Transportation in Little Village: Why People Move The Way They Do

Project Sponsor: Enlace Chicago *Simone Alexander, Jaime de Leon*

Kevin Boyter, Dennis Fendrich, Adam Svoboda, Jessica Vorobel, Allie Wiegand

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Project Summary:

This ten week project linked with Enlace Chicago centered in Little Village was undertaken by our group because each of us, to some extent, has experienced the issue that Little Village is trying to improve upon. A few of us are avid bicyclists in the city, while others have had to deal with congested streets that are both frustrating and at times dangerous. While we were assigned to the Alternative Transportation project with Enlace Chicago, our interests met somewhere in the middle and our interactions with the project became a bit more personal than originally expected.

When we first met with Simone Alexander and Jaime de Leon, our Enlace Chicago representatives, we learned of the traffic issues and congestion that plagued 26th Street in Little Village, as well as the apparent lack of bicycle traffic and pedestrian traffic safety. Their largest concern was the lack of bicycle infrastructure in the neighborhood, which hindered alternative transportation. We learned that Enlace Chicago wants to encourage alternative forms of transportation as well as improve upon the minimal and negligent existing bicycle infrastructure in the neighborhood. However, during conversation, we decided it would be best to focus on vehicular traffic concerns so as to paint a better picture of just how pedestrian and bicycle traffic interact with vehicular traffic—which is often the dominated form of transportation on the roads. In order to understand why traffic is the way it is, it is necessary to understand those who create the traffic: the drivers, pedestrians, bicyclists and residents of Little Village.

In brief summation of our ten weeks of research, our project focused on two aspects of understanding transportation habits in Little Village. First, we attempted to capture key characteristics of Little Village traffic patterns. In doing this, we mapped locations of parking availability on or near 26th Street, as well as tracked traffic patterns of different types of vehicles, including busses, pedestrian traffic, and bicycle traffic, in order to gauge just when and where traffic is the heaviest. Second, we sifted through census data in order to find pertinent information that might shed a light on why Little Village seems to be a vehicle dominated area, such as the amount of people who own cars, owning versus renting, and age. By understanding the trends of traffic on 26th street as well as the people who create the traffic, we hope to give Enlace a basis of information to join with the previous group's work on bicycle related information that can hopefully lead to a future implementation of alternative transportation encouragement in Little Village.

Our information products for this project are quite telling, though much more about vehicular traffic trends than about alternative transportation trends. A group of maps dedicated to depicting parking availability along 26th Street showed a clear difference between availability to the east and west of the Central Park intersection on 26th Street. A map depicted our personally collected street data gives an idea of just what the traffic looks like on a typical winter day. There was a good amount of SUV, truck and car traffic, while pedestrian traffic was low and bicycle traffic nonexistent. This will likely be some disappointing but realistic news for Enlace Chicago, as winter weather often deters bicyclists from riding even in the most bicycle friendly neighborhoods. Our demographic maps shine a light on the reasons behind our data in the first two sets of maps.

While the main goal of Enlace Chicago in Little Village will be to encourage and foster a larger presence of bike riders in the neighborhood, we hope that the data collected and spatially depicted during our project will help paint a holistic picture of the transportation trends of Little Village.

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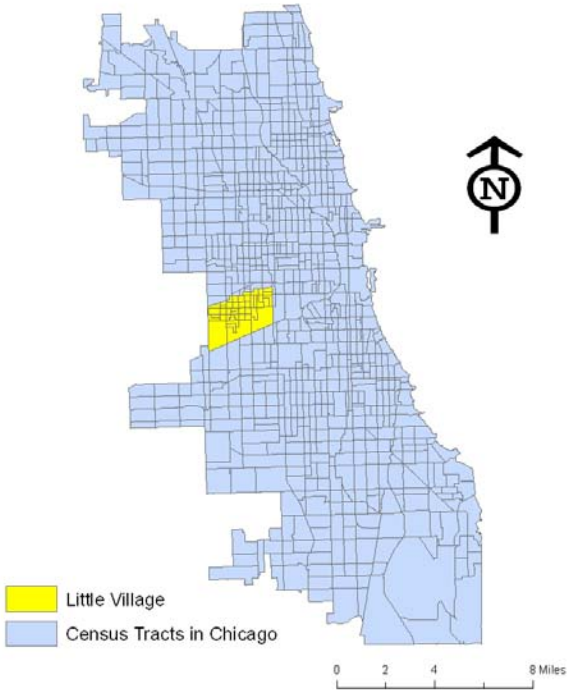
Location of Little Village



1. Introduction

Little Village, located on the southwest side of Chicago, often suffers from intense traffic congestion on 26th Street, the main hub of activity in the neighborhood. Enlace Chicago, a community based organization in Little Village, is looking to encourage alternative forms of transportation such as bicycle riding and pedestrian movement to not only try and alleviate vehicle traffic congestion, but encourage healthier lifestyles for the residents of Little Village. There is also an emphasis on creating a safe, family friendly community.

When our group first met with Simone Alexander and Jaime de Leon, our representatives at Enlace Chicago, our conversation began with a discussion of bicycle use in Little Village. It was noted that bicycle use was low and usually need based. Jaime noted that many South American countries have implemented programs that encourage bicycle riding and healthier lifestyles and added that Enlace Chicago was hoping to make baby steps toward implanted something like this in Little Village. As our conversation continued, we figured it would be best to focus trying to understand the reasons people move the way they do in Little Village. This led us to focus on traffic trends, parking availability, and demographic information on the residents of Little Village.

With these problems at mind, we soon became interested in the exact types of traffic we were dealing with along with the people in the area. We conducted two different types of research. Our unobtrusive research involved the collection and analysis of census data in the Little Village area while our physical measurements consisted of the collection of traffic types using ratio measurements at different intersections and times. With this data, we were able to create maps of parking availability, traffic trends, as well as demographic data on the residents in little village.

The following sections are included in the report. The *Needs Assessment* section fully explains our motivation and goals for this project. *System Requirements* outlines the technical GIS software and processes we went through to produce our results. *Data Acquisition* outlines the steps taken to acquire the data necessary to produce our maps. *Data Analysis and Visualization* describes the map making processes used in order to produce our maps, as well as a technical analysis of what was produced. The *Results* section is where all of our collected data is mapped, graphed and analyzed with in depth descriptions. In the *Summery, Conclusions, and Recommendations* offers our group's conclusions about our maps and what we suggest future groups that work with Enlace Chicago focus on.

2. Needs Assessment

Background

Enlace Chicago is an extremely wide-reaching and busy organization. They conduct their business in Little Village, an underprivileged neighborhood on Chicago's west side. Their mission statement is as follows: "Enlace Chicago is dedicated to making a positive difference in the lives of the residents of the Little Village Community by fostering a physically safe and healthy environment in which to live and by championing opportunities for educational advancement and economic development".

Enlace focuses on four programs of community organizing—community education, violence prevention, economic development, and new communities program. The need that we will help augment is providing information and maps regarding transportation in the Little Village area. Our group will be able to assist Enlace in collecting data of available parking on 26th street, as well as mapping the parking data we collect using the GIS technologies available to us. We will also map some census information that pertains to transportation in order to have some background information to build conclusions off of. In addition, we will provide the Enlace team with an analysis of the conditions we encounter. This will help Enlace assess the condition of transportation in Little Village so that they can be better informed when proposing new infrastructure and statutes to the City of Chicago.

Simone Alexander and Jaime de Leon, our correspondents at Enlace, gave our team a myriad of different options for the project, but they spent a lot of time focusing on parking and movement of traffic. Rather than focus primarily on bicycling as past groups have, they would like us to direct our efforts towards cars. This will require fieldwork in Little Village, and our group will correspond times to conduct data collection in the area. We will work in teams, but will not always visit the area at the same time of day, as we would like to examine traffic at different hours of the day as well as different days of the week. Our group will also meet outside of class in the Richardson Library in order to compile the data we have collected. We will meet with Simone and Jaime in order to fit their schedules, but they also gave us permission to drop by the Enlace office whenever we want. We will more than likely send an e-mail warning them of our visit for courtesy's sake.

Goals:

When we first met with Enlace, we had not yet decided what we wanted to accomplish with our project. At the meeting we discussed several ideas that examined various aspects of transportation in Little Village. Much of our discussion focused not only on the physical aspects of transportation, such as bike lane availability and the amount of traffic congestion in the neighborhood, but also on the human aspect of transportation. For example we discussed why and how people might move in and around Little Village. Why cars? Why busses? Why bikes? Project ideas that we discussed ranged from forming a database of the size and gas mileage of the cars that Little Village residents drive to the cataloging different reasons why Little Village residents use bikes to get around. Our group left the meeting with several prospective project ideas, many of them centered on 26th street (one of, if not, the most used streets in the neighborhood), though nothing was concretely figured out. Ultimately, our group decided on the following goals:

- Explore what sort of public parking is available along 26th street between Kostner Avenue and California Avenue in order to understand traffic congestion in order to eventually try to alleviate said congestion
- Examine census and demographic information of Little Village residents, specifically information pertinent to driving and transportation in the neighborhood in order to understand more clearly why people use certain forms of transportation in Little Village
- Provide Enlace with a comprehensive report detailing our findings, which will hopefully give them the basis needed for any tasks they may wish to undertake regarding alleviating traffic on 26th street.

