

Access to Child Care in Cook County

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Executive Summary

- On average, Cook County parents using the Illinois Child Care Assistance Program travel 2.4 miles to take their children to child care.
- Families using child care centers travel on average 61% farther than families using the most abundant and informal types of care: relatives, friends and neighbors.
- Families with infants and toddlers that use center-based care travel on average 22% farther than families with school age children.
- Families with higher income travel an average of 27% farther for child care than lower income families.
- Generally, families in Chicago travel shorter distances than families in suburban Cook County.
- Child care centers are three times as likely to be located within a half mile of a CTA station as they would be if centers were evenly distributed in Cook County.
- Centers are twice as likely to be located within a half mile of a Metra station as they would be if centers were evenly distributed in Cook County.
- No clustering was found around highway entrances and exits.
- There are clearly identifiable child care deserts in Cook County where the supply of child care slots in centers falls short of the likely demand in the vicinity by significant numbers (300-1000 more children than slots). The most egregious areas include Rogers Park, Bronzeville, Albany Park, and the suburban municipalities of Elgin and Orland Hills.

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Chapter 1: Introduction

Child care is a critical support mechanism for working families, and resources can be placed more effectively if child care supply and demand patterns are well understood. We are charged with assessing these patterns of child care use and distribution in Cook County. At the request of Illinois Action for Children, a resource and advocacy organization serving Cook County, we address three specific questions regarding the supply and demand of child care.

- 1) How far do parents travel for child care, and how does this vary based on their child's age, where they live in Cook County, their family income and the type of child care they use?
- 2) Do child care centers in Cook County cluster around major transportation nodes?
- 3) What areas of Cook County could be considered child care center "deserts", meaning that there is a shortage of child care centers in geographical areas that have demand for child care?

For each of these questions, a needs assessment was conducted to determine what research has been done in the past and lay out our objectives for each research question. The datasets required to complete our objectives are outlined in Chapter 3, and the relationships among the data entities are specified in Chapter 4. The methods used to obtain the desired results are presented in Chapter 5, and the final results are shown and explained in Chapter 6.

Chapter 2: Needs Assessment

2.1 Purpose

Illinois Action for Children's (IAFC) mission is to be a "catalyst for developing, organizing and supporting strong families and powerful communities where children matter most." IAFC's main focus is on improving families' access to quality child care and early education programs, particularly for families that are low-income or hard-to-reach. Exposure to quality early learning opportunities can profoundly affect a child's ability to succeed in school and in life. IAFC's goal is for every child to have early learning opportunities, and it works toward this goal by implementing programs that connect families with child care and early education programs, by providing resources to early education providers to develop high-quality programs, and by advocating for more state resources to be applied toward this end.

Some of the problems facing families in accessing quality child care include finding programs that are affordable, finding an open slot in their neighborhood (especially for children under two), and finding care during evening, weekend, or other non-traditional hours of care. The distance parents have to travel, or choose to travel, to a child care program that meets their needs is also a part of the family's decision-making process and is a topic that IAFC would like to learn more about.

Our project is to analyze how far parents travel for child care, to see whether child care centers are clustered around major transportation nodes and to identify areas in Cook County with few, if any, child care centers (child care center deserts). This analysis will support IAFC in its goal to understand barriers families face in accessing child care so that IAFC can use resources effectively to better assist families.

Supply and demand is complex. The scope of this project is to answer basic questions that can serve as a foundation or starting point for more in-depth research needed to understand the underlying factors behind the results we found.

2.2 Background

Very little has been written about determining how far families travel for child care, but we reviewed the methodology of several studies using distance measures as we developed our own methodology. There are several methods of computing of distance. A geographic measurement of distance “as the crow flies” is the simplest measurement, although it is also the least realistic (since human beings rarely travel as the crow flies). More likely, the measurement of distance along a certain route is more realistic. A study analyzing accessibility to bus stops (Kimpel and Dueker 2006) opted to use “network distance rather than straight-line distance to define transit service areas around bus stops.” In the case of bus stops, only walking distances are relevant, but in the case of access to child care centers, network distance can be defined in terms of walking, driving, public transit, or some combination of these means of transportation. These various means of transportation complicate the use of distance as a measure of accessibility. One way to summarize these complexities would be to use travel time as a measure of accessibility. For instance, a route that consists of one mile of walking and a five mile bus trip would be a six mile trip, but the value of six miles is not meaningful without the context of how the distance is to be travelled. Total travel time would incorporate all of that complexity into a single number.

For the tools used to measure distance, we explored three potential options from ESRI. BusinessMAP 4.5 software is for businesses that are looking for competitive advantages and areas of opportunity within a geographic area. One compelling feature was the ability to perform spider diagrams, which could show the relationship of parents to the centers (a many to one). This could quickly reveal areas of “desertification”. Another feature is drive-time analysis, which would calculate the actual commute time from a central location to an outlying point. Also, ESRI announced the release of ArcLogistics, which is a set of free plug-ins to the ArcGIS Desktop software product. This product could be used for building efficient routes, measuring routes, and building the actual drive-time schedules. This would be helpful in achieving our main goal of measuring distances parents travel with their children to child care centers in Cook County.

Neither of these two software packages was available to us, but we did have access to ESRI’s Network Analyst extension. This software allows the user to calculate route distance using an Origin-Destination Matrix.

The second challenge of our project was to define a child care center “desert.” We reviewed methodologies for defining food deserts, which are commonly studied. In a study by Mari Gallagher, “Examining the Impact of Food Deserts on Public Health in Chicago,” census block groups with non-zero children were identified (based on 2000 Census data). Food stores were mapped, and the distance of the centroid of each block group to the nearest store was calculated. These distances were weighted based on the population density of the block group. Block groups whose nearest grocery store was over one mile away received the worst score, while those with stores within a half mile away received the best scores.

Another food desert study used three measures to determine a food desert: the distance to the nearest supermarket, the number of supermarkets within a distance of 1000 meters (about a 15-minute walk), and the mean distance to three supermarkets of different brands to reflect consumer options (Apparicio, Cloutier and Shearmur 2007).

Finally, we found an article that discussed food deserts in the city of London in Ontario, Canada. In this study, they considered a walk of 500 meters to be the limit for accessibility after a short 10 minute bus trip. The public transit in London, Ontario determined that a 10 minute bus ride covered 3 km on average (roughly 5 miles). Gilliland found that as new supermarkets were being built in the suburbs and areas that are more accessible to autos, they are driving the small local “mom and pop” supermarkets out of business, leaving food deserts.

2.3 Objectives

Goal 1: How far do parents travel for child care, and how does this vary based on their child's age, where they live in Cook County, their family income and the type of child care they use?

Objectives:

- a) Calculate the distance between parents' homes and where their children are in child care
- b) Chart the average distance traveled versus type of child care (child care center, licensed home care, and "family, friend and neighbor" care).
- c) Chart the average distance traveled versus family income
- d) Chart the average distance traveled versus child age
- e) Map the average distance traveled by Chicago Community Area and suburban municipality

Goal 2: Do child care centers in Cook County cluster around major transportation nodes?

Objectives:

- a) Map location of child care centers
- b) Map CTA routes and stops.
- c) Map Metra stations and platforms.
- d) Map major expressway exits/entrances.
- e) Analyze data for clustering of centers around transportation nodes noted above (e.g. bus stops, "L" stops, Metra train stations/platforms).

Goal 3: What areas of Cook County could be considered child care center "deserts", meaning there is a shortage of center care for families who might choose to use it?

Objectives:

- a) Calculate the number of children in need of child care by Cook County census tract
- b) Calculate the number of center slots per tract
- c) Map "deserts" reflecting areas of high need but low slot counts

Chapter 3: Data Acquisition and Constraints

To meet the needs and requirements of the project, the following data sets are required:

1. Parents using a child care provider **(Goal 1)**
2. Child care providers **(Goal 1)**
3. Chicago community areas **(Goals 1,2, and 3)**
4. Cook County Municipalities **(Goals 1,2, and 3)**
5. Child care centers **(Goals 2 and 3)**
6. Cook County census tracts **(Goal 3)**
7. Child population by census tract **(Goal 3)**
8. Households with all parents working **(Goal 3)**
9. Main roads in Cook County **(Goal 2)**
10. Ramps for main roads in Cook County **(Goal 2)**
11. CTA train stations **(Goal 2)**
12. Metra train stations **(Goal 2)**

For Goal 1, we are evaluating distance between parents and the providers that they use for child care in Cook County. Datasets 1 and 2 provide the core information requirement of Goal 1 (location of parents and their care providers). In addition, we want to relate average distance travelled to several factors: family income, child age, community area, and municipality. Dataset 1 contains information about family income and child age, while datasets 3 and 4 identify the boundaries of Chicago community areas and suburban municipalities.

There are three significant data constraints in determining the distance a parent travels to their child care provider.

- 1) The provider's address could be a mailing address rather than a home address. The extent to which providers use a mailing address rather than a physical address is not known, but from anecdotal evidence, some providers prefer their child care payments be sent to an address other than their home address (including PO Boxes) in the interest of security. Since providers using PO Boxes cannot be geocoded, these providers and their corresponding parents are excluded from the study. For the remaining providers there will be an unknown degree of error due to the possibility that the address is not their home address.
- 2) It is not known if parents walk, drive, or take public transportation to get to their child care provider. These three cases each have widely varying measures of accessibility.
- 3) It is not known where the child care provider is geographically positioned relative to the parent's employer. This could yield more information about the inconvenience factor for the parent.

For Goal 2, we are evaluating the locations of Child Care Centers and assessing whether they tend to cluster around major transportation nodes in Cook County. We defined major transportation nodes as CTA train stations, Metra train stations, and major highway exits. Datasets 3, 4, 5, and 9-12 contain information on the locations of child care centers and all major transportation nodes.

For Goal 3, we are searching for "child care deserts" in Cook County. We need dataset 6 because we are conducting our analysis at the census tract level. For a given census tract, we need to know how many children are in the tract (dataset 7), as well as which child care centers are located in the tract (dataset 5). To adjust the total number of children in each tract to more accurately reflect the number of children likely in need of care,

we must use household data to determine which houses have no parents staying at home to take care of the children (dataset 8). When we have our results for all the census tracts of Cook County, we will put them into the context of Chicago’s community areas (dataset 3) and Cook County’s municipalities (dataset 4).

There are two significant data constraints in assessing goals 2 and 3.

- 1) The child care center data may not contain all child care centers in Cook County. Some license-exempt centers that do not list their program with the Illinois Action for Children referral program are not included. However, we do not think this number is significant enough to affect the conclusions we draw from the project.
- 2) The child care center data does not account for accessibility limits that are not geographical (distance-based). For example, some centers may be priced out of the budget range of many people in the surrounding area, or some centers may be restricted to employees of certain companies. Therefore, the accessibility assessment presented here is limited to geographic accessibility, and does not extend to other access limitations.

