

## D.08 - Health Impact Assessment





# ***Connectivity and Equity***

A health impact assessment

# Acknowledgements

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## Our Mission

**This health impact assessment report reviews public health trends regionally and locally to identify policy changes that could positively improve community health. By analyzing, coordinating, and implementing effective projects, plans, and policies, MCCOG and its municipal partners can enhance positive health outcomes.**



**MCCOG**  
A Metropolitan Planning Organization



# Executive Summary



# Executive Summary

## Planning & Health

The role of the built environment and how it affects health outcomes has recently garnered increased attention from both public health and planning professionals. By using Health Impact Assessments (HIA) to better understand health trends, planners can concentrate their efforts to address increasing health disparities by identifying projects that will positively impact those trends.

The Center for Disease Control and Prevention (CDC) describes a Health Impact Assessment as “a process that helps evaluate the potential health effects of a plan, project, or policy before it is built or implemented.” HIAs consider potential positive and negative public health impacts as part of decision-making processes that fall outside of traditional public health arenas, such as transportation and land use planning.

By conducting an HIA, MCCOG aims to ensure that people of all groups, abilities, and income levels can benefit from the health improvement opportunities provided through transportation-related investments that incorporate design elements that support healthy lifestyles.

Figure 1.1 Health trends of MPA

| Physical Inactivity |      |      |      |
|---------------------|------|------|------|
| County              | 2014 | 2015 | 2016 |
| Hancock             | 26%  | 24%  | 24%  |
| Delaware            | 28%  | 24%  | 27%  |
| Madison             | 27%  | 28%  | 31%  |
| Obesity             |      |      |      |
| Delware             | 32%  | 29%  | 31%  |
| Hancock             | 34%  | 32%  | 36%  |
| Madison             | 36%  | 37%  | 39%  |
| Diabetes            |      |      |      |
| Delware             | 10%  | 10%  | 10%  |
| Hancock             | 12%  | 13%  | 12%  |
| Madison             | 11%  | 11%  | 16%  |

## Scoping Health Trends & Indicators

Research shows three (3) dominant health trends in the Anderson MPA that can be impacted by changes in the built environment and associated policies. These trends included: Physical inactivity, obesity, and diabetes.

The trends establish a base line for understanding the current condition of public health in the Anderson MPA, but additional factors must be considered to understand how MCCOG can influence them. Health indicators were chosen after extensive research to provide a deeper understanding between the built environment and its effect on various aspects of health. Some of the indicators analyzed included: exercise opportunities, poverty level, age, minority status, SNAP recipients, and health insurance.

## Scoping Connectivity & Vulnerability

To gain further insight on where improvement efforts should be concentrated, MCCOG conducted a 3-step analysis. The first step was to build and use a Walk Access Tool, to measure how accessible certain destination types were by walking. The second step was to use a Health Vulnerability Index (HVI) by combining socioeconomic characteristics from American Community Survey (ACS), that were associated with greater health risks to identify areas with populations with high vulnerability. The third step was to then overlay the Health Vulnerability Index with the Walk Access Tool results.

### Step 1: Walk Access

The MCCOG Walk-Access Tool uses a network-based buffer to estimate the population, households, and employees within a set Walk Time (5-minutes, 10-minutes, 20-minutes) of six (6) Destination Types.

The analysis revealed low levels of accessibility for five (5) out of the six (6) Destination Types in relation to the estimated population.

# Executive Summary

## Scoping Connectivity & Vulnerability

Figure 1.2 Destination type walk access comparison

| Destination (s)          | % Population<br>20-minute walk | % Employees<br>20-minute walk |
|--------------------------|--------------------------------|-------------------------------|
| Parks                    | 30%                            | 36%                           |
| Government<br>services   | 24%                            | 33%                           |
| Grocery & food<br>stores | 23%                            | 30%                           |
| Schools                  | 21%                            | 28%                           |
| Bus stops                | 20%                            | 27%                           |
| Primary care             | 15%                            | 23%                           |

### Step 2: Health Vulnerability

From the Health Vulnerability Index (HVI), results indicated a significant percentage of the minority population residing on the west side of Anderson, as well as vulnerable populations to the north and south, which may be due to the high percentage of those who are uninsured or under the poverty line. Because there is a higher risk to develop certain health trends in these areas, it can be assumed that these areas may be experiencing higher levels of physical inactivity, obesity, or diabetes.

### Step 3: Vulnerability & Access Comparison

After overlaying the HVI with the Walk Access Tool, results revealed the areas around the city of Anderson, as well as the parts of northern Madison County near the cities of Elwood and Alexandria, had distinct concentrations of both specific socioeconomic characteristics and low accessibility. One example where the low levels of accessibility could be visualized was the lack of access and number of grocery & food store locations on the west side of Anderson. Analysis showed that there was a distinct lack of sidewalks and trails available, and from the HVI, a high concentration of minorities, population

below the poverty line, and receiving SNAP benefits.

Furthermore, MCCOG found that of the populations most significantly impacted from the low levels of walk accessibility were those who are: below the poverty line, minority, live in a household with no vehicle available, and age 60 years and older.

## Recommendations

Following the findings and conclusions made from the walk access analysis, MCCOG prepared recommendations and next steps post-HIA that the MPO could follow. Four (4) goals were proposed and were split into eight (8) objectives and 29 action steps which would build a stronger, healthier, and more equitable region by improving the built environment, as well as the planning and decision-making process of municipalities and the MPO.

**Goal 1: Enhance multi-model connectivity within the transportation system.**

**Goal 2: Encourage development that improves community connectivity and accessibility.**

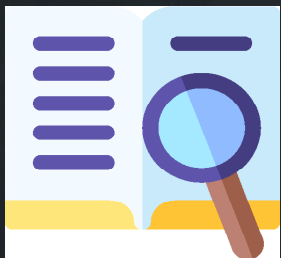
**Goal 3: Expand efforts to better utilize health-related data.**

**Goal 4: Improve policies on health-related issues that affect transportation planning process.**

It is the intent of MCCOG to integrate the results of this HIA into every decision moving forward such as the project selection process. To further monitor health trends and ensure an accurate understanding of current community health, MCCOG will update this HIA at least every five (5) years. The ongoing review of these trends will be important to ensure future proposed projects or plans focus on areas where concentrated effort is necessary to make progressive impacts.



# Introduction



# Chapter 1

## Introduction

### The role of health in planning

Research has shown that where you live, work, and play, influences your overall health. The role of the built environment and how it affects health outcomes has recently garnered increased attention from both public health and planning professionals. From this emerging discussion, planners with their knowledge on the built environments are in the right position to help positively influence public health. Because of increasing disparities within communities, planners can ensure the projects that are being proposed are positively impacting affected populations. Measuring the impacts of a proposed project, plan, or policy is a common responsibility for planners, but for measuring impacts on health, it requires a different tool. One of the tools planners can utilize to measure health trends and their impacts is a Health Impact Assessment (HIA).

### What is a health impact assessment?

The Center for Disease Control and Prevention (CDC) describes a Health Impact Assessment (HIA) as “a process that helps evaluate the potential health effects of a plan, project, or policy before it is built or implemented...”. More specifically, an HIA is a public health assessment tool that considers potential positive and negative public health impacts as part of decision-making processes for plans, projects, and policies that fall outside traditional public health arenas, such as transportation and land use planning. HIA’s rely on scientific data, health expertise, and community input to build an assessment of health effects within certain regions or population groups. They also provide practical, evidence-based recommendations that will increase positive health effects, yet also minimize those that are negative.

However, an HIA is not the only public health assessment tool. Others include Community Health Assessments, Human Health Risk Assessments, and Public Health

Assessments. A Community Health Assessment (CHA) is an examination of the health status indicators of a given population that can be used to identify problems and assets in a community. Unlike an HIA, a CHA only reviews the potential effects of a policy, program, or plan, on health indicators. CHA’s are usually researched and compiled by public health professionals with the goal of addressing and improving health trends. For both the Human Health Risk Assessments (HHRA) and Public Health Assessments (PHA), the HHRA and PHA are conducted for the purpose of examining and evaluating the implications of exposure to certain environmental conditions or chemical contaminations.

### Why conduct a health impact assessment?

The Anderson MPO is involved in the planning and implementation of numerous projects, policies, and programs at both the local and regional level. These projects have lasting effects on the built environment in communities within the Anderson MPA, including public health. The built environment is important to consider as it is the environment that affects all aspects of our lives, from the buildings we work and live in, the distributions systems for amenities like water and sewer, recreational spaces, and the transportation systems that help us get from one destination to another.

Through various planning processes and organizational policies, the Anderson MPO regularly responds to issues and feedback from residents. This community-based input allows the Anderson MPO to invest its resources towards communities and their environments and in turn, generate new, resilient, and accessible transportation opportunities within the Anderson MPA.

While these investments may result in better streets, sidewalks, and options for transportation; it also means people have the chance to see their community grow in a healthy and equitable manner. By conducting an

# Chapter 1

## Introduction

HIA, the Anderson MPO will ensure that people of all groups, abilities, and income levels will be able to enjoy the new opportunities and amenities of transportation-related investments. Furthermore, by coordinating and collaborating with community leaders and elected officials, the Anderson MPO can assist in the implementation of the HIA. Once implemented, the HIA can provide valuable information that can be used during local decision-making processes and present options to improve and expand existing or planned projects that results in a “Complete Street” to ensure the end-product will be functional for all residents and visitors.

### What are “complete streets”

Complete streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit rides of all ages and abilities. Complete streets make it easy to cross the street, walk to shops, and bicycle to work.



Image from New Jersey Walk & Bike Coalition

## Methodology

When using an HIA to measure health impacts, there are several types that can be utilized. According to the Health Impact Assessment Quick Guide, each type pertains to a certain format, timeframe, and its depth of research. The overall goal of improving health remains central to each format and allows planning or government organizations to conduct a study that meets the needs of their timeline, personnel, and resources. The three (3) different types of HIAs include:

- **Rapid** - A brief investigation of health impacts that involves the exchange of existing knowledge and data from previous literature and is produced with the use of minimal resources.
- **Intermediate** - An in-depth examination of health issues and impacts that requires analysis of other HIAs and Community or Environmental Assessments conducted by other health agencies.
- **Comprehensive** - An intensive investigative process of health impacts using previous literature, collecting, and analyzing new information, and collaborating with community members.

# Chapter 1

## Methodology

Based on the timeframe and data available for the Anderson Metropolitan Planning Area (MPA), this HIA follows the Intermediate HIA Process. Because more information could not be collected from community residents due to time restraints, this HIA did not investigate other health issues like a Comprehensive HIA format specifies. Regardless of the format or topic, all HIAs follow five (5) steps to guide an organization through a careful and effective process:

- 1) **Screen** - identifying the plan, project, or policy decisions for which an HIA would be useful.
- 2) **Scope** - planning the HIA and identifying what health risks and benefits to consider.
- 3) **Recommend** - suggesting practical actions to promote positive health effects and minimize negative health effects.
- 4) **Report** - presenting results to decision makers, affected communities, and stakeholders.
- 5) **Monitor & Evaluate** - determining the HIA's impact on decisions and health status.

### SCREENING

During the screening process, it was determined that this HIA would not be used to assess a specific project, but instead show why an HIA was important in understanding health trends and how planning efforts could improve them. By reviewing health trends and certain health

indicators within the Anderson MPA, future projects can be reexamined to lessen any potential consequences.

### SCOPING

Research shows three (3) dominant health trends in Indiana can be impacted by changes in the built environment and associated policies.

- Physical Inactivity
- Obesity
- Diabetes

Further research shows that within the state, certain factors were likely contributing to these health trends, such as income, housing, education, race/ethnicity, and age. To better understand why physical inactivity, obesity, and diabetes was prevalent within the state further review of specific health indicators was conducted.

Health indicators, as described by the CDC, are measurable characteristics that describe the health of a population, specific determinants of health, and their access to healthcare, as well as its cost and quality. Per the CDC's description, health behaviors, health risks factors, and both the physical and socioeconomic environment are considered determinants of health. For this HIA, determinants of health and other indicators were closely analyzed to reveal correlations with health trends and provide some explanation of their recent patterns.

# Chapter 1

## Methodology

The indicators that were observed for this HIA include:

- Mode Choice
- Safety Level
- Trail Availability
- Bike-Share programs
- Exercise Opportunities
- Poverty Level
- Age
- Minority Status
- SNAP Recipients
- Food Insecurity
- Physician Availability
- Diabetic Support
- Health Insurance

To further analyze these health indicators and the socioeconomic conditions linked to these health indicators, the following websites were used: Stats Indiana, Indiana Indicators, United Health Foundations American Health Rankings, Indiana State Department of Health, Indiana Criminal Justice Institute Crash Statistics, Federal Highway Administration, Indiana Department of Transportation, Indiana Department of Natural Resources, Robert Wood Johnson Foundation County Health Rankings, Savi, American Planning Association,

and Centers for Disease Prevention and Control. By analyzing the information from these sites, critical knowledge surrounding health was gathered to identify certain health trends affecting the Anderson MPA.

Because most public health data was available only at the national, state, or county level, local health assumptions had to be based on available socioeconomic data by census tract. Therefore, demographic and population data were retrieved from the American Community Survey (ACS) available from the US Census Bureau. In review of the socioeconomic data associated with health, six (6) characteristics were chosen from the ACS based upon supported research and their known link to developing higher risks for certain health conditions. Once gathered, all the data was reviewed, ranked on the weight of its risk on health, and compiled into a Health Vulnerability Index (HVI) to identify any concentration and used to form assumptions of the locations where certain public health concerns may be occurring within the Anderson MPA.

Once concentrations were revealed within the Anderson MPA, an assessment was done regarding the level of accessibility of specific destination points. Measuring the level of access through a Walk Access tool developed by MCCOG could aid in showing which areas may be experiencing limited access to important goods and services. The destinations chosen for this process was based on the amount of activity and use they generated. The destination types that were identified and analyzed included:

# Chapter 1

## Methodology

- Parks
- Grocery & food stores
- Bus Stops
- Primary care facilities
- Schools
- Government Services

Each destination type was measured for its level of accessibility based on existing sidewalk networks. The approach used for analyzing these destination types, their locations, and the sidewalk networks was approached by using a network-based buffer. Because a network-based approach produces a more realistic measure than a standard aerial buffer would provide. The results produced show areas that are lacking in access or in sidewalk infrastructure, as well as reveal potential concentrations of local health trends. Once results from the Walk Access Analysis were thoroughly examined, a final analysis was conducted regarding health impacts and potential effects on local health trends in the Anderson MPA.

### RECOMMENDATIONS

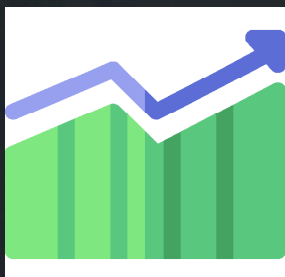
After compiling this data and identifying patterns from each analysis, evidence-based recommendations were proposed on how to improve certain areas, including the overall planning process. Effective ways to improve some of the issues that were identified are borrowed and supported by the American Planning Association (APA). These recommendations cover a range of objectives, such as improving access, transportation, equity, and over methodology for future studies and projects. Overall, the primary objective was to identify specific solutions that enable communities to improve their understanding of the vital connection between health and planning.

### MONITORING & EVALUATING

With more publications in public health and planning showing that planners can be effective in improving public health, MCCOG will continue to monitor and promote planning activities and proposals that benefit the long-term environmental, and physical health of the Anderson MPA. As an MPO, it is imperative to continuously update and improve the methods and tools to better the needs and impacts to the population. This HIA underlines by using and incorporating new tools and methodology in planning and decision-making processes, the general well-being of the Anderson MPA can be better understood, and steps can be identified to make necessary improvements.

While HIA's are used to assess specific projects and their potential impacts on public health, the primary objective of this HIA was to identify health trends, evaluate them, and then identify ways to monitor them in the future. The trends and associated recommendations will be incorporated into the MTP to ensure that they are incorporated into a future project list, as well as any planning policies or other actions to address these potential or existing health-related impacts.

# Health trends & indicators



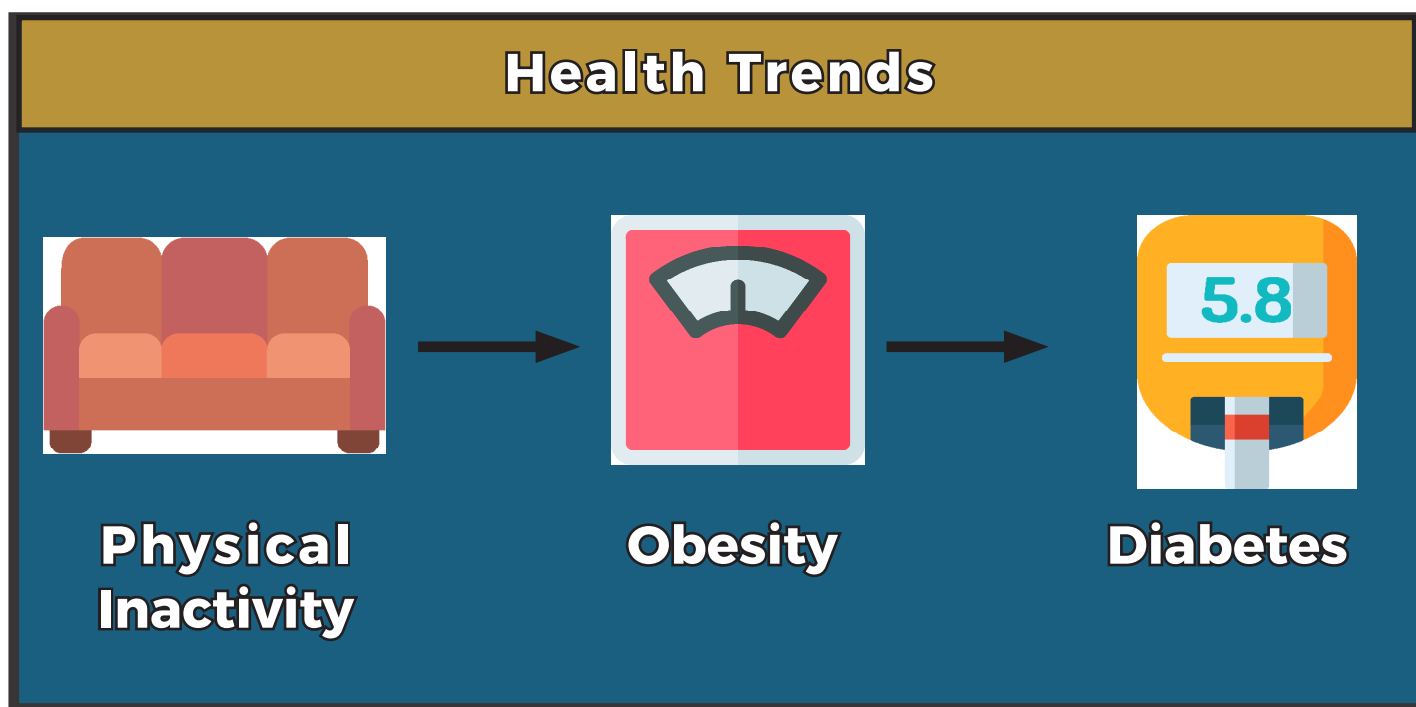
# Chapter 2

## Overview

Before an in-depth analysis can be made, data was gathered on certain health trends and indicators. By identifying the most commonly reoccurring health trends, specific health indicators were chosen and closely examined to then be used for analysis in the next chapter. Health indicators were chosen based on evidence, and their known relation to certain health trends and behaviors to provide a deeper understanding between the built environment and its effect on various aspects of health.

## Health Trends

After thorough research at the state, regional, and local level, three (3) health trends were identified: Physical Inactivity, Obesity, and Diabetes. Data was gathered for a total of ten (10) counties for comparison. Nine of those counties were within the Greater Indianapolis Region, but because the Anderson Metropolitan Planning Area (MPA) encompasses portions of three (3) counties, Delaware County was also included in the analysis area comparison.



# Chapter 2

## Health Trends

### Physical Inactivity

Physical activity is an important element to a healthy lifestyle and a prolonged life span. Experts have noted that being physically active can positively affect bone health, cardiorespiratory and muscular fitness, and cognitive skills. Additionally, being physically active can help lower the risk of chronic diseases such as coronary heart disease, high blood pressure, and type 2 diabetes. Although, health officials agree that at least 30-minutes of moderate physical activity everyday can help minimize these health concerns, only 1 in 4 adults and 1 in 5 high school students meet or exceed this guideline.

While physical activity data is measured at the individual level, it is important for communities to understand this data to adequately respond to decision-making that impacts their local built environment. For instance, the Centers for Disease Prevention and Control (CDC) noted that less than half of the US population lives within one-half mile of a park. In Indiana, physical inactivity has

been increasing steadily and is making decision-makers consider how they can encourage physical activity through changes in the built environment.

In 2018, the Americas Health Rankings (AHR) Report from the United Health Foundation (UHF), identified that 29.8% of Indiana's population was physically inactive, which is 3% higher than in 2017. Furthermore, 31.6% of women were more likely to be physically inactive compared to 27.8% for men. The Indiana Department of Health (ISDH) noted in 2015 that less than 50% of Indiana residents met the moderate physical activity recommendations. They also reported that people who lived in car-dependent environments walked less, weighed more, and suffered more from chronic diseases.

For the analysis area, physical inactivity was identified by the CDC as the dominant health trend for all ten (10) counties, which showed increases from 2014 to 2016. Overall, Madison County had the highest percentage (31%) of physical inactivity in 2016.

