2022 Atlas

Neighborhood Environments and Childhood Obesity in the Kansas City Region

Prepared by

Center for Children's Healthy Lifestyles & Nutrition
Children's Mercy Kansas City

December 2022

Acknowledgements

This project was made possible by support from the Enid and Crosby Kemper Foundation, UMB Bank, n.a., trustee.

The project could not have been completed without the critical input provided by numerous local organizations and community leaders. The team that led this project comprised Chelsea Fairbairn, Lauren Fitzpatrick, Madison Pilla, Mallory Moon, Qianxia Jiang, Sarah Hampl, and Jordan Carlson of the Center for Children's Healthy Lifestyles & Nutrition and Children's Mercy Kansas City.

Project Website

The data used in this Atlas are made available on the project website. Documentation is provided to allow users to link these data to specific census tracts of interest. All patient information has been de-identified.

www.ciparesearchteam.org/2022atlas

Suggested Citation

Center for Children's Healthy Lifestyles & Nutrition. (2022). The 2022 Atlas on Neighborhood Environments and Childhood Obesity in the Kansas City Region. Available at: www.ciparesearchteam.org/2022atlas

Version 1
Last Updated 1/5/2023

Table of Contents

List of Tables & Figures iii
List of Maps iv

Executive Summary 1

1 Introduction 2
2 Childhood Obesity Rates 6
3 Individual Neighborhood Characteristics 14
4 Environmental Differences by Neighborhood Poverty 36
5 Environmental Differences by Neighborhood Obesity 46
6 Historical Trends in Neighborhood Characteristics 62
7 Conclusions 76

References 79

List of Tables & Figures

Table 1. Data sources used in this Atlas.
Table 2. Children's Mercy Primary Care patient characteristics 2017-2020.
Table 3. Low-access distance measures.
Table 4. Description of the neighborhood walkability features included.
Table 5. Data sources and year(s) reflected for the recent and historical time period for each variable.
Table 6. Magnitude of association between the neighborhood environment and childhood obesity.
Table 7. Recommendations for addressing health disparities in childhood obesity that are related to neighborhood walkability and park access.

Figure 1. Number of census tracts within each childhood obesity rate category.
Figure 2. Number of census tracts within each overweight/obesity rate category.
Figure 3. Number of census tracts with a high, moderate, and low proportion of residents who are children.
Figure 4. Number of census tracts with a high or moderate proportion of Black/African American or Latinx residents.
Figure 5. Number of census tracts with a high, moderate, and low proportion of households with an annual median income below $60,000.
Figure 6. Number of census tracts with high, moderate, and low proportion of family poverty.
Figure 7. Number of census tracts within each food access category.
Figure 8. Number of census tracts within each of the walkability categories.
Figure 9. Number of census tracts that contain 0, 1, 2, or 3+ parks.
Figure 10. Poverty rates within each food access category.
Figure 11. Poverty rates within each walkability category.
Figure 12. Poverty rates within each number of parks category.
Figure 13. Childhood obesity rates within each poverty category.
Figure 14. Observed versus expected obesity rate calculations for 3 census tracts.
Figure 15. Number of census tracts within each observed versus expected obesity rate category.
Figure 16. Observed versus expected obesity rates within each food access category.
Figure 17. Observed versus expected obesity rates within each walkability category.
Figure 18. Observed versus expected obesity rates within each number of parks category.
Figure 19. Number of census tracts within each observed obesity change category.
Figure 20. Number of census tracts within each poverty change category.
Figure 21. Number of census tracts within each food access change category.
Figure 22. Number of census tracts within each change in walkability category.

List of Maps

Map 1.1. Boundaries for the 6-County Region, Kansas City, KS and Kansas City, MO

Map 2.1a. Rates of Childhood Obesity (6-County Region)
Map 2.1b. Rates of Childhood Obesity (KCK/KCMO)
Map 2.2a. Rates of Childhood Overweight/Obesity (6-County Region)
Map 2.2b. Rates of Childhood Overweight/Obesity (KCK/KCMO)

Map 3.1a. Child Population (6-County Region)
Map 3.1b. Child Population (KCK/KCMO)
Map 3.2a. Race/Ethnicity (6-County Region)
Map 3.2b. Race/Ethnicity (KCK/KCMO)
Map 3.3a. Household Income (6-County Region)
Map 3.3b. Household Income (KCK/KCMO)
Map 3.4a. Poverty Status (6-County Region)
Map 3.4b. Poverty Status (KCK/KCMO)
Map 3.5a. Food Access (6-County Region)
Map 3.5b. Food Access (KCK/KCMO)
Map 3.6a. Walkability (6-County Region)
Map 3.6b. Walkability (KCK/KCMO)
Map 3.7a. Parks (6-County Region)
Map 3.7b. Parks (KCK/KCMO)

Map 4.1a. Poverty and Low Food Access (6-County Region)
Map 4.1b. Poverty and Low Food Access (KCK/KCMO)
Map 4.2a. Poverty and Walkability (6-County Region)
Map 4.2b. Poverty and Walkability (KCK/KCMO)
Map 4.3a. Poverty and Park Access (6-County Region)
Map 4.3b. Poverty and Park Access (KCK/KCMO)

Map 5.1a. Childhood Obesity and Poverty (6-County Region)
Map 5.1b. Childhood Obesity and Poverty (KCK/KCMO)
Map 5.2a. Observed versus Expected Childhood Obesity Rates (6-County Region)
Map 5.2b. Observed versus Expected Childhood Obesity Rates (KCK/KCMO)
Map 5.3a. Childhood Obesity and Low Food Access (6-County Region)
Map 5.3b. Childhood Obesity and Low Food Access (KCK/KCMO)
Map 5.4a. Childhood Obesity and Walkability (6-County Region)
Map 5.4b. Childhood Obesity and Walkability (KCK/KCMO)
Map 5.5a. Childhood Obesity and Park Access (6-County Region)
Map 5.5b. Childhood Obesity and Park Access (KCK/KCMO)

Map 6.1a. Change in Childhood Obesity Rates (6-County Region)
Map 6.1b. Change in Childhood Obesity Rates (KCK/KCMO)
Map 6.2a. Change in Poverty (6-County Region)
Map 6.2b. Change in Poverty (KCK/KCMO)
Map 6.3a. Change in Food Access (6-County Region)
Map 6.3b. Change in Food Access (KCK/KCMO)
Map 6.4a. Change in Walkability (6-County Region)
Map 6.4b. Change in Walkability (KCK/KCMO)

Executive Summary

It is generally understood that environmental characteristics of neighborhoods impact residents' healthy eating, active living, and health. Within the Kansas City region, environmental health disparities have been recognized and efforts are occurring to reduce the burden of these disparities. However, there is limited local data for informing data-driven decisions that impact individual communities in the region. To support stakeholders in community planning and development efforts, this Atlas compiles neighborhood sociodemographic, food access, walkability, and park access information, and integrates this information with childhood obesity data that are made available at the census tract level across the 6-county region. The data show that children in the region are less likely to have obesity if they live in a neighborhood that has high walkability, high park access, and/or a moderate-to-low rate of poverty. Specific communities are highlighted based on combinations of these risk factors. This link between neighborhoods and health emphasizes the important impact city planning and development departments and parks departments have in shaping the health of our communities. Recommendations for supporting improvements in these neighborhood factors are provided, including considerations for neighborhood poverty when addressing neighborhood built environment characteristics such as walkability. Multiple sectors must work together and strive for ambitious community transformations to combat the existing environmental health disparities in the region.

Chapter 1
Introduction

Overview & Purpose

Supporting children to maintain a healthy weight is a critical target in the U.S. and world, including within the Kansas City metropolitan area. However, despite the long-term negative health impacts of obesity on chronic diseases such as type 2 diabetes, childhood obesity rates have increased over the past several decades. In the U.S., 13.9% of children aged 2-5, 18.4% of children aged 6-11, and 20.6% of children aged 12-19 are experiencing obesity,[1] and 33.4% of children aged 2-19 are classified as overweight.[2] Physical inactivity and poor diet are primary contributors to obesity and leading preventable causes of chronic diseases.[3,4] Physical inactivity also has detrimental impacts on healthy development and mental health in children. Yet, few U.S. children ages 6-17 have dietary patterns that align with dietary guidelines and less than 28% meet the 60 minutes/day physical activity guideline.[7,8] Physical activity also declines drastically as children reach adolescence.[4]

Creating more health-supportive neighborhood-built environments has been recommended by multiple leading health officials as means to reduce lifetime risk for preventable chronic diseases. Neighborhood built environmental features impact the health of communities by providing opportunities for healthy lifestyles.[5] Environmental features can create walkable neighborhoods where pedestrian activity is encouraged and where it is safe and easy to engage in multiple types of neighborhood-based activities.[5] Environmental features can also create healthy eating options that are accessible within neighborhoods.[6] While an accumulation of evidence has shown that neighborhood-built environment features can influence children's active living, healthy eating, and weight status, there is a lack of evidence on the current conditions of these factors in the Kansas City region to inform localized efforts.

The purpose of this Atlas project was to compile, visualize, and summarize the status of neighborhood environment features and childhood obesity in the Kansas City area. By integrating obesity information from Children's Mercy's Primary Care Health System with multiple layers of neighborhood environment information, the Atlas aims to support the use of empirical health impact data in community planning and development efforts.

About the Atlas

The Kansas City metropolitan area comprises over two million residents and spans two states (MO and KS), nine counties, and numerous cities, the largest of which is Kansas City, MO with approximately 500,000 residents. This Atlas focuses on the most central 6 counties: Cass County, MO; Clay County, MO; Jackson County, MO; Platte County, MO; Johnson County, KS; and Wyandotte County, KS.

The series of maps included in each section of the Atlas describe neighborhood information compiled from multiple sources as shown in **Table 1**, with all indicators presented at the census tract level. The primary information presented aims to reflect the most recent and up to date information available, with multiple years of information used in some cases to provide stability of estimates. Since the COVID-19 pandemic has impacted several of the data collection resources that were leveraged, such as the American Community Survey and in-person health care visits, some indicators were not obtained after early 2020. Thus, most information presented in this Atlas are aligned with the years 2019 and 2020. Given the stability in the indicators presented, the information is expected to generalize to the current year, 2022. However, it is likely that some indicators have worsened due to the pandemic, such as poverty status and childhood obesity rates.

Table 1. Data sources for features of interest explored in Atlas.

Neighborhood Characteristic	**Data Source**
Sociodemographics	
Child Population	U.S. Census Bureau American Community Survey (ACS) 5-year Estimates
Race/Ethnicity	
Income	
Poverty Status	
Built Environment	
Food Access	U.S. Department of Agriculture (USDA)
Walkability	U.S. Environmental Protection Agency (EPA)
Parks	Mid-America Regional Council (MARC)
Health Information	
Obesity Rates	Children's Mercy Kansas City Primary Care Health System

How to Navigate the Atlas

There are five main sections in this Atlas, each building on one another.

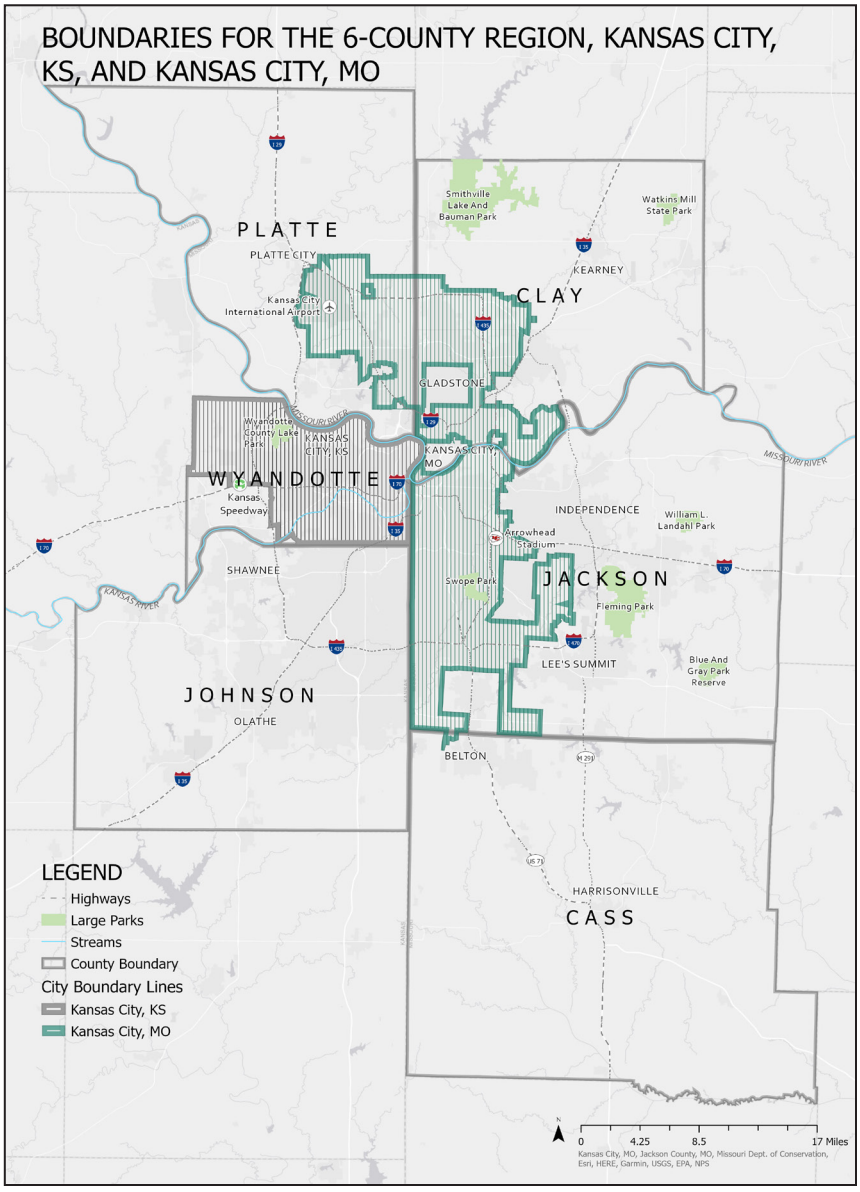
The first sections, **Childhood Obesity Rates** and **Individual Neighborhood Characteristics**, present individual indicators of sociodemographic, built environment, and obesity information across the region. Maps in these chapters are presented as *single indicator maps* and provide context for subsequent map series.

The following sections, **Environmental Differences by Neighborhood Poverty** and **Environmental Differences by Neighborhood Obesity**, present *composite maps* in which two neighborhood indicators are joined to visualize the relationship between indicators. This information can aid in the identification of communities most affected by the cooccurrence of environmental barriers, such as high poverty and high obesity rates, or low walkability and high obesity rates.

The final map series, **Historical Trends in Neighborhood Characteristics**, presents changes in select indicators across a ~5-year time period, highlighting communities that have experienced detrimental changes.

All maps throughout the Atlas are presented at two scales to depict (1) the *6-County Kansas City Region*, comprising up to 483 census tracts, and (2) *Kansas City, KS and Kansas City, MO (KCK/KCMO)*, comprising up to 225 census tracts. The latter approach allows a closer look at the parts of the region that have a greater population density and can sometimes be difficult to capture in detail in the former maps. The total number of census tracts shown varies slightly depending on the data source and is indicated in the figure corresponding to each map. 'Null' census tracts shown in the maps are those that have few to no residents (i.e., nonresidential tracts).

Map 1.1



Chapter 2
Childhood Obesity Rates

Patient body mass index (BMI) information from Children's Mercy Primary Care Clinic visits from 2017-2020 was used to approximate childhood obesity rates in the Kansas City region. Children's Mercy operates the largest pediatric primary care health system in the Kansas City region, with over 12,000 well child visits performed annually. A large portion of the patients are insured by Medicaid or are uninsured and from economically disadvantaged areas within the region. Thus, it is important to note that this patient population is not representative of all children in the region. However, this patient population includes a large proportion of families who have experienced health disparities due to structural discrimination based on economic, racial/ethnic, and other factors. These health disparities can be addressed, in part, by increased efforts to improve community health factors using data-driven approaches.

The childhood obesity and overweight/obesity rates presented in this section are based on a total of 20,485 children between the ages of 6 and 17 years old (**Table 2**). To minimize bias in estimates, obesity rates were only calculated for census tracts that contained at least 15 patients with weight status information. This resulted in inclusion of 302 (63%) of the 483 census tracts in the 6-County Region and 185 (82%) of the 225 census tracts in KCK/KCMO. Patients in the Children's Mercy Primary Care health system have high rates of obesity, with 26.6% having obesity.

Since the age and sex distribution of the patients differs across census tracts, we employed weighted adjustments to calculate an obesity rate for each census tract that is based on the same age and sex distribution (the distribution is shown in **Table 2**). Thus, the differences in obesity rates across census tracts that are presented in this Atlas are not attributable to age or sex differences across tracts.

Table 2. Children's Mercy Primary Care patient characteristics 2017-2020 (n=20,485)

Age	
6-9 years old	8,043 (39%)
10-13 years old	6,835 (34%)
14-17 years old	5,606 (27%)
Sex	
Female	10,406 (51%)
Male	10,079 (49%)
Race/Ethnicity	
White non-Hispanic	2,604 (13%)
Black non-Hispanic	8,328 (41%)
Hispanic	8,026 (39%)
Other	1,527 (7%)
Health Insurance Type	
Commercial insurance	2,581 (12.6%)
Government/Public insurance	16,368 (79.9%)
No insurance	1,536 (7.5%)
Weight Category	
Obese	5,448 (26.6%)
Overweight	3,627 (17.7%)

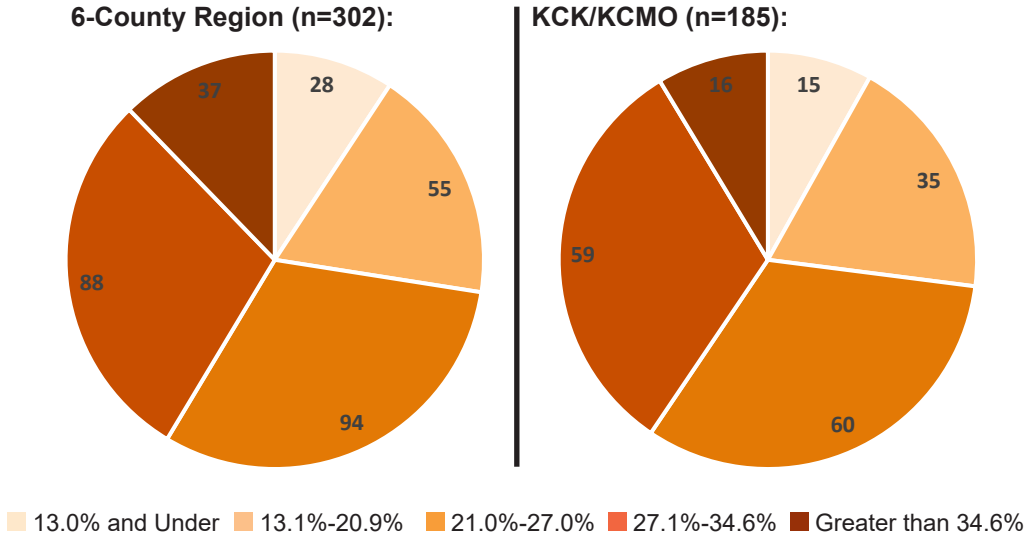
Maps in this chapter include:

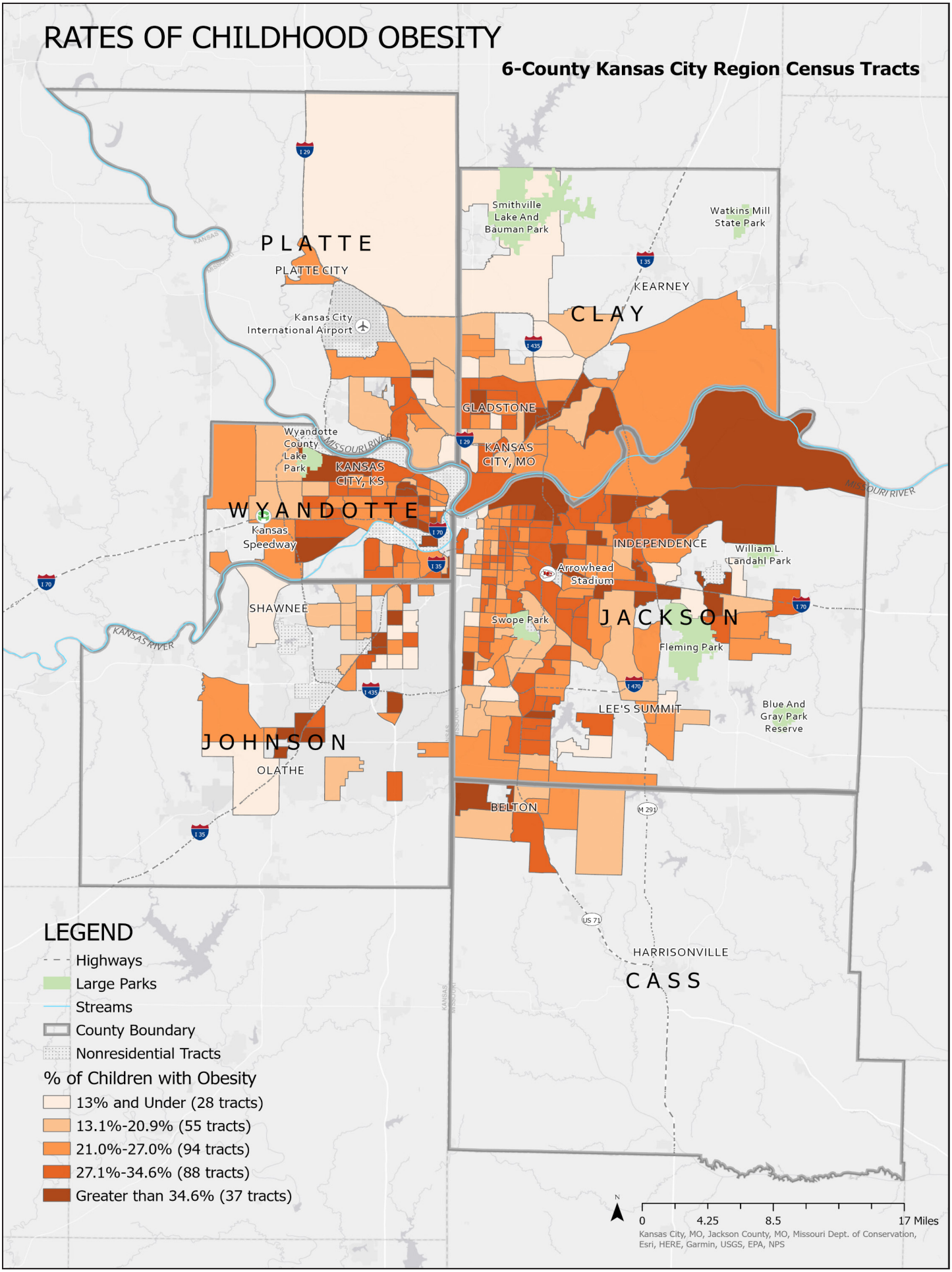
Childhood Obesity Rates
Childhood Overweight/Obesity Rates

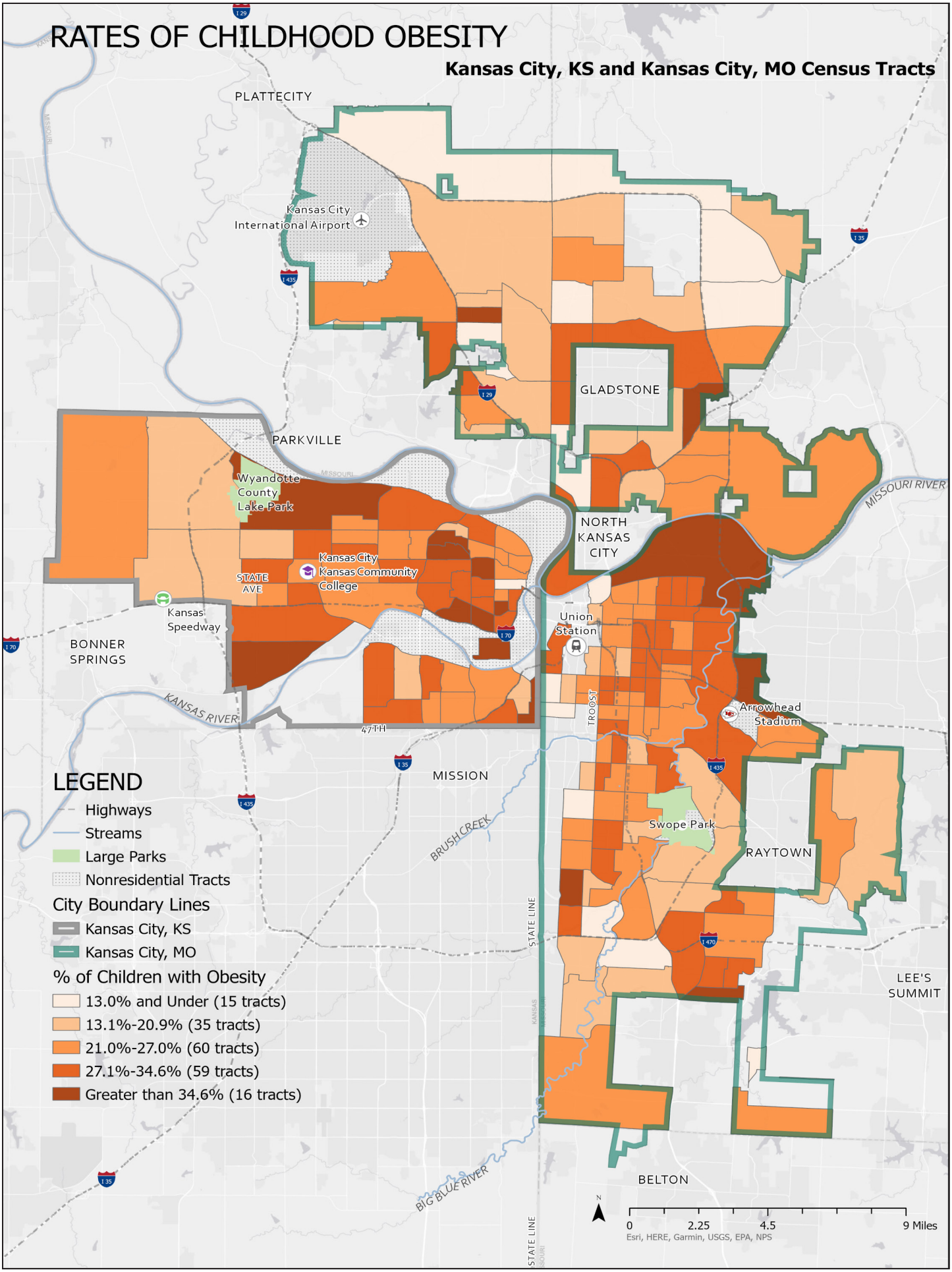
Observed Childhood Obesity Rates

Children with a BMI greater than or equal to the 95th percentile for their age and sex were classified as having obesity.[15] Obesity rates are presented as the proportion of Children's Mercy patients living in the tract who had obesity (number of patients in tract with obesity divided by total number of patients in tract). Categories were determined using the natural breaks method which is based on natural groupings inherent in the data. Obesity rates are generally similar between the KCK/KCMO and the 6-County Region (**Figure 1**).

Figure 1. Number of census tracts within each childhood obesity rate category.




RATES OF CHILDHOOD OBESITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
Smithville Lake And Bauman Park
Watkins Mill State Park
KEARNEY
CLAY
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
% of Children with Obesity
13% and Under (28 tracts)
13.1%-20.9% (55 tracts)
21.0%-27.0% (94 tracts)
27.1%-34.6% (88 tracts)
Greater than 34.6% (37 tracts)
N
0
4.25
8.5
17 Miles
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

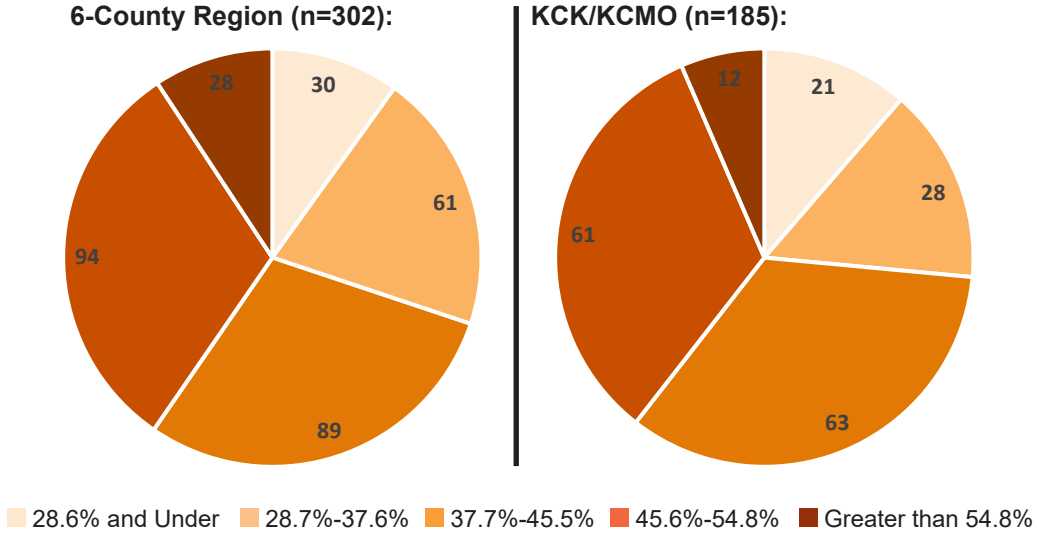

RATES OF CHILDHOOD OBESITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
NORTH KANSAS CITY
MISSOURI RIVER
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Children with Obesity
13.0% and Under (15 tracts)
13.1%-20.9% (35 tracts)
21.0%-27.0% (60 tracts)
27.1%-34.6% (59 tracts)
Greater than 34.6% (16 tracts)
0 2.25 4.5 9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

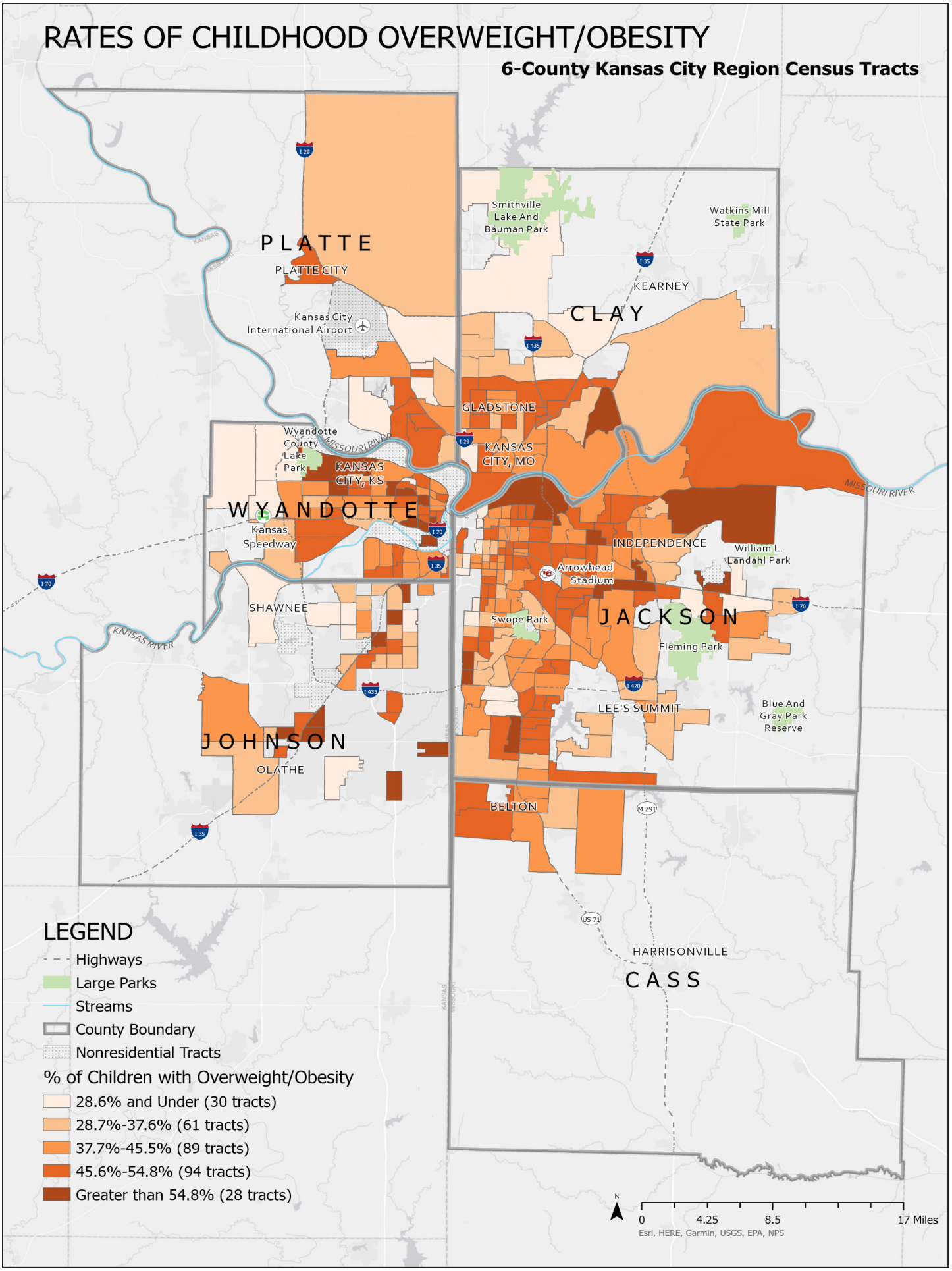
Observed Childhood Overweight/ Obesity Rates

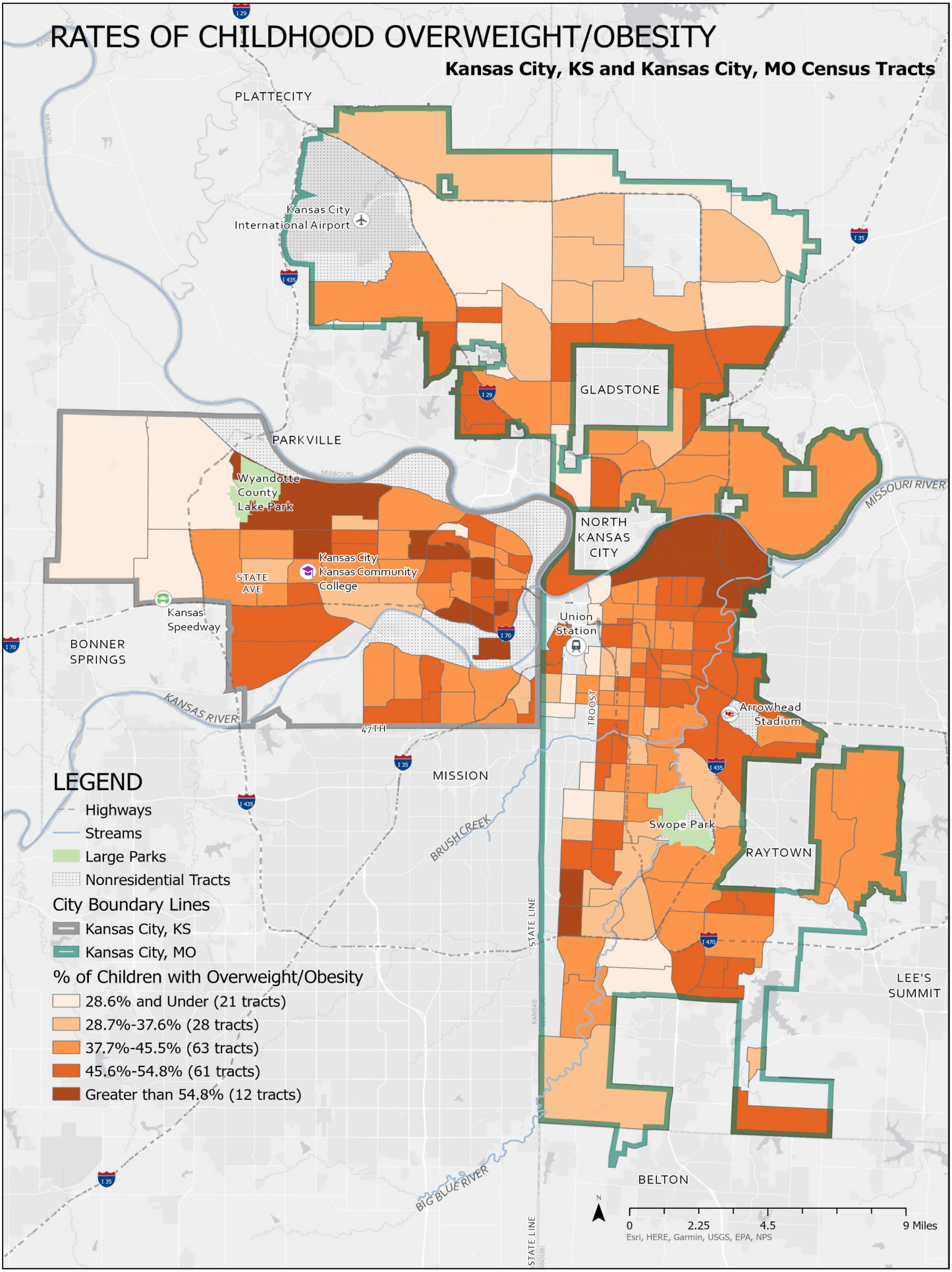
Children with a BMI greater than or equal to the 85th percentile for their age and sex were classified as having overweight/obesity.[15] Overweight/obesity rates are presented as the proportion of Children's Mercy patients living in the tract who had overweight or obesity.

