

10– Chapter 10: Environmental Justice Analysis

10.1 Introduction

Wisconsin’s freight transportation system is critical to the movement of goods throughout the state, and close proximity to the system provides access to many important items such as agricultural produce, consumer goods, and other manufactured products and raw materials. However, the freight system also has the potential for negative impacts in the form of increased noise, vibration, reduced air quality, and safety concerns. Highways and rail lines on the freight system also have the potential to limit access to certain neighborhoods unless a sufficient number of crossing locations are maintained.

An environmental justice analysis, as directed under federal Executive Order (EO) 12898, evaluates potential adverse impacts of the freight system on minority populations and low-income populations to determine if there is a risk for disproportionately high and adverse effects on an individual’s health or their surrounding environment.¹ The analysis reviews demographic data for the State of Wisconsin to identify the distribution of various populations and the potential effects the freight system may have. Although not required under EO 12898, additional populations that may be sensitive to freight impacts were also analyzed.

This chapter consists of six sections:

- An overview of the history and requirements of environmental justice
- A summary of Wisconsin’s population demographics throughout the state
- A demographic analysis of populations that reside in areas adjacent to the state’s freight transportation system
- An examination of the potential impacts of the plan’s recommendations on minority populations and low-income populations, as well as additional populations that may be sensitive to freight impacts including youth, seniors (aged 65 and over), persons with disabilities, and households without immediate access to vehicles.
- A summary of public engagement efforts to provide education and opportunities for input to minority populations and low-income populations.
- A discussion of the next steps necessary for the inclusion of environmental justice considerations in future planning efforts

Environmental Justice Overview

Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was signed and adopted in 1994. It directs federal agencies to take steps necessary to address disproportionately high and adverse effects on the health or environment of minority populations and low-income populations through its programs, policies, and activities. The executive order covers federal agencies such as the United States Department of Transportation (DOT) and Federal Highway Administration (FHWA), as well as projects receiving federal assistance under these agencies.

¹ Executive Office of the President, “Executive Order 12898.” (February 11, 1994)

As a recipient of federal financial assistance, WisDOT works closely with the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) in implementing the Executive Order and these agencies' corresponding policy directives. Corresponding directives include United States DOT Order 5610.2(a) "Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," FHWA Order 6640.23a "FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and the Federal Transit Administration's Environmental Justice Circular 4703.1. WisDOT's actions and decisions are guided by the three fundamental principles of environmental justice, which are:

- 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
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- To prevent the denial of, reduction of, or significant delay in the receipt of benefits by minority populations and low-income populations

WisDOT considers environmental justice at every stage of planning and design, from statewide planning-level documents to individual project implementation. The analyses conducted in this chapter do not constitute a complete assessment of the impact of freight and freight-related projects on environmental justice populations. Rather, this analysis is intended as a starting point that subsequent plans may build upon. WisDOT's review process for environmental justice at the project level is consistent with the environmental evaluation and documentation process required under the National Environmental Policy Act (NEPA) of 1969.²

10.2 Summary of Wisconsin's Population Demographics

While environmental justice specifically refers to the evaluation of impacts on minority populations and low-income populations, this chapter also evaluates the potential impacts on other populations that are traditionally underserved by the transportation system. These include youth (aged nine and under), seniors (aged 65 and over), persons with disabilities, and households without immediate access to vehicles. The following section summarizes the distribution of these populations throughout the state and within each of the five WisDOT regions (North Central, Northeast, Northwest, Southeast, and Southwest). WisDOT regions were used for the analysis to analyze the demographic variability within the state. Reviewing the regional distributions of these populations helps to provide an overall picture of key population characteristics that will provide context and additional information for future projects, policies, and activities.

Data for each of these groups was collected from the United States Census Bureau. Data for race, ethnicity, and age was collected at the census block level from the 2010 Decennial Census. Beginning in 2010, information on income, vehicle availability, and disability status was no longer included in the Decennial Census and was instead collected as part of the American Community Survey (ACS).³ The ACS surveys only a subset of the population and is therefore less accurate at smaller census geographies. The data used in this analysis for low-income populations, persons with disabilities, and zero-vehicle households was collected from the 2014 ACS five-year estimates. Data for low-income populations and zero-vehicles households is available at the census block group level. Data for persons with disabilities is available at the census tract level.

² U.S. Environmental Protection Agency, "National Environmental Policy Act."

³ U.S. Census Bureau, "What is the American Community Survey?"

Environmental Justice Populations

As noted earlier, the requirements of Executive Order 12898 refer explicitly to minority populations and low-income populations. However, the Executive Order does not provide a definition of “minority” or “low-income.” This was later clarified by United States DOT Order 5610.2(a) and FHWA Order 6640.23a. These definitions are discussed in detail below.

Minority Populations

The United States DOT and FHWA Environmental Justice Orders define “minority” as an individual who self-identifies as one of the following racial or ethnic categories:

- **Black or African American:** a person having origins in any of the black racial groups of Africa
- **Asian:** a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent
- **American Indian or Alaskan Native:** a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition
- **Native Hawaiian and Other Pacific Islander:** people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **Hispanic or Latino:** a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race^{4,5}

These definitions correspond to the racial and ethnic categories used by the United States Census Bureau. However, since the year 2000, two additional categories have been available. Respondents that select more than one racial category are categorized as “Two or More Races.” For the purposes of this analysis, and consistent with guidance from the Office of Management and Budget⁶, respondents in this category were considered part of the minority population. Respondents may also select “Some Other Race” and write in a response if they feel that none of the other racial categories sufficiently describes their background. For the purposes of this analysis, respondents in this category were also considered part of the minority population.⁷

According to the United States Census Bureau’s 2010 Decennial Census, the statewide minority population is 16.7 percent. The largest racial minority population category in the state is Black or African American at 6.3 percent. The next largest racial category is Some Other Race Alone at 2.4 percent of the population. Those who identify as Hispanic or Latino ethnicity comprise 5.9 percent of the population. It is important to note that the category of Hispanic or Latino is an ethnic categorization that functions independently of the racial categories and may include individuals from any race. For example, a person may self-identify as both White and Hispanic or Latino.⁸

The distribution of these populations between the five WisDOT regions varies significantly. For example, the Black or African American population is heavily concentrated in the Southeast Region, particularly for areas in and around the City of Milwaukee. Approximately 82 percent of the Black or African American population in Wisconsin resides in the Southeast Region compared with 36 percent of the population as a whole. Similarly, those identifying as Hispanic or Latino are also heavily concentrated in the southeast region with nearly 60 percent of the population compared with 36 percent of the population as a whole. American Indian or Alaskan Native populations

⁴ Federal Highway Administration, “Department of Transportation Order 5610.2(a).”

⁵ Federal Highway Administration, “FHWA Order 6640.23A.”

⁶ The White House, “Guidance on Aggregation and Allocation of Data on Race for Use in Civil Rights Monitoring and Enforcement.” (March 9, 2000).

⁷ Ibid.

⁸ U.S. Census Bureau, “2010 Decennial Census.”

account for only 1 percent of the state population. Over 70 percent of this population resides in the Northeast, Northwest, and North Central Regions compared to 41 percent of the population as a whole. The distribution of these populations in Wisconsin is summarized in Table 10-1.