Chapter 4: System Requirements

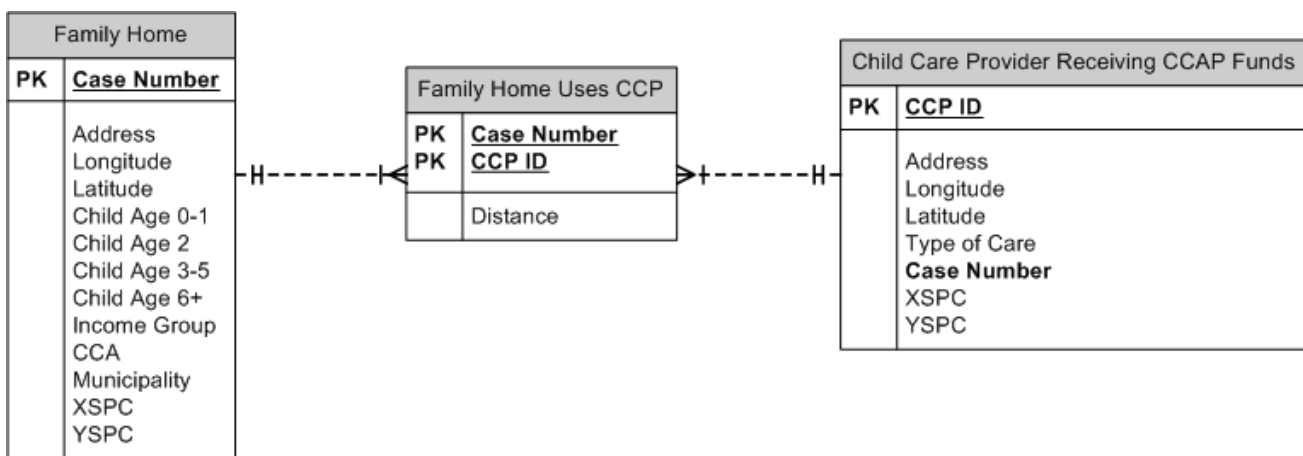


Figure 4-1: Entity-relationship diagram for goal 1 (assessing distance travelled to child care providers in relation to child age, income, and type of care)

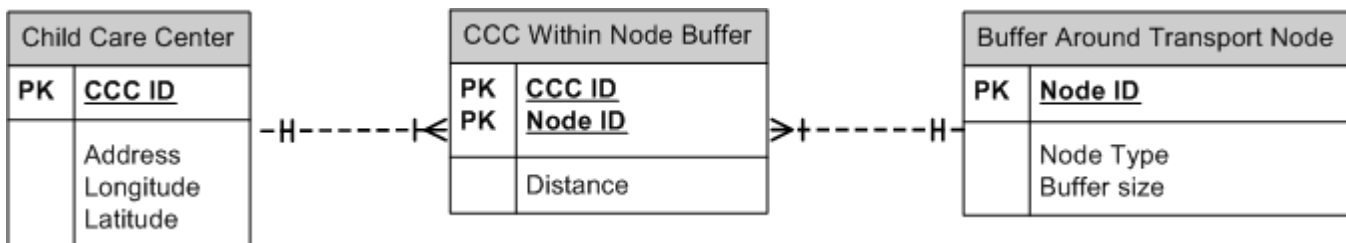


Figure 4-2: Entity-relationship diagram for goal 2 (evaluating if child care centers cluster around transportation nodes)

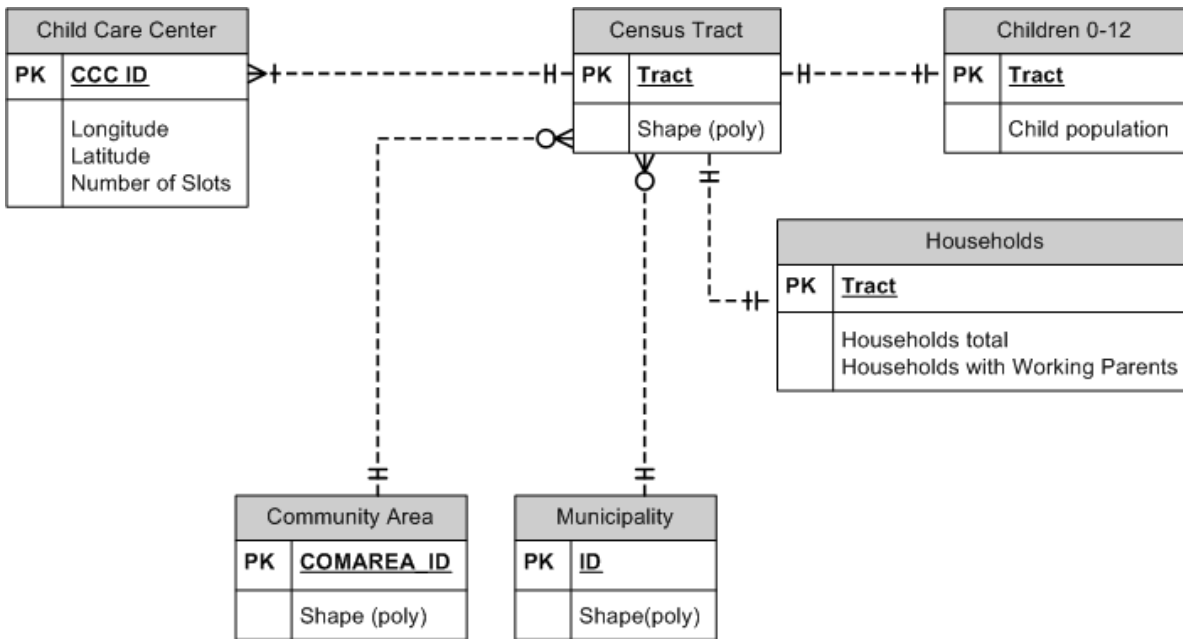


Figure 4-3: Entity-relationship diagram for goal 3 (identifying child care center deserts)

Chapter 5: Data Analysis

5.1 Goal 1: Data Visualization and Process Diagram

For this analysis, we had hoped to calculate the actual route distance that parents traveled using ESRI’s Network Analyst tool, as well as the time it took to travel that distance. However, the Network Analyst O-D matrix could not handle 43,000 parent-provider pairs. To use this tool we would have had to divide our data into 20 to 40 smaller subsets. Therefore, though not ideal, we calculated point-to-point distance using Euclidean geometry. Both parent address and their corresponding child care provider’s address were geocoded. We calculated the point-to-point distance for every parent-provider pair whose address could be geocoded. Our end result is a simplistic measure. It does not take into consideration how direct or indirect parents’ routes are to their child care provider, nor how long it takes parents to travel the distance. Two miles on a highway and two miles on a city street could vary greatly in how long it takes to travel.

After determining distance, we determined how distance varied based on factors of child age, type of care used, geography and family income, taking the steps outlined below.

- 1) For each age group (0-1, 2, 3-5, 6 and over), we used an attribute query to select families with a child in the age group. Based on the selection, we calculated the average distance traveled for each age group. Families with multiple children were included in each group where applicable.
- 2) To determine child care type, we relied on a type of care code collected by the Child Care Assistance Program. We grouped the code’s seven categories into three types: child care center, licensed home and “family, friend or neighbor care” (also known as license-exempt care). By summarizing the data by provider type, we calculated the average distance traveled to each provider type.
- 3) To look at the factor of geography, we broke Cook County into Chicago Community Areas (CCA) and suburban municipalities. We overlaid our geocoded parent point feature with the CCA’s and municipalities to determine where each parent lives (e.g. Lincoln Park). Using the Summarize tool, we

calculated the average distance traveled by parents in each CCA or municipality. We joined our results to the CCA and Cook County Municipality shapefiles, and then created a thematic map reflecting the average distances traveled by CCA and suburban municipality.

- 4) Families using the Child Care Assistance Program can earn up to 200 percent of the federal poverty level to be eligible for the program. The data set contains each family’s income as a percent of poverty level. We used this data to classify families into one of four groups: 0-50% of FPL, 51-100% of FPL, 101-150% of FPL and 151-200% of FPL. Our output field was the average distance traveled for each income group.

These operations are summarized visually in the process diagram in Figure 5.1.

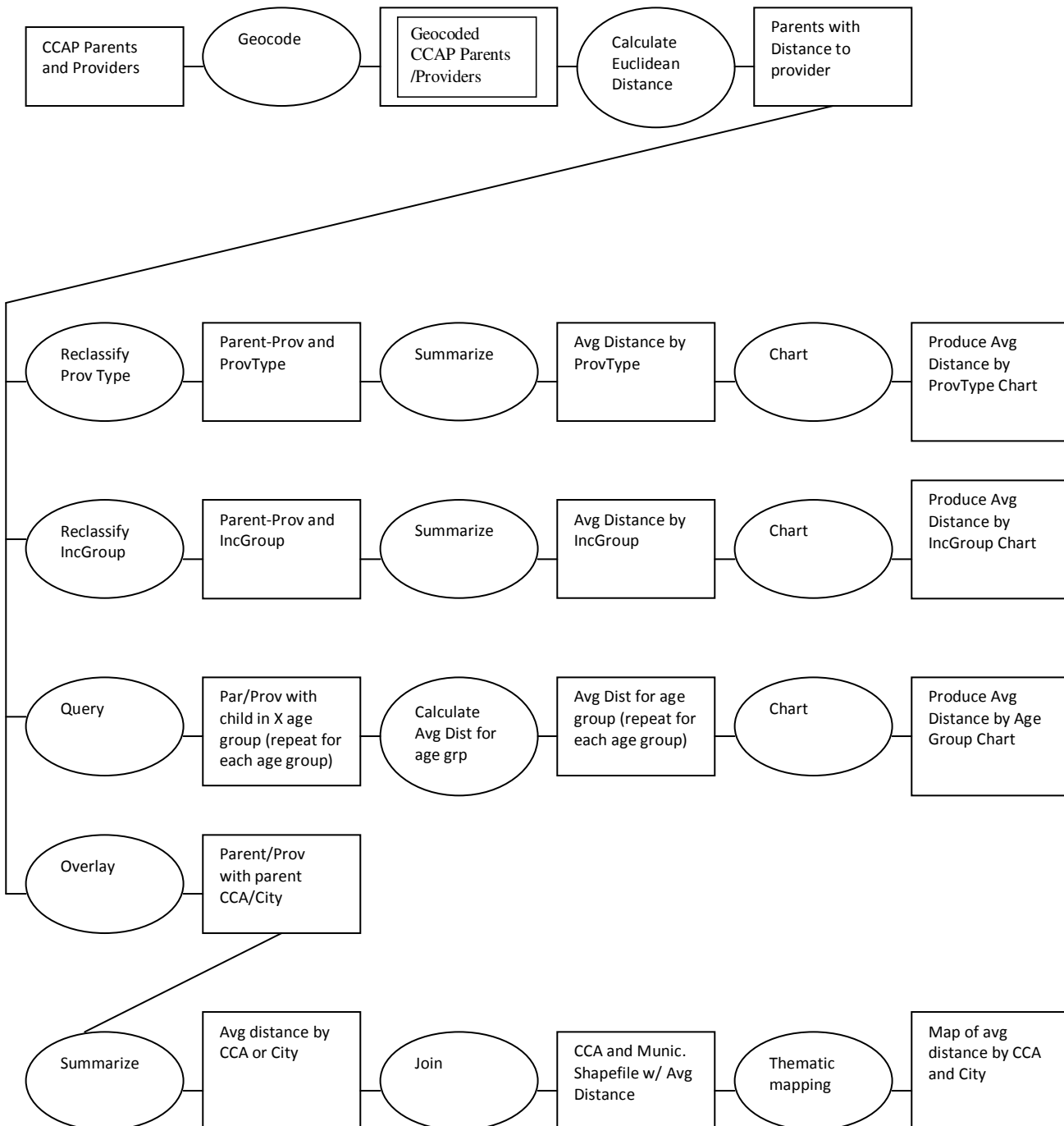


Figure 5-1: Process diagram for goal 1 (assessing distance travelled to child care providers in relation to child age, income, and type of care)

