



To: Lee Ann Prather, Janel Veile, Adam Gabany, and Michael Vanderhoof (IDOT)
From: Alta Planning + Design
Date: June 15th, 2023
Re: Illinois Active Transportation Plan – Health Analysis

Introduction

One of the goals of the Illinois Active Transportation Plan is to foster healthier and more active communities by promoting active transportation through the built environment. By providing more safe and comfortable means to walk, bike, and roll, IDOT will affect meaningful change in the everyday lives of the people who call Illinois home. Changing the environmental context of communities holds the second highest impact on health, according to Dr. Thomas Frieden, former Director of the CDC¹. Developing communities which promote healthy transportation options as a safe and viable option is one of the most effective methods for improved community health outcomes (Frieden, 2010). Sedentary lifestyles are a common result of modern life, but negative effects can be counteracted by incorporating regular physical activity into weekly routines such as walking or rolling to work or school. This adjustment in mode choice can help lower risk of cardiovascular disease (heart attack and stroke), high blood pressure, type 2 diabetes, certain cancers, dementia, and depression². Furthermore, increasing regular physical activity can help combat pre-mature deaths as just over 8 percent of all adult deaths can be traced to lack of physical activity according to the CDC (Carlson, Adam, Yang & Fulton, 2018). According to the Illinois Department of Health, chronic diseases are leading causes of death in the state. Heart disease and stroke are, respectively, the first and third leading causes of death, and the major causes of disability in Illinois. In 2017, there were 25,393 deaths in Illinois due to heart disease and 6,021 deaths due to stroke. Deaths due to heart disease and stroke combined (31,414) represent almost 29 percent of all deaths in Illinois in 2017 (109,726). In Illinois, about 12.5% of the adult population has diabetes, and it is the seventh leading cause of death in the state. According to the CDC, lack of physical activity is one of the key lifestyle risks for chronic disease.

This memo provides an overview of Alta Planning + Design's technical approach and outcomes from the Health Analysis. Combined with the results from the Equity and Demand Analysis, the results from the Health Analysis will highlight areas that can particularly benefit from active transportation infrastructure investments. Often, areas with poor health have experienced historic disinvestment in active transportation infrastructure leading to multiple dimensions of need within these communities. Through the health analysis, IDOT staff and Alta staff have gained a deeper understanding as to the pressing health concerns in Illinois, along with their geographic distributions. The results presented here will be used to inform future tasks, engagement efforts, and project prioritization in Illinois.

¹ "A Framework for Public Health Action: The Health Impact Pyramid", Dr. Thomas Frieden, 2010.

² "Walking and Cycling to Health: A Comparative Analysis of City, State, and International Data", Dr. John Pucher et al. 2010.

Health Assessment Indicators

The following health indicators were selected to inform the overall composite health score. These indicators were based on their relevance and ties to active transportation infrastructure and coordination with IDOT staff. Table 1 summarizes the health indicators that were used and their rationale for inclusion. The indicator data was collected and compiled at the census tract level, except where otherwise noted.

Table 1. Data Used in the IDOT ATP Health Analysis

Health Data Metric	Definition	Justification	Source	Weight
Physical Inactivity	Percentage of adults that report no leisure-time physical activity	Physical inactivity is a major contributor to the steady rise in rates of obesity, diabetes, heart disease, stroke, and other chronic health conditions in the United States. (CDC)	CDC PLACES (2022 Release)	5%
Access to Exercise Opportunities	The percentage of the population without access to places for physical activities	Research suggests that physically active adults “have lower rates of all-cause mortality, coronary heart disease, high blood pressure, stroke, type 2 diabetes, metabolic syndrome, colon cancer, breast cancer, and depression” than their physically inactive peers. ³	County Health Rankings (2022 Release)	10%
Obesity	The proportion of adult respondents whose BMI was greater than or equal to 30.0 (BMI benchmark for obesity)	Obesity costs account for approximately nine percent of all health care spending in the U.S., and part of these costs are attributable to auto-oriented transportation that inadvertently limits opportunities for physical activity. ⁴	CDC PLACES (2022 Release)	10%
Hypertension	The number of preventable hospitalizations for hypertension for the entire population, expressed as an area-level risk adjusted rate per 100,000 population	Moderate or high levels of occupational or leisure-time physical activity reduce cardiovascular mortality among both men and women with hypertension. Walking or cycling to and from work daily reduces cardiovascular mortality among hypertensive women. ⁵	CDC PLACES (2022 Release)	15%
High Cholesterol	The proportion of adults who reported ever being told by a health professional that they have high cholesterol	Regular physical activity can lower blood pressure and improve cholesterol levels. ⁶	CDC PLACES (2022 Release)	10%

³ <https://www.transportation.gov/mission/health/physical-activity-transportation>

⁴ https://www.apha.org/-/media/files/pdf/topics/transport/apha_active_transportation_fact_sheet_2010.ashx

⁵ <https://pubmed.ncbi.nlm.nih.gov/18047912/>

⁶ <https://www.cdc.gov/nccdphp/dnpao/features/physical-activity/index.html>

Heart Attack	Crude death rate attributed to heart attack	There is an 11% reduction in risk of cardiovascular disease associated with active transportation (Hamer, et. al., 2008; Hu, et. a., 2007. ⁷	CDC PLACES (2022 Release)	15%
Stroke	Crude death rate attributed to stroke	Physical activity such as biking or walking, can reduce the risk of strokes. ⁸	CDC PLACES (2022 Release)	10%
Asthma Rates	Percentage of the adult population with asthma	Increased bicycling has been shown to improve quality of life for asthma patients. ⁹	CDC PLACES (2022 Release)	5%
Diabetes	The percentage of the adult population that reported having diabetes	Physical activity such as biking or walking, can reduce the risk of type 2 diabetes. ¹⁰	CDC PLACES (2022 Release)	15%
Behavioral Wellness	Average number of mentally unhealthy days reported in past 30 days	A 30-minute round-trip bicycle commute is associated with better mental health in men. ¹¹	CDC PLACES (2022 Release)	5%

The project team compiled these variables, percentile ranked¹² them relative to the study region (Illinois) and assigned a respective weight to each variable. See Table 1 for weights. These variables were then combined into a weighted sum. Once the index was calculated, a map of the results was generated by categorizing all the hexagons into five bins that indicate how high they score on the index. Higher scores indicate areas of higher priority.

On the maps that follow, the data is displayed in hexagons that were sized to correspond to census tracts. Proportional allocation was used to correctly assign values where the hexagon crossed one or more census boundaries. The use of the hexagons decreases the “boundary effect” which can occur when geographic analyses are too influenced by geographic boundaries that are not necessarily related to the underlying data.

⁷ <https://www.transportation.gov/mission/health/physical-activity-transportation>

⁸ APHA. 2009. At the Intersection of Public Health and Transportation: Promoting Healthy Transportation Policy

⁹ Yüksel, H., Sögüt, A., Yılmaz, Ö., Günay, Ö., Tikiz, C., DüNDAR, P., & Onur, E. (2009). Effects of physical exercise on quality of life, pulmonary function and symptom score in children with asthma. *Asthma Allergy Immunology/Astım Allerji İmmunoloji*, 7(1).

¹⁰ APHA. 2009. At the Intersection of Public Health and Transportation: Promoting Healthy Transportation Policy

¹¹ https://www.apha.org/-/media/files/pdf/topics/transport/apha_active_transportation_fact_sheet_2010.ashx

¹² Percentile ranking is a way to evaluate the relative standing of a value within a data set. A percentile rank is the percent of scores in the distribution that are less than it. For example, if Block Group A receives a 0.65 percentile rank for total population, that means that out of all the census block groups in the study area, 65% of them have a smaller total population than Census Block A.

Results by Indicator

Physical Inactivity

The highest concentrations of adults that report no leisure-time physical activity include the following areas:

District 1	
Chicago	
District 2	
Rock island	Rockford
District 3	
Kankakee	
District 4	
Peoria	
District 5	
Champaign	Danville
District 6	
Quincy	Springfield
District 7	
Decatur	
District 8	
East St. Louis	
District 9	
Mount Vernon	

Lack of Access to Exercise Opportunities

The highest concentrations of the population without access to places for physical activity include the following areas:

District 1	
Chicago	
District 2	
Byron	Freeport
Dixon	Rochelle
Sterling	
District 3	
Lasalle	Watseka
District 4	
Beardstown	Eureka
Canton	Monmouth
Peoria	
District 5	
Mahomet	Paris
Monticello	
District 6	
Beardstown	Jacksonville
East St. Louis	Jerseyville
Greenville	Litchfield
Hillsboro	Pana
Vandalia	
District 7	
Carmi	Olney
Effingham	Robinson
Fairfield	Salem
Greenville	Vandalia
Lawrenceville	
District 8	
Centralia	Jerseyville
Greenville	Salem

District 9	
Anna	Harrisburg
Benton	Metropolis
Carmi	Mount Vernon
East Cape Girardeau	West Frankfort

Access to exercise opportunities was measured at the county level, results were more concentrated around the urban areas, due to the methodology for this indicator as defined below.

Access to Exercise Opportunities measures the percentage of individuals in a county who live reasonably close to a location for physical activity. Locations for physical activity are defined as parks or recreational facilities.

Individuals are considered to have access to exercise opportunities if they:

- reside in a census block that is within a half mile of a park, or
- reside in an urban census block that is within one mile of a recreational facility, or
- reside in a rural census block that is within three miles of a recreational facility.

