An Assessment of Park Quality, Proximity, and Race in the City of Takoma Park, MD

Abstract

The purpose of this report is to contribute to the development of a Public Space Management Plan, which aims to provide a vision, goals, and guidance on how public space will be used and maintained in Takoma Park. This project falls in overall alignment with City Council's priorities of achieving "A Livable Community for All" and an "Environmentally Sustainable Community".

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Table of Contents

Introduction

In 2016, an inventory assessment was conducted in the City of Takoma Park on all the City maintained public space, including parks, plazas, and natural spaces. This assessment largely focused on which amenities were present in public spaces but did not take note of the quality or condition of the amenities. As a part of the Public Space Management Plan, City of Takoma Park Mayor, Kate Stewart has requested that this be reverified with a focus on the quality and condition of the parks. The purpose of this report is to contribute to the development of a Public Space Management Plan, which aims to provide a vision, goals, and guidance on how public space will be used and maintained in Takoma Park.

The Public Space Management Plan will be an update to the City's 1994 Open Space Plan (amended in 1999). On January 22, 2020, City staff developed a set of draft goals which were reviewed by City Council. Following the review by City Council, a quality assessment of all parks in the City was completed in April 2020.

In order to accurately determine the quality of parks, a grading scale was determined in order to better understand how to improve parks within the City of Takoma Park. Parks were graded differently based on whether potential use was classified as "active" or "passive". In order to better understand the spatiality of these relationships, GIS software was used to map park space and visualize park quality and racial demographic data. Park amenities were mapped on site using the *Collector for ArcGIS* mobile app. Throughout this process, an in-app photo feature was used to attach photos to individual park amenities in order to better classify structural feature quality. Park data was then added into *ArcGIS Pro* and converted to an online interactive map in *ArcGIS Online*.

In total, three objectives were defined for this project (1) determine the quality of parks within the City and distribution of park amenities, (2) identify the distribution of parks in terms of racial demographics throughout the City, and (3) determine how well the City meets the national standard of all residents living within ¼ mile or 10 minute walk of a

park (American Planning Association and National Recreation and Park Association). Parks assessed in this analysis were both city owned and county owned however, stream valley's, such as Sligo Creek, and neighborhood conservation areas were excluded from this analysis since they lack amenities, they are generally difficult to access, and they are not maintained in the same ways that community parks are.

Racial demographic data and park proximity were both analyzed at the block group level. Racial demographic data was collected from the United States Census Bureau and park accessibility was determined using geoprocessing tools in QGIS.

It should be noted that the City of Takoma Park does not own all parks within the city boundary. Some of the parks found throughout the city are owned by Maryland National Capital Parks and Planning Commission (M-NCPPC). With that being said, the city can use the results of this study to provide feedback to M-NCPPC on the quality of their parks in hopes that M-NCPPC will conduct improvements. Choosing to exclude these parks from this analysis would lead to an inaccurate assessment and would ignore many of the parks that city residents chose to visit throughout the year.

Determining current city and county owned park conditions, number and quality of amenities, park distribution in terms of racial demographics, and accessibility to parks space are all important factors which will greatly contribute to the City of Takoma Park's Public Space Management Plan and will lay the groundwork for holistic decision making with respect to public space in the City of Takoma Park.

Field Methodology

Park Amenity Data Collection

As a part of the Public Space Management Plan, City of Takoma Park Mayor, Kate Stewart has requested that park space be assessed with a focus on the quality and condition of the parks. In order to achieve this goal with the highest degree of efficiency

the city staff has determined that the mobile app, *Collector for ArcGIS* would be used as the primary tool for data collection.

The primary goal of the park data collection process was to determine the number and location of amenities within all city and county owned parks within the City of Takoma Park. Prior to going out in the field, park amenities layers were created using *ArcGIS Online*. The location of park amenities was then determined in the field and recorded using the *Collector for ArcGIS* mobile app. Quality of park amenities was recorded using a notes feature and photos were taken of amenities which were deemed to be in poor or questionable condition. Additionally, photos of playground equipment were also taken since this layer was broadly defined in *ArcGIS*.

To clarify, all forms of playground equipment were categorized under a single layer, photos of these objects were then used to identify specific types of playground equipment as opposed to overcomplicating the map with a different layer for each type of playground equipment. Once all park amenity data was gathered and recorded at each park, each park was given a grade for overall quality.

Park Grading Scale

Overview

If given enough attention urban parks can evolve from their recreational role into a catalyst for community development, cohesion, and enhancement. A park and its surrounding area can not only be a place to understand and relate to nature, but it can also be a place for social and cultural exchange. Many of today's urban parks have few activities outside of recreational opportunities, and do not attract people such as seniors or teens, or people who are just looking for a place to sit or walk on a daily basis. The danger in all of this is that when there are few reasons for people to go to a park, fewer people use them and they will cease to be valued.

In order to better understand how to improve parks within the City of Takoma Park, a quantitative evaluation of each park has been completed. This will help to prioritize which parks need the most improvement.

Since different parks have different intended use, parks have been classified into two general categories. Upon initial inspection, parks have been classified as either active or passive. From there, the analysis is divided into three areas of assessment for active parks: landscape features, structural features, and cleanliness; and two areas of assessment for passive parks: landscape features and cleanliness.

Landscape and structure are given an overall rating between 1-5 with 1 being "Very Bad" and 5 being "Excellent". The scores for these categories are then multiplied by 8 for active parks. The landscape feature score is multiplied by 10 for passive parks. Cleanliness is also assessed on a scale of 1-5 with 1 being "Very Bad" and 5 being "Excellent". The cleanliness category is given an overall rating for the park and then the score is multiplied by 4 for active parks and multiplied by 10 for passive parks. The scores for all categories are then added to produce a total score out of 100.

Scores are measured this way simply because passive parks will contain little to no structural features and therefore this category is not measured for passive parks. Moreover, since passive parks have less to see/do, cleanliness is determined to be of higher value in passive parks than in active parks.

Active vs Passive Parks

Upon an initial observation check of city owned parks. Parks were classified based on their intended use: either active or passive. In order to determine intended use, the following scale was used.

Determining Factors	**Active**	**Passive**
Are there amenities?	Yes	No/Not Really
What kind of amenities, if any?	Structural features in addition to benches and trash cans	Benches, trash cans
Where are trees and shrubs?	Spread out or along the periphery	Densely populated within the space itself
General layout	Limited open space due to structural features	Lots of open space with few to no structural features
How are people using the space?	Actively moving through or in the space. Interacting with the space.	Sitting, standing, laying down. Maybe walking.

Once a park was determined to be either active or passive, the analysis is divided into three areas of assessment for active parks (landscape features, structural features, and cleanliness) and two areas of assessment for passive parks (landscape features and cleanliness). Park features and specific grading criteria for each area of assessment are defined categorized in the sections below.

