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"Assessing Green Accessibility: A Geographic Information Systems-Based Analysis for Informed Urban Policy in West Hollywood, Los Angeles"

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Title: "Assessing Walking Accessibility to Parks: A Geographic Information Systems-Based Analysis for Informed Urban Policy in West Hollywood, Los Angeles"

Abstract:

This study employs advanced Geographic Information Systems (GIS) methodologies to evaluate walking accessibility to parks in Los Angeles from West Hollywood. This study aims to visualize areas needing additional parks in the city by comprehensively analyzing walking access times to parks, population density, and median household income and further focus on predicting the feasibility of prioritization. The study's outcomes furnish critical insights germane to urban planning considerations, acting as an informational bedrock for judicious public policy decisions to foster an equitable and accessible urban park network.

1. Introduction

1.1 Background:

Green spaces are integral components within the urban fabric, substantively contributing to public health, recreational avenues, and communal well-being. According to the Park Score ranking disseminated by the Trust for Public Land, Los Angeles garnered specific scores denoting 44 points for accessibility, 52 points for park size, and 41 points for investment. Notably, 63% of Los Angeles' populace resides within a 10-minute radius of a park, surpassing the national median of 55% but trailing behind the median of 74% for the top 100 most populous cities in the United States. This research narrows its focus to the distinctive locale of West Hollywood in Los Angeles, underscoring the imperative for meticulously examining walking accessibility to parks within this urban milieu.

1.2 Problem Statement:

The challenge of inadequacies in walking accessibility to parks poses multifaceted obstacles to urban policy. Therefore, this study seeks to pinpoint specific areas characterized by restricted park access, exploring the consequential implications for the tenets of equitable urban planning. Notably, the study underscores the pivotal role of GIS as a facilitative instrument in engendering decision-making processes grounded in data-driven methodologies.

2. Methodology

2.1 Data Collection:

Data is meticulously curated from diverse sources, encompassing park locations courtesy of the City of Los Angeles Parks and Recreation Department, road network data procured from the Los Angeles Department of Transportation, and demographic information derived from the U.S. Census Bureau. An essential precursor to analysis involves the conscientious preparation and editing of the dataset to ensure its analytical integrity.

2.2 Analysis:

Employing a judicious 15-minute walking accessibility threshold, GIS tools serve as the linchpin of this study, orchestrating the identification of areas exceeding this temporal threshold. Spatial analysis techniques, notably leveraging the Network Analysis Layer function, are adroitly deployed to depict and interpret the resultant accessibility patterns visually. In addition, by utilizing the Business Analysis function using ESRI's Census data within ArcGIS Pro, the population density (Population per Square Mile, 2023) and median household income ACS 5-year estimate (2023) data of the area (West et al.) were utilized to check priorities for new park installations within limited resources.

3. Visualization and Description

3.1 Walking Time to Parks in West Hollywood City:

The following maps are based on California State Parks, Los Angeles Parks and Recreation, and West Hollywood Parks and Facilities data. They are supplemented with Google Maps and Imagery Map from ArcGIS Pro to show when each of the nine locations of West Hollywood city parks can be reached, indicating the surrounding area for each unit. A light blue area dividing line was marked to demarcate the city boundary between Los Angeles and Beverly Hills. From the center of each park, indicated by a green circle, areas from dark green to light green represent areas that can be accessed on foot within 5, 10, and 15 minutes. Through the color expression of green, the darker the green, the more accessible the park is, and the lighter the green, the less accessible the park is.

