Livehouse Location Optimization in Atlanta

Integrating Transportation and Demographic Factors

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Inspired by my old project, Github repo: https://github.com/drunken-boat/livehouse-location-analysis

Background & problem

A **live house** is a Japanese **live music club** – a music venue featuring live music. The term is a Japanese coinage and is mainly used in East Asia.

It most frequently refers to smaller venues, which may double as bars, especially featuring rock, jazz, blues, and folk music.

And this project will emphasize the metal/rock music live house.

Yu Gong Yi Shan → retail store

old MAO → remains

TANGO → government ideological research center

Introduction

- Optimize the allocation of livehouses/music venues in the Atlanta area by integrating transportation and demographic factors.
- Seeks to identify areas with high potential for establishing livehouses.
- Contribute to promotion of a vibrant music scene in Atlanta.

Objectives

1. Identify key factors influencing the location allocation of livehouses/music venues.
2. Analyze the spatial distribution of population and demographic characteristics in the Atlanta area.
3. Evaluate the accessibility to current locations.
4. Develop a methodology for determining optimal livehouse/music venue locations based on the identified factors.

Data

housing price, income – census bearu API

Music venue POI - query from Yelp API

Basemap - OSMX download

Crime data - Atlanta Police Department dataset

Transport (parking lot, road network) - OSMX download

Method - **quantitative analysis**

data mining

housing price, – census tract

Music venue poi - query from Yelp API

data processing: build location model and prediction model, service area

factors: Accessibility, Competitors, Costs, Parking

data visualization

Python - Geopandas, Folium + JavaScript

Method - **qualitative analysis**

data collecting

historical, archival, and other documents

in-depth interviews

cognitive maps

data analysis

mapping

tools

Open Digital Ethnography Archives toolkit

Estimated outcome

1. Visualization of the spatial distribution of existing livehouses and transportation networks in Atlanta
2. Optimization of livehouse allocation based on transportation accessibility and demographic characteristics
3. A web mapping application in Python that allows users to explore the transportation infrastructure and livehouse locations in Atlanta.
4. Analysis of the impact of transportation accessibility on the success of music venues
5. Identification of potential transportation bottlenecks affecting livehouse accessibility
6. Generation of heat maps of transportation demand and livehouse attendance
7. Calculation of the optimal route for concert-goers to travel between multiple livehouse venues in Atlanta, considering transportation modes and safety.
8. (nice to have)Development of a machine learning model in Python that predicts the success of a livehouse venue based on its proximity to transportation hubs and demographic characteristics in Atlanta…?

Which Neighborhood in Atlanta is Best for a Metal Music Venue Business?

Considering Transportation, Demographic, and Urban Planning Factors

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Topic and Objectives

1. Evaluate the accessibility to **current** music venues.
2. Identify **neighborhoods** with high **potential** for establishing metal music venues, considering transport, demographic, and urban planning factors.
3. Contribute to promotion of a vibrant music scene in Atlanta.

Transport & GIS:
Network Analysis
Vector Analysis

Business:
Cost Analysis
Competitor analysis
Location analysis

Sociology:
Sub-cultural group(metal music) Analysis

Urban planning:
Zoning
Landuse

Terminal West, a music venue near Georgia Tech

A metal music live

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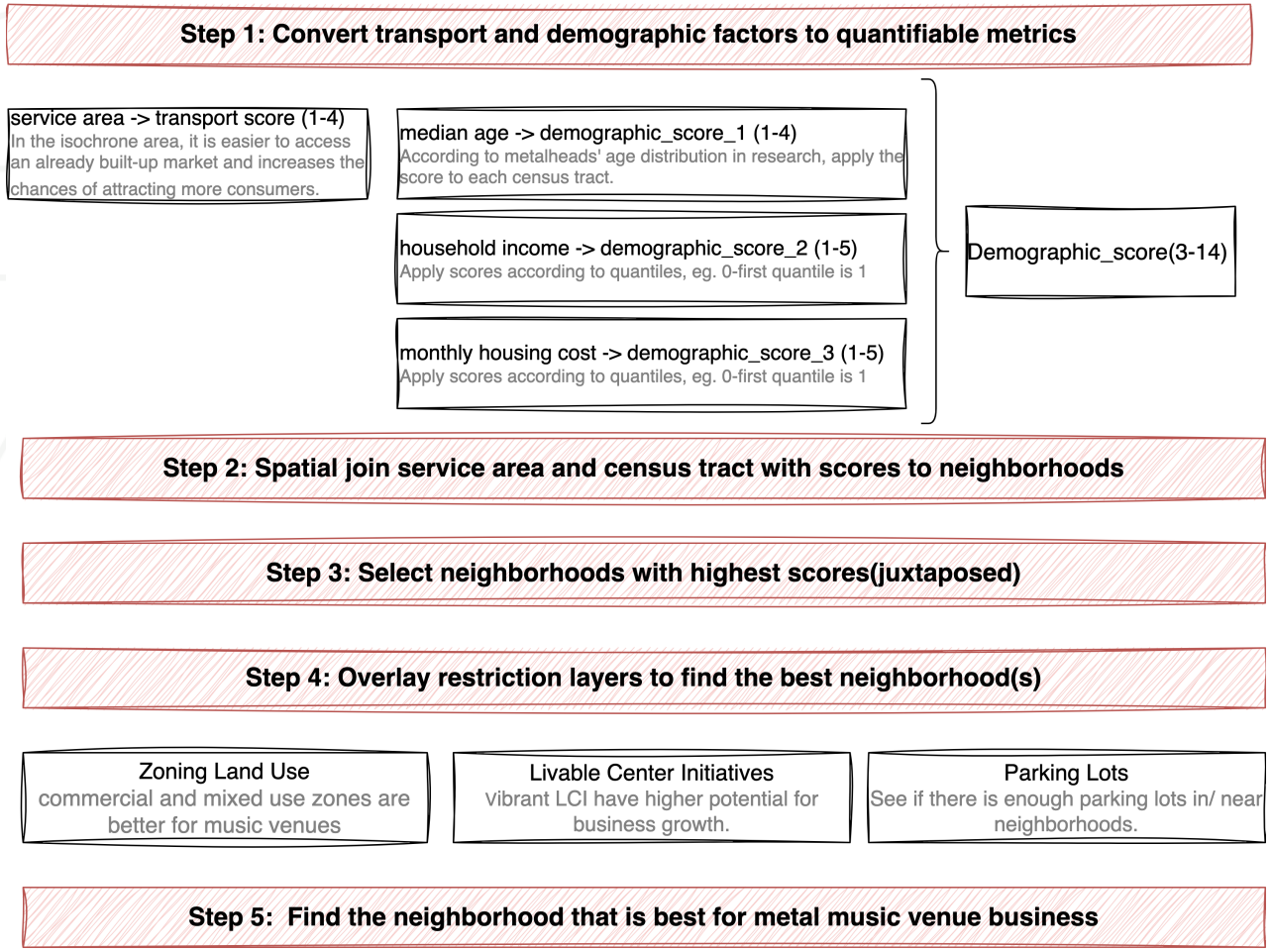
Method & Tools