Categories were determined using the natural breaks method which is based on natural groupings inherent in the data. A slightly greater proportion of census tracts within KCK/KCMO had a very high overweight/obesity rate (greater than 54.8%) than in the 6-County Region (**Figure 2**).

Figure 2. Number of census tracts within each overweight/obesity rate category.




RATES OF CHILDHOOD OVERWEIGHT/OBESITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
% of Children with Overweight/Obesity
28.6% and Under (30 tracts)
28.7%-37.6% (61 tracts)
37.7%-45.5% (89 tracts)
45.6%-54.8% (94 tracts)
Greater than 54.8% (28 tracts)
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


RATES OF CHILDHOOD OVERWEIGHT/OBESITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
NORTH KANSAS CITY
MISSOURI RIVER
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Children with Overweight/Obesity
28.6% and Under (21 tracts)
28.7%-37.6% (28 tracts)
37.7%-45.5% (63 tracts)
45.6%-54.8% (61 tracts)
Greater than 54.8% (12 tracts)
0 2.25 4.5 9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Chapter 3
Individual Neighborhood Characteristics

To understand how neighborhood environment characteristics relate to the health of communities, it is important to consider the sociodemographic and physical characteristics of the neighborhoods. This section of the Atlas is designed to serve as a foundation for understanding the distribution of sociodemographic and physical characteristics across census tracts in the Kansas City region. Maps in this series are presented as *single indicator maps*, each considering one characteristic or variable of interest at a time. The neighborhood characteristics explored in each map were selected based on their potential to impact health as indicated by an accumulation of public health evidence.

Maps in this chapter include:

Child Population
Race/Ethnicity
Income
Poverty Status
Food Access
Walkability
Park Access

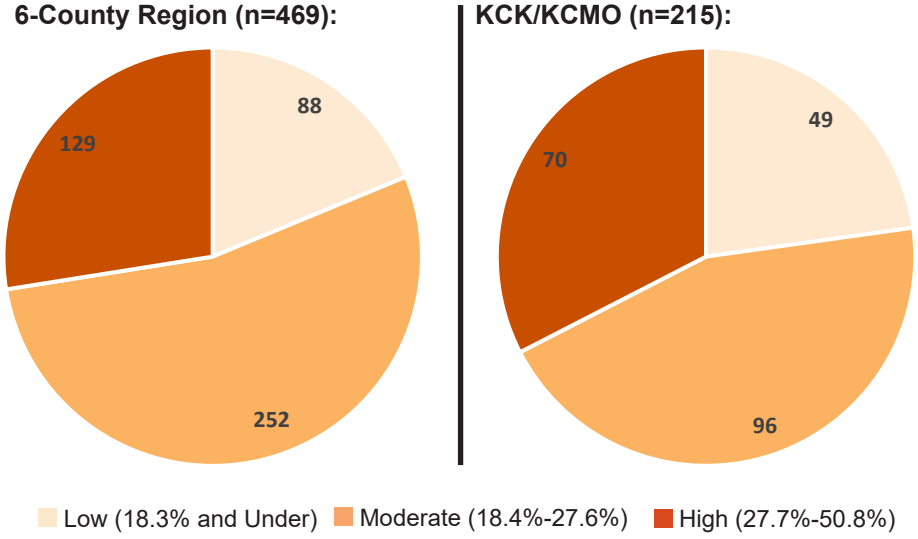
Sociodemographic Characteristics

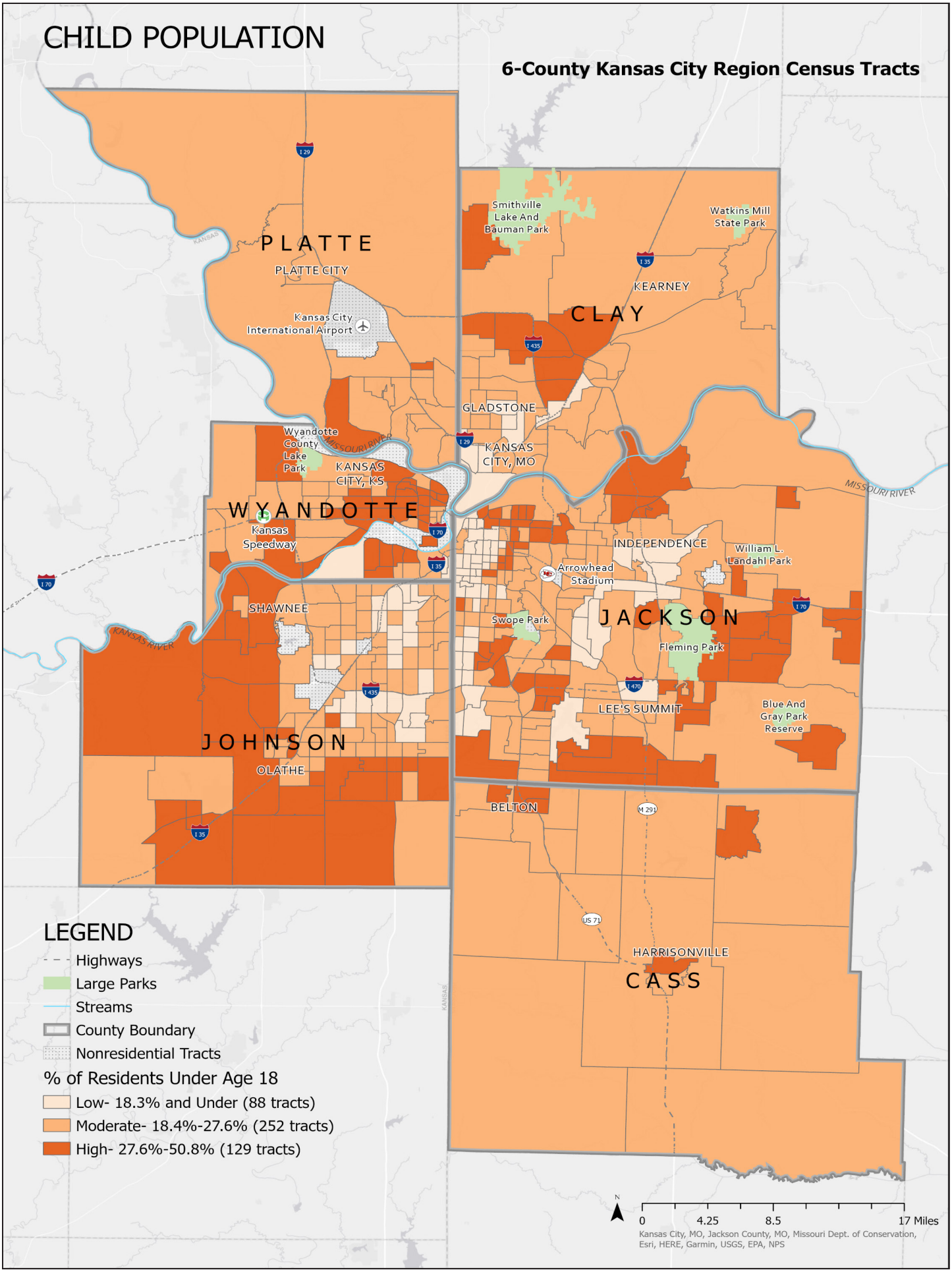
Sociodemographic characteristics reflect social and economic neighborhood conditions that have been shown to impact health both directly and indirectly. The sociodemographic characteristics were measured by the American Community Survey (ACS) and reflect approximate averages over the 5-year period from 2015 to 2019. The 5-year estimates were selected to provide more stability over single-year estimates and the time-period was selected to align with the Children's Mercy clinic data presented.

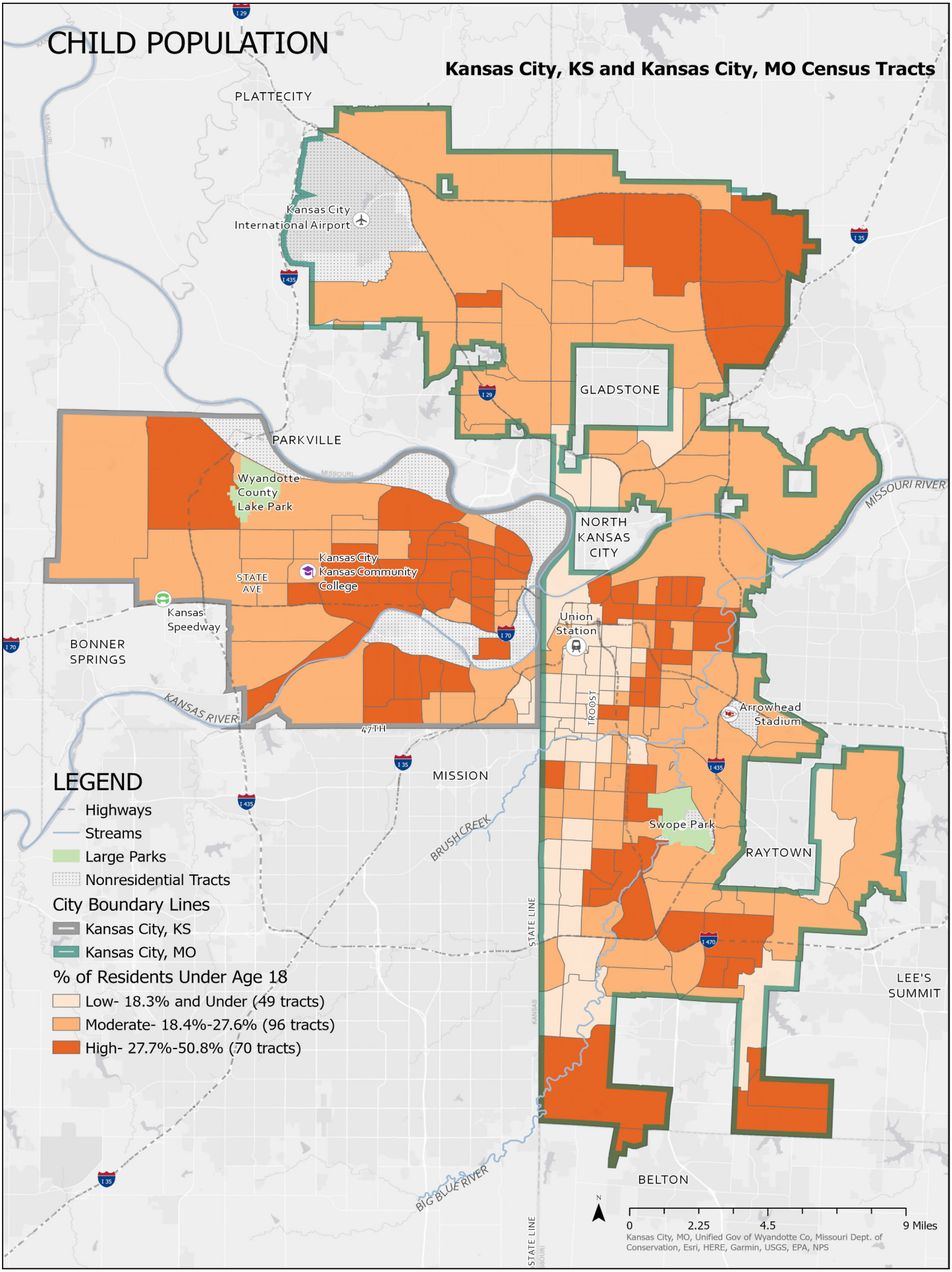
Child Population

To reflect age of the population within the census tract, this indicator is based on the proportion of residents younger than 18 years old. Census tracts were characterized as having a low (0-18.3%), moderate (18.4-27.6%), or high (27.7-50.8%) proportion of residents under 18 years old. **Figure 3** shows that a majority of Kansas City Region census tracts have a high proportion of residents who are children.

Figure 3. Number of census tracts with a high, moderate, and low proportion of residents who are children.



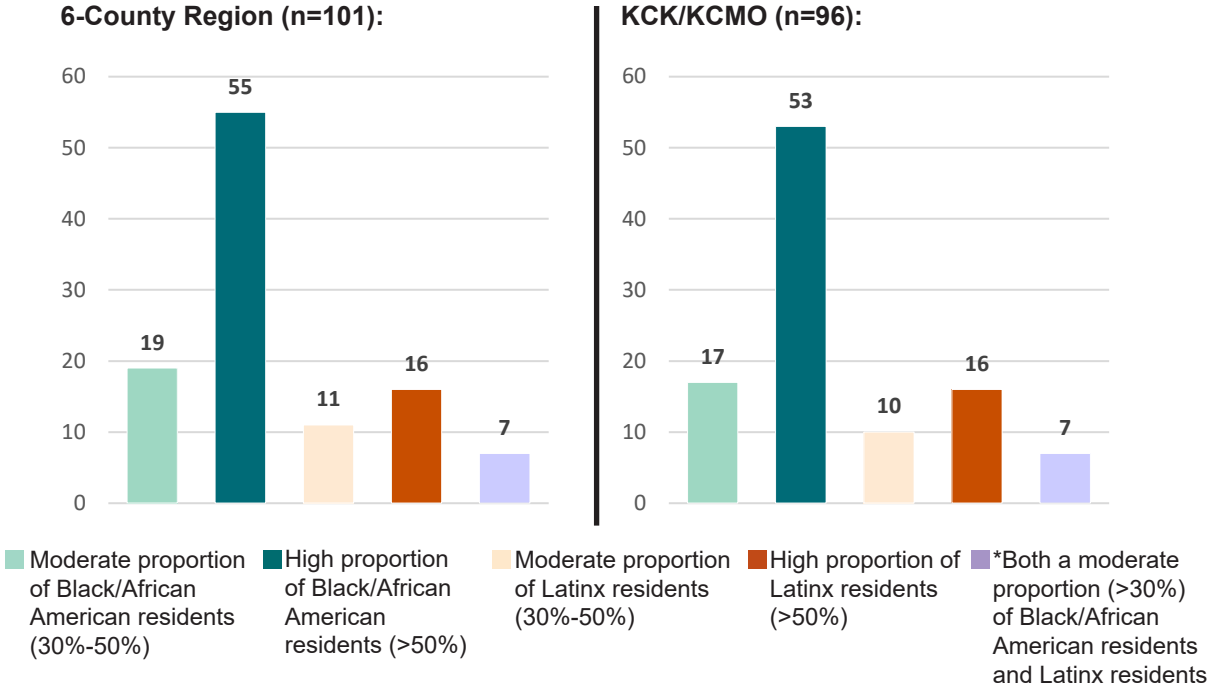

CHILD POPULATION
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
KANSAS RIVER
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
% of Residents Under Age 18
Low- 18.3% and Under (88 tracts)
Moderate- 18.4%-27.6% (252 tracts)
High- 27.6%-50.8% (129 tracts)
0
4.25
8.5
17 Miles
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS


CHILD POPULATION
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
STATE AVE
Kansas City Kansas Community College
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Residents Under Age 18
Low- 18.3% and Under (49 tracts)
Moderate- 18.4%-27.6% (96 tracts)
High- 27.7%-50.8% (70 tracts)
0 2.25 4.5 9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

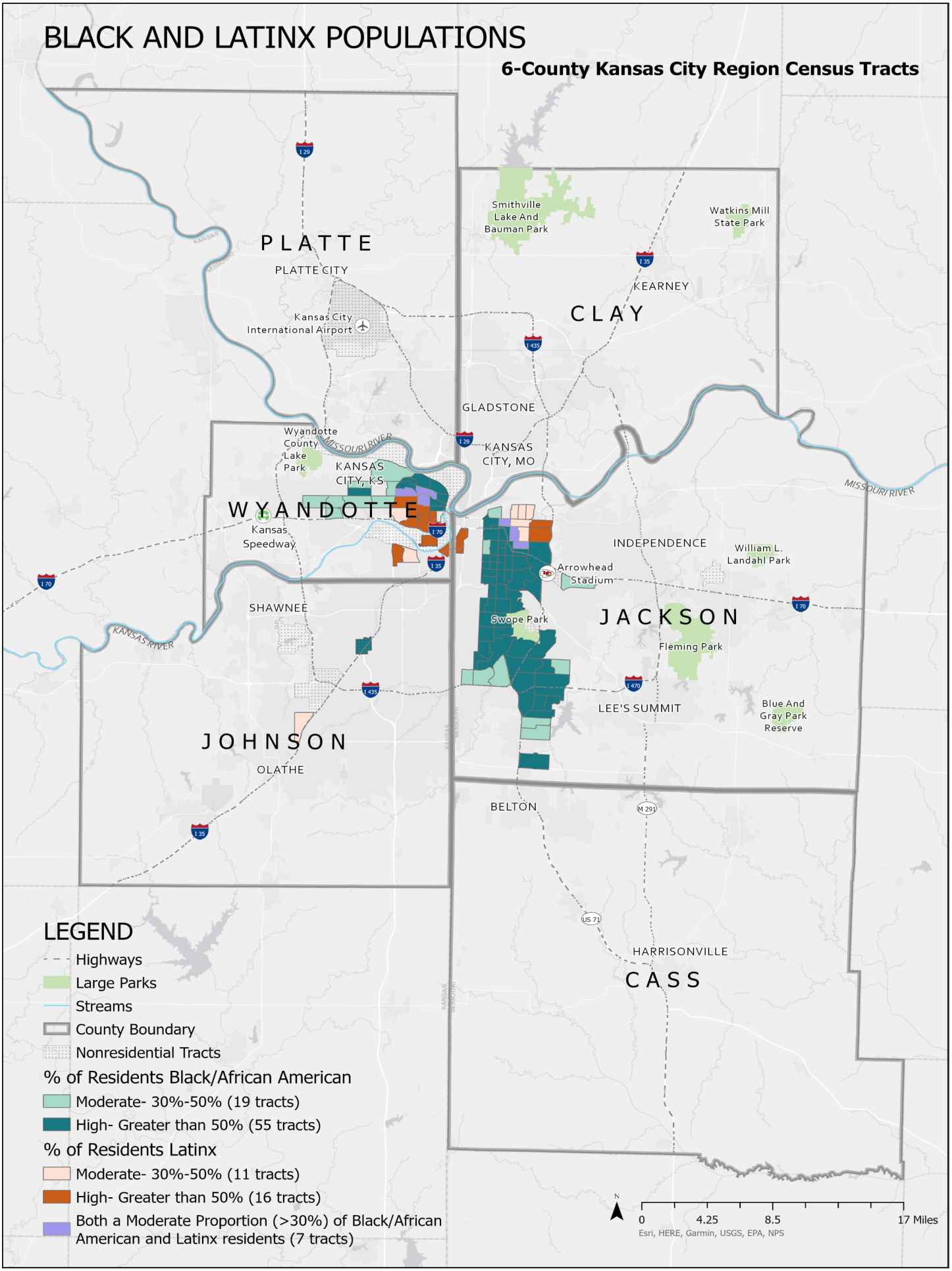
Race/Ethnicity

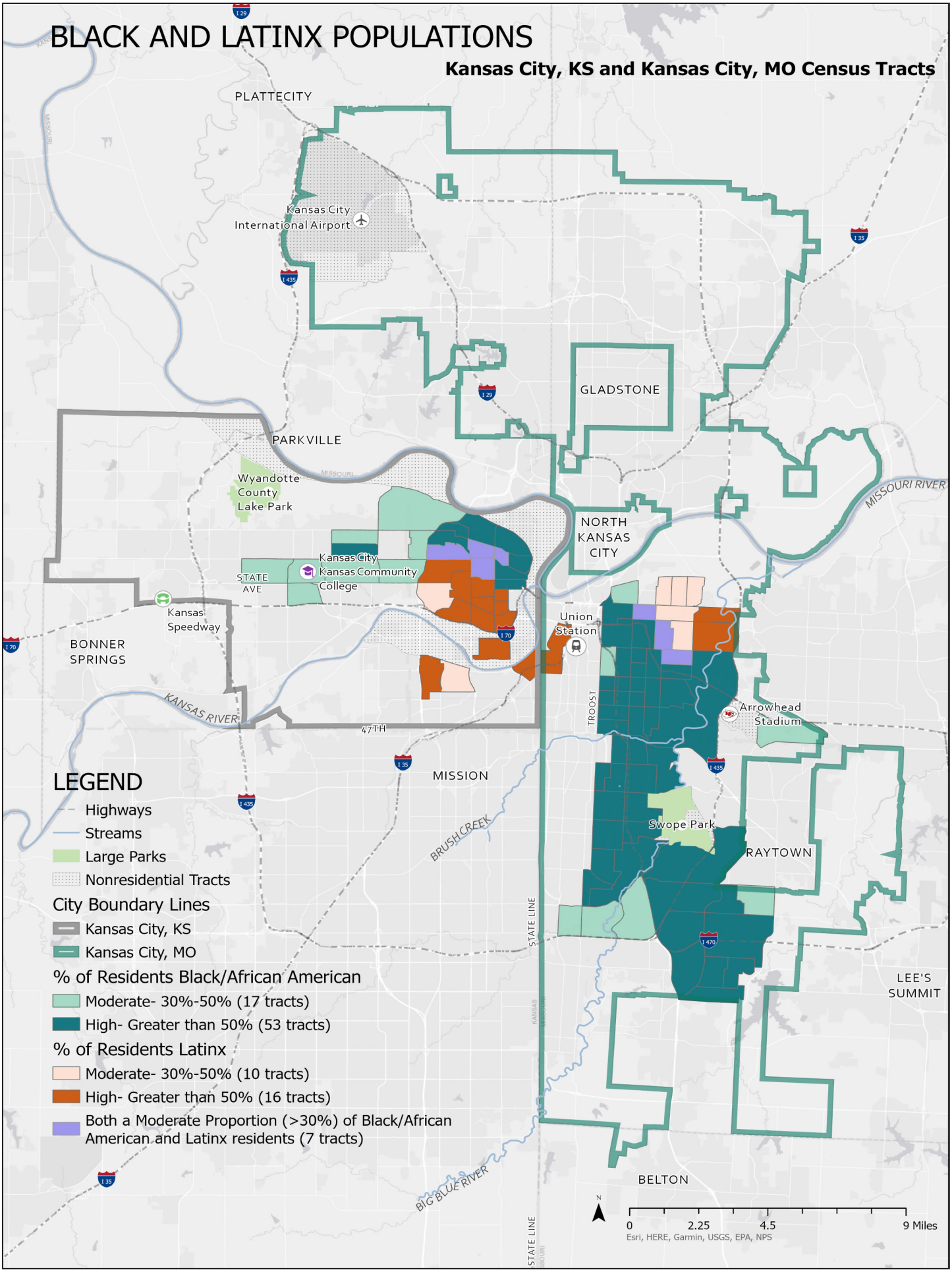
Racial/ethnic distribution is presented based on the two largest racial/ethnic minority groups in the region. Census tracts were characterized into the categories shown in **Figure 4**. Within the 6-County Region, 101 (21%) of the census tracts in the region have a moderate or high proportion of residents who identify as Black/African American or Latinx, and most of these census tracts were in KCK/KCMO (**Figure 4)**. Residents who identify as both Black/African American and Latinx were placed in the Latinx category for the purposes of this presentation.

Figure 4. Number of census tracts with a high or moderate proportion of Black/African American or Latinx residents.



***Note:** Census tracts included in the moderate proportion (>30%) of Black/African American residents and Latinx residents category (represented by the purple bar) are also included in the categories for their respective race/ethnicity. Therefore, these 7 census tracts should not be included in the overall count for census tracts explored for this indicator.

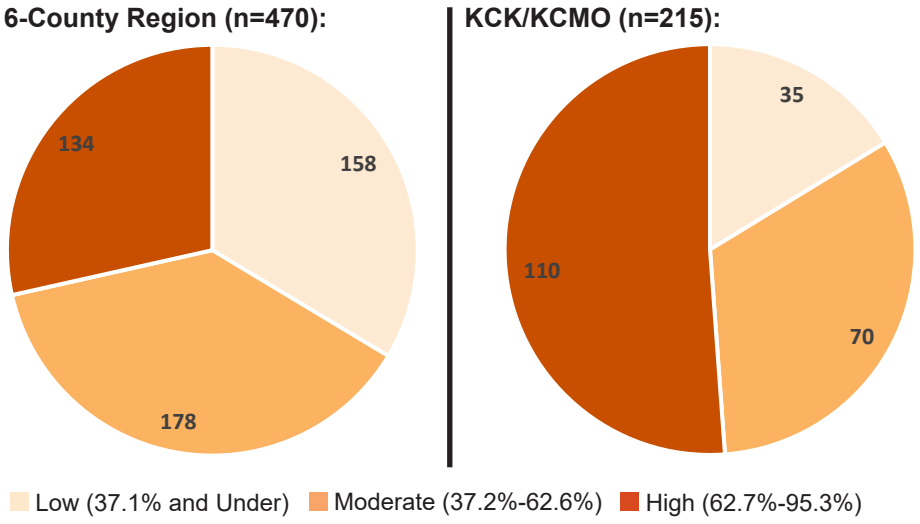

BLACK AND LATINX POPULATIONS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
% of Residents Black/African American
Moderate- 30%-50% (19 tracts)
High- Greater than 50% (55 tracts)
% of Residents Latinx
Moderate- 30%-50% (11 tracts)
High- Greater than 50% (16 tracts)
Both a Moderate Proportion (>30%) of Black/African American and Latinx residents (7 tracts)
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

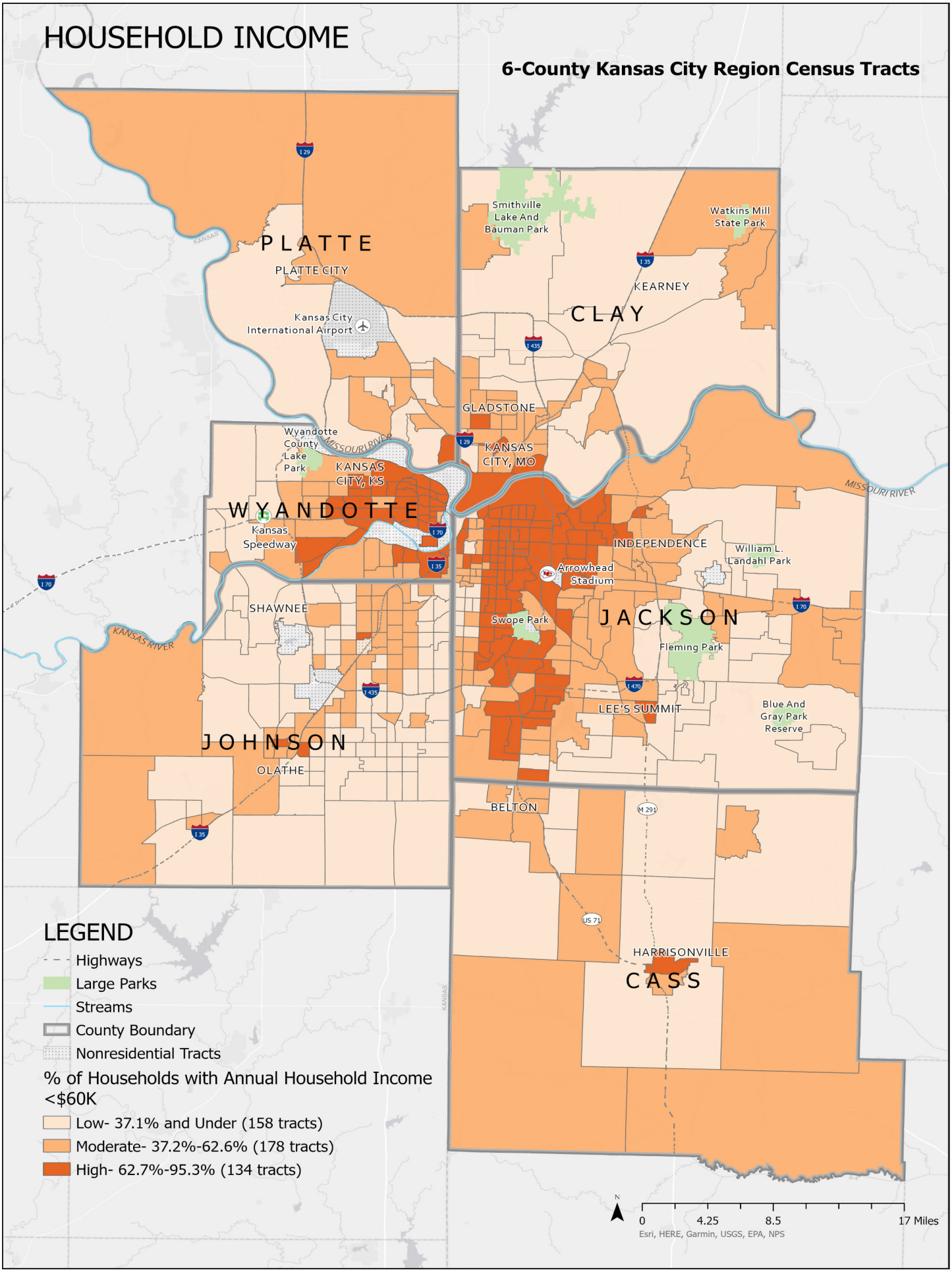

BLACK AND LATINX POPULATIONS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Residents Black/African American
Moderate- 30%-50% (17 tracts)
High- Greater than 50% (53 tracts)
% of Residents Latinx
Moderate- 30%-50% (10 tracts)
High- Greater than 50% (16 tracts)
Both a Moderate Proportion (>30%) of Black/African American and Latinx residents (7 tracts)
N
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

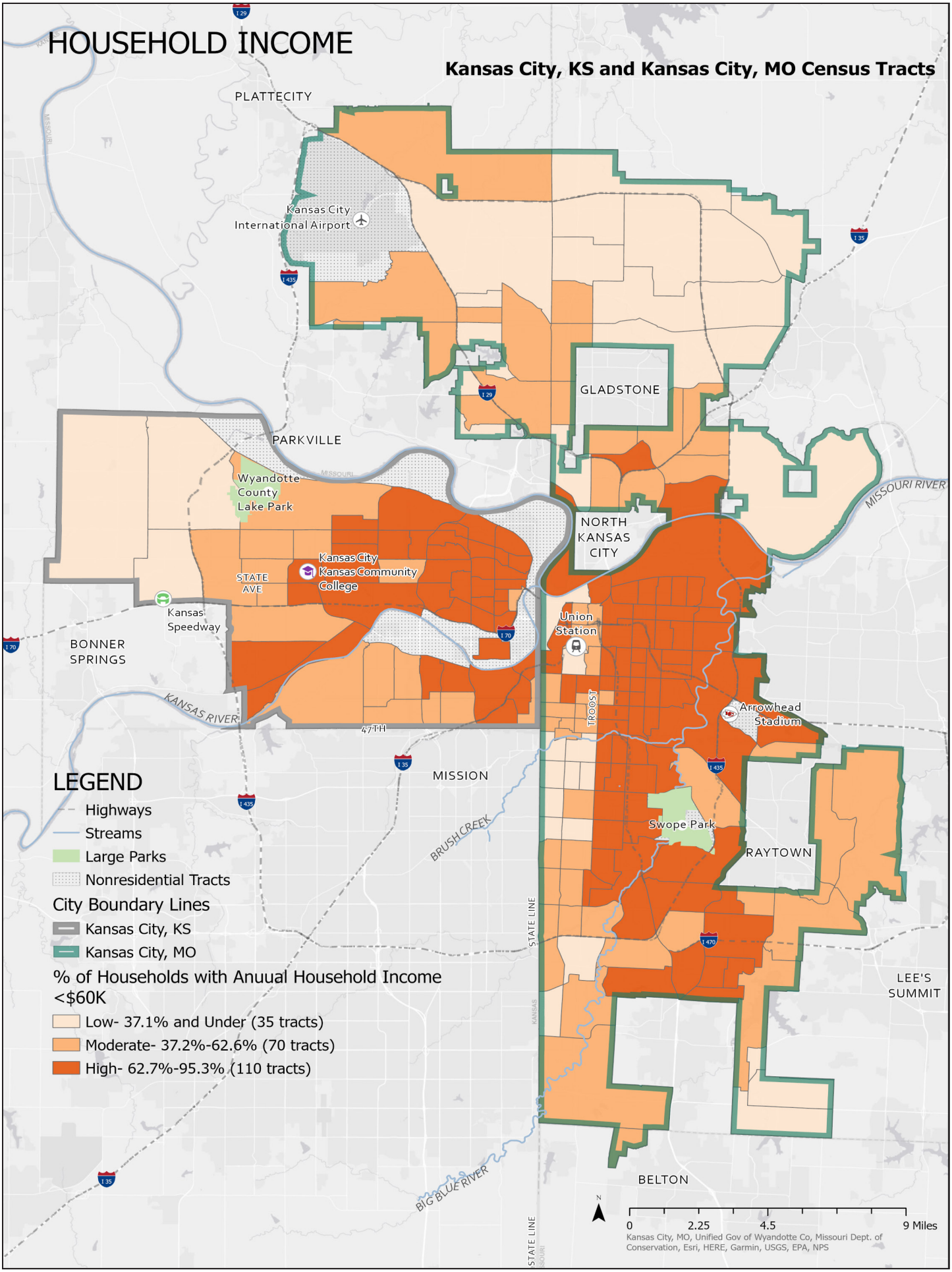
Household Income

Area income is presented based on annual household income. Census tracts were categorized as having a low (0-37.1%), moderate (37.2-62.6%), or high (62.7-95.3%) proportion of households with an annual household income below $60,000, which is the approximate median for the 6-County Region. As shown in **Figure 5**, the rate of having an annual household income below $60,000 is higher in KCK/KCMO than in the 6-County Region.

