

# Selective Access

## Transportation Accessibility Analysis of Selective Enrollment High Schools in Chicago

### Background

Chicago Selective Enrollment High Schools admit students based on “grades, test scores, and where you live” (WTTW). This model seems to exclude students who may have difficulty testing from getting into the most competitive public schools in the city. Yet, the system also considers students’ socioeconomic and educational backgrounds as averaged throughout the census tract in which one lives. To do this, Chicago Public Schools (CPS) divides the city into census tracts and calculates “each area’s median income, education level, home-ownership rates, single-parent family rates, rates of English-speaking, and neighborhood school performance” (Eder and Gregg) into a single value of 1 through 4. These computed separations, known as socioeconomic tiers, are then factored into one’s high school admissions score. Tier 1 is the lowest tier and, on average, consists of lower income and less-educated communities, whereas Tier 4 areas consist of higher income and higher-educated communities.

It is difficult enough to get into these schools, but what further limits access is location. A lot of the selective enrollment high schools are concentrated on the north side of Chicago. If a student is accepted - it is not easy for them to get to school everyday CPS high schools do not provide school bus services so students are left to independently navigate their own commute. This led to the question: Which tiers can most easily access CPS Selective Enrollment high schools?

According to a 2017 study done by CPS, Walter Payton High school (WPCP) was the most difficult to get into. In the 2017-18 school year students needed a score of 898 of a possible 900. Northside College Prep (NCP), with students needing 896 point, and Jones College Prep (JCP) with 889 points, come in close second and third. These are the schools that the study will focus on.

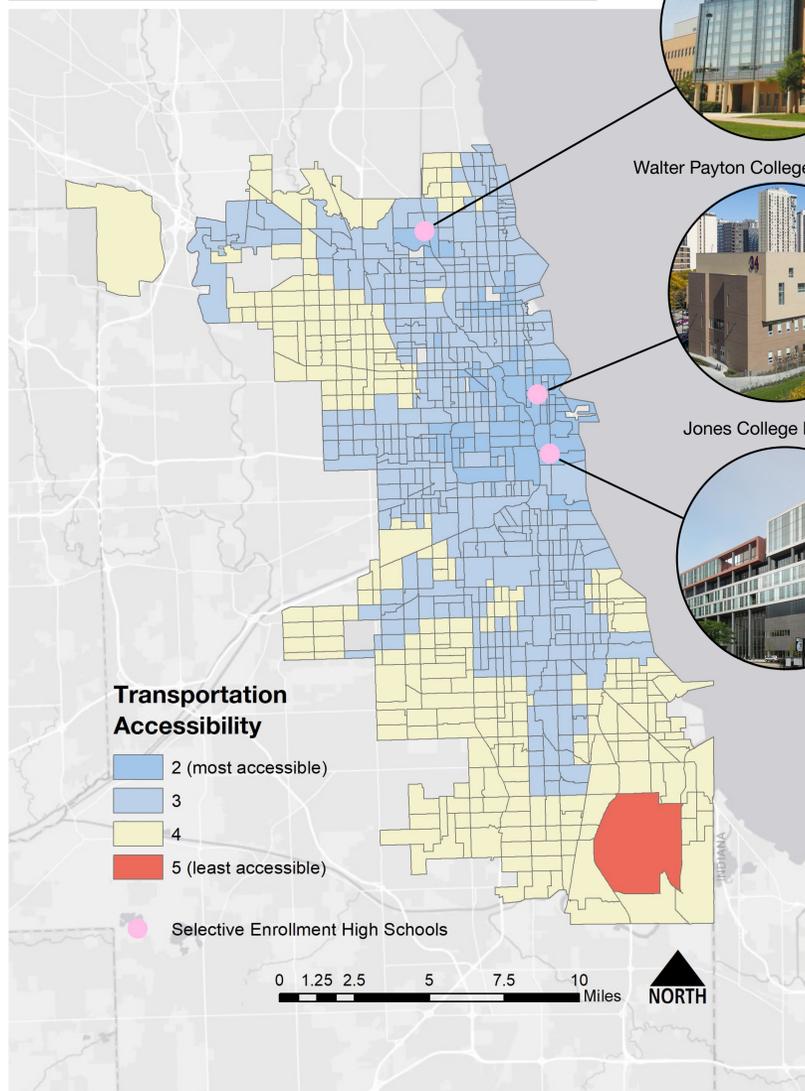
### Results

This analysis was conducted in order to see if some socioeconomic tiers have transportation accessibility advantages over other tiers. It is important to note the aggregate accessibility index does not include 1 as an option of accessibility. In every other index presented a factor of 1 represents the areas that can most easily access a specific area or form of transportation. The fact that this is missing indicates that no area has complete easy access to all of these schools at one time.

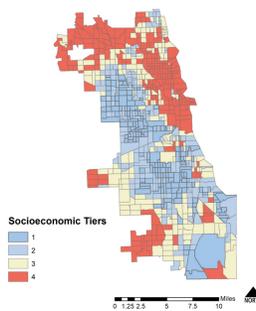
Next, if one compares the Transportation Accessibility Index to the Socioeconomic Tiers map it seems that the least accessible area is actually a tier 1 area. Further, one may conclude from these maps that most tier 1 or tier 2 areas seem to have most access to these selective enrollment schools. The index suggests that northern and central areas of the city have more transportation options ready to them. Overall it is difficult to derive anything conclusive as many tier 4 areas on the north side seem to have level 2 or 3 accessibility.

The project was successful in measuring the distance of tiers from potential transportation options. This is not indicative of how much time it may take one to get to school. Further research should find accessibility in terms of time by finding the average commute time of students traveling to these high schools. Travel times as well as distance would create a more concise transportation accessibility index.

