

Accounting for Income Mobility in Opportunity

Strategies for improving intergenerational income mobility
for subsidized housing residents in Northeast Ohio
(DRAFT)

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Abstract

Previous studies using data from the Moving to Opportunity project and federal income tax returns have revealed that neighborhood effects on the employment and earning outcomes of residents tend to be gradual, and have a much more significant impact on children than on adults. Despite these findings, however, current measures of neighborhood opportunity do not explicitly account for this kind of ‘long-term opportunity,’ and may be inadvertently steering families into neighborhoods that do not offer the best prospects for the residents and their children in the long-run. This paper uses a series of data indicators to assess the likelihood that neighborhoods in Ohio’s Cuyahoga and Summit counties identified as ‘high-opportunity’ by the Ohio Housing Finance Agency (OHFA) will retain high levels of job accessibility in the near future. We also measure the degree to which these neighborhoods provide the kinds of environment that promote long-term upward income mobility for children, using a mobility index based on the work of Chetty, et al. (2014). Findings indicate that OHFA’s current policies promote income mobility and long-term opportunity primarily by encouraging the production of housing units outside of the urban cores of Cleveland and Akron. While this is an important step, we find that a more explicit strategy for income mobility is necessary to improve outcomes in the region.

Introduction

Place matters. The quality of a neighborhood has been shown to have significant impacts in the quality of life of its residents, influencing outcomes in mental and physical health, safety, educational attainment, and overall happiness.¹ Given the high degree of spatial inequality that separates affluent and low-income neighborhoods across most American cities, the impact of place on wellbeing tends to exacerbate the already severe marginalization of inner-city, low-income, and minority households.²

The complexity and enduring nature of the problem has led scholars, government officials and policy makers to focus efforts on breaking the cycle of disinvestment and marginalization. Part of this effort involved the development of a new concept, first coined by Galster & Killen (1995), that specifically addresses the spatial nature of the issue. The Geography of Opportunity refers to the spatially-determined differences in access to opportunities for, simply put, a better life. This geography is shaped by historical patterns of targeted (dis)investment, racial and economic segregation, sprawl and the economic cycle, and as such can be best visualized at the regional scope, across jurisdictions and commuting zones. When taken at the local level, however, the term describes the variation across neighborhoods in the levels of access to essential neighborhood ‘goods’: affordable housing; a safe and healthy living environment; good edu-

cation; suitable jobs and opportunities for career advancement; accessible social services; adequate urban infrastructure; etc (Wilson, 2005).

This new language of opportunity has been used to inform policy at all levels of government in the past two decades. At the federal level, the US Department of Housing and Urban Development (HUD)’s has since 2010 encouraged local agencies to conduct ‘opportunity mapping’ exercises, which became a requirement in 2015 when HUD unveiled the Affirmatively Furthering Fair Housing rule. The rule requires institutions funded through HUD to address “significant disparities in housing needs and in access to opportunity” and provides data and mapping tools to assist such institutions in meeting this requirement (HUD, 2015). At the local level, cities such as Denver, Portland, Atlanta, Los Angeles and New York city have been early adopters of opportunity or equity mapping as a tool for informing policy (HUD, 2014).

In Ohio, the most significant use of the concept has been the incorporation of an Opportunity Mapping Tool in the Ohio Housing Finance Agency (OHFA)’s 2016-2017 Qualified Allocation Plan (QAP), which determines the policies and procedures for the allocation of Low-Income Housing Tax Credit (LIHTC) funding in the state. The Tool, developed by the Kirwan Institute for the Study of Race and Ethnicity, is one of the most comprehensive opportunity indices produced to date.³ It compiles a series of neighborhood indicators under the three categories of ‘Education’, ‘Job Access and Mobility’, and ‘Environmental Hazards’ to estimate the degree of opportunity for low-income house-

¹ See Darrah & DeLuca (2014), Raphael & Stoll (2011), Green (2015), and Ludwig, et al. (2014).

² A 2011 report from the United States Census Bureau documents this increase in inequality across and within neighborhoods has in recent years. The report also reveals that Cincinnati holds the unfortunate distinction of being home to the country’s most unequal census tract in terms of income distribution, although Ohio fares slightly better than the nation’s average in overall income inequality (Weinberg, 2011).

³ For other recent approaches to measuring opportunity, see: Acevedo-Garcia, et al. (2008); Turner, et al. (2012); HUD (2013); and Dawkins, Jeon, & Pendall (2015).

holds in Ohio's six largest cities. The 2016-2017 QAP encourages the production of new housing in opportunity areas through a point system, and stipulates a set-aside for new unit production in moderate to high opportunity areas (OHFA, 2015).

In this paper, we analyze the expected effects of OHFA's incorporation of the Opportunity Mapping Tool in its Qualified Allocation Plan with a particular focus on employment and income mobility, and make policy recommendations to improve outcomes for low-income households relocating into opportunity neighborhoods as well as for those who stay in low-opportunity areas. In particular, drawing from available data on neighborhood indicators and recent literature on intergenerational income mobility, we examine the spatial distribution and characteristics of places that offer what we call 'long-term opportunity' in Cuyahoga and Summit counties, and analyze the degree to which OHFA's current policies promote access to those places.⁴ 'Long-term opportunity' refers to the benefits that are realized in the long-term by households that reside or move into a neighborhood; it is determined by the expected longevity of positive opportunity indicators at a given neighborhood as well as the intergenerational impact of living in said neighborhood. The next section explores in detail the relevance of such a future-oriented perspective, and defines long-term opportunity explicitly.

⁴ We limit the scope of the paper to the Cuyahoga and Summit counties in Ohio partly as a way to give focus to this preliminary analysis and partly due to restrictions in data availability. Most critically, OHFA has so far only made available tract-level Opportunity Index categorization for those two counties in the Northeast Ohio region.

We guide this study through four key research questions:

1. What does the current geography of opportunity look like?
2. What are the areas of long-term opportunity in the region?
3. How well does the current definition of opportunity account for the long-term aspect of opportunity?
4. How do we maximize long-term opportunity in the region?

The key findings of the study are:

- High-opportunity tracts are both rarer and present overall lower levels of opportunity within Akron and Cleveland than in the surrounding areas
- In spite of this, nearly 60% of LIHTC units in Cleveland are located in high-opportunity areas, benefitting from the concentration of opportunity in and around the city's downtown
- Sharp declines in local competition for low-skill jobs poses a risk to the economic sustainability of several currently high-mobility tracts in Cleveland's inner suburbs
- Intergenerational income mobility, like opportunity, is strongest outside the region's urban cores; 75% of the region's 'high-mobility' tracts are outside the cities' boundaries, while only a fifth of tracts within the two cities can be ranked as 'high' or 'very high' mobility
- 74% of high-opportunity tracts rank 'high' or 'very high' in income mobility for the whole region, but that figure drops to 0% and 16% in Cleveland and Akron, respectively
- Inasmuch as it encourages the production of LIHTC units outside of Cleveland and Akron, OHFA's 2016-2017 QAP is successful in promoting higher levels of income mobility for LIHTC residents, with a few important exceptions

Long-term opportunity: Concept and Methodology

Several systematic initiatives to study and evaluate strategies to promote equality of access have emerged in the last fifty years, in the United States and abroad. Most notably in the U.S., the Gatreux and Moving to Opportunity (MTO) projects have provided researchers with a unique opportunity to assess the impacts that moving to a better neighborhood can have on low-income households.⁵ Findings from an extensive series of studies based on the two programs have confirmed the significant effects of place on the health and wellbeing of residents. However, they have also revealed that the link between neighborhoods and the income, employment and education outcomes of new residents of those neighborhoods are less explicit than the programs' creators had hoped (HUD 2011; Turner, et al. 2012).

The MTO program defined opportunity neighborhoods as those with low poverty rates (less than 10%), and so measures of job access were not directly included when determining where the families enrolled in the experimental group would relocate. The Kirwan Institute addresses this issue in its own definition of opportunity: measurements for existing low- to moderate-paying jobs, access to transit options, commuting time, and availability of child care account for a third of the criteria used to identify high-opportunity neighborhoods (see Appendix Table 1). But the question remains whether, even under this new definition, residents that move from low- to high-opportunity areas experience better employment and income outcomes.

While studies that compared MTO's experimental and control groups found little variation in out-

comes between the two, Clampet-Lundquist and Massey (2008) found significant evidence of neighborhood impact on employment and earnings by measuring the cumulative amount of time residents spent in various neighborhood types. The longer families stayed in low-poverty neighborhoods, the authors found, the more likely were they to experience gains in employment and earnings as well as a decreased dependency on welfare (Clampet-Lundquist & Massey, 2008). This points to an important factor in the efficacy of programs and policies that promote or encourage the relocation of households to higher-opportunity neighborhoods: a neighborhood's future is just as important for new residents as its present. It is necessary, therefore, to consider whether today's opportunity-rich neighborhoods will remain so in the near future.⁶

As mentioned above, the opportunity index referred to in OHFA's 2016 QAP includes a host

⁵ See Duncan & Zuberi (2006) for an overview of both programs, and Stal & Zuberi (2010) for a comparison between MTO and a similar program in the Netherlands.

⁶ Clampet-Lundquist & Massey's findings also reveal the importance of addressing the barriers that prevent families from staying in their new neighborhoods once they relocate. Much has been written about this topic in relation to the MTO program; issues relating to access to transportation, problems with the lease or the landlord, dissatisfaction with the new housing, and the pressures of tight markets have been proposed as reasons that many MTO families moved back to low-opportunity areas shortly after relocation (Pendall, et al. 2014; Turner, et al., 2012b; Briggs, Comey, & Weismann, 2010). The literature on LIHTC residents and their movement patterns is much less robust than the literature on MTO's outcome, however. Conceptual and anecdotal challenges to the success of LIHTC projects are well-documented (see Taylor (2012) and (Wallace, 1998)), and it is possible that many of the same issues mentioned above also apply to LIHTC households. Challenges specific to the LIHTC program are beyond the scope of this paper, however, and we leave to those more familiar with the program the tasks of measuring the length of stay of LIHTC residents and assessing its impacts on the residents' access to opportunity.

of indicators of job accessibility. It does not, however, consider how job accessibility may change over time. In this paper we measure the likelihood that a high-opportunity neighborhood will retain high levels of job accessibility based on two characteristics measured at the tract-level: 1) the change in jobs per capita over recent years, and 2) job accessibility via transit. In the first measure, in order to better reflect the job market for low-income households, we restrict jobs to those that pay low to moderate wages (up to \$3,333 a month) and the population to individuals between 18 and 64 years of age with less than a college degree. In the second measure, we measure job accessibility (again restricting jobs to low- and moderate-paying ones) using the methodology developed by Barkley & Gomes-Pereira (2015): we generated transit networks from General Transit Feed Specification (GTFS) files, modelled commutes between every pair of census tracts in the region, and for each tract added up the number of jobs in tracts within a 90 minute commute.⁷ The most recent U.S. Census data indicates that in Cuyahoga and Summit counties, slightly over four percent of total commuters commute via public transit, but that figure increases

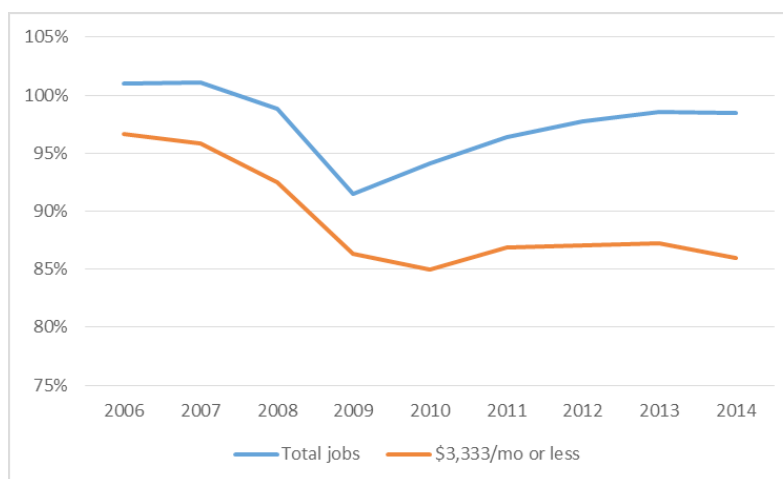
to 7 percent when we consider workers who make less than \$25,000 a year. Transit plays an important role in allowing low-income families in the region to reach employment, which is why we measure job accessibility based on the length of commute via transit.

