

A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient

by

Rial Tombes Carver

B.S., Virginia Tech, 2012

A THESIS

submitted in partial fulfillment of the requirements for the degree

MASTER OF REGIONAL AND COMMUNITY PLANNING

Department of Landscape Architecture and Regional & Community Planning  
College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

2019

Approved by:

Major Professor  
Dr. Hyung Jin Kim

## **Copyright**

© Rial Carver 2019.

## **Abstract**

Neighborhoods are fundamental units of planning. Over the past century, planners have presented theories on designing the ideal neighborhood. Many of these theories include recommendations for size, population, and orientation to basic amenities like food, healthcare and education. Most neighborhood level research has paid little attention to the contexts (urban, suburban, and rural) that neighborhoods are situated. The purpose of this research is to explore the differences in neighborhood forms, characteristics, and access to basic needs (food, healthcare and education) along an urban to rural gradient. Specifically, this study aims to (1) explore contextual factors in neighborhood characteristics and access to basic needs of the neighborhood, and (2) identify patterns in people's perceived neighborhood center and boundaries and (3) identify patterns in access to basic needs (food store, primary health care, and school) from selected neighborhoods along an urban to rural gradient in the Wichita, Kansas, metropolitan area. This study uses surveys as a primary data collection method and cognitive mapping in order to capture data on neighborhood characteristics and travel patterns to basic needs. Descriptive statistics, cross tabulations, ANOVAs and geo-spatial analysis are used to analyze the results. Results indicate that variations in neighborhood perceptions along the urban to rural gradient exist and they are more prevalent than variations in travel patterns along the urban to rural gradient. Neighborhoods along the urban to rural gradient are distinct, but suburban and rural neighborhoods appear to be more alike than suburban and urban. The need for a definition of suburban is evident. Planners often use neighborhoods as a unit for developing plans. This research provides insight that informs and improves future neighborhood level planning efforts.

## Table of Contents

List of Figures .....	vi
List of Tables .....	vii
Acknowledgements .....	viii
Chapter 1 - Introduction.....	1
Research Questions and Aims: Why the Urban to Rural Gradient.....	1
Structure of Study .....	2
Chapter 2 - Literature Review.....	4
Neighborhood planning .....	6
The evolution of planned neighborhoods .....	7
Neighborhood Planning for Basic Needs.....	9
Food Access .....	10
Access to Healthcare.....	11
Access to Education .....	11
The urban to rural gradient as an analytical tool.....	12
Summary .....	14
Chapter 3 - Methodology .....	15
Overview.....	15
Study Area and Population .....	16
Defining the Wichita urban-to-rural transect:.....	18
The Sample .....	22
Measurement.....	23
Study Variables.....	23
Survey Instrument Development Procedure .....	25
Survey Administration .....	25
IRB and Human Subjects.....	26
Data Analysis .....	26
Transect Zone Nomenclature .....	27
Chapter 4 - Results.....	29
Neighborhood Patterns.....	29
Demographics .....	29



Neighborhood Characteristics.....	30
Access to Basic Needs .....	34
Access to Food by Neighborhood.....	35
Access to Healthcare by Neighborhood.....	38
Access to School by Neighborhood.....	40
Chapter 5 - Discussion and Conclusion.....	43
Discussion.....	43
Study Limitations.....	46
Future Research .....	47
Conclusion .....	48
References.....	50
Appendix A - Questionnaire.....	61
Appendix B - IRB Approval.....	67
Appendix C - Research Proposal .....	70

## List of Figures

Figure 1.1 Flow Chart of Study Structure.....	3
Figure 2.1. Relevant literature and existing research gaps. ....	5
Figure 2.2. Clarence Perry's Neighborhood Unit Concept Diagram detailing the distances and locations of neighborhood elements. ....	8
Figure 2.3. A diagram of Transit Oriented Design which specifies land use and distances between neighborhood centers.....	9
Figure 2.4. Examples of Nomenclature for differing Urban Contexts .....	13
Figure 3.1. The methodological framework and research questions for this study. ....	15
Figure 3.2. Wichita, KS, Metropolitan Area.....	16
Figure 3.3. Study Area Population Density by Block Group .....	20
Figure 3.4. Study Area Median Household Income by Block Group.....	20
Figure 3.5. Study Area Median Age by Block Group .....	21
Figure 3.6. Study Area Distance from Urban Core and Street Network .....	21
Figure 3.7. Study Area made up of USPS routes in six zip codes.....	22
Figure 3.8. Examples of urban to rural nomenclature as it applies to the study area. ....	28
Figure 4.1. Survey Responses by Neighborhood.....	29
Figure 4.2. Continuum of Resident Demographics by Neighborhood .....	30
Figure 4.3 Neighborhood boundary drawn in relation to map elements. ....	32
Figure 4.4 Neighborhood boundary drawn without relation to map elements .....	32
Figure 4.5. Neighborhood Characteristics by Neighborhood .....	33
Figure 4.6 Mean Distance to Neighborhood Center by Neighborhood .....	34
Figure 4.7 Mean Network Distance to Food Store by Neighborhood .....	36
Figure 4.8 Map of Food Store Locations by Neighborhood.....	37
<b>Figure 4.9 Mean Network Distance to Healthcare by Neighborhood .....</b>	<b>38</b>
Figure 4.10. Map of Healthcare Facility Locations by Neighborhood .....	39
Figure 4.11 Mean Network Distance to School by Neighborhood.....	40
Figure 4.12. Map of School Locations by Neighborhood .....	41

## List of Tables

Table 3.1. Basic Demographics of Wichita, KS, and Midwest Region.....	17
Table 3.2. Industry in Wichita, KS and Midwest Region.....	18
Table 3.3. Sample by Zip Code and Route .....	23
Table 3.4. Study variables and measurement.....	24
Table 3.5. Types of Analysis per Variable .....	27
Table 4.1 Mean Distance to Neighborhood Center by Neighborhood .....	34
Table 4.4. Travel Patterns by Type of Need .....	35
Table 4.5 Mean Network Distance to Food Store by Neighborhood .....	36
Table 4.6 Mean Network Distance to Healthcare by Neighborhood.....	38
Table 4.7 Mean Network Distance to School by Neighborhood .....	40
Table 4.8 Mean Network Distances to Basic Needs by Neighborhood.....	42

## **Acknowledgements**

This research is funding by the Clarence C Stein Institute at Cornell University and the Dwight D. Eisenhower Transportation Fellowship also contributed to the completion of research. I would like to thank both institutions for their support of this research.

To my committee members, thank you for your willingness and enthusiasm to join me on this project. I'd like to thank my major advisor, Hyung Jin Kim, for the time, dedication, and passion that he shared with me over the past few years.

I'd like to extend a sincere thank you to my colleagues at the Center for Engagement and Community Development who inspire me to continue learning and have never doubted my ability to "do it all." To my fellow post-bacs, thank you for your friendship and good humor.

I'd like to thank my family who taught me to be thoughtful, ask questions, and to dream big. And most of all, thank you to Elliott for being my rock, my hype-man and my number one cheerleader. I absolutely couldn't have done this without you.

## **Chapter 1 - Introduction**

Neighborhoods are fundamental units of planning (Hester, 1975; Keller, 1968; Park & Rogers, 2015). Many planners have developed theories that attempt to define the ideal characteristics of a neighborhood. Planned neighborhood theories prescribe the ideal size, population, distance to a neighborhood center, and even amenities that should occupy a neighborhood. In America, neighborhoods occur in most any setting or context including urban, suburban and rural areas (Chaskin, 1997; Park & Rogers, 2015). Generally, a gradient of urban form has emerged where neighborhoods are more dense in urban areas and steadily less dense as distance increases from the urban core. Often this gradient follows a major arterial road that allows for easy access by car to a range of neighborhoods (Nelson, 1992). This trend has been documented as a result of a multitude of policy decisions that encourage development outside of the urban core (Schwartz, 2014).

An important component of neighborhood planning is siting basic needs like food, healthcare and education to ensure access to these basic needs (Stewart, 1985). In particular, research on this topic reveals that sufficient access to basic needs, or lack thereof, directly impacts ones' quality of life (Davis, 1991; Schwartz, 2014; The Reinvestment Fund & Opportunity Finance Network, 2012; Widener, Metcalf, & Bar-Yam, 2013) As important as neighborhood level planning is for the planning profession, there are gaps in understanding how neighborhoods behave in varying urban contexts and, in turn, how the provision of basic needs differs among these varying contexts.

### **Research Questions and Aims: Why the Urban to Rural Gradient**

Building from existing planned neighborhood theories, this research explores the differences in perceived neighborhood forms, physical characteristics and access to basic needs like food, healthcare and education in six neighborhoods along an urban to rural gradient. The similarities and differences in how people identify their neighborhood provides insight into how residents perceive and interact with their neighborhood. Moving from a downtown urban core to a rural area typically involves a change in density, distance to city center, and demographics. Everyone accesses basic needs like food, healthcare and education, but the differences in how people access these needs from urban, suburban, or rural contexts are less clear. This research aims to answer the following questions:

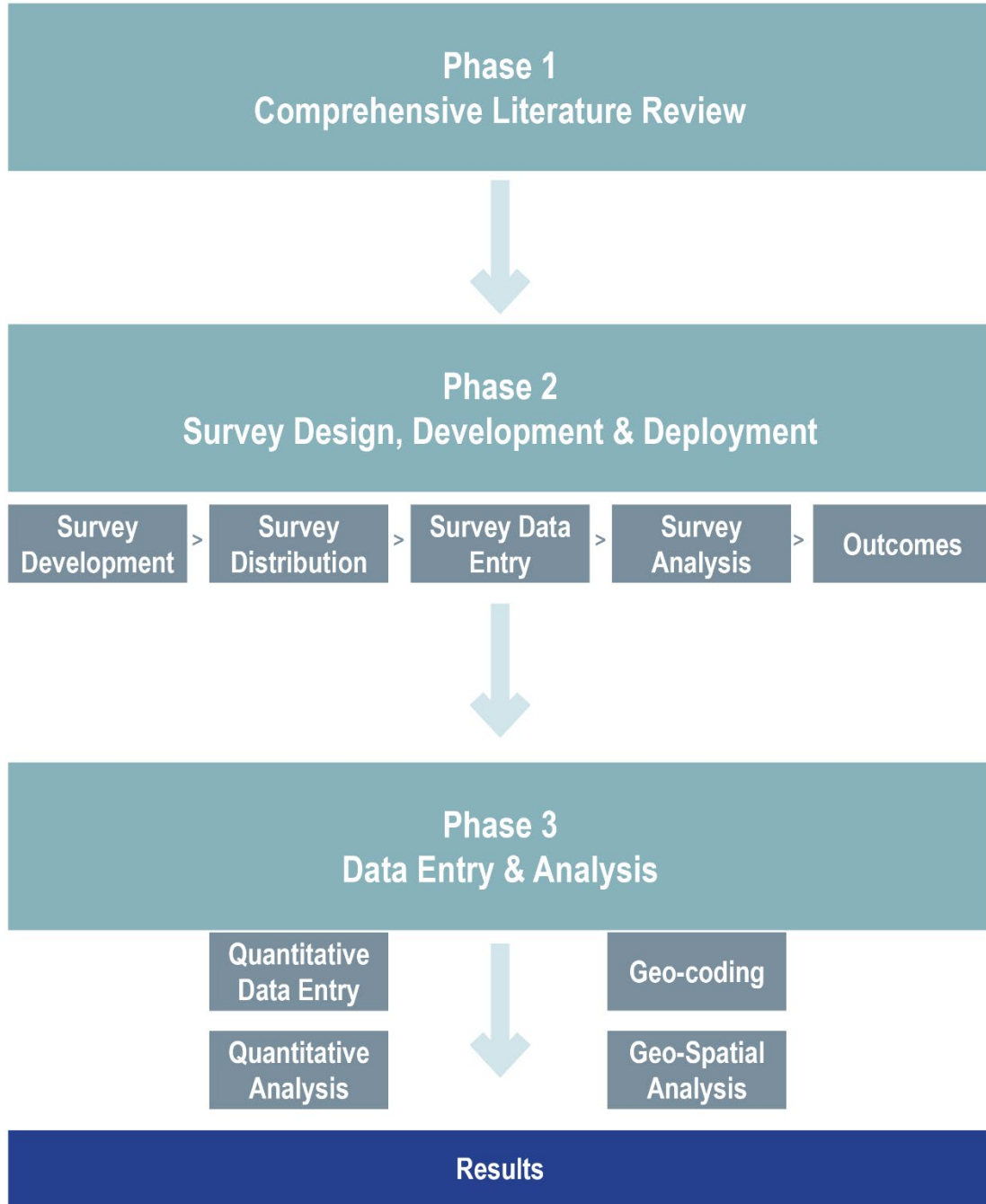
- How does urban context affect the perceptions that residents have of their neighborhood?
- Do urban, suburban, and rural residents classify their neighborhood centers and boundaries similarly?
- Do neighborhood residents' patterns vary in accessing basic needs of school, food and healthcare?

Visible differences between urban, suburban and rural neighborhoods are evident, however, differences in residents' neighborhood perceptions and access to basic needs among urban, suburban and rural neighborhoods are not. To answer the research questions stated above, this study will achieve the following aims: explore the contextual factors related to the observed differences in neighborhood characteristics and access to basic needs (**Aim #1**), identify patterns in perceived neighborhood characteristics, boundaries and center among different neighborhoods along an urban to rural gradient (**Aim # 2**), and identify patterns in access to food, healthcare and education among different neighborhoods along an urban to rural gradient(**Aim #3**).

A better understanding of how neighborhood perceptions change compared to neighborhood characteristics will enable planners to better support neighborhoods in varying urban contexts (urban, suburban, rural). The urban to rural gradient as a research methodology is being used in this study to show differences in varying contexts and could be used to answer future relevant planning questions.

### **Structure of Study**

This study was completed in three phases. It began with a comprehensive literature review (Chapter 2). The second phase of this study focused on questionnaire development, testing, deployment and data entry (Chapter 3). Analysis of survey results made up the last phase of the study (Chapters 3 and 4).

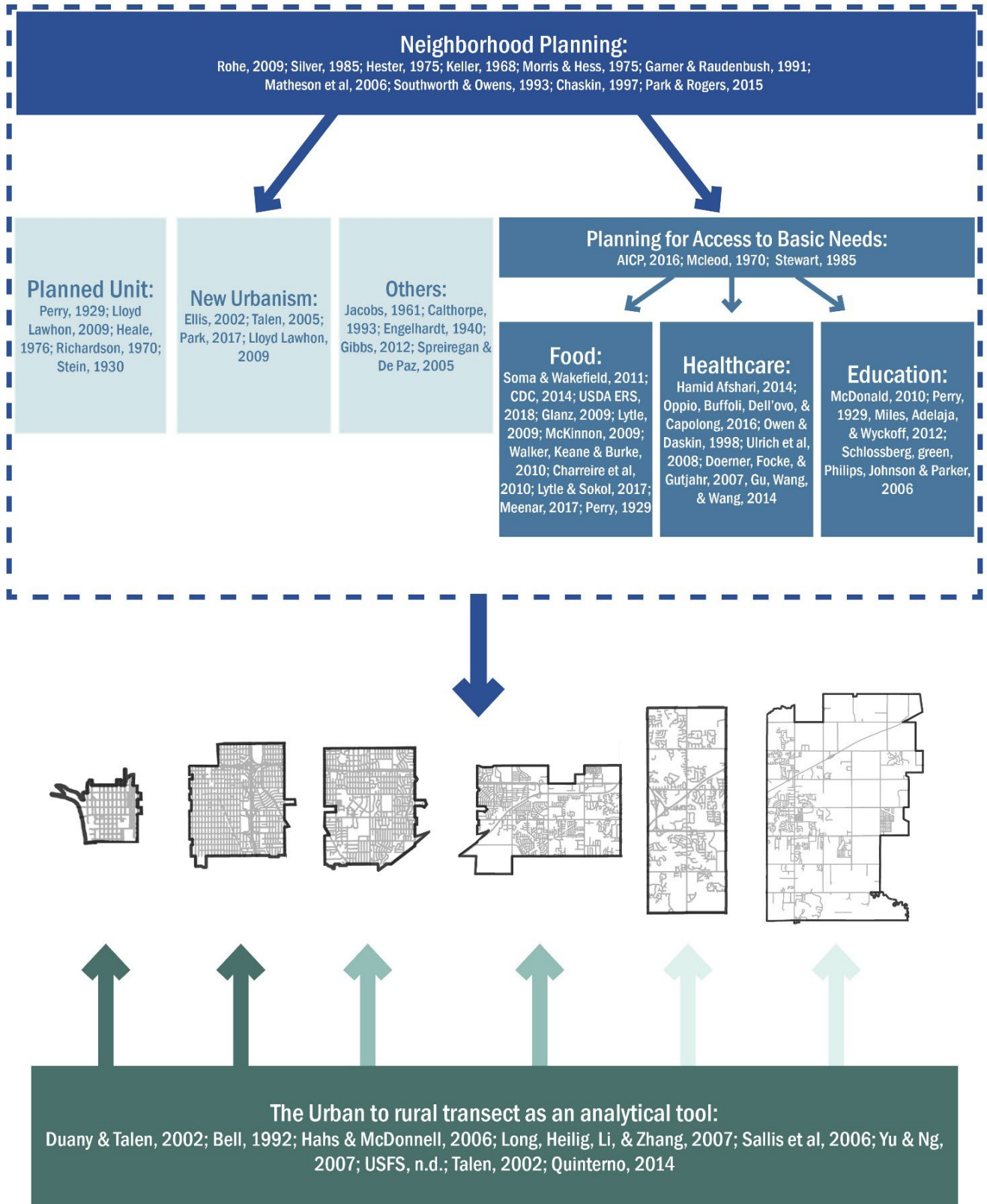


**Figure 1.1 Flow Chart of Study Structure**

## Chapter 2 - Literature Review

Neighborhood level planning is thought to be responsive to local community need, and is a well-regarded tool for planners (Hester, 1975; Park & Rogers, 2015). Residents tend to buy-in to neighborhood level planning because it is seen as something that can affect them through home values, provision of open space, and general quality of life (Hester, 1975; Rohe, 2009). Park and Rogers define a neighborhood as a “collection of people who share services and some level of social cohesion in a geographically bounded place” (2015, p. 19). There is extensive literature and dialogue on how a neighborhood should be planned - from the number of residents in a neighborhood, to the street network, and types of neighborhood amenities. Many neighborhood theories include recommendations for siting schools, retail centers, and other basic needs (Chaskin, 1997; Duany Plater-Zyberk & Company, 2016; Hester, 1975; Isaacs, 1948; Kelbaugh & Kelbaugh, 1997; Nolen, 1929; Park & Rogers, 2015; Perry, 1929; Sirgy & Cornwell, 2002). Additionally, neighborhood planning principles consider access, typically measured by distance, travel time or density, as an important component of neighborhood planning (Duany Plater-Zyberk & Company, 2016; Kostka, 1957; Perry, 1929). Traditionally, neighborhood planning has not prescribed the location within which a planned neighborhood should exist. This is evident in the critiques of planned neighborhood concepts arguing that planned neighborhoods often look the same no matter where they are situated and these neighborhoods completely disregard their own context (Ellis, 2002; Lloyd Lawhon, 2009). The following section will discuss neighborhood level planning, planning for access to basic needs, and a method for analyzing the contexts within which neighborhoods are situated along an urban to rural gradient. This project adapts existing methodology to bridge the gaps of understanding between neighborhood planning principles and neighborhood contexts (Figure 2.1).





**Figure 2.1. Relevant literature and existing research gaps.**

## **Neighborhood planning**

Neighborhoods abound, but can be hard to define (Chaskin, 1997; Park & Rogers, 2015). Whether located in a small town or in the historic downtown, neighborhoods signify a subset of a larger area with a unique social fabric (Hester, 1975; Keller, 1968; Morris & Hess, 1975). Many agree that neighborhoods are comprised of two components; its physical and social dimensions (Hester, 1975; Keller, 1968; Morris & Hess, 1975; Rohe, 2009). Its physical characteristics are what distinguish a neighborhood from a community. Neighborhoods are inherently place-based (Chaskin, 1997; Keller, 1968; Park & Rogers, 2015). The boundary of a neighborhood is used to determine the geographic location of the neighborhood. Boundaries can be made up of natural or man-made features (Park & Rogers, 2015). Social characteristics of neighborhoods are based on the behaviors and characteristics of its residents. Planners tend to focus on the physical elements of a neighborhood rather than its social characteristics (Hester, 1975). This research aims to explore both.

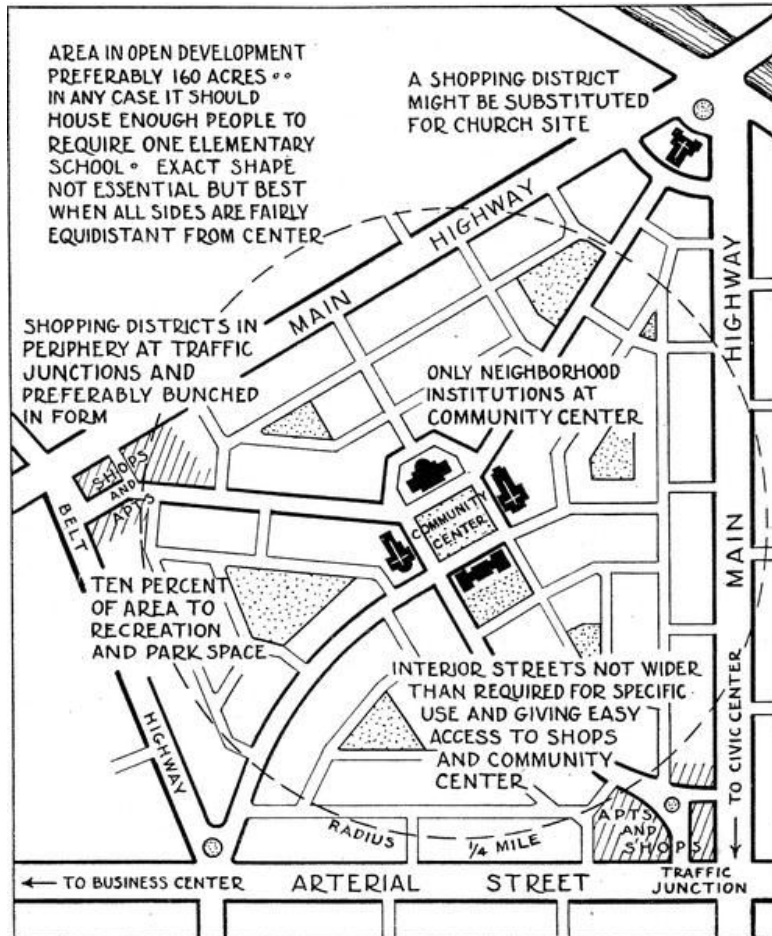
Neighborhoods have often been studied within an urban context, but it is known that they exist within many contexts (Chow, 1998; Warren, 1978). A critical aspect of planning includes the provision of amenities and services (American Planning Association, 2016; McLeod, 1970). Planned neighborhood strategies have attempted to guide neighborhood design in order to accommodate basic needs.