Spatial and mathematical model

ArcGIS Pro: Service Area

QGIS: Join attribute by location, Field Calculator, Attribute Table Edit, Layouts

Python:

- OSMnx: Network analysis and Data collection
- Folium: Interactive visualization
- Geopandas: Geospatial data processing

Tools used

Data

Census tract with housing price, household income, age, race – Census Bureau API

Music venue POI - yelp API

Parking lot, Road network - OSMX download

Atlanta Neighborhood Area - Course Material

Transport	Demographic	Urban Planning
Road Network	Median Age - *Consumer Character*	Zoning Land Use - Compatibility
Service Area - Accessibility	Median Household Income - *Consumer Character*	Urban Policy: Livable Initiatives - Develop Potential
Parking lots - Accessibility	Monthly Housing Cost - *Real Estate Cost*	Department of CITY PLANNING

OSMnx

OpenStreetMap

United States Census Bureau

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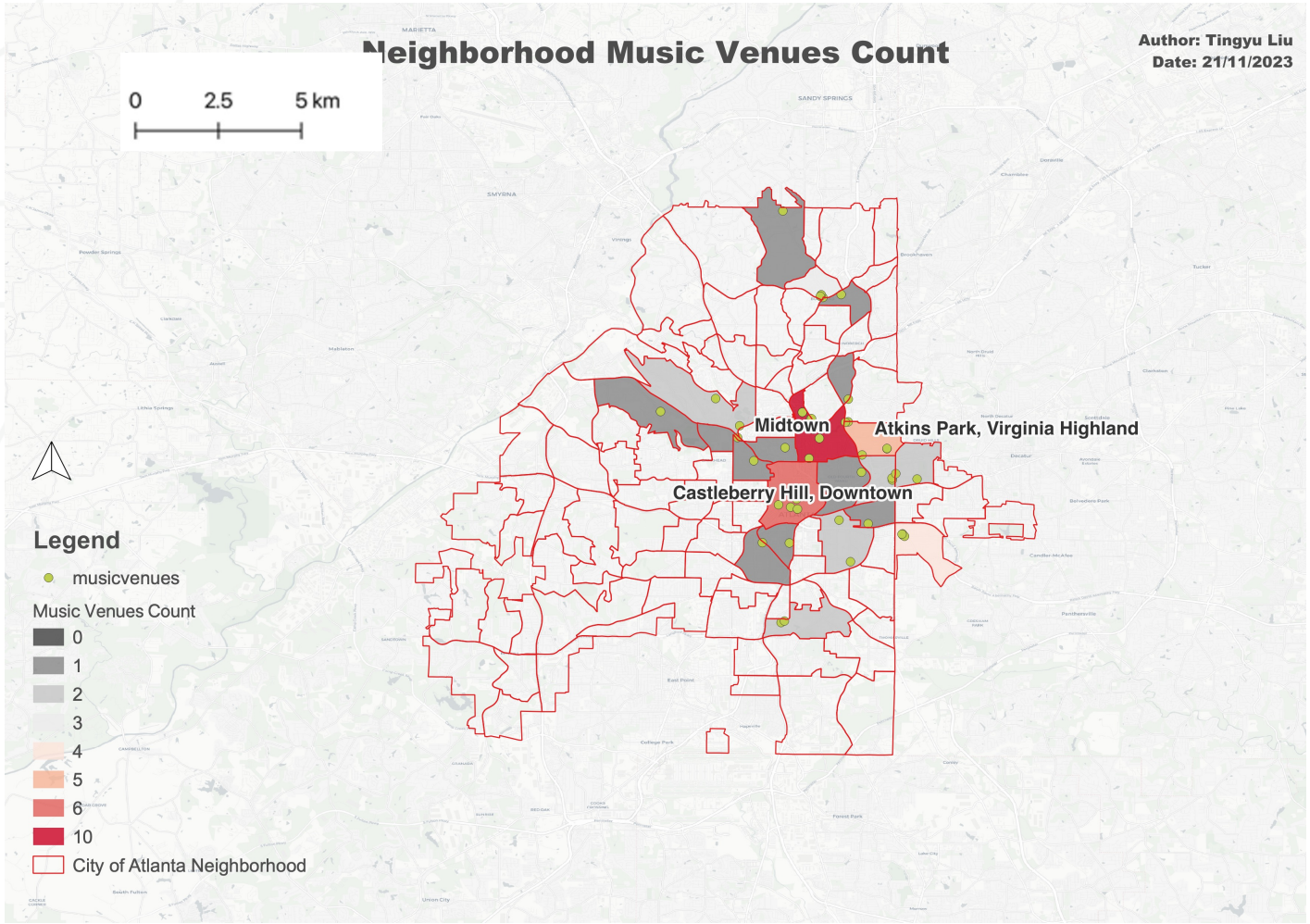
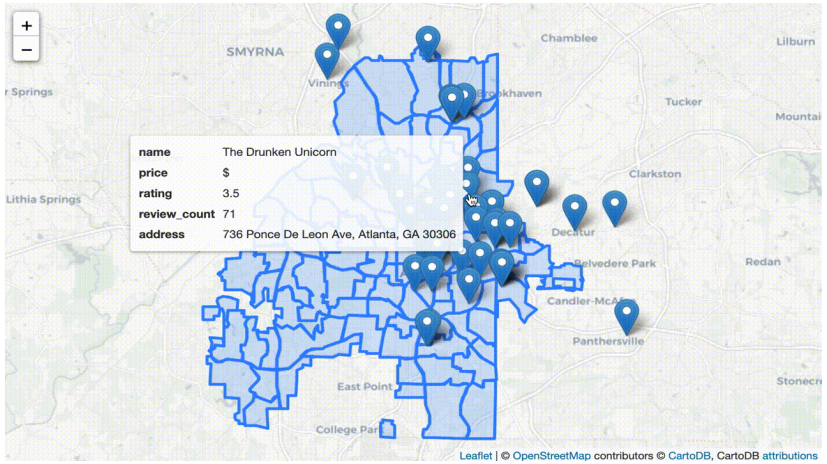
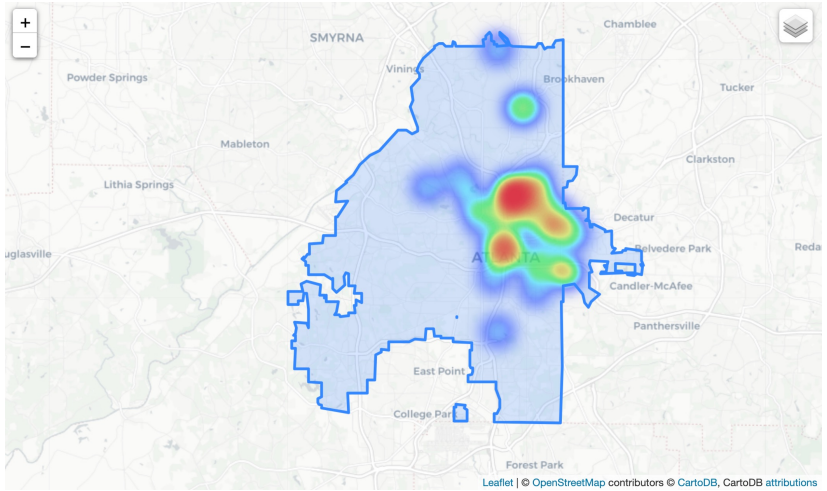
Competitor Analysis: Existing Music Venue



