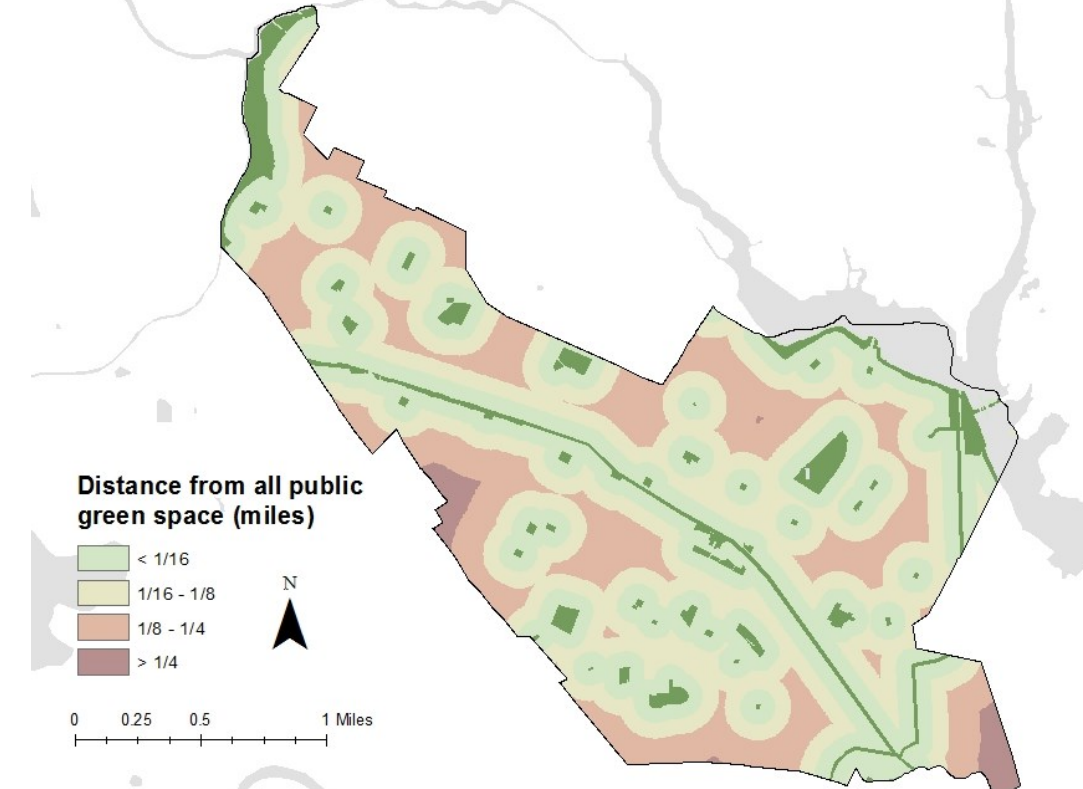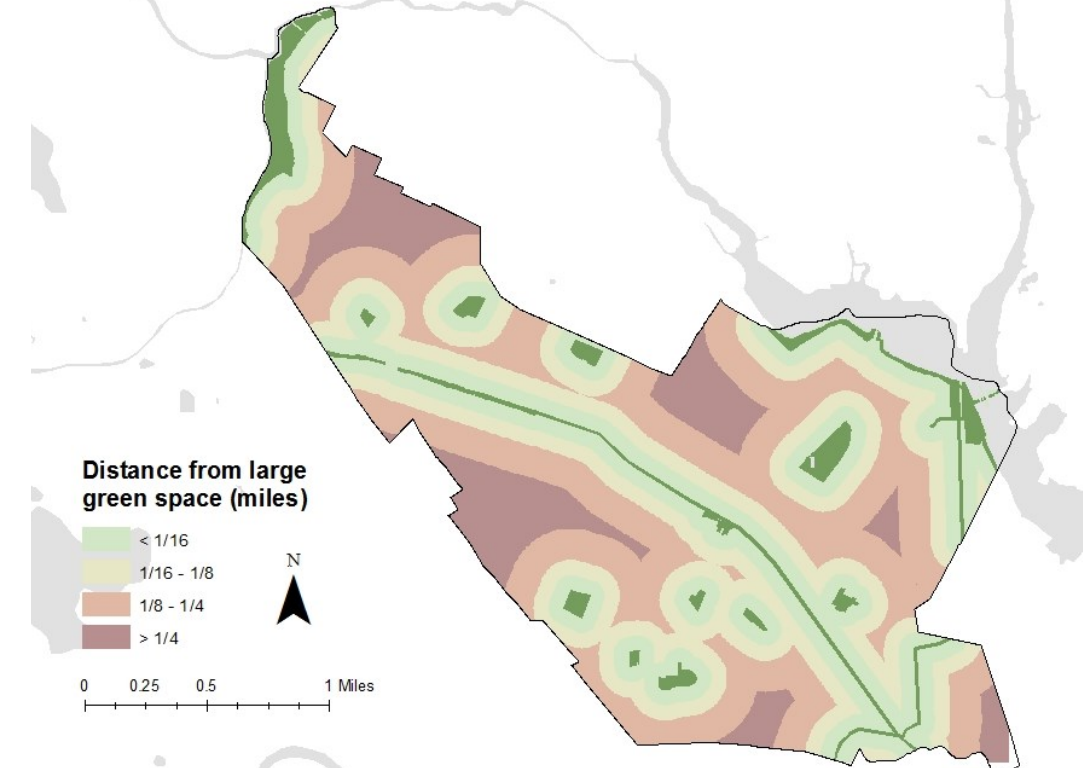# Green Space Site Suitability in a Dense Urban Setting