In both measures, we use the 2011-2014 time-frame to calculate changes in job per capita or industry-specific job growth. This specific time-frame was chosen because job growth stabilized in the region in 2011 following the Great Recession (see Figure 1), and 2014 is the most recent year for which the Census Longitudinal Employment-Household Dynamics (LEHD) data is available.

Building onto the work of Clampet-Lundquist and Massey, Chetty, Hendren and Katz (2015) found that while moving to low-poverty neighborhoods brought little economic benefit for adults, children that spent their formative years in such neighborhoods had markedly better employment and earnings outcomes in their adult life than children that remained in high-poverty areas or those that were already in their teenage years when their families moved. Their findings suggest that relocation programs should pay careful attention to how the selected target neighborhoods affect young children in particular. Beyond assessing the

⁷ See Appendix A in Barkley & Gomes-Pereira (2015) for a detailed methodology.

Figure 1: Number of jobs by wage level as a percentage of 2005 levels, Cuyahoga and Summit counties



Source: LEHD Workplace Area Characteristics 2005-2014, US Census Bureau

near-future employment prospects of opportunity neighborhoods, therefore, in this paper we also measure the degree to which these neighborhoods offer the kinds of opportunities that enable children to maximize the benefits from the move.

Here we draw from the earlier work of Chetty, et al. (2014), where the authors crossed income tax data with several neighborhood-level indicators to identify particularly significant correlates of intergenerational mobility. The authors found five variable categories that showed strong correlation with upward mobility: residential segregation, income inequality, quality of early education, social capital, and family structure. Then, by isolating the most significant variables within each category, the authors identified five neighborhood characteristics that together account for 76 percent of the variance in upward mobility across all neighborhoods (Chetty, et al., 2014). While the study's findings do not suggest a causal effect between the identified variables and intergenerational income mobility, the strong correlation allows us to identify which neighborhoods are likely to provide the kind of environment and services that allow for an above-average upward mobility in the Cuyahoga-Summit region.

In order to evaluate the effects of each census tract on intergenerational mobility in a holistic manner, we combined the variables into a 'mobility index' following the methodology used by the Kirwan Institute in calculating the opportunity index.⁸ Each variable was normalized across all tracts by converting them into z-scores, which were then combined into a single measure of upward mobility. Whereas Kirwan Institute's opportunity index averages the various z-scores to obtain the final opportunity value for each tract, however, we weighted each z-score based on the raw calculated correlation of the corresponding variable with upward mobility, as per Chetty, et. al (2014). That way,

⁸ As seen in Reece, et al. (2010)

we ensure that variables that are better predictors of upward mobility have a relatively larger influence in the overall mobility index value of each tract. Finally, following OHFA's approach in the 2016-2017 QAP, in this paper we label tracts on the upper three quintiles of the mobility index as 'high-mobility', and those in the lower two as 'low-mobility' tracts.

Because some of the data used by Chetty, et. al are only available at the county level, however, in three occasions we had to substitute a proxy variable for the one used in the study. Where possible, we substituted variables that were also included in the study so that we had estimates for the correlation between the proxy variable and upward mobility, and were thus able to weigh the final index score appropriately. Where this was not possible, which was only the case in the social capital category, we used the closest available proxy and weighed that category's z-score using the correlation value of the original variable. Table 1, below, lists the five variables identified by the study, the proxy variable we used where necessary, and the correlation value used to weigh the z-score of each category, and explanatory notes on each variable.⁹

⁹ Negative correlations indicate an inverse correlation between a variable and intergenerational mobility. Only the absolute values of each variable's correlation were used in calculating the combined mobility index. See Appendix Table 2 for explanatory notes on the methodology used and rationale for the variables chosen.

Table 1: Mobility Index Variables

Variable Category	Variable used in Chetty, et al., 2014	Proxy variable	Correlation with mobility
Residential Segregation	Fraction of workers with commute <15 mins	N/A	0.605
Income Inequality	Gini coefficient for the bottom 99% income share	Gini coefficient (including the top 1%)	-0.578
Early Education	High School dropout rate (income adjusted)	Test Score Percentile (income adjusted)	0.588
Social Capital	Social Capital Index as calculated by Rupasingha and Goetz (2008)	Total Crime Index, calculated by Applied Geographic Solutions	-0.380
Family Structure	Fraction of households with children headed by single mothers	N/A	-0.764

Source: Chetty, et al., 2014

In the sections that follow, we address each of the four key research questions listed above. We rely on the forementioned data on future job accessibility and the mobility index, in addition to data from HUD and the U.S. Census, to evaluate the state of opportunity and long-term opportunity in Cuyahoga and Summit counties, and present rec-

ommendations for improving long-term outcomes, particularly in employment and earnings, for low-income households in the region. Lastly, data on the size and location of existing LIHTC units in the region was obtained from OHFA's Compliance Tool, and is current as of 2011.

What does the current geography of opportunity look like?

Distribution of opportunity

In its 2016-2017 QAP, OHFA defines high-opportunity tracts as those identified as tracts of moderate, high, or very high opportunity by Kirwan Institute’s Opportunity Index. By definition, 60 percent of all tracts in Cuyahoga and Summit counties are high-opportunity tracts under the Index, since the final scoring was based on quintiles. These tracts are primarily located outside of the municipal boundaries of the region’s two largest cities, Cleveland and Akron – nearly 75 percent of all high-opportunity in the region tracts lay outside these cities’ borders. Conversely, 63 percent of the low-opportunity tracts in the region are within the cities’ borders, which results in a high proportion of low-opportunity tracts within each city: 60

percent of total tracts in Cleveland, and 68 percent in Akron, are low-opportunity tracts (see Appendix Figure 1).

Besides being rarer, high-opportunity tracts within Cleveland and Akron also exhibit overall lower levels of opportunity than those in other parts of the region. Within Cleveland and Akron, over half of the tracts that qualify as ‘high-opportunity’ in the QAP are in fact ranked as ‘moderate’ in the Opportunity Index. That figure drops to 27% for the tracts outside the two cities (henceforth referred to as ‘suburban tracts’), revealing that the highest levels of opportunity are found primarily outside of Cleveland and Akron, in areas that are both wealthier and less dense than the city cores (see Table 2).

Table 2: Distribution of Opportunity in the Cuyahoga and Summit counties region

Geography	Total Tracts ¹⁰	Median Income	Density (residents/acre)	% High-Opportunity tracts ¹¹	% of High-Opportunity Tracts ranked as Moderate
Cleveland	172	\$28,613	10.85	40%	49%
Akron	60	\$37,785	6.49	32%	58%
Urban ¹²	232	\$31,735	9.37	38%	51%
Suburban	342	\$61,689	5.54	75%	27%
Region	575	\$51,910	6.79	60%	33%

Sources: American Community Survey 2010-2014, US Census Bureau; Ohio Housing Finance Agency

¹⁰ Cuyahoga and Summit Counties have a combined 579 Census tracts, but four of those were removed from the dataset due to gaps in the data.

¹¹ Includes tracts ranked as moderate, high, and very high opportunity tracts.

¹² ‘Urban’ refers to all tracts inside the Cleveland and Akron municipalities, whereas ‘suburban’ refers to tracts outside those city boundaries. The political boundaries of each municipality provide an imperfect proxy for the definition of urban versus suburban (or inner versus outer) neighborhoods. However, municipalities (or Census ‘places’) are the only Census-defined set of boundaries that groups tracts at a small enough scale to allow us to look at infra-county differences in opportunity. As Table 3 indicates, furthermore, there is a marked difference in both density and income between ‘urban’ and ‘suburban’ tracts. This definition therefore correctly accounts for at least some of the variation we were hoping to capture.

This disparity in opportunity levels within ‘high-opportunity’ tracts also emerges from a comparison of neighborhood-level data. Table 3 below compares indicators of opportunity for high-opportunity tracts in Cleveland, Akron and suburban tracts. Suburban high-opportunity tracts perform substantially better in school proficiency, median income, vacancy rates, and poverty rates than those within city boundaries, although the latter show slightly better figures for commute times and number of medium- and low-wage jobs. It is also noteworthy that high-opportunity tracts in Cleveland perform worse across all indicators than those in Akron, indicating a disparity in opportunity between the two cities.

It appears therefore that opportunity is heavily concentrated outside the region’s urban cores. Nearby towns such as Lakewood, Cleveland Heights and Cuyahoga Falls are more likely than

Cleveland and Akron to present its residents with the kinds of educational, employment and environmental characteristics that the Kirwan Institute has identified as positive indicators of opportunities. Table 3 further suggests that this disparity is closely tied to the concentration of poverty in inner cities and the spatial disparities in income and educational quality across the area. However, a closer look at the geography of opportunity reveals areas of high-opportunity within both Cleveland and Akron, particularly near the downtown areas. Specifically, Appendix Figure 2 shows that although school quality, income, poverty levels and vacancy rates improve as one moves away from urban areas in the Northeast Ohio (NEO) region, other indicators factored in the calculation of opportunity – such as access to low-income jobs and Early Childhood Care (ECE) Centers, and commute times – are significantly better within urban cores.

¹³ These indicators were based on the criteria used by Kirwan Institute, listed in Appendix Table 1, and are meant to reflect the three main areas of opportunity identified by the Institute: Education, Job Access and Mobility, and Environmental Hazards.

Table 3: Neighborhood Indicators for High-Opportunity Tracts

	School Proficiency Index (FHEA) ¹⁴	Median Income	Number of Jobs (\$3,333/month or less)	Mean Commute Time	Vacancy Rate	Poverty Rate
Cleveland	21	\$31,292	1,489	23 mins	18%	32%
Akron	36	\$42,695	1,805	20 mins	16%	19%
Urban	26	\$34,707	1,583	22 mins	18%	28%
Suburban	63	\$65,614	1,457	24 mins	8%	8%
Region	56	\$59,429	1,482	23 mins	10%	14%

Sources: Fair Housing Equity Assessment 2013, US Dept. of Housing and Urban Development; American Community Survey 2010-2014, US Census Bureau

¹⁴ The School Proficiency Index, developed by HUD as part of the Fair Housing Equity Assessment, measures students’ performance in reading and math state tests, and is aggregated at the school district level (HUD, 2013).

Opportunity for LIHTC residents

This ‘pocket’ of opportunity around the downtown area is good news for residents of LIHTC-subsidized housing in Cleveland. Although the city’s high-opportunity tracts present, as we have seen, lower levels of opportunity than those in Akron, LIHTC units are more likely to be located in high-opportunity tracts in Cleveland than in Akron. While only 40 percent of tracts in Cleveland are high-opportunity tracts, the concentration of LIHTC units near downtown means that nearly 60 percent of those units are located within a high-opportunity tract.¹⁵ In Akron, only 35 percent of LIHTC units are in high-opportunity area, which is only slightly higher than the fraction of high-opportunity tracts in the city as a whole (32 percent). The picture is even less promising for LIHTC units outside of Cleveland and Akron, however. Although 75 percent of all suburban tracts are high-opportunity ones, only 28 percent of LIHTC units outside the two cities are within high-opportunity areas (see Appendix Figure 1).

