

THE RURALIZATION OF DETROIT:
IMPLICATIONS FOR ECONOMIC REDEVELOPMENT POLICY

By

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ABSTRACT

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As industrial cities transition into a post-industrial state, their demographics and socioeconomic characteristics transition as well. Their population sizes and densities are still considered urban, but are they truly as urban as a thriving central city? The literature identifies many characteristics beyond population size that could be used as rural indicators. There are clear distinctions between rural and urban economic development, so it is imperative that there is a clear understanding of where a community fits on a rural-urban spectrum, to create effective redevelopment policy. There is limited research on urban placement along a rural-urban continuum in the absence of spatial association. Using place level data, I study the differences between population ranges across select rural indicators and apply the findings to Detroit, Michigan on the Census tract level, a city that has shrunk to half its peak size and has faced extreme financial difficulties while transitioning into the post-industrial state. Significant differences were found between population sizes based on several rural indicators. It was also found that based on these rural indicators, Detroit's population increasingly resembles that of a rural community. These findings support the theory that traditionally rural economic development policies may have positive effects in Detroit.

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CHAPTER 1: INTRODUCTION

For many decades, economic development efforts focused on urban areas with rural communities being of secondary importance. Despite this, and over time, two general tracts of development policies have evolved—one for urban places and another for rural communities. Urban and rural areas are not just distinct from one another in terms of population size and density, but also in other social and economic characteristics that could potentially help distinguish a rural area more fully than a definition that relies solely on population.

In terms of economic development, it is crucial to assess a community's social and economic condition. Because urban and rural redevelopment plans and policies emphasize and address different issues, determining location within the urban-rural spectrum is important. For example, urban policies are often place-based, focused on managing congestion and growth, whereas rural policies are often person- and community-based, focused on improving the disadvantages such as lack of access to employment and resources. Is it enough to look at the size of a population, or population density of an area, to determine which development policies should be used? I argue there should be a broader view on the specific needs of each community.

Detroit, Michigan, prides itself on the resilience of its community members. However, a similar resilience has not historically been present in the sustainability of the city's economic activities. Many have referred to this distressed city as dead (Reese and Sands, 2017), but the people of Detroit have not given up and still strive to revitalize it. Detroit was once the center of the auto industry and home to the Big Three: Ford, General Motors, and Chrysler. People relocating to Detroit to take jobs in the growing

manufacturing industry resulted in a steep population increase, peaking in 1950 at almost 1.86 million people. The regional economy was built and heavily dependent on this industry. Racial tensions and union negotiations contributed to the movement of the auto industry from Detroit to the broader metropolitan area (Reese, Eckert, Sands, and Vojnovic, 2017; Reese, Sands and Skidmore, 2014; Padnani, 2013, Vojnovic and Darden, 2013). The result was a reduction in employment opportunities within the central city. As automation increased, employment opportunities became scarcer, as the automobile companies required less labor. Eventually, auto companies began to shrink and relocate out of the Detroit region altogether to areas with lower labor costs, such as southern states and out of the U.S. completely, following the energy crisis in the 1970s, the recession in the 1980s, and more recently, increase in foreign competition (Padnani, 2013). The city's ongoing failure to diversify put it at higher financial risk than cities in similar positions, culminating in the largest municipal bankruptcy in U.S. history (Padnani, 2013; Neuman, 2014). The lack of effective leadership is partly to blame for Detroit's continued struggle since the loss of the manufacturing industry (Padnani, 2013; Reese, et al., 2017, Vojnovic, 2013, Reese, Sands, and Skidmore, 2014). Since 1950, the city's population has fallen from 1.8 million to 683,443 people in 2016.

Under Mayor Mike Duggan's leadership, Detroit has seen some positive results from the many efforts made to reverse the economic downturn. After four decades of financial struggles, the city government appears to have improved control of its finances and is no longer under financial oversight (Domonoske, 2018). However, the majority of these improvements have been seen in Downtown and Midtown, creating a divided city. The recent vibrancy displayed in these up-and-coming areas has not spilled over into

the rest of Detroit's neighborhoods, which have become isolated from the recent growth (Reese et al., 2017). Despite the investments made in designated regions, the city still faces high unemployment and poverty rates, low educational attainment levels, and high rates of residential vacancy. Although Detroit has made progress, it still faces many challenges and must use the most effective redevelopment policies that are designed for the specific needs of the struggling city. Are strictly urban development policies appropriate, or given the significant and ongoing population loss should development policies designed for rural places be considered? The evolving socioeconomic conditions suggest that relying solely on traditional urban development policies may not be the most effective approach.

This thesis shows a clear difference between rural and urban areas by identifying significant differences in sociodemographic characteristics and focal points in economic development policies among the different populations. I then evaluate the city of Detroit to determine the degree to which it resembles urban versus rural places. I conclude by offering implications for effective economic development policies for Detroit, given where it lies along an urban-rural continuum. As a prelude to the full evaluation, based on a number of factors, Detroit resembles rural places more so than urban places. Chapter 2 offers a literature review that includes a discussion of rural indicators and key components of redevelopment policies in both rural and urban areas. In Chapter 3, data from the United States Census Bureau are used to measure the differences in economic and demographic conditions for places of different populations. These findings are used to assess the degree to which Detroit resembles urban or rural environments. Regression and outlier analyses and a cluster analysis provide further

support that Detroit in many ways resembles rural places more so than urban places.

Chapter 4 offers a set of development policy implications for Detroit and concludes.

CHAPTER 2: LITERATURE REVIEW

2.1 Indicators of Urban and Rural Communities

There is an expansive amount of literature on the comparison of urban and rural communities, but most of this literature focuses on poor areas. Some argue that “rural” cannot simply be defined by population density or proximity to metropolitan areas (Hart, Larson, and Lishner, 2005; Modi, 2009; Halfacree, 1993). Regardless, researchers often refer to the Census Bureau Rural and Urban Taxonomy’s definition to categorize ruralness and urbanicity. The Census Bureau defines rural areas as those outside of urban clusters with populations less than 2,500 people and often lack substantial commuting activity to the urban center (Hart, Larson, and Lishner, 2005). This assumes that rural is merely a residual category representing all communities not classified as urban (Burchinal and Siff, 1964). Many believe that this definition is not always satisfactory. Hart, Larson, and Lishner (2005) described rural as a “multifaceted concept about which there is no universal agreement.” Common definitions frequently rely on stereotypes and personal experience such as pastoral landscapes. A number of studies consider factors beyond a traditional framework, providing a common set of factors that characterize rural areas beyond the limited definition offered by the Census Bureau. Duncan and Tickamyer (1988) show similarities between the average rural population and poor urban populations, such as the presence of a low-skill labor force, isolation from established social and economic institutions, limited access to formal education, and a higher level of persistent poverty.

Although many agree that having a low population density is an important indicator of rural (Hart, Larson, and Lishner, 2005; Duncan and Tickamyer, 1988;

Halfacree, 1993; Castle and Weber, 2011), there are several other characteristics that many studies support, such as limited access to public services. Rural areas often lack a well-developed public sector and have limited access to individual and community resources (Duncan and Tickamyer, 1988). Hart, Larson, and Lishner (2005) and Dillman and Tremblay (1977) emphasize that health care is an important example of this; although rural residents tend to have worse health conditions, they often make significantly fewer visits to health care facilities. Rural areas tend to severely lag urban areas in terms of both access to and quality of health care providers and services. Medical personnel are fewer, especially trained specialists, and services offered are more limited. Health care facilities and practices used are often not up to of date. The reason for these disparities between rural and urban places is partly due to the lack of collegial support in rural areas.

Education is another example of where services are lacking. Rural areas have limited access to formal education and on average have lower quality educational resources, resulting in a population with lower levels of education (Hart, Larson, and Lishner, 2005; Duncan and Tickamyer, 1988; Burchinal and Siff, 1964; Dillman and Tremblay, 1977). Teachers in rural areas are often less educated, receive lower salaries, are responsible for teaching more classes (and subjects), and are less likely to be members of professional societies (Burchinal and Siff, 1964). Urban areas also tend to see higher returns to schooling compared to rural areas (Mills and Hazarika, 2003). Rural education systems also tend to lack vocational schooling and post-high school opportunities (Burchinal and Siff, 1964; Dillman and Tremblay, 1977).

Defining rurality used to be based on whether an area was dedicated to or supported by agriculture, but many modern rural families have no affiliations to farming, relying on other industries, such as manufacturing, for household income (Perry, 1984). Castle, Wu, and Weber (2011) note that agriculture is no longer limited to rural areas and is becoming more common in urban areas, generally on a smaller, more compact scale, producing more per acre and more diverse, higher-value crops. Urban areas also tend to have recreational farmers that have other incomes as well. Burchinal and Siff (1964) point out that the majority of rural populations no longer solely depend on agriculture. In fact, blue-collar workers replaced farm workers as the largest occupational group in rural areas in the 1950s.

