

# Analysis of The Green Chair Project Client Demographics

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## Abstract

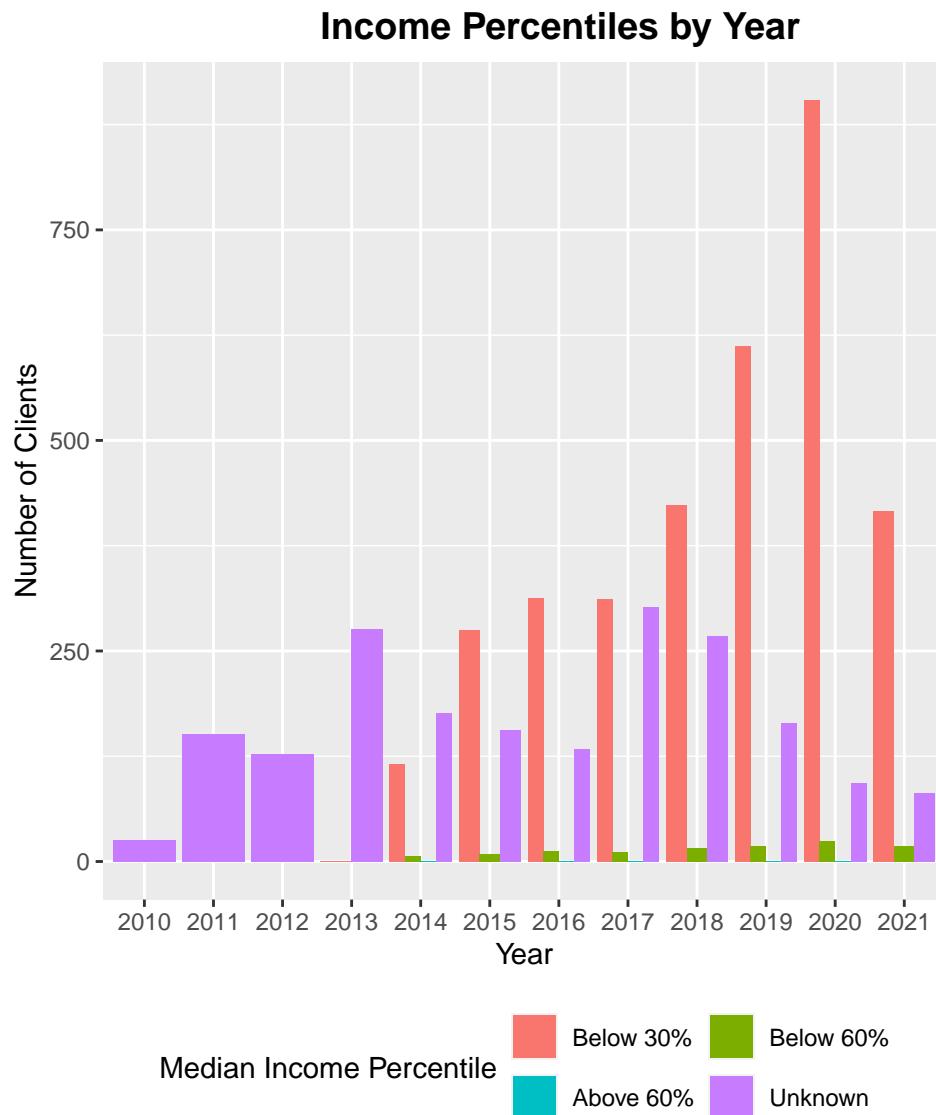
This report contains an exploration and analysis of data on The Green Chair Project's (TGCP) clients and Wake County public schools through plots and maps.

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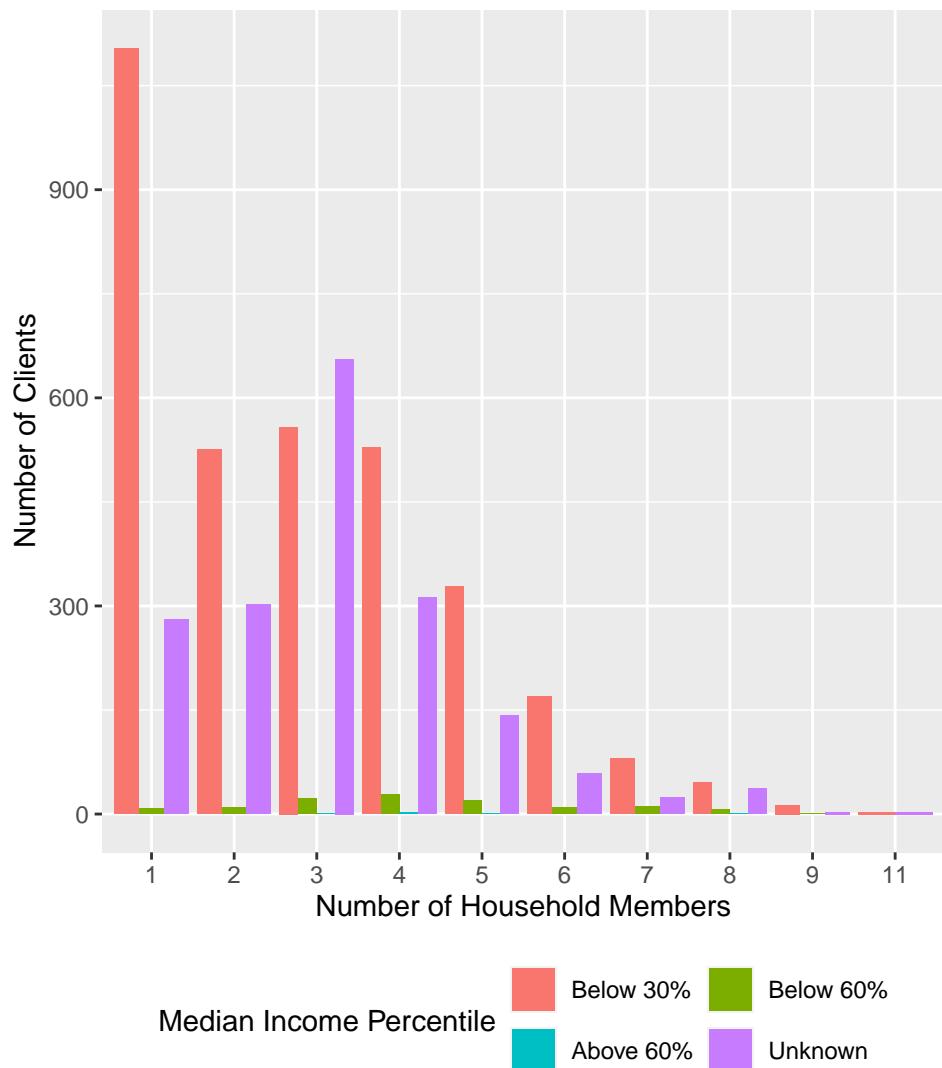
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## 1 Exploring TGCP data

We have spent a lot of time cleaning the data, allowing us to start making visualizations. First, we wanted to answer how many clients are living below the 30% median income line, how many are in the 30% and 60% range, and how many are above the 60% range. It's important to note that the thresholds for these classifications change both by year and by the number of people that live in a household. You can see the thresholds for 2021 here, provided by the HOME Investment Partnerships Program. Note that we are using the threshold for Raleigh. With all that in mind, we have categorized each client/family as being below the 30% line, between 30% and 60%, above 60%, or unknown (if the income data was unavailable).