Landscape Features

- Open fields
- Athletic fields
- Waters bodies
- Trees
- Trails
- Horticultural Areas

Assessing the Quality of Landscape Features (Score is multiplied by 8 for Active parks and by 10 for Passive parks)

Excellent (5) – Landscape features look well maintained with little to no signs of damage.
Good (4) – Landscape features look maintained with minor signs of damage.
Fair (3) – Landscape features could use some maintenance. Signs of damage are present.
Bad (2) – Landscape features are heavily damaged but could be repaired. Features should be evaluated for maintenance.
Very bad (1) – Landscape features show major damage and should be removed and replaced/renovated.

Structural Features

- Playground equipment
- Paved surfaces
- Benches
- Trash cans
- Fences
- Sidewalks
- Safety surfaces
- Drinking fountain
- Pavilions
- Picnic tables,
- Bike racks
- Public art
- Basketball hoops

Assessing the Quality of Structural Features (Score is multiplied by 8. This score is only evaluated for Active parks)

Excellent (5) – Features look new/well maintained, little to no sign of physical use/deterioration.
Good (4) – Features look well maintained but show some signs of minor deterioration.
Fair (3) – Features show general signs of wear and deterioration, may require some attention. Some elements display significant deficiencies.
Bad (2) – Features show clear signs of deterioration, appear to be approaching the end of service life. Large portions of the feature exhibit significant deterioration.
Very bad (1) – Features display widespread signs of advanced deterioration. Many components exhibit signs of imminent failure. Feature use is highly questionable at best.

Cleanliness

- Litter
- Glass
- Graffiti
- Weeds

Assessing the Degree of Cleanliness (Score is multiplied by 4 for Active and by 10 for Passive)

Excellent (5) – Space is almost completely free of litter, glass, graffiti, and weeds.
Good (4) – Space is mostly free of litter, glass, graffiti, and weeds.
Fair (3) – Space has 1-2 places where litter, glass, graffiti, or weeds are present.
Bad (2) – Space has multiple places where there is litter, glass, graffiti, or weeds are present.
Very bad (1) – Space has a copious amount of litter, glass, graffiti, or weeds.

Final Score

Once the totals for each area of assessment have been calculated, they are then added together to produce a final score out of 100. It should be noted that since passive parks are only evaluated for two areas of assessment the scores for passive parks may vary more greatly than for active parks.

Once all park scores had been tallied, new fields (scores for Landscape Features, Structural Features, Cleanliness, and Total Score) were added to a "City Parks" layer in *ArcGIS Pro*. The city parks layer distinguished parks by ownership. Those owned by Montgomery County appear in dark green while those owned by the City of Takoma Park appear in light green.

Racial Demographics

In 2017, the Takoma Park City Council began including a "Racial Equity Impact Statement" on every agenda item. The purpose of the statement was to call attention to and raise the issue of racial equity, so the Council ensures it is always considered, along with other considerations such as the fiscal and environmental impacts, when making formal decisions.

The statement is one part of an overall initiative by the City to address institutionalized racism. Additional efforts have or will include racial equity workshops and training for City officials, staff and residents, and proactively revising policies and programs so that they are more equitable. Since adopting a racial equity initiative, the Council has been deliberate in how it considers potential racial equity impacts when developing priorities and working on the budget, and will continue to build on this focus in future discussions.

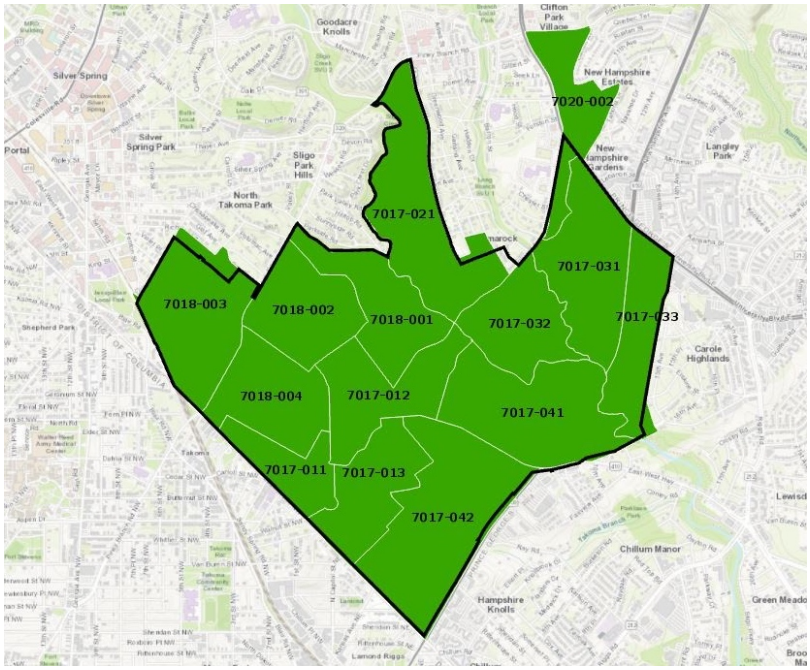
By overlapping racial demographic data with city park data, the City of Takoma Park can have a better understanding of how parks are currently distributed in terms of race. Data on racial demographics was collected from the United States Census Bureau at the block group level. Block group data was selected since it results in the largest number of divisions. This data was imported into *ArcGIS Pro* for visualization and then clipped from the state level to the city level. "Percent White" was chosen as the defining attribute and then the data was displayed as a graduated scale.

Distance Matrix

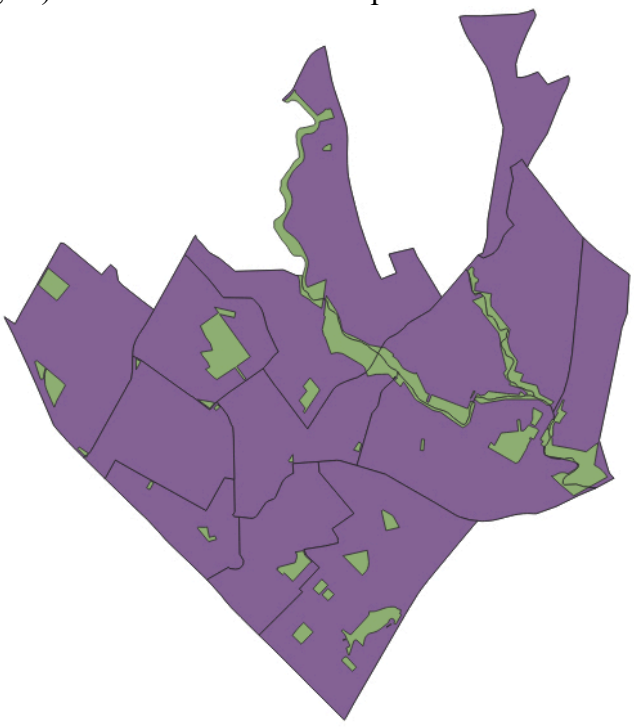
Walkability is a key factor when determining whether or not a park is accessible. In order to get an idea of how accessible parks are within the city, a Mapbox API Distance Matrix was used to calculate the average walking distance from any location within a single block group to all parks throughout the city. Prior to this analysis the open-source GIS software *QGIS* was used to prepare the data.