Spatial Distribution of Existing Music Venue

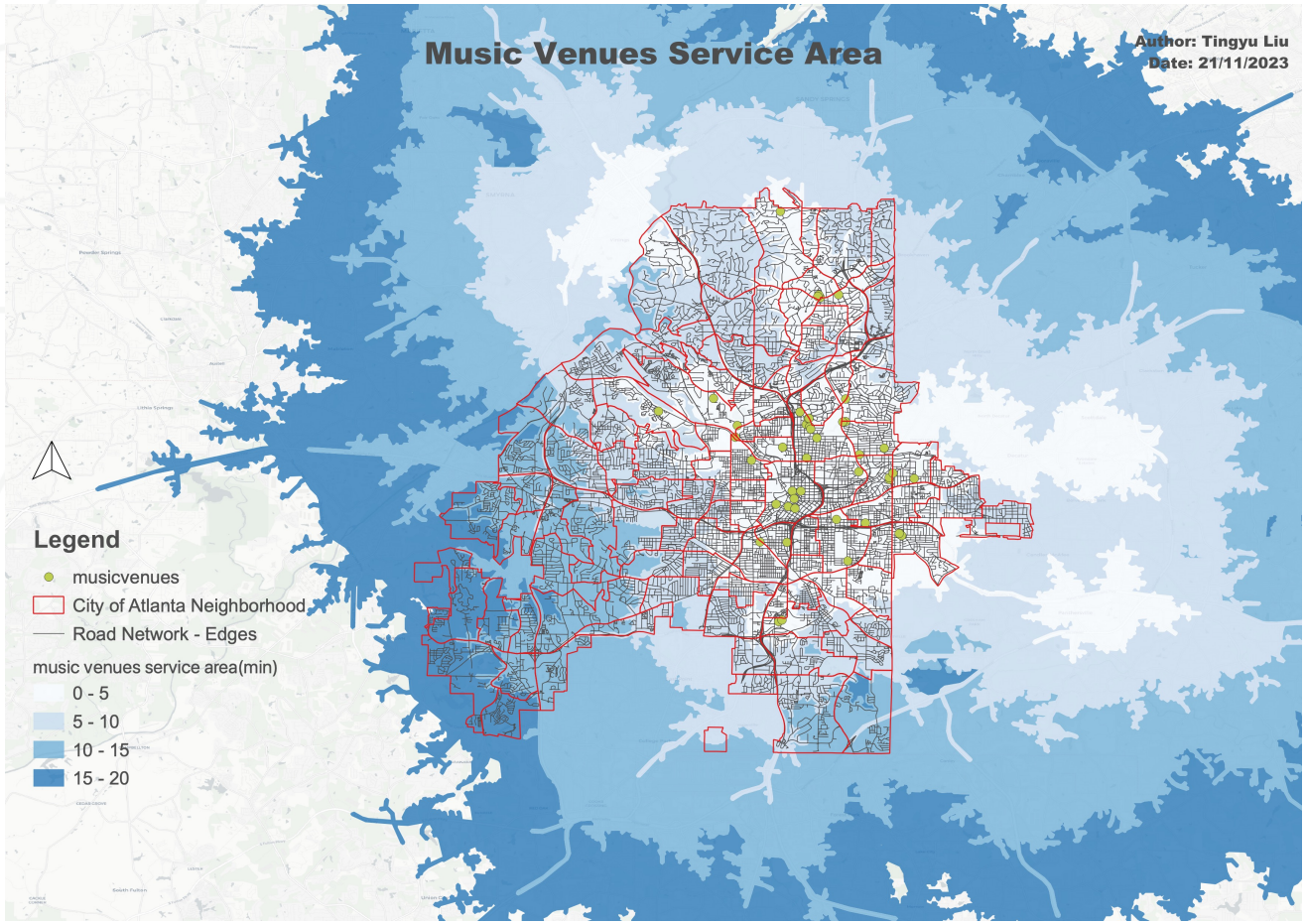


Music Venue Attribute



Music Venue Density

Transport Analysis: Existing Music Venue Service Area



Step 1: Convert transport and demographic factors to quantifiable metrics

Facilities: music venue point of interest

Network: road network

Time threshold: 5, 10,15, 20

Type: Driving

service area -> transport score (1-4)
In the isochrone area, it is easier to access an already built-up market and increases the chances of attracting more consumers.

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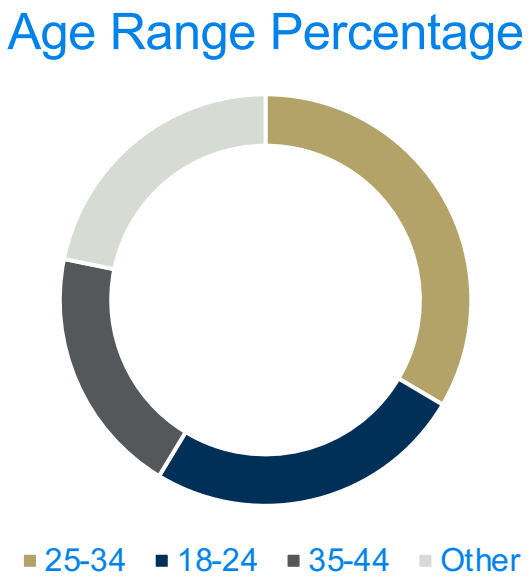
Demographic Analysis – Who are metalheads?