Obesity

The highest concentrations of adult respondents whose BMI was greater than or equal to 30.0 (BMI benchmark for obesity) include following areas:

District 1	
Chicago	
District 2	
Freeport	Rockford
Rock Island	South Beloit
District 3	
Kankakee	
District 4	
Peoria	Canton
Galesburg	
District 5	
Champaign	Danville
Bloomington	
District 6	
Springfield	
District 7	
Decatur	
District 8	
East St. Louis	
District 9	
Mount Vernon	Carbondale East Cape Girardeau

**Hypertension**

The highest concentrations of the population with hypertension include the following areas:

District 1	
Chicago	
District 2	
Rockford	
District 3	
Kankakee	
District 4	
Peoria	
District 5	
Champaign	Danville
District 6	
Springfield	Quincy
District 7	
Decatur	
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	Benton

High Cholesterol

The highest concentrations of the population with high cholesterol include the following areas:

District 1	
Chicago	
District 2	
Rockford	Rock Island
District 3	
Kankakee	
District 4	
Peoria	
District 5	
Champaign	Danville
District 6	
Springfield	
District 7	
Decatur	
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	

Heart Attack

The highest concentrations of the population affected by cardiovascular disease include the following areas:

District 1	
Chicago	
District 2	
Rockford	Freeport
District 3	
Kankakee	Watseka
District 4	
Peoria	Galesburg
District 5	
Danville	
District 6	
Springfield	Quincy
District 7	
Decatur	Fairfield
Lawrenceville	Olney
Mattoon	
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	West Frankfort
Benton	Harrisburg
Carmi	Metropolis

Stroke

The highest concentrations of the population affected by stroke include the following areas:

District 1	
Chicago	
District 2	
Rockford	Freeport
District 3	
Kankakee	Watseka
District 4	
Peoria	Galesburg
District 5	
Danville	
District 6	
Springfield	Quincy
District 7	
Decatur	Fairfield
Lawrenceville	Olney
Mattoon	
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	West Frankfort
Benton	Harrisburg
Carmi	Metropolis

Asthma Rates

The highest concentrations of the population with asthma include the following areas:

District 1	
Chicago	
District 2	
Rock Island	Freeport
Rockford	
District 3	
Kankakee	De Kalb
District 4	
Peoria	Galesburg
Macomb	
District 5	
Danville	Bloomington Champaign
District 6	
Springfield	
District 7	
Decatur	Charleston
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	Carbondale

Diabetes

The highest concentrations of the population living with diabetes include the following areas:

District 1	
Chicago	
District 2	
Rockford	Rock Island
District 3	
Kankakee	
District 4	
Peoria	
District 5	
Danville	Champaign
District 6	
Springfield	
District 7	
Decatur	
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	

Behavioral Wellness

The highest concentrations of the population that reported mentally unhealthy days include the following areas:

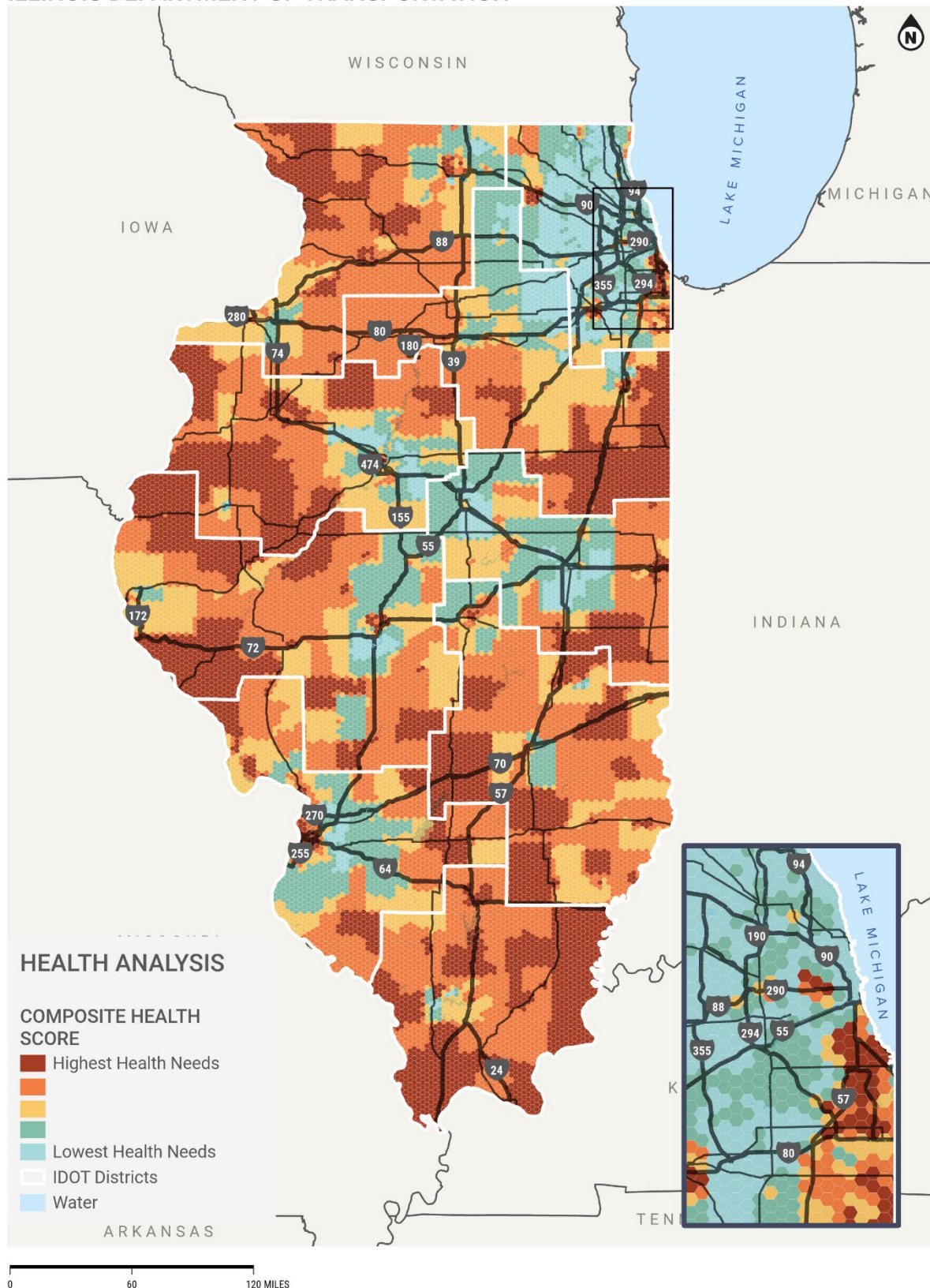
District 1	
Chicago	
District 2	
Freeport	Rock Island
Kewanee	Rockford
District 3	
De Kalb	Lasalle
Kankakee	Pontiac
District 4	
Peoria	Galesburg
	Macomb
District 5	
Bloomington	Danville
Champaign	Rantoul
District 6	
Beardstown	Quincy
Jacksonville	Springfield
District 7	
Charleston	Olney
Decatur	
District 8	
East St. Louis	Centralia
District 9	
Mount Vernon	Carbondale
West Frankfort	

Statewide Health Assessment

Identification of the top quintile of priority areas are determined based on the composite health score. For the purposes of this plan, hexagons with a composite score in the top quintile (top 20%) is considered an area of highest need. The composite scores are shown on the map on the following page for the state of Illinois. The following urban areas had the highest composite scores, and featured the highest concentrations of poor indicators of health:

District 1	
Chicago	
District 2	
Freeport	Rockford
Kewanee	South Beloit
Rock Island	
District 3	
Kankakee	Pontiac
	Watseka
District 4	
Galesburg	Peoria
District 5	
Champaign	Danville
District 6	
Gillespie	Quincy
Hillsboro	Springfield
Litchfield	Taylorville
District 7	
Decatur	Lawrenceville
Fairfield	Olney
District 8	
East St. Louis	Centralia
District 9	
Benton	Harrisburg
Carbondale	Metropolis
Carmi	Mount Vernon
East Cape Girardeau	West Frankfort

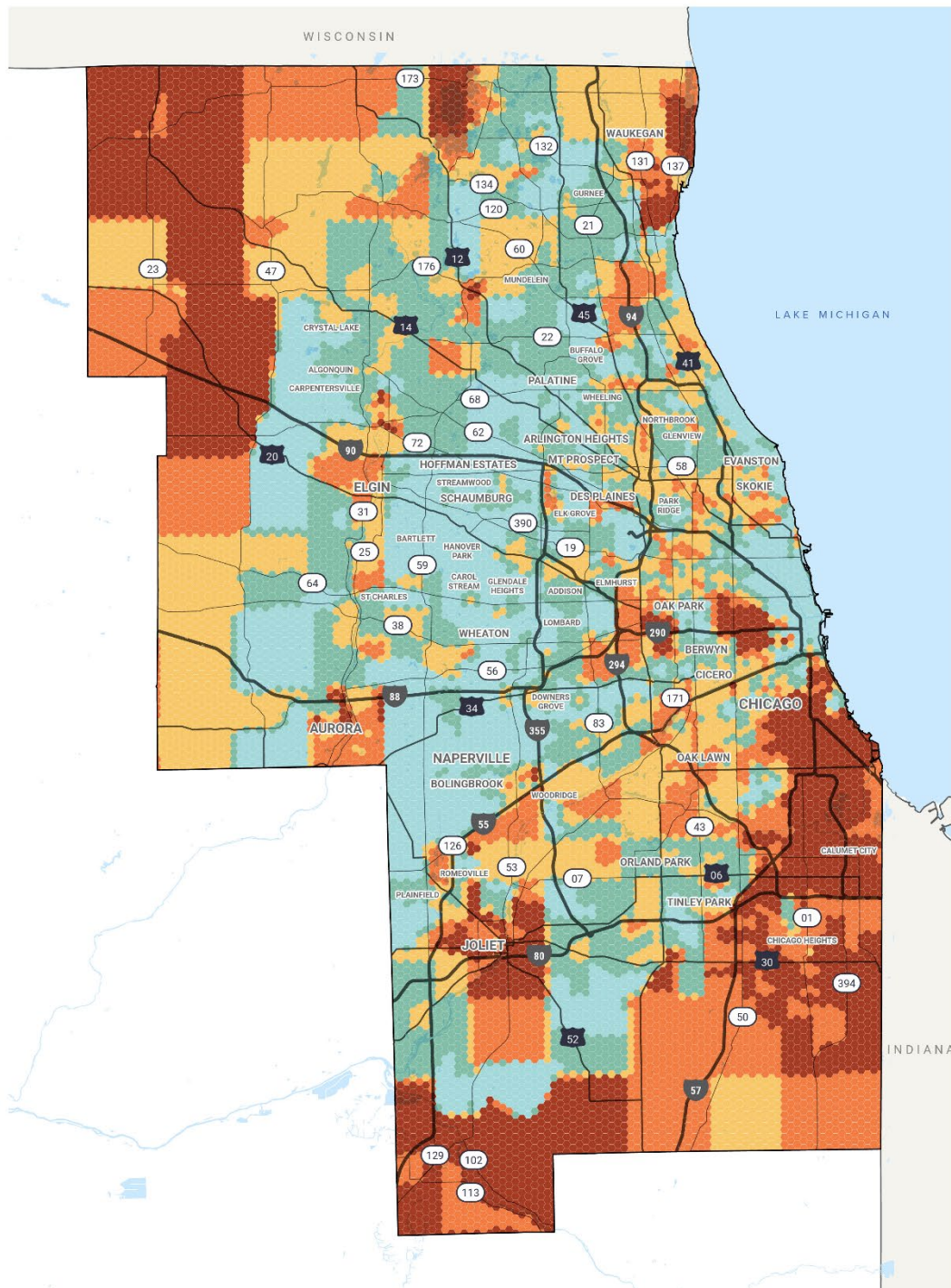
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District Health Profiles

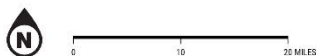
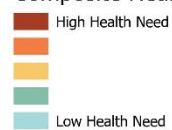
In addition to analyzing Health profiles at the state level, an analysis was completed at each IDOT district level. For the IDOT districts, the health assessment was determined only considering the census tracts located within each district boundaries. In the maps below, each district is being compared with itself rather than the entire state to determine pockets of need with greater specificity than at the statewide scale.