¹⁵ This effect is due in large part to the fact that LIHTC developments near downtown are built at a relatively higher density; according to LIHTC developments in high-opportunity areas in Cleveland average 108 units per property, versus 54 units per property in low-opportunity areas. The same effect does not take place in Akron, where developments in both high- and low-opportunity areas average between 62 and 64 units per property. On average, LIHTC units in Cuyahoga county are 4.9 miles away from the population-weighted centroid of Cleveland; in Summit county, the units are an average of 2.7 miles from the centroid of Akron.

Opportunity, as we noted above, is located largely outside Cleveland and Ohio when we consider the broader definition of the term (namely, the aggregated index). But not all aspects of opportunity follow this trend; tracts within the urban cores fare relatively better in regards to indicators of job opportunity. Furthermore, as our analysis of the location of LIHTC units reveals, the heterogeneity of opportunity within the two cities means that the divide between the outside and inside of city boundaries may matter less than the particular neighborhoods in which homes get built. Opportunity indicators that are aggregated within a single index, or at higher geographic levels than the neighborhood/tract, thus run the risk of masking nuances in the distribution of opportunity within a region, a point to which we will return in section IV. For now, we will shift lenses to look at the ‘geography of mobility’ in the region – that is, how indicators of intergenerational income mobility are distributed within the two counties.

What are the areas of long-term opportunity in the region?

We divide long-term opportunity into two aspects: the prospects of a neighborhood regarding job accessibility in the future, and its potential for promoting intergenerational income mobility. These are only two possible measures of the long-term effects of moving to a neighborhood, but were chosen due to MTO's observed failure to promote better employment outcomes as well as studies that suggest employment outcomes are more likely to be affected in the long-run, and the recent emphasis on intergenerational income mobility in the literature (Turner, et al., 2012; Clampet-Lundquist & Massey, 2008; Chetty, et al., 2014).

Prospects for future job accessibility

The Kirwan Institute's Opportunity Index includes in its criteria a measure for the number of low- and medium-wage jobs available to potential movers in a neighborhood, but it tells us little regarding how we can expect that job availability to change once those families move in. There are two primary ways in which job availability can change for residents in a neighborhood: the number of jobs available may change, or the competition for existing jobs may change. In the following analysis, we look at indicators for both factors across Cuyahoga and Summit counties to identify areas of the region where job availability has increased or decreased significantly between 2011 and 2014, as well as areas that present a promising industry mix for future job growth. It is important to note that this analysis is limited to a superficial look at prospects of future job availability in the region. Rather than predict actual changes in jobs and population, our intention is to conduct an overview of current employment and demographic trends in the region. This overview will provide the basis for our assessment, in the next section, of whether current housing mobility policy is effectively directing residents

to areas of good future job prospects.

As Figure 1 shows, the bi-county region has seen a modest (2.3 percent) increase in overall number of jobs between 2011 and 2014. This has been primarily driven by high-paying (over \$3,333/month) jobs, however, as low- to moderate-paying jobs (\$3,333/month or less, representing nearly 60 percent of the jobs in the region) have dropped by 1.0 percent in the same period. Mirroring this pattern, the population in the region with less than a college degree has decreased by 1.4 in the 2011-2014 period, while the population with a college degree or higher increased by 4.4 percent. These paralleling trend have resulted in very minimal change (-0.05 percent) in jobs per capita in the region between 2011 and 2014. When we narrow the analysis down to low- and moderate-paying jobs and the fraction of the population with less than a college degree, however, the picture changes somewhat.¹⁶ Due to a faster rate of decrease in jobs than in population in Cleveland and Akron, jobs per capita in the two cities combined has decreased by 0.37 percent. Meanwhile, the trend is reversed outside the two cities resulting in a 0.57 percent increase in jobs per capita in the surrounding region (see Figure 2).

¹⁶ In the remainder of this section, unless otherwise noted, 'jobs' will be used to refer to jobs paying \$3,333/month or less, 'population' will refer to residents over 17 with less than a college degree, and 'jobs per capita' will refer to the former divided by the latter.

Figure 2: Percent changes in Jobs by Wage and Population by Education Attainment, 2011-2014



Sources: American Community Survey 2007-2011 and 2011-2014, US Census Bureau

Drilling down to the tract-level, we find that growth and decline in both jobs and population are concentrated in particular areas of the region. The east edge of Cleveland, especially around University Circle, has seen both a large drop in population with less than a college degree and a steep increase in the number of jobs paying \$3,333/month or less, perhaps indicative of gentrification taking place in the area.¹⁷ In turn, both Akron’s and Clevelanown-town areas have seen an increase in that population, while low- to moderate-paying jobs have decreased sharply in Cleveland’s southwestern edge, around downtown Brooklyn, Old Brooklyn and Parma, likely influenced by an overall decline in retail business in the region (Bullard, 2015) These trends have combined to promote a large increase in jobs per capita in along Cleveland’s eastern edge, in southwestern Akron, and in several outer suburbs of Cleveland (see Appendix Figure 3).

The availability of suitable jobs withing a res-

¹⁷ See Smith (2014).

ident’s neighborhood is no doubt important. A 1998 study of unemployment in Chicago found that the number of low- and moderate-skilled jobs within a two-mile ratio of a residential zone has a significant, if modest, impact on employment rates (Immergluck, 1998). In addition, several studies on spatial mismatch have found a relationship between job proximity (or job accessibility) and employment outcomes.¹⁸ However, an analysis of 2014 Origin-Destination commuting data from the U.S. Census LODES dataset shows that of all workers that live and work in the region, only 3 percent live and work in the same tract. Additionally, in the region over 30 percent of all workers and 79 percent of workers that commute via transit have a commute of thirty minutes or longer. This points to the importance of having jobs (presently or in the future) not only within one’s neighborhood, but also within reasonable reach by commute from

¹⁸ See Rogers (1997) and Allard & Danziger (2003) for examples, and Kain (1992) for a review of three decades of studies on the topic).

one's residence.

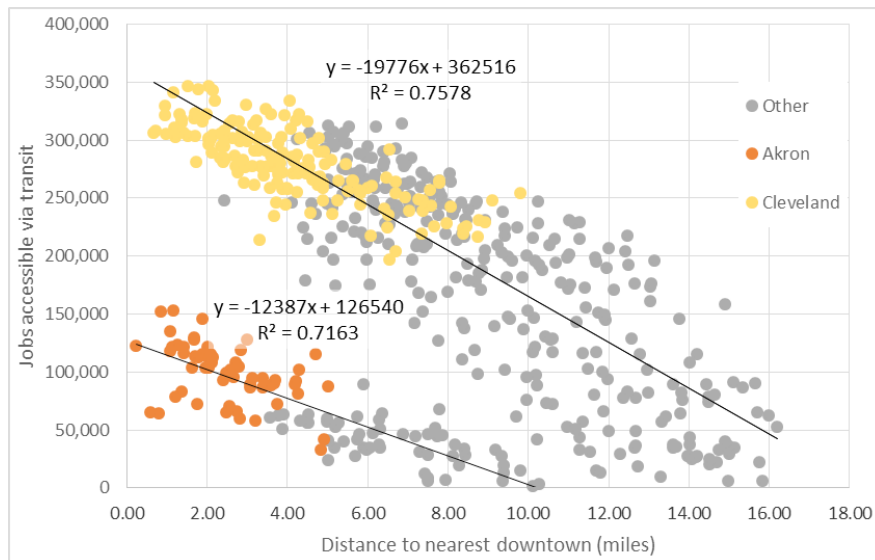
To address this question, we turn to the methodology used in Barkley & Gomes-Pereira (2015) to assess, for each tract, the degree of accessibility to low- and moderate-paying jobs throughout the region. This is not explicitly a measure of the potential for future job accessibility, since it only takes into account jobs as they existed in a fixed point in time (in this case, the year of 2013). However, assuming that existing job centers and major patterns of employment concentration do not easily change over time, job accessibility today provides a good estimate of job accessibility in the future.

Analyzing job accessibility at the county level in the Northeast Ohio region, Barkley & Gomes-Pereira found that low-skill jobs are the least accessible across the entire region but, differing from the less urban counties in the region, in Cuyahoga and Summit counties residents in low-income and minority neighborhoods have generally better access to jobs than the rest of the population (Barkley & Gomes-Pereira, 2015). Examining accessibility at the tract level, we can gain a better understanding of this dynamic. Low- and

moderate-paying jobs in Cuyahoga and Summit counties are concentrated in two kinds of locations: within or near the downtowns of Cleveland and Akron, or along the inner suburbs of either. The distribution of transit options follows a similar pattern, creating a strong transit network that links the inner neighborhoods of both cities, where low-income and minority populations are concentrated, to a majority of low-skill jobs in the region (see Appendix Figure 4).

The average Cleveland resident can access 276,847 low- or moderate-paying jobs within a 90 minute transit commute, but the lower intensity of economic activity in Akron means that the average resident there can access only 94,882 jobs. Looking at the suburbs as a whole, residents outside of the two cities can access 132,575 jobs on average. However, accessibility declines sharply as we move away from the inner suburbs of either city. Workers in Garfield Heights and Cleveland Heights can access as many as 247,000 jobs, whereas workers in Hudson and Brecksville, with fewer transit options and smaller job concentrations, are within reach of under 60,000 jobs. Figure 3, a plot of every tract's job accessibility on its distance from the nearest

Figure 3: Jobs Accessible by Distance to nearest Downtown



Sources: American Community Survey 2007-2011 and 2011-2014, US Census Bureau

downtown, shows the positive effect that living near Cleveland’s or Akron’s downtown areas has on job accessibility, as well as the stronger effect of the former city relative to the latter.¹⁹ On average, for every mile of distance away from downtown Cleveland, residents lose access to 19,776 jobs, whereas for every mile away from downtown Akron residents lose access to 12,387 jobs.

Access to low- and moderate-paying jobs via transit is thus highest in areas around either city’s center, but the larger job market in Cleveland means that nearby suburbs benefit from a large pool of jobs accessible via transit within a reasonable time as well. However, we have also seen that locally the competition for such jobs can be volatile: as certain areas gentrify, they gain jobs but lose population; other areas have suffered from a decline in retail, and lost large percentages of job opportunities without a comparable decline in resident workers. As we will see in the next section, the regional variations in both the competition for and access to jobs have important implications for housing policy. But before turning to that question, we complement this picture of long-term opportu-

nity with an analysis of how intergeneration income mobility varies across the region.

Intergenerational income mobility

The above-cited study on intergenerational mobility found that the Cleveland communiting zone (or CZ, defined as geographical aggregations of counties that cover the entire country, including rural areas) ranks 40th out of the 50 largest metropolitan areas in the country in income mobility (Chetty, et al., 2014). While this finding is enough to raise warnings signs, it does not tell the whole picture regarding the geography of mobility in the region. Examining indicators of mobility at the tract level, we find that the two-county region is highly segregated in terms of intergenerational mobility. In contrast with the nuances we identify above in the distribution of opportunity across Cuyahoga and Summit counties, the geography of mobility in the region is unequivocally dictated by the urban/suburban divide. ‘High-mobility’ tracts (including moderate mobility tracts) outside of Cleveland and Akron account for over 80 percent of the total, with over 60 percent of those tracts ranking in the ‘high’ or ‘very high’ mobility levels. Within Cleveland and Akron, high-mobility tracts account for only 25 percent of the total – and nearly 80 percent of those rank as ‘moderate’ mobility tracts (see Table 4).

