White Paper
Metro Parks Tacoma Facility Siting Study

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Purpose

This study is designed to identify potential locations for future parks in Tacoma. It identifies *gap areas* that are outside of a 10-minute walk to Metro Parks facilities. These *gap areas* are further analyzed to find concentrations of low Equity Index scores and/or high population densities of young children and families. These areas would be ideal locations to prioritize Tacoma's next park, community center or green space.

Background

The city of Tacoma boasts nearly 3,000 acres of open spaces, parks and community centers that are managed by Metro Parks Tacoma. Numerous studies show access to these amenities is associated with a higher prevalence of physical activity. Furthermore, those who travel to parks on foot or bike, especially children and adolescents, are more active in the park setting than those arriving by other means. The city of Tacoma, working with the Trust for Public Land, is endeavoring to provide a park or open space within a 10-minute walk of every citizen. Metro Parks Tacoma teamed with the University of Washington Tacoma to determine which areas of the city fall short of this goal and to prioritize potential locations for new parks, open spaces and community centers.
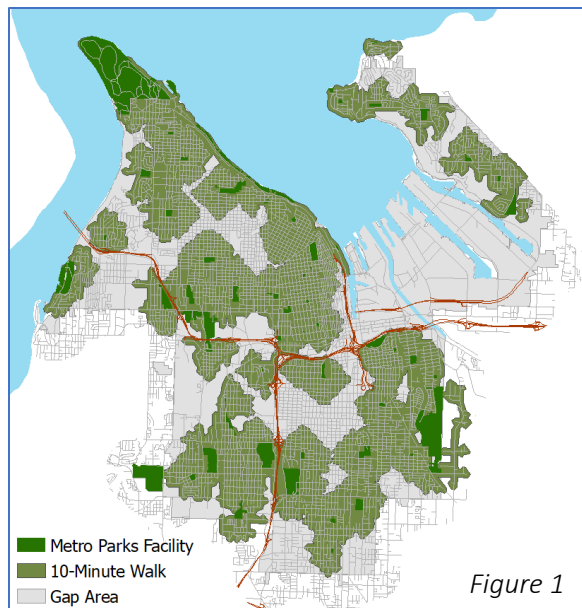
> "I have endorsed the vision that everyone deserves a park or open space within a 10-minute walk of home." — Mayor Woodards

Assumptions and limitations

- Spatial extent for the study: The city of Tacoma plus a half-mile buffer.
- "Facilities" are limited to Metro Parks Tacoma land including parks, playgrounds and community centers.
- The study does not include paid facilities such as golf courses, museums or zoos.
- The study does not include gardens, dog parks or other limited-service areas.
- The study does not include playgrounds or green spaces that aren't owned or maintained by Metro Parks Tacoma, such as school playgrounds.
- Walking speed is assumed to be three miles per hour.
- Populations are, on average, evenly spaced throughout U.S. Census block groups.

Step One: Identify *gap areas*

Areas that are outside a 10-minute walk to any Metro Parks facilities are *gap areas*. Defining these areas was a key, first step in the process. 40 percent of Tacoma's geography falls within *gap areas*.

Methodology: Identifying *gap areas* first required mapping out the Metro Parks facilities and the territories they serve. ArcMap was used to create a geodatabase and feature dataset using the projected coordinate system *NAD 1983 HARN State Plane Washington South FIPS 4602 Feet*. The working extent was established to one-half mile beyond the city boundaries to eliminate or reduce potential edge effects on the analysis. A shapefile of Metro Parks facilities was edited to remove spaces not included in the study such as paid facilities, public gardens and schools. The remaining facilities polygons (represented in dark green on Figure 1) were converted to points at vertices to act as park entrances. Some entrance points were removed as applicable (e.g. Puget Creek Park is in a deep gully with trailheads, or entrances, only at either end).

Figure 1

Legend:
- Metro Parks Facility
- 10-Minute Walk
- Gap Area

The road network throughout the working extent was added to create a network analysis. Arterial routes were exported and classified as barriers. Service areas were created around the Metro Parks facility entrance points to represent a 10-minute walk (represented in light green on Figure 1).

➡ The remaining territories were the *gap areas* which are the focus of this study (shown in gray on Figure 1).

## Step Two: Apply the Tacoma Equity Index

The Equity Index is a form of opportunity mapping that highlights obstacles connected to upward mobility. It is a primary tool for city staff and decision makers to address access to opportunity for all Tacoma residents. Created by the Kirwan Institute for the Study of Race and Ethnicity, the Equity Index aggregates 20 indicators within four categories: accessibility, economy, education and livability.

The Overall Equity Index rates opportunity in five categories ranging from *very high* to *very low*. *Very high* equity represents locations that have access to better opportunities to succeed. The data indicators include high performing schools, a safe environment, access to adequate transportation, safe neighborhoods and sustainable employment. In contrast, *low* equity areas have more obstacles and barriers. These communities have limited access to institutional or societal investments.