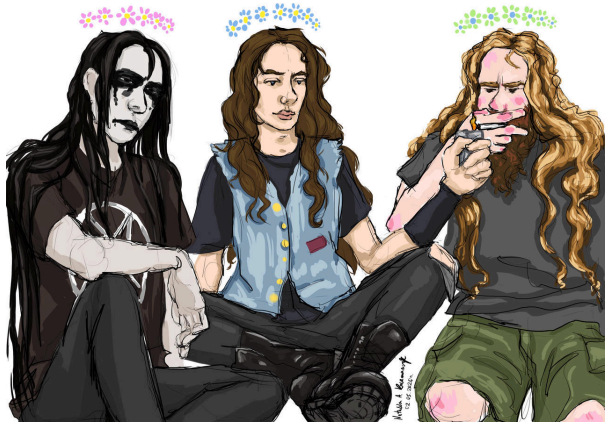
Metalheads are people who enjoy metal music and regularly attend metal music venues = consumers

- Largely white, cis-gendered, and male.
- Age: Majority age range is 18-34
- Most popular in North America and Northern Europe.



Metalheads' age distribution, Shown in research(Shukla,2022)

Typical/ stereotypical metalheads



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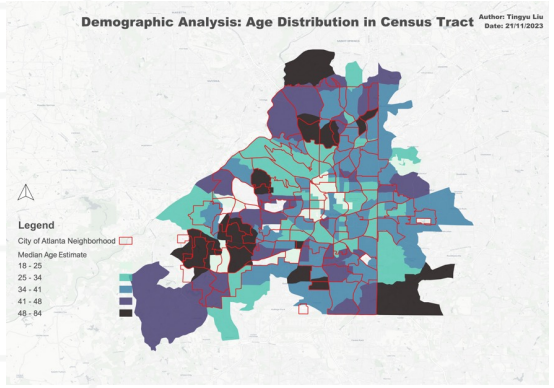
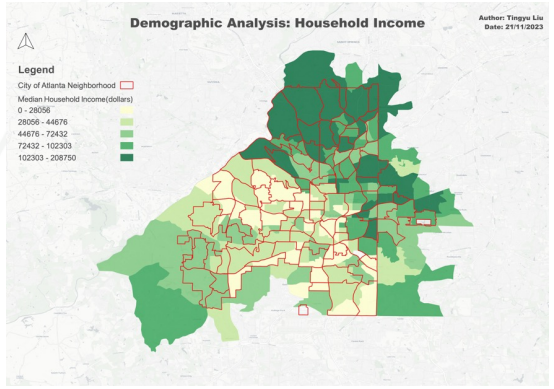
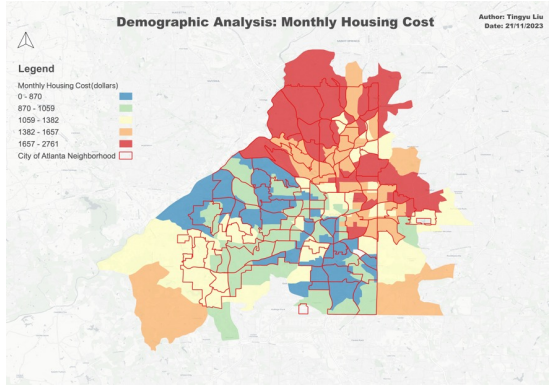
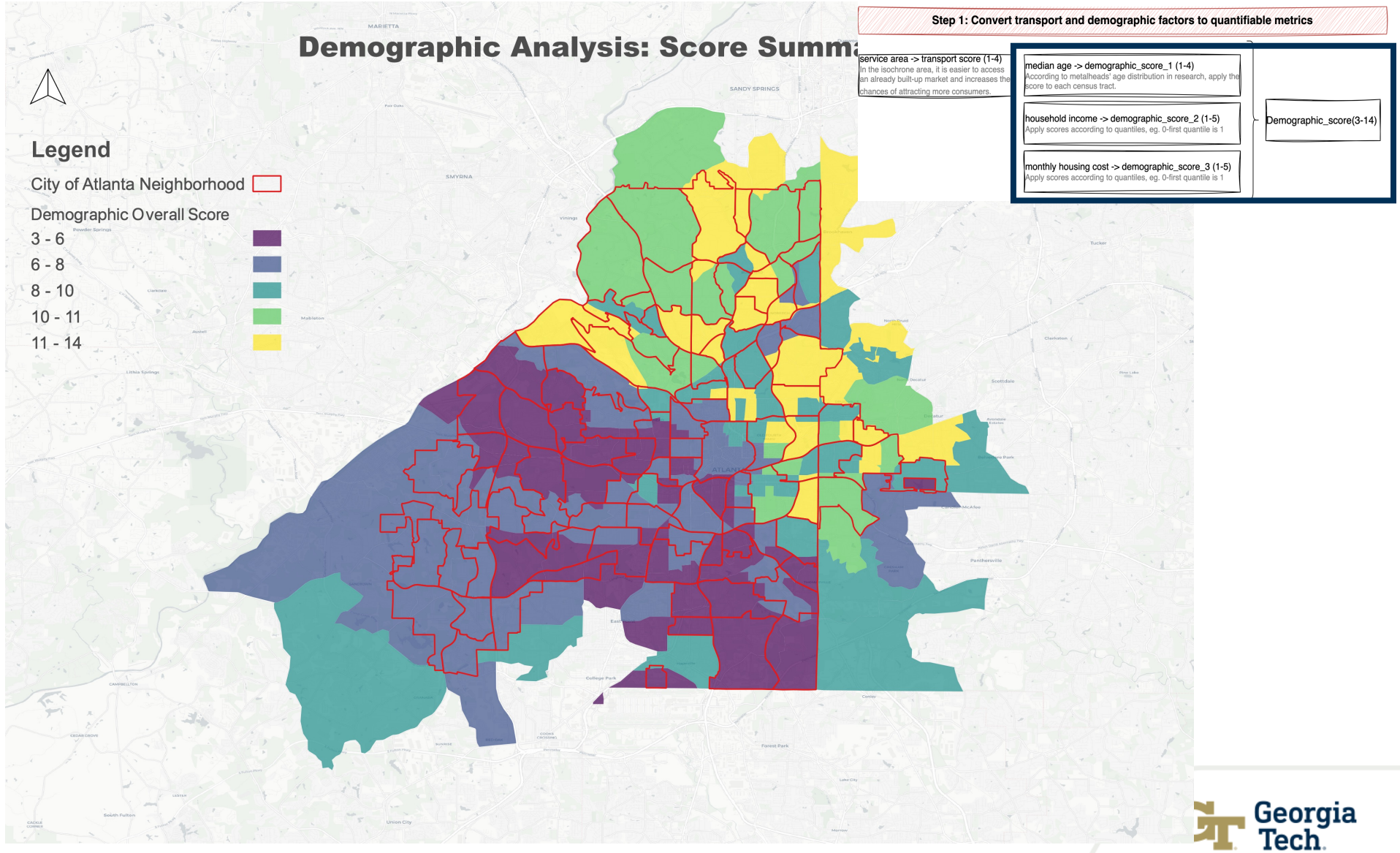
Demographic Analysis – Census Tract









