

A CASE FOR MORE SOLAR POWER IN BROCKTON

SPATIAL ANALYSIS FOR POTENTIAL SOLAR FARM SITING



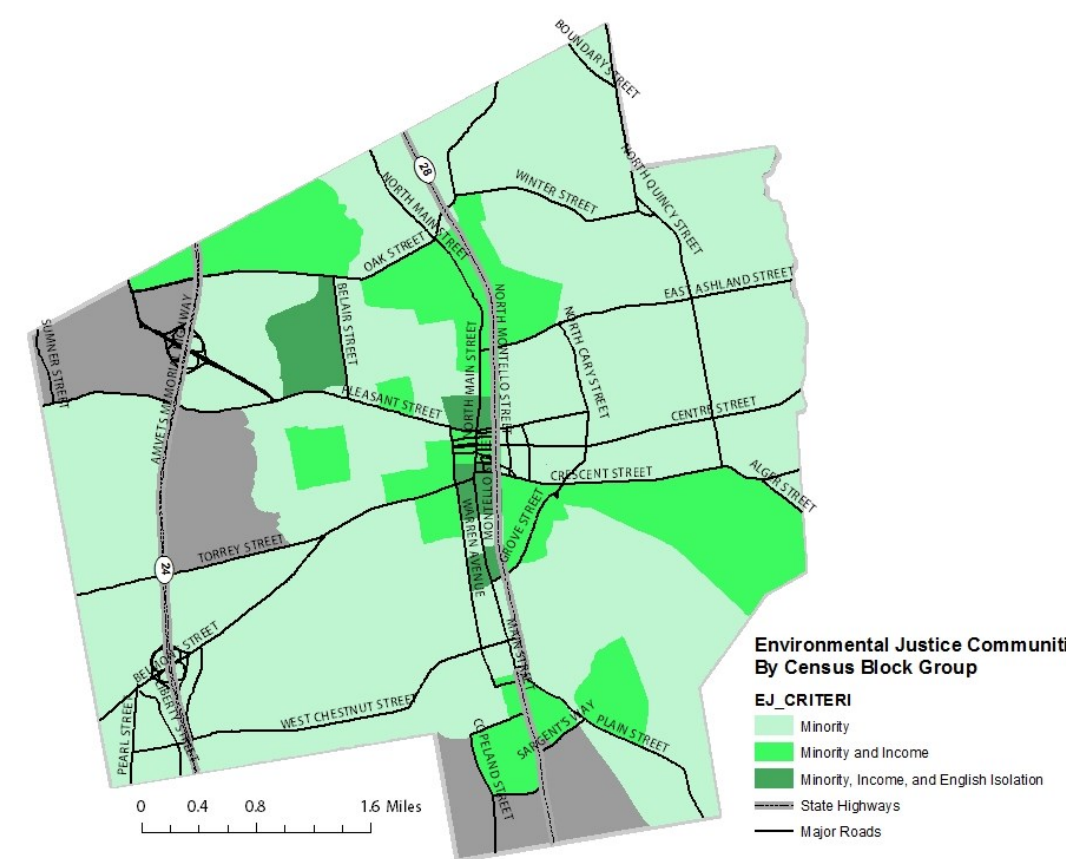
Graduate School of Arts and Sciences

Introduction

The recent expansion of solar energy in Massachusetts is the result of favorable government policies, technological advancements, and growing awareness of the advantages of renewable energy. In response to the growing demand for solar energy, community-shared solar (CSS) is a solar energy system that provides energy and/or financial benefits to multiple members of a community, and it has the potential to expand access to solar energy in low- and middle-income (LMI) communities and communities of color.

Located in Plymouth County, Massachusetts, Brockton is a city with a population of 94,779. Referred to as the "City of Champions" for homes of boxing champs Rocky Marciano and Marvin Hagler, Brockton can be a leader in solar. There is a solar farm in the city's south side opened in 2006 on 3.7 acres of brownfields and powers 77 homes.

Environmental Justice Communities



However, technology has advanced in the last ten years and the need for cheap energy is increasing. This city can stand to champion another CSS model that can help alleviate the energy burdens of some its LMI residents. Where do these residents live and where is the best location for a CSS project?