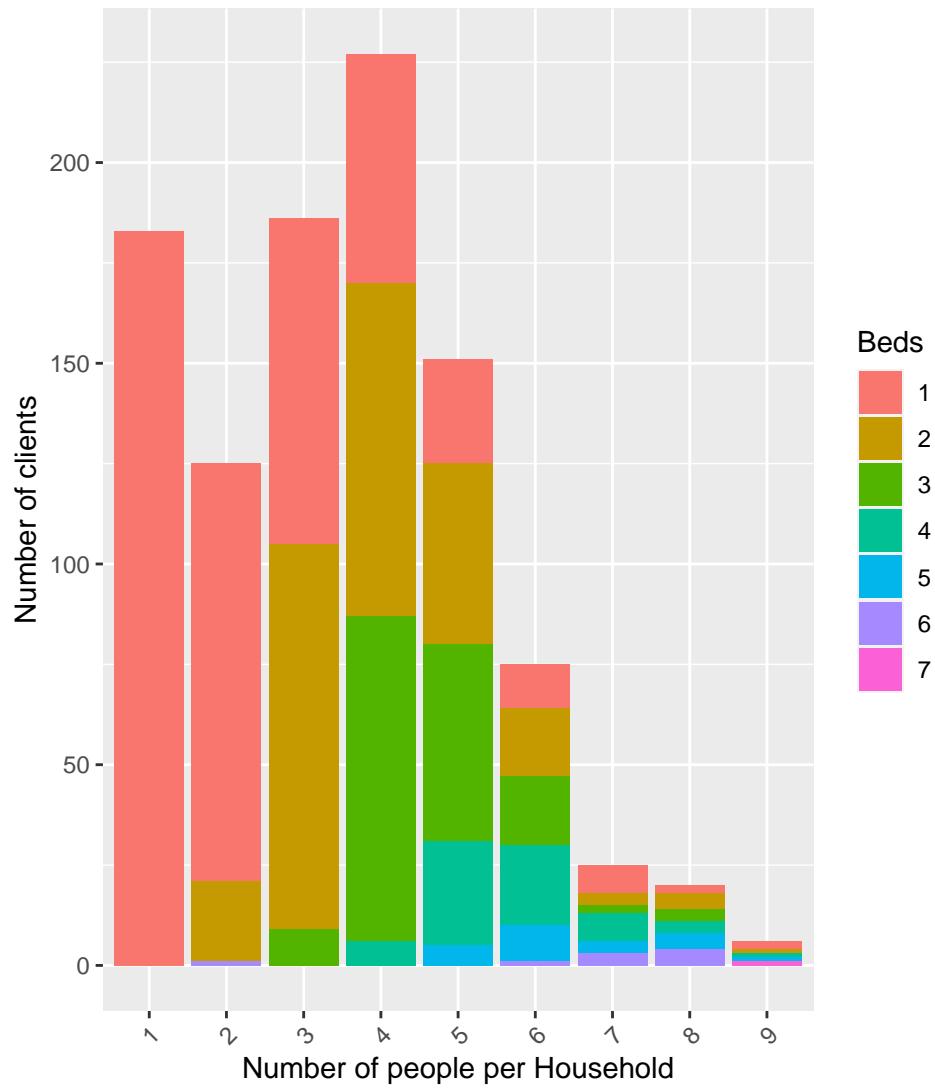


## Income Percentiles by Number of Household Members



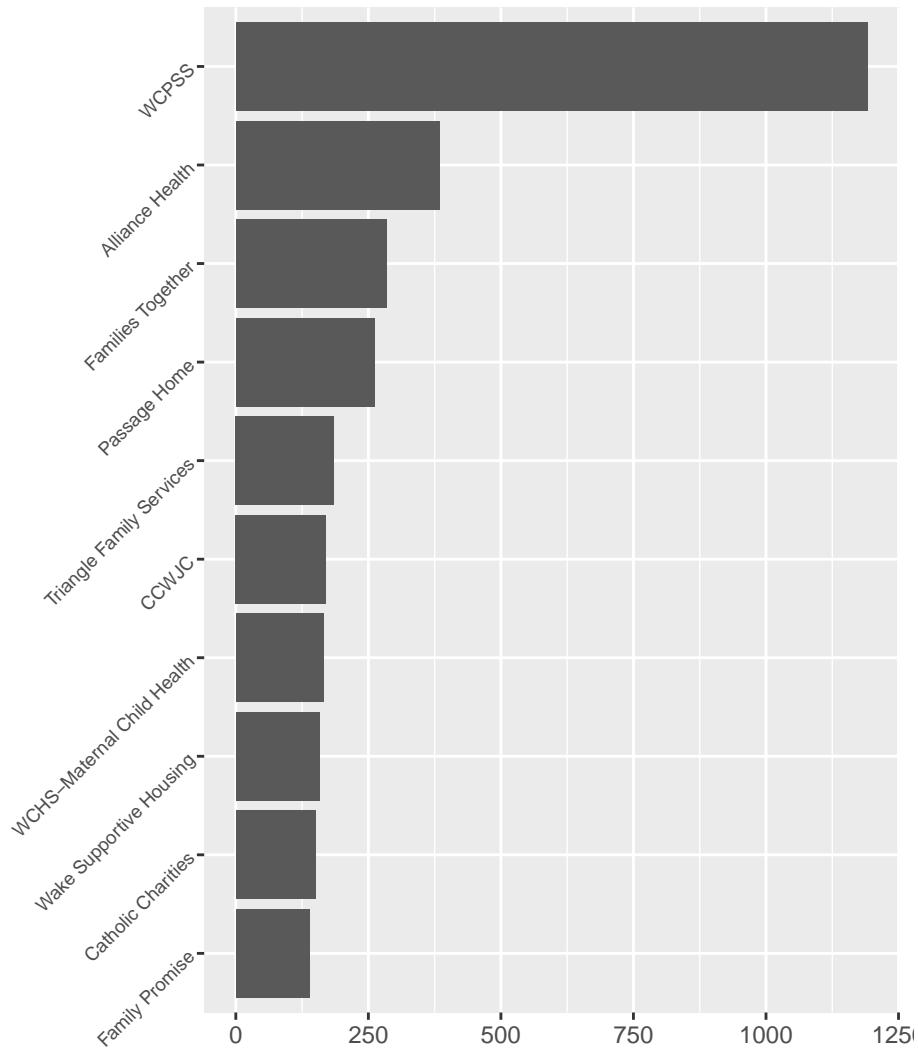
We have also looked at the total number of beds provided to clients (number of twins and queens combined). Again, since this may change based on the number of members of a household, we have stratified.

### Number of Total Beds Given By Household Size



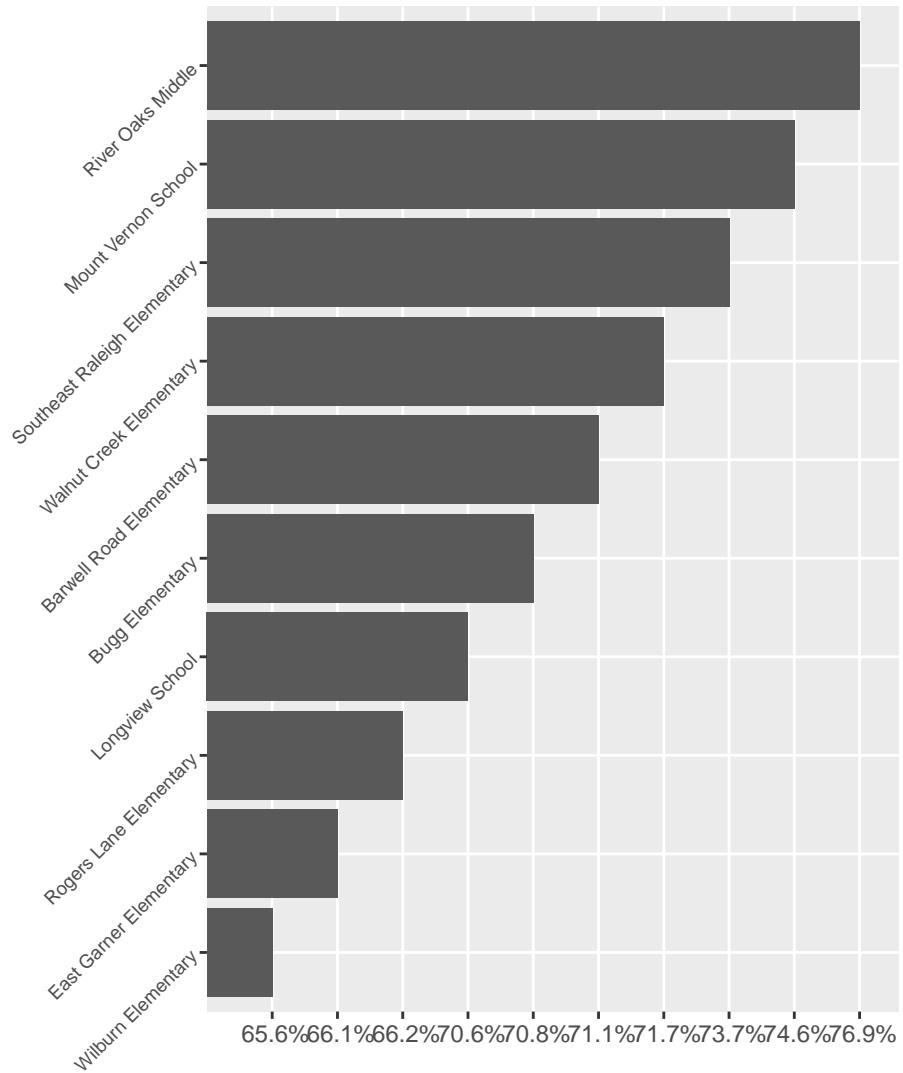
Next we wanted to investigate which agencies referred the most clients. From this, we can get a better grasp on where the clients are coming from and how to best serve them. These are the ten agencies that refer the most clients.

### Top 10 Agencies

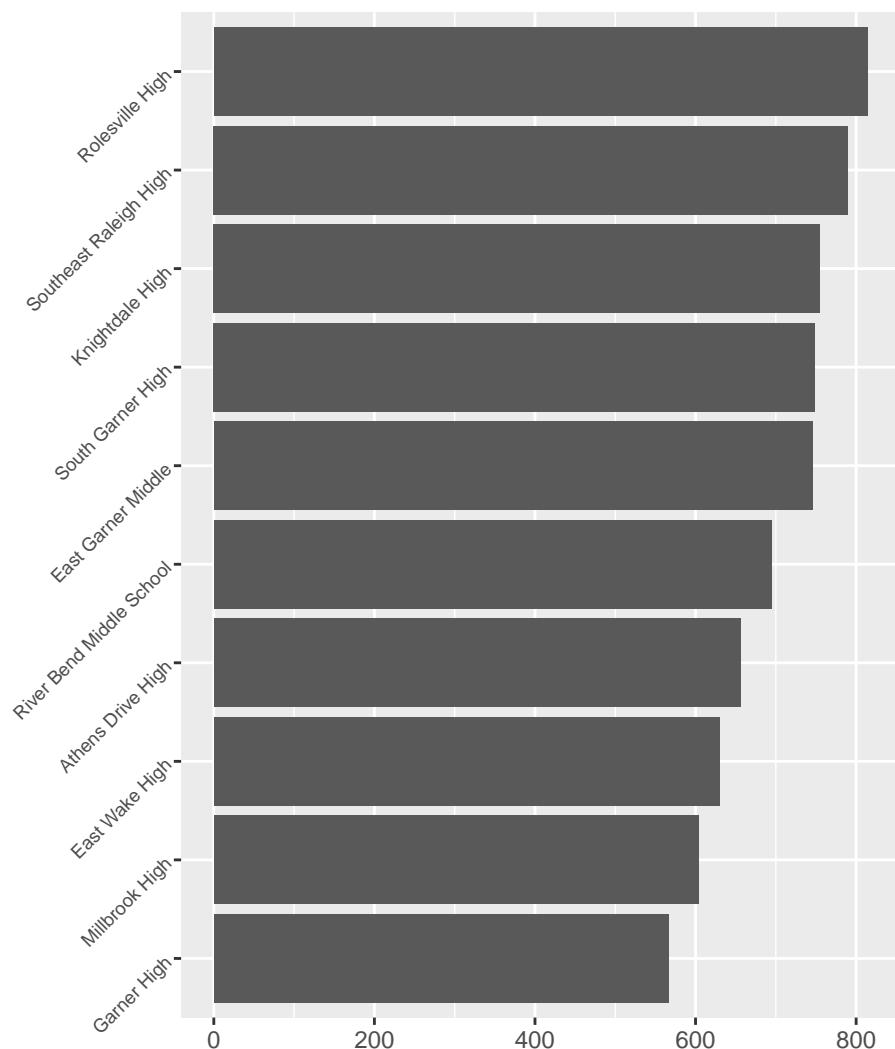


As expected, the Wake Country Public School System was referred the most by far, with nearly 1200 referrals. This has encouraged us to look further into the schools. We are compiling data including drop out/graduation rates, test scores, and free and reduced lunch participation for each public school in Wake county. Then we will be able to cross reference this with our data to find correlations between clients referred to TGCP and these external, school variables. Here we present the schools with the highest percentage of their students enrolled in the free and reduced lunch program as well as the schools with most highest total number of students enrolled in a lunch program.