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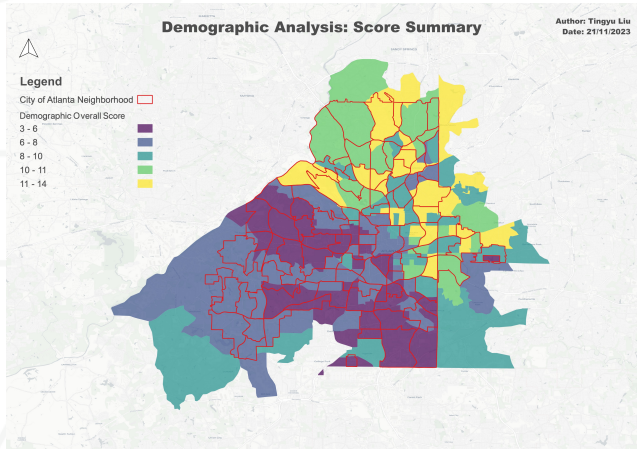
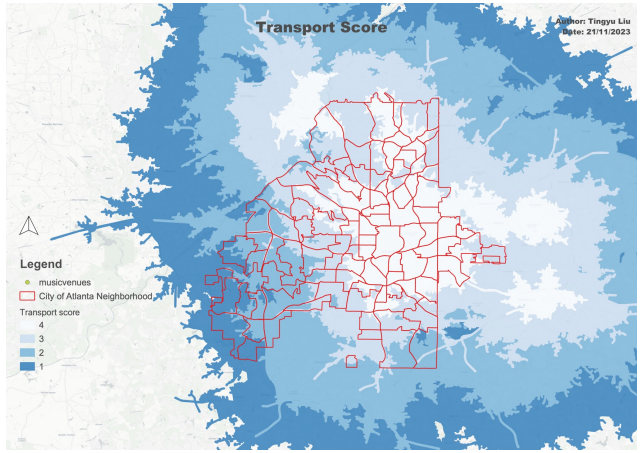
Factor Integration

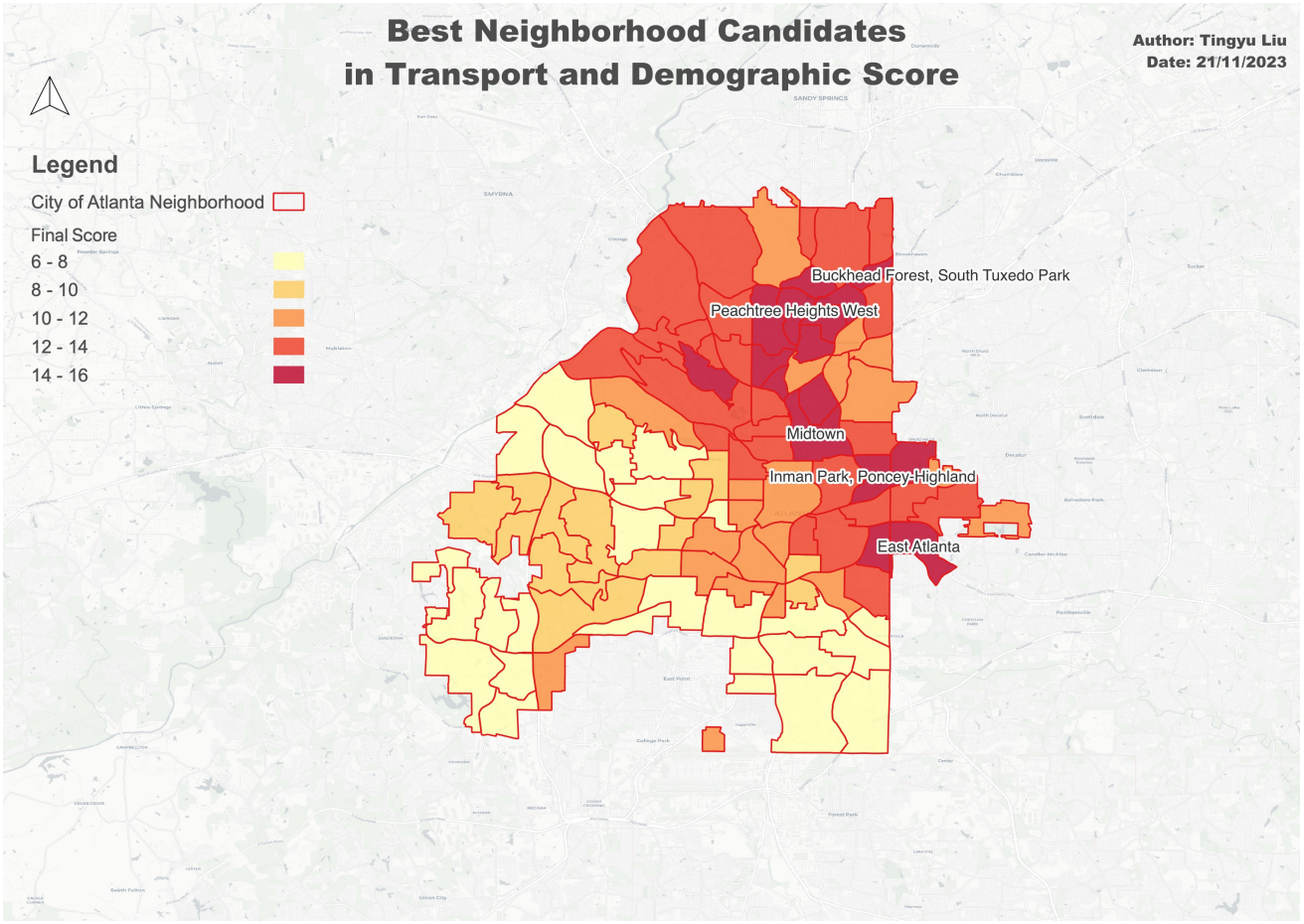
Step 2: Spatial join service area and census tract with scores to neighborhoods





