Where Do People Go? An Urban Vitality Analysis of Atlanta

INTRODUCTION

Atlanta is the 9th largest metropolitan region in the United States and the capital city of Georgia (American Factfinder, 2010). Ranked among the top 20 world cities based on GDP, Atlanta has been contributing to the development of global business, technology, and entertainment (GaWC, 2016). It is also a city currently undergoing tremendous changes including suburbanization and gentrification, economic growth, and population migration. Understanding the spatial vitality pattern of Atlanta is important for optimizing the urban fabric and improving city planning.

According to Jane Jacob, urban vitality can be reflected by the active streets' life with a high level of pedestrian activities (Jacobs, 2020). Applying Jane's theory, this project aims to uncover the Neighborhood Planning Units (NPU, zonings commonly used for urban planning) that have the highest pedestrian activity or the highest urban vitality in Atlanta.

DATA & METHOD

Building Density: Building footprints were processed from feature to point, then performed with kernel density and reclassified from 1: lowest to 5: highest density. (Figure 1)

Population Density: Population density by NPU was processed from polygon to raster, then reclassified from 1 to 5. (Figure 2)

Land Use: Land use was processed from polygon to raster, then reclassified from 1: lowest pedestrian activity to 5 (Table 1 and Figure 3)

Land Use Type	Rank
Airport, forest, industrial, cell towers, limited access highway, forest, bare exposed rocks, quarries, transitional area	1
Low density residential, industrial, mobile home parks, golf courses, cemeteries, agriculture, rivers, wetlands	2
Industrial and commercial complexes, other urban, reservoirs	3
Medium density residential, churches, extensive institutional, parks, park lands	4
High density and multifamily residential, commercial, intensive institutional, transportation utilities	5

Table 1. Land Use Reclassification

Intersection Density: Streets were processed to intersections using the geometric network, then performed with kernel density and reclassified from lowest to highest (Figure 4)

Metropolitan Atlanta Rapid Transit Stop Density (Marta): Stops were processed with kernel density and reclassification from 1 to 5 (Figure 5)

Distance to Landmark: City landmarks were performed with Euclidean distance and reclassified from most distant to closest (Figure 6)

The weighted vitality score was calculated from the six indicators raster using the raster calculator through the following formula:

15% population density+20% intersection density+ 20% building density + MARTA stop density+25% land use rank+5% distance to landmark
Zonal statistics were applied to the weighted vitality score by NPU.

NPU	Neighborhoods Included	Score
L	English Avenue, Vine City	3.92
M	Castleberry Hill, Downtown, Old 4th Ward, Sweet Auburn	3.91
T	Ashview Heights, Atlanta University Center, Harris Chiles, Just US, The Villages at Castleberry Hill, West End, Westview	3.78
V	Adair Park, Capitol Gateway, Mechanicsville, Summerhill, Pittsburgh, Peopletown	3.62

