BICYCLE RESOURCE EQUITY IN CHICAGO

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GEO442

Report for Slow Roll Chicago

Bicycle Resource Equity in Chicago

Project Summary

The purpose of this project is for a group of DePaul graduate GIS students to utilize a service-based learning method to support a local community-based organization (CBO) in Chicago.

CBO and organizational need

Slow Roll Chicago (SRC) is "a community-based organization utilizing bicycles to connect a diverse group of people, transform lives, and improve the condition of communities by organizing community bicycle rides and other bicycling-related programs throughout the greater Chicago area." SRC has enlisted this group of DePaul GIS students to help the organization better understand **how equitably current bicycle infrastructure/resources are distributed in Chicago**. With this information, SRC can better articulate their concerns to a diverse range of stakeholders and decision-makers.

Data and methods

This study is based upon the use of **GIS** processing techniques to answer SRC's pressing question. This study focuses on the development of maps which explore the relationship between a) income and race and b) bike lanes and divvy stations. Data processing and analysis is conducted to explore clustering of income/race around bicycle resources and, furthermore, to establish how many people from various race/income groups have proximate (.25 and .5 miles) access to these resources. Data is primarily taken from the US Census and Chicago Data Portal.

Results

Critically, this study has found that **54%** of White Chicago residents have access to Divvy stations within .25 miles of their home while only **29%** and **22%** of Hispanic and Black residents do, respectively. Similarly,**49%** of middle/high income households have access to Divvy stations within .25 miles of their home while only **39%** of low/moderate income households do. This study has also found that **79%** of White Chicago residents have access to bike lanes within .25 miles of their home while only **74%** and **71%** of Hispanic and Black residents do, respectively. Similarly, **79%** of middle/high income households have access to bike lanes within .25 miles of their home while only **76%** of low/moderate income households do.

Conclusions

It is evident that bicycle resources in Chicago, particularly Divvy stations, are **not equitably distributed** between various race/income groups Due to the limited time scope of this exercise, much further research is necessary (more variables, breaking down bike lanes, etc).

Table of Contents

1. Introduction

Through a service-based learning model, a group of DePaul University Sustainable Urban Development masters students have been matched with a local community-based organization (CBO). In this relationship, the group of students utilize GIS skills and techniques to provide research of value to the CBO. This group of students has been matched with the Chicago-based CBO Slow Roll Chicago (SRC).

SRC is "a community-based organization utilizing bicycles to connect a diverse group of people, transform lives, and improve the condition of communities by organizing community bicycle rides and other bicycling-related programs throughout the greater Chicago area." Critically, SRC has approached this GIS project seeking to better understand how equitably bicycle resources and infrastructure are distributed in Chicago.

This study will begin by exploring SRC and their research needs in further detail. Following the CBO needs assessment, this study will explore pertinent data used to answer the organization's pressing question. This study will then turn describing information products produced to articulate results to this exploration. The key results found within these products will then be presented (maps and figures). Lastly, this study will discuss conclusions based upon the research conducted.

2. Needs Assessment

The purpose of the needs assessment is to outline preparations for the DePaul student-led GIS project with Slow Roll Chicago. This section will introduce the reader to the organization, their GIS needs, the proposed GIS-based product to address their needs, and the plan followed to produce this product.

The Organization

Jamal Julien and Olatunji Oboi Reed founded Slow Roll Chicago (SRC) in September of 2014. They explicitly set out to use the movement and bicycles as vehicles for social change. The organization's mission is to be "a community-based organization utilizing bicycles to connect a diverse group of people, transform lives, and improve the condition of communities by organizing community bicycle rides and other bicycling-related programs throughout the greater Chicago area."

Slow Roll works to achieve equity in bicycle access, bicycle usage, bicycle infrastructure, bicycle safety, bicycle culture, and other community-related and bicycle-related resources in Chicago. In particular, the organization focuses on communities on the Southside and Westside; making these communities healthier, more empowered, more economically viable, more socially cohesive, more bikeable, and ultimately more livable. SRC has developed a three-fold strategy consisting of their signature ride series, youth and family programs, and bicycle equity advocacy in order to help achieve their goals.

Slow Roll has welcomed the progress Chicago has made in these areas, including advances like protected bike lanes and the Divvy bike share system. However, the organization continues to emphasize the need to focus on equity– creating better biking infrastructure and encouraging healthy transportation in neighborhoods of color and low-to-moderate income levels.

The Question

SRC's primary question, thus, is how equitably bicycle resources are distributed throughout Chicago. Specifically, SRC wants to know how bike-related infrastructure is distributed throughout the city based on demographic and socioeconomic factors. In addition, Slow Roll would also like to know the percentage of people with access (.25 mile & .5 mile) to bicycle infrastructure according to various demographic designations.

Information Product

The primary information product requested by Slow Roll is a portfolio of maps. Slow Roll believes a series of applicable maps will help both answer the question above and, more importantly, articulate the results to relevant stakeholders. Maps are powerful visual tools with which, for example, Slow Roll can justify their case to local politicians, planners, business owners, and residents.

In order to address the needs described above, Slow Roll's requested maps will juxtapose two primary categories of data: 1) bicycle infrastructure and 2) demographic and socioeconomic indicators. Bicycle infrastructure will focus on bike lanes and divvy stations. Demographic and socio-economic indicators will focus on race and income.

While Slow Roll is interested in a public internet-based rollout (on their website) of these maps, the organization will be employing DePaul web design students to do so. Accordingly, the goal of this project is to focus on high-quality production of the maps and organization of the maps into a simple map/report platform for Slow Roll to access and manipulate to their needs.

Production Plan

The data needed to produce the product requested will be the following categories for the most recent collection date available:

- bike lanes (location and type)
- Divvy stations (location)
- primary race (African-American, Hispanic/Latino and White)
- incomes (Low to Moderate, Middle to Upper)
- wards, census block group boundaries

The sources of data collection will be:

- US Census (race, incomes, census tracts, census block groups)
- City of Chicago Data Portal (bike lanes, divvy stations, community areas)

In terms of data processing, choropleth maps will be created in order to show a variety of the variables. Additionally, a major part of the product will show access to bike infrastructure. In order to provide this, the buffer function will be heavily used. All data collection and processing with the exception of the optional bike racks & bike shops will be prioritized in order to deliver the minimum product expectations. Further data collection and processing may be completed in order to compare other variables and to develop a bike equity index.

3. Data Acquisition

The purpose of this section is to detail the key data which is used to articulate Slow Roll Chicago's most pressing question: are bicycle resources equitably distributed in Chicago and, if not, what shape does this socio-spatial inequity take? While there are a number of variables which can go into answering this question, we identify three datasets of primary importance: a) bike routes, b) divvy stations, and a) income and race (by block group).

Bike Routes

Name: Bike Routes
Description: Bike routes in Chicago
Source: City of Chicago Data Portal
Contact: Tom Schenk Jr.
URL:https://data.cityofchicago.org/Transportation/Bike-Routes/3w5d-sru8
Date: December 14, 2014
Data Format: Shapefile
Spatial Object Type: Vector – Lines
Attributes:

> **f_street:** the cross street where the bike route starts
> **type:** each type of bike route is given a number that corresponds to attribute bikeroute
> **bikeroute:** provides a description of the type of bike route (includes access path, existing bike lane, existed buffered bike lane, existing cycle track, existing neighborhood greenway, existing off street trail, existing shared lane & recommended [city identified future dev] bike route)
> **t_street:** the cross street where the bike route ends
> street: provides the street name that the route travels along

As the question being answered for the project is whether or not the distribution of bike infrastructure has been inequitably distributed, this dataset of the bike lane locations is perfectly fit for use. For this data, the attribute table does not contain any measurements and as such the precision level of measurements is not applicable. The attribute table was scanned for missing data and was deemed to be complete.

The positional accuracy was tested by comparing the bike routes to an open streets basemap. The location of the routes lines up perfectly with the streets & paths on the basemap. Therefore, the data has high positional accuracy. For purposes of the project, there are no known limitations of the data.