Developing more green space in Somerville, MA
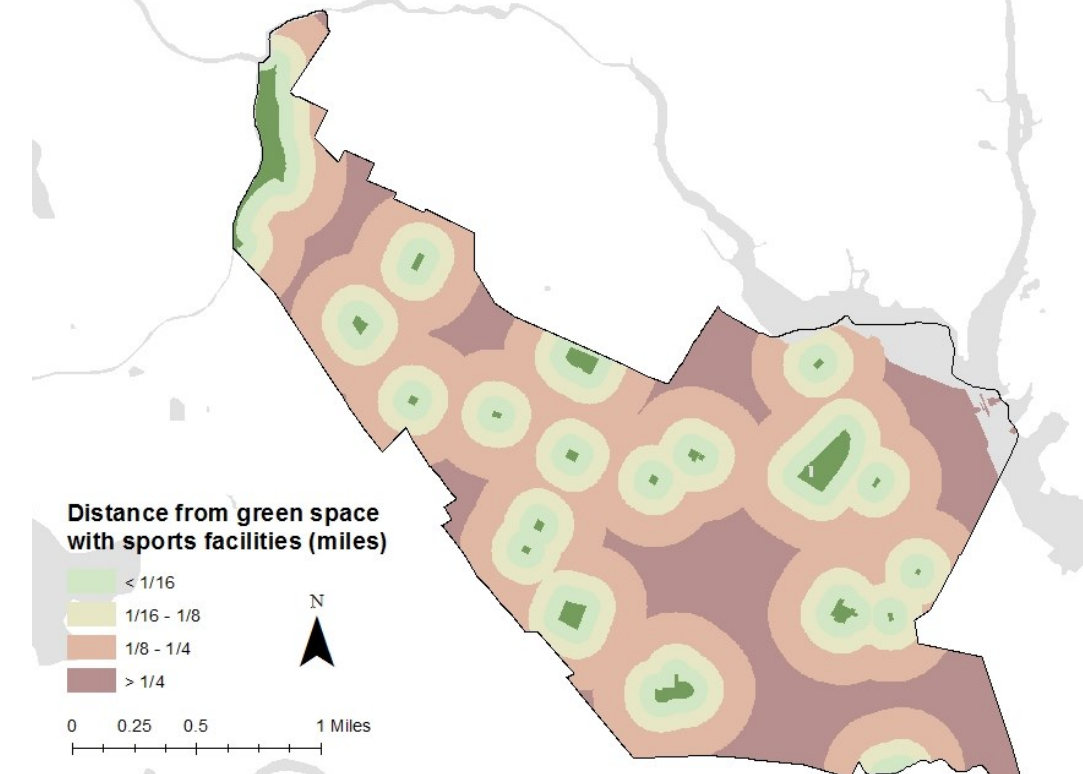
Map 1: Distance from public green space