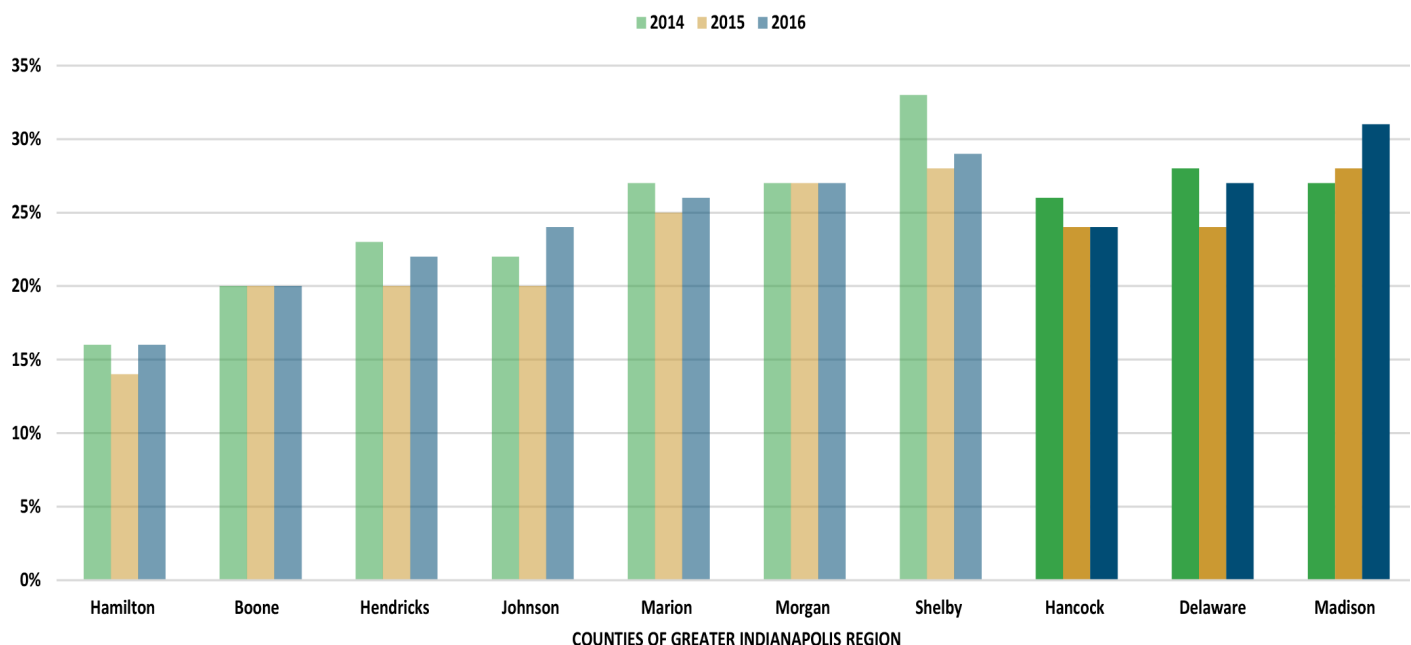


Figure 2.1 Total percentage of physically inactive adults age 20 years and older, 2014 to 2016

# Chapter 2

## Health Trends

### Obesity

Based off the National Health and Nutrition Examination Survey (NCHS) from the CDC, in 2017 and 2018 the prevalence of obesity in adults was 42.4%. Research shows that obesity has a drastic effect on overall physical and mental health. Obesity can increase the risk of other health conditions such as: high blood pressure, type 2 diabetes, coronary heart disease, and even some cancers (breast, colon, and liver).

These effects are not only limited to physical health but have also been linked to personal and financial health. In 2005, the Harvard School of Public Health reported that obesity accounts for as much as 21% (\$190 billion) of all US medical expenses annually, which includes both direct and indirect costs. Direct costs include health services (tests, surgery, and therapy), while indirect costs account for resources lost because of a health condition, such as value of lost wages and employer subsidized insurance. While indirect costs are difficult to calculate, a company with an estimated 1,000 employees may lose an estimated \$285,000 per year associated with obesity.

In 2018, the Americas Heath Rankings (AHR) Report stated that the State of Indiana ranked 39<sup>th</sup> in the nation for obesity (33.6% compared to the national average of 31.3%). These statistics showed that there is a high percentage of obesity across all population cohorts but is even higher among certain groups. For example, within Indiana, African Americans showed the highest percentage of obesity (43.5%), for Multiracial, 38.1% were obese, 33.3% were obese for Caucasians, 29.3% for Hispanics, 28.9% amongst American Indian/Alaskan Natives, and 13.9% were obese amongst Asians. The CDC noted that this drastic increase of obesity can be attributed to many different factors, but one that is most significant is the community environment. Barriers within communities can prevent opportunities for residents to encourage healthy habits that can reduce obesity.

Within the analysis area, the CDC indicated that at least 25% or more of the population of each county was identified as obese. Of those ten (10) counties, Madison County had the highest percentage of obesity (39%).

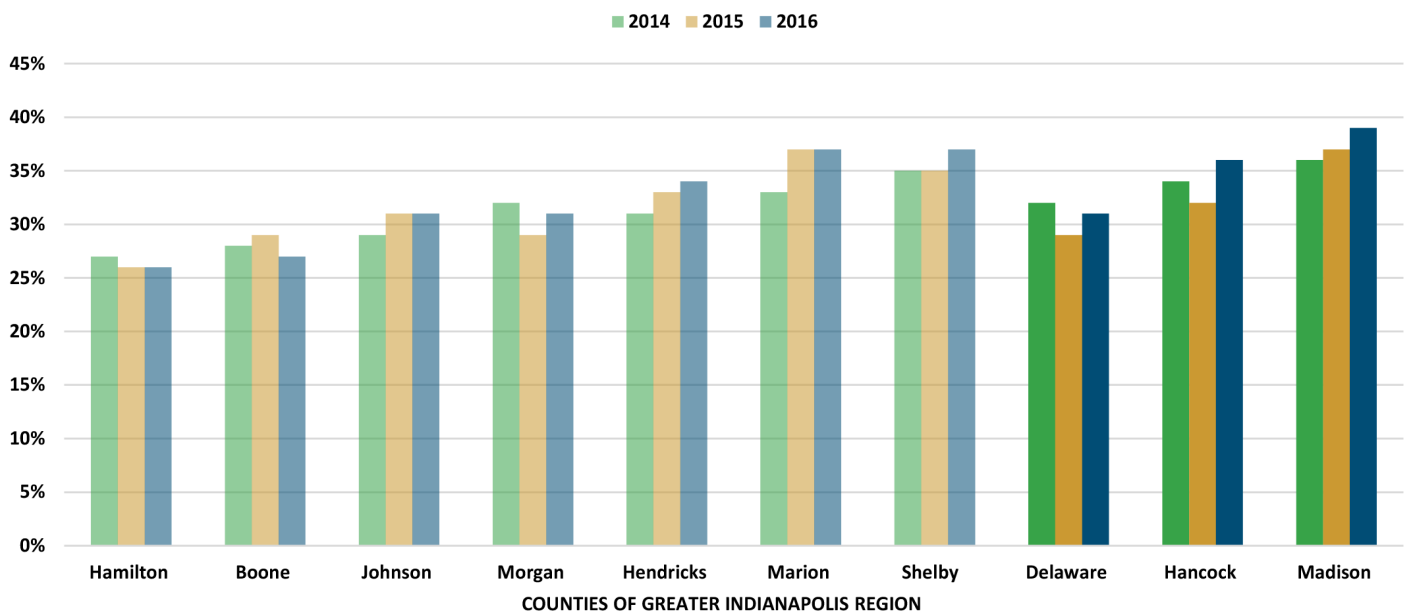


Figure 2.2 Total percentage of obese adults age 20 years and older, 2014 to 2016

# Chapter 2

## Health Trends

### Diabetes

Diabetes has been widely discussed issue in the United States as it has been increasing at an alarming rate. According to the CDC, the 2020 National Diabetes Statistics Report, the number of cases of diabetes increased to 34.2 million, which is 10.5% of the American population. The two most common forms of diabetes are Type 1 and Type 2 diabetes with most people in the United States having type 2. Type 1 is commonly hereditary and is believed to cause by the immune system attack on cells that produce insulin. Unlike, Type 1, Type 2 diabetes occurs when a person begins resisting the effects of the body's insulin and stops its production because of high blood glucose levels. It is believed that it can be caused by medications, diet, and exercise. Obesity, smoking, and lack of exercise are some of the notable risk factors associated with Type 2 diabetes.

It is important to address diabetes because it can lead to further complications such as heart disease, stroke, kidney failure, and even blindness. In 2017, data from the Diabetes Research Institute noted that diabetes was

the 7<sup>th</sup> leading cause of death with an estimated 83,564 deaths having listed as the underlying cause of death. Additionally, in 2017, the estimated cost for diagnosed diabetes in the United States was \$327 billion. It was found that between 2012 and 2017, the medical costs per person with diabetes increased from \$8,417 to \$9,601.

In 2018, the Americas Heath Rankings (AHR) Report showed that 11.8% of Indiana's population had diabetes, which was a .3% increase from 2017. Additionally, males showed a slightly higher percentage of persons with diabetes (12.4%) than females (11.3%). The largest population cohort with diabetes were those 65 years and older (24.4%). Among racial and ethnic groups, Native Americans had the highest percentage of diabetes (20.2%), while Caucasians had the lowest (11.7%).

For the analysis area, the CDC reported that diabetes was more prevalent among select counties. Between 2014 and 2016, both Delaware and Hancock Counties saw decreases in diabetes rates. Overall, Madison County had the highest percentage of diabetes at 16%, a 5% increase between 2014 and 2016.

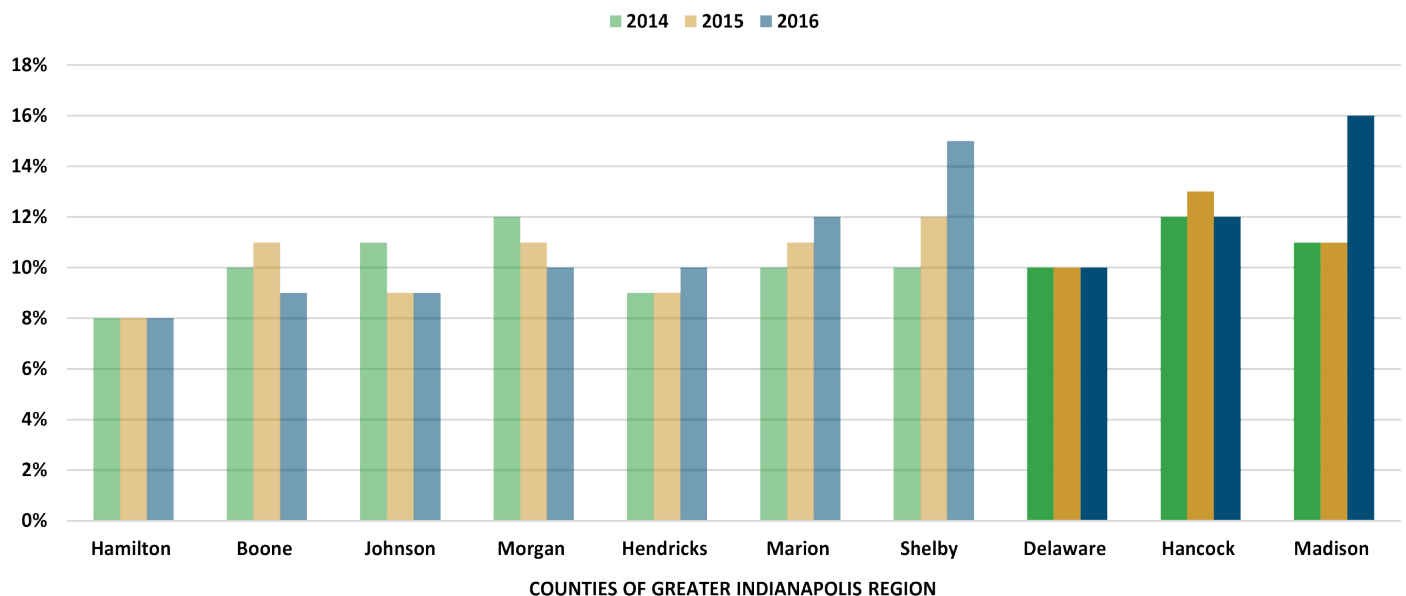


Figure 2.3 Total percentage of diabetic adults age 20 years and older, 2014 to 2016

# Chapter 2

## Health Indicators

Health indicators, as described by the CDC and the Pan American Health Organization (PAHO), are measurable characteristics that describe the health of a population, specific determinants of health, and their access to healthcare, as well as its cost and quality. According to CDC, and PAHO, health behaviors, health risk factors, the physical environment, and the socioeconomic environment are considered determinants of health.

The indicators that were observed for this HIA include:

- Mode Choice
- Safety Level
- Trail Availability
- Bike-Share Programs
- Exercise Opportunities
- Poverty Level
- Age
- Minority status
- SNAP Recipients
- Food Insecurity
- Physician Availability
- Diabetic Support
- Health Insurance

### Mode choice

Decisions to walk or bike as a mode of transportation to work or any other destination indicate a healthier lifestyle. Thus, the activity levels of a given population may be representative of the number of trips walking or biking. Because this data is estimated through travel modeling, it is limited in scope as it is dependent on gathering input from cyclists and pedestrians where mileage cannot be precisely calculated like a vehicle travel model. While there are fitness and health-related mobile technology applications that record and measure walking and/or biking activities, as well as well the number of trips, cost and privacy concerns often prevent the use of that data. Currently, some data is available through the US Census Bureau and the Federal Highway Administration (FHWA).

Figure 2.4 Household travel survey comparison

| Location     | Bicycle | Walking |
|--------------|---------|---------|
| US           | 1%      | 10.5%   |
| Anderson MPA | 0.3%    | 3%      |

# Chapter 2

## Health Indicators

### Safety level

Safety is another important health indicator as it considers the physical environment of communities or more specifically, the level of safety of both motorists and non-motorists. The level of traffic safety can be measured by the number of motorist collisions recorded. Determining how many collisions, the type of collisions (such as vehicle and or person type), the location, and the injuries involved can suggest the level of safety of a community's transportation system.

However, one common limitation is the reliability of accident reports recorded by law enforcement. In some cases, the exact location of an accident may be incorrectly reported. The persons involved and their level of injury can also include errors or be incomplete in the accident report. Another limitation can be the use of specific pre-defined terminology like level of injury, person-types, and even the reporting of outcomes of injuries, such as deaths which might occur later at a hospital, which can

skew data if documented incorrectly or incompletely. Because of this unpredictability with this data, a measure upon the level of safety is dependent their accuracy and its subsequent evaluation.

Crash Report Data is commonly organized and reviewed by state government agencies like Departments of Transportation or State Police Departments. However, in Indiana, the Criminal Justice Institute (CJI) coordinates with the Indiana Department of Transportation (INDOT) and the Indiana State Police for education, clarification, and definitions to continually improve data reported. Additionally, these agencies are often aided through partnerships with the National Highway Traffic Safety Administration (NHTSA) and Metropolitan Planning Organizations (MPOs), which in Indiana is done through coordination with the Indiana MPO Council. While some states review and normalize this data at the state level, Indiana relies on the end users to normalize this data, which is the case of the Anderson MPO.

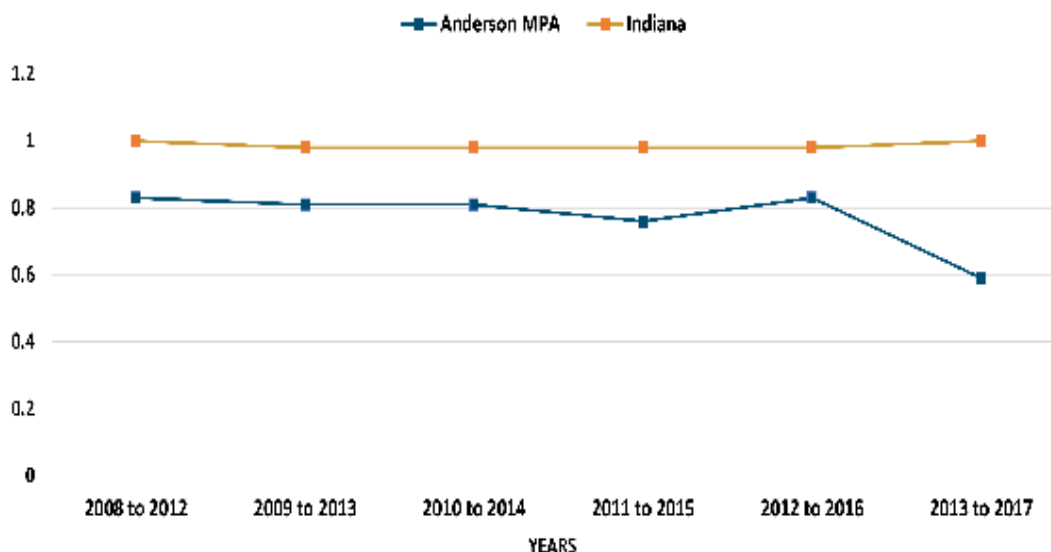


Figure 2.5 Rolling average crash rate fatalities comparison

Figure 2.6 MPA rolling average serious injury crashes

| Years        | Rate  |
|--------------|-------|
| 2008 to 2012 | 3.55  |
| 2009 to 2013 | 3.64  |
| 2010 to 2014 | 3.55  |
| 2011 to 2015 | 6.79  |
| 2012 to 2016 | 10.8  |
| 2013 to 2017 | 11.27 |

# Chapter 2

## Health Indicators

### Trail availability

Analyzing the availability of trails and their mileage can also be used as a health indicator. For this measurement, the number of available trails within an area and the total mileage available for residents was considered. However, there are limitations when measuring trails, such as different name designations of a trail (i.e., pedestrian line, footpath, multi-use path, side path, or sidewalk path). To avoid discrepancies, only those specifically designated as a “trail” were identified and measured for their mileage. This was completed by utilizing existing GIS Data from the Indiana Department of Natural Resources (IDNR) and public park and trail websites, which differentiate the facilities between trail, path, and or other recreational facility types.

Of the three (3) counties encompassing the Anderson MPA region, Delaware County had the highest number of trail miles per 10,000 people (5.59 miles).

Figure 2.7 Total trail mileage in Greater Indianapolis Region

| County          | Trail mileage per 10,000 people |
|-----------------|---------------------------------|
| Hendricks       | 5.28                            |
| Boone           | 4.44                            |
| Morgan          | 3.36                            |
| Marion          | 1.83                            |
| Shelby          | 1.36                            |
| Hamilton        | 1.17                            |
| Johnson         | 0.61                            |
| <b>Delaware</b> | <b>5.59</b>                     |
| <b>Madison</b>  | <b>2.05</b>                     |
| <b>Hancock</b>  | <b>1.68</b>                     |

### Bike-share programs

Bike sharing programs have recently gained attention in communities to encourage residents to be more active and provide alternative modes of transportation. The number of bike-share programs within a community or other geographic boundary can suggest how active a population may be and provide insight on their physical environment. However, identifying bike share programs can only measure the number of available programs, as most bike-share programs do not publish the number of available bikes for communities to use nor the number of daily trips used for that bike program, which would provide a better data measurement. Also, because the bike-share programs are usually located in cities that can afford to support them or that can attract the business that offer them, the data does not provide a complete comparison by county. Additionally, there is currently no database or website that identifies all locations or areas offering bike-share programs. To get a more effective analysis on bike-sharing programs, and their availability, measurement of populations and certain areas would have to be considered.

Figure 2.8 Available bike-share programs in Greater Indianapolis Region

| County          | Bike-share programs | Cities   |
|-----------------|---------------------|----------|
| Hamilton        | Yes                 | 3        |
| Hendricks       | Yes                 | 1        |
| Johnson         | Yes                 | 1        |
| Marion          | Yes                 | 1        |
| Shelby          | No                  |          |
| Morgan          | No                  |          |
| Boone           | No                  |          |
| <b>Madison</b>  | <b>Yes</b>          | <b>2</b> |
| <b>Delaware</b> | <b>Yes</b>          | <b>1</b> |
| <b>Hancock</b>  | <b>No</b>           |          |

# Chapter 2

## Health Indicators

### Exercise Opportunities

County Health Rankings compiled and published by the Robert Wood Johnson Foundation measures the availability, accessibility, and location of exercise facilities within a certain community or area. The rankings consider the percentage of individuals that reside in a Census Block that is within a half (1/2) mile of a park, reside in an Urban Census Block that is within one (1) mile of a recreational facility, or reside in a Rural Census Block that is within three (3) miles of a recreational facility.

Measuring access to exercise opportunities is difficult because of limitations in defining access. For instance,

while there may be a part within a Census Block, the park still may be in a difficult location to access because of busy streets, inadequate sidewalk networks, or poor infrastructure. Thus, a more localized analysis is often required, but the aggregate data is still useful to indicate a likely percentage of individuals with access.

Of the three (3) counties encompassing the Anderson MPA region, Delaware County had the highest percentage of population (78%) with access to exercise opportunities.

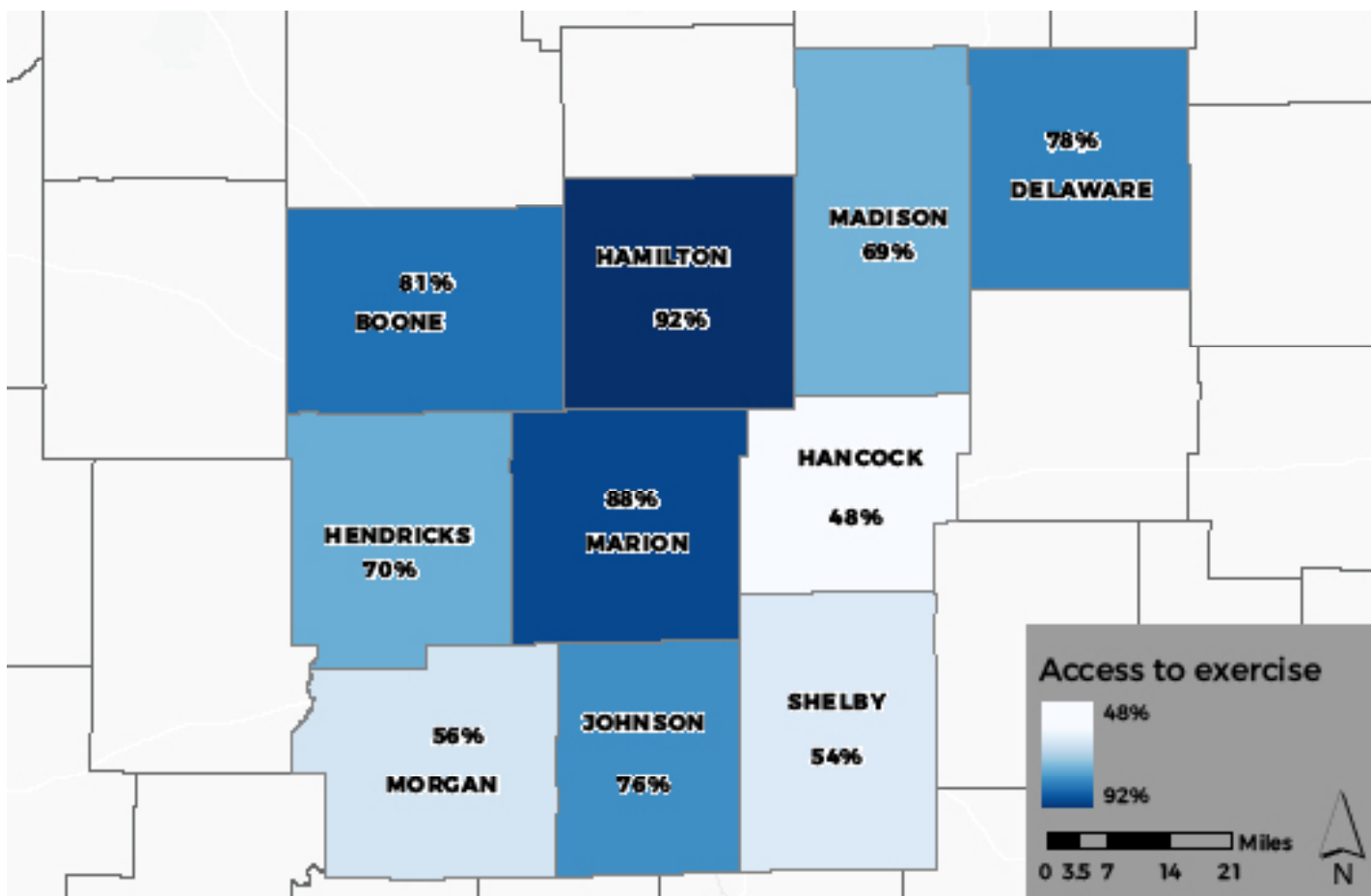


Figure 2.9 Total percentage of population access to exercise opportunities in Greater Indianapolis Region

# Chapter 2

## Health Indicators

### Poverty

A health indicator concerning the socioeconomic environment is poverty level, which was chosen to identify potential concentrations of disadvantaged populations with certain health conditions. Evidence has shown that factors like the level of poverty on a person's physical health. The American Community Survey (ACS) from US Census reports poverty level by established census boundaries and certain characteristics. Due to health data being limited, health complications have been overlapped with socioeconomic characteristics like poverty to review health.