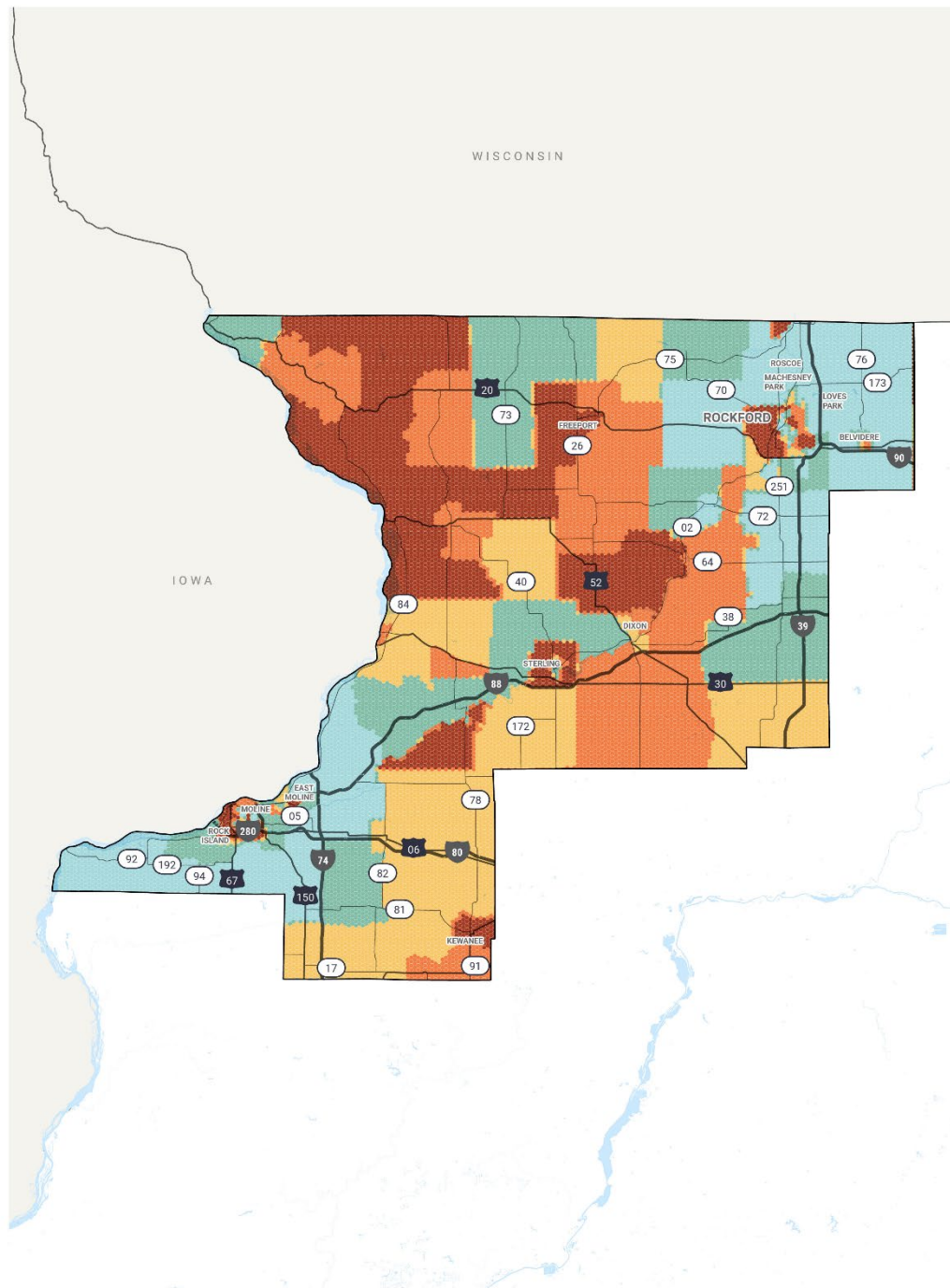


ILLINOIS DEPARTMENT OF
TRANSPORTATION
DISTRICT: 1

HEALTH ANALYSIS

Composite Health Results



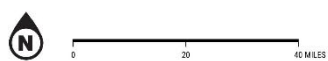


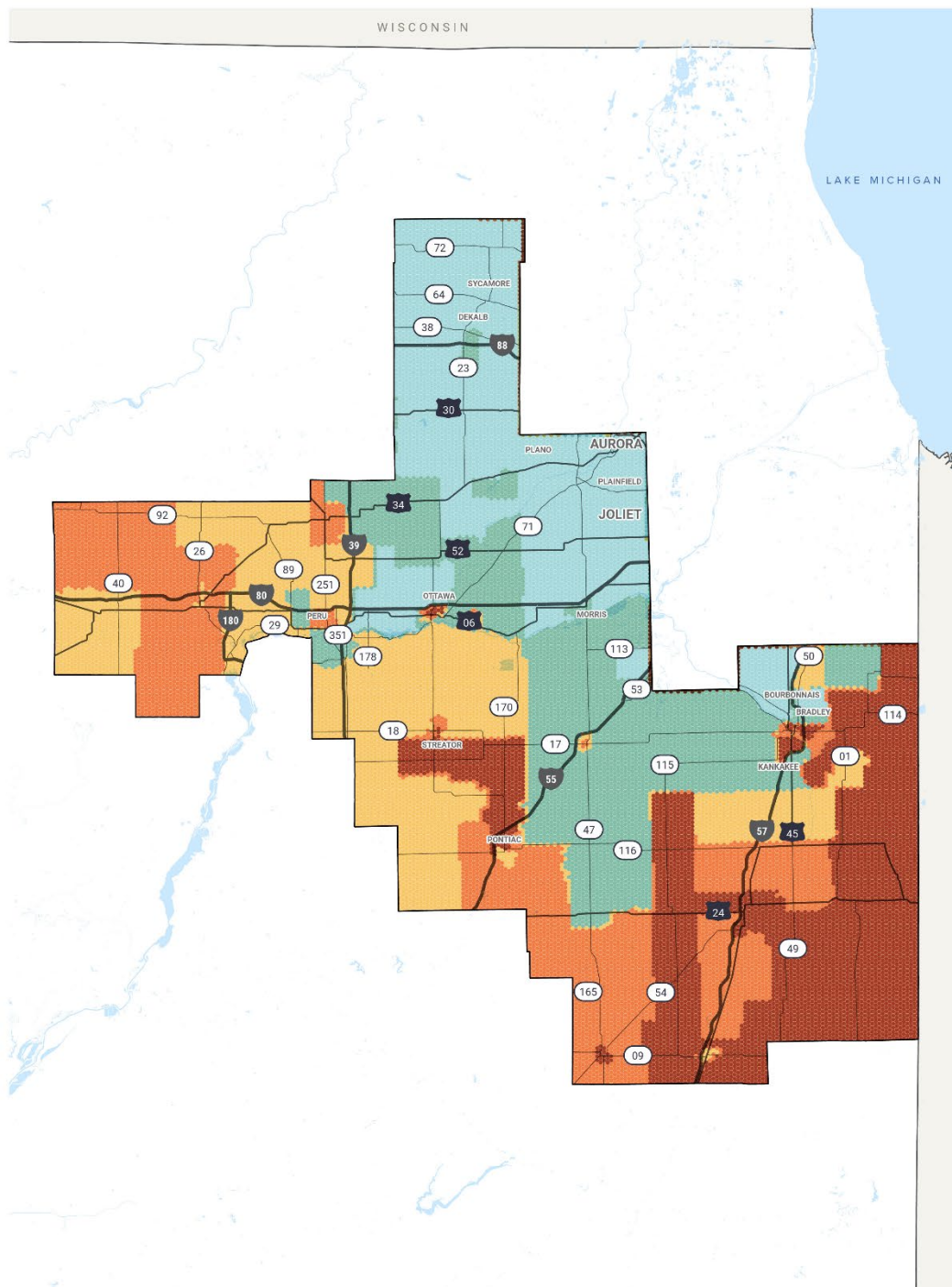
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DISTRICT: 2

HEALTH ANALYSIS

Composite Health Results

- High Health Need
- Moderate Health Need
- Low-Moderate Health Need
- Low Health Need
- Very Low Health Need



