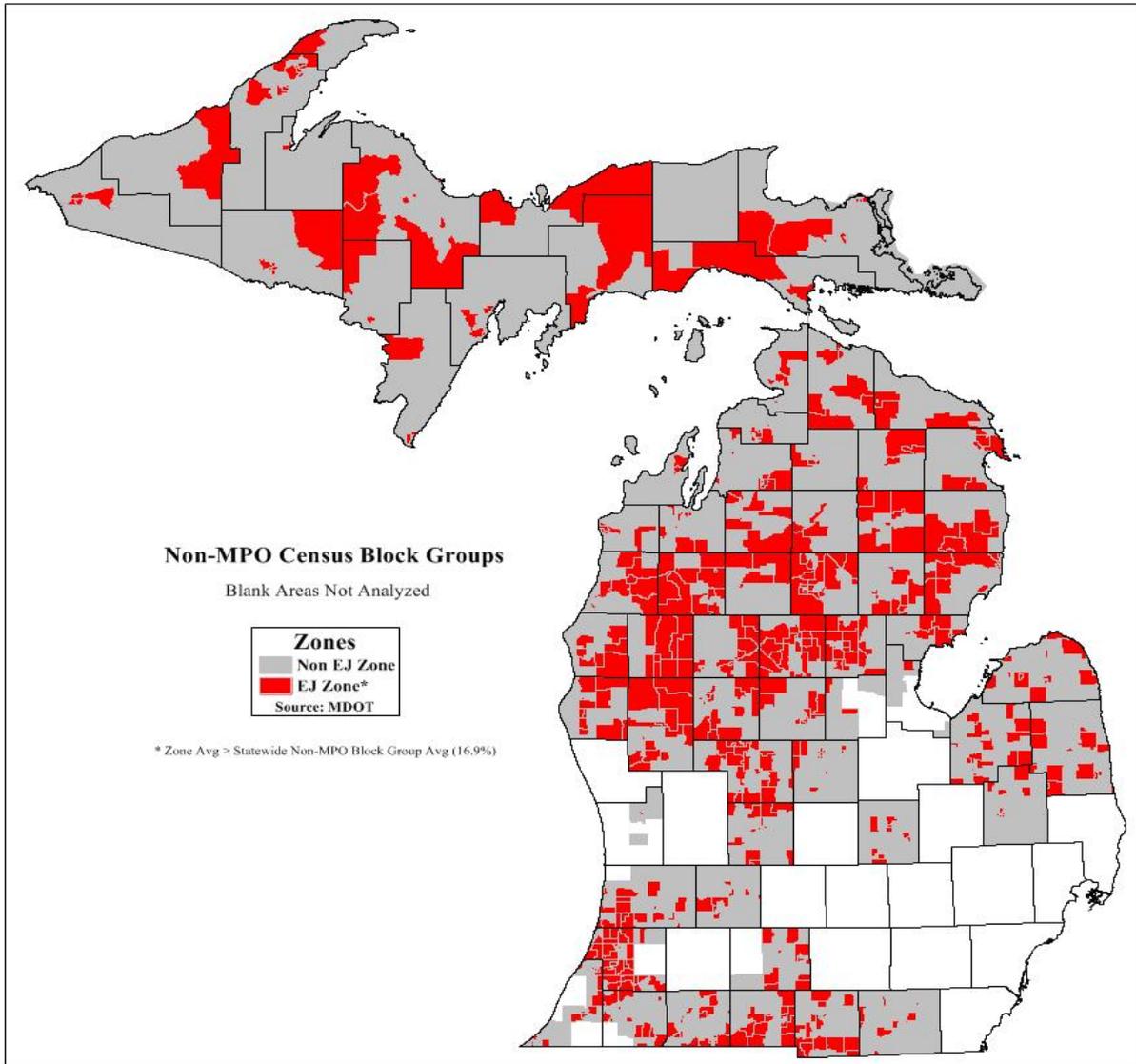


Source: U.S. Census Bureau, American Community Survey 2009-2013 Five-Year Period Data

The distribution of Native American EJ zones is moderately different from what it was in the previous plan, except in the northern Lower Peninsula where there are more numerous EJ concentrations.<sup>12</sup> MDOT’s block group threshold (1.2 percent) for Native American EJ designation remains consistent with that of the previous plan.