Objectives

Goal one is to explore what sort of public parking is available along 26th street between Kostner and California Avenues in Little Village. In order to do this, we must complete several objectives. We must first begin by exploring the areas between Kostner and California along 26th street and identifying what types of parking are available. We should note metered parking, public parking, permit parking, and parking lots. Once we have catalogued these, we will geocoding and GPS for exact positioning and use ArcGIS in order to create a map of all of the parking lots along 26th street. We must also travel a block or two away from 26th street in order to look for other areas with public parking. We will also use GPS and geocoding for this data and include it on our maps.

Goal two, to examine census and demographics information of Little Village residents, specifically information pertinent to driving and transportation in the neighborhood, will require a few different steps. To collect the census data needed, we will use the official Census Data collection website, www.census.gov. We will also do a lot of research of public data in order to sift through the large amounts of information that are already available and come up with a comprehensive and thorough view of the residents in Little Village. Data points like population, age ranges, and number of car owners will be pertinent to this data collection process. Outside of the census data, we will explore the idea of collecting information on the amount of people walking and biking in the area at different times, the number of vehicles traveling down 26th street, types of vehicles to include busses, cars and trucks. To achieve a better understanding of this area and the people in it, we will use Simone to help us communicate with people working and living in the Little Village area.

Once all of our data is collected, and all parking is plotted on our maps, we will analyze everything collected and attempt to better understand why the area is one of the most congested in the city of Chicago with the help of Enlace.

Information Products:

Once we collect our data outlined above, we expect to create multiple maps for Enlace Chicago. One map will pertain to goal one: public parking availability. The maps will depict 26th street between Kostner and California Avenue and the types of parking that are available and

their locations. The maps will vary depending on the data we collect. However, we certainly hope to create helpful maps pertaining to public parking availability in order to better understand and/or direct traffic.

Another type of map will depend on our research of the available public data pertaining to traffic congestion, transportation records, and demographics of the residents of Little Village. We hope to create comprehensive maps that help to visually explain why alternative transportation is often need based and how it can be improved, why so many people in Little Village own cars, why few people choose to ride bikes but rather have to, and why 26th street is so congested.

Sources to Assist Us:

We have numerous sources that will assist us in getting information for our final product. We have access to DePaul's broad database system, which will give us access to existing statistical data along with journals, newspaper articles, etc. which have been written on transportation in both Little Village and Chicago as a whole. Several of these databases include:

- ICPSR (Inter-University Consortium for Political and Social Research)
- Illinois Report
- ProQuest Statistical Insight

We will also make use of census data, which is available online.
Two articles that may provide us information in which to ground our analysis are:

- "Relationship between proximity to transit and ridership for journey-to-work trips in Chicago" from the journal Transportation Research published in November 2010. This article provides research analysis from a study of the usage of public transit versus privately owned vehicles when traveling to and from work, specifically in the Chicagoland area. It provides great background information regarding why most people actually do not take the train to work, despite the fact that it is so much better for the environment. The article says that "for work trips having the origin/destination as close as 1 mile from rail transit stations, POVs [privately owned vehicles] were still the dominant travel mode, capturing as much as 61%, followed by rail use at 14%". The article also suggests a push for "mode shifting", meaning encouraging people who live or work within one mile of the train to take this form of alternative transportation, as they are the most apt to oblige. However, the article also says that "the ability and willingness of travelers to make this mode shift are influenced by the characteristics of rail transit such as network coverage, price, travel time, reliability, service schedule, and station accessibility". These factors can be manipulated to make public transit more widely used, for the sake of the environment.

- "The Little Village Project: A Community Approach" from the Journal of Social Work, includes four charts that may be useful to our work, as they describe gang activity that could be pertinent to people's use of different methods of transportation. Perhaps when there is a lot of gang activity in the area, people would prefer to be in the safety of a car rather than on a bike or walking to and waiting for public transportation. It also describes some interesting bits of history regarding Little Village including the following:

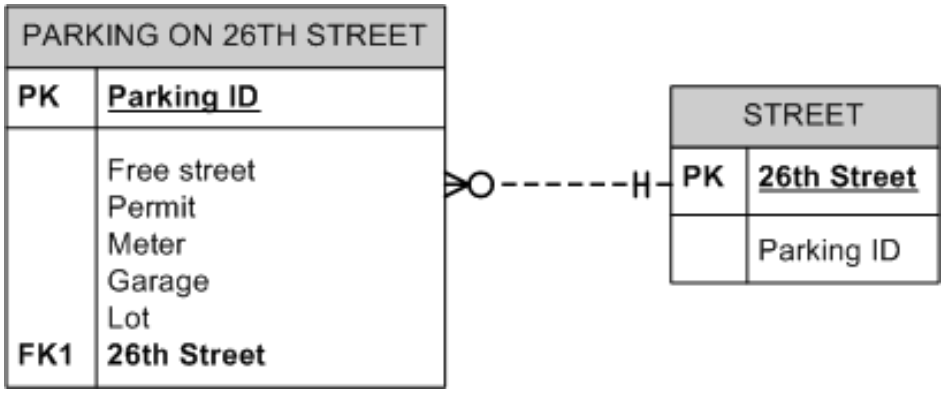
“Until the 1970s Little Village, or La Villita, was a community of aging Central Europeans residing in small bungalows and apartment buildings. In 1992 Little Village had a population of 80,000, of which more than 90 percent were Mexican and Mexican American. It is a low-income area but does not have much public housing and is not one of the poorest communities in Chicago. Currently in **t**he community is a wide array of small businesses and educational, medical, social, cultural, and religious institutions. A sizable number of factories are in **t**he area, which provide jobs for the local population. The community, southwest of Chicago's central business district, consists of six beats of the 10th District of the Chicago Police Department”.

3. System Requirements

Introduction:

The purpose of our research is to give Enlace Chicago some information and visual data to work with and study in order to decide how to encourage Alternative Transportation methods along 26th Street in Little Village. Our system requirements are mostly centered on spatial data collection around 26th street as well as attribute data collection on parking lot types, vehicle types, and demographic information. The following information outlines the technical tasks that were completed in order to create a database to answer our need to know questions.

- **Question 1:** *Explore what sort of public parking is available along 26th street between Kostner Avenue and California Avenue in order to understand traffic congestion in order to eventually try to alleviate said congestion*



Processing Requirements:

Data Collection

- Spatial Data:
  - Secondary data capture: heads up digitizing

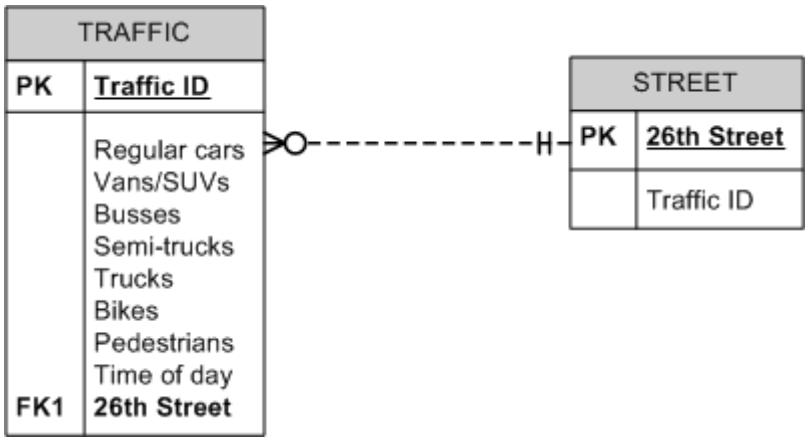
Data Manipulation

- Attribute Data:
  - Field manipulation: in order to label map
  - Table join

Data Analysis

- Spatial Data:
  - Vector overlay
  - Raster overlay: if needed

- **Question #2:** *Explore the numbers and types of cars that populate 26th Street on an average weekend day in order to better understand the traffic trends of Little Village.*



Processing Requirements:

Data Collection

- Attribute data
  - Data input: what types of cars we see where and how many

Data Manipulation

- Spatial Data
  - Feature conversion: Streets may be changed from lines to polygons if we are to plot the car locations
- Attribute Data
  - Field manipulation: to edit attribute data gathered
  - Table join: to join attribute data gathered

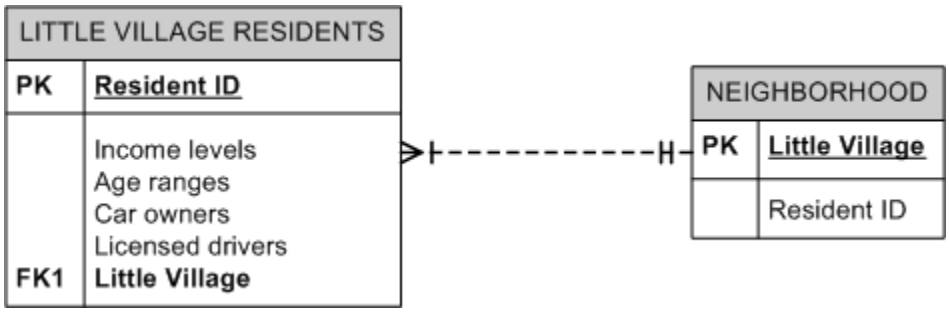
Data Analysis

- Attribute Data
  - Field statistics: to find out percentages of types of cars

Data Visualization

- Attribute data
  - Graphing: pie graphs to display data collected on car numbers

- **Question #3**: *Examine census and demographic information of Little Village residents, specifically information pertinent to driving and transportation in the neighborhood in order to understand more clearly why people use certain forms of transportation in Little Village*



Processing Requirements:

Data Collection

- Attribute Data
  - Data input/transfer: acquire data from census information, etc

Data Manipulation

- Attribute Data
  - Field manipulation
  - Table join: join attribute data to spatial data

Data Analysis

- Spatial Data
  - Query
  - Density estimation
- Attribute Data
  - Query
  - Field statistics

Data Visualization

- Spatial Data
  - Thematic mapping: choropleth maps

4. Data Acquisition

Introduction:

This section references the process our group went through in acquiring data in order to produce maps to answer our need-to-know questions, as well as an assessment of the data we did collect. Processes include heads up digitizing from aerial images for question 1, personal data collection on 26th Street in Little Village, and collecting pertinent census data on the residents of Little Village.