Rural households struggle financially without access to skilled jobs and on average have lower levels of income than urban households. With a lack of diverse economic activities, they can be more vulnerable to economic downturns due to concentrated economic specializations (Duncan and Tickamyer, 1988; Hart, Larson, and Lishner, 2005). Although cost of living is lower in rural areas (Joliffe, 2003), Dillman and Tremblay (1977) say that on average the more rural the lifestyle, the more worse off residents are economically. Castle, Wu, and Weber (2011) show that urban residents have access to more highly paid jobs on average and that rural per capita income is much lower, resulting in rural counties having a higher probability of being a poverty-persistent county. These characteristics are supported in other literature as well; there are lower market wages in rural areas and less access to jobs, skilled or unskilled (Mills and Hazarika, 2003). Unlike urban areas, rural areas tend to lack a middle class (Duncan and Tickamyer, 1988). There are higher rates of unemployment and

underemployment in rural areas as well as higher rates of poverty. Rural populations also have higher percentages of uninsured and underinsured individuals (Hart, Larson, and Lishner, 2005).

Household demographics are another trait that many agree defines “rural.” On average, rural households have higher white populations and less diversity than urban areas (Duncan and Tickamyer, 1998; Hofferth and Iceland, 1998). Rural communities have higher rates of elderly and children and a lack of young, middle-age adults (Hart, Larson, and Lishner, 2005; Duncan and Tickamyer, 1988; Hofferth and Iceland, 1998). The proportion of people age 50-90 years is greater in rural areas while the proportion of people age 15-40 is greater in urban areas (Joliffe, 2003). This supports Burchinal and Siff’s (1964) theory that outmigration consists of mainly youth and young adults. There are also fewer female headed household in rural areas compared to urban ones (Duncan and Tickamyer, 1988).

Davis, Grobe, and Weber (2010) found that although rural areas are generally worse off economically, rural families demonstrate less use of childcare subsidies. They indicate that similar findings are shown in other welfare programs. Even given worse economic conditions with higher unemployment rates and lower wages, rural families participate in social service programs less often and for shorter periods of time. A reason behind this behavior is based on stronger social networks in rural areas. Hofferth and Iceland’s (1998) study shows that social networks in rural areas consist of longer relationships and are more likely to be made up of family members than social networks in urban areas. They also show that rural households are more likely to receive financial support from family members compared to similar urban households. These households

also differ in the way financial help is provided. In urban areas, older generations are more likely to give to younger households, but in rural areas, younger household heads are more likely to give to older households.

Dillman and Tremblay (1977) discuss other characteristics that are more common in rural than in urban areas. They find those in rural areas generally have worse housing situations; there is more home ownership but lower land values. Homes are more crowded and have less adequate plumbing and worse quality of drinking water. There is a shortage of credit in rural counties. Less time is spent on recreational activities in rural areas, and unlike urban areas, most recreational time is spent outdoors. There are fewer formal recreational structures such as movie theatres, bowling alleys, and formal sporting facilities. On the upside, they also find that there are fewer reported crimes, especially violent and property crimes. When surveyed, rural residents report higher general levels of satisfaction with their lives but more dissatisfaction with specific components. Rural residents tend to have higher satisfaction levels with intangible things such as environmental quality, a place to raise children, and safety from crime, but they report dissatisfaction with services such as public transportation and roads. These characteristics have the opposite satisfaction patterns in urban areas.

2.2 Policy Review

It is logical for urban and rural areas to have different economic development priorities. While urban planners need to focus on managing congestion and finding the right balance between the diverse needs of their communities, rural planners have the opposite issues like a lack of revenue-generating sources and a population that is

suffering from a lack of available resources (Cruickshank, 2018). This is why the literature seems to agree that urban redevelopment policies are often place-based, compared to people or community-based as seen in rural communities (Daft, 1971; Sutton, 2008; Dandekar and Hibbard, 2016). Therefore, urban planners tend to focus more on the overall economy and structure of the city by focusing on elements such as investments in infrastructure and policies that incentivize large, individual firms to enter the market (Reese and Ye, 2015; McCarthy, 1998; Sutton, 2008).

Of course, populations can share many of the same needs, but most rural communities focus attention elsewhere, on more basic human needs, before prioritizing the same concerns as urban areas. Rural planners tend to use more people-based approaches, developing policies that focus on improving human and community capital, governance, and resilience (Dandekar and Hibbard, 2016). This is why rural development economics often entail investments in improving household utilities and the skill level of the workforce with a focus on low-income areas (Drabenstott, 1995; Martin, 1966; Dewitt, 1993; Bahmura, 1961; Hansen, 1969). Dewitt (1993) supports the need for bottom-up policies that prioritize the rural poor. Many rural planners focus on reducing the high unemployment rates, not just by strengthening the workforce through better academic and vocational training, but also by creating employment opportunities through incentivizing business development (McCarthy, 1998; Dewitt, 1993).

Although aiding smaller businesses is a concern that has been expressed in both urban and rural areas, it has not been as much of a priority in urban economic development (Reese and Ye). Using financial incentive programs to stimulate business development has been common in urban areas by creating specialized zones that offer

tax incentives to individual firms, such as Enterprise and Empowerment Zones (Kroopka and Noonan, 2009; McCarthy, 1998). Leo and Brown (2000) stress that urban policies that are effective in rapidly growing cities are not necessarily appropriate in smaller, more slowly growing places. Large, prosperous cities have the resources and capacity for specialization to support a large relocating firm, but smaller cities in economic distress may not have the means to do so.

Rural areas tend to lack employment opportunities, so incentivizing businesses to open within the community is crucial. However, the literature suggests that urban planners' focus on attracting large, individual firms to the area would not be beneficial for rural areas with high unemployment rates. Although industrial recruitment is commonly practiced for business development, academics now suggest that communities are wasting their resources with this strategy (Loveridge, 1996). Large enterprises entering the market are often branch plants, which leads to the hiring of those who have relocated with the business, while smaller, locally based businesses are more likely to hire local residents (McCarthy 1998). Many other academics also agree that offering tax incentives to firms is not an effective means of generating employment and weakens the tax base (Dewitt, 1993).

Rural businesses are often at a disadvantage when it comes to access to information. Rural areas often need improvements in telecommunications for their people and businesses to succeed and grow. Much of the literature suggests that local governments need to strengthen their relationships with institutions that can provide better access to information, particularly in rural areas (Drabenstott, 1995).

Quality of life has not been enough of a focus in urban economic development (Reese and Ye, 2015). Urban redevelopment efforts often include reuse of underutilized property. The American Planning Association (APA) (2004) suggests that although not as common, redevelopment of underused property can and should be used in rural areas as well. Above all, many sources, including Dewitt (1993), Drabenstott (1995), and the APA Policy Guide on Public Redevelopment (2004), stress that due to varying needs, rural redevelopment policies should not be aimed at broad regional areas, like we see in urban development economics, but rather individualized planning done for each unique area.

In summary, it appears that rural economic development policies are often people and community-based, focusing on issues such as improving household utilities, telecommunications, governance, sustainability and resilience, and human and community capital through investments in education and job skills training. Development policies in both urban and rural areas focus on business development. However, rural policies tend to try to target small and midsize local businesses through human capital formation, whereas urban policies focus on attracting large, individual firms through financial incentives like tax abatements and specialized zones. Traditional urban policies also tend to focus on areas such as managing expansion and congestion, fostering competitiveness and innovation, and investments in infrastructure. The next chapter uses multiple techniques to identify indicators of the rural-urban divide to later infer which category of policies may be of use to Detroit.

CHAPTER 3: EVALUATION

This chapter is divided into five sections. The first section discusses the methods of identifying statistically significant rural indicators among places in the United States as well as methods of comparing Detroit on the census tract level to rural and urban places using mean values. The second section presents the results of the qualitative analysis with a series of maps and tables and discussion. The third and fourth sections discuss the methods and results, respectively, of an outlier analysis using three regressions. The fifth and final section presents a cluster analysis.

3.1 Methods

In this section, I conduct an evaluation to determine where Detroit would fit on the rural-urban spectrum using a variety of socioeconomic factors. See Table A1, in the appendix, for summary statistics of these factors. Although places are most commonly defined as urban or rural based on population size and population density, the literature identifies many other variables that show clear distinctions between rural and urban places. I used several of the most commonly cited variables that were available through the United States Census Bureau: population size, population density, household vacancy rates, income levels, unemployment rates, percent of population under the poverty level as designated by the official family thresholds (United States Census Bureau, 2016), educational attainment, and industry composition. To get an overall impression of the degree to which Detroit may exhibit rural characteristics, first maps are presented comparing Detroit Census tracts to incorporated places within the U.S. based on the above-listed variables.

Using the United States Census Bureau’s 2010 decennial data and American Community Survey data from 2014 and 2016, incorporated places, minus towns, were chosen for the data set. Census Designated Places (CDPs), or unincorporated places, and towns were not used to limit the number of places with vast amounts of uninhabited lands that would not accurately represent true population densities. Thus, the evaluation is based on all incorporated areas in the categories of villages and cities. After removing CDPs, towns, and any observation that did not have complete data across all variables, we were left with a sample of 14,468 places across the contiguous United States.

A categorical variable, named “rural,” was created to indicate the rural-urban classification of a place based on the Census Bureau’s definition of a rural place having a population of fewer than 2,500 people. Rural populations were divided into three categories based on population size.

Table 1: Summary of Rural Indicator Variable

Rural Indicator	Population Range	Number of Places
Urban	2,500+	6,124
Moderately Rural	1,500 - 2,499	1,408
Rural	500 - 1,499	3,253
Extremely Rural	0 - 499	3,683

To identify the difference in average values for each variable among different population ranges, mean values were taken within all four “rural” categories. To test whether there was a statistically significant difference between means across the population ranges, a one-way analysis-of-variance (ANOVA) model with a Bonferroni multiple-comparison test was used for each variable. Some variables were not statistically significant between all four categories. So, a binary variable, “rural-urban,” was created to compare mean values between rural and urban areas, as defined by the

Census Bureau. See Table A2, in the appendix, for a summary of mean values in rural and urban places with a comparison to Detroit.