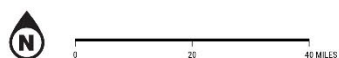


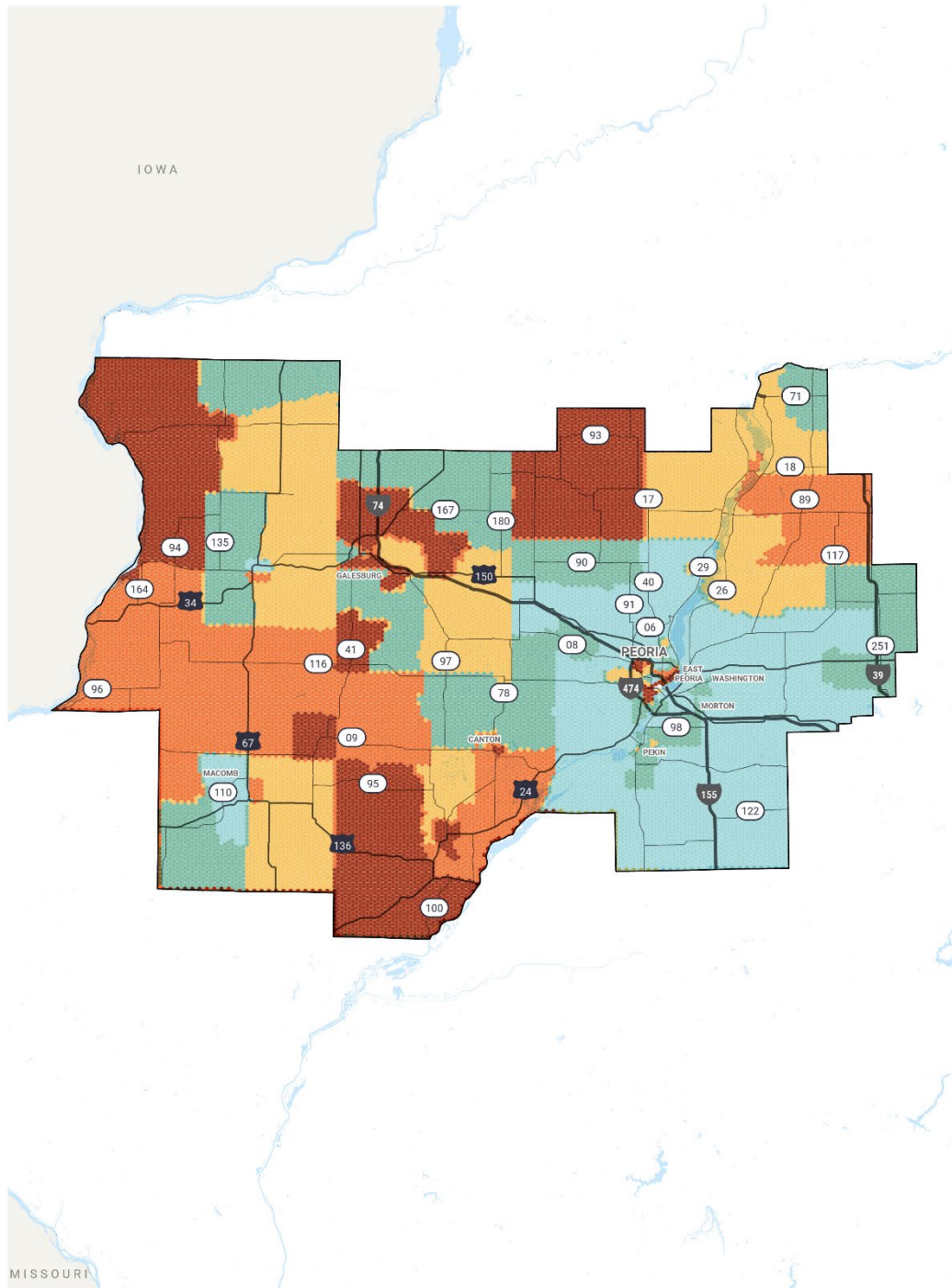
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TRANSPORTATION
DISTRICT: 3

HEALTH ANALYSIS

Composite Health Results

- High Health Need
- Moderate Health Need
- Low Health Need



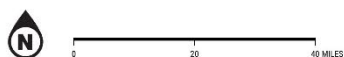


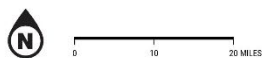
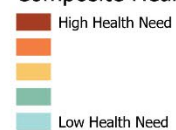
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TRANSPORTATION
DISTRICT: 4

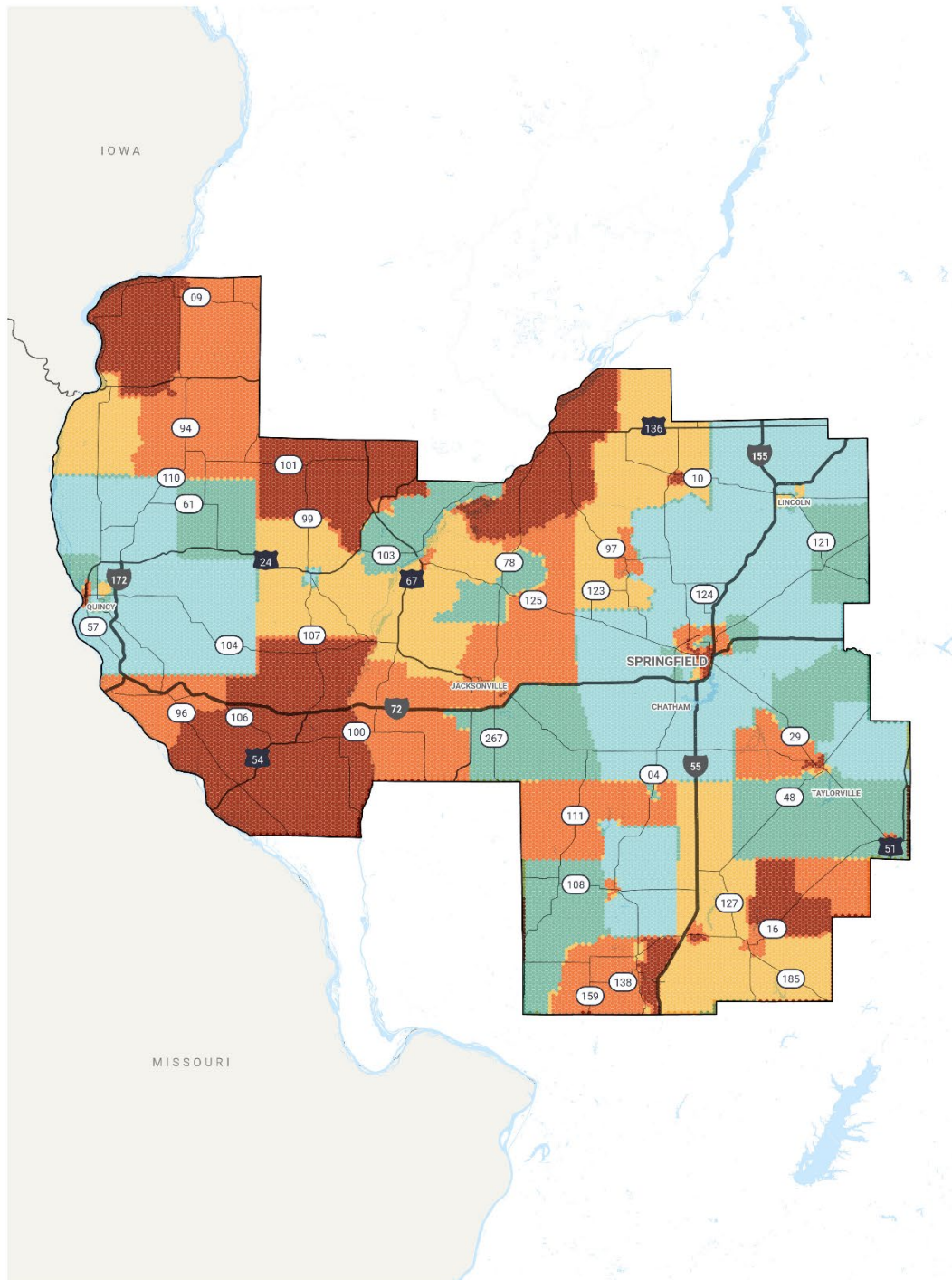
HEALTH ANALYSIS

Composite Health Results

- High Health Need
- Moderate Health Need
- Low-Moderate Health Need
- Low Health Need





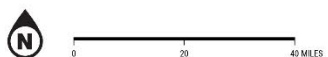


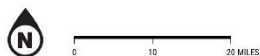
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TRANSPORTATION
DISTRICT: 6

