

2.2 Environmental Justice

Introduction

The Environmental Protection Agency (EPA) defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income.¹ According to the Federal Highway Administration (FHWA), environmental justice is imperative because it helps to ensure full and fair participation by potentially affected communities in every phase of the transportation decision-making process. When this is accomplished, the development, construction, operation, and maintenance of transportation projects should reflect an equitable distribution of benefits and burdens.²

To better address environmental justice within the Meramec Region, four variables (low income, elderly, disabled, and minority) were selected based upon their relevance to Environmental Justice and Title VI (of the Civil Rights Act of 1964) reporting requirements. The four variables (vulnerable populations) were analyzed amongst counties and block groups. The data utilized in the following sections were obtained from the 2010-2014 American Community Survey 5-Year Estimates and the 2000 Census.³

Meramec Region

The Meramec Region is made up of eight rural counties (Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, and Washington), and includes 37 municipalities. Located in the southeast-central portion of Missouri, the region covers 5,131 square miles. Furthermore, the region is currently home to some 201,832 people, according to 2010-2014 ACS 5-Year Estimates. Residing within the Ozark Mountains, the region is subdivided amongst the Salem Plateau and St. Francois Mountains. The region contains 13,000 miles of road including Interstate 44, U.S. 63, and the historic Route 66. The region is home to 10 publicly owned airports, and three operating rail services (Burlington Northern Santa Fe, Union Pacific, and Missouri Pacific).

Low-Income (Poverty)

Low-income (Poverty) is determined by federal poverty guidelines, which are generated annually based on poverty thresholds by size of family and number of related children less than 18 years of age.⁴ According to the 2010-2014 ACS 5-Year Estimates, the Meramec Region has approximately 32,936 low-income residents (17.6 percent of the total population). Within the Meramec Region the four counties with the highest poverty rates include Washington (23.8 percent), Crawford (22.6 percent), Dent (20.1 percent), and Phelps (19.3 percent). Osage County

¹ <https://www.epa.gov/environmentaljustice>

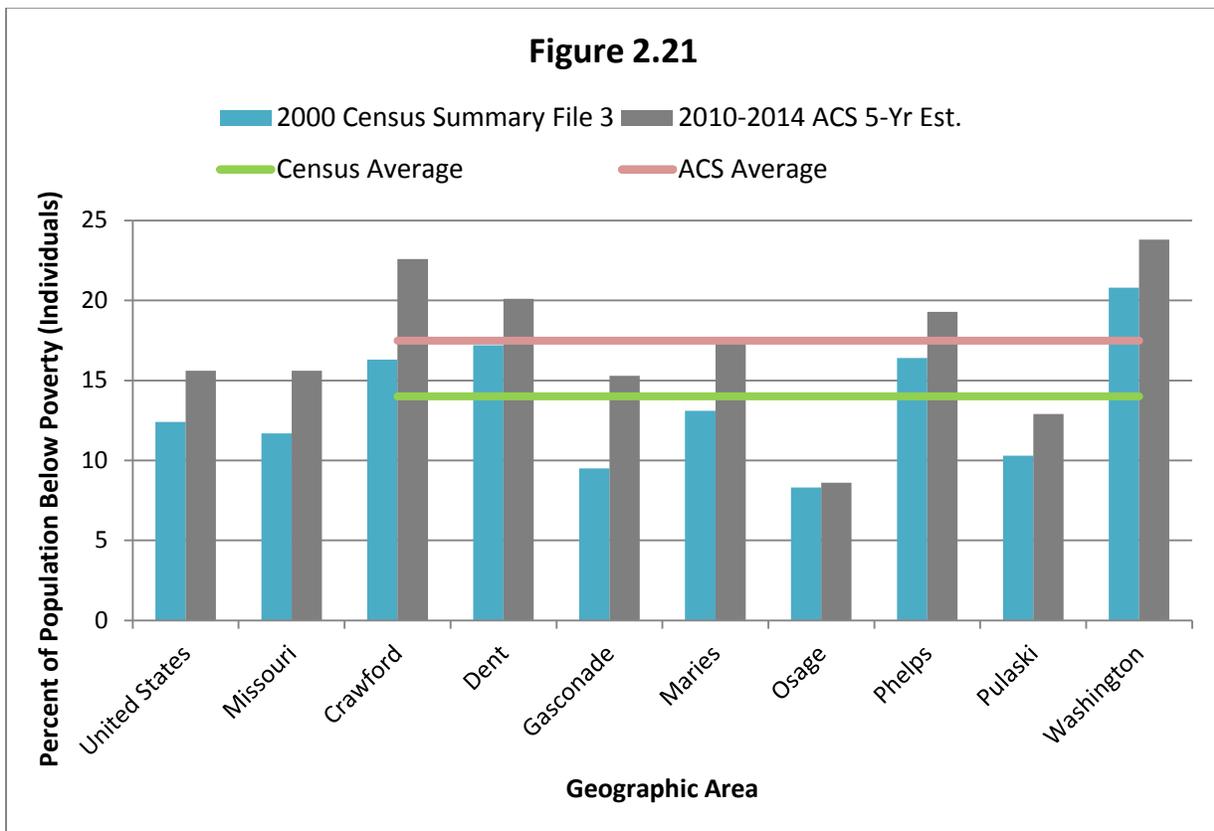
² http://www.fhwa.dot.gov/environment/environmental_justice/

³ <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

⁴ <https://www.census.gov/topics/income-poverty/poverty.html>

has the lowest poverty rate at 8.6 percent. In comparison to National and State poverty rates (15.6 percent); the Meramec Region is higher at 17.6 percent.

Figure 2.21 below illustrates poverty rate change between 2000 and 2014. Poverty rate increased within each geographic area over the 14 year span. Counties with the highest increase in poverty include Crawford (6.3 percent), Gasconade (5.8 percent), and Maries (4.3 percent). Osage had the lowest change in poverty rate (0.3 percent). The average percent of population below poverty level for the 2000 Census was 14 percent and 17.5 percent for the 2010-2014 ACS 5-Year Estimates.



Portions of Rolla, Cuba, Steelville, Potosi, Salem, and Crocker have block groups with high percentages of persons living below the poverty level. Furthermore, Crawford, Dent, Gasconade, Phelps, Pulaski, and Washington Counties have block groups with up to 55 percent poverty. Every county in the Meramec Region contains block groups with 14 percent to 22 percent poverty. On the following page **Figure 2.22** depicts poverty as a percent of total population.