## Top 10 Percentage Free and Reduced Lunch



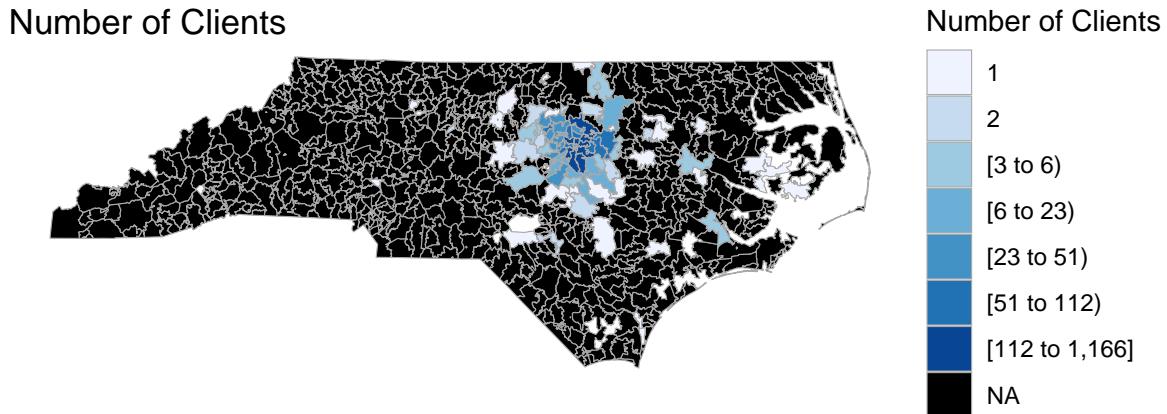
### Top 10 Total Free and Reduced Lunch



## 2 Met and Unmet Needs Mapping

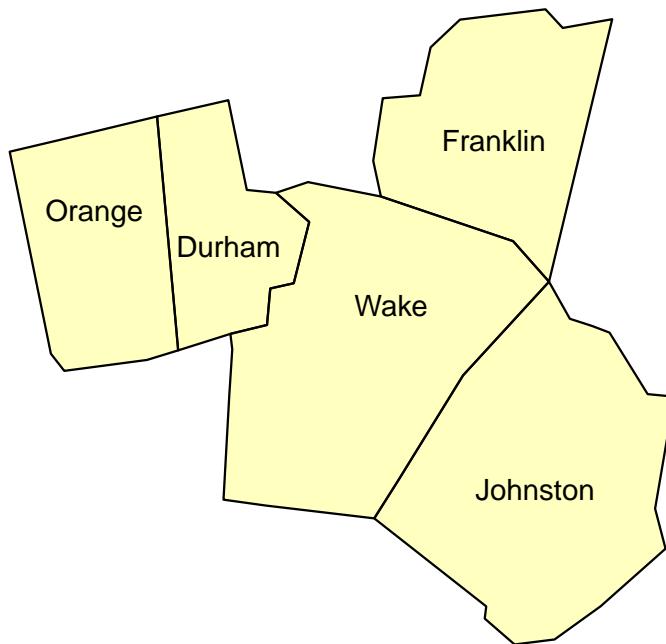
First, we map all the client zip codes in North Carolina.

For the zip codes that are not in North Carolina, one zip code is from Virginia (with one client), one zip code is from West Virginia (with one client) and the rest are typos.

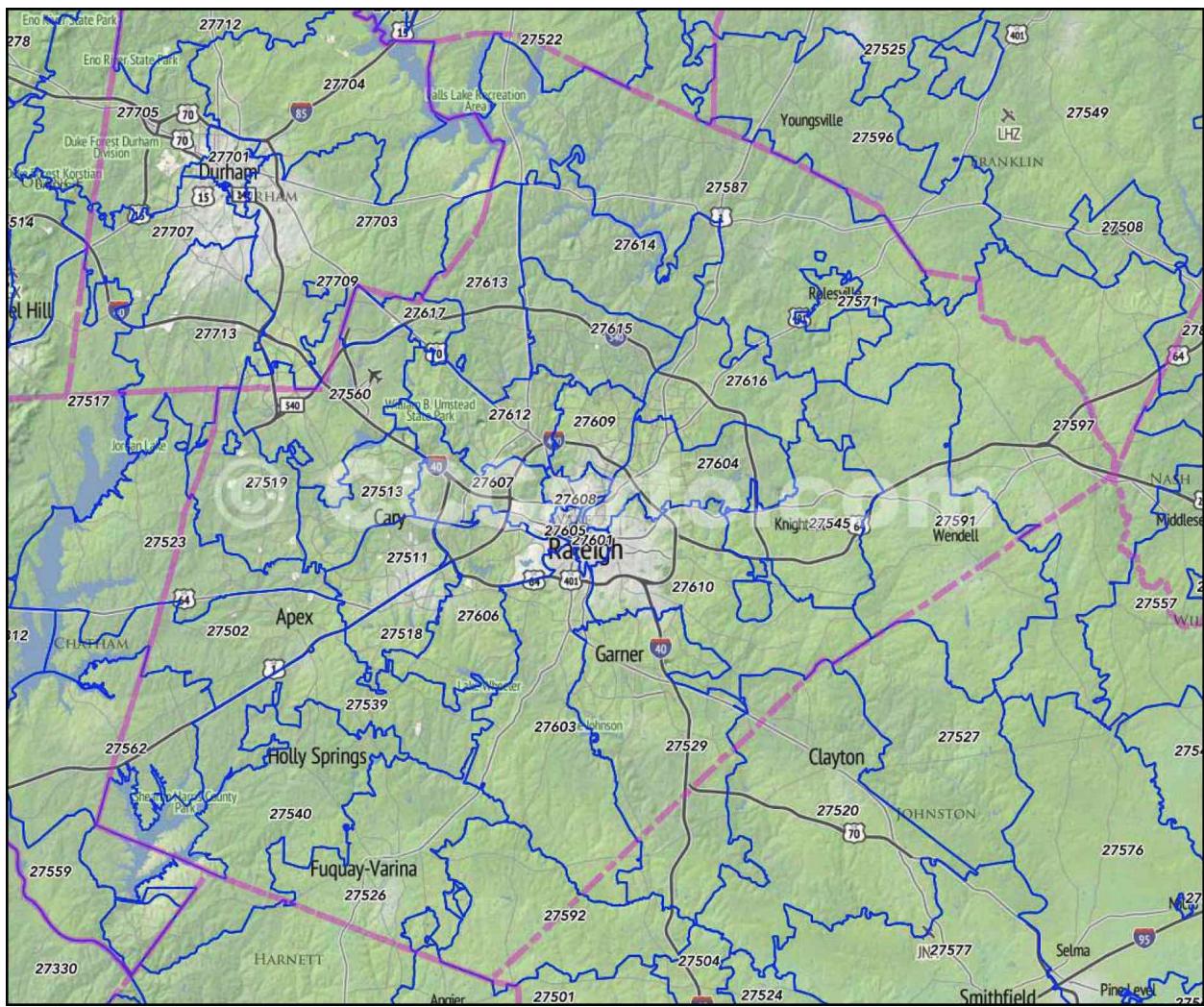


Five counties contain all the zip codes with at least 5 client households: Orange, Durham, Franklin, Wake, and Johnston. Most of the zip codes lie within Wake county.

**Counties Serviced by TGCP**



Below is a map of the zip codes in Wake County, taken from [https://www.cccarto.com/nc/wake\\_zipcodes/](https://www.cccarto.com/nc/wake_zipcodes/).