Figure 5. Number of census tracts with a high, moderate, and low proportion of households with an annual median income below $60,000.



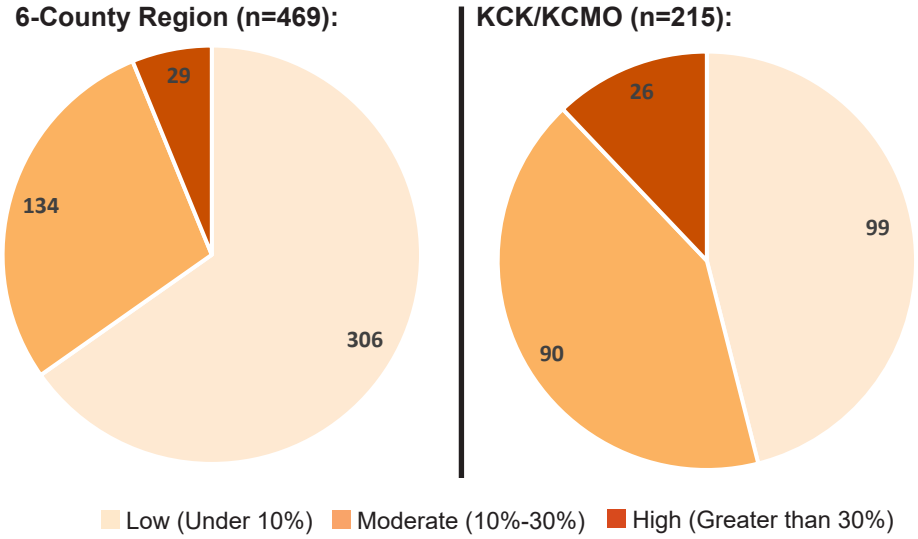

HOUSEHOLD INCOME
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
MISSOURI RIVER
KANSAS RIVER
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
% of Households with Annual Household Income <$60K
Low- 37.1% and Under (158 tracts)
Moderate- 37.2%-62.6% (178 tracts)
High- 62.7%-95.3% (134 tracts)
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

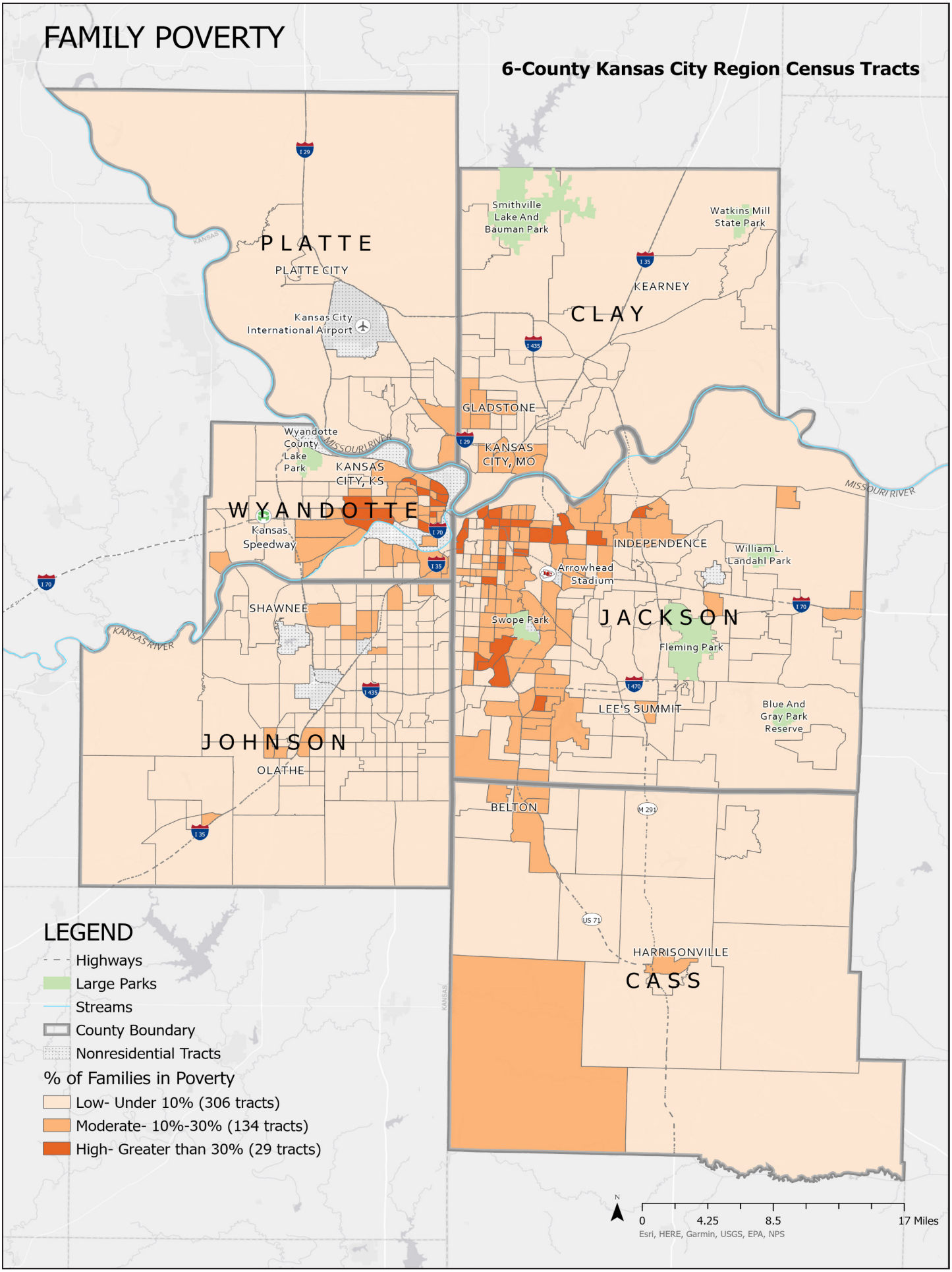

HOUSEHOLD INCOME
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Households with Anuual Household Income <$60K
Low- 37.1% and Under (35 tracts)
Moderate- 37.2%-62.6% (70 tracts)
High- 62.7%-95.3% (110 tracts)
0
2.25
4.5
9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

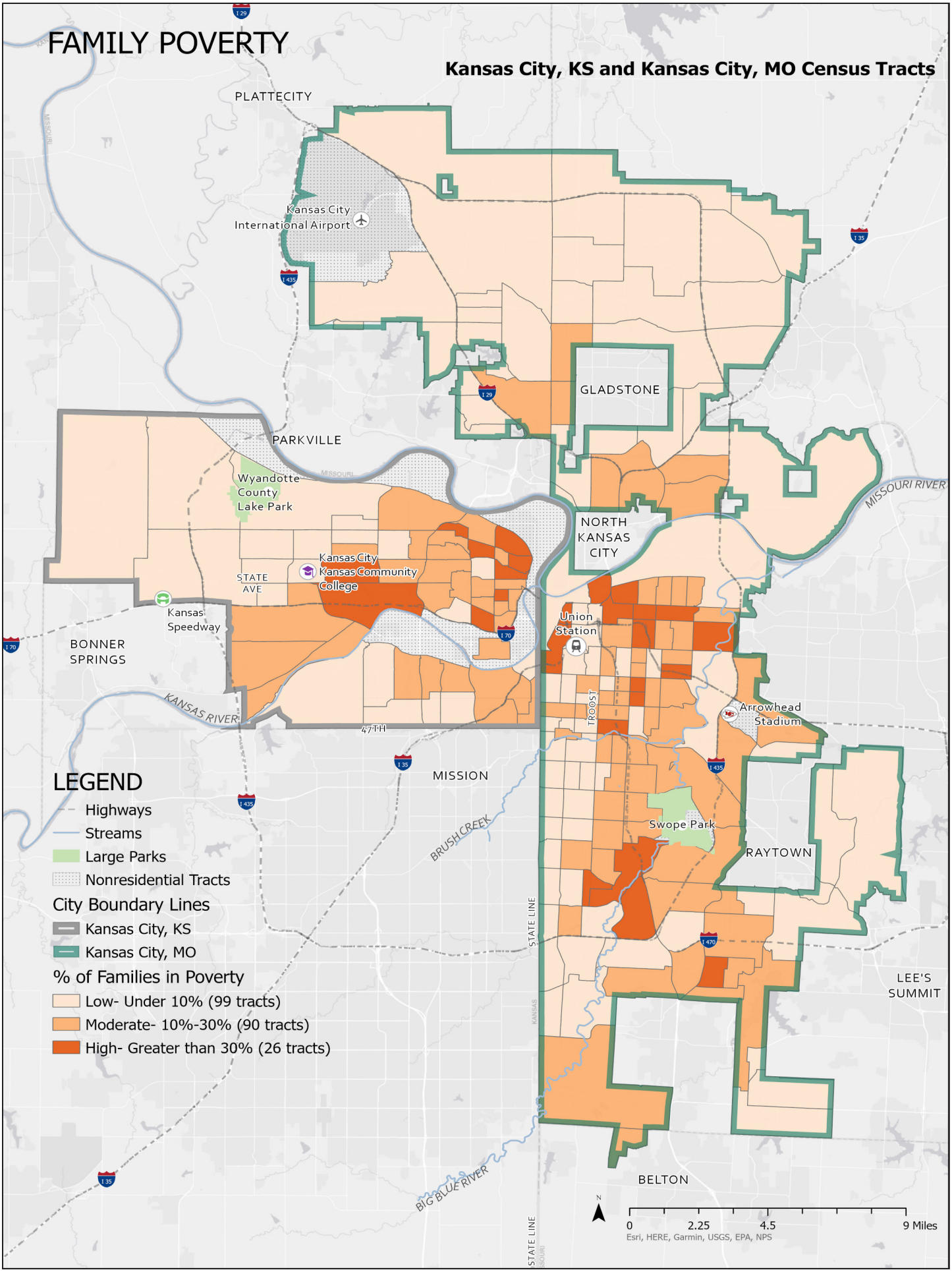
Poverty Status

Differences in income distribution between areas are also presented as the proportion of families within each census tract falling below the federal poverty level. Families are considered in poverty when their annual income falls below the determined poverty threshold that varies by family size and composition.[9,10] Census tracts were categorized as having a low (less than 10%), moderate (10-30%), or high (30% or greater) proportion of families in poverty. Higher rates of poverty are observed in KCK/KCMO than in the 6-County Region (**Figure 6**).

Figure 6. Number of census tracts with high, moderate, and low proportion of family poverty.




FAMILY POVERTY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
KANSAS RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
% of Families in Poverty
Low- Under 10% (306 tracts)
Moderate- 10%-30% (134 tracts)
High- Greater than 30% (29 tracts)
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


FAMILY POVERTY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
Swope Park
BRUSH CREEK
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Families in Poverty
Low- Under 10% (99 tracts)
Moderate- 10%-30% (90 tracts)
High- Greater than 30% (26 tracts)
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Built Environment

Built environment characteristics include the physical components of the places where people live, work, learn, and play.[21] Neighborhood features present within different communities reflect social and economic neighborhood conditions that have been shown to impact opportunities for community members to engage in health behaviors. The following built environment characteristics were obtained from multiple data sources and were selected to provide context for the built environment features available within different neighborhoods.

Food Access

The ability to eat a healthy diet is impacted by the availability of nutritious food options, food cost, and distance/travel time to a grocery store. To identify areas of low access, food access information was obtained from the 2019 U.S. Department of Agriculture (USDA) Food Access Research Atlas.[11] The Food Access Research Atlas provides information at the census tract level on low food access based on distance to a grocery store (**Table 3**). Low access tracts are those where a large amount of the population (at least 500 people, or at least 33%) live more than the threshold distance (one-half, 1 mile, or 10 miles) from the nearest grocery store.[12]

In the 6-County Region and within KCK/KCMO, 204 (43%) and 87 (39%) of the census tracts are classified as low food access according to the USDA based on the 1 mile distance (or 10 mile distance for rural tracts), respectively (**Figure 7**).

Figure 7. Number of census tracts within each food access category.

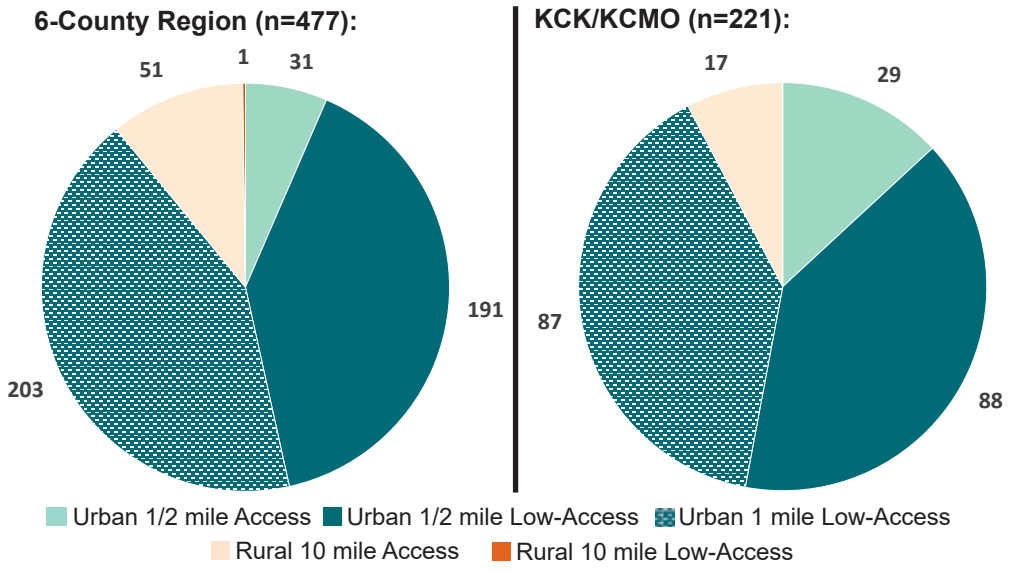
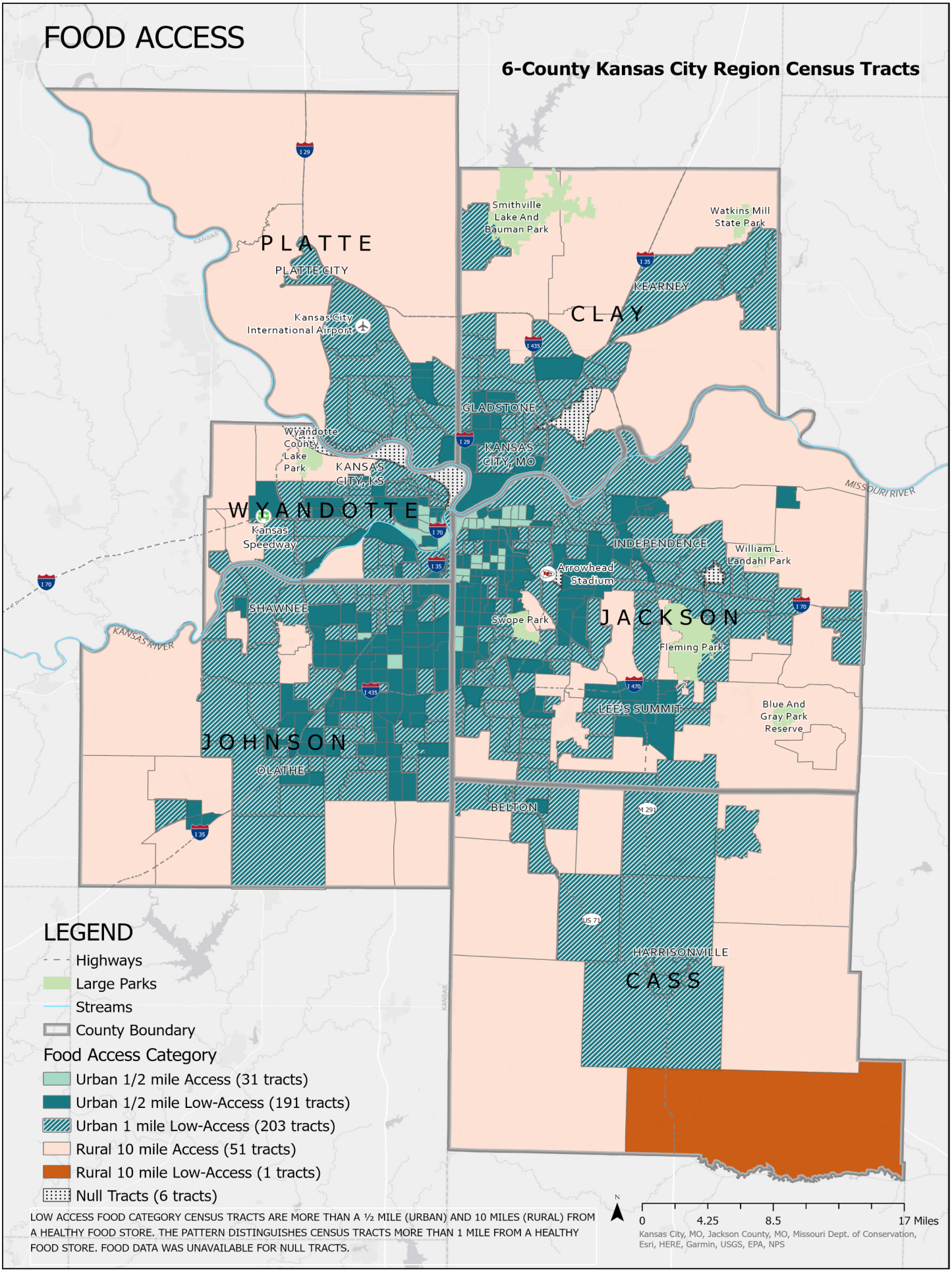
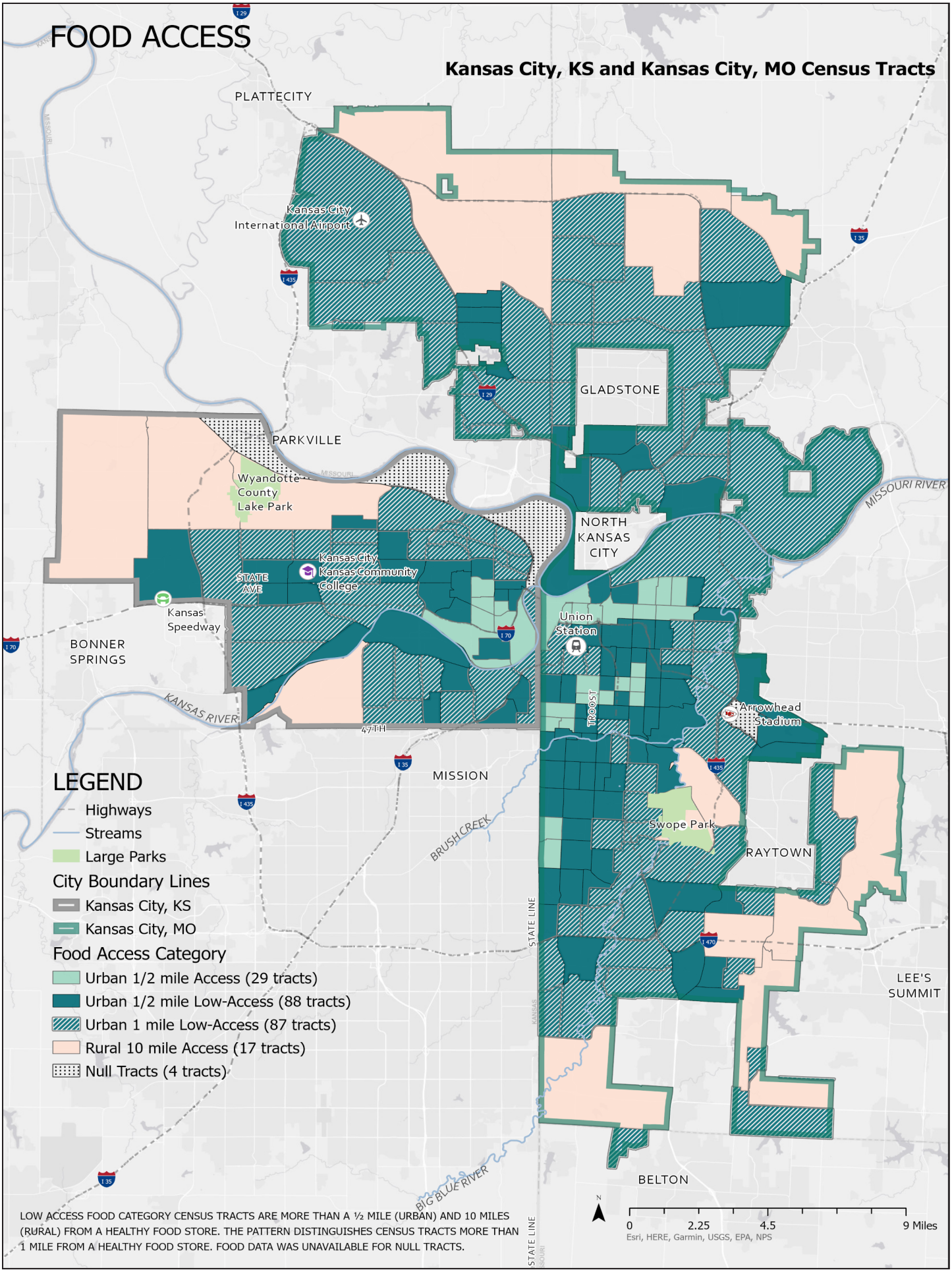


Table 3. Low-access distance measures.

Access Measure	Distance Measure	Significance
Urban Low-Access	1/2 mile	Vehicle availability is an important measure of how readily a household can access a supermarket, so one-half mile low access measures are utilized on the maps to include populations within census tracts that may lack access to vehicles.
	1 mile	The USDA uses 1-mile as a standard threshold for low food access within an urban census tract. Residents living in census tracts with low access at 1-mile may have more difficulty obtaining healthy food options due to having to travel a longer distance to reach a food store.
Rural Low-Access	10 miles	The USDA uses 10-miles as a threshold for low food access within a rural census tract. Rural/urban is defined based on the Bureau of the Census urbanized area definitions.[12]


FOOD ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Food Access Category
Urban 1/2 mile Access (31 tracts)
Urban 1/2 mile Low-Access (191 tracts)
Urban 1 mile Low-Access (203 tracts)
Rural 10 mile Access (51 tracts)
Rural 10 mile Low-Access (1 tracts)
Null Tracts (6 tracts)
LOW ACCESS FOOD CATEGORY CENSUS TRACTS ARE MORE THAN A ½ MILE (URBAN) AND 10 MILES (RURAL) FROM A HEALTHY FOOD STORE. THE PATTERN DISTINGUISHES CENSUS TRACTS MORE THAN 1 MILE FROM A HEALTHY FOOD STORE. FOOD DATA WAS UNAVAILABLE FOR NULL TRACTS.
N
0
4.25
8.5
17 Miles
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS


FOOD ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Food Access Category
Urban 1/2 mile Access (29 tracts)
Urban 1/2 mile Low-Access (88 tracts)
Urban 1 mile Low-Access (87 tracts)
Rural 10 mile Access (17 tracts)
Null Tracts (4 tracts)
LOW ACCESS FOOD CATEGORY CENSUS TRACTS ARE MORE THAN A ½ MILE (URBAN) AND 10 MILES (RURAL) FROM A HEALTHY FOOD STORE. THE PATTERN DISTINGUISHES CENSUS TRACTS MORE THAN 1 MILE FROM A HEALTHY FOOD STORE. FOOD DATA WAS UNAVAILABLE FOR NULL TRACTS.
N
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Walkability

The way neighborhoods are designed and maintained can impact the availability of opportunities for physical activity. Walkable neighborhoods provide opportunities for physical activity by allowing for walking to/from school, friends' homes, jobs, stores, entertainment, and other destinations.

Walkability data were obtained from the 2021 U.S. Environmental Protection Agency (EPA) National Walkability Index and Smart Location Database, which reflect data from 2017-2020,[13,14] to indicate neighborhood design characteristics that are known to support walking. The National Walkability Index is based on the four community design features shown in **Table 3**. The walkability index values utilized in this Atlas are ranked based on their distribution within the 6-County Region, from least to most walkable. A greater proportion of census tracts within KCK/KCMO (64%) are rated as Most Walkable or Above Average Walkable than in the 6-County Region (53%) (**Figure 8**).

Figure 8. Number of census tracts within each of the walkability categories.

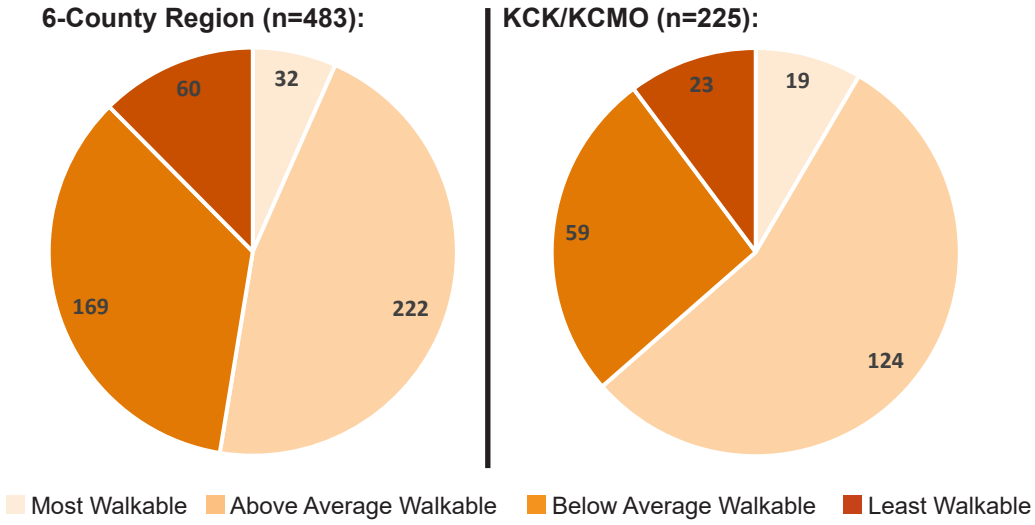
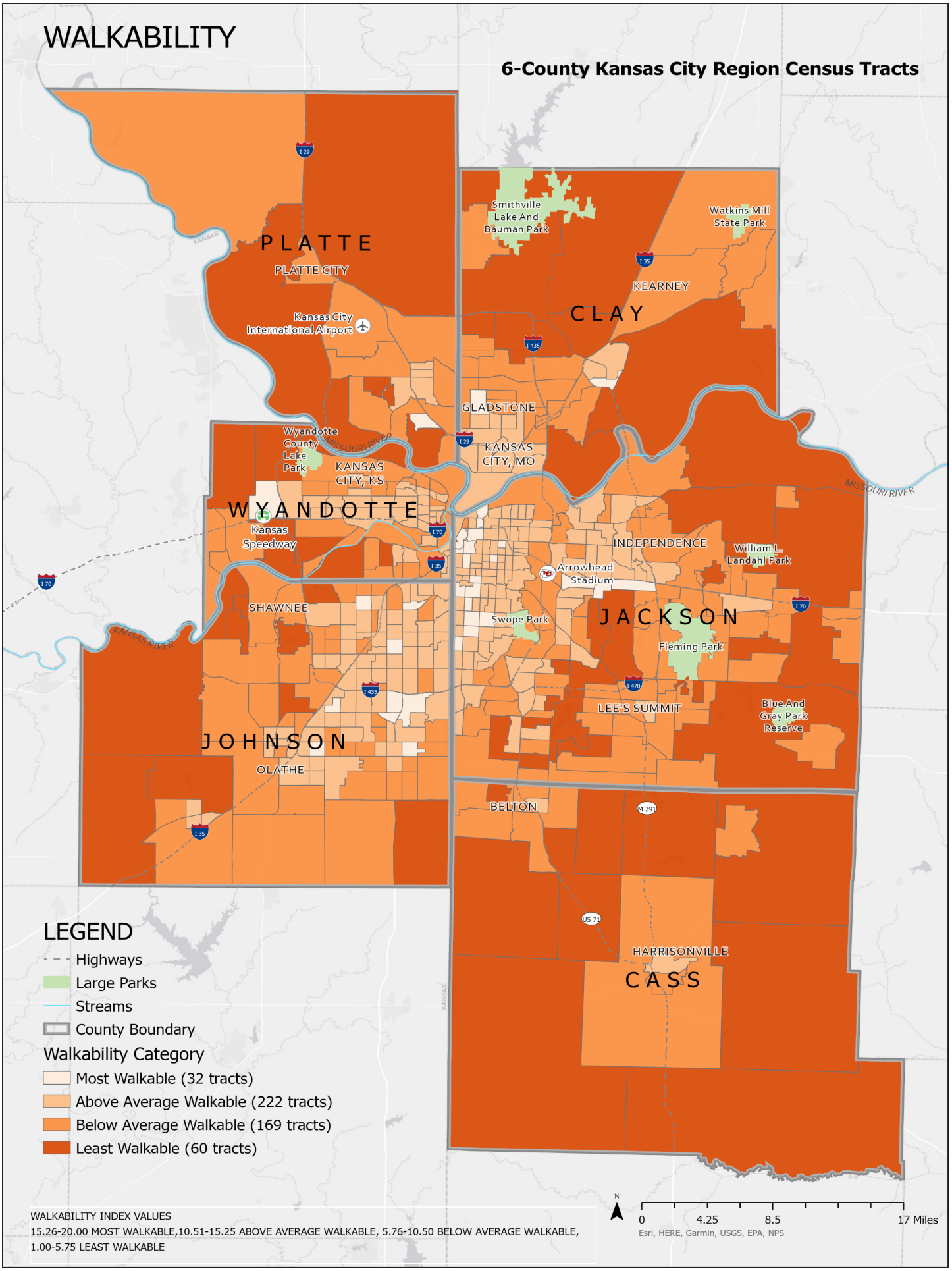
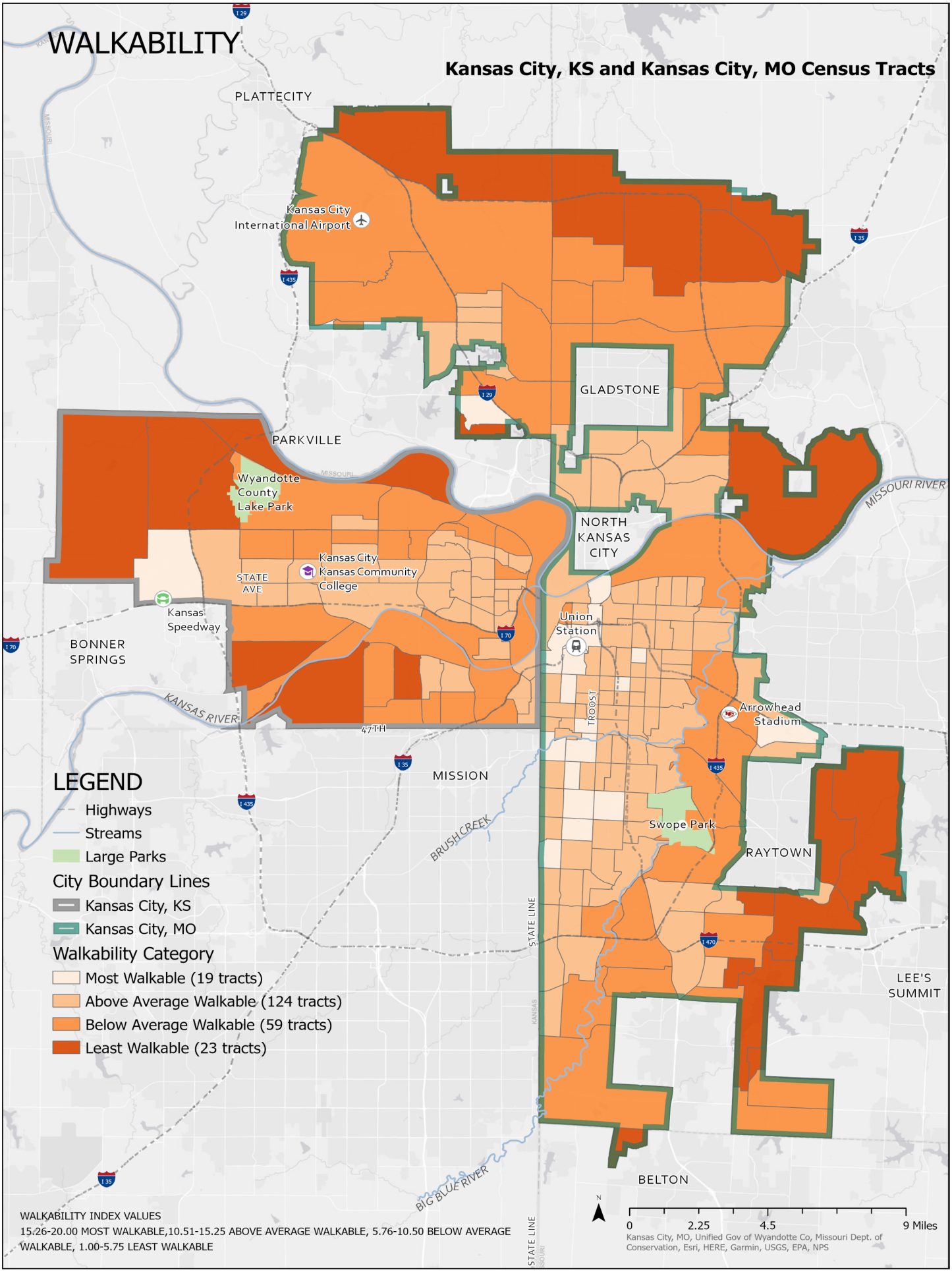


Table 4. Description of the neighborhood walkability features included.