¹⁹ Distance from downtown was measured as the distance from each tract’s centroid to the population-weighted centroid of either Cleveland or Akron (whichever was closest)

Table 4: Distribution of Mobility in the Cuyahoga and Summit counties region

Geography	Total Tracts	% High-Mobility tracts ²⁰	% of High-Mobility Tracts ranked as Moderate
Cleveland	172	9%	94%
Akron	60	72%	74%
Urban	232	25%	80%
Suburban	342	84%	23%
Region	575	60%	33%

Sources: American Community Survey 2007-2011 and 2011-2014, US Census Bureau

²⁰ Includes tracts ranked as moderate, high, and very high opportunity tracts.

Although the primary divide in mobility takes place between ‘urban’ and ‘suburban’ tracts, the prospects of income mobility also vary in important ways within and between the two cities. Comparing the two cities, Cleveland emerges as lagging considerably behind in terms of income mobility. Table 4 shows some of this disparity; Akron’s share of high-mobility tracts of 72 percent is larger than regional average (although with a much higher concentration of ‘moderate’ mobility tracts), but Cleveland’s share is six times lower, at 9 percent. Perhaps most strikingly, out of sixteen ‘high-mobility’ tracts in Cleveland, only a single one ranks above moderate – located immediately south of the University Circle (see Appendix Figure 5). Another indicator of the disparity in income mobility between Cleveland and the surrounding region is the fact that 47 of the 50 census tracts with the lowest score in our weighed mobility index are within the city’s boundaries. It is likely, therefore, that the city of Cleveland is the primary driver for the low level of mobility Chetty, et al. have found in the larger Cleveland Commuting Zone.²¹

Just as was the case with the Opportunity Index, however, our aggregated mobility index masks some crucial nuance in the distribution of mobility across the region. A separate analysis of each of the five indicators used to compose the index reveals that while some indicators do place mobility squarely outside Cleveland and Akron’s boundaries, the two cities are not very different from the rest of the region in other aspects. Table 5, below, provides averages for each indicator for both total and

high-mobility tracts in the relevant geographies.²²

Both the incidence of crime and the rate of households led by single mothers are heavily concentrated within Akron and Cleveland; their combined average tract would rank in the bottom 25rd percentile in estimated crime rate in the region, and over half of households with children in the two cities are headed by single mothers. These figures look worse if we consider Cleveland alone, where the average tract ranks in the bottom 15th percentile in the region, and nearly 60% of households with children are headed by single mothers. Income-adjusted school performance also trends upwards as one leaves the cities towards the surrounding region (with the important exception of school zones near downtown Akron, which perform as well or better than those in the surrounding suburbs). Income inequality as measured by the Gini coefficient, however, does not show a clear divide between ‘urban’ and ‘suburban’ tracts. Additionally, as we would expect, commutes are shorter, on average, for residents within the two cities, particularly near downtown areas (see Appendix Figure 6).

Another way to parse this data is to consider the effect that moving away from either city’s downtown has on each indicator and on the aggregate mobility measure. This was done similarly to the above analysis of the effect of downtown proximity on job accessibility (see Figure 3). Here, we use absolute values for each of the indicators instead of grouping them into ‘very low-mobility’ to ‘very-

²¹ In order to analyze the effect that weighing each indicator according to its correlation with income mobility had on the overall index, we re-calculated the index without weighing the variables, taking instead simple averages of the z-scores of each variable. The resulting index does not differ substantially from the original: tracts within Cleveland still show much lower levels of mobility than both Akron and the region as a whole, whereas Akron has a slightly higher rate of high-mobility tracts than the region as a whole, albeit with a much higher concentration of moderate-mobility tracts.

²² Values for the Income-Adjusted School Performance and Total Crime Index indicators in Table 6 are given as the percentiles to which the average tract in each geography corresponds, rather than a simple average value for all tracts within each geography. This was necessary because the two indicators consist of normalized data, and as such are of more value in relative (how each tract performs in relation to the others) than absolute terms. High percentiles mean relatively high-performing schools or low estimated crime rates. Average values for all indicators were weighed by tract population.

Table 5: Averaged Mobility Indicators for Cuyahoga and Summit counties Census Tracts

Geography	% of Commutes under 15 mins	Gini Coefficient	Income-adjusted School Performance (percentile)	Total Crime Index (percentile)	% of HHs with Children Headed by Single Mothers
Cleveland	23%	0.467	20	15	59%
Akron	34%	0.432	48	37	48%
Urban	27%	0.455	30	25	55%
Suburban	25%	0.408	67	67	24%
Region	25%	0.424	58	45	34%

Sources: American Community Survey 2014-2010, US Census Bureau; National Geospatial Data Asset, US Data; Fair Housing and Equity Assessment Tool, US Dept. of Housing and Urban Development; Ohio Department of Job and Family Services.

high mobility’ categories, which allows for a better understanding of the variation within each indicator (see Appendix Figure 7). Albeit weak in most cases (R-square values vary between 0.02 and 0.32), the relationship between several of the indicators and distance to the nearest downtown presents some degree of linearity in several cases. In particular, the rate of households with children headed by single-mothers ($R^2 = 0.288$) and the aggregated mobility score ($R^2 = 0.268$) show distinctive trends, with the former decreasing and the latter increasing as we move away from the two downtowns. On the other hand, the rate of short commutes does not show a clear correlation with distance from downtowns, while income-adjusted test scores and income inequality vary only slightly with distance, with R-square values under 0.15. Lastly, the plot of (estimated) crime rating reveals the clear separation we noted above between the relatively high-crime tracts in Cleveland and Akron and the low-crime tracts outside the two cities.

Long-term Opportunity for LIHTC residents

As mentioned in the previous section, LIHTC units in both counties are concentrated within the urban cores. This characteristic directly impacts the long-term opportunity that residents of current LIHTC units are exposed to, but in contradictory ways (see Table 6, below). Across the region the number of jobs per capita is relatively higher, on average, for tracts where LIHTC units are located, but in all cases that number has decreased significantly between 2011 and 2014. Of particular concern is the fact that jobs per capita for the tract of the average LIHTC unit has decrease the fastest (by nearly 14 percent in three years) in the suburbs, where it the levels are lowest in the region. On the other hand, the centrality of LIHTC units provide them with higher-than-average access to jobs via transit; this is particularly visible in the suburban area, where the average LIHTC unit can access nearly 60 percent more jobs than residents in the average suburban tract.

Table 6: Long-term Opportunity indicators for LIHTC residents

		Jobs per Capita (JpC)	%Δ JpC, 2011-2014	Jobs Accessible	% Commutes <15 mins	Gini Coefficient	School Rank	Crime Rank	% Single Mothers	% High Mobility
Cleveland	Total	0.54	-0.7%	276,847	22.9	0.47	20%	85%	59%	9%
	LIHTC	1.46	-1.6%	296,776	22.5	0.49	40%	78%	70%	7%
Akron	Total	0.44	-0.5%	94,882	34.1	0.43	48%	63%	48%	70%
	LIHTC	0.62	-9.7%	103,346	32.2	0.49	62%	64%	65%	40%
Urban	Total	0.51	-0.7%	214,912	26.7	0.45	30%	75%	55%	25%
	LIHTC	1.26	-2.7%	249,019	24.9	0.49	46%	74%	69%	15%
Suburban	Total	0.60	0.9%	136,575	24.5	0.41	67%	33%	24%	84%
	LIHTC	0.45	-13.9%	214,396	24.3	0.51	54%	56%	53%	25%
Region	Total	0.57	0.4%	162,187	25.2	0.42	58%	55%	34%	60%
	LIHTC	1.05	-4.0%	240,391	24.8	0.50	48%	70%	65%	18%

Sources: American Community Survey 2007-2011 and 2011-2014, US Census Bureau; 2012 Compliance Tool, Ohio Housing Finance Agency; CrimeRisk 2016, Applied Geographic Solutions; Global Report Card, George W. Bush Institute.

In terms of mobility, we again see conflicting trends emerge as a result of LIHTC units' proximity to the downtown areas. Commutes and income inequality are better or very similar to the levels we see in the average tract across all geographies. While income-adjusted school performance is worse than average for LIHTC units in suburban tracts, it is significantly better than average for LIHTC units within Akron and Cleveland. This is likely due to the concentration of LIHTC units on the east side of Cleveland and in downtown Akron, where schools rank higher than in the rest of the urban area (see Appendix Figures 5 and 6). The es-

timated crime rate and the rate of households with children headed by single mothers, on the other hand, are worse than average for LIHTC units in nearly every geography – the only exception being crime rate in Cleveland, where LIHTC units fare slightly better than average. Lastly, the combined effect of the indicators results in lower-than-average overall rates of intergenerational income mobility for LIHTC units. The disparity is greatest in Akron and in the suburbs, however, since Cleveland on the whole has a low number of tracts that rank as high mobility.

How well does the current definition of opportunity account for the long-term aspect of opportunity?

Having established where opportunity is located and how it is distributed across the region, and having also identified the geography of ‘long-term opportunity’ in the region, we are now in a position to compare the two geographies. Our aim in this section is to assess the degree to which the 2016 QAP has the potential to allocate residents in neighborhoods where they and their families can thrive in the long run, and provide policy recommendations for fine-tuning this process in order to maximize the long-term benefits of relocating, or providing incentives for the relocation of, low-income families in Cuyahoga and Summit counties.

Opportunity and future job prospects

As we have seen, drastic changes in the jobs per capita ratio over the 2011-2014 period have been limited to particular areas – such as around the University Circle area or in Akron’s southwestern neighborhoods – rather than in well-defined spatial patterns across the region. The performance of high-opportunity tracts in this regard is thus mostly dependent on whether the tracts fall within such areas, but the aggregate figures presented in Table 7 below reveal a few discernible patterns.

As a general trend, tracts in the urban cores that rank as ‘high’ or ‘very high’ in opportunity experienced relatively high percentage losses in jobs per capita: 2.4 percent in Cleveland and 5.2 percent in Akron, although in both cities the inclusion of ‘moderate’ opportunity tracts results in a smaller loss in jobs per capita. This loss is a result of both a net loss in jobs and a higher gain (or smaller loss) in population than low-opportunity urban tracts. In suburban tracts, on the other hand, low-opportunity tracts have seen one of the highest (4.7 percent) losses in jobs per capita in the region, while small job gains and simultaneous population losses have led to net positive changes in jobs per

capita in ‘high’ and ‘very high’ opportunity suburban tracts.

In both the cities and the suburbs, however, high-opportunity tracts have a much higher number of jobs per capita than low-opportunity ones. In the region as a whole, high and very high-opportunity tracts have nearly four times (or three times if moderate tracts are included) as many jobs per capita as low-opportunity ones. It is unlikely, therefore, that the recent shifts in jobs per capita will have a significant impact on the overall distribution of opportunity in the region in the near future. There are particular high-opportunity tracts, however, that merit particular attention – we will examine those at the end of this section.

Shifting to job accessibility, the regional trends we identified above hold largely true regardless of opportunity level; tracts within Cleveland have the highest access while those in Akron have the lowest, with suburbs falling somewhere in the middle. The only noteworthy variation in this respect happens in suburban tracts: ‘high’ and ‘very high’ opportunity tracts can access on average nearly 50,000 less jobs than low-opportunity suburban tracts (see Table 7). This difference stems largely from a disparity between ‘inner’ versus ‘outer’ suburbs: low-opportunity suburban tracts are an average of 7.6 miles away from the nearest downtown, compared to 9.8 miles for ‘high’ and ‘very high’ opportunity tracts. In the case of suburban LIHTC units, then, it is possible that OHFA’s guidelines for the 2016-2017 QAP may be steering households away from areas of high job accessibility. But given the above-mentioned higher ratios of jobs per capita in high- versus low-opportunity suburban tracts, any negative changes in job accessibility would be at least somewhat offset by the higher job densities in the high-opportunity tracts.