5.2 Goal 2: Data Visualization and Process Diagram

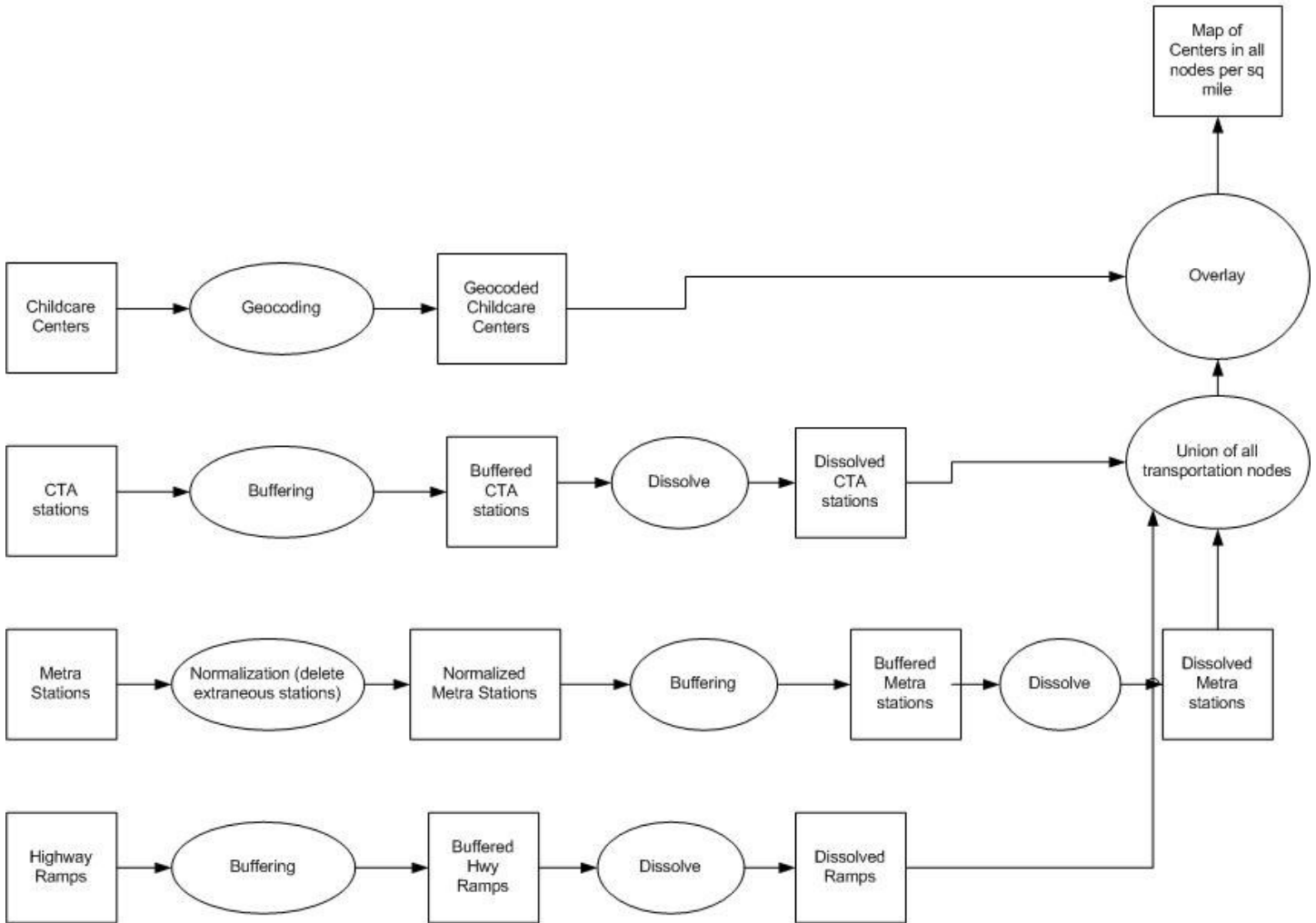


Figure 5-2: Process diagram for goal 2 (assessing clustering of child care centers around transportation nodes)

5.3 Goal 3: Data Visualization and Process Diagram

Most of the data used in the analysis for goal 3 pertains to census tracts. The only “point” data were the child care center locations, which were processed and assigned to census tracts to facilitate comparison with other data sources. Since all data is essentially uniform across a census tract (i.e. If there are 100 children in a census tract, there is a uniform density of children throughout the tract), a choropleth is an appropriate map format. In this case, excess demand for child care slots is coded in shades of red, with the shade becoming darker in proportion with the excess demand. Similarly, excess supply of child care slots is coded in shades of blue. The shading achieves the desired visual hierarchy: darker shades of red and blue are the most prominent features of the map. This is appropriate because it makes the viewer focus on the most severe deserts in red (and “anti-deserts” in blue). To orientate the viewer, light gray outlines of Chicago’s community areas and Cook County’s municipalities are shown.

To further orientate the viewer, the statistical distribution of the child care demand data is integrated into the legend, so that the viewer can relate the various shades of red and blue to standard deviations in the normal distribution of the child care demand. This emphasizes that the “desert areas” are underserved when compared to the vast majority of other census tracts.

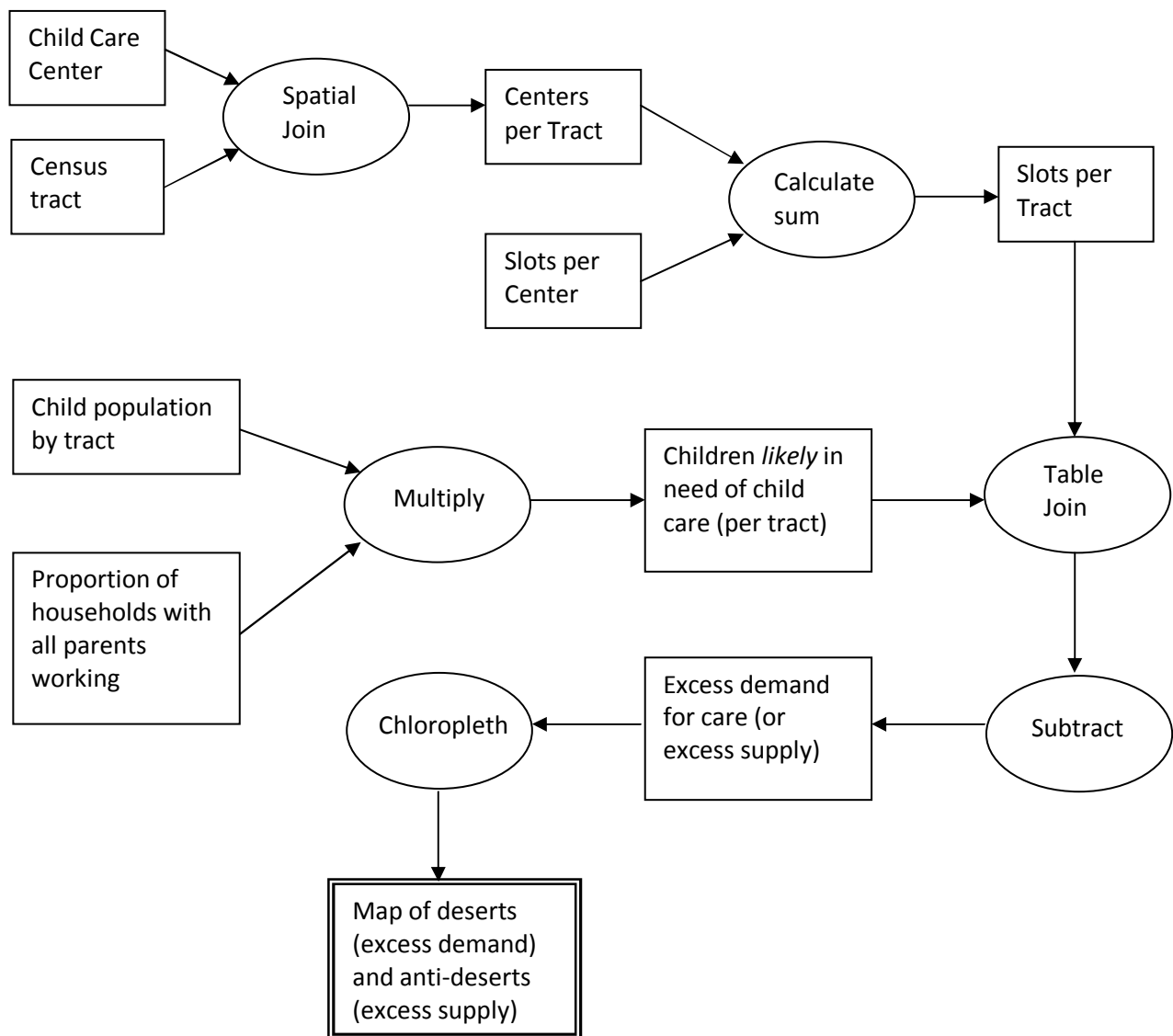


Figure 5-3: Process diagram for goal 3 (identifying child care center deserts)

Chapter 6: Results

6.1 Goal 1: Assessing Distance Parents Travel for Child Care

Based on 43,410 pairs of parents and their corresponding child care providers, we found that parents travel, on average, 2.4 miles to their child care provider.