Figure 2.22

Poverty as Percent of Total Population

Poverty as Percent

<8%

8% - 14%

14% - 22%

22% - 33%

33% - 55%

Block Groups

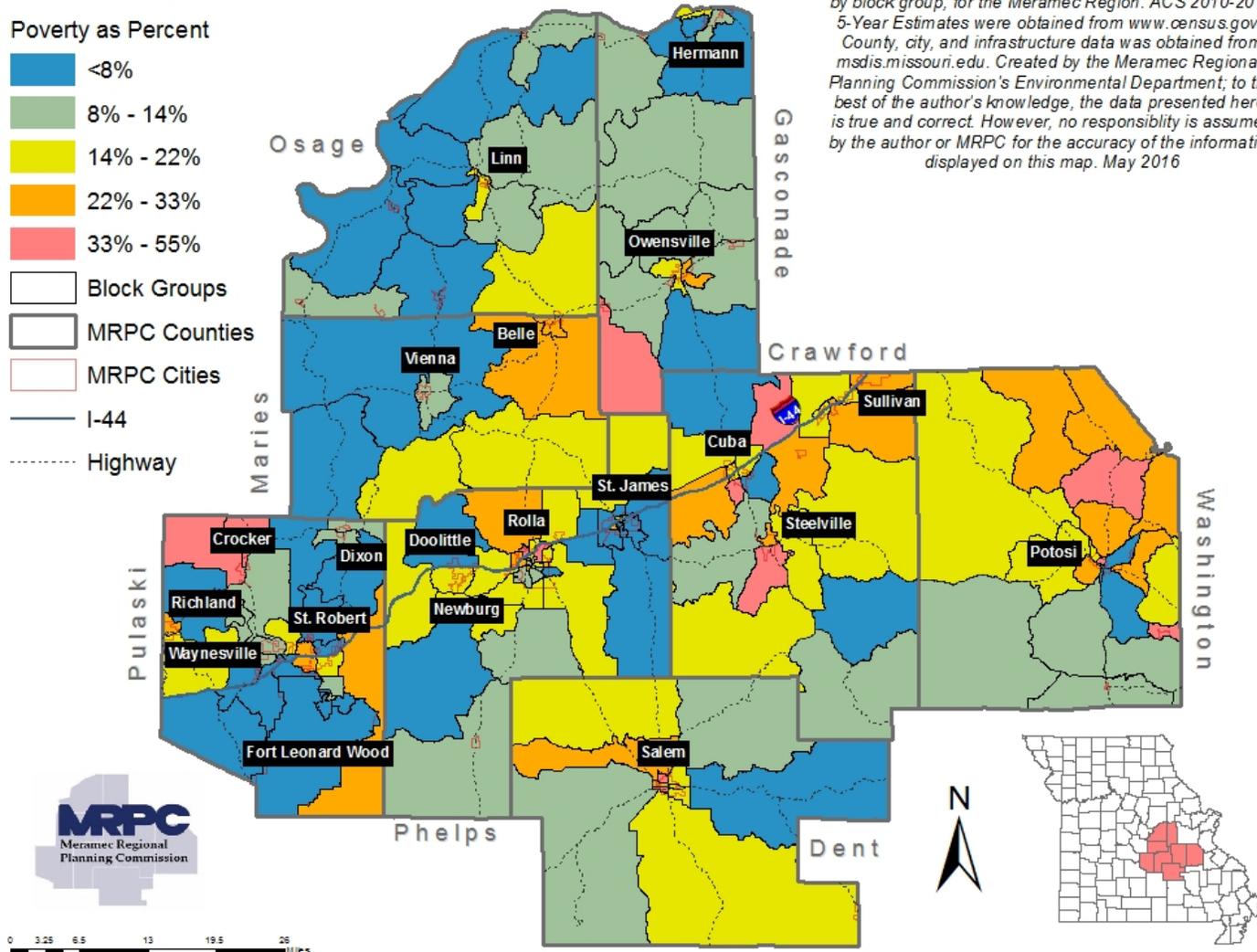
MRPC Counties

MRPC Cities

I-44

Highway

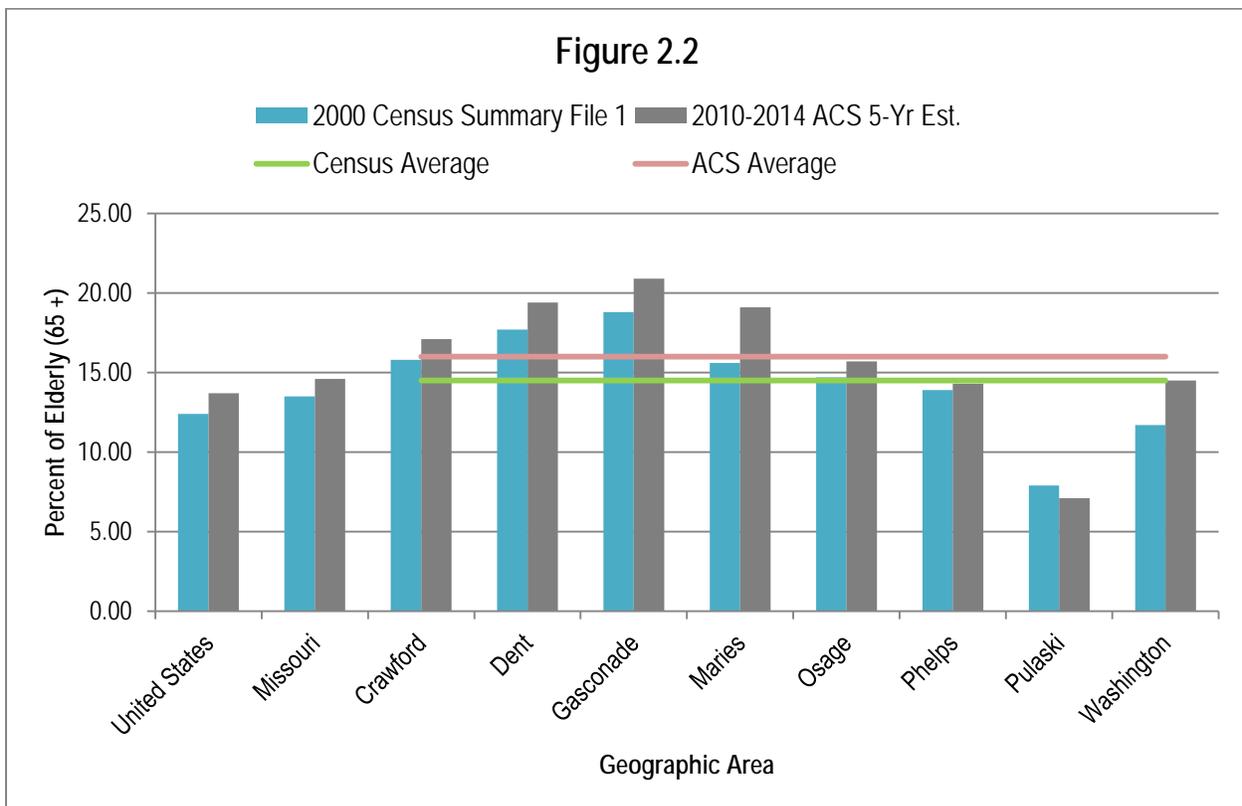
This map depicts poverty as percent of total population, by block group, for the Meramec Region. ACS 2010-2014 5-Year Estimates were obtained from www.census.gov. County, city, and infrastructure data was obtained from msdis.missouri.edu. Created by the Meramec Regional Planning Commission's Environmental Department; to the best of the author's knowledge, the data presented here is true and correct. However, no responsibility is assumed by the author or MRPC for the accuracy of the information displayed on this map. May 2016



Elderly

According to the World Health Organization, elderly are defined as persons age 65 and up.⁵ Utilizing the most recent data available, elderly populations were characterized as a percent. According to the 2010-2014 ACS 5-Year Estimates, the Meramec Region has approximately 28,183 elderly residents (13.9 percent of the total population). Within the Meramec Region the County with the greatest percent of elderly residents is Gasconade (20.9 percent); Pulaski County has the lowest at 7.1 percent. In comparison to National (13.7 percent) and State (14.6 percent) percentages of elderly residents, the Meramec Region falls between the two.

Figure 2.23 below illustrates the percent of elderly residents between 2000 and 2014. The number of elderly residents increased within each county, except for Pulaski over the 14 year span. Counties with the largest increase in elderly residents include Maries (3.5 percent), and Gasconade (2.1 percent). Phelps had lowest increase in elderly residents (0.4 percent). Furthermore, Pulaski's elderly population decreased by 0.8 percent between 2000 and 2014. The average percent of elderly residents for the 2000 Census was 14.5 percent and 16 percent for the 2010-2014 ACS 5-Year Estimates.



According to the Missouri Department of Transportation, between the years of 2009 and 2011, elderly made up 17 percent of the total number of licensed drivers within the State. Increased life

⁵ <http://www.who.int/healthinfo/survey/ageingdefnolder/en/>

expectancy is anticipated to increase the proportion of seniors within the State by at least 1 percent by 2020. Therefore we can expect a higher number of elderly drivers within the Meramec Region in the years to come.⁶

Portions of Crocker, Hermann, Rolla, Salem, and Steelville have block groups with high percentages of elderly residents. Furthermore, every county within the Meramec Region contains a block group with 24 percent to 38 percent of elderly residents. **Figure 2.24** on the following page portrays elderly as percent of total population.