Table 10-1: Race and Ethnicity by WisDOT Region

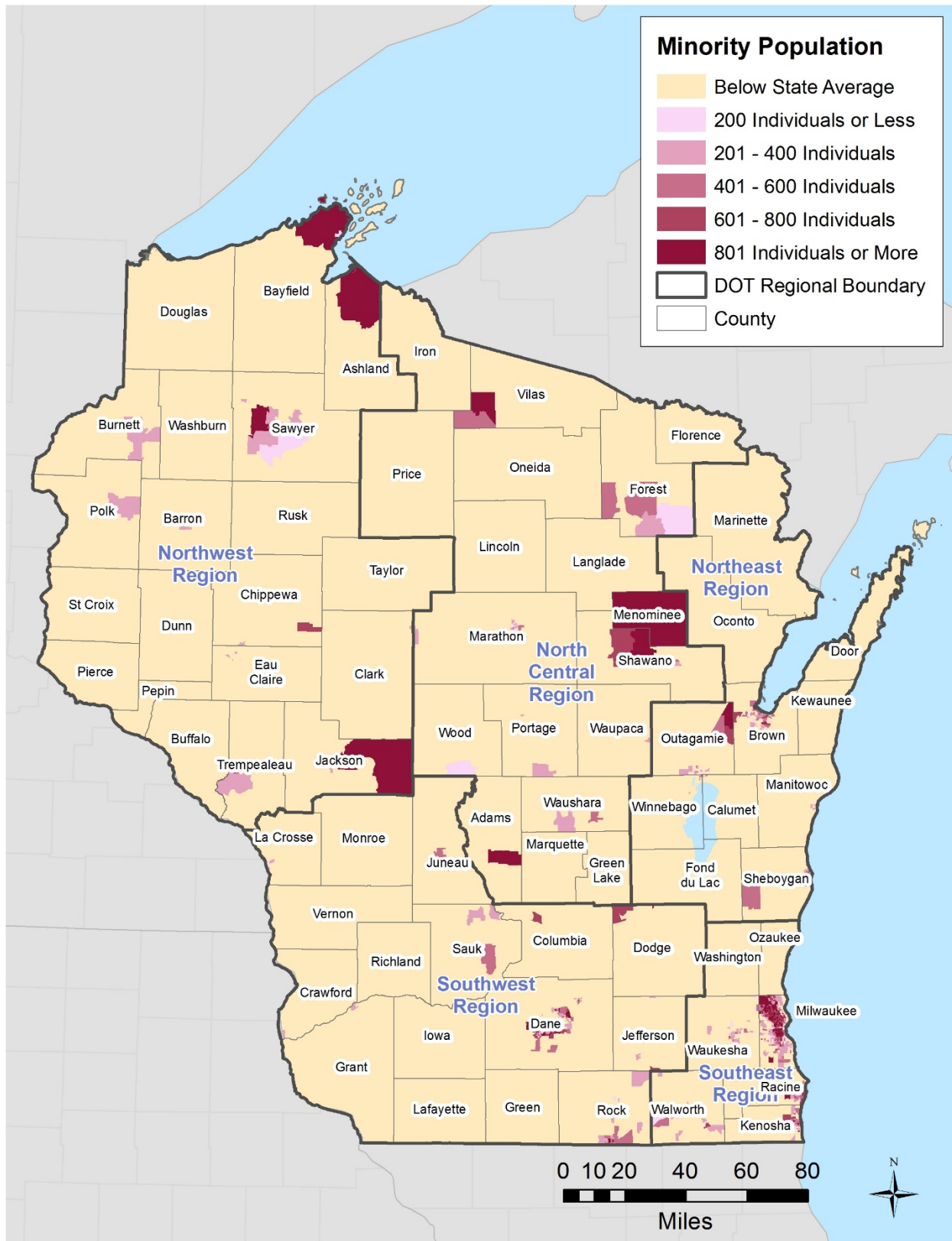
Region	Total Population	Hispanic or Latino	Non-Hispanic or Latino	White	Black	American Indian or Alaskan Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races
North Central Region	597,198	13,841	583,357	556,042	3,729	13,452	11,680	190	4,787	7,318
		2.3%	97.7%	93.1%	0.6%	2.3%	2.0%	0.0%	0.8%	1.2%
Northeast Region	1,067,017	47,255	1,019,762	975,993	14,273	13,245	25,815	332	20,684	16,675
		4.4%	95.6%	91.5%	1.3%	1.2%	2.4%	0.0%	1.9%	1.6%
Northwest Region	684,157	12,963	671,194	644,949	4,856	11,710	7,885	160	4,725	9,872
		1.9%	98.1%	94.3%	0.7%	1.7%	1.2%	0.0%	0.7%	1.4%
Southeast Region	2,019,970	200,219	1,819,751	1,536,028	294,809	10,386	51,426	729	79,535	47,057
		9.9%	90.1%	76.0%	14.6%	0.5%	2.5%	0.0%	3.9%	2.3%
Southwest Region	1,318,644	61,778	1,256,866	1,189,055	41,481	5,733	32,428	416	26,136	23,395
		4.7%	95.3%	90.2%	3.1%	0.4%	2.5%	0.0%	2.0%	1.8%
Statewide	5,686,986	336,056	5,350,930	4,902,067	359,148	54,526	129,234	1,827	135,867	104,317
		5.9%	94.1%	86.2%	6.3%	1.0%	2.3%	0.0%	2.4%	1.8%

Source: U.S. Census Bureau, "2010 Decennial Census"

Figure 10-1 displays the distribution of minority populations throughout the state. A statewide average population proportion was calculated for each group. In each of the subsequent figures, areas are highlighted if the proportion of the group in that area exceeds the statewide average. Additionally, these highlighted areas display the approximate population count to convey a sense of size and magnitude for the populations in these areas.

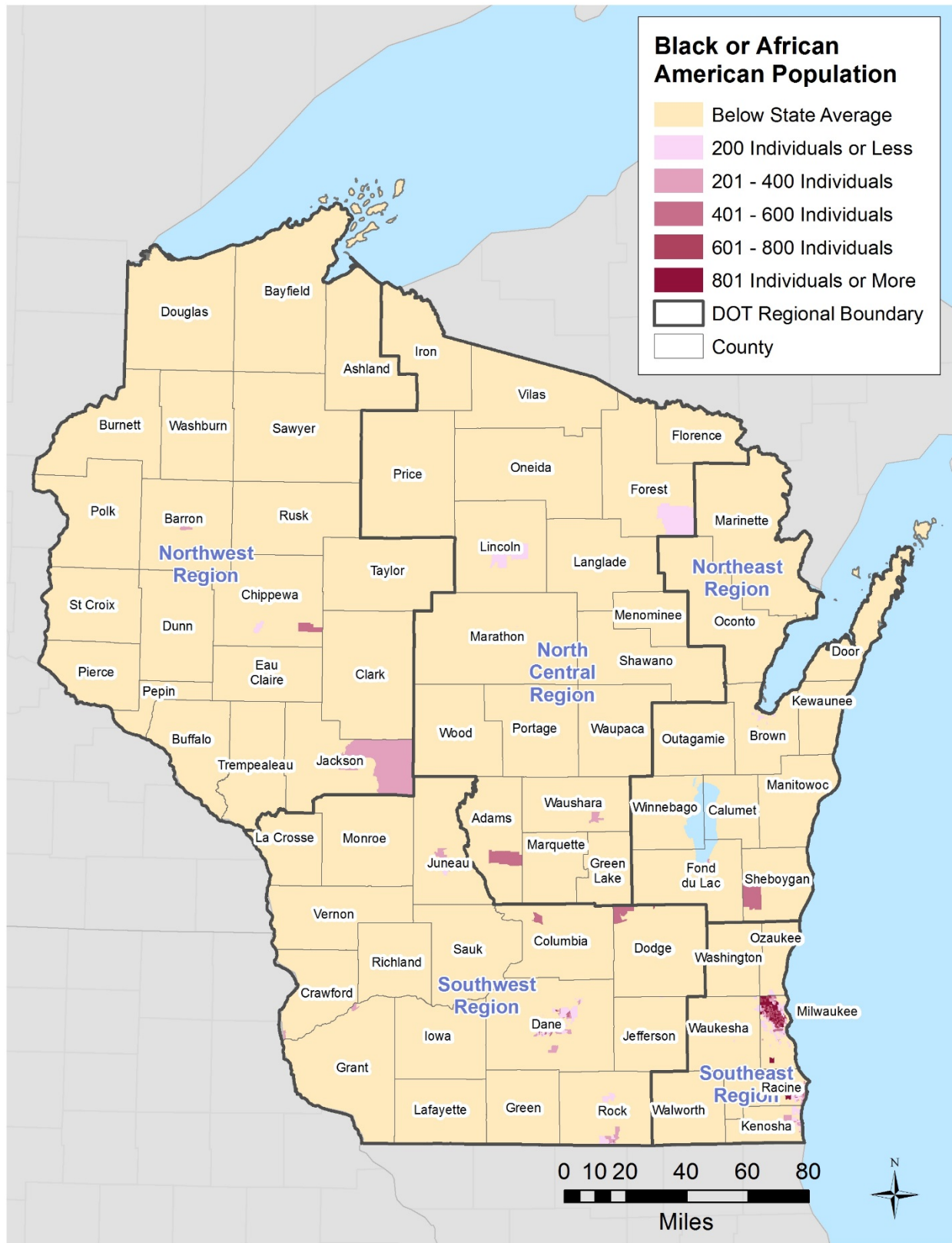
The maps provide additional context to the previous demographic summary. Figure 10-2 and Figure 10-5 highlight the concentration of Black or African American and Hispanic or Latino populations within the Southeast Region. Figure 10-3 shows the concentration of American Indian or Alaskan Native populations and includes the boundaries of Tribal lands throughout the state, emphasizing the strong overlap between Tribal lands and Native American populations, with a particularly high concentration in the northern areas of the state. Figure 10-4 highlights a concentration of Asian population in the Southeast Region, but also shows additional areas of concentration near Madison, Eau Claire, and Wausau.