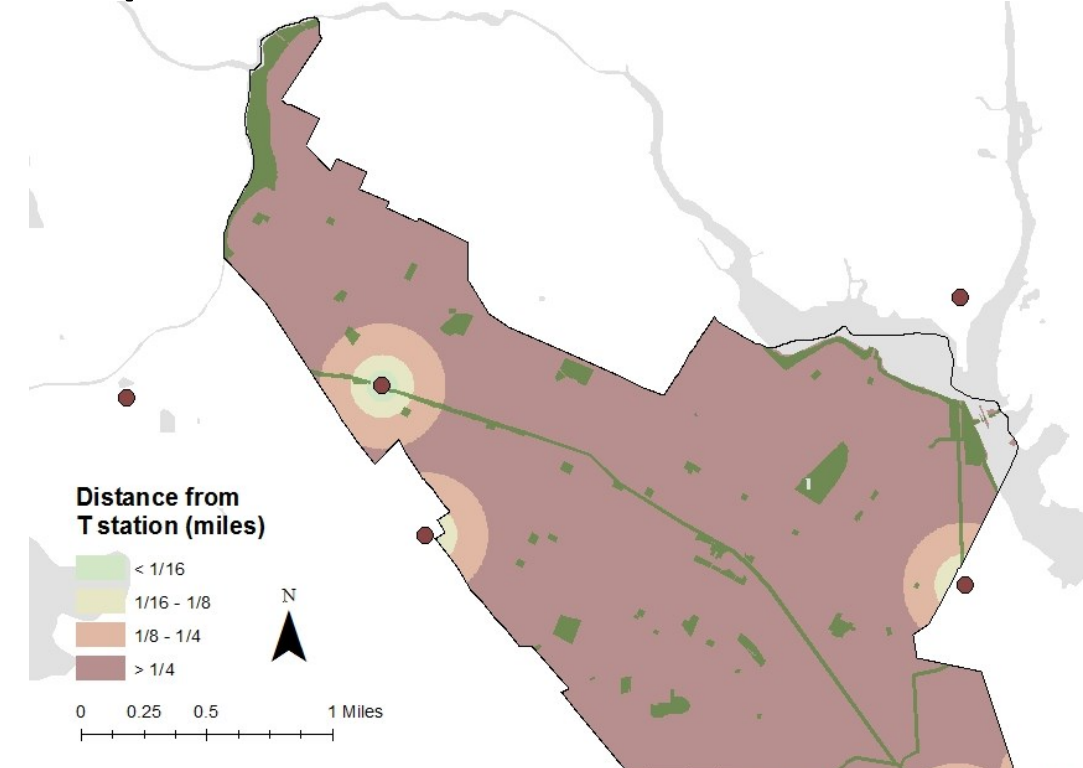

Distance from all public green space (miles)
- < 1/16
- 1/16 - 1/8
- 1/8 - 1/4
- > 1/4

Map 2: Distance from large green space

Distance from large green space (miles)
- < 1/16
- 1/16 - 1/8
- 1/8 - 1/4
- > 1/4

Map 3: Distance from sports facilities

Distance from green space with sports facilities (miles)
- < 1/16
- 1/16 - 1/8
- 1/8 - 1/4
- > 1/4

Map 4: Distance from T stations

Distance from T station (miles)
- < 1/16
- 1/16 - 1/8
- 1/8 - 1/4
- > 1/4

Map 5: 2012 Poverty by census tract

2012 poverty by census tract (%)
- 4 - 10
- 11 - 15
- 16 - 20
- 21 - 28
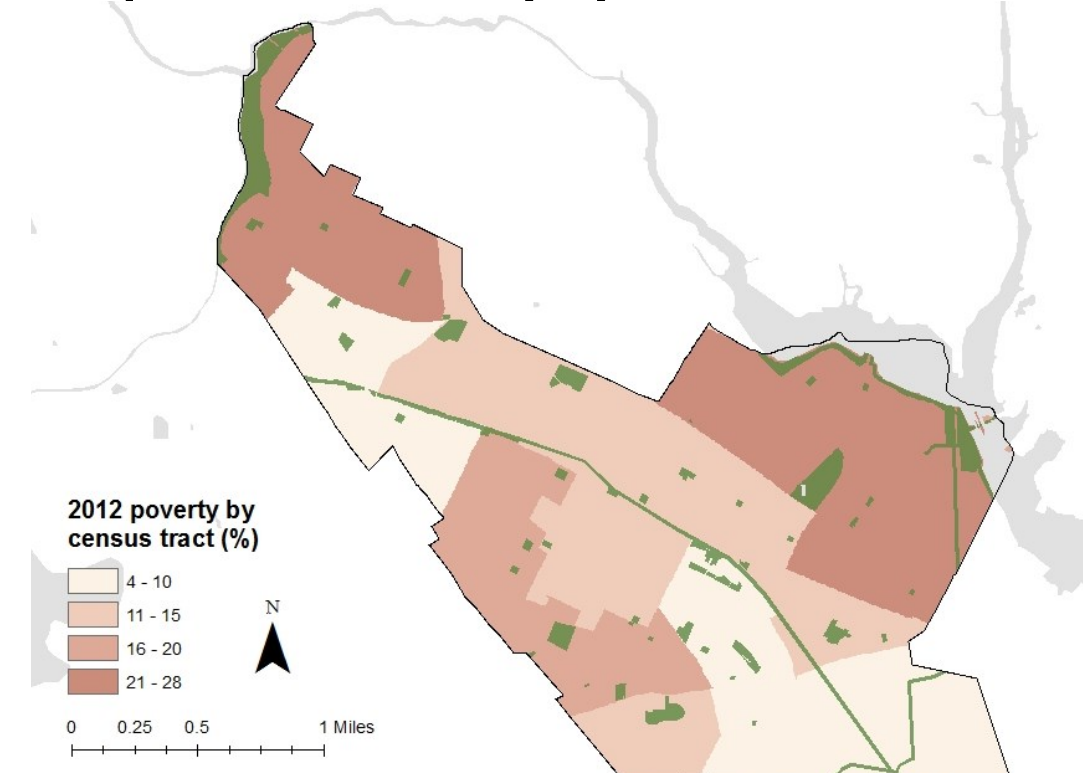
Background