Neighborhood planning theories have typically included recommendations for the ideal size and number of residents, distances to the neighborhood center, and makeup of the neighborhood center (Park & Rogers, 2015). One of the most notable planned neighborhood theories is Clarence Perry's Neighborhood Unit Concept. Perry's Neighborhood Unit Concept suggested 160 acres of land, no more than 5,000 people, an elementary school at the neighborhood center that is no more than a 5 minute walk or ¼ mile from every residence (Perry, 1929). In contrast, Jane Jacobs argued that a neighborhood in a large city could be up to 100,000 people (Jacobs, 1961; Park & Rogers, 2015). Other neighborhood planning theories have focused instead on retail at the center rather than a school (Calthorpe, 1993; Engelhardt, 1940; Gibbs, 2012; Spreiregen & De Paz, 2005; C. S. Stein, 1949). Gibbs(2012) classified neighborhoods by the type of store it could sustain: corner store, convenience store, neighborhood center, and community center. Most planning theories have considered walking distance as an important measure, but Spreiregan and DePaz (2005) based their neighborhood on

driving distance. Education and retail centers, presumably including grocery stores, are most prevalent in established neighborhood planning theories (Park & Rogers, 2015). Fewer theories discuss access to healthcare, although some consider healthcare as part of the retail or commercial center (Spreiregen & De Paz, 2005). While the planned neighborhood theories have their critics, the legacy of guidance that planned neighborhood theories provide regarding access to basic needs is a fundamental contribution to the planning profession.

### **The evolution of planned neighborhoods**

Because of their profound influence on neighborhood planning, this study looks at the Neighborhood Unit Concept and New Urbanist principles in more detail. At the dawn of the 20<sup>th</sup> century, American cities were becoming known as places of squalor and filth (Heale, 1976; Richardson, 1970). Out of this urban crisis emerged social reformers that included urban planners like Clarence Stein, Henry Wright, and Clarence Perry (Lloyd Lawhon, 2009). During this time, Perry established the neighborhood unit concept (Figure 2.2) as a response to the need to improve urban conditions. It included five main recommendations for the ideal neighborhood; (1) an area defined by arterial streets, (2) low-speed streets within the neighborhood, (3) schools located at the center of the neighborhood, (4) shopping centers on the periphery, and (5) designated area for greenspace(Perry, 1929).

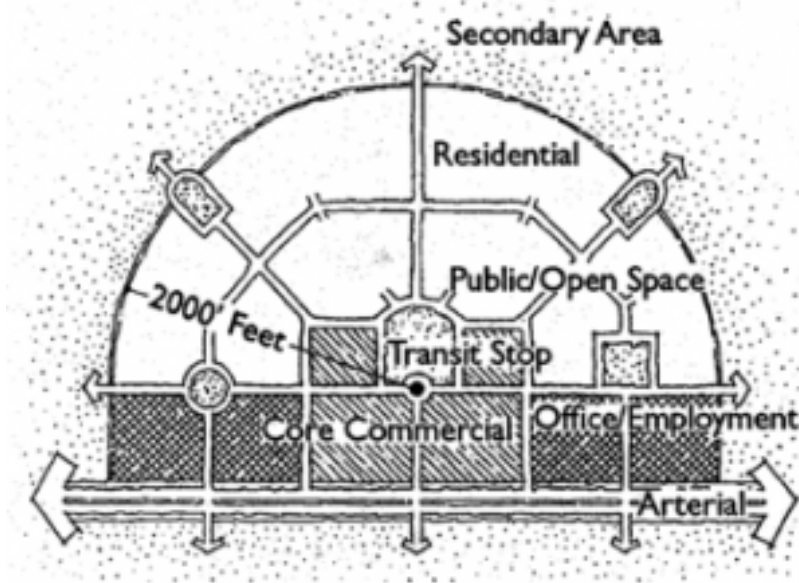


**Figure 2.2. Clarence Perry's Neighborhood Unit Concept Diagram detailing the distances and locations of neighborhood elements.**

One of Perry's associates, Clarence Stein, a leading planner and architect at the time, contributed to the field of neighborhood planning by being one of the first to incorporate retail into the center of neighborhoods (Park & Rogers, 2015).

Criticisms of the neighborhood unit concept have pervaded since its development. These critiques focus on the disconnection planned neighborhoods often have with their surroundings and the tendency for homogeneity of residents in these types of neighborhoods (Ellis, 2002; Talen, 2005). Starting in the early 21<sup>st</sup> century, New Urbanist planners began to imagine alternatives like Transit Oriented Development (Figure 2.3) and Smart Growth (Park, 2017). Key components of New Urbanist design include increased density, mixed use development, smaller blocks, connected streets, access to transit, and provision of open spaces and public

realms (Park, 2017). Some believe that the Neighborhood Unit Concept and New Urbanist principles are simply different iterations of the same idea (Lloyd Lawhon, 2009).



**Figure 2.3. A diagram of Transit Oriented Design which specifies land use and distances between neighborhood centers**

While neighborhood planning theories have evolved over time, they have not addressed differences in neighborhood types and contexts (Ellis, 2002; Park, 2017). A diversity of neighborhood types exist, but there is a dearth of research on how varying urban contexts effect neighborhood life (Chow, 1998; Warren, 1978).

### **Neighborhood Planning for Basic Needs**

At the core of the planning profession is a responsibility to “serve the public interest” (American Planning Association, 2016). Neighborhood planning theories begin to address the importance of planning for basic needs by discussing where in the neighborhood they should be located. McLeod claims that, “the purpose of a community is to satisfy the needs of people” (McLeod, 1970, p. 91). Accordingly, one responsibility that falls under the purview of the planning profession is providing for access to basic needs (American Planning Association, 2016). Basic needs can encompass many things and many scholars have attempted to define basic needs. From the infamous Maslow’s Hierarchy of basic needs to more contemporary perspectives, most proposed definitions include some reference to food, healthcare and

education (Corning, 2000) Since the 1920s, the public health field has defined its profession with a focus on the provision of basic needs (Koplan et al., 2009). British Economist, Stewart asserts that the most common and most essential of basic needs to consider in planning are food, healthcare and education (Stewart, 1985). As evidence of disparities in access to basic needs emerge, planners have developed tools for planning for these specific needs. One of the American Planning Association's applied research focuses is in "Planning and Community Health," which includes tools for planner to assess community access to basic needs like food, healthcare and education that impact community health (American Planning Association, 2018).

### **Food Access**

Interest in the food environment has gained increased attention from planners and researchers alike in the past few decades (Soma & Wakefield, 2011). Many definitions of the food environment exist ("Health Places Healthy Food," 2014; USDA ERS, 2018), however, Glanz describes the food environment broadly as, "virtually all potential determinants of what people eat that are not clearly individual factors, such as cognitions, attitudes, beliefs, and skills," (Glanz, 2009, p. S93), more simply described as the characteristics of one's physical environs as they relate to food. The food environment, also referred to as the community food environment, nutritional food environment, or local food environment, is highly complex. A diversity of professions have researched the food environment due to its broad implications for community health (Lytle, 2009; McKinnon, 2009). In recent decades, planners have begun to consider the food environment. The environmental and social costs of food, the distance to food stores, and the mitigation of food deserts are considered some of the most relevant topics for planners to tackle (Soma & Wakefield, 2011). Research on the food environment has led to the development of terms that describe varying conditions of the food environment like food access, food insecurity, food security, food desert, food oasis, and many others. Due to the complex nature of the food environment, a multitude of methods have been used to measure and identify characteristics of the food environment (Walker, Keane, & Burke, 2010).

One commonly used method in the field of food environment research is geo-spatial analysis (Charreire et al., 2010; Lytle & Sokol, 2017; McKinnon, 2009; Meenar, 2017). Geo-spatial analyses are frequently used to identify characteristics of distance and/or proximity to

food stores. This type of analysis is useful in showing geographically where there may be gaps in food access and who is affected.

### **Access to Healthcare**

The impacts of healthcare facilities on their surrounding community have been shown to provide community benefits like creating jobs, increasing economic activity, even contributing to “social and economic regeneration of cities” (Hamid Afshari, 2014; Oppio, Buffoli, Dell’Ovo, & Capolongo, 2016). Before a healthcare facility enters a community, much deliberation is done to determine the optimal location of the healthcare facility (Oppio et al., 2016; Owen & Daskin, 1998; Ulrich et al., 2008). Because factors like convenience, distance, and infrastructure have been shown to impact patients’ decisions to visit one healthcare facility over another (Doerner, Focke, & Gutjahr, 2007; Hamid Afshari, 2014), location siting decisions tend to account for these variables.

The field of healthcare siting research differentiates types of healthcare facilities into two main categories of preventive care and emergency services. Preventive care includes regular checkups and immunizations. Emergency services include immediate, urgent medical needs. Ultimately, patients make decisions differently based on the healthcare need. Patients in need of emergency care typically choose the closest healthcare facility or the one they can reach most quickly. For preventive care, patients tend to be more flexible, and will travel further in search of higher quality service (Gu, Wang, & Wang, 2012; Hamid Afshari, 2014). This theory is less applicable in rural areas, where the quality of the healthcare facility is not as important as the distance to the healthcare facility (Doerner et al., 2007). Inequalities in access to healthcare have been studied in the past and have been shown to be linked to the geographic location (distance) of individuals (Comer & Mueller, 1995; Davis, 1991)

### **Access to Education**

When it comes to determining the location of a school, the National Council on Schoolhouse Construction, later known as the Council of Educational Facility Planners, International (CEFPI) has traditionally been the authority. CEFPI issues acreage guidelines for siting schools. According to CEFPI, elementary schools require the least land, and high schools

require the most. Prior to the 1950s, it was suggested that elementary schools be sited on at least 5 acres and high schools on a minimum of 10 acres. By the 1960s, these guidelines doubled and tripled, respectively (McDonald, 2010).

Traditionally schools have played a major role in neighborhood development. In Perry's Neighborhood Unit Concept, the number of houses and distance from amenities in the neighborhood were directly linked to the capacity of the neighborhood school (Perry, 1929). Since the 1950s, school siting theories have shifted from building neighborhood schools within walking distance, to building larger, consolidated schools with increased student travel time (Miles, Adelaja, & Wyckoff, 2012; Schlossberg, Greene, Phillips, Johnson, & Parker, 2006; Schlossberg, Phillips, Johnson, & Parker, 2005). This is even evident in how some of the neighborhood planning principles shifted from siting schools in the center of the neighborhood to citing retail or commercial areas at the center (Gibbs, 2012).

As important components of livability in neighborhoods and in some cases an indicator of lifelong success, planners must understand the ways in which people access these basic needs.

### **The urban to rural gradient as an analytical tool**

In 2002, Duany and Talen proposed the concept of transect planning as a method to eliminate urban sprawl (Duany & Talen, 2002). Duany and Talen's transect planning approach offered an alternative to Euclidean Zoning, zoning based on the separation of uses, which they felt was the crux of urban sprawl (Duany & Talen, 2002).

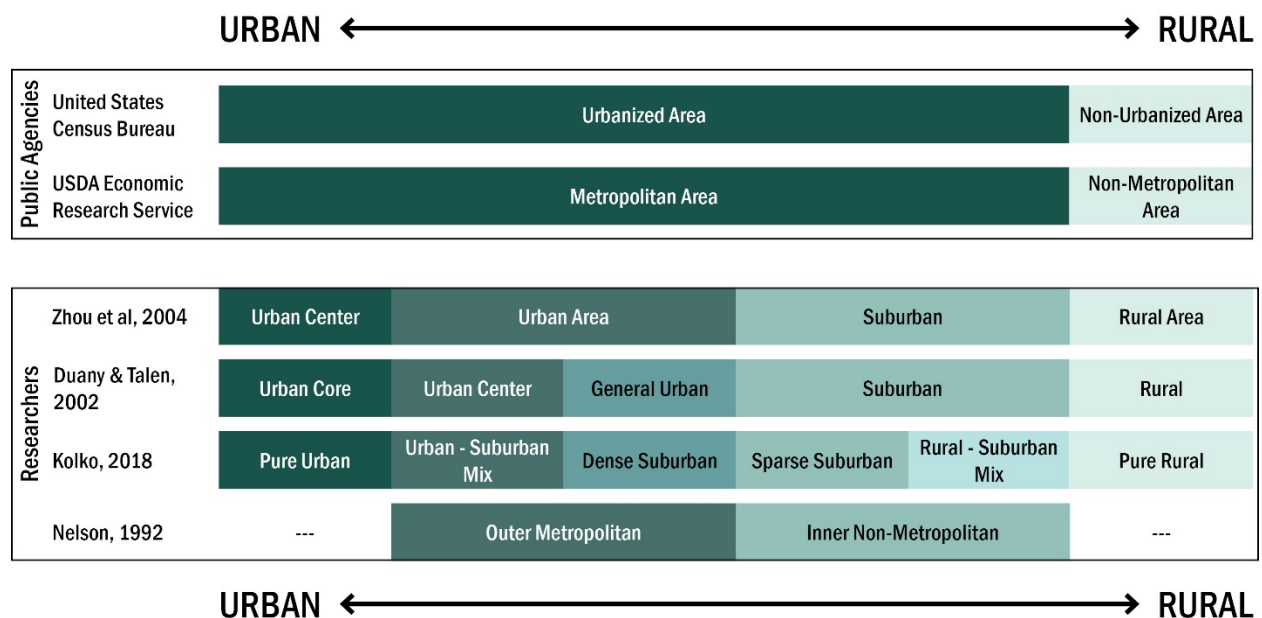
Stemming from an ecological approach, the transect approach aims to explain patterns by understanding the environment in which these patterns occur (Sallis et al., 2006). In forestry, the transect is "a line, laid on the forest floor," used to measure the distribution of species within a certain distance (United States Forest Service, n.d.). It would be difficult to measure each tree in the forest, but by measuring ecological transects, researchers gather a representative understanding of the forest health and ecology. General consensus agrees that ecological systems gradually change in a logical progression, creating distinct regions as they evolve (Talen, 2002).

Since its introduction, rather than being used as a planning and development tool, the transect planning approach has been used mostly as an analytical tool by a range of professionals (Bell, 1992; Hahs & McDonnell, 2006; Long, Heilig, Li, & Zhang, 2007; Sallis et al., 2006; Yu



& Ng, 2007). For this research, it presents a methodology for evaluating differences in neighborhoods along the urban to rural gradient.

Development patterns happen on a continuum of urban to suburban to rural. Unfortunately, definitions of urban, suburban, and rural are not consistent or sufficient (Figure 2.4). The United States Census Bureau defines rural as, “what is not urban.” This simplified definition overlooks many variations within urban form, the most glaring omission being suburbia. As such, the census bureau, and other federal agencies have attempted to identify additional indicators to help paint a more accurate picture. The Census Bureau categorizes urban places into urbanized areas (population > 50,000) and urban clusters (population between 2,500-50,000). The United States Department of Agriculture (USDA) Economic Research Service (ERS) uses their Urban-Rural Continuum which categorizes places based on population and metropolitan status (Quinterno, 2014). Even still there is not a specific definition of suburban places. Public agencies and researchers have proposed alternative definitions for variations in urban form (Kolko, 2015; Nelson, 1992; Zhou, Xu, Radke, & Mu, 2004). A sample of these naming protocols is shown in Figure 2.4..



**Figure 2.4. Examples of Nomenclature for differing Urban Contexts**

The localized scale of neighborhoods provides an opportunity to use the transect approach to identify differences in perceptions of neighborhood centers and boundaries, mobility patterns, and existing infrastructure along an urban to rural gradient.

### **Summary**

Neighborhoods are one of the most fundamental units in planning. Residents spend a great deal of time in their neighborhood and thus tend to care that it provides their basic needs and a high quality of life. Planned neighborhood concepts prescribe siting requirements for basic needs like food, healthcare and education in order to create the ideal neighborhood. Understanding varying neighborhood types and those neighborhoods' access to basic needs can provide insight into effective neighborhood planning strategies. Measuring differences between neighborhoods can be difficult because of inconsistent definitions. The transect approach will be used in this study to better explore variations in urban form and its impact on neighborhoods.

## Chapter 3 - Methodology

### Overview

This research explores the differences in perceived neighborhood forms, characteristics, and access to basic needs (food, healthcare and education) in six neighborhoods along an urban to rural gradient outside of a representative metropolitan midwestern city. This study uses a mixed methods approach including both qualitative and quantitative approaches including geo-spatial data analysis. Cognitive mapping and mailed survey questionnaires provide answers to the study's three research questions and aims (Figure 3.1).

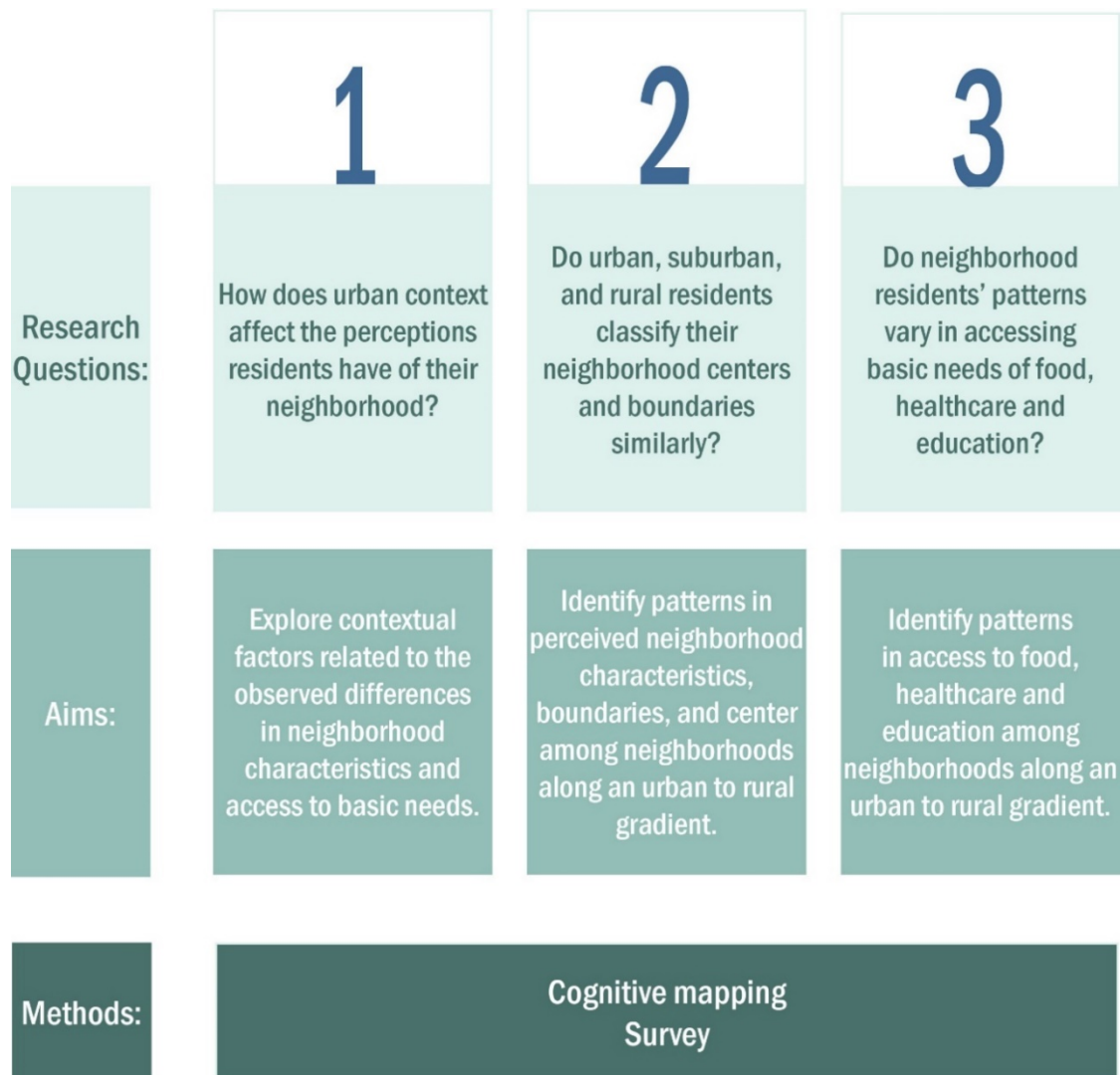
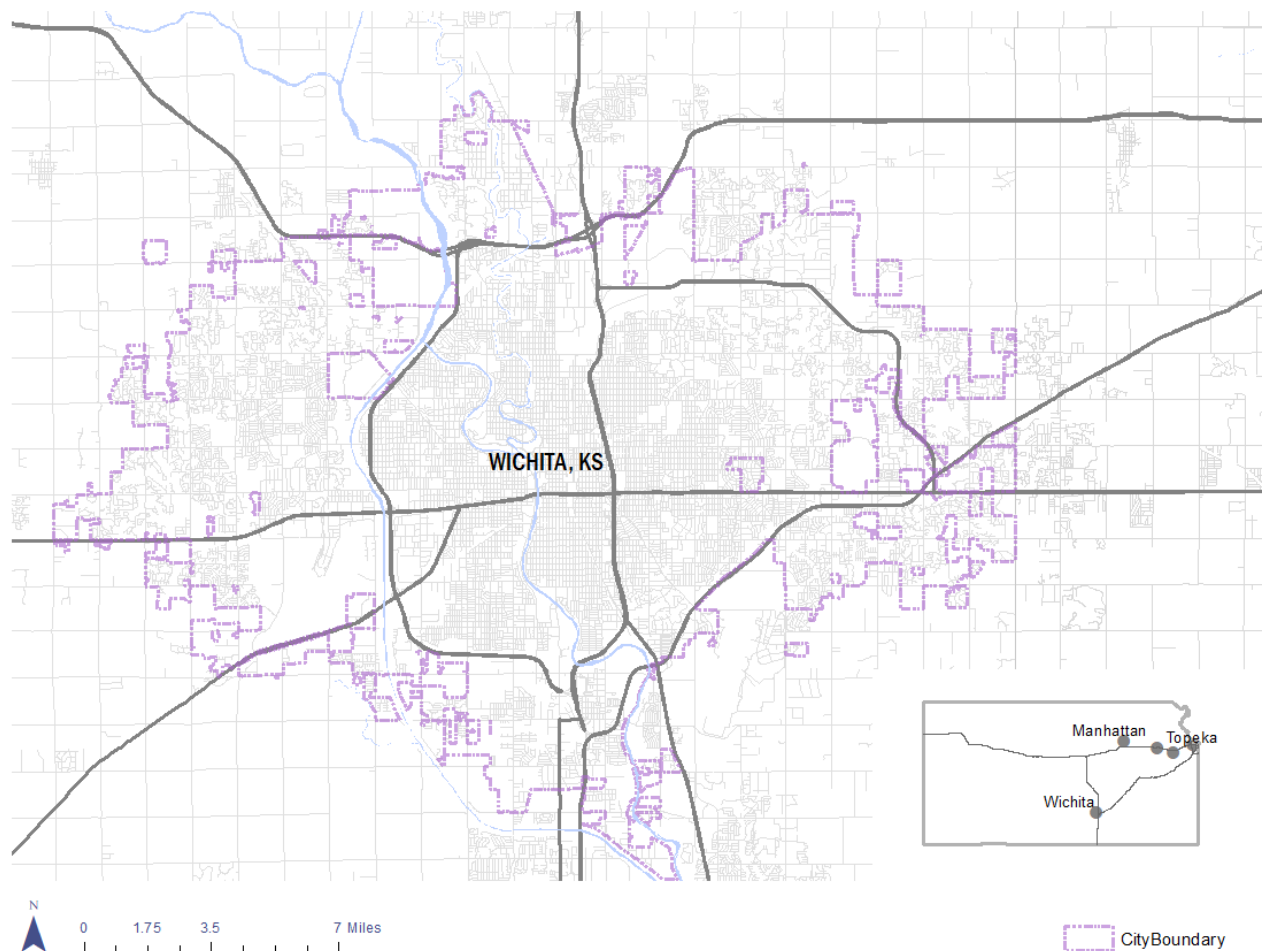


Figure 3.1. The methodological framework and research questions for this study.