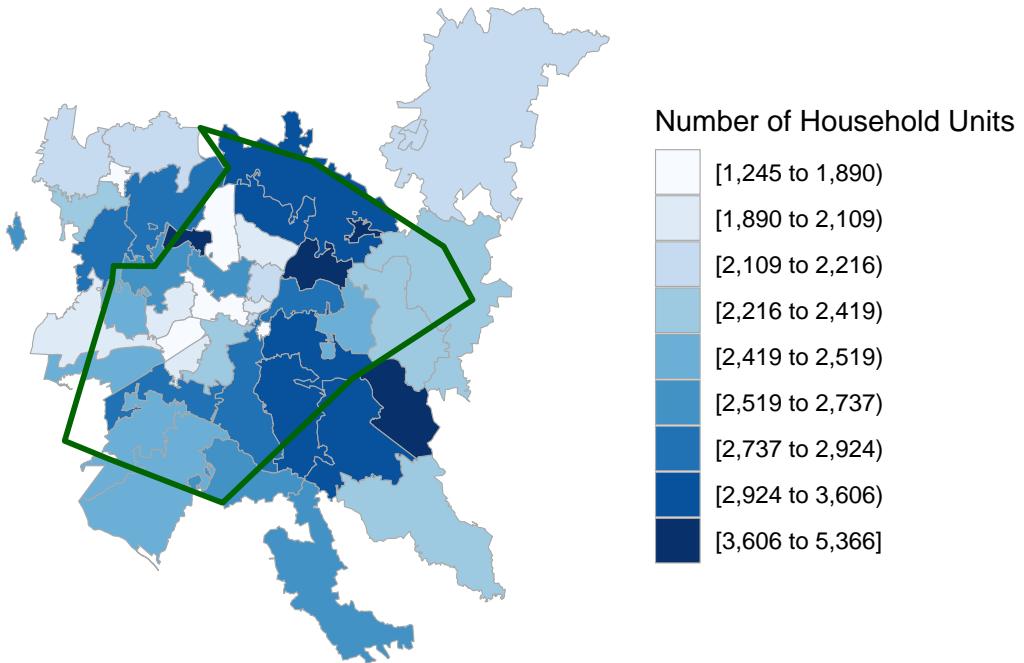


## 2.1 Needs mapping

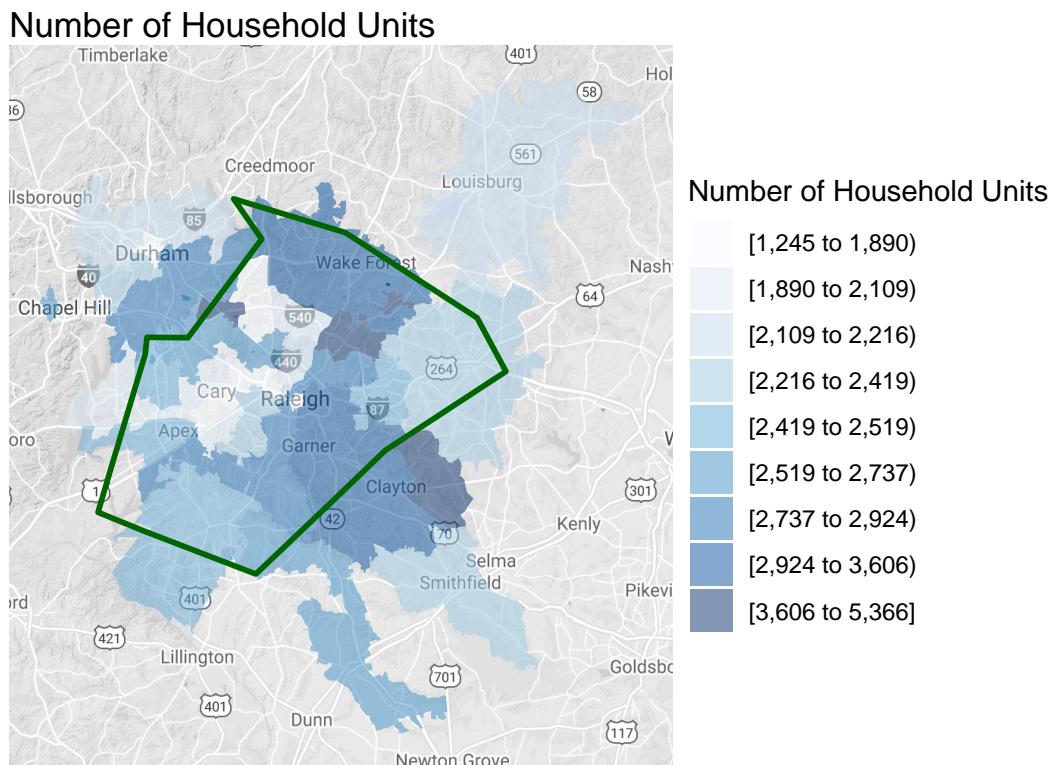
First, we plot the number of household units and the need as represented by lower Per Capita Income (PCI). These two variables are taken from the CDC Social Vulnerability Index.

Below shows the number of household units in each zip code that contains at least 5 TGCP client households. Wake County is outlined in green.

## Number of Household Units

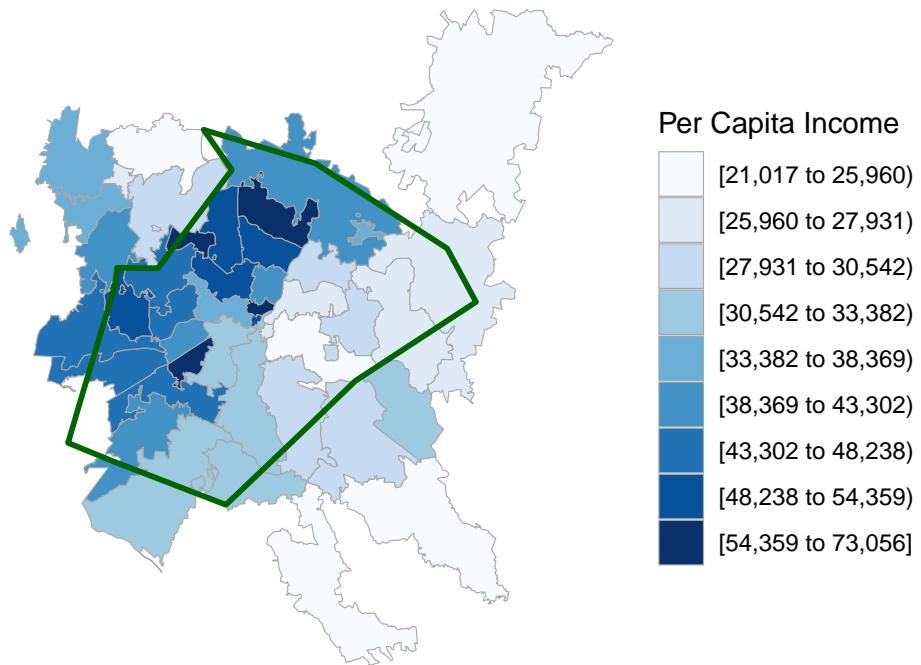


Below is the same map, overlaid over Google Maps.



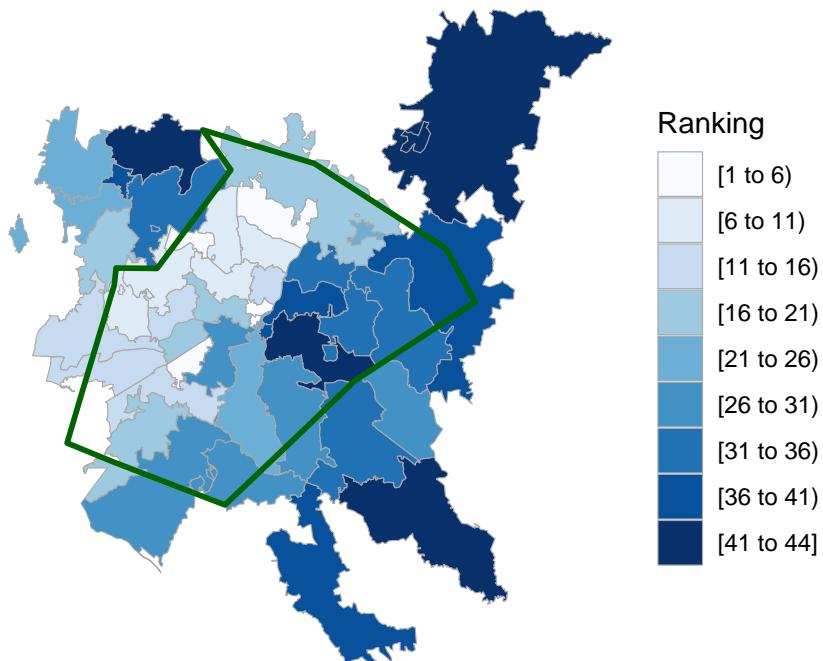
Below shows the Per Capita Income of each zip code.

## Per Capita Income



Below ranks the zip code according to PCI. That is, the rank of 1 is assigned to the highest PCI, and the last rank of 44 is assigned to the lowest PCI. Thus, a higher rank corresponds to higher need.

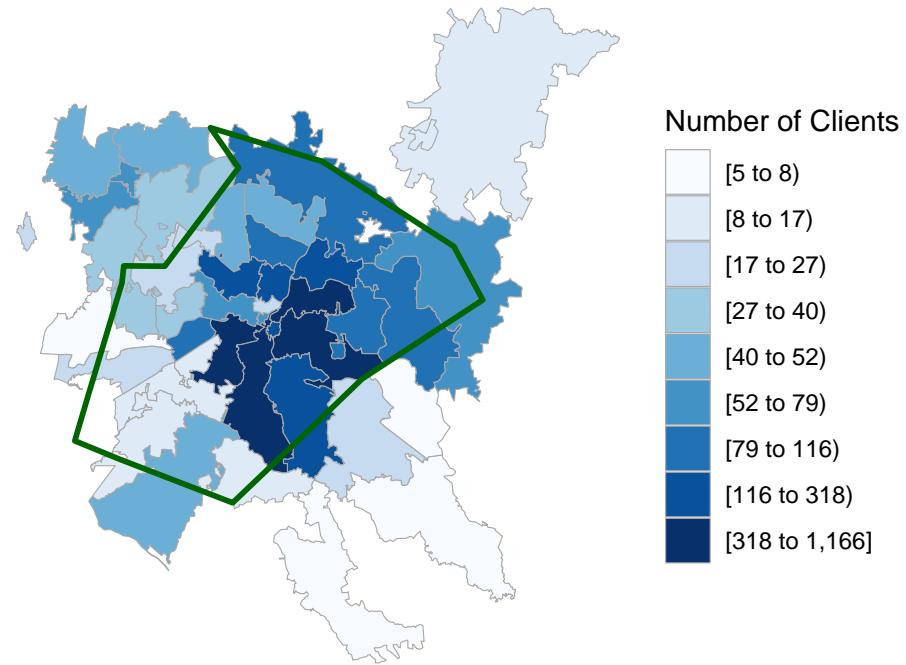
### Ranking of Need (corresponding to lower PCI)