Join attribute(score) by location to each Neighborhoods

Weighted by area



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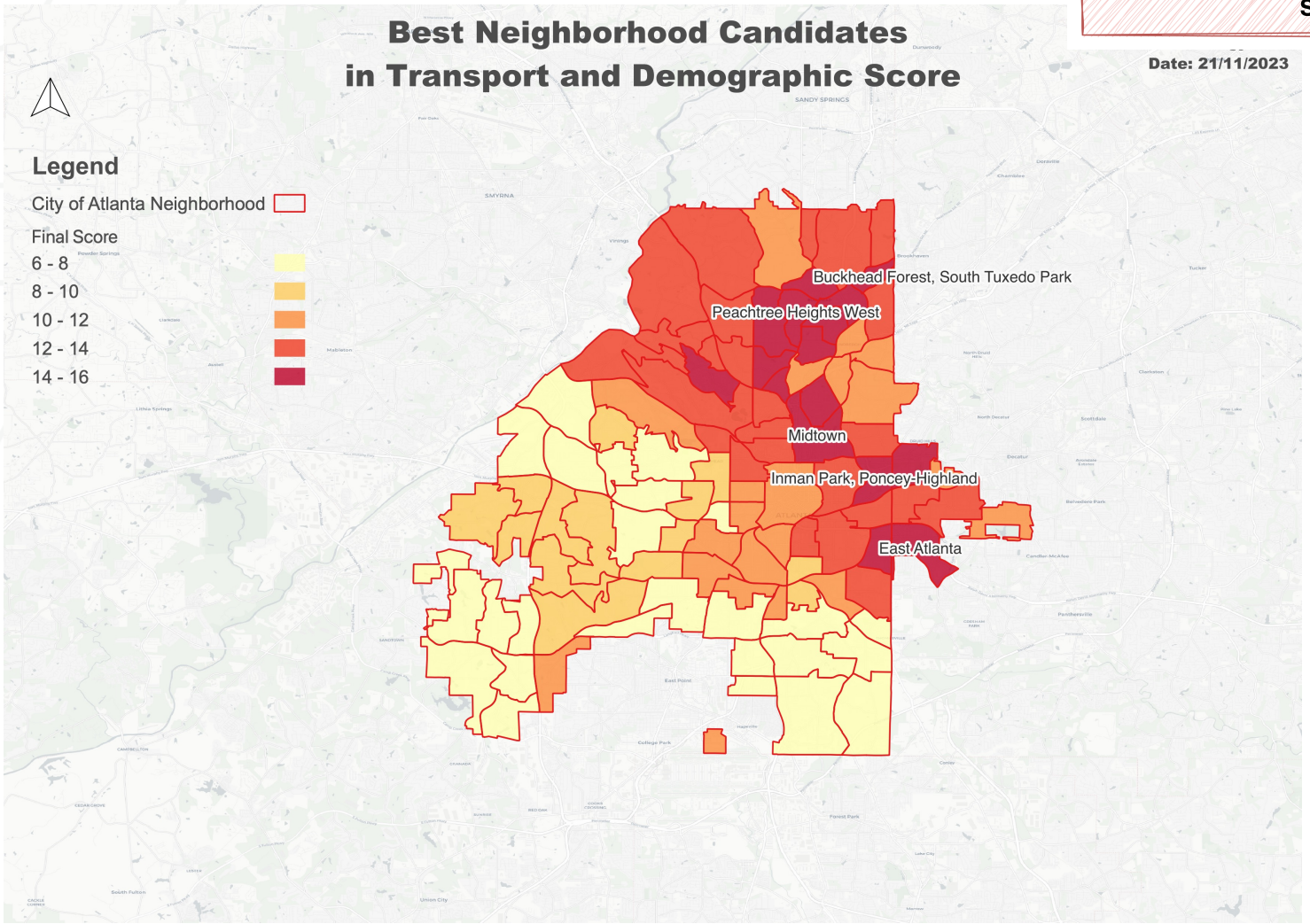
Integrate Transport and Demographic Factors

Step 3: Select neighborhoods with highest scores(juxtaposed)



After adding up the transport and demographic scores, the neighborhoods with the highest score (15/16) are:

Midtown
Inman Park
East Atlanta
Peachtree Heights West
Buckhead Forest

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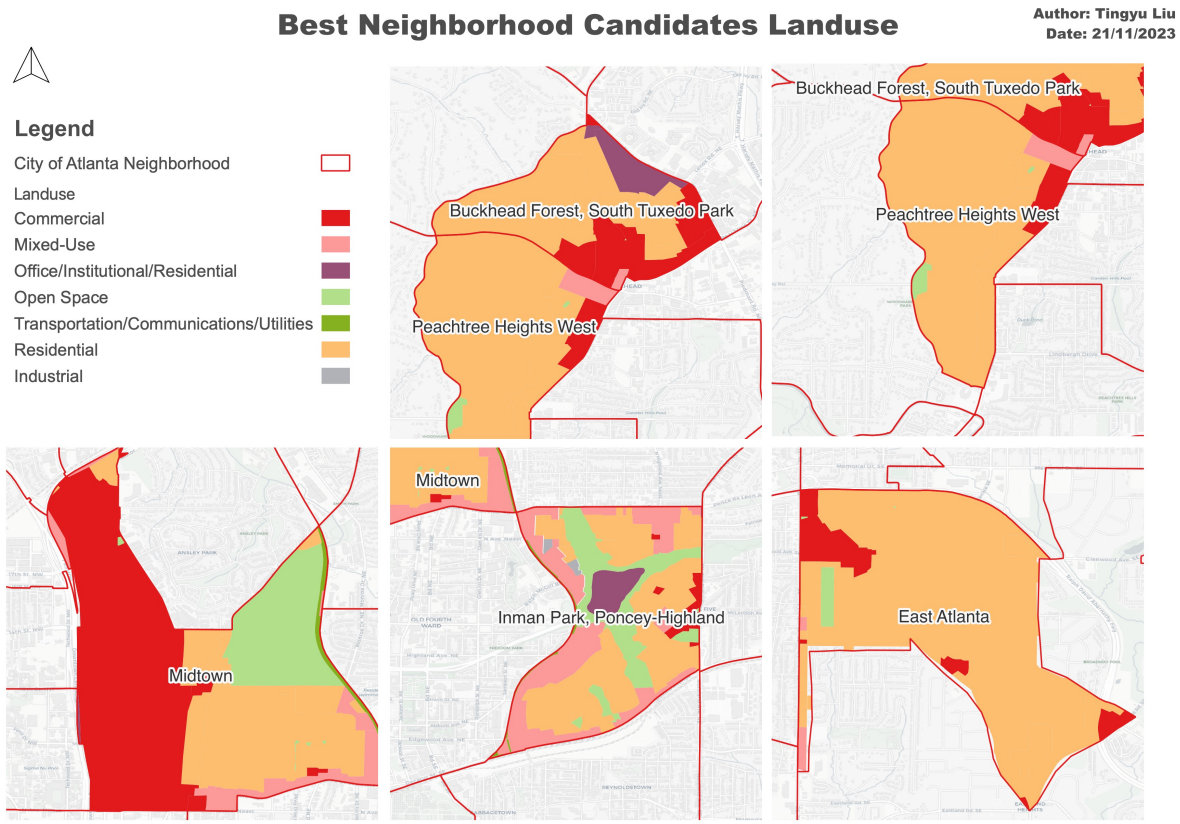
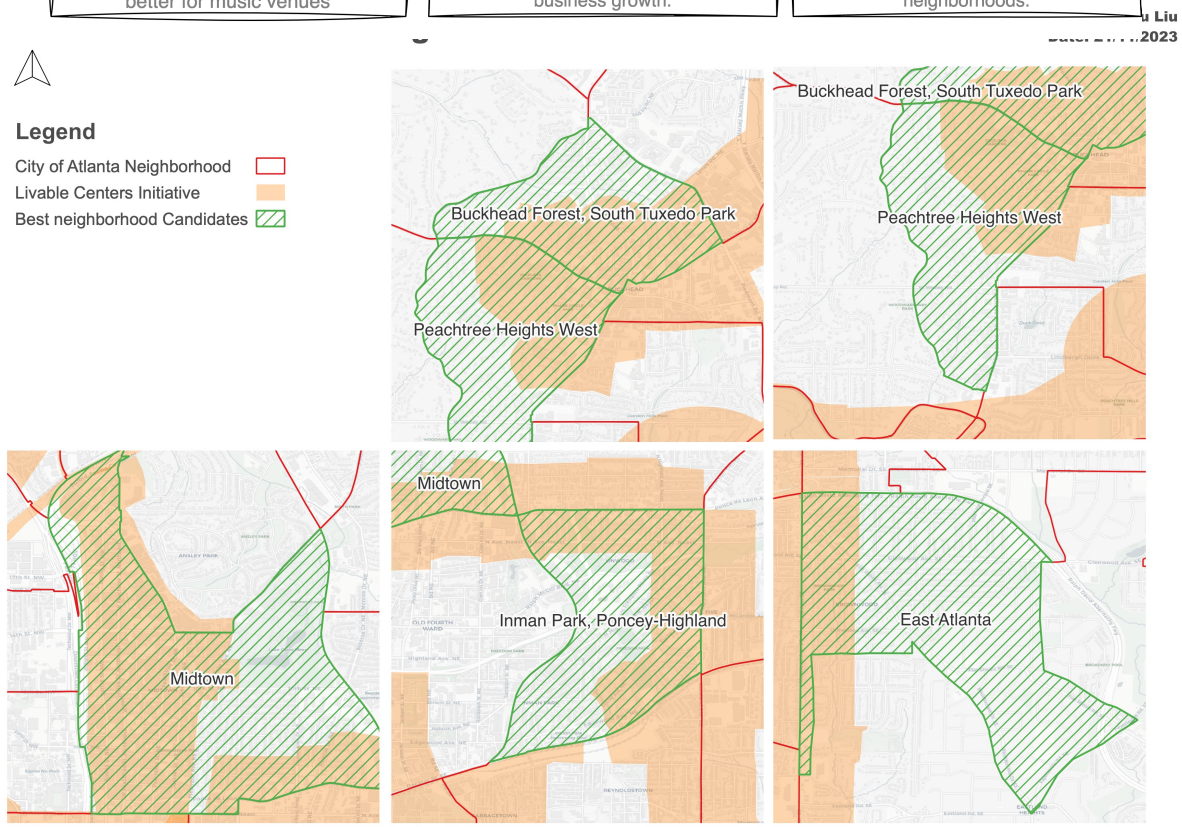
Restrictions: Zoning



Step 4: Overlay restriction layers to find the best neighborhood(s)

Zoning Land Use	Livable Center Initiatives	Parking Lots
commercial and mixed use zones are better for music venues	vibrant LCI have higher potential for business growth.	See if there is enough parking lots in/ near neighborhoods.



The **Midtown, Inman Park, and Buckhead Forest** neighborhoods perform better in terms of zoning restrictions.

Contextual Information: Commercial and mixed-use land use are more suitable for a music venue business. The Livable Centers Initiative encourages vibrant and walkable places.

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Restrictions: Parking

Step 4: Overlay restriction layers to find the best neighborhood(s)