Feature	Description	Why it's important
Street connectivity	Weighted sum of pedestrian-oriented street intersections per square mile of land	Greater connectivity makes for more walkable distances between locations
Land use mix	Mix of occupation types (service, entertainment, housing) as a proxy to represent land use	Commercial/retail land use makes for destinations (shops, restaurants, jobs) within walking distance of people's homes
Residential density	Number of housing units per acre on unprotected land[14]	Greater density makes for more places to walk to and shorter walking distances
Transit	Whether a transit stop was within 500 meters	Having transit nearby provides opportunities for walking to/from the transit stop for those who ride transit


WALKABILITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
Swope Park
JACKSON
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
MISSOURI RIVER
KANSAS RIVER
KANSAS
LEGEND
Highways
Large Parks
Streams
County Boundary
Walkability Category
Most Walkable (32 tracts)
Above Average Walkable (222 tracts)
Below Average Walkable (169 tracts)
Least Walkable (60 tracts)
WALKABILITY INDEX VALUES
15.26-20.00 MOST WALKABLE,10.51-15.25 ABOVE AVERAGE WALKABLE, 5.76-10.50 BELOW AVERAGE WALKABLE,
1.00-5.75 LEAST WALKABLE
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

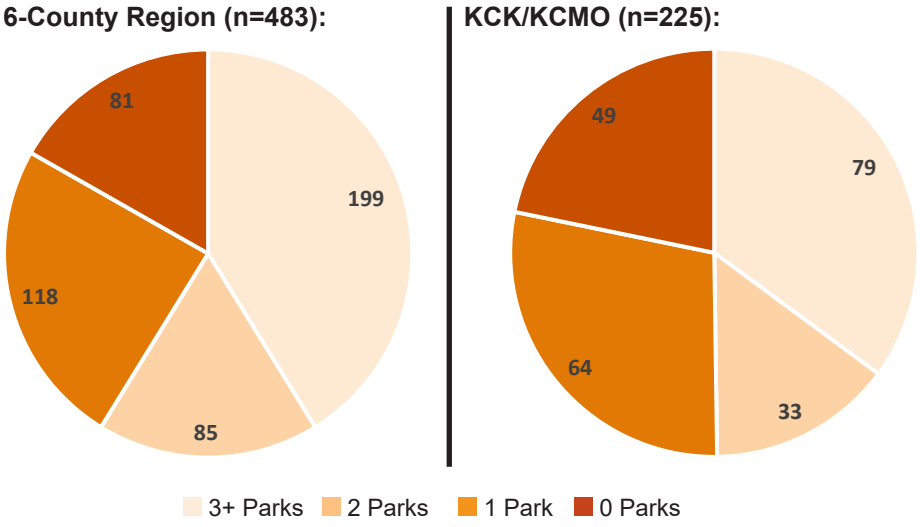

WALKABILITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Walkability Category
Most Walkable (19 tracts)
Above Average Walkable (124 tracts)
Below Average Walkable (59 tracts)
Least Walkable (23 tracts)
WALKABILITY INDEX VALUES
15.26-20.00 MOST WALKABLE,10.51-15.25 ABOVE AVERAGE WALKABLE, 5.76-10.50 BELOW AVERAGE WALKABLE, 1.00-5.75 LEAST WALKABLE
0 2.25 4.5 9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

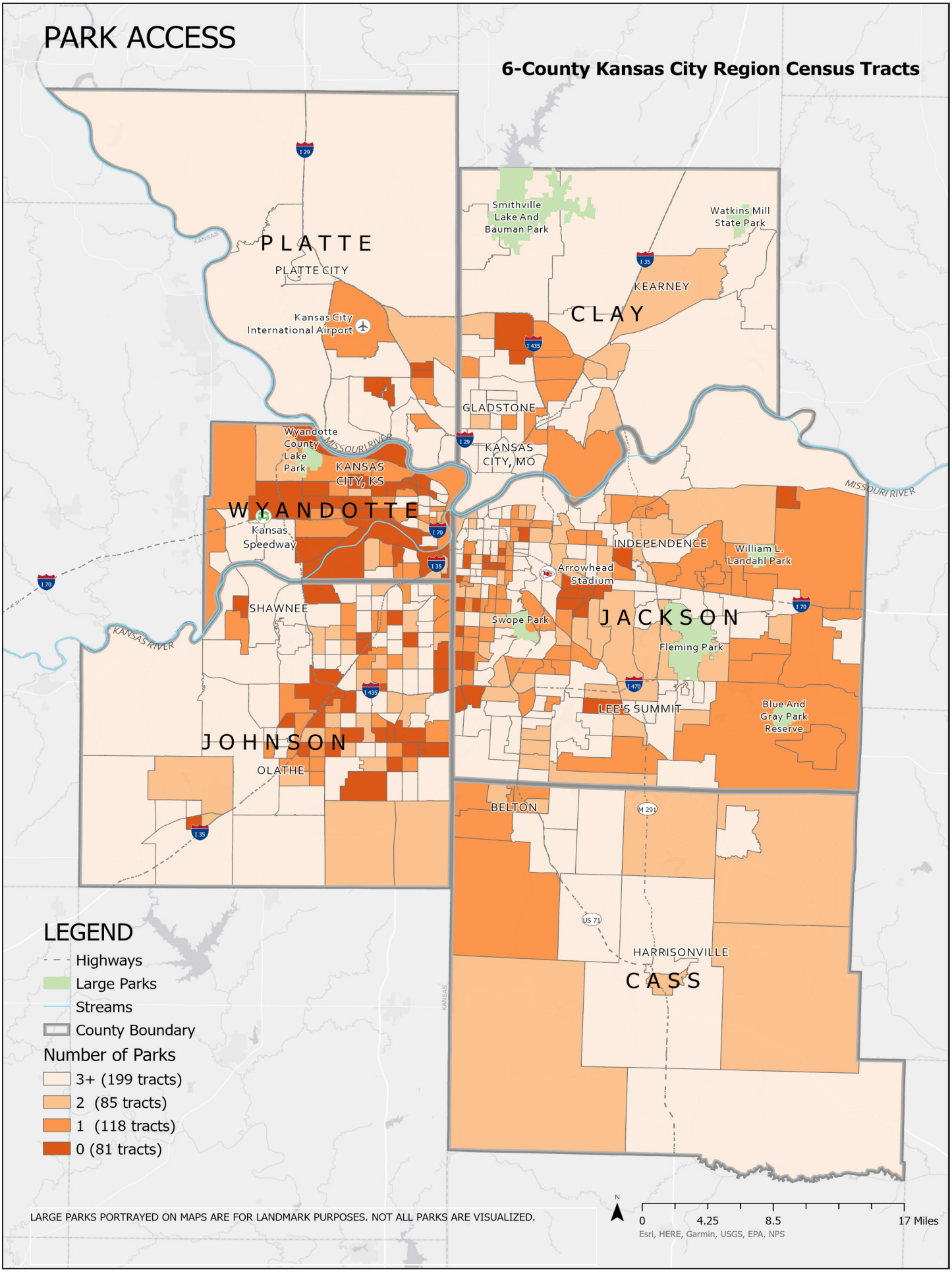
Parks

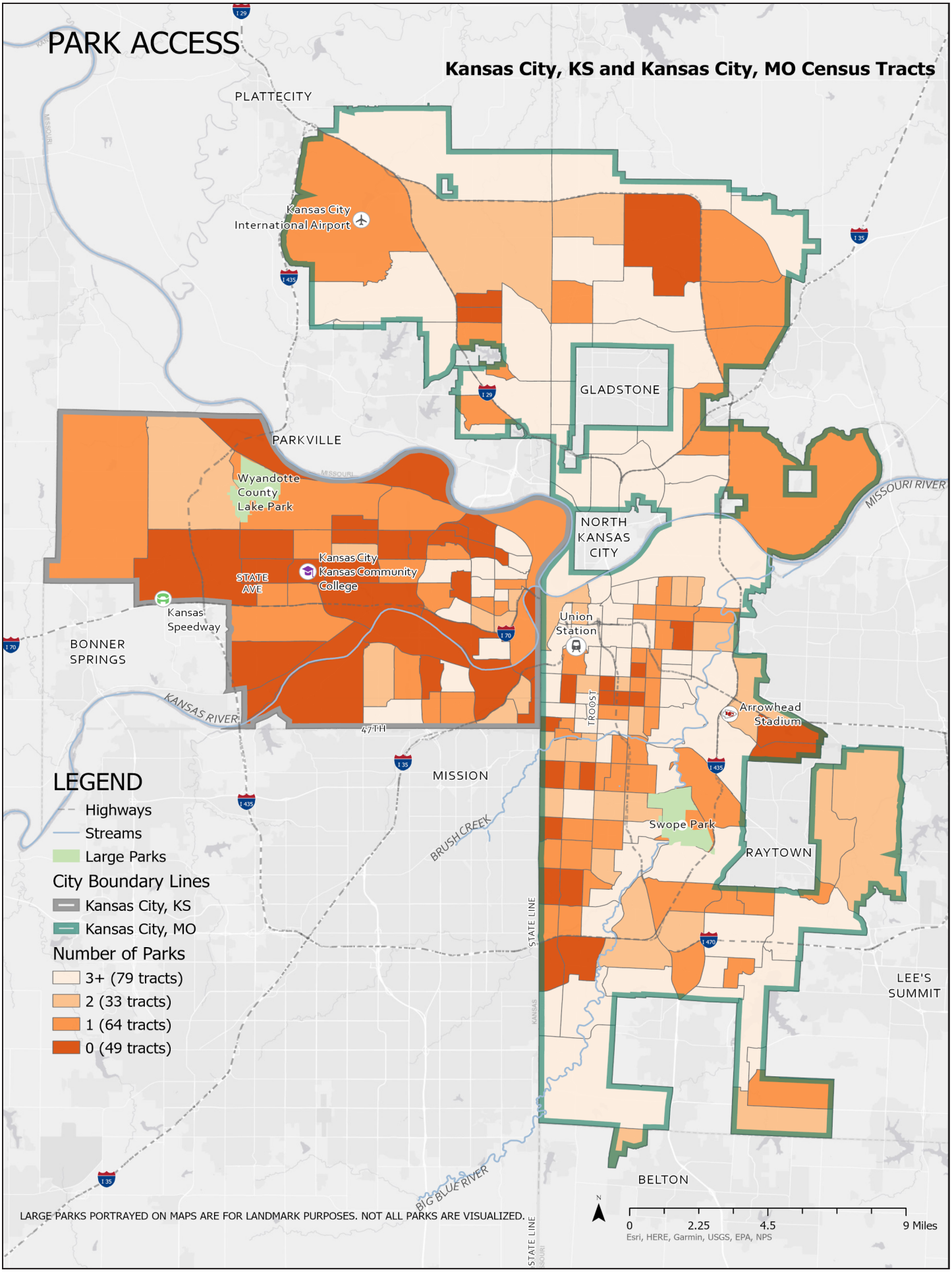
Communities with greater access to parks tend to have more opportunities for physical activity, social connectedness, and exposure to nature that can induce multiple benefits. Park location information was obtained from the Mid-America Regional Council and reflects 1,066 public parks at least one quarter-acre in size.

Park access is presented based on the number of parks present in each census tract. Census tracts are categorized as having 0, 1, 2, or 3+ parks. While a large number of census tracts have 3+ parks, there are also many census tracts that have 0 or 1 park (**Figure 9**).

Figure 9. Number of census tracts that contain 0, 1, 2, or 3+ parks.




PARK ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
KANSAS RIVER
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Number of Parks
3+ (199 tracts)
2 (85 tracts)
1 (118 tracts)
0 (81 tracts)
LARGE PARKS PORTRAYED ON MAPS ARE FOR LANDMARK PURPOSES. NOT ALL PARKS ARE VISUALIZED.
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


PARK ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
NORTH KANSAS CITY
MISSOURI RIVER
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Number of Parks
3+ (79 tracts)
2 (33 tracts)
1 (64 tracts)
0 (49 tracts)
LARGE PARKS PORTRAYED ON MAPS ARE FOR LANDMARK PURPOSES. NOT ALL PARKS ARE VISUALIZED.
0 2.25 4.5 9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Chapter 4
Environmental Differences by Neighborhood Poverty

Neighborhood poverty is an important factor that can directly and indirectly contribute to poor health, the latter of which can occur through inequities in health-promoting neighborhood resources and built environments. This section of the Atlas explores associations between neighborhood poverty and neighborhood built environment characteristics by presenting *composite maps* in which two indicators are presented together. To identify communities with the greatest need for support, the census tracts presented in each of the maps show the areas where there is a co-occurrence of moderate or high neighborhood poverty and poor neighborhood conditions based on the built environment indicator of interest. Thus, the maps only show census tracts that are within the moderate (10-30% of families) or high poverty category (greater than 30% of families) and within the lowest two categories of the built environment indicator (e.g., Below Average Walkable or Least Walkable). All maps included in this series build upon data presented in the previous map series.

Maps in this series include:

Poverty and Low Food Access
Poverty and Walkability
Poverty and Park Access

Poverty and Low Food Access

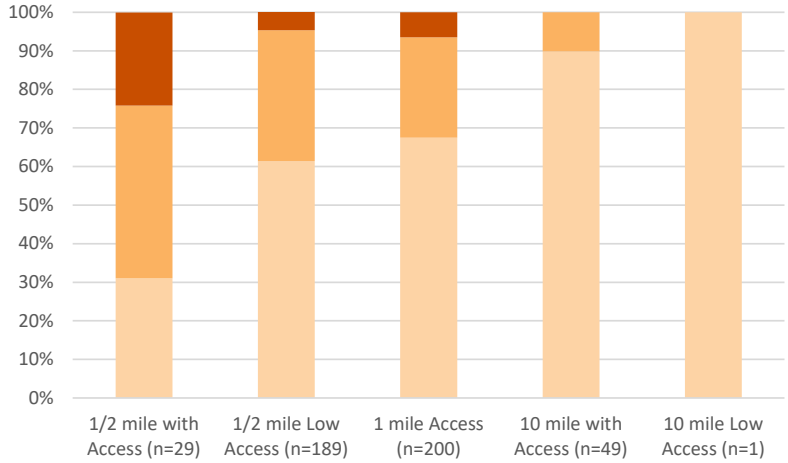
Economically disadvantaged neighborhoods may be particularly impacted by poor access to healthy foods. Food insecurity affects 32.1% of families in the U.S.[16] who are living below the federal poverty level. Census tracts shown in these maps highlight areas where there is a co-occurrence of low food access and moderate or high levels of family poverty.

Census tracts classified as low access at the 1 mile distance are also considered low access at the ½ mile distance, though these categories are presented as mutually exclusive in **Figure 10**. This figure shows that, when considering only the ½- and 1-mile indicators (i.e., omitting tracts that base food access on the 10-mile distance due to being in less population-dense areas on the periphery of the region), 138 (35%) of the low food access tracts in the 6-County Region have high or moderate rates of poverty, whereas 20 (69%) of the high/adequate food access tracts in the 6-County Region have moderate or high rates of poverty. Thus, low food access is more prevalent in low poverty areas as compared to moderate and high poverty areas.

A similar but slightly weaker association is observed within KCK/KCMO, with 93 (54%) of the low food access tracts having high or moderate rates of poverty, and 19 (70%) of the high/adequate food access tracts having high or moderate rates of poverty (this excludes the tracts that use the 10-mile distance). However, despite this association, the prevalence of low food access is high, including in areas with moderate or high poverty. This map shows that the areas where moderate/high poverty and low food access co-occur tend to be concentrated within KCK/KCMO, though are present in all 6 counties. The census tracts with the dotted pattern are those that have the poorest healthy food access among the low access areas.

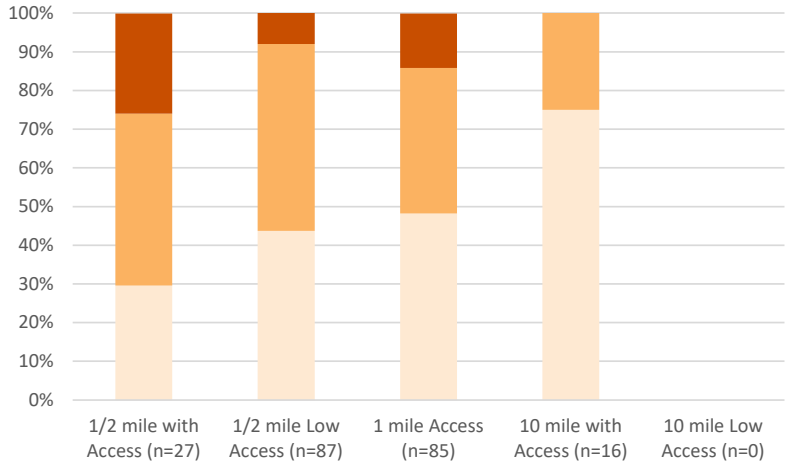
Figure 10. Poverty rates within each food access category.

6-County Region (n=468):

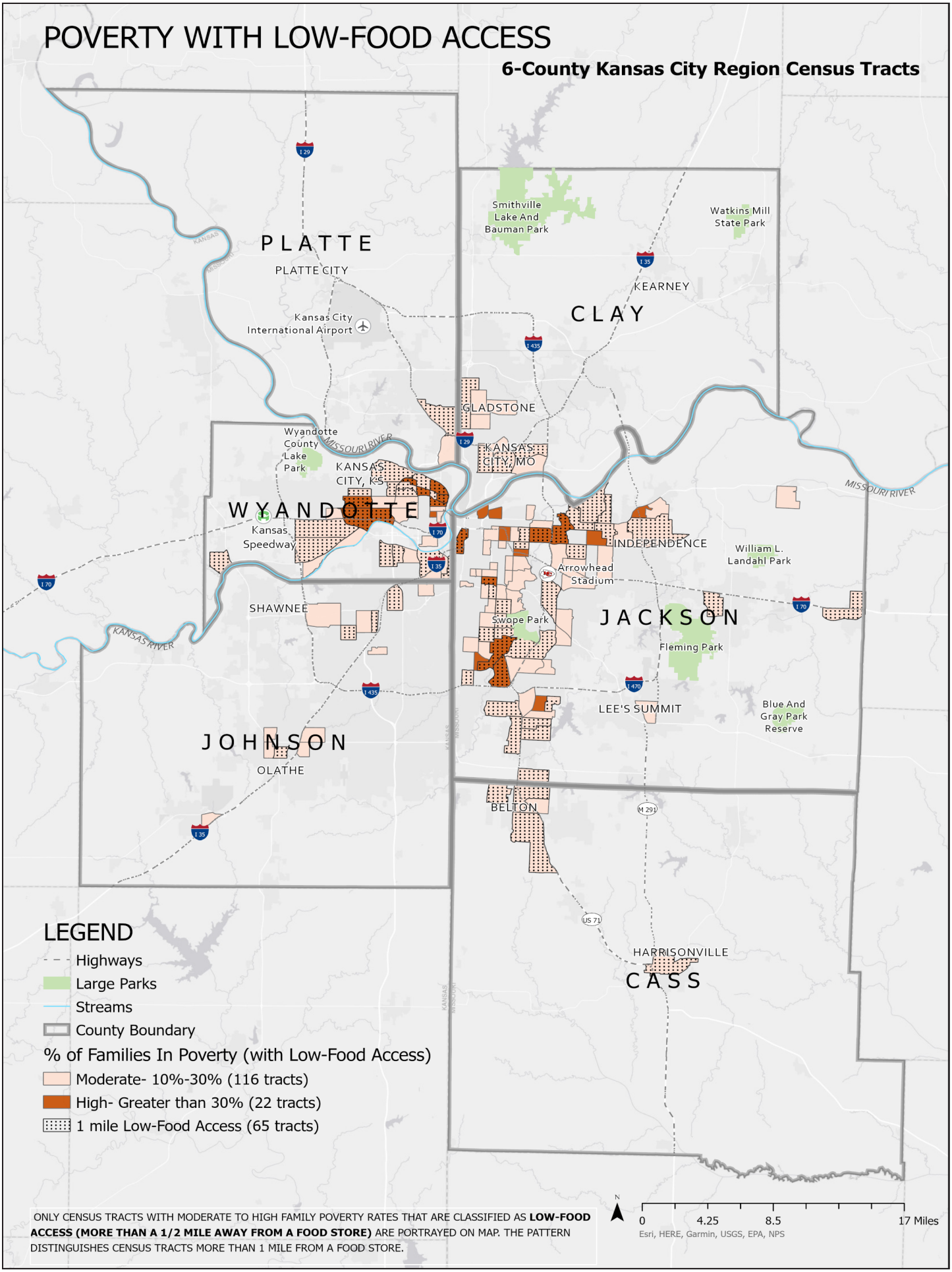


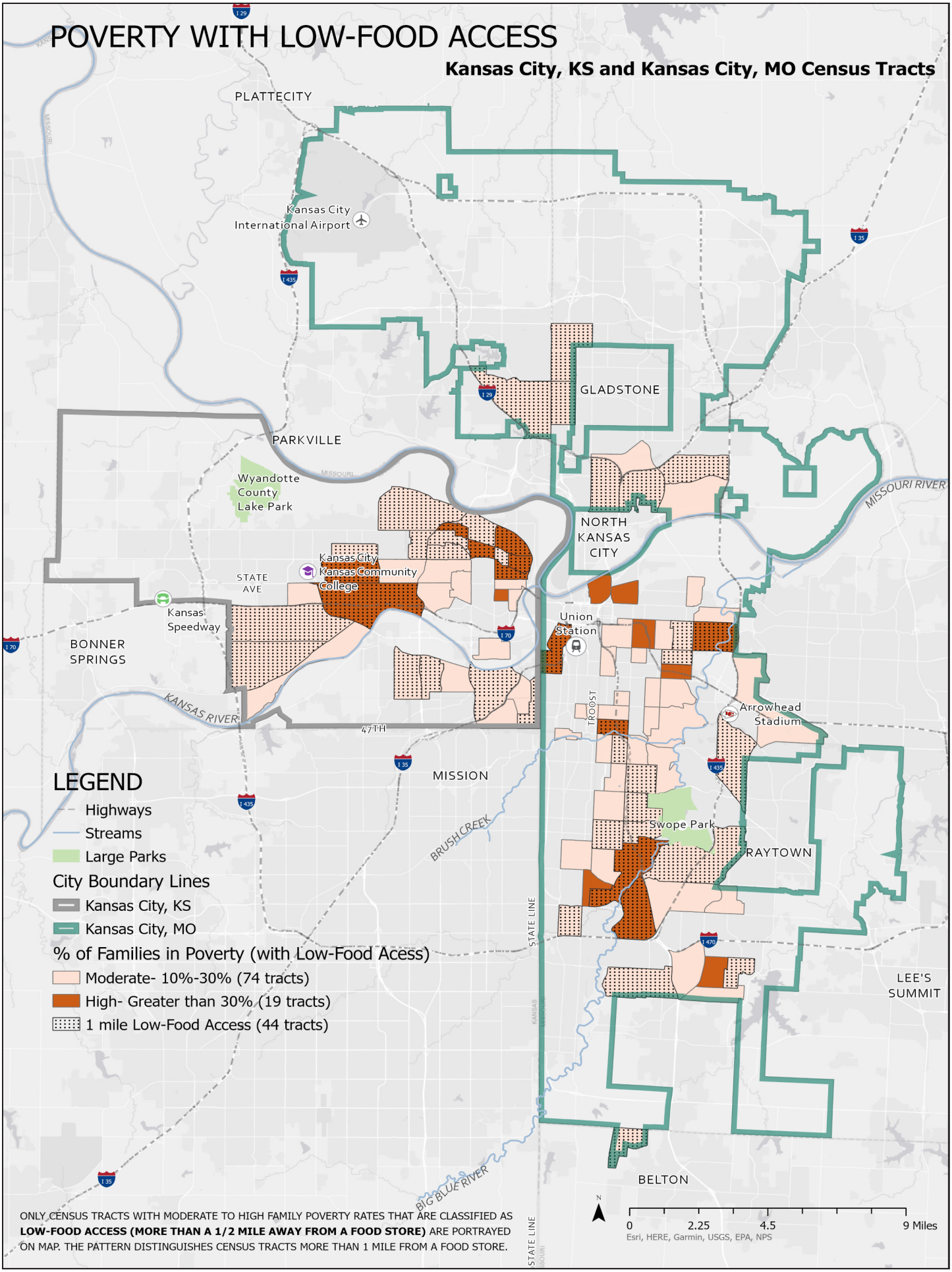
	1/2 mile with Access (n=29)	1/2 mile Low Access (n=189)	1 mile Access (n=200)	10 mile with Access (n=49)	10 mile Low Access (n=1)
High Poverty	24.1%	4.8%	6.5%	0.0%	0.0%
Moderate Poverty	44.8%	33.9%	26.0%	10.2%	0.0%
Low Poverty	31.0%	61.4%	67.5%	89.8%	100.0%

KCK/KCMO (n=215):



	1/2 mile with Access (n=27)	1/2 mile Low Access (n=87)	1 mile Access (n=85)	10 mile with Access (n=16)	10 mile Low Access (n=0)
High Poverty	25.9%	8.0%	14.1%	0.0%	0.0%
Moderate Poverty	44.4%	48.3%	37.6%	25.0%	0.0%
Low Poverty	29.6%	43.7%	48.2%	75.0%	0.0%


POVERTY WITH LOW-FOOD ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
Wyandotte County Lake Park
KANSAS CITY, KS
KANSAS CITY, MO
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
MISSOURI RIVER
KANSAS RIVER
LEGEND
Highways
Large Parks
Streams
County Boundary
% of Families In Poverty (with Low-Food Access)
Moderate- 10%-30% (116 tracts)
High- Greater than 30% (22 tracts)
1 mile Low-Food Access (65 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES THAT ARE CLASSIFIED AS LOW-FOOD ACCESS (MORE THAN A 1/2 MILE AWAY FROM A FOOD STORE) ARE PORTRAYED ON MAP. THE PATTERN DISTINGUISHES CENSUS TRACTS MORE THAN 1 MILE FROM A FOOD STORE.
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


POVERTY WITH LOW-FOOD ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Families in Poverty (with Low-Food Acess)
Moderate- 10%-30% (74 tracts)
High- Greater than 30% (19 tracts)
1 mile Low-Food Access (44 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES THAT ARE CLASSIFIED AS LOW-FOOD ACCESS (MORE THAN A 1/2 MILE AWAY FROM A FOOD STORE) ARE PORTRAYED ON MAP. THE PATTERN DISTINGUISHES CENSUS TRACTS MORE THAN 1 MILE FROM A FOOD STORE.
N
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Poverty and Walkability

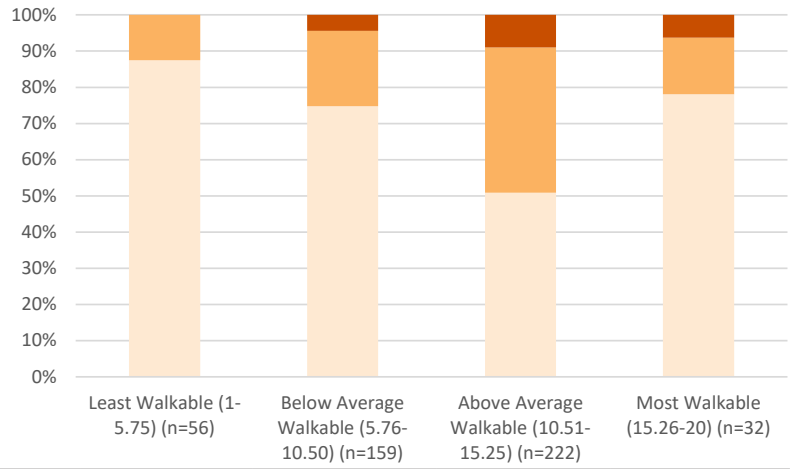
Walkable neighborhoods, particularly those with greater connectivity, land use mix, density, and transit access, tend to be those that are older and more urban, though there are exceptions such as with smart growth design.[17]

Census tracts shown in these maps highlight areas where there is a co-occurrence of low walkability and moderate or high levels of family poverty. **Figure 11** shows that, in the 6-County Region, 116 (46%) of the tracts rated as Above Average Walkable or Most Walkable have moderate or high rates of poverty, whereas 47 (22%) of the tracts rated as Below Average Walkable or Least Walkable have moderate or high rates of poverty. Thus, higher walkability is more prevalent in moderate and high poverty areas as compared to low poverty areas.

A similar association is observed within KCK/KCMO, with 89 (62%) of the tracts rated as Above Average Walkable or Most Walkable having moderate or high rates of poverty, and 27 (38%) of the tracts rated as Below Average Walkable or Least Walkable having moderate or high rates of poverty. The areas where moderate/high poverty and low walkability co-occur tend to be outside of the urban core areas of the region, though many are within KCK/KCMO. The census tracts with the dotted pattern are those that have the poorest walkability among the low walkability areas.

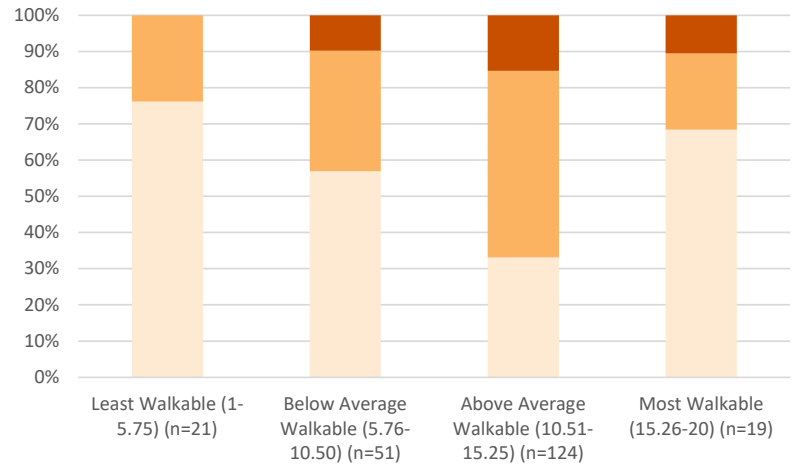
Figure 11. Poverty rates within each walkability category.

6-County Region (n=469):

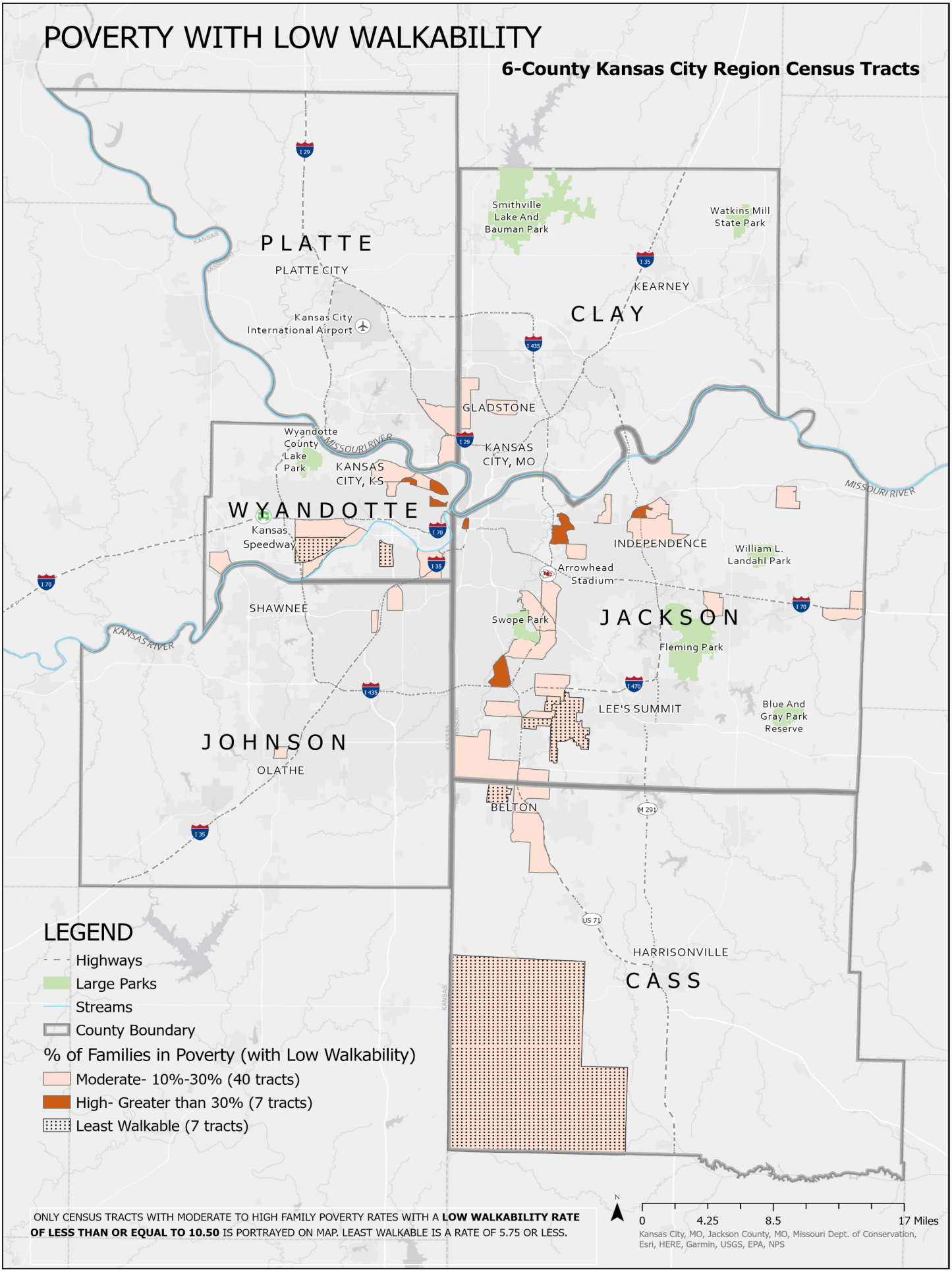


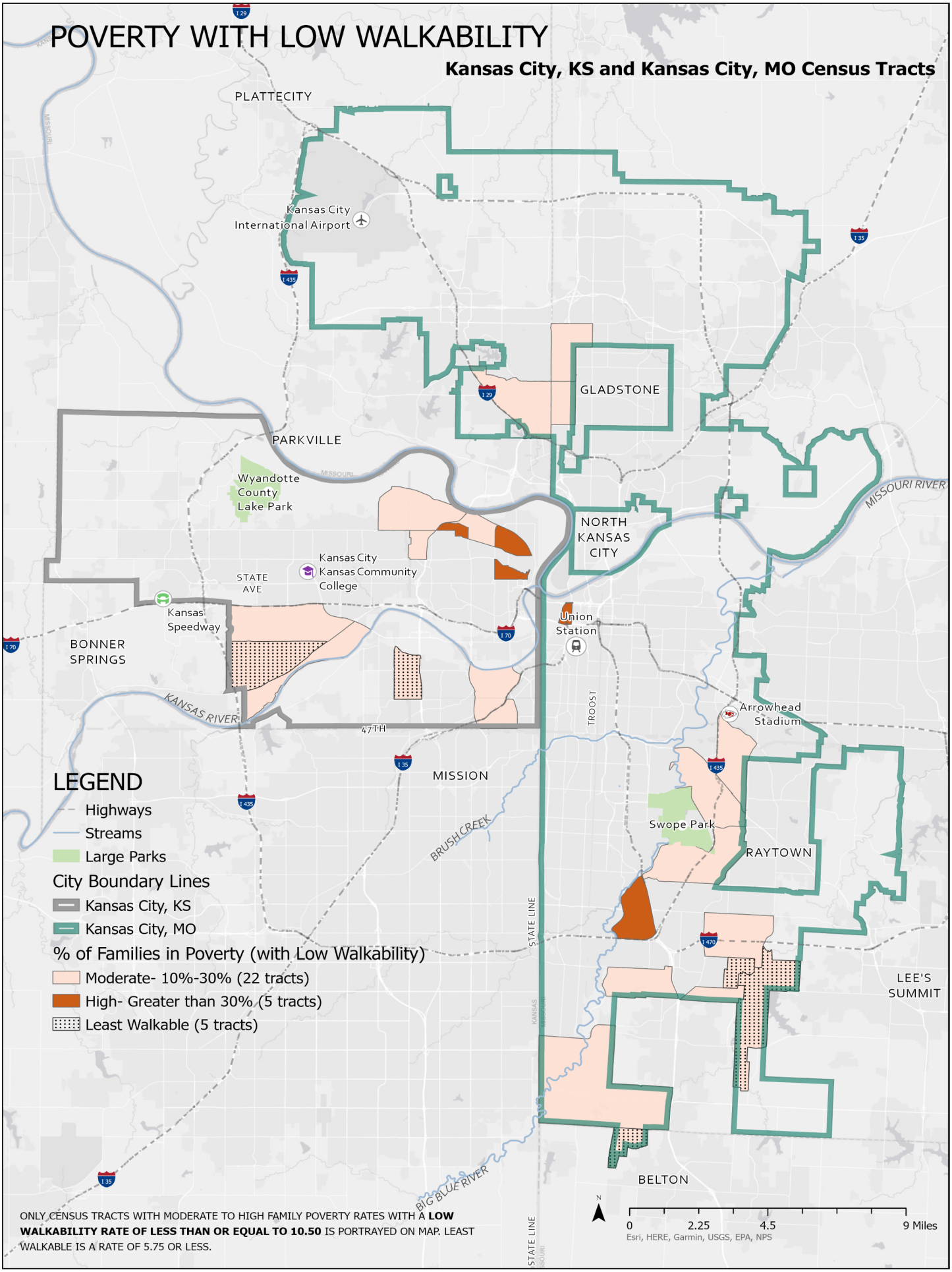
	Least Walkable (1-5.75) (n=56)	Below Average Walkable (5.76-10.50) (n=159)	Above Average Walkable (10.51-15.25) (n=222)	Most Walkable (15.26-20) (n=32)
High Poverty	0.0%	4.4%	9.0%	6.3%
Moderate Poverty	12.5%	20.8%	40.1%	15.6%
Low Poverty	87.5%	74.8%	50.9%	78.1%