In terms of data constraints, only data for 2015 was able to be obtained from the City of Chicago Data Portal. Data will need to be collected for 2011 and 2013 bike routes. Slow Roll has previously mentioned that they can help in obtaining this data. A request will be placed for 2011 and 2013 data in order to meet the requirements of the project.

Divvy Stations

Name: Divvy Bicycle Stations_ All
Description: All Divvy (bikeshare) stations in the City of Chicago
Source: City of Chicago Data Portal
Contact: Jonathan Levy
URL: https://data.cityofchicago.org/Transportation/Divvy-Bicycle-Stations/bbyy-e7gq
Date: February 12, 2016 (seemingly "updated" daily)
Data Format: Excel/CSV
Spatial Object Type: Vector – Points
Attributes:

- **ID:** Unique identification assigned to each station
- **Station Name:** Unique name assigned to each station; generally cross streets or landmark
- **Address:** Physical address of the station
- **Total Docks:** Number of spots in which bikes can be parked at a station
  - **Docks in Service:** Number of spots used for bike parking at station
  - **Status:** Whether a station is in-use or out-of-use
- **Latitude:** Latitude
- **Longitude:** Longitude
- **Location:** Lat, Lon

The only data processing required for this dataset is to a) geocode the station locations and then b) turn the newly mapped data into a shapefile. Within the new shapefile, two main symbology techniques can be used to make the dataset more visually useful. Firstly, the color of the point can be black if the station is in-use and red if not in-use. Secondly, the size of each dot can be relative to the number of docks, total or in-service.

In terms of data fitness, a number of factors make the Divvy dataset useful and reliable. Firstly, the divvy station data is updated daily on the Chicago Data Portal. While there are probably rarely changes, this still means that any changes are up-to-date. Secondly, the dataset appears complete: a) no stations are missing attribute data, i.e. location, docks, or status, and b) based upon a crude

comparison between this dataset and information from Divvy's website, the number of stations matches completely.

Thirdly, the data appears very accurate. In terms of attributes, there appear to be no extreme outliers (i.e. in number of docks) which would imply any data entry error. In terms of locational accuracy, the dataset lat/lon do appear to be quite accurate. In order to assess locational data accuracy, three techniques were employed:

a) A random sample of lat/lon was compared via a KMZ file format with aerial and streetview imagery from Google Earth. In most cases the point was indeed on top of the station in Earth. Occasionally data was a few feet off but never more than a few feet.
b) The dataset was mapped and crudely compared to the Divvy website station map. All points appeared to align.
c) Lat/lon was field recorded at a few stations and compared to dataset lat/lon. Locations, once again, varied by only a few feet.

Due to the CSV format of this vector data, little consideration for map scale or resolution is required. As mentioned above, the lat/lon provided in the dataset appear to be quite accurate and can, thus, be applied to a map quite accurately.

There are, frankly, very few limitations to this dataset. Due to its simple, complete, and accurate characteristics, Divvy data stations data can be used in conjunction with other data to make important observations and arguments related to bicycle resource equity in Chicago.

The main constraint for this dataset, as with bike routes described above, is the challenge in acquiring older datasets which can help identify and prove a temporal argument about equity. Because the dataset is updated daily, no publicly available historical record appears to exist. Obtaining 2013 data (Divvy did not exist in 2011) will require some coordination with Divvy, Active Transportation Alliance, the dataset author, or someone else who may have some record.

Income and Race

Name: ACS 2014 5-Year Estimates
Description: Demographic information for Chicago block groups
Source: American FactFinder
Contact: US Census Bureau
URL: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml
Data Format: .csv
Spatial Object Type: Characteristic data only
Relevant Attributes:

White: White Race and Ethnicity
Hisp: Hispanic or Latino Race and Ethnicity
Black: Black Race and Ethnicity
MEDINC: Median Household Income

The data processing required for this dataset was to add columns which could identify the dominant race/income in a given block group. This processing allows for easy chloropleth visual representation in GIS as compared to percentage data alone.

In regards to data fitness, the data was last updated August 27 2015, (up-to-date) with new information from the U.S. Census Bureau's 2009-13 American Community Survey. Updated data covers population characteristics. The American Community Survey is a sample-based data product. CMAP recommends to exercise caution when using data from low-population municipalities, as the margins of error are often large compared to the estimate. Otherwise, the data is accurate and complete with regards to attributes. This dataset is perfectly fit for use when trying to answer the question of whether or not the distribution of bike infrastructure has been inequitably distributed, as it will help provide information on the relationship between equity and race/income.

In terms of constraints, data was obtained using the American Community Survey, which basically takes estimates of existing data. However, this is a minor constraint as the American Community Survey is a reputable source used by many governmental agencies.

Overall constraints

As mentioned above, one major constraint is the difficulty in finding older data for bicycle resources from, say, 2011 and 2013 which could better establish any potential temporal relationship regarding equity in bicycle resources.

4. Information Product

The purpose of this section is to outline the design of the information products which can answer Slow Roll Chicago's pressing question: is bicycle infrastructure equitably distributed within Chicago? In this section we intend to plot out the presentation of and data processes within the maps which will aim to answer Slow Roll's pressing question.

Range of products

The information product provided to Slow Roll will include a portfolio of maps and tables. The maps/tables are as follows:

Basic Maps

- "Divvy Bicycle Stations in Chicago"
- "Bike Lanes in Chicago"
- "Population by Race in Chicago"
- "Median Income in Chicago by Block Group"

Analytic Maps

- "Black Residency Hot-Spots and Bicycle Resources in Chicago"
- "Hispanic Residency Hot-Spots and Bicycle Resources in Chicago"
- "White Residency Hot-Spots and Bicycle Resources in Chicago"
- "Low/Moderate Income Residency Hot-Spots and Bicycle Resources in Chicago"
- "High Income Residency Hot-Spots and Bicycle Resources in Chicago"
- "Proximity to Divvy Stations by Race" (for data not for presentation)
- "Proximity to Divvy Stations by Income" (for data not for presentation)
- "Proximity to Bike Lanes by Race" (for data not for presentation)
- "Proximity to Bike Lanes by Income" (for data not for presentation)

Tables

- Access by Race
- Access by Household Income

Key elements found in these maps are now detailed in turn.

"Black Residency Hot-Spots and Bicycle Resources in Chicago"

This map incorporates layers of a census block group shapefile, bike lanes, Divvy stations, and hot-spot analysis based on race (black, white and hispanic) and income levels. Sequential color schemes are used within the hot-spot analysis of races/income levels to help distinct between values (colors have not been decided and will not have any particular meaning). Single color is used for bike lanes and a distinct symbol is used to represent bike lanes and Divvy stations. A legend will be provided to show how the thematic information in the map is organized and symbolized.

"Proximity to Divvy Stations by Race"

The processing earlier described for this relationship will be used to create maps which will ultimately be presented as values only. The maps are not easily intelligible and their ultimate value is in producing figures for numbers of people/households with proximate (.25 miles or .5 miles) access to divvy stations and bike lanes. This output will be in the form of tables detailing the processing results.

Efficacy

The two above categories of maps/outputs, those which a) utilize the natural distance method to explore proximity and b) utilize hot-spot analysis to explore spatial autocorrelation, should both work well to answer Slow Roll's pressing question.

The hot-spot maps allow one to recognize that a) there are indeed agglomerations in Chicago of high wealth/poverty and racial clustering and b) that bicycle resources appear to exist in greater amount within certain clusters. These maps afford the audience a bit of a heuristic to understand Chicago's tremendous racial and economic segregation and its relationship to location of bicycle resources.

The natural distance maps/tables allow us to explore what number and/or percentage of certain race/income groups have proximate (.25 miles and .5 miles) access to bicycle resources. This, of course, goes a long way towards identifying any possible disparities in access between groups. Slow Roll aims to understand equity, or lack thereof, and this technique will allow us to both visually and numerically articulate an answer to this question.