Table 2: Summary of Rural-Urban Indicator Variable

Rural_Urban Indicator	Population Range	Number of Places
Urban	2,500+	6,124
Rural	0 - 2,499	8,344

The variables that had statistically significant differences among mean values between all four “rural” categories were as follows:

- Population density
- Residential vacancy rates
- Educational attainment levels
- Diversity of industry composition; in year 2010

The additional variables that were statistically significant between rural and urban areas were as follows:

- Mean household income
- Per capita income
- Employment share in the manufacturing industry
- Diversity of industry composition; in year 2016

A third categorical variable, “urban,” was created to obtain mean population densities in incorporated places among six population ranges. The urban variable includes the rural values 1-3 like the “rural” variable, but also divides the urban population into three categories. The Census Bureau defines an Urban Cluster (UC) as having a population of at least 2,500 people but below 50,000, as a place with a population of at least 50,000 people is classified as an Urbanized Area (UA). A third category was created to represent very large cities with populations of at least 500,000 people, like Detroit. We will refer to them as Extreme Urbanized Areas (EUA).

Table 3: Summary of Urban Indicator Variable

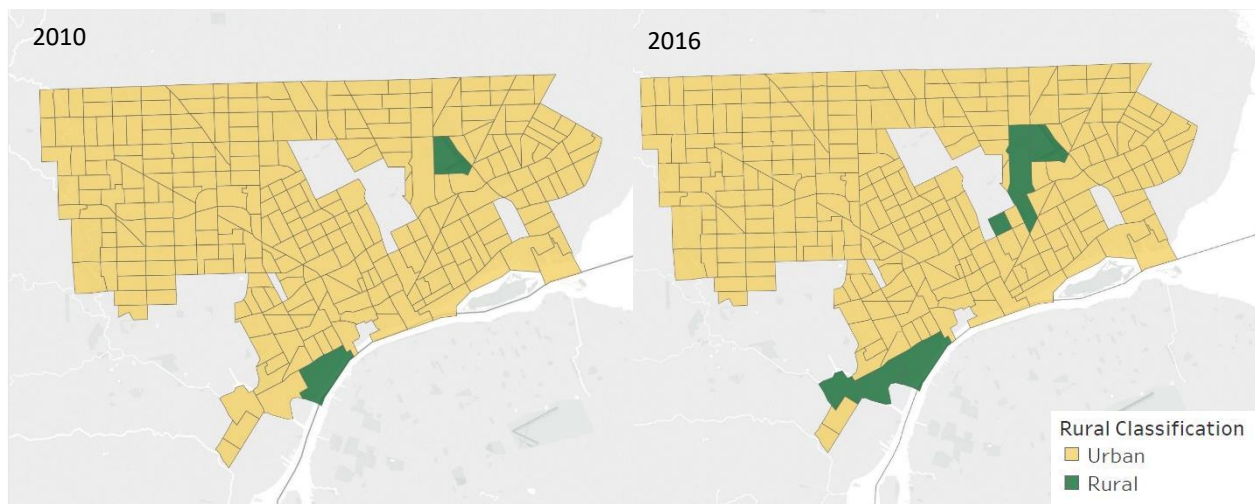
Rural Indicator	Population Range	Number of Places
EUA	500,000+	34
UA	50,000 - 499,999	689
UC	2,500 - 49,999	5401
Moderately Rural	1,500 - 2,499	1,408
Rural	500 - 1,499	3,253
Extremely Rural	0 - 499	3,683

Decennial data and the American Community Survey from the Census Bureau were also used to obtain mean values of the same variables in Detroit at the Census tract level. Removing census tracts that did not have complete information across all variables left a data set of 291 tracts. The mean values were then compared to those among incorporated places to determine where Detroit fits on a rural-urban spectrum.

3.2 Results

To understand where Detroit might fit on a rural-urban spectrum, I considered several socioeconomic characteristics that the literature indicates vary between rural and urban areas. With a total population of 683,443 people in 2016, Detroit would not classify as rural based solely on population size. Population density is another common indicator used to define a place as rural or urban. According to the USDA, a place is considered rural if there is a population density lower than 1,000 people per square mile. With an average population density of 4,926 people per square mile in 2016, Figure 1 shows that Detroit was largely considered urban based on this criterion. However, this poses the questions of how urban is Detroit and how closely does it resemble other large cities? Later in the paper, Detroit will be considered a single entity. But to begin the evaluation, it will be considered on the Census tract level in this portion of the chapter.

Figure 1: Rural Classification based on Population Density in Detroit



In Figure 2, average population densities were taken in incorporated places in six different population ranges (see legend) and then compared to the population densities within Detroit Census Tracts. The darkest shade of red indicates Census tracts that have population densities that are closest to those in places with total populations similar to Detroit's (over 500,000 people). All other tracts have population densities comparable to places with smaller total populations, with shades of green denoting rural populations. Table 4 indicates that in 2016, about 42% of Detroit Census tracts have population densities close to or below those in less-populated incorporated places, which is thirteen percentage points, (38 Census tracts), higher than in 2010.

Also, a requirement to be eligible for USDA's Rural Economic Development Loan & Grant Program is to have a population of no more than 50,000 people. Figure 2 and Table 4 show that in 2016, about 20% of Detroit's Census tracts had population densities that correlate with places with populations less than 50,000 people. This

indicates that although Detroit does not qualify for such programs as a single entity, some areas may benefit from policies like those designed by the USDA for rural areas.

Figure 2: Comparing Detroit Census Tracts to Population Ranges throughout Incorporated Places in the U.S.-based on Population Density

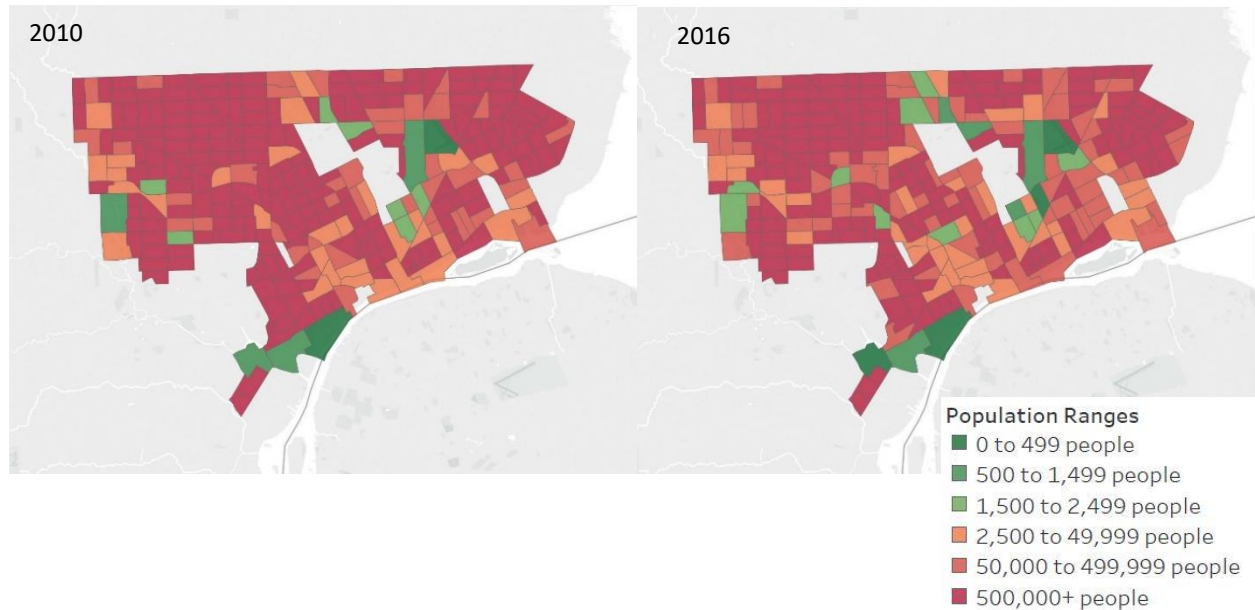


Table 4: Number of Detroit Census Tracts that Correlate with Population Ranges

Year	Less than 500,000 people	Less than 50,000 people
2010	85	44
2016	123	56

Rural areas tend to have higher percentages of vacant households than urban areas. In 2016, about 92% of Detroit Census tracts would have been classified as rural with household vacancy rates of at least 12.98% compared to the national urban average household vacancy rate of about 10.54%. Detroit's average household vacancy rate almost tripled that with a value of about 31%. Figure 3 and Table 5 presents this

information. Note that although the city has recently made efforts to destroy vacant structures (Reese et al., 2017), the current rate of vacancies remains higher than Detroit's 2010 average residential vacancy rate of about 23%. Similarly, referring to Figure 4 and Table 6, in 2010, about 85% of Detroit had a rental vacancy rate of at least 10.6%, which is more consistent with rural areas. The average among urban places was only about 9%.