- **Question 1:** *Explore what sort of public parking is available along 26th street between Kostner Avenue and California Avenue in order to understand traffic congestion in order to eventually try to alleviate said congestion*

Little Village Parking Availability

Data Dictionary

File Name: Little Village Parking
Source: ARCGIS online, http://www.esri.com/software/arcgis/arcgisonline/standard-maps.html
Processing Steps: download raster data for areas on 26th street between Kostner and Kedzie Avenues, heads up digitize the free street parking, permit, meter, garage and lot (while cross referencing data collected from googlemaps streetview on meter and free street parking)
Spatial object type: Polygon
Attributes:

Latitude: Latitude in decimal degree, WGS84
Longitude: Longitude in decimal degree, WGS84
Free Street Parking
Metered Street Parking
Parking Lots

Data format: shapefile

Fitness for Use

Resolution: The map allows for high resolution imagery for the United States using a scale of 1:1,128 (1 pixel = 0.298582 m) for pixels.

Accuracy: Using heads up digitizing, we were able to collect most of the parking lots with reasonable access to 26th street, as well as free street parking and metered parking along 26th street. Because of the length of 26th street and the area we needed to cover, it is possible that it could have been more accurate using GPS handheld systems, but very difficult and time consuming with the weather issues.

Completeness: The data is generally complete, though as mentioned above, it may have been more complete if we were able to use hand held GPS systems to collect street parking data. However due to time and weather constraints, the data is quite complete.

Consistency: The data is pretty consistent, as there was no change of data points being in the middle of the street as opposed to near the sidewalk wear street parking sits because we did not use handheld GPS controllers. Instead, because of Heads Up Digitizing, it was easy to make thinks logically consistent.

Current: The data is current, as it is part of an internet source of ARCGIS 10.

Limitations: The limitation to this particular data set is that the parking lots are not divided into categories (i.e. restaurant parking, store parking, etc), and that there is a chance smaller lots that are not visible on raster aerial images are missing. It became clear after gathering data that parking garages, which we highlighted as an entity in P2, were not available along 26th street and therefore no longer an entity.

- **Question #2:** *Explore the numbers and types of cars that populate 26th Street on an average weekend day in order to better understand the traffic trends of Little Village.*

Little Village Traffic Information

Data Dictionary

Data Set Name: Little Village Traffic
Description: This dataset is the amount of traffic traveling on 26th Street between Central Park and Kostner collected at three different intersections over the course of three days. Traffic is not only limited to vehicles, as we included bikes and pedestrians as well.
File Name: Traffic
Source: Personal observations
Processing Steps: 1) Collect data at each intersection. 2) Data collated and entered into three database files (one for each intersection) 3) Graph the data collected using Microsoft Excel.
Spatial Object Type: N/A, but this can be geocoded/visualized properly as point
Attributes:

Cars
Trucks/Vans/SUVs
Busses
Semis/Other large trucks
Pedestrians
Bicyclists

Data Format: DataBase

Fitness for Use

Positional Accuracy: Accuracy was high because we knew exactly which intersections we needed to collect data from.

Attribute: Given that each vehicle was passing by at around 30mph with a limited view East and West, due to parked vehicles or other obstructions, not all vehicles may have been counted as planned. Also, the times that we were collecting data would of course not give a perfect representation of how much traffic there was at that intersection on average.

Completeness:

- Attribute: We have no missing values in our data but, for as traffic can vary by time of day and day of the week, the data will be skewed towards what times of day and days of the week that we were able to collect it.
- Spatial: Since we are collecting event data, it is unavoidably incomplete.

Spatial Consistency: N/A

Current: Our data is current considering the data was collected the week of February 14th.

Limitations: This project needed us to be in Little Village a lot more than we could really offer due to time restrictions in the course. To fully finish this project, we would have to collect days if not weeks of data in order to fully understand the traffic congestion. We would need to see how traffic really varies each and every day and to what extent during all hours. Another major limitation of our data is that is difficult to display it spatially, which is why we chose to display it as a graph. Given what was available, our data still seems to be representative of what the data might be at those given times of day and days of the week.

- **Question #3:** *Examine census and demographic information of Little Village residents, specifically information pertinent to driving and transportation in the neighborhood in order to understand more clearly why people use certain forms of transportation in Little Village*

Population Density of Little Village by Census Block

Data Dictionary

Data Set Name: Population
File Name: Population of Little Village by Census Block
Description: Census data obtained from the Greater Chicago Housing and Community Development Website, which was obtained from the 2000 U.S. Census data of Chicago.

It includes population for each of the twenty census tracts in Little Village/South Lawndale
Source of the data: Compiled from the Greater Chicago Housing and Community Development Website:
http://data.cmap.illinois.gov/chicagoareahousing.org/List_Block.asp
They got their information from the U.S. Census Bureau: www.census.gov
Processing steps: 1) different sets of census data was collected in tabular format (in Excel file) and will be joined to this Census Tract shapefile in every case. 2) The Census map will be cut so that it only shows Little Village (the 20 census tracts included)
Spatial object type: polygon
Attributes:

Field Name	Description
Block ID	ID number of census block
POP00	Number of people in each block
Area	Area of Census Block
Population Density	(POP00/Area)

Data format: shapefile

Fitness for Use

Resolution: Density of vertices is adequate.

Accuracy: Because we compiled the data table on our own, the accuracy is good. We made sure that it fit with Codd's Rules of Normalization, along with Enlace's needs.

Completeness: There are no missing values, and the data is complete, as we compiled it manually. There are no missing features.

Consistency: Spatially consistent, no measurement errors.

Current: The data is the most recent census data, but it was compiled in 2000, which was eleven years ago, therefore it is not current enough by our standards, but is as current as possible.

Limitations: The limitations to this data set are that you cannot tell how the population of Little Village compares to the rest of Chicago, although we may make some changes so that this is more obvious. Another limitation is that, since we are looking at traffic on 26^{th} street, the population may indicate somewhat where the people traveling on 26^{th} street are coming from, but they easily could be traveling from some place other than within Little Village. This data is just to give a sense of where most of the people in Little Village reside.

Percentage of Owner-Occupied Housing in Little Village by Census Block

Data Dictionary

Data Set Name: Owner-Occupied Housing
File Name: % of Owner-Occupied Housing in Little Village by Census Block
Description: Census data obtained from the Greater Chicago Housing and Community Development Website, which was obtained from the 2000 U.S. Census data of Chicago. It includes the percentage of housing that is owner-occupied for each of the 42 census blocks in Little Village/South Lawndale.
Source of the data: Compiled from the Greater Chicago Housing and Community Development Website:
http://data.cmap.illinois.gov/chicagoareahousing.org/List_Block.asp
They got their information from the U.S. Census Bureau: www.census.gov
Processing steps: 1) This excel file was compiled from census data, and 2) was joined with the census block shapefile by Tract ID, focusing specifically on Little Village.
Spatial object type: polygon
Attributes:

Field Name	Description
Block ID:	ID number of block
Owner-Occupied Housing:	Percentage of Housing Labeled Owner-Occupied in Census Data

Data format: shapefile

Fitness for Use

Resolution: Density of vertices is adequate.

Accuracy: Because we compiled the data table on our own, the accuracy is good. We made sure that it fit with Codd's Rules of Normalization, along with Enlace's needs.

Completeness: No missing values. No missing features.

Consistency: Spatially consistent, no errors.

Current: The data is the most recent census data, but it was compiled in 2000, which was eleven years ago, therefore it is not current enough by our standards, but is as current as possible.

Limitations: Some limitations of this dataset are that because a member of our group compiled it manually, there could be a chance of human error in recording the percentages into the original excel file. We did check our facts to make sure that this risk was minimized. Another limitation is that knowing whether a home is owned or rented does not necessarily help us determine whether they are likely to

drive on 26th street, which is one of the main purposes of our research, as any conclusions made by this data are only speculations.

Median Age of Little Village Residents by Census Block

Data Dictionary

Data Set Name: Median Age
File Name: Median Age of Little Village by Census Block
Description: Census data obtained from the Greater Chicago Housing and Community Development Website, which was obtained from the 2000 U.S. Census data of Chicago. It includes the median age for each of the twenty census tracts in Little Village/South Lawndale.
Source of the data: Compiled from the Greater Chicago Housing and Community Development Website:
http://data.cmap.illinois.gov/chicagoareahousing.org/List_Tract.asp
They got their information from the U.S. Census Bureau: www.census.gov
Processing steps: 1) This excel file was compiled from census data, and was joined with the census block shapefile by Tract ID, focusing specifically on Little Village.
Spatial object type: polygon
Attributes:

Field Name:	Description
Block ID:	ID number of block
Median Age:	Median Age of Residents in Each Census Block

Data format: shapefile

Fitness for Use

Resolution: Density of vertices is adequate.
Accuracy: Because we compiled the data table on our own, the accuracy is good. We made sure that it fit with Codd's Rules of Normalization, along with Enlace's needs.

Completeness: No missing values. No missing features. Data is complete.

Consistency: Spatially consistent, no measurement errors.