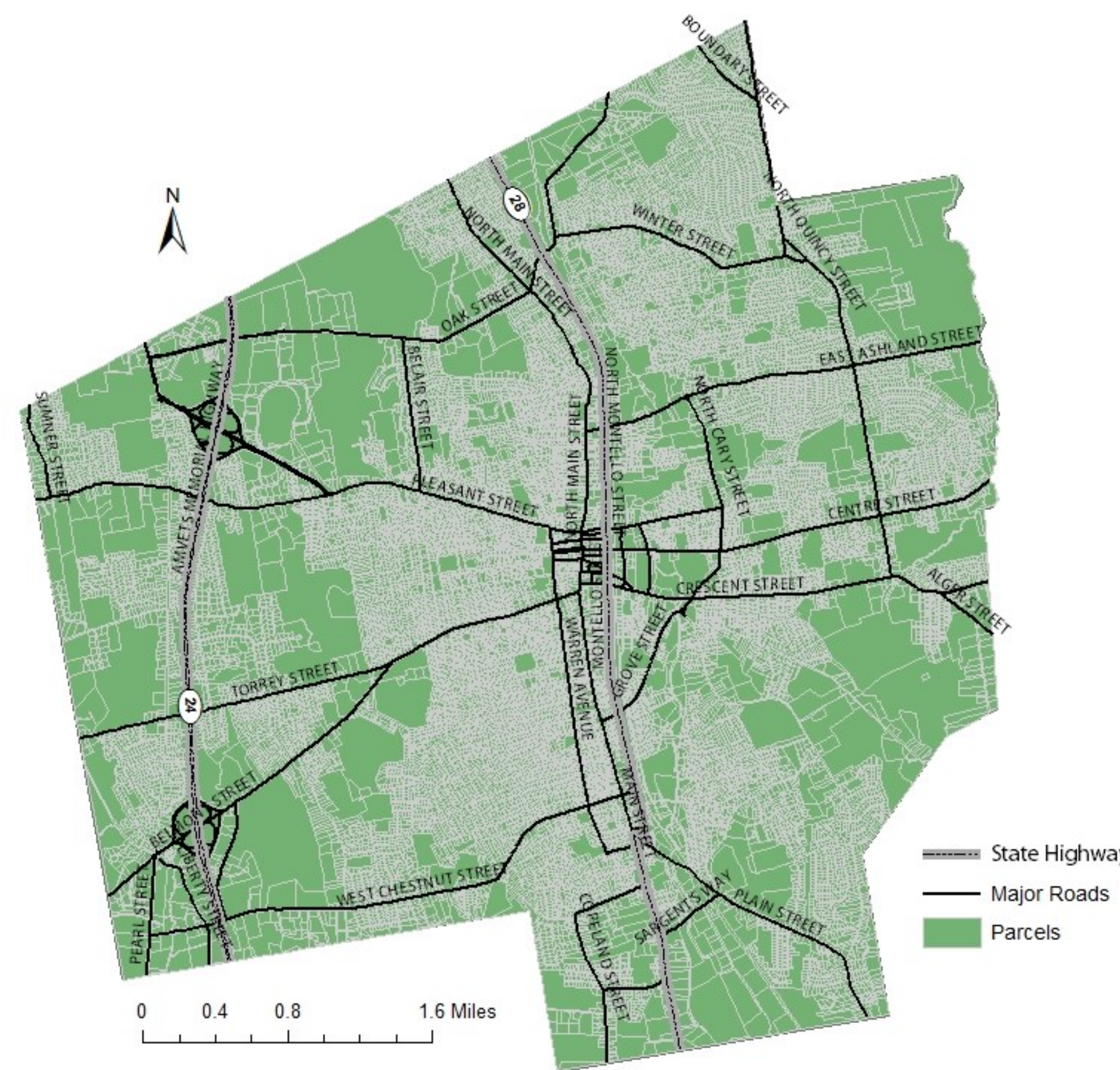
Methodology

Areas with high concentrations of Environmental Justice (EJ) communities, and high amounts of renters are perfect candidates for CSS models. According to MassDEP, a community is recognized as an EJ community if any of the following are true: Block group whose annual median household income $\leq 65\%$ of the statewide median (\$62,072 in 2010); or 25% or more of the residents identifying as minority; or 25% or more of households having no one over the age of 14 who speaks English only or very well - Limited English Proficiency (LEP). The map on the far right shows a breakdown of the renter population in the city. These first two maps show Brockton residents are in fact good candidates for CSS.