Figure 3: Rural Classification based on Percent of Vacant Households in Detroit

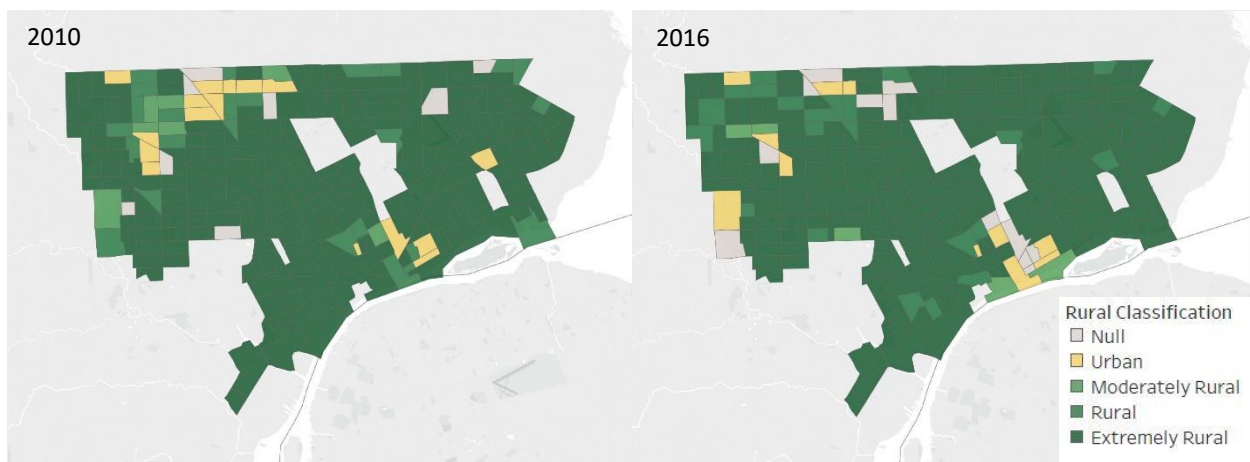


Table 5: Average Vacant Household Rates

Year	Average Vacant Household Rates in Urban Places	Average Vacant Household Rates in Moderately Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	9.67	11.4	23.37	267
2016	10.54	12.98	31	268

Figure 4: Rural Classification based on Rental Vacancy Rate in Detroit

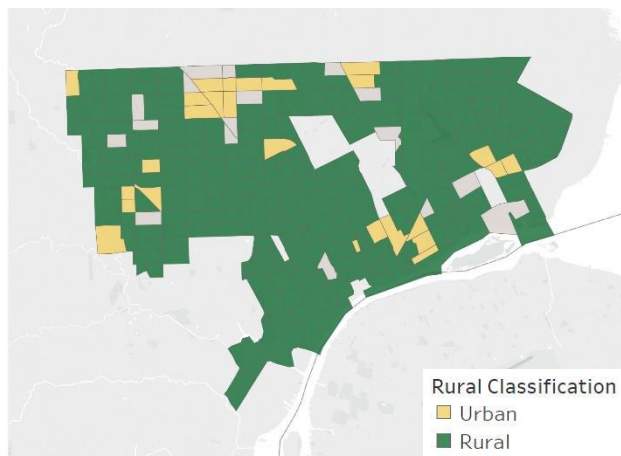


Table 6: Average Rental Vacancy Rates

Year	Average Rental Vacancy Rate in Urban Places	Average Rental Vacancy Rate in Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	9.11	10.61	17.64	248

Rural places tend to be worse off financially than urban places. In 2016, the average mean household income in rural places was about \$58,674 compared to \$71,962 on average in urban places. Detroit's mean household income on average was about \$37,300, which is substantially lower than the national average. About 94% of Detroit Census tracts would have been classified as rural. Figure 5 and Table 7 presents this information.

Figure 5: Rural Classification based on Mean Household Income in Detroit

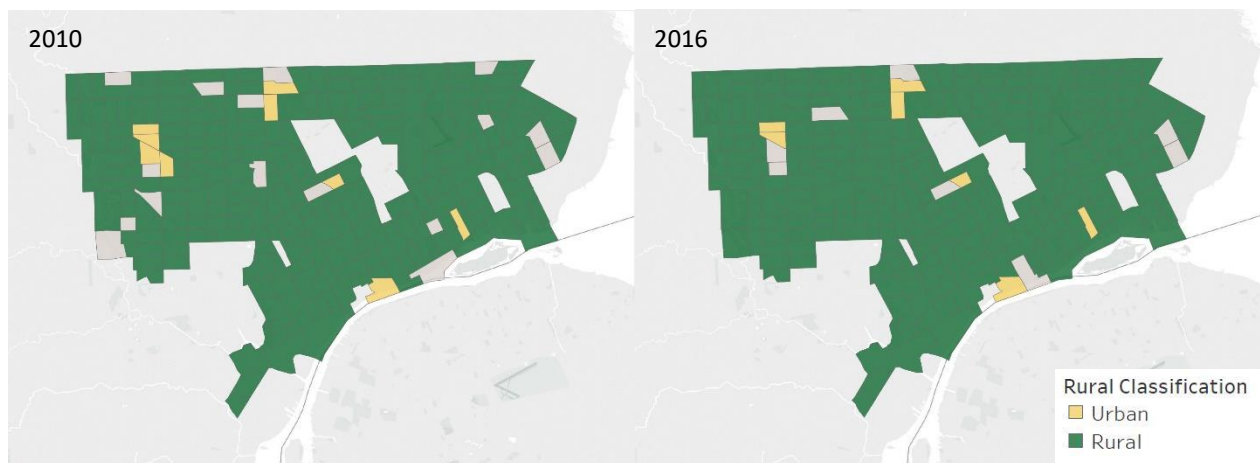


Table 7: Mean Household Incomes

Year	Average Mean Household Incomes in Urban Places	Average Mean Household Incomes in Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	\$66,259.29	\$52,790.04	\$37,755.17	266
2016	\$71,965.61	\$58,674.14	\$37,298.67	276

Similar results are shown for another measure of income, per capita income. In 2016, the average per capita income in rural places was about \$24,342 compared to the average of about \$28,016 in urban places. Detroit's average per capita income was substantially lower at about \$15,473. About 90% of Detroit Census tracts would have been classified as rural. Figure 6 and Table 8 presents this information.

Figure 6: Rural Classification based on Per Capita Income in Detroit

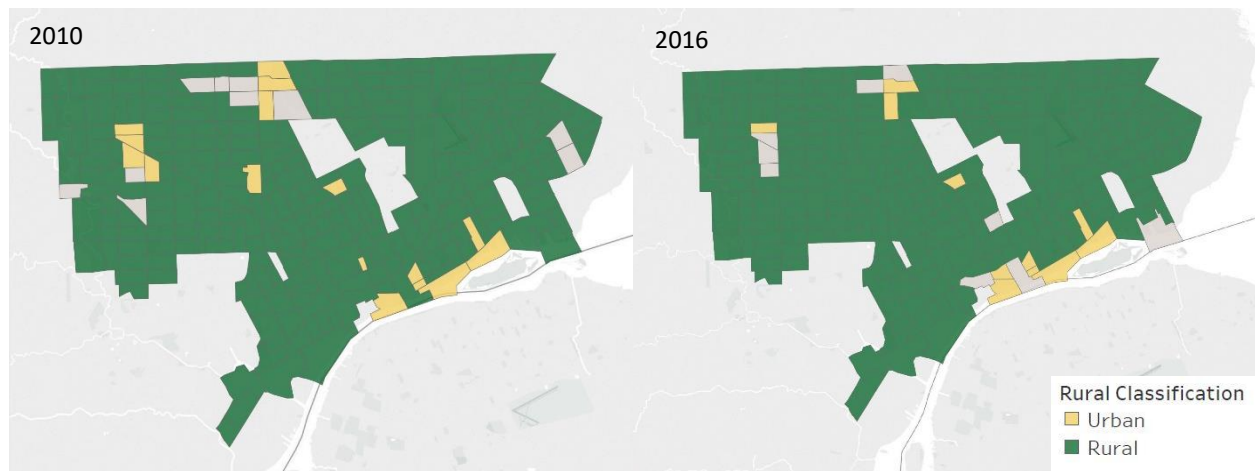


Table 8: Per Capita Incomes

Year	Average Per Capita Incomes in Urban Places	Average Per Capita Incomes in Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	\$25,920.06	\$21,841.65	\$15,064.08	265
2016	\$28,016.47	\$24,341.93	\$15,472.99	271

Educational attainment levels tend to be lower in rural areas compared to urban areas. In 2016, about 85% of Detroit Census tracts would have been classified as rural, where, at the most 19.96% of their population had an educational attainment level of at least a bachelor's degree. Overall, only about 13% of Detroit's population had at least a bachelor's degree. In urban places, about 27% of the population obtained at least a bachelor's degree on average. Figure 7 and Table 9 presents this information.