Current: The data is the most recent census data, but it was compiled in 2000, which was eleven years ago, therefore it is not current enough by our standards and it would be better if it were more current, but is as current as possible.

Limitations: One of the limitations of this dataset is that the median age of Little Village residents is very similar within each census tract. The data is interesting because the median age is much lower than many other areas, but because our map focuses solely on Little Village, this is not well represented. Our group will likely

address this limitation and then decide whether or not to go forward with presenting this information to Enlace.

Percentage of Little Village Residents that do not Own Cars by Census Tract

Data Dictionary

Data Set Name: Do not Own Cars
File Name: Little Villagers who do not own cars
Description: Census data describing the number of people who do not own cars in Little Village by census tract.
Source of the data: Census 2000 Summary file 3
Processing steps: 1) Download Vehicle Availability data, 2) Delete tracts that are not in Little Village 3) Divide population without cars from total population by tract
Spatial object type: polygon
Attributes:

Tract ID	Tract ID number
NoCar	Little Village Residents that do not have a car
POP00	Population by tract from the year 2000
PrcNoCar	Percent of population by tract with no car (NoCar/POP00)

Data Format: shapefile

Fitness for Use

Resolution: The resolution is accurate, density of vertices accurate.

Accuracy: There are no unusual values, and tract level has the highest accuracy available, and is adequate.

Completeness: No missing values, no missing features. Data is complete.

Consistency: Spatially consistent, measurement errors.

Current: The data is the most recent census data, but it was compiled in 2000, which was eleven years ago, therefore it is not current enough by our standards and it would be better if it were more current, but is as current as possible.

Limitations: It might be nice if the data was at block level. In addition, people may have access to a car from a family member or friend, and may use it on 26th street. Also, the population data likely includes children, and since children cannot drive this may skew data slightly. Overall, it is a good indication of where people without cars are located.

5. Data Analysis and Visualization

Introduction:

The following section outlines the information products applicable to each need to know question as well as outlines the steps taken in order to create said information products. It goes through the technical issues considered in making the maps as well as a general analysis of the maps.

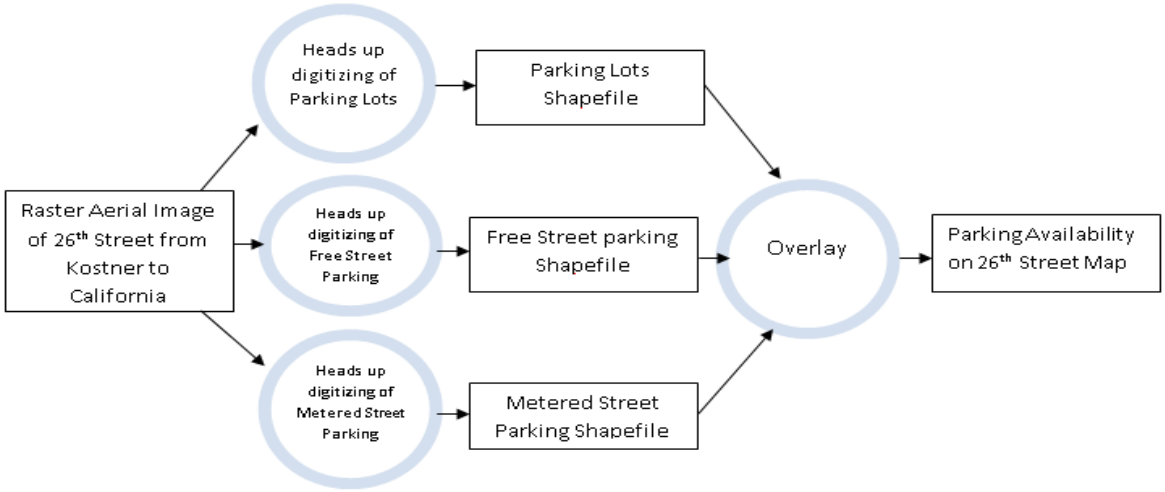
- **Question 1:** *Explore what sort of public parking is available along 26th street between Kostner Avenue and California Avenue in order to understand traffic congestion in order to eventually try to alleviate said congestion*

Information Products

The maps produced show the spatial distribution of parking availability with relatively easy access to 26th Street between Kostner and Kedzie Avenues in Little Village, Chicago. The types of parking included are lot parking, free street parking, and metered street parking. Originally included were also garage parking and permit parking, but no data was found that included these types of parking.

These information products indeed answer the need to know question, or are at least a step toward answering the question of what exactly causes congestion on 26th Street. This map can help users visualize the areas along 26th street that have relatively little parking access.

Data Analysis



The Raster image was imported from ArcMap's Basemap option. From there, I created a shapefile template for parking lots and drew them in using heads up digitzing. I repeated these steps for both free street parking and metered street parking, and then overlayed these three shapefiles with the base raster aerial image. There is a good chance that for functionality sake

and the limited detail because of the large area covered, that more than one map will be produced from this need to know question in order to split 26th Street up by block.

Data Visualization

Purpose: The purpose of this map is to show areas of parking availability along 26th Street between Kostner and Kedzie Avenues in Little Village, Chicago IL, in order to eventually understand what causes the congestion on 26th Street that often times discourages alternative transportation (like bike riding).
Audience: The users of this map are Enlace Chicago representatives and leaders trying to create a presence of alternative transportation in Little Village, as well as possibly future GIS II students who work on this project.
Cartographic Rules:

Map Projection: WGS_1984_UTM_Zone_16N is the coordinate system that works with the basemap included in ARC GIS 10. The projection is Transverse Mercator which comes along with the basemap.

Map Symbols: While this map will not have any thematic mapping, the symbols were chosen with a purpose. The parking lots are polygons, while the free street parking spaces as well as metered parking spaces are polylines. All three types of parking are color coded.

Map Types: The purpose of this map is simply to visualize spatially where the parking availability is on 26th Street, and so, again, thematic mapping is not needed. The map is an overlay of three shapefiles created using heads up digitizing.

Data Classification: As little attribute data is used in this map, there is no need for data classification in terms of jenks, standard deviation, or equal interval, etc.

Normalize Data: No normalization is needed on this basemap.

Map Elements: This map will include the standard map elements such as a title, a north arrow, a scale, and especially the legend. The legend is probably one of the most important map elements, as it will help the user distinguish between free street and metered street parking.

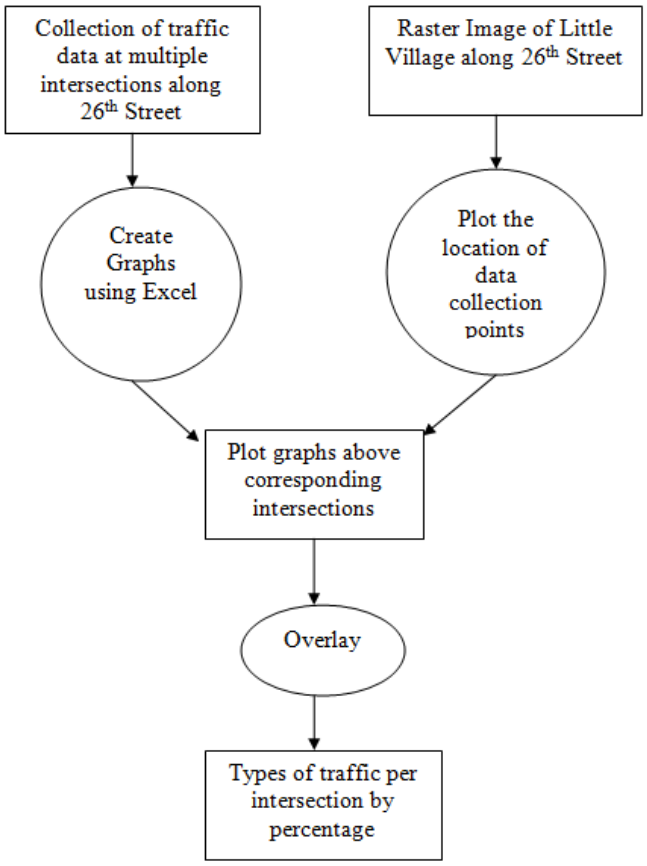
- **Question #2:** *Explore the numbers and types of cars that populate 26th Street on an average weekend day in order to better understand the traffic trends of Little Village.*

Information Products

The maps and graphs produced show the intersections at which data was collected between Kostner and California on 26th Street in Little Village, Chicago. The different types of traffic data collected were cars, busses, large trucks/semis, SUVs/vans, pedestrians and bicycles.

This data was collected on the basis of answering previous questions to include what causes traffic congestion in the Little Village area. To better understand this, we first needed to find out what kind of traffic we were dealing with. Graphs were created to show how much of each type of traffic there was along 26th Street while maps show which intersections the data was collected at. Each graph created was then placed on the map to correctly show each intersection's data. The map created will help users see the larger picture of the types of traffic in Little Village which may eventually lead to ways of solving the congestion problem.

Data Analysis



Data Visualization

Purpose: The purpose of this map is to display the amount of different types of traffic going through three of Little Village's busiest intersections at certain times of interest.

Audience: The audience for this map will be employees of Enlace Chicago and anyone who would like to better understand what types of traffic are traveling on 26th Street.

Cartographic Rules:

Map Projection: State Plane, NAD 83 Illinois East Zone is the best coordinate system to use on this map as it will focus on a small area of Chicago. The map will be projected using Transverse Mercator.

Map Symbols: The symbols on this map will be three different colored points marking the three intersections we are using.