Methodology: Cluster and hot spot analyses were conducted on Tacoma's overall Equity Index scores for the *gap areas*. These tools identify concentrations of high and low scores on the map. Multiple analyses were conducted to verify results.
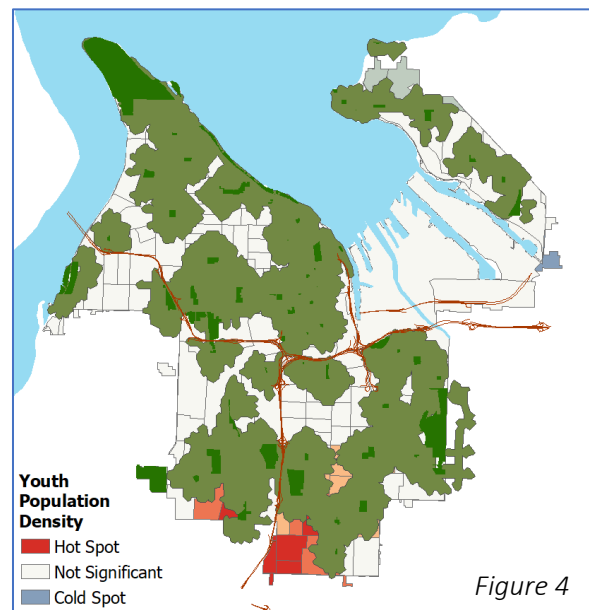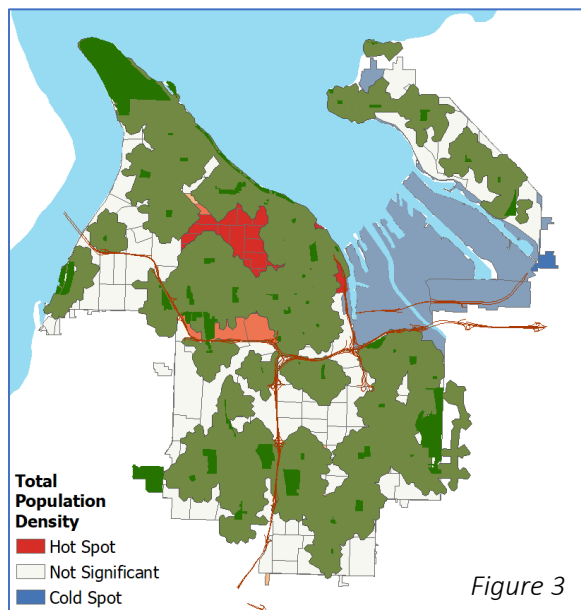
➡ Both tools showed clusters of *very high* and *high* Equity Index scores in North End and Northeast Tacoma (labeled in red on Figure 2). These analyses also illuminated a cluster of *very low* and *low* Equity Index scores in South End and South Tacoma (shown in blue on Figure 2).

Equity Index Score
- High Cluster
- Not Significant
- Low Cluster

Figure 2
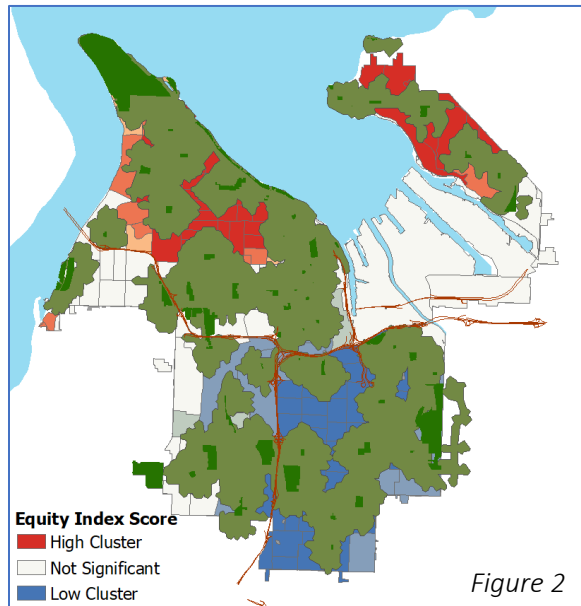
Step Three: Identify high population density areas

Population density, or residents per square mile, is an important factor in maximizing limited resources. More people can be served when first addressing areas with higher population densities. Cluster analysis of data from the U.S. Census Bureau was key to identifying population density in two categories: *total* population and *youth* population (i.e. children and adolescents under 18 years old).

Methodology: 2018 Census data for populations in Census block groups encompassing Tacoma was the most current available and coincided with the 2018 Equity Index. Even though they do not line up with the city boundaries, block groups were kept whole to enable accurate density calculations. (Note: for visual clarity, the final maps in Figures 3 and 4 were clipped to Tacoma's borders after completing analysis.)