Figure 7: Rural Classification based on Percent of Population with a Bachelor's Degree or Higher in Detroit

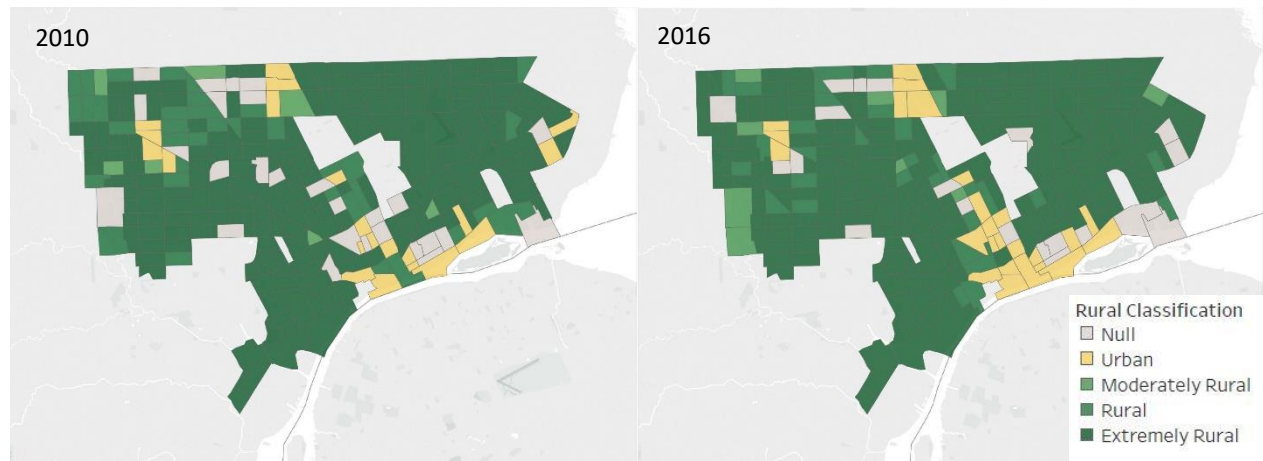


Table 9: Educational Attainment

Year	Average Percent of Population with a Bachelor's Degree or Higher in Urban Places	Average Percent of Population with a Bachelor's Degree or Higher in Moderately Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	25.42	18.23	11.7	243
2016	27.15	19.96	12.94	246

Using the Herfindahl-Hirschman Index (HHI) as a model of industry diversity, a rating of industry composition was calculated for all incorporated places and Detroit census tracts in the data sets.

$$(1) Ind_i = S_{1i}^2 + S_{2i}^2 + S_{3i}^2 + \dots + S_{ni}^2$$

where Ind_i is the industry composition ranking in place i and ranges from near zero to 10,000. S_{ni} represents the employment share for industry n in place i , accounting for all 13 industries categorized in the Census data. This model assigns a ranking value that

represents the level of diversity among industries, where the higher the value, the less diverse the economic activities.

Rural places tend to have less diversity among economic activities (Baldwin, Vinodrai, and Brown, 2001), and thus would be expected to have higher industry composition rankings. This was true for both 2010 and 2014. In 2016, there was a statistically significant difference in industry composition rankings only between rural and urban communities—not across the four “rural” categories. Rural places had an average industry composition ranking of about 1,600 while urban places had an average industry composition ranking of about 1,400. About 61% of the Census tracts would have been classified as rural.

Figure 8: Rural Classification based on Industry Composition in Detroit

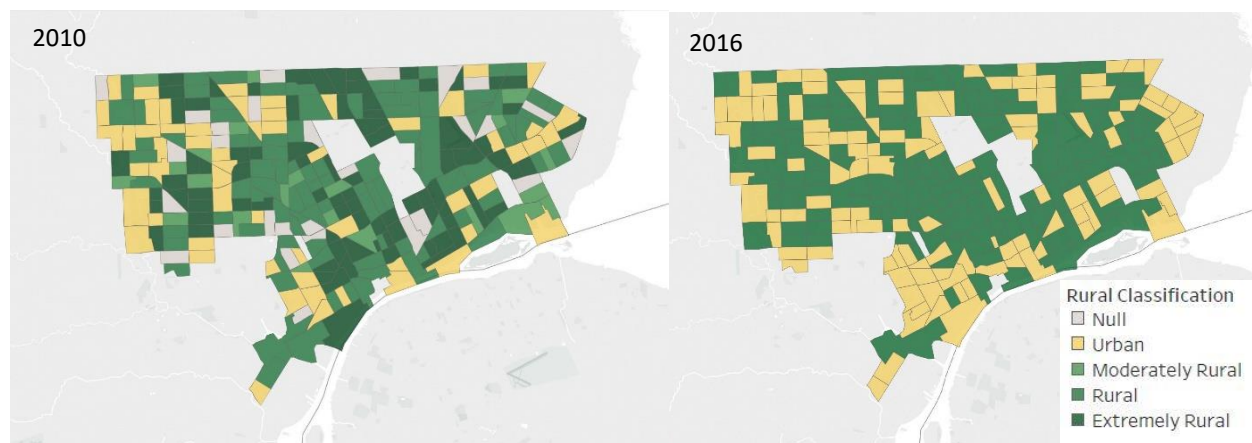


Table 10: Industry Composition

Year	Average Industry Composition Rating in Urban Places	Average Industry Composition Rating in Moderately Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	1370.99	1464.2	1739.9	205
2016	1407.8	1598.7	1642.2	129

The manufacturing industry has become more common in rural areas. In 2016, rural places had a mean value of about 15% of their population being employed in the manufacturing industry, as opposed to a mean value of about 12.4% in urban places. About 47% of Census tracts in Detroit would have classified as rural. Note that there has been an increase in the share of employment in the manufacturing industry since 2010, as shown in Figure 9 and Table 11.

Figure 9: Rural Classification based on Percent of Population Employed in the Manufacturing Industry

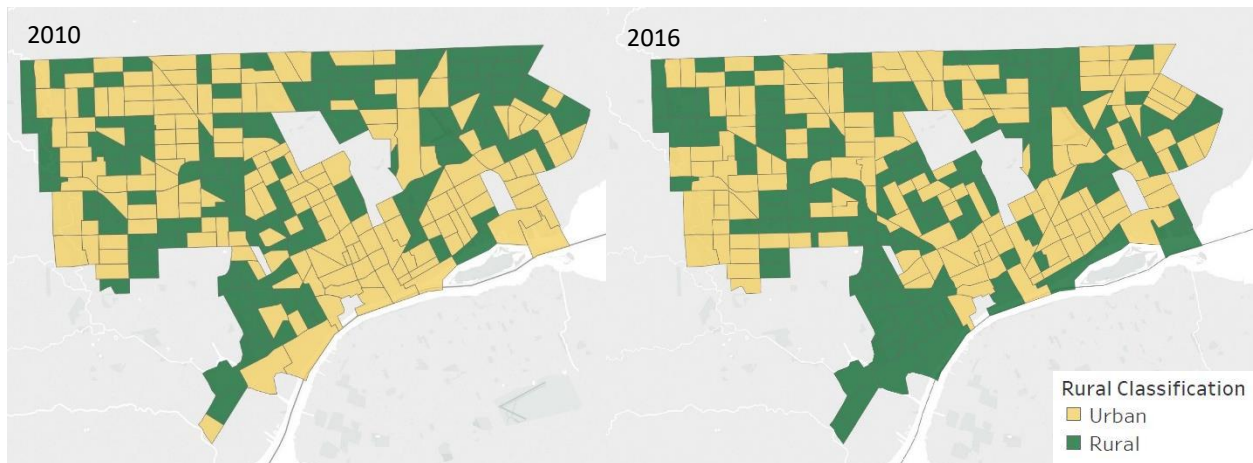


Table 11: Manufacturing Industry

Year	Average Percent of Population Employed in the Manufacturing Industry in Urban Places	Average Percent of Population Employed in the Manufacturing Industry Rural Places	Detroit Average	Number of Detroit Census Tracts Classified as Rural
2010	12.68	15.45	13.75	127
2016	12.41	14.95	14.31	136

The literature states that rural areas tend to have higher poverty and unemployment rates. Although there was a statistically significant difference in the

complete data set obtained from the Census Bureau, the sample of incorporated places did not show a statistically significant difference between rural and urban areas for either variable. So rather than displaying maps of rurality, Figures 10 and 11 illustrate how Detroit compares to national averages. They clearly illustrate that Detroit has above-average unemployment and poverty rates, and as shown in Table 12, both rates in Detroit are about three times larger than the average national rates in 2016.

Figure 10: Detroit Census Tracts above the National Average Poverty Rate

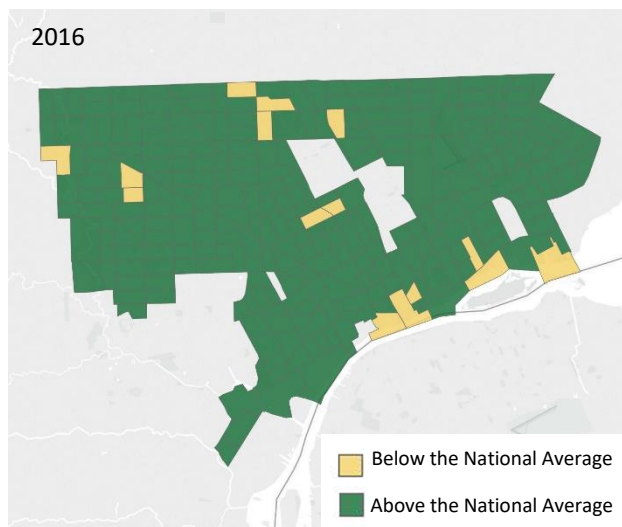


Figure 11: Detroit Census Tracts above the National Average Unemployment Rate

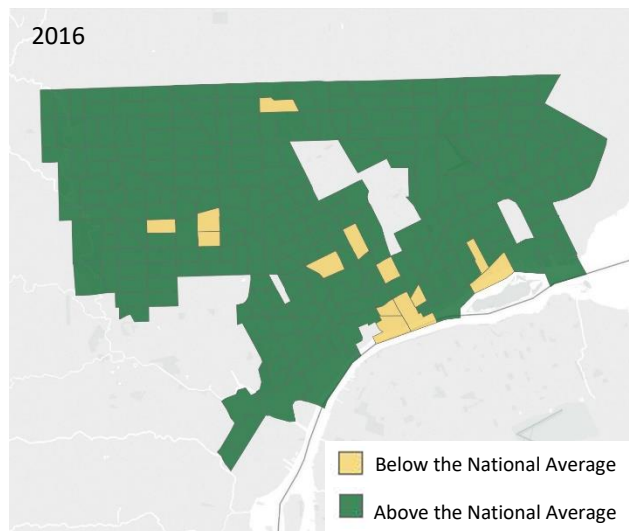


Table 12: Average Poverty and Unemployment Rates

Year	National Average Poverty Rate	Detroit Average Poverty Rate	National Average Unemployment Rate	Detroit Average Unemployment Rate
2010	11.08	31.32	4.77	13.97
2016	12.05	36.038	4.21	12.11