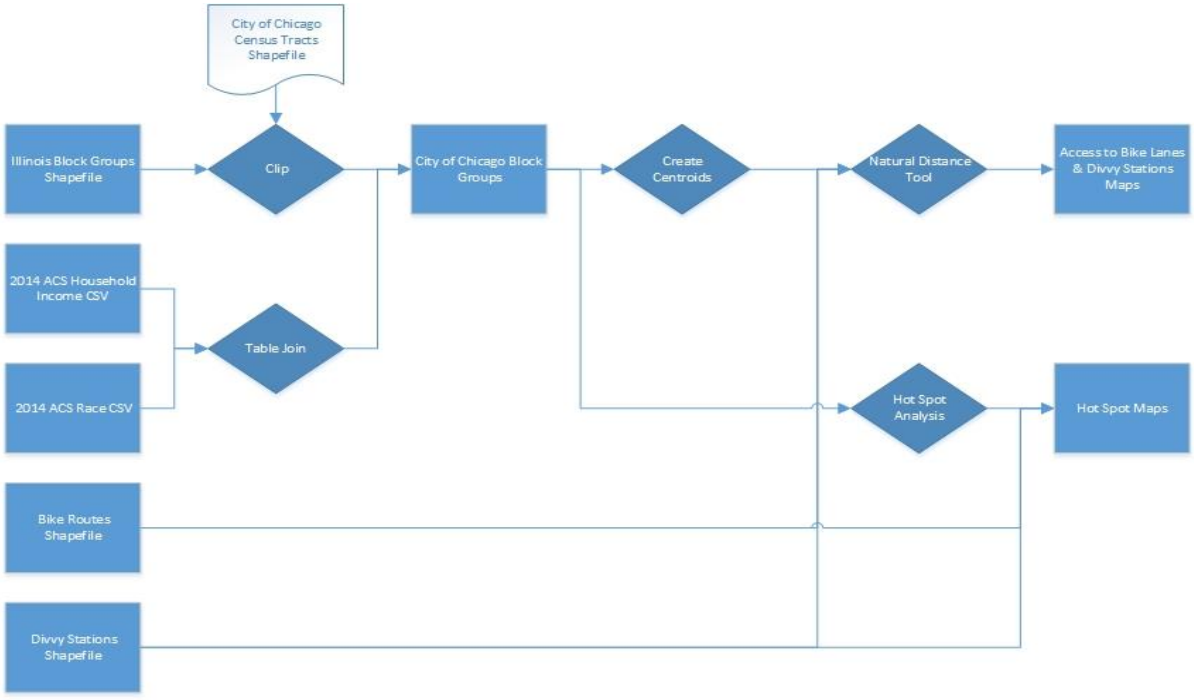
Processing Methods

After obtaining the data, several processing techniques are employed. The shapefile for block groups within Chicago was not available on the City of Chicago Data Portal. Therefore, the shapefile for block groups of the state of Illinois isbe downloaded from the Tiger/Line section of the Census website. It is then clipped by the shapefile for census tracts of Chicago in order to create a new layer of only

the block groups for Chicago. A table join is then performed to link the 2014 ACS data for household income and race with the Chicago block groups. Centroids are then calculated for each of the block groups in order to load as incidents for the Closest Facility function in the Network Analyst tool. Divvy stations and bike routes (a process will first be performed to convert lines to points) are loaded as facilities for separate calculations to show the block groups within .5 miles and .25 miles of the bike infrastructure. From this process, maps are produced to show access to bike infrastructure and calculations are performed to determine the percentage of people within in each race and income level that fall within the .5 mile and .25 mile thresholds. The maps will provide some level of presentation while the calculations will provide critical figures describing access.

In a separate process, hot spot analysis is performed for both income and race. The location of Divvy stations and bike routes are then be displayed for comparison.

Process Diagram for Information Products



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Processing Constraints

A key processing constraint is the lack of temporal analysis due to lack of available Divvy and Bike Lane data for prior years. For example, Slow Roll is interested in exploring the temporal relationship between bicycle resources and variables such as income. A time lapse could be created in ArcGIS to present such a relationship, but the prior year data would be necessary to establish such a relationship.

A second obvious key constraint is time. Slow Roll would undoubtedly like to explore the relationship between a number of variables, in a number of permutations, over a number of years. This sort of comprehensiveness would allow Slow Roll to articulate arguments to a widest range of stakeholders. However, there is insufficient time to a) prepare 10-20 data sets and b) develop 20-50 maps within the time limitations of this course.

In this regard, other processing techniques could be employed given more time. While the Network Analyst/Natural Distance tool is used to measure proximity, use of other tools including buffer, the near tool, etc. would provide further context and evidence for the proximity argument.

Due to the time and data availability restrictions, we focused our attention on a) hot-spot analysis to demonstrate a visual relationship between bicycle resources and certain income/race groups and b) the natural distance tool to quantify this relationship. These two processes allow us to explore and answer Slow Roll's pressing questions given the evident constraints.

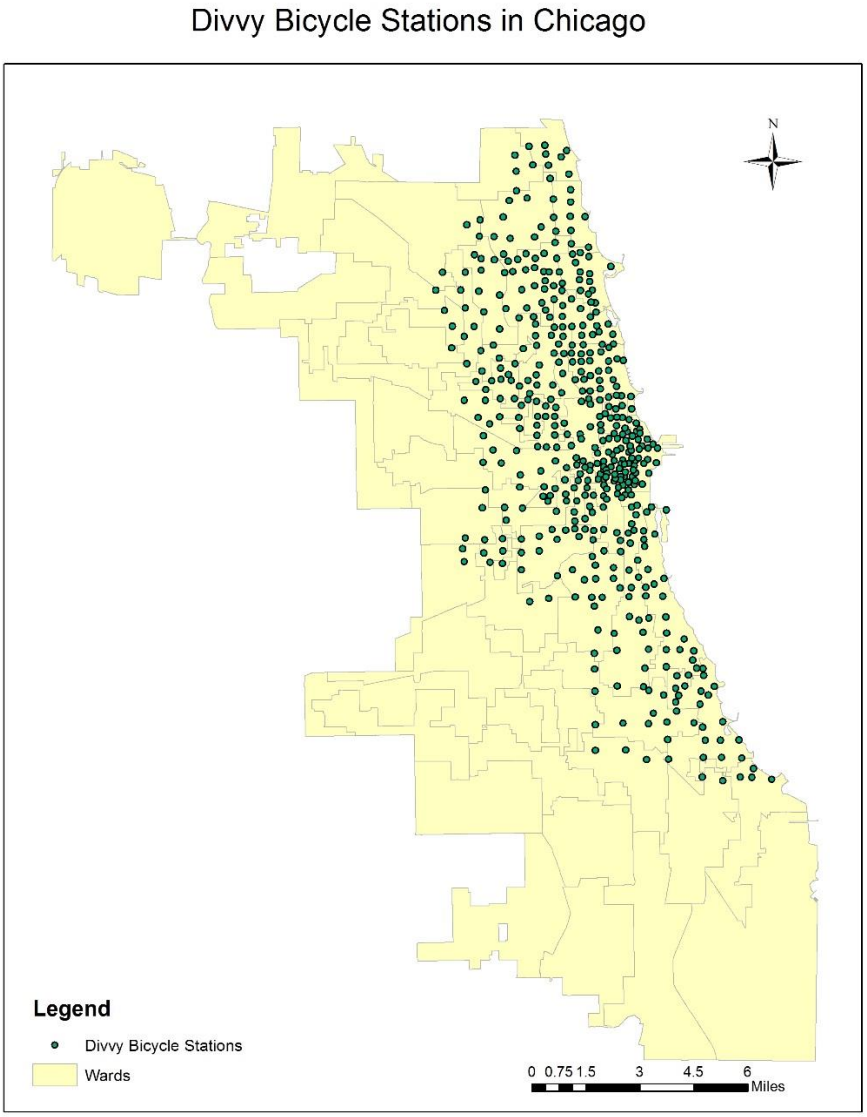
5. Results

The results of this study are found in the portfolio of maps created and values quantified through GIS processing. This section displays the resulting maps and figures.

