English As A Second Language

COMMUNITY SERVICE PROJECT

Chicago Federation of Labor Workers Assistance Committee (CFL-WAC)

Geographic Information Systems II

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Immigrants of the U.S. are arriving at an increasing rate, the majority of which are settling in large metropolitan areas (Grognet 2-3) Primarily, immigrants come to America in search of a better life, including employment opportunities. However, in order to get a job, at a minimum an immigrant needs to be able orally to give personal information, express skills, and communicate with the interviewer. These skills are in addition to those needed to find a job, such as being able to read want ads and fill out job applications. English as a Second Language (ESL) centers benefit immigrants immensely in improving their English language skills in order to obtain a job.

This project incorporates mapping ESL centers for those in need. In order to find ESL centers and immigrants in search of these centers, we contacted the Chicago Federation of Labor – Workers Assistance Committee (CFL-WAC) to help create maps for their clients. The maps we created will help clients find ESL centers near them, and public transportation routes needed to get there.

The major goal of this project was to create an information product that is able to convey a clear map of ESL centers, client locations, and public transportation routes for the CFL-WAC. The finished product was ultimately created through combining goals and need to know questions, examining the contents, creating final maps using ArcGIS 9.2, and analyzing the end results.

The steps taken in order to create our final information product were complicated. A general resesarch goal was established, followed by questions that would be incorporated into our results (Need To Know Questions). Next a Needs Assessment was established, specifying in greater detail what we intended to accomplish, and also providing a deeper description of the context of the project.

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Introduction

Through working with the CFL-WAC, our group intended to help the job seekers and workers who have been laid off by creating maps of ESL Locations near their homes. Many job seekers are currently unemployed, or have been laid off, because they cannot speak English. English as a Second Language Centers are located all over the Chicago area, offering classes to those in need. In order to help these non-English speaking clients of the CFL-WAC, our group will produce maps showing the location of client's homes, along with the location of ESL Centers.

The mission of the Chicago Federation of Labor Workers Assistance Committee (CFL-WAC) is to proved job seekers and workers with the skills they need to step up to better employment and succeed. The organization is a unique employment resource and an integral link for job seekers, unions, and employers. They link the three together in the following ways. For employers, they offer a skilled labor pool and a variety of companion services. For unions and job seekers, they offer assistance and funding to cover the cost of training to upgrade the skills they need to obtain jobs (such as learning English).

Before we could begin the project, a research question needed to be formulated. After assessing the CFL-WAC's needs and what they wanted as an end result, we came up with a driving research goal, which was to be able to locate which ESL centers were nearest to the clients that the CFL-WAC provided us with. Next, we had to come up with the process of how to answer our research question in the GIS. This was a complicated process that included flow charts, experimenting with different functions in the GIS,

editing and geocoding the data given to us by the CFL-WAC, and finally deciding which information was most important to portray in our final products.

To clarify the process and steps we went through in this project, following this introduction will be a Needs Assessment, in which the intended accomplishments of this project will be specified. Next will be a Results section, where our end product will be discussed and displayed, followed by the Summary which will provide a brief overview, including future and further recommendations.

Needs Assessment

This project seeks to create maps which enable clients of CFL-WAC lacking English skills to locate ESL centers offering appropriate services. Our intention is to help job seekers and workers that have been laid off because of lack of English skills. In addition to general maps showing ESL locations in the city of Chicago, individual maps for each client showing their home and the nearest ESL location(s) will be created to meet these needs.

System Requirements

This section describes in detail the technological and institutional requirements necessary for this project. It details the data that will be used and the way in which the database will be constructed in terms of relationships. Additionally, it explains the software and institutional arrangements essential to the completion of the project.

The need to know questions for this project are as follows:

Which ESL centers are located near CFL-WAC clients (letter coded ESLnearClient)?

Which CTA stations are located near each ESL center (letter coded ESLnearCTA)?

Which ESL centers are compatible with CFL-WAC clients based on cost of services (letter coded ESLcost)?

Which ESL centers are compatible with CFL-WAC clients based on language (letter coded ESLlanguage)?

Which ESL centers are compatible with CFL-WAC clients based on handicap accessibility needs (letter coded Accessibility)?

The entity classes are as follows (entity classes represent the different layers of data to be included in the map):

ESL Center

Client

CTA

Below is a matrix of need to know questions cross-referenced with entity classes:

	ESLnearClient	ESLnearCTA	ESLcost	ESLlanguage	Accessibility
ESL Center	X	X	X	X	X
Client	X		X	X	X
CTA		X			
Road	X	X			

Below the attributes of each entity class are listed:

The attributes of the entity class ESL Center are: name, address, predominant language, cost, handicap accessibility, daycare availability.

The attributes of the entity class Client are: name, address, language, cost preference, handicap accessibility needs, daycare needs.

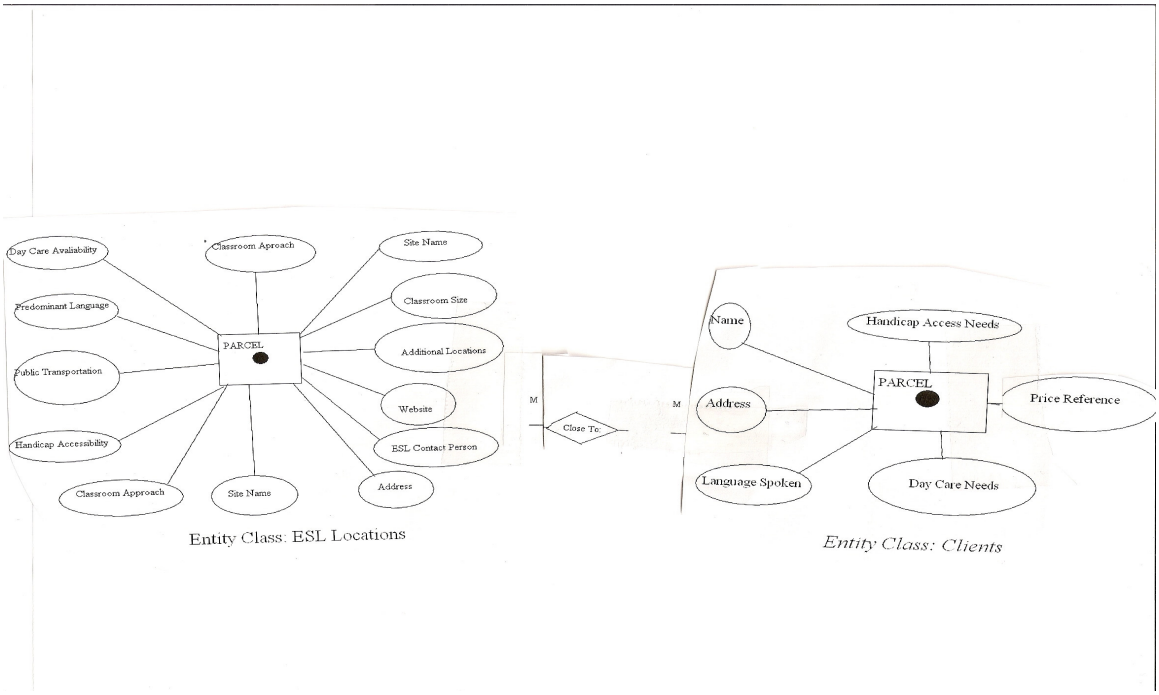
The attributes of the entity class CTA are: station ID, station name, line, address, handicap accessibility.

The following is a summary of the relationships between entity classes that will be used to construct the relationships to be used in the project. The relationship between ESL

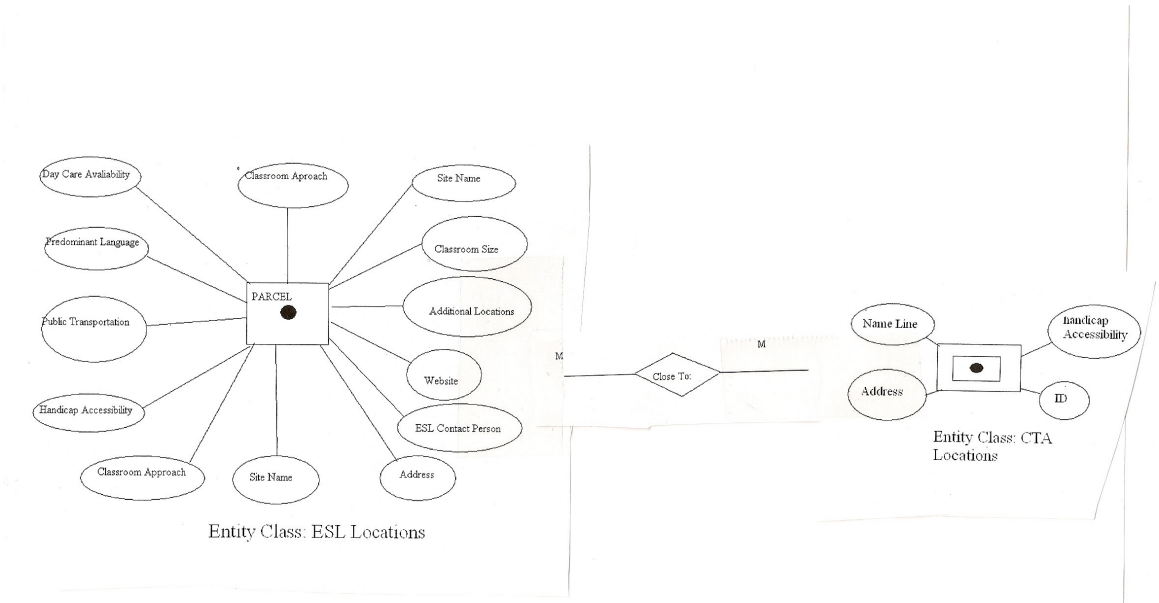
Center and Client entity classes is based on a spatial relationship (ESL Center near Client). The cardinality of the relationship is many-one (M:1) because there can potentially be many ESL centers located near the client. The relationship between the entity classes ESL Center and CTA is based on a spatial relationship (ESL Center near CTA). The cardinality of this relationship is many-one (M:1) because there could potentially be many CTA stations located near the ESL center.