In order to find the optimum site location there were several factors taken into account. The first was to locate land use that was zoned as either Industrial or commercial. The next step was to distinguish sites that were at least 1/4 of a mile from a major road in Brockton. The third requirement was for a site to be at least a 1/4 of a mile away from a FEMA designated flood zone. Lastly parcels that were at least 2.5 acres in area were chosen as prime property.

Results and Limitations

The requirements for the optimum solar parcels resulted in three properties: (1) 24 Lawrence Street; (2) Parameter Park off of Pleasant Street; and (3) 29 E Market Street. Each parcel had a zoning code of C2 or a general commercial property. Two of these sites look as though they are dilapidated buildings. The city could buy them back and either



demolish them for a solar field or possibly repurpose the buildings and use the roofs for solar arrays. The park could be converted to a solar farm if abutters were welcome to the idea. The limitations of the selection process fall on the accessors data that was provided by the city of Brockton. Parameter park was not listed and a google maps search was able to identify the parcel. Also there may be other land uses in the city that could host solar farms such as landfills and open spaces which were not listed in the accessors data. Furthermore the selection process did not account for land elevation or canopy cover which are both things to consider for CSS models.

Conclusion

Brockton is a working class city with residents that could greatly benefit from a CSS model whether it be a solar farm on a plot of land or a large rooftop solar array. Further investigation would reveal more areas suitable for a CSS model.