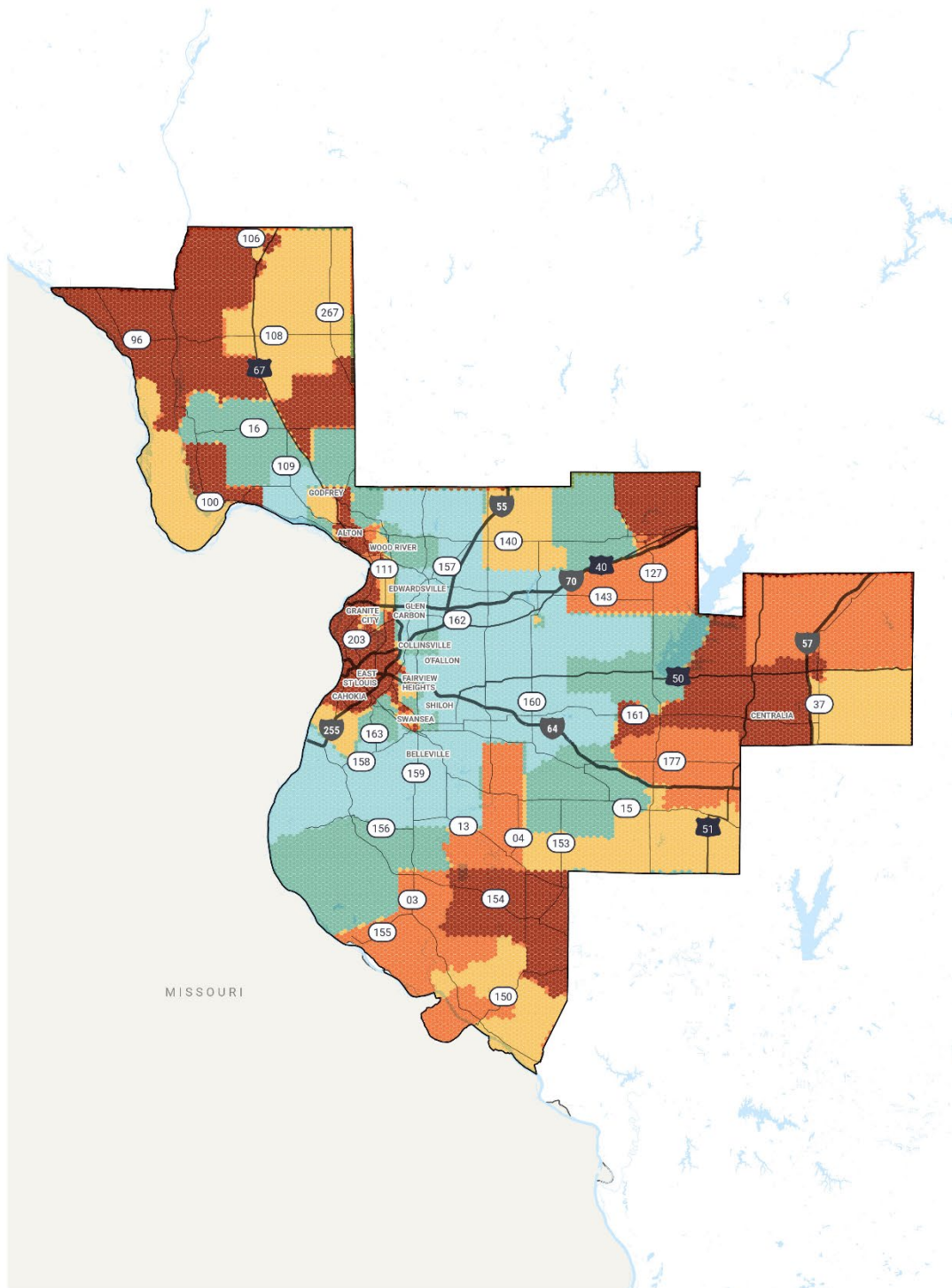
HEALTH ANALYSIS

Composite Health Results

- High Health Need
- Moderate Health Need
- Low-Moderate Health Need
- Low Health Need
- Very Low Health Need



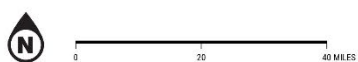
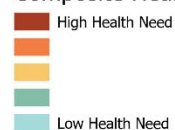


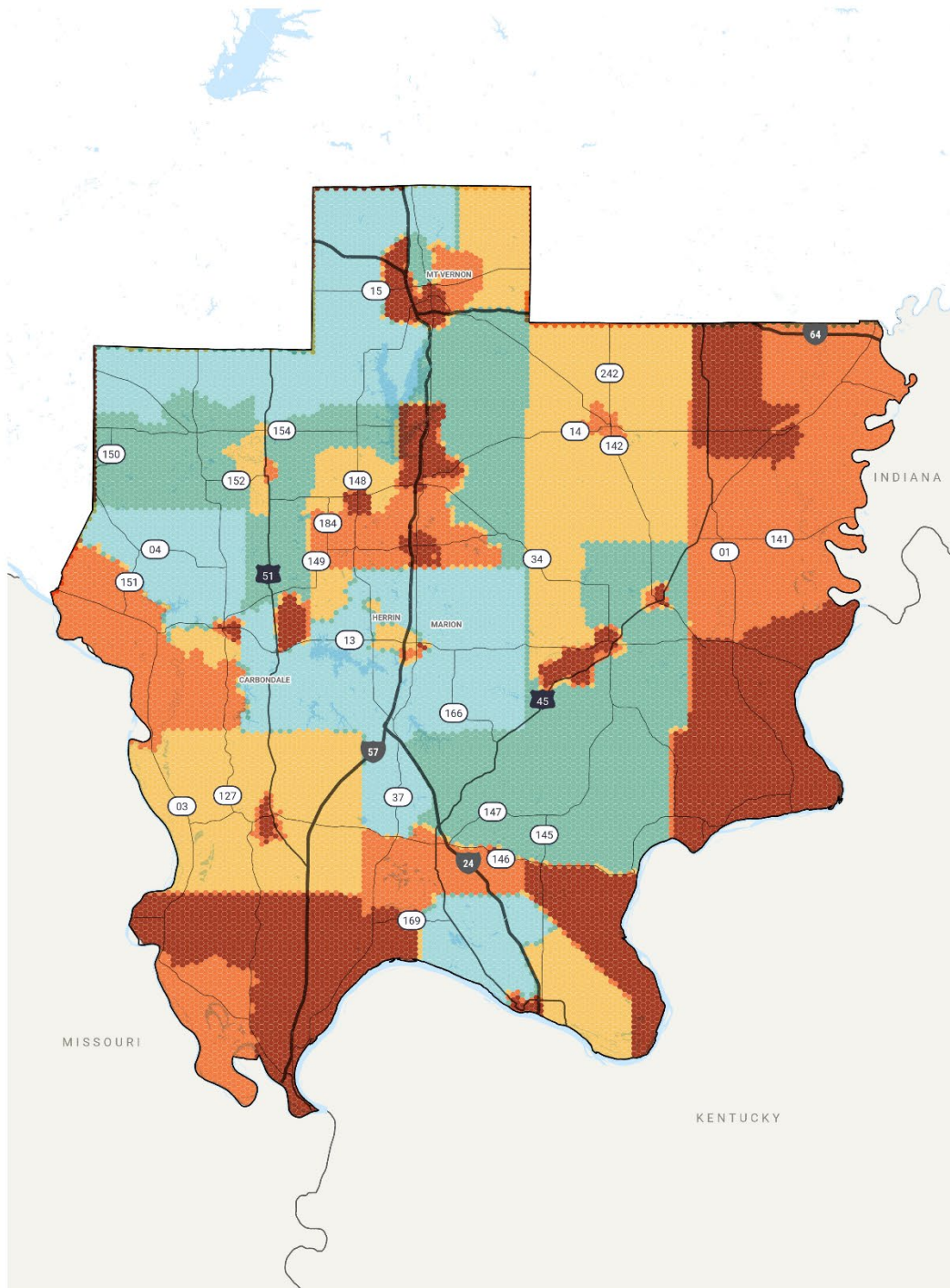


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TRANSPORTATION
DISTRICT: 8

HEALTH ANALYSIS

Composite Health Results



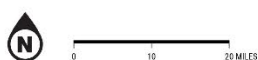


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TRANSPORTATION
DISTRICT: 9

HEALTH ANALYSIS

Composite Health Results

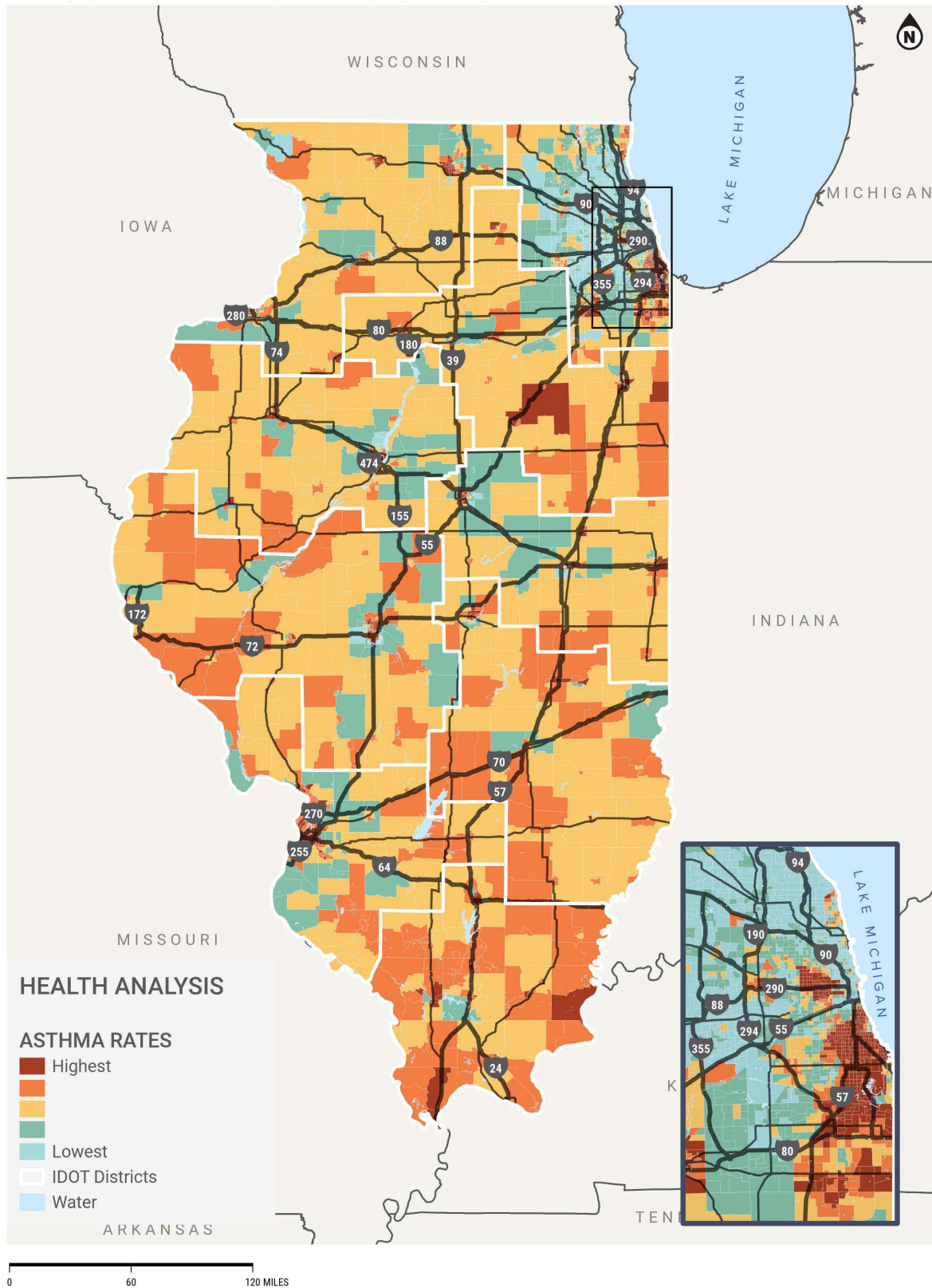
- High Health Need
- Moderate Health Need
- Low-Moderate Health Need
- Low Health Need