Though using poverty is only used an assumption for examining health trends, researchers generally agree that there is a clear relationship between poverty and

the increase risk for disease and premature death. Since financial resources are limited, health services and groups may not be readily available to certain groups. Further examining other characteristic influenced by poverty level, such as food assistance programs and those uninsured, can be important to understanding the potential correlation between health trends and poverty. Because of limitations with data available at the local level, Boone County had no data from American Community Survey (ACS) on the percentage of the population by poverty level threshold and was left as empty.

Of the three (3) counties within the Anderson MPA region, Delaware County had the largest percentage of population less than 125% of the poverty level, as well as for the rest of the poverty thresholds.

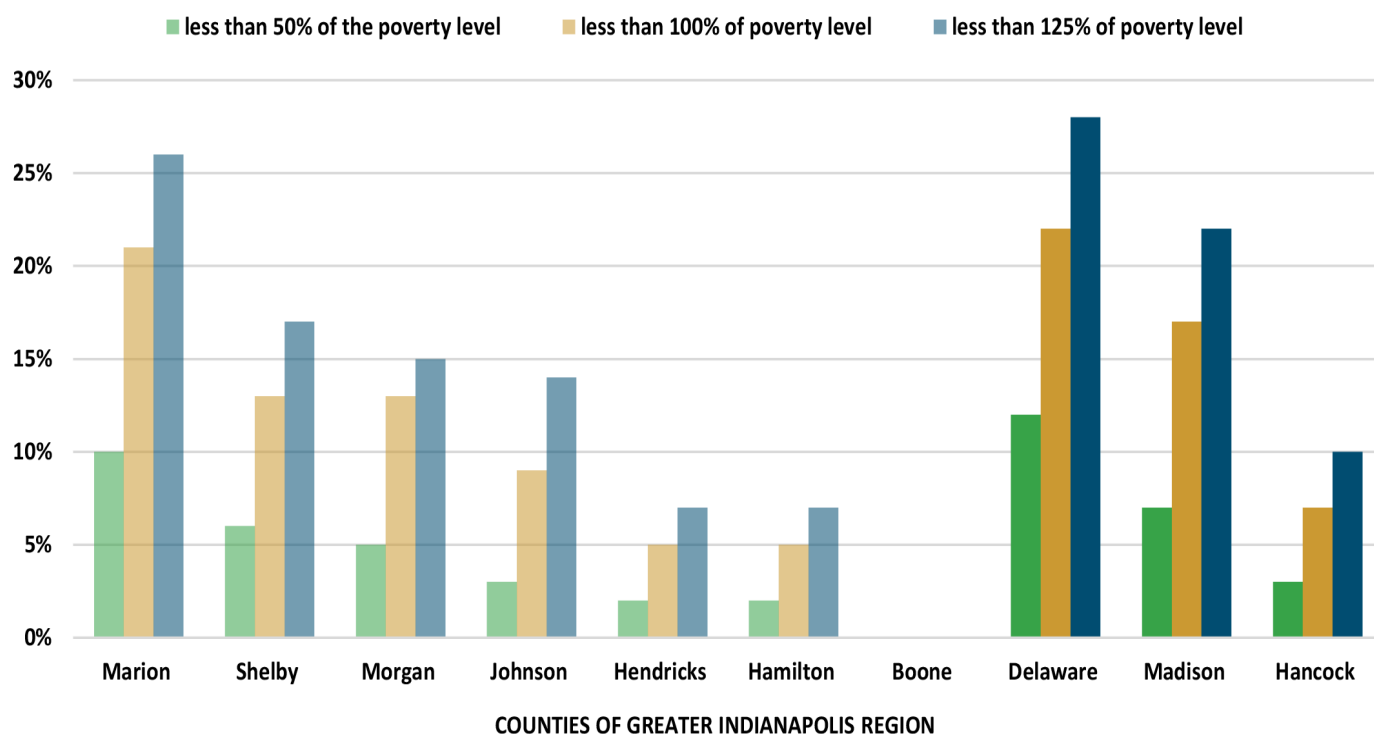


Figure 2.10 Total percentage of population by poverty threshold in Greater Indianapolis Region

# Chapter 2

## Health Indicators

### Age

Age is another important indicator of health for its consideration of those most at risk for certain health complications. Evidence has found that older adults, especially those who are 65 years and older, are more susceptible in developing chronic diseases. In 2012, HealthyPeople.gov reported that 60% of older adults in the US managed two (2) or more chronic conditions such as heart disease, bronchitis, cancer, and diabetes. To measure age, specifically older population cohorts, data from the American Community Survey (ACS) can identify geographic areas which may have a higher concentration of older adults.

Like poverty, using age to locate areas with higher concentrations of older adults can be used to build assumptions for identifying health trends. With limitations in the availability of health data, and to privacy concerns, age cannot fully provide an explanation for certain health trends. While age is a critical determinant of health, age must be overlapped with other socioeconomic characteristics to build stronger assumptions of health within localized settings.

Based off data from American Community Survey (ACS), Madison County had the largest percentage of adults 65 years and older.

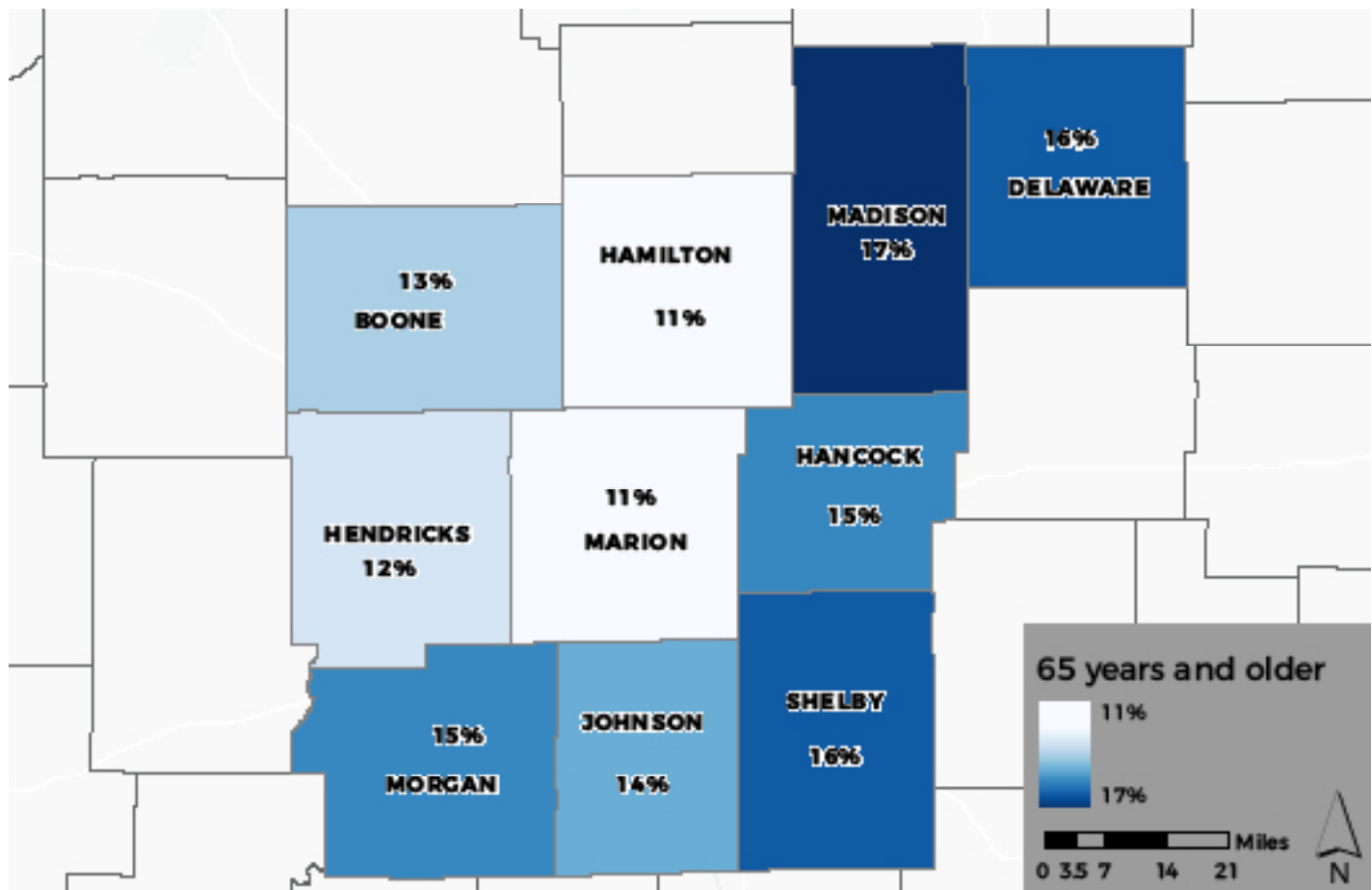


Figure 2.11 Total percentage of population 65 years and older in Greater Indianapolis Region

# Chapter 2

## Health Indicators

### Minority status

Minority status is an additional indicator used for its identification of groups most at risk for certain health complications. Measuring minority status is important as evidence has found that there are disparities between health and race/ethnicity. Results have found that various factors such as environment, culture, and biology, may provide an explanation into the increasing health disparities but still require more research. Still measuring minority status, like poverty and age, can be used to help examine local conditions.

Through databases like the US Census American Community Survey (ACS), concentrations of minority population cohorts can be identified and then overlapped with other socioeconomic characteristics. While limitations exist with health data availability and explaining the connections between health and race/ethnicity, minority status can still aid in building assumptions of local health trends.

Between the three (3) counties encompassing the Anderson MPA region, Madison county had the largest percentage of minorities.

Figure 2.12 Total percentage of minority population in Greater Indianapolis Region

| County    | Minority population |
|-----------|---------------------|
| Marion    | 43%                 |
| Hamilton  | 15%                 |
| Hendricks | 14%                 |
| Johnson   | 9%                  |
| Boone     | 8%                  |
| Shelby    | 7%                  |
| Morgan    | 4%                  |
| Madison   | 14%                 |
| Delaware  | 13%                 |
| Hancock   | 7%                  |

### SNAP Recipients

The Supplemental Nutritional Assistance Program (SNAP) is a federal program that aids low-income populations under a certain poverty level by providing temporary benefits to families that may not have the means to buy or access nutritional foods. Data is available through the American Community Survey (ACS) which identifies SNAP households, and other characteristics of households such as race, family type, income level, and more.

Between the three (3) counties encompassing the Anderson MPA region, Madison county had the largest percentage of SNAP recipients.

Figure 2.13 Total percentage of households receiving SNAP in Greater Indianapolis Region

| County    | SNAP recipient households |
|-----------|---------------------------|
| Marion    | 17%                       |
| Shelby    | 13%                       |
| Morgan    | 12%                       |
| Johnson   | 8%                        |
| Boone     | 7%                        |
| Hendricks | 5%                        |
| Hamilton  | 4%                        |
| Madison   | 16%                       |
| Delaware  | 15%                       |
| Hancock   | 7%                        |

# Chapter 2

## Health Indicators

### Food insecurity

This health indicator was chosen for its consideration of how communities with low access to healthy food environments may develop serious health conditions. Food insecurity considers poverty, unemployment, homeownership, and food and meal cost at the county, state, and national levels. These characteristics are compiled through government and non-for-profit organizations like Feeding America who specialize in food-related disparities within the US.

However, like accessibility, measuring food insecurity is limited by what it can measure outside of socioeconomic

characteristics. Measuring food access cannot fully examine sidewalk networks, streets, and trips taken by households. Instead, to get an adequate measure of access, census blocks are measured by the number of food stores and overlaid with specific socioeconomic characteristics.

Of the three (3) counties encompassing the Anderson MPA region, Delaware County had the highest rate of food insecurity (17%).

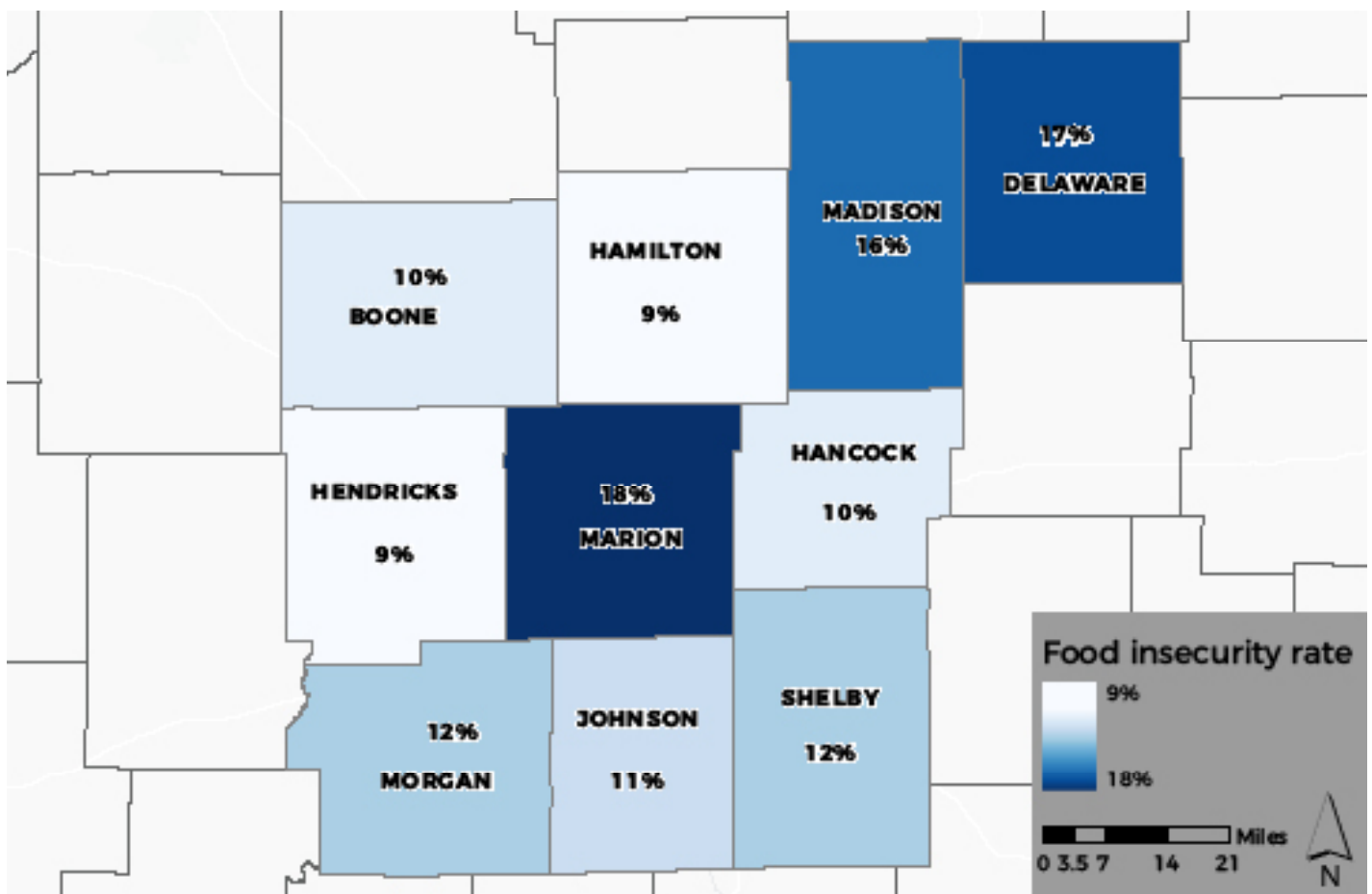


Figure 2.14 Total percentage of population 65 years and older in Greater Indianapolis Region

# Chapter 2

## Health Indicators

### Physician Availability

The availability of primary care physicians is another significant health indicator as it helps determine the efficiency and accessibility of health care systems within a population. This is an important consideration of the environment and health as consequently, a lacking health system with few physicians, cannot properly address individual health concerns. To get an adequate measure on the availability of physicians within a population, data was compiled from the County Health Rankings (CHR) Report from the Robert Wood Johnson Foundation regarding the ratio of primary care physicians to the population of each county within the analysis area.

An issue when measuring the number of physicians within a population is that there is a possibility that while a physician's office may be in one county, they may practice in multiple counties. Also, this measure is

limited to primary care physicians even though there are other primary care providers such as nurse practitioners. To understand accessibility to both primary care facilities and primary care physicians, additional data would need to be gathered.

Estimations from the County Health Rankings (CHR) Report reveal that of the three (3) counties within the Anderson MPA region, Madison County has the lowest ratio of population to primary care physicians.

Figure 2.15 Ratio of population to primary care physicians in Greater Indianapolis Region

| County    | Ratio of population to primary care physicians |
|-----------|------------------------------------------------|
| Boone     | 480 to 1                                       |
| Hamilton  | 710 to 1                                       |
| Marion    | 1,220 to 1                                     |
| Johnson   | 1,230 to 1                                     |
| Hendricks | 1,870 to 1                                     |
| Morgan    | 2,050 to 1                                     |
| Shelby    | 3,410 to 1                                     |
| Delaware  | 1,000 to 1                                     |
| Hancock   | 1,190 to 1                                     |
| Madison   | 2,050 to 1                                     |

# Chapter 2

## Health Indicators

### Diabetic Support

Due to the extensive health complications associated with diabetes, diabetic services and support groups are an important health indicator that considers the quality of healthcare and the environment. Because certain groups lack the necessary education and resources to mitigate diabetes, supportive services and groups help to provide additional resources and information. Thus, identifying the number of available support services and groups for diabetic populations is important if the condition is to be properly diagnosed.

However, because of multiple issues, whether it be internal issues with the health care system or external issues with the population, services and groups could have been discontinued. Additionally, the data available only includes groups identified by the state through the Diabetes Group Directory provided by the Indiana State Department of Health (ISDH), which does not include community-based health groups. To get a more accurate number of available support services and groups, more research and additional data would need to be gathered.

Figure 2.16 Ratio of population to diabetic services/groups in Greater Indianapolis Region

| County    | Available diabetic services/groups |
|-----------|------------------------------------|
| Marion    | 454 to 1                           |
| Hamilton  | 1,428 to 1                         |
| Johnson   | 3,333 to 1                         |
| Morgan    | 3,333 to 1                         |
| Hendricks | 5,000 to 1                         |
| Shelby    | 44,229 to 1                        |
| Boone     | 64,192 to 1                        |
| Madison   | 3,333 to 1                         |
| Delaware  | 5,000 to 1                         |
| Hancock   | 5,000 to 1                         |

### Health Insurance

The estimated number of uninsured persons within a population is another important health indicator because those who are uninsured may not properly receive medical diagnosis or services. Measuring the number of uninsured is important in determining population groups who may be at higher risk for developing long-term health complications. Additionally, for those uninsured populations other characteristics like race, ethnicity, education, and income should also be considered.

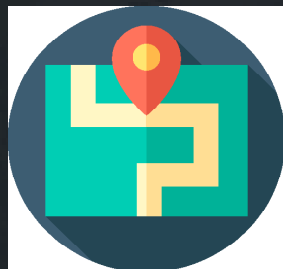
However, because there are multiple types and sources of insurance, such as private vs. public, and those provided through unions, employment, and even government agencies, it is difficult to determine a proper estimate. Data provided through the American Community Survey (ACS) from the Census Bureau, and other medical insurance databases like the Small Area Health Insurance Measure, have improved the estimated number of insured and uninsured persons.

Based off data from American Community Survey (ACS), Madison County had a slightly larger percentage of uninsured (12%) than Delaware County.

Figure 2.17 Total percentage of population uninsured in Greater Indianapolis Region

| County    | Uninsured population |
|-----------|----------------------|
| Marion    | 14%                  |
| Shelby    | 12%                  |
| Morgan    | 10%                  |
| Johnson   | 9%                   |
| Hendricks | 8%                   |
| Boone     | 7%                   |
| Hamilton  | 6%                   |
| Madison   | 12%                  |
| Delaware  | 11%                  |
| Hancock   | 9%                   |

# Walk access analysis



# Chapter 3

## Analysis

To gain further insight into where to concentrate improvement efforts for localized health trends regarding physical inactivity, obesity, and diabetes, a 3-step analysis was conducted. The first step was to measure the level of accessibility for an individual to walk to a given destination. The second step was to compile socioeconomic characteristics from American Community Survey (ACS) that are known to effect health, to then be used to develop a Health Vulnerability Index (HVI). Then the third step was to overlay the level of accessibility from the Walk Access measures of step one, with socioeconomic concentrations of the health vulnerability index of step two, to analyze which areas are more likely to suffer from certain health trends.