Cartographer:
Elijah Romulus

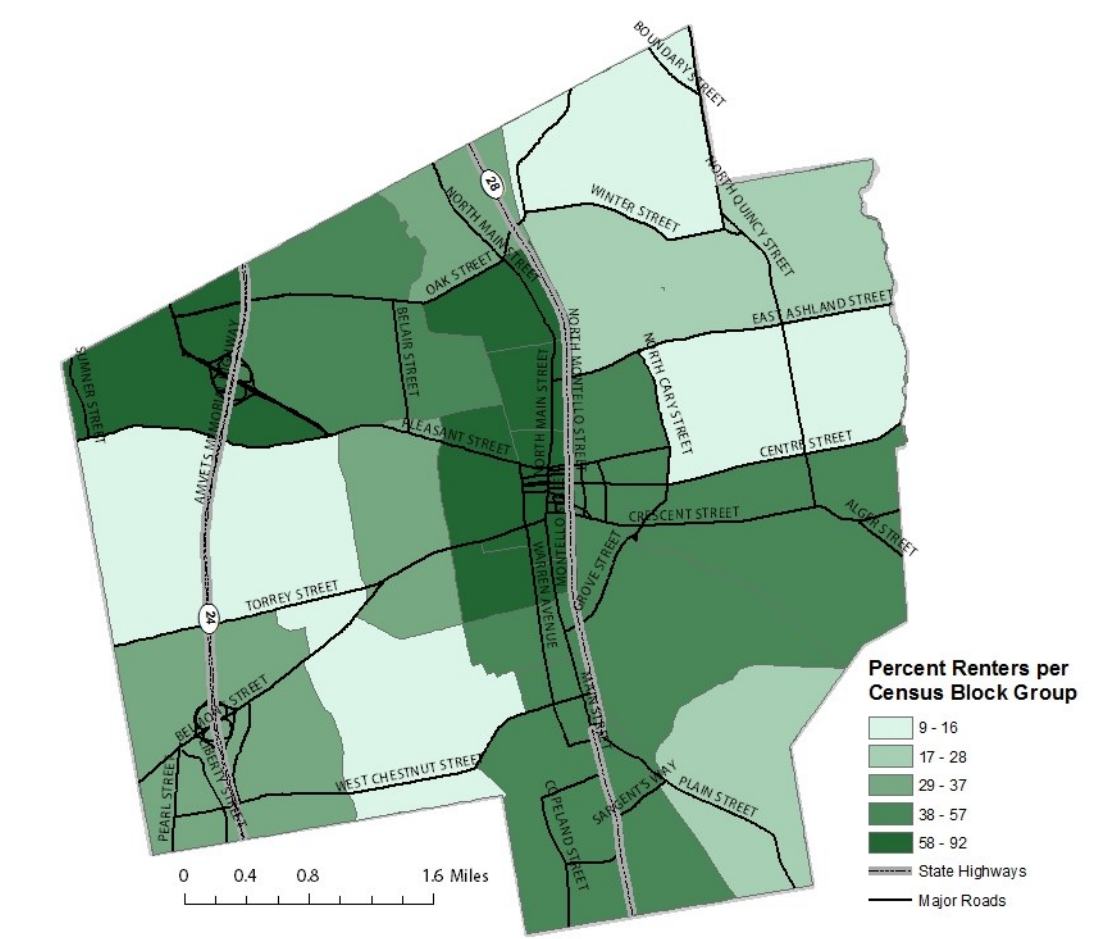
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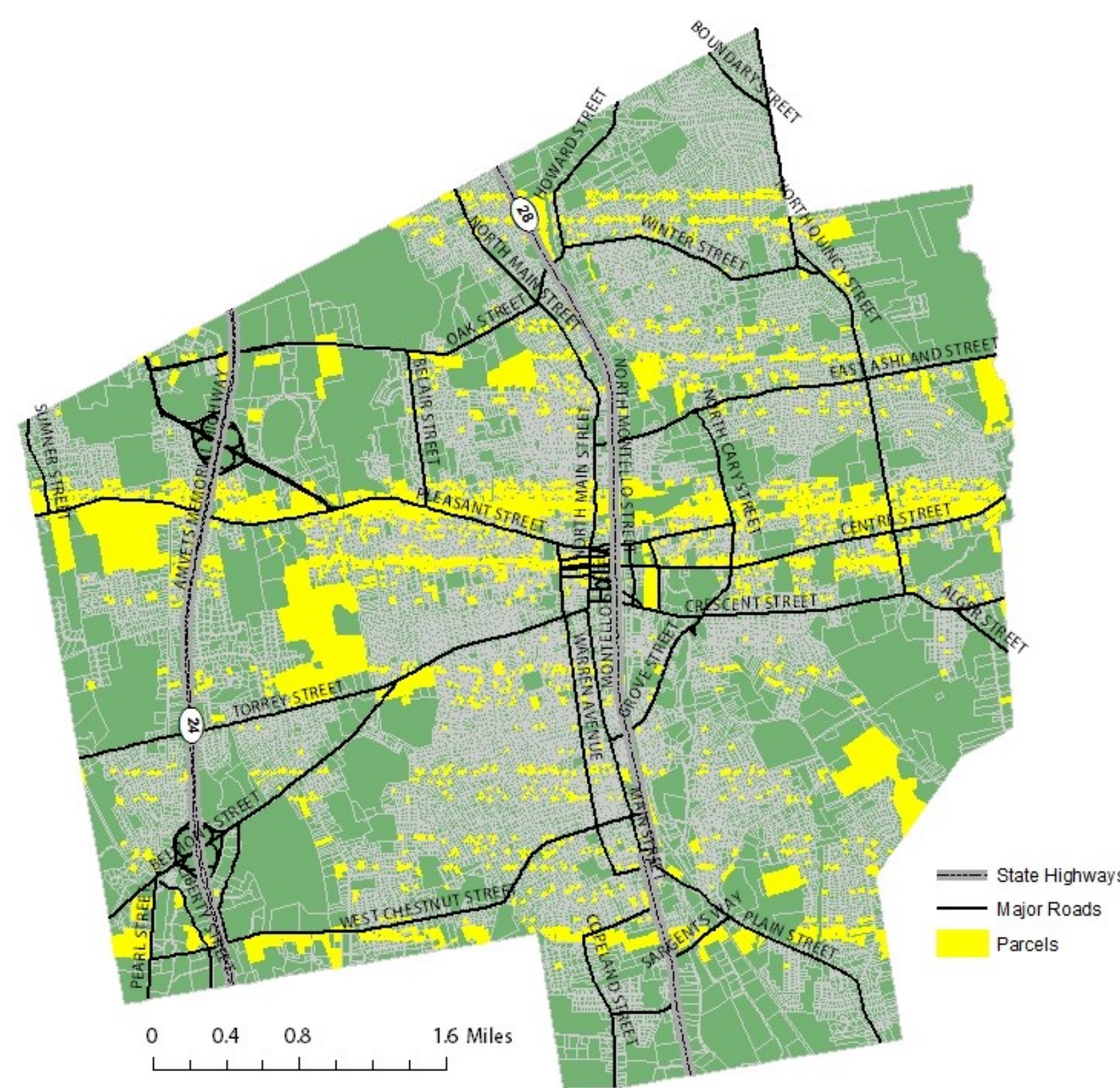
Thanks to Professor
Barbara Parameter

MassGIS Data: Level 3 Assessors' Parcel Mapping, FEMA National Flood Hazard Layer, Massachusetts Department of Transportation (MassDOT) Roads, 2010 U.S. Census - Environmental Justice Populations, Housing Owner Rental Demographics.