Map Type: We will be using a graph map (pie graphs) to display this information. This will allow us to best portray how much traffic there is at each intersection.

Data Classification: As little attribute data is used in this map, there is no need for data classification in terms of jenks, standard deviation, or equal interval, etc.

Normalize Data: No normalization is needed on this basemap.

Map Elements: This map will include north arrow, scale bar, legend, and title. The legend will show which point corresponds to which intersection.

- **Question #3:** *Examine census and demographic information of Little Village residents, specifically information pertinent to driving and transportation in the neighborhood in order to understand more clearly why people use certain forms of transportation in Little Village*

Information Products

In order to display the demographic information of Little Village, we will need to make the demographics dataset into three maps.

The first, population density, will show the density of residents in Little Village by census block. This will be a choropleth map, and will adequately distinguish areas of high residency from those of relatively low residency. This will help us and Enlace hypothesize about where heavy traffic is coming from, as areas of high residency could very well produce more traffic on 26th street.

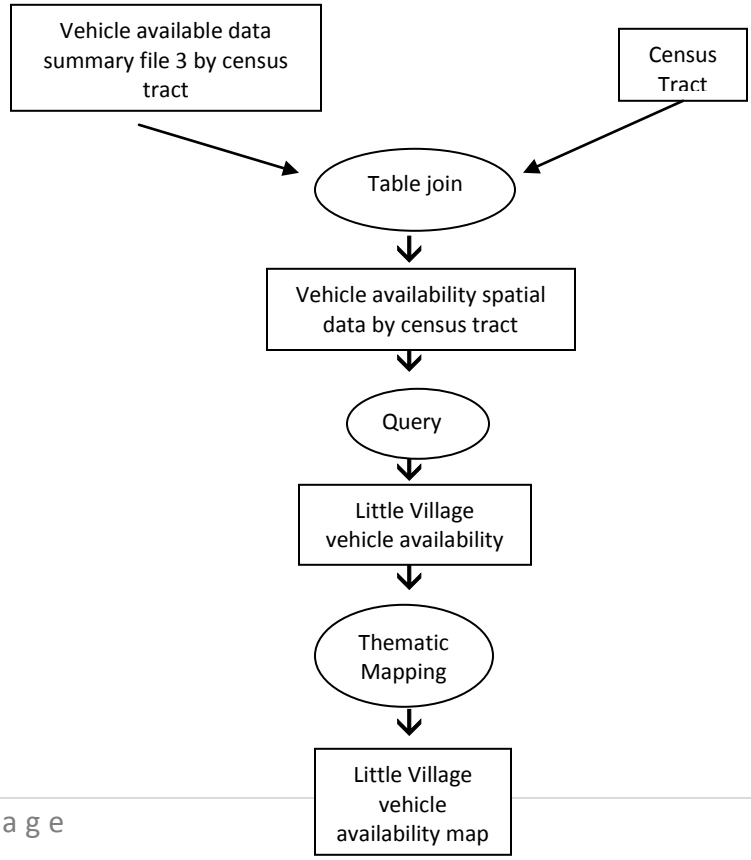
The second map will show the median age of residents in Little Village by census block. This will also be a choropleth map, so it will be evident what the spatial distribution of age of residents will be. This may help us determine which areas are likely to produce traffic in that a younger median age in certain blocks may mean fewer cars, as children do not drive. However, this could also lead us to assume that there are more cars, as people with children often need a private form of transportation such as a car. This could also lead us to hypothesize which areas have larger cars such as vans and SUVs that contribute to traffic on 26th street. Median age could be an ambiguous part of the dataset, up for interpretation.

The third map will show the spatial distribution of owner-occupied housing throughout Little Village, divided by census block. This too will be a choropleth map, making it easy to distinguish areas of high owner-occupancy from areas where houses are heavily rented. This is another slightly ambiguous area of the demographic data, as it is not definite whether renting or owning makes one more likely to contribute to traffic on 26th street. However, we think that Enlace will be able to provide opinions based on their community work that will make this map useful.

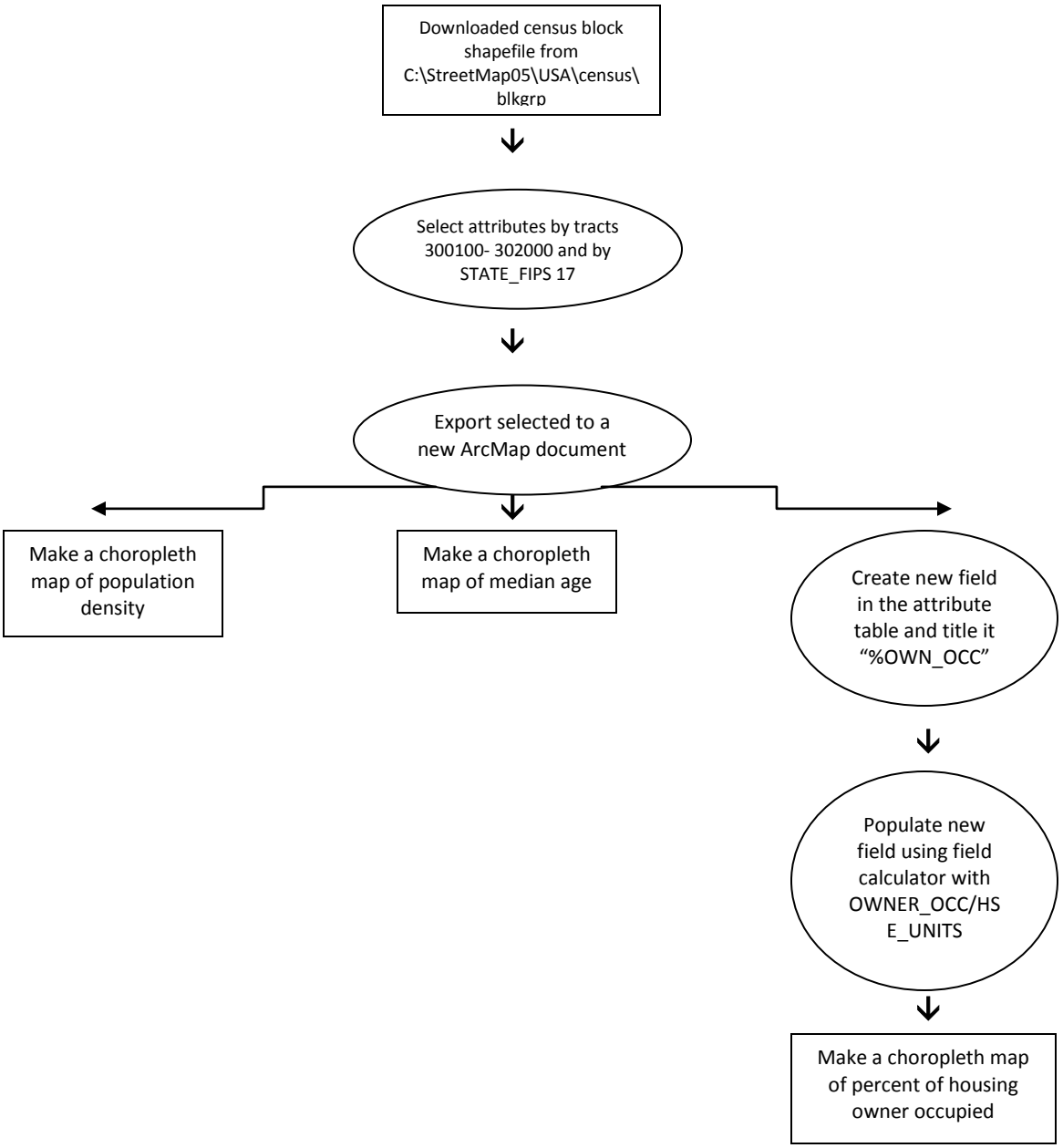
The fourth map will show the percent of people who do not own cars in Little Village by census block. This will also be displayed with a choropleth map, with darker color indicating a higher concentration of residents who do not own a car, and lighter color, in this case yellow, displaying the areas where a higher percentage of people own cars. This will help us determine where traffic on 26th street is coming from, because it is more likely coming from areas where more people have cars. This could help Enlace address where alternative transportation promotion and other action would have the biggest benefit.

Data Analysis

Percent of Residents Without a Car



Population, Median Age, and Percent of Housing Owner-Occupied



Data Visualization

Purpose: The purpose of the population density map is to show where the residents of Little Village are most concentrated. This will help show where the most people live, and these people may be the highest contributors to traffic on 26th street.

The purpose of the median age map is to show what the median age distribution is in the different census blocks of Little Village. This may help determine where cars are coming from on 26th street.

The purpose of the map showing the percent of homes that are owner-occupied is to show the distribution of houses that are owner-occupied throughout the census blocks of Little Village. This will show how many people in the area have the money to purchase a house and where people are mostly renting. This could help indicate who owns cars, has bigger families, etc.

The purpose of the car-ownership map is to show what percentage of people in each census tract in Little Village own one or more cars. This will help us see where the traffic on 26th street may be coming from.

Audience: Our audience is Enlace Chicago. These maps will help give background information in which to base assumptions and hypothesis that Enlace might develop to determine the cause and potential solutions to heavy traffic on 26th street in Little Village.

Cartographic Rules:

Map Projection: This map will use SPC IL East Zone, as this tends to work best on a map of Chicago.

Map Symbols: We will be making choropleth maps for all four, and we will use lightness and shading to show high and low quantities.

Map Type: All of these maps will be choropleth maps.

Data Classification: We will consider data distribution and purpose (e.g., manual method for comparison, natural break for data with natural subdivision). This applies to graduated color/symbol maps in ArcGIS terms.