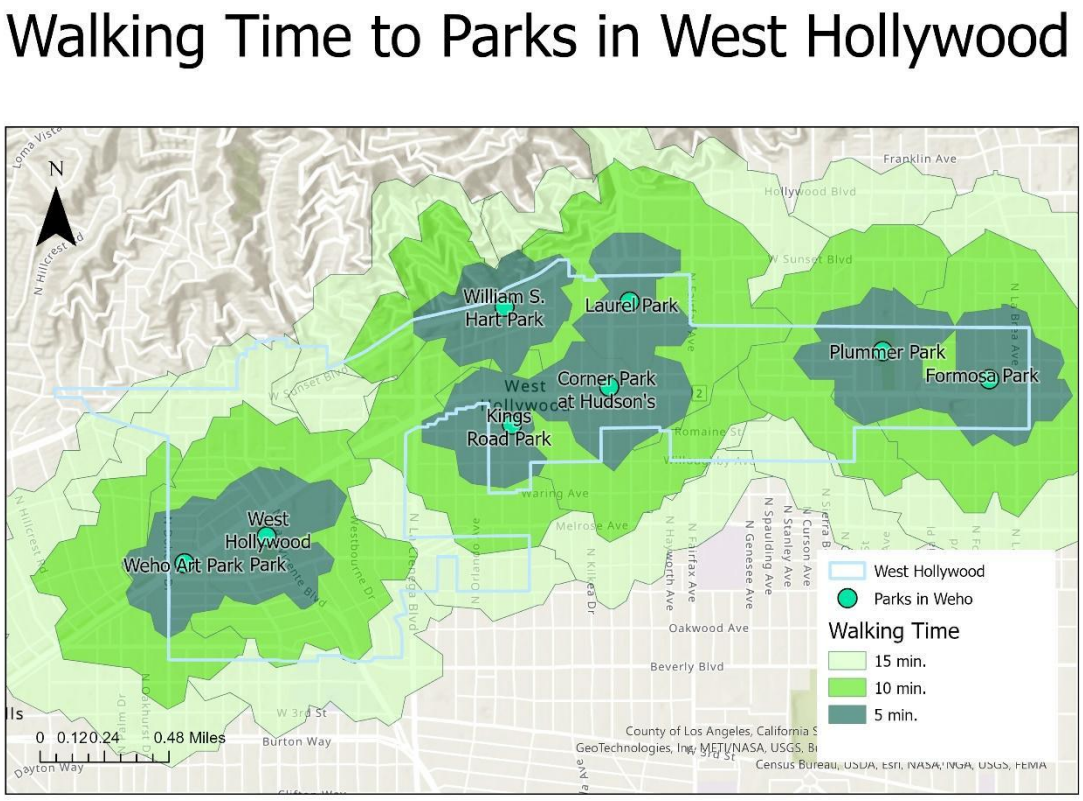

Figure 1. Walking Time to Parks in West Hollywood

3.2 2023 Population Density:

West Hollywood's population is 35,757 as of the 2020 Decimal Census. The map below shows population density as of 2023, analyzed using ArcGIS Pro's Business Analysis feature (ESRI). The five-tier classification shows high population density around the boundaries of the Beverly Hills area. This map also uses green as a color code to visualize park needs. The area adjacent to Beverly Hills, which has been shown to have a low population density, is likely to be considered a high-quality residential environment. However, in addition to this speculation, this study assumed that areas with a low population are relatively low priorities for new parks, so the lower the density, the darker green it is expressed. This map visually shows that the city's eastern part requires a new park.

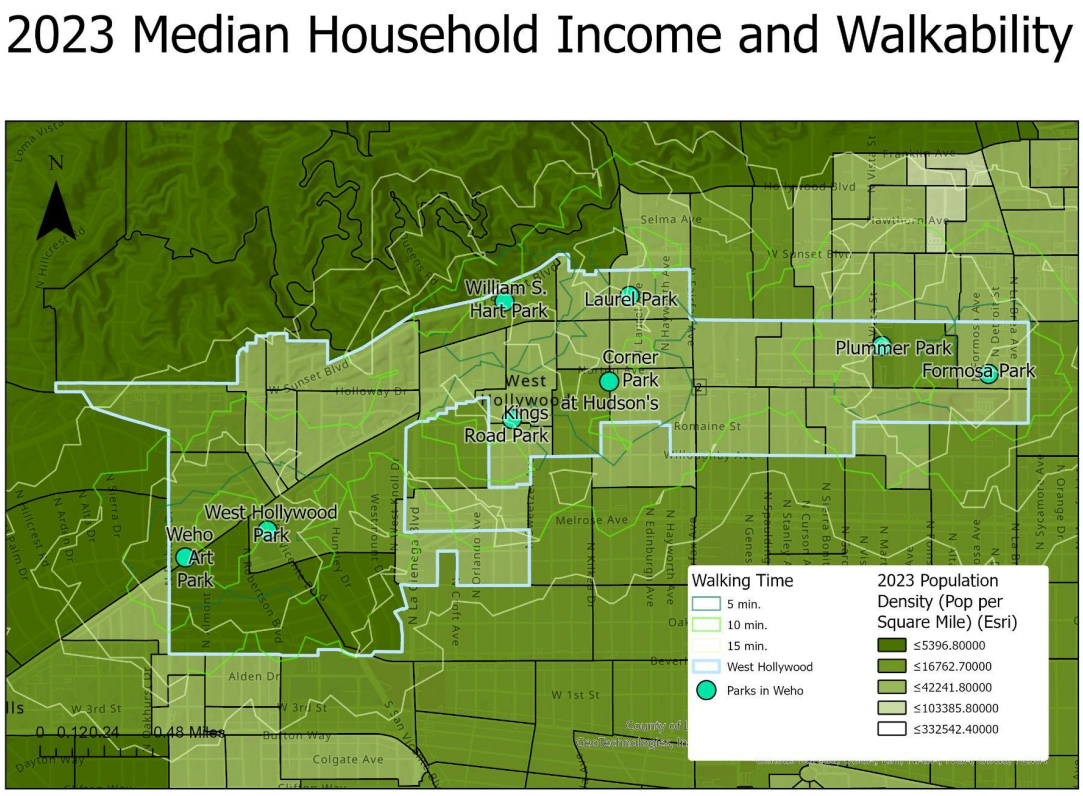

Figure 2. 2023 Population Density and Walkability in West Hollywood

3.3 2023 Median Household Income:

The Median Household Income is $78,719 as of the 2021 ACS-5yr. The map below shows the 2023 median household income distribution map using the Business Analysis function of ArcGIS Pro. The assumption behind this map analysis is that the higher the median income, the higher the level of individual housing affordability. This implies many privately-owned green areas, such as gardens, flower beds, and backyards. Therefore, the higher the median household income, the green, and the lower the median household income, the lighter the color. This map also shows that the area east of the city up to the La Brea Ave border urgently needs new parks.