KCK/KCMO (n=215):



	Least Walkable (1-5.75) (n=21)	Below Average Walkable (5.76-10.50) (n=51)	Above Average Walkable (10.51-15.25) (n=124)	Most Walkable (15.26-20) (n=19)
High Poverty	0.0%	9.8%	15.3%	10.5%
Moderate Poverty	23.8%	33.3%	51.6%	21.1%
Low Poverty	76.2%	56.9%	33.1%	68.4%


POVERTY WITH LOW WALKABILITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
% of Families in Poverty (with Low Walkability)
Moderate- 10%-30% (40 tracts)
High- Greater than 30% (7 tracts)
Least Walkable (7 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES WITH A LOW WALKABILITY RATE OF LESS THAN OR EQUAL TO 10.50 IS PORTRAYED ON MAP. LEAST WALKABLE IS A RATE OF 5.75 OR LESS.
N
0
4.25
8.5
17 Miles
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS


POVERTY WITH LOW WALKABILITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Families in Poverty (with Low Walkability)
Moderate- 10%-30% (22 tracts)
High- Greater than 30% (5 tracts)
Least Walkable (5 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES WITH A LOW WALKABILITY RATE OF LESS THAN OR EQUAL TO 10.50 IS PORTRAYED ON MAP. LEAST WALKABLE IS A RATE OF 5.75 OR LESS.
0 2.25 4.5 9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

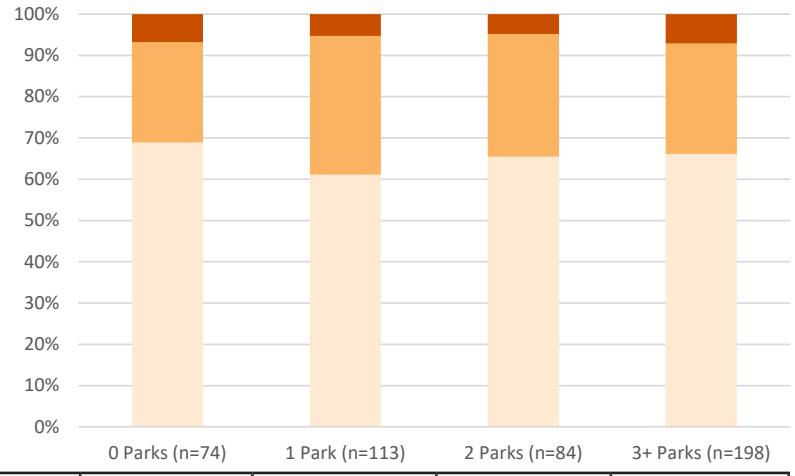
Poverty and Parks

While parks are generally distributed across the region with equity in mind, it is important to determine whether park access differs as a function of neighborhood poverty. Census tracts shown in these maps highlight areas where there is a co-occurrence of low park access and moderate or high levels of family poverty. **Figure 12** shows that, in the 6-County Region, 67 (36%) of the tracts with 0 or 1 park have moderate or high rates of poverty, and a similar proportion of the tracts with 2 or more parks have moderate or high rates of poverty (34%, n=96). Thus, there is no association between park access and poverty, meaning parks appear to be distributed similarly across higher and lower poverty areas.

This is also true within KCK/KCMO, where 54 (52%) of the tracts with 0 or 1 park have moderate or high rates of poverty, and a similar proportion of the tracts with 2 or more parks have moderate or high rates of poverty (56%, n=62). The one exception within KCK/KCMO is that more of the tracts with 3 or more parks have a high poverty rate, as compared to tracts with fewer parks, indicating a slightly higher concentration of parks in the highest poverty areas in these cities. However, there are several areas where moderate/high poverty and low park access co-occur, and these areas tend to be concentrated within KCK/KCMO, though also occur elsewhere. The census tracts with the dotted pattern are those that have no parks.

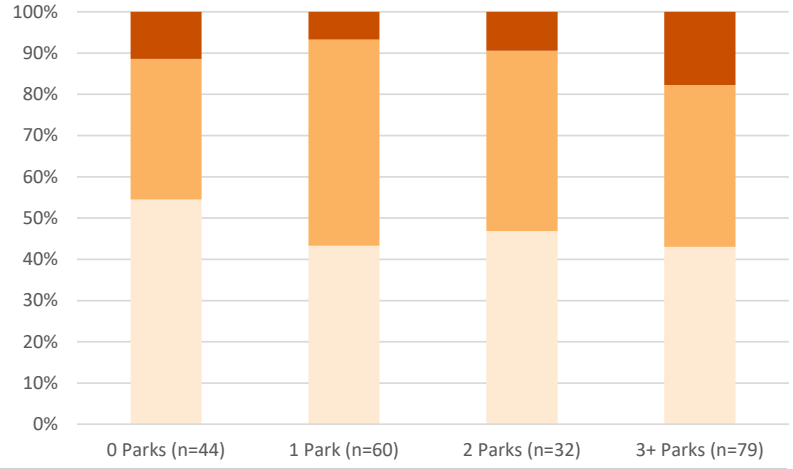
Figure 12. Poverty rates within each number of parks category.

6-County Region (n=469):

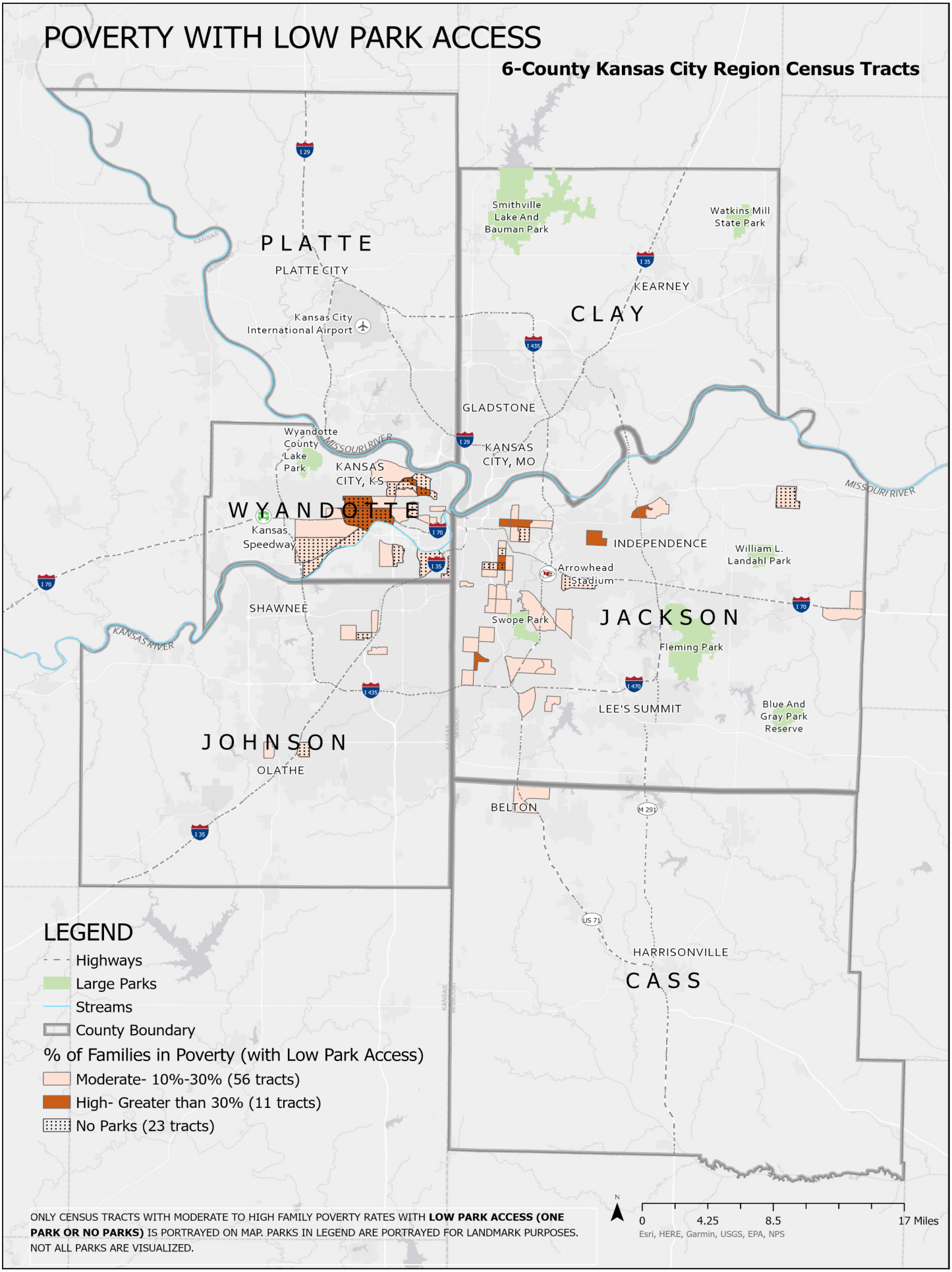


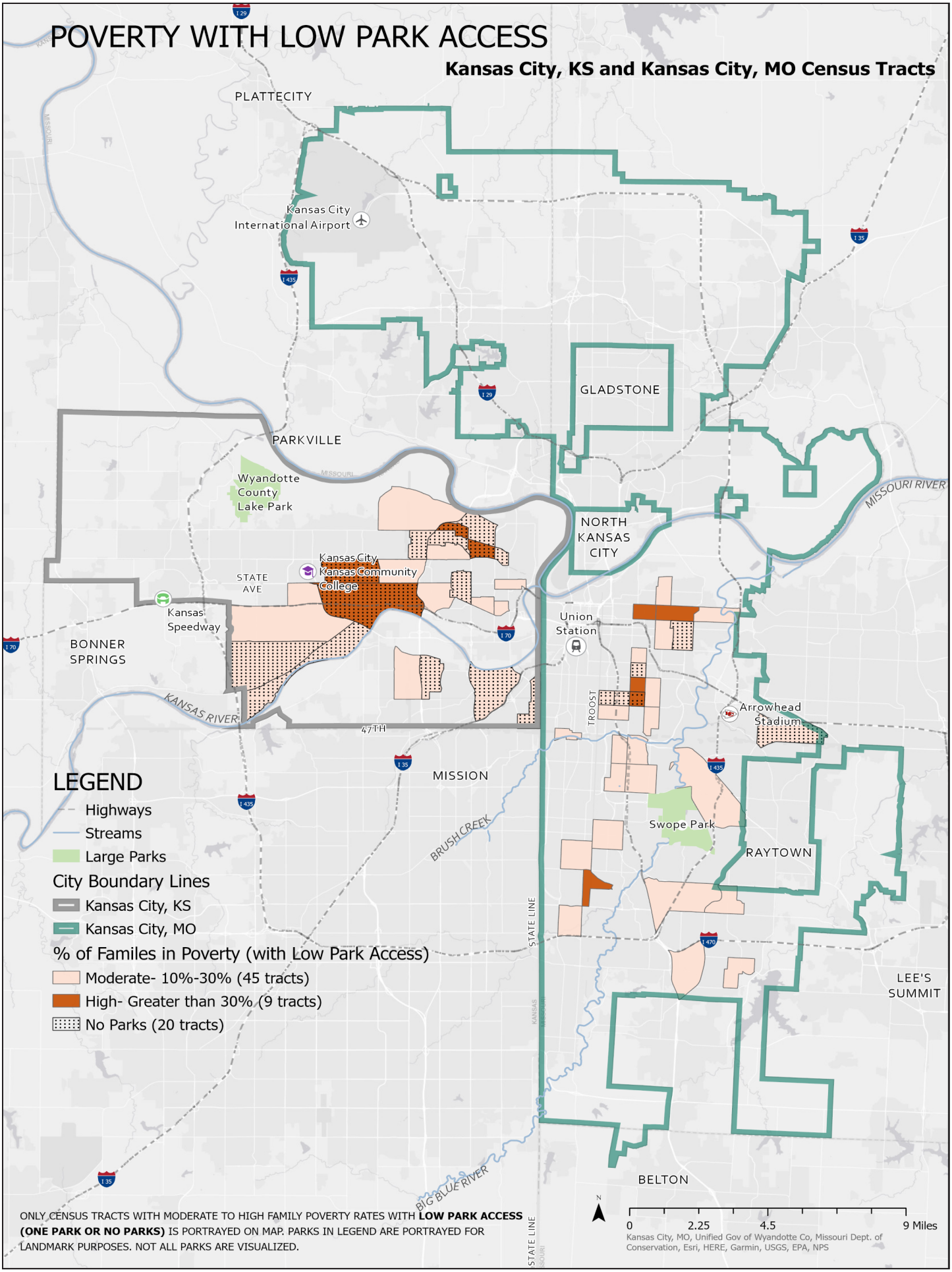
	0 Parks (n=74)	1 Park (n=113)	2 Parks (n=84)	3+ Parks (n=198)
High Poverty	6.8%	5.3%	4.8%	7.1%
Moderate Poverty	24.3%	33.6%	29.8%	26.8%
Low Poverty	68.9%	61.1%	65.5%	66.2%

KCK/KCMO (n=215):



	0 Parks (n=44)	1 Park (n=60)	2 Parks (n=32)	3+ Parks (n=79)
High Poverty	11.4%	6.7%	9.4%	17.7%
Moderate Poverty	34.1%	50.0%	43.8%	39.2%
Low Poverty	54.5%	43.3%	46.9%	43.0%


POVERTY WITH LOW PARK ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
% of Families in Poverty (with Low Park Access)
Moderate- 10%-30% (56 tracts)
High- Greater than 30% (11 tracts)
No Parks (23 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES WITH LOW PARK ACCESS (ONE PARK OR NO PARKS) IS PORTRAYED ON MAP. PARKS IN LEGEND ARE PORTRAYED FOR LANDMARK PURPOSES. NOT ALL PARKS ARE VISUALIZED.
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


POVERTY WITH LOW PARK ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Familes in Poverty (with Low Park Access)
Moderate- 10%-30% (45 tracts)
High- Greater than 30% (9 tracts)
No Parks (20 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES WITH LOW PARK ACCESS (ONE PARK OR NO PARKS) IS PORTRAYED ON MAP. PARKS IN LEGEND ARE PORTRAYED FOR LANDMARK PURPOSES. NOT ALL PARKS ARE VISUALIZED.
N
0 2.25 4.5 9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

Chapter 5
Environmental Differences by Neighborhood Obesity

This section of the Atlas explores associations between neighborhood-based rates of childhood obesity and neighborhood economic and built environment characteristics by presenting *composite maps* in which two indicators are presented together. To identify communities with the greatest need for support, the census tracts presented in each of the maps show the areas where there is a co-occurrence of high rates of childhood obesity and poor neighborhood conditions based on the economic or built environment indicator of interest. Thus, the maps only show census tracts that are within the high (27.1-34.6% of patients) or very high obesity category (greater than 34.6% of patients) and within the lowest two categories of the environment indicator (e.g., moderate or high poverty, Below Average Walkable or Least Walkable). All maps included in this series build upon data presented in the previous map series.

Maps in this series include:

Childhood Obesity and Poverty
Observed versus Expected Childhood Obesity Rates
Childhood Obesity and Low-Food Access
Childhood Obesity and Walkability
Childhood Obesity and Park Access

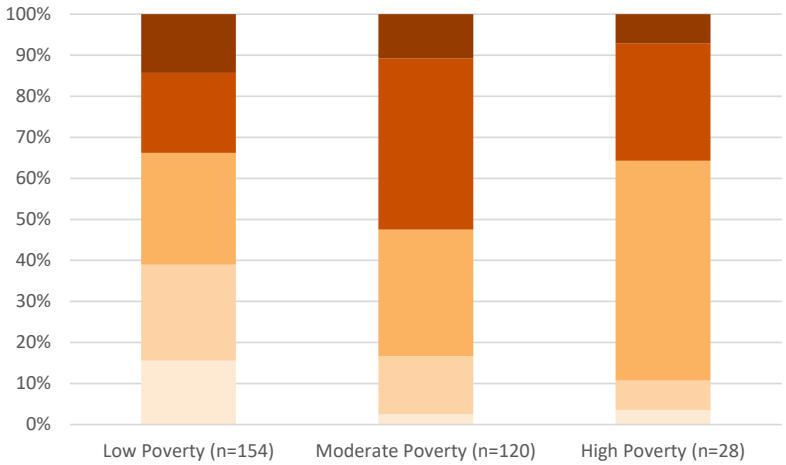
Childhood Obesity and Poverty

Economically disadvantaged neighborhoods may be disproportionately impacted by high rates of childhood obesity due to structural barriers to opportunities for healthy eating and active living. Census tracts shown in these maps highlight areas where there is a co-occurrence of moderate (10-30% of families) or high (greater than 30% of families) poverty and high (27.1-34.6% of patients) or very high (34.6% of patients) rates of childhood obesity. **Figure 13**, shows that 73 (49%) of the moderate or high poverty tracts in the 6-County Region have high or very high rate of childhood obesity, whereas 52 (34%) of the low poverty tracts have high or very high rates of childhood obesity. Thus, there is an association between greater poverty and higher rates of childhood obesity.

This is also true within KCK/KCMO, where 55 (50%) of the moderate or high poverty tracts have high or very high rates of childhood obesity, whereas 20 (26%) of the low poverty tracts have high or very high rates of childhood obesity. The areas where moderate/high poverty and high childhood obesity rates co-occur tend to be concentrated within KCK/KCMO, though are present in all 6 counties. The census tracts with the dotted pattern are those that have the highest rates of obesity.

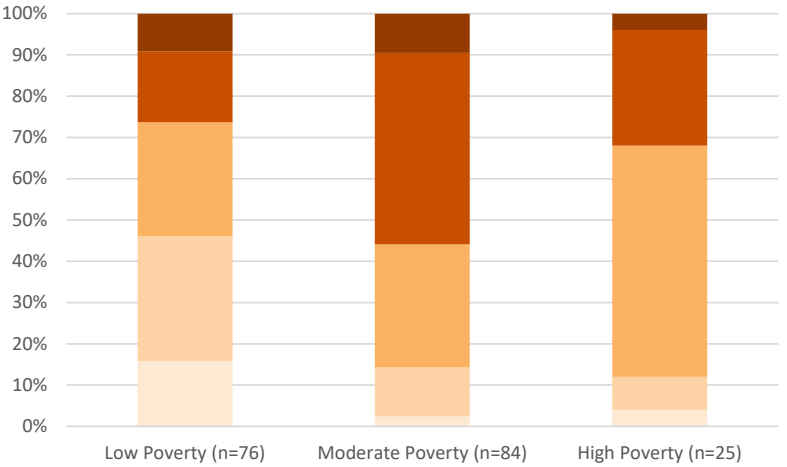
Figure 13. Poverty rates within each number of parks category.

6-County Region (n=302):

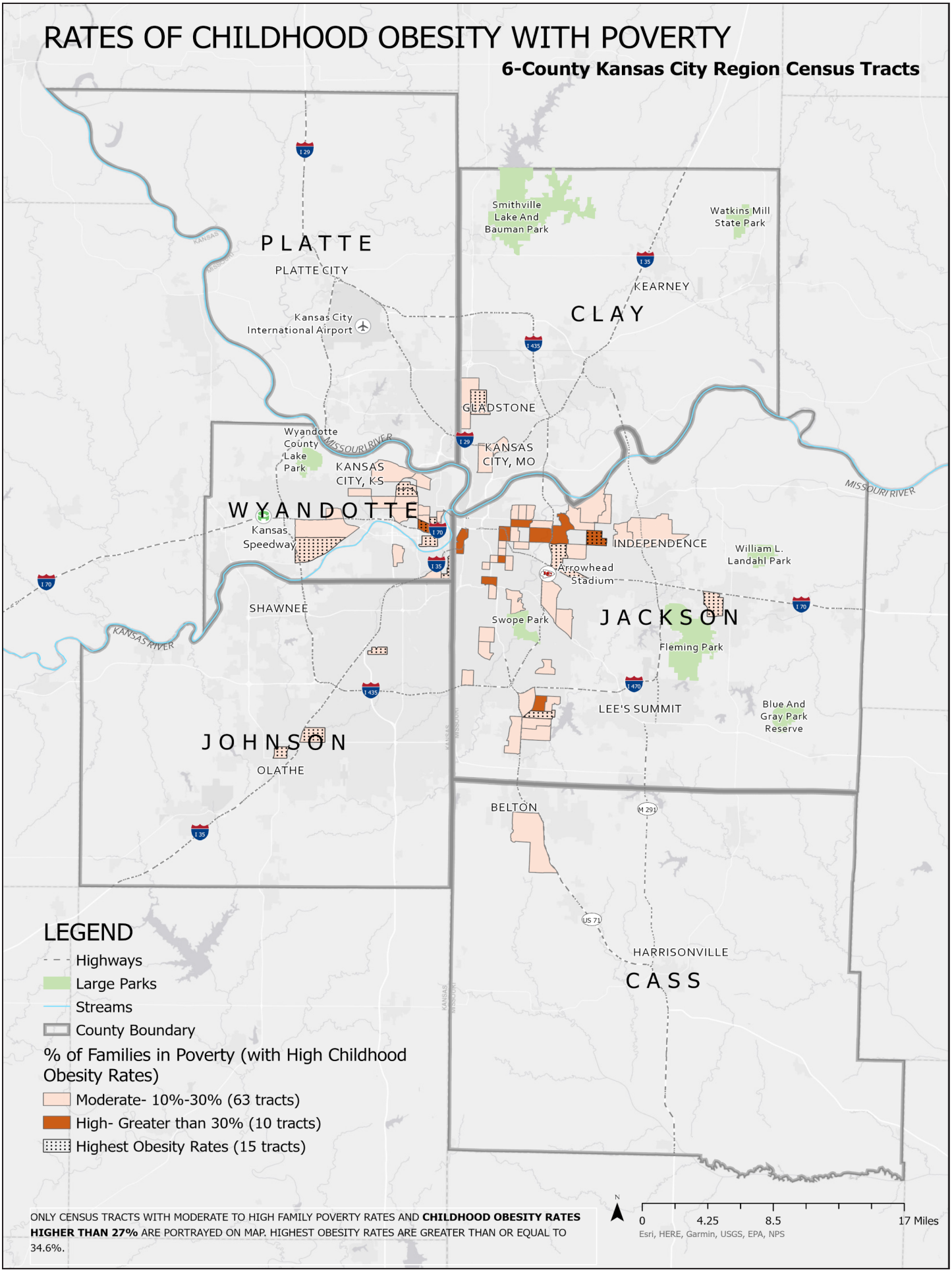


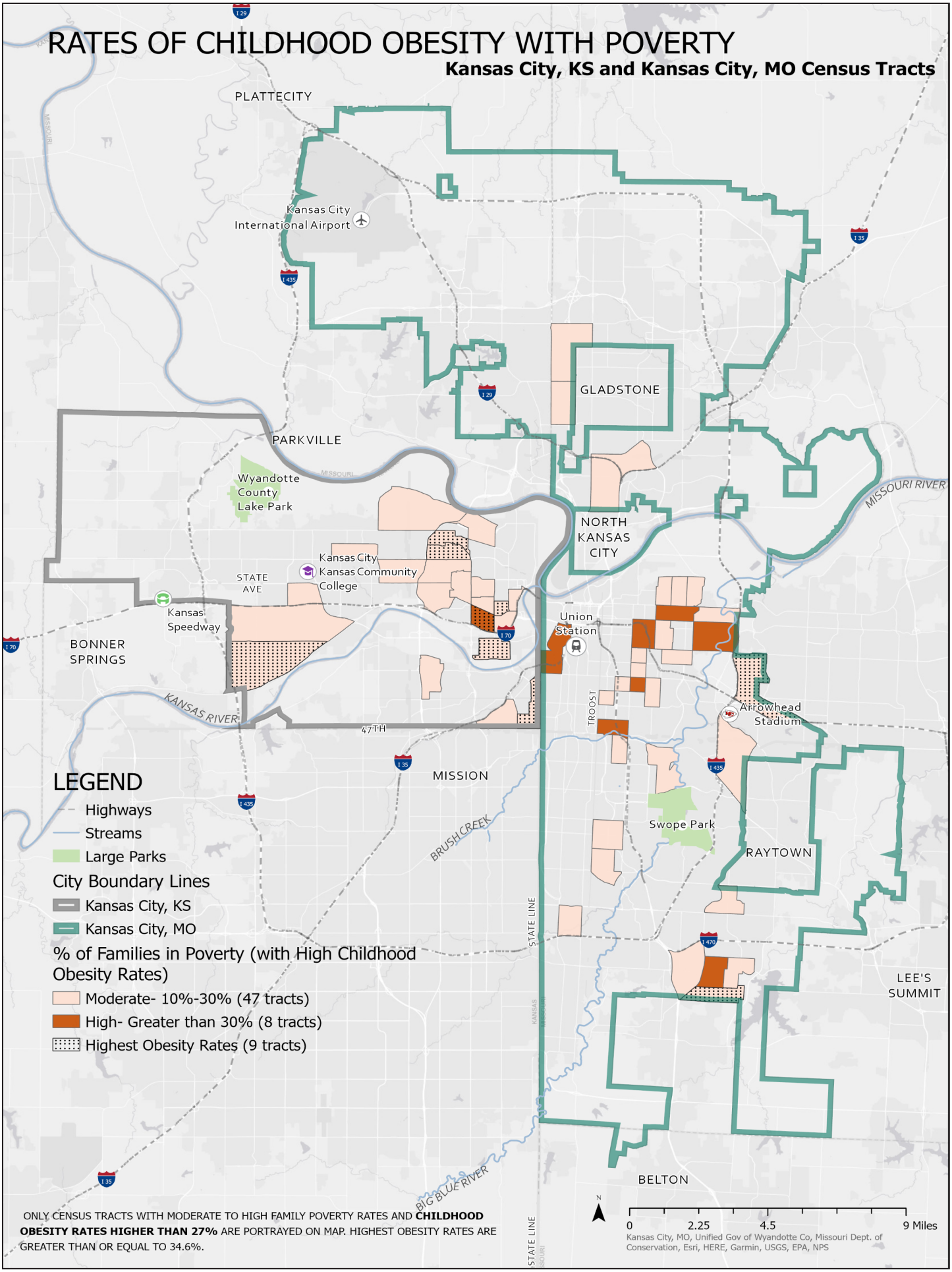
	Low Poverty (n=154)	Moderate Poverty (n=120)	High Poverty (n=28)
Greater than 34.6%	14.3%	10.8%	7.1%
27.1%-34.6%	19.5%	41.7%	28.6%
21.0%-27.0%	27.3%	30.8%	53.6%
13.1%-20.9%	23.4%	14.2%	7.1%
13.0% and Under	15.6%	2.5%	3.6%

KCK/KCMO (n=185):



	Low Poverty (n=76)	Moderate Poverty (n=84)	High Poverty (n=25)
Greater than 34.6%	9.2%	9.5%	4.0%
27.1%-34.6%	17.1%	46.4%	28.0%
21.0%-27.0%	27.6%	29.8%	56.0%
13.1%-20.9%	30.3%	11.9%	8.0%
13.0% and Under	15.8%	2.4%	4.0%


RATES OF CHILDHOOD OBESITY WITH POVERTY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
MISSOURI RIVER
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
% of Families in Poverty (with High Childhood Obesity Rates)
Moderate- 10%-30% (63 tracts)
High- Greater than 30% (10 tracts)
Highest Obesity Rates (15 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES AND **CHILDHOOD OBESITY RATES HIGHER THAN 27%** ARE PORTRAYED ON MAP. HIGHEST OBESITY RATES ARE GREATER THAN OR EQUAL TO 34.6%.
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


RATES OF CHILDHOOD OBESITY WITH POVERTY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
% of Families in Poverty (with High Childhood Obesity Rates)
Moderate- 10%-30% (47 tracts)
High- Greater than 30% (8 tracts)
Highest Obesity Rates (9 tracts)
ONLY CENSUS TRACTS WITH MODERATE TO HIGH FAMILY POVERTY RATES AND CHILDHOOD OBESITY RATES HIGHER THAN 27% ARE PORTRAYED ON MAP. HIGHEST OBESITY RATES ARE GREATER THAN OR EQUAL TO 34.6%.
N
0
2.25
4.5
9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

Observed versus Expected Childhood Obesity Rates

Due to the data indicating that children in families with a lower income have a greater likelihood of having obesity, which is shown in the poverty map in this chapter, we aimed to identify whether the neighborhood built environment characteristics are associated with childhood obesity rates independent of (or separate from) neighborhood income. This required us to calculate an indicator we refer to as the 'observed versus expected' obesity rate.

First, we calculated the expected obesity rate for each census tract based on the median annual household income for the census tract, using a regression analysis of all 302 tracts that had at least 15 patients. Next, we compared the observed (actual) obesity rate to the expected obesity rate for each tract. **Figure 14** shows how these calculations work using three examples.

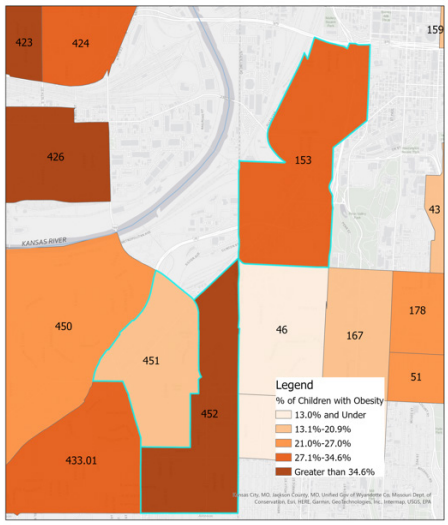
Census tract 451, for example, has a low median household income of $36,364 and thus a high expected obesity rate of 26.9%. However, the actual or observed obesity rate is 15.6%, meaning the observed obesity rate is 11.3% less than the expected obesity rate for this tract.

These observed versus expected obesity rates were then grouped into the categories shown in **Figure 15**. The following maps in this series use this observed versus expected obesity rate indicator to identify how the built environment factors relate to childhood obesity rates over and above the role of neighborhood income.

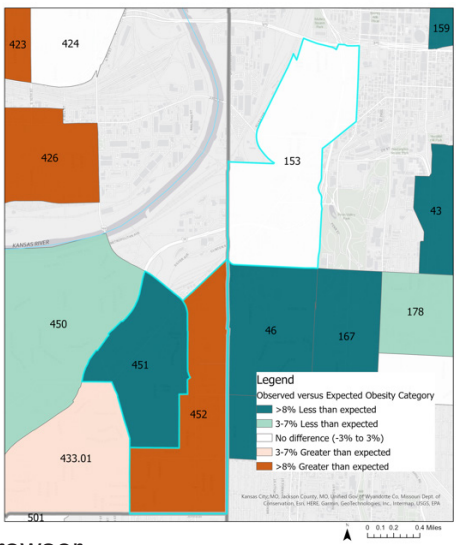
Figure 14. Observed versus expected obesity rate calculations for 3 census tracts.

Census Tract	Median Household Income	Expected Obesity Rate	Observed Obesity Rate	Observed versus Expected	Interpretation
451	$36,364	26.9%	15.6%	▼ -11.3%	Less than expected
153	$32,415	27.4%	27.2%	▼ -0.2%	No difference
452	$46,750	26.0%	37.1%	▲ 11.1%	Greater than expected

Observed Obesity Rate



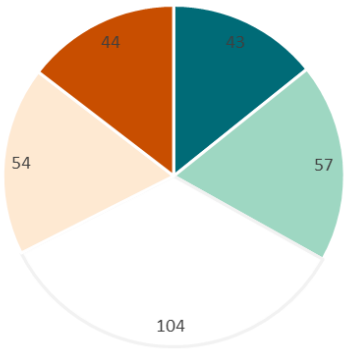
Observed versus Expected Obesity Rate



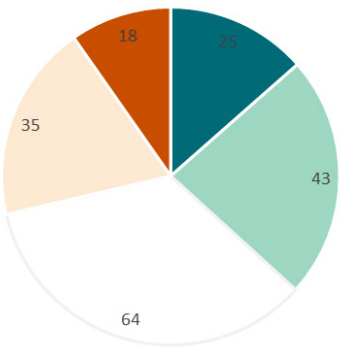
Click **HERE** to open image in web browser

Figure 15. Number of census tracts within each observed versus expected obesity rate category.