The data show that the type of care used makes a difference in how far parents travel. The more formal and expensive types of child care are associated with parents travelling farther. Families using informal child care (like family members, friends or neighbors) travel 1.8 miles on average, families using regulated home care travel 2.6 miles, and families using center-based child care travel, on average, 2.9 miles. See Figure 6-1. It is logical that average distance for informal child care is less than that of regulated care since this care often takes place in the same home or in the same neighborhood. Also, since there are fewer child care centers than child care homes, one would expect that families do not have to travel as far to reach a licensed home as they would a center.

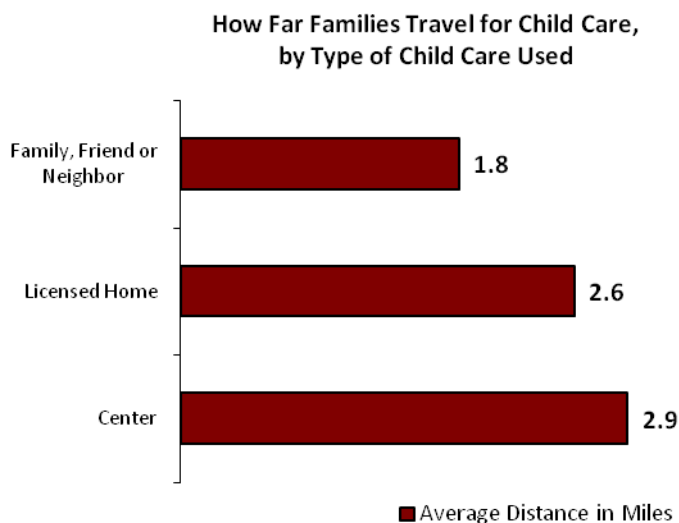


Figure 6-1: Distance travelled by type of child care

There was very little variation in distance travelled between the four age groups (birth-1, age 2, 3-5, and 6+). However, looking at the subset of parents who used child care *centers*, one finds differences among the age groups. Figure 6-2 shows that the younger the child, the farther parents travel for center-based child care. This supports the hypothesis that parents have to travel farther for center child care because slots in centers are scarcer for younger children.

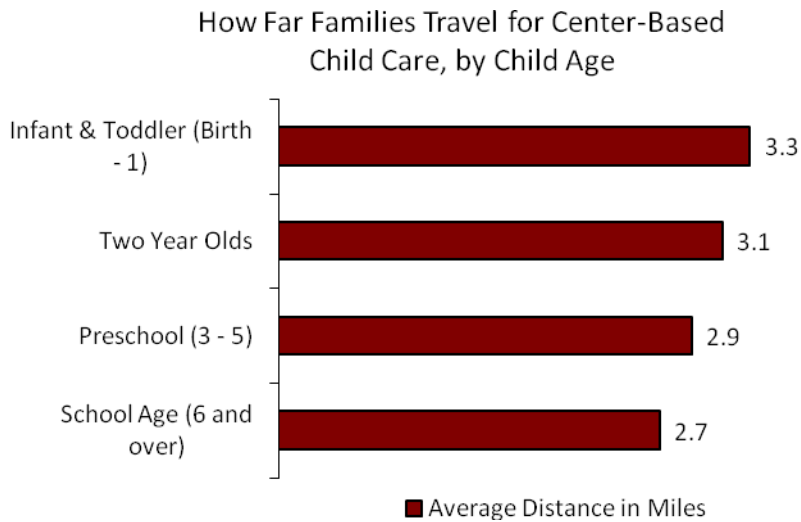


Figure 6-2: Distance travelled by child age

Figure 6-3 shows that families with higher income travel farther for child care. Families in the lowest income group (0-50% of the poverty level) travel, on average, 2.2 miles for child care, while families in the highest group (151-200% of the poverty level) travel 2.8 miles. This extra distance traveled could be due to a correlation between income and type of care used. Often lower-income families use family, friend and neighbor care, which we have already seen has shorter child care commutes than center care. Higher income families might be more likely to live in suburban areas where, as we will see next, distances traveled are longer.

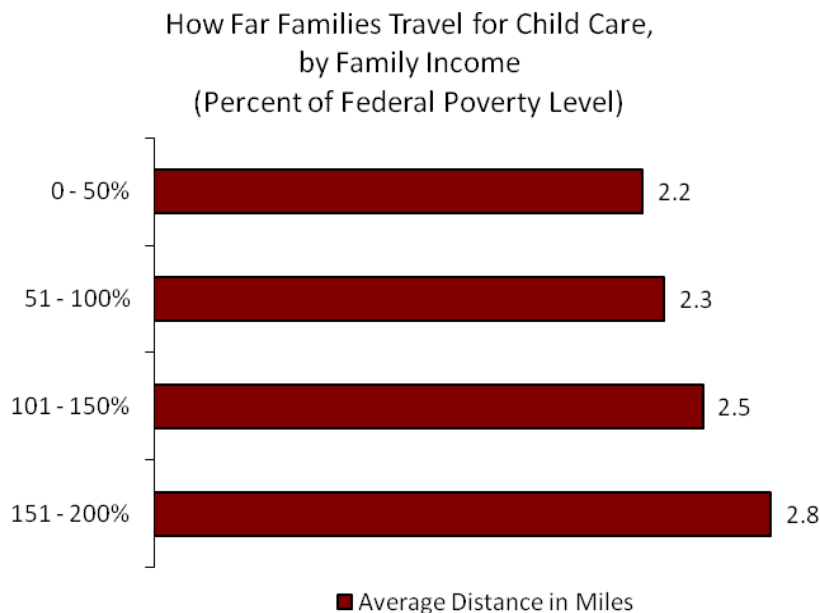


Figure 6-3: Distance travelled by income level

Finally, we mapped the average distance traveled by Chicago Community Area for families living in the city and by municipality for families living in suburban Cook County. In general, parents living in suburban Cook County travel farther than parents living within the city, with some exceptions. In the city, families in the community

areas along the lake and in southern Chicago travel distances similar to families in the suburbs, while families in the western suburbs travel distances comparable to those of families living in the city. See Figure 6-4.

Do families in the suburbs travel farther because child care is scarcer? Is it because families tend to earn more and use center-based care, or because highways allow for greater travel distances in the same amount of commute time? These are all questions for further investigation.

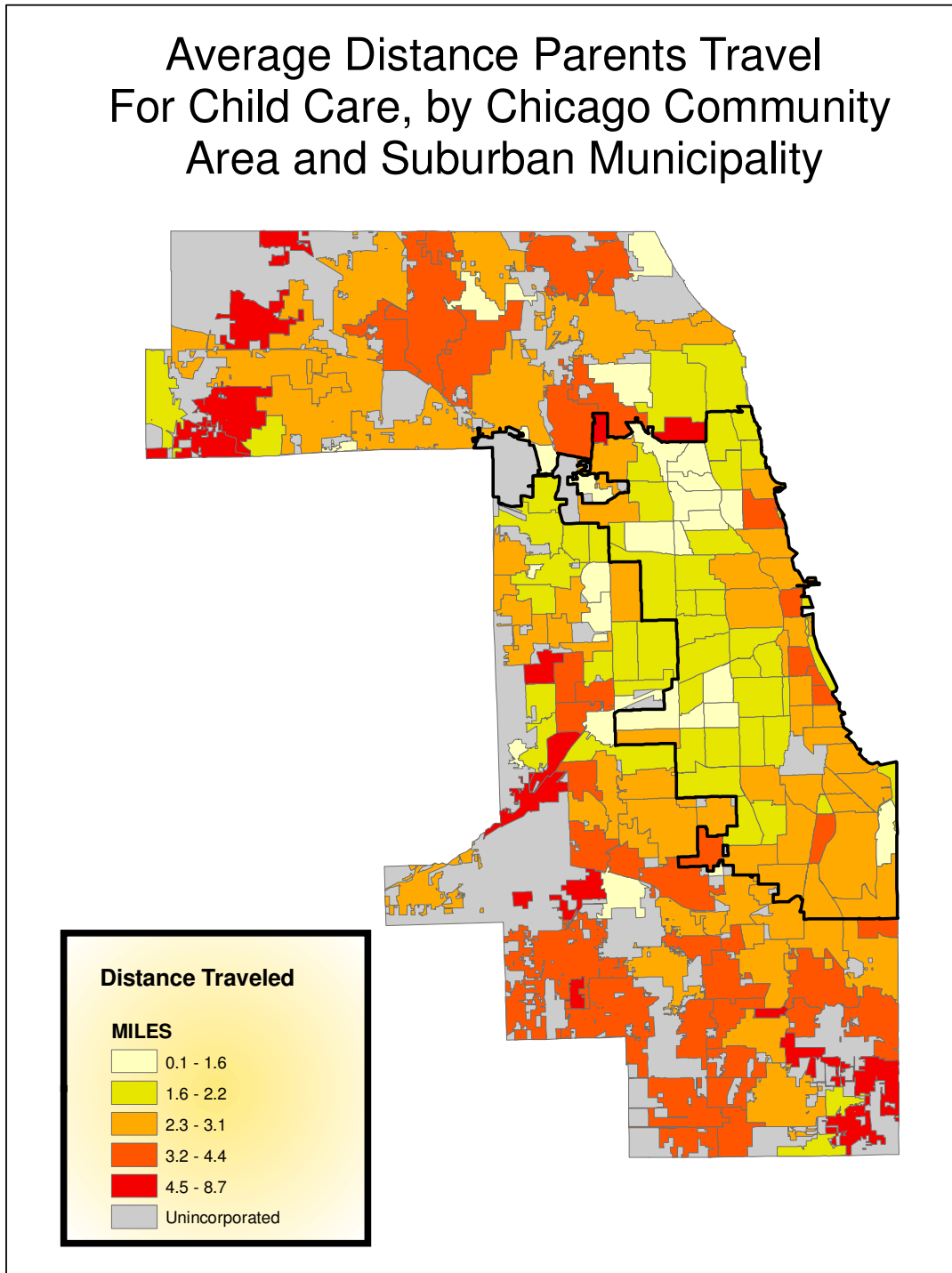


Figure 6-4: Distance travelled by community area or municipality

6.2 Goal 2: Assessing clustering of child care centers around transportation nodes

Cook County occupies an area of 957 square miles, and there are 1096 childcare centers in Cook County. Assuming that the distribution of centers were even throughout the county, there would be 1.14 childcare centers per square mile. To determine if centers cluster around transportation nodes, the child care center density near transportation nodes must be evaluated and compared to the neutral figure of 1.14 centers per square mile. A larger number indicates some degree of clustering, while a smaller number indicates that centers are repelled by transportation nodes.

