

1. Sourcing Data
- demographic need

median after tax income

source: ACS 5 Year Estimates, table B19013

ratio of median rent to median income

source: ACS 5 Year Estimates, table B25071

- neighborhood assets

CPS elementary schools

source: Chicago Data Portal

grocery stores

source: Chicago Data Portal

CTA train stops

source: Chicago Data Portal

Metra stations

source: Regional Transportation Authority Mapping & GIS Portal

health clinics

source: Chicago Data Portal

parks

source: Chicago Data Portal

- land acquisition

zoning

source: Chicago Data Portal

vacant land

source: CMAP Land Use Inventory

city-owned land

source: Chicago Data Portal

assessed land value

source: Cook County Assessor’s Office

- economic characteristics

TIF boundaries

source: Chicago Data Portal

Enterprise Zones

source: Chicago Data Portal

2. Preparing Data

- Project all data to NAD 1983 StatePlane Illinois East FIPS 1201 Feet

- For all Census data:

prepare tables in Excel (clean up GEOID for joining, remove secondary headers, rename columns as needed)

- Cook County Assessor’s dataset may be too large to tidy in Excel and will be prepared for use in GIS in R

- For datasets that expand beyond Chicago:

SBL features with centers in the City of Chicago boundary

Data > export > save new features in geodatabase

3. Neighborhood Assets / ModelBuilder

- Amenities (elementary schools, grocery stores, train stops, health clinics, and parks) will need to be buffered because we want to prioritize building in places with a high level of amenities.

- Create model in ModelBuilder to output rasters where values within 0.5 miles of an amenity = 1 and values beyond = 0

Euclidean Distance, cell size = 90 x 90 ft

Reclassify

0 to 2640 ft = 1

2640 ft and beyond = 0

output will be 5 rasters for each amenity type

school_dist

grocery_dist

train_dist

clinic_dist

parks_dist

4. Demographic Need Variables

- join median after tax income and ratio of rent to income to block groups in Chicago

- Feature to Raster

Input Features: Chicago_block_groups

Field: MedHHI

Output raster: income_raster

Output cell size: 90 ft

- Feature to Raster

Input Features: Chicago_block_groups

Field: RentPercentHHI

Output raster: ratio_raster

Output cell size: 90 ft

- Reclassify both rasters

ratio_raster

if rent is 30% or more than household income, cell receives a 1.

all other data = 0

income_raster

if household income is less than \$59,580 (60% of the area median income based on a household size of 3 - Chicago’s average household size), cell receives a 1

all other values = 0

5. Land Acquisition Variables

- vacant land

Select by

Reclassify land_use raster from above again

non-vacant land will be given a 0

vacant land will be given a 1

- assessed land value

Clip Cook County parcel shapefile to City of Chicago in Python window before bringing into ArcGIS Pro

Export new feature class to shapefile

In R:

Join assessed value table to shapefile (necessary because of the size of the data)

Calculate assessed land value per square foot of land

Export shapefile from R

Remove exempt properties and 0 values

Feature to Raster

field: assessed land value per square foot

Reclassify

Values lower than the average land value per square foot were given a 1

Values higher than the average land value per square foot were given a 0

- zoning

Dissolve zoning classes

Selected by attribute for districts where zoning allows any sort of household living, export selected features

with exported features, Euclidean Distance, cell size 90 ft

Reclassify

zoning districts where housing is allowed (distance = 0) given a 1

zoning districts where housing is not allowed = 0

- city-owned land

Display XY Data from CSV of city-owned land

Spatial join to parcel shapefile

Export parcels in shapefile with join_count > 1

With exported features, Euclidean Distance, cell size 90 ft

Reclassify

city-owned land (distance = 0) given a 1

land not owned by city = 0

6. Economic Characteristics

- TIF boundaries

Euclidean Distance, cell size 90 ft

Reclassify

outside of a TIF will be given a 0

within a TIF (distance = 0) will be given a 1

- Enterprise Zones

Euclidean Distance, cell size 90 ft

Reclassify

outside of an enterprise zone will be given a 0

within an enterprise zone (distance = 0) will be given a 1

7. Weighting Scheme

- Based on literature and personal judgments on what makes neighborhoods desirable, the following weighting scheme was devised:

8. Combining Rasters

Use Raster Calculator to multiply rasters by weights and combine weighed values

9. Remove non-buildable land

- Select by attribute for land uses that are not buildable (ie transportation features, water, non-parcel areas, and non-codable land)

export selected features to new feature

- Erase from City of Chicago boundary the features from the previous step and parks. The resulting feature includes only the buildable land in the City of Chicago

- Extract by mask using new buildable land feature

Project 3 Methods

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