Maps

Basic

"Divvy Bicycle Stations in Chicago"



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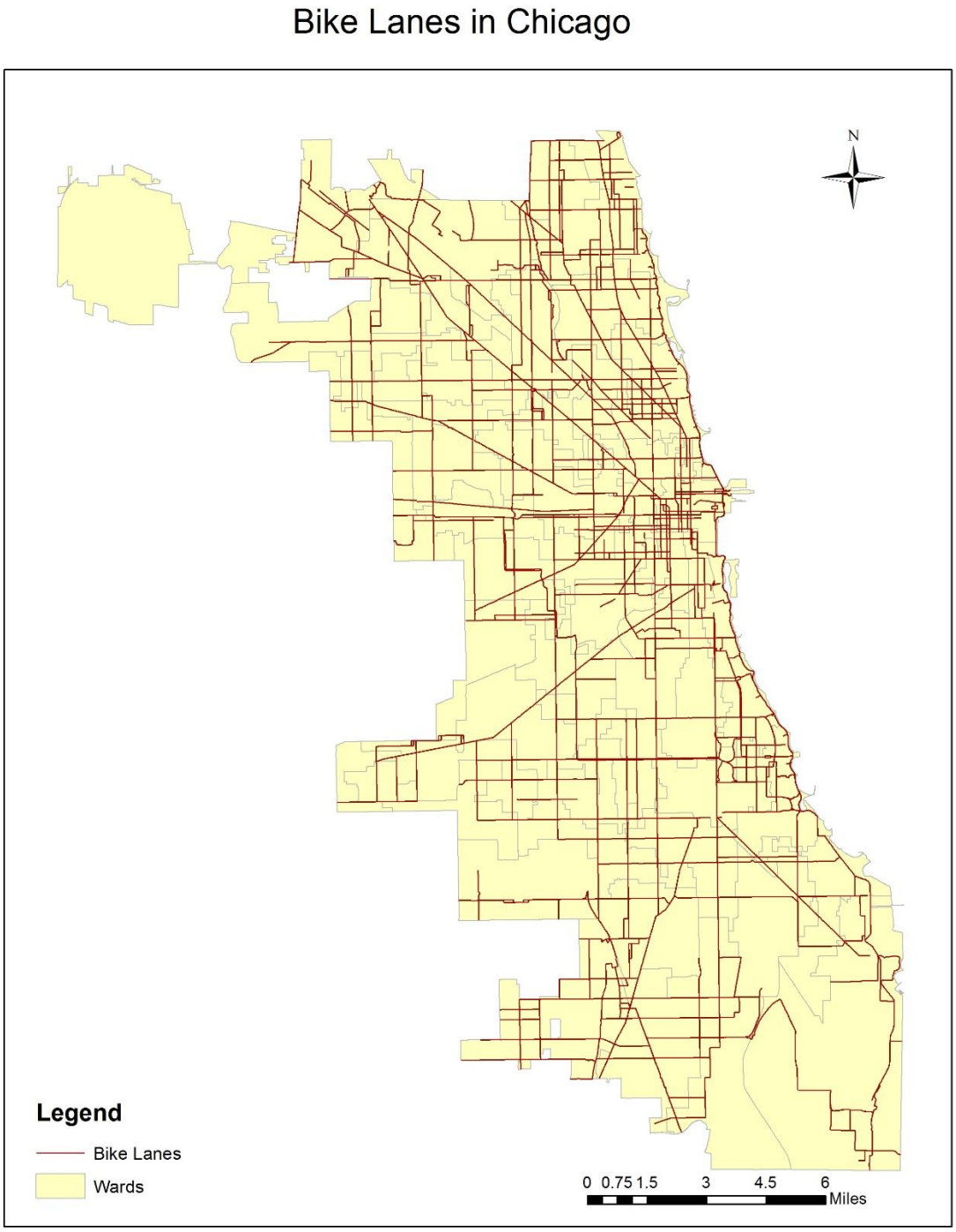
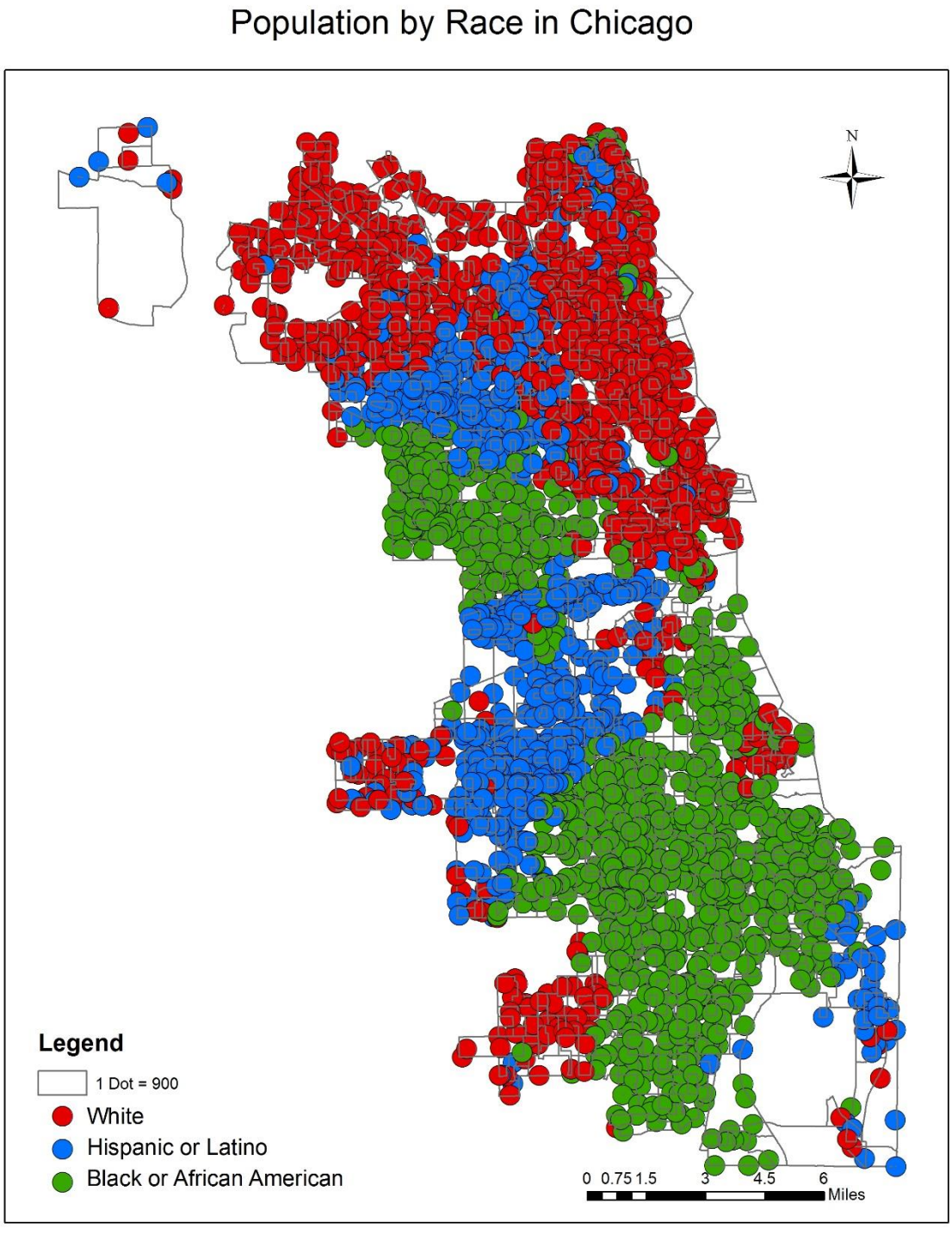
"Bike Lanes in Chicago"



"Population by Race in Chicago"