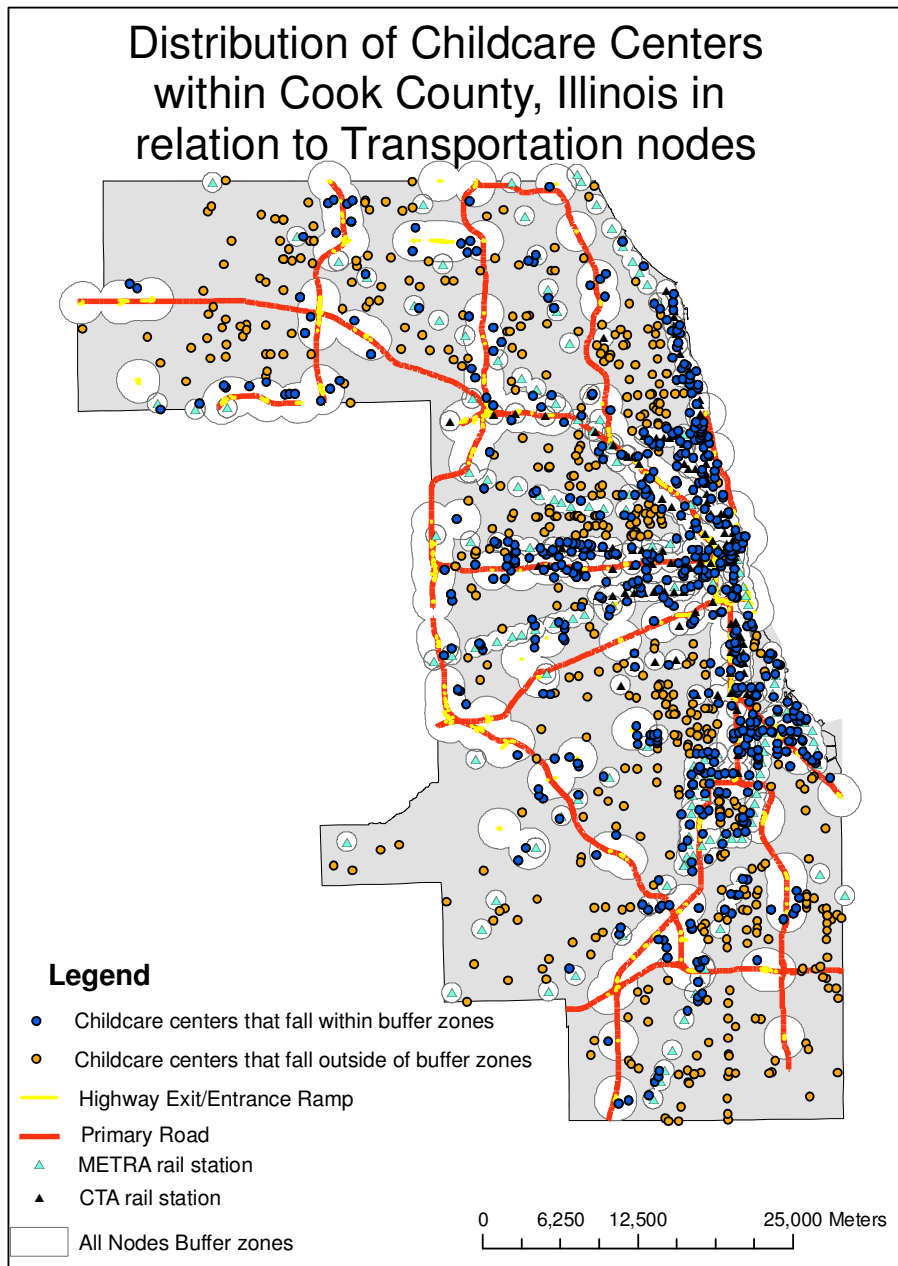


Figure 6-5: Child care centers in relation to transportation nodes

The buffer zones were determined from the following criteria: a 10 minute walk from the CTA/METRA stations (which equates to about 0.5 mile), or a 1 mile drive from an on/off ramp for a highway/primary road ramp. After buffering, dissolving, and unionizing, we found that 422.18 sq miles of Cook County were inside of the transportation buffer zones. In the neutral case (even distribution), we determined that 44% of all childcare centers should fall within the buffer zones. In reality, 53% of all childcare centers are located within the buffer zone areas, indicating measurable clustering is occurring around transport nodes. Further analysis is needed to understand the specific clustering factors of CTA, Metra, and freeway/primary road exits.

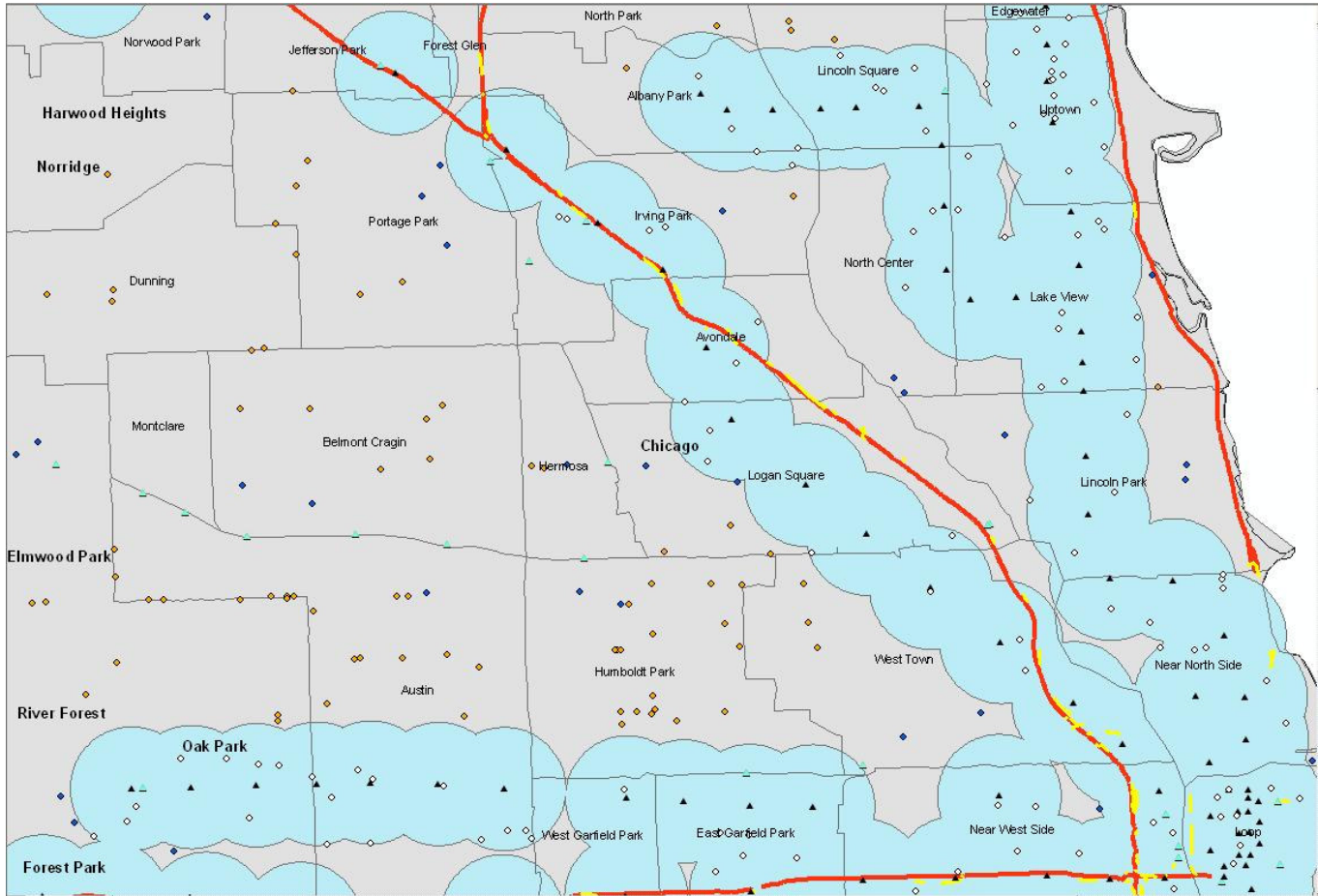


Figure 6-6: Buffers around CTA/Metra stations.

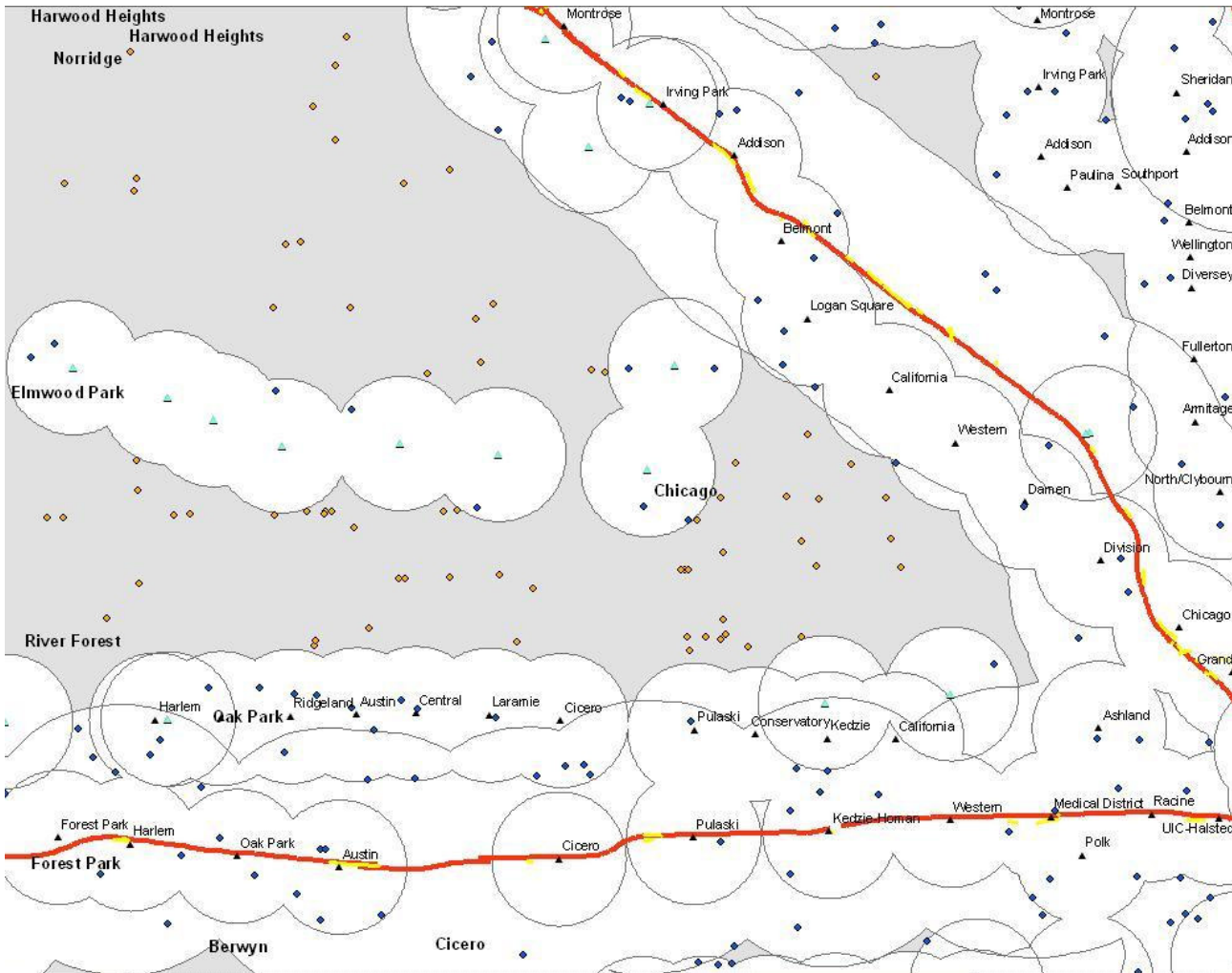


Figure 6-7: Buffers around transportation nodes near the Kennedy and Eisenhower expressways.