The following steps were taken to determine average walking distance from any location within each block group to any park within the city:

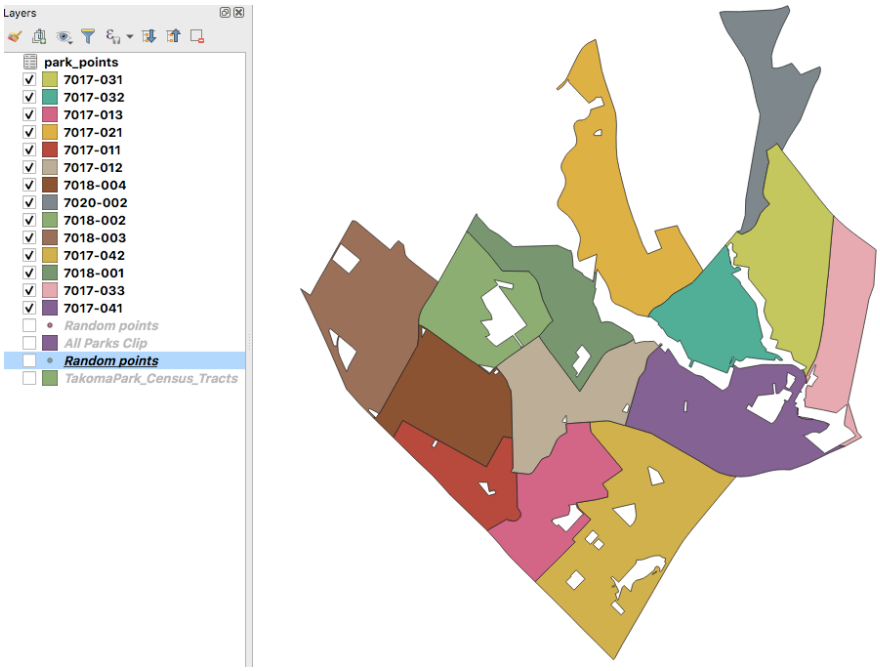
1. Block group level racial demographic data was collected from the United States Census Bureau and Park data was gathered from the City of Takoma Park GIS database.



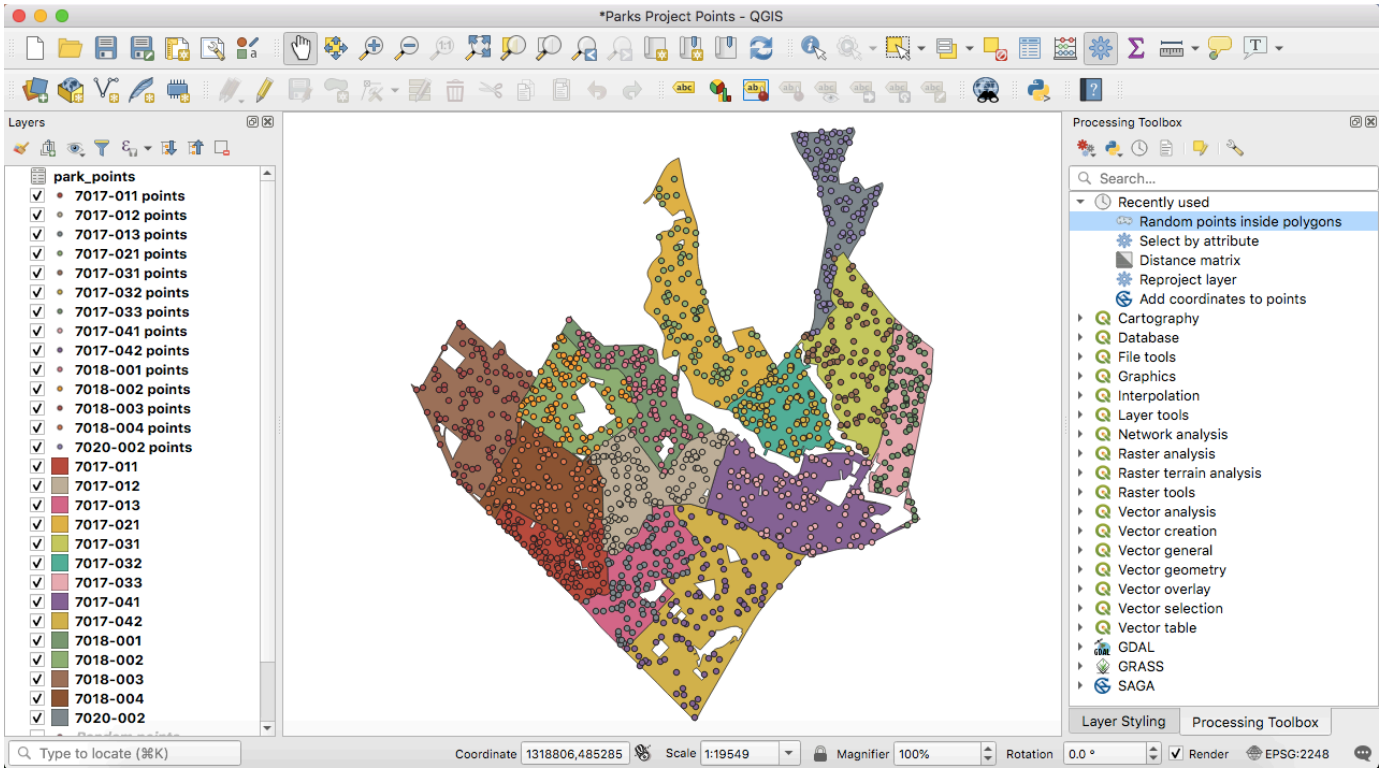
2. Data was imported into *QGIS* so that park data overlapped the block group data. Park data was then clipped from block group data so that randomly generated points (origins) would not reside within parks.



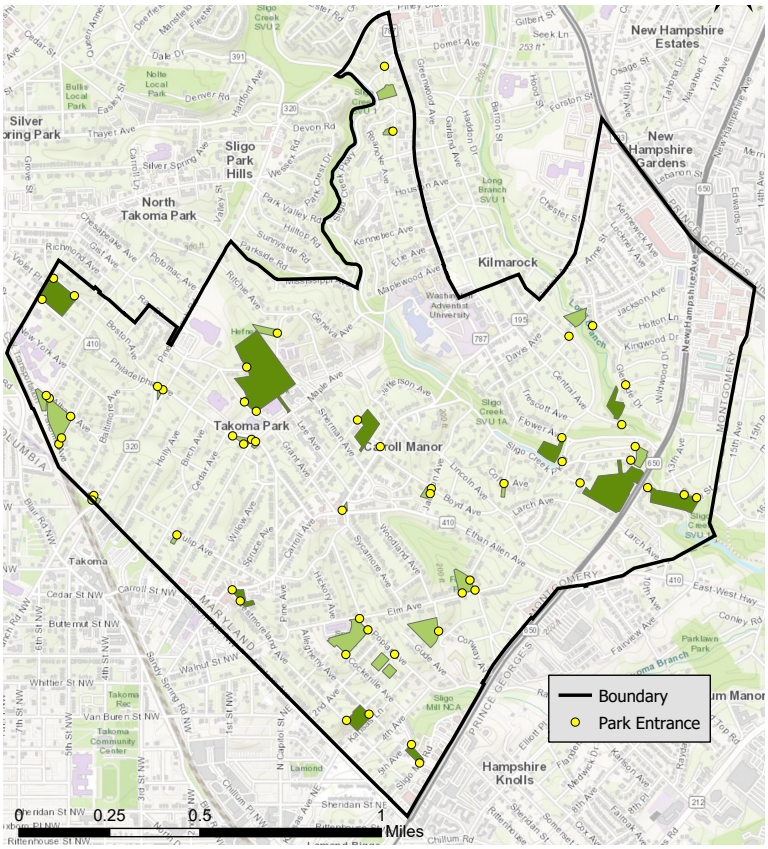
3. Block group data was separated from a single layer into individual layers so that each block group could be assessed individually.