Figure 10-1: Minority Population



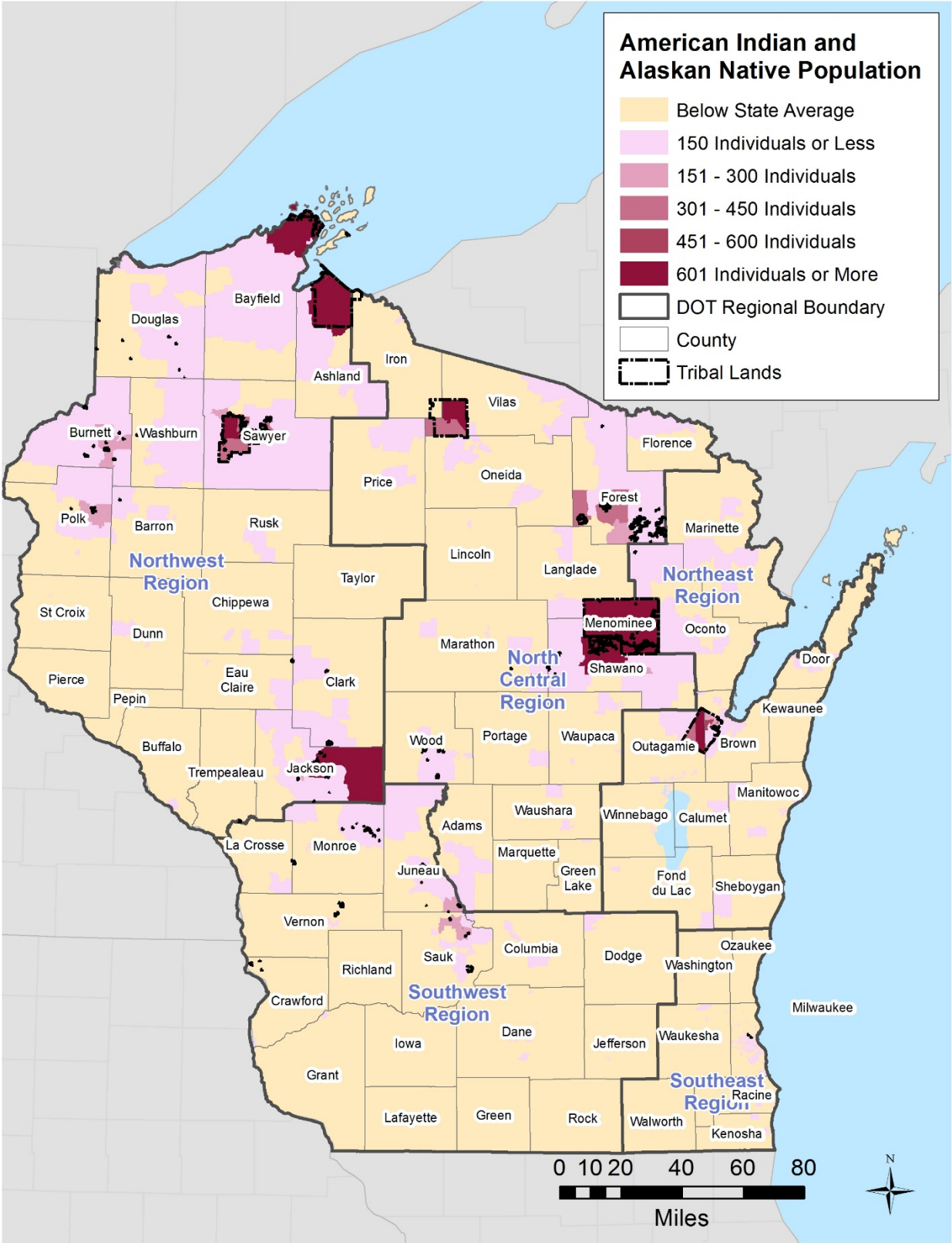
Source: U.S. Census Bureau, "2010 Decennial Census"

Figure 10-2: Black or African American Population



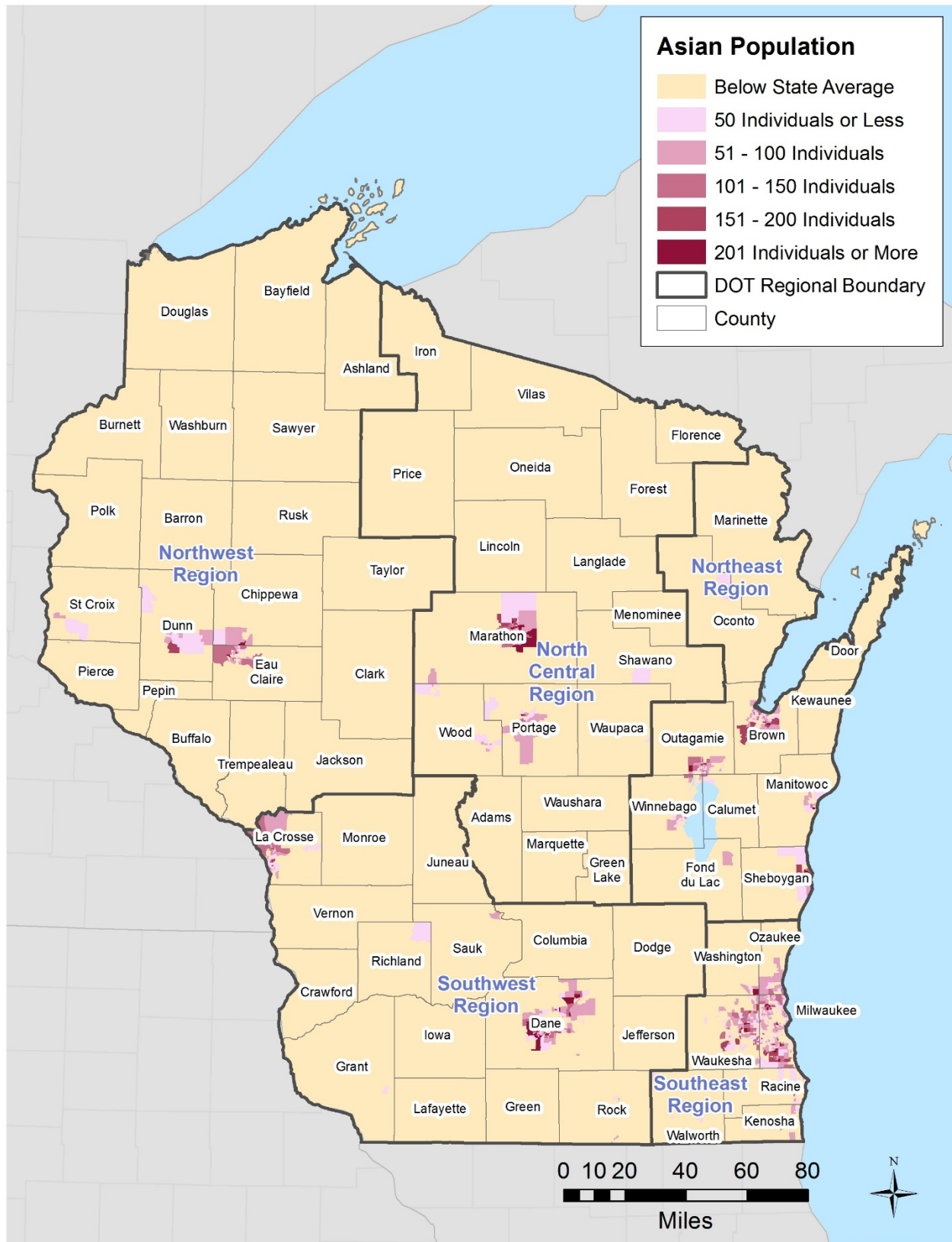
Source: U.S. Census Bureau, "2010 Decennial Census"