## Methodology

### STEP ONE

To conduct the first step of the analysis, MCCOG developed a Walk-Access Tool, which uses a network-based buffer to estimate the population, households, and employees within a set Walk Time of each Destination Type identified for analysis using the existing sidewalk network. This network-based approach accounts for walk speed and the availability of pedestrian facilities to produce a more realistic access area than a standard aerial buffer. Furthermore, unlike the standard aerial buffer, the network-based approach relies on existing sidewalk networks to produce more accurate measurements. It should be noted that the sidewalk network data used in this analysis is from 2015 and there may have been new sidewalks constructed in some areas between then and the present. Regardless, of these new sidewalk additions the measurements and results found from the Walk Access would still be similar.

To apply the Walk-Access Tool for this analysis, several baseline variables were established, which included

Destination Types, Walk Times, Link Types, and Walk Speeds. A total of five (5) Destination Types, listed below, were chosen because of the level of activity that they generate.

- Parks - Locations in this Destination Type included public parks only within the Anderson MPA. Trails, botanical gardens, and other types of recreational facilities were not included.
- Grocery & Food Stores - Locations in this Destination Type included grocery and food stores only. Convenience stores and farmers markets were not included.
- Bus Stops - Locations in this Destination Type included the bus stop locations for the City of Anderson Transit System (CATS) only.
- Primary Care Facilities - Locations in this Destination Type included hospitals, federally qualified health centers and community health centers, and other health facilities that have emergency room and/or vaccination services.
- Schools - Locations in this Destination Type included primary and secondary public schools, as well as private schools, colleges, and adult learning centers.
- Government Services - Locations in this Destination Type included city and town halls, the county courthouse, utility offices for services like water, sewer, and streets, public libraries, as well as police, fire, and EMS department offices and stations. Utility stations, or ancillary locations like power stations were not included, as well as campus libraries were not included. Additionally, jails, and juvenile program centers were also not included.

# Chapter 3

## Methodology

The level of accessibility was determined for a 5, 10, and 20-minute Walk Time using an estimated average Walk Speed for three Link Types: sidewalks, crosswalks, and trails. Each of the Link Types have distinct elements of their design that impact their functionality and thus, have varying Walk Speeds. Walk speeds were estimated by conducting a pedestrian speed study at sample locations for each link type. To help differentiate the various elements involved in the process, points were included. Points were used in this analysis to identify and locate places associated with the Destination Type.

This portion of the analysis produced a series of Travel Bands that represent areas that could be reached within each of the three (3) Walk Times. Travel Bands were produced from the network-based analysis to create a travel time boundary which then provided data on the number of populations, households, and employees present in that specific band.

These Travel Bands were overlaid onto the Travel Analysis Zones (TAZs) developed for the MCCOG Travel Demand Model (TDM). By doing this, population and household estimates were determined by adding together the demographics of each TAZ or portion of TAZ represented within each Travel Band. Where the Travel Band did not include an entire TAZ, the demographics were estimated by the percentage of the zone within the Travel Band. For example, if a TAZ has a population of 1,000 and the Travel Band only includes 50% of the TAZ, the population of that TAZ included would be 500. While an assumption of equal distribution of zonal characteristics is a major

limitation to this method, the results provide the best method to estimate Walk Access.

By measuring the level of accessibility or Walk Access for each Destination Type, concentrations of potential health trends were identified. This aids in determining funding allocations for specific project types and specific areas that may need a more concerted effort. For instance, in a neighborhood or community is found to be deficient in their accessibility for walking, funds can be targeted to areas where sidewalk or trail improvements may be critical.

### STEP TWO

In step two, specific socioeconomic characteristics provided at the Census Tract Level from the American Community Survey (ACS) were used to identify areas of concentration for the health trends of physical inactivity, obesity, or diabetes. A total of six (6) characteristics were used to build a Health Vulnerability Index (HVI), which is a tool used by public health agencies and government organizations to identify specific areas of higher health risk from certain conditions or settings. These settings may be described as environments that are lacking certain services, or amenities, such as public transportation, healthcare, sidewalks, that have a significant impact on a person's health. Usually, communities such as those living under the poverty line, unemployment, and other indicators that indicate social and economic stress are examined through an HVI.

# Chapter 3

## Methodology

Of the six (6) characteristics used, the characteristics included households receiving SNAP, households with no vehicles available, and populations who were uninsured, below poverty, 60 years and older, and identify themselves as minorities. Each characteristic or population cohort was chosen because they were more likely to have the health concerns of physical inactivity, obesity, and diabetes. All six (6) characteristics were then weighted based on their vulnerabilities to health for a more effective measurement and identification. The HVI weighted the characteristics on a ranking scale from 0 to 1. Zero being the least vulnerable, one being the most vulnerable. The ranking of the six (6) characteristics included:

- Percent of cohort 60 years and older
- Percent of cohort that belongs to a minority status
- Percent of cohort that are under the poverty line
- Percent of cohort that is uninsured
- Percent of cohort that receives SNAP
- Percent of cohort that is of a household with no vehicles available

The reason for weighing the characteristics differently, particularly for 60 years and older, minority status, and poverty, is that research has shown that cohorts that fall under these characteristics are at a greater risk for certain health conditions. Additionally, adding specific weight to each characteristic ensures a better recognition of areas that may be disproportionately affected by health trends that are directly impacted from outside socioeconomic

consequences. For instance, characteristics such as poverty, uninsured, SNAP, no vehicles available, can be dramatically influenced by poor environments and may be improved upon by organizational resources and efforts. While characteristics such as age, cannot be changed with certain resources.

While this Health Impacts Assessment (HIA) was limited to these six (6) characteristics, to gain a better understanding of specific cohorts that may be more vulnerable to certain health trends, it may be valuable to include more characteristics in future studies. Once ranked, socioeconomic data was compiled and used in GIS (Geographic Information System) software to develop a series of maps to identify where certain health trends were concentrated

### STEP THREE

Once concentrations were identified, travel band measures from the Walk Access Analysis in step one were overlaid with the identified socioeconomic concentrations from the Health Vulnerability Index in step two to show locations where high concentrations of both lower or limited accessibility and health concerns of physical inactivity, obesity, and diabetes. By identifying these areas of concentrated socioeconomic characteristics and low accessibility, a thorough analysis could be conducted.

To get an overall perspective of accessibility, the entire Anderson MPA was first examined. All six (6) destination types, their travel band measures, and destination points were shown in a GIS format to identify cities or towns that

# Chapter 3

## Methodology

showed a significant lack of accessibility. Once complete, cities or towns that distinctly showed low accessibility from the analysis in Step 1 and were also located in areas where there were concentrations of the socioeconomic characteristics used in Step 2, were then studied further to identify areas that may be lacking specific services or sidewalks that might have positive impacts upon health.

To aid in this analysis, sidewalk connections, used in the TransCAD calculations for the Walk Access measures, were reformatted to be used in HIS to reveal areas that may be lacking in sidewalk infrastructure. Additionally, this shows which destination points were accessible and which could not be easily accessed by the public. From the data generated through these GIS maps, the areas around Anderson, as well as the parts of Northern Madison County near Elwood and Alexandria, had distinct concentrations of both these specific socioeconomic characteristics and low accessibility. Once areas were identified, and carefully examined, assumptions were then made on the potential impacts upon the 13 health indicators discussed from the previous chapter. By understanding these potential impacts, it shows how important access is to disadvantaged communities and where future efforts should be concentrated to improve the relationship of transportation and health.

## Results

### STEP 1: WALK ACCESS ANALYSIS

To measure the level of accessibility in the Anderson MPA, six (6) destination types were analyzed based on the level of activity they generate, and their association with public health. These five destination types included: Parks, Grocery and Food Stores, Bus stops, Primary care facilities, Schools, and Government Services. Using these six (6) destination types, the estimated percentage of population and employees living within a certain walk distance from the destination were analyzed to determine accessibility. Because accessibility has no singular definition, and can be measured by multiple variables, whether a destination type had a low or high level of access, it was to be determined by the percentage of the estimated population within a certain walk time. A destination type that is said to have low levels of accessibility can be considered low when the percent of the population within a 20-minute walk time is 25% or less, while a high level of accessibility is 50% or more.

# Chapter 3

## Results

### PARKS

Parks are an important community asset that provides significant opportunities to improve community health. Access to parks has been identified as an asset that encourages physical activity. A study from the American Journal of Preventive Medicine (AJPM) found that increasing public open space access increased the overall likelihood of residents using public open space. Additionally, those who use parks and open spaces are three (3) times more likely to achieve the levels of physical activity compared to others. Understanding the level of accessibility to parks and other recreational facilities is important to ensure health trends will be improved.

A total of 87 park locations were identified within the Anderson MPA. The analysis showed that of the 139,905 Anderson MPA residents, an estimated 30% of residents have access to a park or open space that is within a walking distance of 20 minutes or less. Additionally, only 6% of the estimated population are within a 5-minute walk to a park and 37% of employees live within a 20-minute walk to a park. In conclusion, although there are 87 park locations, many parks within the Anderson MPA are not quickly and easily accessible to the population

Figure 3.1 Parks access measure

|            | Percent of total population by walk time |            |            |                  |
|------------|------------------------------------------|------------|------------|------------------|
| Variable   | 5 minutes                                | 10 minutes | 20 minutes | Total population |
| Population | 6.36%                                    | 16.44%     | 30.01%     | 139,509          |
| Employees  | 12.68%                                   | 24.11%     | 36.92%     | 51,666           |

# Chapter 3

## Results

### GROCERY & FOOD STORES

Reports from the Centers for Disease Control and Prevention (CDC) have found that having healthy food that is available and affordable creates a Healthy Food Environment allowing people to make healthier food choices. Supporting the creation and expansion of healthy food environments prevents people from buying foods that have no nutritional value because of limited choice.

A total of 40 grocery and food stores were identified within the Anderson MPA. The analysis showed that 23% of the total population is within a 20-minute walking distance to a grocery or food store. Additionally, only 10% of the estimated population are within a walk time of 10-minutes or less and an estimated 30% of employees were within a 20-minute walk or less to a grocery or food store.

Because grocery and food store locations have limited accessibility, families within the Anderson MPA may have difficulty purchasing healthy foods. Since only 23% of the estimated population are within a 20-minute walk of a grocery or food store, many residents may be unable to purchase from other locations if their transportation is not reliable. With this disparity in accessibility of food store locations, households with limited transportation and sidewalk infrastructure must continuously purchase the same foods regardless if they have any nutritional value and continue unhealthy eating habits.

Figure 3.2 Grocery & food stores access measure

|            | Percent of total population by walk time |            |            |                  |
|------------|------------------------------------------|------------|------------|------------------|
| Variable   | 5 minutes                                | 10 minutes | 20 minutes | Total population |
| Population | 3.35%                                    | 9.68%      | 23.02%     | 139,509          |
| Employees  | 3.54%                                    | 15.28%     | 30.08%     | 51,666           |

# Chapter 3

## Results

### BUS STOPS

Evidence has shown that public transportation systems provide increase opportunities for physical in the form of walking, biking, in the beginning or end of the trip. The Center of Disease Control and Prevention found that those who used public transportation walked an additional 8 to 33 minutes per day.

Additionally, public transportation is also credited with the reductions in motor vehicle crashes and pollution. Despite these positive effects, certain factors continue to prevent residents from using public transportation. For population cohorts who may be disabled, older, or live within a community that lacks sidewalk infrastructure, safety, reliability, and access continue to be difficult barriers. To reduce the increasing health trends in the Anderson MPA, improving access to those with limited means in income and transportation, and improving the level of safety will be critical.

A total of the 39 bus stop locations was identified within the Anderson MPA and more specifically, within the City of Anderson utilized by the City of Anderson Transit System (CATS). Of the bus stop locations, results from the network-based analysis indicated that an estimated 20% of the estimated population were within a walk of 20-minutes or less of a bus stop. Only 22% of employees had access to a bus stop that was within a 10-minute walking distance from a bus stop. For those who are limited in their means of transportation or have no vehicle available, bus stop access is an important element to properly address and reduce local health trends.

Figure 3.3. Bus stops access measure

|            | Percent of total population by walk time |            |            |                  |
|------------|------------------------------------------|------------|------------|------------------|
| Variable   | 5 minutes                                | 10 minutes | 20 minutes | Total population |
| Population | 6.77%                                    | 13.72%     | 19.86%     | 139,509          |
| Employees  | 13.06%                                   | 22.29%     | 27.90%     | 51,666           |

# Chapter 3

## Results

### PRIMARY CARE FACILITIES

Because some health trends require prolonged care and attention, such as diabetes, and cannot technically be cured; access to primary care facilities, clinics, and services are important for diagnosing conditions and symptoms, as well as providing treatment. The Association of Diabetes Care & Education Specialists (ADCES) agree that for health trends like diabetes, access to community-based education and health services is crucial toward reducing rates. Depending on specific needs, certain limitations may prevent individuals from accessing healthcare facilities and providers and may be due to the current format of the US Health Care System. Considering the importance of accessing health services and professionals, measuring the level of accessibility of primary care facilities will be an important step in improving health equity in the Anderson MPA.

A total of 41 primary care facilities were identified within the Anderson MPA. The analysis showed that only 15% of

the estimated population were within a 20-minute or less walk time from a primary care facility. Additionally, only 23% of employees were within a 20-minute walk from a primary care facility.

The implication from these results show that low accessibility could be potentially influencing the health trends within the Anderson MPA. Because only 15% of the estimated live within 20-minutes or less of a primary care facility, some population cohorts may be reluctant to make the trip if they do not have a vehicle or may be on a fixed income, which may be an additional incentive to bear the cost for diagnosis and treatment. Studies have shown this to be accurate, especially for racial and ethnic groups, who are low-income, to avoid seeking treatment for their health conditions or symptoms. Because much of the population of Anderson MPA live beyond a 20-minute walk of a primary care facility, improving access will be important to decrease negative health trends.

Figure 3.4 Primary care facilities access measure

|            | Percent of total population by walk time |            |            |                  |
|------------|------------------------------------------|------------|------------|------------------|
| Variable   | 5 minutes                                | 10 minutes | 20 minutes | Total population |
| Population | 2.53%                                    | 7.26%      | 15.31%     | 139,509          |
| Employees  | 5.14%                                    | 14.43%     | 23.49%     | 51,666           |

# Chapter 3

## Results

### SCHOOLS

For children and teenagers, aged 5 to 17, health trends such as obesity, and diabetes are an increasing public health concern. Schools play a critical role in addressing and improving health among children and teenagers. Children are of most concern as they are among some of the population cohorts most at risk of developing certain health complications. To address the increasing rate of health trends like obesity, schools can prioritize the health, and safety of children and teenagers by encouraging a healthier school environment and programs. To encourage healthier school environments, access is one factor that is critical to long-term improvements. Schools see large amounts of activity from every mode of transportation from walking, driving alone, biking, and transit. Therefore, measuring the level of accessibility of schools can help in determining

whether schools are accessible and how much they are influencing local health trends.

A total of 49 schools were identified within the Anderson MPA. Results indicated that schools provide access to only 21% of the estimated population with access within a 20-minute or less walk. Examining further, the analysis showed that only 10% of the estimated population are within a 10-minute walk of a school. These results reveal that schools have limited accessibility for walking and may be preventing from being more active. Because only 10% live within 10 minutes or less of a school, families may be discouraged to allow their children to walk to school. With children being at high risk for becoming obese, improving the accessibility in the sidewalk network is important for the future of the Anderson MPA.

Figure 3.5 Schools access measure

|            | Percent of total population by walk time |            |            |                  |
|------------|------------------------------------------|------------|------------|------------------|
| Variable   | 5 minutes                                | 10 minutes | 20 minutes | Total population |
| Population | 2.54%                                    | 9.72%      | 20.96%     | 139,509          |
| Employees  | 4.17%                                    | 16.43%     | 28.22%     | 51,666           |

# Chapter 3

## Results

### GOVERNMENT SERVICES

Considering the importance of government facilities, such as public libraries, and services, such as police and fire stations, accessibility is an important element for a functioning and healthy population. Government services for many regions and cities, serve as the focal point for many residents to pay taxes, receive various forms of assistance, and perform public duties. Government services are critical to review as population cohorts who may be under the poverty level, and or disabled, accessing certain services may be difficult. If government services are to promote, educate, and provide necessary services to the public, and help improve local health trends, accessibility must be improved.

A total of 65 government service locations were identified within the Anderson MPA. The analysis showed that 24% of the estimated population have access that is within

20-minutes or less of a government service location. Additionally, only 10% of the estimated population are within a 10-minute or less walk from a government service. Since government centers are mostly located within or adjacent to downtown areas, with only 24% of the estimated populations being located within a 20-minute or less walk suggests that the sidewalk network to these locations could be improved. These results echo that government service locations have limited accessibility for walking and could be preventing certain population cohorts from accessing important government assistance.

Figure 3.6 Government services access measure

|            | Percent of total population by walk time |            |            |                  |
|------------|------------------------------------------|------------|------------|------------------|
| Variable   | 5 minutes                                | 10 minutes | 20 minutes | Total population |
| Population | 3.78%                                    | 10.53%     | 24.24%     | 139,509          |
| Employees  | 11.37%                                   | 18.60%     | 33.32%     | 51,666           |

# Chapter 3

## Results

### FINAL SYNOPSIS

When comparing the results of all Destination Types, parks had the “highest” level of walk accessibility (30% of the estimated population within 20-minute walk time) and primary care facilities had the lowest level of walk accessibility (15% of the total estimated population within 20-minute walk time). However, overall, the analysis revealed low levels of accessibility for five (5) out of the six (6) Destination Types in relation to the estimated population.

Of the Destination Types, those that have a significant role in encouraging health habits, such as grocery and food stores, schools, and primary care facilities; had levels of walk accessibility that were below 25% of the estimated

population within a 20-minute walk time. For the estimated employee populations, accessibility measures showed a slight increase in the percentage of employee’s access to the six (6) Destination Types but was still minimal. These critical areas should be accessible for all populations by every mode of transportation, especially for cohorts that are limited in resources. Generally, the entire analysis presented highlights that the sidewalk network within the Anderson MPA could be improved to improve accessibility and subsequently improve health trends.

Figure 3.7 Destination type walk access comparison

| Destination Types       | % population within 20-minute walk time | % employees within 20-minute walk time |
|-------------------------|-----------------------------------------|----------------------------------------|
| Parks                   | 30%                                     | 36%                                    |
| Government services     | 24%                                     | 33%                                    |
| Grocery & food stores   | 23%                                     | 30%                                    |
| Schools                 | 21%                                     | 28%                                    |
| Bus stops               | 20%                                     | 27%                                    |
| Primary care facilities | 15%                                     | 23%                                    |

# Chapter 3

## Step 2: Health Vulnerability Index

Using the ranking method to identify concentrated areas in the Anderson MPA revealed that urban areas around the city of Anderson along with some areas of northern Madison County showed the strongest concentration of the six (6) selected socioeconomic characteristics. Further examining these areas, the strongest concentration of the six (6) characteristics are in the west, south, and north sides of Anderson.

Data from the American Community Survey (ACS) revealed that a significant percentage of the minority population reside on the west side of Anderson. Likewise, concentrations to the north and south may be due to

the high percentage of populations who are uninsured, or under the poverty line. Additionally, households who were identified as receiving SNAP or no vehicles showed higher concentrations on the north and south sides of Anderson. Other areas of concentration, specifically in the northern part of Madison County had concentrations around Elwood and Alexandria. It can be assumed that these distinct concentrations were due in part to the rise of the aging population there. Because there is a higher risk to develop certain health trends in these areas, they may be experiencing higher levels of physical inactivity, obesity, or diabetes.

## Step 2: Health Vulnerability Index

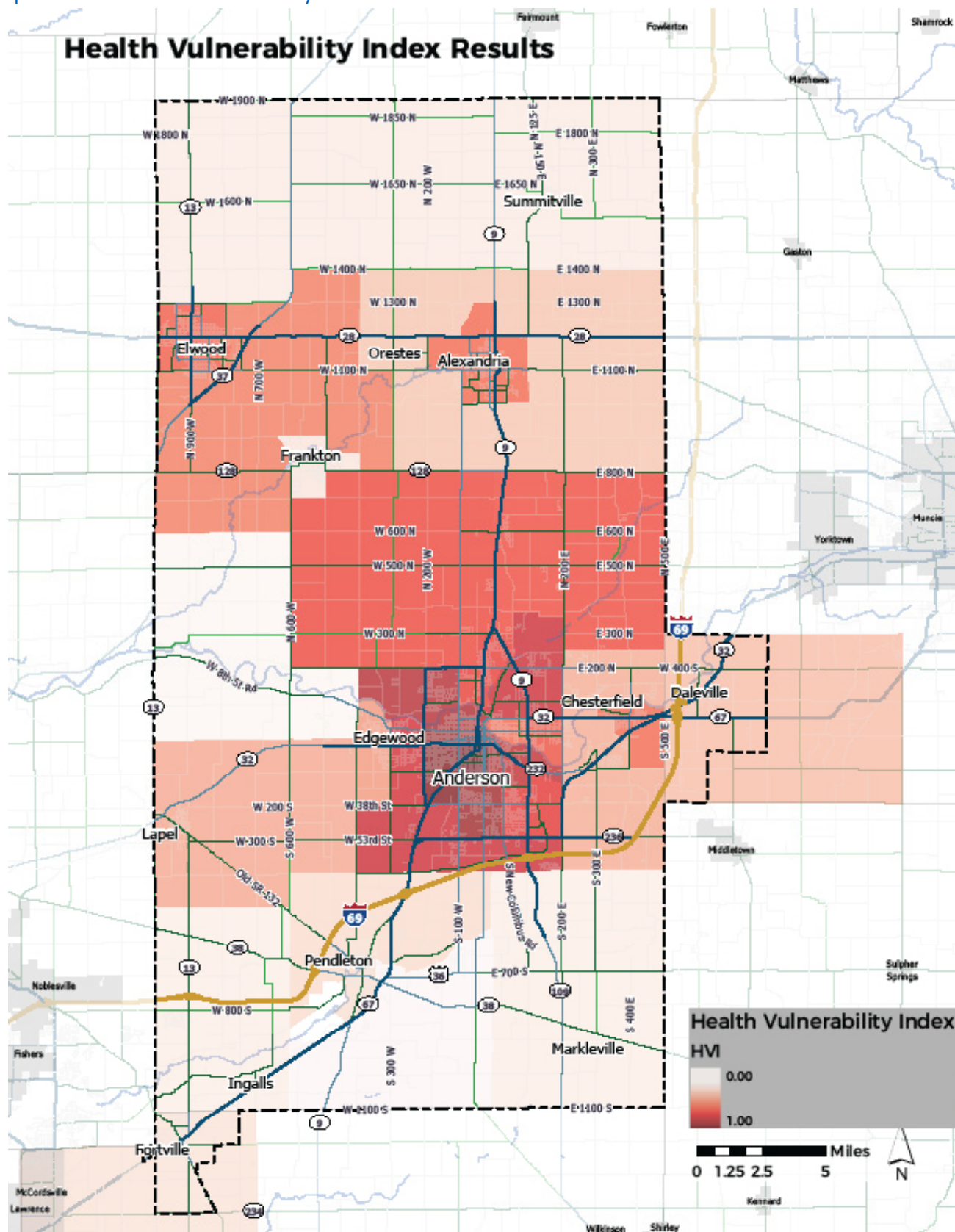


Figure 3.8 Health Vulnerability Index

# Chapter 3

## Step 3: Health Impact Analysis

Having identified concentrations with certain socioeconomic characteristics, by overlaying the Walk Access Travel Bands with the Health Vulnerability Index, it reveals areas of lower accessibility and can be assumed that they may be disproportionately affected by health trends of physical inactivity, obesity, and diabetes. First, looking at the entirety of the Anderson MPA, all five (5) destination types walk access were applied. Then by examining the Anderson MPA, cities, and towns with areas of low access were identified and analyzed using local sidewalk infrastructure and destination points.