<sup>12</sup> This is likely due to differences in data collection methods between the decennial census and the ACS.

**Figure 15: EJ Population Below the Poverty Line (2009-2013)**



Source: U.S. Census Bureau, American Community Survey 2009-2013 Five-Year Period Data

The distribution of the share of population below the poverty line is generally random across the state with relatively broader, denser concentrations in the northern Lower Peninsula and in the Upper Peninsula. This pattern is consistent with the 2030 MITP (which was based on Census 2000 block group poverty data; there was no block group-level poverty data available for the 2035 MITP). However, there has been an increase in MDOT’s block group threshold for EJ designation for the share of population below the poverty line (16.9 percent) compared to 2000 (10.4 percent).<sup>13</sup>

<sup>13</sup> This is likely due to differences in data collection methods between the decennial census and the ACS.

## Transportation Implications of Demographic and Socioeconomic Changes

The demographic and socioeconomic characteristics of Michigan's population can have a substantial effect on changes in transportation behavior. Therefore, it is very important that these socioeconomic changes are well understood as policies are developed for the MITP. The following sub-sections discuss several implications for transportation in Michigan based on the preceding analyses of population, households, employment, labor force, migration, and environmental justice.

### Population and Age Groups

It is important to note that, although Michigan's population is expected to grow at a slower rate to the year 2040, the population will still increase in the time horizon of the MITP. Increases in population growth will continue to place greater demands on the transportation system if it remains relatively static. These demands may lead to increased congestion in urban and suburban regions and longer trip lengths that may extend peak commuting periods.

Although overall population growth is expected to slow, major life cycle and demographic shifts are anticipated by 2040. As described in this report, the dominant socioeconomic change in Michigan is expected to be the dramatic increase in aging and retired populations. Consequently, transportation to health, recreational, and other activities will increase in importance as this segment of the population transitions from the daily commute to travel patterns characteristic of retirees and older travelers.

Some of the effects of the overall changing age profile are likely to include:

1. An aging population may require changes in roadway and intersection design, traffic engineering, road signage, vehicle equipment accommodations, and aging driver safety education and prevention strategies. These efforts may be implemented through a broad interdisciplinary partnership of safety engineering, medical, law enforcement, driver licensing, rehabilitation, and aging services professionals.
2. Bicycle and pedestrian facilities accommodating access to wellness, recreational, and nearby shopping and service activities for aging population segments.
3. An aging population may produce greater demand for transit and related transportation services offering region-wide service, including during off-peak hours, for persons who choose to limit or discontinue driving or who become unable to drive safely.
4. Some segments of the senior population will remain in the labor force longer, thereby contributing to a greater midday peak, increased vehicle-miles traveled (VMT) on the system, and potentially increased congestion.
5. An aging population may create increased demand for more flexible specialized public transportation, or customized private transportation, to essential services (e.g., medical, grocery shopping) that accommodates personal needs such as "door through door" assistance, flexible scheduling, and waiting on-site for customer return trips.

6. Significant numbers of Michigan residents may plan to “age in place” in their current home residences and in senior adult living and assisted living centers, including in rural areas of the state. Collaborative planning efforts involving state, urban, and rural regional planning agencies, transit and related transportation providers, and community health and social services providers, may assist in developing transportation options to reduce the number of aging, non-driving citizens who are isolated from essential health, shopping, and social activities. This is particularly important in rural areas of the state.
7. The decline in the working-age population may translate to relatively fewer trips in the traditional commuting peak periods.
8. Increasing numbers of aging citizens may benefit from the services of a statewide network of local and regional “mobility management” programs, to help identify and schedule alternative transportation to essential medical and other personal services.
9. Continued stagnation/decline in younger age groups will affect the number of new licensed drivers in Michigan.