Figure 10-3: American Indian or Alaskan Native Population



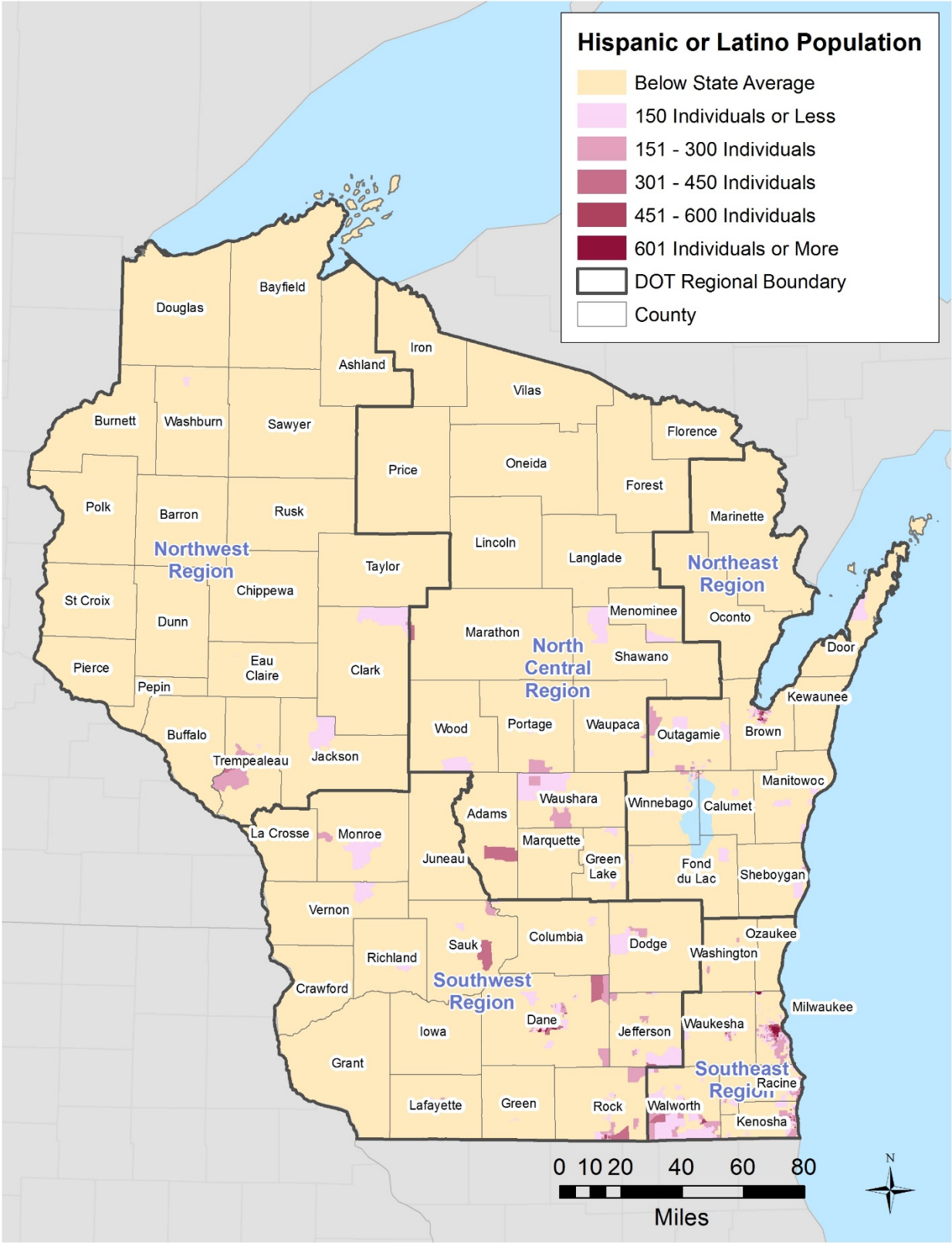
Source: U.S. Census Bureau, "2010 Decennial Census"

Figure 10-4: Asian Population



Source: U.S. Census Bureau, "2010 Decennial Census"

Figure 10-5: Hispanic or Latino Population



Source: U.S. Census Bureau, "2010 Decennial Census"

Low-Income Populations

The United States DOT and FHWA Environmental Justice Orders define “low-income” as “a person whose median household income is at or below the United States Department of Health and Human Services (DHHS) poverty guidelines.” The DHHS poverty guidelines are based on household size and the number of related children less than eighteen years of age. The guidelines are updated annually and are summarized separately for the 48 contiguous states, Alaska, and Hawaii. The 2014 poverty guidelines are summarized in Table 10-2.

Table 10-2: 2014 DHHS Poverty Guidelines (48 Contiguous States)

Persons in Family/ Household	Poverty Guideline
1	\$11,670
2	\$15,730
3	\$19,790
4	\$23,850
5	\$27,910
6	\$31,970
7	\$36,030
8	\$40,090
For each additional person, add	\$4,060

Source: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (ASPE), "2014 Poverty Guidelines"

For practical purposes, this evaluation uses the poverty thresholds developed by the United States Census Bureau to identify low-income populations in Wisconsin. The poverty thresholds are the original measure of poverty and are divided into 48 distinct household income thresholds based on family size and the age of the household members. The DHHS poverty guidelines are a simplification of the poverty thresholds and are used mainly for administrative purposes, such as eligibility criteria for governmental programs.

In order to be more inclusive, WisDOT went beyond the DHHS poverty guidelines and evaluated a broader low-income population. The poverty thresholds are determined for the United States as a whole and do not reflect regional variations in cost of living. An income that is sufficient to live above the poverty line in one part of the country may not be sufficient in another part. To help provide a more complete picture of low-income populations, this evaluation includes a review of populations with a median household income less than twice the poverty threshold. This more inclusive definition captures a broader section of the population in Wisconsin. Approximately 13 percent of Wisconsin’s population has a household income less than the poverty thresholds while over 30 percent of Wisconsin’s population has a household income less than twice the poverty thresholds.⁹

A summary of Wisconsin’s low-income population within each region is provided in Table 10-3. It should be noted that the Census Bureau is unable to define poverty status for certain populations such as persons living in college dormitories or in institutional group quarters. These populations are excluded from the tabulations, resulting in slightly lower populations totals than in other categories. There is a relatively small variation in the distribution of low-income populations between the WisDOT regions, ranging from a high of 32.9 percent in the northwest region to a low of 28.0 percent in the northeast region. Figure 10-6 displays census block groups where the proportion of low-income population (below the poverty threshold) exceeds the state average. Figure 10-6 further highlights the widespread distribution of low-income populations.

⁹ U.S. Census Bureau, “2010 - 2014 American Community Survey.”

Table 10-3: Low-Income Population by WisDOT Region

Region	Total Population	Under Poverty Threshold	Percent Under Poverty Threshold	Under 2x Poverty Threshold	Percent Under 2x Poverty Threshold
North Central Region	580,589	71,634	12.3%	187,940	32.4%
Northeast Region	1,044,474	109,591	10.5%	292,252	28.0%
Northwest Region	664,047	87,485	13.2%	218,492	32.9%
Southeast Region	1,988,077	301,597	15.2%	634,388	31.9%
Southwest Region	1,293,896	168,250	13.0%	384,192	29.7%
Statewide	5,571,083	738,557	13.3%	1,717,264	30.8%

Source: U.S. Census Bureau, "2010 - 2014 American Community Survey"

Low-Income Population

- Below State Average
- 200 Individuals or Less
- 201 - 400 Individuals
- 401 - 600 Individuals
- 601 - 800 Individuals
- 801 Individuals or More
- DOT Regional Boundary
- County

Northwest Region

Northeast Region

North Central Region

Southwest Region

Southeast Region

0 10 20 40 60 80
Miles

386

Additional Populations

Additional populations that may be sensitive to freight impacts were also evaluated. While not required under Executive Order 12898, these populations may be susceptible to impacts created by freight movements. These include youth (aged nine and below), seniors (aged 65 and over), persons with disabilities, and households without immediate access to vehicles.

Youth and Senior Population

Studies have shown that youth and senior populations are more susceptible to adverse air quality effects.^{10,11} Children under nine years of age are particularly susceptible to environmental impacts because their bodies and systems are not fully developed. Relative to their size, children are also more likely to eat more food, drink more water, and have increased inhalation rates compared to adults. Finally, typical child behaviors such as putting their hands in their mouth and playing on the ground increase the likelihood of exposure to potential contaminants.¹²

For the purposes of this evaluation, youth is defined as aged nine or younger and senior is defined as age 65 and over. A summary of Wisconsin's youth and senior population is provided in Table 10-4. The locations of areas where youth and senior population proportions exceed the state average are shown in the Figure 10-7 and Figure 10-8 on the following pages. The results of this analysis show an inverse relationship between youth and senior populations. That is, areas with higher proportions of senior population tend to have lower proportions of youth population and vice versa. For example, the north central region has the lowest percent of population age nine and under (11.5 percent), but has the highest percent of population age 65 and over (17.6 percent). Likewise, the southeast region has the highest percent of population age nine and under (13.4 percent), but has the lowest percent of population age 65 and over (12.6 percent).

Figure 10-7 and Figure 10-8 further highlight this disparity, with very little overlap between areas of concentration for these groups. In general, there appears to a significant urban/rural split in the distribution of these populations, with youth typically concentrated in urban areas and senior populations typically concentrated in rural areas or on the periphery of urban centers.

Table 10-4: Youth and Senior Population by WisDOT Region

Region	Total Population	Population Age 9 and Below	Percent Age 9 and Below	Population Age 65 and Above	Percent Age 65 and Above
North Central Region	597,198	68,532	11.5%	104,909	17.6%
Northeast Region	1,067,017	135,797	12.7%	147,258	13.8%
Northwest Region	684,157	86,255	12.6%	100,651	14.7%
Southeast Region	2,019,970	270,513	13.4%	254,007	12.6%
Southwest Region	1,318,644	165,963	12.6%	170,489	12.9%
Statewide	5,686,986	727,060	12.8%	777,314	13.7%

Source: U.S. Census Bureau, "2010 Decennial Census"

¹⁰ Pediatrics: Official Journal of the American Academy of Pediatrics, "Air Pollution and Children's Health." (April 2004).