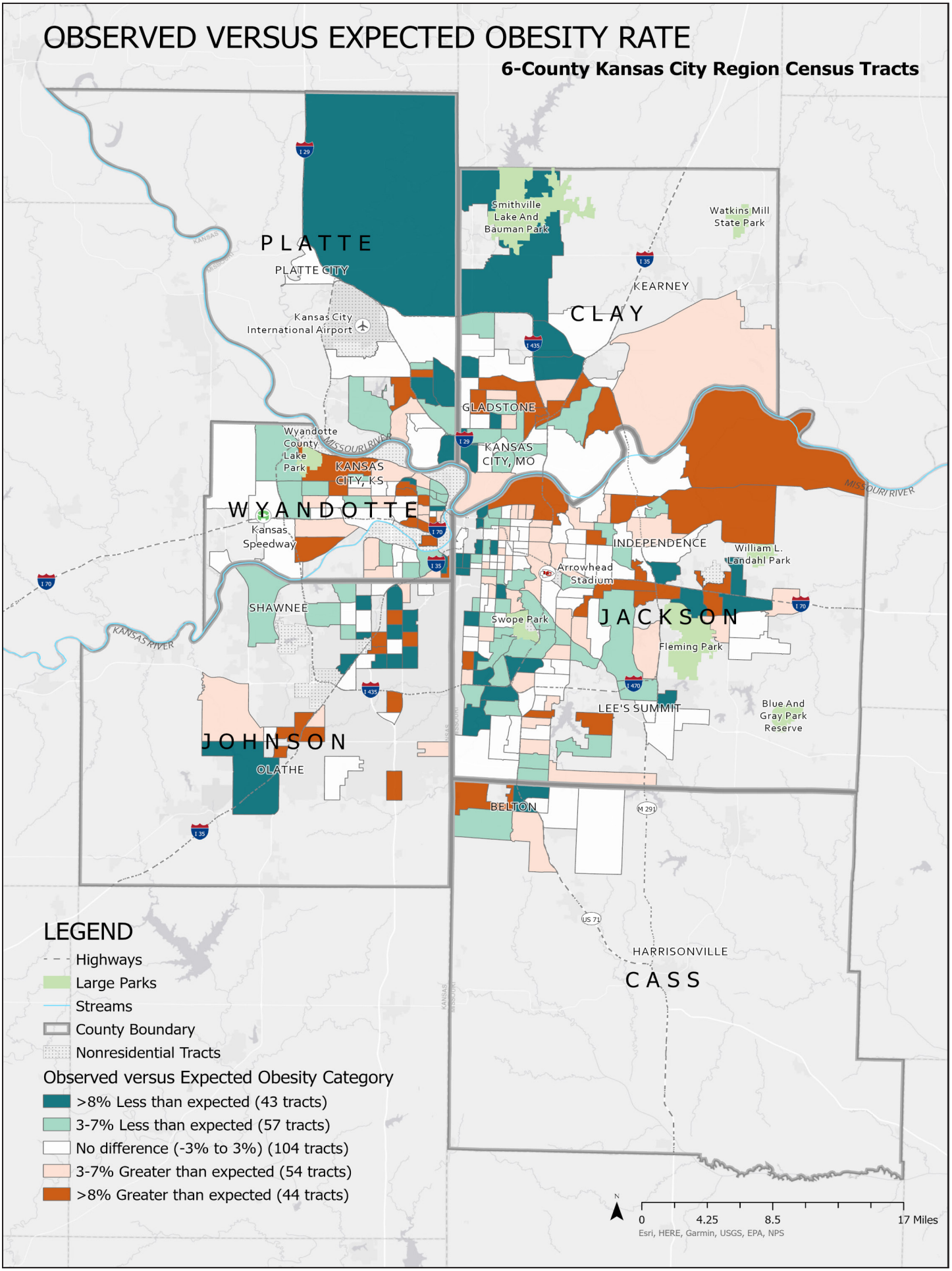
6-County Region (n=302):

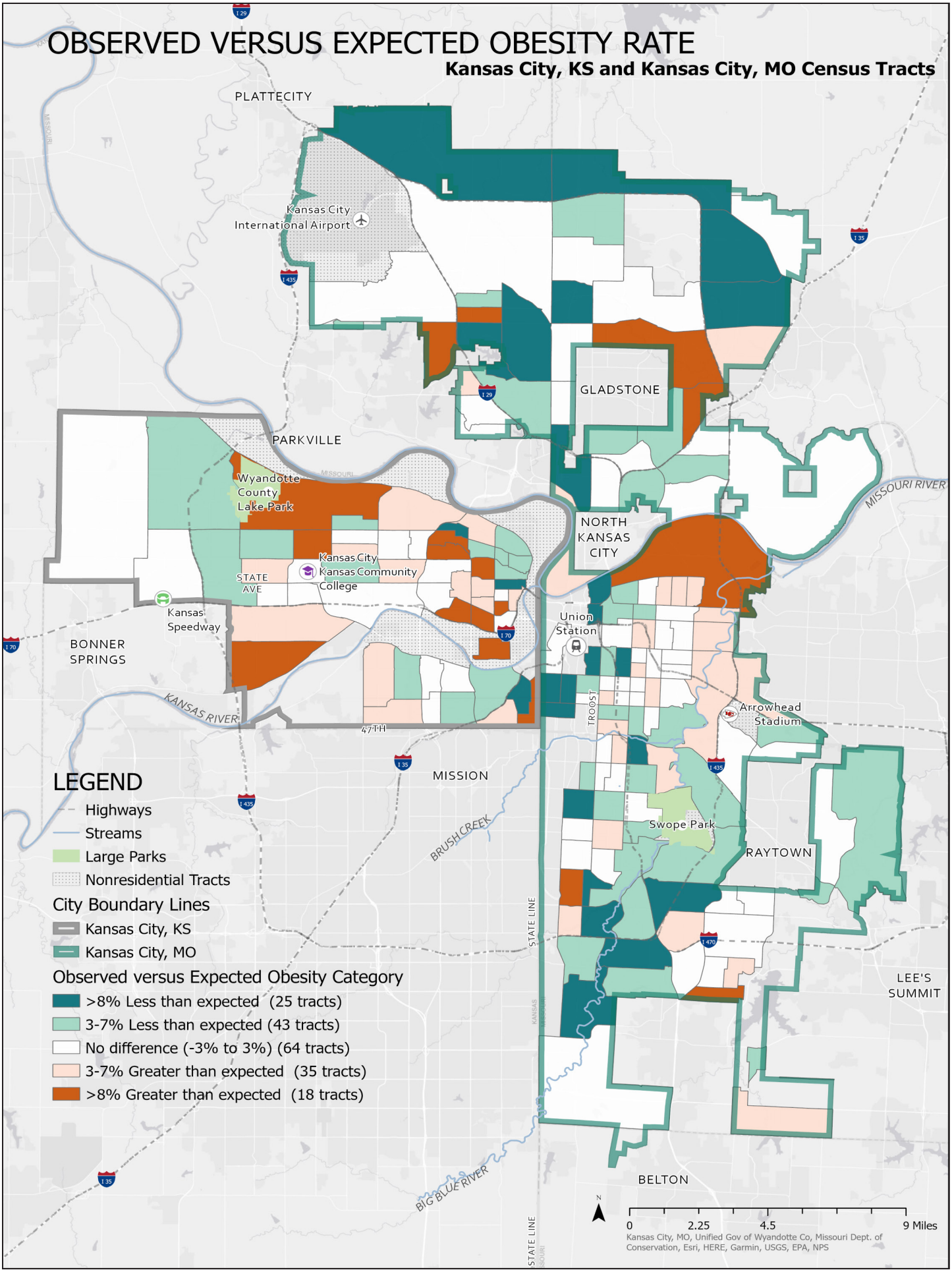


KCK/KCMO (n=185):



>8% Less than expected | 3-7% Less than expected | No difference (-3% to 3%) | 3-7% Greater than expected | >8% Greater than expected


OBSERVED VERSUS EXPECTED OBESITY RATE
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
MISSOURI RIVER
KANSAS RIVER
LEGEND
Highways
Large Parks
Streams
County Boundary
Nonresidential Tracts
Observed versus Expected Obesity Category
>8% Less than expected (43 tracts)
3-7% Less than expected (57 tracts)
No difference (-3% to 3%) (104 tracts)
3-7% Greater than expected (54 tracts)
>8% Greater than expected (44 tracts)
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


OBSERVED VERSUS EXPECTED OBESITY RATE
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
NORTH KANSAS CITY
MISSOURI RIVER
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
Nonresidential Tracts
City Boundary Lines
Kansas City, KS
Kansas City, MO
Observed versus Expected Obesity Category
>8% Less than expected (25 tracts)
3-7% Less than expected (43 tracts)
No difference (-3% to 3%) (64 tracts)
3-7% Greater than expected (35 tracts)
>8% Greater than expected (18 tracts)
0
2.25
4.5
9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

Childhood Obesity and Low Food Access

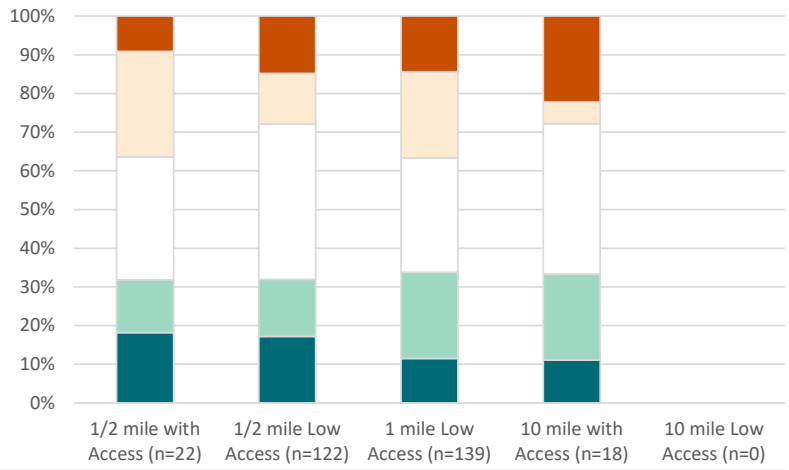
Low food access can contribute to obesity because, when a family has low access to healthy foods, they have fewer opportunities to consume healthy foods and may acquire many of their meals from places that have limited healthy options. Census tracts shown in these maps highlight areas where there is a co-occurrence of low food access and rates of childhood obesity that are greater than what is expected based on neighborhood income.

Figure 16 shows that, in the 6-County Region, 85 (33%) of the low food access tracts have a greater than expected obesity rate, and a similar proportion of the tracts with high/adequate food access have a greater than expected obesity rate (33%, n=13). Thus, there is no association between low food access and childhood obesity rates, meaning obesity rates are similar between low and high/adequate food access areas.

This is also true within KCK/KCMO, where 44 (29%) of the low food access tracts have a greater than expected obesity rate, and a similar proportion of the tracts with high/adequate food access have a greater than expected obesity rate (29%, n=9). The areas where low food access and high observed versus expected rates of childhood obesity co-occur tend to be concentrated within KCK/KCMO, though are present in all 6 counties. The census tracts with the dotted pattern are those that have the poorest healthy food access among the low access areas.

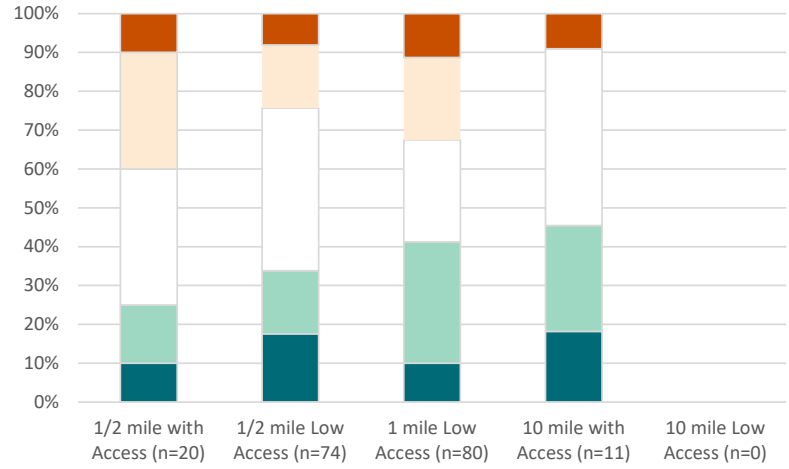
Figure 16. Observed versus expected obesity rates within each food access category.

6-County Region (n=301):

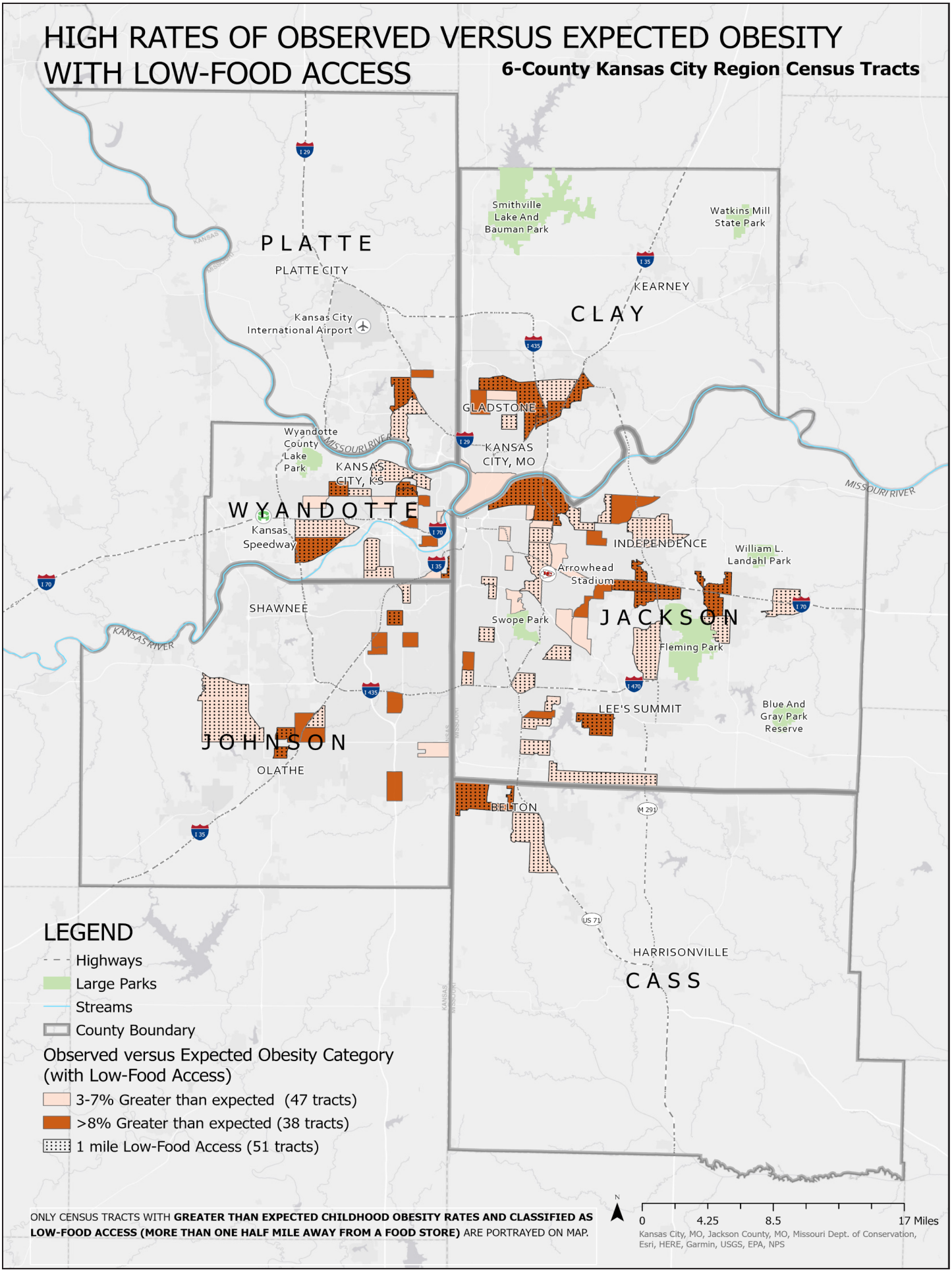


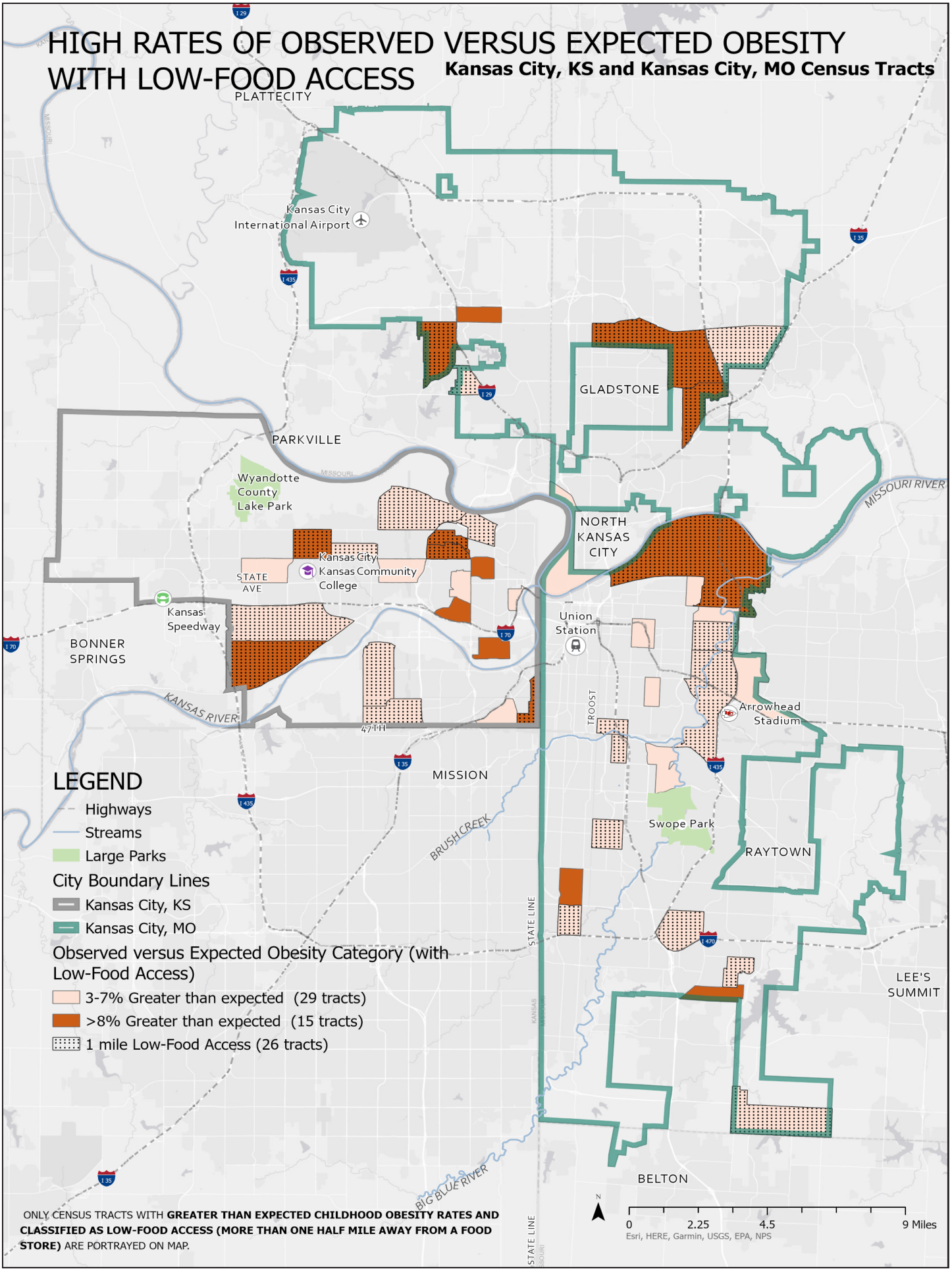
	1/2 mile with Access (n=22)	1/2 mile Low Access (n=122)	1 mile Low Access (n=139)	10 mile with Access (n=18)	10 mile Low Access (n=0)
>8% Greater than expected	9.1%	14.8%	14.4%	22.2%	0.0%
3-7% Greater than expected	27.3%	13.1%	22.3%	5.6%	0.0%
No difference (-3% to 3%)	31.8%	40.2%	29.5%	38.9%	0.0%
3-7% Less than expected	13.6%	14.8%	22.3%	22.2%	0.0%
>8% Less than expected	18.2%	17.2%	11.5%	11.1%	0.0%

KCK/KCMO (n=185):



	1/2 mile with Access (n=20)	1/2 mile Low Access (n=74)	1 mile Low Access (n=80)	10 mile with Access (n=11)	10 mile Low Access (n=0)
>8% Greater than expected	10.0%	8.1%	11.3%	9.1%	0.0%
3-7% Greater than expected	30.0%	16.2%	21.3%	0.0%	0.0%
No difference (-3% to 3%)	35.0%	41.9%	26.3%	45.5%	0.0%
3-7% Less than expected	15.0%	16.2%	31.3%	27.3%	0.0%
>8% Less than expected	10.0%	17.6%	10.0%	18.2%	0.0%


HIGH RATES OF OBSERVED VERSUS EXPECTED OBESITY WITH LOW-FOOD ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
SHAWNEE
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Observed versus Expected Obesity Category (with Low-Food Access)
3-7% Greater than expected (47 tracts)
>8% Greater than expected (38 tracts)
1 mile Low-Food Access (51 tracts)
ONLY CENSUS TRACTS WITH GREATER THAN EXPECTED CHILDHOOD OBESITY RATES AND CLASSIFIED AS LOW-FOOD ACCESS (MORE THAN ONE HALF MILE AWAY FROM A FOOD STORE) ARE PORTRAYED ON MAP.
N
0
4.25
8.5
17 Miles
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS


HIGH RATES OF OBSERVED VERSUS EXPECTED OBESITY WITH LOW-FOOD ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Observed versus Expected Obesity Category (with Low-Food Access)
3-7% Greater than expected (29 tracts)
>8% Greater than expected (15 tracts)
1 mile Low-Food Access (26 tracts)
ONLY CENSUS TRACTS WITH GREATER THAN EXPECTED CHILDHOOD OBESITY RATES AND CLASSIFIED AS LOW-FOOD ACCESS (MORE THAN ONE HALF MILE AWAY FROM A FOOD STORE) ARE PORTRAYED ON MAP.
0 2.25 4.5 9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

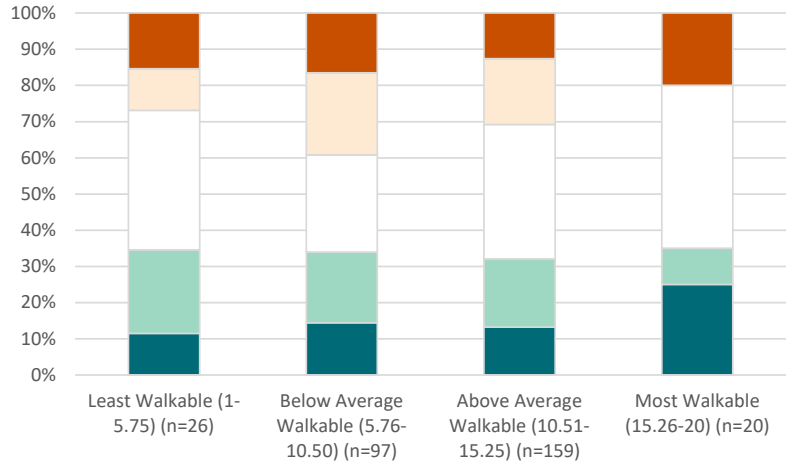
Childhood Obesity and Walkability

Neighborhood walkability can support children's healthy weight by providing opportunities for walking. Census tracts shown in these maps highlight areas where there is a co-occurrence of lower walkability and rates of childhood obesity that are greater than what is expected based on neighborhood income. **Figure 17** shows that, in the 6-County Region, 53 (30%) of the tracts rated as Above Average Walkable or Most Walkable have a greater than expected obesity rate, whereas 45 (37%) of the tracts rated as Below Average Walkable or Least Walkable have a greater than expected obesity rate.

This association is more complex within KCK/KCMO, as the proportion of tracts with a greater than expected obesity rate was similar between the Above Average Walkable/Most Walkable (29%, n=35) and Below Average Walkable/Least Walkable categories (28%, n=18), though none of the Most Walkable tracts had greater than expected obesity rate. Thus, there is evidence that higher walkability is associated with lower rates of childhood obesity, rates that are lower than what would be expected based on neighborhood income, within the 6-County Region and to some extent within KCK/KCMO. The Most Walkable category appears to provide the largest benefit, both in the 6-County Region and within KCK/KCMO. The areas where low walkability and high observed versus expected rates of childhood obesity co-occur tend to be outside of or on the periphery of KCK/KCMO. The census tracts with the dotted pattern are those that have the lowest walkability.

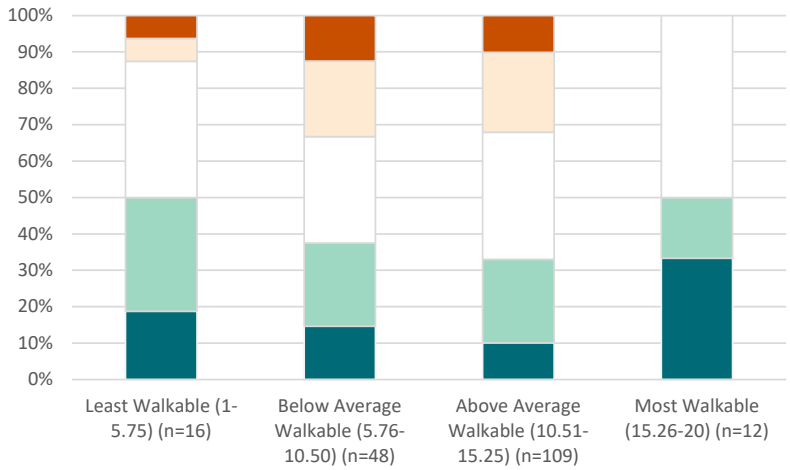
Figure 17. Observed versus expected obesity rates within each walkability category.

6-County Region (n=302):

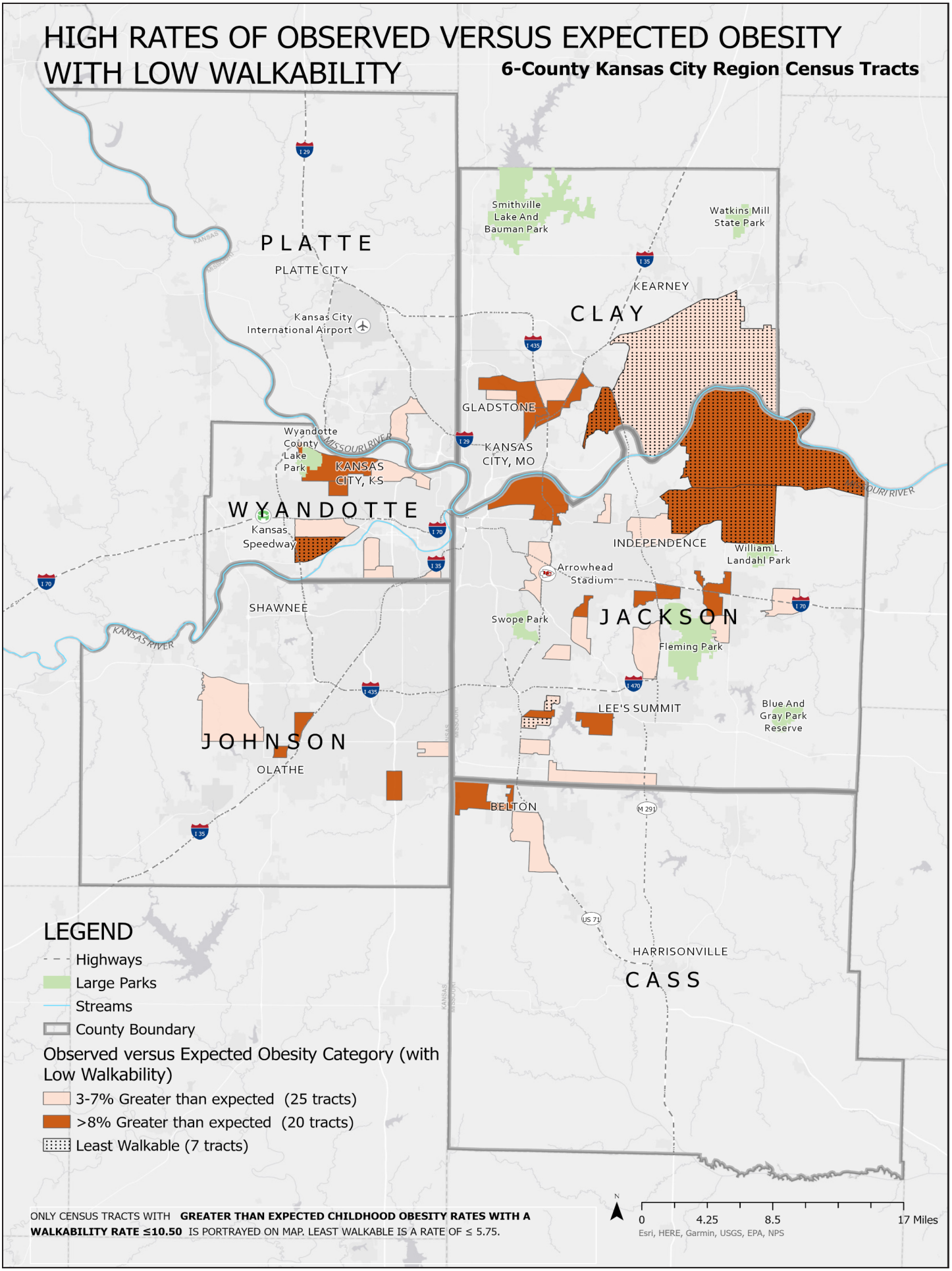


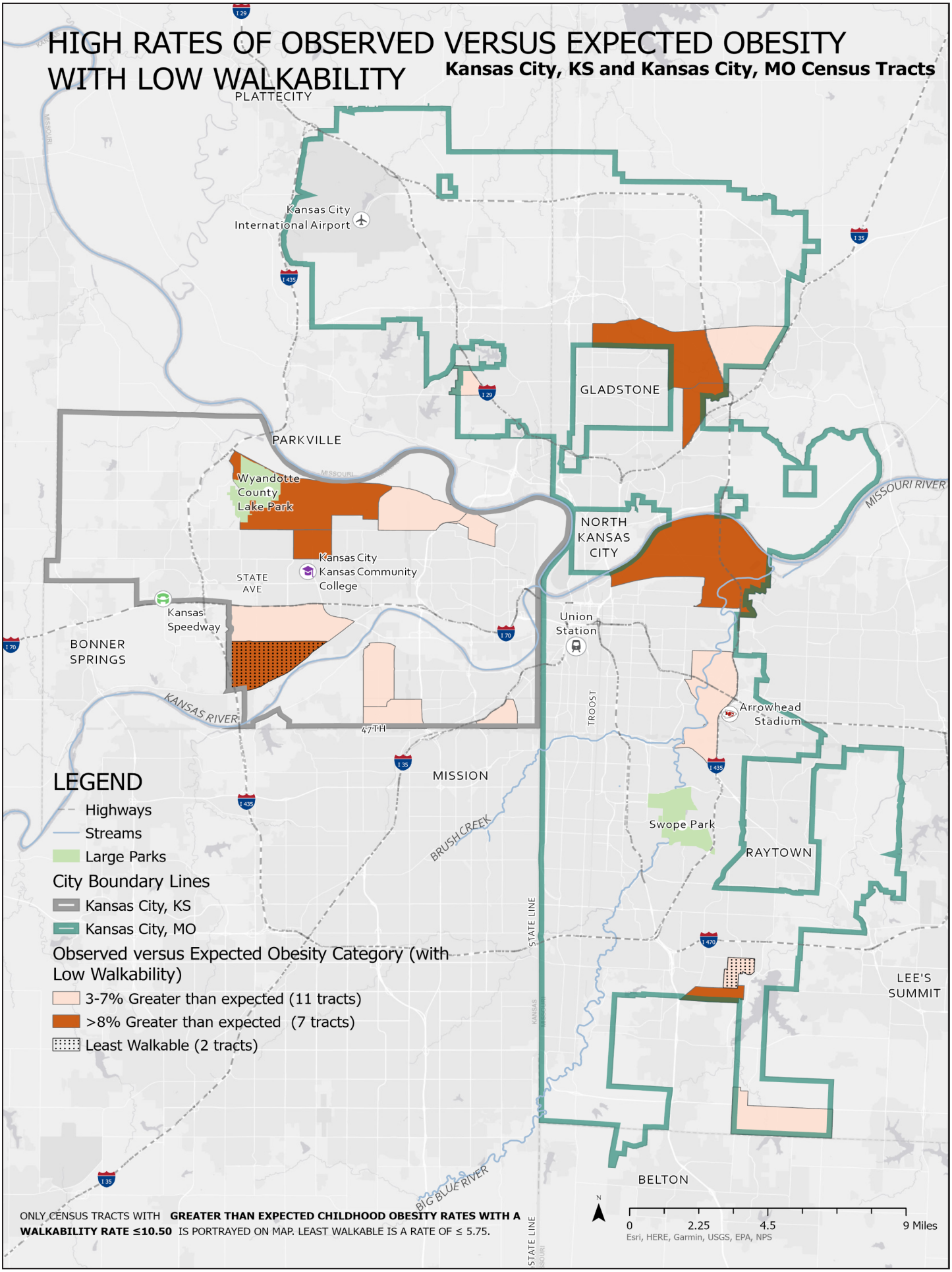
	Least Walkable (1-5.75) (n=26)	Below Average Walkable (5.76-10.50) (n=97)	Above Average Walkable (10.51-15.25) (n=159)	Most Walkable (15.26-20) (n=20)
>8% Greater than expected	15.4%	16.5%	12.6%	20.0%
3-7% Greater than expected	11.5%	22.7%	18.2%	0.0%
No difference (-3% to 3%)	38.5%	26.8%	37.1%	45.0%
3-7% Less than expected	23.1%	19.6%	18.9%	10.0%
>8% Less than expected	11.5%	14.4%	13.2%	25.0%

KCK/KCMO (n=185):



	Least Walkable (1-5.75) (n=16)	Below Average Walkable (5.76-10.50) (n=48)	Above Average Walkable (10.51-15.25) (n=109)	Most Walkable (15.26-20) (n=12)
>8% Greater than expected	6.3%	12.5%	10.1%	0.0%
3-7% Greater than expected	6.3%	20.8%	22.0%	0.0%
No difference (-3% to 3%)	37.5%	29.2%	34.9%	50.0%
3-7% Less than expected	31.3%	22.9%	22.9%	16.7%
>8% Less than expected	18.8%	14.6%	10.1%	33.3%


HIGH RATES OF OBSERVED VERSUS EXPECTED OBESITY WITH LOW WALKABILITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
Smithville Lake And Bauman Park
Watkins Mill State Park
KEARNEY
CLAY
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
MISSOURI RIVER
KANSAS RIVER
LEGEND
Highways
Large Parks
Streams
County Boundary
Observed versus Expected Obesity Category (with Low Walkability)
3-7% Greater than expected (25 tracts)
>8% Greater than expected (20 tracts)
Least Walkable (7 tracts)
ONLY CENSUS TRACTS WITH GREATER THAN EXPECTED CHILDHOOD OBESITY RATES WITH A WALKABILITY RATE ≤10.50 IS PORTRAYED ON MAP. LEAST WALKABLE IS A RATE OF ≤ 5.75.
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


HIGH RATES OF OBSERVED VERSUS EXPECTED OBESITY WITH LOW WALKABILITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTE CITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Observed versus Expected Obesity Category (with Low Walkability)
3-7% Greater than expected (11 tracts)
>8% Greater than expected (7 tracts)
Least Walkable (2 tracts)
ONLY CENSUS TRACTS WITH GREATER THAN EXPECTED CHILDHOOD OBESITY RATES WITH A WALKABILITY RATE ≤10.50 IS PORTRAYED ON MAP. LEAST WALKABLE IS A RATE OF ≤ 5.75.
0 2.25 4.5 9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

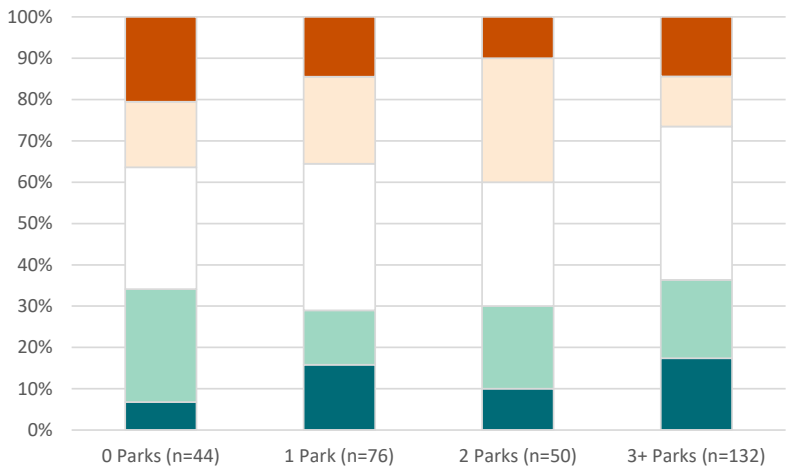
Childhood Obesity and Parks

Parks can support children's healthy weight by providing opportunities for active play and recreation. Census tracts shown in these maps highlight areas where there is a co-occurrence of low park access and rates of childhood obesity greater than what is expected based on neighborhood income. **Figure 18** shows that, in the 6-County Region, 43 (36%) of the tracts with 0 or 1 parks have a greater than expected obesity rate, whereas 55 (30%) of the tracts with 2 or more parks have a greater than expected obesity rate.