## Study Area and Population

The study area for this research is located within the Wichita metropolitan area (Figure 3.2). Wichita is a midwestern city located in the south-central region of Kansas. Outside of the Kansas City metropolitan area which spans two states, Wichita has the largest population in the state of Kansas. Wichita is a representative midwestern city. Nationally, peak population growth between 1980 and 2010 happened in the 80s and 90 and then dropped slightly in the 2000s. Wichita followed a similar pattern of growth (Frey, 2012).



**Figure 3.2. Wichita, KS, Metropolitan Area**

Additionally, the demographics of Wichita are characteristic of the Midwest region (Table 3.1). Similar to the Midwest region, Wichita has a median age in the mid-30s. Wichita is a majority-white city (nearly 80%) with its next largest race being Black or African American with a

slightly higher percent of Hispanic citizens than an average Midwest city. The median household income in Wichita is slightly lower than the midwestern average, and in turn, the percent of families living below the Federal Poverty Level is slightly higher than the average in Midwest cities.

**Table 3.1. Basic Demographics of Wichita, KS, and Midwest Region**

	City of Wichita, Kansas		Midwest Region	
	Count	Percent	Count	Percent
Total population	388,033		66,941,187	
Male	191,310	49.3%	32,939,606	49.2%
Female	196,723	50.7%	34,001,581	50.8%
Median age (years)	34.4		37.7	
White	309,625	79.8%	54,885,601	82.0%
Black or African American	51,270	13.2%	6,906,574	10.3%
American Indian and Alaska Native	9,435	2.4%	405,139	0.6%
Asian	22,155	5.7%	1,751,725	2.6%
Native Hawaiian and other Pacific Islander	664	0.2%	23,001	0.0%
Some other race	11,434	2.9%	1,524,089	2.3%
Hispanic or Latino (of any race)	63,659	16.4%	4,660,962	7.0%
Median household income (in dollars)	\$46,775		\$51,310	
Families living below Federal Poverty Level		12.6%		10.0%

*2012 – 2016 ACS 5-Year Estimates*

The industry found in Wichita is representative of other midwestern cities with education, healthcare and social services, manufacturing, and retail employing the most residents (Table 3.2). The airplane industry has had a long legacy of employment in the Wichita area. Companies like Boeing and Cessna have operated facilities in the area off and on since the 1920s, contributing to Wichita being known colloquially as the “Air Capital of the World” (The Kansas Sampler Foundation, 2007).

**Table 3.2. Industry in Wichita, KS and Midwest Region**

<b>Industry</b>	<b>City of Wichita, Kansas</b>	<b>Midwest Region</b>
Educational services, health care and social assistance	41,884 22.8%	7,720,497 45.6%
Manufacturing	32,847 17.9%	4,834,768 28.6%
Retail trade	21,419 11.7%	3,696,264 21.8%
Arts, entertainment, and recreation, and accommodation and food services	18,253 10.0%	2,886,784 17.1%
Professional, scientific, management, administrative and waste management	16,745 9.1%	3,052,912 18.0%
Construction	12,435 6.8%	1,797,565 10.6%
Finance and insurance, real estate, rental and leasing	9,445 5.1%	2,108,377 12.5%
Other services, except public administration	8,812 4.8%	1,483,852 8.8%
Transportation and warehousing, utilities	6,881 3.8%	1,613,648 9.5%
Public administration	4,846 2.6%	1,210,144 7.2%
Wholesale trade	4,783 2.6%	897,640 5.3%
Information	3,470 1.9%	578,870 3.4%
Agriculture, forestry, fishing, hunting and mining	1,586 0.9%	627,032 3.7%

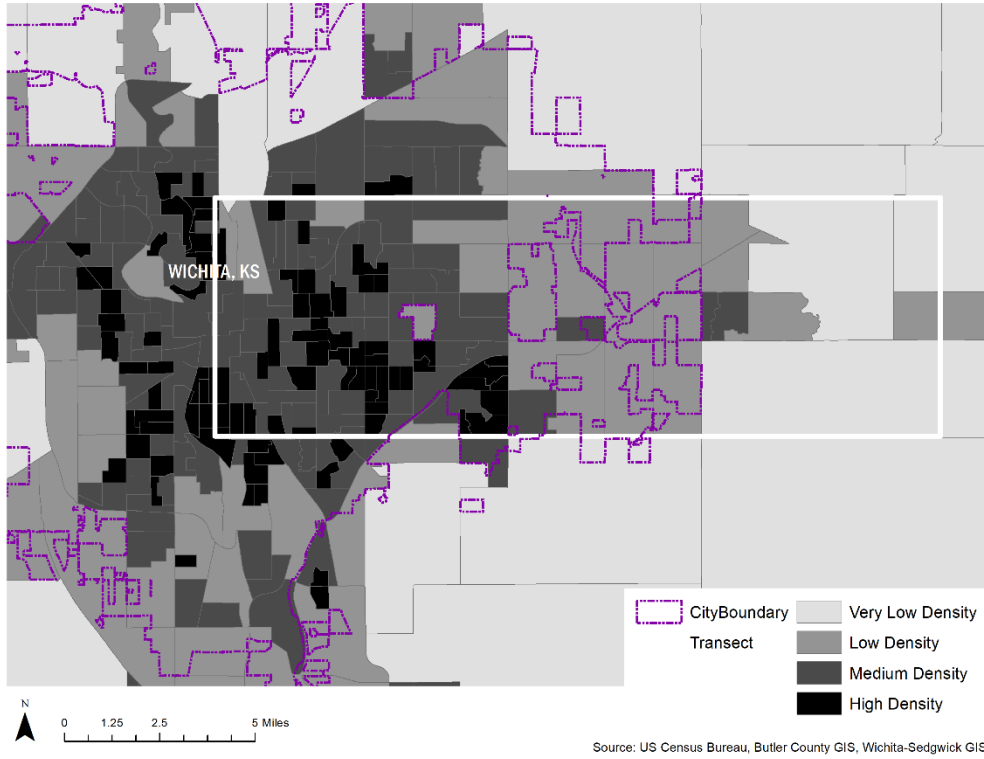
*2012 – 2016 ACS 5-Year Estimates*

**Defining the Wichita urban-to-rural transect:**

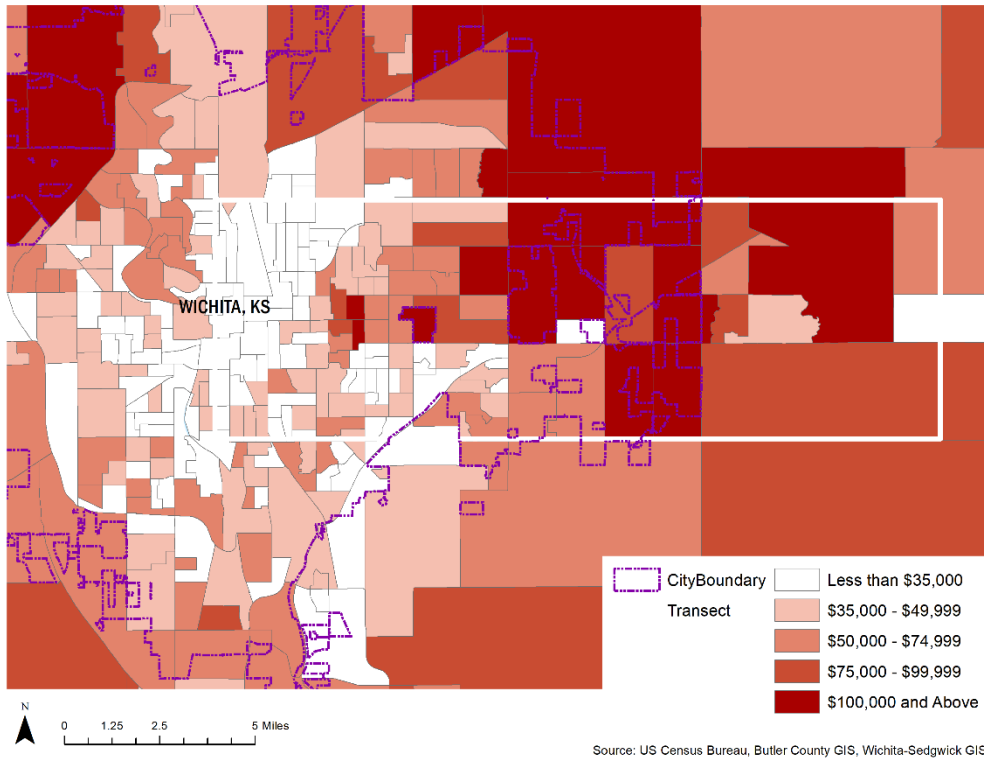
The demographic and economic characteristics of Wichita suggest that Wichita is an appropriate study subject to apply the urban to rural transect planning methodology. Based on additional review of the Wichita metropolitan area including population density, income, age, urban form and distance from the urban core, a 15-mile-long transect area was selected. The selected study area radiates out of downtown Wichita in an easterly direction.

Preliminary GIS(Geographic Information System) analysis of the Wichita Metropolitan Area showed a general gradient of more dense to less dense urban form within the transect

(Figure 3.3). The density thresholds are based on a 2015 study asking individuals to identify their neighborhood type (Kolko, 2015). Additionally, the median household income map shows a trend of generally lower income to generally higher income within the transect (Figure 3.4). The median age map shows patterns of more young people towards the urban core and more older adults towards the rural area (Figure 3.5). The street network map shows the change in density of the street network as distance increases from the center of Wichita (Figure 3.6). Demographic, economic, and physical characteristics assisted in defining the transect study area.

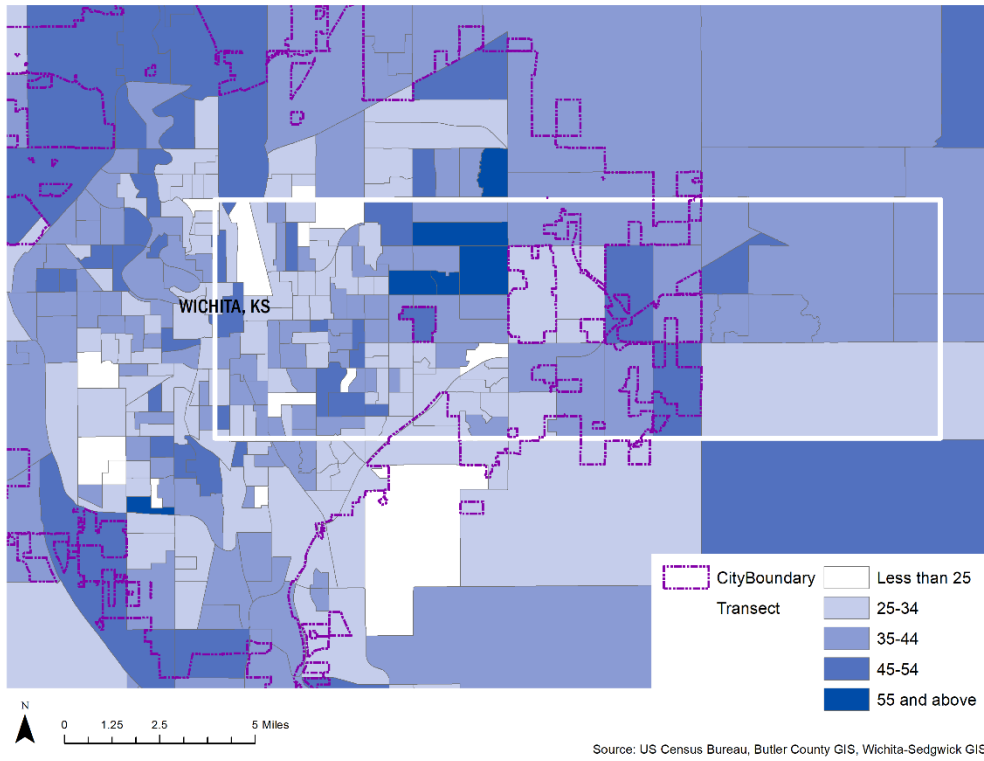


**Figure 3.3. Study Area Population Density by Block Group**

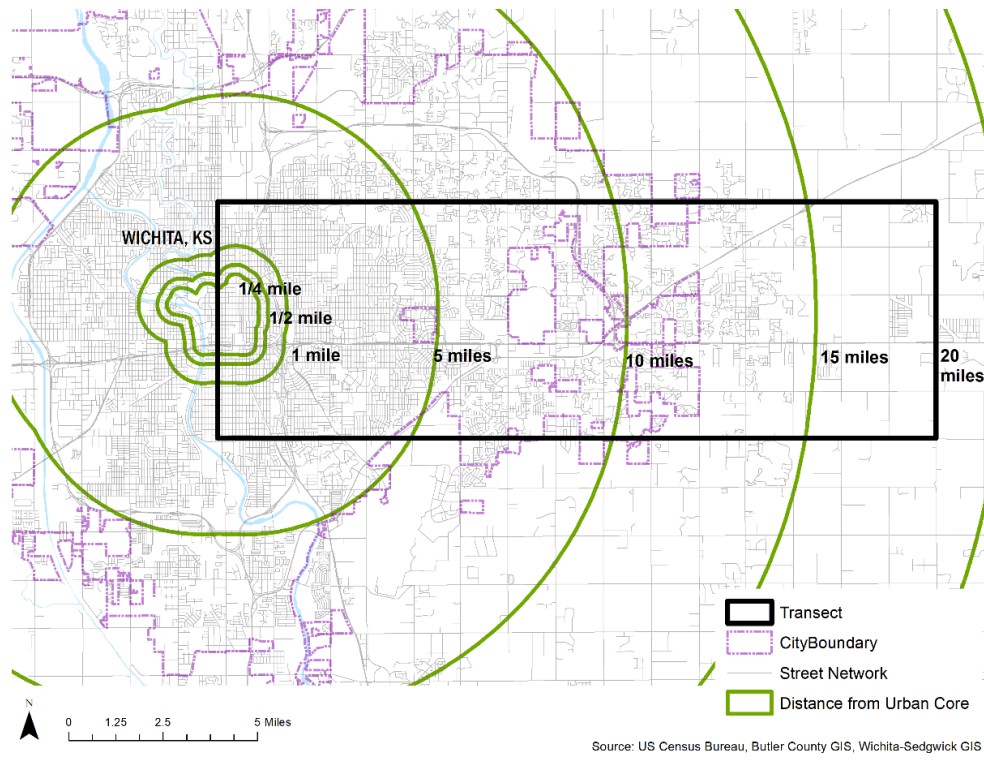


**Figure 3.4. Study Area Median Household Income by Block Group**





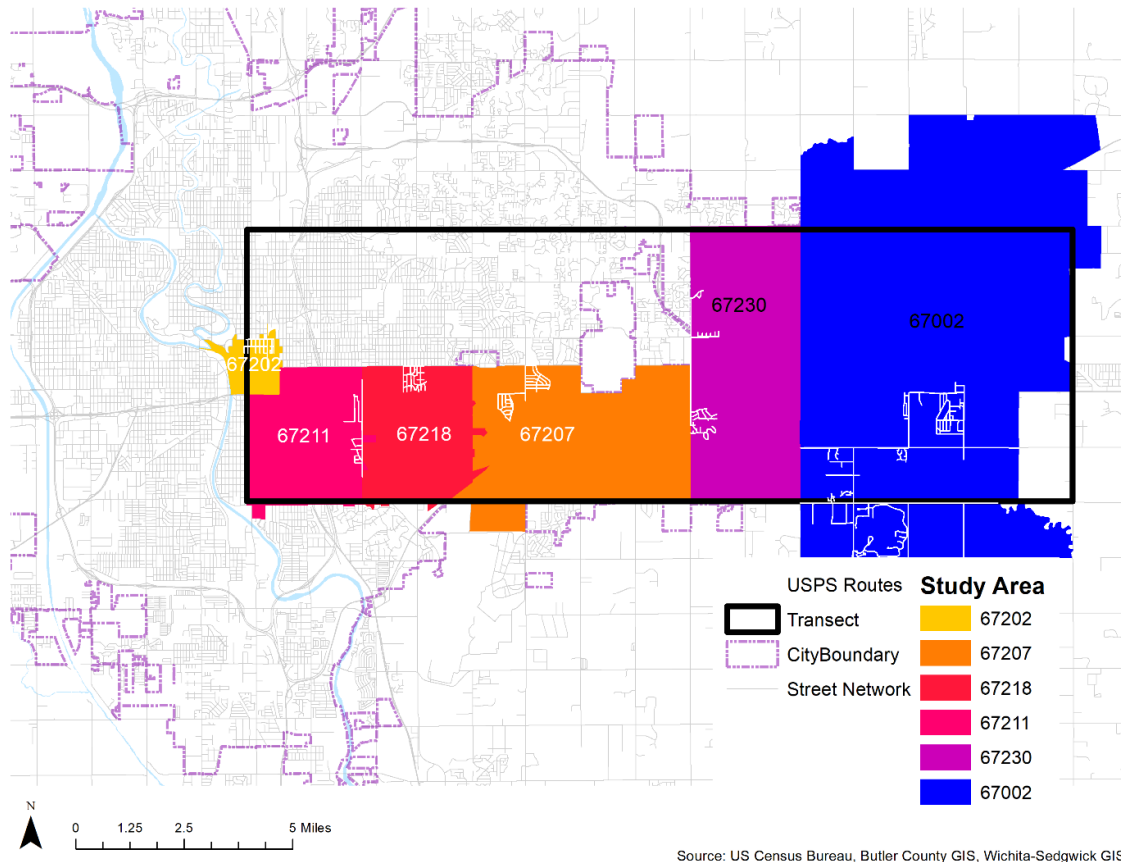
**Figure 3.5. Study Area Median Age by Block Group**



**Figure 3.6. Study Area Distance from Urban Core and Street Network**

## The Sample

In this study, households were recruited using a stratified clustered sampling method. Stratified sampling is used to achieve a representative sample. Clustering is used to reach a specific community (Acharya, Prakash, Saxena, & Nigam, 2013; Campbell, Donner, & Klar, 2007). The combination of stratification and clustering in this study was useful for reaching specific neighborhoods within a larger geography (transect). Based on the selected transect area from GIS analyses (from Figure 3.3 to Figure 3.6), the sample was stratified by six zip codes, and then clustered by zip code route (Figure 3.7). Zip codes were chosen as a survey distribution method for this study because of its geographic specificity. Without an available database of emails, a paper questionnaire distributed by mail was the most feasible option to achieve a representative sample.



**Figure 3.7. Study Area made up of USPS routes in six zip codes.**

Using the United States Postal Service’s (USPS) Every Day Direct Mail website, each route in the 6-zipcode study area was identified. The routes were assigned a number and then randomly selected to be sampled using Microsoft Excel. The sampled routes are shown in Figure 3.7 and the number of residences per route can be seen in Table 3.3. Approximately 2,400 surveys were mailed. One limitation of this study was that the number of residences per zip code is not consistent. The range in number of residences per route is 210.<sup>1</sup>

**Table 3.3. Sample by Zip Code and Route**

<b>Zip Code</b>	<b>Route Number</b>	<b>Residences</b>
<b>67202</b>	C025	304
<b>67214</b>	C030	417
<b>67208</b>	C003	365
<b>67206</b>	C010	350
<b>67230</b>	R064	351
<b>67002</b>	R005	514
<b>TOTAL</b>		<b>2,356</b>

### **Measurement**

The primary data collection method for this study is a survey method. The survey questionnaire included two sections of map-based questions that asked about respondents’ neighborhoods (Aim #1) and where respondents access basic needs like food, healthcare and education (Aim #2). The questionnaire also asked supplemental questions related to respondents’ neighborhood, access and travel patterns to basic needs, and demographics. United States Census Bureau information including population, number of households, and basic demographics were also used to understand context of study area. Land use, parcel, and road shapefiles were collected from the study area’s relevant municipal GIS departments (Table 3.4).

### **Study Variables**

The variables measured in this study are shown in Table 3.4. The difference in perceived neighborhood boundary was measured by comparing the neighborhood area (mi<sup>2</sup>). The shape of

---

<sup>1</sup> The Kansas State University Statistical Consulting Lab was contacted during the research design process. Their feedback was incorporated into the final research design of this study.

the neighborhood and its relation to existing features on the map was categorized. The neighborhood center was classified by proximity to the respondents' home. Access to food, healthcare and education were measured by distance from home.

The six zip codes routes identified along the urban to rural gradient served as the variable upon which comparison occurred. Other explanatory variables including demographic information were incorporated into the analysis to provide context.

**Table 3.4. Study variables and measurement**

Variable	Description	Data Source	Research Aim	
Dependent Variable	Differences in neighborhood form <ul style="list-style-type: none"> <li>Perceived neighborhood boundaries</li> </ul>	Neighborhood size(mi <sup>2</sup> ), shape, connection to existing features	Survey and cognitive mapping, GIS data	Aim #2
	<ul style="list-style-type: none"> <li>Perceived neighborhood center</li> </ul>	Distance from center to home (mi),	GIS Network Analysis	Aim #2
		Neighborhood characteristics	Survey and cognitive mapping, GIS data	
	Differences in access to basic needs <ul style="list-style-type: none"> <li>Food store</li> <li>Healthcare</li> <li>Education</li> </ul>	Network distance from home to basic need (mi)	Survey and cognitive mapping, GIS data	Aim #3
	Travel characteristics to access basic needs	Survey and cognitive mapping, GIS data		
Independent Variable	Neighborhood Transect Zones (zip codes used as proxy for transect zones)	Zip code Routes	GIS spatial analysis, (Aim #1 and #2)	Aim #2 and #3
	Other Explanatory Variables: <ul style="list-style-type: none"> <li>Population Density</li> <li>Income</li> <li>Race and Ethnicity</li> <li>Age</li> </ul>	Respondent characteristics (Section 4)	American Community Survey, Decennial Census, ESRI Business Analyst	Aim #1, #2 and #3

## **Survey Instrument Development Procedure**

The three-page double-sided paper questionnaire included four sections. The first page provided a brief description of the study, informed consent language, and contact information for both the study team and Kansas State University's Institutional Review Board office. It also included an area for respondents to leave an email or mailing address in order to receive a \$10 gift card upon completion of the questionnaire. Two sections included map-based questions about respondents' neighborhood, and access to basic needs like food, healthcare and education. Each mail route received questionnaires within route-specific maps in order to match the map questions to include each route. Additionally, the survey included questions about respondents' neighborhoods, their typical travel patterns related to food, healthcare and education, and basic demographic questions.