There were 383 centers inside of the ramp buffers, 219 in the CTA buffers, and 217 in the Metra buffer zones. These measurements were taken independently to account for centers being in more than one buffer zone. When we calculated the number of centers per square mile, we found that there are more centers (3.2 per sq mile) inside of the CTA buffers zones by a margin of almost 3-to-1 over the neutral case of 1.14 centers per sq mile. Similarly, there was a 2-to-1 clustering factor around Metra stations. However, no clustering was apparent around freeway/primary road exits. See Figure

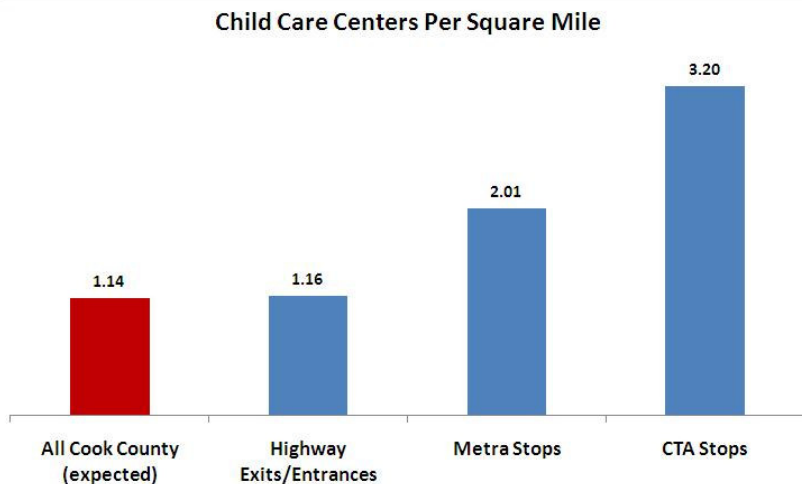


Figure 6-8: Measurements of clustering of child care centers around various types of transportation nodes

6.3 Goal 3: Child Care Deserts

The map shown in Figure 6-9 shows the difference between the total children in a tract and the slots available in child care centers in that tract. Large positive numbers (shown in gradually darkening shades of red) indicate excess demand for child care slots, while large negative numbers (shown in gradually darkening shades of blue) show excess supply of child care slots. However, determining deserts from Figure 6-9 is problematic, since stay-at-home parents are not being taken into account. The child population in each tract must be adjusted by the proportion of households in which all parents have full-time jobs (in that tract). Figure 6-10 shows the adjusted results. Many of the most extreme measures of raw data in Figure 6-9 are more moderate in the adjusted data of Figure 6-10.

Setting the threshold for being a “child care desert” is a somewhat arbitrary task. However, since the adjusted data in Figure 6-10 has a normal statistical distribution, the assessment of deserts can be done comparatively. If a tract performs far below its peers (other tracts in the county), then it can be categorized as a desert. In Figure 6-11, a mean-standard deviation method of data classification is used to color-code every tract, indicating where each tract falls in the statistical distribution. The worst 6.7% of census tracts ($>1.5\sigma$) are labeled as deserts in Figure 6-11. However, the map provides the reader with the freedom to choose a different threshold for deserts. For instance, deserts could be defined as the worst 0.6% of census tracts ($>2.5\sigma$). Figures 6-12, 6-13, 6-14, and 6-15 show detailed views (from Figure 6-11) of specific community areas of Chicago and municipalities of Cook County where there are clusters of child care desert tracts.

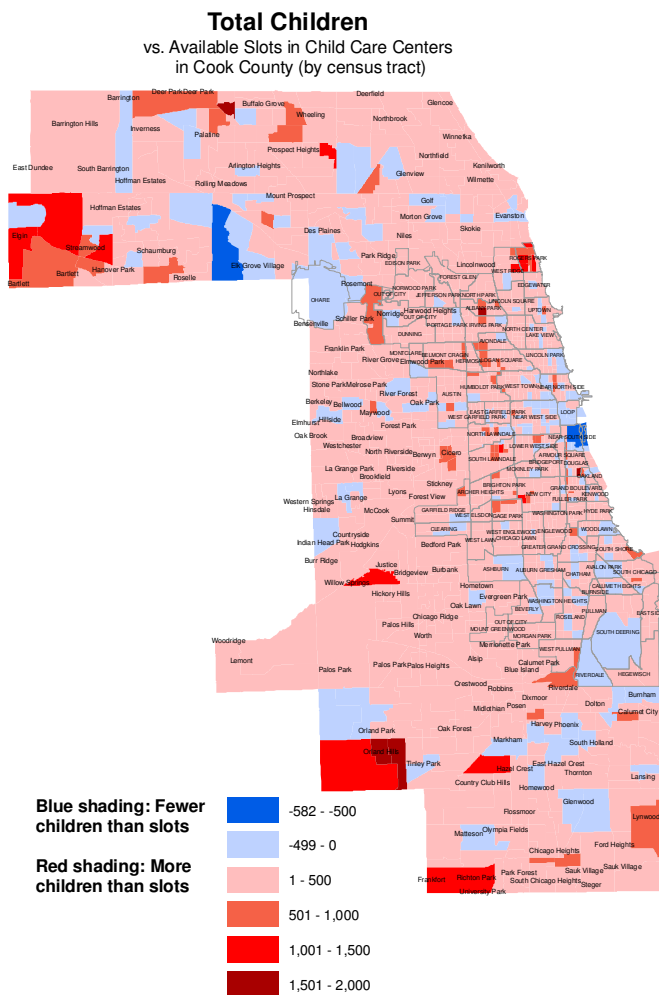


Figure 6-9

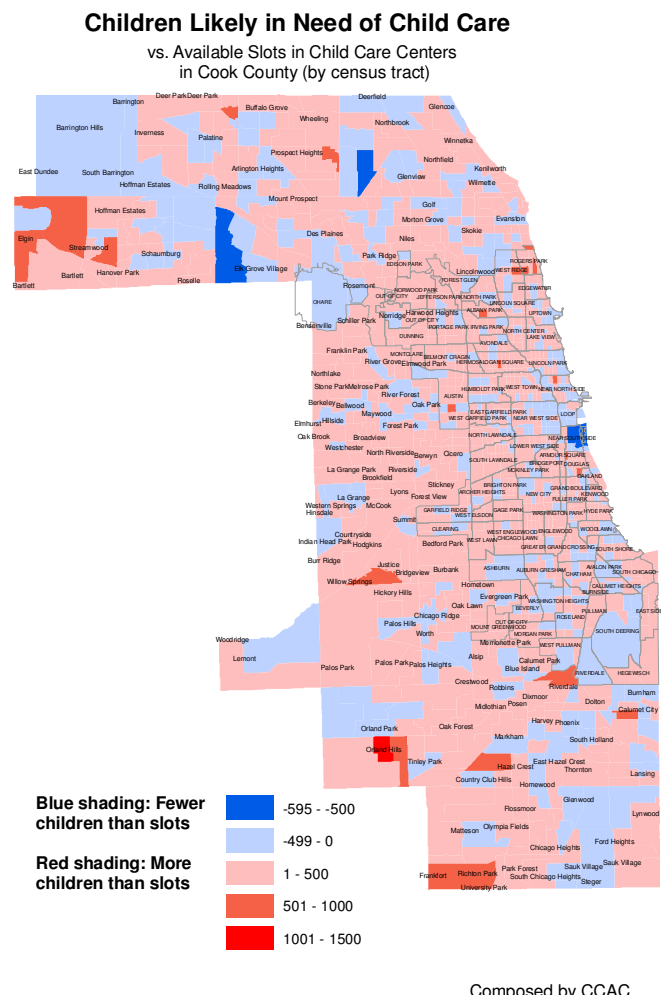


Figure 6-10

Composed by CCAC

Child Care Deserts in Cook County

The difference between number of children and available child care slots (by census tract)