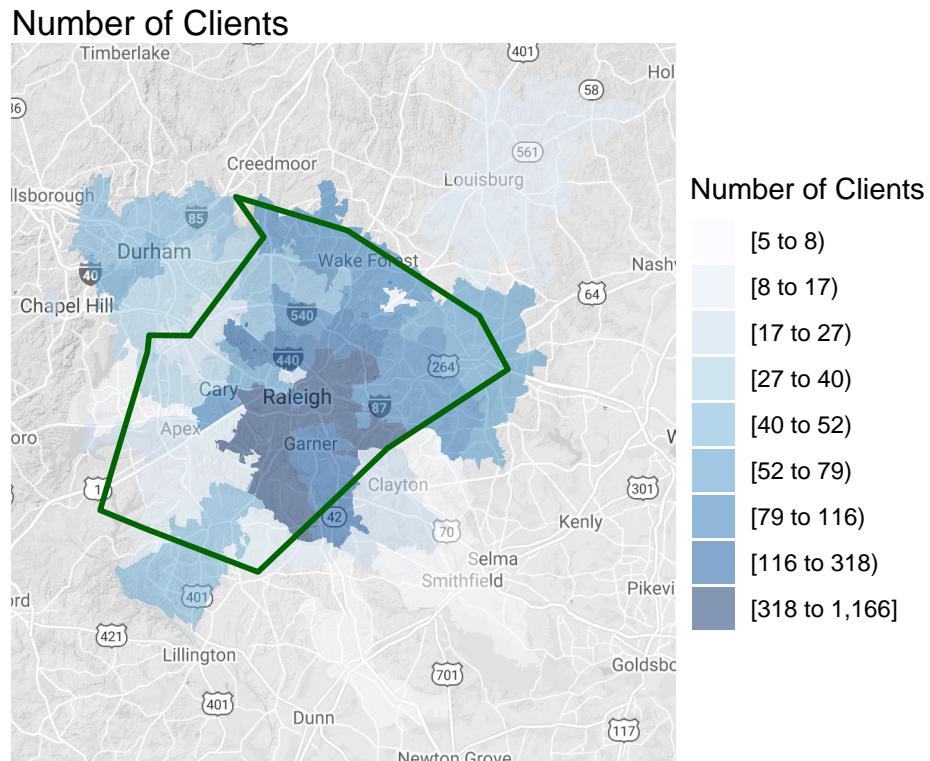
## 2.2 Met Needs Mapping

The below map shows the number of client households served by TGCP at each zip code.

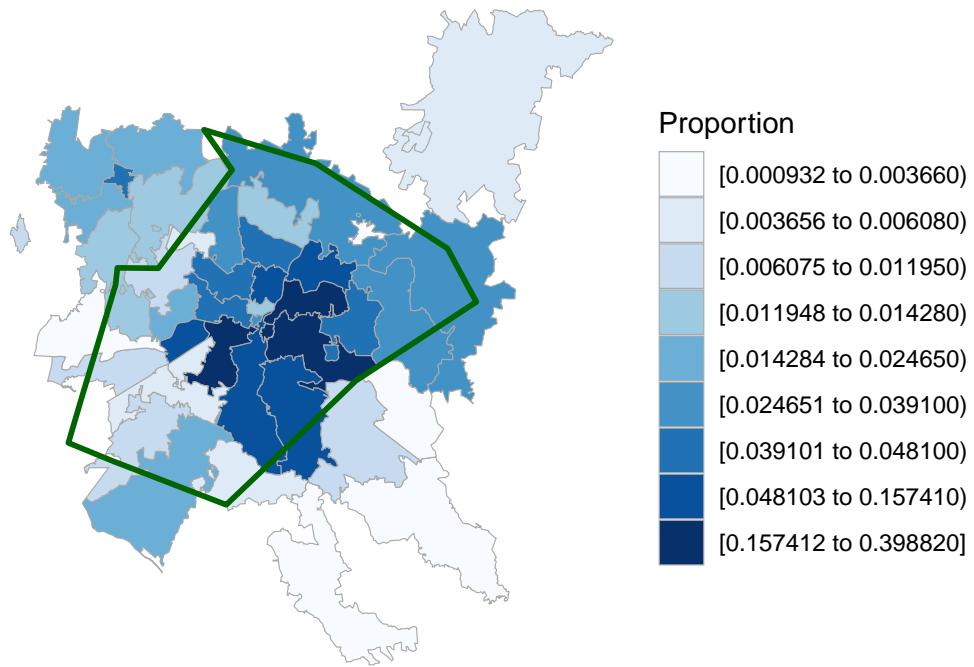
## Number of Clients



Below is the same map, overlaid over Google Maps.

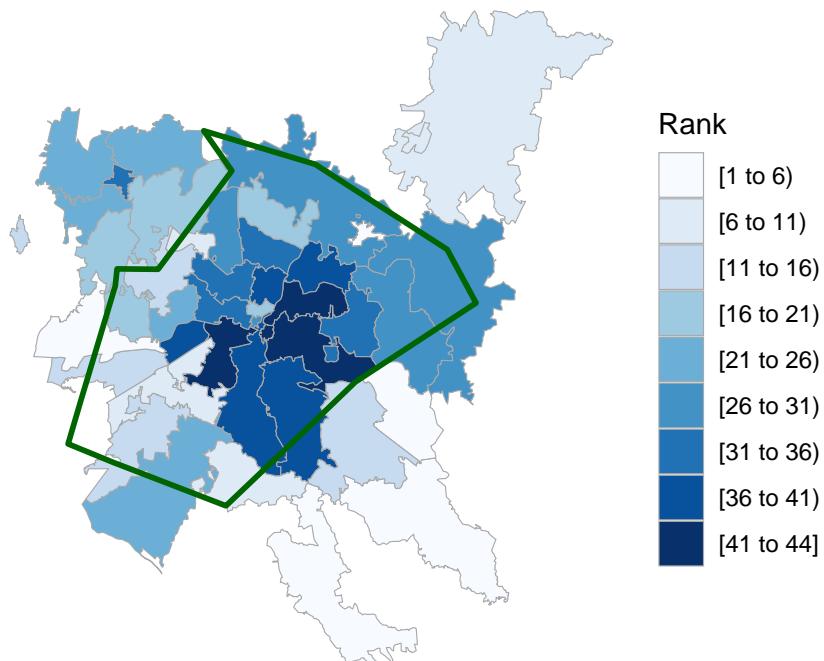


## Proportion of Households Served



Below ranks the zip code according to the proportion of households served. That is, the rank of 1 corresponds to the lowest proportion of households served, and the last rank of 44 corresponds to the highest proportion of households served. Thus, a higher rank corresponds to more service, or “needs met”.

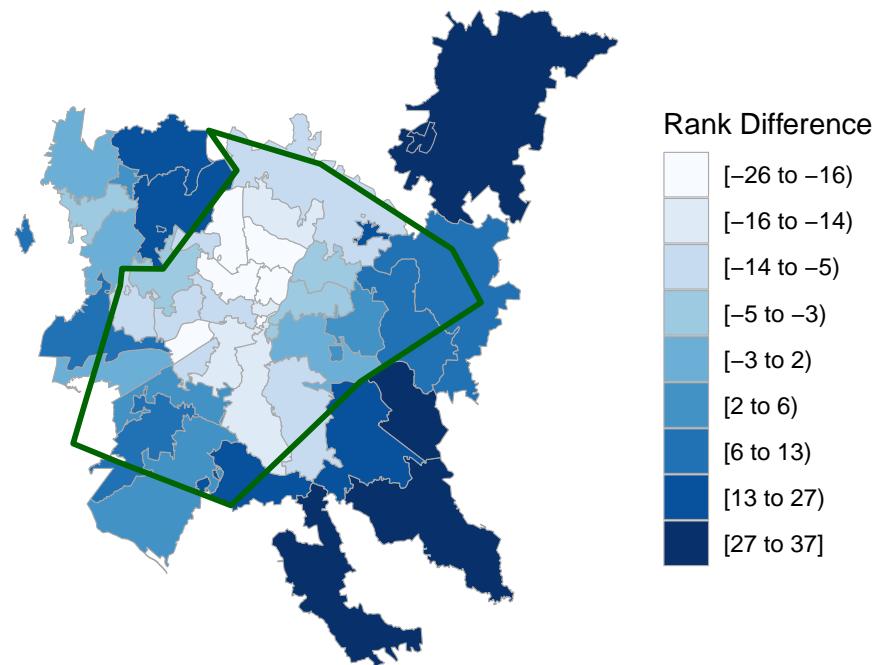
## Ranking of Proportion of Households Served



## 2.3 Unmet Needs Mapping

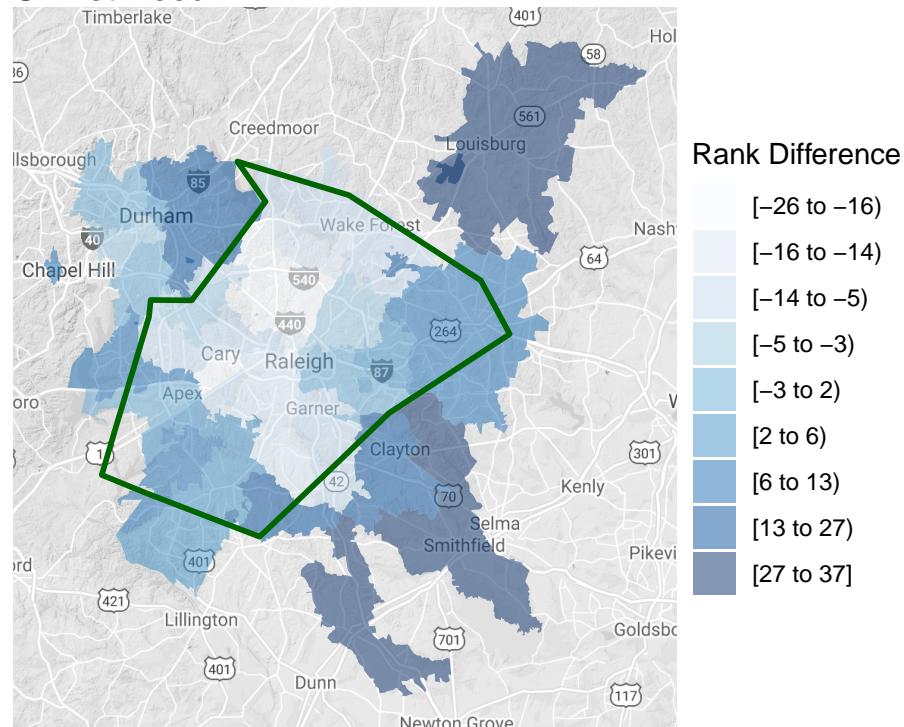
To measure “unmet need,” I take the difference of the PCI ranking (representing the “need”) and the proportion of households served ranking (representing the “met need”).