The spatial object type of the entity classes ESL Center, Client, and CTA is point. The spatial object type of the entity class Road is line.

Below is a flowchart for the need to know question "Which ESL center is closest to the Client?":



Below is a flow chart for the need to know question "Which CTA location is closest to each ESL center?":



The following matrix of need to know questions cross-referenced with software functions summarizes the software requirements for the project.

	ESLnearClient	ESLnearCTA	ESLcost	ESLlanguage	Accessibility
Address Matching	X				
Buffering	X	X			
Spatial Overlay	X	X			
Query	X	X	X	X	X
Thematic Mapping	X	X	X	X	X
Table Join			X	X	X

In addition to the software requirements for the project, there are also certain institutional frameworks which are important. In order to meet the objectives for this project certain institutional requirements will be necessary. Cooperation with the Chicago Federation of Labor Workers Assistance Committee (CFL-WAC) will be essential to this project. The data for ESL centers and clients will be provided by CFL-WAC.

Data Acquisition

This section describes the process of data acquisition. It details the steps involved in this process and provides a list of the datasets used. The accuracy and appropriateness of the data is also discussed in this section.

A. Data Dictionary: this is a list of all the datasets used.
Data Set Name: ESL Locations
File Name: ESL Locations
Description: Data surveyed on ESL locations throughout the Chicagoland metropolitan area. Data within the set describes ESL location, daycare availability, predominant language, public transportation, handicap accessibility, classroom approach, classroom size, additional locations, website, ESL contact person, costs, site name, fax and phone numbers.
Spatial Type: point
Source of Data:
Chicago Federation of Labor: Program Coordinator, Mary E. Buford.
II)
Data Set Name: Client Addresses.
File Name: Client Addresses.
Description: Data compiled on client background, clients who may need assistance from the ESL centers. Data describes clients' name, address and in some cases, the phone number.
Spatial Type: point
Source of Data:
Chicago Federation of Labor: Program Coordinator, Mary E. Buford
III)
Data Set Name: CTA stops (Train) (TBD)
File Name: CTA Stops
Description: Data intended to exhibit the location of train stops in the Chicagoland area. Data should describe station name, address, wheel chair accessibility, and color of line.
Spatial Type: point
Source of Data: Chicago Transportation Authority
IV.
Data Set Name: CTA lines
File Name: CTA lines
Description: Data intended to exhibit the location of train lines in the Chicagoland area. Data should describe color, length, and location of line.
Spatial Type: line
Source of Data: Chicago Transportation Authority
V.
Data Set Name: Community
File Name: ChiComm

Description: Data intended to exhibit the boundaries of Chicago communities.
Spatial Type: polygon
Source of Data: GIS lab X-drive, DePaul University Labs
VI.
Data Set Name: Census Tract
File Name: ChiTract
Description: Data intended to exhibit the location of census tracts in the city of Chicago.
Spatial Type: polygon
Source of Data: US Census Bureau
B. Data Source Steps

The data set for ESL Locations was provided by CFL-WAC, as was the data for Client Locations. The data is in Excel format. The data for Chicago census tracts was from the US Census Bureau and is a shapefile. The data for the population lacking English skills was provided by American Fact Finder, a division of the US Census Bureau. The data is in vector form and uses universal transverse Mercator (zone 16) map projection. The data set CTA Stations and CTA lines was obtained from the City of Chicago website. The data is in vector form and uses the state planar projection.

C. Fitness for Use

The data sets ESL Locations and Client Locations were compiled by CFL-WAC and the methods used are not known. The accuracy and completeness of these data sets cannot be guaranteed for this reason. Neither data set has been normalized or geocoded, and these processes could result in further inaccuracies. Additionally, the possibility of human error for these data sets is high. This data would be plotted as points and thus corresponds with the overall vector data model.

The census tract data set is appropriate for this project because it was provided by the US Census Bureau. The US Census Bureau is a reliable source and provides a data set that is up-to-date. The data set is also appropriate because its spatial type is vector.

The CTA Stations and CTA Lines data sets are also in vector format and can be easily incorporated with the other data sets. The accuracy is somewhat limited because the data has not been updated to account for recent CTA station closures. However, this only affects a small number of stations and the overall accuracy of the data set is acceptable for this project.

Because the data sets which have the most potential for error (ESL Locations, Client Locations) were provided by the clients themselves, we assume that they are accurate enough to be acceptable for the purposes of this project. Further, the difference in projection systems used by the different data sets will have to be accounted for. Although these data sets are not without limitations, overall their accuracy is acceptable for this project.

5. Data Analysis

The following section will detail the plan of action for answering the need to know questions. It will include flowcharts which describe the operations to be done in GIS.

The two most important need to know questions are:

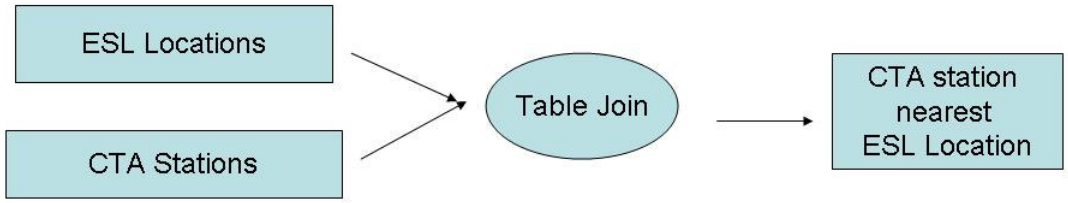
1. Which ESL Center is near the client?

2. Which ESL Center is near which CTA Station?

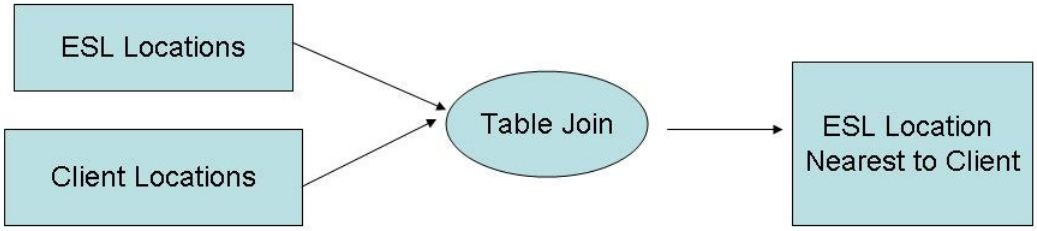
Need to know question number one can be answered in a series of steps using the GIS software. A buffer was created around each client location to locate ESL centers within a certain distance of each client. The ESL centers nearest to the client can also be determined by a table join. The Client layer could be joined to the ESL center layer by spatial location in a way that calculates the shortest distance between points in the two

layers. Need to know question number two can be answered using a similar set of steps in GIS. A table join by spatial location could be carried out. The ESL center would be joined to the CTA station layer based on the nearest distance between the points of the two layers.

Below is a flowchart of need to know question number one:



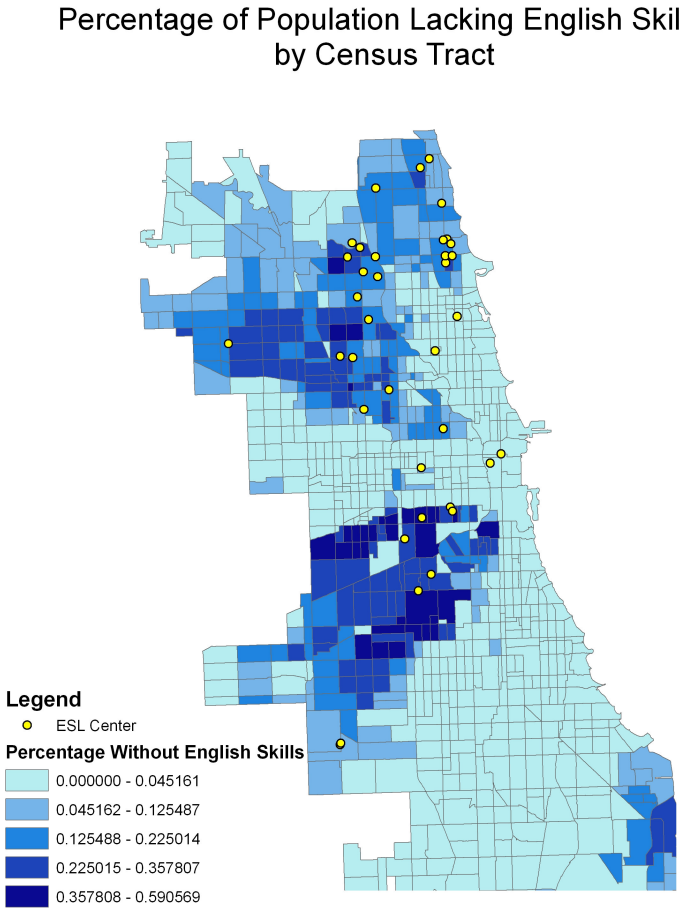
Below is a flowchart of need to know question number two:



Additionally, thematic mapping will be used to create maps that characterize ESL locations by cost, predominant language and handicap accessibility.