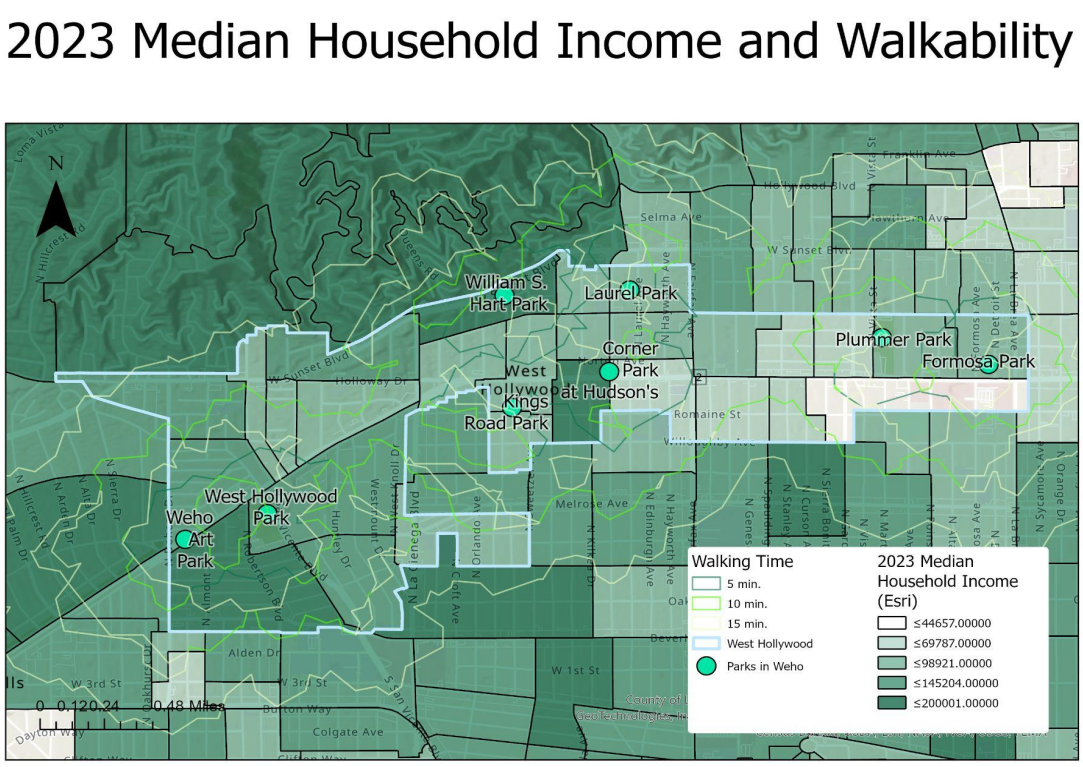

Figure 3. 2023 Median Household Income and Walkability in West Hollywood

4. Limitations:

A sagacious acknowledgment of data limitations forms an integral component of this study, delineating factors that potentially impact the precision of findings. Among these limitations is the incomplete dataset concerning parks designated as Service Areas. Illustratively, the park data procured from the City of Los Angeles Parks and Recreation Department should have included West Hollywood Park, necessitating manual supplementation through satellite mapping. Furthermore, the dataset's lacuna is underscored by its inability to comprehensively encapsulate spatial information analogous to the amenities derived by residents from parks, including private gardens, small playgrounds, and street flower beds. Finally, the study's analytical scope is circumscribed by the absence of granular walking environment data, precluding a detailed examination of walking and signal infrastructure and areas of pedestrian risk.

5. Recommendations:

This study posits a springboard for expansive research endeavors to refine park accessibility, mainly through the inclusive incorporation of public transportation systems such as the metro. The overarching goal of curtailing park accessibility to less than 10 minutes, including walking, holds promise for enhancing the city's health indicators. Strategic analyses, encompassing the expansion of bus routes and judicious addition of bus stops, emerge as actionable recommendations within existing transit frameworks. Furthermore, the study underscores the potential for more nuanced analyses through the judicious application of the advanced functionalities inherent in the paid version of ArcGIS Pro.

6. Conclusion:

This research augments the discourse at the intersection of GIS-based analyses, urban policy, and public health imperatives. Identifying areas characterized by limited Green-Accessibility, notably around Romaine St and Spaulding Ave, serves as an unequivocal clarion call to urban policymakers. Strategies aimed at fortifying green infrastructure, expanding park access, and fostering pedestrian-friendly initiatives emerge as imperatives for fostering equitable urban development. As the nexus between GIS methodologies and urban policies evolves, this study contributes substantially to the ongoing dialogue on sustainable urban development.

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