3.3 Outlier Analysis Methods

Population density is often used to determine whether a place is rural or urban (Castle and Weber, 2011), and therefore which redevelopment policies are prescribed to that area. The analysis explained in section 3.2 shows that, based on several non-population rural indicators, Detroit compares heavily with rural communities. Therefore, it can be inferred that population size and density should not be the only variables used to determine where the city lies on a rural-urban spectrum. To further explore this issue, using the 2016 incorporated places data set, I regressed population density on several other rural indicators and used them to predict values for population density. How these predictions compare to actual population density in Detroit will tell us how well of a fit population density is as a proxy for rurality. The first analysis is a simple regression, only regressing the natural logarithm of population density, $\ln(\text{popdens})$, on the natural logarithm of total population, $\ln(\text{total})$ and a constant. Natural logs and robust standard errors were used to correct for heteroskedasticity.

$$(2) \ln(\text{popdens})_i = \beta_0 + \beta_1 \ln(\text{total})_i + \varepsilon_i, \forall i$$

where β_0 is constant, β_1 is the coefficient on the natural logarithm of total population for place i , and ε_i is the error term. The predicted values from this regression reveal expected population density based only on total population.

Next, a full regression was computed with several other variables that, based on the literature and above analysis, are rural indicators.

$$(3) \ln(popdens)_i = \beta_0 + \beta_1 \ln(total)_i + \beta_2 vacanthh_i + \beta_3 \ln(pcincome)_i + \beta_4 educ_i + \beta_5 \ln(indcomp)_i + \beta_6 manu_f_i + \varepsilon_i, \forall i$$

where β_2 is the coefficient on *vacanthh*, percent of vacant households, for place i . β_3 is the coefficient on $\ln(pcincome)$, the natural logarithm of per capita income, for place i . β_4 is the coefficient on *educ*, percent of the population with an educational attainment of at least a bachelor's degree¹, for place i . β_5 is the coefficient on $\ln(indcomp)$, the natural logarithm of the calculated industry composition variable, for place i , and β_6 is the coefficient on *manuf*, percent of the population employed in the manufacturing industry, for place i . A difference in predictions from Equations 2 and 3 would infer that the other included variables are in fact rural indicators.

Finally, the full regression, Equation 3, was estimated again but minus total population.

$$(4) \ln(popdens)_i = \beta_0 + \beta_1 vacanthh_i + \beta_2 \ln(pcincome)_i + \beta_3 educ_i + \beta_4 \ln(indcomp)_i + \beta_5 manu_f_i + \varepsilon_i, \forall i$$

¹ It was assumed that there would be a U-shaped relationship between percent of population with a bachelor's degree or higher and population total and/or density, with low educational attainment levels in both rural and highly populated areas. However, no such pattern was determined.

This model is estimated to compare predicted densities with and without population size. A significant difference between the predicted values between Equations 3 and 4 suggests that the demographics, or socioeconomic characteristics, are also significant indicators of the rural-urban divide. It should be noted that population densities of incorporated places are not normally distributed, but rather exponentially distributed toward low-density places, and therefore has a tendency to favor under-predictions.

3.4 Outlier Analysis Results

Equations 2, 3, and 4 were estimated using the incorporated places data set; see Table A3, in the appendix, for the regression results of each model. In 2016, Detroit's population was 683,443 with a population density of 4,926 people per square mile. Equation 2 predicts a population density of 6,963 people per square mile, a difference of 2,037 people, showing that based on population size alone, Detroit is predicted to be much more densely populated than it is. Although the difference between predicted and actual population density is not among the largest in terms of percentage, the substantial difference is among the largest 10% in absolute terms. This is also quite interesting due to the model's tendency to underestimate predicted population densities of larger metropolitan areas. However, once other factors are included in the regression as reflected by Equation 3, predicted population density falls to 3,802 people per square mile. This predicted value now underestimates the actual value by about 1,123.3 people. This shows that when taking into account socioeconomic factors, Detroit is more like a rural community. The large predicted value from Equation 2 infers that population size alone is not enough to accurately predict population density. The lower

prediction from Equation 3 indicates that once other indicators are included, Detroit appears to be more similar to areas with smaller populations. Since population density correlates strongly with total population, researchers often use population density as a proxy for rurality. However, the difference in predicted values between Equations 2 and 3 suggests that it is useful to also consider other socioeconomic factors to determine the level of rurality.

Finally, by removing total population as a regressor, Equation 4 further supports this theory. Based solely on the non-population rural indicators, Detroit's population density is predicted to be 795 people per square mile. This is within the Census Bureau's requirement to be considered a rural area and is also less than the mean population density (979 people per square mile) of communities with a total population of fewer than 2,500 people. The economic and social characteristics of Detroit are not what would be expected for a city of its size and population density. In fact, socioeconomic factors alone predict Detroit to be rural. It therefore may be prudent to consider whether rural redevelopment policies would be more appropriate for Detroit and other declining urban places.

The results indicate that using population size or density alone as a proxy for rurality may not offer a complete assessment. The regression based on Equation 2 showed that although there is a strong relationship between the two variables, it is not enough to imply that population density can be estimated solely based on population size. Using population size alone could lead to the conclusion that Detroit is extremely urban. Equations 3 and 4 indicate that including other rural indicators into the model shows that Detroit, in some respects, reflects the characteristics of rural places.

3.5 Cluster Analysis

Several variables correlate with rurality. These variables can also be used to predict membership among calculated clusters with varying levels of rurality. To further examine just how rural the city is, a k-means partition cluster method was estimated to determine which incorporated places Detroit is most similar to. This technique groups observations based on common traits. Incorporated places were grouped into ten clusters² using the following rural indicators as traits: population density, percent of vacant housing, per capita income, percent of population with an educational attainment of at least a bachelor's degree, industry composition calculation, percent of population employed in the manufacturing industry and average household size. These clusters are evaluated using data from 2010 (Tables 13 and 14) and 2016 (Tables 15 and 16).

In 2010, Detroit was placed in cluster 2, among places with an average population of 3,445 people and a population density of 1,034 people per square mile, the lowest mean population density among all clusters. Table 13 presents this information. These figures are very close to the criteria used to indicate a rural place and only one cluster has a smaller average population size. Table 14 shows that Detroit's cluster is also very rural based on the other rural indicators; cluster 2 has the highest average percent of the population employed in the manufacturing industry, the highest average vacancy rate, and the lowest average per capita income and educational attainment levels.

² As a robustness check, the cluster analysis was performed repeatedly with numbers of clusters ranging from five to 15 and Detroit was grouped among the same places for all cluster amounts.

Table 13: Summary of 2010 Clusters

Cluster	Sample Size	Mean Population (people)	Average Population Density (people per square mile)
1	47	2423.3	1110.3
2	1,841	3445.2	1034.7
3	3,994	5489.7	1107.4
4	139	5874.7	1922.3
5	3,985	9734.1	1264.8
6	251	11529.8	2788.9
7	2,312	20709.9	1603.1
8	540	22344.4	2898.4
9	1,138	23965.8	2247.2
10	221	107255.7	10243.6

Table 14: Means of Select Features in 2010 Clusters

Cluster	Percent of Population Employed in Manufacturing Industry	Per Capita Income	Percent of Vacant Households	Percent of Population with a minimum of a Bachelor's Degree
1	8.7	\$118,783.00	13.8	73.8
2	14.8	\$13,301.00	15.6	9
3	16	\$17,845.61	13.2	12.6
4	8.3	\$83,814.92	14.9	69.3
5	15.2	\$21,764.07	11.4	16.4
6	8.7	\$58,963.17	11.8	60.8
7	13.2	\$26,314.21	10.3	22.3
8	10	\$43,101.37	11.9	48.3
9	11.1	\$32,883.75	9.8	34.1
10	11.7	\$20,191.60	8.6	17.8

Clusters estimated with the 2016 data produced results similar those in 2010.

Detroit was also sorted into cluster 2 with the second smallest mean population size of 4,340 people and the smallest population density of 1,130 people per square mile.