4. 100 random points were generated in each individual block group using the "Random points inside polygons" tool in *QGIS*.



5. Data was then transferred to *ArcGIS Pro*.
6. All possible destination points (any location where someone could potentially enter a park) were then determined using google street view and created as a layer in *ArcGIS Pro*. 55 destination points were created.



7. Coordinates for origin and destination points were determined using the "Add XY Coordinate" tool in *ArcGIS Pro*. Once coordinates for all origin and destination points were established attribute tables were converted to *Excel*. Destination points (park entrances) maintained consistent throughout, however, origin points changed from block group to block group. Therefore, spreadsheets were created for each individual block group and then park entrance points were added to each table.
8. *Excel* was used to structure a rough code format (required for a Mapbox API Matrix) for each block group. The code was then imported to into *Word* to be finalized. From there, code for each block group was dropped into *Firefox* and run (Firefox provides a copy button which can be used to copy results).

Once matrix results were attained they were copied and converted from JSON to CSV (*Excel*) using https://www.convertcsv.com/csv-to-json.htm. Matrix results (appearing in seconds) were averaged and then converted to minutes giving a final result (average walking time from any location in the block group to all parks throughout the city) for each block group.

9. Final results for each block group were then added as a field in an attribute table to a block group base layer. The results could then be visualized using symbology tools in *ArcGIS Pro*.
10. In addition to analyzing results for average walking time from any location in each block group to all parks, maps were also created to analyze minimum average walking time from any location in each block group to the nearest active park, as well as park grades for active parks with the minimum average walking time from origin points in each block group.

Results

Park Evaluation Scores

The final results each of park evaluation can be viewed in the table below. This table also includes individual scores for Landscape Features, Structural Features, and Cleanliness. The average total score for all parks in the city was calculated at 72.94. Only 2 parks were given a total score of 100 and 8 parks had total scores that fell below the average.

Most parks within the city appear to be in good condition. However, it should be noted that just because a park received a high score doesn't necessarily mean that it's a good park.

Generally speaking, many of the parks that were assessed were classified as "passive" use parks. These parks lacked structural amenities such as playground equipment, athletic fields, pavilions, drinking fountains, picnic tables, trash cans, grills, etc. When determining which parks are high quality and which parks are not, the City of Takoma

Park should consider whether these parks are for active use or passive use in addition to the scores they were given.

That is not to say that just because a park is indented for passive use, it should not be classified as a high-quality park. Many passive parks with high-end total scores do in fact earn those scores. But it should be noted that some city owned parks consist of nothing more than a vacant plot of land. Some of the parks that fall under this category are given a high total score simply because there is nothing wrong with the land that is there, and the space is free of litter and waste.

While this fact is not detrimental to authenticity of this study it is something that should be considered when attempting to determine which parks are high quality and which ones are not.

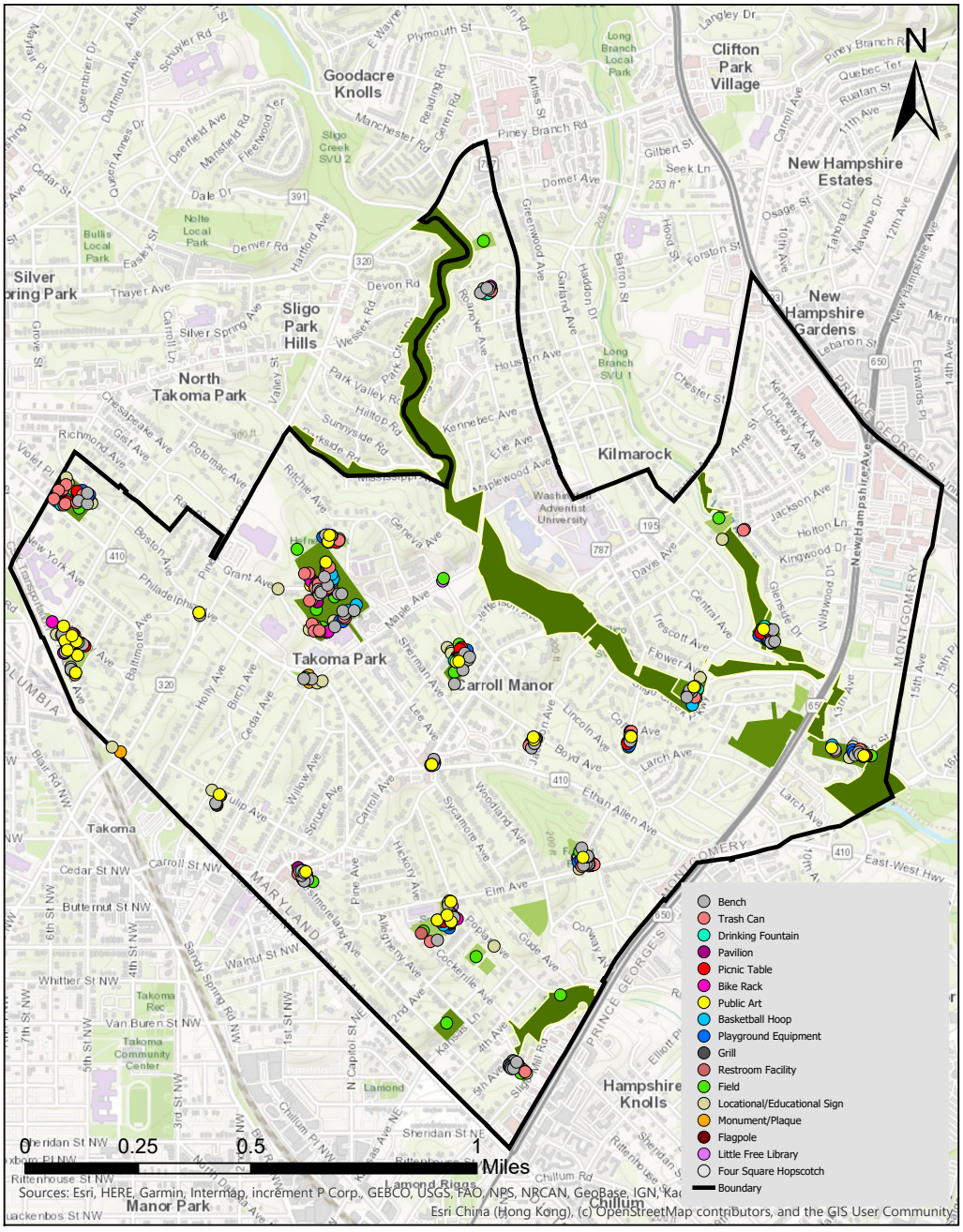
Park Number	Owner	Park Name	Type	Acres	Active or Passive	Landscape Features	Structural Features	Cleanliness	Total Score
1	Takoma Park	Forest Park	Municipal	1.41436519	Active	4	5	5	92
2	Takoma Park	Spring Park	Municipal	3.07842394	Active	4	5	5	92
3	Takoma Park	Memorial Park	Municipal	0.41102998	Passive	3		4	70
4	Takoma Park	Glengary Place Park	Municipal	0.85170019	Passive	4		5	90
5	Takoma Park	Colby Tot Lot	Municipal	0.23194114	Active	5	5	4	96
6	Takoma Park	Thomas Siegler Historic Site	Municipal	0.20118138	Passive	2		5	70
7	Takoma Park	B.Y. Morrison Park	Municipal	0.14447924	Passive	4		5	90
8	Takoma Park	Toatley Fraser Park	Municipal	0.28957867	Active	4	5	5	92
10	Takoma Park	Upper Portal Park	Municipal	0.33872695	Passive	5		3	80
11	Takoma Park	Belle Ziegler Park	Municipal	2.89190655	Active	3	4	5	76
12	Takoma Park	Jackson Boyd Park	Municipal	0.27590976	Active	5	4	5	92
13	Takoma Park	Circle Woods	Municipal	1.29245767	Passive	4		5	90
14	M-NCPPC	Opal A. Daniels Neighborhood Park	Neighborhood	2.27664154	Active	4	4	5	84
15	M-NCPPC	Takoma Park South Neighborhood Park	Neighborhood	1.57034639	Passive	3		2	50
16	Takoma Park	Takoma Park Property	Municipal	1.0924579	Passive	3		3	60
17	Takoma Park	Hefner Park	Municipal	0.730808	Active	4	5	5	92
18	M-NCPPC	Hillwood Manor Neighborhood Park	Neighborhood	3.35341347	Active	4	4	5	84
19	Takoma Park	Wabash Park	Municipal	0.93788618	Passive	1		1	20
20	M-NCPPC	Sligo Mill Overlook Neighborhood Park	Neighborhood	0.66067844	Active	5	5	5	100
21	M-NCPPC	Takoma Park Neighborhood Park	Neighborhood	6.94292071	Passive	2		5	70
22	M-NCPPC	Sligo Creek North Neighborhood Park	Neighborhood	1.61043431	Active	5	4	5	92
24	M-NCPPC	Takoma Urban Park	Urban	0.78093692	Active	4	5	5	92
25	M-NCPPC	Silver Spring Intermediate Neighborhood Park	Neighborhood	3.62390859	Active	5	5	5	100
26	M-NCPPC	Becca Lilly Neighborhood Park	Neighborhood	1.28254387	Active	5	4	5	92
27	M-NCPPC	Takoma-Piney Branch Local Park	Local	12.97909422	Active	4	5	4	88
28	Takoma Park	Lower Portal Park	Municipal	0.18084048	Passive	3		2	50
30	Takoma Park	Dorothy's Woods	Municipal	2.53404345	Passive	2		3	50
31	Takoma Park	Unidentified Green Space	Municipal	0.73553694	Passive	5		4	90
32	Takoma Park	Democratic and Republican Gardens	Municipal	0.12914364	Passive	4		5	90