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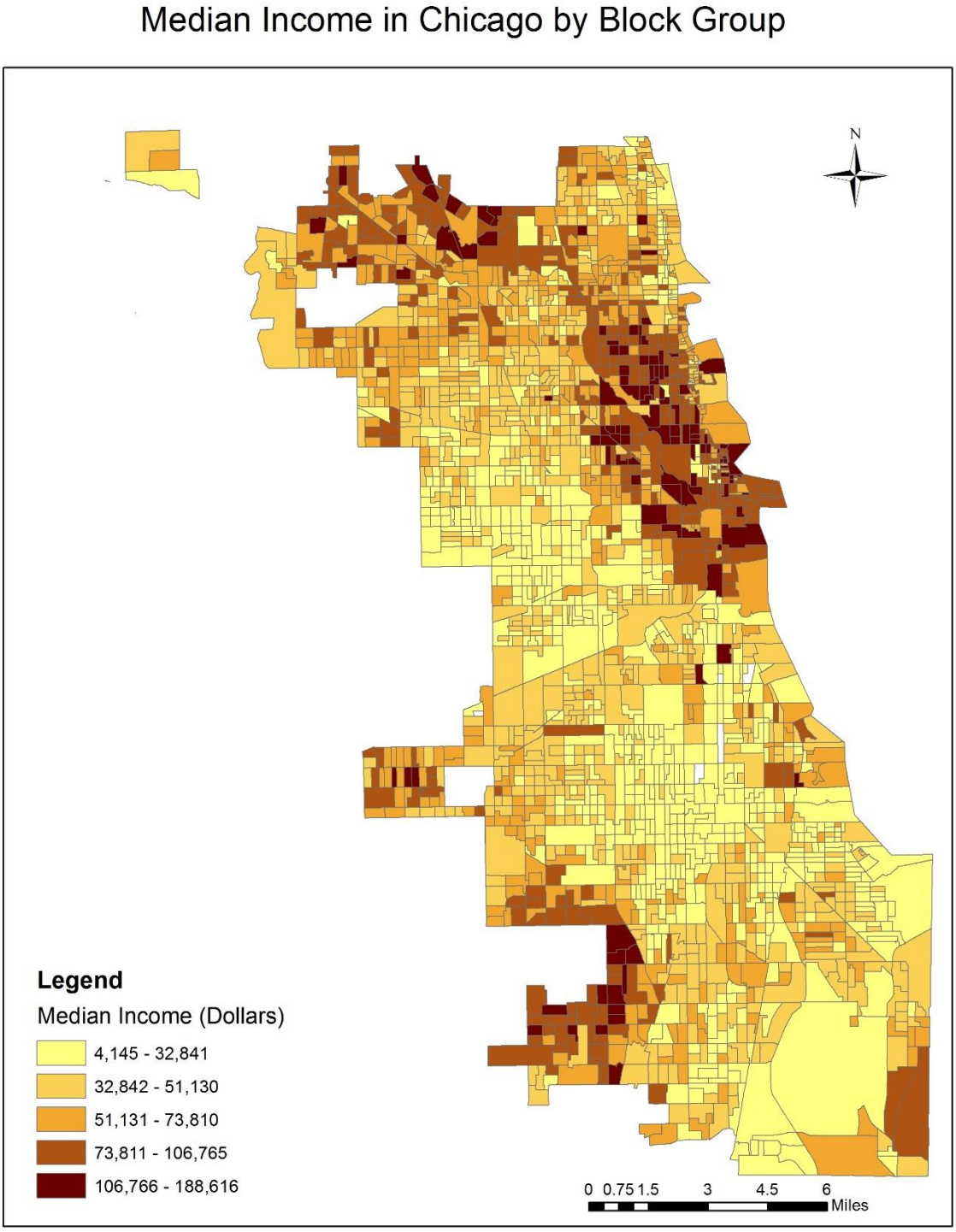
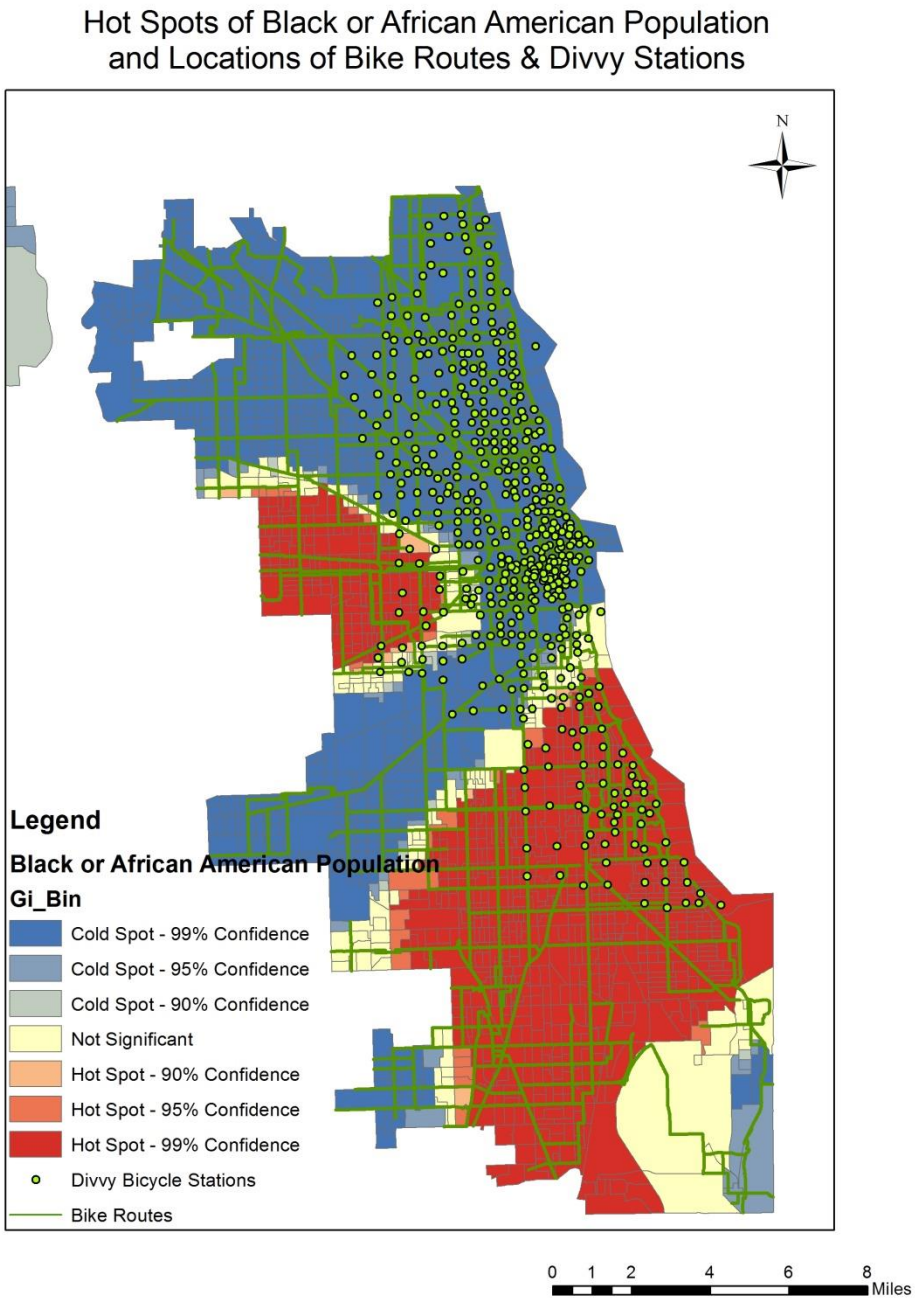
"Median Household Income in Chicago by Block Group"



Analytic

"Black Residency Hot-Spots and Bicycle Resources in Chicago"