Access to green space provides communities with a host of benefits, including physical and mental wellness, environmental service provision, community cohesion, and more. (Green space is defined as open public space covered in vegetation.) Somerville, Massachusetts is one densely settled urban area with limited existing green space to fully capture these benefits. The *Land Use Technical Report* released by the City of Somerville's Office of Strategic Planning and Community Development[1] determined that the percentage of land dedicated to green space in Somerville is lagging behind that of neighboring communities. The City is furthermore dedicated to increasing the amount of green space available to the public, as detailed in the *Somerville Open Space and Recreation Plan 2008–2013*.[2]
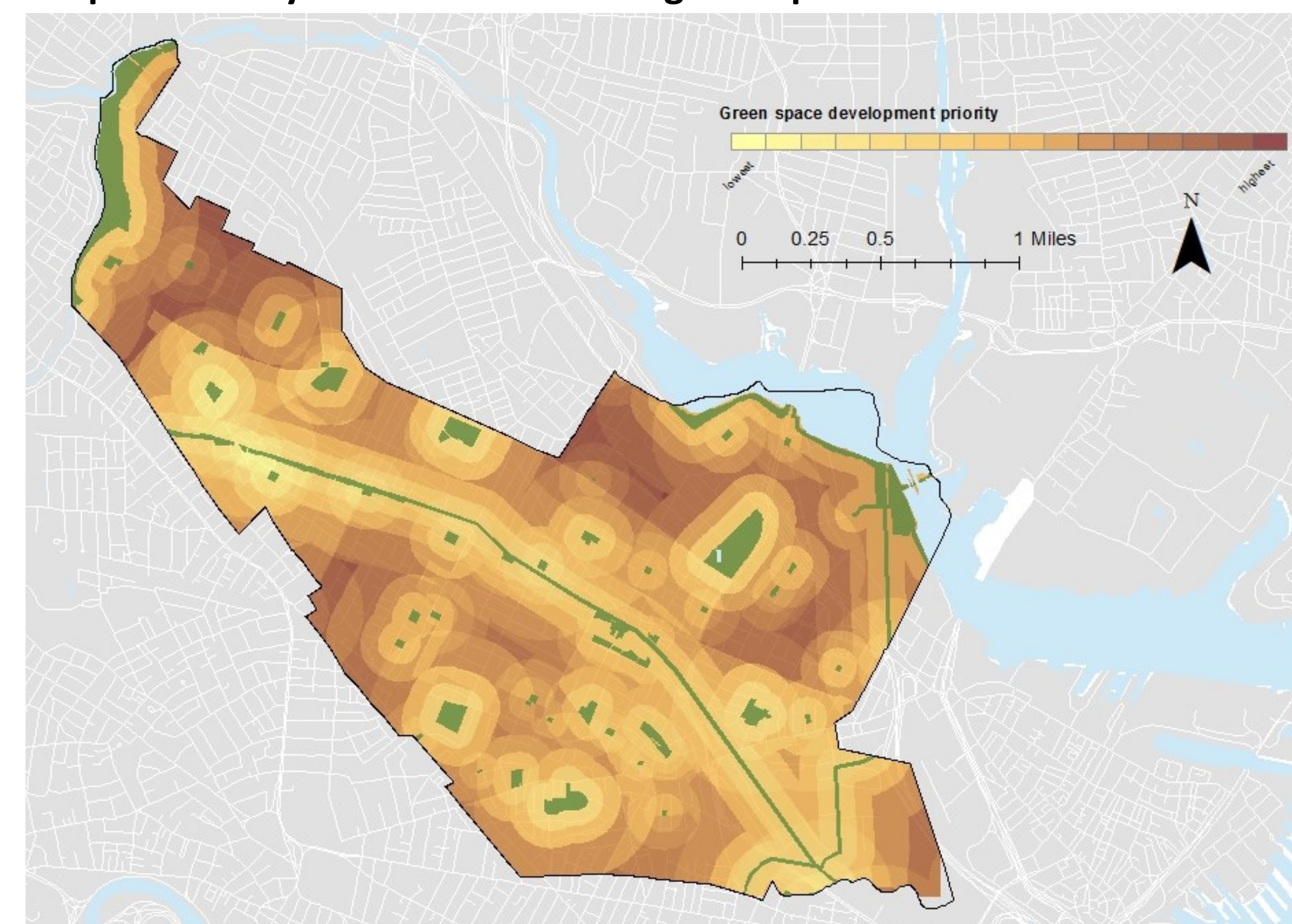
GIS offers tools to assess current accessibility to green space in Somerville, as well as to find suitable sites for more green space development. This project entails a suitability analysis dependent on two main factors: current equity of access to green space and parcel appropriateness. Since Somerville has few undeveloped areas, some innovative ways of introducing more green space have been used. Commercial rooftops and land held by private interests have the potential of being converted to public green space, as they have been in cities on the West Coast.[3][4] Vacant lots represent other potential green space sites. Ultimately, GIS was used to identify parcels that are both structurally appropriate and whose conversion to green space would address issues of access equity within Somerville.