A similar but smaller association between greater park access and lower obesity is observed within KCK/KCMO, with 27 (31%) of the tracts with 0 or 1 parks having a greater than expected obesity rate, and 26 (27%) of the tracts with 2 or more parks having a greater than expected obesity rate. In both the 6-County Region and within KCK/KCMO, the greatest benefit is observed for having 3+ parks, as these tracts have the lowest rates of childhood obesity, rates that are lower than what would be expected based on neighborhood income. The areas where low park access and high observed versus expected rates of childhood obesity co-occur are concentrated within Jackson and Wyandotte Counties but outside of or on the periphery of KCK/KCMO. The census tracts with the dotted pattern are those that have no parks.

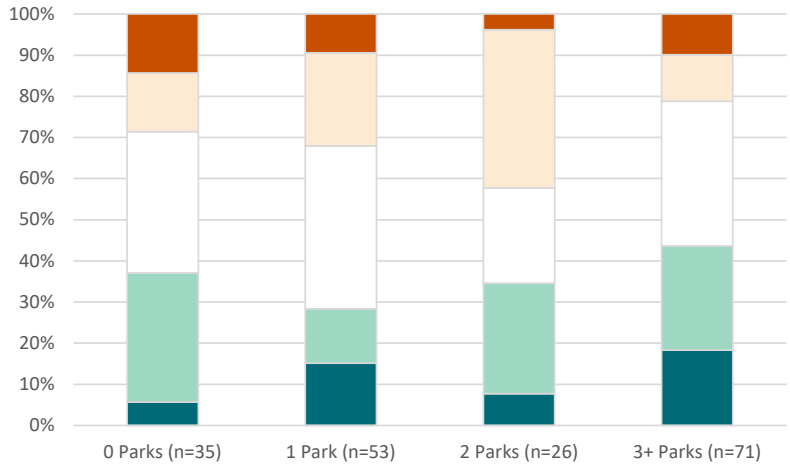
Figure 18. Observed versus expected obesity rates within each number of parks category.

6-County Region (n=302):

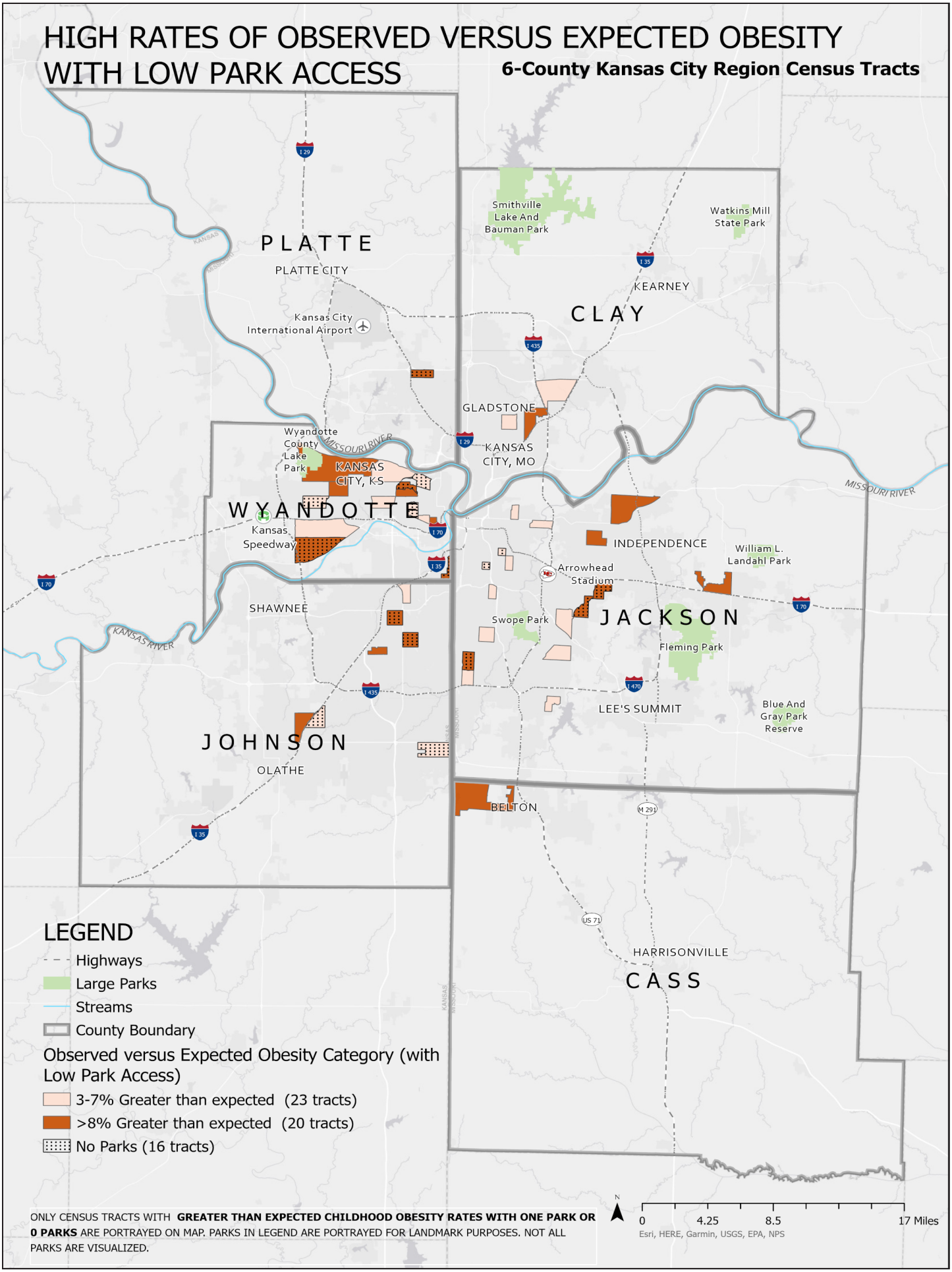


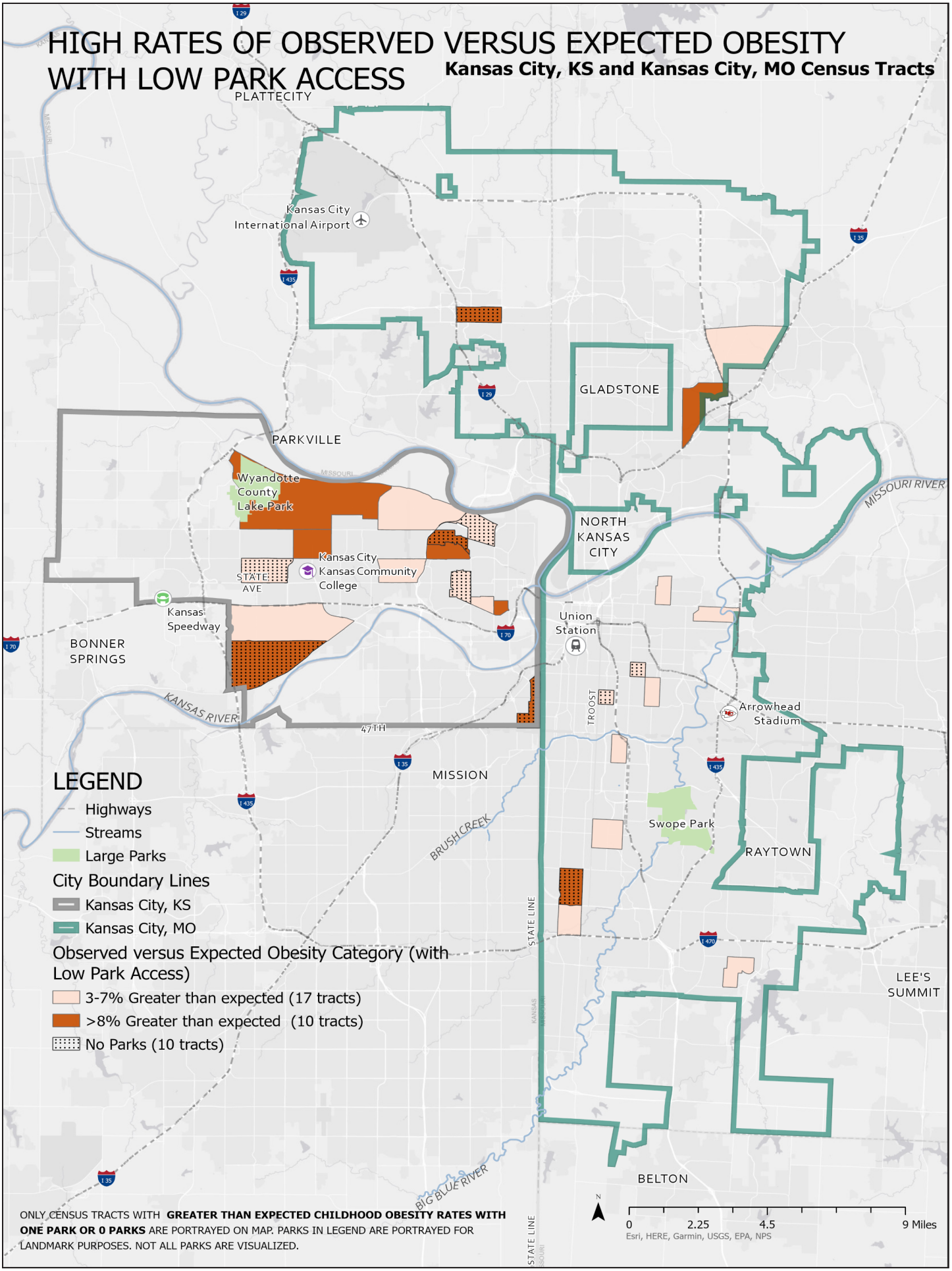
	0 Parks (n=44)	1 Park (n=76)	2 Parks (n=50)	3+ Parks (n=132)
>8% Greater than expected	20.5%	14.5%	10.0%	14.4%
3-7% Greater than expected	15.9%	21.1%	30.0%	12.1%
No difference (-3% to 3%)	29.5%	35.5%	30.0%	37.1%
3-7% Less than expected	27.3%	13.2%	20.0%	18.9%
>8% Less than expected	6.8%	15.8%	10.0%	17.4%

KCK/KCMO (n=185):



	0 Parks (n=35)	1 Park (n=53)	2 Parks (n=26)	3+ Parks (n=71)
>8% Greater than expected	14.3%	9.4%	3.8%	9.9%
3-7% Greater than expected	14.3%	22.6%	38.5%	11.3%
No difference (-3% to 3%)	34.3%	39.6%	23.1%	35.2%
3-7% Less than expected	31.4%	13.2%	26.9%	25.4%
>8% Less than expected	5.7%	15.1%	7.7%	18.3%


HIGH RATES OF OBSERVED VERSUS EXPECTED OBESITY WITH LOW PARK ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Observed versus Expected Obesity Category (with Low Park Access)
3-7% Greater than expected (23 tracts)
>8% Greater than expected (20 tracts)
No Parks (16 tracts)
ONLY CENSUS TRACTS WITH GREATER THAN EXPECTED CHILDHOOD OBESITY RATES WITH ONE PARK OR 0 PARKS ARE PORTRAYED ON MAP. PARKS IN LEGEND ARE PORTRAYED FOR LANDMARK PURPOSES. NOT ALL PARKS ARE VISUALIZED.
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


HIGH RATES OF OBSERVED VERSUS EXPECTED OBESITY WITH LOW PARK ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
NORTH KANSAS CITY
MISSOURI RIVER
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
KANSAS RIVER
47TH
TROOST
Arrowhead Stadium
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Observed versus Expected Obesity Category (with Low Park Access)
3-7% Greater than expected (17 tracts)
>8% Greater than expected (10 tracts)
No Parks (10 tracts)
ONLY CENSUS TRACTS WITH GREATER THAN EXPECTED CHILDHOOD OBESITY RATES WITH ONE PARK OR 0 PARKS ARE PORTRAYED ON MAP. PARKS IN LEGEND ARE PORTRAYED FOR LANDMARK PURPOSES. NOT ALL PARKS ARE VISUALIZED.
N
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Chapter 6
Historical Trends in Neighborhood Characteristics

To examine temporal trends in indicators and neighborhood features, this section of the Atlas utilizes data from two time periods 5 or more years apart. For each variable of interest, data from the most recent time-points (approximately 2019-2020), which are presented in previous chapters, were compared to data from approximately 2010-2014.

The number of years between the two time points differs slightly across variable based on data availability, as shown in **Table 5**. Maps in this series show changes in obesity rates, poverty, food access, and walkability for census tracts within the region. The maps serve to identify communities most in need of support based on experiencing detrimental changes in one or more of these factors.

Table 5. Data sources and year(s) reflected for the recent and historical time period for each variable.

Variable	Source	Historical Time Period	Recent Time Period
Obesity	Children's Mercy Kansas City Primary Care Health System	2012-2014	2017-2020
Poverty	U.S. Census Bureau American Community Survey (ACS) 5-year estimates	2010-2014	2015-2019
Food Access	U.S. Department of Agriculture (USDA) Food Access Research Atlas	2010	2019
Walkability	U.S. Environmental Protection Agency (EPA) Smart Location Database	2013	2019

Maps in this chapter include:

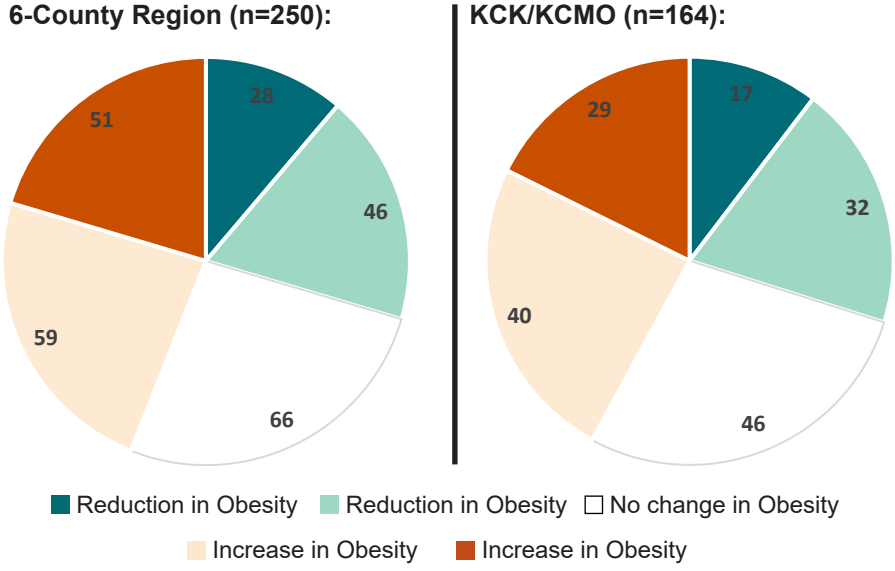
Change in Childhood Obesity Rates
Change in Poverty
Change in Food Access
Change in Walkability

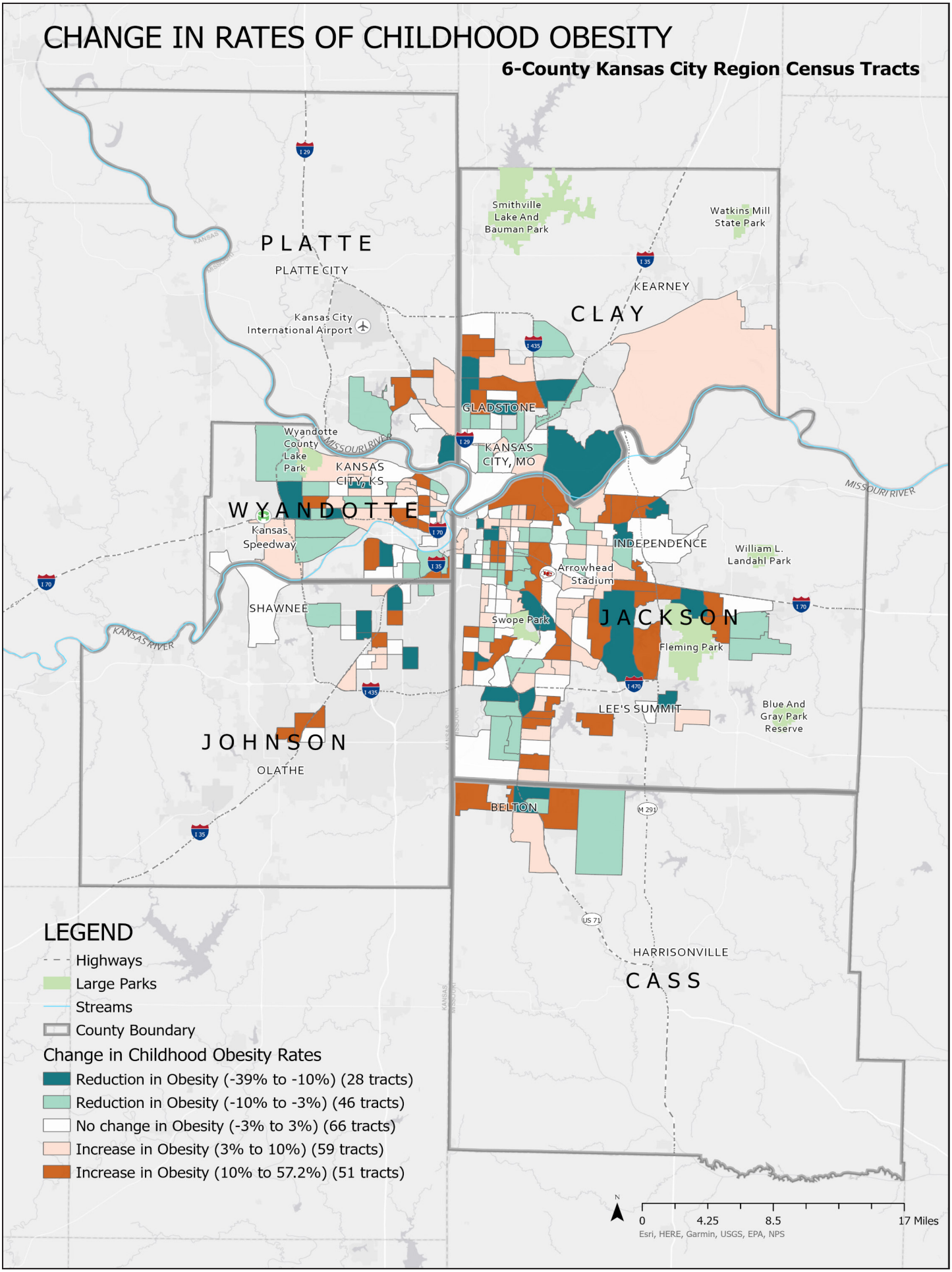
Change in Obesity

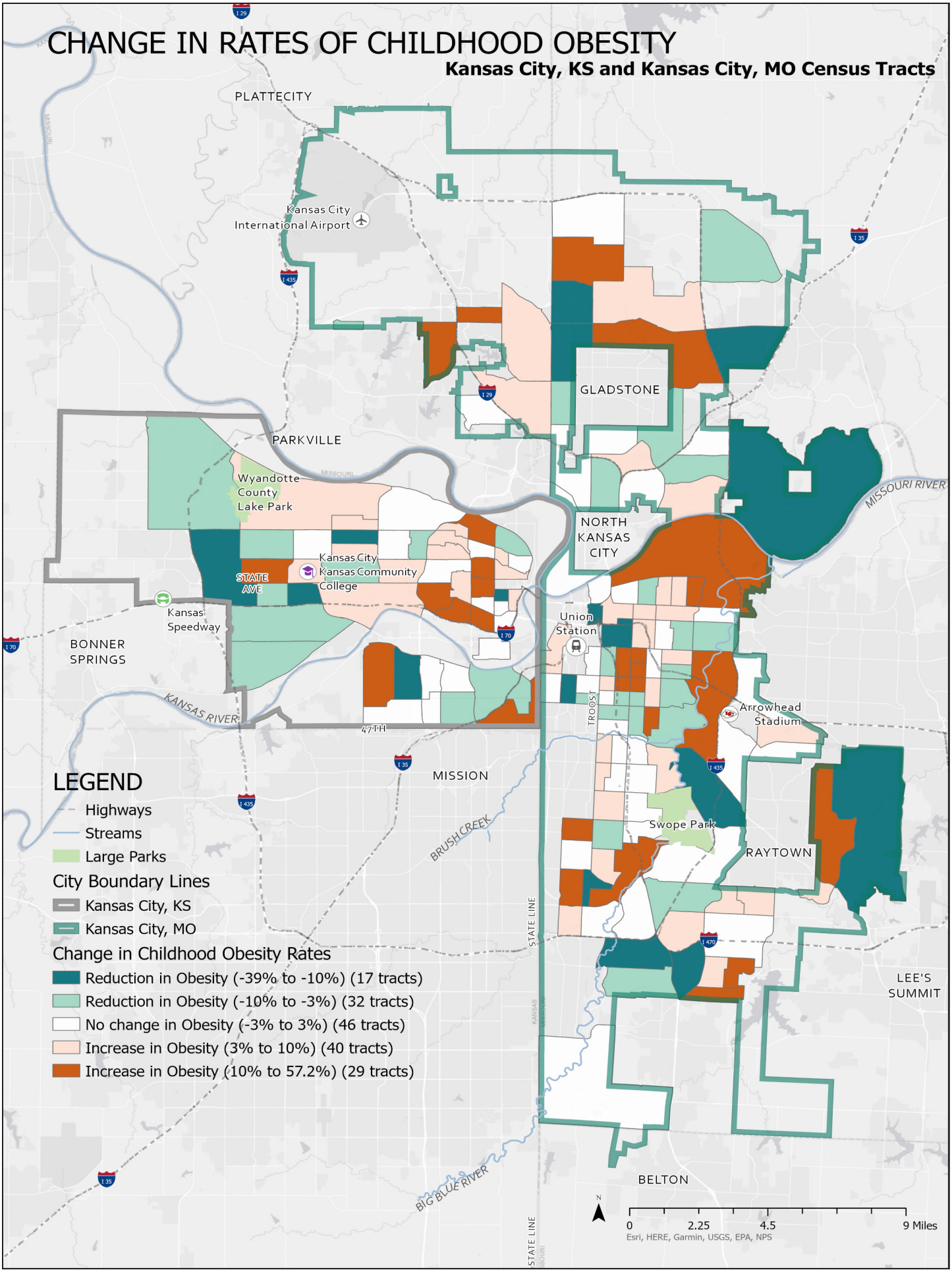
Change in childhood obesity was calculated by comparing recent data from 2017-2020 to historical data from 2012-2014. To minimize bias in estimates, obesity rates were only calculated for census tracts that contained at least 15 Children's Mercy patients with weight status information at both time periods.

Since the age and sex distribution of the patients within each census tract differs between time periods, we employed weighted adjustments to calculate an obesity rate for each census tract that is based on the same age and sex distribution at each time period (the distribution is shown in Chapter 1, **Table 2**). Thus, the temporal changes in obesity rates that are presented in this Atlas are not attributable to age or sex differences between time periods. Each census tracts' change in obesity rates was grouped into the categories shown in **Figure 19**. This figure shows that 74 (30%) of the census tracts in the 6-County Region experienced a reduction in obesity and 110 (44%) of the census tracts in the 6-County Region experienced an increase in childhood obesity over the ~5-year period.

Figure 19. Number of census tracts within each observed obesity change category.



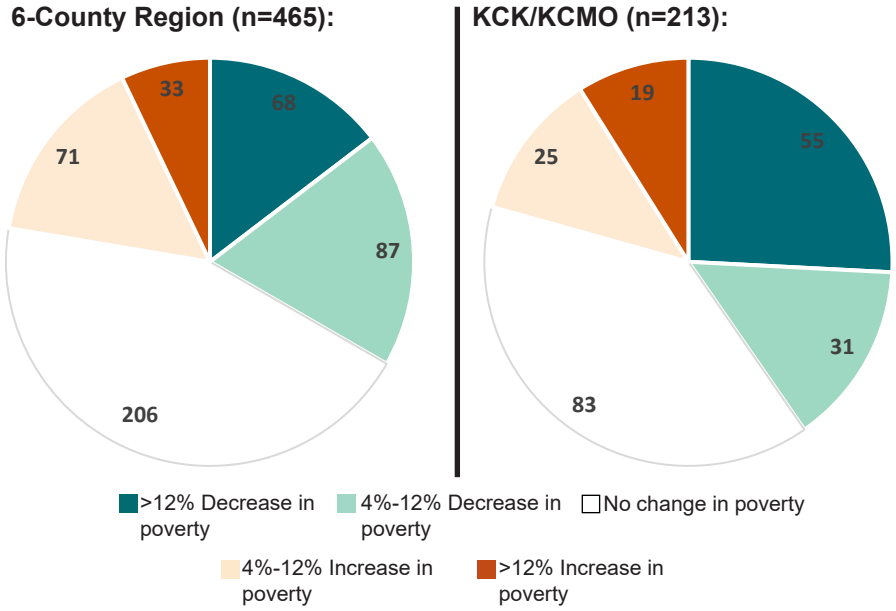

CHANGE IN RATES OF CHILDHOOD OBESITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
Kansas City International Airport
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
SHAWNEE
Swope Park
JACKSON
Fleming Park
KANSAS RIVER
LEE'S SUMMIT
Blue And Gray Park Reserve
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Change in Childhood Obesity Rates
Reduction in Obesity (-39% to -10%) (28 tracts)
Reduction in Obesity (-10% to -3%) (46 tracts)
No change in Obesity (-3% to 3%) (66 tracts)
Increase in Obesity (3% to 10%) (59 tracts)
Increase in Obesity (10% to 57.2%) (51 tracts)
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

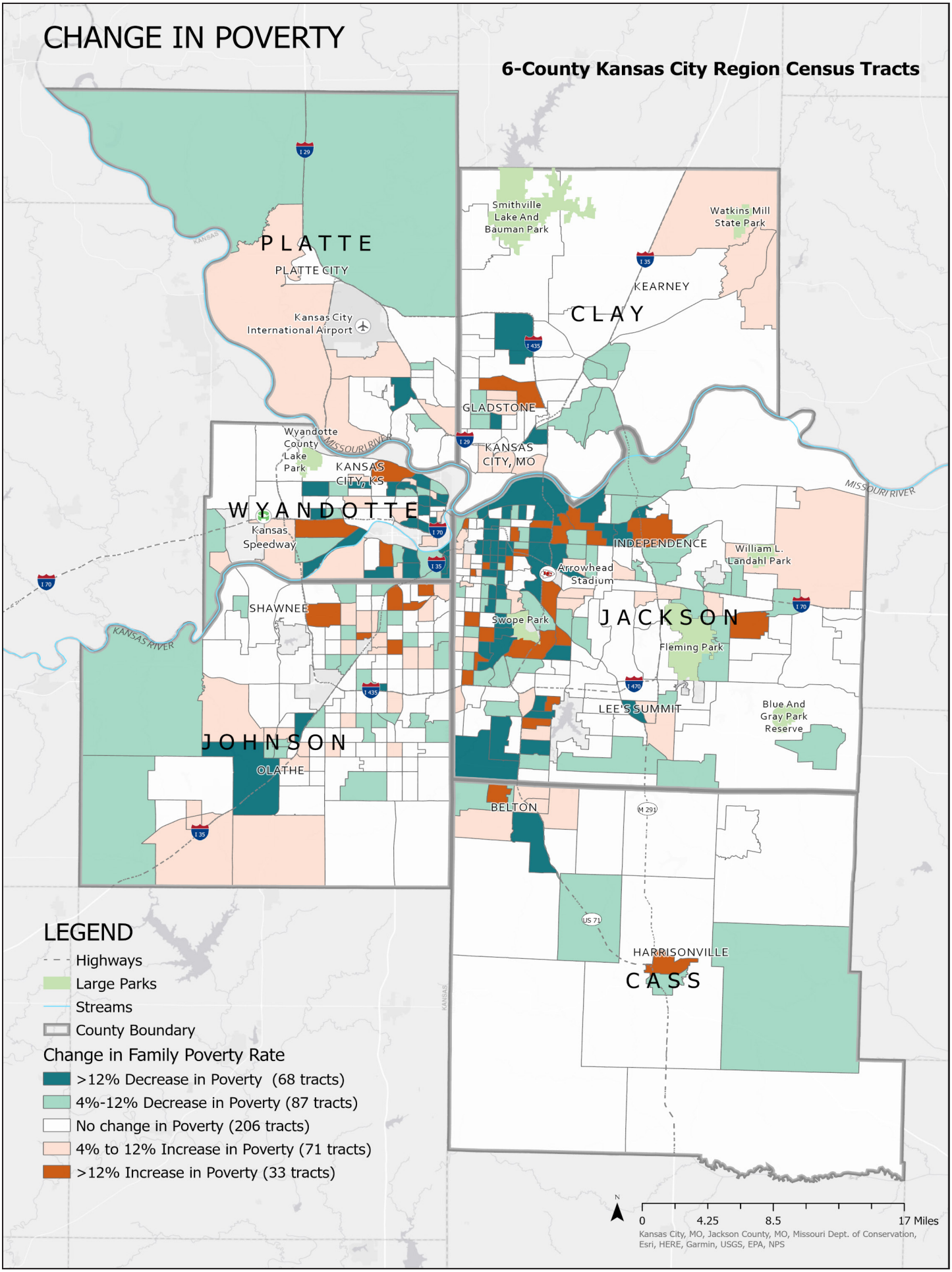

CHANGE IN RATES OF CHILDHOOD OBESITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Change in Childhood Obesity Rates
Reduction in Obesity (-39% to -10%) (17 tracts)
Reduction in Obesity (-10% to -3%) (32 tracts)
No change in Obesity (-3% to 3%) (46 tracts)
Increase in Obesity (3% to 10%) (40 tracts)
Increase in Obesity (10% to 57.2%) (29 tracts)
N
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

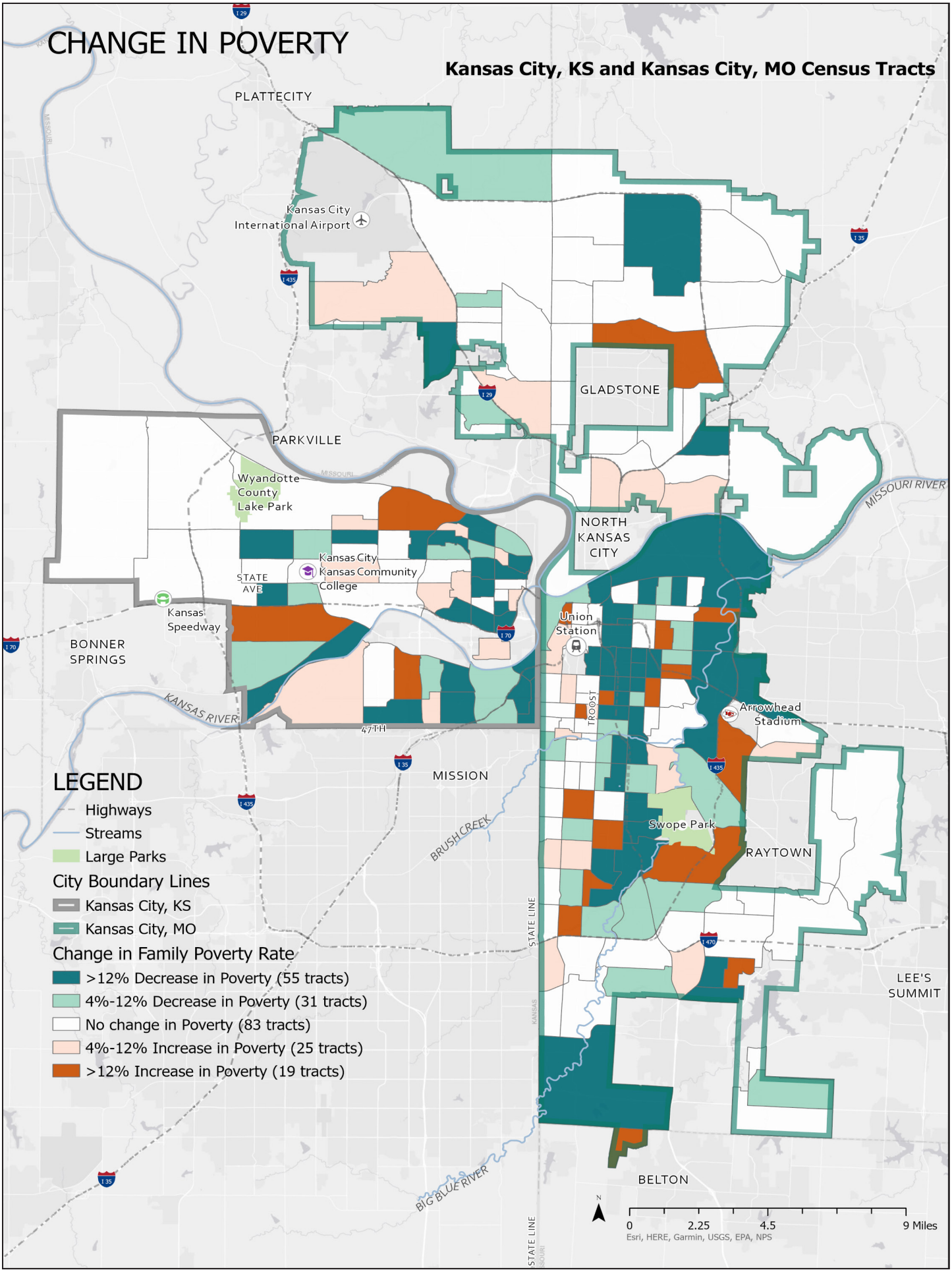
Change in Poverty

Change in poverty, defined as the proportion of families within each census tract falling below the federal poverty level, was calculated by comparing recent data from 2015-2019 to historical data from 2010-2014. Each census tract's change in poverty was grouped into the categories shown in **Figure 20**. This figure shows that 104 (22%) of the census tracts in the 6-County Region experienced an increase in poverty over the ~5-year period, whereas 155 (33%) experienced a decrease in poverty.