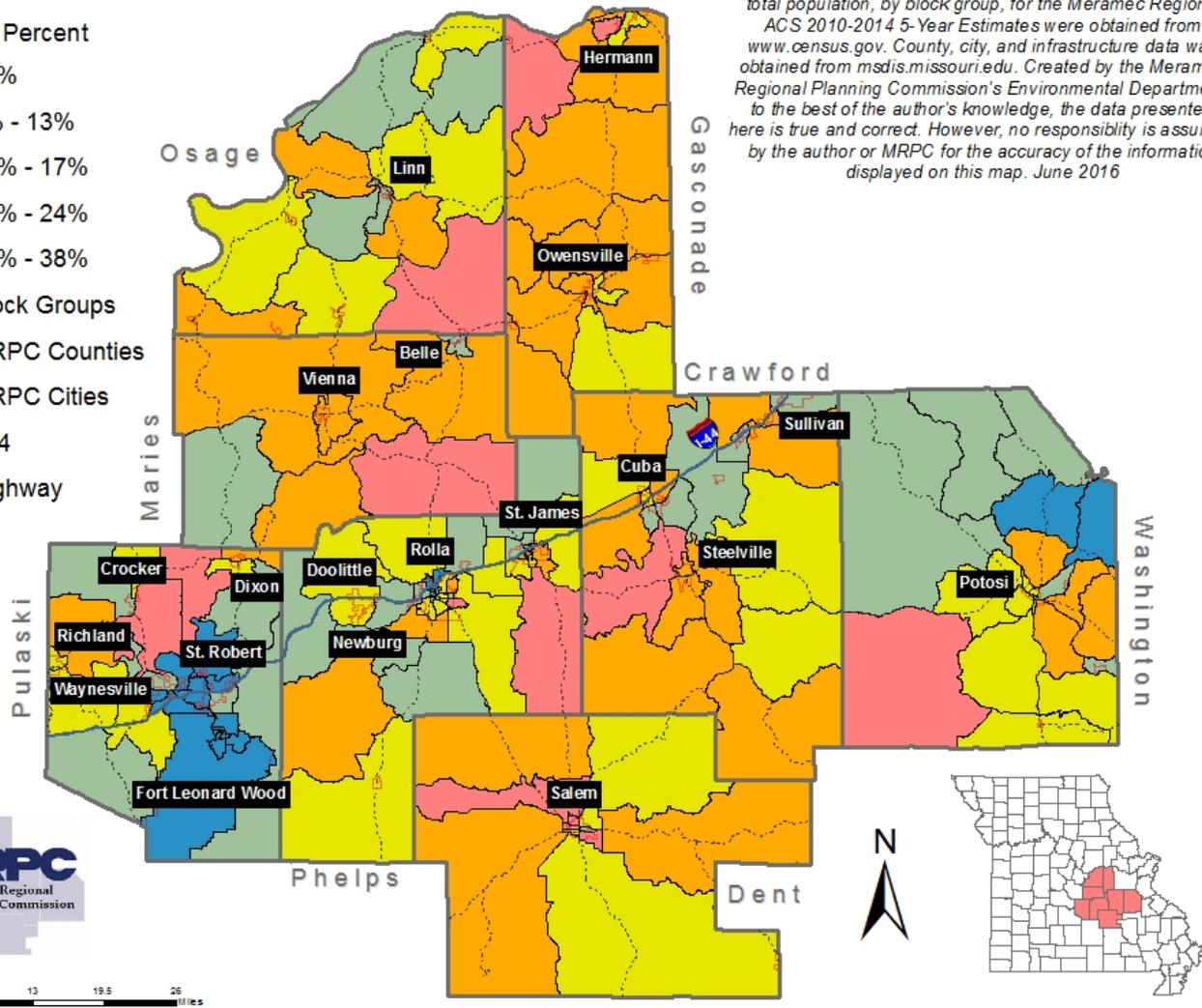
⁶ <http://www.modot.org/safety/olderDriver.htm>

Figure 2.24

Elderly as Percent of Total Population

Elderly as Percent

- <6%
- 6% - 13%
- 13% - 17%
- 17% - 24%
- 24% - 38%
- Block Groups
- MRPC Counties
- MRPC Cities
- I-44
- Highway



This map depicts the elderly (65+) as a percentage of the total population, by block group, for the Meramec Region. ACS 2010-2014 5-Year Estimates were obtained from www.census.gov. County, city, and infrastructure data was obtained from msdis.missouri.edu. Created by the Meramec Regional Planning Commission's Environmental Department; to the best of the author's knowledge, the data presented here is true and correct. However, no responsibility is assumed by the author or MRPC for the accuracy of the information displayed on this map. June 2016



Disabled

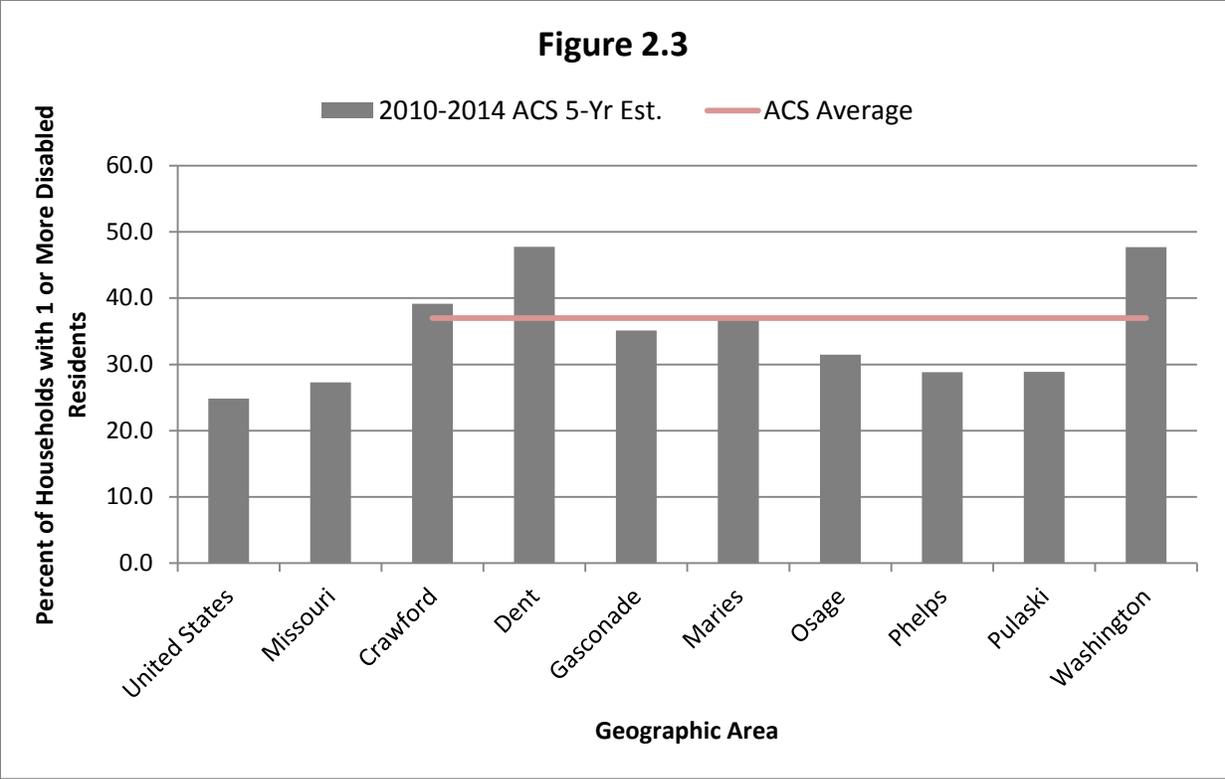
According to the U.S. Census Bureau, disabilities are classified among six different types.