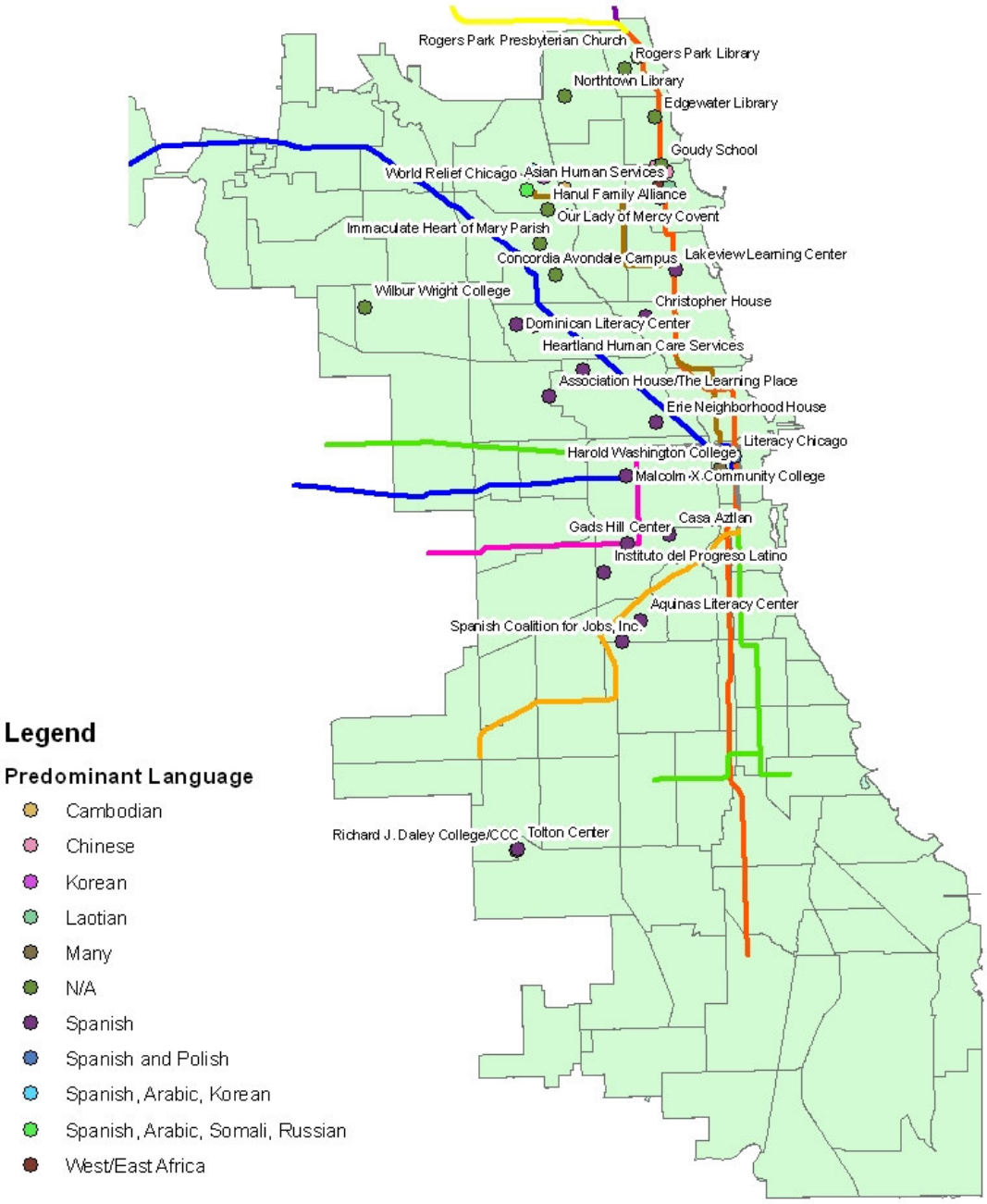
Results

The need to know questions were answered by the following maps described in this section. The results of the project are a series of thematic maps. Ultimately, the project yielded maps which located ESL centers in Chicago and matched CFL-WAC clients with the nearest ESL center.

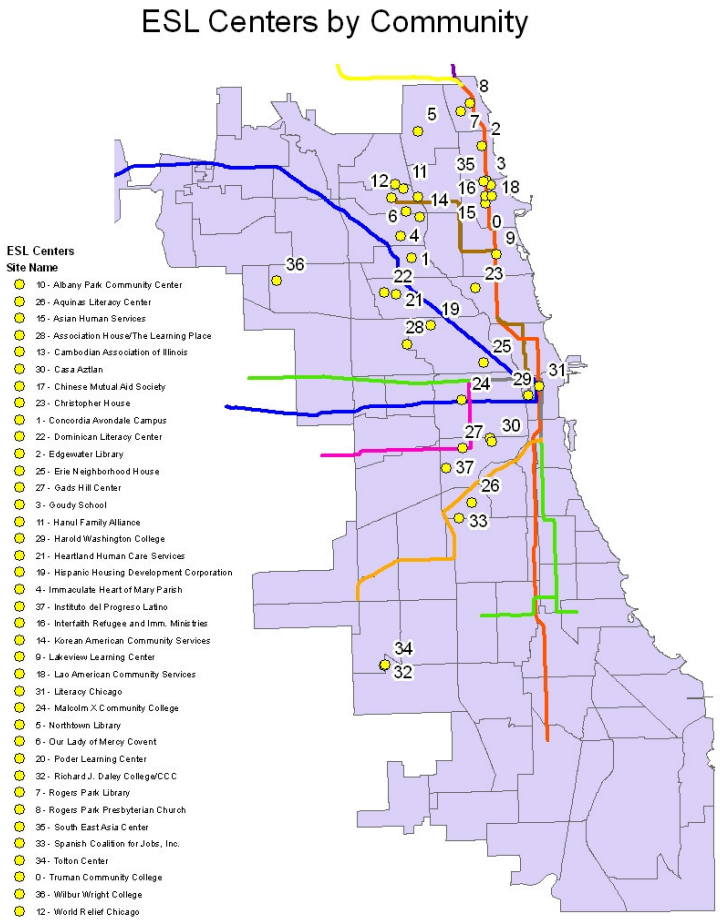


Map 1 displays the percent of the population that lacks English skills by census tract. Further analysis of the data was conducted to determine if there was a pattern in the geographic distribution of non-English speakers. The spatial autocorrelation (the likelihood that similar results are located close to one another) for the percentage of non-English speakers was calculated using Moran's I. The Moran's I value for non-English speakers was .12 with a z score of 62.02. This indicates that non-English speakers are clustered in certain locations.

