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Project Proposal Part 2

**Goal**

To construct a database useful for assessing access to public transit in Chicago, IL. The intended application would be to identifying areas of low access to public transit so that perhaps policy makers would have data on where to site new transit stops and lines to have more equitable access to transportation in the city.

**Specific Objectives**

Assess areas well served by CTA bus lines, CTA rail lines, and Metra commuter lines within the city boundaries of Chicago.

Assess areas with high population underserved by these mass transit lines.

Assess “destinations” (shopping centers, universities, sports arenas, and other points of interest) underserved by mass transit.

Assess if different socio-demographic and/or socio-economic grounds are underserved by mass transit lines.

Which neighborhoods have the best access/worst access to mass transit?

Using a spatial database allows for network distances from a station to be used which is more representative of real life than Euclidean distances.

**Data Collection**

The spatial extent is the city limits of Chicago, IL. The temporal state is the present day.

Data for this project comes from the City of Chicago Data Portal and the NHGIS IPUMS websites. Most of the data is provided through the city of Chicago’s website, so it should be accurate and relevant for this database.

CTA bus lines, CTA rail lines and stops.

Bus Routes:<https://data.cityofchicago.org/Transportation/CTA-Bus-Routes-Shapefile/d5bx-dr8z>

“CTA\_BusRoutes:”

Attributes of Interest: geom, name, Route, WKDAY, SAT, SUN

NOTE: the bus stops datafile from the Chicago Data Portal is not usable as it is not atomic and violates 1st Normal Form (each stop as multiple “routes” stored in the same column). However, given the heavy saturation of stops on each route, this project will assume that people within a given proximity to the bus route will have access to a bus stop. This is a limitation of the project.

CTA Rail Lines (rail lines, ‘L’ lines): <https://data.cityofchicago.org/Transportation/CTA-L-Rail-Lines-kml/sgbp-qafc>

“CTA\_RLines:”

Attributes of Interest: geom, name

CTA Rail Stations:

<https://data.cityofchicago.org/dataset/CTA-L-Rail-Stations-kml/4qtv-9w43>

“CTA\_RailStations:”

Attributes of interest: geom, name

Chicago Boundaries: neighborhoods, wards, census tracts, Central Business District

Neighborhoods/Community Areas: <https://data.cityofchicago.org/Facilities-Geographic-Boundaries/Boundaries-Neighborhoods/bbvz-uum9>

“Neighborhood:”

Attributes of Interest: geom, name

Census Tracts: <https://data.cityofchicago.org/Facilities-Geographic-Boundaries/Boundaries-Census-Tracts-2010/5jrd-6zik>

“tractsshp:”

Attributes: id, geom

Demographic Data

Census Data from NGHIS IPUMS for Census Tracts

“tracts:”

Attributes of Interest: geo\_id, total, white, black, native, asian, pacific, other, twoormore

Raw counts

Data from Chicago Health Atlas for Neighborhood Rates:

“Demographics:”

Attributes of Interest: geoid, whitepct, blackpct, Asianpct, hispanicpct, natamerpct, pacificpct, 2orpct, otherpct

Percentages

Points-of-Interest

Hospitals: <https://data.cityofchicago.org/Health-Human-Services/Hospitals-Chicago/ucpz-2r55>

“hospitals:”

Attributes of Interest: id, facility

Public Schools: <https://data.cityofchicago.org/Education/Chicago-Public-Schools-School-Locations-SY1718/4g38-vs8v>

“schools”

A diagram on a piece of paper

Description automatically generated Attributes of Interest: id, grades, grades\_cat, short\_name, governance

**Example Queries**

Neighborhoods without Rail Line Stops

SELECT neighborhood.name

FROM project.neighborhood, project.CTA\_RailStations

WHERE ST\_Disjoint(CTA\_RailStations.geom, neighborhood.geom)

Neighborhoods without Rail Line Stops but with Rail Lines

SELECT neighborhood.name

FROM project.neighborhood, project.CTA\_RailStations

WHERE ST\_Disjoint(CTA\_RailStations.geom, neighborhood.geom) AND ST\_Intersect (CTA.RLines.geom, neighborhood.geom)

Hospitals within walking distance (.25mi) of Rail Station

SELECT hospitals.facility

FROM project.hospitals, project.CTA\_RailStations

WHERE ST\_DWithin(hospital.geom, CTA\_RailStations.geom, 402)

**Reference**

Ermagun, Alireza and Nebiyou Tilahun,“Equity of transit accessibility across Chicago.” Transportation Research Part D: Transport and Environment, Volume 86, 2020, 102461, <https://www.sciencedirect.com/science/article/pii/S1361920920306489>.

Discusses access to transportation to jobs, hospitals, and grocery stores particularily for “underserved cohorts” (low wage workers, the elderly, and low educated people).