- **Hearing difficulty** – deaf or having serious difficulty hearing
- **Vision difficulty** – blind or having serious difficulty seeing, even when wearing glasses
- **Cognitive difficulty** – Because of a physical, mental, or emotional problem, having difficulty remembering, concentrating, or making decisions
- **Ambulatory difficulty** – Having serious difficulty walking or climbing stairs
- **Self-care difficulty** – Having difficulty bathing or dressing
- **Independent living difficulty** – Because of physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor’s office or shopping.

Respondents who report any one of the six disability types are considered to have a disability. In addition, due to changes in survey questions over the years regarding disability, data should not be compared to previous ACS disability questions or Census 2000 data.

Utilizing the most recent data available (2010-2014 ACS 5-Yr Est.), disabled populations were characterized as a percent of households with one or more disabled individuals. The Meramec Region has approximately 25,344 households with one or more residents with some type of disability (35.3 percent of households). Within the Meramec Region the three counties with the highest percent of households with one or more residents with a disability include Dent (47.8 percent), Washington (47.7 percent), and Crawford (39.2 percent). Phelps County has the lowest percent of households with one or more disabled residents at 28.82 percent. In comparison to National (24.9 percent) and State (27.3 percent) percentages, the Meramec Region is higher at 35.3 percent.

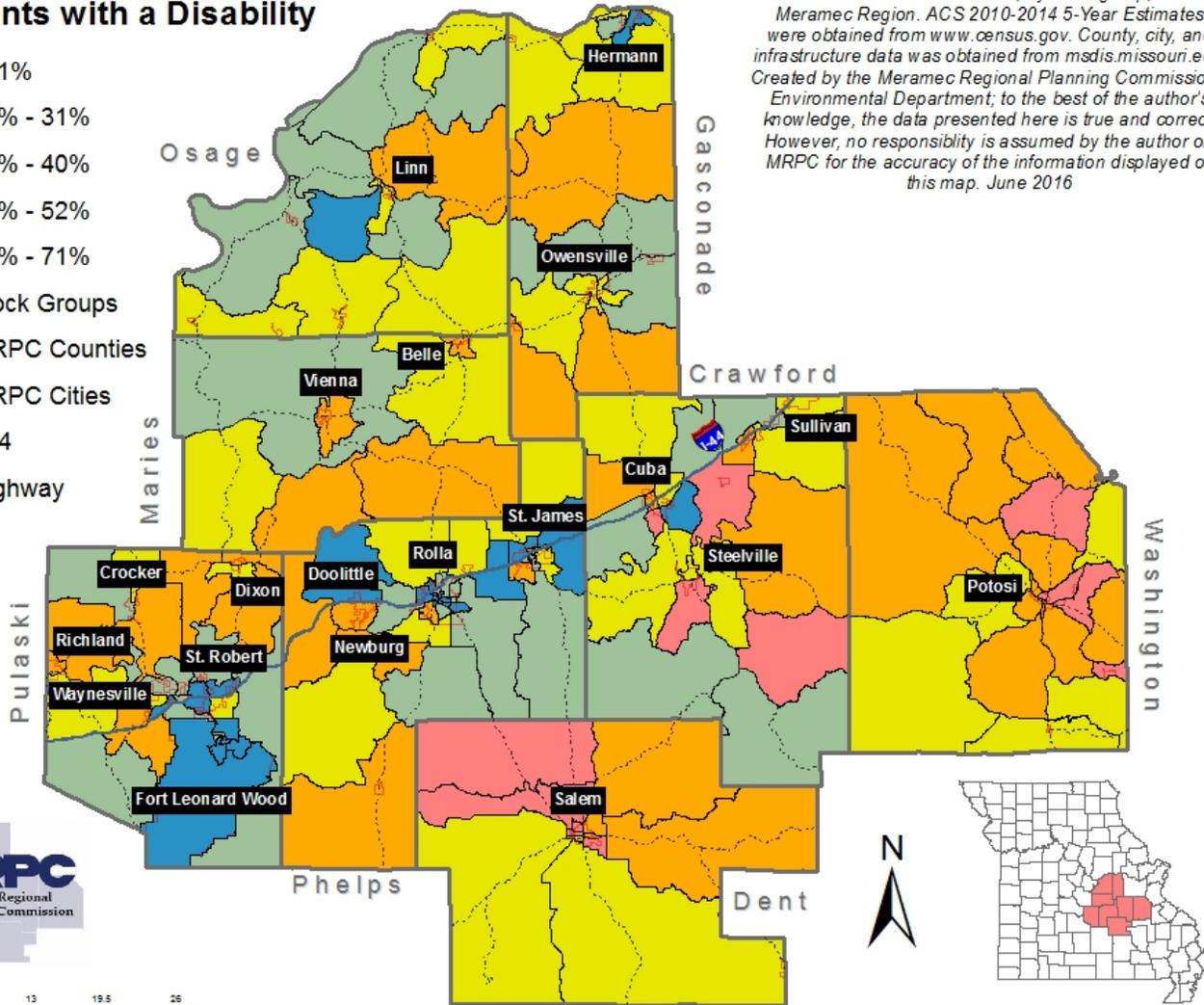
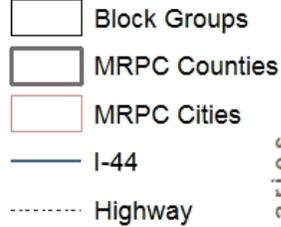
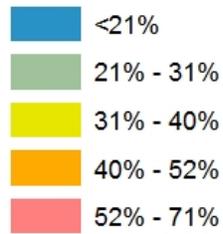
Figure 2.25 on the following page illustrates the percent of households with one or more disabled residents. The average percent of households with one or more disabled residents is 37 percent.



Portions of Cuba, Potosi, Salem, and Steelville have block groups with high percentages of households with disabled residents. Furthermore, every county within the Meramec Region contains a block group with 40 percent to 52 percent of households with disabled residents. On the following page, **Figure 2.26** depicts the percent of households with one or more residents with a disability.

Figure 2.26

Percent of Households with One or More Residents with a Disability



This map depicts the percentage of households with one or more disabled resident, by blockgroup, for the Meramec Region. ACS 2010-2014 5-Year Estimates were obtained from www.census.gov. County, city, and infrastructure data was obtained from msdis.missouri.edu. Created by the Meramec Regional Planning Commission's Environmental Department; to the best of the author's knowledge, the data presented here is true and correct. However, no responsibility is assumed by the author or MRPC for the accuracy of the information displayed on this map. June 2016