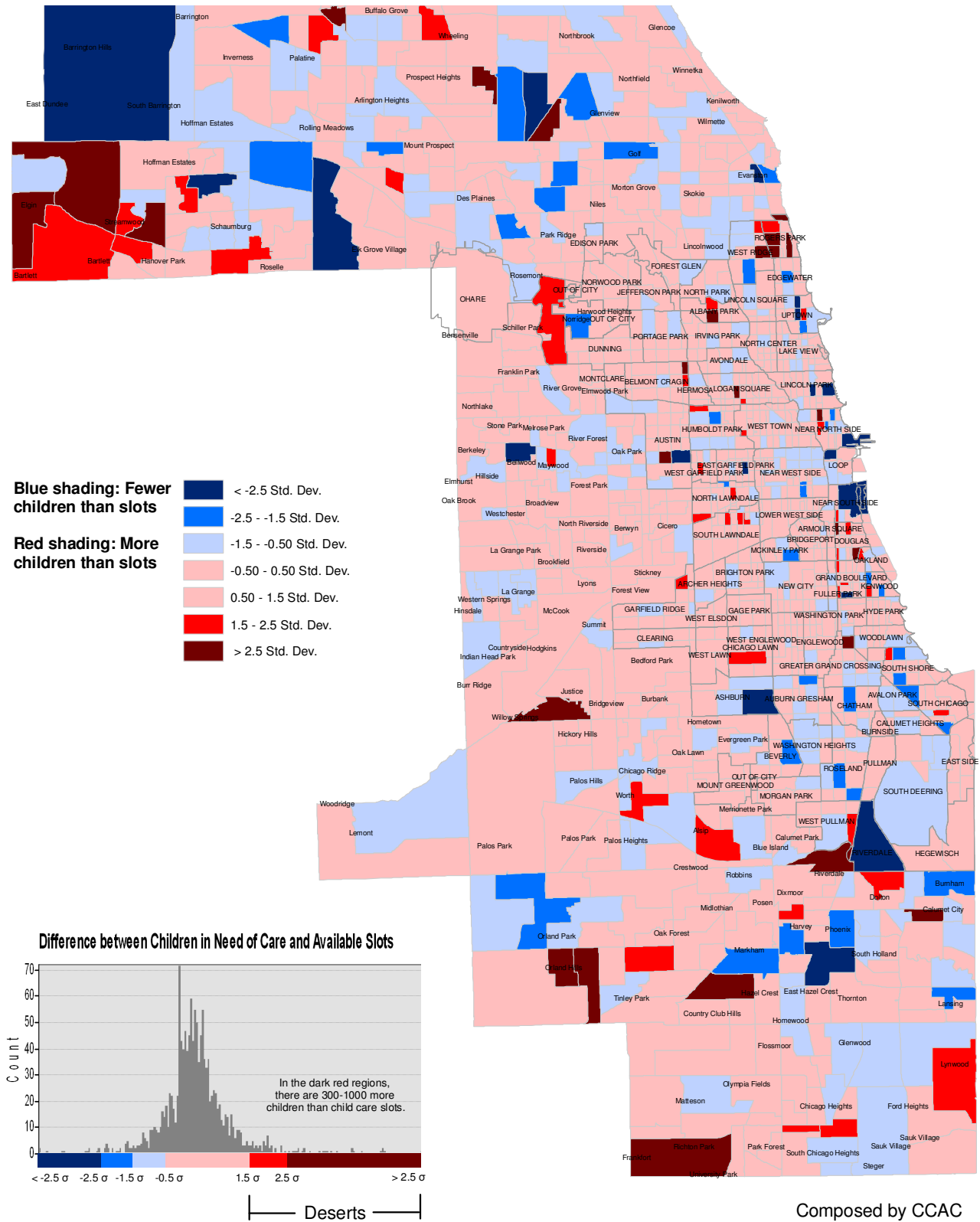


Figure 6-11: Child Care Deserts classified by standard deviations

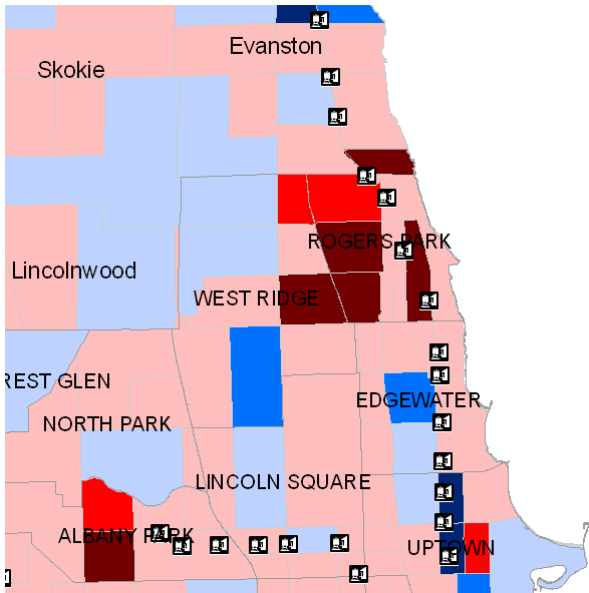


Figure 6-12: All census tracts in the Rogers Park community area of Chicago, as well as the tracts immediately adjacent to Rogers Park, fall short in meeting the likely demand for child care in those tracts. In seven of those tracts (darker shades of red), there is a severe shortage of supply (>1.5 σ). CTA red and brown line stations are shown for reference.

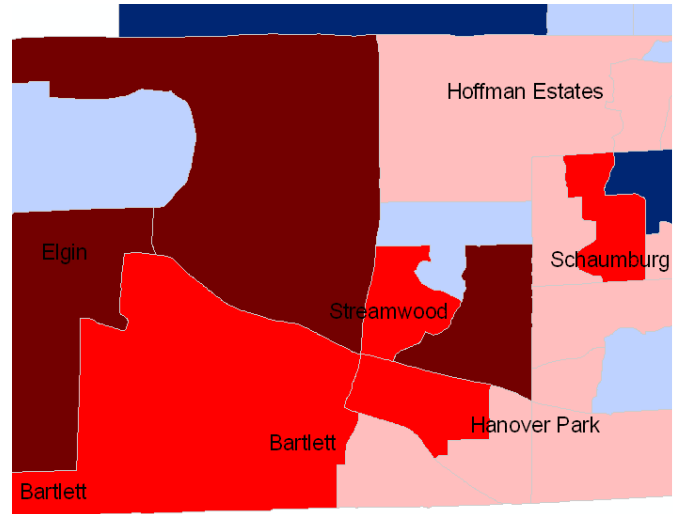


Figure 6-13: Cluster of seven census tracts in northwest Cook County where children (likely in need of child care) exceed the supply of child care by far more than average (>1.5 σ)

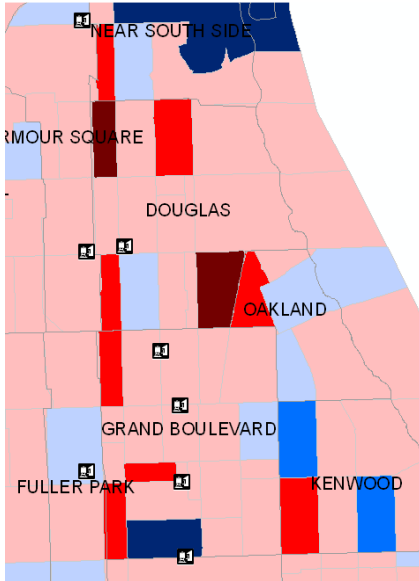


Figure 6-14: The South Side of Chicago from Cermak Road to 51st Street is sprinkled with child care desert tracts. CTA red and green line stations are shown for reference. There are a string of child care desert tracts running along the CTA red line from north to south.

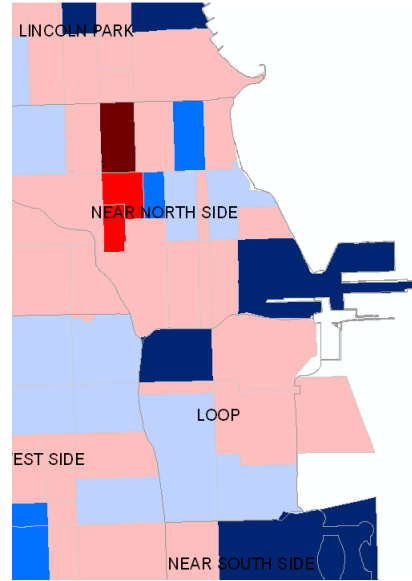


Figure 6-15: The areas of Chicago around the Loop and Near North Side are examples of “anti-deserts”. In these areas, the supply of child care exceeds the number of children in those areas who need care. These areas are among the wealthier areas of Chicago, with the exception of the Cabrini Green area, which is shown as an island of dark red tracts in the Near North Side.

Chapter 7: Summary, Conclusions, and Recommendations

Significant results were produced for all three goals. The results show that there is a link between distance travelled and income level and care type. Child age was not a good predictor of distance travelled unless the child care was limited to center-based care.

Child care centers cluster around CTA stations by a factor of 3-to-1, and they cluster around Metra stations by a factor of 2-to-1. They do not cluster around freeway/primary road ramps.

There are clearly identifiable child care deserts in Cook County where the supply of child care slots in centers fall short of the likely demand in the vicinity by significant numbers (300-1000 more children than slots). The most egregious areas include Rogers Park, Bronzeville, Albany Park, and the suburban municipalities of Elgin and Orland Hills.

Appendix A: Data Dictionaries

Data Set Name: Parents using CCAP

File Name: Family Home

Description: Data on Cook County parents who participate in the Illinois Child Care Assistance Program (CCAP). Contains parent ID, family income level and ages of children in child care. Also includes parent address, corresponding latitude and longitude and Chicago Community Area when applicable.

Source of the data: Illinois Action for Children, Marcia Stoll.

Processing steps: Dbase file of parent attributes was geocoded. The resulting shapefile was then spatially joined with the Chicago Community Area shapefile. An X and Y State Plane coordinate was calculated for each record.

Spatial object type: point

Attributes:

<u>Field name</u>	<u>Description</u>
Case number	Parent identification number
Address	Parent street
City	Parent city
State	Parent state
Zip code	Parent zip code
Latitude	Latitude in decimal degree
Longitude	Longitude in decimal degree
Child age 0-1	Indicates a child age birth through 1 is in child care
Child age 2	Indicates a child age 2 is in child care
Child age 3-5	Indicates a child age 3 through 5 is in child care
Child age 6+	Indicates a child age 6 or over is in child care
Income	Family income level as percent of eligibility limit of CCAP (200% of federal poverty level).
CCA	If parent lives in Chicago, the Chicago Community Area in which parent lives.
X-SPC	The X coordinate in SPC projection
Y-SPC	The Y coordinate in SPC projection

Data format: shapefile

Fitness for Use

Measurement scale – is appropriate for all attributes.

Accuracy – appropriate level of accuracy

Completeness – 5 percent of homes were not able to be geocoded.

Logical consistency – not applicable

Limitations – Some parents could not be geocoded. Time and the size of the dataset did not allow for in-depth investigation into each unmatched home.

Data Set Name: Child Care Providers

File Name: CCAP Providers

Description: Child care providers caring for children of Cook County parents who participate in the Illinois Child Care Assistance Program (CCAP). It contains provider ID, type of child care, address of provider and latitude and longitude corresponding to this address.

Source of the data: Illinois Action for Children, Marcia Stoll.

Processing steps: Geocoded provider addresses and calculated the X and Y state plane coordinates for each record.

Spatial object type: point

Attributes:

<u>Field name</u>	<u>Description</u>
Provider ID	Provider identification number
Address	Provider street
City	Provider city
State	Provider state
Zip code	Provider zip code
Latitude	Latitude in decimal degree, WGS84
Longitude	Longitude in decimal degree, WGS84
Type of Care	Type of child care provider. Codes used by CCAP: 760 – 761: child care center 762 – 763: licensed home child care 764 – 767: license-exempt home child care
X-SPC	The X coordinate in SPC projection
Y-SPC	The Y coordinate in SPC projection

Data format: shapefile

Fitness for Use

Measurement scale – is appropriate for all attributes.

Accuracy – The provider address does not necessarily have to be the provider’s physical address. It could also be a mailing address. If a provider uses a mailing address, this is a source of error because we will not accurately calculate the distance a parent travels to the provider’s home.

Completeness – 9 percent of providers could not be able to be geocoded. Addresses reflect mailing address and some providers use PO Boxes that can’t be geocoded.