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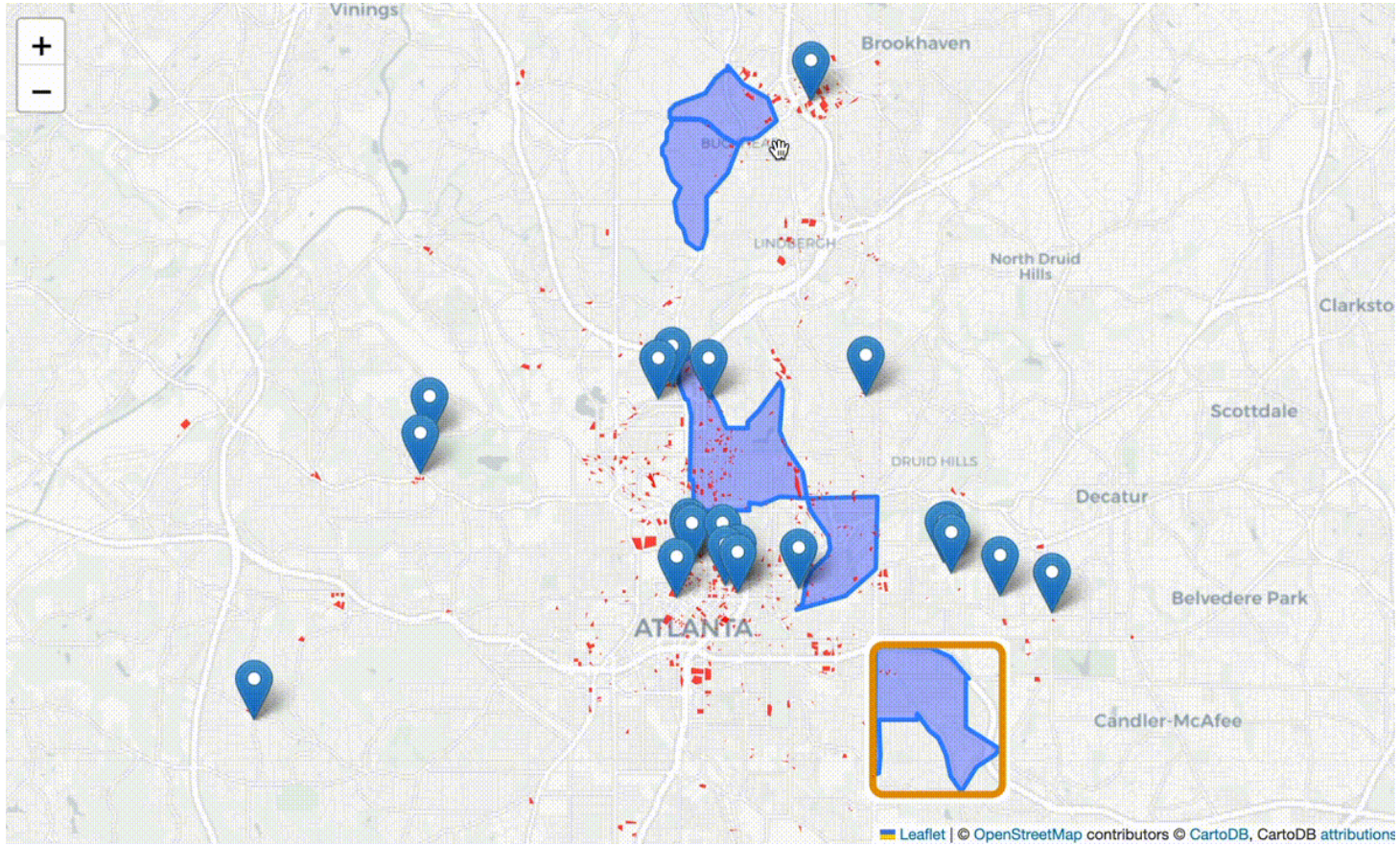
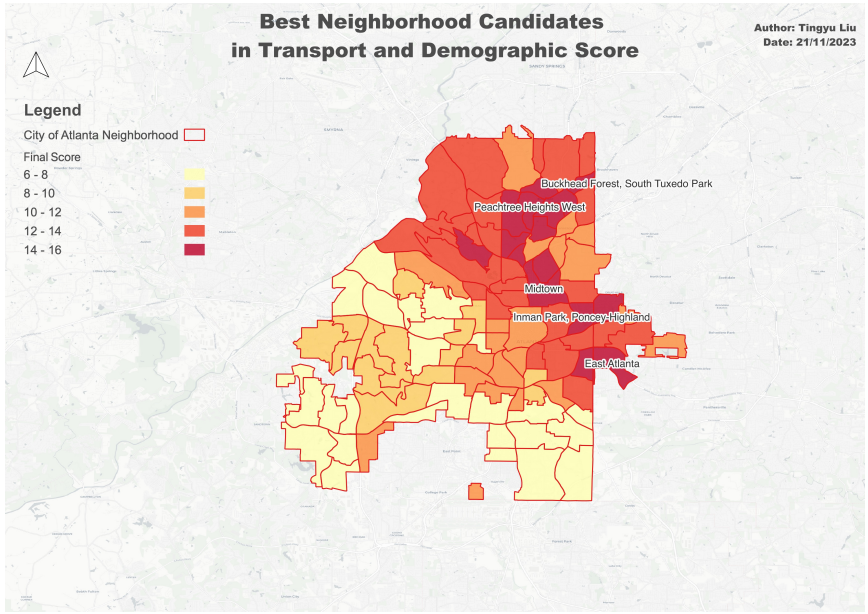
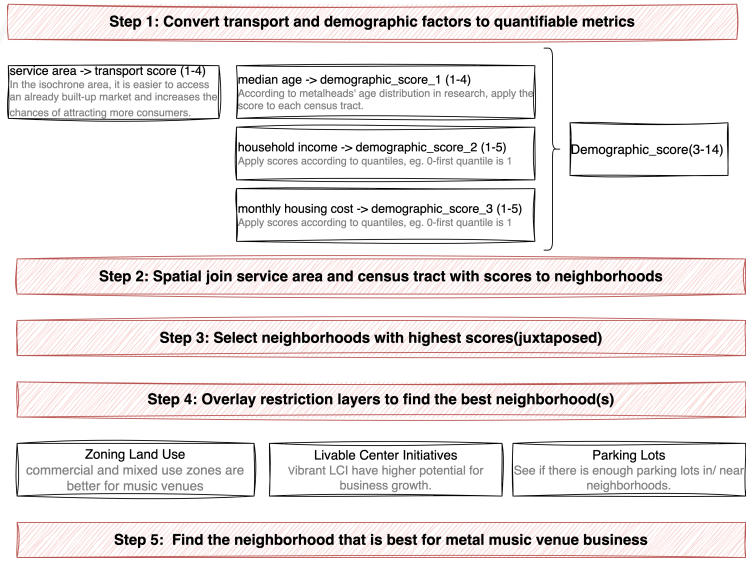




Based on parking lot amenity, **Midtown** and **Inman Park** are the best!

Conclusion and Discussion

After quantifying transport and demographic factors, and using transport and urban planning factors as restrictions, we have determined that **Midtown** and **Inman Park** are the best locations for a metal music venue business.



In more detail, Midtown has a more established music venue business and is more competitive. It will be more familiar to metalheads, but it is also a high-risk, high-reward type of venture.

Inman Park has higher potential with fewer existing music venues and suitable conditions for this business. Suggested location for music venue will be Edgewood Avenue, which has a restaurant street, however, the real estate price is also higher.

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Prandi, C., Barricelli, B. R., Mirri, S., & Fogli, D. (2023). Accessible wayfinding and navigation: a systematic mapping study. Universal Access in the Information Society, 22, 185-212

Picture source:

P8: https://www.deviantart.com/nataliaakaczmarczyk/art/Majestatic-Metalheads-893413346

P8-2: https://finance.yahoo.com/news/watch-behaviour-analyst-serve-amusing-103054565.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAADjXRPMtDjwVAduVO24TNFmF5-Q5qV5R7Q7PLe97yjNCDnfmnQBNLmLcglIAK52qJfKycyFAUQLhgz4LO_vksMEXqBxMnuij0TCzJkWJoUoESeHcfm3cYHgDHy9xuOqGbpBoffQAXnqgf5UuznO-gy58mnE2WS7WPqheNei7BsSl

P14: https://en.wikipedia.org/wiki/Inman_Park#Atlanta's_first_intown_neighborhood_to_gentrify

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Thank you

Open to comments and suggestions!

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