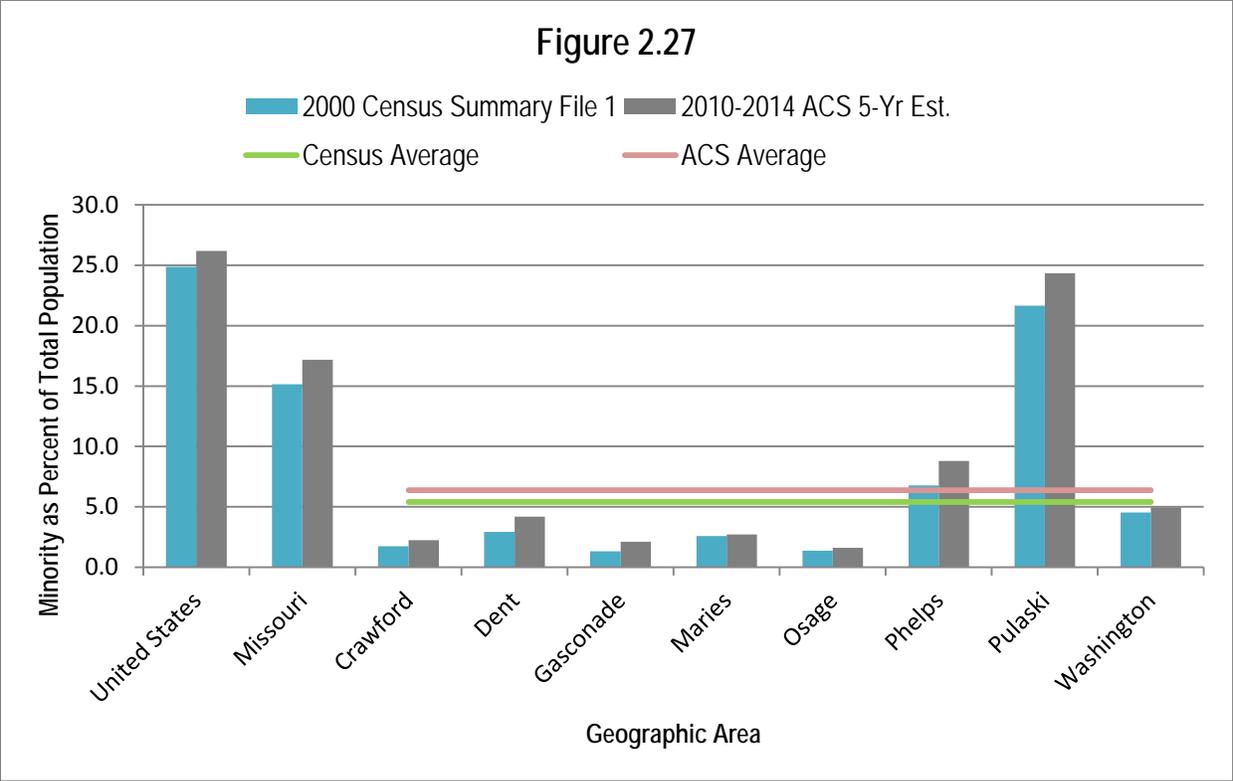
Minorities

Minorities, defined by the US Census Bureau, include Black, American Indian and Alaska Native, Asian, Pacific Islander, Other, and Two or More races. In addition, Hispanic or Latino is considered a minority; however the US Census Bureau defines the two as an ethnicity not a race.⁷ Utilizing the most recent data available (2010-2014 ACS 5-Yr Est.), minority populations (race) were characterized as a percent of the total population.

The Meramec Region has approximately 20,213 minority residents (10 percent of the total population). Within the Meramec Region, Pulaski County contains the greatest percent of minority residents at 24.4 percent. In contrast, the County with the lowest percent of minority residents is Osage (1.6 percent). In comparison to National (26.2 percent) and State (17.2 percent) percentages, the Meramec Region falls well below both.

Figure 2.27 on the following page illustrates the percent change of minority residents between 2000 and 2014. The number of minority residents increased within each county over the 14 year span. Counties with the largest increase in minority residents include Pulaski (2.7 percent), and Phelps (2.0 percent). Maries County had lowest increase in minority residents (0.15 percent). The average percent of minority residents for the 2000 Census was 5.4 percent and 6.4 percent for the 2010-2014 ACS 5-Year Estimates.

⁷ <http://www.esri.com/library/brochures/pdfs/minority-population-growth.pdf2012>



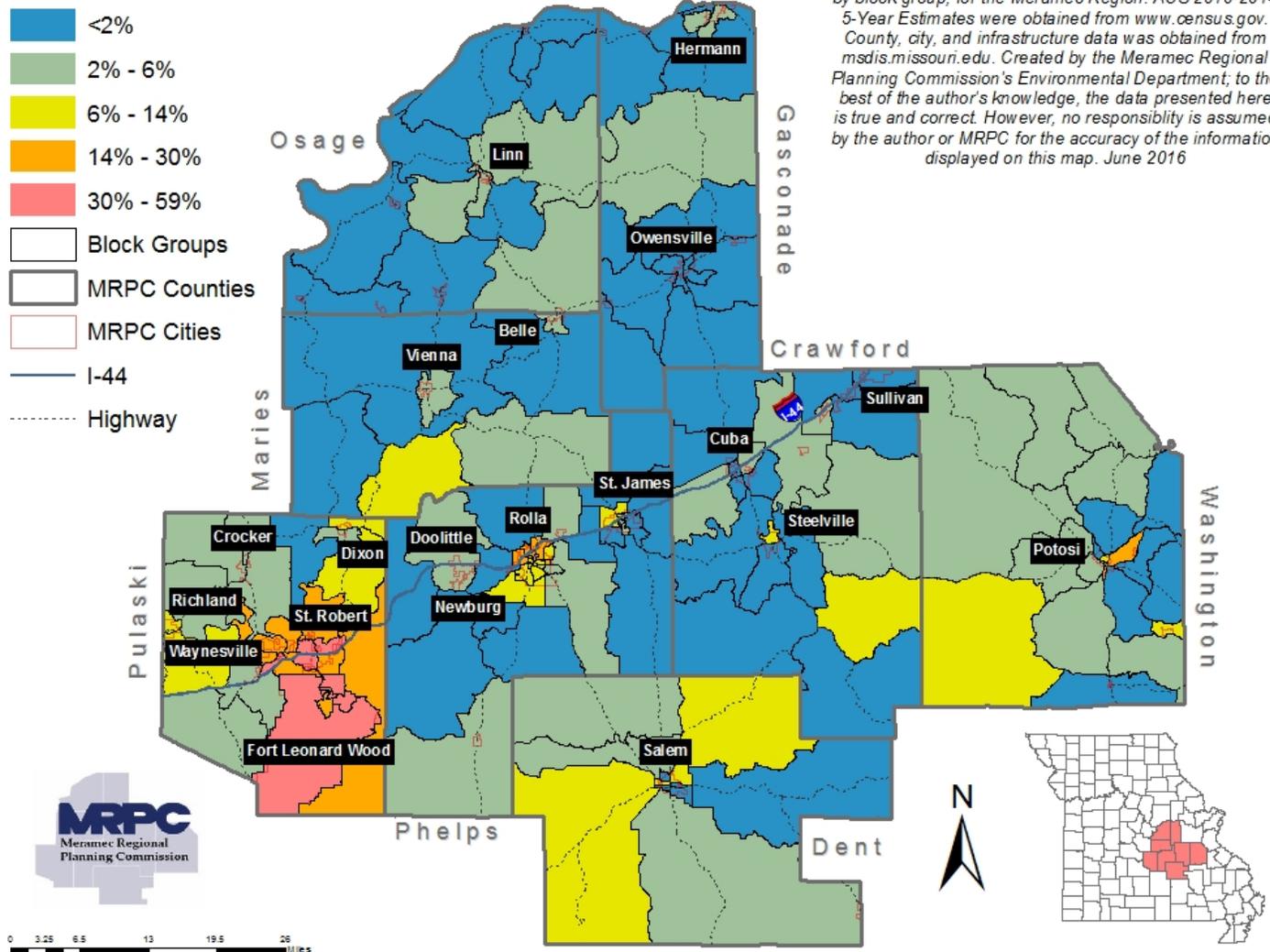
Portions of Fort Leonard Wood, St. Robert, and Waynesville all had the highest percent of minority populations within the region. On the following page **Figure 2.28** illustrates minority as percent of total population by block groups within the Meramec Region. Every county contains a block group with 2 percent to 6 percent of minorities.