Table 7: Future Job Prospects by Opportunity Level

	Level of Opportunity	Count	%Δ Jobs per capita (2011-2014)	%Δ Pop. less than college degree (2011-2014)	%Δ Jobs paying ≤ \$3,333/mo (2011-2014)	Jobs per Capita (2014)	Avg. low- to moderate-wage jobs accessible
Cleveland	All	172	-0.7%	-2.6%	-3.2%	0.54	276,847
	High or very high	35	-2.4%	-0.7%	-3.1%	1.62	290,451
	Moderate to very high	68	-0.1%	-2.2%	-2.2%	0.94	281,492
	Low or very low	104	-3.3%	-2.9%	-6.1%	0.24	273,258
Akron	All	60	-0.5%	-0.3%	-0.8%	0.44	94,882
	High or very high	8	-5.2%	2.3%	-3.0%	0.98	95,192
	Moderate to very high	19	-4.7%	2.2%	-2.6%	0.80	92,105
	Low or very low	41	4.4%	-1.7%	2.6%	0.24	96,451
Urban	All	232	-0.7%	-1.8%	-2.6%	0.51	214,912
	High or very high	43	-3.2%	0.1%	-3.1%	1.45	239,811
	Moderate to very high	87	-1.5%	-0.9%	-2.3%	0.90	224,783
	Low or very low	145	-0.6%	-2.5%	-3.1%	0.24	208,040
Suburban	All	341	0.9%	-1.2%	-0.2%	0.60	136,575
	High or very high	188	3.4%	-1.7%	1.6%	0.84	118,537
	Moderate to very high	257	1.7%	-1.2%	0.4%	0.72	128,141
	Low or very low	84	-4.7%	-1.0%	-5.7%	0.25	169,658
Region	All	574	0.4%	-1.4%	-1.0%	0.57	162,187
	High or very high	231	1.8%	-1.4%	0.3%	0.95	135,143
	Moderate to very high	344	0.7%	-1.1%	-0.4%	0.76	147,482
	Low or very low	229	-2.3%	-1.9%	-4.2%	0.24	192,113

Sources: American Community Survey 2007-2011 and 2011-2014, US Census Bureau; LEHD Workplace Area Characteristics 2014, US Census Bureau; Ohio Housing Finance Agency

Opportunity and income mobility

The good news is that high opportunity tracts across the region score better on income mobility indicators than low opportunity ones, indicating that there is some synergy between the two measurements of opportunity: as OHFA nudges the construction of new LIHTC units towards high-opportunity areas, it is also largely pushing them towards high-mobility areas. For the whole region, 74 percent of high-opportunity tracts also exhibit high (i.e. moderate to very high) levels of mobility, although that figure drops to 55 percent if we remove

tracts with moderate mobility. Within the urban cores, high-opportunity tracts present smaller rates of single mother-led households, marginally better rates of short commutes and income inequality, similar levels of crime, and slightly worse school rankings. Outside the two cities, the dynamic is largely similar, although here schools in high-opportunity tracts rank slightly higher than those in low-opportunity ones (see Table 8).

The bad news is that the remaining 36 percent of high-opportunity tracts, those that rank as low or very low mobility, are heavily concentrated within

Table 8: Mobility Indicators by Opportunity Level

	Level of Opportunity	Count	% Com-mutes <15 mins	Gini Coeffi-cient	School Rank	Crime Rank	% Single Mothers	% High Mobility	% High Mobil-ity (excluding moderate)
Cleveland	All	172	22.9	0.467	20%	85%	59%	9%	1%
	High or very high	35	29.5	0.493	16%	81%	54%	14%	0%
	Moderate to very high	68	27.3	0.475	16%	83%	52%	15%	0%
	Low or very low	104	19.5	0.460	23%	86%	64%	6%	1%
Akron	All	60	34.1	0.432	48%	63%	48%	70%	18%
	High or very high	8	38.3	0.454	59%	64%	40%	100%	13%
	Moderate to very high	19	35.2	0.444	51%	62%	45%	74%	16%
	Low or very low	41	33.6	0.425	46%	63%	49%	68%	20%
Urban	All	232	26.7	0.455	30%	75%	55%	25%	5%
	High or very high	43	31.8	0.483	29%	75%	50%	30%	2%
	Moderate to very high	87	29.7	0.466	28%	75%	50%	28%	3%
	Low or very low	145	24.7	0.447	31%	75%	59%	23%	6%
Suburban	All	341	24.5	0.408	67%	33%	24%	84%	64%
	High or very high	188	25.0	0.416	75%	27%	19%	93%	78%
	Moderate to very high	257	24.7	0.411	72%	29%	21%	90%	72%
	Low or very low	84	23.7	0.400	55%	48%	38%	64%	38%
Region	All	574	25.2	0.424	58%	55%	34%	60%	40%
	High or very high	231	26.0	0.425	69%	43%	23%	81%	64%
	Moderate to very high	344	25.7	0.422	64%	48%	27%	74%	55%
	Low or very low	229	24.3	0.428	43%	66%	50%	38%	18%

Sources: American Community Survey 2014-2010, US Census Bureau; CrimeRisk 2016, Applied Geographic Solutions; Global Report Card, George W. Bush Institute; Ohio Housing Finance Agency

Cleveland: while 20% of the region’s high-opportunity tracts are in Cleveland, two-thirds of high-opportunity tracts ranking low or very low in mobility are within the city. This is concerning because historically the majority of LIHTC units have been built in Cleveland – the city is currently home to 57 percent of all LIHTC units in the region. In this scenario, it is unlikely that OHFA’s new guidelines will promote any significant gains in income mobility for LIHTC residents within Cleveland. Akron’s situation seems better at first glance; 74 percent of the city’s high-opportunity tracts also rank high in mobility. As we observed earlier, however, a large

proportion of Akron’s tracts rank as moderate in mobility; removing those from the high-mobility group, only 16 percent of high-opportunity tracts rank as high-mobility in Akron, and none do in Cleveland.

Another point of concern is the existence of high-opportunity tracts in Cleveland that not only rank as low-mobility, but also have experienced high losses in jobs per capita. These tracts represent particularly severe examples of neighborhoods that may not be able to sustain a high level of opportunity in future years, and thus present a threat to the long-term welfare of residents that relocate there.

On the other hand, tracts that rank highly in both opportunity and mobility are plentiful in outside of Cleveland and Akron; particularly in the suburbs to the west and south of Cleveland, and to the north of Akron. In many ways, OHFA's 2016-2017 QAP succeeds in promoting the access of low-income families to areas where they and their families can thrive in the long-run. This is particularly true regarding the three quarters of qualifying tracts located in the suburban parts of the region; if the QAP is able, through the language of opportunity, to shift the balance of LIHTC unit construction away from the urban cores and towards the suburbs, that will

constitute an important step towards promoting long-term opportunity for relocating families. It is also clear, however, that the language of opportunity omits certain pitfalls in the long-run; several of the qualifying tracts in the QAP raise a red flag when we examine their potential for promoting employment and income mobility in the future. In the next section, we make brief suggestions for ways in which these pitfalls can be avoided, and point towards broader lessons we can draw from the preceding analysis to inform housing policy in Northeast Ohio.

How do we maximize long-term opportunity in the region?

As calculated by Chetty, et. al (2014) an individual born in a family in the bottom fifth in terms of income faces odds of nearly 95 percent against their moving into the top fifth in income in their lifetime. The same study team also reveals that housing and neighborhoods play a very important role in allowing or barring this upward mobility (Chetty, et al., 2015). And as we have shown, the neighborhood characteristics that are most likely to encourage this kind of mobility in the Cuyahoga-Summit region are located in the suburbs outside of Akron and Cleveland. So the most obvious answer to the question posited in this section heading is the production of more affordable housing in the region's suburbs.

This is certainly a piece of the answer. We already know that access to affordable housing is an increasing concern in the region (Barkley, 2015), and most LIHTC units in the region are currently concentrated near the downtown areas of Akron and Cleveland, where the potential for mobility is among the lowest in the region. But this is a strategy that is, to a large extent, already being pursued. OHFA's task of controlling the disbursement of LIHTC credits puts it in charge, within Ohio, of what has become the country's primary method of producing affordable housing (Hollar, 2014). And the 2016-2017 QAP, by incorporating criteria pertaining to the geography of opportunity in the state, shows that the agency is well aware of the need to deconcentrate housing and expand choices for low-income families.

Another element of this answer involves limiting the development of new units in areas that do not offer good prospects for continuing opportunity. Tracts that rank as high-opportunity in Kirwan Institute's index but have experienced large losses in jobs, drastic demographic changes, or other indica-

tors of instability need to be identified and analyzed carefully. Given the high percentage of tracts that qualify as high-opportunity (by definition, 60 percent of tracts in the region do), removing certain 'red flag' tracts from the eligible pool may not have a discernible impact on developers' ability to site their projects in high-opportunity areas. On the other hand, it would promote the location of units in stabler and higher-mobility areas and prevent the siting of affordable housing in areas similar to the ones where such housing is currently concentrated.

The fact remains, however, that thousands of households live in areas of low opportunity and low-mobility, as well as areas that have lost many jobs (or not gained them at the same rate as workers have moved in) over the years and thus pose a threat to the economic sustainability of the families living there. The 2016-2017 QAP stipulates that the affordable portions of any (non-infill) LIHTC-subsidized development must be affordable for households with incomes of up to 50 percent of Area Median Income (AMI), which in 2014 corresponded to \$31,300 in Cuyahoga county for a 4-person household (HUD, 2014b). Combined, our region of study had nearly 300,000 households in 2014 that earned less than \$35,000, 48 percent of which resided in Cleveland and Akron, although combined the two cities only accounted for a third of the region's total households. Using households with incomes under \$35,000 as a proxy for those eligible to reside in LIHTC-subsidized units, nearly half of eligible households live within the two cities.

Building housing in the suburbs and relocating families to higher-opportunity and higher-mobility cannot, it should be clear by now, be the whole answer to the region's low levels of mobility. Thousands of households live in 'low-mobility' areas

across the region, and only a small fraction of those would be both able and willing to relocate to higher opportunity and mobility areas. A successful regional strategy to increase intergenerational mobility necessarily has to include local investments in the neighborhoods where low-income families currently live. Commonly referred to as ‘place-based’ strategies, they include initiatives aimed at improving education, promoting workforce development, providing essential services such as child care, and generating affordable housing without the need to displace families. While crucial, place-based strategies are beyond the scope of this paper. In what follows, therefore, we present a recommendation as to how the LIHTC program administered by OHFA can be tweaked, given existing resource and policy constraints, in order to improve the mobility outcomes for future generations in the region.

Returning to Chetty, et al. (2015)’s findings, neighborhood effects on income mobility are much stronger for children than for adults. It follows that moving to a high-mobility neighborhood can generate more benefits in the long-term for families and households with young children than for those without.

A March, 2016 report from HUD summarized tenant-level data for LIHTC units across the country, and provides some insight regarding the makeup of households living in LIHTC units around the country. Data on age of tenants and family composition of households are not available for Ohio in the report, but the variation nationally is small enough that we can make educated guesses on these figures. Nationally, 37.4% of households in LIHTC units include at least one child; this figure varies from 25.2% in Illinois to 51.3% in Mississippi in the continental U.S. (with the exclusion of New York, which is an outlier at 15.5%). Regarding households with at least one elderly member (over 61 years old), the national average is 32.3%, with a low of 16.9% in Mississippi and a high of 50.0% in Illinois. It is arguably safe to assume, therefore, that at least a quarter of households living in LIHTC

units in Ohio have at least one child, and that a similar number of households include a senior member (HUD, 2016).