Table 2: NPU with Highest Vitality Score and included neighborhoods

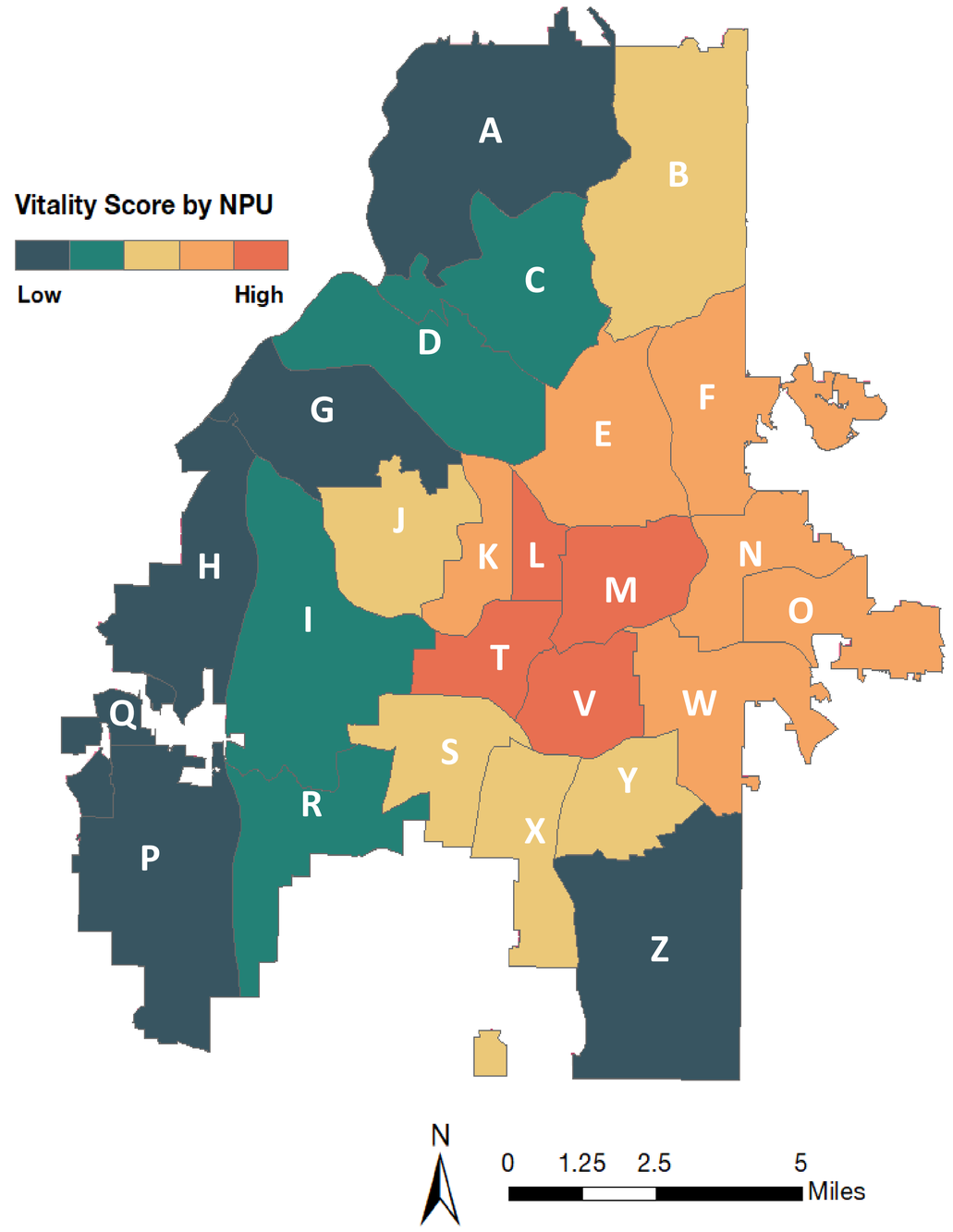

Figure 7: Weighted Atlanta Urban Vitality Score by NPU

RESULTS

The final results were presented by weighted Atlanta vitality score map (Figure 8) and score based on NPU (Figure 7). The results suggested that the central area of Atlanta including NPU L, M, T, V had the highest vitality score among all regions with an average urban vitality score of 3.81 (calculated from Table 2). The vitality pattern spreads from high to low from downtown Atlanta where major landmarks, commercial areas, and large institutions like Georgia Institute of Technology locate and to the edge of the city where most of the heavy industrials, airport, and limited-access highway aggregate.

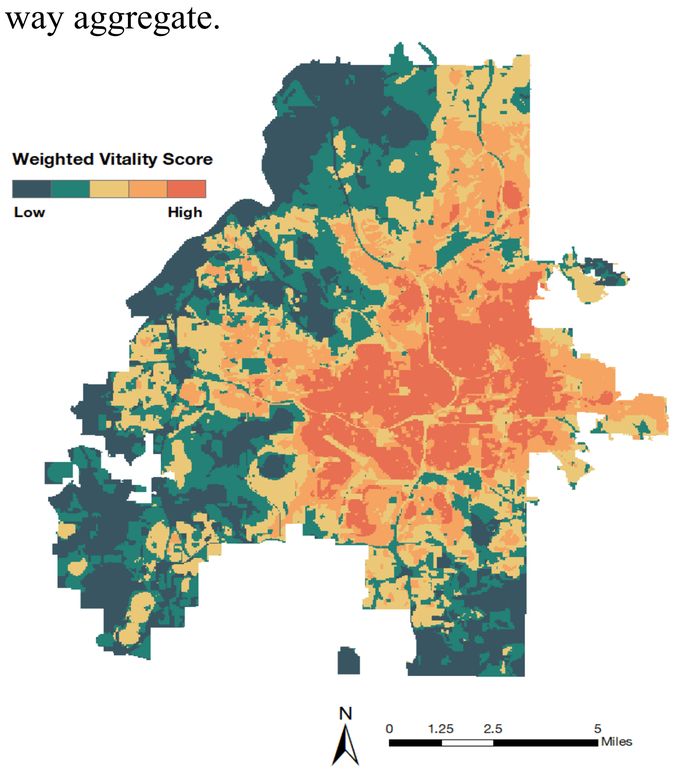

Figure 8: Weighted Atlanta Urban Vitality Score

DISCUSSION

This analysis using GIS showed that central regions around downtown Atlanta had the highest pedestrian activity/urban vitality. The vitality reduces as the distance between regions from downtown Atlanta increases. This analysis based on NPU could potentially help the Atlanta City Council identify regions that need further infrastructure improvements for high-level of pedestrian activity.

There are still limitations to this analysis, as many other potential indicators that contribute to the pedestrian activity had not been examined. For example, Jacob's theory addressed that the mixture of old and new buildings contributed to the urban vitality. Besides, another previous research had utilized cellphones-based trackers to track the pedestrian activity of selected younger adults for the vitality analysis (Gutiérrez et al., 2019). More indicators needed to be accounted for further analysis.