A more detailed version of these results can be viewed below in the map titled: Race and Park Quality in the City of Takoma Park, MD. Additionally, the distribution of active and passive parks can be viewed below in the map titled: Race and Park Use in the City of Takoma Park, MD.

Park Amenity Distribution

Data from the park amenity field data collection was used to produce both a static map (pg10) and an interactive map, which can be viewed here: https://arcg.is/09faaS The interactive map allows for the user to click on individual park features which will display relevant data in a pop-up window.

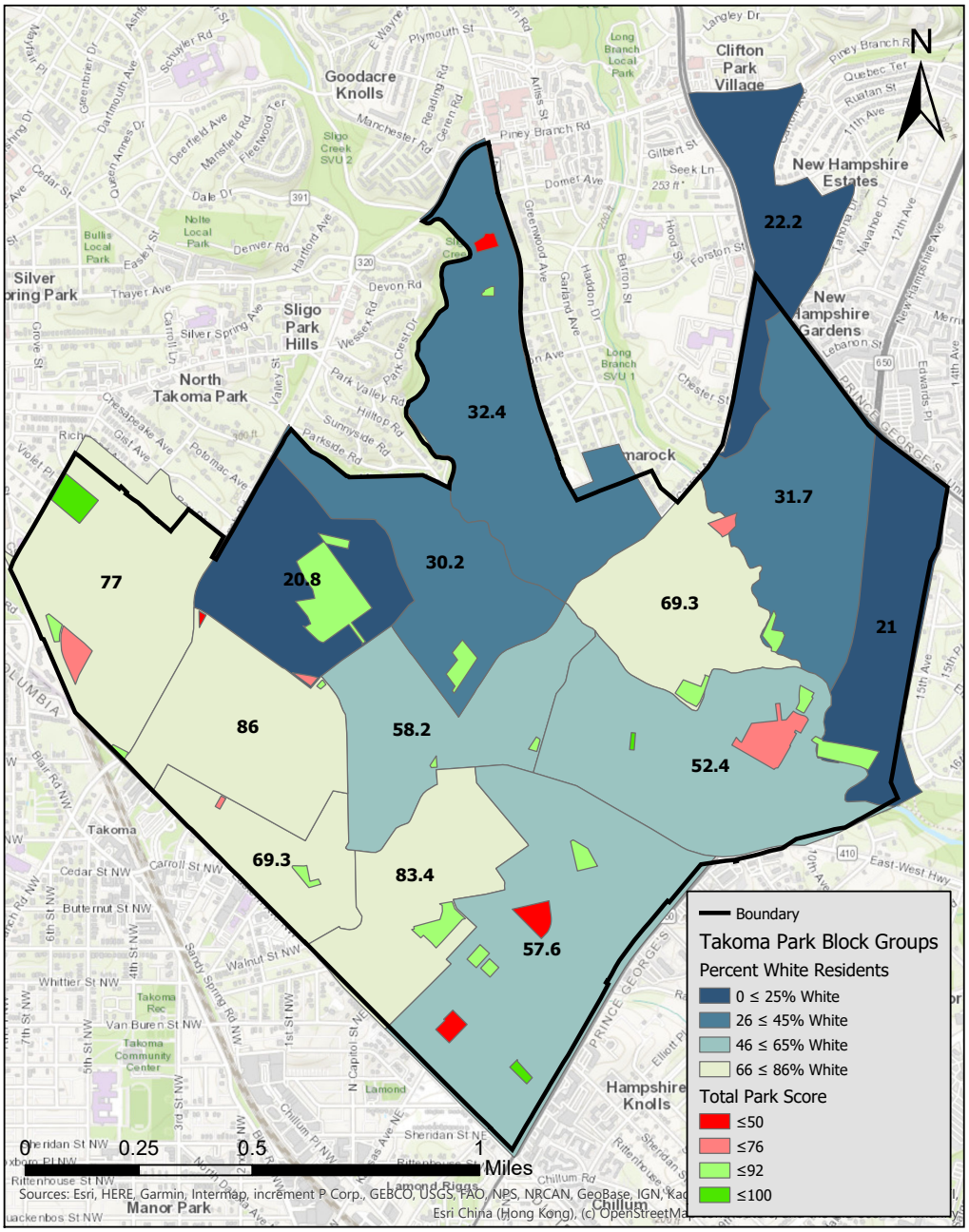
Park Amenities in the City of Takoma Park, MD