#### Households and Household Size

Because most trips are generated at the household level, it is likely that expected increases in the number of households will increase the number of trips on the system and overall VMT in Michigan. The [Travel Characteristics Technical Report](#) further explores trips generated at the household level and patterns such as trip chaining.

The trend towards smaller household size in Michigan could have significant implications on transportation system needs, dependent on associated changes in household composition and land use patterns. The life cycle changes associated with the aging population indicate more one- and two-person households (households with no children, or where children have grown and left the home). This composition is associated with a rise in per-capita auto ownership and lower vehicle occupancy, where fewer households have working parents sharing rides to work or transporting other family members from within the household to activities. The dispersion of travelers into smaller households can potentially increase VMT, trip lengths, and the ratio of vehicle trips to person trips. However, as retirees and persons of retirement age represent an increasing share of one- and two-person households, it should be noted that the increasing number of trips associated with *empty nest* households may be spread throughout the day with retirees traveling less during peak periods and traveling more for other trip purposes throughout the day, or for trips potentially made using modes other than the single-occupant vehicle.

Shifts in land use will likely be a key determinant of how changes in household size and composition affect transportation system needs in Michigan. Smaller households suggest the potential for a reduction in population density and increases in trip lengths. However, at some spatial scales, the situation could be different. For example, smaller households in a growing downtown (such as in Grand Rapids or Mid-Town Detroit) will mean population density increases and infill development compared to shifts in suburbia with empty-nest baby boomers living without children or alone. In any case, the character and density of neighborhoods, zoning, and the

preferred living arrangements for one- and two-person households can significantly increase or decrease the number of vehicle miles that may change with smaller households and the viability of transit, walking, and other modes.

When trip origins and destinations are closer together due to land use and zoning decisions, the number of miles needed for a trip is reduced (reducing the number of vehicle miles). Higher densities also increase the number of trips that may originate or terminate within a particular area, increasing the potential transit market per revenue mile and contributing to the feasibility and productivity of transit routes. When households are located in close enough proximity to other activities to be within walking distance, walking becomes a transportation option that is not otherwise available. Living arrangements enable household members to share rides to activities and may enable one household member to make a single trip on behalf of the entire household. For example, if one person makes a weekly shopping trip for a two-person household, the number of shopping trips (and miles traveled for this activity) is half of what it would be if the two people each lived alone. Household size is also a key consideration in the *Land Use Technical Report*, which will further explore this trend and its potential linkages to transportation demand.

Changes in household size and composition have additional implications for the transportation system. This relationship is discussed in the [Travel Characteristics Technical Report](#), which shows that members of smaller households make more trips than members of larger households. The role of “proxy trips” (trips by one person made on behalf of the entire household) is one factor in reducing vehicle trip rates for members of larger households. Another factor is the relative ease of carpooling with other members of the same household. Consequently, the expected continued decline in average household size suggests that there will be an increase in the number of vehicle trips per person with the potential for increasing VMT.

The growth in the number of households and decreasing average household sizes directly influence the number of trips and resulting VMT. Given the limited growth in road system capacity, these socioeconomic changes are expected to lead to increases in congestion and decreases in system efficiency.

#### Employment

Continued overall employment growth (though at slower than historical rates) is expected to increase overall trip attractions, leading to associated increases in VMT. However, with the overall tightening of the labor force, it is also possible that employers will relocate for better proximity to localized labor pools, further altering regional VMT patterns and levels. Additionally, as Michigan’s employment continues to generally decentralize, commuting fields will likely increase, resulting in longer work trips (time and distance), increased VMT, and congestion. Furthermore, provision of efficient transit service will become more difficult to achieve due to reductions in the size of the potential transit market per revenue mile of transit service needed to reach transit markets.