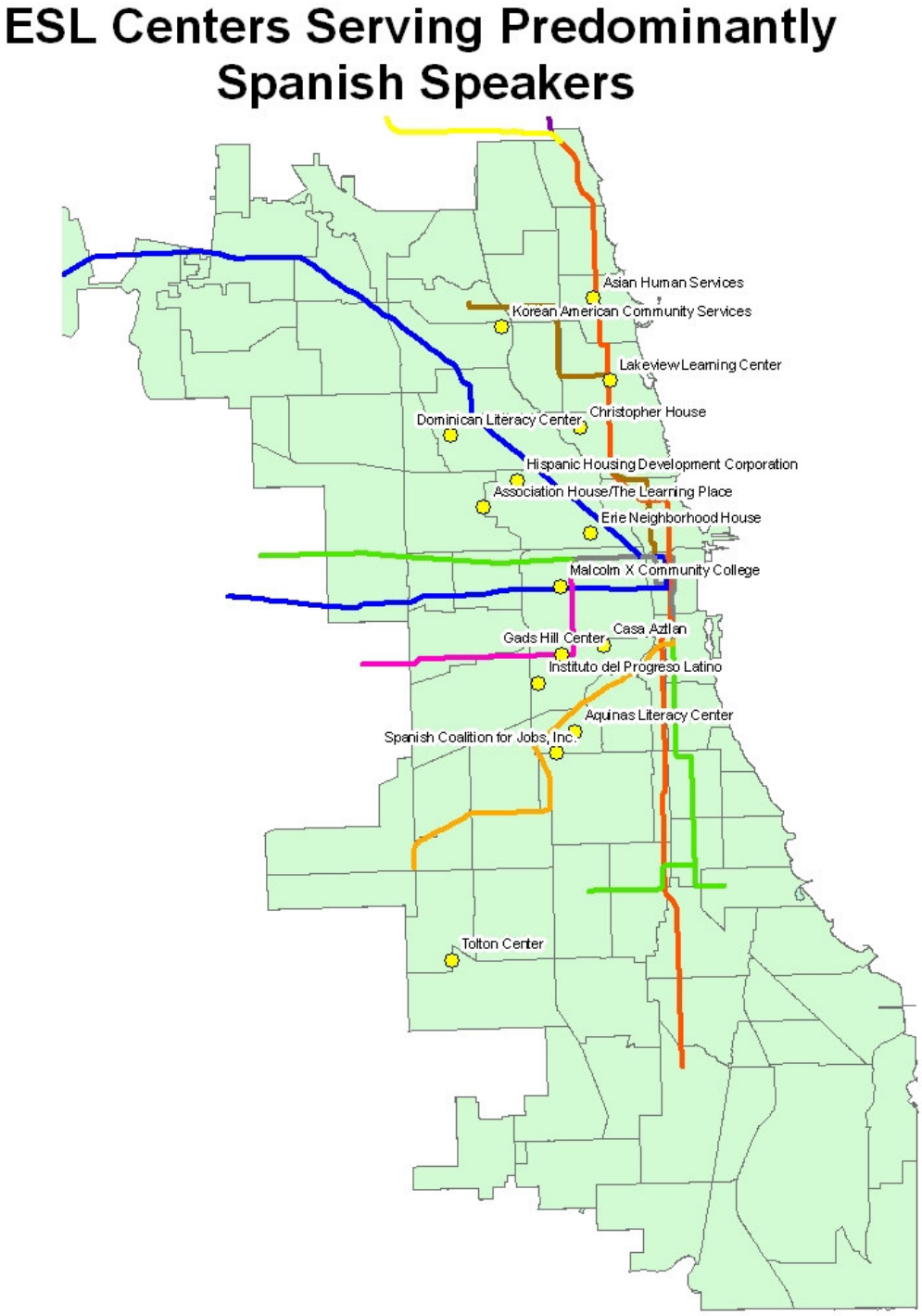
ESL Centers by Predominant Language



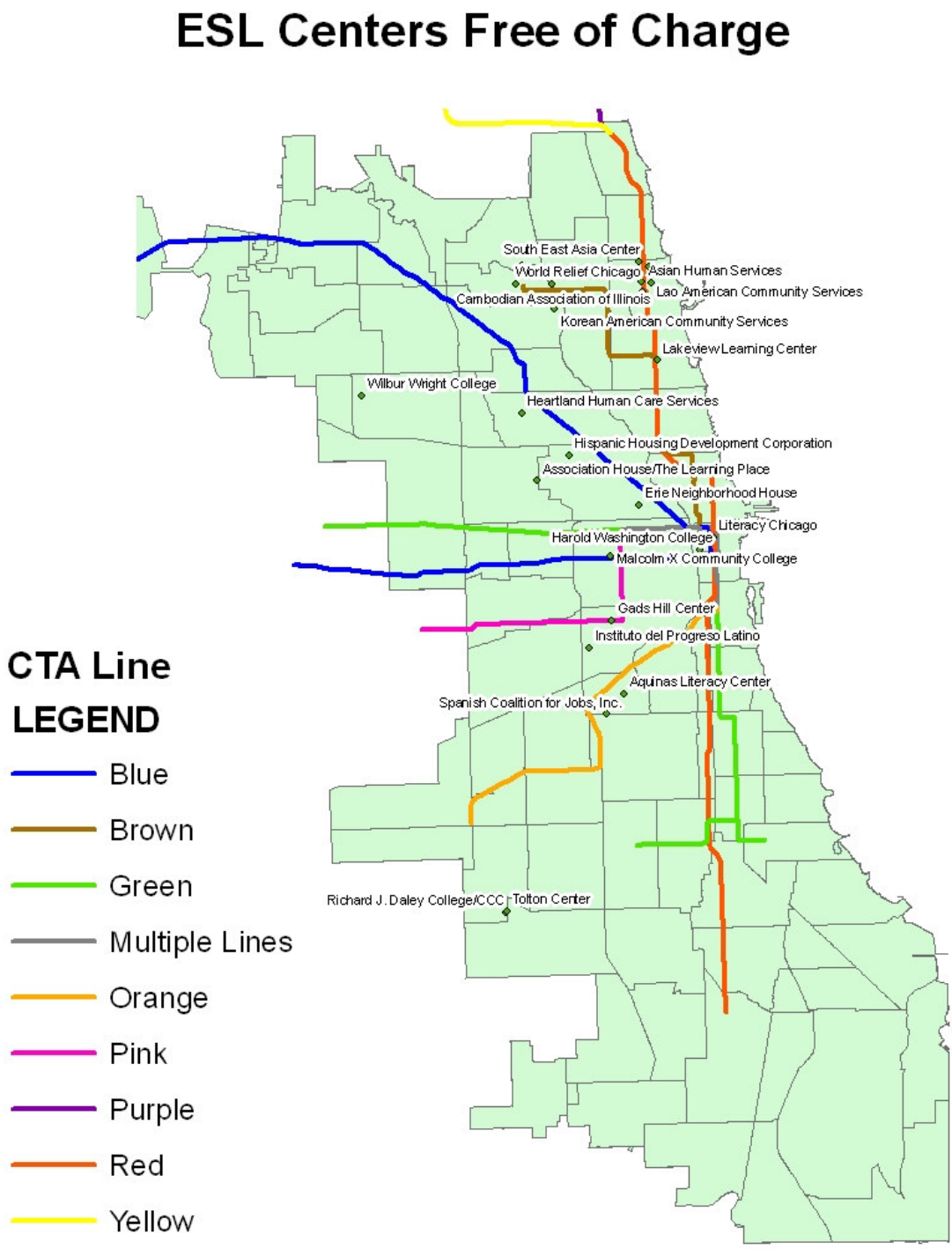
Map 2 shows displays the ESL centers by the languages they serve. Chicago community boundaries are the backdrop an the CTA lines are shown in their appropriate colors.



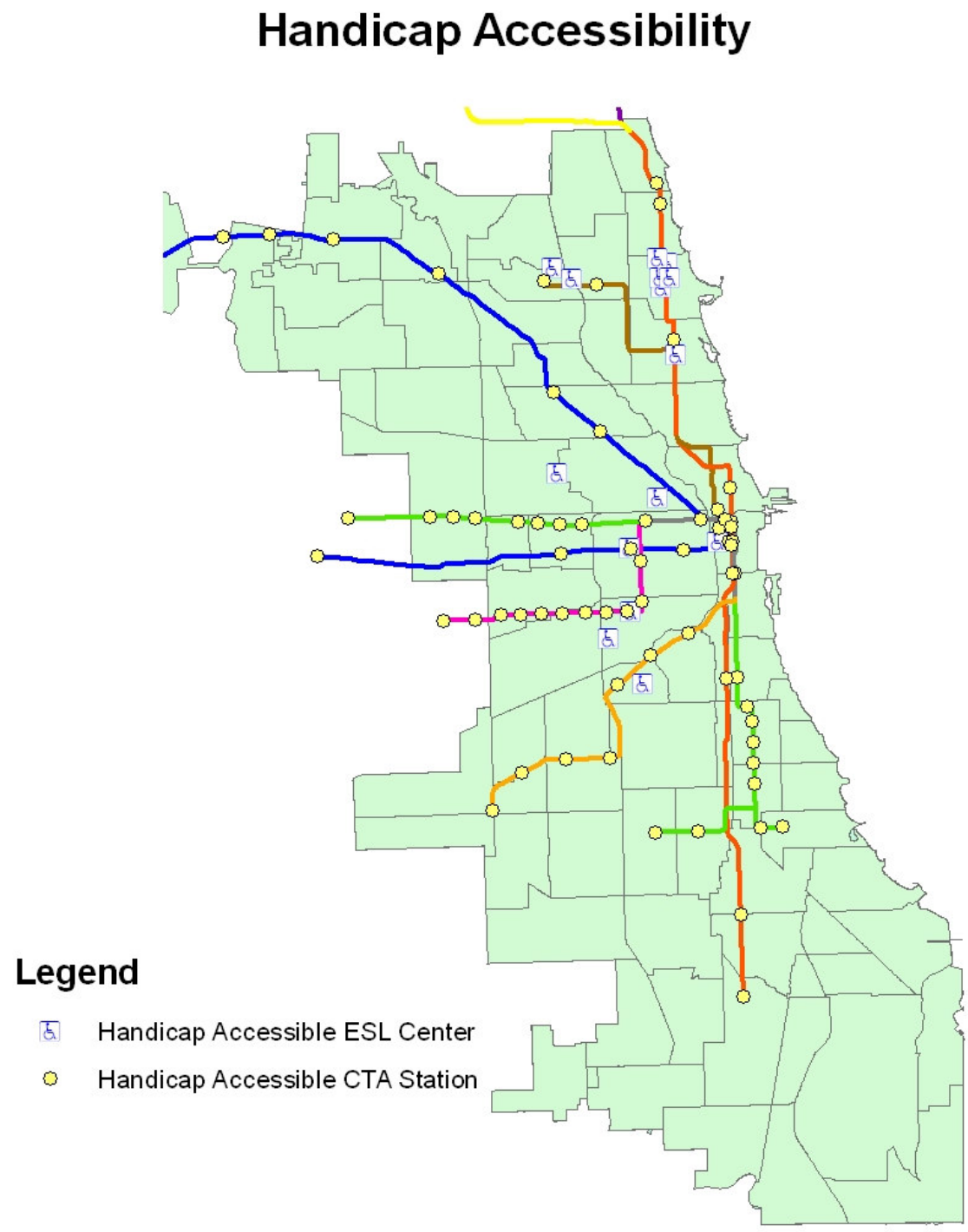
Map 3 shows the ESL locations with community boundaries as a backdrop. The map also includes CTA lines in their appropriate colors.