Total Population Density
- Hot Spot
- Not Significant
- Cold Spot

Figure 3

Youth Population Density
- Hot Spot
- Not Significant
- Cold Spot

Figure 4

➡ Cluster and hot spot analyses of block groups in the gap areas showed a high *total* population density cluster in the North End (shown in red on Figure 3), which includes the University of Puget Sound campus. Meanwhile, cluster and hot spot analyses of the *youth* population found a cluster of high population density block groups in the South End (shown in red on Figure 4), which includes the Helen B. Stafford Elementary School.

Step Four: Analyze specific populations by Equity Index

The study had defined *gap areas*, identified clusters of *high* and *low* Equity Index areas and identified hot spots of *total* and *youth* population density. The final step involved analyzing these data together. That required looking at specific populations within parts of Census block groups within the *gap areas*. One-third of Tacoma's *total* population, or 71,209 people, live in the *gap areas*. This includes 15,154 youths.

Methodology: Clipping block groups to conform with the Tacoma city border and the *gap areas* required averaging the *total* and *youth* populations across the area of each block group. For example, if 30 percent of a block group's geographic area fell within Tacoma, then 30 percent of the block group's population was assumed to reside within Tacoma. Using this method to clip block groups to the Tacoma city boundary was accurate to within one percent of the U.S. Census Bureau's published total. It was reasonable to assume further clipping of block groups to the *gap areas* was similarly accurate.

When population counts are correlated to the five Equity Index categories (*very high* to *very low)*, each category should be expected to have similar numbers of people. However, there was a slightly elevated percentage of residents living in *very low* Equity Index areas compared to the average. This elevated number was exacerbated in the *gap areas*. While 34 percent of the *total* population lives in the *gap areas*, 40 percent of the *total very low* Equity Index population resides there. That number jumps significantly for the youth population. While 34 percent of the *youth* population lives in the *gap areas*, 45 percent of the *youth very low* Equity Index population resides there.
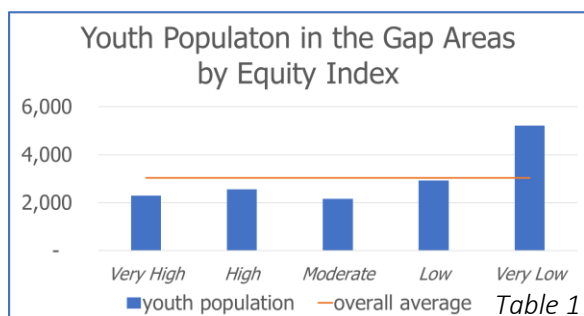
Table 1

➡ Even more telling, one third of all the *youth* population living in the gap areas comes from the *very low* Equity Index score (Table 1). This is more than twice as many youths in the *very high, high* or *moderate* Equity Index scores. Specifically, an average of 3,031 youths from each Equity Index category live in the *gap areas*. However, 5,214 youths from the *very low* Equity Index category live in the *gap areas*.

Conclusion

Two zones within the gap areas make good candidates for Tacoma's next park or community center.

Recommendations
- 🟥 Total Population
- 🟦 Youth Population
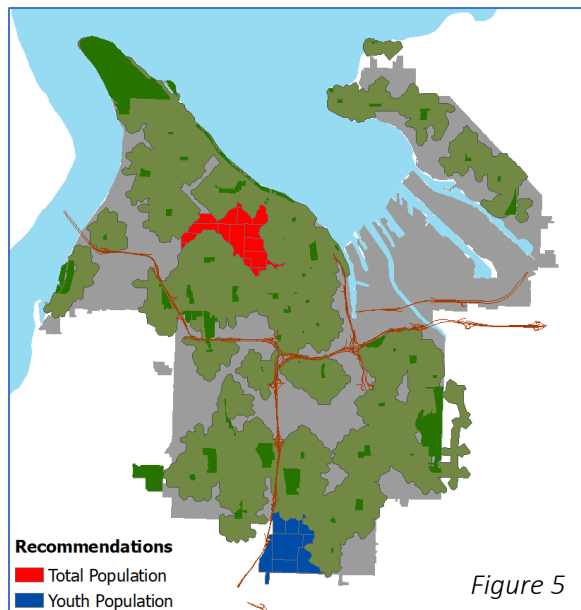
Figure 5

➡️ A park in the North End would serve a high *total* population cluster (denoted in red on Figure 5). It coincides with *very high* and *high* Equity Index scores (shown in red on Figure 2).

➡️ A park in the South End would benefit a high *youth* population cluster (shown in blue on Figure 5). This area coincides with *low* and *very low* Equity Index scores (shown in blue on Figure 2). There were no parks or open lands south of that location (i.e. outside Tacoma) to serve this population group. **This option most closely aligns with the purpose of this study.**

Special Thank You

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Geospatial Data

Metro Parks Tacoma, City of Tacoma GeoHub Portal, Pierce County Open Geospatial Data Portal, Washington Geospatial Open Data, U.S. Census Bureau