Normalize Data: Most of the data is basically normalized for us. We do, however, have to normalize the percentage of owner-occupied housing by dividing the number of houses that are owner-occupied by the number of houses in each block total.

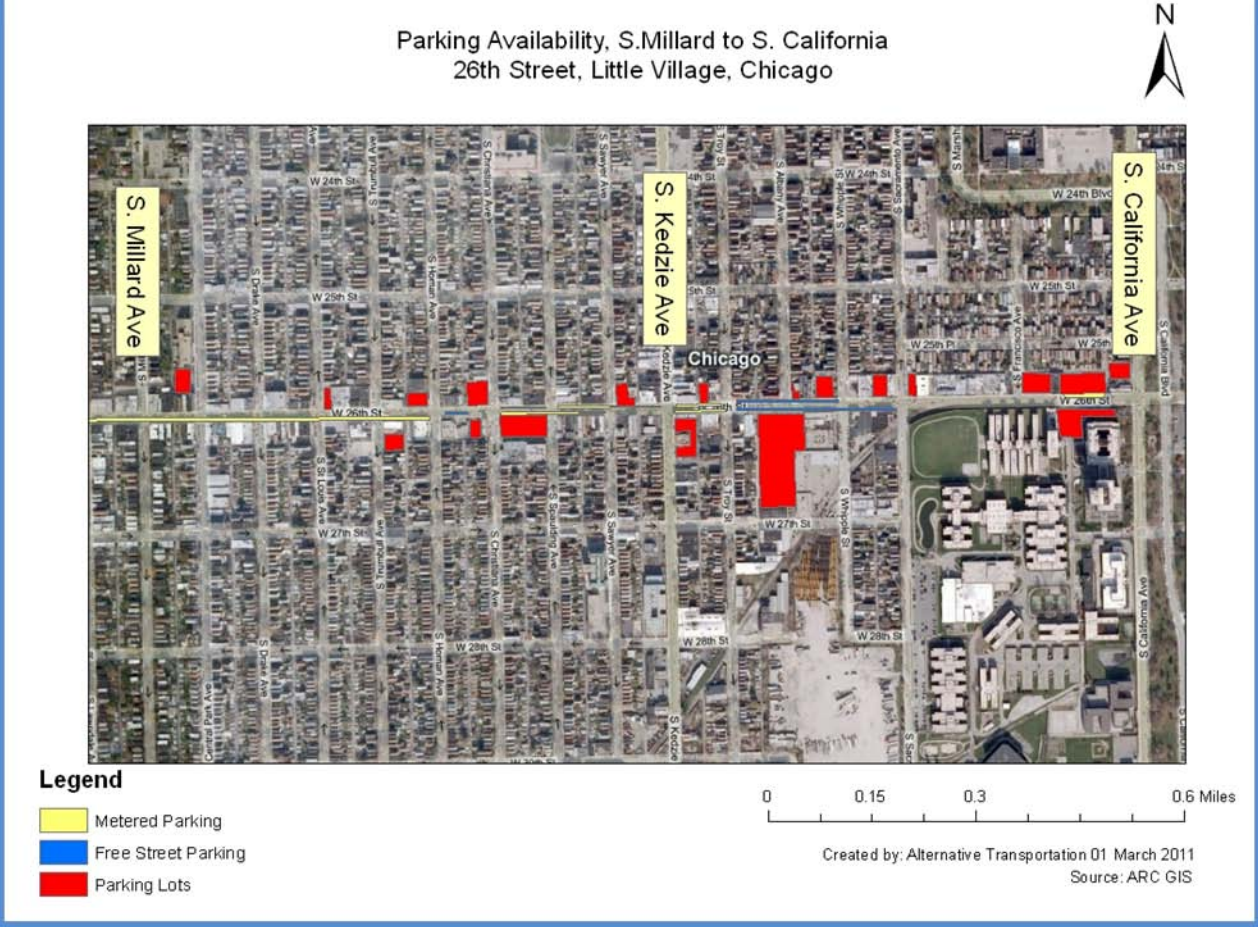
Map Elements: These maps will include north arrow, scale bar, legend, and title on along with the actual choropleth maps.

6. Results

Introduction:

Below are the maps produced using the data collected on 26th Street parking, traffic trends, and census information.

- **Question 1:** *Explore what sort of public parking is available along 26th street between Kostner Avenue and California Avenue in order to understand traffic congestion in order to eventually try to alleviate said congestion*



Both of the above maps feature 26th Street and the three types of parking available. The top one shows the west side of the street, from S. Kostner to S. Millard. The second one continues along 26th Street on the east side, from S. Millard to S. California. They are separated so as to show more detail. These maps show some interesting results, as we were expected a pretty evenly distributed amount of parking availability along 26th St. between Kostner and California. However, our analysis of these particular maps shows a clear difference in the amount of parking available at different parts of the street. It is clear that east of Millard St. has far less parking availability than west of Millard St. Our analysis shows that there are places that lack parking which may add to the amount of traffic along 26th street that prevents ease of transportation and hinders pedestrians and bicyclists.

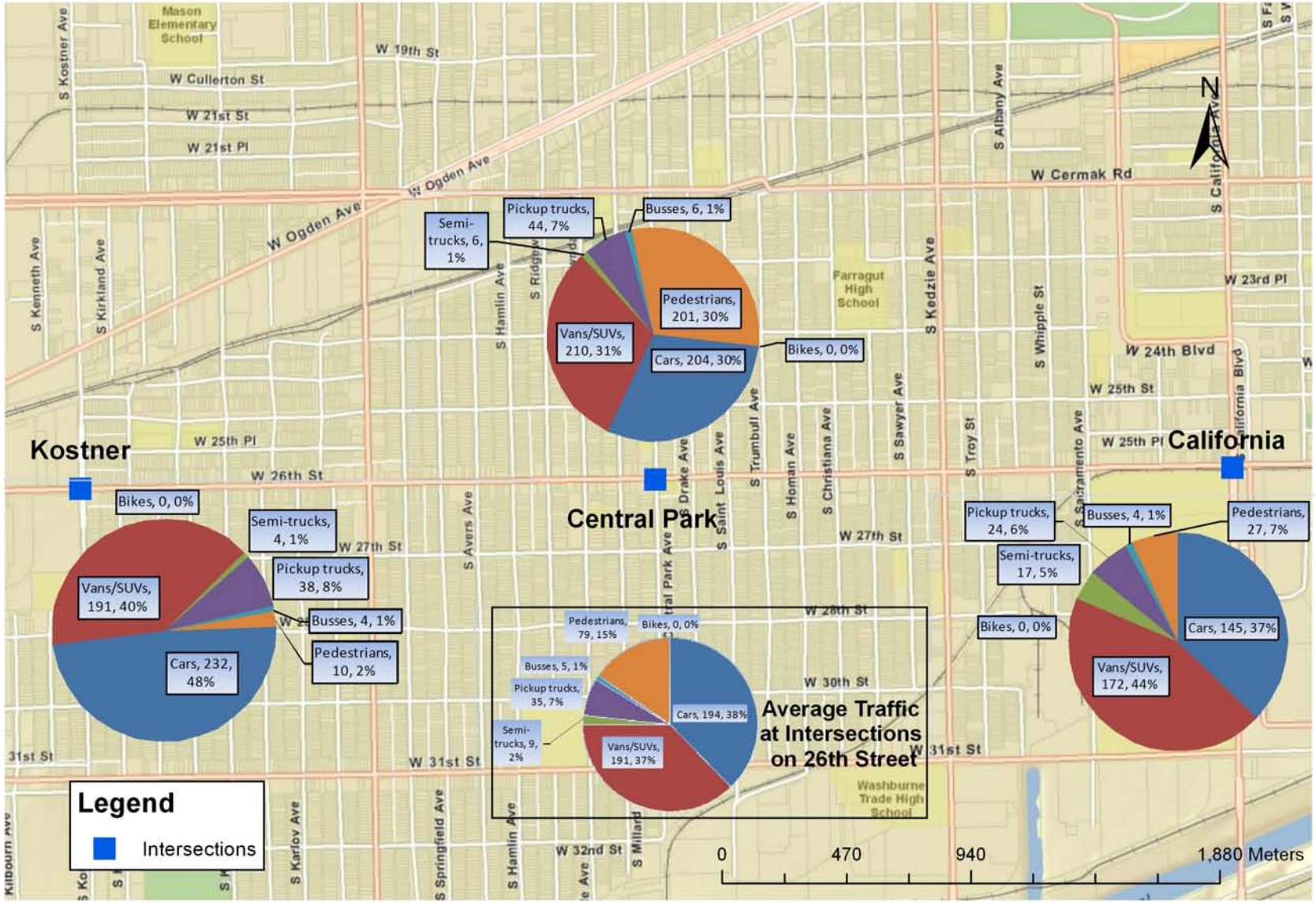
- **Question #2:** *Explore the numbers and types of cars that populate 26th Street on an average weekend day in order to better understand the traffic trends of Little Village.*

The results that we found after collecting the traffic data were somewhat surprising. At the outset of the project our original plan was to study bike traffic and bike lanes in Little Village. It was ultimately probably a good decision to not focus only on bike traffic, as in our hour and a half of data collection, we did not observe a single bicycle on 26th Street. Instead, focusing on all kinds of traffic, we were able to observe how residents and visitors to Little Village accessed the neighborhood.