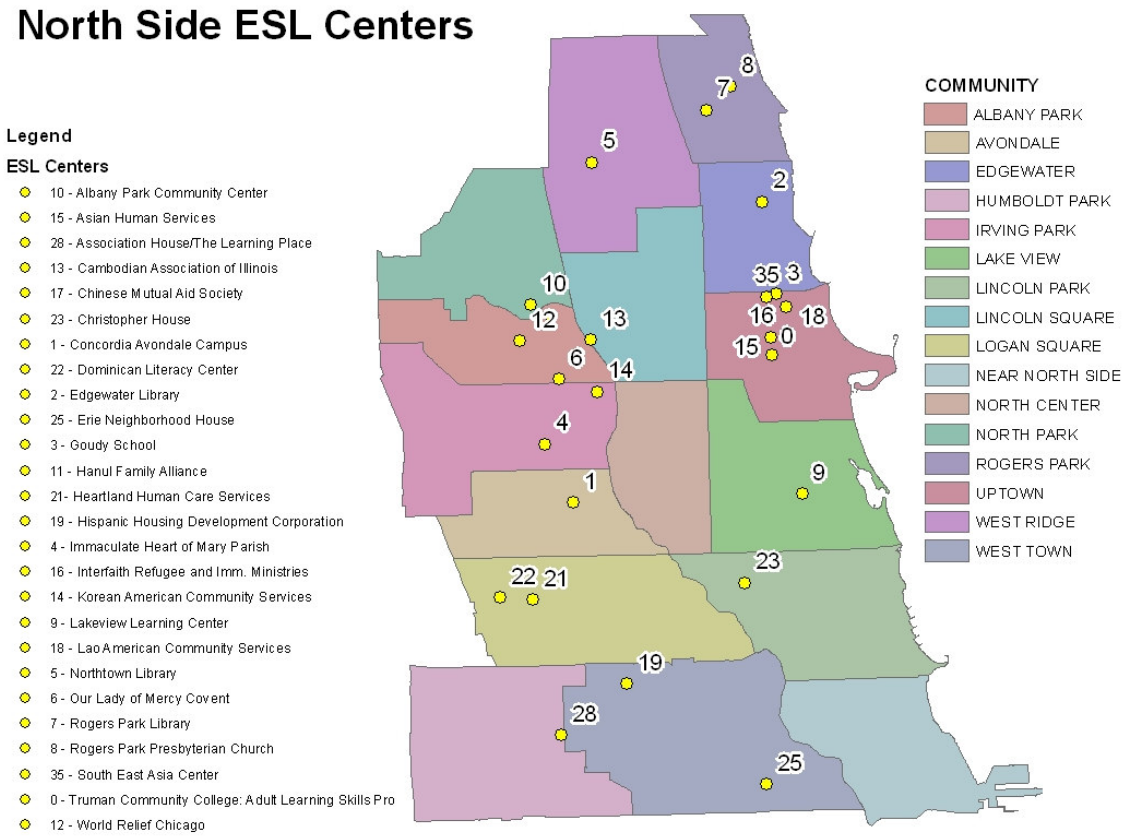
Map 4 shows the ESL centers serving Spanish speakers.



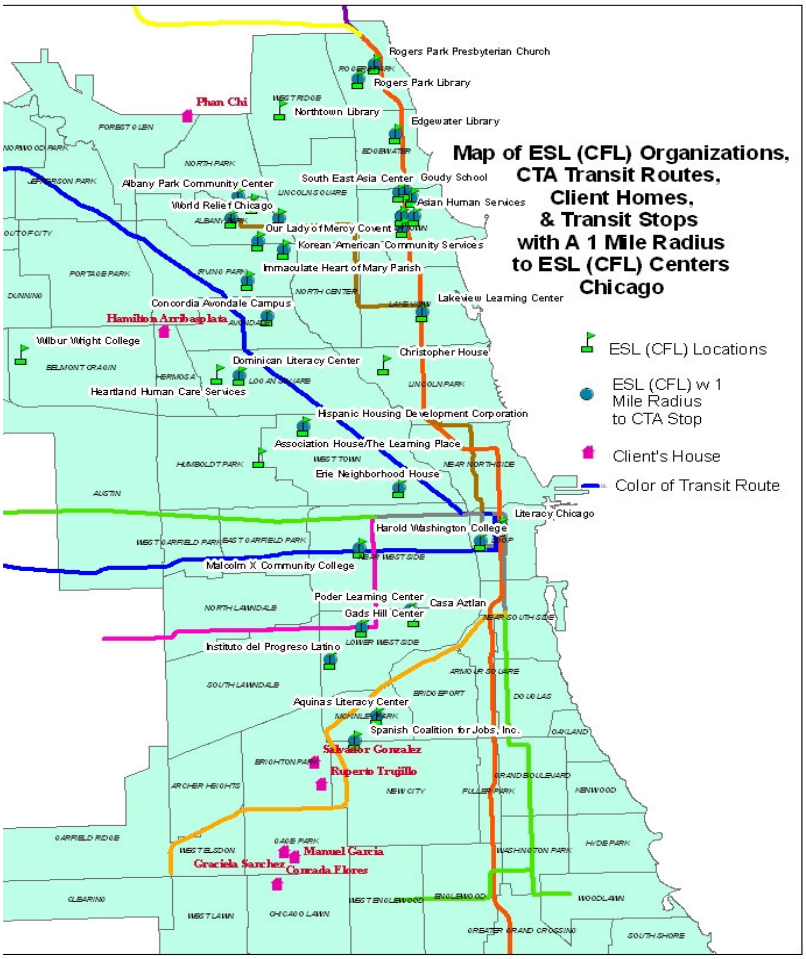
Map 5. shows all the ESL centers that do not charge for service with the CTA lines and community boundaries in the background.



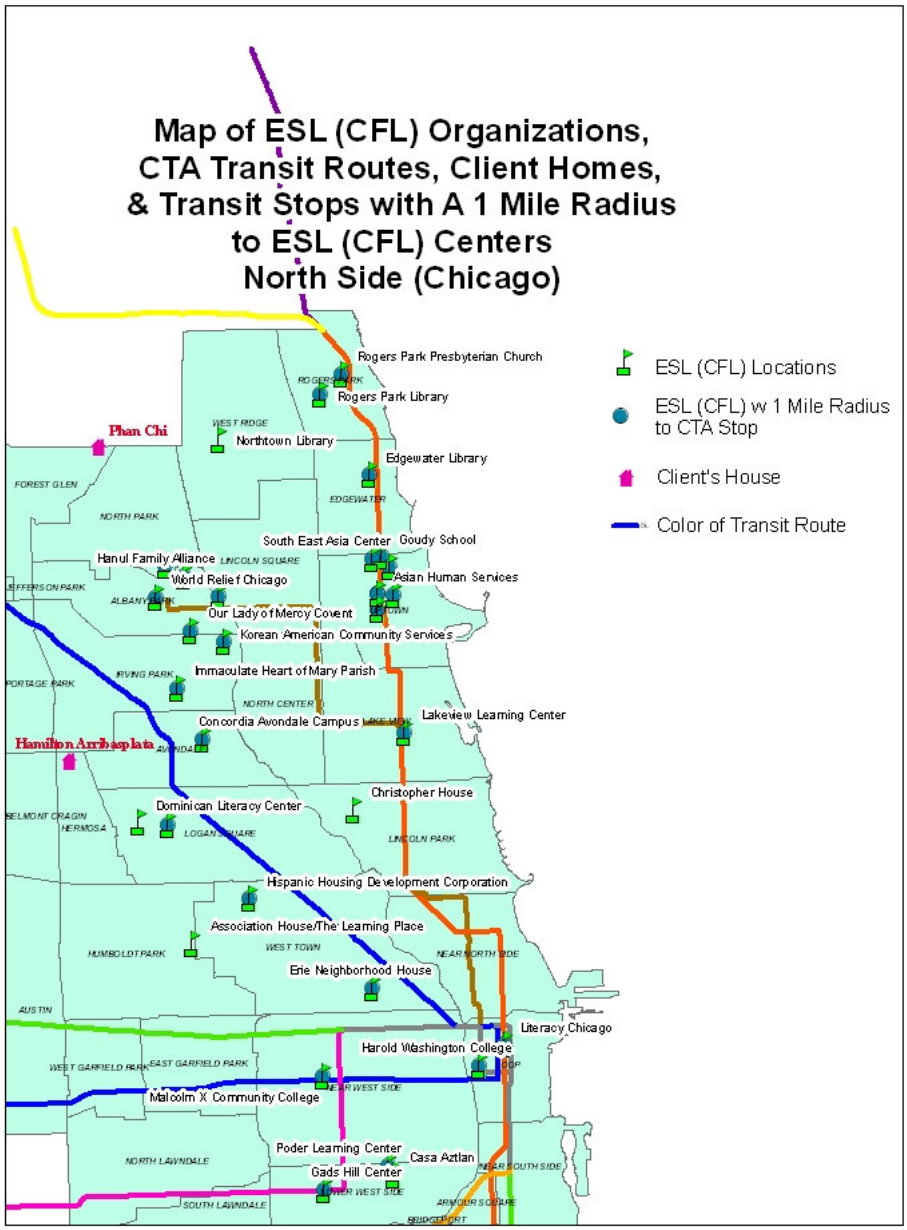
Map 6 describes the ESL centers and CTA stations that are handicap accessible.