Racial Demographics and Green Space

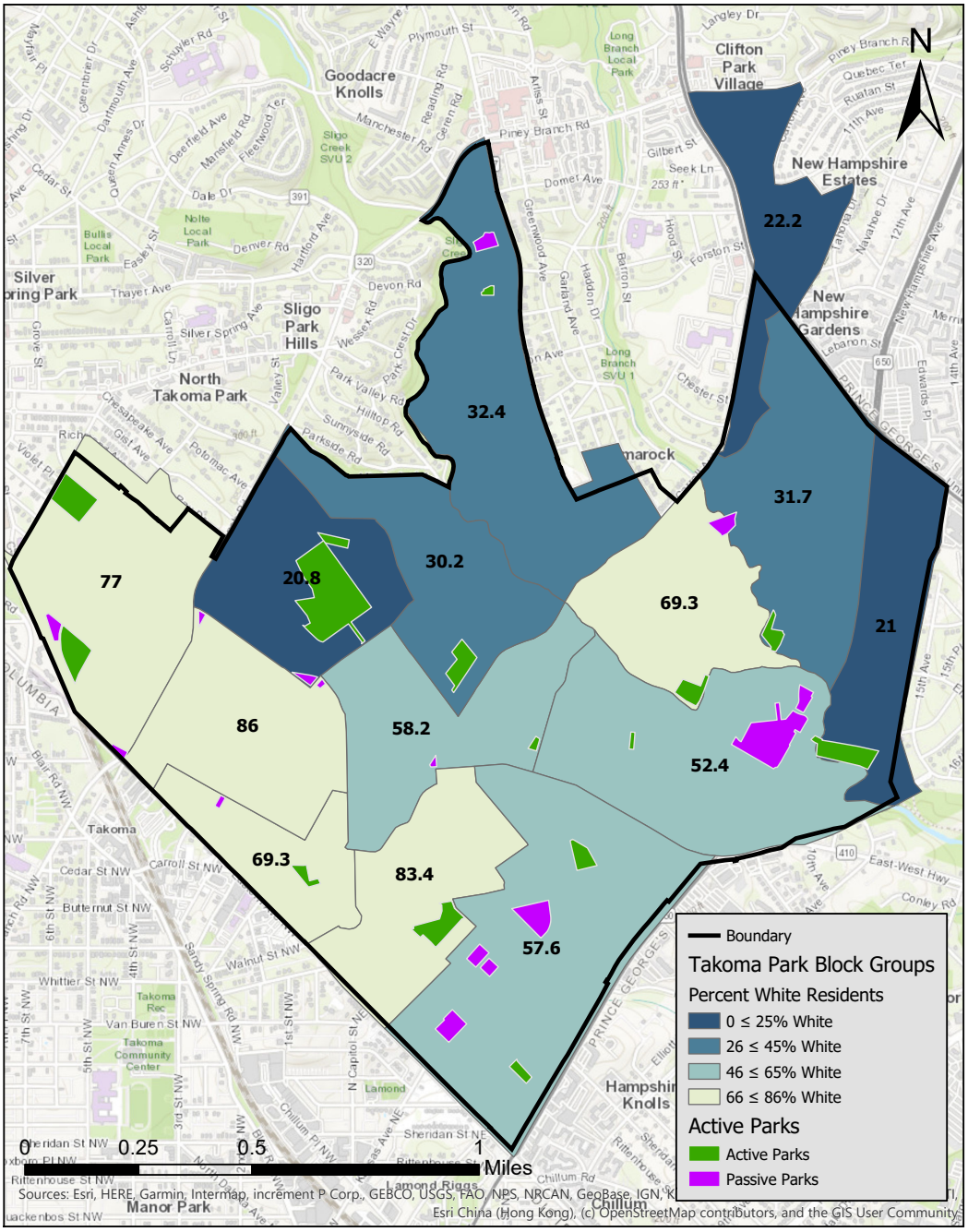
By overlapping city park data over racial demographic data, the City of Takoma Park can gain a better understanding of how parks are currently distributed in terms of race. The map below displays the percentage of white residents in each block group in bold numbers. Additionally, the map displays Park Quality based on the total scores given to each park.

Race and Park Quality in the City of Takoma Park, MD



When observing racial demographics in relation to park quality (based on the park grading scale) there appears to be no correlation between park quality and race. When observing racial demographics in relation to park use (active parks vs passive parks) there does not appear to be any initial correlation between park use and race, however this can be more accurately assess when looking at the Mapbox API Matrix results.

Race and Park Use in the City of Takoma Park, MD



There appears to be no direct correlation between park quality and park use. While parks which have grades below 76 appear to be mostly passive parks. It should be reiterated that not all passive parks received grades below a 76 and not all active parks received grades above a 76. Park quality and park use are not inextricably linked.