One relatively inexpensive way to increase long-term opportunity in the region would therefore be to steer households with young children towards census tracts that present high-levels of both opportunity and mobility. This could be done explicitly by incorporating criteria regarding household composition in the LIHTC allocation process through the QAP, or indirectly by regulating unit sizes and minimum number of bedrooms for developments in certain ‘high-mobility’ areas. On the other hand, households without children, especially those headed by seniors, have a very different set of priorities and needs than those with children. This difference amounts to an entirely parallel geography of opportunity: elderly residents may benefit from living near downtowns and give little stock to the quality of education in their neighborhoods, whereas others may prioritize proximity to a particular industry. Relaxing the definition of opportunity and allowing it to be shaped by the diverse realities of the households served by the program would therefore result in a more efficient allocation process, and maximize the program’s contribution towards a more equitable Ohio.

Of course, breaking down barriers to income mobility in the region is not as simple as moving families with children to the suburbs. Relocation policies are by nature severely limited in reach, and can at best make a small contribution towards decreasing inequalities in income and opportunities in any region. However, we hope that the preceding analysis has made clear the need for a regional focus on income mobility, paired with aggressive and explicit strategies to address this problem at its roots. OHFA has taken an important step in incorporating Kirwan Institute’s Opportunity Mapping Tool in its most recent QAP, and it is the task of policy makers in Ohio to build upon that effort.

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Appendix Table 1

Variables included in Kirwan Institute's Opportunity Index

Category	Indicator	Description
Education	Value Added Data	Calculation that uses student achievement data over time to measure the gains in student learning. It provides a way to measure the effect a school or teacher has on student academic performance over the course of a school year or another period of time
	Performance Index	Calculation that measures student performance on the Ohio Achievement Assessments and Ohio Graduate Tests at the 3 rd , 4 th , 5 th , 6 th , 7 th , 8 th , and 10 th (OGT) grade levels. This ranking helps determine possible state interventions, which include a portion of the Title 1 funding directed to interventions, and implementation of the Ohio Improvement Process.
Job Access and Mobility	Jobs Nearby	Number of jobs which pay \$3,333 or less
	Services Offered (ECE)	Proximity to ECE centers (of any type)
	Transit Coverage	Proximity and availability of bus routes
	Mean Commute Time	Average commute time, in minutes, of commuters in the Census tract
	Commute by Alternative Mode	Percentage of commutes by alternative mode (Biking, Walking, Bussing, etc.)
Environmental Hazards	Vacancy	Percentage of housing units which have been vacant for 12 months or more
	Infant Mortality Rate	Rate of infant mortality
	Volume of Nearby Toxic Release	Pounds of toxic release emitted from toxic waste sites
	Retail Healthy Food Index	Ration of healthy food retailers to unhealthy food retailers

Source: Reece, et al. 2010.

Appendix Table 2

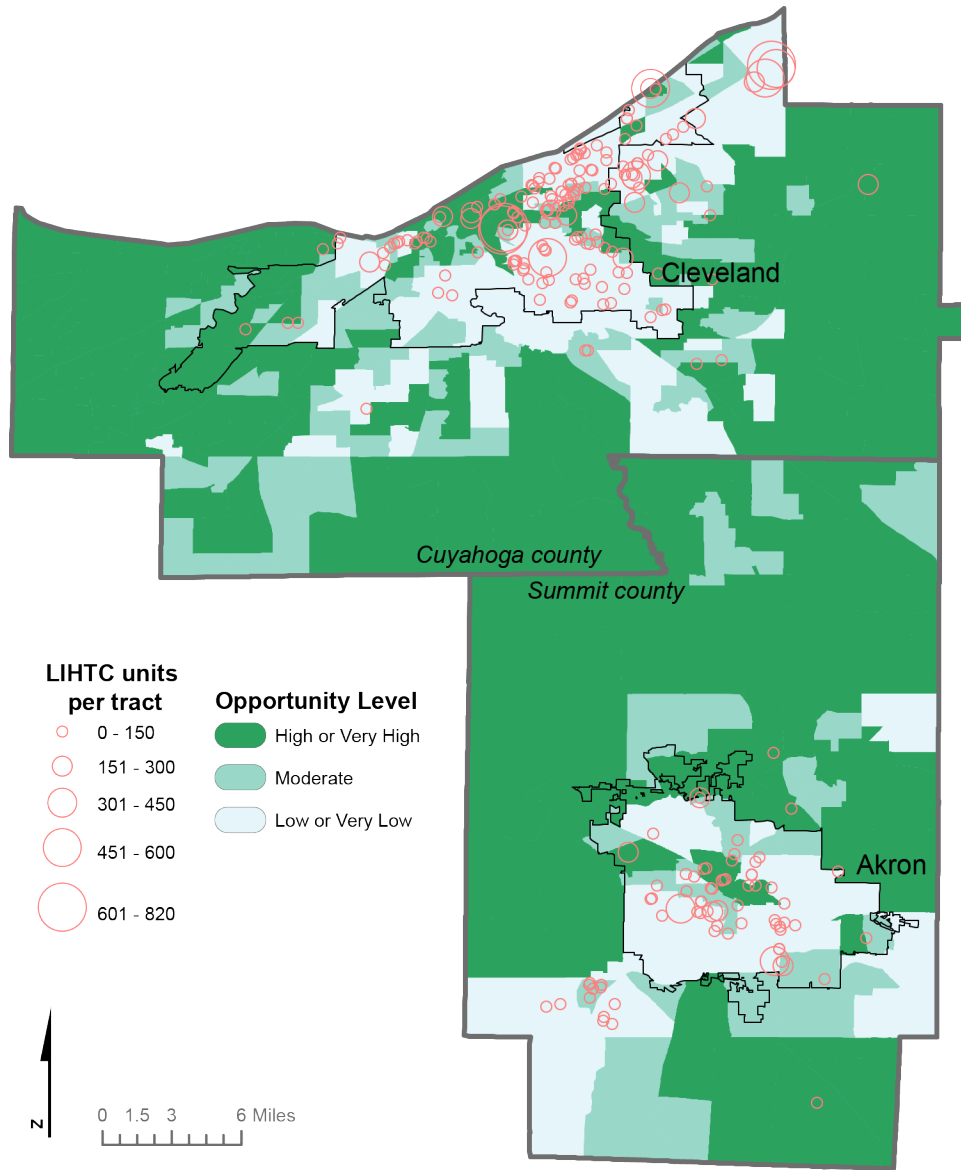
Explanatory notes on variables used in Mobility Index

Variable Category	Variable used in Chetty, et al. (2014)	Proxy variable	Notes
Residential Segregation	Fraction of workers with commute <15 mins	N/A	Calculated from the 2009-2014 American Community Survey; includes only workers 16 or older that do not work at home.
Income Inequality	Gini coefficient for the bottom 99% income share	Gini coefficient (including the top 1%)	Tax returns used in to calculate the Gini coefficient for the bottom 99% are aggregated at the zipcode level. Instead, Gini coefficient values at the tract-level were obtained from the 2009-2014 American Community Survey. Correlation calculated in Chetty, et al. (2014).
Early Education	High School dropout rate (income adjusted)	Test Score Percentile (income adjusted)	Only 4 out of nearly 50 school districts in Summit and Cuyahoga counties have their dropout rates reported by the National Center for Educational Statistics, so dropout rates were not obtainable for most tracts in the region. We used instead the next-best estimator, Test Score Percentile, using data from the George Bush Global Report Card. The variable represents the residuals from a regression of mean math and English standardized test scores on household income per capita in 2009.
Social Capital	Social Capital Index as calculated by Rupasingha and Goetz (2008)	Total Crime Index, calculated by Applied Geographic Solutions	The data used by Chetty, et al. to calculate all three Social Capital variables included in the study (Social Capital Index, religiosity and violent crime) are only available at the county level. ²³ We use the CrimeRisk index calculated by Applied Geographic Solutions as a proxy for Chetty, et al.'s 'violent crime' variable. The CrimeRisk Index uses data from FBI reports and the U.S. Census to calculate crime risk at the block-group level and higher, and was current as of November, 2015. ²⁴ We use the correlation associated with the original 'violent crime' variable to weigh this category's z-score, although it is important to note that the CrimeRisk index includes both violent and non-violent crimes, so the proxy variable is an imperfect approximation of the original.
Family Structure	Fraction of children with single mothers	N/A	Calculated from the 2009-2014 American Community Survey; represents the fraction of total households with children that are headed by single females, aggregated at the tract level.

²³ There are other neighborhood-level indicators available in the literature, but since we do not know how correlated these are with mobility, we are unable to properly weigh their effects in the final index. See, for example, Scribner, et al. (2007), Brown- ing & Cagney (2002), and Saguaro Seminar (n.d.)

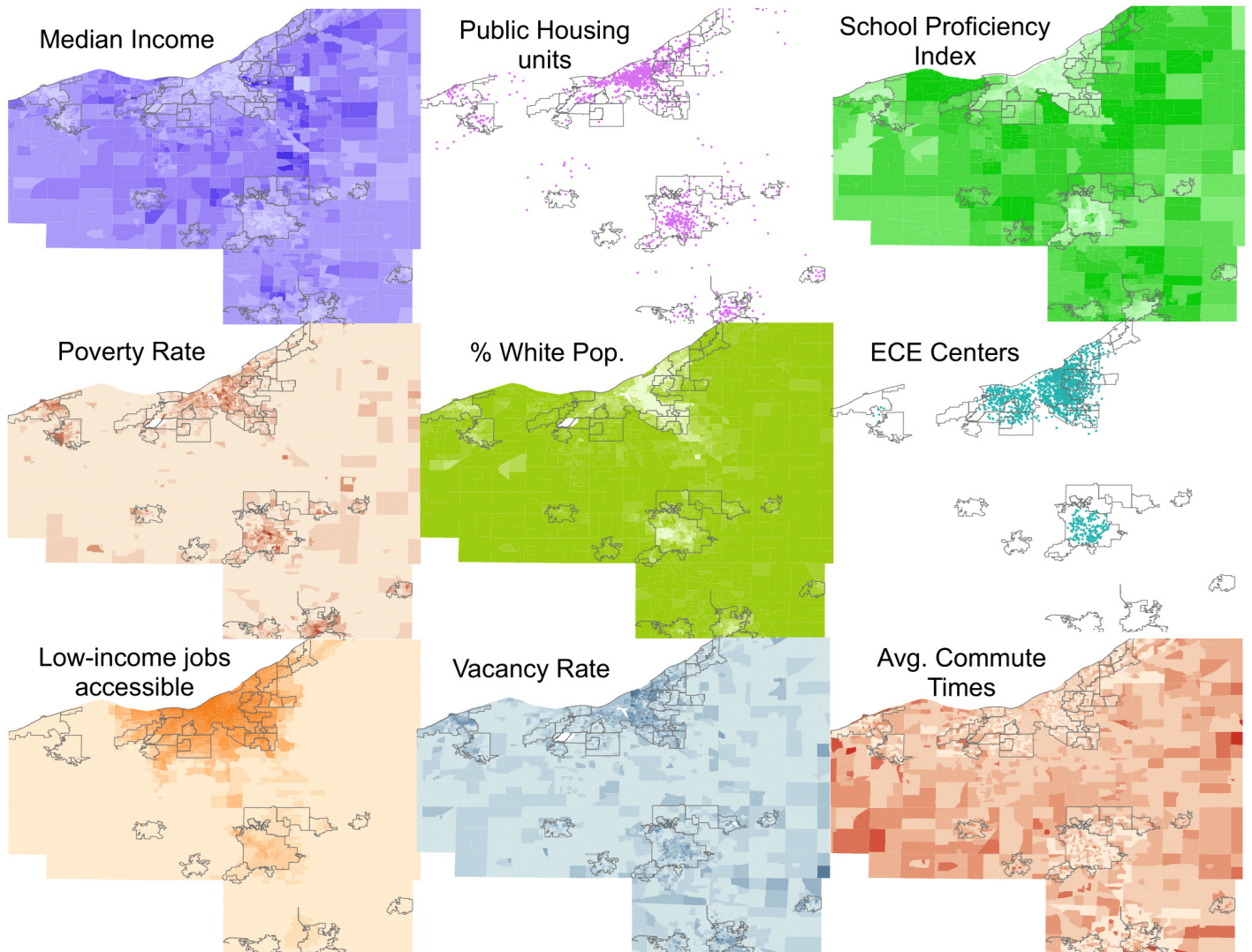
²⁴ See Applied Geographic Solutions (2015)