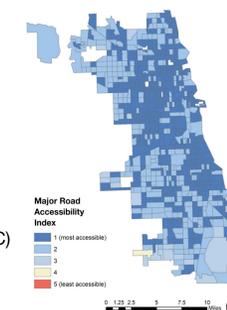
### Selective Enrollment Transportation Accessibility Index



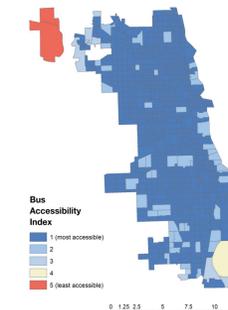
### Socioeconomic Tiers



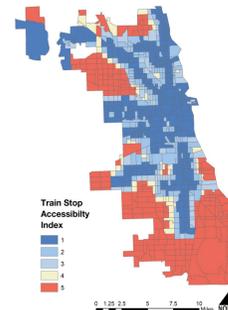
### Major Road Index



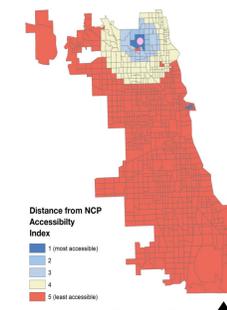
### Bus Stop Index



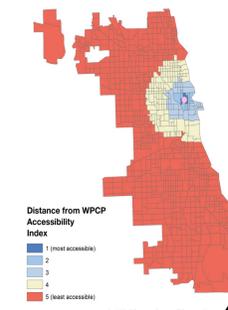
### Train Stop Index



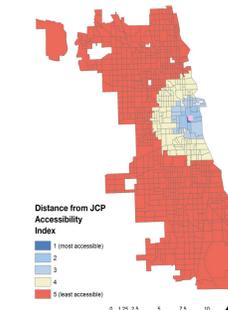
### Distance from NCP



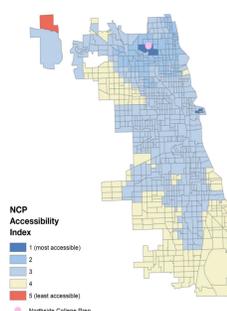
### Distance from WPCP



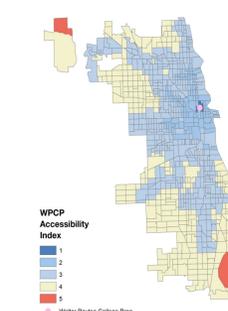
### Distance from JCP



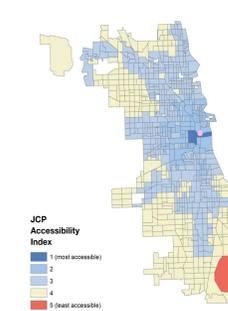
### NCP Accessibility Index



### WPCP Accessibility Index



### JCP Accessibility Index



### Methodology

Although there are 10 selective enrollment schools total, the research focuses on the three most difficult to get into. This study consists of a series of proximity analyses. An accessibility index was created based on distance from the schools to the tiers and the proximity of tiers to major transportation. In order to create an overarching transportation accessibility index for each tier to the three high schools, a series of individualized indices were first made. Each distance was measured from the center of the tier to the nearest transportation option. Firstly there is a major road index which shows the proximity of tiers to significant Chicago streets. Second there is a bus accessibility index that measures the proximity of bus stations to tiers. Thirdly, there is a train stop accessibility index that accounts for how far away tiers are from the closest train stop.

The next set of indices is based on tier distance from each selective enrollment high school being considered in this study. Again distances were measured from the center of the tier to the high school.

Lastly, a set of accessibility indices was created for each school by merging the above data through a simple equation:

$$(\text{Major Road Accessibility} \cdot .15) + (\text{Bus Accessibility} \cdot .15) + (\text{Trainstop Accessibility} \cdot .20) + (\text{School Proximity} \cdot .50)$$

The weight of each factor of the index as well as the defining features of the indices themselves are outlined in the table below.

In order to obtain a complete index of the accessibility of all three schools to each tier the three selective enrollment high school accessibility indices were merged. This was done by weighting each index equally by a factor of 1/3 and then adding them together:

$$[\text{NCP accessibility index} \cdot (1/3)] + [\text{WPCP accessibility index} \cdot (1/3)] + [\text{JCP accessibility index} \cdot (1/3)]$$

The transportation accessibility map was then compared to the socioeconomic tier map to determine which tiers have the most access to these high schools.

Index Factor	Weight	1 (most accessible)	2	3	4	5 (least accessible)
Tier proximity to bus stop	15%	0-0.25 miles	0.25-0.50 miles	0.50-0.75 miles	0.75-1 miles	> 1 mile
Tier proximity to train station	20%	0-0.25 miles	0.25-0.50 miles	0.50-0.75 miles	0.75-1 miles	> 1 mile
Tier proximity to major roads	15%	0-0.25 miles	0.25-0.50 miles	0.50-0.75 miles	0.75-1 miles	> 1 mile
Tier proximity to selective enrollment high school	50%	> 0.5 miles	0.5-1 miles	1-2 miles	2-4 miles	> 4 miles

### Sources

- Map Data**
- City of Chicago Open Source Data
  - US Census Bureau, Geography Division
  - Open City App, Chicago Public School Tiers, by Derek Eder and Forest Gregg

### Image Sources

- <https://www.dnainfo.com>
- <https://www.wpcp.org/>
- <https://perkinswill.com/>

### Works Cited

- Eder, Derek, and Forest Gregg. “Chicago Public School Tiers.” *Chicago Public School Tiers, Open City, cpstiers.opencityapps.org/*.
- “Selective Enrollment in Chicago Public High Schools.” *WTTW Chicago Public Media—Television and Interactive, 30 Apr. 2014, interactive.wttw.com/*