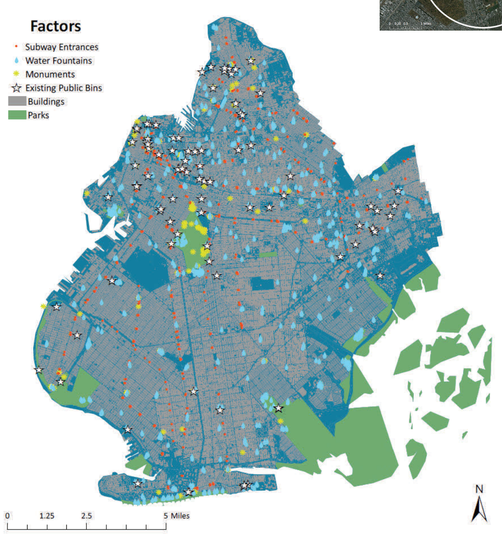
Demonstration of a Suitability Analysis on Possible Placement of Public Recycling Bins in Brooklyn, NY

INTRODUCTION

In urban areas, where populations and consumerism are high and contact with nature is low, remembering to be environmentally conscious of daily actions within the hustle and bustle of city life can prove to be especially challenging. In New York City, getting the public to participate in recycling outside their homes has historically been an issue. This may be due in part to a simple lack of sufficient conveniently located public recycling bins. If this is the case, additional bins in areas of high traffic might help increase participation. For this reason, a demonstration of a suitability analysis on possible additional locations for public recycling bins seemed an appropriate mission.

In an effort to narrow down the focus of the assessment, and in order to generate a few specific locations for recommendations of new bin placements, the borough of Brooklyn was used as an example within the city for the focus. Areas of high traffic were deemed the most important areas to investigate, and were determined by looking at factors like locations of monuments, parks, and subway entrances within Brooklyn. Water fountain locations were also taken into account as representative of general areas of traffic and for convenience.



METHODOLOGY

As many of the data layers were presented as coordinate locations, a good amount of time was spent getting this information into points in ArcMap. This step involved lots of projection troubleshooting. Buffer areas were created to show areas of suitable (opportunity) and unsuitable (constraint) locations around various features (ex. not within 50ft of a monument for aesthetic reasons, within 10ft of a subway entrance for convenience).

Areas considered as opportunities included:

within 10ft of a subway entrance, within 10ft of a water fountain, within 20ft of a park (including inside the park), and between 50-100ft of a monument (to accommodate tourists).

Areas considered as constraints included:

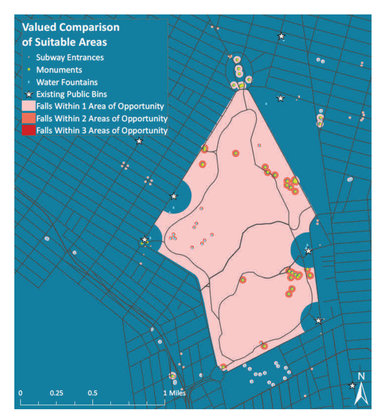
within 500ft of an existing public bin, within 50ft of a monument, in a street, in a building, and on existing points (water fountains, subway entrances).

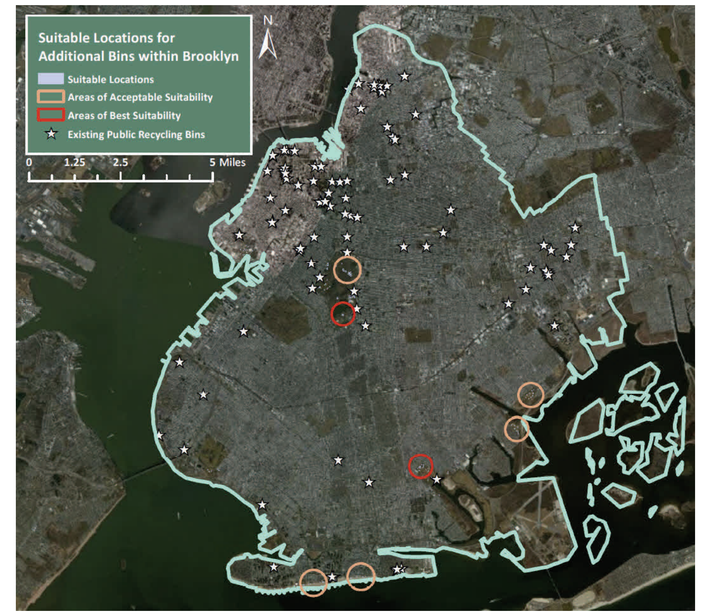
Opportunistic areas (buffers of suitable areas) were superimposed and valued to find overlapping areas of suitability, while constraining areas (buffers of unsuitable areas) were eliminated from opportunity areas using the erase function. This left only areas suitable for new bins, and using the value system of overlapping opportunities, showed the most convenient locations appropriate for multiple opportunity factors – where the bins would be killing two birds with one stone in terms of high traffic areas.

Detail maps of one particular area in the Northwest quadrant of Brooklyn are shown to demonstrate a close up of the values and analysis, as this area showed the highest concentration of suitable locations. This area's placement in relation to the rest of Brooklyn can be seen in the general location map detail.

RESULTS

The demonstration showed very few areas with more than two factors overlapping for suitable locations. Most areas with a value of 2 (with two factors overlapping) were within existing parks that also contained monuments or water fountains. Due to the spread of the city, a great many locations with suitability values of 1 (meaning they were only within suitable range of one factor) emerged, where a new public recycling bin would no doubt be helpful, but would not be optimal locations if efficiency and number of bins were a concern. It also appeared that many subway entrances throughout Brooklyn were not within 500ft of an existing bin, suggesting that efforts could be better directed to these definite points of high traffic to ensure those in transit can recycle with convenience during their commutes. Two areas (circled in red on the Suitable Locations map of Brooklyn) appeared as the best suitable locations for new bins, as they represented intersections of 3 areas of suitability. Both of these locations were within parks and also within suitable range of a monument and a water fountain, but none intersected with subway entrances.





CONCLUSIONS

While a few areas arose as particularly well-suited locations for new public recycling bins according to overlapping areas of opportunity, these were mostly within parks that often had existing bins somewhere around their perimeter. Despite the results of the analysis, it appears that subway entrances may in reality prove to be the most lucrative locations for new public bins as they most likely experience more daily traffic than water fountains and monuments, although they are rarely near these other areas of opportunity. If this demonstration of a suitability analysis were to be undertaken for a larger project, I would suggest mediating this disparity between value results and real world circumstances by attempting to obtain actual data of daily pedestrian traffic flow for various locations, and using this information to weigh the values of these opportunity areas. Without this data, however, it was difficult to assign any additional weight to a factor, and thus they were considered of equal importance.

REFERENCES

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Introduction to GIS

Sources: NYC Open Data, 2010 TIGER/Line, New York Department of Information Technology and Telecommunications, NYC Planning

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