### PARKS

In review of all park locations within the Anderson MPA, every city and town has at least one or more public park. Most of these parks are located around the City of

Anderson and the Town of Chesterfield. However, most cities and towns had at least one or more park accessible by sidewalk except for the Town of Daleville.

Viewing the map of parks within the City of Anderson shows parks are generally accessible. Areas on the east and west sides of Anderson show limited access. Sidewalk infrastructure shows that there are not enough sidewalks on the Westside for many to access parks within Anderson. One area that is also lacking is the southeast side, which shows a limited number of parks, despite having the sidewalk infrastructure to support them.

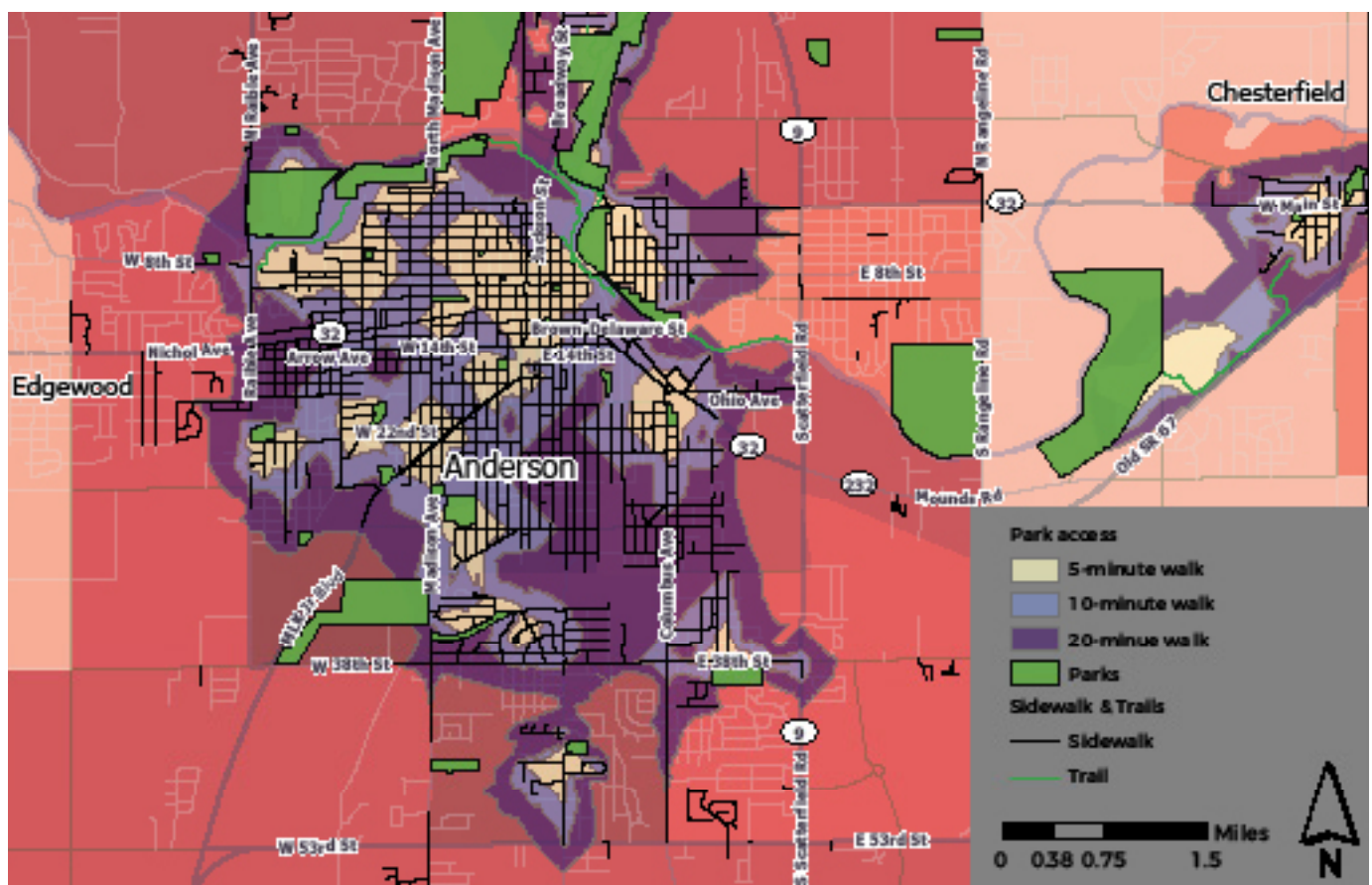


Figure 3.9 Park accessibility map

### Step 3: Health Impact Analysis

# Chapter 3

## Step 3: Health Impact Analysis

### BUS STOPS

In review of bus stop locations, the City of Anderson is the only municipality that offers public transportation and thus, the only one with bus stops. Therefore, no other cities and towns within the Anderson MPA could be analyzed for accessibility.

One area that shows limited access to bus stops is the west side of Anderson. Additionally, the area shows a low number of bus stop locations in general.

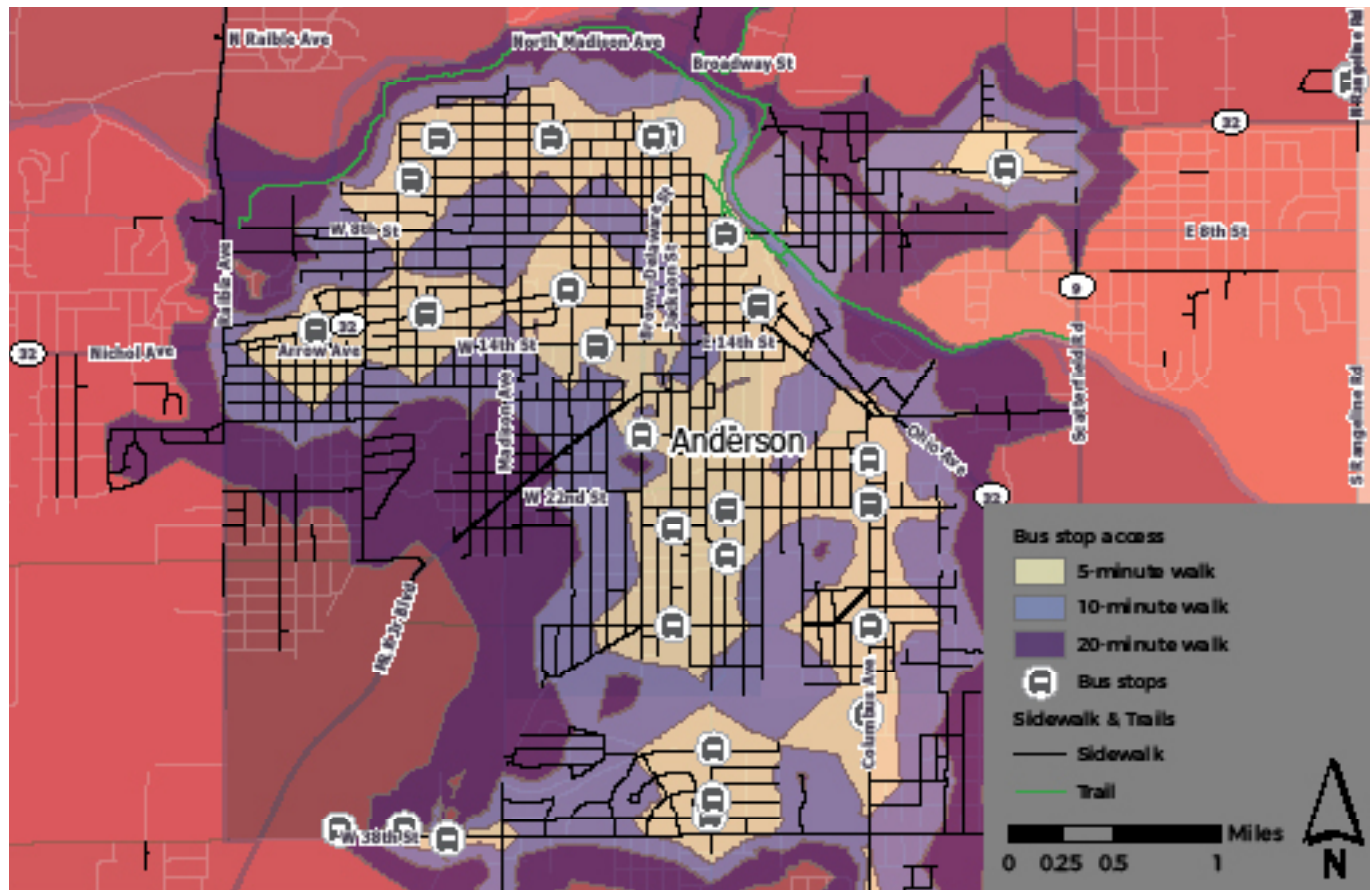


Figure 3.11 Bus stop accessibility map

# Chapter 3

## Step 3: Health Impact Analysis

### PRIMARY CARE FACILITIES

In review of accessibility of primary care facilities throughout the Anderson MPA, only a small number of cities and towns have existing primary care facilities. Of those, the cities of Anderson, Alexandria, and Elwood have primary care facilities accessible by sidewalk. Additionally, the towns of Fortville, Pendleton, and Lapel had at least one or more primary care facility, but they are not accessible by sidewalk. Other towns like Chesterfield, Markleville, and Frankton have no primary care facilities within their communities.

Of the communities identified, many of the primary care facilities within the City of Anderson had low accessibility. Despite having many primary care facilities along Scatterfield Road (SR 9), there is very little sidewalk infrastructure to provide accessibility. The west side of the community also shows a distinct lack in access because there are no primary care facilities available, which could be detrimental to those who are diabetic and/or require certain treatment or services.

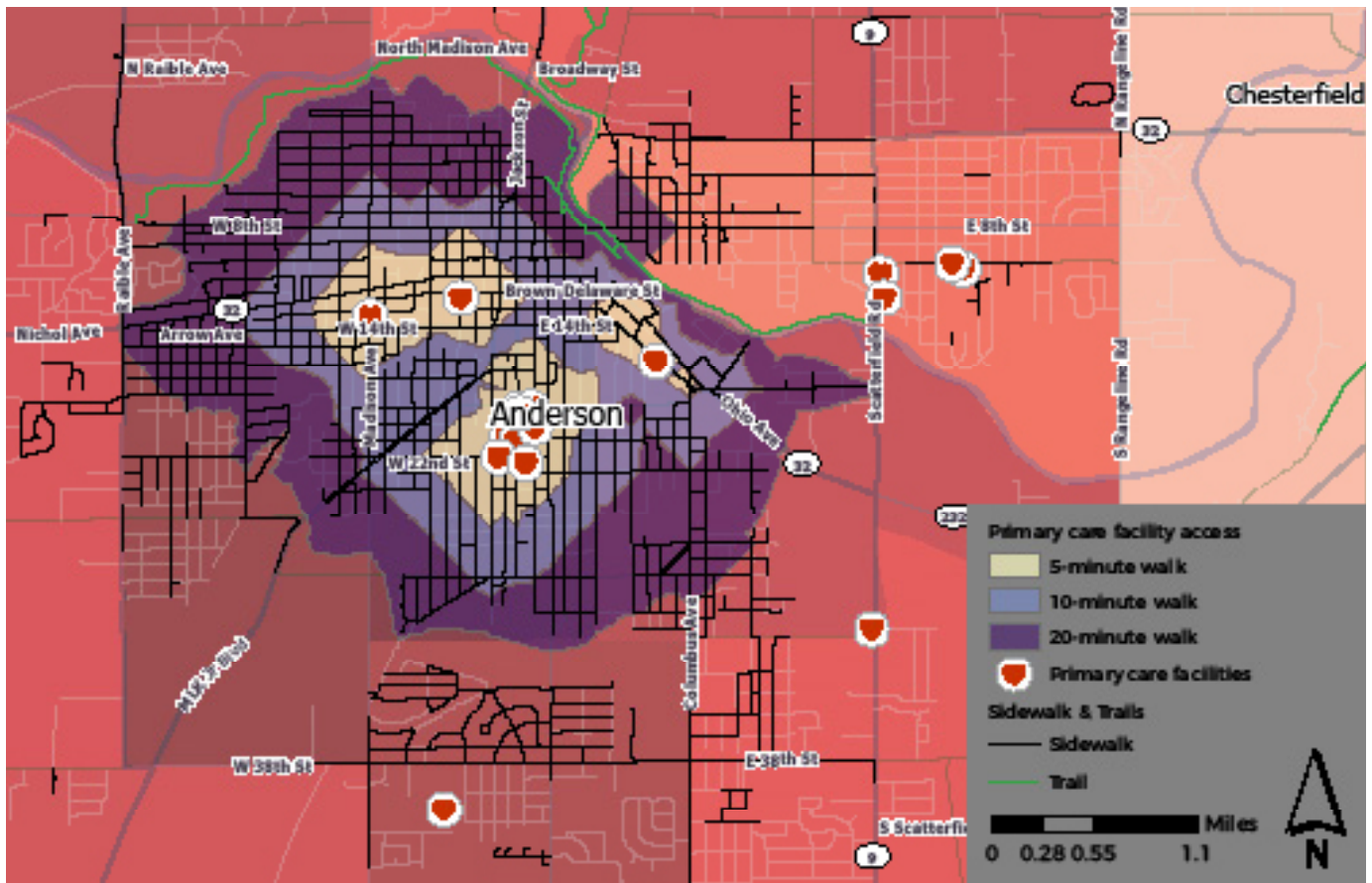


Figure 3.12 Primary care facility accessibility map

# Chapter 3

## Step 3: Health Impact Analysis

### SCHOOLS

When evaluating school locations within the Anderson MPA, results from the Walk Access Analysis indicated that there was an even amount of accessible and inaccessible locations. Most cities and towns did have at least one or more school locations that were accessible by sidewalk. These cities and towns included: Anderson, Alexandria, Pendleton, Elwood, Frankton, Lapel, and Summitville. Other towns such as Fortville, Markleville, Chesterfield, and Daleville have schools, but were not connected to any existing sidewalk systems. Further examination of those locations within City of Anderson have a similar combination of access for some residents and limited access for others, but overall accessibility was low.

Generally, schools located to the north and south sides of the community show particularly low accessibility. Despite the north side of community having existing sidewalk infrastructure, there are no sidewalk connections to school locations. A similar pattern is seen on the south side of the community, where sidewalk infrastructure exists but is limited. When encouraging healthier and safer daily habits amongst children and other school age youth, absence of existing pedestrian infrastructure makes the argument challenging.

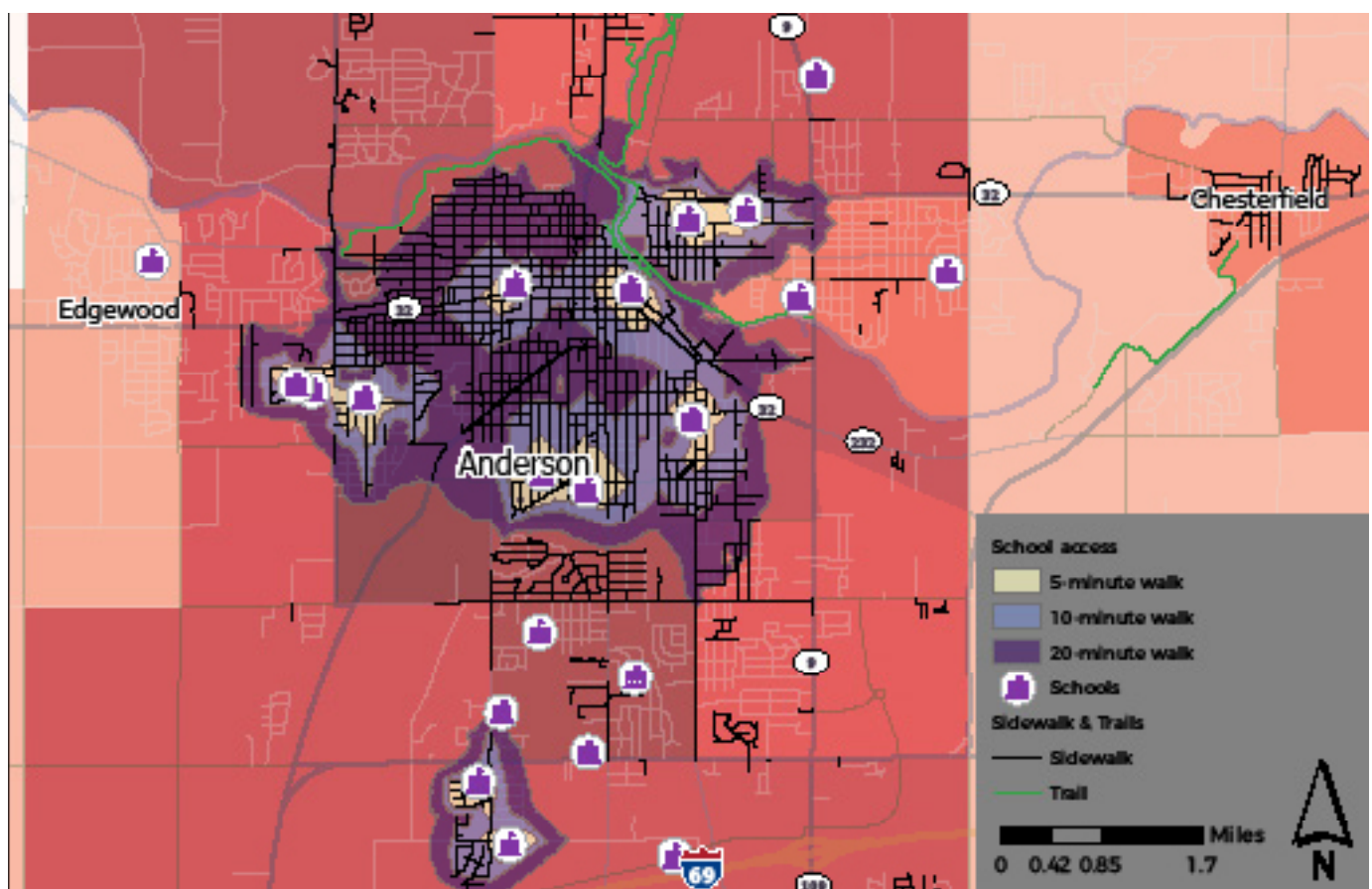


Figure 3.13 School accessibility map

# Chapter 3

## Step 3: Health Impact Analysis

### GOVERNMENT SERVICES

In review government services locations within the Anderson MPA, most cities and towns had locations that were accessible by sidewalk. Only the Towns of Ingalls and Daleville did not have government service locations that were accessible by sidewalk links. However, because there have been additions and enhancements since the 2015 sidewalk data was collected, these communities now have partial sidewalk connections to these locations.

Most government services are in or near Downtown Anderson and thus, because of the concentration of sidewalk infrastructure, most locations were identified as accessible. However, some destinations on the west and east sides of the community shows limited accessibility.

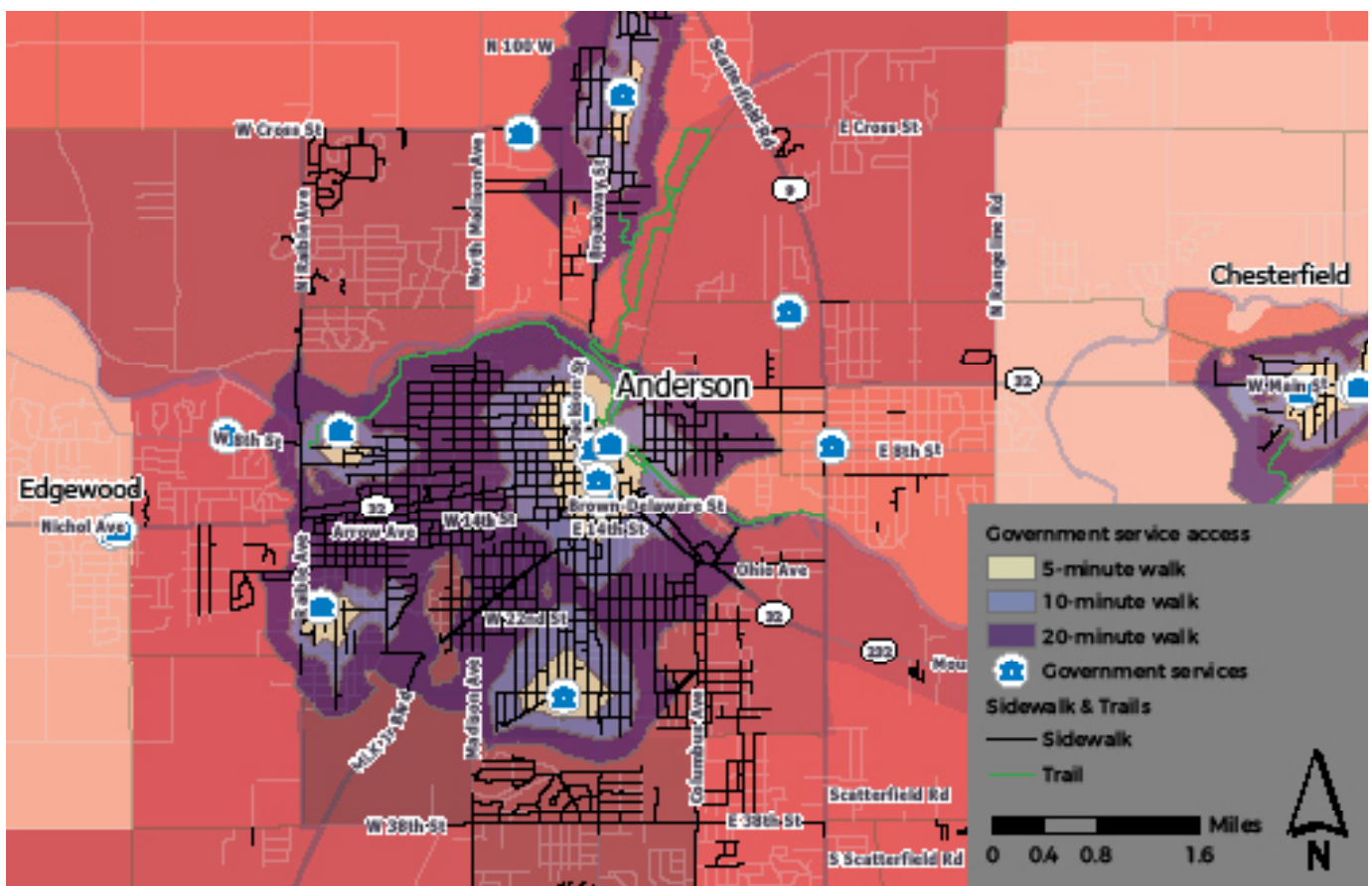


Figure 3.14 Government service accessibility map

# Chapter 3

## Final Considerations

Based on the GIS Maps generated, future efforts should be concentrated to improve existing sidewalk infrastructure, expanding the number of bus stops locations and bus routes where none currently exist, and address specific areas of concentration that have limited or no services or destination types. As indicated from these maps, grocery stores and primary care facilities have minimal sidewalk infrastructure that fully connects residents to existing locations within their area. Because these destination types are critical to improve long-term health, these at-risk areas should be targeted for improvements to improve health equity specifically in the cities of Anderson and Elwood.