Unmet Need



Below is the same map, overlaid over Google Maps.

Unmet Need



As shown in the two plots above, the zip codes with the most “unmet need” tend to be on the periphery of Wake County.

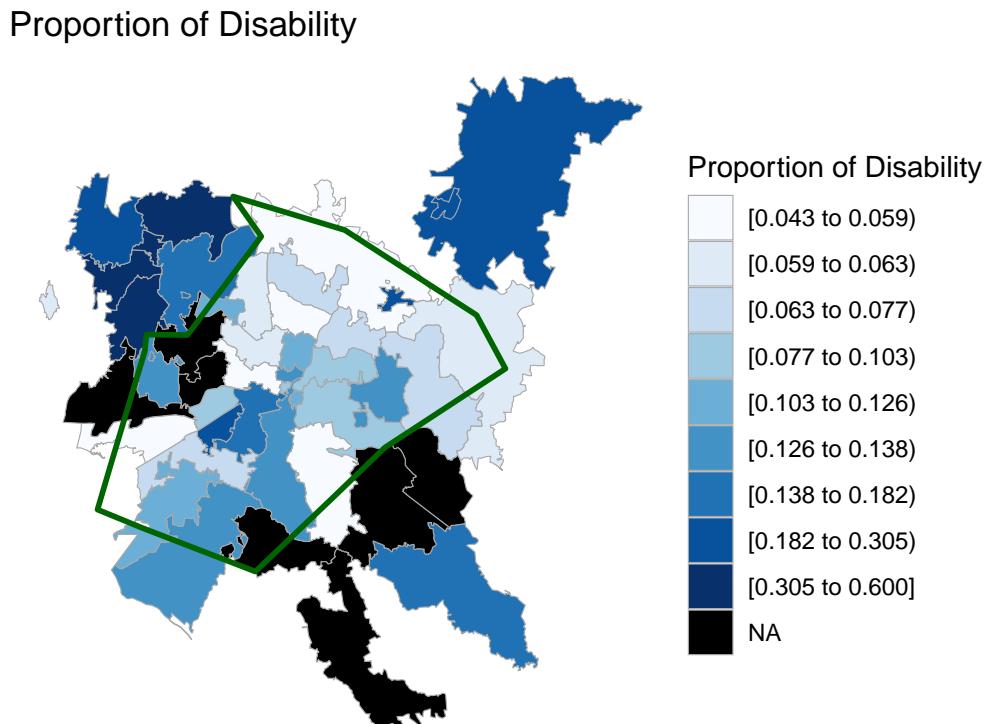
## 2.4 References

1. Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, Geospatial Research, Analysis, and Services Program. CDC/ATSDR Social Vulnerability Index 2018 database United States. [https://www.atsdr.cdc.gov/placeandhealth/svi/data\\_documentation\\_download.html](https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html).

### 3 Mapping TGCP variables

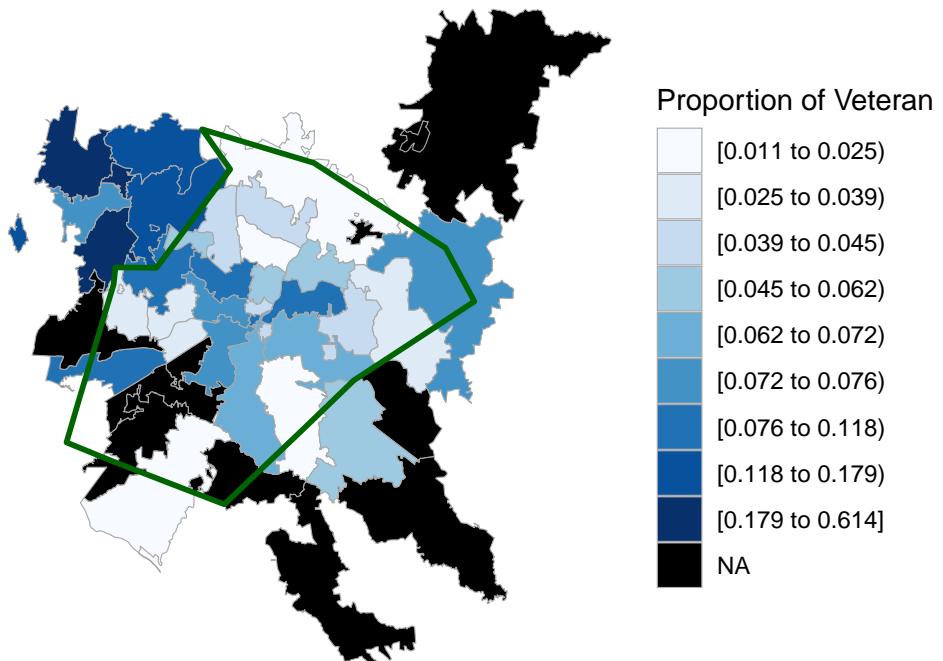
We focus on five variables from the TGCP client demographics data. The Wake county area is outlined in green. The mapping zone includes only the zip codes in which TGCP served at least five clients. For each variable, the proportion of clients served within the zip code with that particular characteristic is mapped.

#### 3.1 Mapping Disability



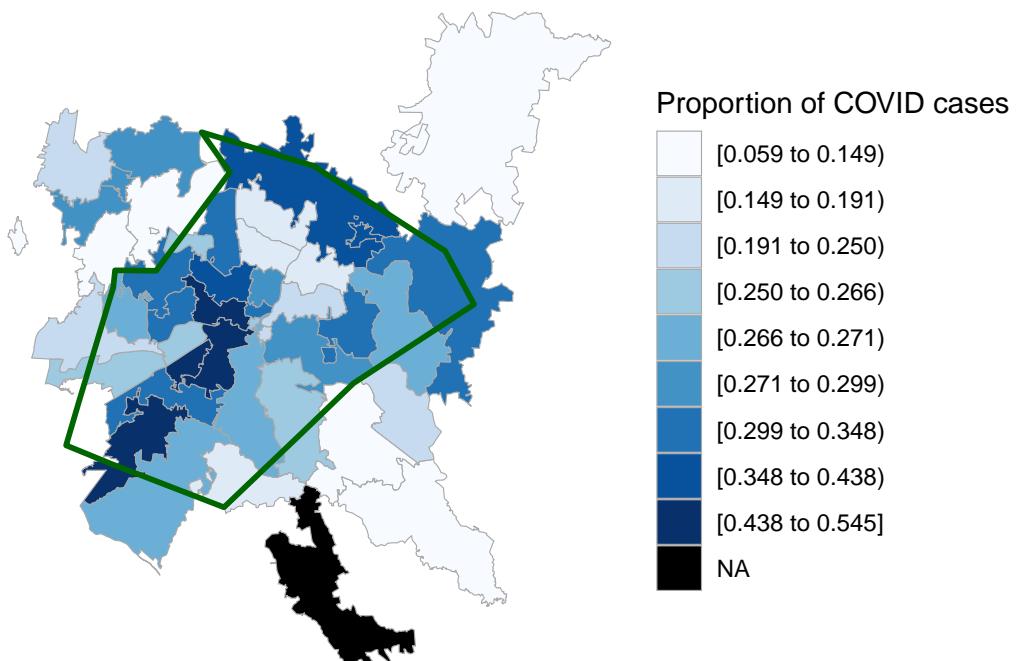
### 3.2 Mapping Veteran

Proportion of Veteran



### 3.3 Mapping COVID status

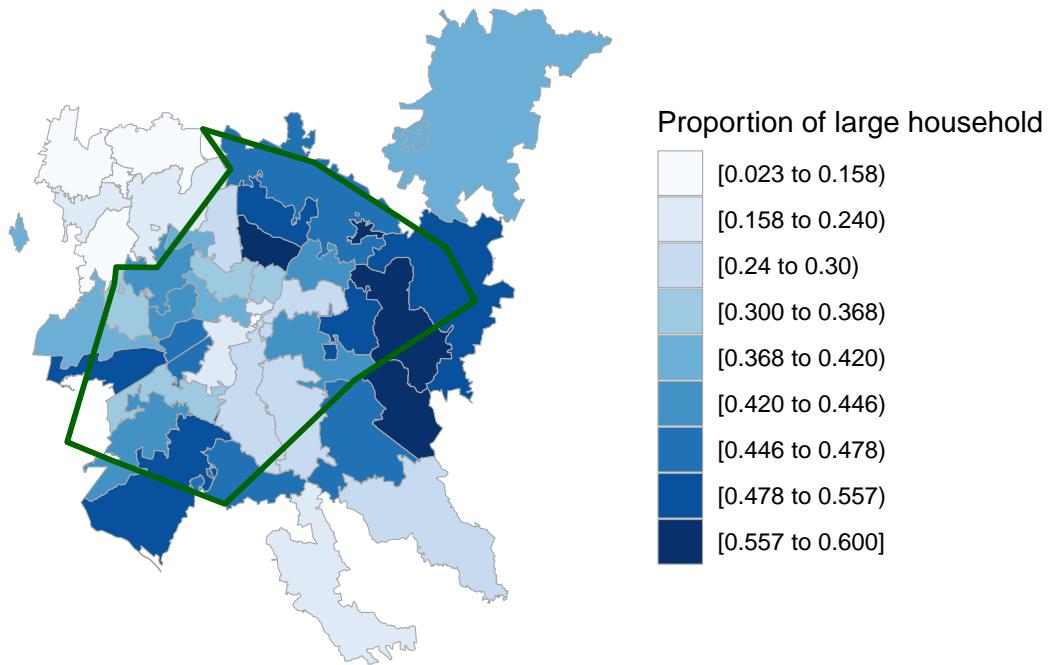
Proportion of COVID cases



### 3.4 Mapping TotalHHNumber

The median number of household members in the client demographics data is 4. Thus, homes with five or more total household members were classified as large households.