Appendix Figure 1 Opportunity level by Census Tract and location of LIHTC units



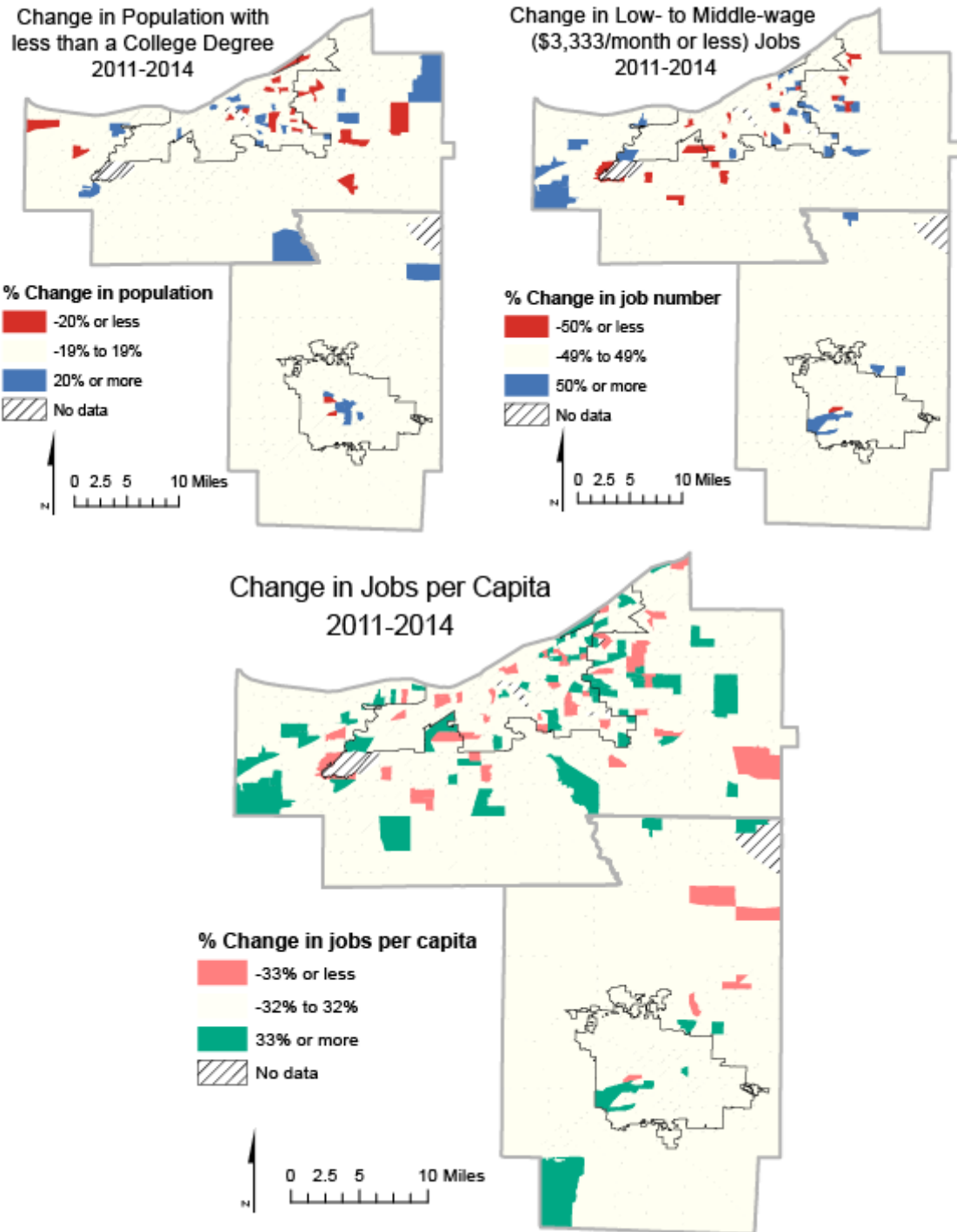
Source: Ohio Housing Finance Agency

Appendix Figure 2 Opportunity Indicators for Census Tracts in Northeast Ohio



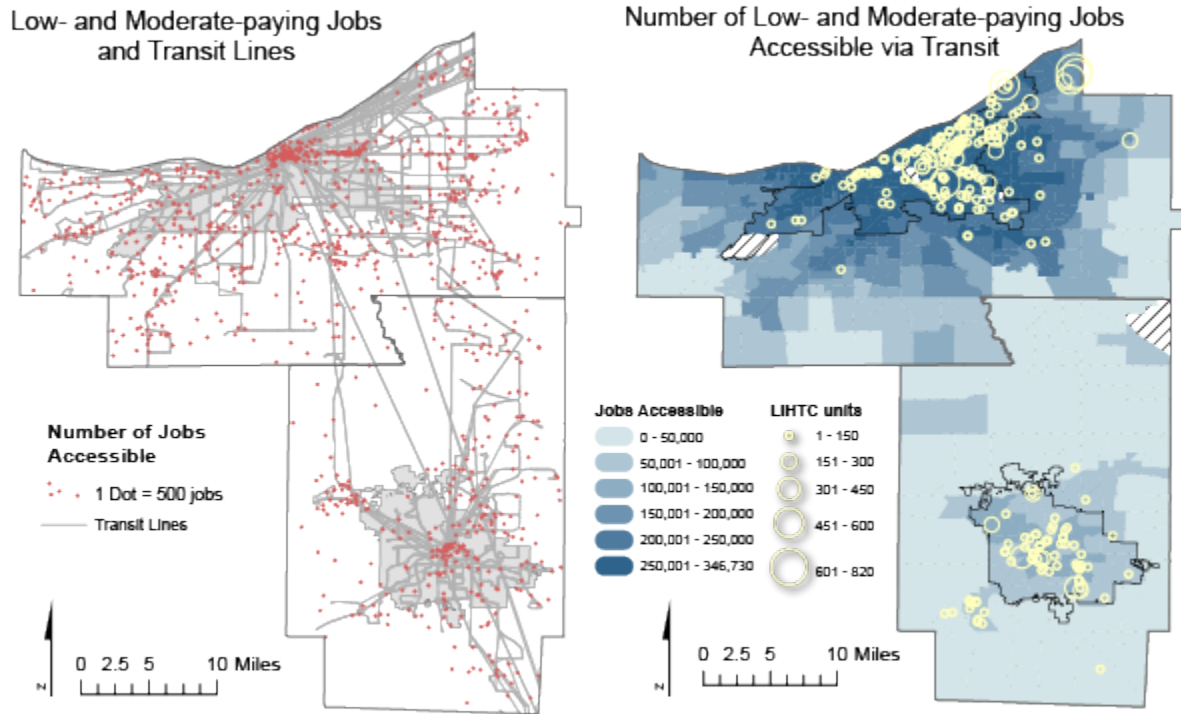
Sources: American Community Survey 2014-2010, US Census Bureau; National Geospatial Data Asset, US Data; Fair Housing and Equity Assessment Tool, US Dept. of Housing and Urban Development; Ohio Department of Job and Family Services.

Appendix Figure 3 Change in Jobs per Capita, 2011-2014



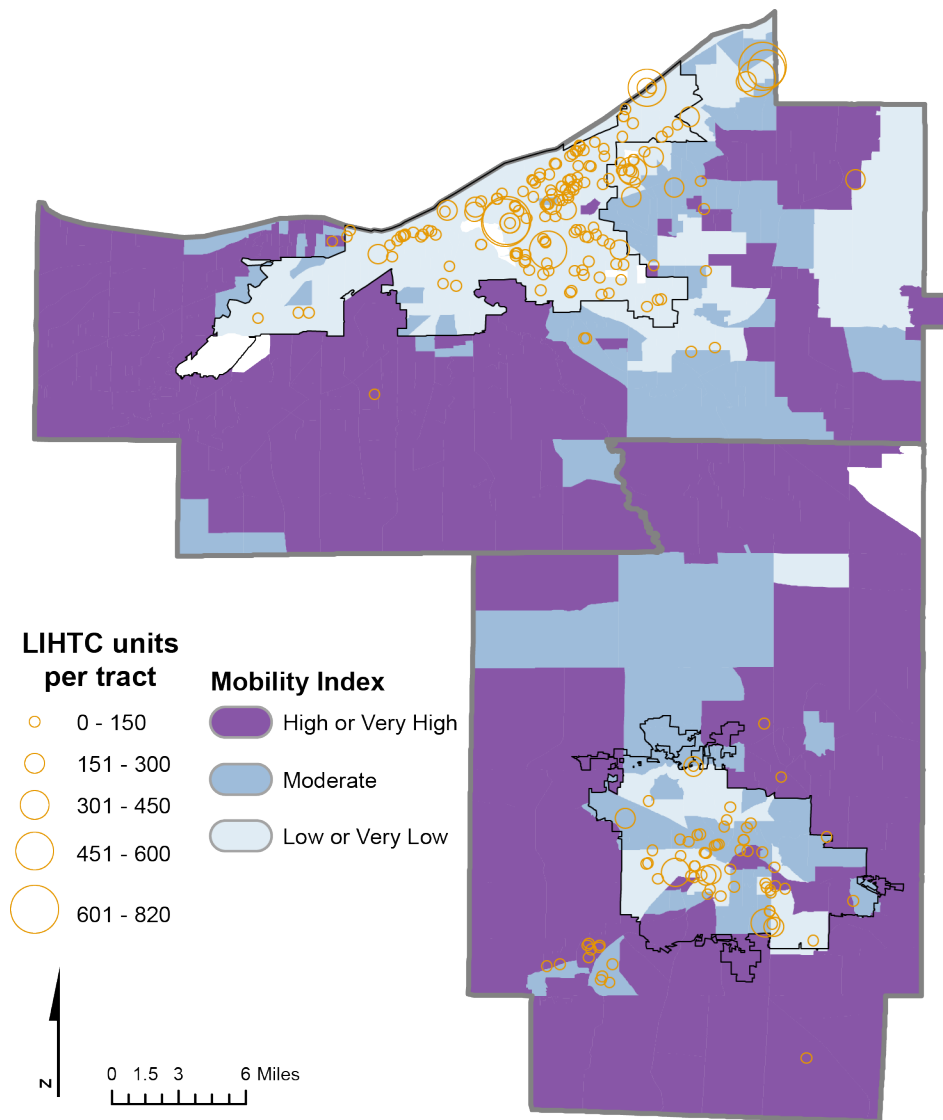
Sources: American Community Survey 2007-2011 and 2011-2014, US Census Bureau
 Note: Considers only jobs that pay \$3,333/month or less and population with less than a college degree