After reviewing the at-risk areas that were revealed from the GIS maps, it is important to also consider the significant impact these low levels of accessibility may have had on the health indicators previously discussed. The measures from the Walk Access Tool highlighted that specific population cohorts are being disproportionately affected from the low accessibility. By understanding these impacts, it can help with formulating future policy recommendations to help improve the conditions of these cohorts.

Of the population cohorts that were impacted from the low levels of accessibility were cohorts living in unhealthy food environments. As mentioned before, a food environment is the physical, social, economic, cultural, and political factors that impact the accessibility, availability, and adequacy of food within a community or region. Cohorts who were living under the poverty line, of minority status, or who are a SNAP recipient were significantly impacted from being unable to access destination points like grocery or food stores. This is especially evident on the West side of Anderson where there is substantial minority population, and limited availability and access to grocery and food stores. Without the proper access to nutritional goods, these cohorts will continue to be in an unhealthy environment where they risk becoming obese and developing diabetes. These factors, as well as the lack of access to nutritional foods, may explain the significant rate of food insecurity that currently exists in the Anderson MPA.

# Chapter 3

## Final Considerations

Another cohort that experienced a significant impact were those who use active transportation and recreational facilities. Due to the lack of infrastructure, and areas that have a lack of access to bus stop locations, those who use active means of transportation have little to no choice but to rely on their automobiles. Consequently, the lack of sidewalk connections also hampers efforts in encouraging residents to walk and or bicycle more. Because of the limited sidewalk infrastructure in certain areas such as SR-9 in Anderson, these cohorts will continue to be less physically active. Additionally, recreational facilities that improve physical activity such as bike-share programs and trails will continue to see little to no use. A general indicator that shows the full extent of these effects is the health indicator “access to exercise opportunities” which highlights that because of the low accessibility, residents of the Anderson MPA have a lower amount of access to exercise opportunities. As a result, this will increase the rates of physical inactivity among all cohorts in the Anderson MPA and potentially lead to increased rates of obesity.

One other cohort that was also affected were those who are at a higher risk for developing certain health conditions. Because of the limited accessibility to health

facilities, services, and personnel, this increases the health risk for population cohorts who require consistent treatment and increased services. The population cohorts who were specifically impacted from these low levels were those who are uninsured, 60 years and older, and minorities. These cohorts live in areas with little sidewalk infrastructure and low access to health services and facilities. This is evident in some areas such as in Northern Madison county where access was particularly limited and had a high concentration of those who were 60 years and older. Arguably the two other cohorts, minorities and those uninsured, were impacted the most. As indicated from the HVI and Walk Access Tool, they had lesser access to important health services due to the low sidewalk infrastructure in their areas and availability of health facilities. Considering these impacts, these cohorts may continue to see a greater risk of developing conditions such as obesity and or diabetes.

# Goals & next steps



# Chapter 4

## Action items

After reviewing the predominant health trends of the Anderson MPA and their impacts, it is vital to address and improve any reoccurring obstacles identified. To build a stronger, healthier, and more equitable region, changes must be made regarding matters of the existing built environment, as well as planning and decision-making processes of municipalities and the MPO.

The recommendations identified will improve specific infrastructure elements and various programs, plans, and policies, which have been recognized as best practices by the American Planning Association (APA). Each recommendation or action step has been developed to accomplish a series of goals and objectives, which relate directly to the findings of this Health Impact Assessment (HIA). Each overarching goal is a statement to strive toward, while corresponding objectives address more specific topic areas to assist in achieving the corresponding goals

# Chapter 4

## Action items

### ***Goal 1: Enhance multi-modal connectivity within the transportation system.***

The current transportation system of the Anderson MPA is predominately focused on motorized transportation with limited emphasis on non-motorized transportation. As discussed throughout this HIA, safe and reliable access to parks and other destinations have proven effects on improving health. This is an important element for the MPO to improve upon as results from the Walk Access Tool revealed limited connectivity to important destinations. To help improve the current health trends in the MPA, it will be necessary for the MPO to concentrate future efforts to enhance multi-modal connectivity.

| <b><i>Objectives</i></b>                                                                                                        | <b><i>Action steps</i></b>                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Objective 1: Utilize bicycle and pedestrian friendly design to improve safety and connectivity of non-motorized infrastructure. | <b>Action Step 1.1.1:</b> Identify best practices for the design of non-motorized infrastructure in communities.             |
|                                                                                                                                 | <b>Action Step 1.1.2:</b> Work with municipalities to integrate bicycle parking guidelines into local development standards. |
|                                                                                                                                 | <b>Action Step 1.1.3:</b> Encourage optimal sidewalk designs for municipalities undergoing corridor improvement projects.    |
| Objective 2: Expand bicycle & pedestrian planning efforts.                                                                      | <b>Action Step 1.2.1:</b> Establish a bicycle and pedestrian subcommittee of the MPO Citizens Advisory Committee.            |
|                                                                                                                                 | <b>Action Step 1.2.2:</b> Leverage input on bicycle and pedestrian planning from existing organizations.                     |
|                                                                                                                                 | <b>Action Step 1.2.3:</b> Work with municipalities to develop bicycle & pedestrian master plans.                             |
|                                                                                                                                 | <b>Action Step 1.2.4:</b> Develop a Sidewalk Gap Identification & Prioritization Tool (SGIPT).                               |
|                                                                                                                                 | <b>Action Step 1.2.5:</b> Establish a Safe Routes to School (SRTS) Assistance Program centered upon health & wellness.       |

# Chapter 4

## Action items

### ***Goal 2: Encourage development that improves community connectivity and accessibility.***

Current development patterns within the MPA have contributed to sprawl and low access among some population cohorts. For example, Scatterfield Road (SR 9) is not fully accessible and has limited sidewalk infrastructure along the corridor, as well as limited adjacent sidewalk connections leading to this corridor. This pattern of development prevents some population cohorts from accessing important health services and nutritional goods. To address the issue of access and connectivity, it is vital that the MPO encourage local development in communities that will improve access between these cohorts and their destinations.

| <b><i>Objectives</i></b>                                                                                                                                       | <b><i>Action steps</i></b>                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective 1: Develop policy recommendations that support community accessibility.                                                                              | <b>Action Step 2.1.1:</b> Identify municipalities that require updates to zoning and development ordinances.                                                              |
|                                                                                                                                                                | <b>Action Step 2.1.2:</b> Contracting with municipalities for zoning and development ordinance updates.                                                                   |
|                                                                                                                                                                | <b>Action Step 2.1.3:</b> Identify opportunity to develop overlay districts to increase and improve connectivity.                                                         |
| Objective 2: Encourage municipalities on the importance of incorporating non-motorized infrastructure requirements in their zoning and development ordinances. | <b>Action Step 2.2.1:</b> Educate municipalities on the importance of incorporating non-motorized infrastructure requirements in their zoning and development ordinances. |
|                                                                                                                                                                | <b>Action Step 2.2.2:</b> Provide technical assistance to address problem corridors identified by municipalities.                                                         |
|                                                                                                                                                                | <b>Action Step 2.2.3:</b> Utilize the Sidewalk Gap Identification & Prioritization Tool (SGIPT) to support locally funded sidewalk expansion programs.                    |
|                                                                                                                                                                | <b>Action Step 2.2.4:</b> Establish a funding program for sidewalk, bike lane, and trail improvements to support transit throughout the City of Anderson.                 |

# Chapter 4

## Action items

### ***Goal 3: Expand efforts to better utilize health-related data.***

Based upon the results of this HIA, the MPO should expand its efforts to apply health-related data when developing plans and projects. The methodology used to analyze trends in this HIA was limited, but with new research continuously being published on the correlation between health and planning, it is important that the MPO considers incorporating new methods and tools in the development of its next HIA. Building key resources and tools to evaluate projects or planning processes will also allow the MPO to effectively monitor emerging trends.

| <b><i>Objectives</i></b>                                                                  | <b><i>Action steps</i></b>                                                                                                                              |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective 1: Develop data collection method to effectively evaluate health equity issues. | <b>Action Step 3.1.1:</b> Create database for health-related data.                                                                                      |
|                                                                                           | <b>Action Step 3.1.2:</b> Gather data from public health databases and research studies.                                                                |
|                                                                                           | <b>Action Step 3.1.3:</b> Monitor and update database before plans or certain projects.                                                                 |
| Objective 2: Utilize Impact & Community Assessment Tools.                                 | <b>Action Step 3.2.1:</b> Develop set of tools useful for assess health-related issues.                                                                 |
|                                                                                           | <b>Action Step 3.2.2:</b> Use tools like the HIA and other assessment tools to help gather necessary up to date data for planning studies and projects. |
|                                                                                           | <b>Action Step 3.2.3:</b> Integrate assessment tools into the project selection process.                                                                |
|                                                                                           | <b>Action Step 3.2.4:</b> Analyze plans and programs through health and community impact assessments.                                                   |
|                                                                                           | <b>Action Step 3.2.5:</b> Establish an update procedure for assessment tools.                                                                           |

# Chapter 4

## Action items

### ***Goal 4: Improve policies on health-related issues that affect transportation planning process.***

Because planning agencies can play a vital role in improving public health concerns, by developing policies to ensure their incorporation in the planning process. Following the trends and results of this HIA, updates to planning policies can better equip the MPO and to address evolving health trends. To improve the long-term health of the MPA, it is important that the MPO incorporate the new information gained from this HIA regarding health-related issues into its planning policies.

| <b><i>Objectives</i></b>                                                           | <b><i>Action steps</i></b>                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective 1: Improve equity analysis measures for facilities, projects, and plans. | <b>Action Step 4.1.1:</b> Research new methods to measure and evaluate access and equity.                                                                                                                                         |
|                                                                                    | <b>Action Step 4.1.2:</b> Update measures from new methods to ensure facilities, such as bus stop locations, can be used in reports and plans.                                                                                    |
| Objective 2: Expand coordination with health professionals.                        | <b>Action Step 4.2.1:</b> Identify local and regional professionals for future coordination.                                                                                                                                      |
|                                                                                    | <b>Action Step 4.2.2:</b> Communicate regularly with local and regional health professionals.                                                                                                                                     |
|                                                                                    | <b>Action Step 4.2.3:</b> Coordinate on overlapping objectives with transportation and health.                                                                                                                                    |
|                                                                                    | <b>Action Step 4.2.4:</b> Participate in health-related events, such as the Health Equity Summit and American Planning Association mobility in the modern era, to stay up to date with health-related planning topics and issues. |

# Chapter 4

## Conclusion

In review of the knowledge gained regarding transportation and health from this HIA, it is important to also consider the obstacles and lessons learned during its development. Because this was the first HIA conducted by the MPO, the process consisted of many different terms, tools, and methods that were not entirely understood, especially their relationship to transportation planning.

### Health Professionals

To assist in understanding the connection better, public health professionals were incorporated into the planning process. This posed additional challenges, as one person's advice was often limited or evolved from contact with another professional. Additionally, the data known by most professionals and required for the scope of research were also often limited in scope or unavailable to the MPO altogether. Furthermore, because of the valuable connections developed, the MPO avoided outdated databases and found crucial data supporting the HIA. Thus, it is important to note that without the knowledge and resources gained from health professionals, the MPO would not have been able to locate and apply all relevant data to develop this HIA. However, because of the significant amount of data and data sources, coordination with health professionals should be conducted much earlier in the planning process to eliminate data discrepancies and determine which health trends have the most data available.

### Methodology

Another challenge was developing methodology to measure accessibility throughout the Anderson MPA to effectively assess its impact on health. There were numerous methods that could be utilized and difficult

to choose given the capacity and resources available. Elements such as sidewalk connections, inclusion of destinations, type of analysis, and travel time all needed to be considered. To effectively measure these components, the Walk Access Tool was developed. While this method had limitations, it was instrumental in identifying areas with low accessibility, disadvantaged populations, and potential concentrations of negative health trends. However, critical to the use of this tool was the infrastructure data available. Therefore, future use of the tool would benefit from improved data sets documenting destinations, destination types, and their adjacent sidewalk connections.

Additionally, the health indicators chosen were another important part of the methodology used. Those considered had evidence that they were directly or indirectly impacted from a lack of access. Because of the limited availability of local health data, while an indicator would be chosen, identifying qualifying evidence for the Anderson MPA was often difficult especially with food insecurity and exercise opportunities. While input from health professionals was valuable for the development of this methodology, additional consideration must be made in the future as improvements are made with local health data.

# Chapter 4

## Conclusion

### Evolving Research

As the MPO continue to examine the interconnected relationship of health and transportation, additional health studies and research must be incorporated into the HIA planning process. During the initial stages developing the methodology and identifying resources, minimal data and studies developed or maintained by the MPO were identified. Therefore, establishing a database of health professionals and resources available on health and transportation issues can better prepare the MPO for future HIA planning processes.

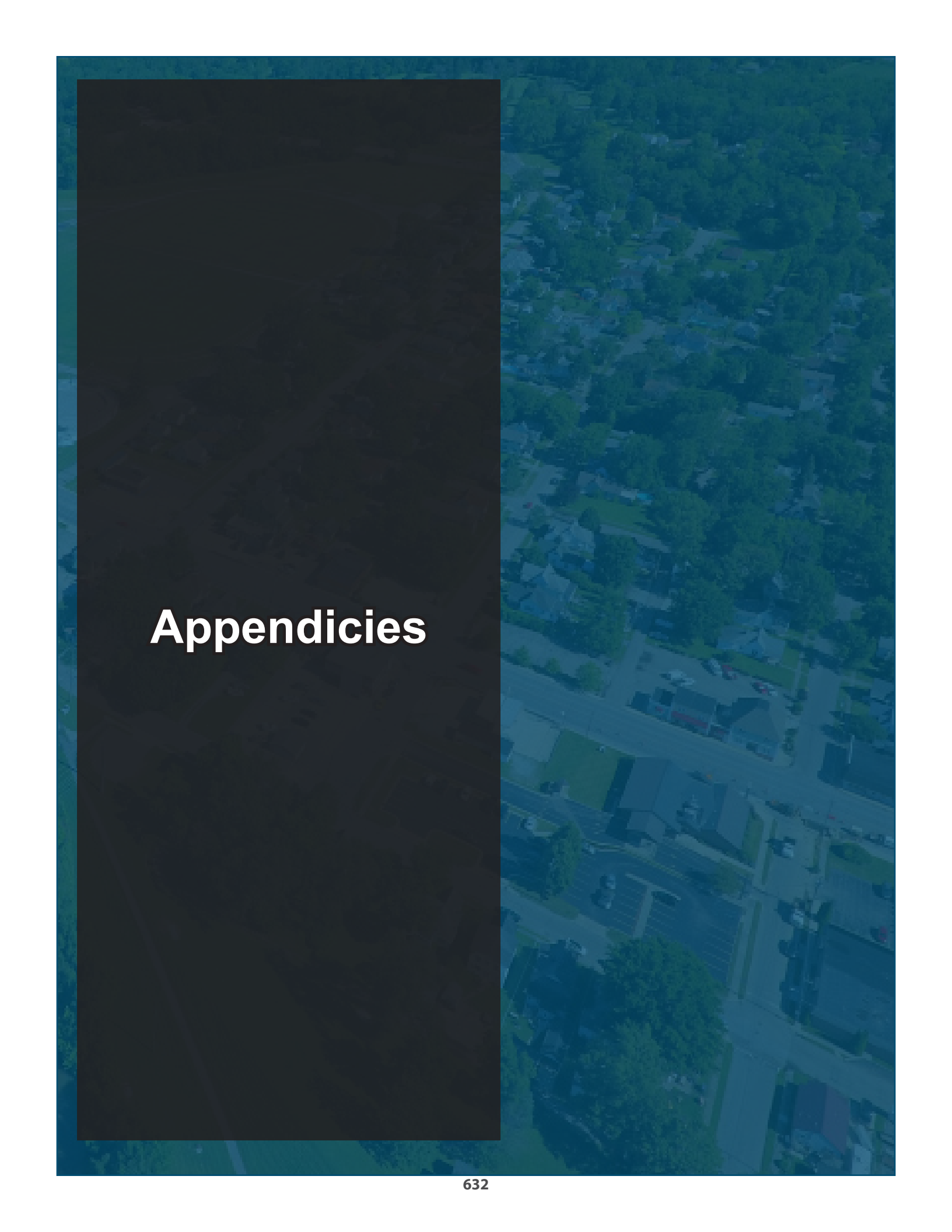
### Next Steps

Through the HIA development process, MCCOG has identified important developments regarding health and their link to the built environment from available health data and local socioeconomic factors. From the findings, this HIA has built a foundation for monitoring important trends like physical inactivity, obesity, and diabetes of the Anderson MPA.

Overall, the HIA process highlighted the importance of role of health in planning and how it is currently undervalued. When consulting with health professionals, it was noted that many MPO's have not considered public health this extensively within the planning process. If health is mentioned, it is usually discussed briefly alongside the

benefits of pedestrian-friendly infrastructure or other planning related subjects. This HIA process has illustrated that health is an important element to consider for the long-term sustainability of any plan, project, or policy. Most recently with the effects of Covid-19, health and our built environment proved further how the two are intertwined and impact the overall quality of life. This HIA process has highlighted the importance of health in the planning process and reinforced the need that health becomes a routine consideration in the planning process to the affect the long-term success of communities and neighborhoods.

To further monitor these emerging trends, the MPO will update this HIA every five (5) years or before major planning processes like the MTP. The ongoing review of these trends will be important to ensure future proposed projects or plans focus on areas where concentrated effort is necessary to make progressive impacts.