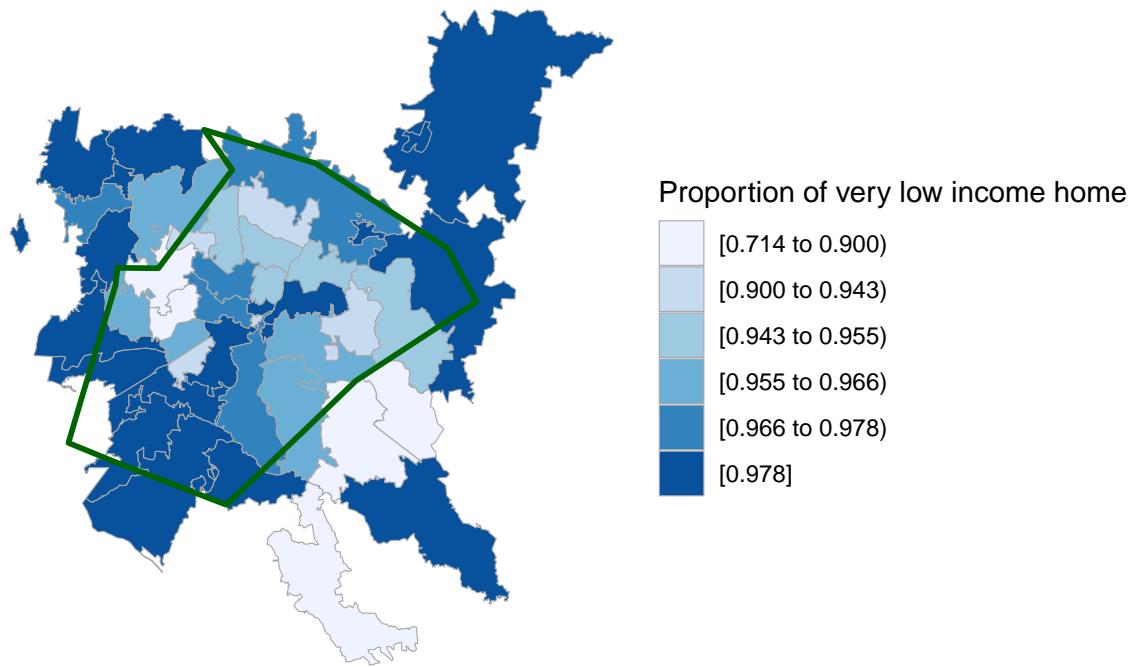
Proportion of large household



### 3.5 Mapping Homeincome: Very low income status

Very low income status refers to being below 30% area median income.

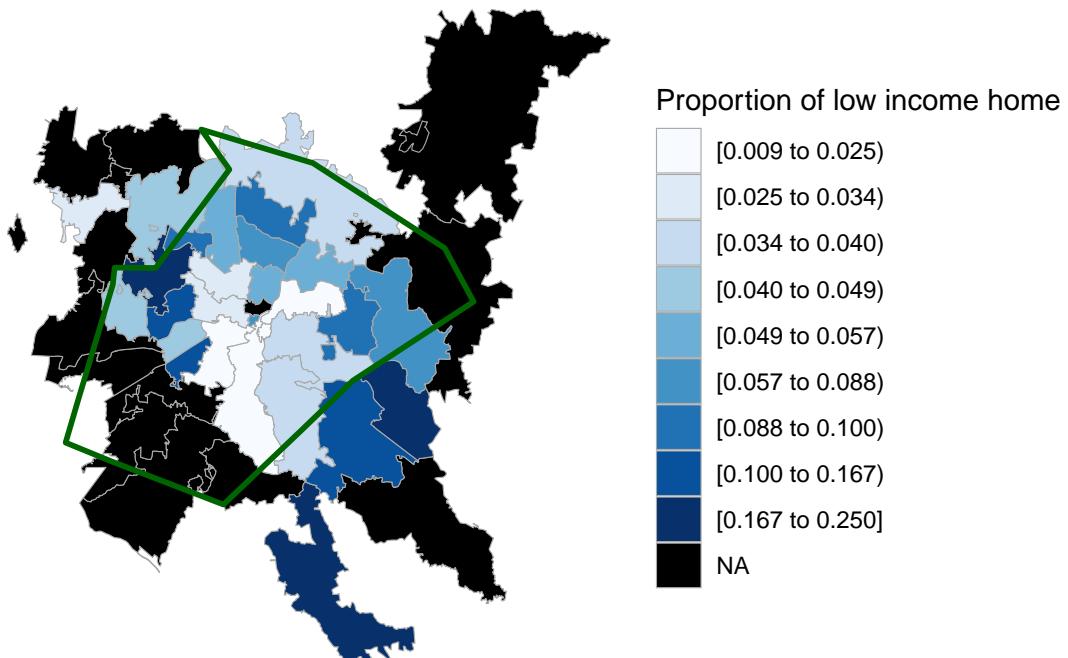
### Proportion of very low income home



### 3.6 Mapping Homeincome: Low income status

Low income status refers to being between 30% to 60% area median income.