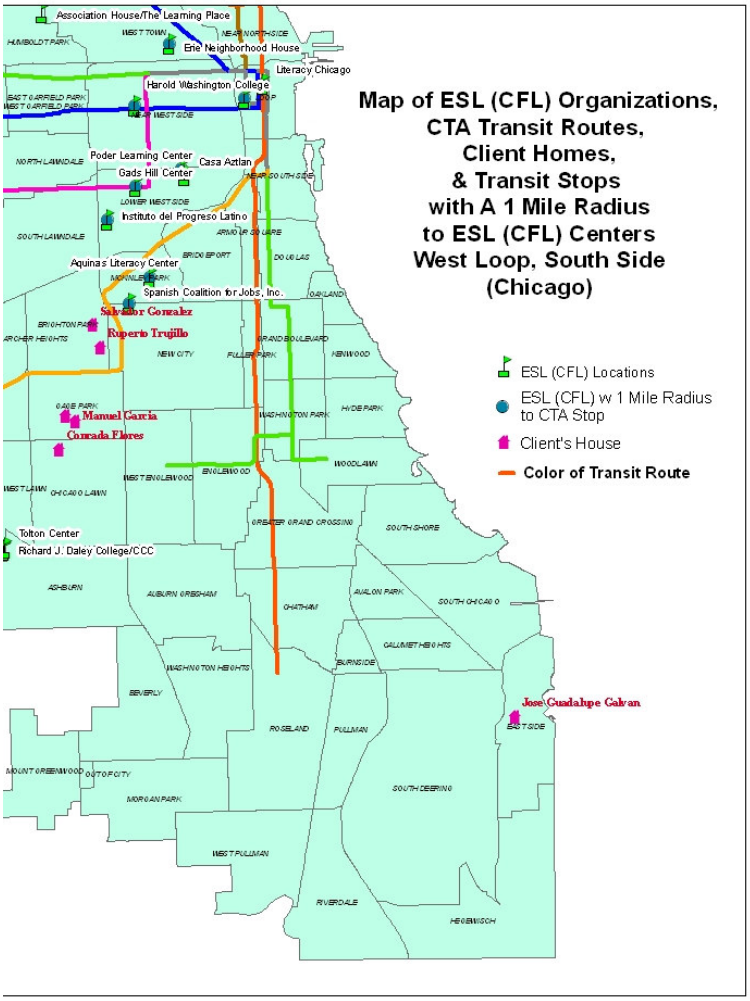
Map 7 is a map of ESL centers on the north side of Chicago. This area was zoomed in on because many of the ESL centers are located in this area.



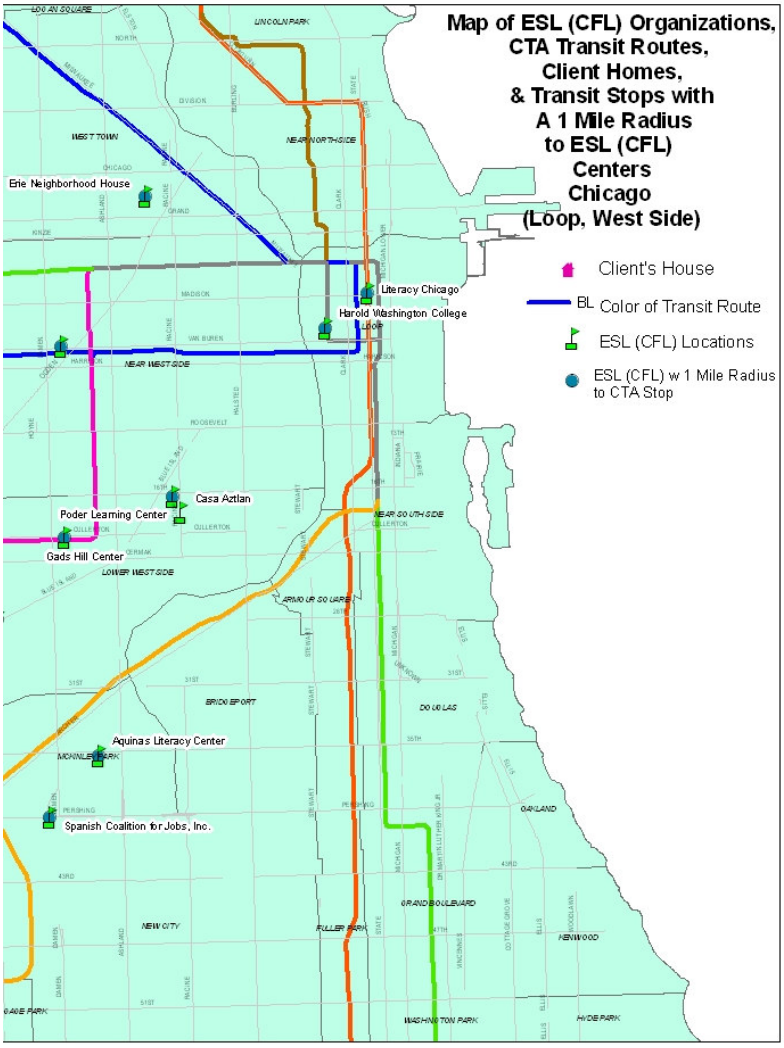
Map 8 shows an overview of ESL locations, client's homes next to CTA transit lines in the Chicagoland area. The map provides a general overview of the ESL locations in the city and their proximity to major transit lines. One can notice that there are more ESL (CFL) centers in the North side of Chicago. This suggests that there are more ethnically diverse neighborhoods on the north side than on the south side.



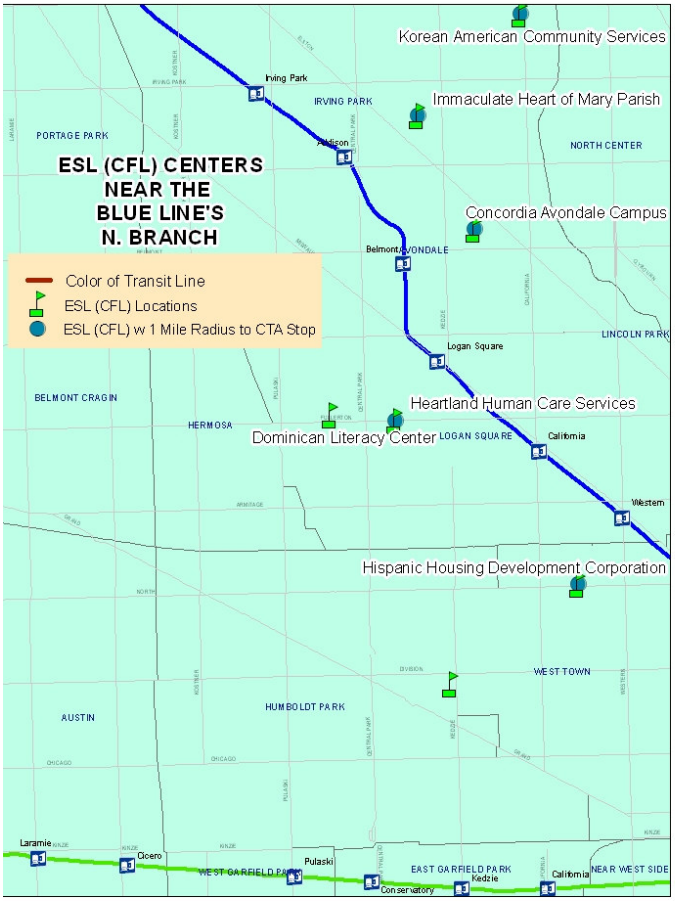
Map 9 is more of a close up on the North side. One can notice that influx of ESL centers dispersed in Uptown and Albany Park.