¹¹ Health Effects Institute, "The National Morbidity, Mortality, and Air Pollution Study: Part II: Morbidity and Mortality from Air Pollution in the United States." (June 2000).

¹² World Health Organization, "Children's environmental health > Environmental risks."

Population 9 Years and Under

- Below State Average
- 150 Individuals or Less
- 151 - 300 Individuals
- 301 - 450 Individuals
- 451 - 600 Individuals
- 601 Individuals or More
- DOT Regional Boundary
- County

Northwest Region

Northeast Region

North Central Region

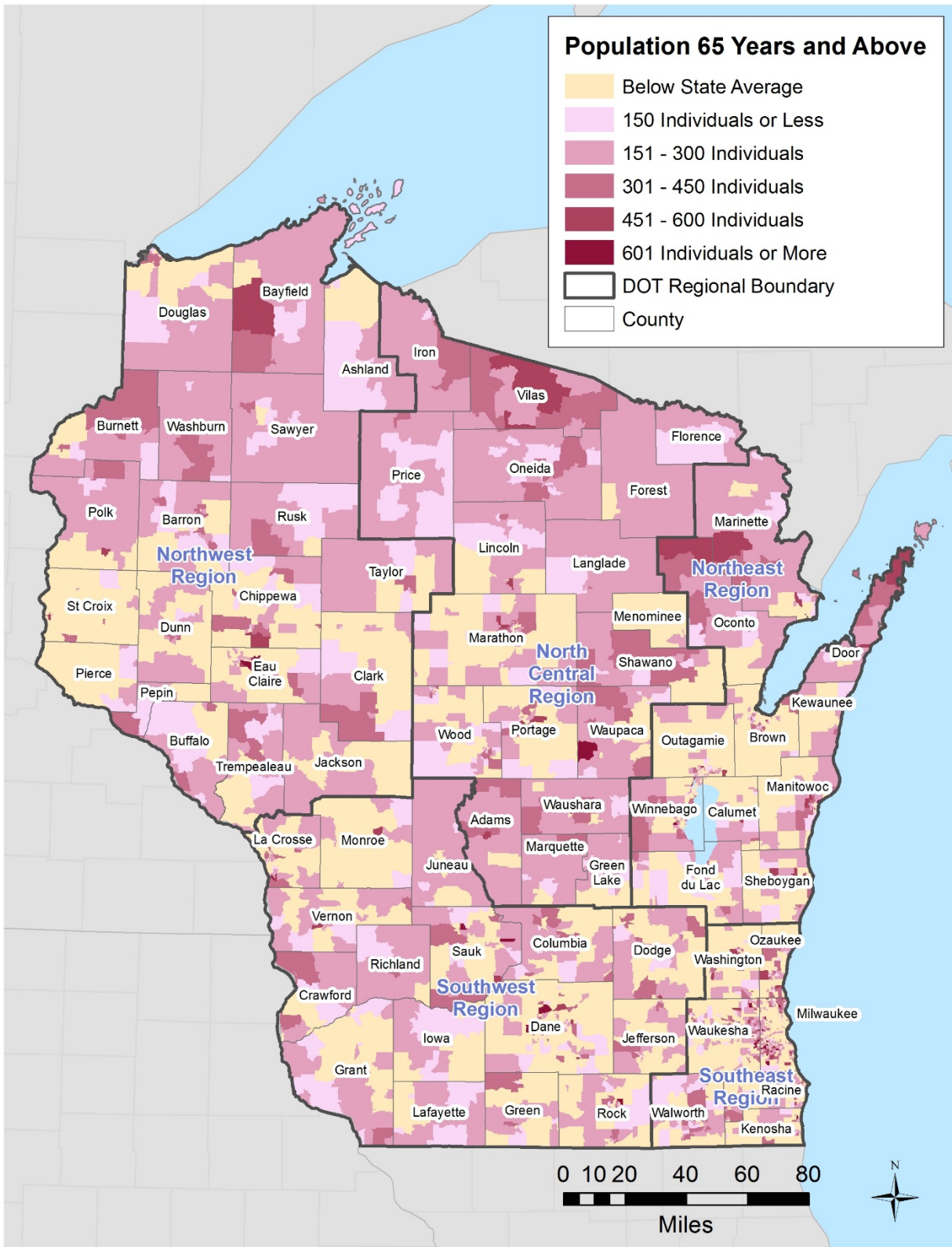
Southwest Region

Southeast Region

0 10 20 40 60 80
Miles

388

Figure 10-8: Population 65 Years and Above



Source: U.S. Census Bureau, "2010 Decennial Census"

Zero-Vehicle Households

People residing in zero-vehicle households are more likely to walk or use transit to reach their destinations than people residing in vehicle-owning households.¹³ Proximity to freight infrastructure can limit walkability and presents potential safety issues at locations such as major roadway intersections and highway-rail grade crossings. A summary of Wisconsin's zero-vehicle households is provided in Table 10-5. The locations of areas where zero-vehicle households exceed the state average are shown in Figure 10-9 on the following page. Households without immediate access to vehicles comprise 6.7 percent of all households in Wisconsin. The distribution of zero-vehicle houses varies between regions, with the three northern regions exhibiting the lowest proportion of zero-vehicle households (4.8 to 5.3 percent) and the southeast region exhibiting the higher proportion with 8.9 percent compared to a statewide average of 6.7 percent.

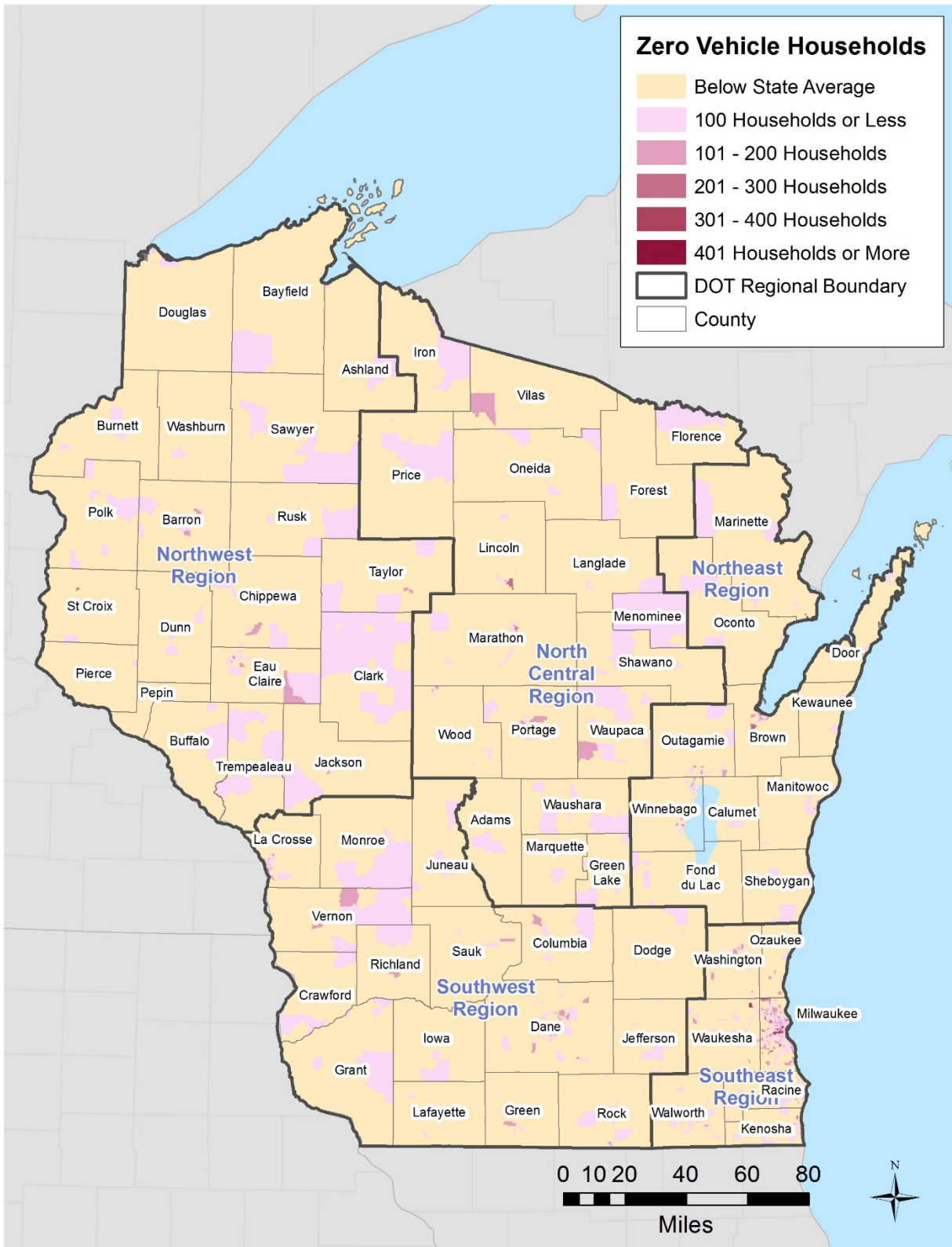
Table 10-5: Zero-Vehicle Households by WisDOT Region

Region	Zero-Vehicle Households	Total Households in District	Percent of Population Zero-Vehicle Households
North Central Region	12,226	252,870	4.8%
Northeast Region	22,897	429,756	5.3%
Northwest Region	14,170	276,452	5.1%
Southeast Region	70,886	792,701	8.9%
Southwest Region	31,518	522,832	6.0%
Statewide	151,697	2,274,611	6.7%

Source: U.S. Census Bureau, "2010 - 2014 American Community Survey"

¹³ Federal Highway Administration, "2013 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance, Chapter 1: Household Travel and Freight Movement."