Two rounds of pre-tests were conducted. During the first round, the survey was tested on students in the department of Landscape Architecture and Regional & Community Planning (LARCP). Many of their suggestions were based on updating and reformatting the maps. The second round of testing intentionally reached an audience outside of the LARCP department. The test group included librarians from outside the LARCP department, and acquaintances without a planning or design background. Suggestions from this group primarily focused on simplifying language in the questionnaire. Questionnaire revisions were made based on suggestions from both sets of pre-test groups. The final version of the survey can be found in Appendix A.

## **Survey Administration**

Upon completion of questionnaire development and testing, the questionnaires were printed and mailed through Kansas State University's Printing Services. The envelopes included the questionnaire, and a pre-addressed business reply envelope for easy return. Survey respondents were asked to return their completed questionnaire within roughly one month of receiving the questionnaire. Social exchange theory asserts that people are oriented towards maximizing rewards and minimizing costs (Baxter & Braithwaite, 2008; Cook, Cheshire, Rice, & Nakagawa, 2013; Emerson, 1976). Filling out a questionnaire received in the mail can be perceived as a cost more than a reward. However, monetary incentives have been shown to improve survey response rates (Hopkins & Gullickson, 1992; James & Bolstein, 1992). As such,

a \$10 gift card was offered to all survey respondents that sent in a completed survey. Respondents were offered an option of receiving their gift card by email or by mail. The goal was for the gift card to incentivize the completion and return of the survey.

### **IRB and Human Subjects**

This research involves human subjects and has been reviewed by the Institutional Review Boards (IRB) at Kansas State University. IRB approval was secured prior to data collection beginning. Two modifications were made to the initial IRB protocol (#9402) due to survey edits and personnel updates. All personally identifiable information obtained from the survey has been kept confidential. The IRB approval letters can be seen in Appendix B.

### **Data Analysis**

Geo-spatial based analysis including distance, size, and network analysis to identify differences and similarities in perceived neighborhood boundaries and center among different neighborhood zones along the gradient (Aim # 1). Network analysis was used instead of buffer distance analysis to get a better understanding of travel distance. Analysis of Variance (ANOVA) tests were used to compare means of distances and size variables. Descriptive statistics were used to identify differences and similarities in access to food, healthcare and education among different neighborhood gradient zones (Aim #2). Cross-tabulations of the collected quantitative data were used to explore the contextual factors related to the observed differences in neighborhood characteristics and access to basic needs (Aim # 1, 2 and3). The variables and types of data analyzed are described in Table 3.5.

Upon return of completed questionnaires, each survey was assigned a unique 4-digit code. Data was entered in three methods: quantitatively, qualitatively, and geo-spatially. The multiple choice (quantitative) and free response (qualitative) questions were recorded in two excel spreadsheets. The quantitative data was imported into SPSS version 24 for analysis.

Descriptive statistics were performed for total respondents and for each zip code route. The drawn boundaries, neighborhood centers, and service locations were geo-coded in ArcMap and labelled by survey code. Each separate data point was saved as a distinct feature class (5 points and 1 polygon) and the survey code was used as the unique identifier.

**Table 3.5. Types of Analysis per Variable**

<b>Variable</b>	<b>Analysis</b>	<b>Technique</b>
Differences in neighborhood form	Average neighborhood boundary size	Geo-spatial analysis (calculation), ANOVA
<ul style="list-style-type: none"> <li>• Perceived neighborhood boundaries and</li> </ul>		
<ul style="list-style-type: none"> <li>• Perceived neighborhood center</li> </ul>	Proximity from home to center	Geo-spatial analysis (network), ANOVA
Differences in access to basic needs	Proximity from home and center to food store, healthcare, and school	Geo-spatial analysis (network), ANOVA
<ul style="list-style-type: none"> <li>• Food store</li> <li>• Healthcare</li> <li>• Education</li> </ul>		
	Number of basic needs located within neighborhood boundary	Geo-spatial analysis (spatial join)
	Number of land use zones located within neighborhood boundary	Geo-spatial analysis (spatial join)
	Patterns of travel to/from basic needs.	Descriptive statistics and cross-tabulations (SPSS)

The average neighborhood boundary size was calculated in square miles using the ArcMap editing and “calculate field” feature. Network analysis was used to determine distance between home and neighborhood center and from home and neighborhood center to food, healthcare and school. The number of schools, healthcare facilities and schools located within neighborhood boundary was identified using spatial joining in ArcMap. Patterns of travel to basic needs were identified using SPSS. For categorical data, cross-tabulations were used to show the differences between zip codes. For continuous data like travel time, Analysis of Variance (ANOVA) was used to identify differences between zip code routes.

### **Transect Zone Nomenclature**

The study area for this research included six zones or neighborhoods. These neighborhoods are the main unit for comparison and analysis. A key consideration during analysis was how to refer to the neighborhoods. A brief review of nomenclature was conducted in order to determine an appropriate naming protocol for each neighborhood in this study (Figure

3.8). Based on existing nomenclature applied to the study area as well as the demographic analysis (Figure 3.3-Figure 3.6), the following names were identified: Urban Core, Inner Urban, Outer Urban, Inner Suburb, Outer Suburb, and Rural. Three of these neighborhoods were considered urban (Urban Core, Inner and Outer Urban), two were considered suburban (Inner and Outer Suburb) and one neighborhood was considered rural (Rural). These broader categories of urban context allowed for analysis to look at differences among neighborhoods and among urban contexts.

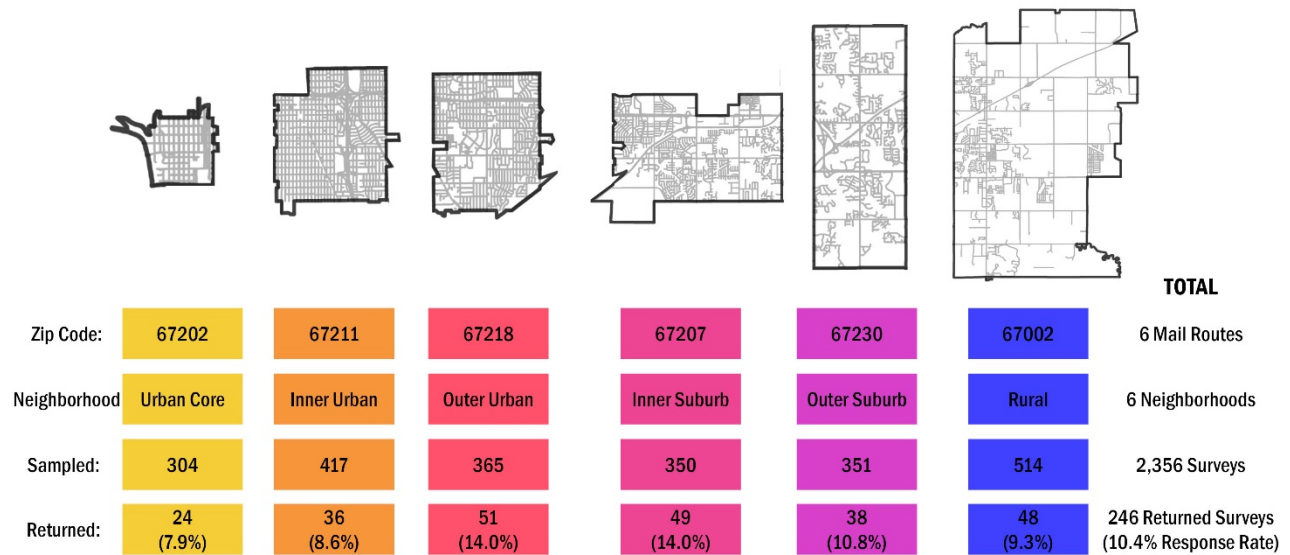


**Figure 3.8. Examples of urban to rural nomenclature as it applies to the study area.**



## Chapter 4 - Results

Of the 2,356 surveys distributed to the study area, 246 surveys were completed and returned. This equates to an overall response rate of 10.4%. Among neighborhoods, the highest response rates (14.0%) were found in the Outer Urban and Inner Suburban neighborhoods. The lowest response rate occurred in the Urban Core (7.9%) (Figure 4.1). This response rate was lower than expected, but still provide relevant data due to the large sample sizes in each neighborhood. Potential for increasing response rates are discussed in Chapter 5.



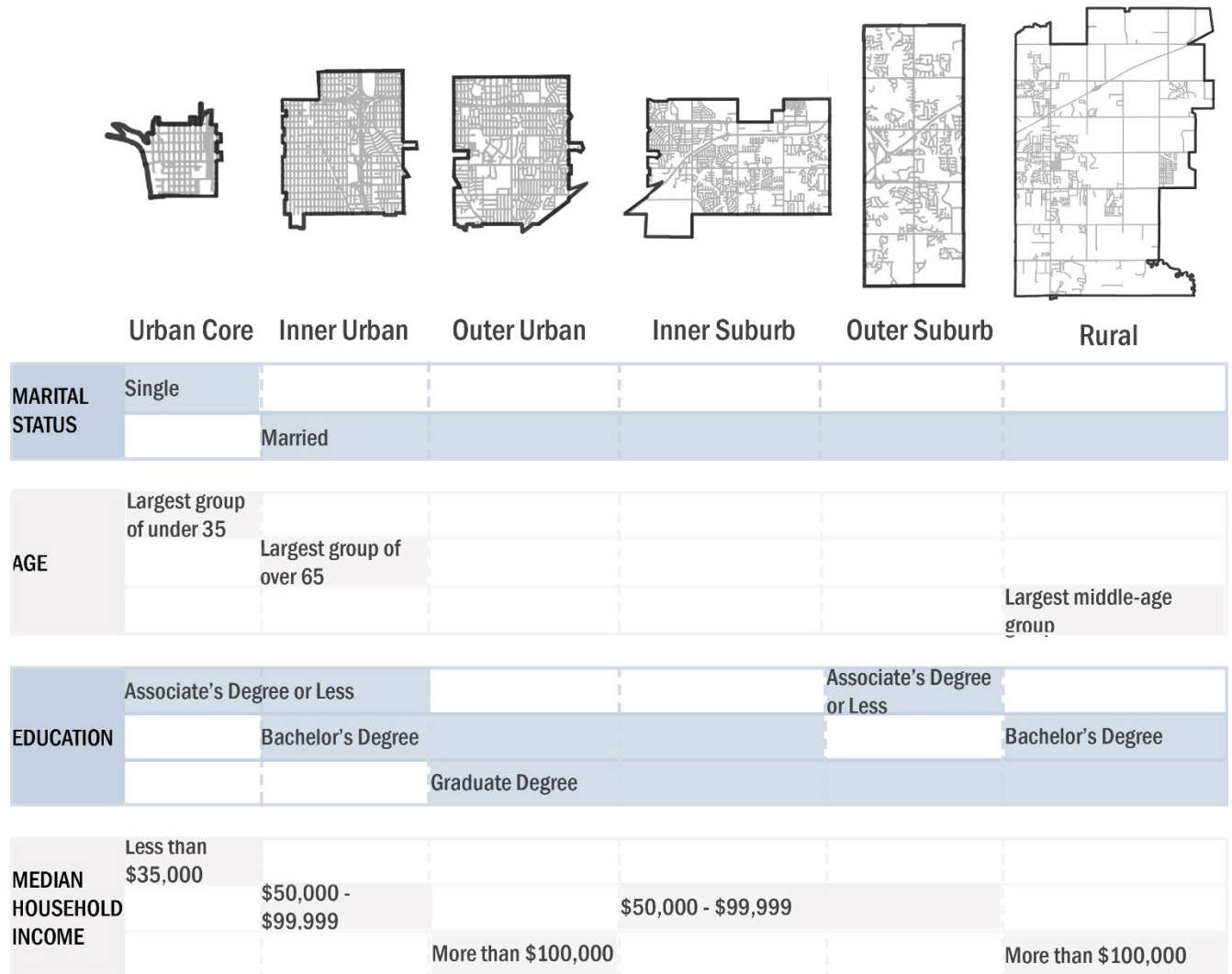
**Figure 4.1. Survey Responses by Neighborhood**

### Neighborhood Patterns

#### Demographics

The demographics of respondents in each neighborhood varied in some ways. A majority of respondents from the Urban Core identified themselves as single, while the majority of respondents from all other zip codes identified themselves as married. Age demographics of respondents resulted in a younger population in the Urban Core neighborhood with the largest percentage of young professionals (45.5%). The largest percentage of respondents above 65 years old occurred in the Inner Urban neighborhood. Generally, household incomes increased as distance increases from the urban core. The Urban Core had the most respondents with annual

incomes below \$35,000 (58.3%) and the fewest respondents with annual incomes greater than \$75,000 (16.6%). Residents in the Urban Core had the lowest mean number of vehicles per household. Residents in the rural neighborhood had the highest mean number of vehicles per household (Figure 4.4).



**Figure 4.2. Continuum of Resident Demographics by Neighborhood**

### Nighborhood Characteristics

The average size of neighborhoods identified by respondents was just under 1 square mile (0.95 mi<sup>2</sup>). The smallest neighborhood (0.05 mi<sup>2</sup>) was identified in the Urban Core neighborhood and the largest neighborhood (12.62 mi<sup>2</sup>) was identified in the Rural

neighborhood, however, neighborhood size was not determined to be significantly different among neighborhoods.

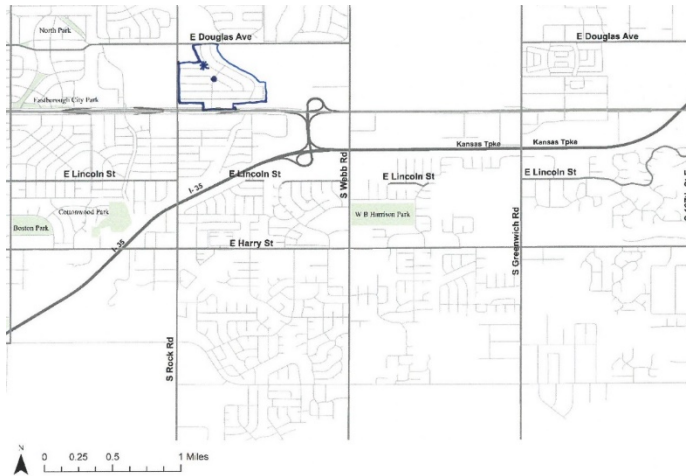
In the Urban Core and Inner Urban neighborhoods, housing price was the most likely reason for choosing to live in that neighborhood. In the Outer Urban, Suburban, and Rural neighborhoods, the neighborhood quality was most likely to influence the choice to move to the neighborhood (Figure 4.7). In the rural neighborhood, the quality of the school system was cited most of all neighborhoods (40.8%) as a reason to choose the neighborhood. Crime and safety were cited the least in the Urban Core and Inner Urban neighborhoods.

In terms of housing tenure, more than 80% of respondents in the Urban Core neighborhood indicated living in their home for five years or less. Almost two-thirds of Outer Suburb residents have lived in their neighborhood for five years or less. The Inner Urban, Outer Urban, and Inner Suburban neighborhoods tended to have longer neighborhood tenure (15 years or more). The Rural neighborhood had the most equally distributed number of residents regarding housing tenure (Figure 4.7).

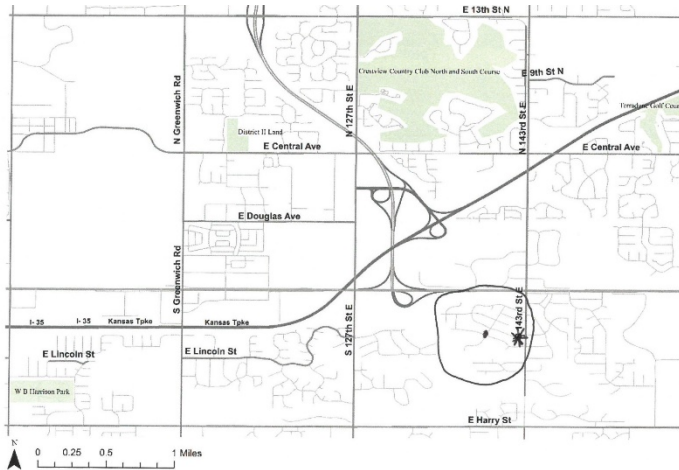
In terms of characterizing their own neighborhoods, generally, respondents identified their neighborhood along with its urban context. All the respondents in the Urban Core neighborhood characterized their neighborhood as “inner city or downtown.” Suburban residents tended to identify their neighborhood as “suburban.” In the Rural neighborhood, the majority of respondents identified their neighborhood as either “suburban” or “rural” (Figure 4.7).

A majority of overall respondents (77.3%) indicated that roads were a factor in determining their neighborhood boundary. In urban neighborhoods, one-third of respondents cited the use of buildings or commercial centers to delineate their neighborhood boundary. Natural features or parks were more likely to be used to draw neighborhood boundaries in urban and suburban neighborhoods. Residents in the Outer Suburb and Rural neighborhood identified neighborhood subdivisions or developments as their neighborhood boundary (Figure 4.7).

Variations in the method of drawing neighborhood boundaries existed. Overall, respondents used existing landmarks, often roads, to draw their neighborhood boundary (82%) (Figure 4.5). Some respondents drew their neighborhood boundary as a circle or oval, without any clear connection to the elements on the map (Figure 4.6). In the rural neighborhood more than 40 percent of respondents used a circle to represent their neighborhood boundary without any clear connection to the elements on the map.

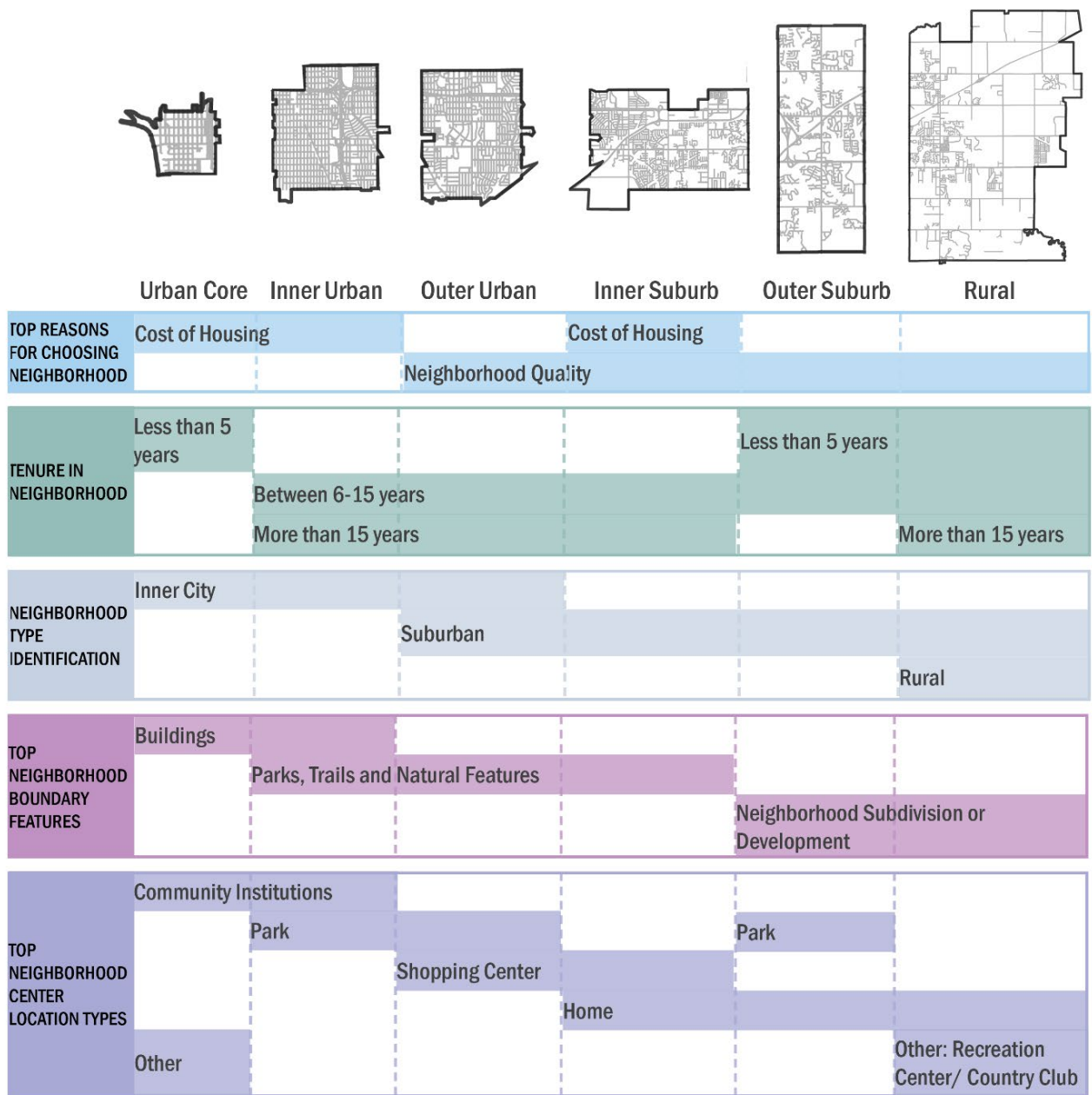


**Figure 4.3 Neighborhood boundary drawn in relation to map elements.**



**Figure 4.4 Neighborhood boundary drawn without relation to map elements**

In the Urban Core and Inner Urban neighborhoods, respondents were more likely to identify a neighborhood institution like a church as their neighborhood center. Few respondents identified a school as their neighborhood center (1.3%). Few overall residents identified shopping centers as their neighborhood center (7.7%), however, 1 in 5 respondents in the Outer Urban neighborhood identified a shopping center as their neighborhood center (Figure 4.7). In suburban and rural areas, residents primarily identified their home as their neighborhood center, but some also identified a recreation center or country club.



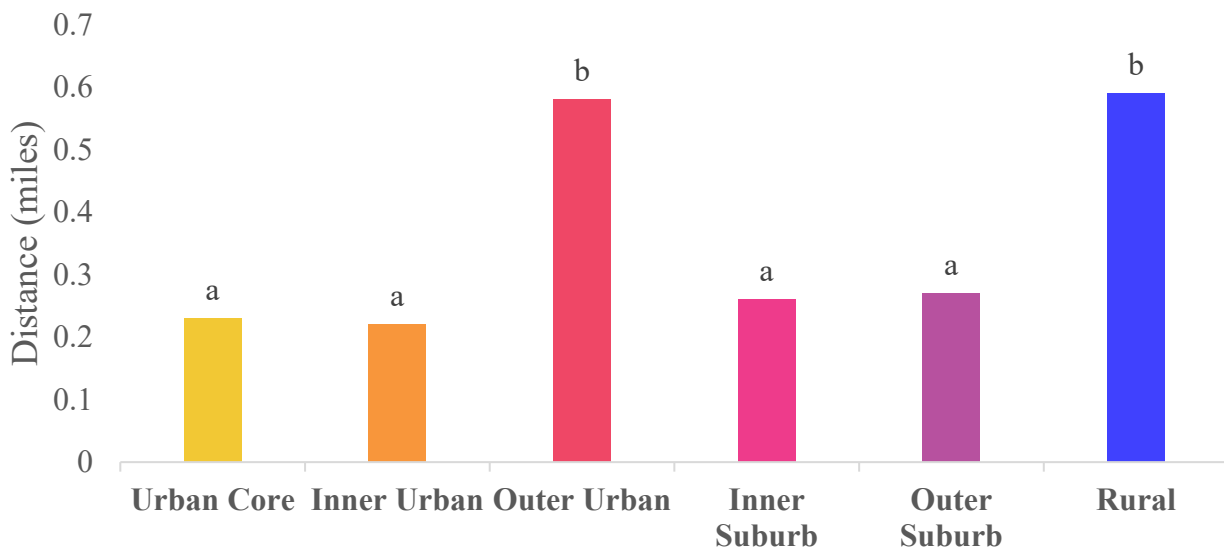
**Figure 4.5. Neighborhood Characteristics by Neighborhood**

Overall, neighborhood centers were identified as less than half a mile away from home (0.39 mi). The Rural and Outer Urban neighborhoods had the longest mean distance from home to neighborhood center. All other neighborhoods had a mean distance from home to neighborhood center that was about 0.25 miles (Table 4.3).