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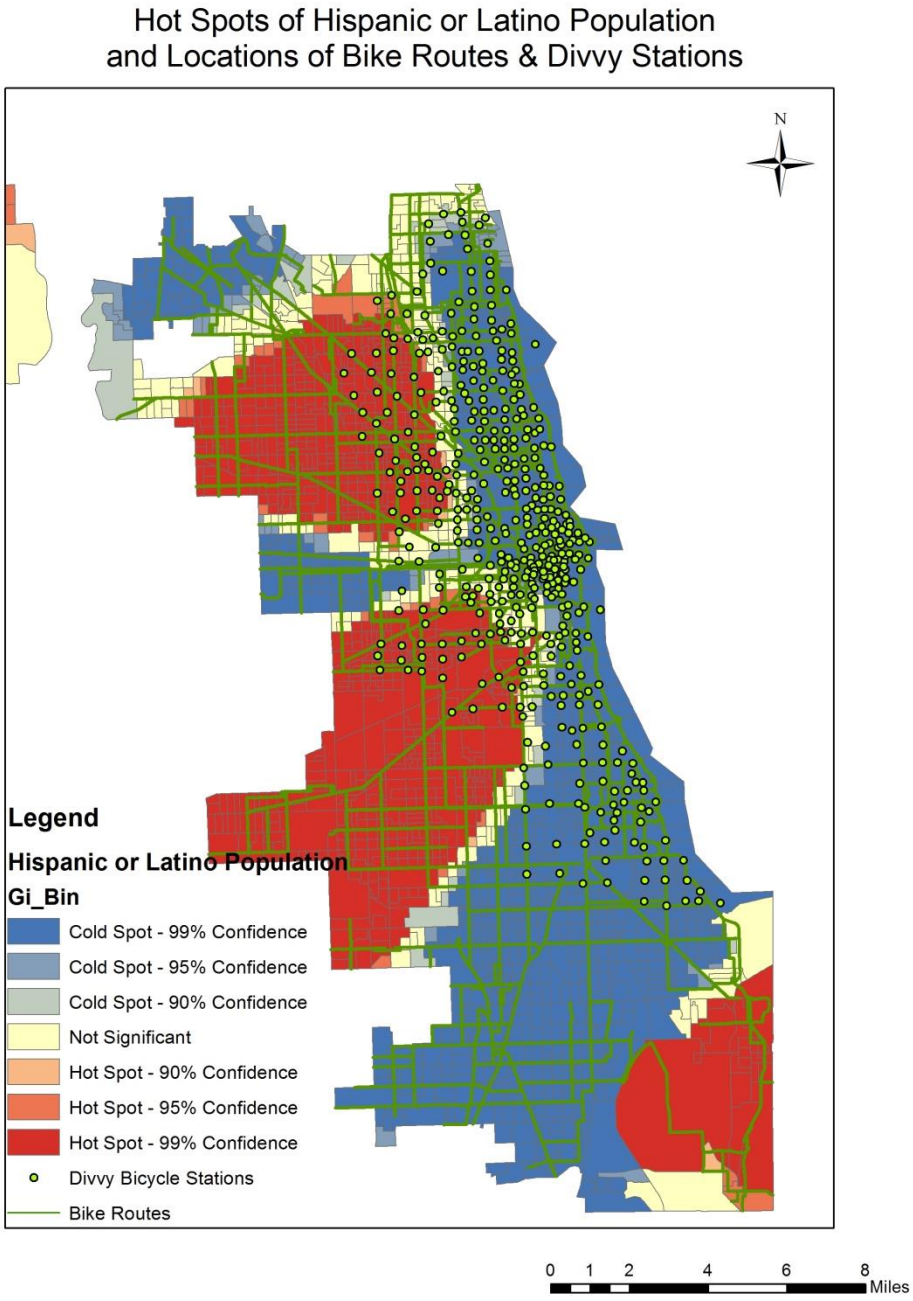
"Hispanic Residency Hot-Spots and Bicycle Resources in Chicago"



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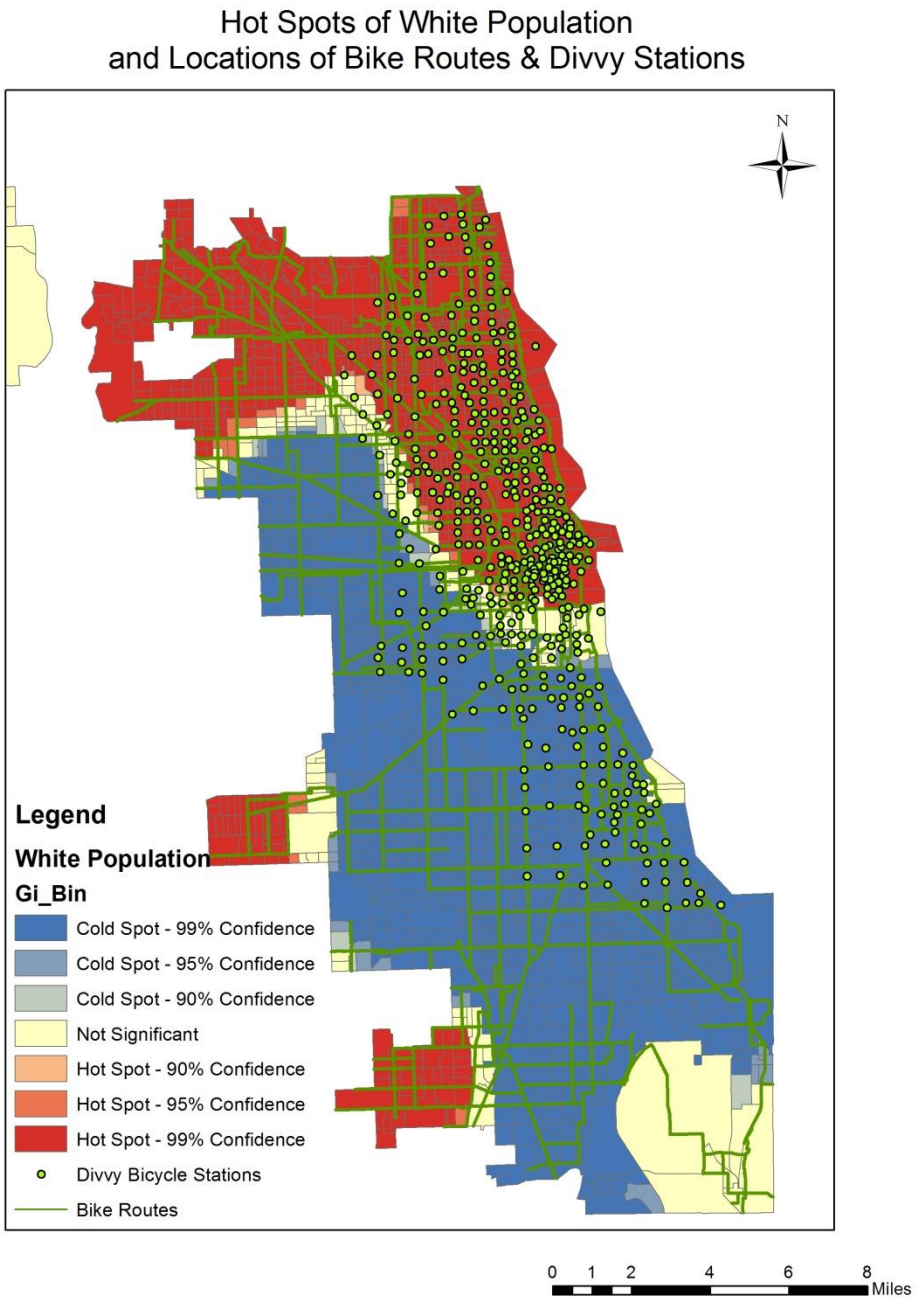
"White Residency Hot-Spots and Bicycle Resources in Chicago"