Table 15 presents this information. Again, Detroit has the largest population in its cluster

with a total population of 683,433 people. Laredo, Texas, has the second largest population size in the cluster with only 251,671 people. Detroit is also much larger than Laredo in terms of population density. Table A4, in the appendix, provides a list of the places in cluster 2 with the twenty largest populations and their corresponding population densities. Table 16 indicates that only eighteen places have populations larger than 50,000 people and about 68% of the cluster, 1,358 places, are considered rural based on the Census Bureau's definition for rurality. Also, Detroit is in the 95th percentile for population density within the cluster. Although it is not the largest outlier, there are only thirty-five places in cluster 2 with larger population densities. Almost 1,200 places have population densities fewer than 1,000 people per square mile, meeting the Census Bureau's definition for rurality. It is clear that Detroit is not representative of the average place in cluster 2 based on population size and density. Consequently, other Detroit characteristics must be similar to those of cluster 2.

Table 15: Summary of 2016 Clusters

Cluster	Sample Size	Mean Population (people)	Average Population Density (people per square mile)
1	38	2,447.8	1,438.7
2	1,985	4,340.3	1,130.0
3	123	6,552.5	2,117.9
4	4,008	7,351.8	1,204.8
5	240	9,792.8	2,680.0
6	3,968	11,142.2	1,318.0
7	2,396	19,670.8	1,678.8
8	1,032	24,333.7	2,265.0
9	514	24,471.3	3,043.6
10	164	113,288.9	11,567.5

Table 16: Size Distribution of Places in Cluster 2 for 2016

Population Size (in people)	Number of Places	Population Density (people per square mile)	Number of Places
Less than 1,000	968	Less than 1,000	1,194
1,000 – 2,499	390	1,000 – 2,999	670
2,500 – 49,999	609	3,000 – 4,999	86
50,000+	18	5,000+	35

Hence, sociodemographic traits within Detroit's cluster are very rural. As presented in Table 17, cluster 2 has the lowest per capita incomes and educational attainment levels and the second highest percent of population employed in the manufacturing industry and residential vacancy rate.

Table 17: Means of Select Features in 2016 Clusters

Cluster	Percent of Population Employed in Manufacturing Industry	Per Capita Income	Percent of Vacant Households	Percent of Population with a minimum of a Bachelor's Degree
1	7	\$132,862.70	18.3	74.2
2	14.8	\$14,774.38	18.0	10.4
3	7.5	\$91,815.67	13.1	72.6
4	15.4	\$19,844.70	14.8	14.0
5	9	\$67,040.19	13.8	66.5
6	14.6	\$24,306.03	12.4	18.1
7	12.8	\$29,392.99	11.3	24.9
8	10.7	\$37,034.97	10.5	38.0
9	9.4	\$48,724.76	11.6	52.6
10	10.9	\$20,429.46	9.6	18.5

As a robustness check, to ensure Detroit was sorted into an appropriate cluster with other similar places, Equation 3 was used to predict Detroit's population density as

well as all other variables by rearranging the model five times, using the places data set, regressing each variable individually on all the others.

$$(5) \text{vacanthh}_i = \beta_0 + \beta_1 \ln(\text{popdens})_i + \beta_2 \ln(\text{pcincome})_i + \beta_3 \text{educ}_i + \beta_4 \ln(\text{indcomp})_i + \beta_5 \text{manuf}_i + \varepsilon_i, \forall i$$

$$(6) \ln(\text{pcincome})_i = \beta_0 + \beta_1 \text{vacanthh}_i + \beta_2 \ln(\text{popdens})_i + \beta_3 \text{educ}_i + \beta_4 \ln(\text{indcomp})_i + \beta_5 \text{manuf}_i + \varepsilon_i, \forall i$$

$$(7) \text{educ}_i = \beta_0 + \beta_1 \text{vacanthh}_i + \beta_2 \ln(\text{pcincome})_i + \beta_3 \ln(\text{popdens})_i + \beta_4 \ln(\text{indcomp})_i + \beta_5 \text{manuf}_i + \varepsilon_i, \forall i$$

$$(8) \ln(\text{indcomp})_i = \beta_0 + \beta_1 \text{vacanthh}_i + \beta_2 \ln(\text{pcincome})_i + \beta_3 \text{educ}_i + \beta_4 \ln(\text{popdens})_i + \beta_5 \text{manuf}_i + \varepsilon_i, \forall i$$

$$(9) \text{manuf}_i = \beta_0 + \beta_1 \text{vacanthh}_i + \beta_2 \ln(\text{pcincome})_i + \beta_3 \text{educ}_i + \beta_4 \ln(\text{indcomp})_i + \beta_5 \ln(\text{popdens})_i + \varepsilon_i, \forall i$$

Then for each variable, a z-score test was used to determine how many standard deviations away was the predicted value from the mean value in the 2nd cluster.

$$(10) Z = \frac{\mu - \bar{X}}{SD}$$

where Z is the number of standard deviations away from the variable mean, μ , within Detroit's cluster. $\bar{X}$ is the predicted value for Detroit and SD is the standard deviation of the variable mean within the cluster.

Table 18: Detroit's Fit within the 2016 Cluster

Variable	Cluster Mean	Detroit Prediction	Detroit Actual
popdens	1,144.6	795.0	4,925.7
vacanthh	18.0%	8.4%	29.8%
pcincome	\$14,721.04	\$19,483.57	\$15,562.00
educ	10.4%	10.6%	13.8%
indcomp	1,719.0	1,555.3	1,305.3
manuf	14.8%	9.1%	14.5%

All the predicted values were within one standard deviation of the respected variable mean within the cluster except per capita income. It should be noted that based on population density, Detroit was in the 95th percentile, reinforcing that Detroit isn't representative of the average place in the cluster based on population density. This means that Detroit's other social and economic characteristics are rural enough for it to be sorted into the cluster and thus, Detroit's other characteristics do not resemble those of an average highly populated urban area. These results are similar to those in Section 3.4, indicating that population density and population size alone are not appropriate proxies for rurality.

CHAPTER 4: POLICY IMPLICATIONS AND CONCLUSION

As Cowan (2010) notes, among the focal points in USDA Rural Development programs are adequate housing, generating employment opportunities, sustainable business development, and improving human capital and poverty rates. These are all objectives that are of concern for Detroit. With the current eligibility requirements, it does not qualify for such programs. To qualify for USDA Rural Development programs, the place must have a population density of fewer than 1,000 people per square mile and a total population of fewer than 50,000 people. Detroit does not meet these criteria, but as this analysis concludes, the sociodemographic characteristics within the city are actually closer to rural areas than urban areas. Referencing Figure 2, in section 3.2, even the population density in much of the region is similar to that in much smaller cities, including areas with total populations less than 50,000 people. And as the models estimate, based on social and economic traits, Detroit is similar to places much smaller than itself. Equations 3 and 4 use rural indicators to predict a population density for Detroit that is significantly smaller than the actual value and even further away than the prediction estimated from Equation 2 using population only as a factor. These findings suggest that population density alone is not an appropriate proxy for rurality. This is further supported by Equation 4, where only non-population sociodemographic factors are considered, predicting a population density of 795 people per square mile for Detroit, which is below the requirement of eligibility for USDA Rural Development programs, and the cluster analysis grouping Detroit among rural communities defined by the Census Bureau.

Decades of struggling with racial and class conflicts, suburbanization, the decline of the automobile industry, and weak governance have put the city in a state of economic distress and transformed the population into one that, in some respects, resembles a rural community. Thus, it may be useful to consider applying what is thought of as traditional rural economic development policies in Detroit. As this analysis has shown, and the literature suggests, some of Detroit's major concerns are high rates of unemployment and poverty, low levels of human capital, lack of employment and educational opportunities, and high residential vacancy rates. All of these traits are common in rural areas and thus often major points of focus in rural redevelopment policies.

Detroit's Master Plan of Policies (Detroit City Council, 2009) is a working document that outlines the major issues local government should be concerned with, goals for improvement, and policy theme suggestions. The report makes clear that these goals do not have timelines and cannot all be addressed at the same time. It is the responsibility of elected officials to prioritize the concerns and choose policies based on available resources. This work suggests that local government consider both the traditional urban development policies as well as policies typically thought of as most appropriate for rural places. In short, policymakers may want to consider redevelopment through both policy lenses to assess the specific needs of Detroit's unique population. The Master Plan has done a good job of outlining these specific needs and has suggested policy angles that would traditionally resemble those from either end of the rural-urban spectrum. Now it is in the hands of local government to prioritize the most pressing concerns and choose appropriate policies.

The Master Plan presents policies that suggest a continued focus on the downtown area while others suggest focusing on underserved neighborhoods. Downtown and Midtown Detroit have seen the majority of recent development, whereas the rest of the neighborhoods are being left behind (Reese et al., 2017). These underserved neighborhoods may be exhibiting rural characteristics because of their lack of access to the growing resources and amenities of Downtown and Midtown. Increasing employment or educational opportunities will have minimal effect if the residents who need them most do not have access to them.

Reese (2014) found that cities still tend to employ traditional economic development policies by investing in basic infrastructure, offering tax incentives and implementing development zones. Detroit has already attempted conventional urban business development plans, with limited success (Reese, 2014; Reese, Eckcert, Sands, and Vojnovic, 2017). As discussed earlier, although tax incentives and development zones are common urban development strategies for helping to generate employment opportunities, such approaches may not be the most effective for Detroit. As previously noted, rural development approaches are people- and community-based, placing the needs of the residents as a first priority. Detroit's residents face many challenges close to those of rural residents, such as high unemployment rates partly due to a lack of employment opportunities.