**Table 4.1 Mean Distance to Neighborhood Center by Neighborhood**

Mean Distance (miles)	Urban Core	Inner Urban	Outer Urban	Inner Suburb	Outer Suburb	Rural
From Home to Neighborhood Center	0.23 <sup>b</sup>	0.22 <sup>b</sup>	0.58 <sup>a</sup>	0.26 <sup>b</sup>	0.27 <sup>b</sup>	0.59 <sup>a</sup>

Note: Superscript letters indicate significant differences at  $p < 0.05$ .



**Figure 4.6 Mean Distance to Neighborhood Center by Neighborhood**

### Access to Basic Needs

Overall, a majority of respondents (87%) identified the food store that they visit most frequently. Fewer identified their healthcare facility (74%), and even fewer identified a school (50%). Overall patterns of travelling to food, healthcare and school were similar in origin point, and satisfaction, but differed in mode, frequency of travel, travel companions, time, and distance (Table 4.2).

The most common types of food stores, healthcare facilities and schools were supermarkets, general practitioners and k-12 schools, respectively. Generally, respondents travel

to all three basic needs from home. Respondents were generally satisfied with their level of access to the basic needs. The most common travel mode to basic needs is by vehicle.

The majority of respondents travel to a food store at least once per week, travel to a healthcare facility a few times per year, and travel to a school more than once per week. Respondents travelling to food stores and healthcare facilities tend to travel alone while respondents travelling to schools tend to travel with children.

**Table 4.2. Travel Patterns by Type of Need**

	<b>Food</b>	<b>Healthcare</b>	<b>School</b>
<b>Type</b>	Supermarket	General Practitioner	K-12
<b>Origin Point</b>	From home (88.2%)	From home (71.1%)	From home (91.7%)
<b>Satisfaction</b>	Satisfied (87.5%)	Satisfied (83.3%)	Satisfied (87.0%)
<b>Mode</b>	Drive/ride in vehicle (96.3%)	Drive/ride in vehicle (96.6%)	Drive/ride in vehicle (92.5%)
<b>Frequency</b>	At least once per week (82.8%)	A few times a year (83.9%)	More than once per week (64.9%)
<b>Travel Companion</b>	Alone (75.1%)	Alone (74.4%)	With children (66.7%)
<b>Mean Distance</b>	2.16 miles	3.33 miles	2.78 miles

### **Access to Food by Neighborhood**

Overall, the majority of respondents visit a supermarket or grocery store most frequently (92.4%), however, those in the Urban Core neighborhood were less likely to go to a supermarket or grocery store. Respondents generally use a vehicle to get to food stores, however in the Urban Core, respondents were more likely to bike, bus or walk (25.0%). Overall, travel time to a food store takes an average of 9 minutes, but in the Urban Core, the mean travel time to a food store was 20 minutes. Generally, respondents travel to food stores at least once per week (82.8%).

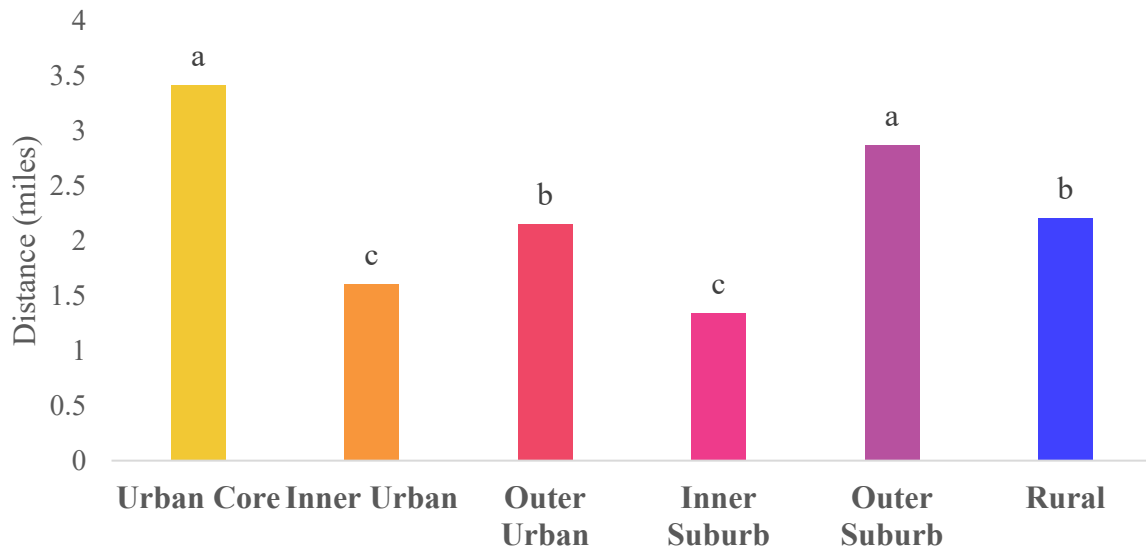
Respondents in the Urban Core neighborhood were most likely to be dissatisfied with their food stores (50.0%).

The mean distance to a food store was 2.11 miles. The Outer Suburb and Urban Core neighborhoods had the longest mean distances to food stores. The Inner Suburb and Inner Urban neighborhoods had the shortest mean distances to food stores (Table 4.5). The longest individual distance to a food store was found in the Urban Core (7.69 miles) and the shortest individual distance was found in the Inner Urban (0.18 miles) neighborhood. Food stores were located inside and outside of identified neighborhood boundaries (Figure 4.10).

**Table 4.3 Mean Network Distance to Food Store by Neighborhood**

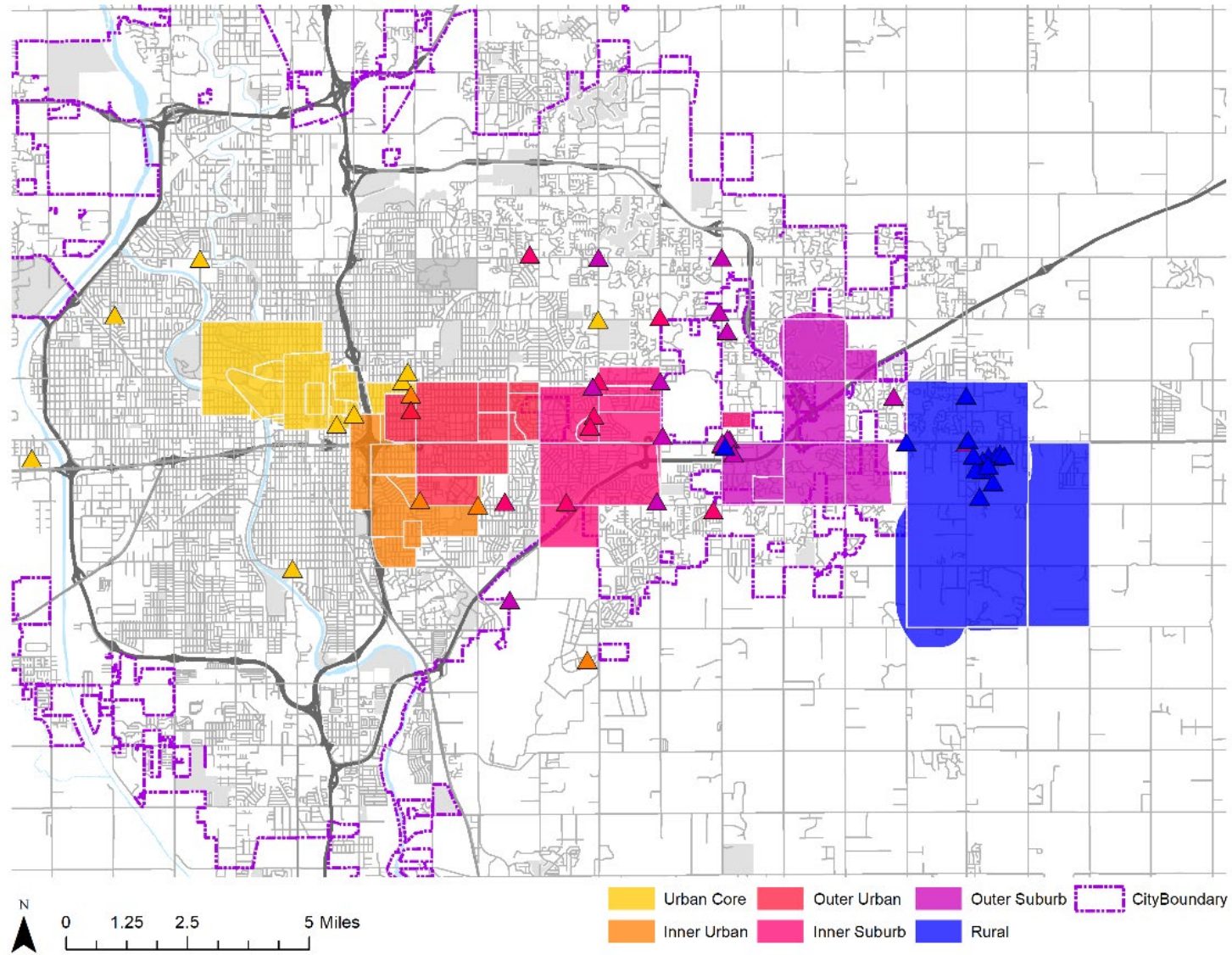
Mean Distance (miles)	Urban Core	Inner Urban	Outer Urban	Inner Suburb	Outer Suburb	Rural
From Home to Food	3.42 <sup>a</sup>	1.61 <sup>c</sup>	2.15 <sup>b</sup>	1.34 <sup>c</sup>	2.87 <sup>a</sup>	2.21 <sup>b</sup>

Note: Superscript letters indicate significant differences at  $p < 0.05$ .



**Figure 4.7 Mean Network Distance to Food Store by Neighborhood**





**Figure 4.8 Map of Food Store Locations by Neighborhood**

### Access to Healthcare by Neighborhood

Overall, respondents indicated that they visit a general practitioner or family doctor (81.3%) most frequently. Respondents were most likely to have an ongoing or serious health problem in Urban Core (34.8%) and Inner Urban (40.6%) neighborhoods. Respondents in the Urban Core were more likely to bus, walk or bike to their healthcare facility than all other neighborhoods. Respondents were generally satisfied with their healthcare facility. Respondents in urban areas were more likely to travel to healthcare alone than respondents in rural areas.

The mean distance to a healthcare facility was 3.33 miles. The Outer Suburb had the longest mean distance to a healthcare facility. The Urban neighborhoods had the shortest mean distance to a healthcare facility (Table 4.4). Both the longest (12.56 miles) and shortest (0.35 miles) individual distances to healthcare were located in the Inner Suburban neighborhood. Healthcare facilities were located inside and outside of self-identified neighborhood boundaries (Figure 4.12).

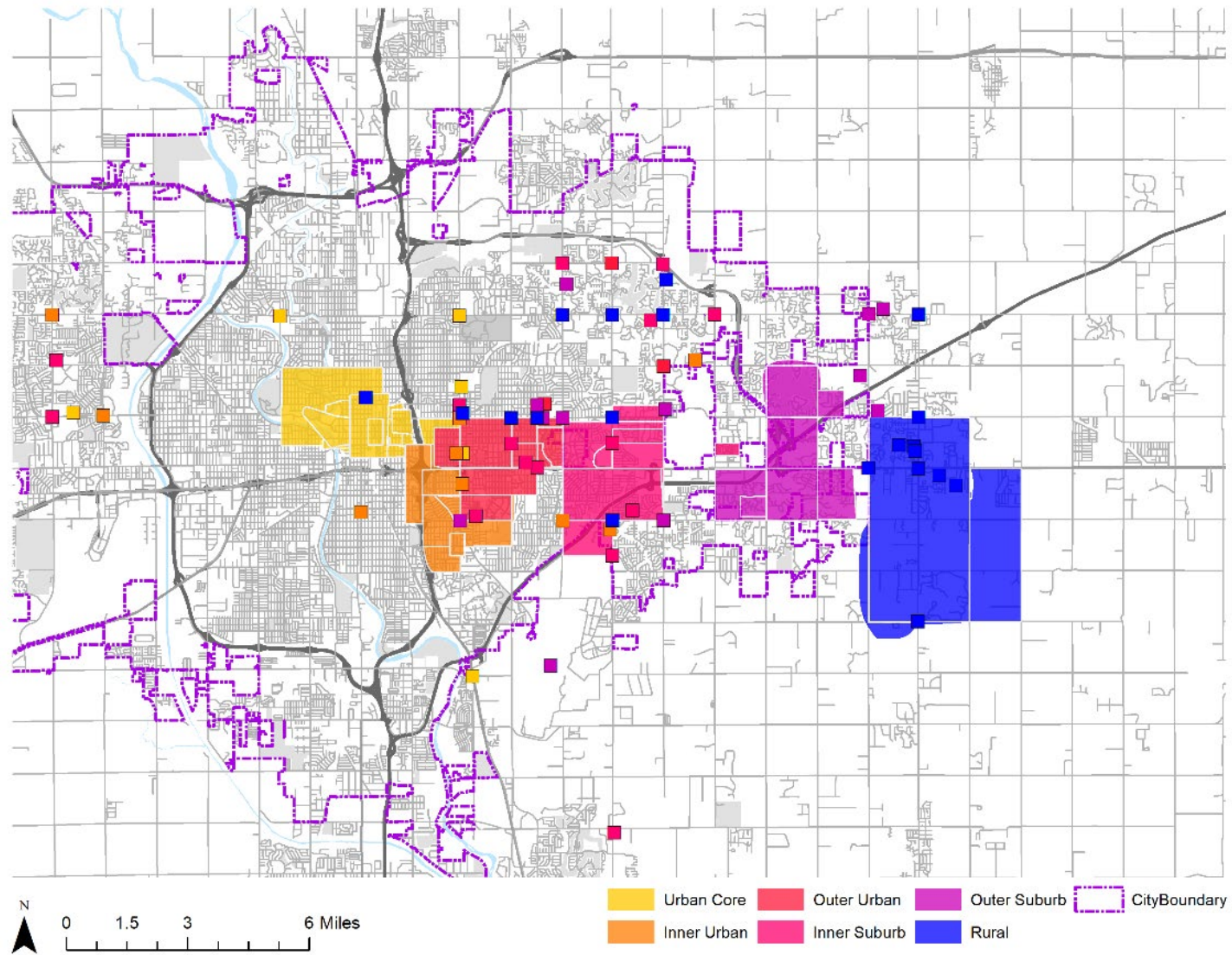
**Table 4.4 Mean Network Distance to Healthcare by Neighborhood**

Mean Distance (miles)	Urban Core	Inner Urban	Outer Urban	Inner Suburb	Outer Suburb	Rural
From Home to Healthcare	2.58 <sup>bc</sup>	2.55 <sup>bc</sup>	2.30 <sup>c</sup>	3.85 <sup>b</sup>	5.45 <sup>a</sup>	3.51 <sup>b</sup>

Note: Superscript letters indicate significant differences at  $p < 0.05$ .



**Figure 4.9 Mean Network Distance to Healthcare by Neighborhood**



**Figure 4.10. Map of Healthcare Facility Locations by Neighborhood**

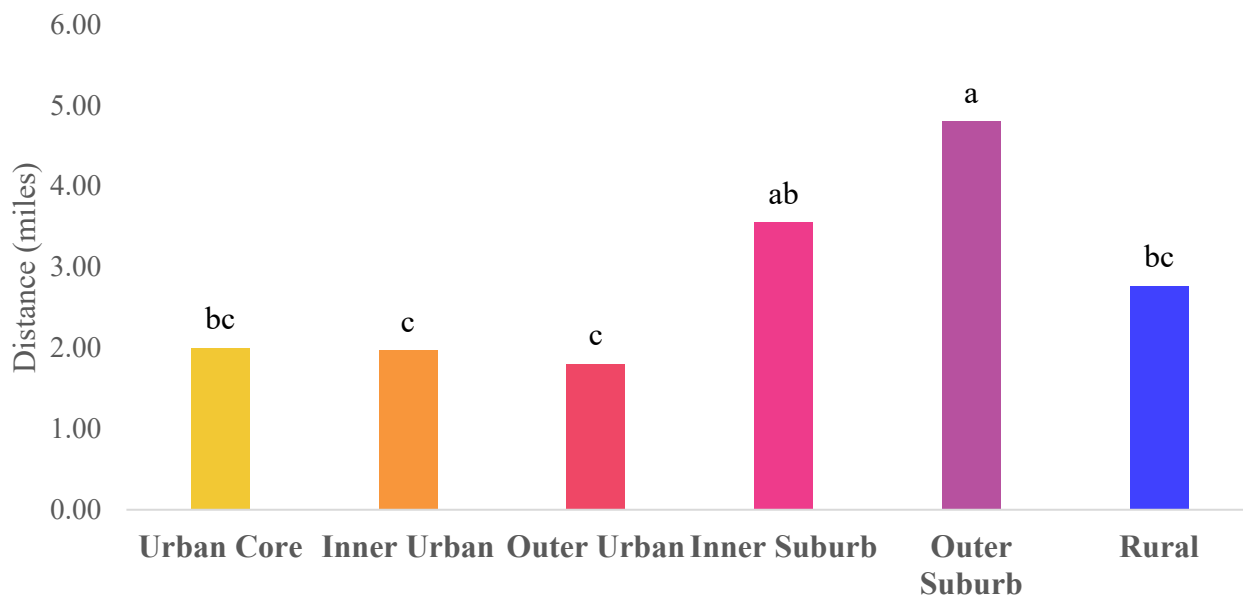
### Access to School by Neighborhood

A majority of respondents indicated visiting a k-12 school most frequently. A majority of respondents in the Urban Core bike, bus or walk to school (91.7%), however, 15% of respondents in the Inner Suburban neighborhood indicated that they walk to school. Generally, respondents travel to school more than once per week (64.9%) with their children (66.7%). Respondents were generally satisfied with the schools they visit (87.0%). Overall, the mean distance to school is 2.78 miles. The Outer Suburban neighborhood had the longest mean distance to school (4.80 miles) (Figure 4.7). The longest individual distance to school was located in the Rural neighborhood (9.66 miles), while the shortest individual distance to school was located in the Inner Suburban neighborhood (0.21) (Table 4.5). Schools were located inside and outside of neighborhood boundaries (Figure 4.14).

**Table 4.5 Mean Network Distance to School by Neighborhood**

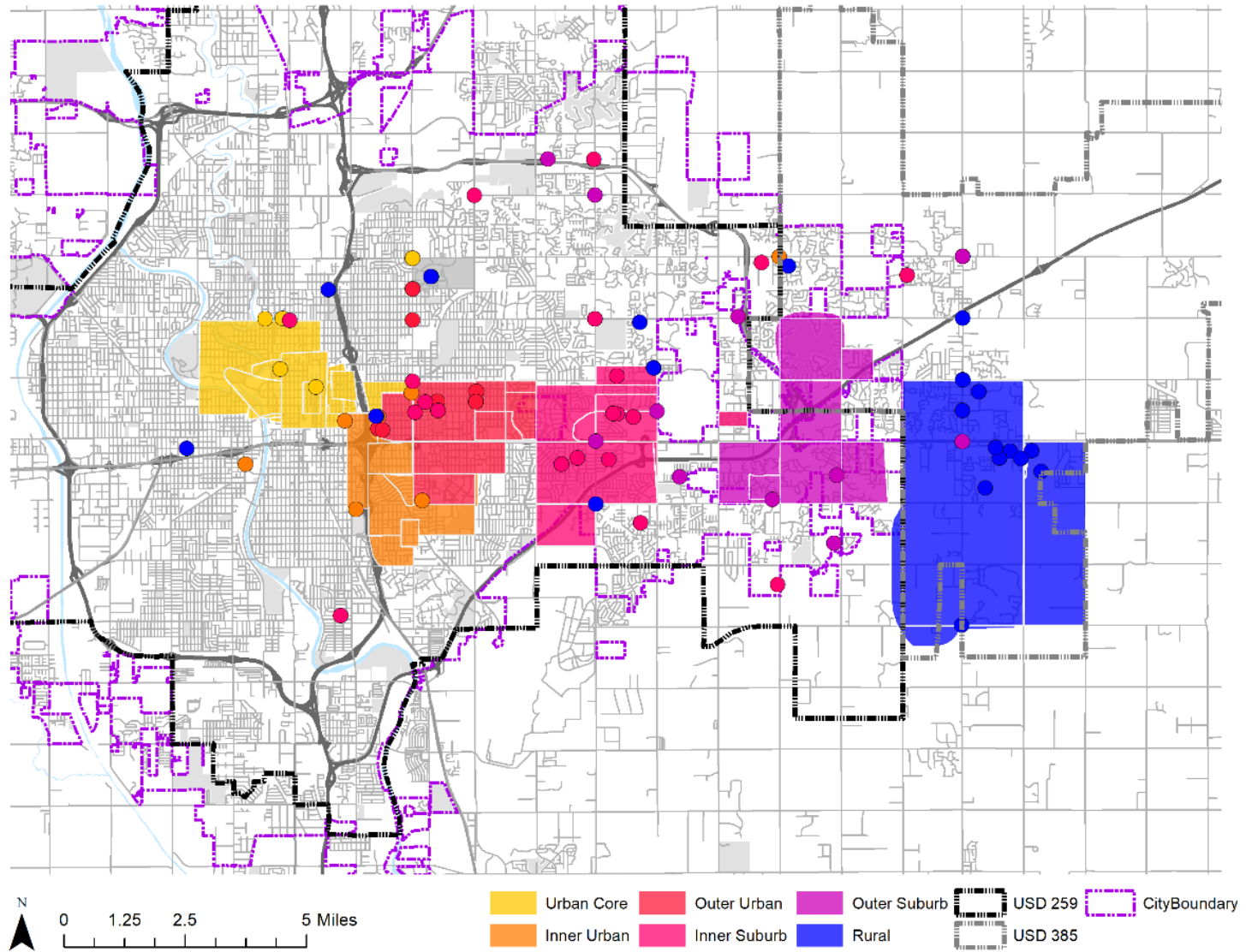
Mean Distance (miles)	Urban Core	Inner Urban	Outer Urban	Inner Suburb	Outer Suburb	Rural
From Home to School	2.00 <sup>bc</sup>	1.97 <sup>c</sup>	1.80 <sup>c</sup>	3.55 <sup>ab</sup>	4.80 <sup>a</sup>	2.77 <sup>bc</sup>

Note: Superscript letters indicate significant differences at  $p < 0.05$ .