Figure 2.28

Minority as Percent of Total Population

- <2%
- 2% - 6%
- 6% - 14%
- 14% - 30%
- 30% - 59%
- Block Groups
- MRPC Counties
- MRPC Cities
- I-44
- Highway

This map depicts minority as percent of total population, by block group, for the Meramec Region. ACS 2010-2014 5-Year Estimates were obtained from www.census.gov. County, city, and infrastructure data was obtained from msdis.missouri.edu. Created by the Meramec Regional Planning Commission's Environmental Department; to the best of the author's knowledge, the data presented here is true and correct. However, no responsibility is assumed by the author or MRPC for the accuracy of the information displayed on this map. June 2016



Vulnerable Populations Analysis

To determine block groups with the most vulnerable populations, data was utilized from the previously mentioned variables (poverty, elderly, disabled, and minority) and analyzed with Esri's ArcGIS.^{8,9} Utilizing **Figures 2.22, 2.24, 2.26, and 2.28**, block groups with the two highest percentage classes for each variable were selected (orange and red). The resulting block groups were then categorized by the number of overlapping vulnerable populations. Block groups deemed as high concentrations of vulnerable populations were comprised of three overlapping vulnerable populations (poverty, elderly, and disabled). However, since there were four variables identified, it is anticipated that high concentration vulnerable populations would be comprised of four overlapping vulnerable populations. This was not the case due to the minority population being primarily located around Fort Leonard Wood. Due to this concentration, there were no block groups comprised of four vulnerable populations. Block groups deemed as moderate concentrations of vulnerable populations were comprised of two overlapping vulnerable populations; which could be a combination of poverty, elderly, disabled, or minority.

According to **Figure 2.29** on page 15, there are seven block groups with the highest concentration of vulnerable populations within the Meramec Region. High concentration block groups are identified in **Table 2.21** below.

County	Tract	Block Group
Gasconade	960500	2
Crawford	450400	4
Washington	460100	4
Washington	460400	2
Dent	960200	2
Dent	960300	1
Dent	960300	2

In addition, there are 32 block groups with a moderate concentration of vulnerable populations (**Figure 2.29**). Moderate block groups are identified in **Table 2.22** on the following page. Moreover, specific block groups (tract.blockgroup) are identified in **Figures 2.30 and 2.31**, pages 16 and 17.

⁸ <https://www.census.gov/geo/maps-data/data/tiger.html>

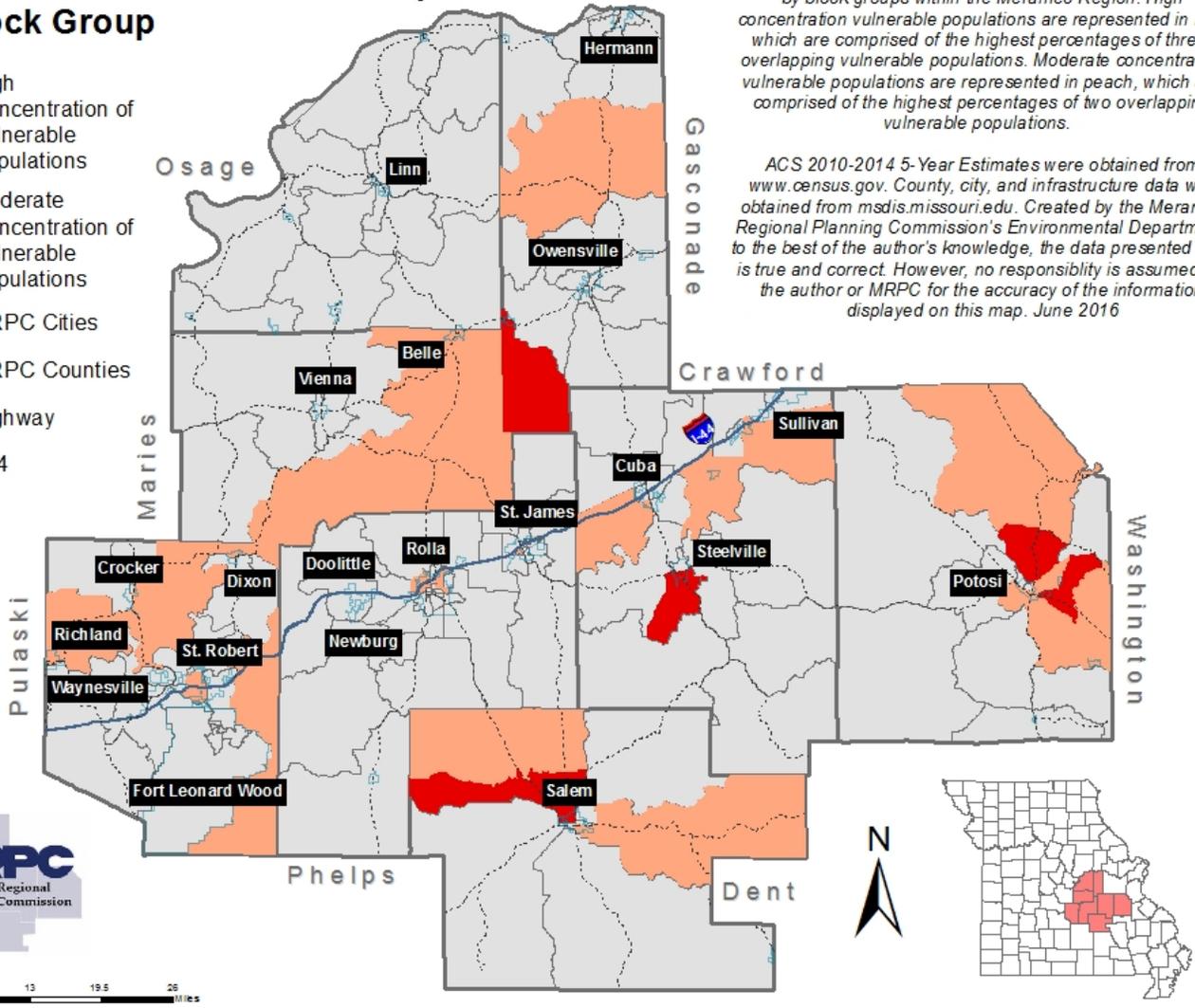
⁹ <https://www.census.gov/geo/maps-data/data/tiger.html>

Table 2.22: Moderate Concentration of Vulnerable Populations by Block Group		
County	Tract	Block Group
Dent	960100	2
Dent	960200	1
Dent	960400	3
Crawford	450102	1
Crawford	450200	4
Crawford	450301	1
Crawford	450302	2
Gasconade	960300	1
Maries	880300	1
Maries	880300	2
Maries	880100	1
Maries	880100	2
Phelps	890300	2
Phelps	890400	3
Phelps	890400	2
Phelps	890200	6
Phelps	890300	1
Pulaski	470500	3
Pulaski	470101	3
Pulaski	470101	2
Pulaski	470286	1
Pulaski	470102	2
Pulaski	470287	3
Pulaski	470500	4
Washington	460100	1
Washington	460300	1
Washington	460100	2
Washington	460300	3
Washington	460400	1
Washington	460400	3
Washington	460200	1
Washington	460400	4

Figure 2.29

Location of Most Vulnerable Populations by Block Group

- High Concentration of Vulnerable Populations
- Moderate Concentration of Vulnerable Populations
- MRPC Cities
- MRPC Counties
- Highway
- I-44



This map depicts locations of most vulnerable populations by block groups within the Meramec Region. High concentration vulnerable populations are represented in red, which are comprised of the highest percentages of three overlapping vulnerable populations. Moderate concentration vulnerable populations are represented in peach, which are comprised of the highest percentages of two overlapping vulnerable populations.

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Figure 2.30

High Concentration Block Groups

- High Concentration of Vulnerable Populations
- Counties
- Cities
- I-44

This map depicts locations of most vulnerable populations by block groups within the Meramec Region. High concentration vulnerable populations are represented in red, which are comprised of the highest percentages of three overlapping vulnerable populations.