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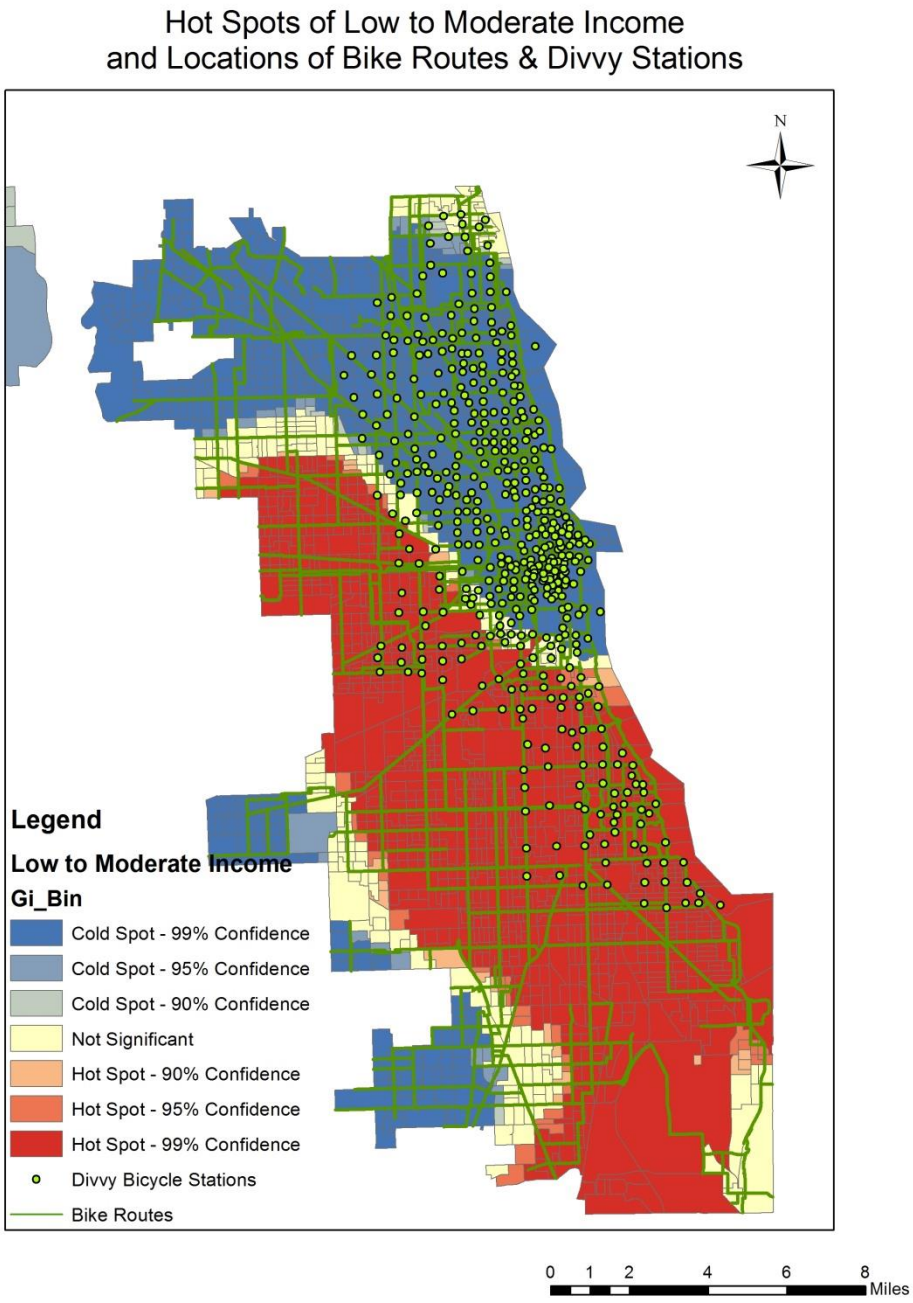
"Low/Moderate Income Residency Hot-Spots and Bicycle Resources in Chicago"



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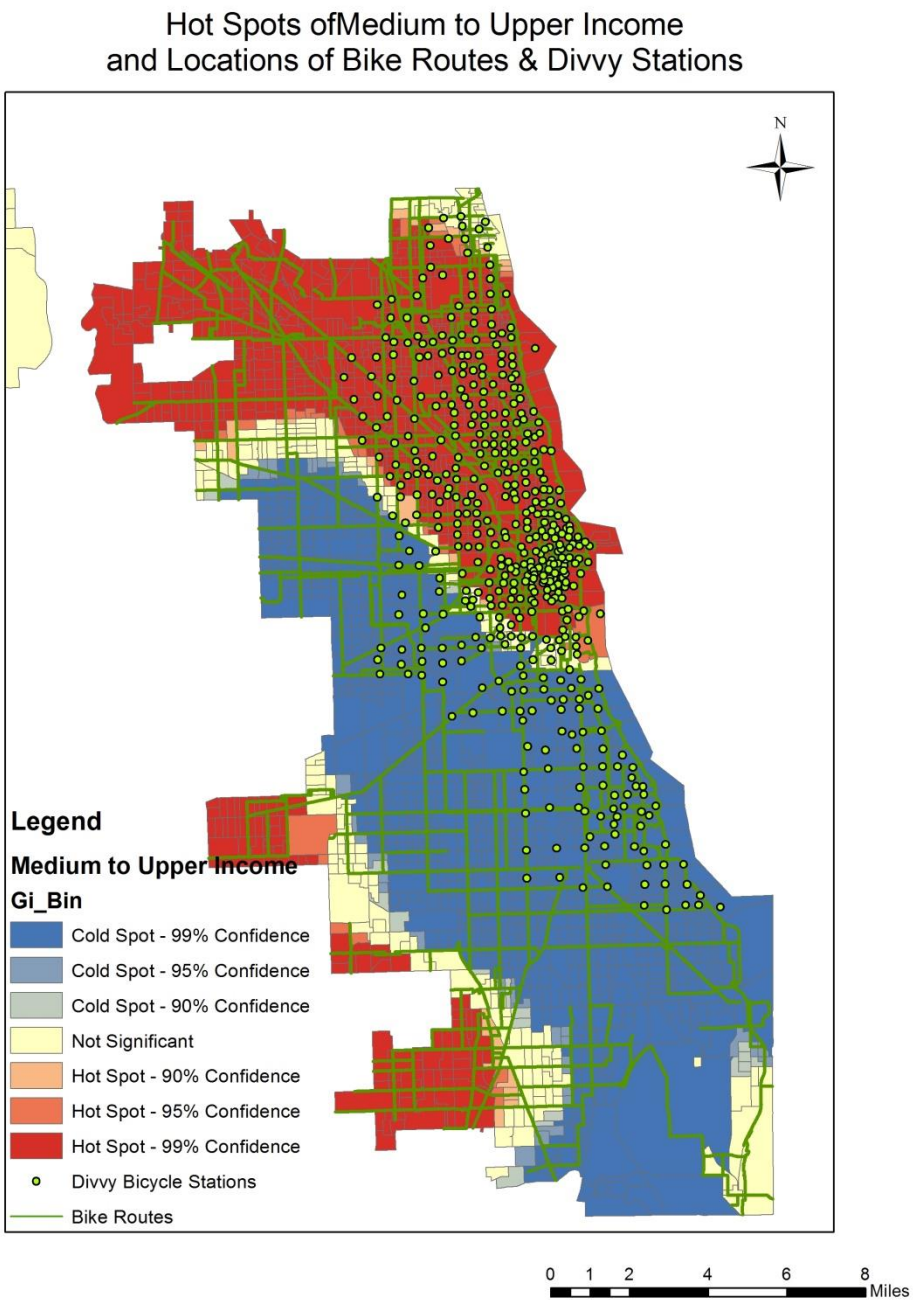
"High Income Residency Hot-Spots and Bicycle Resources in Chicago"



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Figures

Access by Race

	Divvy					Bike Lanes			
	Total Pop	Pop (.25 miles)	% of total	Pop (.5 miles)	% of total	Pop (.25 miles)	% of total	Pop (.5 miles)	% of total
Black	866,176	191,458	**22%**	384,169	**44%**	610,793	**71%**	812,972	**94%**
Hispanic	802,020	231,305	**29%**	368,110	**46%**	590,746	**74%**	745,308	**93%**
White	909,370	486,591	**54%**	600,321	**66%**	721,619	**79%**	850,971	**94%**

Access by Household Income

	Divvy					Bike Lanes			
	Total House-holds	Households (.25 miles)	% of total	Households (.5 miles)	% of total	Households (.25 miles)	% of total	Households (.5 miles)	% of total
Low/Moderate Income (<$45,000)	503,294	195,971	**39%**	293,095	**58%**	380,350	**76%**	472,875	**94%**
Medium/High Income (>$45,000)	551,328	272,683	**49%**	349,293	**63%**	433,661	**79%**	520,711	**94%**

6. Conclusions

The results found in this study demonstrate that there is indeed inequitable access to bicycle resources/infrastructure between income/race groups, particularly at the closer .25 mile threshold. Critically, the inequity is greater for access to Divvy stations than for bike lanes. This conclusion means that bike lanes intended to serve the public can only significantly serve certain segments of the public due to limited bike-share resources accessible for many other segments of the population. The hot spot maps in the results section provide the "eye-test" with which this conclusion can be surmised while the network analysis conducted provides the analytical rigor to confirm this conclusion. While the differences between demographic segments may not be as stark as one might expect (particularly for bike lanes), there is indeed statistically significant difference in access. The .5 mile threshold depicts more equitable access but is less critically important as .5 miles is a relatively far distance to travel to access safe/comfortable/useful infrastructure. Accordingly, this study pays less heed to those figures. Chicago's White residents and middle/high income residents do indeed tend to have better access to resources/infrastructure than Black, Hispanic/Latino, and low/moderate income residents. One important observation is the amazing degree to which income and race do covary in this analysis; race and income are approximate proxies for each other in terms of access. This research, while discrepancies in access are subtle, demonstrates that SRC rightfully can and should push for more equitable distribution of resources, particularly bike-sharing stations. This study will hopefully provide sufficient geographic detail for SRC to lead city-level and ward-level battles for improved equity of access.