Research Questions

The following questions guided a site suitability analysis for additional green space development in Somerville:
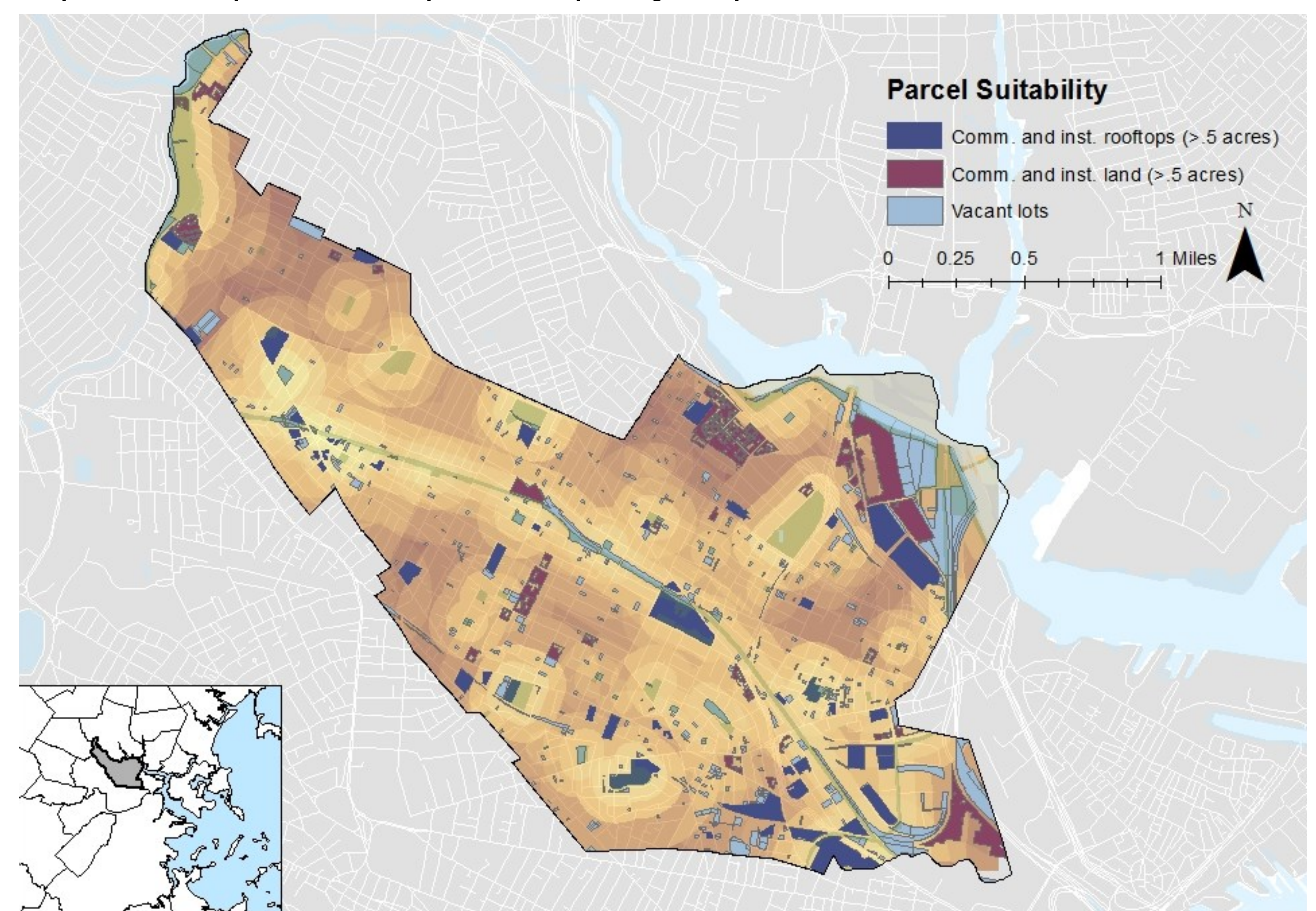
1. Are there currently areas in Somerville that lack access to green space in the immediate vicinity, as compared to other areas?