ACS 2010-2014 5-Year Estimates were obtained from www.census.gov. County, city, and infrastructure data was obtained from msdis.missouri.edu. Created by the Meramec Regional Planning Commission's Environmental Department; to the best of the author's knowledge, the data presented here is true and correct. However, no responsibility is assumed by the author or MRPC for the accuracy of the information displayed on this map. June 2016

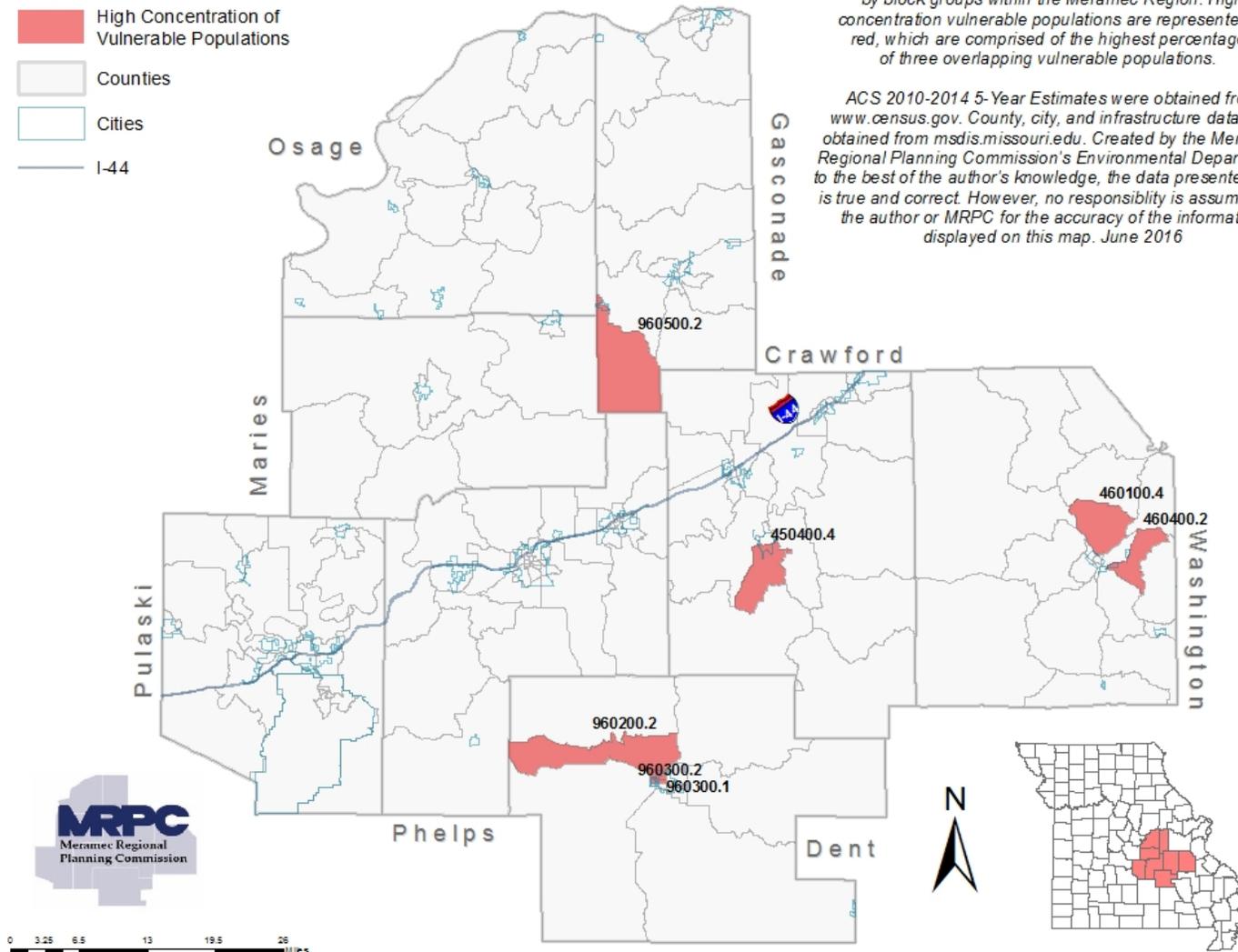


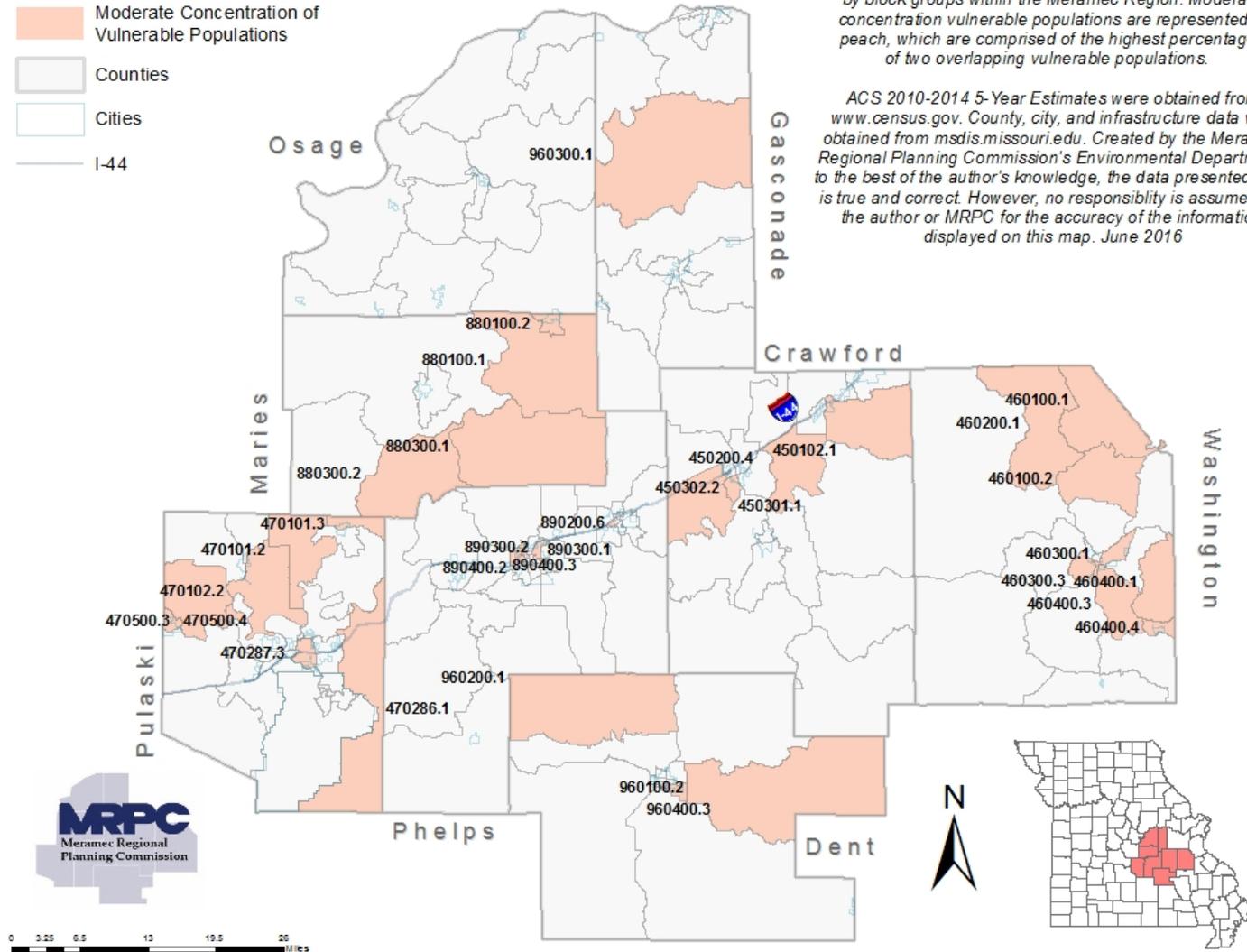
Figure 2.31

Moderate Concentration Block Groups

- Moderate Concentration of Vulnerable Populations
- Counties
- Cities
- I-44

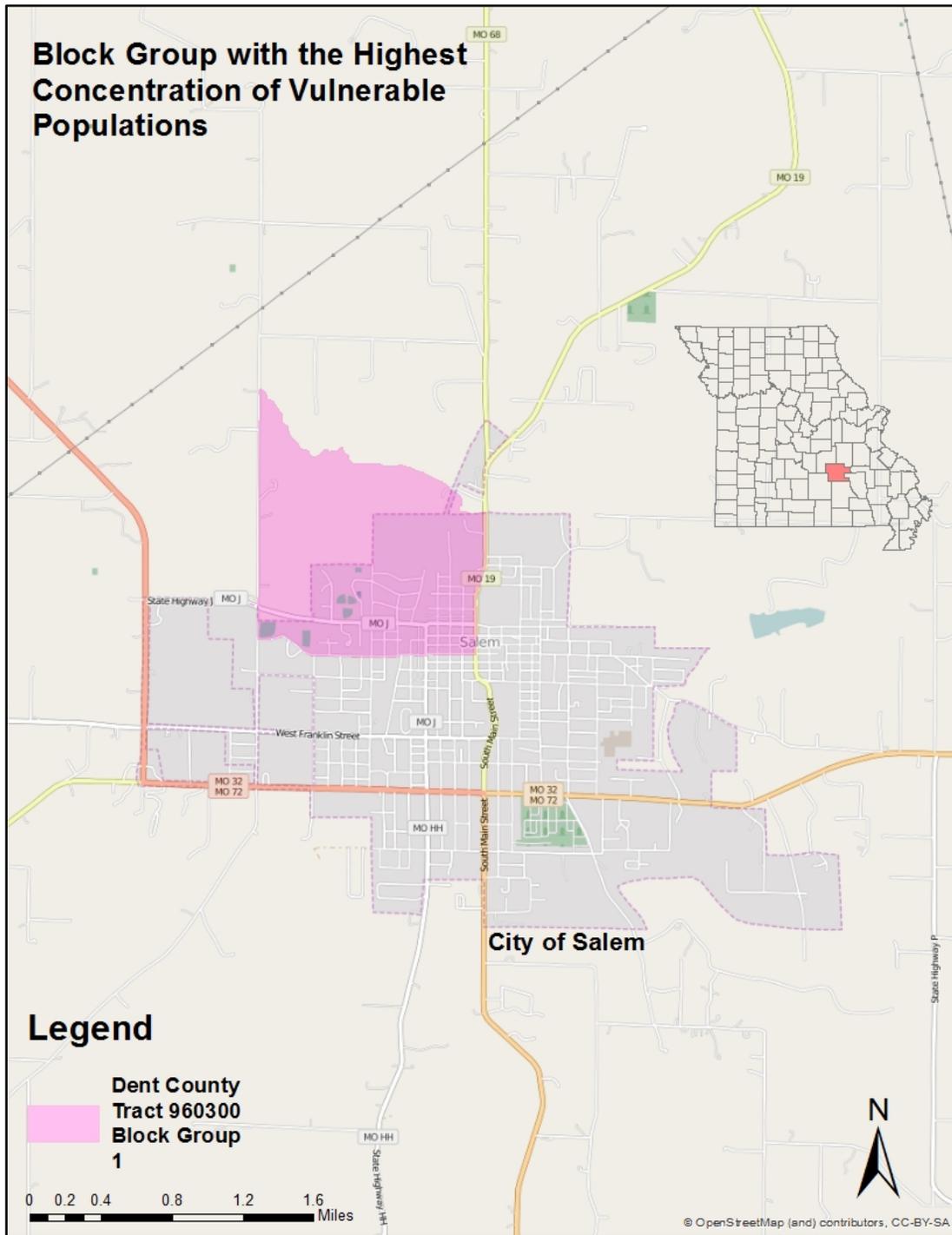
This map depicts locations of most vulnerable populations by block groups within the Meramec Region. Moderate concentration vulnerable populations are represented in peach, which are comprised of the highest percentages of two overlapping vulnerable populations.

ACS 2010-2014 5-Year Estimates were obtained from www.census.gov. County, city, and infrastructure data was obtained from msdis.missouri.edu. Created by the Meramec Regional Planning Commission's Environmental Department; to the best of the author's knowledge, the data presented here is true and correct. However, no responsibility is assumed by the author or MRPC for the accuracy of the information displayed on this map. June 2016



Moreover, after further analysis, one block group in the Meramec Region was comprised of three overlapping vulnerable populations (poverty, elderly, and disabled); each of the highest percentage class (red). The block group, located in Dent County, partially resides in the city limits of Salem (**Figure 2.32**).

Figure 2.32



Additional Socioeconomic Data

Table 2.23 below provides additional demographic and socioeconomic data that relates to environmental justice for the United States, Missouri, and Meramec Region.

Table 2.23: Demographic and Socioeconomic Data for the U.S., Missouri, and Meramec Region						
Location	Population	Unemployment Rate (%)	Less Than High School Graduate (18 and Over)	Median Household Income	Median House Value	% Households without Transportation Availability
United States	314,107,084	9.2%	13.7%	\$53,482	\$175,700	9.1%
Missouri	6,028,076	8.4%	12.0%	\$47,764	\$136,700	7.4%
Crawford	24,680	11.3%	21.8%	\$35,829	\$106,200	6.3%
Dent	15,681	9.6%	21.8%	\$37,658	\$88,900	7.0%
Gasconade	15,014	7.6%	16.4%	\$42,574	\$116,300	5.0%
Maries	9,098	10.6%	16.7%	\$41,492	\$113,200	3.5%