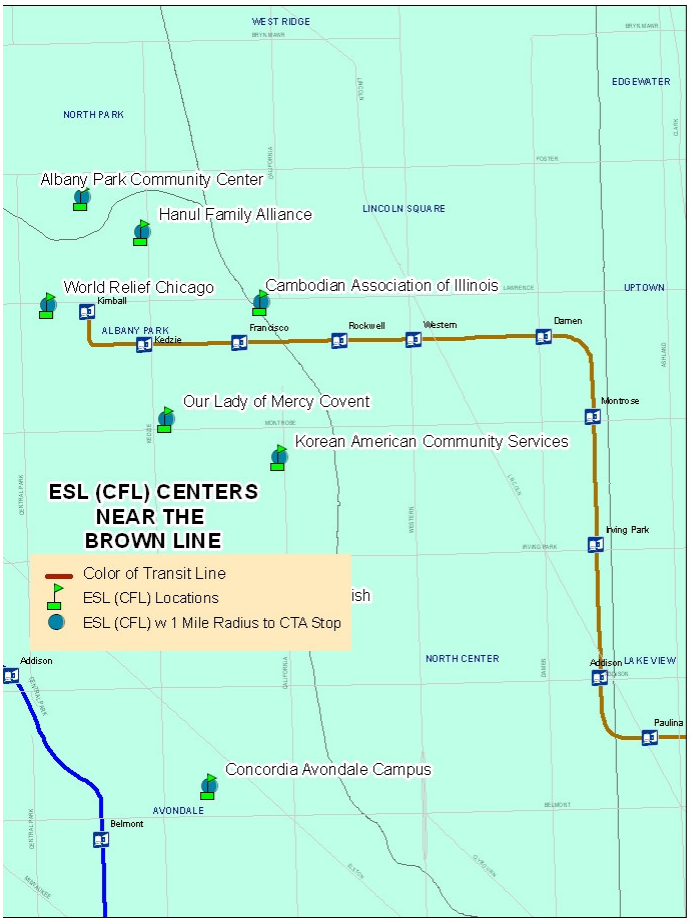
Map 10 portrays a close up of the greater South side of Chicago. The Lower West Side reveals high concentrations of data, because the area has a large Latino population.



Map 11 look at what types of ESL locations are located within the central business district. We notice that there are very few.



Map 12 zooms in on a section of the blue line, and tells us more about the nature of the neighborhoods and ESL locations located in the vicinity.



Map 13 zooms in on a section of the brown line, and tells us more about the nature of the neighborhoods and ESL locations located in the vicinity. All locations are located within one mile from the nearest CTA station.

Map14 zooms in on a section of the red line, and tells us more about the nature of the neighborhoods and ESL locations located in the vicinity. Judging by the names of the ESL centers located in Uptown, one can figure that the area as a high Asian population.

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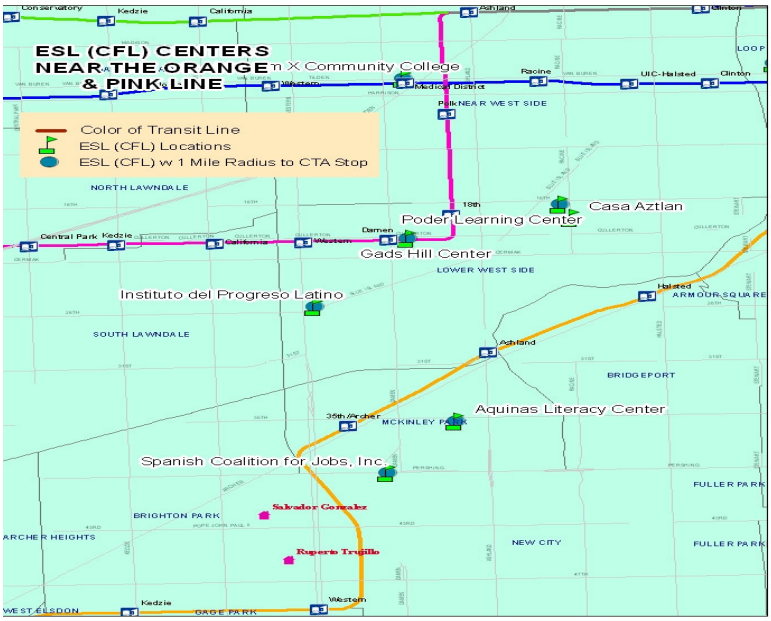


Map 15 zooms in on a section of the pink and orange line, and tells us more about the nature of the neighborhoods and ESL locations located in the vicinity. Once again all the ESL locations are located within one mile of the nearest CTA stop.

Data Analysis

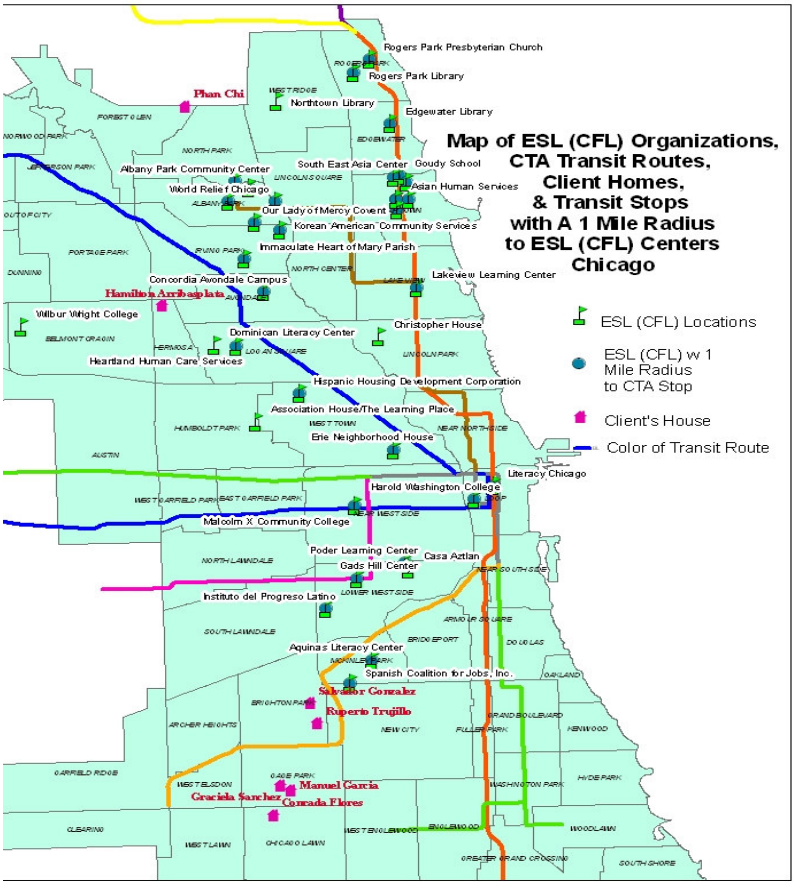
In the final analysis, the goals and objectives our group set out to accomplish in the beginning of the project have been completed to a point where we as a group feel satisfied with the work and progress made within the project making process. The CFL organization ultimately wanted to have their data be presented in a convenient, easy-to-understand, visual fashion which could be translated to all audiences. (Those audiences representing their clients and parties interested in using their special services across the Chicagoland area).

(*Original information product shown as a table, given to us by the CFL)*

Site name	**Address**	**Fax**
Truman Community College: Adult Learning Skills Program	1145 W. Wilson	
*Christopher House	2507 N. Greenview	
*Concordia Avondale Campus	3300 N. Whipple	
*Edgewater Library	1210 W. Elmdale	
*Goudy School	5120 N. Winthrop Ave.	
*Immaculate Heart of Mary Parish	3834 N. Spaulding (Address of Church is 3900 N. Albany)	
*Northtown Library	6435 N. California	
*Our Lady of Mercy Covent	4432 N. Troy	

As GIS specialists, our group was depended on to construct information products such as maps to help the CFL generate an information product map that they could utilize in marketing their organization to clients and potential clients within the Chicagoland area.

(map below, one of the final information products we completed)



The CFL emphasized the importance of mapping all the CFL affiliated organizations and addresses of their clients in proximity to those (CFL) ESL locations within the Chicagoland area (although the latter was less significant in the final result). From the beginning, knowing where the locations of the CFL affiliated organizations in the Chicagoland area was established first and foremost as the foundation for our entire project. Our group understood that just by knowing the locations of the CFL affiliated centers, and client addresses in proximity to those locations in the Chicagoland area was not enough to organize a dynamic, elaborate, and quality project. We wanted to create an

information product map that served audiences in more ways than one. Our brainstorming led us to add additional need to know questions to the original one (Locations of ESL centers). Suddenly, the significance of knowing what CTA affiliated stations and route lines close to the CFL (ESL) locations became quintessential need to know questions that could add more depth into our analysis. Transportation to these centers was the group's main theme and building block in additional data analysis to the original need to know question.

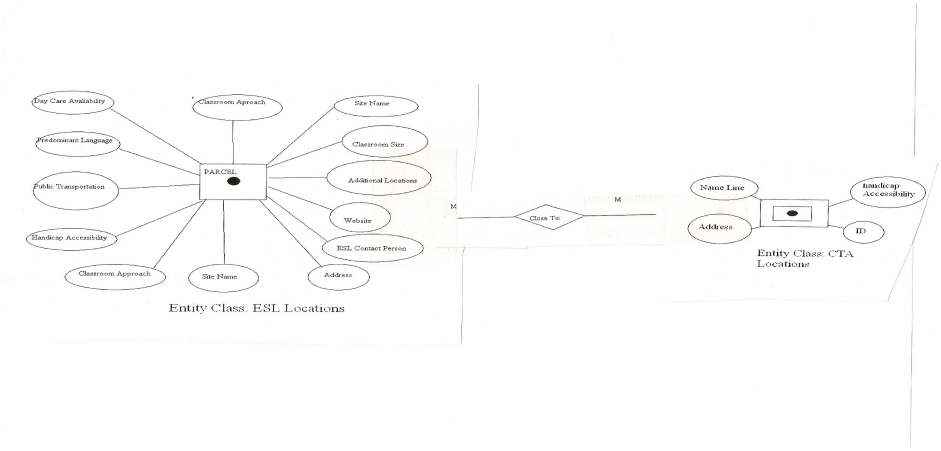
Originally we set out to include the need to know questions that are described below:

- what major roads are near these CFL related organizations/ clients homes
- what major bus routes, bus stops, were close to the locations/ client homes
- what major transit lines and transit stops were close to the locations/ client homes

We eventually could not use the first two need to know questions, because the data sets were hard to obtain and at times too large to include into an information product. Sometimes displaying too much information on the map didn't necessarily clarify the intention of what the maps were originally set out to explain. The realization came from a series of trial and errors sessions in creating the maps.