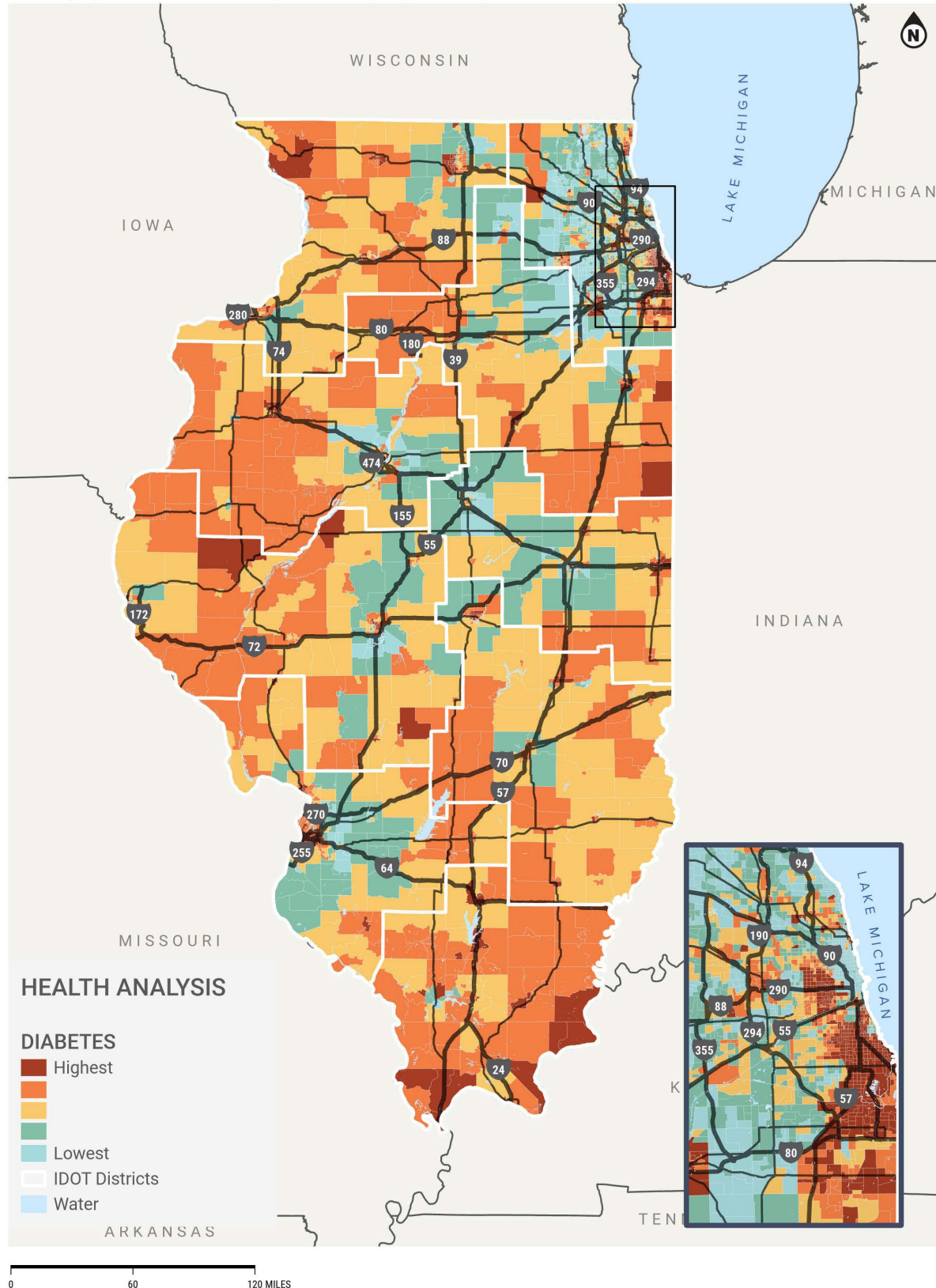


Appendix I: Health Indicator Maps

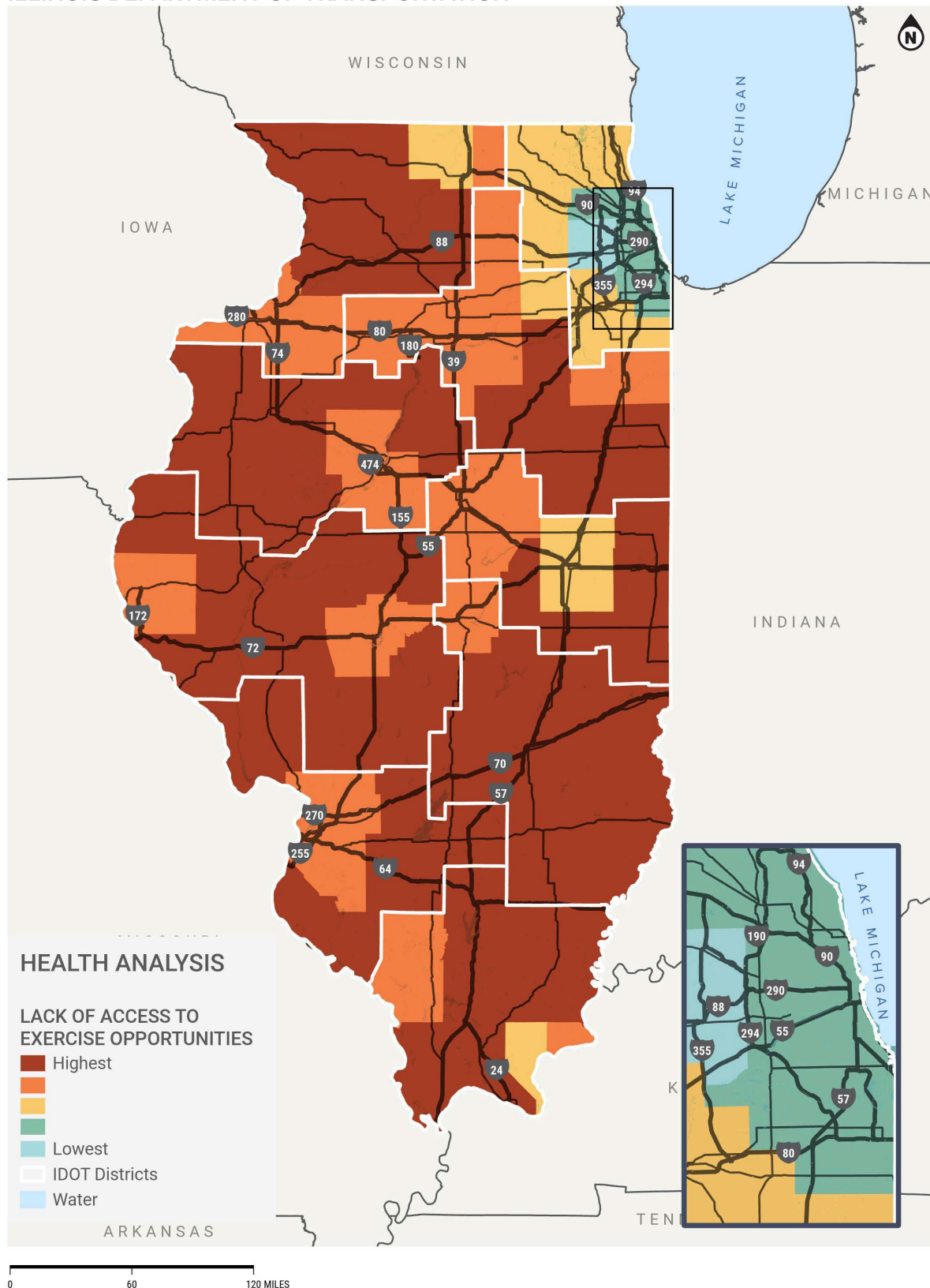
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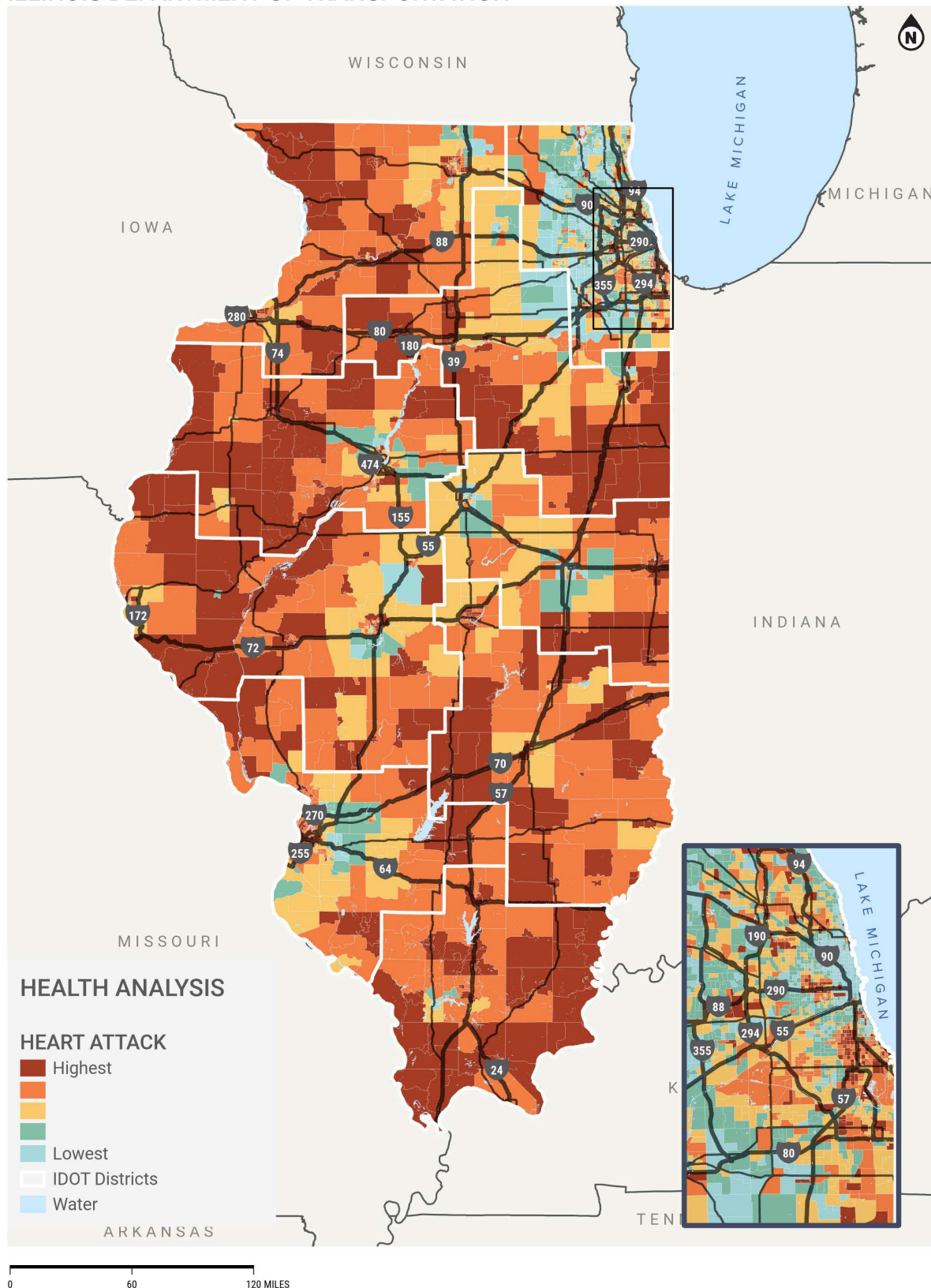