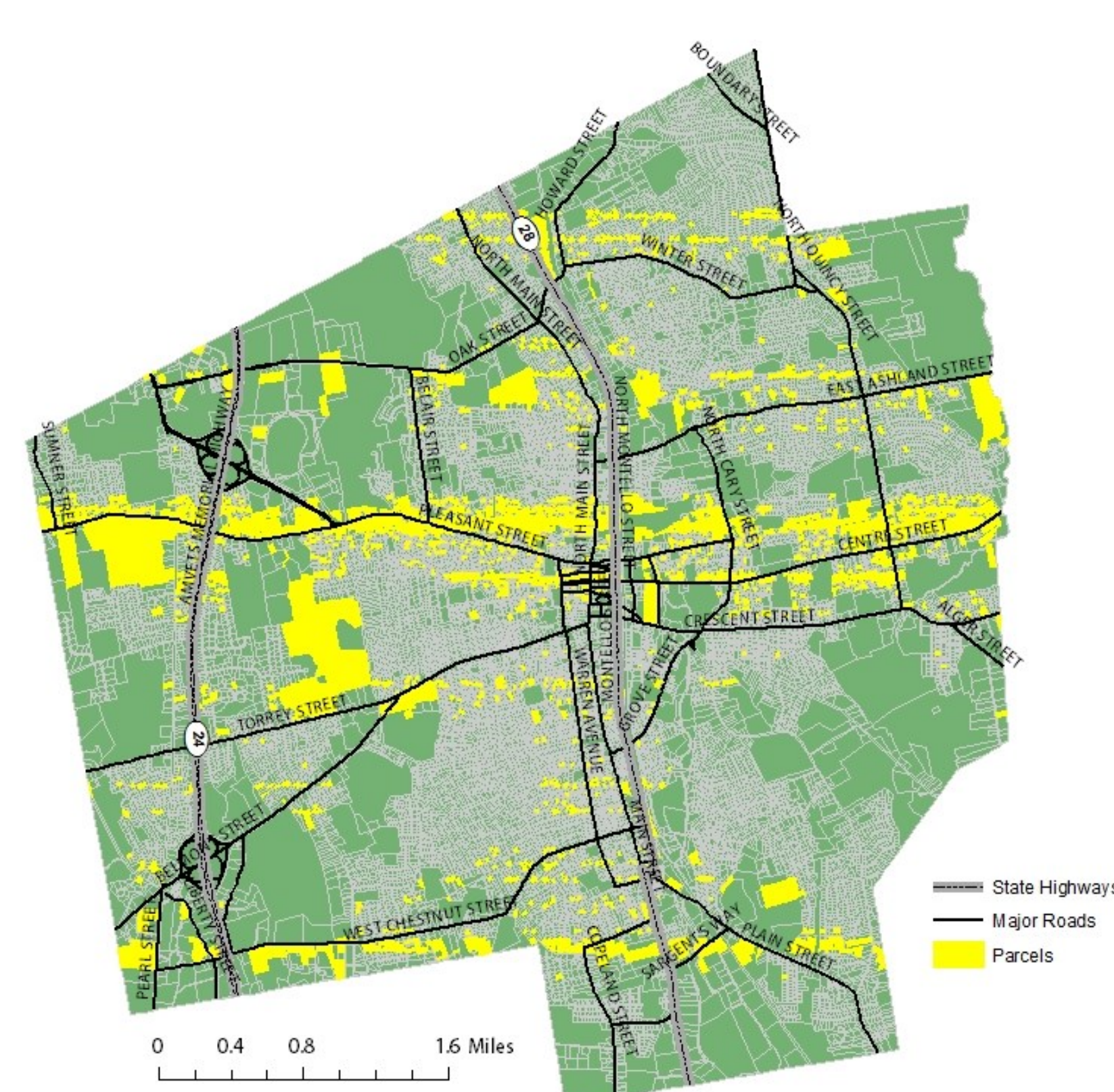
Renters in the City



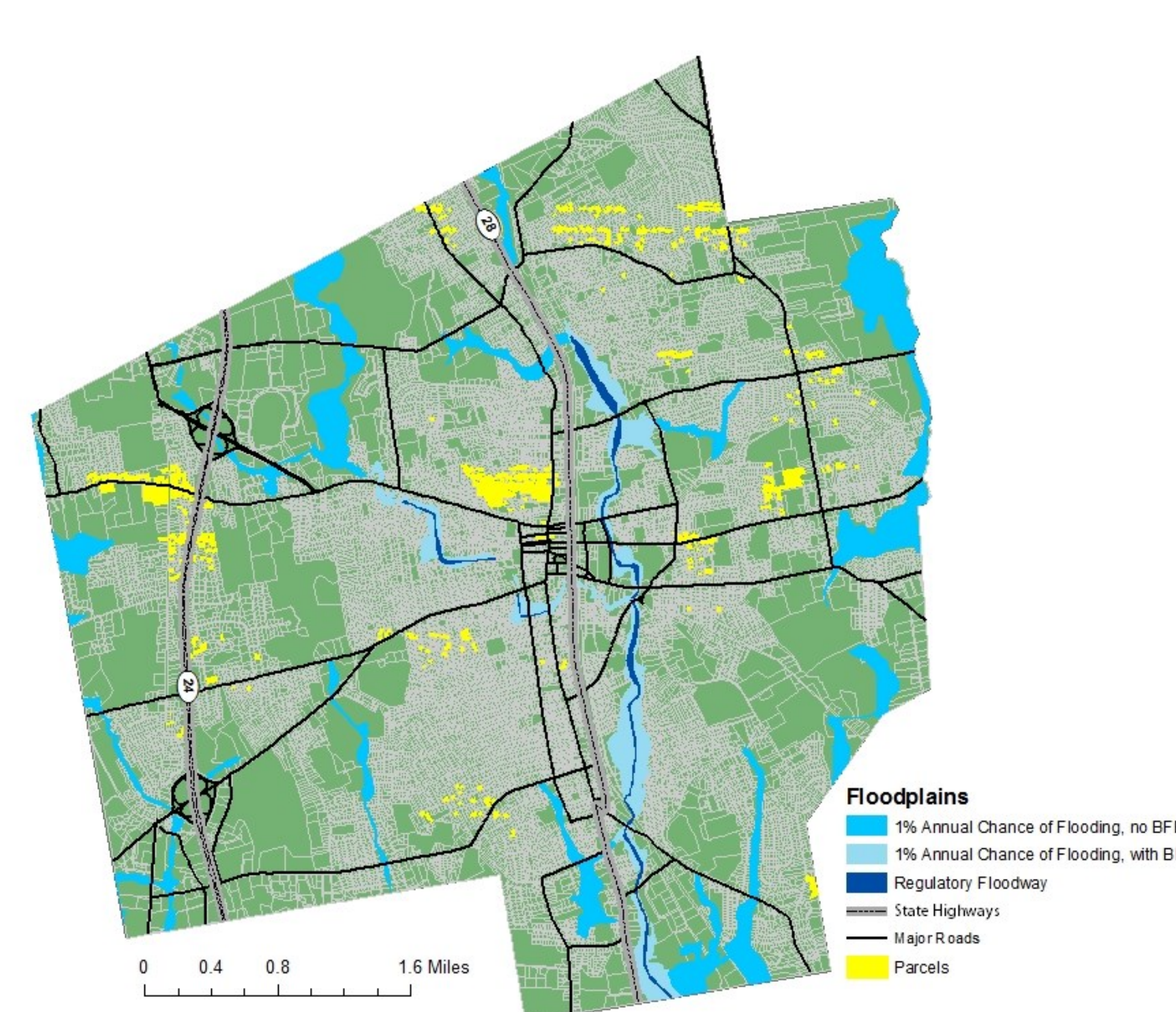
Land Use



Proximity to Roads



Proximity to Floodplains



Area of Parcel