Detroit's Master Plan of Policies addresses this concern with suggested policies that focus on rebuilding the automobile industry as well as diversifying the economy. As previously discussed, overreliance on the automobile industry played a large role in Detroit's decline (Reese et al., 2017; Reese, Sands, and Skidmore, 2014). Diversifying

into other industries is very important for sustainable growth. Pittelko, Bommersbach, and Erickcek (2016) conducted a review of the New Economy Initiative (NEI), a collaboration of 10 foundations pledging \$100 million in 2007 to aid economic growth through entrepreneurship and small business development in Southeast Michigan. An estimated total of 17,490 direct and indirect jobs were created. Out of the 7,468 direct jobs generated from the initiative, there was an average annual salary of about \$44,000. About 51% of these were in professional, scientific, and technical services. The effectiveness of these efforts supports the notion that public development policies that focus on small and midsize business may generate more employment opportunities for residents, contributing to a healthier and more sustainable economy.

However, the Master Plan also suggests offering tax incentives. A wide variety of literature urges cities to take precaution or completely steer away from this strategy (Loveridge, 1996). Although tax abatements are among the oldest and most commonly used incentive programs nationally (Reese and Sands, 2013), many academics have found them, and other specialized development zones with tax incentives, to be ineffective and expensive (Peters and Fisher, 2004). Any improvements from past programs were found to be marginal and did not generate long-term effects (McCarthy 1998). Studies found that tax abatements were being used by existing facilities and did not successfully increase employment, and any positive effects that occurred in Renaissance zones, a program used in Detroit, did not spill over into surrounding areas (Reese, 2014). The majority of Detroit's population live in underserved areas that did not see any spillover effects from the investments in Downtown and Midtown; employment did not rise and vacancy did not decrease (Reese, et al., 2017).

Detroit needs policies that will improve the well-being of the residents in these underserved neighborhoods, and many studies suggest that large investments in specialized zones will not result in positive effects for the overall population. Kang, Skidmore, and Reese (2013) also found that tax abatements were not promising for spillover effects and that such programs have a minimal positive effect in relation to the high costs. In 2013, Reese conducted research among Michigan cities that determined there was not a statistically significant relationship between residential economic health and tax abatements. This conclusion supports a large array of other studies (Fisher & Peters, 1998; Peters & Fisher, 2004; Sands & Reese, 2012; Wassmer & Anderson, 2001).

McArthy (1998) emphasized that tax incentives more often than not attract large, individual firms that are generally branch plant relocations. These firms tend to employ those who have relocated with the business and have little effect on local unemployment rates. Smaller, locally owned businesses are much more likely to employ residents and generate more revenue for the local economy. Bartik (2018) also agrees that tax incentives are expensive and focus should be placed on small and medium-sized manufacturers. Michigan cities have a persistent emphasis on tax abatements and enterprise zones, but they will not aid Detroit in developing the diverse economy they need, and there is little evidence to support the assumption that they will attract business development (Reese and Sands, 2007). High unemployment rates and the city's historic lack of a tax base are indicators that employment generation and conserving an inflow of taxes could be very beneficial to the city. It may be useful for policymakers to consider this and focus on suggestions that support local businesses.

Detroit's high unemployment rate is not only due to the lack of employment opportunities, but also because of the low-skilled labor force. Residents have limited access to job skills training and quality education (Reese and Sands, 2007). Tens of thousands of students have left the Detroit public school system, which isn't surprising in light of the very low standardized test scores (Reese et al, 2017). Local government needs to focus on improving educational attainment and skill level to enhance the quality of the labor force. This is a concern more commonly addressed in rural development policies. The Master Plan has several policy suggestions that appear to be influenced by rural economic development, such as increasing opportunities and quality of business education and training, supporting start-ups, providing additional support for working families in the form of child care, transportation, and access to support goods. They also suggest encouraging local institutions to offer training courses for local residents. On the human resource side, the Master Plan suggests increasing additional educational opportunities for several specialized populations such as adults, immigrants, and at-risk youth, along with early childhood development. Educational institutions can be great resources to stimulate the whole community. An economic impact study by Erickcek and Pittelko (2015) revealed that North Central Michigan College generated employment opportunities and training programs, access to higher education, and increased revenue for the region.

The large percentages of vacant households correlate strongly with rural areas. This trait is interesting because although it is a rural characteristic, traditional urban development policies may be more effective for this concern. The APA Policy Guide on Public Redevelopment explains that reusing and redeveloping underused sites is a

practice more commonly found in urban planning but could be very beneficial to rural areas as well. The Master Plan offers several potentially effective ways of turning the blight into functional spaces for the community, such as attracting entrepreneurship. The vast amount of vacant land in Detroit leaves a lot of potential for business development. Improving these spaces in distressed neighborhoods will make them more developable, increasing the opportunity for business investment, and could bring employment opportunities to the residents (Bartik, 2018). These spaces could also be offered to public schools or other community organizations. Officials noted increasing community programs in the Master Plan. If used as community gardens or public green space, neighborhoods would benefit from improved air quality and quality of life from increased natural habitat.

This excess of vacant land is a great example of how traditional urban and rural development policies would need to be combined and adapted to best suit the city. Rural development economics stress the notion that every place should be observed uniquely and should have redevelopment policies specially designed for them. This is true for Detroit as well. There are many factors that set the city apart from other urban areas, including the many rural indicators discussed in this thesis. Detroit may not fit into the definition of a rural place defined by the Census Bureau, but this study infers that the economy and social demographics of this distressed city relate more to a rural place than to an urban one. Thus, officials should be looking toward rural development approaches as an example for economic redevelopment policies.

APPENDIX

APPENDIX

Table A1: Summary Statistics of Rural Indicators in Census Places, FY 2016

	Mean	Standard Deviation	Min	Max
Total Population (people)	13,059	96,304.80	9	8,461,961
Population Density (people per square mile)	1,595.36	1,949.78	1.78	53,766.98
Unemployment Rate	4.20%	2.74	0	34.40%
Mean Household Income	\$64,319.03	34,129.03	\$18,030	\$727,189
Per Capita Income	\$25,904.30	12,621.45	\$3,284	\$261,848
Percent of Population with a Minimum of a Bachelor's Degree	21.11%	15.19	0	92.40%
Residential Vacancy Rate	13.51%	10.57	0	98.40%
Residential Rental Vacancy Rate	6.44%	8.71	0	100%
Industry Composition Rating	1517.45	460.51	906.91	10,000
Employment Share in Manufacturing Industry	13.88%	8.84	0	100%
Poverty Rate among Families	12.05%	9.13	0	100%

Number of Observations: 14,468 places

Table A2: Mean Values of Rural Indicators in Census Places

	Urban	Rural	Detroit
Population Density (people per square mile)	2,435.7 (2,387.4)	978.6 (963.6)	4,925.7 (5,144.3)
Residential Vacancy Rate	10.5 (9.7)	15.7 (13.9)	31.0 (23.4)
Residential Rental Vacancy Rate	- (9.1)	- (10.6)	- (17.6)
Percent of Population with a Minimum of a Bachelor's Degree	27.2 (25.4)	16.7 (15.2)	11.7 (12.9)
Mean Household Income (dollars)	\$71,965.61 (\$66,259.29)	\$58,674.14 (\$52,790.04)	\$37,298.67 (\$37,755.17)
Per Capita Income (dollars)	\$28,016.47 (\$25,920.06)	\$24,341.93 (\$21,841.65)	\$15,472.99 (\$15,064.08)
Industry Composition Rating	1,408 (1,371)	1,598 (1,658)	1,642 (1,740)
Employment Share in Manufacturing Industry	12.4 (12.7)	15.0 (15.5)	14.3 (13.8)

Number of Observations: 14,468 places

Values for FY 2010 in parenthesis

Table A3: Regression Results

	Equation 2	Equation 3	Equation 4
ln(total)	0.330*** (-0.0036)	0.271*** (-0.00481)	-
ln(pcincome)	-	-0.204*** (-0.0338)	-0.770*** (-0.0326)
ln(Indcomp)	-	-0.0932** (-0.0377)	-0.826*** (-0.0343)
manuf	-	-0.00246*** (-0.000842)	-0.00234*** (-0.000908)
vacanthh	-	-0.0178*** (-0.000846)	-0.0270*** (-0.000739)
percbach	-	0.00898*** (-0.000876)	0.0306*** (-0.000802)
Constant	4.414*** (-0.028)	7.680*** (-0.491)	20.46*** (-0.435)
R-squared	0.368	0.406	0.247
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Table A4: Places in Cluster 2 with the Twenty Largest Populations for 2016

Place	Total Population	Population Density
Detroit city, Michigan	683,443	4,926
Laredo city, Texas	251,671	2,831
San Bernardino city, California	214,581	3,625
Brownsville city, Texas	182,110	1,376
Victorville city, California	121,320	1,658
Rialto city, California	102,418	4,582
Flint city, Michigan	98,918	2,960
Hesperia city, California	92,664	1,268
Nampa city, Idaho	87,896	2,818
Gary city, Indiana	77,858	1,561
Pharr city, Texas	75,172	3,210
Perris city, California	73,718	2,348
Madera city, California	63,398	4,015
Pontiac city, Michigan	59,920	3,000
Porterville city, California	58,472	3,321
Delano city, California	52,538	3,673
Elkhart city, Indiana	52,378	2,233
Caldwell city, Idaho	50,288	2,279
Saginaw city, Michigan	49,892	2,878
Pine Bluff city, Arkansas	45,404	1,019

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