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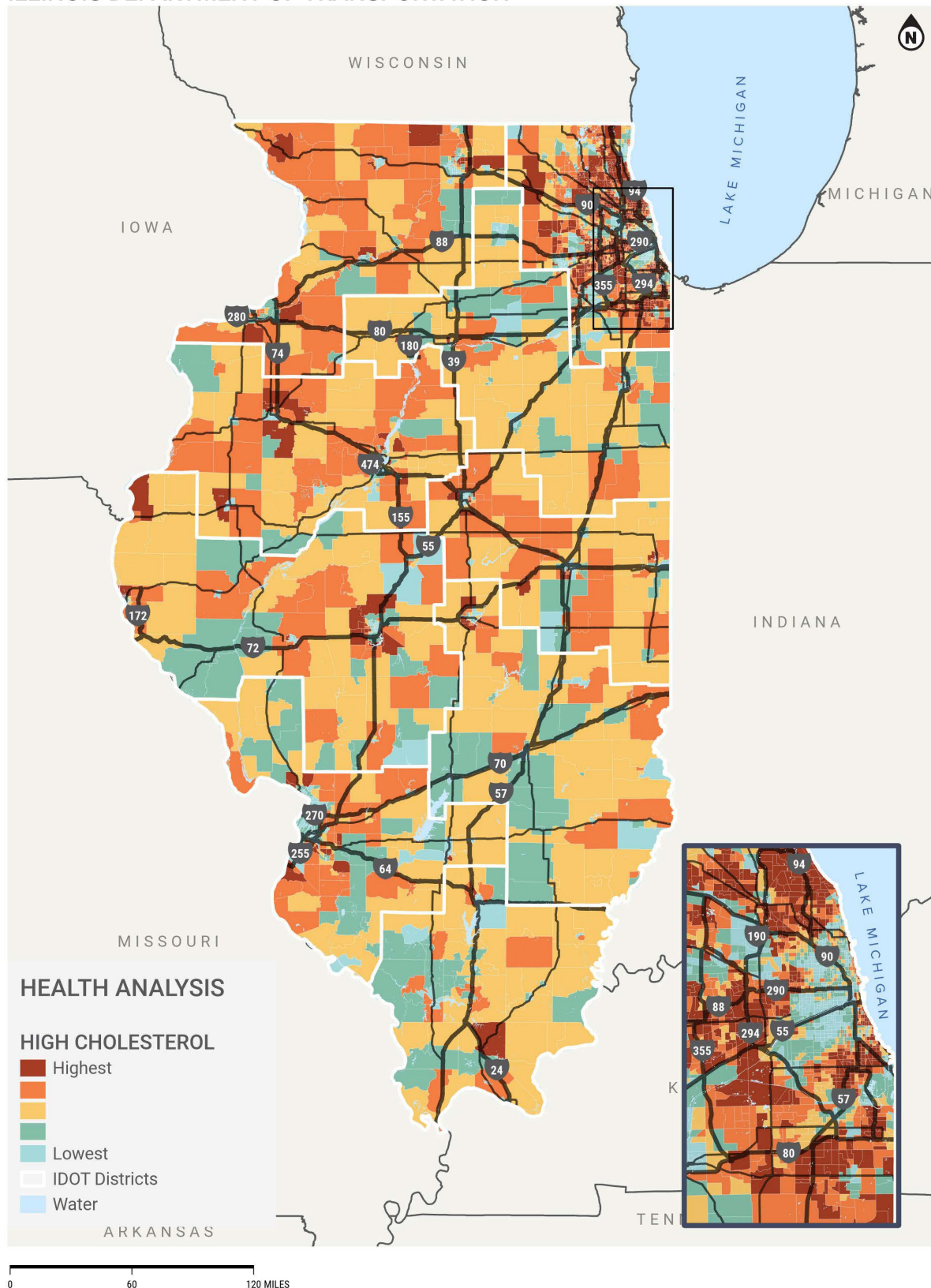
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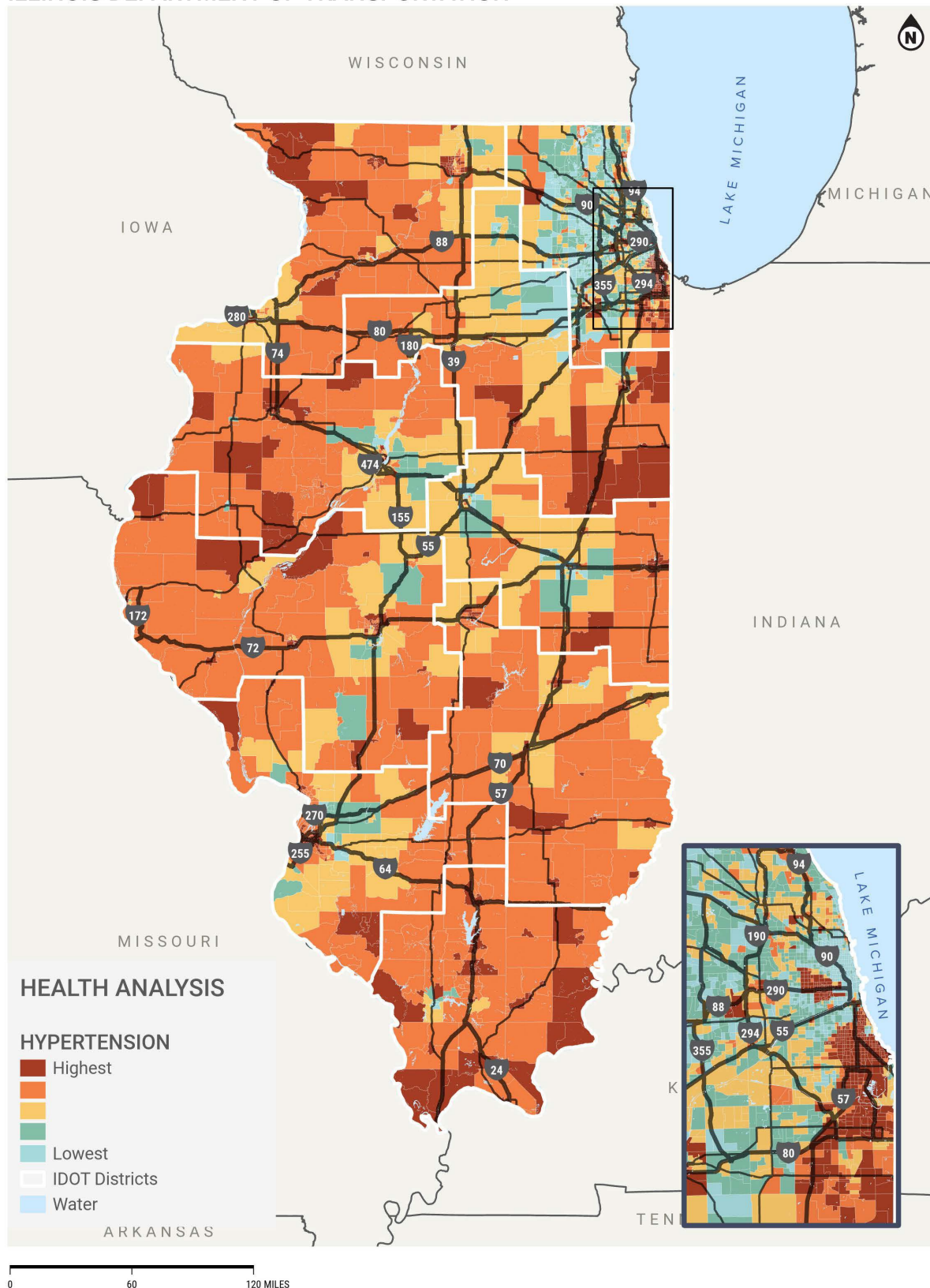
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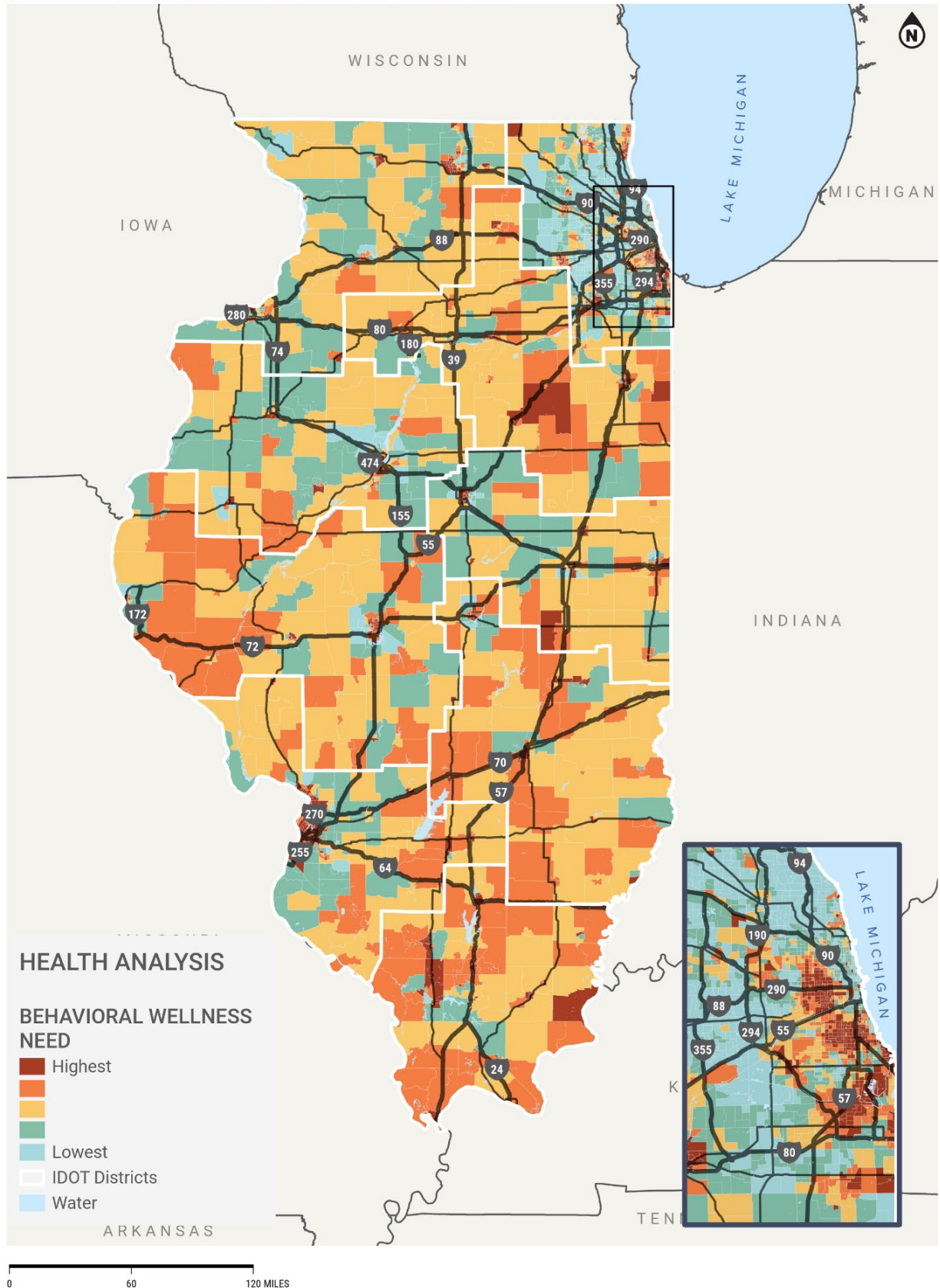