Figure 10-9: Zero Vehicle Households



Source: U.S. Census Bureau, "2010 - 2014 American Community Survey"

Individuals with Disability

A summary of individuals with disabilities in Wisconsin is provided in Table 10-6. The locations of areas where the proportion of individuals with a disability exceeds the state average (11.4 percent) are shown in Figure 10-10 on the following page.

Individuals with a disability are evenly distributed throughout the states regions and do not appear to follow set patterns of concentration. There is only a two percent difference between the highest region, North Central Region (12.8 percent), and the lowest region, Southwest Region (10.8 percent).

Table 10-6: Individuals with Disability by WisDOT Region

Region	Individuals with Disability	Total District Population	Percent of Population with Disability
North Central Region	75,224	586,516	12.8%
Northeast Region	115,913	1,058,681	10.9%
Northwest Region	78,604	676,520	11.6%
Southeast Region	234,122	2,010,328	11.6%
Southwest Region	142,772	1,317,658	10.8%
Statewide	646,635	5,649,703	11.4%

Source: U.S. Census Bureau, "2010 - 2014 American Community Survey"

Persons with Disability

- Below State Average
- 200 Individuals or Less
- 201 - 400 Individuals
- 401 - 600 Individuals
- 601 - 800 Individuals
- 801 Individuals or More
- DOT Regional Boundary
- County

Northwest Region

Northeast Region

North Central Region

Southwest Region

Southeast Region

0 10 20 40 60 80
Miles

393

10.3 Demographic Analysis of Populations Adjacent to Freight Transportation System

In order to better understand the potential impacts to individual populations, this environmental justice evaluation includes a 'buffer' analysis to summarize the demographic characteristics of census areas located within one-quarter mile of the freight system. The demographics within this study area were then compared against the demographics of the state as a whole to determine if each individual group is present in the study area at a rate higher or lower than the state average. The intention of this planning-level assessment is not to identify specific locations where adverse impacts are being borne disproportionately by environmental justice populations, but rather is meant as a starting point to provide statewide context for further investigation and analysis on individual projects.

Freight Impacts

The movement of freight on the transportation system may result in both positive benefits and adverse impacts to Wisconsin populations. In general, a robust freight system benefits local and regional economies by improving access to markets, decreasing shipping costs, and supporting economic development and growth. See Chapter 4 for additional information regarding the positive economic impacts of Wisconsin's Freight Transportation System. While it is important to acknowledge these benefits, it is difficult to pinpoint the precise impacts that they will have on specific populations.

For the purposes of this analysis, a one-quarter-mile distance was chosen to approximate the typical effective distance of localized adverse impacts such as noise, vibration, and air pollution. FHWA guidance regarding highway traffic noise notes that highway traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads.¹⁴ Likewise, the FTA Transit Noise and Vibration Manual recommends screening distances for noise assessments between 750 and 1,600 feet for commuter rail operations.¹⁵ A 2007 meta-analysis of the factors influencing the distribution of air quality impacts from mobile sources found that typical impact screening distances ranged on average between 500 and 1,320 feet.¹⁶ The quarter-mile distance encompasses the majority of these impact distances, therefore, for this analysis, all census blocks intersected by a one-quarter mile buffer of the freight system were assumed to be within the freight system study area.

Census Data

Much of the demographic information for this analysis is available at the census block level from the 2010 United States Decennial Census. However, information on low-income populations and zero-vehicle households is available only at the census block group level from the American Community Survey (ACS) 5-year Estimates. Census block groups and blocks differ in their geographic makeup. Census blocks are the smallest geographic unit used by the United States Census Bureau and are bounded by roadways or water features in urban areas. A census block group is typically made up of a cluster of approximately 40 blocks.

Block-level demographics were estimated for the ACS data by allocating populations in each block group to individual blocks based on the 2010 United States Decennial Census total population distribution. For example, if the Decennial Census showed that 20 percent of the total population within a specific block group resided in a single block, then 20 percent of all ACS block group populations were assumed to reside in this block. This approach assumes that the proportion of low-income populations and zero-vehicle households correlates with the total population in each block group. Doing so allows for greater precision than an analysis using data at only the block group level.

¹⁴ Federal Highway Administration, "Highway Traffic Noise: Analysis and Abatement Guidance." (December 2011).

¹⁵ Federal Transit Administration, "Transit Noise and Vibration Impact Assessment."

¹⁶ Zhou, Ying and Jonathan Levy, "Factors influencing the spatial extent of mobile source air pollution impacts: a meta-analysis." (May 22, 2007).

Information on individuals with a disability is limited to census tracts only. Census tracts generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people. A census tract usually covers a contiguous area; however, the spatial size of census tracts varies widely depending on the density of settlement. Due to the significant size difference between census tracts and blocks, it was assumed that the distribution of disabled populations could not be accurately estimated at the block level. Therefore, individuals with a disability were excluded from this buffer analysis.

Freight Transportation System Components

A key step in conducting this analysis is to first understand what the “freight transportation system” is. For modes such as rail where nearly all of the activity on the system is related to the movement of freight, it is an easy task to define the entire rail system as being part of the statewide multimodal freight system. For this evaluation, the rail freight system in Wisconsin was defined as all Class I, short line, and state-owned railroad lines. Likewise, the water freight system was defined as all 20 lake and river ports with commercial service and the air freight system was defined as the twelve airports in Wisconsin capable of carrying cargo flights.

Roadways, however, provide a unique challenge in this regard. Freight is present on nearly all roads, from tractor-trailers on major Interstate highways to parcel delivery trucks on local streets. For this evaluation, it was determined that only the most critical portions of the roadway system at a state level would be considered. The Wisconsin Backbone highways - 1,588 miles of the highway system identified in *Connections 2030* as “multi-lane highways connecting all major populations and economic regions of the state” - were used to define the roadway freight system. The Wisconsin multimodal freight system in this evaluation is shown in Figure 10-11. This freight system used in this evaluation is only for analysis purposes to understand potential environmental justice impacts.

Figure 10-11: Wisconsin Multimodal Freight System



Analysis Results

The results of the buffer analysis are shown in the tables on the following pages. The analysis was completed for the state's multimodal transportation freight system as a whole, as well as for each component. In each table, the proportion of the population within one-quarter mile of the freight system is shown for each population group. This is compared to the proportion of the total population within that distance. To assist with this comparison, each table includes a column to show a comparison index. This index is equivalent to the proportion of the individual population groups divided by the proportion of the total population:

- A comparison index of 1.0 indicates that the target population is represented in the quarter-mile study area at a rate equal to that of the population as a whole. There are no disproportionate impacts for this group.
- A comparison index value greater than 1.0 indicates that the target population is represented in the quarter-mile study area at a rate higher than the population as a whole. Adverse effects in the study area have the potential to disproportionately affect the target population.
- A comparison index value less than 1.0 indicates that the target population is represented in the quarter-mile study area at a rate lower than the population as a whole. Adverse effects in the study area are less likely to have the potential to disproportionately affect the target population.

Table 10-7 summarizes the demographic characteristic of populations within one-quarter mile of any component of the freight system. With a comparison index of 1.21, this indicates that Hispanic or Latino populations are 21 percent more likely to reside next to the Wisconsin freight system than the population as a whole. This value is surpassed only by the category Some Other Race at an index of 1.25.¹⁷ Only three groups are less likely to reside next to the System: Non-Hispanic or Latino, White, and American Indian or Alaskan Native.