Our research found that regular cars along with SUVs and vans dominated 26th Street, accounting for eighty one percent of the traffic. We were surprised that SUVs and vans were nearly equal to regular cars as we would expect to see more regular cars in any other part of the city. On average, the next most prevalent type of traffic was pedestrians. However, this data is skewed as we found that, while there was an extremely limited amount of pedestrian traffic during the two weekdays that we were collecting data, there was roughly ten times that amount of pedestrians travelling on 26th Street on Saturday at around noon. This data that was collected on Saturday was collected at Central Park, right in the center of Little Village, which also may have affected our data. At Kostner there are abandoned buildings and a vacant lot while at California there is the Cook County Prison, which might explain the lack of pedestrian traffic. This ultimately skewed our average data, as is evident in our pie charts. Different kinds of trucks accounted for nine percent of the total traffic, with pickups making up seven and semi trucks two percent. Finally, city busses accounted for one percent of traffic which was pretty much expected.

(Map for Question 2 on following page)

Traffic in Little Village



- **Question #3**: *Examine census and demographic information of Little Village residents, specifically information pertinent to driving and transportation in the neighborhood in order to understand more clearly why people use certain forms of transportation in Little Village.*

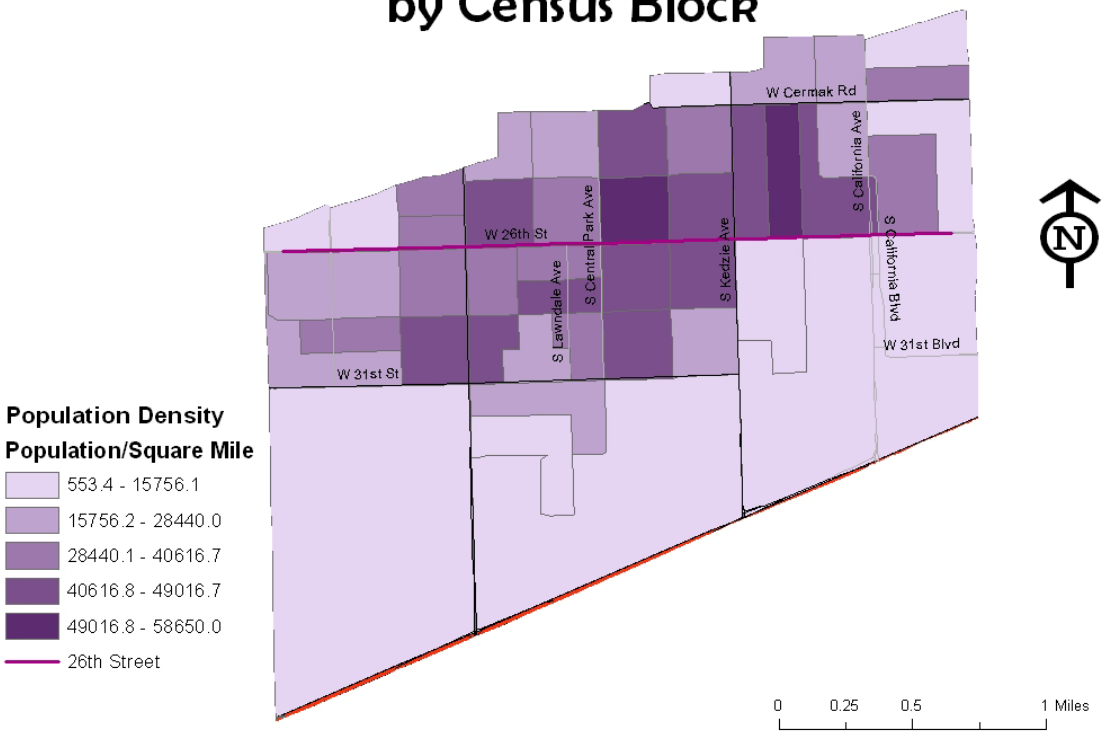
The four graphs depicting demographic information in Little Village show a correlation between the people of Little Village and the space that they inhabit. The four graphs on the following pages show the population density, percent of housing that is owner occupied, median age and percent of residents who do not own a car within Little Village. There was, to no surprise, a relationship between areas whose homes are owner occupied, residents whose median age was relatively high and whose residents own a car. Areas with high population density were more likely to be occupied by renters. From these results we can assume that the high density areas comes from multiunit buildings with younger tenets renting their units versus the single family, lower density, older median age, car owning areas.

26th street is Little Village's economic lifeline; it is filled with shops and offices, has a bus line, and bisects other main roads such as Central Park and Pulaski. But where do people live in relation to 26th street? Do Little Villagers walk or drive to 26th street's shops? The data shows that the census blocks with the highest population density within Little Village are within walking distance of 26th Street. Areas on the Western side of 26th street, West of Central Park Avenue, have older tenants who are more likely to own a car, compared to the eastern side of Little Village.

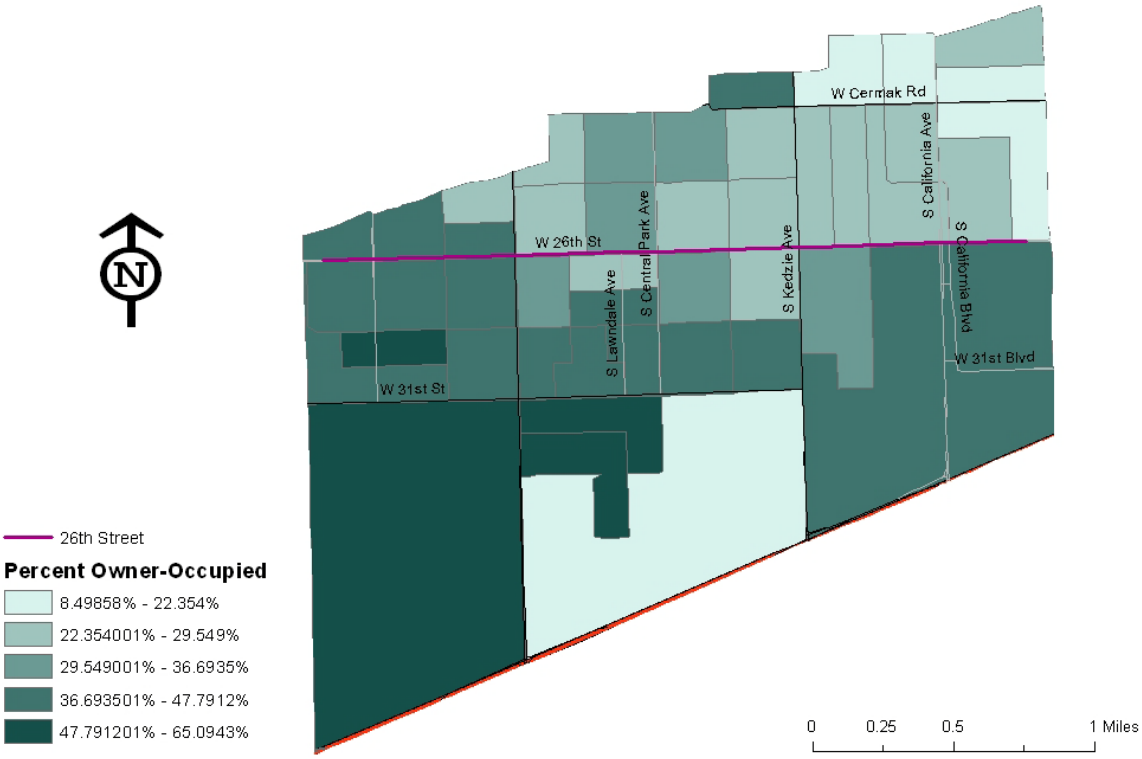
One thing to notice from other sections of this project is that although there is parking available across all of 26th street there are more parking lots east of Central Park than west. This may not be intentional, but demographic data can explain this phenomenon. Not to be repetitive, but a majority of Little Villages' residents do live within walking distance of 26th Street. Also, on the eastern side of Little Village the residents are younger, and most likely rent and do not have cars. The eastern side, however, does have more available parking, most likely for the residents who live on the western side and cannot walk there. The western side of Little Village, whose residents are older and who are more likely to own cars and can walk to the less car friendly west side of 26th street probably drive and park on the more car friendly east side of 26th street.