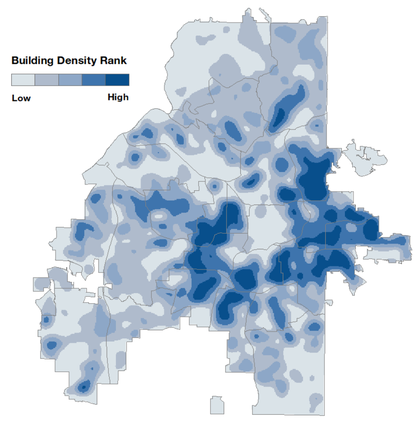

Figure 1: Building

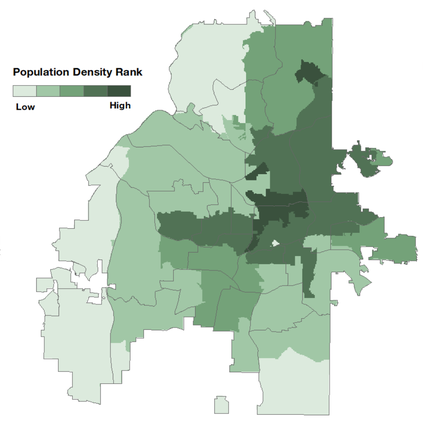

Figure 2: Population

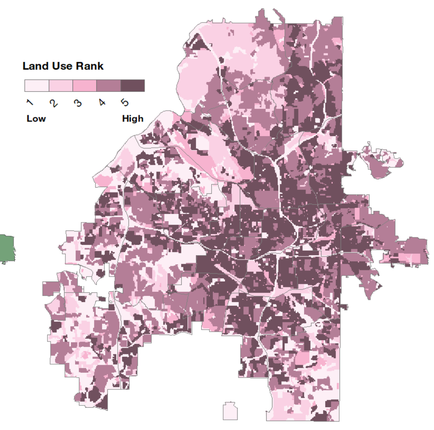

Figure 3: Land Use

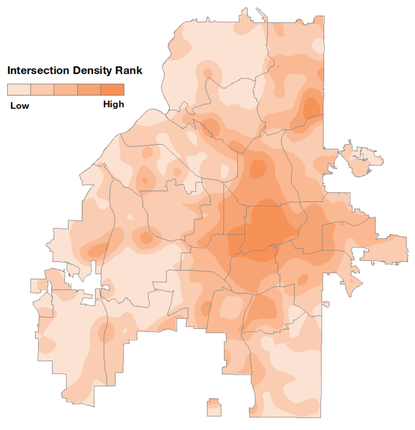

Figure 4: Intersections

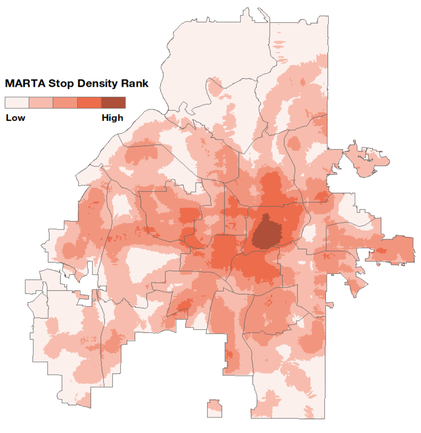

Figure 5: MARTA Stop

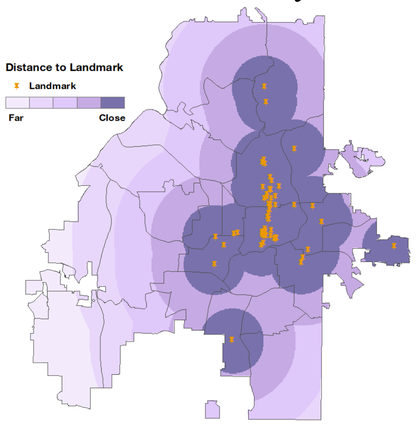

Figure 5: Landmark

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Projected Coordinate System: NAD 1983 Georgia West FIPS 1002 State Plane Coordinate System (Meter)

Data Sources: the U.S Census Bureau; Atlanta Department of City Planning; Fulton County GIS; City of Atlanta GIS

References:

The World According to GaWC 2016. (n.d.). Retrieved from https://www.lboro.ac.uk/gawc/world2016.html.

Data Access and Dissemination Systems (DADS). (2010, October 5). American FactFinder - Results. Retrieved from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.

JACOBS, J. A. N. E. (2020). *Death And Life Of Great American Cities*. S.l.: THE BODLEY HEAD LTD.

Delclòs-Alió, X., Gutiérrez, A., & Miralles-Guasch, C. (2019). The urban vitality conditions of Jane Jacobs in Barcelona: Residential and smartphone-based tracking measurements of the built environment in a Mediterranean metropolis. *Cities*, *86*, 220–228. doi: 10.1016/j.cities.2018.09.021