The continuing shift to an increasingly service-oriented economy will generate a relatively high level of non-home-based travel between offices, clients, and customers. This will increase off-peak

travel volumes and VMT, potentially exacerbating congestion in urban-suburban regions of the state. Furthermore, as service jobs and markets continue to assume an increasing share of Michigan's economy, their associated transportation needs could require changes in system needs. These changes include the potential for changing trip lengths, origin-destination pairs, the spreading of commuting peaks throughout the day, and increased use of other modes. Service establishments often run on more flexible schedules, and employ a smaller number of people per establishment than large factories (which run on shifts). This difference has the potential to affect the spatial concentration and the hourly spreading of trip productions and attractions. Service establishments also tend to attract more consumers to the place of business (compared to factories, which are not consumer destinations). Consequently, the shift may result in overall higher levels of traffic and trip making.

The nature of the service establishment (such as when it operates, whether it caters to consumers on-site, and how much freight it attracts) is a key determinant of its need for roadway access, parking, and the viability of transit and other modes. The spatial location of a service establishment within a community is a key determinant of the suitability of pedestrian alternatives, as manufacturing and industrial properties are rarely located in walking proximity to residential neighborhoods (for environmental and aesthetic reasons). The implications of these changes are also discussed in other technical reports, affecting a wide range of transportation needs and alternatives, including the productivity of transit services to peak-hour roadway capacity, the efficiency of land use patterns, and the safety implications of travel at different times of day.

This continuing structural change will also affect freight and commercial transportation needs since traditional manufacturing supply chains are complemented by service and manufacturing industry value chains with an increasing emphasis on the reliability and timeliness of deliveries for those inputs required to produce services. For example, health care services are extremely sensitive to the safe and timely delivery of medical devices, pharmaceuticals, and other commodities, which may represent less tonnage than traditional manufacturing supply chains, but for which the value and feasibility of the service depends heavily on the quality of the transportation system.

### Labor Force

The aging of the population and the increase in retirees account for a significant anticipated reduction in Michigan's labor force and workforce participation. As this large and growing segment of the population moves from labor markets to consumer markets, trip purposes, time-of-day for trips, and transportation needs are expected to change as described earlier.

An issue not fully understood at this time is the degree to which the aging baby boom population group may continue to participate in Michigan's workforce after attaining retirement age. However, it is known that this generation represents a different set of values, preferences, and behaviors than their older age groups. For example, this generation brought unprecedented participation of women in all segments of the workforce throughout the life cycle to date, and it produced changes in occupational preferences and workplace operations for many sectors of the economy.

Consequently, there is reason to believe that that the aging population may demand more choices regarding workforce participation (such as phased retirement and retirement careers or businesses). Should this occur, it would require a different set of transportation alternatives relative to living and daily travel options. These may include needs for signs and infrastructure to standards found safer for older drivers, transit and roadway capacity in off-peak periods to accommodate more work trips for phased retirees working on a part-time basis, and pedestrian amenities (such as sidewalks or crosswalks) in areas where these populations constitute a large share of the walking population. Further research is needed to determine the specific requirements of this growing and changing population group. This is an important consideration for assessing future directions in other technical reports of the MITP and it is also a focus for ongoing research and tracking beyond the scope of this plan.

### Migration

The key element of changes in the state's migration patterns is the expected (and continuing) growth of international migrants, which is off-setting the continued out-migration of Michigan's workforce-age population. The concentration of populations of foreign origin (and to some degree, non-English-speaking populations) is illustrated in the EJ portion of this report. National trends also indicate the increasing role of this segment in the workforce and in travel demand. Moreover, foreign-born populations create distinctive cultural, economic, and social implications regarding transportation system needs and demands.