2. Are there currently areas in Somerville that lack ways to access to green space outside of the immediate vicinity (such as public transportation), compared to other areas?

3. Where should new green space be placed to create more equitable access to green space within the City of Somerville's boundaries?

4. Which already-developed parcels in Somerville can be converted at least partially to green space use?

5. Which undeveloped parcels in Somerville can be converted into green space?

Map 6: Priority areas for additional green space

Green space development priority
lower ← → higher

Map 7: Combined parcel sites with potential for public green space conversion

Parcel Suitability
- Comm. and inst. rooftops (> .5 acres)
- Comm. and inst. land (> .5 acres)
- Vacant lots

Methodology

Three major phases were involved in this project. First, several data sets that informed an assessment of access to green space were analyzed separately and then combined to create a larger picture of priority areas for green space development. The data sets include five different factors: proximity to all public green space, proximity to large green space greater than one acre, proximity to green space with sports facilities, proximity to MBTA train stations (a proxy for access to green spaces outside of the immediate area), and poverty by census tract. Maps 1 through 5 show the individual analyses of these five factors. Once combined, the resulting map provides a visual tool useful in understanding which areas of Somerville have superior access to quality green space and which have lower levels of access. Map 6 shows the areas that should be prioritized when considering more green space development, with equal weight given to all factors.

Second, three different parcel suitability analyses were run. Vacant lots potentially available for green space development were identified. Commercial and industrial rooftops over half an acre made up a second analysis and commercial and industrial parcels equaling more than half an acre without building footprints made up a third.

Finally, the parcel suitability data was then overlaid on the combined accessibility analysis to identify the best parcels for green space development. Map 7 is the final result.

Results

The combined proximity and poverty data reveal inequities in access to green space in Somerville, and the need to develop more particularly in the outer western, eastern, and southern portions of the city. Fortunately, despite the small size and density of Somerville, the site suitability analysis also shows there are a large number of parcels that could be developed into public green space, including vacant lots, large rooftops, and large commercial and industrial land. While certainly not all of these parcels are realistically available for green space development, at least some represent potential sites that could be developed in areas with current sparse access.

Next Steps

These methodologies have produced many parcels that could be suitable for public green space conversion. The results produced a large number of potential sites, meaning that further investigation would be necessary to determine which of the identified parcels could actually be developed into green space. Further analysis could include researching parcel ownership, looking into current surface type and brownfield status, and groundtruthing work.

Furthermore, this project does not exhaust the possibilities for determining the best sites for green space development in Somerville. The use of these methodologies with updated complete Somerville parcel data will rule out any parcels that have since become unavailable. The methodologies can also be used in conjunction with additional socioeconomic factors to provide a more thorough analysis of current green space accessibility, as well as additional innovative land use possibilities which could identify parcels of different types that could be converted to public green space.