Informal Settlements and Public Transportation in Cape Town, South Africa

Background

In 1994 Nelson Mandela—running on the platform of equality and freedom for all—became President after the first democratic elections in post-apartheid South Africa. Yet, almost 20 years later inequality—now distinguished by class rather than race—persists throughout South Africa, and particularly in large urban areas. The most economically vulnerable populations of urban South Africa generally live in informal settlements. Cape Town—South Africa’s third largest city—houses many informal settlements. To measure the accessibility of a city, many use mobility and freedom of movement as a strong indicator of inclusion or exclusion. Mobility corresponds with equality because if lack of accessible transportation impedes certain populations from occupying certain spaces then these groups are unable to fully participate.

Methodology

To investigate public transportation accessibility, I started by identifying the major modes of public transport. I chose to include in my analysis railway stations, bus stops, and informal taxi routes because these are the three most commonly used transport modes in Cape Town. The data I acquired from the Cape Town Government included exclusively vector data. From this vector data, I used the kernel density tool to create a density map of the taxi routes (Figure 2). From these density maps, I reclassified the densities into categories with 3 as Unacceptable, 4 as Acceptable, 6 as Sufficient, and 8 as Excellent (Figure 9). Then I re-classified 8:11 as 1 and everything else as no data. From this reclassification, I ran the raster to polygon tool to transform the highest transportation density areas into polygons. I ran the Euclidean distance tool using these polygons to create a raster map representing these different distances (Figure 10). Finally, I ran the near tool from informal areas to these high transport density polygons. This tool wrote these distances directly into the informal settlements attribute table, and from this data I used symbology to represent how close each informal settlement is to these polygons (based off of different walking distances), and thus identified the informal settlements with the least access to transportation (Figure 4).

Results & Conclusions

Through this analysis I highlight which informal settlements are the least and best served by public transportation (as seen in Figure 4). Specifically, when comparing each transportation mode’s density maps (as seen in figures 5, 6, and 7), the taxi service serves the outer edges of Cape Town better than both the bus and train services. Further, the railway service is the least accessible to residents of informal settlements because its densest areas are not near most informal settlements. Further, I intended to highlight informal settlements distance from high density transportation areas using different walking distances ranging from 0-400 meters (less than half a mile) to 2400-3200 meters (more than one and a half miles). An important result of my analysis is that only around 100 informal settlements reside within a distance of 2 kilometers (2000 meters) to these high density transport areas (as seen in Figure 8). Further, the informal settlements closest to high density transportation areas are located towards the city center. The settlements least accessible to public transportation are located towards the outskirts of the city (as seen in Figure 4). Given these results, I would suggest that these transportation modes should expand their service towards the outer extent of the city in order to fully fulfill the transportation needs of the residents of informal settlements. Consequently, this transportation expansion will better include these residents in the economic and social life of Cape Town.