(Maps for Question 3 are on fallowing page)

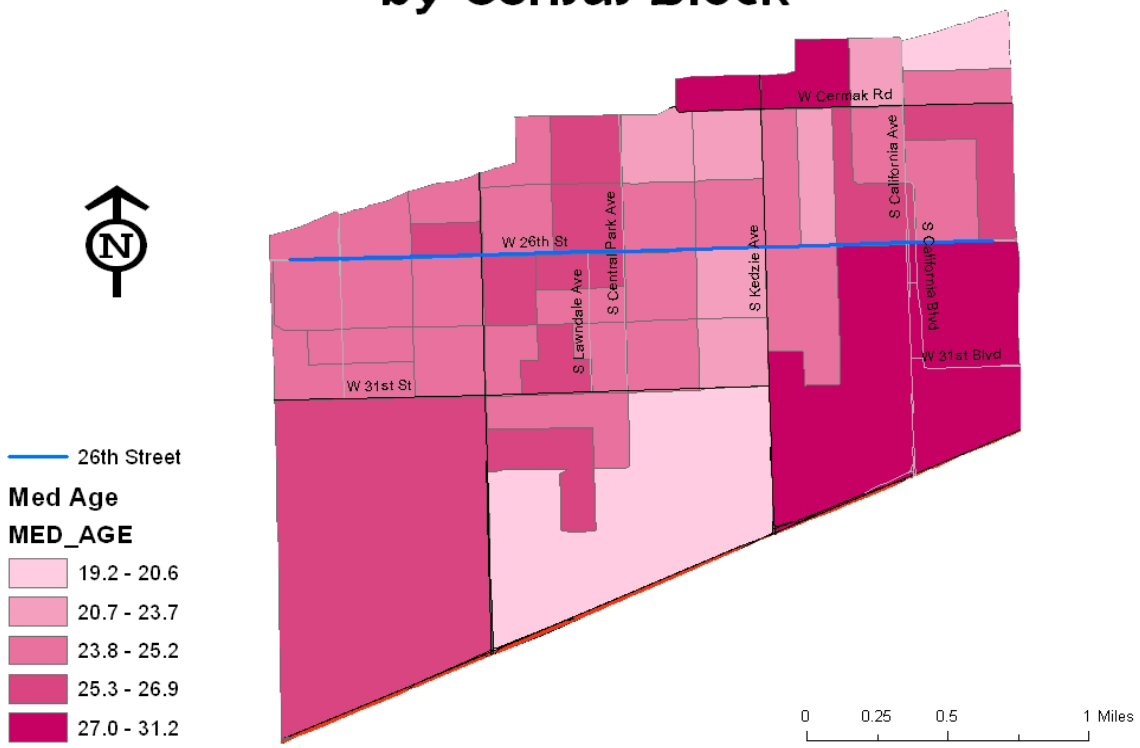
Population Density of Little Village by Census Block

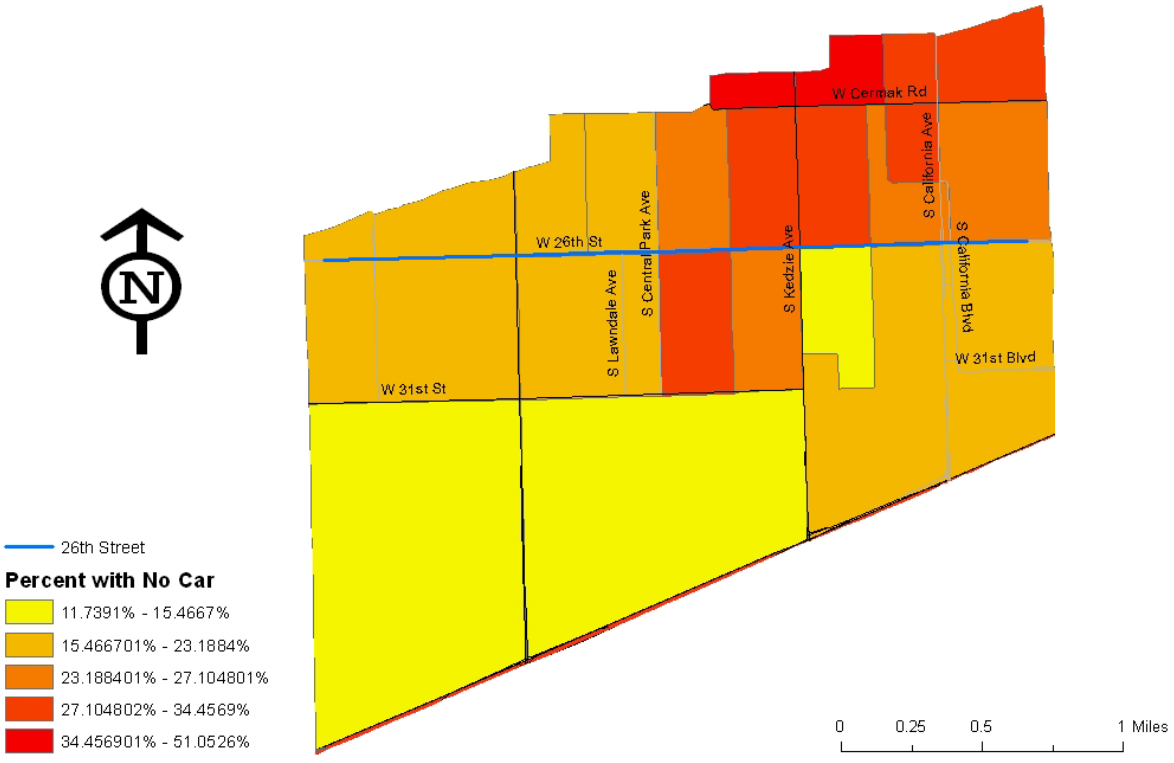


Percent of Housing in Little Village that is Owner-Occupied by Census Block



Median Age of Little Village Residents by Census Block





7. Summary, Conclusions, and Recommendations:

In brief summation, as a group, we collected and mapped data regarding transportation on 26th street in Little Village. We looked at the parking availability, types and quantity of traffic on 26th street, and demographic data such as population, median age, ownership of homes, and car accessibility, in order to assess why and how people travel along the busiest road in Little Village.

Our goal was to give Enlace a comprehensive view of traffic on 26th street. Despite an initial interest in mostly alternative forms of transportation, like pedestrian and bicycle traffic, it seemed logical to have to understand congestion in general, which sometimes prevents bicyclists and pedestrians from moving efficiently. We met this goal by providing a picture of the busiest parts of 26th street, along with the types of traffic that occupy this path. We provided them with a means to assess the traffic by indicating where people can park, which will likely show the motive and/or destination of much of the traffic on 26th. The census data provided does not directly inform the assessment of transportation, but instead provides background information that one can ground a theory of the cause of traffic on.

Parking is far more available on the eastern half of 26th street, if we cut it at Central Park. This is likely because west of Central Park, car ownership is higher, the median age of residents is higher, and more owners occupy their homes. The map displaying available parking reflects this in that there are more parking lots on the eastern half of the section of 26th that we studied than on the western half, most likely to accommodate for those car owners that are not within walking distance. One might look at the parking map and assume that the western portion of 26th street may need more parking, however when comparing the parking map to the demographic information, it becomes clear that parking may not be necessary there, as there is a high population without cars that are within walking distance.

The approach that our group took was effective, as we did the field research necessary to show the type of traffic located on the main street, as well as identify where drivers could park their vehicles. The census data can only be used to infer, as we did not interview members of the community to get a firsthand account of who drives what, where, and why. Next time we would interview people to delve deeper into the reasons why people use 26th street, along with why they drive the types of cars that they do. Although slightly outrageous, it would have been interesting and extremely informative to stop every car on 26th street to see where they were coming from because after all, traffic on 26th street may not come from Little Village at all, although it is reasonable to assume that areas with more car ownership, or more densely populated areas provide for a good portion of the traffic. Overall, however, our research uncovered some of the hidden reasons why 26th street is such a traffic mess.

The map showing the types of vehicles on 26th and Kostner, 26th and Central Park, and 26th and California suggests that vehicles are dispersed evenly across 26th street. Pedestrian traffic, on the other hand is condensed around Central Park. Perhaps Enlace should channel this pedestrian energy in a way that they see fit in order to encourage pedestrians all across 26th street. There were also a surprisingly high number of SUV, truck, and van traffic, so we suggest that either the policy section of Enlace or future GIS groups should look to investigate this further. The conclusions that Enlace will make using our research will likely be more thorough, as they provide expertise in the area of Little Village in respect to sociological trends. It will be interesting to see how they use our parking, transportation, and demographic maps.

As for future recommendations, it is clear that more research is to be done. The best way to encourage alternative transportation has not been found just yet, but we hope our hard work and research can help point Enlace Chicago and future groups in the right direction. It would be interesting to continue research on traffic trends to overlay with parking lot information as well as census information. It might also be useful to combine the work of the previous group that worked with Enlace Chicago in order to have a more thorough vision of all forms of transportation, not just vehicular, which is what our group decided to focus on due to weather and time constraints.

8. Technical Appendices

Appendix A: Contacts

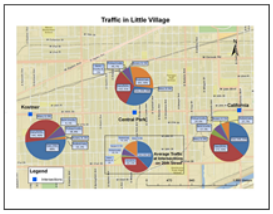
Simone Alexander (Enlace Chicago): salexander@enlacechicago.org

Jaime de Leon (Enlace Chicago): jdeleon@enlacechicago.org

Appendix B: Metadata

Traffic in Little Village

Map



Tags
Traffic, Little Village, Chicago

Summary
Pie graphs displaying traffic in Little Village

Description
There is no description for this item.

Credits
Kevin Boyter, Dennis Fendrich, Adam Svoboda, Jessica Vorobel, Allie Wiegand

Access and use limitations
There are no access and use limitations for this item.

Intersections in Little Village

Tags
Intersections, Little Village, Chicago

Summary
Map displaying intersections in Little Village

Description
There is no description for this item.

Credits
Kevin Boyter, Dennis Fendrich, Adam Svoboda, Jessica Vorobel, Allie Wiegand

Access and use limitations
There are no access and use limitations for this item.

Parking Availability, Kostner to S. Lawndale on 26th Street

Tags
There are no tags for this item.

Summary
This map displays available public parking between Kostner and Lawndale in Little Village.

Description
There is no description for this item.

Credits
Kevin Boyter, Dennis Fendrich, Adam Svoboda, Jessica Vorobel, Allie Wiegand

Access and use limitations
There are no access and use limitations for this item.

Parking Availability, S. Millard to California on 26th Street

Map

Tags
There are no tags for this item.

Summary
This map displays available public parking between Millard and California in Little Village.

Description
There is no description for this item.

Credits
Kevin Boyter, Dennis Fendrich, Adam Svoboda, Jessica Vorobel, Allie Wiegand

Access and use limitations
There are no access and use limitations for this item.