Table 10-7: Population within ¼-Mile of Wisconsin Freight System

Population Category	Statewide Population	Within ¼-Mile of Freight System		
		Total	Percent	Index
Total Population	5,686,986	1,907,897	33.5%	-
Hispanic or Latino	336,056	136,421	40.6%	1.21
Non-Hispanic or Latino	5,350,930	1,771,476	33.1%	0.99
White	4,902,067	1,609,168	32.8%	0.98
Black or African American	359,148	133,568	37.2%	1.11
American Indian or Alaskan Native	54,526	16,791	30.8%	0.92
Asian	129,234	50,851	39.3%	1.17
Native Hawaiian or Other Pacific Island	1,827	695	38.0%	1.13
Some Other Race	135,867	56,928	41.9%	1.25
Two or More Races	104,317	39,896	38.2%	1.14
Low-Income (< 1x Poverty)	738,557	273,896	37.1%	1.11
Low-Income (< 2x Poverty)	1,717,264	626,381	36.5%	1.09
Age 65 and Older	777,314	251,312	32.3%	0.96
Age 9 and Under	727,060	247,388	34.0%	1.01
Total Households	2,293,250	777,771	33.9%	-
Zero-Vehicle Households	163,459	64,927	39.7%	1.17

Source: U.S. Census Bureau, "2010 Decennial Census" and "2010 - 2014 American Community Survey"

¹⁷ Some Other Race could include those who are unsure how to identify themselves on census forms.

Table 10-8 summarizes the demographic characteristics of populations within one-quarter mile of the roadway component of the freight system. The results are largely similar to those for the complete multimodal freight system, with some variations. The highest index result is for Asian at 1.3, following closely by Some Other Race at 1.29, and Hispanic or Latino at 1.27.

Table 10-8: Population within ¼-Mile of Roadways on Wisconsin Freight System

Population Category	Statewide Population	Within ¼-Mile of Freight Roadways		
		Total	Percent	Index
Total Population	5,686,986	480,749	8.5%	-
Hispanic or Latino	336,056	36,094	10.7%	1.27
Non-Hispanic or Latino	5,350,930	444,655	8.3%	0.98
White	4,902,067	401,713	8.2%	0.97
Black or African American	359,148	36,126	10.1%	1.19
American Indian or Alaskan Native	54,526	3,633	6.7%	0.79
Asian	129,234	14,189	11.0%	1.30
Native Hawaiian or Other Pacific Island	1,827	165	9.0%	1.07
Some Other Race	135,867	14,817	10.9%	1.29
Two or More Races	104,317	10,106	9.7%	1.15
Low-Income (< 1x Poverty)	738,557	63,267	8.6%	1.01
Low-Income (< 2x Poverty)	1,717,264	145,156	8.5%	1.00
Age 65 and Older	777,314	65,460	8.4%	1.00
Age 9 and Under	727,060	60,496	8.3%	0.98
Total Households	2,293,250	196,671	8.6%	-
Zero-Vehicle Households	163,459	14,033	8.6%	1.00

Source: U.S. Census Bureau, "2010 Decennial Census" and "2010 - 2014 American Community Survey"

Table 10-9 summarizes the demographic characteristics of populations within one-quarter mile of the rail components of the freight system. While zero-vehicle households are equally likely to be located near freight roadways compared to the total population, they are much more likely to be located near the freight rail system with a comparison index of 1.21.

Table 10-9: Population within ¼-Mile of Rail Corridors on Wisconsin Freight System

Population Category	Statewide Population	Within ¼-Mile of Rail Corridors		
		Total	Percent	Index
Total Population	5,686,986	1,563,254	27.5%	-
Hispanic or Latino	336,056	112,603	33.5%	1.22
Non-Hispanic or Latino	5,350,930	1,450,651	27.1%	0.99
White	4,902,067	1,318,570	26.9%	0.98
Black or African American	359,148	108,538	30.2%	1.10
American Indian or Alaskan Native	54,526	13,772	25.3%	0.92
Asian	129,234	41,096	31.8%	1.16
Native Hawaiian or Other Pacific Island	1,827	587	32.1%	1.17
Some Other Race	135,867	47,591	35.0%	1.27
Two or More Races	104,317	33,100	31.7%	1.15
Low-Income (< 1x Poverty)	738,557	231,186	31.3%	1.14
Low-Income (< 2x Poverty)	1,717,264	527,864	30.7%	1.12
Age 65 and Older	777,314	203,276	26.2%	0.95
Age 9 and Under	727,060	204,696	28.2%	1.02
Total Households	2,293,250	638,357	27.8%	-
Zero-Vehicle Households	163,459	55,195	33.8%	1.21

Source: U.S. Census Bureau, "2010 Decennial Census" and "2010 - 2014 American Community Survey"

Table 10-10 summarizes the demographic characteristics of populations within one-quarter mile of the water port components of the freight system. The most notable finding of this analysis is the high proportion of American Indian or Alaskan native populations adjacent to the ports compared to the statewide population. This group is 25 times more likely to reside near water ports than the population as a whole.

Table 10-10: Population within ¼-Mile of Water Ports on Wisconsin Freight System

Population Category	Statewide Population	Within ¼-Mile of Water Ports		
		Total	Percent	Index
Total Population	5,686,986	2,648	0.05%	-
Hispanic or Latino	336,056	170	0.05%	1.09
Non-Hispanic or Latino	5,350,930	2,478	0.05%	0.99
White	4,902,067	1,792	0.04%	0.79
Black or African American	359,148	57	0.02%	0.34
American Indian or Alaskan Native	54,526	634	1.16%	24.97
Asian	129,234	35	0.03%	0.58
Native Hawaiian or Other Pacific Island	1,827	-	0.00%	-
Some Other Race	135,867	61	0.04%	0.96
Two or More Races	104,317	69	0.07%	1.42
Low-Income (< 1x Poverty)	738,557	427	0.06%	1.24
Low-Income (< 2x Poverty)	1,717,264	1,016	0.06%	1.27
Age 65 and Older	777,314	355	0.05%	0.98
Age 9 and Under	727,060	370	0.05%	1.09
Total Households	2,293,250	1,191	0.05%	-
Zero-Vehicle Households	163,459	144	0.09%	1.70

Source: U.S. Census Bureau, "2010 Decennial Census" and "2010 - 2014 American Community Survey"

Table 10-11 summarizes the demographic characteristics of populations within one-quarter mile of airports on the Wisconsin freight system. The Some Other Race category and Hispanic or Latino populations are located within one-quarter mile of airports proportionately higher than other populations. Black or African American populations are also more likely to reside near airports than other populations.

Table 10-11: Population within ¼-Mile of Airports on Wisconsin Freight System

Population Category	Statewide Population	Within ¼-Mile of Airports		
		Total	Percent	Index
Total Population	5,686,986	615	0.01%	-
Hispanic or Latino	336,056	177	0.05%	4.87
Non-Hispanic or Latino	5,350,930	438	0.01%	0.76
White	4,902,067	342	0.01%	0.65
Black or African American	359,148	135	0.04%	3.48
American Indian or Alaskan Native	54,526	8	0.01%	1.36
Asian	129,234	1	0.00%	0.07
Native Hawaiian or Other Pacific Island	1,827	-	0.00%	0.00
Some Other Race	135,867	116	0.09%	7.89
Two or More Races	104,317	13	0.01%	1.15
Low-Income (< 1x Poverty)	738,557	82	0.01%	1.03
Low-Income (< 2x Poverty)	1,717,264	189	0.01%	1.02
Age 65 and Older	777,314	49	0.01%	0.58
Age 9 and Under	727,060	97	0.01%	1.23
Total Households	2,293,250	251	0.01%	-
Zero-Vehicle Households	163,459	9	0.01%	0.48

Source: U.S. Census Bureau, "2010 Decennial Census" and "2010 - 2014 American Community Survey"

10.4 Environmental Justice Impacts of State Freight Plan Policies

Chapter 8, *Freight Policies and Strategies*, of this plan identifies and discusses the proposed department policies and actions that address current or emerging requirements and trends in freight transportation. The proposed policy and strategy recommendations are grouped into six modal categories as follows:

- Highways
- Local Roads
- Railroads
- Ports and Waterways
- Air
- Pipelines

The following section provides a high-level, qualitative assessment of the potential impacts and considerations that WisDOT should be aware of as the freight policies are implemented.

Highways

As shown in the previous demographic analysis, many of the evaluated population categories, including Hispanic or Latino, Black or African American, and Asian, are more likely to reside in close proximity to the roadway system than the population as a whole. Policies that improve the safety, operations, and quality of life will potentially have a greater positive impact for these population categories.

Truck shipments on the highway system represent the largest modal share of freight movement measured both by value and by weight. Compared to the other freight modes, highways are also the area where WisDOT exercises the most jurisdictional authority. WisDOT's freight policies and strategies will have a clear and direct impact on the safe, efficient operation of the highway system. The policies and strategies for the highway system are further grouped into subcategories as follows.

State Trunk Highway System Preservation

The area of State Trunk Highway System Preservation focuses on the preservation of critical highways throughout the state. The stated policies under this area include using a performance-based approach to identify and prioritize state trunk highway preservation needs. Potential projects included in this area include resurfacing, reconditioning, pavement replacement, and reconstruction.