Distance Matrix Results

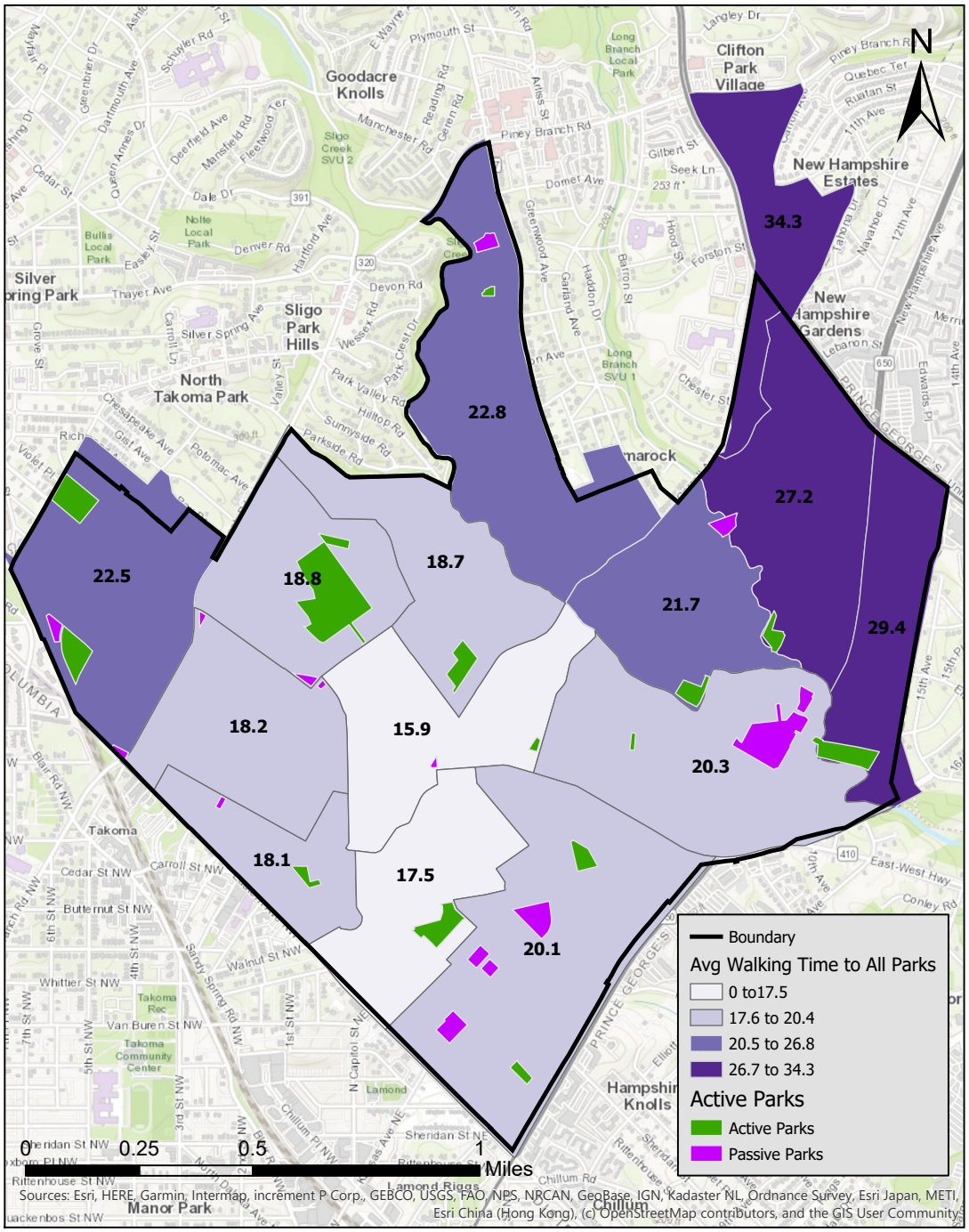
This analysis gives the City of Takoma Park hard numbers on how far most city residents are from all parks throughout the city. Prior to conduction a proximity analysis, the City could see where parks were located, but did not have an empirical measure of their distance or proximity.

The aim of this analysis was to provide the City with concrete data to evaluate the actual distance to parks with the City based on the street network and City Right of Way (ROW). Previously, City staff could visually observe the relative park distribution, but did not have a real measure of access.

Using Mapbox API software we were able to calculate the walking times from each block group to all parks. Distance was measured to all parks since we know that not all residents visit parks which they are closest to. Given that parks throughout the city have varying degrees of use (active vs passive, size, age and quality of amenities, etc.) it should not be assumed that residents exclusively use parks which are closest to their residency.

Additionally, this analysis gives the City empirical data on city-wide park accessibility. Below are the results from the proximity analysis made possible by the Mapbox API distance matrix.

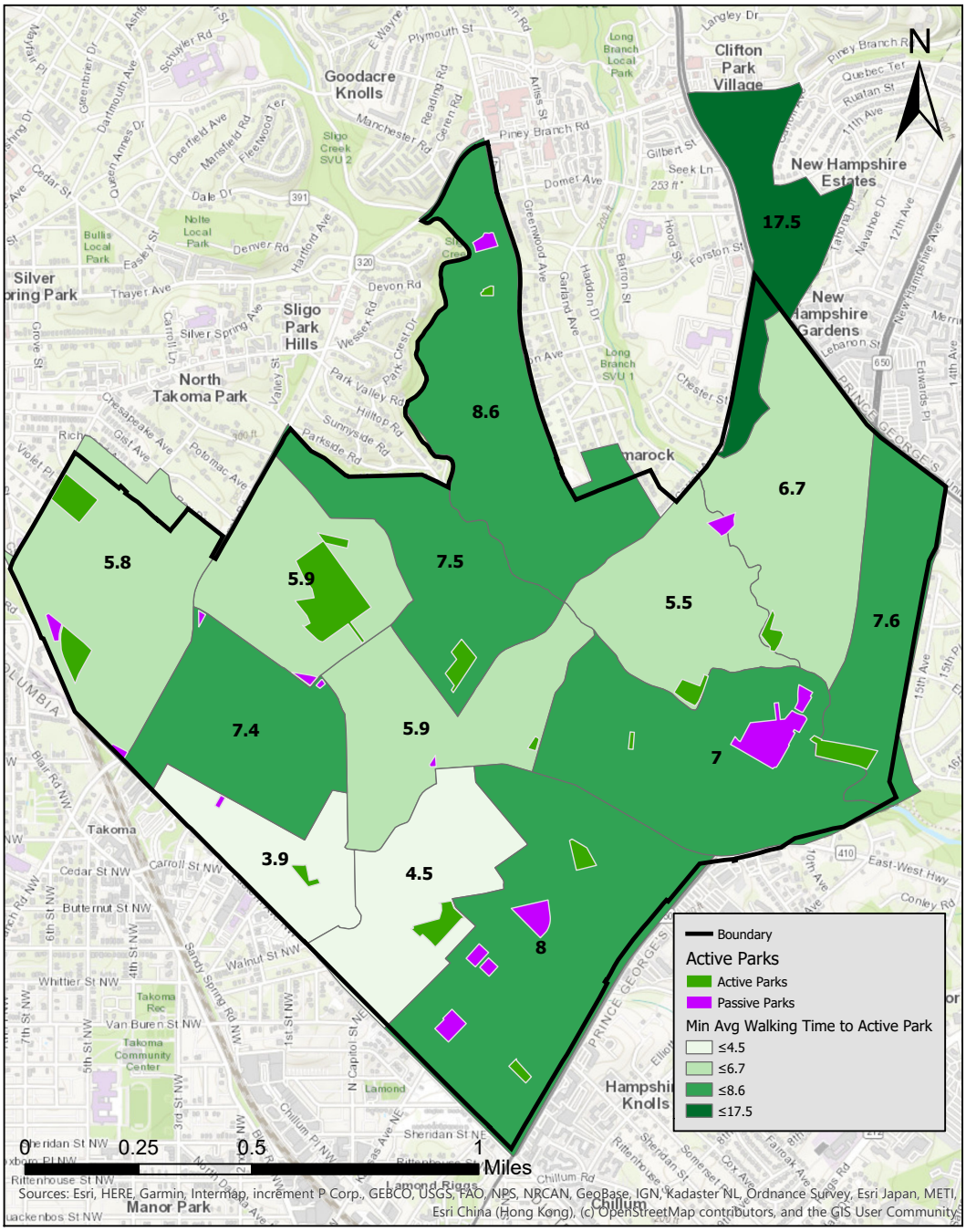
Average Walking Time to All Parks (Minutes)



These results show that the block groups on the eastern most end of the city (27.2, 29.4, 34.3) have, on average, the longest walking time to access parks throughout the city. Additionally, the northern most block group (22.8) also has relative high walking times. It should be noted that one block group (34.3) resides partially outside of the city boundary. The portion of this block group which resides within the city boundary is of