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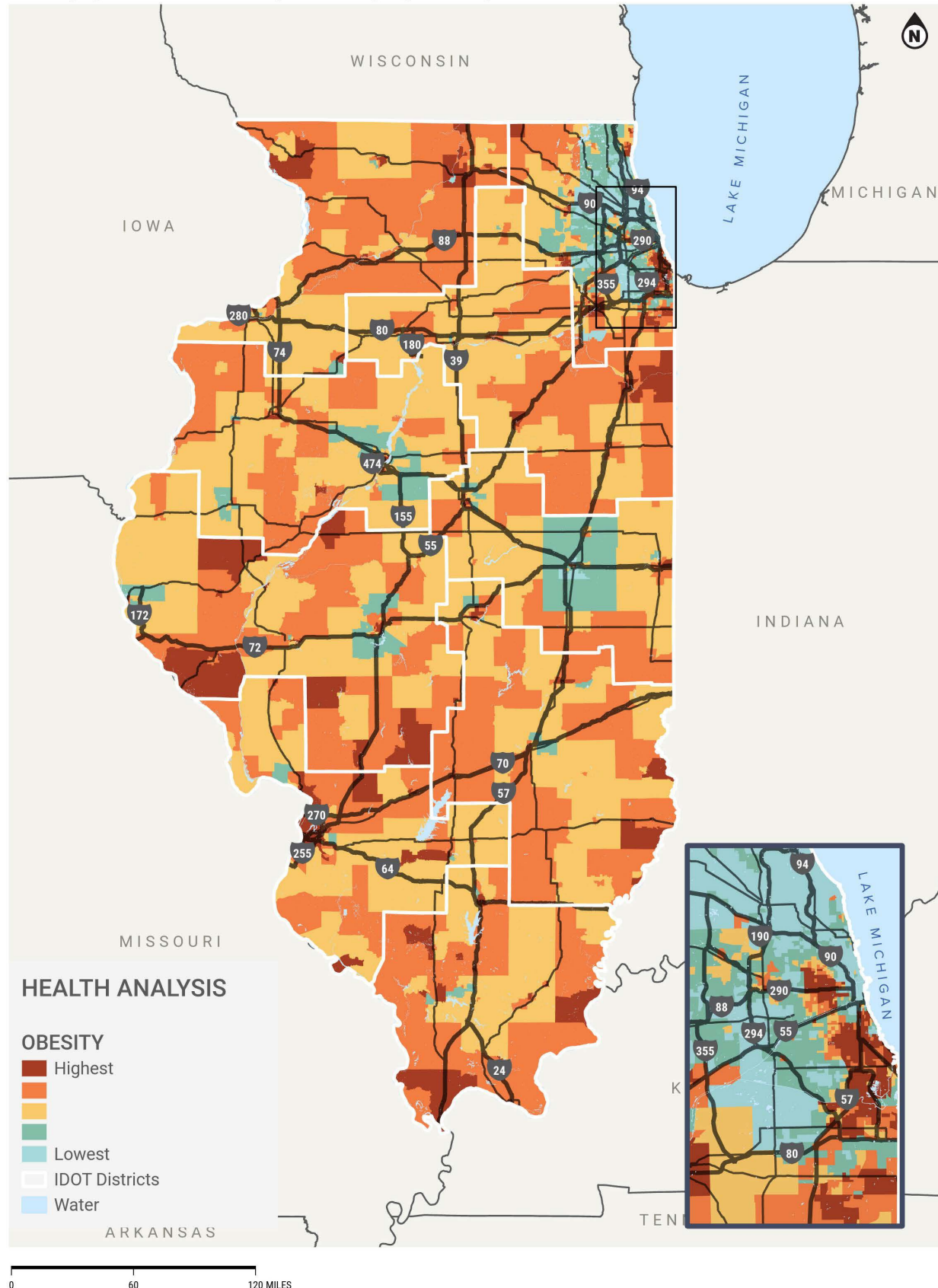
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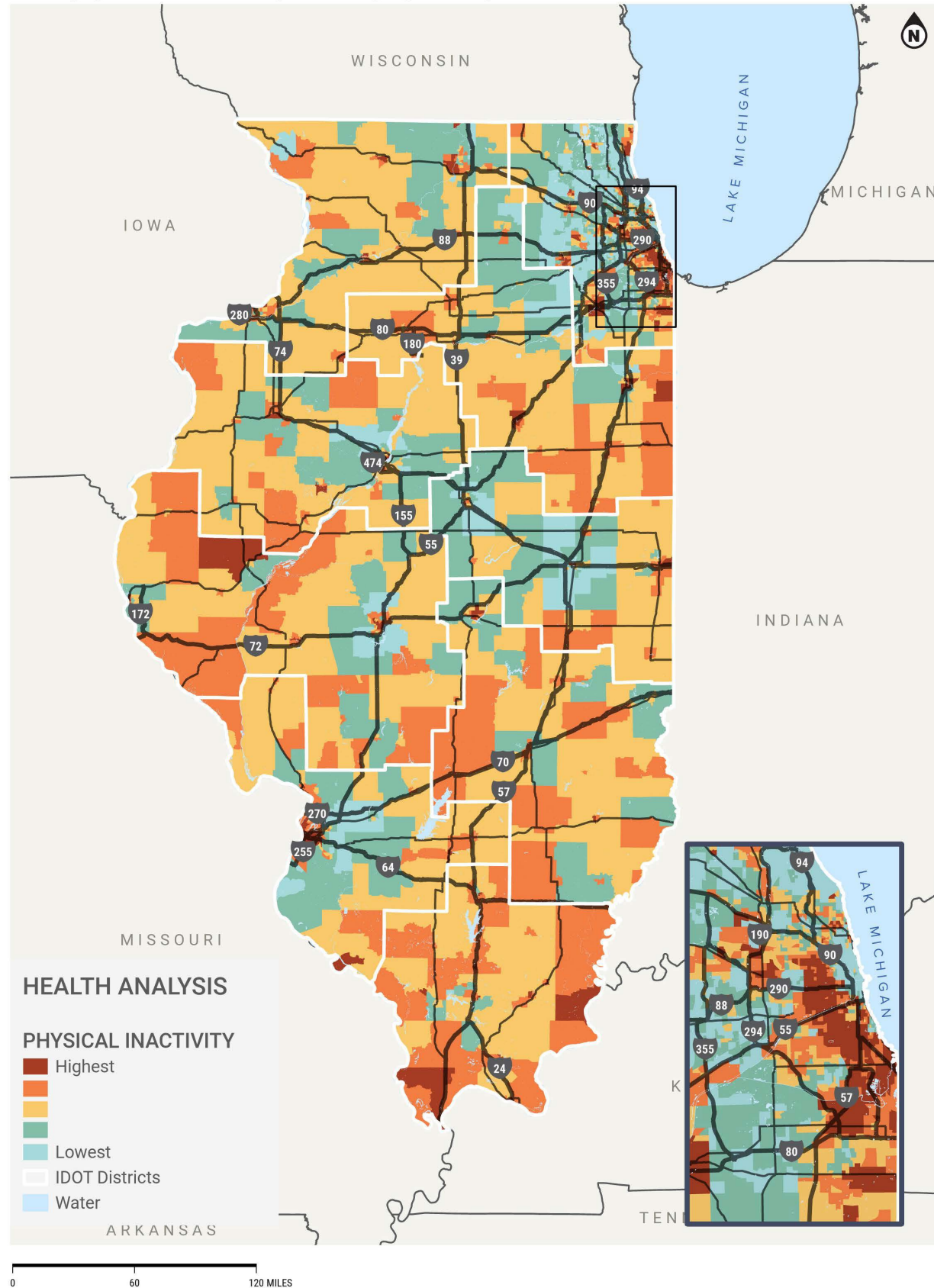
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