Our group stressed the importance of creating products that were neat, simple, concise and highly informative. The emphasis in communicating an easy to understand information product to various types of parties was taken into consideration extensively throughout the campaign. Ultimately, the decision to generate a product that utilized the locations of the CTA transit stops and lines in proximity to the ESL locations/ clients'

homes was one that we stuck with to the end. The data sets relating to transit related themes were easier to obtain, and easy to manipulate on an information product; rather than what we uncovered in working with excessive data sets of major road ways and bus routes on the CTA which populated the map and made it hard to read.



Our final information products reveal to some extent what we originally had in plan. The original need to know question was our reference point, and was present in almost all of our final information products (maps). Our additional input into the original need to know question ended up being the location of the CTA transit stations and lines, because it was consistent within simple and concise parameters.

Eliminating the need to incorporate the locations of major roads, bus stations and routes, was not necessarily a final decision. The additional need to know questions like the ones we chose to exclude are not limitations, but better opportunities in enhancing future information products. Our time frame limited us from taking this extra procedure, so we had to create products that took time into consideration as well as the more significance need to know questions that we prioritized from the beginning. If anything,

the effort in adding more transportation related data (highways, bus routes, railroad, etc) in the map, would compensate for the need to enhance the project's quality even further.

Our information products were successful in being consistent with what the CFL organization wanted from us in the beginning. It was imperative that we helped generate a product that would please their organization and their clientele. Our additional analysis to the original need to know question made our project more dynamic and allowed audiences to understand a visual information product in more ways than one. There are surely no limits on enhancing the information products from the ones we made; and this is where we can improve in the future. Our group is content with the products we have generated, because the original need to know question was met in all information products; any additional data analysis we contributed into the project was beneficiary to the CFL organization in understanding what is being conveyed on the information product maps in more ways than one.

Summary, Conclusions, and Recommendations

In the final analysis, the goals and objectives our group set out to accomplish in the beginning of the project have been completed to a point where we as a group feel satisfied with the work and progress made within the project making process. The CFL organization ultimately wanted to have their data be presented in a convenient, easy-to-understand, visual fashion which could be translated to all audiences. (Those audiences representing their clients and parties interested in using their special services across the Chicagoland area).

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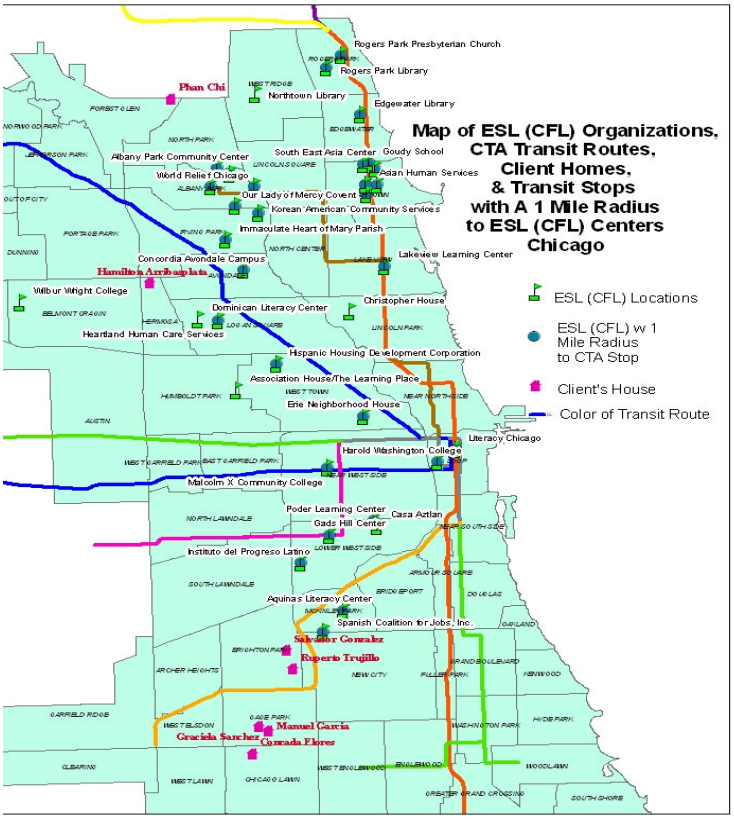
(Map below, one of the final information products we completed)



The CFL emphasized the importance of mapping all the CFL affiliated organizations and addresses of their clients in proximity to those (CFL) ESL locations within the Chicagoland area (although the latter was less significant in the final result). From the beginning, knowing where the locations of the CFL affiliated organizations in the Chicagoland area was established first and foremost as the foundation for our entire project. Our group understood that just by knowing the locations of the CFL affiliated centers, and client addresses in proximity to those locations in the Chicagoland area was not enough to organize a dynamic, elaborate, and quality project. We wanted to create an information product map that served audiences in more ways than one. Our brainstorming led us to add additional need to know questions to the original one (Locations of ESL centers). Suddenly, the significance of knowing what CTA affiliated stations and route lines close to the CFL (ESL) locations became quintessential need to know questions that could add more depth into our analysis. Transportation to these centers was the group's main theme and building block in additional data analysis to the original need to know question.

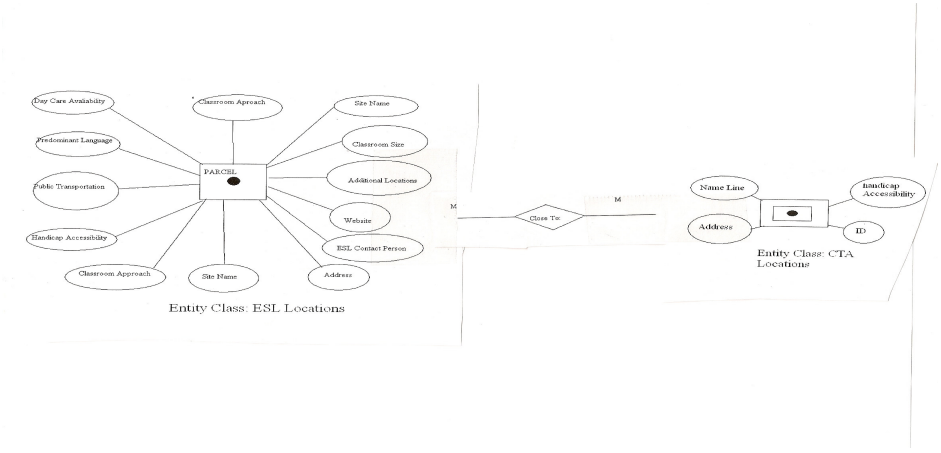
Originally we set out to include the need to know questions that are described below:

- what major roads are near these CFL related organizations/ clients homes
- what major bus routes, bus stops, were close to the locations/ client homes
- what major transit lines and transit stops were close to the locations/ client homes

We eventually could not use the first two need to know questions, because the data sets were hard to obtain and at times too large to include into an information product.

Sometimes displaying too much information on the map didn't necessarily clarify the intention of what the maps were originally set out to explain. The realization came from a series of trial and errors sessions in creating the maps.

Our group stressed the importance of creating products that were neat, simple, concise and highly informative. The emphasis in communicating an easy to understand information product to various types of parties was taken into consideration extensively throughout the campaign. Ultimately, the decision to generate a product that utilized the locations of the CTA transit stops and lines in proximity to the ESL locations/ clients' homes was one that we stuck with to the end. The data sets relating to transit related themes were easier to obtain, and easy to manipulate on an information product; rather than what we uncovered in working with excessive data sets of major road ways and bus routes on the CTA which populated the map and made it hard to read.



Our final information products reveal to some extent what we originally had in plan. The original need to know question was our reference point, and was present in almost all of our final information products (maps). Our additional input into the original

need to know question ended up being the location of the CTA transit stations and lines, because it was consistent within simple and concise parameters.

Eliminating the need to incorporate the locations of major roads, bus stations and routes, was not necessarily a final decision. The additional need to know questions like the ones we chose to exclude are not limitations, but better opportunities in enhancing future information products. Our time frame limited us from taking this extra procedure, so we had to create products that took time into consideration as well as the more significance need to know questions that we prioritized from the beginning. If anything, the effort in adding more transportation related data (highways, bus routes, railroad, etc) in the map, would compensate for the need to enhance the project's quality even further.

Our information products were successful in being consistent with what the CFL organization wanted from us in the beginning. It was imperative that we helped generate a product that would please their organization and their clientele. Our additional analysis to the original need to know question made our project more dynamic and allowed audiences to understand a visual information product in more ways than one. There are surely no limits on enhancing the information products from the ones we made; and this is where we can improve in the future. Our group is content with the products we have generated, because the original need to know question was met in all information products; any additional data analysis we contributed into the project was beneficiary to the CFL organization in understanding what is being conveyed on the information product maps in more ways than one.

Works Cited

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