Logical consistency – not applicable

Limitations – Some providers could not be geocoded Time and the size of the dataset did not allow for in-depth investigation into each unmatched home and many providers use a PO Box as their mailing address.

Data Set Name: Chicago Community Area

File Name: ChiComm

Description: This data set summarizes demographic characteristics by Chicago community area. It is based on data collected on the level of census tract. Data set includes fields of populations, coordinates, housing information and community names.

Source of Data: Census Bureau 2000, DePaul Geography Dept.,
<http://gid.depaul.edu/shwang/242lab3.zip>

Processing Steps: This file was spatially joined with Family Home data set to show comparisons between the families in different community areas.

Spatial Object Type: Polygon

Attributes:

<u>Field Name</u>	<u>Description</u>
CHICOMNO	Chicago Community Area
DISTNAME	Chicago Community Area
DISTITLE	Community Area Name
FAMINC	Family Income
Sum_POP2000	2000 Population by community
Sum_WHIT	White Population
Sum_HSE_UN	Hispanic Population
OID	Community ID number

Data Format: Shapefile

Fitness for Use:

Accuracy: Data set provides fields our group was looking for to spatially join with another data set.

Data Completeness: Attribute table is complete with every field containing information.

Logical consistency: Not applicable

Limitations – None

Data Set Name: Child Care Centers

File Name: Child Care Center

Description: Child care centers in Cook County. It contains provider ID, address of provider and latitude and longitude corresponding to this address.

Source of the data: Illinois Action for Children, Marcia Stoll.

Processing steps: Geocoded provider addresses

Spatial object type: point

Attributes:

<u>Field name</u>	<u>Description</u>
Provider ID	Provider identification number
Street Address	Provider street
City	Provider city
State	Provider state
Zip code	Provider zip code
Latitude	Latitude in decimal degree, WGS84
Longitude	Longitude in decimal degree, WGS84

Data format: shapefile

Fitness for Use

Measurement scale – is appropriate for all attributes.

Accuracy – appropriate level of accuracy

Completeness –All attributes are complete; data is spatially complete.

Logical consistency – not applicable

Limitations – See data acquisition constraints

Data Set Name: Child Population by Census Tract

File Name: Child_Population

Description: 2000 Census data obtained from US Census Bureau. Contains number of children ages 0 through 12 per Cook County block group.

Source of the data: US Census Bureau, Census 2000 Summary File 3 data. American Fact Finder: www.factfinder.census.gov

Table P12. Sex by Age

Processing steps: 1) Calculated *Children 0-12* by adding populations of each age from 0 to 12 for each sex.

Spatial object type: None

Attributes:

<u>Field name</u>	<u>Description</u>
Geography Identifier	Census Geography Code
Census Tract	Census Tract code
Block Group	Census Block code
ChildPop	Population of children ages birth through 12 in 2000

Data format: Dbase

Fitness for Use

Accuracy – appropriate level of accuracy

Completeness – attributes are complete

Logical consistency – not applicable

Limitations – none

Data Set Name: Cook County Census Tracts

Description: Census tracts as they were recorded in the 2000 Census for Cook County, Illinois.

Filename: CookCtyBG00.lyr

Source: TigerLine shapefiles for 2008 at this URL:

<http://www2.census.gov/cgibin/shapefiles/countyfiles?county=17031>

Processing steps: Since this was an Illinois file, I had to perform an attribute selection on Cook County (which was designated in the County attribute as '031'). I then saved the selection as a layer.

Spatial Object type: polygon

Attributes:

Field	Description
STATEFP00	Census 2000 state FIPS code
COUNTYFP00	Census 2000 county FIPS code
TRACTCE00	Census 2000 census tract code
BLKGRPCE00	Census 2000 block group number Census 2000 census block group identifier; a concatenation of state FIPS code, county FIPS code, census tract code, and block group number
BKGPIDFP00	Census 2000 translated legal/statistical area description and the block group number
NAMLSAD00	MAF/TIGER feature class code (G5030)
MTFCC00	
FUNCSTAT00	Census 2000 functional status

Data format: lyr file

Fitness for use:

This dataset appears complete and consistent, and is based off of the NAD 1983 projection. There only seems to be an issue with one census block (FID = 2299), which is not really an issue but more of an aesthetic preference. The problem with is block is that it encompasses the Michigan lakeshore from as far south as the Skyway to the edge of county on the north and out into the lake to form a polygon. It is not known why this is here and if there is a good reason, we may elect to remove it from the dataset.

Data Set Name: Main Roads in Cook County

Description: Major roadways in Cook County as identified by the attributes defined in the "TigerLine Shapefiles Technical Documentation".

Filename: mainroads2.lyr

Source: TigerLine shapefiles for 2008 at this URL: [http://www2.census.gov/cgi-](http://www2.census.gov/cgi-bin/shapefiles/countyfiles?county=17031)

[bin/shapefiles/countyfiles?county=17031](http://www2.census.gov/cgi-bin/shapefiles/countyfiles?county=17031)

Processing steps: Since the dataset needed was roads and this was found in the edges dataset, I had to perform two selection procedures. 1. I performed an attribute selection by road = 'Y'; 2. I consulted the documentation to determine what the attributes used in the file were for major roads and performed a selection on MTFCC = 'S1100' or 'S1200'.

Spatial Object type: polyline

Attributes:

Field	Description
STATEFP	Current state FIPS code
COUNTYFP	Current county FIPS code
TLID	Permanent edge ID
TFIDL	Permanent face ID on the left of the edge
TFIDR	Permanent face ID on the right of the edge
MTFCC	MAF/TIGER feature class code of the primary feature for the edge
FULLNAME	Concatenation of expanded text for prefix qualifier, prefixdirection, prefix type, base name, suffix type, suffix direction, and suffix qualifier (as available) with a space between each expanded text field
SMID	Spatial metadata identifier
LFROMADD	From house number associated with the most inclusive address range on the left side of the edge
LTOADD	To house number associated with the most inclusive address range on the left side of the edge
RFROMADD	From house number associated with the most inclusive address range on the right side of the edge
RTOADD	To house number associated with the most inclusive address range on the right side of the edge
ZIPL	ZIP code associated with the most inclusive address range on the left side
ZIPR	ZIP code associated with the most inclusive address range on the right side
FEATCAT	General feature classification category
HYDROFLG	Hydrography feature indicator
RAILFLG	Rail feature indicator
ROADFLG	Road feature indicator
OLFFLG	Other linear feature indicator
PASSFLG	Special passage flag
DIVROAD	Divided road flag
EXTTYP	Extension type
TTYP	Track type
DECKEDROAD	Decked road indicator
ARTPATH	Artificial path indicator
PERSIST	Hydrographic persistence flag
GCSEFLG	Short lines flag for geographic corridors
OFFSETL	Left offset flag
OFFSETR	Right offset flag

TNIDF
TNIDT

From TIGER node identifier
To TIGER node identifier

Data format: lyr file

Fitness for use:

By and large, this data is consistently accurate in reflecting the main roads of Cook County and is based off of the NAD 1983 projection.. However, for our purposes, we may see fit to break this data out even further, between the Primary roads and the Secondary roads categories. One issue that is noticed immediately is the fact that Lake Shore Drive (LSD) is only considered a Primary road at North Avenue running north to Hollywood Avenue. This inconsistency needs to be addressed and if we do split out the layer, then we need to consider adding the rest of LSD to the Primary Roads table. Another issue that has arisen is the fact that there are some Primary roads that appear to be in the middle of the county. This issue needs further investigation and clean-up.

Data Set Name: Ramps for main roads in Cook County

Description: Ramps for major roadways in Cook County as identified by the attributes defined in the “TigerLine Shapefiles Technical Documentation”.

Filename: ramps2.lyr

Source: TigerLine shapefiles for 2008 at this URL: <http://www2.census.gov/cgi-bin/shapefiles/county-files?county=17031>

Processing steps: Since the dataset needed was roads and this was found in the edges dataset, I had to perform two selection procedures. 1. I performed an attribute selection by road = ‘Y’; 2. I consulted the documentation to determine what the attributes used in the file were for major roads and performed a selection on MTFCC = ‘S1630’. According to the documentation: “A road that allows controlled access from adjacent roads onto a limited access highway, often in the form of a cloverleaf interchange. These roads are unaddressable.”

Spatial Object type: line

Attributes: (same as roads above)

Data format: lyr file

Fitness for use:

This is a subset layer derived from the main roads when it was determined that this could be what we are hoping to identify as a “node” for Goal 2. As with the roads dataset above, the data is not without flaws and will need to be cleaned-up, scrutinized, and further refined in order for it to be used to achieve our objectives.

Data Set Name: CTA Stations

File Name: DATA_ADMIN_CTASTATION

Source of the data: cityofchicago.org

Spatial object type: point

Attributes:

Field Name	Description
FID	Identifier number (primary key)
Shape	Object type {point, line, poly}
SHORTNAME	Short version of CTA station name
LONGNAME	Full version of CTA station name
LINES	The CTA line or lines
ADDRESS	Street address of the CTA station
ADA	Boolean: ADA Paratransit available at that stop?
LEGEND	Abbreviation for CTA line as shown in legend
ALT_LEGEND	Alternate abbreviation for CTA line as shown in legend
EDIT_DATE	Last edit date (null in all cases)
WEBLINK	Web address for information about the station

Data format: Shapefile

Fitness for Use

Accuracy – appropriate level of accuracy

Completeness – attributes are complete

Logical consistency – not applicable

Limitations – none

Data Set Name: Metra Stations

File Name: metrastation

Source of the data: cityofchicago.org

Spatial object type: point

Attributes:

Field Name	Description
FID	Identifier number (primary key)
Shape	Object type {point, line, poly}
STATION_ID	Station identification number
ASSET_ID	Asset identification number
NAME	Short version of Metra station name
LONGNAME	Full version of Metra station name

LINES	Lines that go through station
BRANCH_ID	Branch Identifier
STATUS	Status (unknown significance)
MILEPOST	Linear reference (in miles) from train line origin
FAREZONE	Zone of station (A-H)
ADA	Boolean: ADA Paratransit available at that station?
ADA2	Variation on ADA
PKNRD	Unknown
BIKEPKNG	Bike parking spaces available
TICKET_AVA	Ticket Availability (e.g. agent, vending machine, on train)
ADDRESS	Street address of the CTA station
MUNICIPALI	Municipality where station is located
TELEPHONE	Telephone number of station
WEBLINK	Web address for station
LABELANGLE	Unknown
EDIT_INIT	Unknown
EDIT_DATE	Last edit date

Data Format: Shapefile

Fitness for Use

Accuracy – appropriate level of accuracy

Completeness – attributes are complete

Logical consistency – not applicable

Limitations – none