For instance, expected increases in international migration will require the state to communicate with more diverse segments of the population. Road signs, travel advisories, and other transportation system information may need to be designed using multiple languages. Transportation providers may need to revise customer service staffing policies by hiring workers with multilingual skills to better serve these increasing immigrant segments of the population. Furthermore, foreign-born immigrants are used to a greater variety of modal choices and may rely, to a greater degree, on modes such as transit or bicycles.

Though not examined explicitly in this report, there is another relatively recent increasing migration trend that is worth noting here and monitoring in subsequent MITP analyses. Young adults aged 18-34, or the so-called *Millennial* generation, have the highest rate of migration of all age groups<sup>14</sup> and now represent the largest labor force in the United States.<sup>15</sup> They are also the largest group migrating to cities, urban centers, and downtowns that are walkable, provide mixed land uses, and provide access to transportation options.

Overall, Millennials are more likely to live in urban neighborhoods than any other age group. This age group is also likely to commute by other modes of transportation beyond the automobile, including public transportation, walking, and bicycling.<sup>16</sup> Michigan is beginning to experience this

<sup>14</sup> "Millennial Migration: How the Great Recession Affected the Migration of a Generation as it Came of Age" (U.S. Census Bureau, March 2015).

<sup>15</sup> "15 Economic Facts about Millennials." (The Council of Economic Analysis, Office of the President of the United States, October 2014).

<sup>16</sup> "Core Values: Why American Companies are Moving Downtown." (Smart Growth America, June 2015).

Millennial migration trend in cities like Grand Rapids and Mid-Town Detroit. Therefore, it is important to understand that this trend will have an effect on households, population density, travel patterns, and modes of transportation.<sup>17</sup>

### Environmental Justice

Understanding socioeconomic trends and conditions among Michigan's transportation system users is integral to achieving an environmentally just transportation system. EJ requires that no changes in the transportation system have disproportionately adverse effects on traditionally under-served or disadvantaged population segments. These segments include low-income and minority population and households.

The socioeconomic findings of this report are important for two aspects of EJ:

1. Ensuring that the needs of all groups are adequately addressed in the MITP.
2. Ensuring that potential changes to transportation systems do not result in other adverse effects to the human environment for traditionally under-served or disadvantaged groups.

Figures 11 through 15 provide some indication of areas where EJ populations are concentrated, though only in terms of percentage of total population. Projects associated with changes in the human environments of these areas (including highway improvements that may affect transit or pedestrian accessibility, neighborhood quality, or general public safety and welfare) must ensure that projects enhance, and do not adversely affect, the overall status of these populations.

The increasing diversity of Michigan's population requires the involvement of EJ stakeholders early in the project development process. The MITP includes an outreach to these populations throughout the overall development of the plan to complement the statistical and geographic identification of key areas in this technical report.

The [\*Socioeconomic Technical Report White Paper\*](#) and the results of the public involvement process for the MITP are offered as resources to enable MDOT to:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction, or significant delay in the receipt of benefits by minority and low-income populations.

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<sup>17</sup> The M-1 Rail project in Detroit and the Silver Line Bus Rapid Transit System in Grand Rapids are both a result of these changes, and at the same time they are driving these changes in both cities.

## **Conclusion**

This update of the *Socioeconomic Technical Report* through this white paper is offered as a resource for understanding socioeconomic conditions pertaining to Michigan's transportation system, and as an input to the updating of the integrated MITP. The findings highlight changes in population, household size and composition, age groups, employment, labor force, migration, and environmental justice populations.

Significant changes identified in this report clarify ways in which the aging population, the shift to an increasingly service-oriented economy, and the increasing diversity of Michigan's population are relevant for understanding its transportation system needs. Links between the findings of this update and updates to other technical reports of the MITP are identified relative to how socioeconomic change serves as a driver for the conditions and performance of Michigan's transportation modes and for the emerging and changing labor and consumer markets served by the system to the year 2040.

Draft for Public Comment