Osage	13,812	3.2%	10.4%	\$52,479	\$129,000	5.0%
Phelps	45,091	8.1%	12.6%	\$41,942	\$111,800	6.8%
Pulaski	53,343	13.9%	10.6%	\$49,604	\$126,000	4.9%
Washington	25,113	14.9%	27.0%	\$34,282	\$74,500	8.3%

Source: 2010-2014 ACS 5-Year Estimate

Population

The counties with the highest population within the Meramec Region include Pulaski (53,343), Phelps (45,091), and Washington (25,113). Maries County has the lowest population at 9,098. Additionally, population density (population / mi²) for the Meramec Region is significantly lower at 39.3 persons per square mile compared to the State and National density which is 86.5 and 82.5 respectively.

Unemployment Rate

The average unemployment rate amongst counties within the Meramec Region is 9.9 percent. Compared to the United States (9.2 percent) and Missouri (8.4 percent), the region is considerably higher. The County with the highest unemployment rate is Pulaski County at 13.9 percent, and the lowest is Osage County at 3.2 percent.

Educational Attainment

The average percent of individuals in the region without a high school diploma or equivalent, age 18 and over, is 17.2 percent; in comparison with the United States (13.7 percent) and Missouri (12.0 percent). Crawford and Dent Counties both have the highest/same percent of residents without a high school diploma (21.8 percent). Osage has the lowest percent of residents without a high school diploma (10.4 percent).

Median Household Income

The average median household income for the region is \$41,983; in comparison with the U.S. (\$53,482) and State (\$47,764). Osage County has the highest median household income at \$52,479. Washington County has the lowest median household income at \$34,282.

Median House Value

The average median house value for the region is \$108,238; in comparison with the Nation (\$175,700) and State (\$136,700). The County with the highest median house value is Osage at \$129,000, and lowest median house value is Washington County at \$74,500.

Transportation Availability

Figures were determined by households that possess one or more vehicles for transportation. The average percent of households without transportation availability within the region is 5.8 percent; which is less than National (9.1 percent) and State (7.4 percent) figures. Washington County has the greatest percent of households without transportation availability (8.3 percent). Maries County had the lowest percent of households without transportation availability (3.5 percent).