State Trunk Highway System Maintenance

The area of State Trunk Highway System Maintenance focuses on monitoring existing highway conditions and deficiencies in areas such as pavement quality, signs and markings, guardrails, and traffic signals. Both the Preservation and Maintenance policy areas will improve the quality of life for populations residing near the highway system by reducing roadway noise through installation of higher quality pavements. Ensuring the long-term viability and operational conditions of the roadways will also benefit both local and non-local highway users. WisDOT will consider periodically comparing the performance measures in these categories to the demographics of the surrounding regions to ensure that the policies and strategies are being implemented efficiently and equitably.

Major Highway Development Program

The area of Major Highway Development Program includes those highway projects that are the most complex, costly, and potentially controversial. The stated policies and goals under this area include completing the currently enumerated Major Highway Development projects and studying approved corridors. Due to their large scale and potentially controversial status, all projects and studies included in this category require review and approval by the Transportation Projects Commission (TPC). These reviews are completed by a task force of staff experts in the areas of highway design, construction, planning, environmental analysis, and economic analysis. All projects in the category will also include

opportunities for public feedback and outreach through public hearings and will be reviewed through either an Environmental Impact Statement (EIS) or Environmental Assessment (EA). These reviews include an analysis of potential impacts to environmental justice populations.

Highway Technology and Operations

The goals of the Highway Technology and Operations policies are to promote a safe and efficient transportation system that will reduce delays for freight movements. The stated policies include supporting and responding to operational needs, as well as supporting communications along significant freight corridors to inform users of changing conditions. It is important to recognize the inherent overlap between highway freight operations and the operations of all other highway users. Projects that reduce congestion and improve travel time reliability for freight users will also have the same effects on passenger vehicles and other highway users. WisDOT should consider periodically reviewing the implementation of projects in the category and the relevant performance measures to ensure that the benefits of the projects are distributed equitably.

Highway Safety

Policies in the area of Highway Safety seek to reduce the number of accidents and incidents by improving infrastructure standards, improving emergency response, and identifying freight-specific safety concerns and solutions. Improving safety for freight vehicles will help improve safety for all roadway users, including those protected under environmental justice.

Local Roads

While WisDOT has limited jurisdictional authority over locally-owned and maintained roadways, they are critical for maintaining first- and last-mile connections between freight generators and the state trunk highway system, as well as connections to other freight modes. This chapter does not include a specific review of the demographics residing in proximity to the local roadway system. However, the demographics of many of the first- and last-mile connections to freight facilities included on this system may be approximated by evaluating the population characteristics surrounding ports, airports and other intermodal freight facilities.

The policy area of Local Road Preservation and Safety focuses on working and partnering with local governments to assist with asset management strategies and tools, identify and address key safety issues, and invest in the local road and bridge network. The area of Local Road Safety includes policies focused on working with local governments to manage available safety funding. Similar to the policies under the highway mode, these policies and strategies will improve the operations and safety of all local roadway users.

Railroads

Freight rail shipments are an important modal option, specifically for low-cost, high-volume goods. The ability of shippers to use the rail system helps improve Wisconsin's regional competitiveness.

The area of Freight Rail Preservation and Vitality includes policies and strategies to preserve rail corridors and rights-of-way and to maintain state-owned rail lines and fund upgrades to meet changing industry standards. The area of Rail Safety includes policies and strategies such as enforcement efforts focused on road traffic at grade crossings. Improvements and upgrades to grade crossings are also typically included in roadway reconstruction projects. The demographic analysis in this chapter shows that nearly all of the environmental justice populations are more likely to reside in close proximity to the rail system relative to the population as a whole. Therefore, policies that improve safety and reduce quality of life impacts of the rail system will have a positive impact on these populations.

Ports and Waterways

Similar to the railroad system, ports and waterways provide key modal options specifically for low-cost, high-volume goods. WisDOT's policies and strategies for maintenance and improvement of the ports and waterways system includes continuing state assistance for harbor improvements and encouraging comprehensive harbor and waterfront land use planning. Detailed evaluations of land uses with the potential for negative quality of life impacts will be important given the particularly high concentration of American Indian, low-income, and other environmental justice populations residing in close proximity to the ports and waterways facilities.

Air

Air freight shipments allow fast connections to the regional and global markets and are typically best for high-value, low-volume goods.

WisDOT's policies for Airport Facilities and Infrastructure include using the Airport Improvement Program to help facilitate business plane accommodation through improvements such as instrument approach systems, runway lighting, and visual landing aids. The demographic review included in this chapter found that many environmental justice populations, including Hispanic or Latino, Black or African American, and those identifying as Some Other Race were more likely to reside in close proximity to airports compared to the population as a whole. WisDOT should consider periodically reviewing the potential impacts to environmental justice populations from air freight policies that would affect quality of life issues such as noise and air quality.

Pipelines

Evaluation of the potential impacts on environmental justice populations from pipelines was not included in this chapter due to limited information on the geographic locations of pipelines and related facilities. Regulation of pipelines is primarily led by federal and state agencies outside of WisDOT's control. WisDOT's general strategic approach is to limit the negative impacts of crude oil movements on other transportation users and to encourage participation by pipeline companies in other freight activities, such as the Governor's Freight Industry Summit and the Freight Advisory Committee.

10.5 Public Involvement

The provision of public involvement opportunities is one of the key guiding principles of Executive Order 12898 and subsequent United States DOT guidance. WisDOT's approach to public involvement related to the State Freight Plan is summarized in a Public Involvement Plan (PIP) dated November 6, 2015 and Chapter 3 of the plan. The stated goals of the PIP include ensuring an open and inclusive process, educating the public about Wisconsin's freight transportation system, facilitating dialogue to identify critical issues, and scheduling public meetings at times and locations that are convenient to all people, including minority populations, low-income populations, and Tribal governments.¹⁸

Early outreach efforts focused on identification of potential issues through face-to-face meetings and teleconferences with freight stakeholders involved in *Connections 2030*, the Truck Size and Weight Study, and the Governors Freight Industry Summits.

Phase 1 – Pre Draft and SEE development and Needs Identification: Outreach efforts in Phase 1 were used to define the scope and focus of the State Freight Plan and to identify specific freight needs and issues. This phase included outreach and consultation with freight stakeholders such as the Wisconsin Freight Advisory Committee, environmental resource agencies, Tribal governments, and low-income and minority groups.

¹⁸ Wisconsin State Freight Plan: Public Involvement Plan. (November 6, 2015).

Phase 2 – Draft Plan and SEE Review: Outreach efforts during Phase 2 focused on releasing the draft plan and SEE with supporting documentation and outreach materials, and obtaining feedback through comments from the public and key stakeholders. During this phase, WisDOT solicited feedback on the draft plan and SEE from environmental justice populations, Tribal governments, and environmental resource agencies. To accomplish this, the department released the draft Wisconsin State Freight Plan and SEE for public review on September 29, 2016 and initiated a 45-day public comment period. Comments received during this period were analyzed and the plan was updated, as appropriate.

Phase 3 – Final Plan and SEE Adoption: Upon the release of the draft final plan and SEE, WisDOT published notice of the 45-day public comment period and conducted three public hearings. After adoption of the final plan and SEE by the WisDOT Secretary, WisDOT will produce an executive summary document that highlights the planning process, results of the outreach efforts, and key components of the plan. The executive summary will also be translated into Spanish to assist with outreach and coordination with Spanish-speaking populations with limited English proficiency (LEP).

WisDOT is committed to government-to-government consultation with federally-recognized Tribes on actions that affect identified Tribal rights and issues. Pre-draft plan development outreach efforts focused on sharing information and obtaining feedback through consultation with Wisconsin's eleven federally-recognized Tribes and seven Tribal governments having a historic interest in Wisconsin. As part of these efforts, WisDOT sent a letter to the eleven federally-recognized Tribes and Tribes with a historic interest in Wisconsin that included information about the plan and an offer to meet individually. No requests for individual meetings were received. In addition, WisDOT developed freight movement maps for each federally-recognized Tribe in Wisconsin and distributed them at the May 12, 2016 Great Lakes Inter-Tribal Council and reviewed them at the June 16, 2016 Inter-Tribal Task Force. The maps were informational and depicted freight movement by tonnage for highways and railroads. More information regarding specific public outreach efforts and techniques can be found in Chapter 3, *Public Involvement*.

10.6 Discussion and Next Steps

Environmental justice considerations will continue to be evaluated as part of all WisDOT's freight plan activities. This chapter is the first step in identifying potential impacts of freight on environmental justice and other populations. WisDOT provides tools and guidance to conduct environmental justice analysis that is consistent with the environmental evaluation and documentation process required under the National Environmental Policy Act (NEPA) of 1969 for all transportation projects. These tools will be used to facilitate environmental justice evaluations for freight projects at the project level.

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