# Appendices

# Appendix A.

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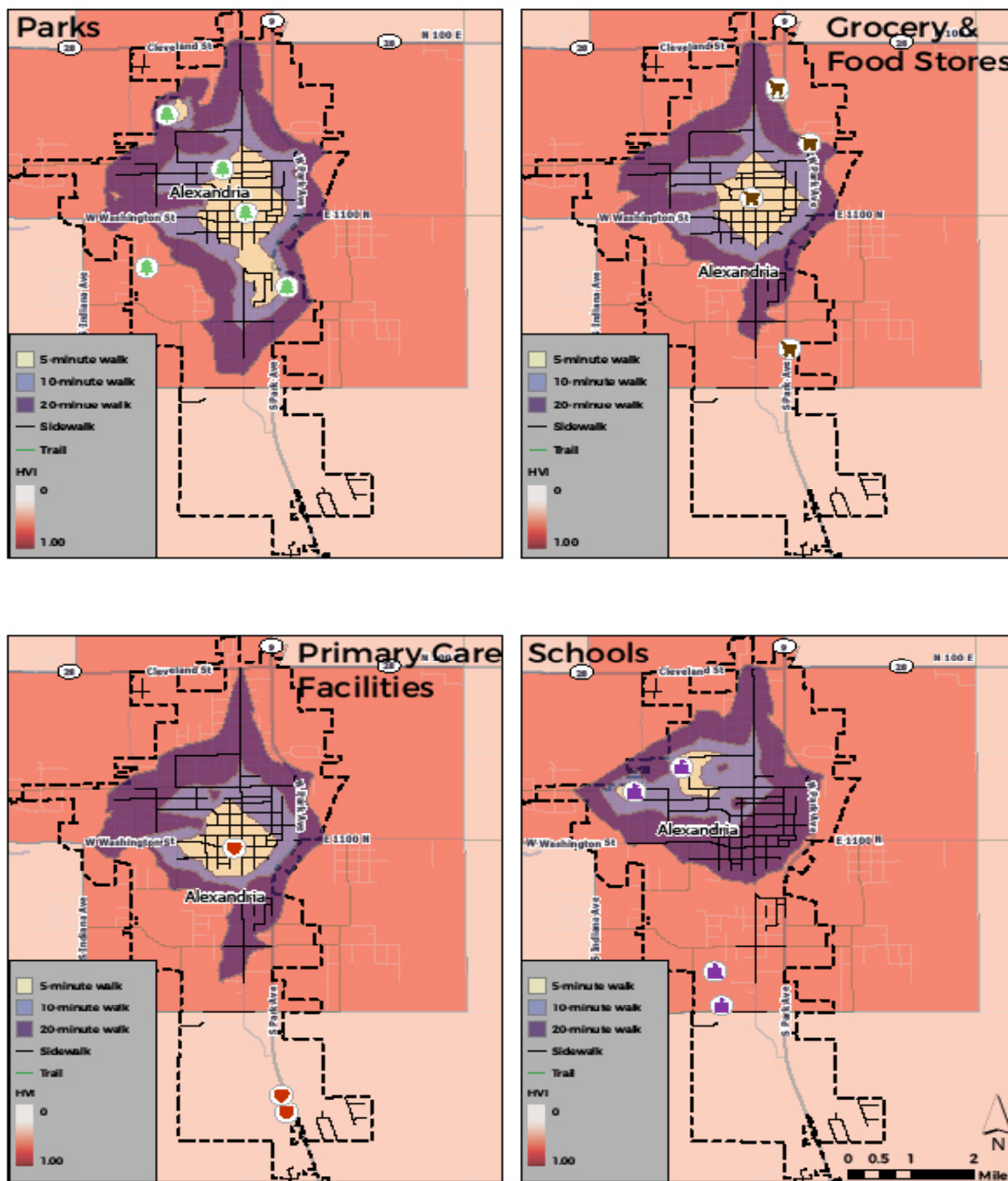
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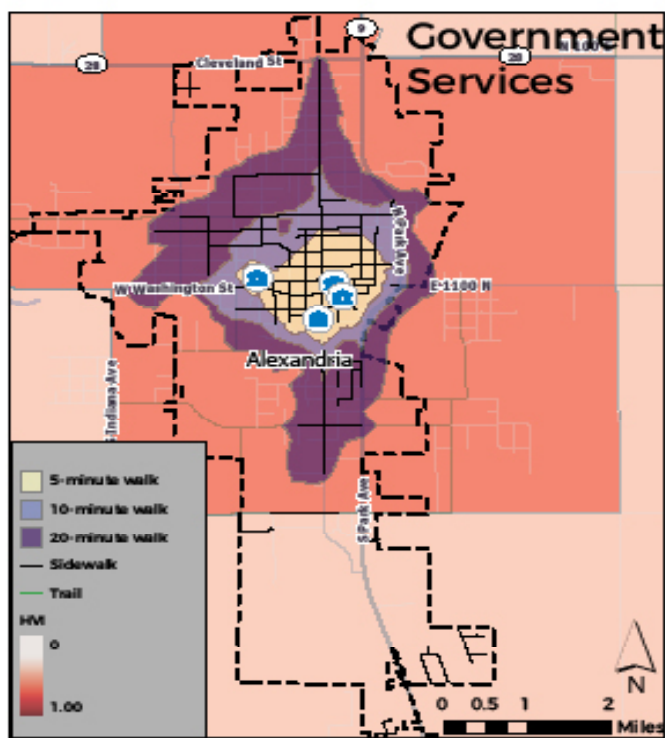
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## Accessibility maps: Alexandria



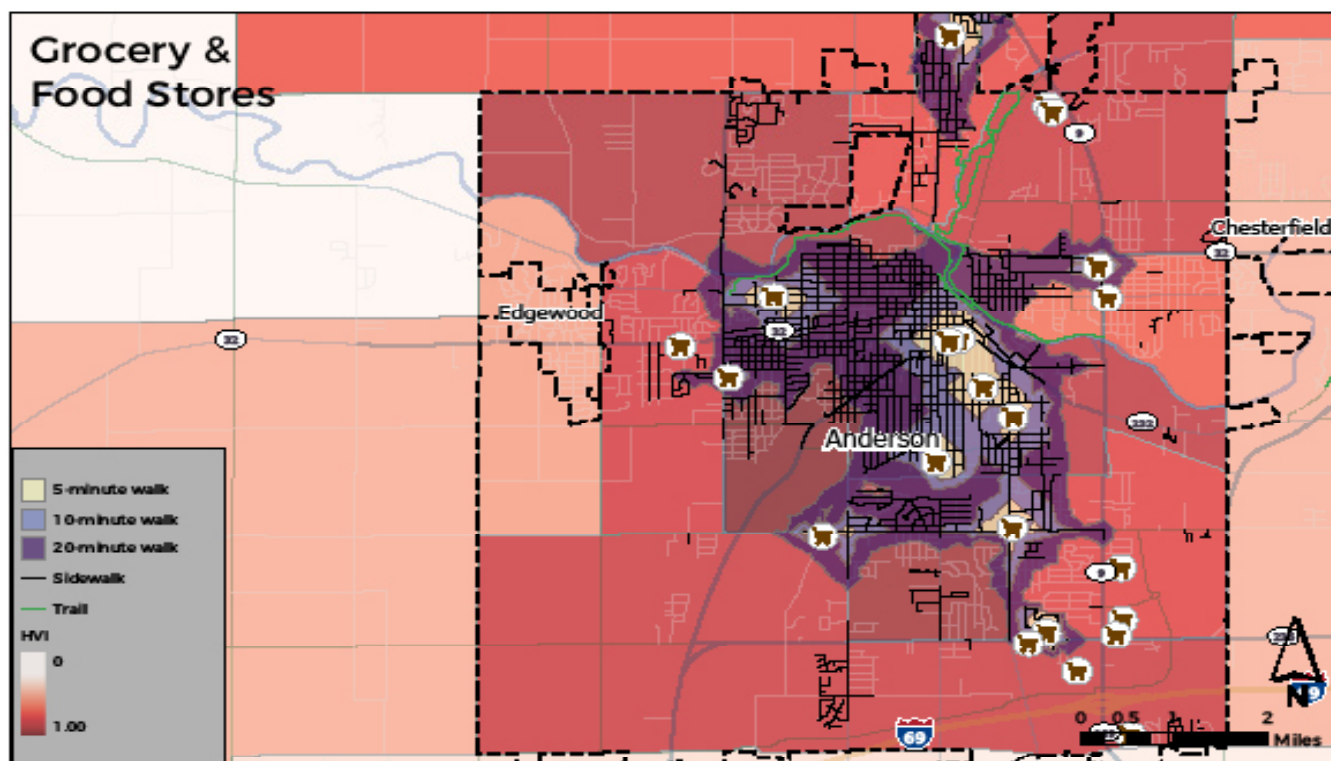
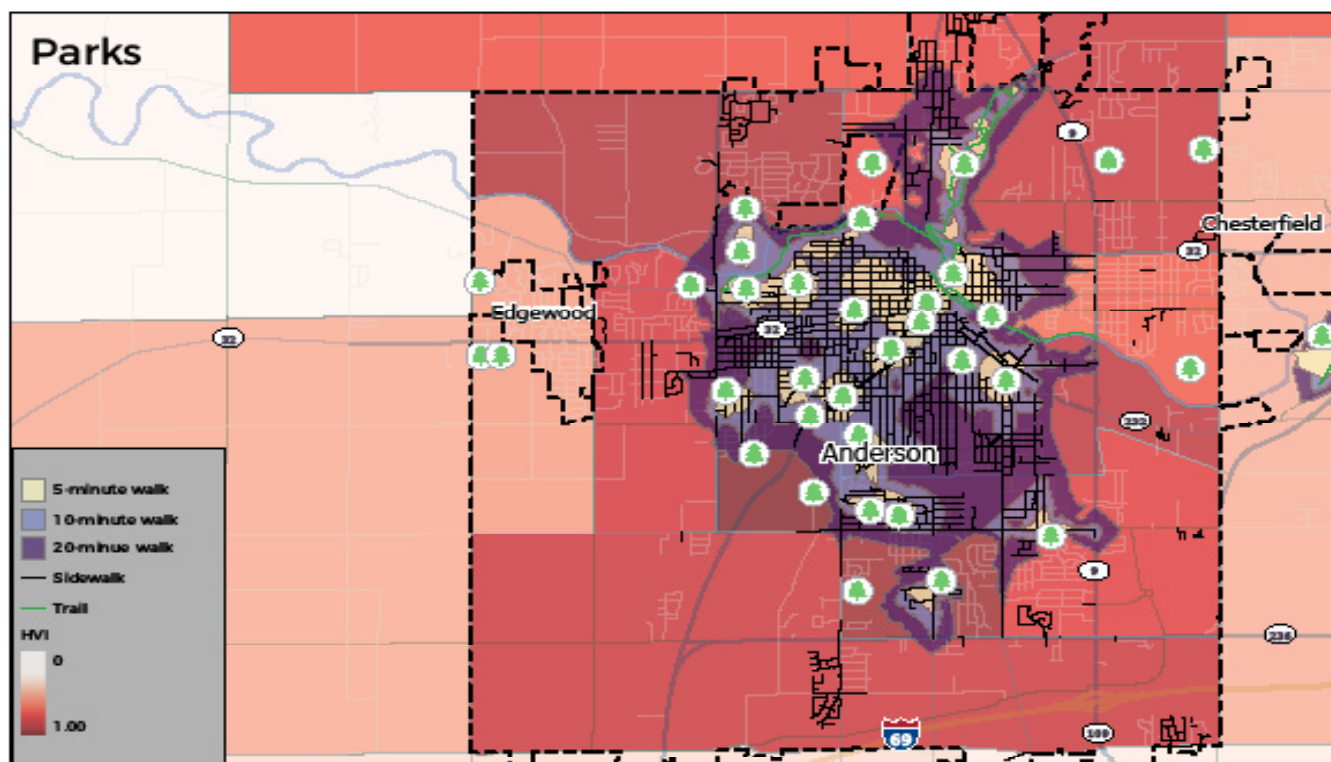
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## Accessibility maps: Alexandria



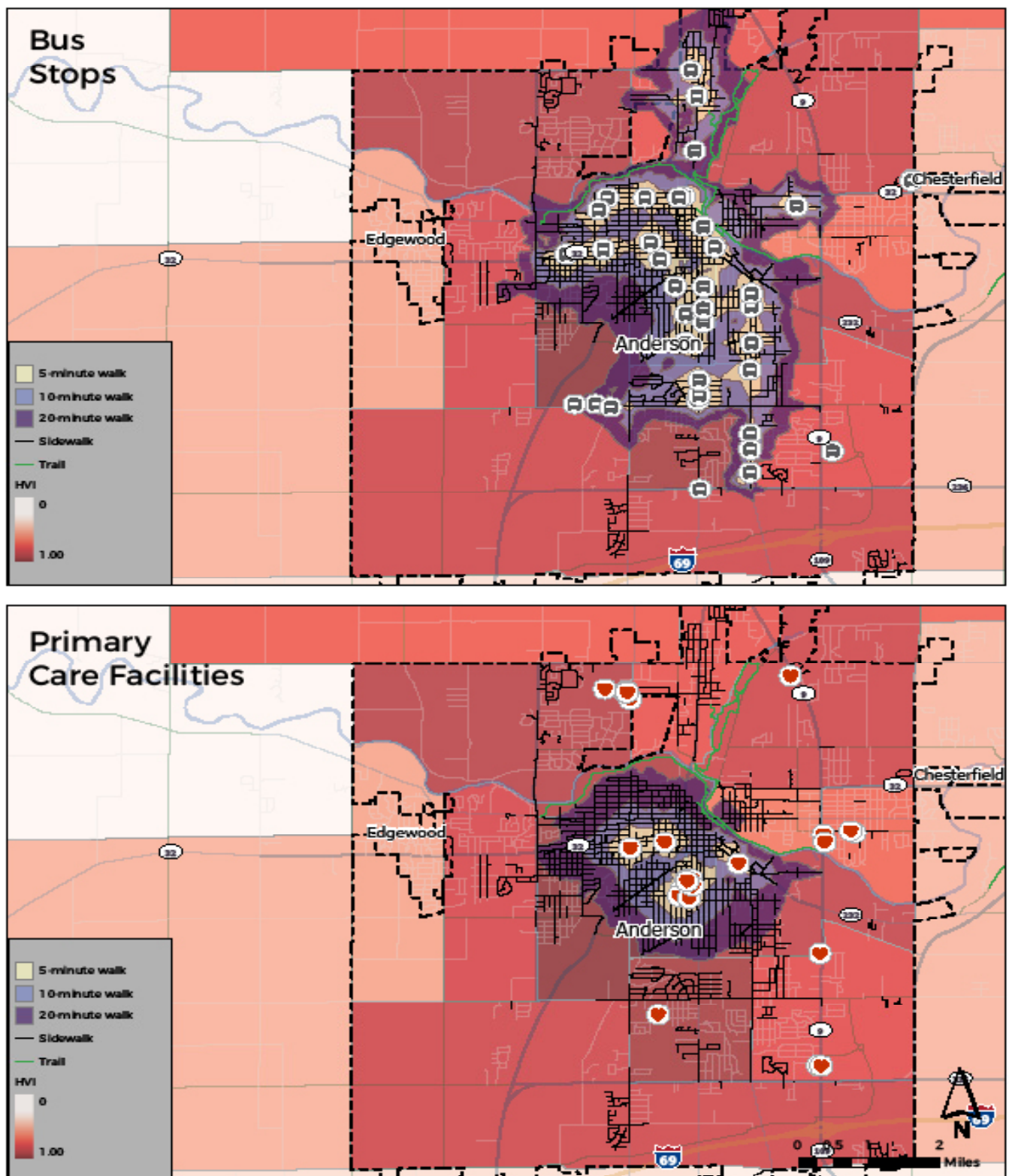
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## Accessibility maps: Anderson



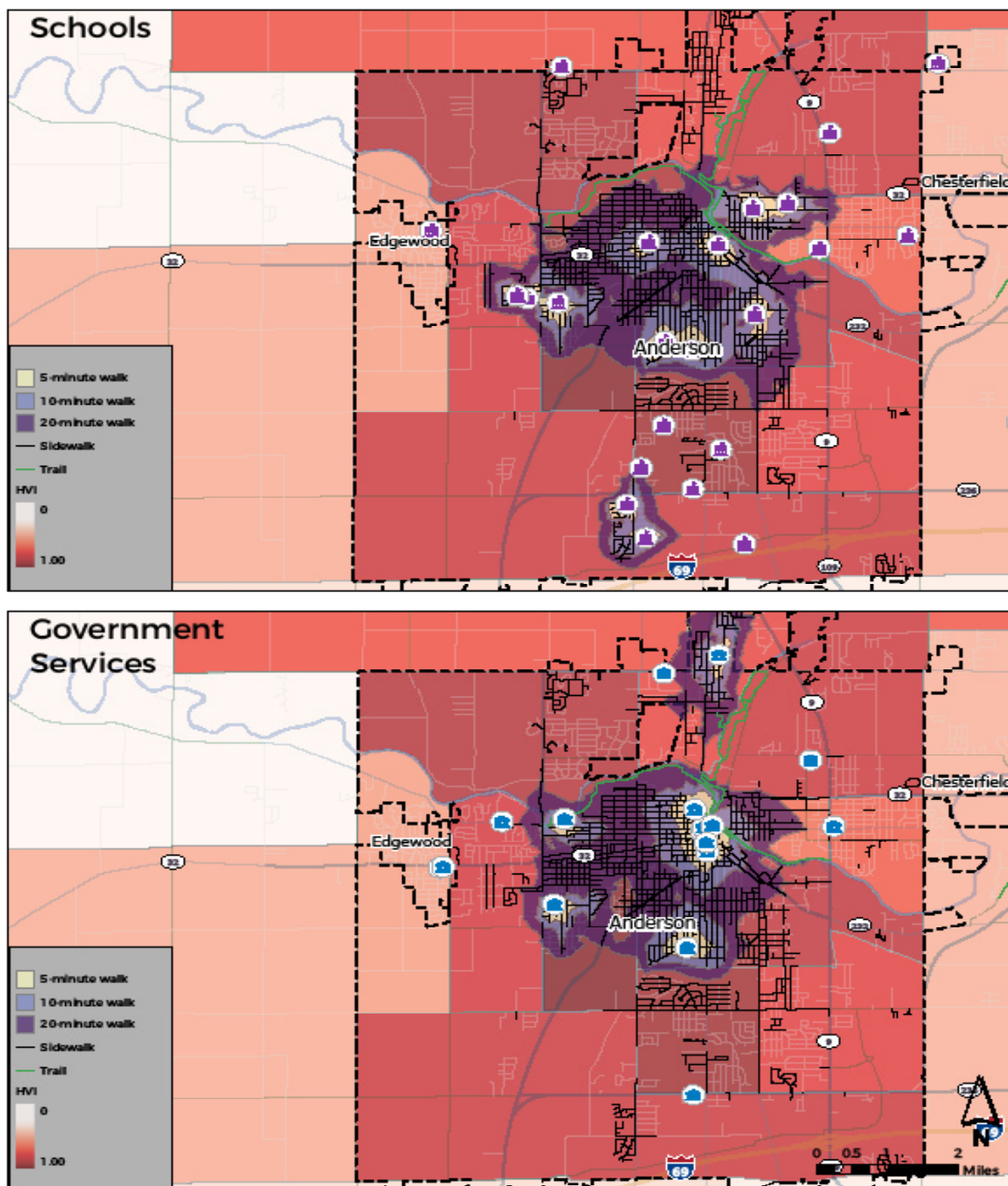
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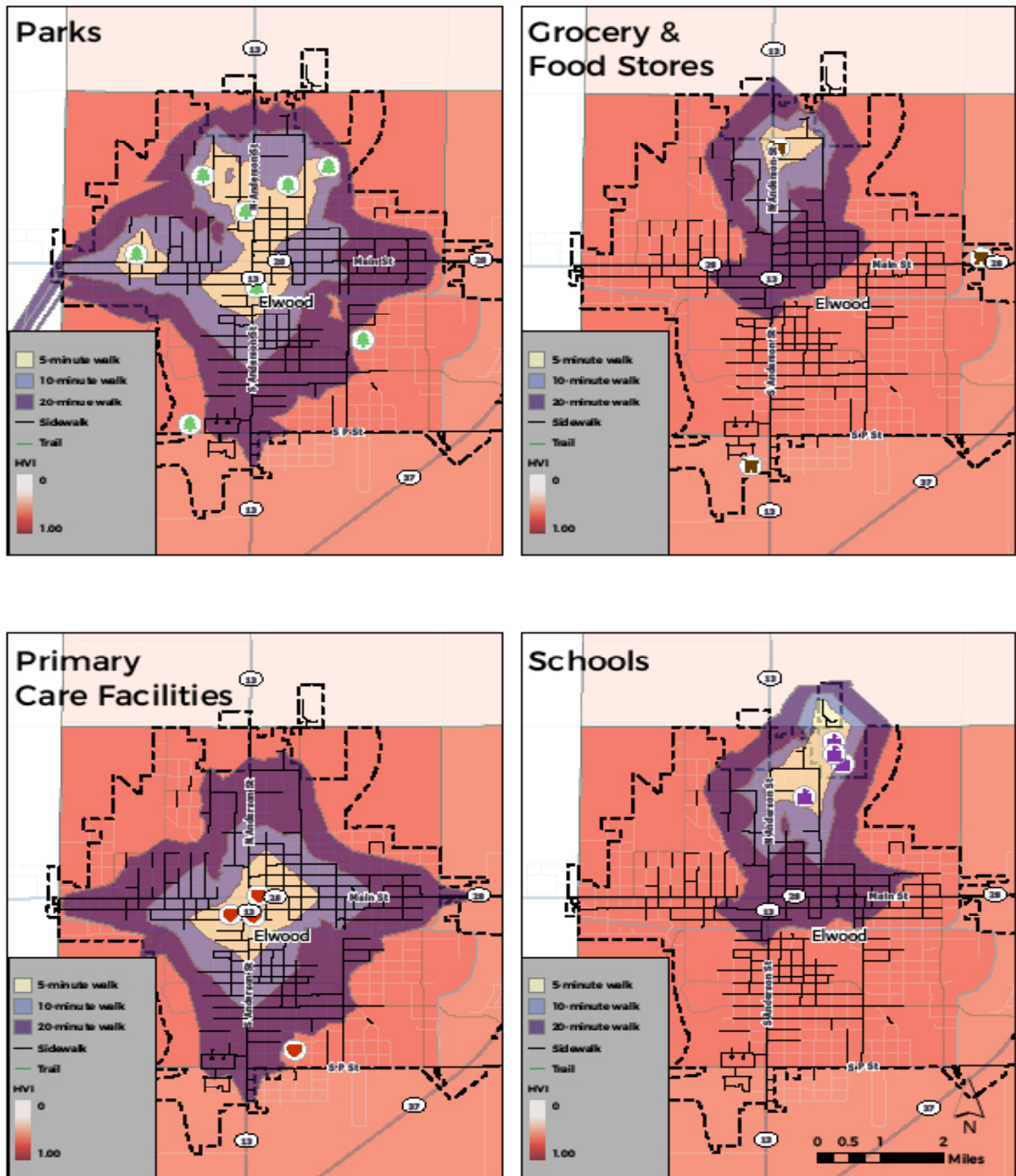
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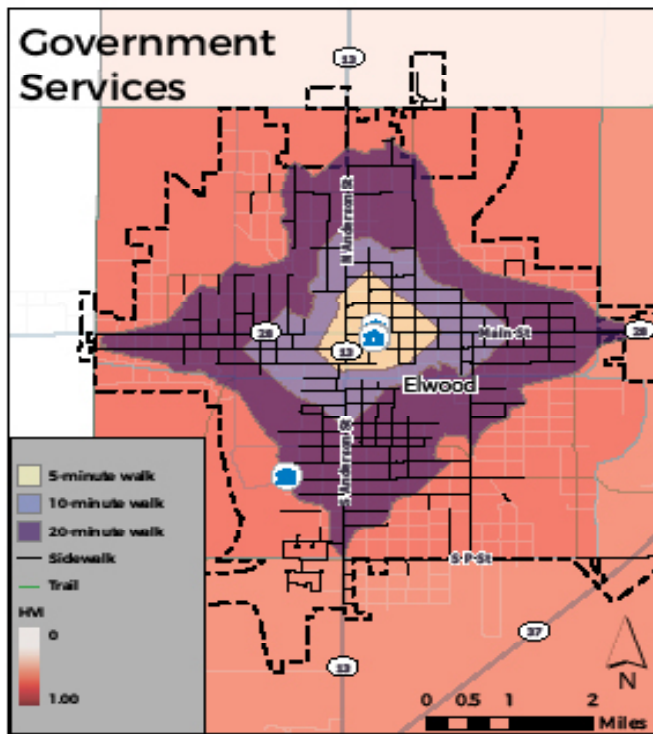
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## Accessibility maps: Elwood