Constraints

As is the norm for academic research, this study group believes that more research is necessary on this topic. The time and expertise limits of the authors reduces the power of this paper's results and conclusions. More time is required to explore time-series data, break down bike lanes by quality/efficacy, and add a myriad other socio-economic indicators. Furthermore, combination of diversified variables and temporal scope would allow analysis of the impact of improved resources on communities. While these additional processes fall outside the time/expertise scope of the GEO 442 DePaul service-based learning course, they would be extremely valuable for SRC and their pursuit of better, larger, more equitable bicycle resource allocation in Chicago.

7. Appendix

Figure 1: Links to pertinent websites

American FactFinder
http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

Chicago Data Portal
https://data.cityofchicago.org/

Slow Roll Chicago
http://slowrollchicago.org/

DePaul Sustainable Urban Development
http://las.depaul.edu/academics/sustainable-urban-development/pages/default.aspx

Figure 2: Metadata

Race

GEO.id	Id
GEO.id2	Id2
GEO.display-label	Geography
HD01_VD01	Estimate; Total:
HD02_VD01	Margin of Error; Total:
HD01_VD02	Estimate; Not Hispanic or Latino:
HD02_VD02	Margin of Error; Not Hispanic or Latino:
HD01_VD03	Estimate; Not Hispanic or Latino: - White alone
HD02_VD03	Margin of Error; Not Hispanic or Latino: - White alone
HD01_VD04	Estimate; Not Hispanic or Latino: - Black or African American alone
HD02_VD04	Margin of Error; Not Hispanic or Latino: - Black or African American alone
HD01_VD05	Estimate; Not Hispanic or Latino: - American Indian and Alaska Native alone
HD02_VD05	Margin of Error; Not Hispanic or Latino: - American Indian and Alaska Native alone
HD01_VD06	Estimate; Not Hispanic or Latino: - Asian alone
HD02_VD06	Margin of Error; Not Hispanic or Latino: - Asian alone
HD01_VD07	Estimate; Not Hispanic or Latino: - Native Hawaiian and Other Pacific Islander alone
HD02_VD07	Margin of Error; Not Hispanic or Latino: - Native Hawaiian and Other Pacific Islander alone
HD01_VD08	Estimate; Not Hispanic or Latino: - Some other race alone
HD02_VD08	Margin of Error; Not Hispanic or Latino: - Some other race alone
HD01_VD09	Estimate; Not Hispanic or Latino: - Two or more races:

HD02_VD09	Margin of Error; Not Hispanic or Latino: - Two or more races:
HD01_VD10	Estimate; Not Hispanic or Latino: - Two or more races: - Two races including Some other race
HD02_VD10	Margin of Error; Not Hispanic or Latino: - Two or more races: - Two races including Some other race
HD01_VD11	Estimate; Not Hispanic or Latino: - Two or more races: - Two races excluding Some other race, and three or more races
HD02_VD11	Margin of Error; Not Hispanic or Latino: - Two or more races: - Two races excluding Some other race, and three or more races
HD01_VD12	Estimate; Hispanic or Latino:
HD02_VD12	Margin of Error; Hispanic or Latino:
HD01_VD13	Estimate; Hispanic or Latino: - White alone
HD02_VD13	Margin of Error; Hispanic or Latino: - White alone
HD01_VD14	Estimate; Hispanic or Latino: - Black or African American alone
HD02_VD14	Margin of Error; Hispanic or Latino: - Black or African American alone
HD01_VD15	Estimate; Hispanic or Latino: - American Indian and Alaska Native alone
HD02_VD15	Margin of Error; Hispanic or Latino: - American Indian and Alaska Native alone
HD01_VD16	Estimate; Hispanic or Latino: - Asian alone
HD02_VD16	Margin of Error; Hispanic or Latino: - Asian alone
HD01_VD17	Estimate; Hispanic or Latino: - Native Hawaiian and Other Pacific Islander alone
HD02_VD17	Margin of Error; Hispanic or Latino: - Native Hawaiian and Other Pacific Islander alone
HD01_VD18	Estimate; Hispanic or Latino: - Some other race alone
HD02_VD18	Margin of Error; Hispanic or Latino: - Some other race alone
HD01_VD19	Estimate; Hispanic or Latino: - Two or more races:
HD02_VD19	Margin of Error; Hispanic or Latino: - Two or more races:
HD01_VD20	Estimate; Hispanic or Latino: - Two or more races: - Two races including Some other race
HD02_VD20	Margin of Error; Hispanic or Latino: - Two or more races: - Two races including Some other race
HD01_VD21	Estimate; Hispanic or Latino: - Two or more races: - Two races excluding Some other race, and three or more races
HD02_VD21	Margin of Error; Hispanic or Latino: - Two or more races: - Two races excluding Some other race, and three or more races

Income

GEO.id	Id
GEO.id2	Id2
GEO.display-label	Geography
HD01_VD01	Estimate; Total:
HD02_VD01	Margin of Error; Total:
HD01_VD02	Estimate; Total: - Less than $10,000
HD02_VD02	Margin of Error; Total: - Less than $10,000
HD01_VD03	Estimate; Total: - $10,000 to $14,999
HD02_VD03	Margin of Error; Total: - $10,000 to $14,999
HD01_VD04	Estimate; Total: - $15,000 to $19,999
HD02_VD04	Margin of Error; Total: - $15,000 to $19,999
HD01_VD05	Estimate; Total: - $20,000 to $24,999
HD02_VD05	Margin of Error; Total: - $20,000 to $24,999
HD01_VD06	Estimate; Total: - $25,000 to $29,999

HD02_VD06	Margin of Error; Total: - $25,000 to $29,999
HD01_VD07	Estimate; Total: - $30,000 to $34,999
HD02_VD07	Margin of Error; Total: - $30,000 to $34,999
HD01_VD08	Estimate; Total: - $35,000 to $39,999
HD02_VD08	Margin of Error; Total: - $35,000 to $39,999
HD01_VD09	Estimate; Total: - $40,000 to $44,999
HD02_VD09	Margin of Error; Total: - $40,000 to $44,999
HD01_VD10	Estimate; Total: - $45,000 to $49,999
HD02_VD10	Margin of Error; Total: - $45,000 to $49,999
HD01_VD11	Estimate; Total: - $50,000 to $59,999
HD02_VD11	Margin of Error; Total: - $50,000 to $59,999
HD01_VD12	Estimate; Total: - $60,000 to $74,999
HD02_VD12	Margin of Error; Total: - $60,000 to $74,999
HD01_VD13	Estimate; Total: - $75,000 to $99,999
HD02_VD13	Margin of Error; Total: - $75,000 to $99,999
HD01_VD14	Estimate; Total: - $100,000 to $124,999
HD02_VD14	Margin of Error; Total: - $100,000 to $124,999
HD01_VD15	Estimate; Total: - $125,000 to $149,999
HD02_VD15	Margin of Error; Total: - $125,000 to $149,999
HD01_VD16	Estimate; Total: - $150,000 to $199,999
HD02_VD16	Margin of Error; Total: - $150,000 to $199,999
HD01_VD17	Estimate; Total: - $200,000 or more
HD02_VD17	Margin of Error; Total: - $200,000 or more