**Figure 4.11 Mean Network Distance to School by Neighborhood**





**Figure 4.12. Map of School Locations by Neighborhood**

Patterns begin to emerge regarding overall neighborhood access to basic needs (Table 4.6). The longest distances to basic needs are located in the Outer Suburb and in the Urban Core. The shortest distances to basic needs are located in the Inner Urban and Outer Urban neighborhoods.

**Table 4.6 Mean Network Distances to Basic Needs by Neighborhood**

<b>Mean Distance (miles)</b>	<b>Urban Core</b>	<b>Inner Urban</b>	<b>Outer Urban</b>	<b>Inner Suburb</b>	<b>Outer Suburb</b>	<b>Rural</b>
From Home to Food	3.42 <sup>a</sup>	1.61 <sup>c</sup>	2.15 <sup>b</sup>	1.34 <sup>c</sup>	2.87 <sup>a</sup>	2.21 <sup>b</sup>
From Home to Healthcare	2.58 <sup>bc</sup>	2.55 <sup>bc</sup>	2.30 <sup>c</sup>	3.85 <sup>b</sup>	5.45 <sup>a</sup>	3.51 <sup>b</sup>
From Home to School	2.00 <sup>bc</sup>	1.97 <sup>c</sup>	1.80 <sup>c</sup>	3.55 <sup>ab</sup>	4.80 <sup>a</sup>	2.77 <sup>bc</sup>

Note: Superscript letters indicate significant differences at  $p < 0.05$ .

## Chapter 5 - Discussion and Conclusion

### Discussion

Research on neighborhood perceptions show that residents in urban areas tend to identify their neighborhood as smaller than suburban areas (Chaskin, 1997; Haeberle, 1988; Haney & Knowles, 1978). Additionally, certain demographics (minorities, older adults, long-term residents) have been known to perceive their neighborhood as smaller than others (Pebley & Sastry, 2009). In this study, however, the perceived size of each neighborhood did not vary significantly. Overall, little variation in racial and minority demographics were seen in this study, so little effects could be attributed to racial or ethnic makeup in the neighborhoods. While some neighborhoods showed higher percentages of older adults and longer tenure in their neighborhood, a relationship to neighborhood size was not found. This could be because the neighborhoods were being compared between urban, suburban, and rural instead of just urban to suburban as was the case in some studies (Haney & Knowles, 1978). It could also be related to the type of cognitive mapping used in this study. Many studies that include neighborhood mapping provide residents with a blank canvas (Coulton, Korbin, Chan, & Su, 2001; Orleans, 1973), whereas this study provided a base map containing the information of street and location of basic needs for respondents to draw and identify what they perceive and use.

While the perception of size did not vary among neighborhoods, the distances from home to neighborhood center did vary significantly between neighborhoods. The distances to the neighborhood center in the Outer Urban and Rural neighborhoods were more than twice as long as the distance to neighborhood center for all other neighborhoods. This could mean that neighborhood size may actually vary, but not in a way that is perceived by residents. Still, in all six neighborhoods, the mean distance to neighborhood centers generally aligned with the recommendations of neighborhood planning theories of  $\frac{1}{4}$  mile to  $\frac{1}{2}$  mile distance to the neighborhood center (Calthorpe, 1993; Perry, 1929).

Neighborhood planning theories identify the types of community institutions that should be at the center of a neighborhood. These recommendations primarily include schools (Perry, 1929) and shopping centers (Spreiregen & De Paz, 2005; C. S. Stein, 1949). Few residents in this study identified schools as their neighborhood center. In fact, the mean distance to school overall was nearly 3 miles. However, residents in the Urban Core and Inner Urban

neighborhoods exhibited tendencies of a structural or institutional perspective, one that orients community institutions at the center. Whereas suburban and rural residents were most likely to exhibit tendencies of an egocentric perspective, one that situates home at the center of a neighborhood (Guest & Lee, 1984; Lee & Campbell, 1997). Demographic characteristics of these types of perspectives identified in Lee & Campbell's study (1997) were also seen in this study. For instance, in both studies, the residents with structural/institutional neighborhood perspectives were more likely to be male, single, and have shorter housing tenure (Lee & Campbell, 1997).

Neighborhood boundaries are thought to be made up of visible or invisible features (Park & Rogers, 2015). In Lynch's foundational work regarding elements of a city, an "edge" relates most closely to the idea of the neighborhood boundary. Lynch's work acknowledges that edges, or boundaries, can be composed of different elements (Lynch, 1960). In all neighborhoods, a majority of residents noted roads as components of their neighborhood boundary. Residents in urban and areas also used buildings or parks/trails as references for drawing their neighborhood boundary. The use of buildings or landmarks to delineate neighborhoods is not uncommon. Buildings can represent a contrast in land use from residential areas, and can allow buildings to serve as effective borders (Alexander, Ishikawa, & Silverstein, 1977). In the outer suburban and rural areas, buildings were not often used to create neighborhood boundaries, rather residents identified their particular subdivision or residential development's boundaries. Residents in the rural neighborhood were more likely to draw their neighborhood irrespective of the elements on the map (Figure 4.6). Interestingly, residents in planned neighborhoods are typically found to have a clear understanding of their neighborhood boundaries (Park & Rogers, 2015). Perhaps, in suburban and rural areas, boundaries are known, but residents have little say in the creation of them.

A majority of respondents in the Urban Core had lived in their neighborhood for 5 years or less. The Urban Core was also younger, less educated, more likely to be single, and had lower household incomes. These factors could contribute to the low housing tenure in comparison to other neighborhoods (Schwartz, 2014). The neighborhood with the longest tenure was the Inner Urban neighborhood which had the largest percentage of older adults. This neighborhood also had the best overall access, in terms of proximity. The Rural neighborhood had the most equal representation of newcomers, mid-range and long-term residents. The access to basic needs for



the Rural neighborhood was not the best of all the neighborhoods, however, the quality of school system was identified as a lesser factor for residents when choosing the neighborhood.

The two main reasons for choosing a neighborhood were housing cost and neighborhood quality. Housing cost tended to be identified by residents in urban areas, while neighborhood quality tended to be identified in suburban and rural neighborhoods. Census data on renter versus owner occupied housing in the Wichita area shows that there are higher rates of renters in the Urban areas and the Inner Suburb neighborhood (US Census Bureau, 2013). Additionally, homeowners tend to be more affluent than renters (Schwartz, 2014), therefore housing cost in the suburban and rural areas may not be the most important priority when choosing a neighborhood.

Residents generally categorized their neighborhood as its appropriate urban context (urban, suburban, rural). Respondents in the Urban Core were resolute in their characterization of their neighborhood as inner city or downtown, but all other neighborhoods were less unanimous. While the rural neighborhood studied in this sample included some subdivisions that could be considered suburban, residents in this neighborhood still identified as living in a rural area. The lack of clarity in defining urban contexts on a national level underscores the increased variation seen in neighborhood characterization in non-urban areas along this transect.

Generally, travel patterns to basic needs did not vary by neighborhood or urban context. However, the urban core was most likely to bike, bus, or walk to all three basic needs. The Urban Core also had the fewest mean number of vehicles per household. Residents in urban centers are known to make more trips on public transit than those that live a further distance from the urban core (Millward & Spinney, 2011). Additionally, research shows that people living in urban areas are more likely to walk while residents in rural areas are less likely to walk (Frank, Kerr, Sallis, Miles, & Chapman, 2008; Kegler et al., 2015).

Distances to basic needs among neighborhoods varied. Overall, the Outer Suburb had the longest distance to all three basic needs. Generally, the distances to basic needs were longer in the suburbs and rural neighborhoods, but not always. Conversely, the urban neighborhoods generally had shorter distances to basic needs, but not always. The Urban Core had the longest mean distance to food stores, but some of the lowest distances to healthcare and school. Generally, the neighborhoods that had longer mean distances to basic needs also had fewer locations of basic needs identified in their neighborhood. Compact built environments, low residential population density in urban core due to concentration of businesses, and lower

socioeconomic status of residents have been cited as challenges for sustaining retail food stores in downtown urban areas (Walker et al., 2010). Access to healthcare facilities, as measured in distance, has been shown to decrease as one moves further from the center of a city (Bissonnette, Wilson, Bell, & Shah, 2012). Consolidation of schools over the past several decades in conjunction with sprawling development have contributed to increased distances to schools (Miles et al., 2012; Schlossberg et al., 2006). There are two unified school districts that exist along this transect and the Outer Urban neighborhood happens to be split between the two. With the longest mean distance from home to school, this could suggest that being so close to the edge of two school districts could indicate a longer distance to school than other residents of that school district.

This research finds that there are differences in ways that residents perceive their neighborhood boundaries and centers among neighborhoods along the urban to rural gradient. Connections to the recommendations of planned neighborhood theories exist in all urban contexts. Travel patterns along the urban to rural gradient did not differ among neighborhoods even though the distances did. This research found that more differences occurred along neighborhoods regarding neighborhood characteristics than access to basic needs. The imperative to access food, healthcare and education could imply that distance is not always the most important concern.

### **Study Limitations**

One of the inherent challenges of this research is in the naming of the neighborhoods within the study area. Existing nomenclature and proposed alternative naming protocols were used to inform the nomenclature for the six neighborhoods studied in this area, but the examples shown in Figure 2.4 and Figure 3.8 do not represent an exhaustive list. These names are appropriate for this study but could look different in a shorter or longer transect.

This study resulted in an overall lower response rate (10.4%) than was anticipated. The promise of an incentive was expected to encourage response. In this study, all neighborhoods, save one, received at least 30 responses. The central limit theorem states that when you achieve a large sample size ( $n \geq 30$ ), it should represent a normal distribution. The Urban Core did not reach 30 samples but was not far ( $n=24$ ). The Urban Core represented the youngest, least

education, and lowest income neighborhood. Some research suggests that these characteristics can result in lower response rates (Gibson, Koepsell, Diehr, & Hale, 1999).

The incentives were distributed once the completed survey was returned. Perhaps, the lag time in receiving the incentive minimized the potential benefits of offering the incentive. Additionally, current research contends that including introductory and follow up correspondence can help achieve a desirable response rate (Church, 1993; James & Bolstein, 1992; Paolillo & Lorenzi, 1984). These were not included in this study but would be something to consider in a future study. Research occurring in the 1980s and 90s showed that mailed questionnaires tend to receive a higher response rate than online surveys (Paolillo & Lorenzi, 1984; Rochford & Venable, 1995). A recent study showed that surveys conducted on paper achieve higher response rates if they are also conducted in person (Nulty, 2008). Hikmet and Chen argue that in some cases a low response rate can still provide valuable data (2003). In future studies of similar design, it would be helpful to reach out to neighborhood associations or homeowner associations in the study areas to advertise and alert residents of the survey.

This study asked residents to identify the places they visited most frequently to access basic needs. While this provides a wealth of information, it assumes that only one place is visited most frequently. In reality, there could be a few food stores, for example, that are visited every week. Conversely, not all residents identified all three basic needs. Only fifty percent of respondents identified a school even though the definition of school included preschool through community college and university. A clearer explanation could limit confusion in the future.

### **Future Research**

Further research needs to be done to understand the underlying contexts that affect the patterns seen in this study. Additional external factors likely had an impact on the differences in neighborhood patterns and characteristics that were not explored in this study. Information related to household workplaces in relation to accessing basic needs would likely provide deeper context into the reasons that some drive further to access basic needs. For instance, trends of school consolidation and increasing specialty schools might be affecting the distance students travel to school.

This study applied the transect methodology to understand differences among neighborhoods along a 15-mile transect. This methodology could be applied to an urban to rural

gradient that spans a larger area, potentially 30-60 miles long which could confirm the patterns seen within neighborhoods in this study and illuminate patterns evident in neighborhoods of starker contrast.

## **Conclusion**

Three research questions were posed and explored in this study.

### **How does urban context affect the perceptions that residents have of their neighborhood?**

This research explored contextual factors related to the observed differences in neighborhood characteristics and access to basic needs. Findings reveal that residents' perceptions of neighborhood size do not vary between urban context (urban, suburban, rural).

### **Do urban, suburban, and rural residents classify their neighborhood centers and boundaries similarly?**

This research identified patterns in perceived neighborhood characteristics like boundaries and neighborhood centers. Residents identified their neighborhood centers and boundaries differently among urban, suburban, and rural areas. Urban areas were more likely to identify landmarks outside of their home as the neighborhood center or as part of their neighborhood boundary, while suburban and rural residents were more likely to identify their home as the neighborhood center and use subdivision boundaries as neighborhood boundaries. Patterns found in suburban and rural neighborhoods resembled each other more than patterns in urban and suburban neighborhoods. This is important to note because of the way that suburban areas are typically considered part of urban areas.

### **Do neighborhood residents' patterns vary in accessing basic needs of school, food and healthcare?**

This research identified patterns in accessing basic needs like food, healthcare, and education along the urban to rural gradient. Travel patterns in access basic needs were not shown to vary significantly except for in mode of travel in the Urban Core where residents were more likely to bike, bus, or walk to basic needs. Significant variation occurred regarding the network distance to basic needs. The Outer Suburb neighborhood had the furthest mean distance from all three

basic needs while the Inner and Outer Urban neighborhoods has the shortest mean distance to basic needs.

The transect methodology approach was useful in identifying patterns and differences among neighborhoods along an urban to rural gradient. In some cases, differences were not seen; the perception of neighborhood size did not vary among urban contexts as was anticipated. Variation in density and urban form are evident along the transect, but neighborhood size perceptions are not. In other areas, differences occurred where expected; the differing characteristics of neighborhood centers in urban, suburban, and rural areas.

Perceived neighborhood characteristics were more likely to vary among neighborhoods than travel patterns to basic needs. While accessing basic need is an important component of day-to-day life, the basic needs appear to have less linkage to a residents' perception of a neighborhood.

Many of the identified neighborhood characteristics in this study relate to neighborhood planning theories and their range of possibilities for neighborhood characteristics. The lack of schools being cited as neighborhood centers, a foundational component of Perry's Neighborhood Unit Concept, raises the question of whether Perry's ideal neighborhood is as relevant as it used to be to the planning profession. However, programs like "Safe Routes to Schools" that encourage children and their parents to walk or bike to school could reinforce some of Perry's ideas moving forward.

Suburban and rural neighborhoods tended to behave similarly more so than suburban and urban neighborhoods. This demonstrates that the current definition of urban and rural are not sufficient. Planners are known to use established administrative boundaries when conducting neighborhood level plans. If planners are using the urban/rural designation to determine neighborhoods, this could lead to inappropriate planning recommendations. Instead of comparing strictly urban to rural, this study provides a framework for planners to understand and assess differences along a gradient that is relevant for future planning projects.

## References

- Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: why and how of it? *Indian Journal of Medical Specialties*, 4(2). <https://doi.org/10.7713/ijms.2013.0032>
- Alexander, Ishikawa, & Silverstein. (1977). *A Pattern Language: Towns, Buildings, Construction* (Center for Environmental Structure). 1.
- American Planning Association. (2016). AICP Code of Ethics and Professional Conduct. Retrieved from American Planning Association website: <https://www.planning.org/ethics/ethicscode/>
- American Planning Association. (2018). Planning and Community Health Center. Retrieved February 25, 2019, from American Planning Association website: <https://www.planning.org/nationalcenters/health/>
- Baxter, L. A., & Braithwaite, D. O. (2008). *Engaging Theories in Interpersonal Communication: Multiple Perspectives*. SAGE.
- Bell, M. (1992). The Fruit of Difference: The Rural-Urban Continuum as a System of Identity. *Rural Sociology*, 57(1), 65–82.
- Bissonnette, L., Wilson, K., Bell, S., & Shah, T. I. (2012). Neighbourhoods and potential access to health care: The role of spatial and aspatial factors. *Health & Place*, 18(4), 841–853. <https://doi.org/10.1016/j.healthplace.2012.03.007>
- Butler County GIS. (2018). Retrieved September 20, 2018, from <https://www.bucoks.com/723/ESRI-Shapefiles-for-Download>
- Calthorpe, P. (1993). *The next American metropolis: Ecology, community, and the American dream*. Princeton architectural press.
- Campbell, M. J., Donner, A., & Klar, N. (2007). Developments in cluster randomized trials and *Statistics in Medicine*. *Statistics in Medicine*, 26(1), 2–19. <https://doi.org/10.1002/sim.2731>

- Charreire, H., Casey, R., Salze, P., Simon, C., Chaix, B., Banos, A., ... Oppert, J.-M. (2010). Measuring the food environment using geographical information systems: a methodological review. *Public Health Nutrition*, 13(11), 1773–1785.
- Chaskin, R. J. (1997). Perspectives on Neighborhood and Community: A Review of the Literature. *Social Service Review*, 71(4), 521–547. <https://doi.org/10.1086/604277>
- Chow, J. (1998). Differentiating urban neighborhoods: A multivariate structural model analysis. *Social Work Research*, 22(3), 131–142. <https://doi.org/10.1093/swr/22.3.131>
- Church, A. H. (1993). Estimating the effect of incentives on mail survey response rates: a meta-analysis. *Public Opinion Quarterly*, 57(1), 62–79. <https://doi.org/10.1086/269355>
- Comer, J., & Mueller, K. (1995). Access to Health Care: Urban-Rural Comparisons from a Midwestern Agricultural State. *The Journal of Rural Health*, 11(2), 128–136. <https://doi.org/10.1111/j.1748-0361.1995.tb00406.x>
- Connell, J. H., Hughes, T. P., & Wallace, C. C. (1997). A 30-Year Study of Coral Abundance, Recruitment, and Disturbance at Several Scales in Space and Time. *Ecological Monographs*, 67(4), 461–488. <https://doi.org/10.2307/2963466>
- Cook, K. S., Cheshire, C., Rice, E. R. W., & Nakagawa, S. (2013). Social Exchange Theory. In J. DeLamater & A. Ward (Eds.), *Handbook of Social Psychology* (pp. 61–88). [https://doi.org/10.1007/978-94-007-6772-0\\_3](https://doi.org/10.1007/978-94-007-6772-0_3)
- Corning, P. A. (2000). Biological Adaptation in Human Societies: a 'Basic Needs' Approach. *Journal of Bioeconomics*, 1, 41–86.
- Coulton, C. J., Korbin, J., Chan, T., & Su, M. (2001). Mapping Residents' Perceptions of Neighborhood Boundaries: A Methodological Note. *American Journal of Community Psychology*, 29(2), 371–383. <https://doi.org/10.1023/A:1010303419034>
- Davis, K. (1991). Inequality and Access to Health Care. *The Milbank Quarterly*, 69(2), 253–273. <https://doi.org/10.2307/3350204>

- Doerner, K., Focke, A., & Gutjahr, W. J. (2007). Multicriteria tour planning for mobile healthcare facilities in a developing country. *European Journal of Operational Research*, 179(3), 1078–1096. <https://doi.org/10.1016/j.ejor.2005.10.067>
- Duany, A., & Talen, E. (2002). Transect planning. American Planning Association. *Journal of the American Planning Association*; Chicago, 68(3), 245–266.
- Duany Plater-Zyberk & Company. (2016). Innovations for New Urbanism | DPZ Initiatives. Retrieved May 2, 2018, from The DPZ Initiatives website: <http://www.dpz.com/Initiatives/About>
- Ellis, C. (2002). The New Urbanism: Critiques and Rebuttals. *Journal of Urban Design*, 7(3), 261–291. <https://doi.org/10.1080/1357480022000039330>
- Emerson, R. M. (1976). Social Exchange Theory. *Annual Review of Sociology*, 2(1), 335–362. <https://doi.org/10.1146/annurev.so.02.080176.002003>
- Engelhardt, N. L. (1940). *Planning the community school*. American Book Company.
- Frank, L. D., Kerr, J., Sallis, J. F., Miles, R., & Chapman, J. (2008). A hierarchy of sociodemographic and environmental correlates of walking and obesity. *Preventive Medicine*, 47(2), 172–178. <https://doi.org/10.1016/j.ypmed.2008.04.004>
- Frey, W. H. (2012). *Population Growth in Metro America since 1980*: 28.
- Garner, C. L., & Raudenbush, S. W. (1991). Neighborhood Effects on Educational Attainment: A Multilevel Analysis. *Sociology of Education*, 64(4), 251–262. <https://doi.org/10.2307/2112706>
- Gibbs, R. J. (2012). *Principles of urban retail planning and development*. John Wiley & Sons.
- Gibson, P. J., Koepsell, T. D., Diehr, P., & Hale, C. (1999). Increasing Response Rates for Mailed Surveys of Medicaid Clients and Other Low-income Populations. *American Journal of Epidemiology*, 149(11), 1057–1062. <https://doi.org/10.1093/oxfordjournals.aje.a009751>
- Glanz, K. (2009). Measuring Food Environments: A Historical Perspective. *American Journal of Preventive Medicine*, 36(4, Supplement), 93–98. <https://doi.org/10.1016/j.amepre.2009.01.010>



- Gu, W., Wang, B., & Wang, X. (2012). An Integrated Approach to Multi-Criteria-Based Health Care Facility Location Planning. In L. Cao, J. Z. Huang, J. Bailey, Y. S. Koh, & J. Luo (Eds.), *New Frontiers in Applied Data Mining* (pp. 420–430). Springer Berlin Heidelberg.
- Guest, A. M., & Lee, B. A. (1984). How urbanites define their neighborhoods. *Population and Environment*, 7(1), 32–56. <https://doi.org/10.1007/BF01257471>
- Haerberle, S. H. (1988). People or Place: Variations in Community Leaders' Subjective Definitions of Neighborhood. *Urban Affairs Quarterly*, 23(4), 616–634.  
<https://doi.org/10.1177/004208168802300408>
- Hahs, A. K., & McDonnell, M. J. (2006). Selecting independent measures to quantify Melbourne's urban–rural gradient. *Landscape and Urban Planning*, 78(4), 435–448.  
<https://doi.org/10.1016/j.landurbplan.2005.12.005>
- Hamid Afshari, Q. P. (2014). Challenges and Solutions for Location of Healthcare Facilities. *Industrial Engineering & Management*, 03(02). <https://doi.org/10.4172/2169-0316.1000127>
- Haney, W. G., & Knowles, E. S. (1978). Perception of neighborhoods by city and suburban residents. *Human Ecology*, 6(2), 201–214. <https://doi.org/10.1007/BF00889095>
- Heale, M. J. (1976). Harbingers of Progressivism: Responses to the Urban Crisis in New York, c. 1845-1860. *Journal of American Studies*, 10(1), 17–36.
- Health Places Healthy Food. (2014). Retrieved April 30, 2018, from <https://www.cdc.gov/healthyplaces/healthtopics/healthyfood/general.htm>
- Hester, R. T. (1975). *Neighborhood Space*. Dowden, Hutchinson & Ross.
- Hikmet, N., & Chen, S. K. (2003). An investigation into low mail survey response rates of information technology users in health care organizations. *International Journal of Medical Informatics*, 72(1), 29–34. <https://doi.org/10.1016/j.ijmedinf.2003.09.002>