#### Proportion of low income home

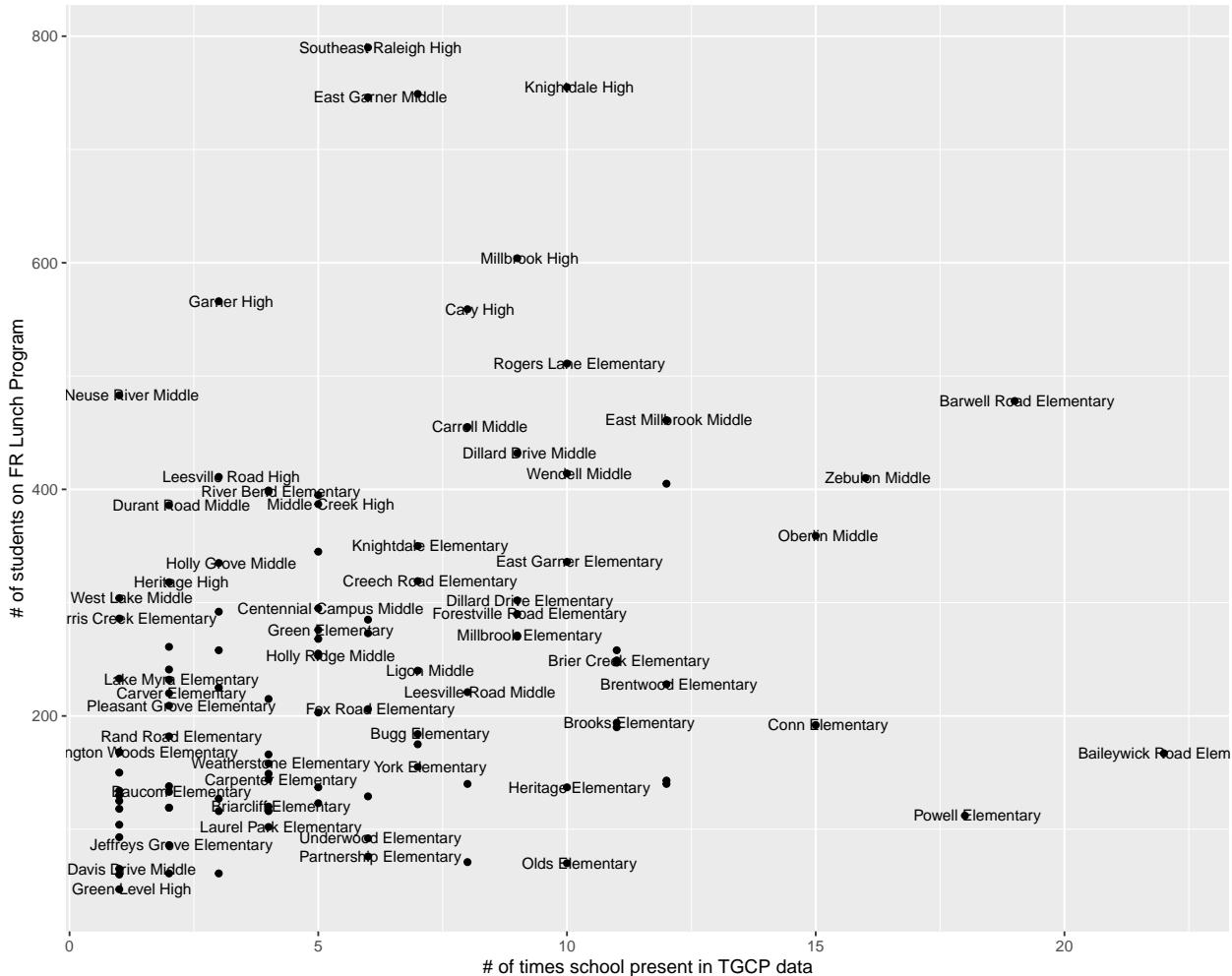


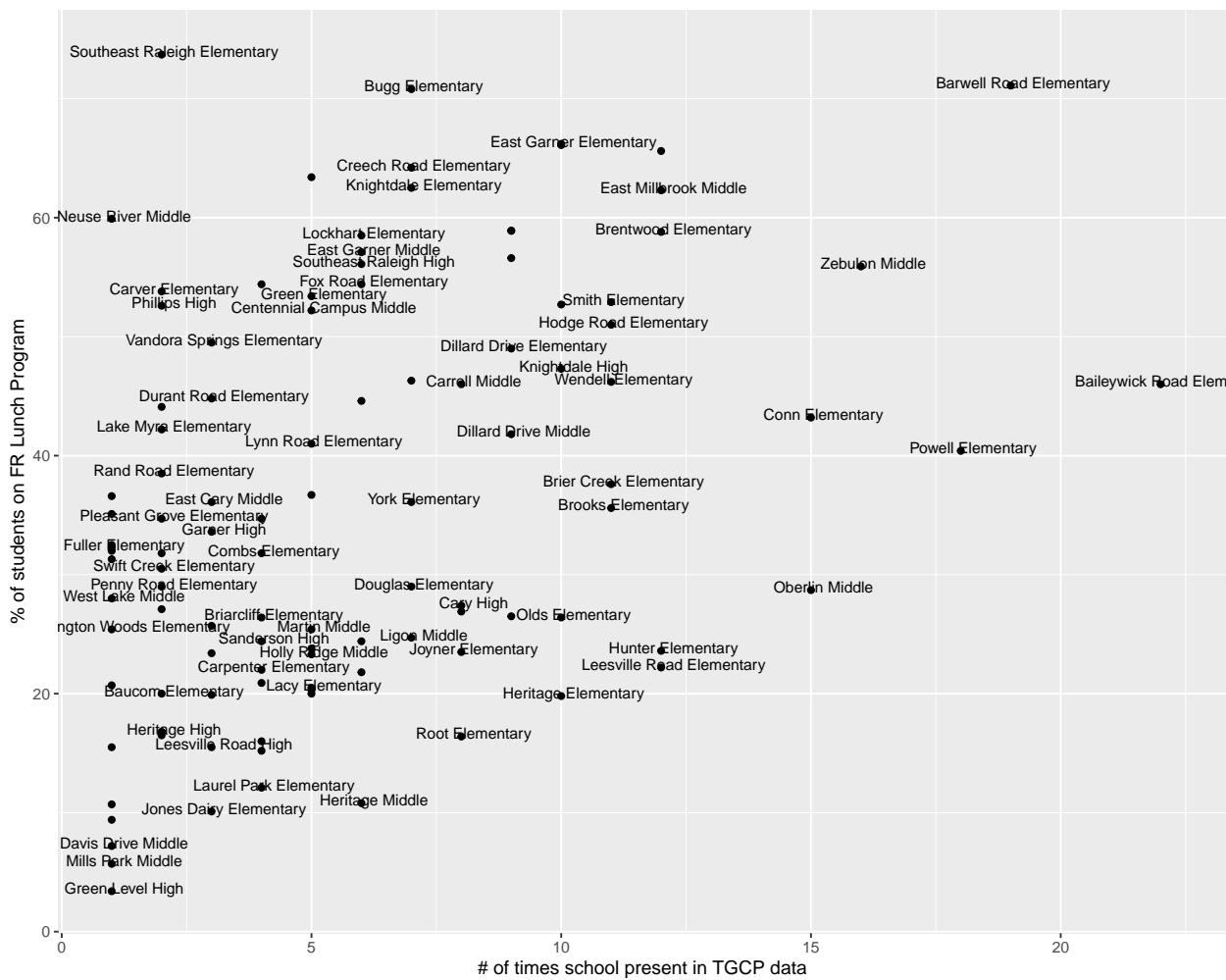
## 4 School Data

We were able to find a variety of useful, longitudinal data provided by the Wake County Public School System. While our analysis mainly focuses on using Free and Reduced-Price Lunch Program (FR Lunch Program) information, we wanted to provide these additional resources in case they are useful to you now or in the future.

Here we plot the number of times a school shows up in the TGCP data (this includes a client attending a school or any of their family members) with the number of students on the FR Lunch Program at that school. We also provide the percentage of the student body at a given school on the FR Lunch Program on the vertical axis. One use case for this information is to recognize unmet need. There may be certain schools that have many students (and/or a high percentage of the student body) participating in a lunch program that do not yet know about The Green Chair Project. Reaching out to the families, faculty, and guidance counselors at these schools may identify communities that would benefit from The Green Chair Project's services.

Additionally, it shows where the current Green Chair Project resources are being allocated. For example, some schools with a very high percentage of students on a lunch program are most prevalent in The Green Chair Project clients. These schools include Baileywick Road Elementary, Barwell Road Elementary, Conn Elementary, Powell Elementary, Oberlin Middle, and Zebulon Middle.





Note: blue and bolded phrases are hyperlinks.

To start, [here you can find](#) a summary of the current status of the WCPSS. This includes number of schools, employees, number of students on the Free and Reduced-Price Lunch Program, and more. Additionally, they provide a *Reports by year* section. This breaks the information out at the school level. This is where we obtained the Free and Reduced-Price Lunch Program data for each school. They also offer ethnicity breakdowns, limited English proficiency rates, and special education services. [You can view the spreadsheet for the 2020-2021 school year here](#), with previous years available on their website.

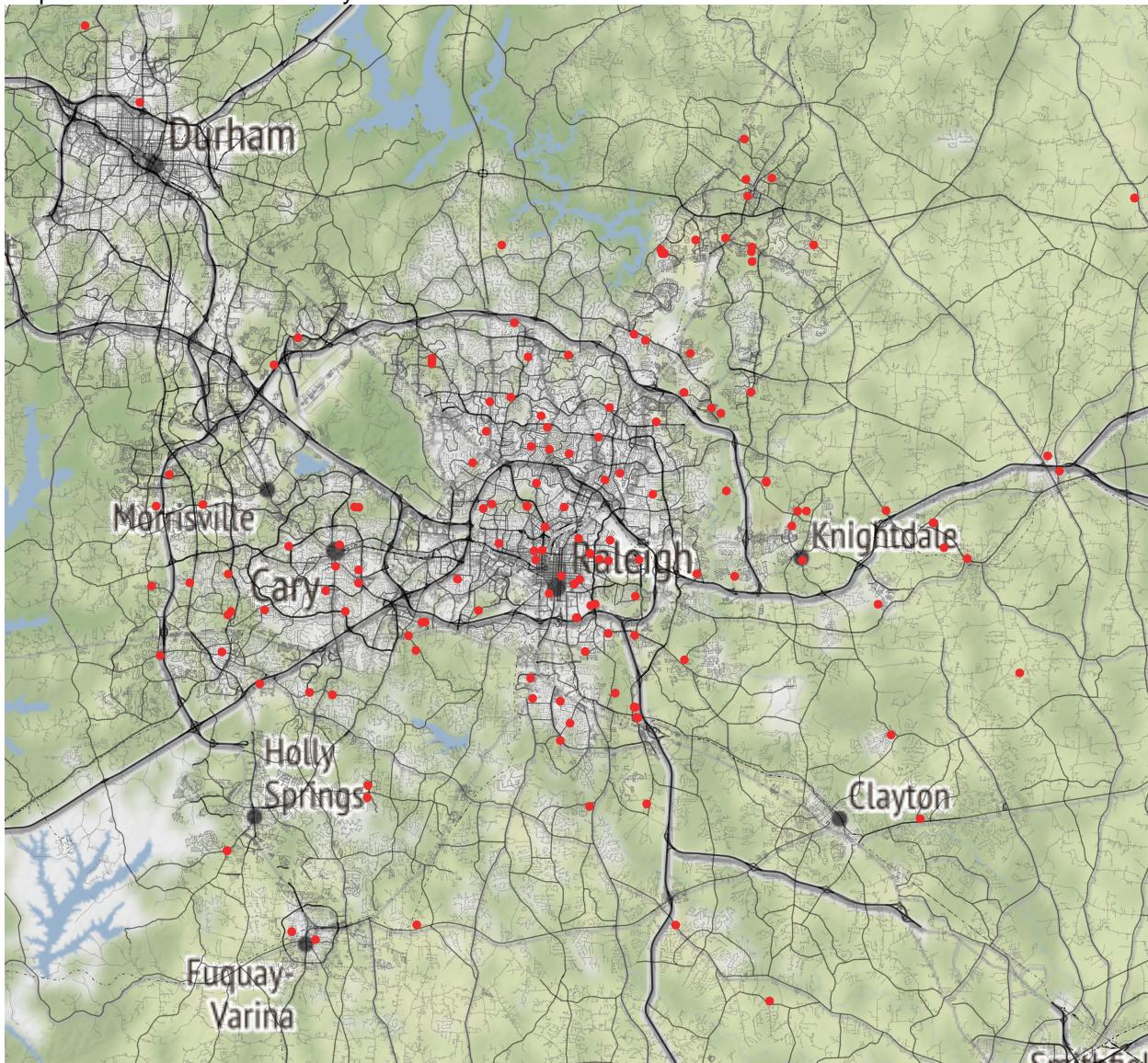
We also found a variety of information from [the North Carolina Department of Public Instruction \(NC DPI\)](#). Some variables include [cohort graduation rate](#), [ACT results](#), and [SAT and AP results](#). These data are again broken up by school and include other school districts along with Wake County. These were not the focus of our analysis, as there are often biases in these scores; however we wanted to provide the resource in you find other uses for it. NC DPI also provides [discipline and dropout data](#). This includes tables about crime, dropout rates and counts, and suspensions. We found this data to be mostly prevalent to high schools and less so in elementary and middle schools.

[Finally, here is a nice visualization about postsecondary enrollment in North Carolina high schools.](#) It allows options to change charts to look at breakdowns for particular schools. Since this data was also focused exclusively on high schools, we did not make use of it ourselves.

## 5 Mapping Schools

We show a plot of the schools (public, non-public) that students served by TGCP go to in Wake County, shown as red dots. Colleges and universities, daycare centers, and schools outside Wake County are not included in the plot.

Map of Schools in Wake County



A map of schools by proportion are also considered. For each school, the proportion of students who are served by TGCP over the total number of students are given below.

Map of Schools in Wake County, by Proportions