Appendix Figure 4 Low- and Moderate-paying Jobs and Transit Network



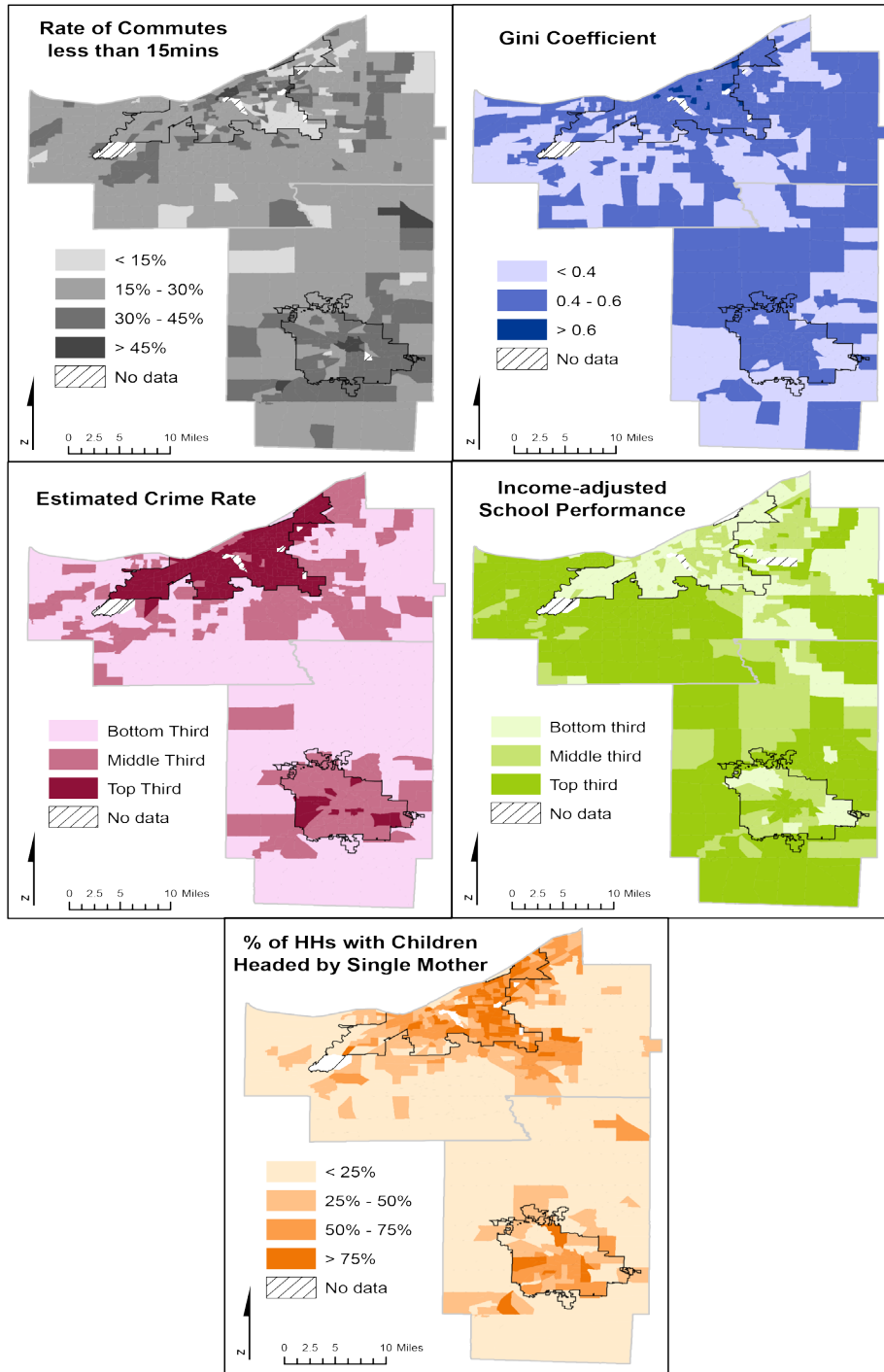
Source: Greater Cleveland Regional Transit Authority; METRO Regional Transity Authority; LEHD Workplace Area Characteristics 2014, US Census Bureau

Appendix Figure 5 Mobility level by Census Tract and location of LIHTC units



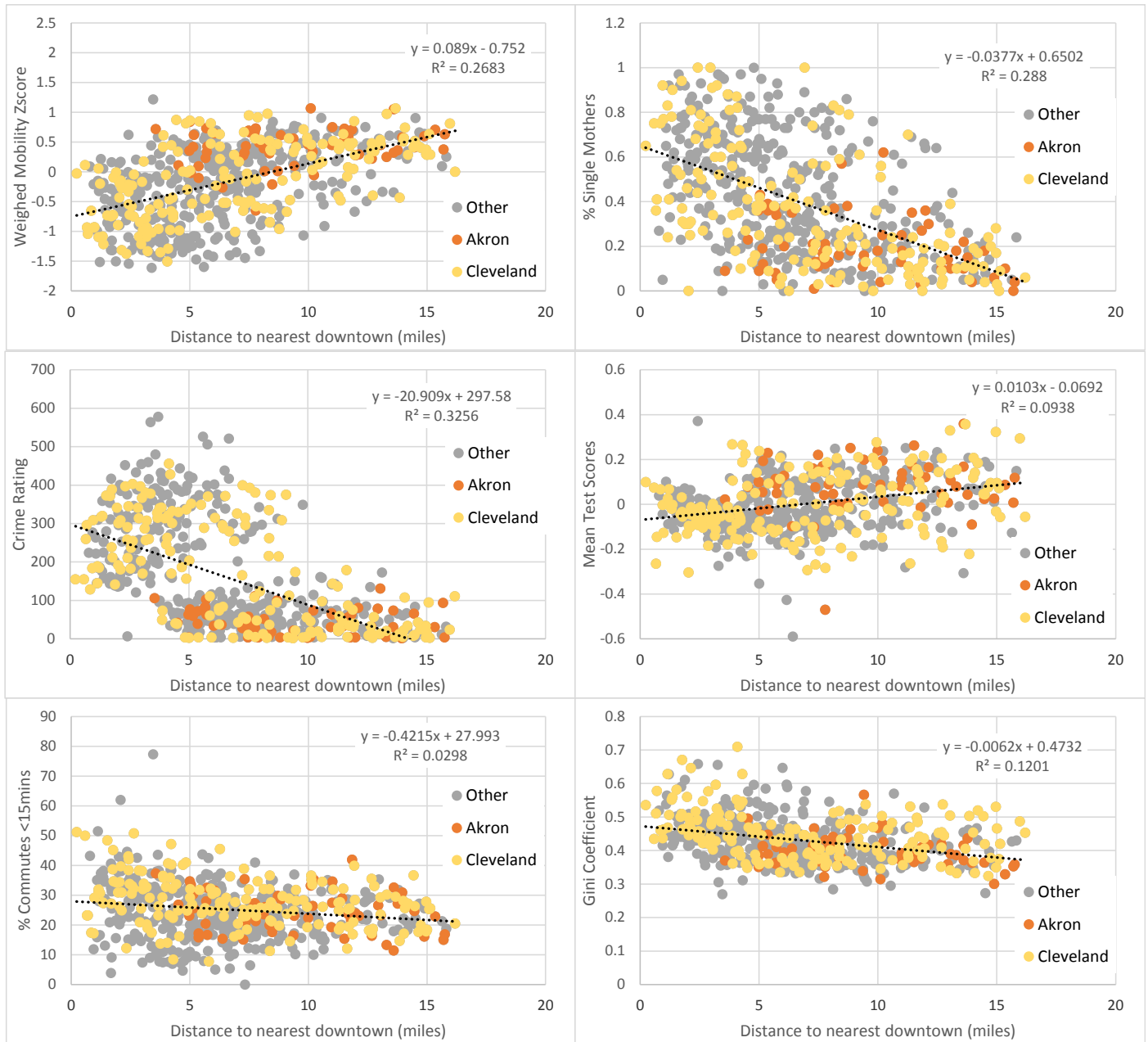
Sources: American Community Survey 2014-2010, US Census Bureau; CrimeRisk 2016, Applied Geographic Solutions; Global Report Card, George W. Bush Institute

Appendix Figure 6 Mobility Indicators for Census tracts in Cuyahoga and Summit counties



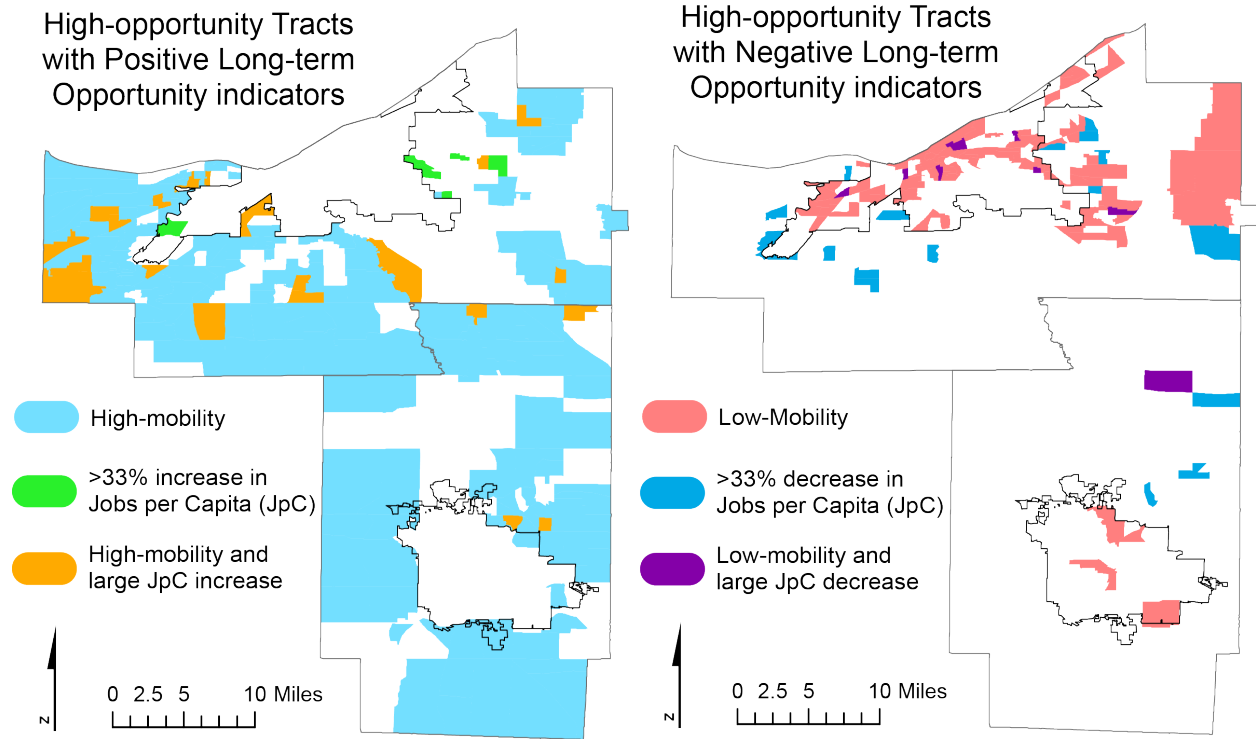
Sources: American Community Survey 2014-2010, US Census Bureau; CrimeRisk 2016, Applied Geographic Solutions; Global Report Card, George W. Bush Institute

Appendix Figure 7 Mobility Indicators by Distance to Nearest Downtown



Sources: American Community Survey 2014-2010, US Census Bureau; CrimeRisk 2016, Applied Geographic Solutions; Global Report Card, George W. Bush Institute

Appendix Figure 8 High-Opportunity Tracts by Long-Term Opportunity Level



Sources: American Community Survey 2014-2010, US Census Bureau; CrimeRisk 2016, Applied Geographic Solutions; Global Report Card, George W. Bush Institute; American Community Survey 2007-2011 and 2011-2014, US Census Bureau