- Hopkins, K. D., & Gullickson, A. R. (1992). Response Rates in Survey Research: A Meta-Analysis of the Effects of Monetary Gratuities. *The Journal of Experimental Education*, 61(1), 52–62. <https://doi.org/10.1080/00220973.1992.9943849>
- Isaacs, R. R. (1948). The Neighborhood Theory: An Analysis of its Adequacy. *Journal of the American Institute of Planners*, 14(2), 15–23. <https://doi.org/10.1080/01944364808978605>
- Jacobs, J. (1961). *The Death and Life of Great American Cities*. London: Jonathan Cape.
- James, J. M., & Bolstein, R. (1992). Large Monetary Incentives and Their Effect on Mail Survey Response Rates. *The Public Opinion Quarterly*, 56(4), 442–453.
- Kegler, M. C., Alcantara, I., Haardörfer, R., Gemma, A., Ballard, D., & Gazmararian, J. (2015). Rural Neighborhood Walkability: Implications for Assessment. *Journal of Physical Activity and Health*, 12(6 Suppl 1), S40–S45. <https://doi.org/10.1123/jpah.2013-0431>
- Kelbaugh, D., & Kelbaugh, D. (1997). *Common Place: Toward Neighborhood and Regional Design*. University of Washington Press.
- Keller, S. I. (1968). *The urban neighborhood: a sociological perspective*. Random House.
- Kolko, J. (2015). How Suburban Are Big American Cities? Retrieved February 24, 2019, from FiveThirtyEight website: <https://fivethirtyeight.com/features/how-suburban-are-big-american-cities/>
- Koplan, J. P., Bond, T. C., Merson, M. H., Reddy, K. S., Rodriguez, M. H., Sewankambo, N. K., & Wasserheit, J. N. (2009). Towards a common definition of global health. *The Lancet*, 373(9679), 1993–1995. [https://doi.org/10.1016/S0140-6736\(09\)60332-9](https://doi.org/10.1016/S0140-6736(09)60332-9)
- Kostka, V. J. (1957). *Neighborhood planning*. [Winnipeg]: Winnipeg.
- Lee, B. A., & Campbell, K. E. (1997). Common Ground? Urban Neighborhoods as Survey Respondents See them. *Social Science Quarterly* (University of Texas Press), 78(4), 922–936.
- Lloyd Lawhon, L. (2009). The Neighborhood Unit: Physical Design or Physical Determinism? *Journal of Planning History*, 8(2), 111–132. <https://doi.org/10.1177/1538513208327072>

- Long, H., Heilig, G. K., Li, X., & Zhang, M. (2007). Socio-economic development and land-use change: Analysis of rural housing land transition in the Transect of the Yangtse River, China. *Land Use Policy*, 24(1), 141–153. <https://doi.org/10.1016/j.landusepol.2005.11.003>
- Lynch, K. (1960). *The City Image and Its Elements*. In *the People, Place, and Space Reader* (pp. 50–55). Routledge.
- Lytle, L. A. (2009). Measuring the Food Environment: State of the Science. *American Journal of Preventive Medicine*, 36(4, Supplement), S134–S144. <https://doi.org/10.1016/j.amepre.2009.01.018>
- Lytle, L. A., & Sokol, R. L. (2017). Measures of the food environment: A systematic review of the field, 2007–2015. *Health & Place*, 44, 18–34. <https://doi.org/10.1016/j.healthplace.2016.12.007>
- Matheson, F. I., Moineddin, R., Dunn, J. R., Creatore, M. I., Gozdyra, P., & Glazier, R. H. (2006). Urban neighborhoods, chronic stress, gender and depression. *Social Science & Medicine*, 63(10), 2604–2616. <https://doi.org/10.1016/j.socscimed.2006.07.001>
- McDonald, N. C. (2010). School Siting: Contested Visions of the Community School. *Journal of the American Planning Association*, 76(2), 184–198. <https://doi.org/10.1080/01944361003595991>
- McKinnon, R. A. (2009, April 1). Measures of the Food Environment: A Compilation of the Literature, 1990 - 2007. Retrieved March 7, 2018, from [http://obesity.publichealthwell.ie/search-results/measures-food-environment-compilation-literature-1990-2007?source=cataloguedisplay&medium=weblink&campaign=healthwell&content=resource&member=572160&catalogue=none&collection=Obesity&tokens\\_complete=true](http://obesity.publichealthwell.ie/search-results/measures-food-environment-compilation-literature-1990-2007?source=cataloguedisplay&medium=weblink&campaign=healthwell&content=resource&member=572160&catalogue=none&collection=Obesity&tokens_complete=true)
- McLeod, A. (1970). The “16 Needs Concept” for Urban Growth. *The Australian Quarterly*, 42(3), 91–93. <https://doi.org/10.2307/20634385>
- Meenar, M. R. (2017). Using participatory and mixed-methods approaches in GIS to develop a Place-Based Food Insecurity and Vulnerability Index. *Environment and Planning A: Economy and Space*, 49(5), 1181–1205. <https://doi.org/10.1177/0308518X16686352>

- Miles, R., Adelaja, A., & Wyckoff, M. (2012). School Siting and Healthy Communities: Why Where We Invest in School Facilities Matters. Retrieved from <http://ebookcentral.proquest.com/lib/ksu/detail.action?docID=3338233>
- Millward, H., & Spinney, J. (2011). Time use, travel behavior, and the rural–urban continuum: results from the Halifax STAR project. *Journal of Transport Geography*, 19(1), 51–58. <https://doi.org/10.1016/j.jtrangeo.2009.12.005>
- Montgomery, D. (2019). Resources, data, and methodology for CityLab data journalism projects: theatlantic/citylab-data [R]. Retrieved from <https://github.com/theatlantic/citylab-data> (Original work published 2018)
- Morris, D. J., & Hess, K. (1975). *Neighborhood Power: The New Localism*. Beacon Press.
- Nelson, A. C. (1992). Characterizing Exurbia. *Journal of Planning Literature*, 6(4), 350–368. <https://doi.org/10.1177/088541229200600402>
- Nolen, J. (1929). Neighborhood Centers. In *National Municipal League Series. City planning; a series of papers presenting the essential elements of a city plan* (2d edition., pp. 117–138). New York, London: Appleton and Company.
- Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: what can be done? *Assessment & Evaluation in Higher Education*, 33(3), 301–314. <https://doi.org/10.1080/02602930701293231>
- Oppio, A., Buffoli, M., Dell’Ovo, M., & Capolongo, S. (2016). Addressing decisions about new hospitals’ siting: a multidimensional evaluation approach. *Annali Dell’Istituto Superiore Di Sanità*, 52(1), 78–87.
- Orleans, P. (1973). Differential Cognition of Urban Residents: Effects of Social Scale on Mapping. In *Image and Environment: Cognitive Mapping and Spatial Behavior* (pp. 115–130). Transaction Publishers.
- Owen, S. H., & Daskin, M. S. (1998). Strategic facility location: A review. *European Journal of Operational Research*, 111(3), 423–447. [https://doi.org/10.1016/S0377-2217\(98\)00186-6](https://doi.org/10.1016/S0377-2217(98)00186-6)

- Paolillo, J. G. P., & Lorenzi, P. (1984). Monetary Incentives and Mail Questionnaire Response Rates. *Journal of Advertising*, 13(1), 46–48. Retrieved from JSTOR.
- Park, Y. (2017). Does new urbanist neighborhood design affect neighborhood turnover? *Land Use Policy*, 68, 552–562. <https://doi.org/10.1016/j.landusepol.2017.07.013>
- Park, Y., & Rogers, G. O. (2015). Neighborhood Planning Theory, Guidelines, and Research: Can Area, Population, and Boundary Guide Conceptual Framing? *Journal of Planning Literature*, 30(1), 18–36. <https://doi.org/10.1177/0885412214549422>
- Pebley, A., & Sastry, N. (2009). Our Place: Perceived Neighborhood Size and Names in Los Angeles. UCLA CCPR Population Working Papers. Retrieved from <http://128.97.186.17/index.php/pwp/article/view/839>
- Perry, C. (1929). The Neighborhood Unit. Retrieved from <https://www.taylorfrancis.com/books/e/9781136205668/chapters/10.4324%2F9780203094235-17>
- Quintero, J. (2014). *Running the Numbers: A Practical Guide to Regional Economic and Social Analysis: 2014* (1 edition). Armonk, New York: Routledge.
- Richardson, J. (1970). The Historical Roots of Our Urban Crisis. *Current History*, 59(351). Retrieved from <https://search.proquest.com/openview/592deead35f0fbd0d19784ec1c15b3da/1?pq-origsite=gscholar&cbl=1816367>
- Rochford, L., & Venable, C. F. (1995). Surveying a Targeted Population Segment: The Effects of Endorsement on Mail Questionnaire Response Rate. *Journal of Marketing Theory and Practice*, 3(2), 86–97. Retrieved from JSTOR.
- Rohe, W. M. (2009). From Local to Global: One Hundred Years of Neighborhood Planning. *Journal of the American Planning Association*, 75(2), 209–230. <https://doi.org/10.1080/01944360902751077>

- Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An Ecological Approach to Creating Active Living Communities. *Annual Review of Public Health*, 27(1), 297–322. <https://doi.org/10.1146/annurev.publhealth.27.021405.102100>
- Schlossberg, M., Greene, J., Phillips, P. P., Johnson, B., & Parker, B. (2006). School Trips: Effects of Urban Form and Distance on Travel Mode. *Journal of the American Planning Association*, 72(3), 337–346. <https://doi.org/10.1080/01944360608976755>
- Schlossberg, M., Phillips, P. P., Johnson, B., & Parker, B. (2005). How do they get there? A spatial analysis of a ‘sprawl school’ in Oregon. *Planning Practice & Research*, 20(2), 147–162. <https://doi.org/10.1080/02697450500414678>
- Schwartz, A. (2014). Trends, Patterns, Problems. In *Housing Policy in the United States*. Taylor & Francis.
- Sirgy, M. J., & Cornwell, T. (2002). How Neighborhood Features Affect Quality of Life. *Social Indicators Research*, 59(1), 79–114. <https://doi.org/10.1023/A:1016021108513>
- Soma, T., & Wakefield, S. (2011). The emerging role of a food system planner: Integrating food considerations into planning. *Journal of Agriculture, Food Systems, and Community Development*, 53–64. <https://doi.org/10.5304/jafscd.2011.021.006>
- Southworth, M., & Owens, P. M. (1993). The Evolving Metropolis: Studies of Community, Neighborhood, and Street Form at the Urban Edge. *Journal of the American Planning Association*, 59(3), 271–287. <https://doi.org/10.1080/01944369308975880>
- Spreiregen, P. D., & De Paz, B. (2005). Pre-design. Kaplan AEC Architecture.
- Stein, C. (1930, September 15). Clarence Stein to Alfred K. Stern (A. Stern, Interviewer).
- Stein, C. S. (1949). Toward New Towns for America. *The Town Planning Review*, 20(3), 203–282.
- Stewart, F. (1985). *Planning to Meet Basic Needs*. Springer.
- Talen, E. (2002). Help for Urban Planning: The Transect Strategy. *Journal of Urban Design*, 7(3), 293–312. <https://doi.org/10.1080/1357480022000039349>

- Talen, E. (2005). *New Urbanism and American Planning: The Conflict of Cultures* (1 edition). New York: Routledge.
- The Kansas Sampler Foundation. (2007). *Wichita Aviation Industry*. Retrieved October 17, 2018, from <https://www.kansassampler.org/8wonders/commerceresults.php?id=131>
- The Reinvestment Fund, & Opportunity Finance Network. (2012). *Searching for Markets: The Geography of Inequitable Access to Healthy & Affordable Food in the United States*. Retrieved from <http://www.hartfordinfo.org/issues/wsd/Health/SearchingForMarketsFullReport.pdf>
- Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H.-B., Choi, Y.-S., ... Joseph, A. (2008). A Review of the Research Literature on Evidence-Based Healthcare Design. *HERD: Health Environments Research & Design Journal*, 1(3), 61–125. <https://doi.org/10.1177/193758670800100306>
- United States Forest Service. (2003). *Multiparty Monitoring and Assessment Guidelines for Community-based Forest Restoration in Southwestern Ponderosa Pine Forests*. Retrieved from [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsbdev3\\_021209.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_021209.pdf)
- US Census Bureau. (2013, 2017). *Estimated percent of all households that rent a home between 2013-2017*. Retrieved March 17, 2019, from PolicyMap website: <https://www.policymap.com/maps>
- USDA ERS. (2018). *Food Environment Atlas*. Retrieved March 14, 2018, from Documentation website: <https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/>
- Walker, R. E., Keane, C. R., & Burke, J. (2010). Disparities and access to healthy food in the United States: A review of food desserts literature. *Health & Place*, 16. Retrieved from [https://ac.els-cdn.com/S1353829210000584/1-s2.0-S1353829210000584-main.pdf?\\_tid=9b3b4aa8-0128-11e8-b135-00000aab0f26&acdnat=1516813635\\_46dd3badf05bdd00e9285f6b53781399](https://ac.els-cdn.com/S1353829210000584/1-s2.0-S1353829210000584-main.pdf?_tid=9b3b4aa8-0128-11e8-b135-00000aab0f26&acdnat=1516813635_46dd3badf05bdd00e9285f6b53781399)
- Warren, D. I. (1978). Explorations in Neighborhood Differentiation. *The Sociological Quarterly*, 19(2), 310–331. <https://doi.org/10.1111/j.1533-8525.1978.tb01173.x>
- Wichita-Sedgwick County GIS. (2018). Retrieved September 21, 2018, from <http://www.wichita.gov/Planning/Pages/default.aspx>

- Widener, M. J., Metcalf, S. S., & Bar-Yam, Y. (2013). Agent-based modeling of policies to improve urban food access for low-income populations. *Applied Geography*, 40. Retrieved from [https://ac.els-cdn.com/S0143622813000283/1-s2.0-S0143622813000283-main.pdf?\\_tid=105cdff8-0139-11e8-8b8c-00000aab0f6c&acdnat=1516820703\\_0814ea98f48dad6dee79e1649ea241b2](https://ac.els-cdn.com/S0143622813000283/1-s2.0-S0143622813000283-main.pdf?_tid=105cdff8-0139-11e8-8b8c-00000aab0f6c&acdnat=1516820703_0814ea98f48dad6dee79e1649ea241b2)
- Yu, X. J., & Ng, C. N. (2007). Spatial and temporal dynamics of urban sprawl along two urban–rural transects: A case study of Guangzhou, China. *Landscape and Urban Planning*, 79(1), 96–109. <https://doi.org/10.1016/j.landurbplan.2006.03.008>
- Zhou, D., Xu, J., Radke, J., & Mu, L. (2004). A spatial cluster method supported by GIS for urban-suburban-rural classification. *Chinese Geographical Science*, 14(4), 337–342. <https://doi.org/10.1007/s11769-004-0038-7>



## Appendix A - Questionnaire

67202\_C025

### Neighborhood Access Survey: Access to Food, Healthcare, and Education



This survey is being conducted by a research team in the Department of Landscape Architecture and Regional & Community Planning at Kansas State University. The project is titled, "A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient," and is funded by the Clarence C. Stein Institute at Cornell University. This project explores two main ideas: (1) how you understand/define your neighborhood, and (2) how you access basic needs in and around your neighborhood, such as, food, healthcare, and education. Your answers will contribute to better community planning principals that prioritizes access to basic needs.

This 15-minute survey will ask you about your neighborhood and about your recent trips to get groceries, to a doctor's appointment and to you or your kids' school. Please have one adult (18 years of age or older) from this household complete this survey. There are no anticipated risks associated with your participation in this study. Everything you tell us will be kept confidential. Your participation in this study is completely voluntary and you can stop at any time without penalty or loss of benefit. **The first 350 participants that complete and return this survey will receive a \$10 gift card.**

**Please complete this survey, place in the provided envelope, and send to the address below by November 1, 2018.**  
 Return Address: *ATTN Neighborhood Access Survey, LARCP, 920 N 17<sup>th</sup> Street, 1086 Seaton Hall, Manhattan, KS 66506*

#### SECTION A. How would you like to receive your \$10 gift card?

The information provided here will be used to deliver your gift card but will not be linked to your survey responses.

**OPTION 1: Fastest method** (approx. 1 week): A one-time email will be sent with a unique code to access your gift card. Please provide your email address: \_\_\_\_\_@\_\_\_\_\_

-OR-

**OPTION 2** (approx. 2-3 Weeks): A physical gift card will be sent to you by mail. Please provide your mailing address:

\_\_\_\_\_

Street Address	City	State	Zip
----------------	------	-------	-----

\*\*Note: The first 350 complete returned surveys are guaranteed a \$10 gift card. Incomplete surveys may not be eligible for gift card. \*\*

#### Questions about this survey can be directed to:

Kansas State University Landscape Architecture and Regional & Community Planning 1086 Seaton Hall, Manhattan, KS 66506 (785) 532-5961 Hyung Jin Kim, Ph.D. Associate Professor <a href="mailto:hyungjin@ksu.edu">hyungjin@ksu.edu</a>	Kansas State University University Research Compliance Office 203 Fairchild Hall, Manhattan, KS 66506 (785) 532-3224 Rick Scheidt, Ph.D. Chair, Committee on Human Subjects <a href="mailto:rscheidt@ksu.edu">rscheidt@ksu.edu</a>
Rial Carver Project Coordinator <a href="mailto:rtcarver@ksu.edu">rtcarver@ksu.edu</a>	Cheryl Doerr Associate Vice President <a href="mailto:cdoerr@ksu.edu">cdoerr@ksu.edu</a>

**SECTION 1.** Use the map below to answer questions 1-7.

- On the map below, draw the boundaries of your neighborhood as you define them? See example for reference.
- What types of features did you use to draw the boundaries of your neighborhood? (Check all that apply.)
  - Administrative boundaries (ex: city, county or township boundary)
  - Building, commercial center, structure
  - Natural features (ex: pond, river, stream, hill)
  - Parks and/or trails
  - Roads
  - School district
  - Other: \_\_\_\_\_
- At its widest, how long would you expect it to take to walk from one side of your neighborhood to the other?  
 \_\_\_ hour \_\_\_ minutes
- On the map below, mark the location that you identify as the neighborhood center with a circle. See example for reference.
- What would you call the center of your neighborhood?
  - a. Home
  - b. School
  - c. Church
  - d. Park
  - e. Civic center
  - f. Shopping center
  - g. Other: \_\_\_\_\_



6. On the map to your left, mark where you live with an asterisk (\*). See example for reference.

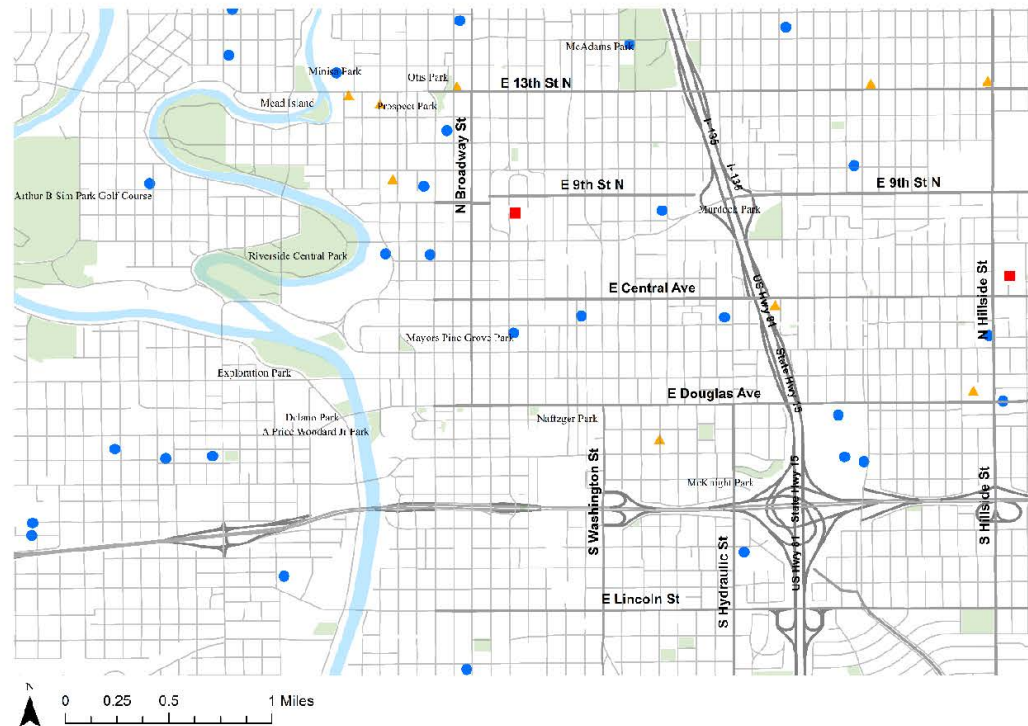
7. What category best describes your neighborhood?
- a. Inner city or downtown
  - b. Suburban
  - c. Small town
  - d. Rural
  - e. Other: \_\_\_\_\_

**EXAMPLE:**

The following questions will ask you about the places you visit most frequently to access basic needs such as food, healthcare and education. These will not necessarily fall within your neighborhood (as identified in Question 1).

**SECTION 2a.** Use the map below to answer questions 8-10.

8. On the map below, identify the location of the food store that you visit most frequently with an (F) (see below example). If you cannot locate this store on the map, please list the closest intersection to this location (for example: intersection of Main Street and 5<sup>th</sup> Avenue): \_\_\_\_\_
9. On the map below, identify the location of the healthcare facility that you visit most frequently with an (HC). If you cannot locate this facility on the map, please list the closest intersection to this location: \_\_\_\_\_
10. Identify the location of the school that you visit most frequently with an (S). This could be a school (preschool – university level) that you or your family attends or works at. If you cannot locate this school on the map, please list the closest intersection to this location: \_\_\_\_\_



**EXAMPLE:**



Note: The locations shown on this map are meant to serve as a reference. This map may not include all schools, food stores, and healthcare facilities in the area.