Figure 20. Number of census tracts within each poverty change category.



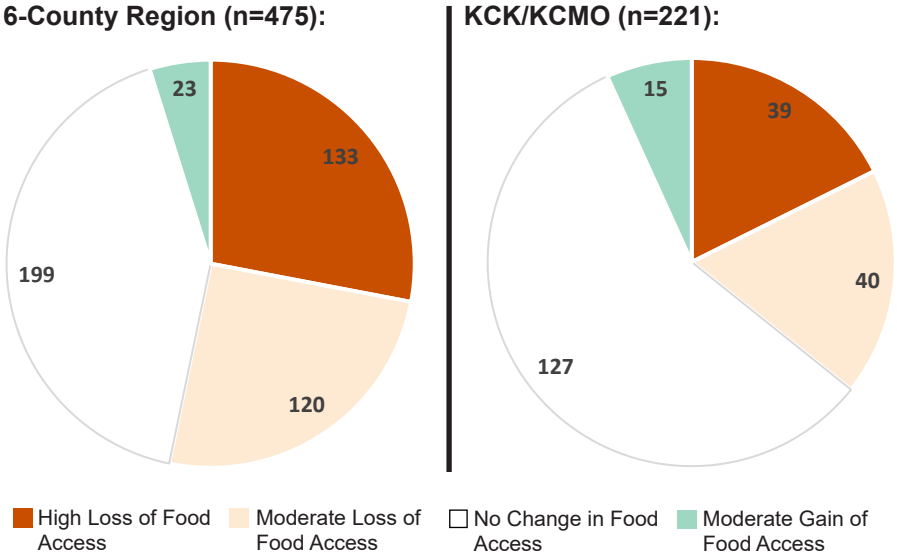

CHANGE IN POVERTY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
KANSAS RIVER
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Change in Family Poverty Rate
>12% Decrease in Poverty (68 tracts)
4%-12% Decrease in Poverty (87 tracts)
No change in Poverty (206 tracts)
4% to 12% Increase in Poverty (71 tracts)
>12% Increase in Poverty (33 tracts)
N
0
4.25
8.5
17 Miles
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

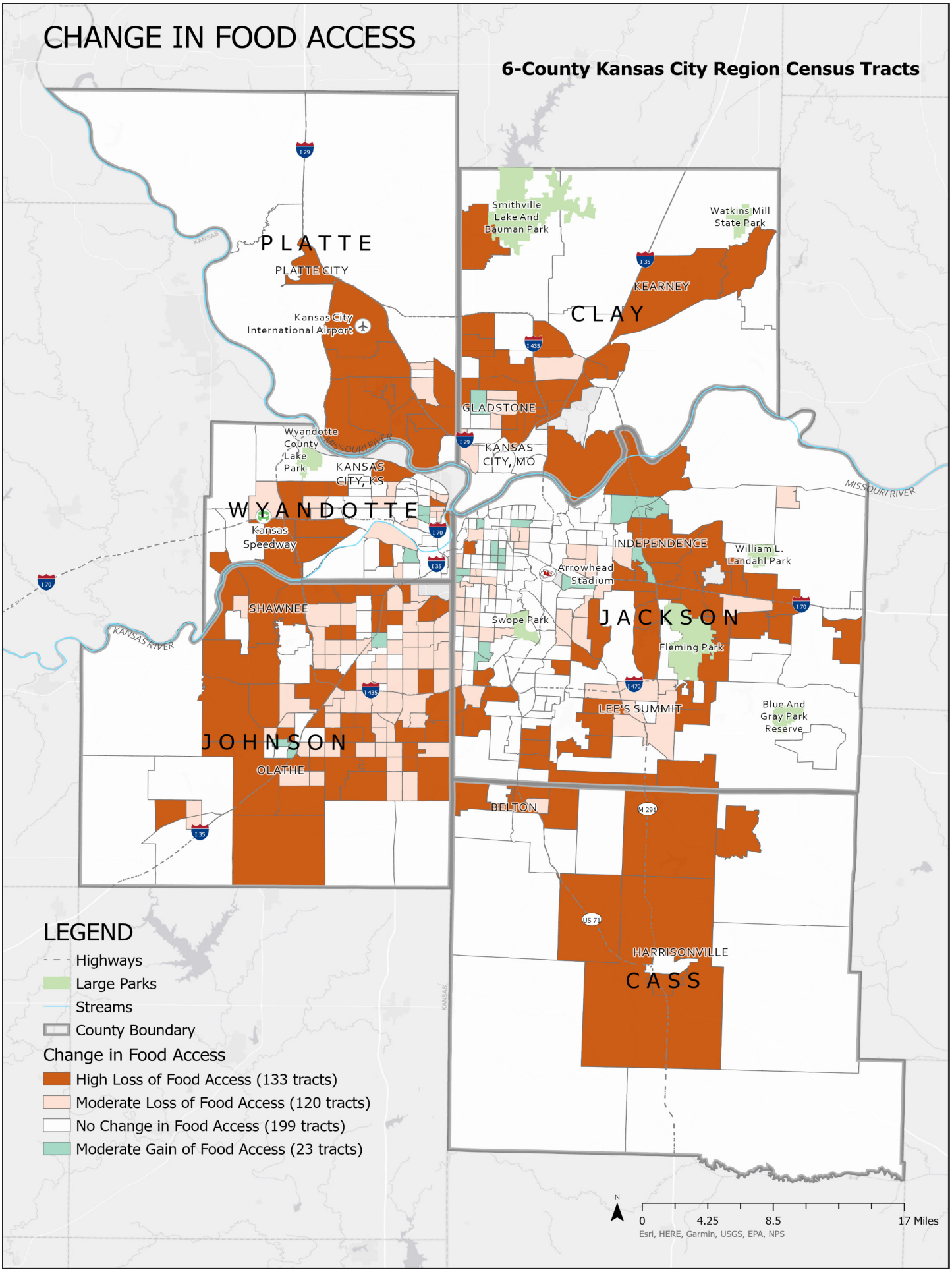

CHANGE IN POVERTY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Change in Family Poverty Rate
>12% Decrease in Poverty (55 tracts)
4%-12% Decrease in Poverty (31 tracts)
No change in Poverty (83 tracts)
4%-12% Increase in Poverty (25 tracts)
>12% Increase in Poverty (19 tracts)
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

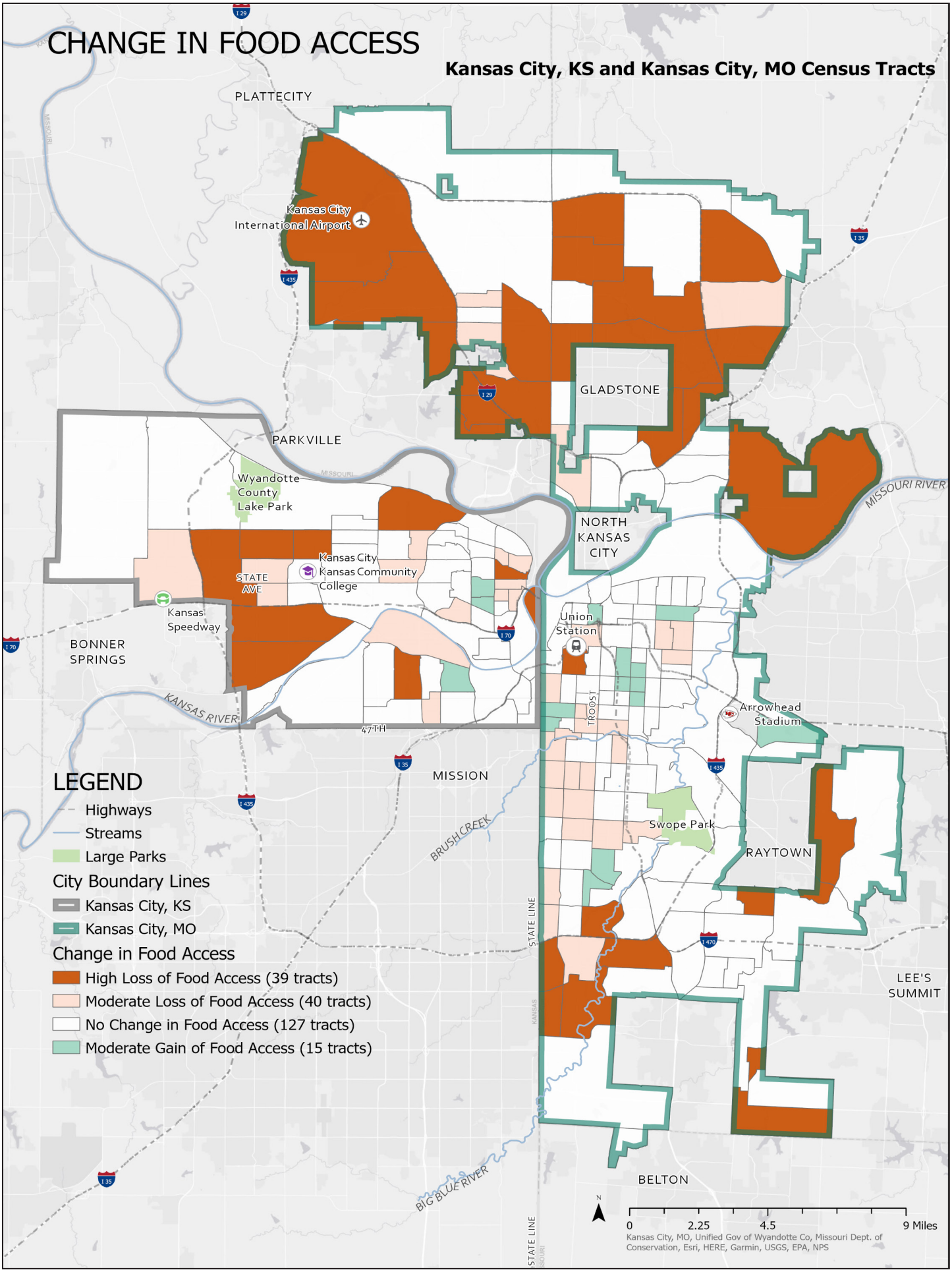
Change in Food Access

Change in food access was calculated by comparing recent data from 2019 to historical data from 2010. Each census tract's change in food access was grouped into the categories shown in **Figure 21**. This figure shows that 253 (53%) of the census tracts in the 6-County Region experienced a decrease in food access over the 9-year period, according to the USDA criteria.

Figure 21. Number of census tracts within each food access change category.



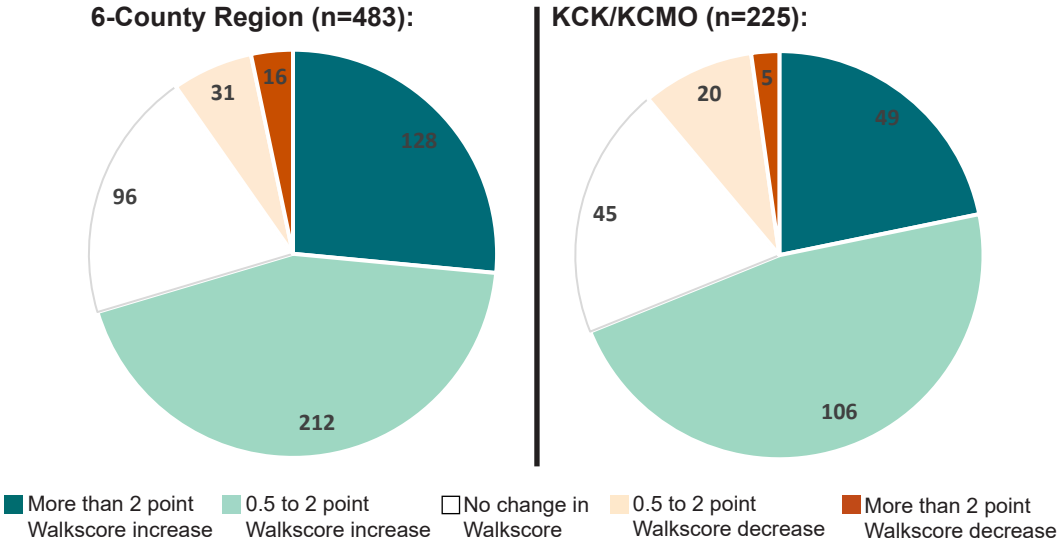

CHANGE IN FOOD ACCESS
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
KANSAS CITY, KS
Wyandotte County Lake Park
WYANDOTTE
Kansas Speedway
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
Swope Park
JACKSON
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
MISSOURI RIVER
KANSAS RIVER
KANSAS
LEGEND
Highways
Large Parks
Streams
County Boundary
Change in Food Access
High Loss of Food Access (133 tracts)
Moderate Loss of Food Access (120 tracts)
No Change in Food Access (199 tracts)
Moderate Gain of Food Access (23 tracts)
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

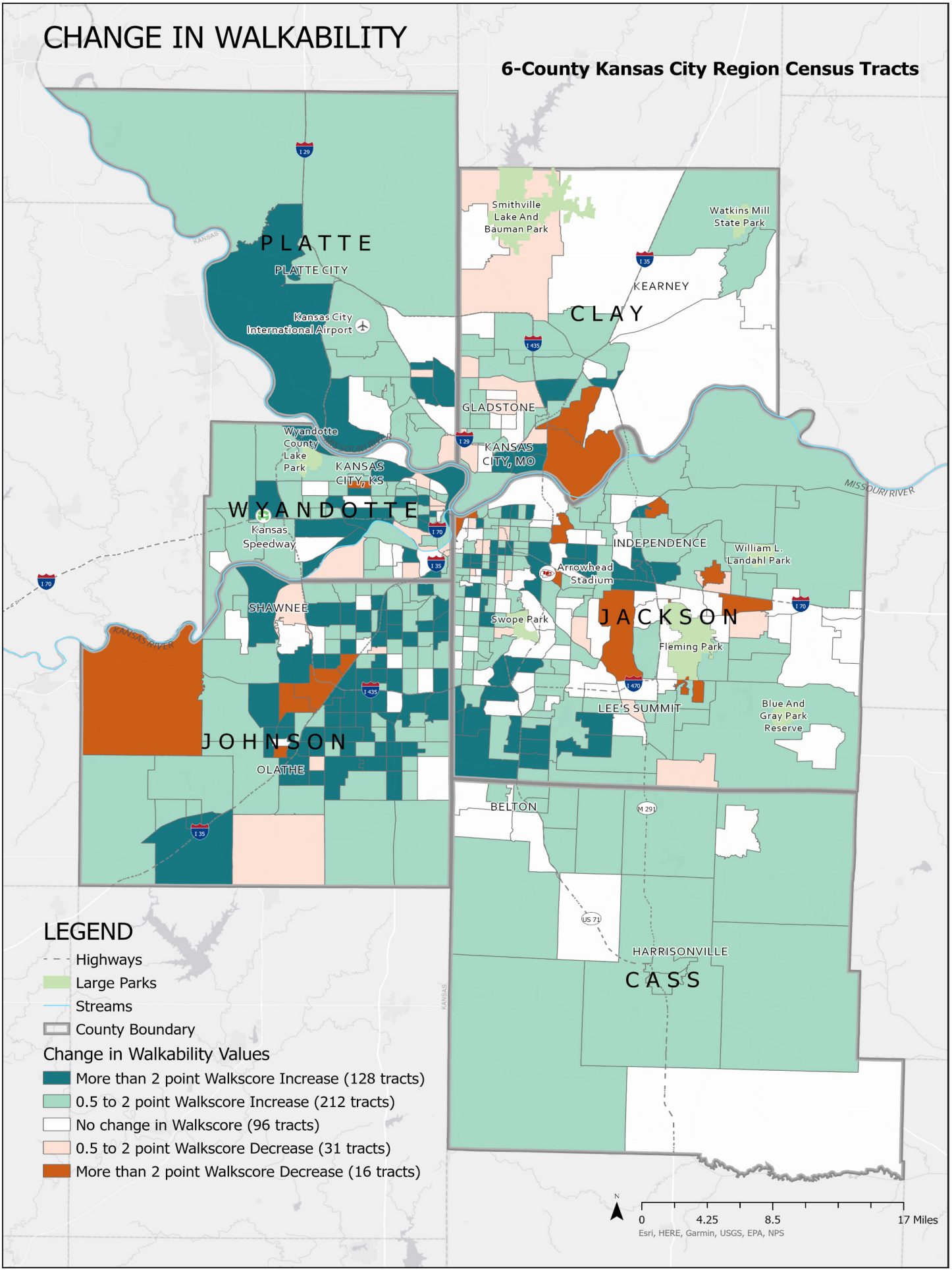

CHANGE IN FOOD ACCESS
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Change in Food Access
High Loss of Food Access (39 tracts)
Moderate Loss of Food Access (40 tracts)
No Change in Food Access (127 tracts)
Moderate Gain of Food Access (15 tracts)
0 2.25 4.5 9 Miles
Kansas City, MO, Unified Gov of Wyandotte Co, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, EPA, NPS

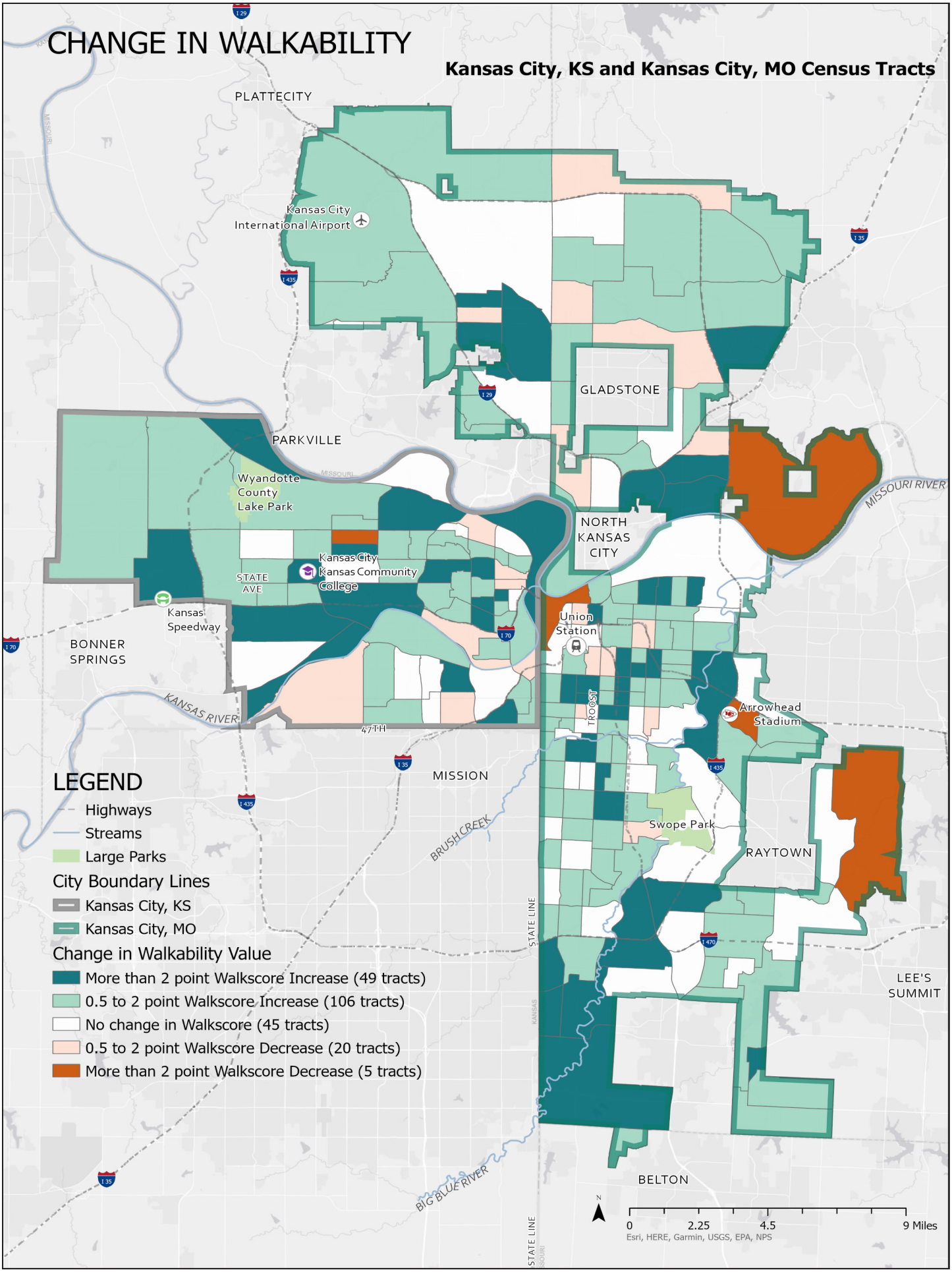
Change in Walkability

Change in walkability was calculated by comparing recent rates from 2019 to historical rates from 2013. Each census tract's change in walkability was grouped into the categories shown in **Figure 22**. This figure shows that 340 (70%) of the census tracts in the 6-County Region experienced an increase in walkability and 47 (10%) of the census tracts in the 6-County Region experienced a decrease in walkability over the 6-year period.

Figure 22. Number of census tracts within each change in walkability category.




CHANGE IN WALKABILITY
6-County Kansas City Region Census Tracts
PLATTE
PLATTE CITY
Kansas City International Airport
CLAY
KEARNEY
Smithville Lake And Bauman Park
Watkins Mill State Park
GLADSTONE
KANSAS CITY, MO
Wyandotte County Lake Park
KANSAS CITY, KS
WYANDOTTE
Kansas Speedway
MISSOURI RIVER
INDEPENDENCE
William L. Landahl Park
Arrowhead Stadium
JACKSON
Swope Park
Fleming Park
LEE'S SUMMIT
Blue And Gray Park Reserve
SHAWNEE
KANSAS RIVER
JOHNSON
OLATHE
BELTON
HARRISONVILLE
CASS
LEGEND
Highways
Large Parks
Streams
County Boundary
Change in Walkability Values
More than 2 point Walkscore Increase (128 tracts)
0.5 to 2 point Walkscore Increase (212 tracts)
No change in Walkscore (96 tracts)
0.5 to 2 point Walkscore Decrease (31 tracts)
More than 2 point Walkscore Decrease (16 tracts)
N
0
4.25
8.5
17 Miles
Esri, HERE, Garmin, USGS, EPA, NPS


CHANGE IN WALKABILITY
Kansas City, KS and Kansas City, MO Census Tracts
PLATTECITY
Kansas City International Airport
GLADSTONE
PARKVILLE
Wyandotte County Lake Park
MISSOURI RIVER
NORTH KANSAS CITY
Kansas City Kansas Community College
STATE AVE
Kansas Speedway
BONNER SPRINGS
Union Station
TROOST
Arrowhead Stadium
KANSAS RIVER
47TH
MISSION
BRUSH CREEK
Swope Park
RAYTOWN
STATE LINE
LEE'S SUMMIT
BELTON
BIG BLUE RIVER
LEGEND
Highways
Streams
Large Parks
City Boundary Lines
Kansas City, KS
Kansas City, MO
Change in Walkability Value
More than 2 point Walkscore Increase (49 tracts)
0.5 to 2 point Walkscore Increase (106 tracts)
No change in Walkscore (45 tracts)
0.5 to 2 point Walkscore Decrease (20 tracts)
More than 2 point Walkscore Decrease (5 tracts)
0
2.25
4.5
9 Miles
Esri, HERE, Garmin, USGS, EPA, NPS

Chapter 7
Conclusions

Summary

The goal of this Atlas was to inform local efforts in the Kansas City region that either directly or indirectly relate to children's health. Childhood obesity was selected as the health marker of interest because of its critical importance in lifelong risk for type 2 diabetes and cardiovascular disease, which are leading preventable causes of early death. Unfortunately, childhood obesity rates in the region have increased over the past decade as shown in this Atlas. While the drivers of a healthy weight, healthy eating and active living, were once believed to be personal choices made by families, the data in this Atlas suggest that the neighborhood environment plays an essential role in these drivers. These data show a clear link between neighborhood environment characteristics and childhood obesity in the Kansas City region, revealing health inequities that are based on where a child lives.

Of the three neighborhood built environment characteristics included in this Atlas, two – walkability and park access – appear to play a particularly important role in childhood obesity in the region. Having low access to healthy foods based on distance to the nearest grocery store, on the other hand, does not appear to be connected to childhood obesity within the region. Regarding walkability and park access, children in the region who live in neighborhoods that have high walkability and ample parks have a significantly lower risk for developing obesity. Although the magnitude of these effects is relatively small for a given individual, the impacts are tremendous when considering that neighborhoods impact all children in our region (**Table 6**). This link between neighborhoods and health shows the important impact city planning and development departments and parks departments have in shaping the health of our communities.

Neighborhood poverty, which tends to be higher in communities with large numbers of Black/African American and/or Latinx residents as shown in the maps in this Atlas, clearly plays a large role in childhood obesity in the region. The maps show that there are numerous areas in the region where high poverty, low walkability, and low park access co-occur. This accumulation of risk factors puts children and families at a high risk for poor health. Yet, given that high poverty areas were not more likely to have low access to healthy foods, low walkability, or low park access than low poverty areas, the environmental factors contributing to economic disparities in childhood obesity are likely different. Factors such as pedestrian infrastructure (e.g., sidewalks), safety from traffic, safety from crime, the quality of parks, density of unhealthy food sources, and affordability of healthy opportunities (e.g., foods, recreational activities) are known to contribute to economic disparities in childhood obesity but were not included in this Atlas because they are difficult to track at the regional level.

Table 6. Magnitude of association between the neighborhood environment and childhood obesity.	
Neighborhood Characteristic	**Magnitude of association between highest and lowest quartile**
Poverty	Children living in one of the 25% lowest poverty census tracts are 20% less likely to have obesity than those living in one of the 25% highest poverty census tracts.
Walkability	Children living in one of the 25% highest walkable census tracts are 7% less likely to have obesity than those living in one of the 25% lowest walkable census tracts.
Park Access	Children living in a census tract with 3 or more parks are 7% less likely to have obesity than those living in a census tract with 0 parks.

How to Use This Information

The information in this Atlas can aid policy, planning, advocacy, and programming activities by (1) helping stakeholders see the real impacts neighborhood environments have on children's health locally in the Kansas City region and (2) revealing specific areas within the region that are particularly disadvantaged based on high rates of childhood obesity and neighborhood characteristics like low walkability, low park access, and high poverty. The data presented tell a clear story on how many of the key factors that relate to health are determined not by health organizations, but by city planners and policy makers.

Healthy communities, put simply, are those that prioritize people and pedestrians over vehicles and include ample opportunities for recreation. Such communities have tremendous co-benefits, including better air quality, less harmful impacts on climate change, increased mobility, better social connectedness, and increased happiness and well-being.[22] Opportunities exist for improving neighborhood built environment characteristics through city planning and development projects that involve smart growth and pedestrian-oriented development, which are summarized in **Table 7**.[17,23,24] This table also summarizes recommendations for other community sectors that are essential for addressing environmental health disparities related to childhood obesity. Neighborhood poverty also needs to be addressed, both directly and indirectly, such as through equitable neighborhood conditions, to address health disparities that are the result of structural barriers largely created through discriminatory policies and practices.

The data presented in this Atlas show that progress has been made over the past decade in creating more walkable communities, which can be credited to the many organizations and cities in the region that have worked strenuously on these efforts. These efforts must be continued and expanded to alleviate remaining environmental health disparities and combat the rising rates of obesity documented in this Atlas.

It is imperative that in all efforts aiming to improve neighborhood environment characteristics that support health, gentrification be avoided. There are numerous strategies that can prevent displacement such as inclusionary zoning policies (e.g., affordable housing set-asides), incentive programs (e.g., tax incentives), home ownership programs, and rent regulation policies.[25] It is also critical that strategies for tracking displacement and other neighborhood environment characteristics that were not able covered in this Atlas, such as safety from traffic, are developed and implemented across the region to support equity in health promoting environments.

Table 7. Recommendations for addressing health disparities in childhood obesity that are related to neighborhood walkability and park access.

City Officials	Community Organizations and Residents	Healthcare Providers and Other Health Leaders
Create and support projects that: 1. Diversify housing options within neighborhoods to increase density and choice. 2. Direct development to existing communities by using infill development on empty or underutilized lots to increase density and amenities as opposed to building new single use communities with few amenities in walking distance. 3. Incorporate mixed land use into new developments and using re-zoning in existing communities to increase the availability of commercial and retail destinations and jobs within walking distance of residential areas. 4. Combine health supporting environments, such as pairing improvements in pedestrian/bicycle transportation systems with efforts to increase land use diversity. 5. Expand parks, trails, and transit.	1. Support community-based programs that target high-need areas and consider existing environmental conditions. 2. Advocate for neighborhood improvements by attending community planning events and talking with local city and elected officials. 3. Hold policy makers accountable for collecting community input and empower families to use their voices to influence policy decisions that impact their neighborhoods.	1. Help increase families' awareness of facilitators and barriers to healthy eating and active living within their neighborhoods. 2. Work with city governments and advocacy groups to support health factors and resident voices to be adequately considered in decisions related to city planning and development. 3. Empower families to use their voices to influence policy decisions that impact their neighborhoods.

References

1. Hales CM, Carroll MD, Fryar CD, Ogden CL. (2017). Prevalence of obesity among adults and youth: United States, 2015–2016. NCHS Data Brief, No. 288. https://www.cdc.gov/nchs/data/databriefs/db288.pdf
2. Fryar CD, Carroll MD, Ogden CL. (2018). Prevalence of overweight, obesity, and severe obesity among children and adolescents aged 2–19 years: United States, 1963–1965 through 2015–2016. NCHS Health E-Stats. https://www.cdc.gov/nchs/data/hestat/obesity_child_15_16/obesity_child_15_16.pdf
3. U.S. Department of Agriculture and U.S. Department of Health & Human Services. (2020). Dietary Guidelines for Americans, 2020-2025. 9th Edition. https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf
4. U.S. Department of Health and Human Services. (2018). Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: U.S. Department of Health and Human Services. https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf
5. National Coolaborative on Childhood Obesity Research (NCCOR). (2016). Measures Registry User Guides [Physical Activity Environment]. https://www.nccor.org/tools-mruserguides/physical-activity-environment/introduction/
6. National Coolaborative on Childhood Obesity Research (NCCOR). (2016). Measures Registry User Guides [Food Environment]. https://www.nccor.org/tools-mruserguides/food-environment/introduction/
7. U.S. Department of Health and Human Services. (2015). Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities. Washington, DC: U.S. Dept of Health and Human Services, Office of the Surgeon General. https://www.hhs.gov/sites/default/files/call-to-action-walking-and-walkable-communites.pdf
8. National Physical Activity Plan Alliance. (2018). The 2018 United States Report Card on Physical Activity for Children and Youth. Washington, DC: National Physical Activity Plan Alliance. https://paamovewithus.org/wp-content/uploads/2020/06/2018-US-Report-Card-Summary_WEB.pdf
9. U.S. Census Bureau. (2021). American Community Survey and Puerto Rico Community Survey: 2021 Subject Definitions [Poverty Status of Households]. https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2021_ACSSubjectDefinitions.pdf
10. U.S. Department of Health and Human Services. (2019). 2019 Poverty Guidelines. https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references/2019-poverty-guidelines
11. U.S. Department of Agriculture Economic Research Service. (2022). Food Access Research Atlas. https://www.ers.usda.gov/data-products/food-access-research-atlas/
12. U.S. Department of Agriculture Economic Research Service. (2022). Food Access Research Atlas - Documentation. https://www.ers.usda.gov/data-products/food-access-research-atlas/
13. U.S. Environmental Protection Agency. (2021). National Walkability Index Methodology and User Guide. https://www.epa.gov/sites/default/files/2021-06/documents/national_walkability_index_methodology_and_user_guide_june2021.pdf
14. U.S. Environmental Protection Agency. (2019). Smart Location Mapping. https://www.epa.gov/smartgrowth/smart-location-mapping
15. Centers for Disease Control and Prevention. (2020). Defining Childhood Obesity. https://www.cdc.gov/obesity/basics/childhood-defining.html
16. U.S. Department of Agriculture Economic Research Service. (2022). Food Security and Nutrition Assistance. https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-security-and-nutrition-assistance/
17. Smart Growth America. (2022). What is Smart Growth? https://smartgrowthamerica.org/what-is-smart-growth/
18. Fleming, M., Kane, W., Meneveau, M., Ballantyne, C. & Levin, D. (2021). Food insecurity and obesity in U.S. adolescents: a population based analysis. Childhood Obesity, 17(2), 110-115. doi: 10.1089/chi.2020.0158
19. Daniels, K., Schinasi, L., Auchincloss, A., Forrest, C. & Diez Roux, A. (2021). The built and social neighborhood environment and child obesity: a systematic review of longitudinal studies. Preventive Medicine, 153, 106790. doi: 10.1016/j.ypmed.2021.106790
20. Jia, P. et al. (2021). Green space access in the neighborhood and childhood obesity. Obesity Reviews, 22(Suppl 1), e13100. doi: 10.1111/obr.13100
21. U.S. Department of Health & Human Services. (2022). Healthy People 2030 [Neighborhood and Built Environment]. https://health.gov/healthypeople/objectives-and-data/browse-objectives/neighborhood-and-built-environment
22. America Walks. (2022). Resources. https://americawalks.org/resources/
23. Centers for Disease Control and Prevention (CDC). (2020). Designing Activity-Friendly Communities. https://www.cdc.gov/nccdphp/dnpao/features/walk-friendly-communities/index.html
24. The Community Guide. (2016). Physical Activity: Built Environment Approaches Combining Transportation System Interventions with Land Use and Environmental Design. USA. gov2020. https://www.thecommunityguide.org/findings/physical-activity-built-environment-approaches
25. Centers for Disease Control and Prevention (CDC). Health Effects of Gentrification 2020. https://www.cdc.gov/healthyplaces/healthtopics/gentrification.htm