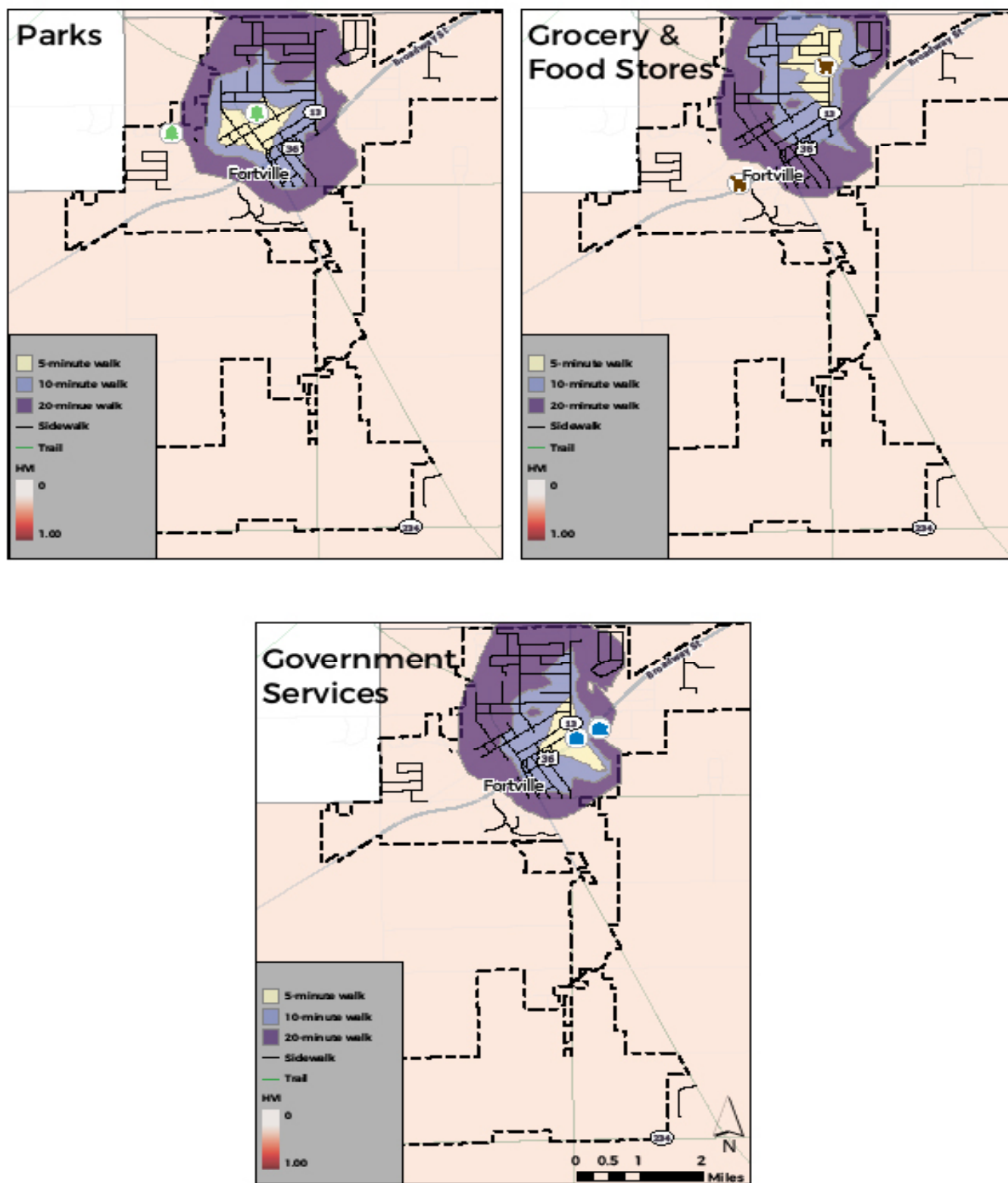
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## Accessibility maps: Elwood



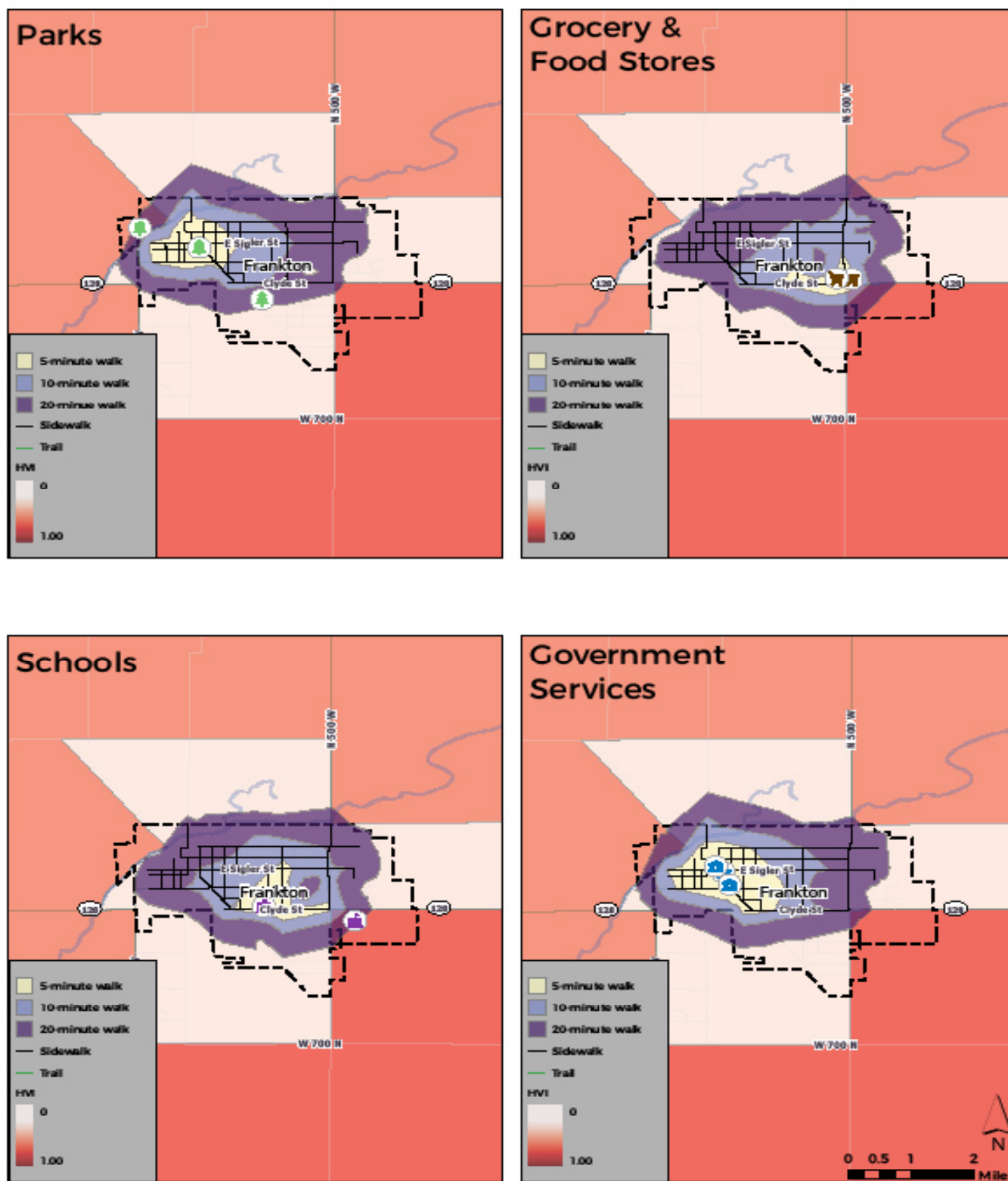
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## Accessibility maps: Fortville



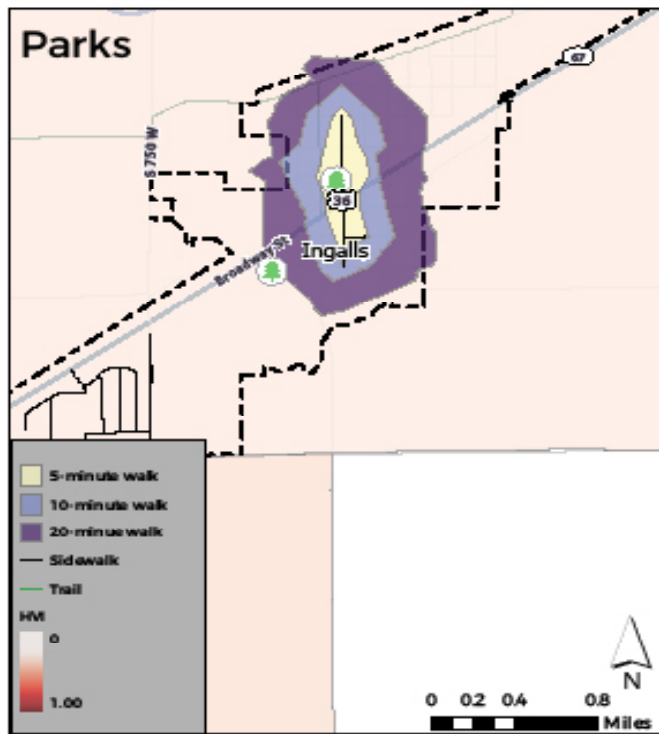
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## Accessibility maps: Frankton



# Appendix B.

## Accessibility maps: Ingalls

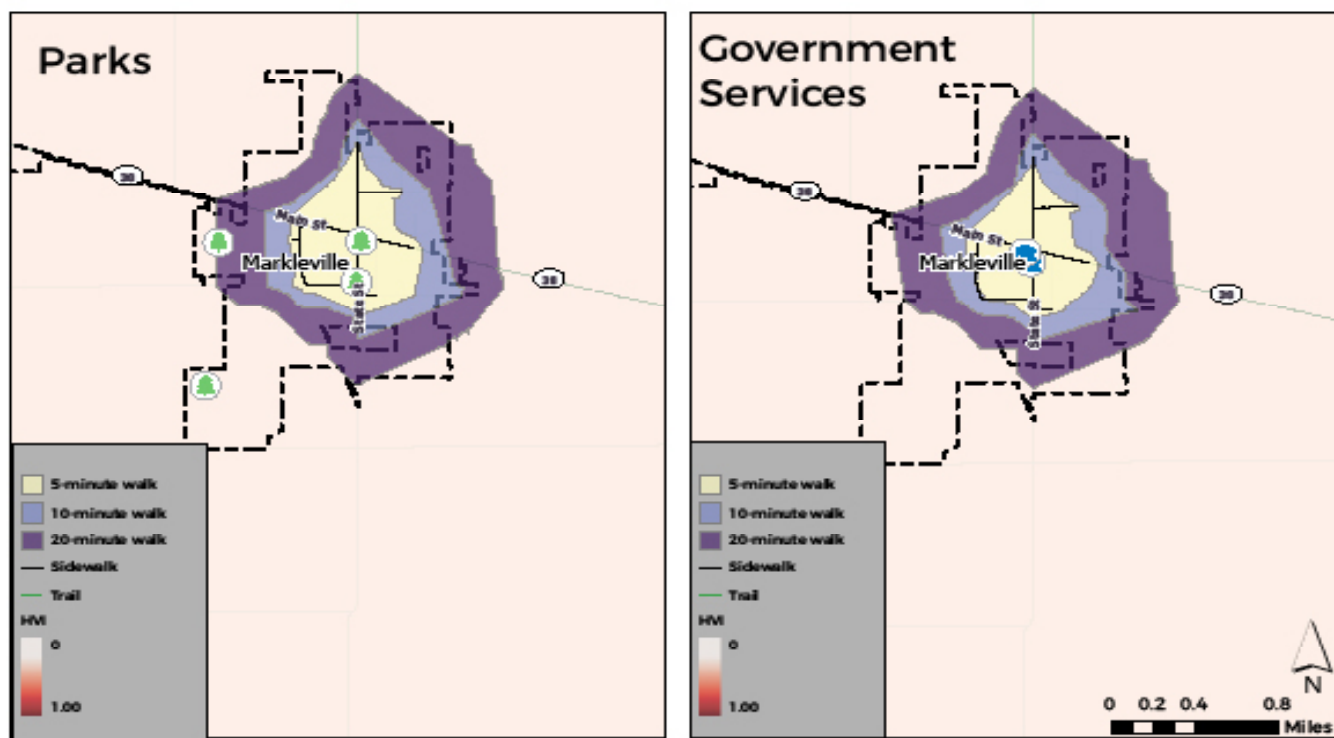


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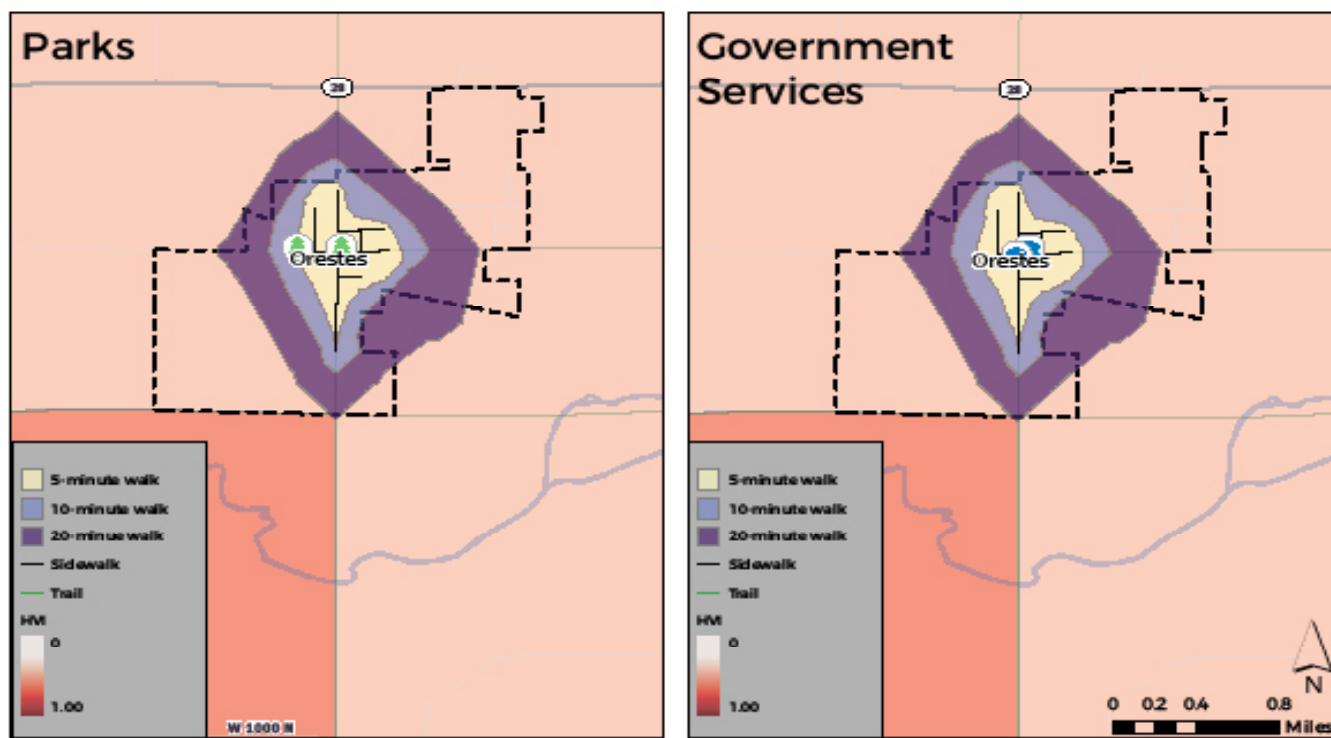
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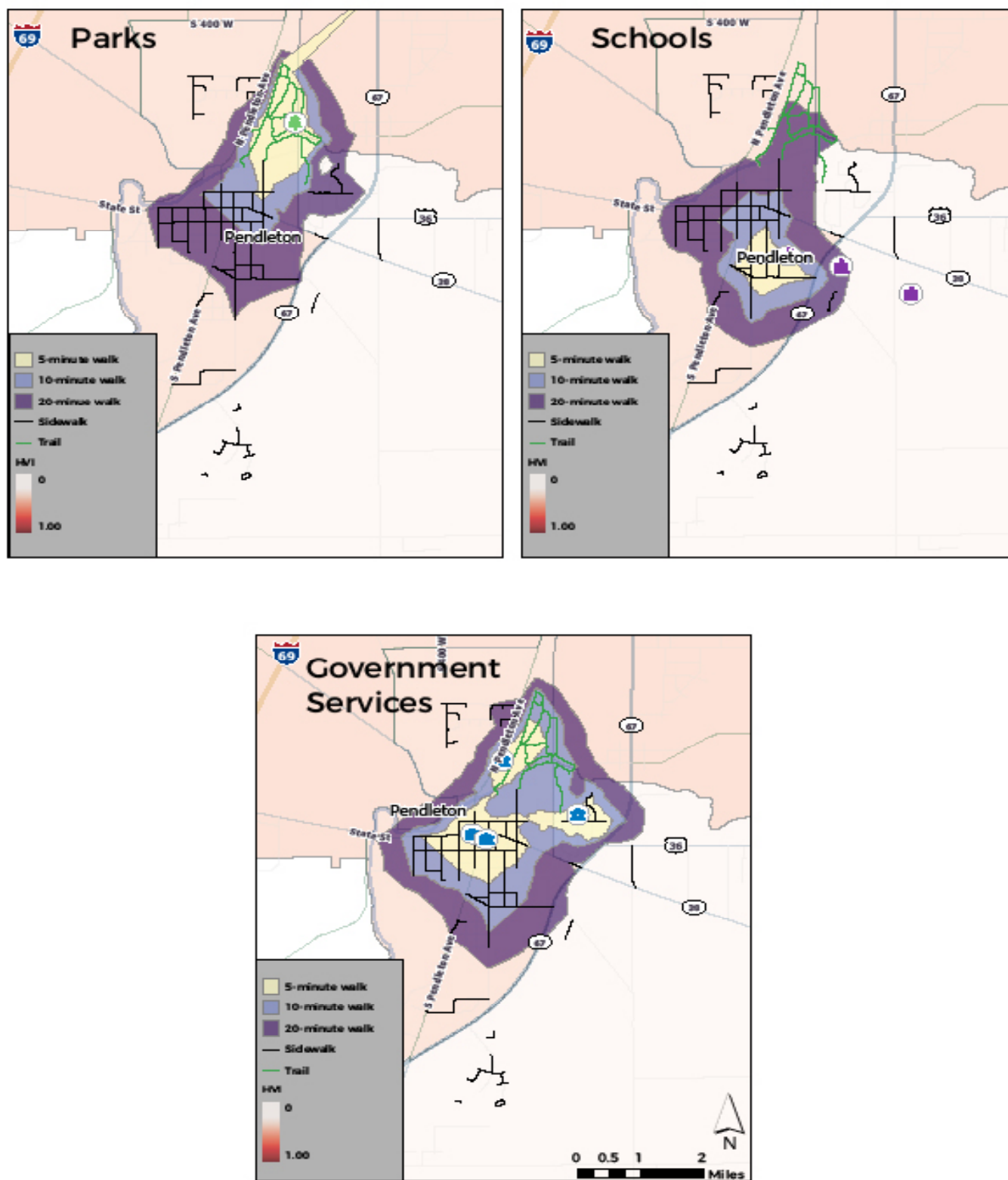
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## Accessibility maps: Orestes



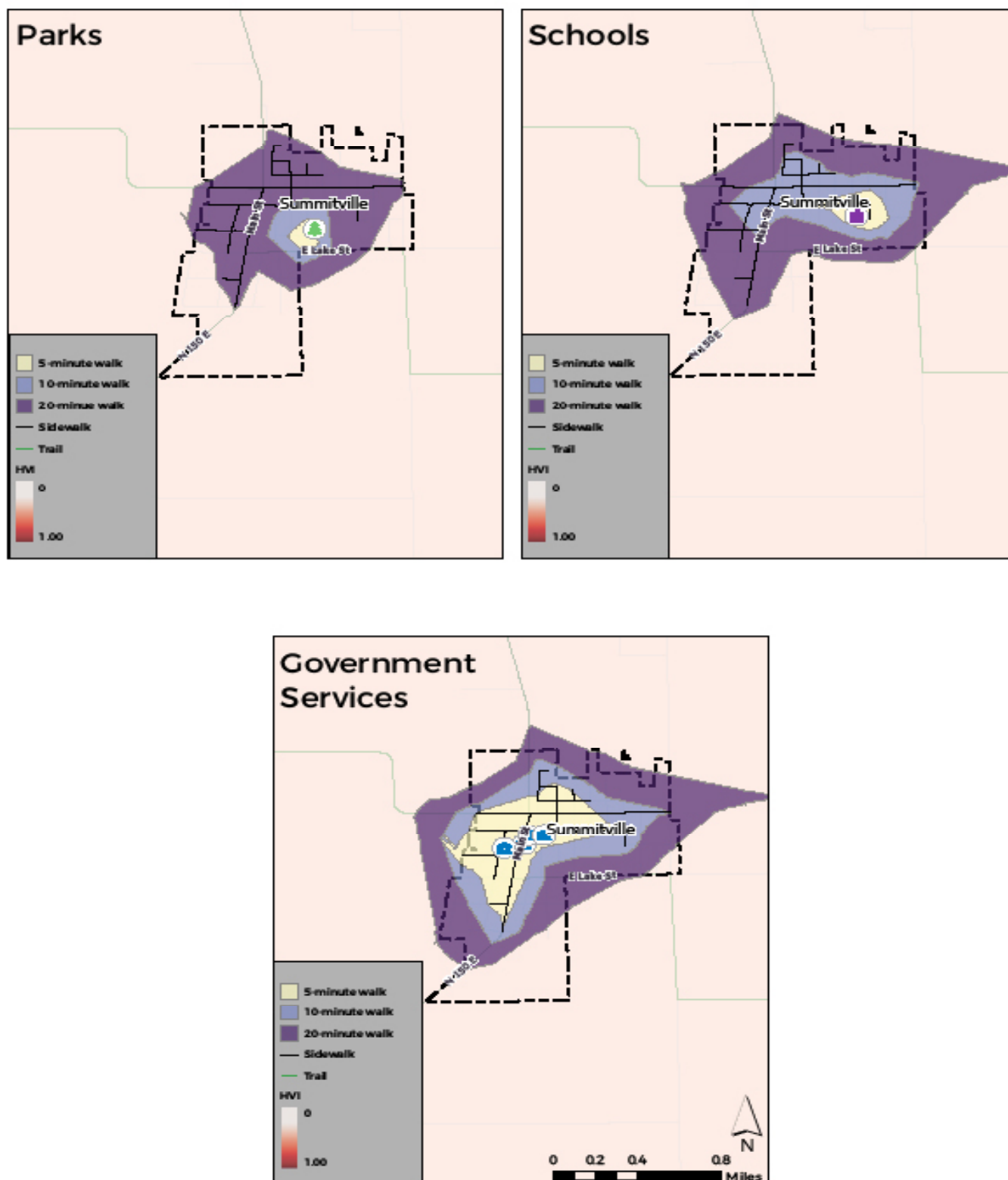
# Appendix B.

## Accessibility maps: Pendleton



# Appendix B.

## Accessibility maps: Summitville



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