**Legend**

- Schools
- ▲ Food Stores
- Healthcare Facilities



**17. How satisfied are you with your level of access to the location where you do the following? Check one per column.**

	Go Grocery Shopping	Go to medical Appointment	Go to (your kids') school
Very satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neither satisfied or dissatisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dissatisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very dissatisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**18. Please describe the food store where you most frequently purchase groceries:**

- |                                  |  |
|----------------------------------|--|
| a. Convenience Store/Gas Station | f. Natural Food Store                    |
| b. Dollar Store                  | g. Mobile Market                         |
| c. Ethnic Market                 | h. Supermarket/Grocery Store             |
| d. Farmer's Market               | i. Wholesale Store (Costco, Sam's, etc.) |
| e. Food Pantry                   | j. Other: _____                          |

**19. Please describe the healthcare facility where you most frequently receive medical care:**

- a. Dentist  
 b. Eye Doctor  
 c. General Practitioner or Family Doctor  
 d. Mental Health Provider  
 e. Specialist (Allergist, Dermatologist, Chiropractor, etc.)  
 f. Other: \_\_\_\_\_

**20. Please describe the type of school you visit most frequently:**

- a. Daycare, preschool or pre-kindergarten  
 b. Elementary school (k-5)  
 c. Middle School (6-8)  
 d. High School (9-12)  
 e. Technical college, university or other higher education  
 f. Other: \_\_\_\_\_  
 g. N/A

**21. What challenges do you face in getting to the food store where you most frequently purchase groceries (ex: inconvenient location)? What would you do to improve your experience getting to this grocery store?**

\_\_\_\_\_

**22. What challenges do you face in getting to the healthcare facility that you visit most frequently (inconvenient office hours)? What would you do to improve your experience getting to this healthcare facility?**

\_\_\_\_\_

**23. What challenges do you face in getting to the school that you visit most frequently (ex: distance from work)? What would you do to improve your experience getting to the school?**

\_\_\_\_\_

**SECTION 3.** The following questions will ask you about your neighborhood.

**24. How long have you lived in your current neighborhood?**

- a. Less than 1 year  
 b. 1-5 years  
 c. 6-10 years  
 d. 11-15 years  
 e. 16-20 years  
 f. More than 20 years

**25. Why did you choose to live in this neighborhood (select all that apply)?**

- |  |   |
|--|---|
| <input type="checkbox"/> Housing Price                   | <input type="checkbox"/> Quality of school system |
| <input type="checkbox"/> Neighborhood quality            | <input type="checkbox"/> Close to work            |
| <input type="checkbox"/> Crime and safety                | <input type="checkbox"/> Close to school          |
| <input type="checkbox"/> Amenities (e.g., parks, trails) | <input type="checkbox"/> Other: _____             |

**SECTION 2b.** Please answer the following questions about the places that you identified on the map in section 2a.

**11. Where do you usually start from when you travel to the locations where you do the following? Check one per column.**

	Go Grocery Shopping	Go to medical Appointment	Go to (your kids') school
From home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
From work or school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
From child's school or activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If other, please explain:			
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**12. How do you typically travel to the location where you do the following? Check one per column.**

	Go Grocery Shopping	Go to medical Appointment	Go to (your kids') school
Drive/ride in car	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicycle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If other, please explain:			
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**13. Who do you usually make this trip with? Select all that apply.**

	Go Grocery Shopping	Go to medical Appointment	Go to (your kids') school
By myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With my child(ren)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With spouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With friend(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If other, please explain:			
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**14. How long does it usually take you to travel to the location where you do the following?**

Go grocery shopping: \_\_\_\_\_ Hours \_\_\_\_\_ Minutes  
 Go to medical appointment: \_\_\_\_\_ Hours \_\_\_\_\_ Minutes  
 Go to (your kids') school: \_\_\_\_\_ Hours \_\_\_\_\_ Minutes

**15. How frequently do you typically do the following activities? Check one per column.**

	Go Grocery Shopping	Go to medical Appointment	Go to (your kids') school
Daily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-6 times per week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Weekly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-3 times per month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monthly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-11 times per year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yearly or less	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**16. How long ago did you travel to the location where you most frequently do the following? Check one per column.**

	Go Grocery Shopping	Go to medical Appointment	Go to (your kids') school
Today or yesterday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Within the last week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Within the last month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Within the last 6 months	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Within the last year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**26. Are you planning to move from your current neighborhood (select one)?**

Yes \_\_\_\_\_ No (continue to question 28)

Please explain why: \_\_\_\_\_

**27. If yes to question 26, what type of neighborhood would you like to move to?**

- a. Inner city or downtown
- b. Suburban
- c. Small town
- d. Rural
- e. Other: \_\_\_\_\_
- f. N/A

**SECTION 4:** Please provide some information about yourself and your household.

**28. How many vehicles do you have in your household?**

\_\_\_\_\_ vehicle(s)

**29. Do you currently have health insurance?**

- a. Yes, a plan through my/my spouse's employer
- b. Yes, a plan I purchased myself
- c. Yes, Medicare
- d. Yes, Medicaid
- e. No
- f. Other: \_\_\_\_\_

**30. Do you have an ongoing or serious health problem that requires frequent medical care?**

Yes \_\_\_\_\_ No \_\_\_\_\_ Prefer not to say \_\_\_\_\_

**31. What is your gender (circle one)?**

Female \_\_\_\_\_ Male \_\_\_\_\_ Prefer not to say \_\_\_\_\_

**32. What is your marital status?**

- a. Single (never married)
- b. Married, or in a domestic partnership
- c. Widowed
- d. Divorced
- e. Separated
- f. Prefer not to say

**33. What is your age?**

- a. 18-24
- b. 25-34
- c. 35-44
- d. 45-54
- e. 55-64
- f. 65-74
- g. 75 and above

**34. What is the highest level of schooling you have completed?**

- a. Less than high school
- b. High school graduate or equivalency
- c. Some college, no degree
- d. Associate's degree
- e. Bachelor's degree
- f. Graduate degree or more

**35. What is your race? Check all that apply.**

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Pacific Islander
- White/Caucasian
- Other: \_\_\_\_\_

**36. Are you of Hispanic, Latino, or Spanish origin (circle one)?**

Yes \_\_\_\_\_ No \_\_\_\_\_

**37. How many children under the age of 18 live in your household?**

0 \_\_\_\_\_ 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5+ \_\_\_\_\_

**38. In your household, how many children are currently enrolled in school (k-12)?**

0 \_\_\_\_\_ 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5+ \_\_\_\_\_

**39. What is your total annual household income, before taxes?**

- a. Less than \$20,000
- b. \$20,000 - \$34,999
- c. \$35,000 - \$49,999
- d. \$50,000 - \$74,999
- e. \$75,000 - \$99,999
- f. \$100,000+
- g. Not Sure
- h. I prefer not to answer

Thank you for completing this survey!  
Don't forget to complete **Section A** on the first page to receive your \$10 gift card. Please place this completed survey into the provided envelope and send by **November 15, 2018**.

## Appendix B - IRB Approval



University Research Compliance Office

TO: Dr. Hyung Jin Kim  
Landscape Architecture/Regional and Community Planning  
1102 Seaton Hall

Proposal Number: 9402

FROM: Rick Scheidt, Chair   
Committee on Research Involving Human Subjects

DATE: 08/23/2018

RE: Proposal Entitled, "A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

TO: Dr. Hyung Jin Kim  
Landscape Architecture/Regional and Community Planning  
1102 Seaton Hall

FROM: Rick Scheidt, Chair   
Committee on Research Involving Human Subjects

DATE: 09/24/2018

RE: Proposal #9402.1, entitled "A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient."

A MINOR MODIFICATION OF PREVIOUSLY APPROVED PROPOSAL #9402, ENTITLED, "A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient."


The Committee on Research Involving Human Subjects at Kansas State University has approved the proposal identified above as a minor modification of a previously approved proposal, and has determined that it is exempt from further review. This exemption applies only to the most recent proposal currently on file with the IRB. Any additional changes affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Unanticipated adverse events or problems involving risk to subjects or to others must be reported immediately to the IRB Chair, and / or the URCO.

It is important that your human subjects project is consistent with submissions to funding/contract entities. It is your responsibility to initiate notification procedures to any funding/contract entity of changes in your project that affects the use of human subjects.



TO: Dr. Hyung Jin Kim  
Landscape Architecture/Regional and Community Planning  
1102 Seaton Hall

FROM: Rick Scheidt, Chair   
Committee on Research Involving Human Subjects

DATE: 11/06/2018

RE: Proposal #9402.2, entitled "A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient."

A MINOR MODIFICATION OF PREVIOUSLY APPROVED PROPOSAL #9402.1, ENTITLED, "A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient."

The Committee on Research Involving Human Subjects at Kansas State University has approved the proposal identified above as a minor modification of a previously approved proposal, and has determined that it is exempt from further review. This exemption applies only to the most recent proposal currently on file with the IRB. Any additional changes affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Unanticipated adverse events or problems involving risk to subjects or to others must be reported immediately to the IRB Chair, and / or the URCO.

It is important that your human subjects project is consistent with submissions to funding/contract entities. It is your responsibility to initiate notification procedures to any funding/contract entity of changes in your project that affects the use of human subjects.

## **Appendix C - Research Proposal**

Clarence S. Stein Institute for Landscape and Urban Studies  
2018 Grant Funding Program  
Category B: Support for Student Research

**Title:** A beautiful day in these neighborhoods: variations in access to school, food, and healthcare in neighborhoods along an urban to rural gradient.

### **Principal Investigator**

**Rial Carver**, Graduate Student  
Masters in Regional and Community Planning  
Kansas State University  
[rtcarver@ksu.edu](mailto:rtcarver@ksu.edu)

Faculty Advisor

**Hyung Jin Kim**, Ph.D., Assistant Professor  
Landscape Architecture and Regional & Community Planning  
Kansas State University  
[hyungjin@ksu.edu](mailto:hyungjin@ksu.edu)

## **Abstract**

The neighborhood unit concept and New Urbanist principles have paved the way in promoting intentional neighborhood design with emphasis on walkability and public space. While these tenets of urban planning have been implemented successfully, most examples are found in urban areas (Garner & Raudenbush, 1991; Matheson et al., 2006; Southworth & Owens, 1993). The interest of this research is to explore the differences in neighborhood forms, characteristics, and access to basic needs (i.e. school, food, and health) along an urban to rural gradient, focusing on behavioral patterns of residents within neighborhoods situated in distinct environments. Specifically, this study aims to identify the differences in (1) people's perceived neighborhood center and boundaries, and (2) access to basic needs (i.e., locations and travel patterns related to school, food environment and primary health care) from selected neighborhoods along an urban to rural gradient in the Wichita, Kansas, metropolitan and micropolitan area. This study will use the survey method, incorporated with GIS, cognitive mapping, and travel diaries. Clarence Stein worked closely with Clarence Perry and Henry Wright in reimagining neighborhoods. Neighborhoods like Radburn and Greenbelt are gleaming examples of planned neighborhood concepts (Lloyd Lawhon, 2009; C. S. Stein, 1949). This research will build upon the work of Stein, Perry and others, and provide understanding of how planned neighborhood concepts manifest themselves in today's neighborhoods. This understanding will lead to a broader understanding of best practices for planners working in all types of communities from urban to rural.

## **Background and Significance**

### The neighborhood unit as planned community:

At the dawn of the 20<sup>th</sup> century, American cities were becoming known as places of squalor and filth (Heale, 1976; Richardson, 1970). Out of this urban crisis emerged social reformers that included urban planners like Clarence Stein, Henry Wright, and Clarence Perry (Lloyd Lawhon, 2009). During this time, Perry established the neighborhood unit concept as a response to the need to improve urban conditions. The neighborhood unit concept recommended a set of physical design characteristics including: (1) a residential area bound by arterial streets that “define and distinguish the ‘place,’” (2) internal streets designed to minimize through traffic, (3) neighborhood institutions like schools and community centers located centrally, (4) local shopping amenities found along the periphery of the neighborhood, and (5) ten percent of the neighborhood area set aside for parks and open space (Perry, 1929).

Clarence Stein, a leading planning and architect at the time, said, “the house itself is of minor importance. Its relation to the community is the thing that really counts” (C. Stein, 1930). Perry, Wright, Stein, partnered in designing new types of neighborhoods, emphasizing the importance of encouraging social life through physical design of neighborhoods. Their work has had a lasting legacy on the planning profession.

Criticisms of the neighborhood unit concept have pervaded since its development. These concerns focused on the homogeneity of residents, and disagreement with the physical determinism of Perry’s neighborhood design (Ellis, 2002). Starting in the early 21<sup>st</sup> century, New Urbanist planners began to imagine alternatives like Transit Oriented Development and Smart Growth (Park, 2017). Key components of New Urbanist design include increased density, mixed use development, smaller blocks, connected streets, access to transit, and provision of open spaces and public realms (Park, 2017). Some believe that the neighborhood unit concept and New Urbanist principles are simply different iterations of the same idea (Lloyd Lawhon, 2009). While notions like the neighborhood unit concept and New Urbanism have evolved over time, these designs do not address all types of neighborhoods (Ellis, 2002; Park, 2017). Much of the existing neighborhood level research has focused on urban neighborhoods (Garner & Raudenbush, 1991; Matheson et al., 2006; Southworth & Owens, 1993); however, a diversity of neighborhood types exist. Neighborhoods can be planned or unplanned, urban or rural, but they are all part of a larger urban system. Understanding the perceptions of varying neighborhood types can provide insight into effective neighborhood planning strategies.

### The urban to rural transect as an analytical tool:

In 2002, Duany and Talen proposed the concept of transect planning as a method to eliminate urban sprawl (Duany & Talen, 2002). Duany and Talen’s concept offered an alternative to Euclidean Zoning, zoning based on the separation of uses, which they felt was the crux of urban sprawl (Duany & Talen, 2002). Since the introduction of transect planning, rather than being used as a planning and development tool, the transect approach has been used most as an analytical tool by a range of professionals (Bell, 1992; Hahs & McDonnell, 2006; Long, Heilig, Li, & Zhang, 2007; Sallis et al., 2006; Yu & Ng, 2007).

Stemming from an ecological approach, the transect approach aims to explain patterns by understanding the environment in which these patterns occur (Sallis et al., 2006). In forestry, the transect is “a line, laid on the forest floor,” used to measure the distribution of species within a certain distance (United States Forest Service, 2003). It would be difficult to measure each tree in the forest, but by measuring ecological transects, researchers gather a representative understanding of the forest health and ecology. Monitoring transects over time can provide insight into patterns of change within an environment (Connell, Hughes, & Wallace, 1997). General consensus agrees that ecological systems gradually change in a logical progression, creating distinct regions as they evolve (Talen, 2002).

In reality, development patterns often happen on a continuum of urban to suburban to rural. This research will utilize the idea of a neighborhood unit to understand differences in perceptions of neighborhood centers and boundaries, mobility patterns, and existing infrastructure along an urban to rural gradient.

### **Research Question**

The neighborhood unit concept and New Urbanist principles have paved the way in promoting intentional design of neighborhoods with concepts like walkability and public space at their core. Both the neighborhood unit concept and new urbanist principles have primarily been applied to the same setting, that of the urban environment (Garner & Raudenbush, 1991; Matheson et al., 2006; Southworth & Owens, 1993). This research will explore the differences in perceived neighborhood forms, characteristics, and access to basic needs (i.e. school, food, and health) in five different neighborhoods along an urban to rural gradient. The question remains as to how do planned neighborhood concepts account for the context of the physical setting of neighborhood? Do urban, suburban, and rural residents classify their neighborhood centers and boundaries similarly? What patterns do residents exercise in order to reach their basic needs of school, food and healthcare? A better understanding of how prevalent neighborhood design principles apply to varying neighborhood types will provide planners with better tools to plan neighborhoods along the urban to rural gradient.

### **Specific Aims**

The specific aims of this research are: (Aim # 1) to identify differences and similarities in perceived neighborhood boundaries and center among different neighborhood zones along an urban to rural transect, (Aim #2) to identify differences and similarities in access to school, food and primary healthcare among different neighborhood transect zones; and (Aim #3) to explore the contextual factors related to the observed differences in neighborhood characteristics and access to basic needs.

### **Study Approach**

The research will explore the existence of neighborhood centers along an urban to rural transect, hereafter referred to as the transect, and mobility patterns therein. This study will use a mixed methods approach. Approval from the Kansas State University Internal Review Board (IRB) will be completed prior to the data collection phase of this study. The transect approach will be used as a tool to compare neighborhood types. Data will be collected through a paper

survey. Survey results will be correlated with secondary data to further explore neighborhood patterns. These variables will be collected from secondary data sources such as ESRI Business Analyst and the United States Census Bureau.

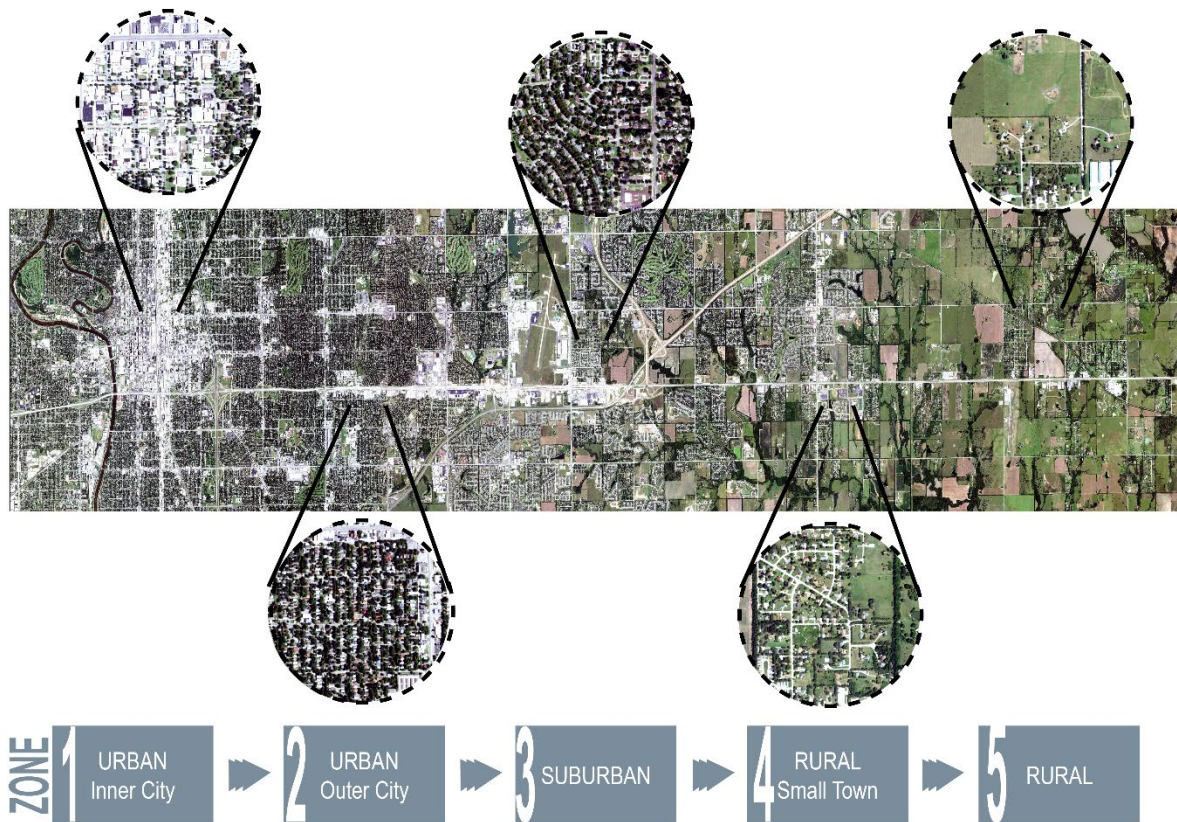
The intermediate outcome of this research is to provide a framework for understanding the neighborhood as it exists within a range of population densities, or zones. Neighborhood transect zones will be created within the scope of this project and will be used as the primary unit of comparison. The study area for this project will be a representative urban to rural transect in South-Central Kansas. The transect will include a metropolitan city as its urban core and radiate into progressively less dense areas. The transect will cover approximately 15 miles. The anticipated workflow for this research is outlined in Figure 1.



**Figure 1.** Diagram of anticipated project work flow.

### Study Design

Respondents that live along the identified urban-to-rural transect will receive a mail survey. The Every Door Direct Mail tool provided by the United States Postal Service (USPS) will be used to determine a representative sample of addresses. The survey questionnaire will include questions related to mapping one's neighborhood as well as reporting travel patterns related to access to basic needs (school, food and health care). The mapping component of the survey questionnaire will ask respondents to draw their neighborhood boundary and identify their neighborhood center. The travel diary component of the survey questionnaire will include questions on location, trip distance and duration for commuting to school, grocery shopping and accessing primary health care services.



**Figure 2.** A representation of neighborhood transect zones within and outside of Wichita, KS. Transect is scaled at 1:125,000. Transect zones are scaled at 1:5,000. (Carver, 2018)

The entire survey data will be geocoded and used for identifying participants’ perceptions about the center and boundary of their neighborhood. The geocoded data will be used to show how perceptions along the transect differ. The locations logged in each travel diary will be geolocated to show the mobility patterns of respondents living in different transect zones. Each unique zone will be used as the unit of analysis to determine how different mobility patterns are among transect zones.

Secondary data like population, income, age will be incorporated with the survey data to better understand socio-physical environments of neighborhoods. A complete list of anticipated variables and methods of measurement for this study can be seen in Table 1. Data sources will include ESRI Business Analyst, the American Community Survey and the Decennial Census. ArcGIS Software will be used to map this data.

**Table 1.** Study variables and methods of measurement.

Variable	Measurement or data source
----------	----------------------------

Dependent Variable	Differences in neighborhood form	Survey and cognitive mapping, GIS data (Aim #1)
	<ul style="list-style-type: none"> <li>• Perceived neighborhood boundaries and</li> <li>• Perceived neighborhood center</li> </ul>	
	Differences in access (location and distance) to basic needs	Survey and cognitive mapping, GIS data (Aim #2)
	<ul style="list-style-type: none"> <li>• Commuting (school)</li> <li>• Food environment (grocery store)</li> <li>• Primary healthcare</li> </ul>	
Independent Variable	Neighborhood Transect Zones	GIS spatial analysis, (Aim #1 and #2)
	<ul style="list-style-type: none"> <li>• Zone 1: Urban - Inner City</li> <li>• Zone 2: Urban - Outer City</li> <li>• Zone 3: Suburban</li> <li>• Zone 4: Rural - Small town</li> <li>• Zone 5: Rural</li> </ul>	
	Other Explanatory Variables:	American Community
	Socioeconomic Factors:	Survey, Decennial Census, ESRI Business Analyst (Aim #1, #2 and #3)
	<ul style="list-style-type: none"> <li>• Population</li> <li>• Population Density</li> <li>• Income</li> <li>• Race</li> <li>• Ethnicity</li> <li>• Age</li> </ul>	
	Environmental Factors:	
	<ul style="list-style-type: none"> <li>• Land use mix</li> <li>• Urban form</li> <li>• Street density</li> </ul>	

### Data Analysis Plan

Spatial analysis of the selected transect will be used to determine the neighborhood transect zones. Descriptive statistics and bivariate analyses will be used to identify differences in neighborhood forms (Aim #1) and in access to basic needs (Aim #2) among the five



neighborhood transect zones by using ANOVAs and Chi-squared tests. Multivariate modeling will be performed for identifying the key explanatory variables that may affect the differences in neighborhood characteristics and accessibilities among the five neighborhood transects (Aim #3). Standard diagnostics will be performed to ensure the validity of statistical modeling being used.

**IRB and Human Subject**

This research involves human subjects and will be reviewed by the Institutional Review Boards (IRB) at Kansas State University. IRB approval will be secured prior to any data collection. All information obtained from the survey will be confidential and that participation will be voluntary.

**Expected Outcomes and Deliverables**

At the conclusion of this research, a final report will be written and shared with the Stein Institute. The report will include detailed description of the methods, results, and discussion of implications for the planning profession and future research. From the report, a manuscript will be submitted to a refereed journal. This research is part of a master’s thesis project that will be shared internally in the Landscape Architecture and Regional & Community Planning department. The research will also be shared more broadly through the American Planning Association’s 2019 National Planning Conference or by visiting the Stein Institute to offer a seminar presentation. A table including the anticipated outcomes and timeline is included in Table 2.

**Table 2.** Anticipated Timeline of Project Outcomes

<b>Outcome</b>	<b>Date</b>
Final Report	May 2019
Journal Manuscript	August 2019
Presentation at National Planning Conference or Seminar presentation at Stein Institute	May 2019