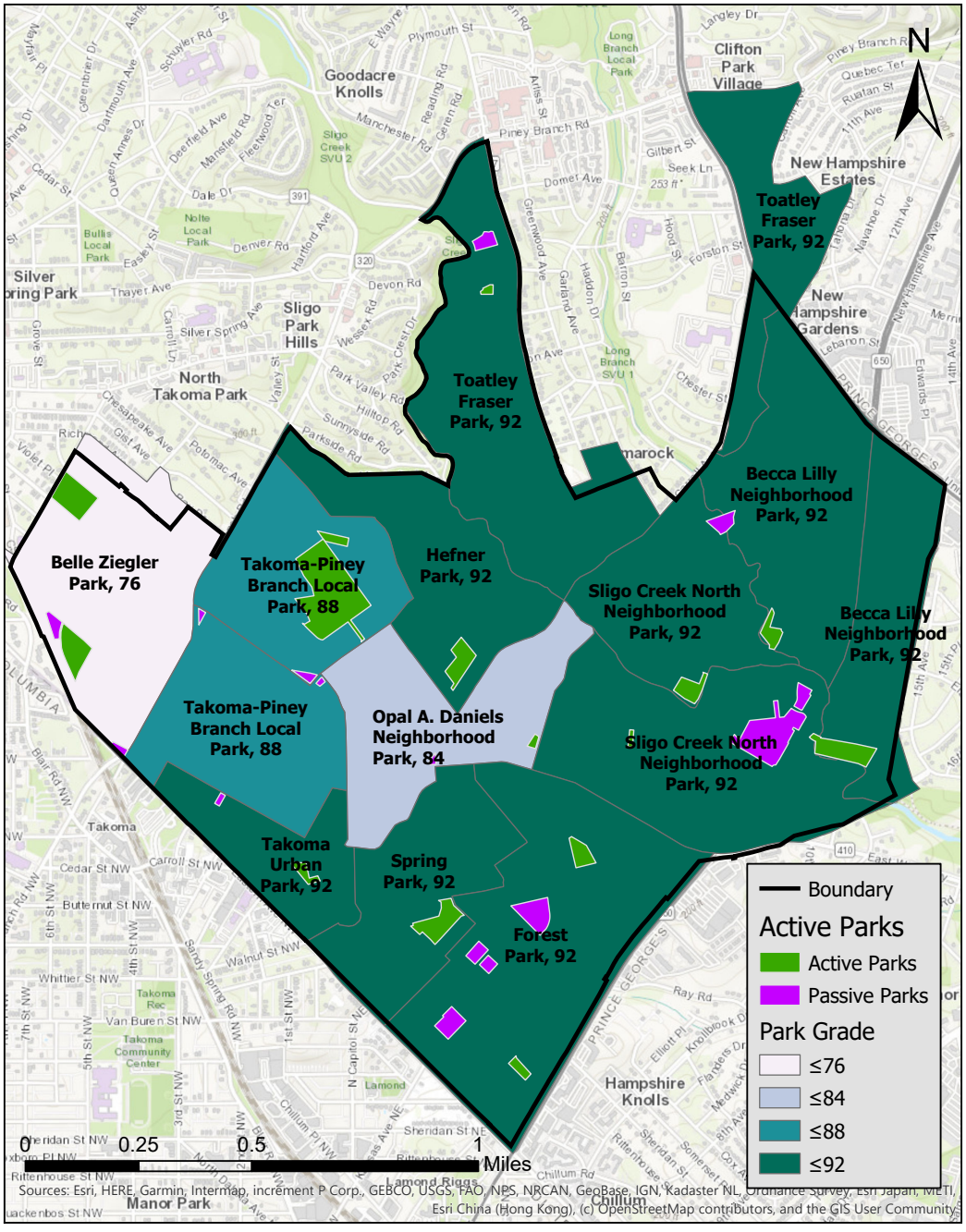
considerable size, so the decision was made to include the block group in the analysis. However, given that many of the origin points the results for this block group are considered to be a data anomaly. The average walking time for the portion of this block group which resides within the city boundary is likely closer to the numbers of the adjacent block groups (27.2 - 29.4).

Minimum Average Walking Time to an Active Park (Minutes)



In addition to measuring average walking times from any location within each block group to all parks within the city, the decision was made to calculate the minimum average walking time from each block group to the nearest active park. Since active parks are more traditional and provide a wider array of amenities this information does prove to be useful. Additionally, a third map was created to highlight the names and grades of the active parks with the minimum average walking times in each block group.

Nearest Active Park and Park Grade



When looking at the minimum average walking time to an active park, walk times appear to be relatively similar across all block groups. When observing the grades given to the nearest active park for each block group, the nearest active park for most block groups was given a score of 92.

A few sets of block groups were closest to the same active parks and so many of the grades for each block group's nearest active park are the same (92). While each block group seems to have relatively short walking times to their nearest active park, and while the nearest active park in each block group appears to be of relatively high quality, it should again be noted that not all residents travel to their nearest park since parks throughout the city vary greatly in terms of size, age, types of amenities, etc. Moreover, this analysis shows that there is a correlation between average walking times to all parks throughout the city and racial demographic data.

Conclusion

This report has sought to contribute to the development of a Public Space Management Plan. As a part of the Public Space Management Plan, City of Takoma Park Mayor, Kate Stewart has requested that park amenities be assessed with a focus on the quality and condition of the parks.

This study used GIS software such as *ArcGIS Pro, Collector for ArcGIS, ArcGIS Online,* and *QGIS* to determine the number and location of park amenities within all city and county owned parks within the City of Takoma Park. This study also developed a grading criterion and assessed the quality of all city and county owned parks and then overlapped the results from this assessment with racial demographic data displayed as percentage of white residents at the block group level.

This study found that the eastern most block groups (22.8, 27.2, and 29.4) and the northern most block group (22.8) seem to have the least amount of access to parks throughout the city. It should be noted, that demographically, these block groups are far more diverse than the eastern side of the city.

It was found that the block groups on the eastern edge (22.8, 27.2, and 29.4) are the block groups which could use the most improvement in terms of park space with respect to racial demographics. If the city wishes consider race as a critical factor when determining where to increase park space, these block groups would be the first place to start.

Additionally, it may be beneficial to consider land acquisition somewhere in the southern portion of the northern most block group (22.8) since this block group only consists of a single high-quality park (Toatley Fraser Park).

There is still of room for this analysis to be expanded upon. Absent from this study was an assessment of park space relative to population density. For instance, using Census data the total amount of park land could be compared with the number of residents in each block group to calculate the average amount of square footage of park space per each resident.

While the City of Takoma Park has generally done a good job in terms of distribution of parks in terms of racial demographics and park maintenance and quality, there are still areas where this can be improved upon. Determining which parks need improvement and which parks don't will help to increase maintenance efficiency for the city's Public Works department. Holistic decision making when determining how to distribute urban parks in the future and will require continued utilization of GIS software and continued study of these spaces in relation to race, accessibility, and quality.