# QGIS Spatial Analysis Appendix

**Technical Appendix**

**Sources:**

* 2020 Census Tracts (Clipped to Shoreline), NYC Department of City Planning (Shapefile)

https://www.nyc.gov/site/planning/data-maps/open-data/census-download-metadata.page

* Asian Cultural Centers Dataset, Self-created Datset (Tabular Data)

Compiled through online searches, Google Maps, and social media.

* MTA Subway Stations (Shapefile)

NYC OpenData

https://data.cityofnewyork.us/Transportation/subway-stations/jaej-er89

* Asian Population Dataset, US Census Bureau, American Community Survey (Tabular Data)

https://data.census.gov/table/ACSDT5YSPT2021.B01003?q=race&t=031&g=040XX00US36,36$1400000

**Technical Workflow Steps:**

1. **Coordinate System:**
   * **Use New York State Plane Coordinate System**
2. **Map/Data Preparation:**
   * Data Cleaning: Ensure the GEOID in the Census population dataset matches the GEOID field in the Census Tracts shapefile.
   * Download Subway shapefile
   * Load the 2020 NYC Census Tract shapefile
3. **Subway Proximity Analysis:**
   * Input Coordinates: Import the self-created dataset of cultural center with XY coordinates (longitutde/latitude)
   * Use the “Buffer” geoprocessing tool to create 0.25-mile buffer around subway stations
   * “Dissolve” the buffer to merge overlapping buffer zones.
   * Count the number of cultural centers that fall in the buffer zones
4. **Asian Population Analysis:**
   * Input Coordinates: Import the self-created dataset of cultural center with XY coordinates (longitutde/latitude)
   * Perform a tabular join to attach the Asian population data to the census tracts shapefile
   * Buffer creation around cultural centers: create a 0.25-mile buffer around each cultural center using the “Buffer” tool
   * Utilize the “Select by Location” Research Tool to select the census tracts that fall within the buffer zone.
   * Export the selected areas into a CSV data and upload it to Google Sheets to calculate the sum of Asian populations that are inside the buffer zone
5. **Ethnic Group Analysis:**
   * Input Coordinates: Import the self-created dataset of cultural center with XY coordinates (longitutde/latitude)
   * Perform a tabular join to attach the Asian population data to the census tracts shapefile
   * Filter the Asian cultural center data by each ethnic group
   * Buffer creation around specific ethnic cultural centers: create a 0.25-mile buffer around each cultural center using the “Buffer” tool
   * Utilize the “Select by Location” Research Tool to select the census tracts that fall within the buffer zone.
   * Export the selected areas into a CSV data and upload it to Google Sheets to calculate the sum of Asian populations that are inside the buffer zone
   * Repeat these steps for all 12 Asian ethnic groups to analyze spatial distribution and accessibility.

# Google Sheets Technical Appendix

**Barchart Workflow Steps:**

1. Data Import

* Asian population in NYC Census tracts
* Asian population totals within cultural center buffer
* Asian population total within specific ethnic cultural center buffer

1. Upload each CSV file to Google Sheets for processing
2. Population Calculations

* Sum Asian Population within NYC tract using =SUM() formula to calculate the total Asian population
* Sum Total Asian Population within cultural center using =SUM() formula to calculate the total Asian population within each cultural center buffer
* Sum Total Asian Population within specific ethnic cultural center using =SUM() formula to calculate the total Asian population within specific ethnic cultural center buffer
  + Repeat until each Asian ethnic cultural center has been analyzed

1. Calculate Walkability by Percentages

* Create a new column to calculate the total Asian population that falls within the buffer.
* Use the formula = (Population in Buffer/ Total Asian Population) \* 100 formula to compute percentages of the Asian population within 0.25-mile buffers.

1. Preparing for Datawrapper

* Create a new Google Sheet
  + Create two new columns:
    - Cultural Center by Ethnic Group
    - % Asian Population within the buffer
* Fill each column with information from previous calculations from above
* Upload data to Datawrapper to create a chart

**Tree map Workflow Steps:**

* Imported the self-created Asian Cultural Centers in NYC dataset containing ethnicity counts and percentages for Asian cultural centers in NYC.
* Grouped, summarized, and mutated to calculate the percentage of each ethnicity and combined it with the ethnicity names for labeling.
* Styling
  + Franklin gothic heavy
  + Fluorescent yellow
  + Positioned the wording to the top-left corner of each rectangle