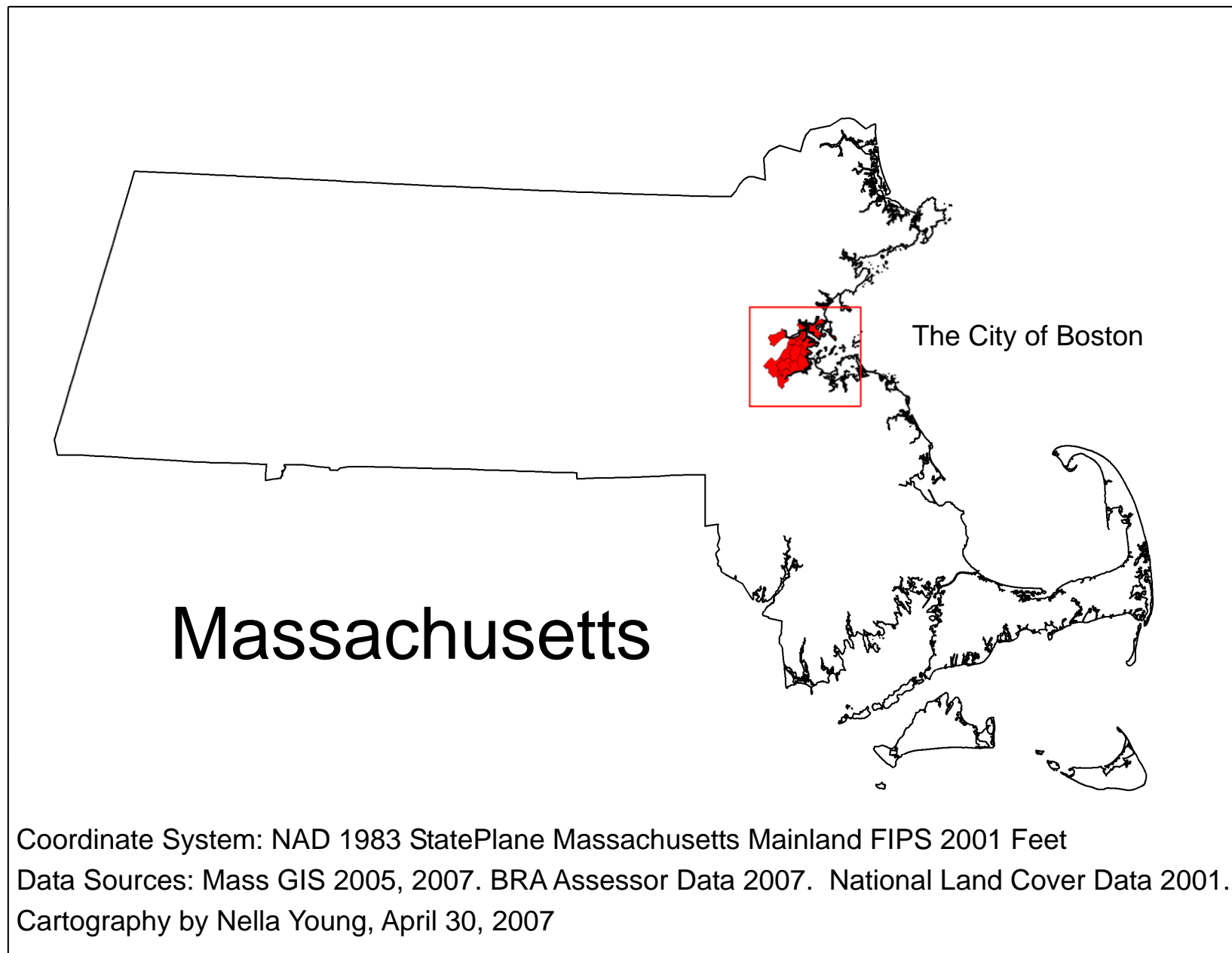


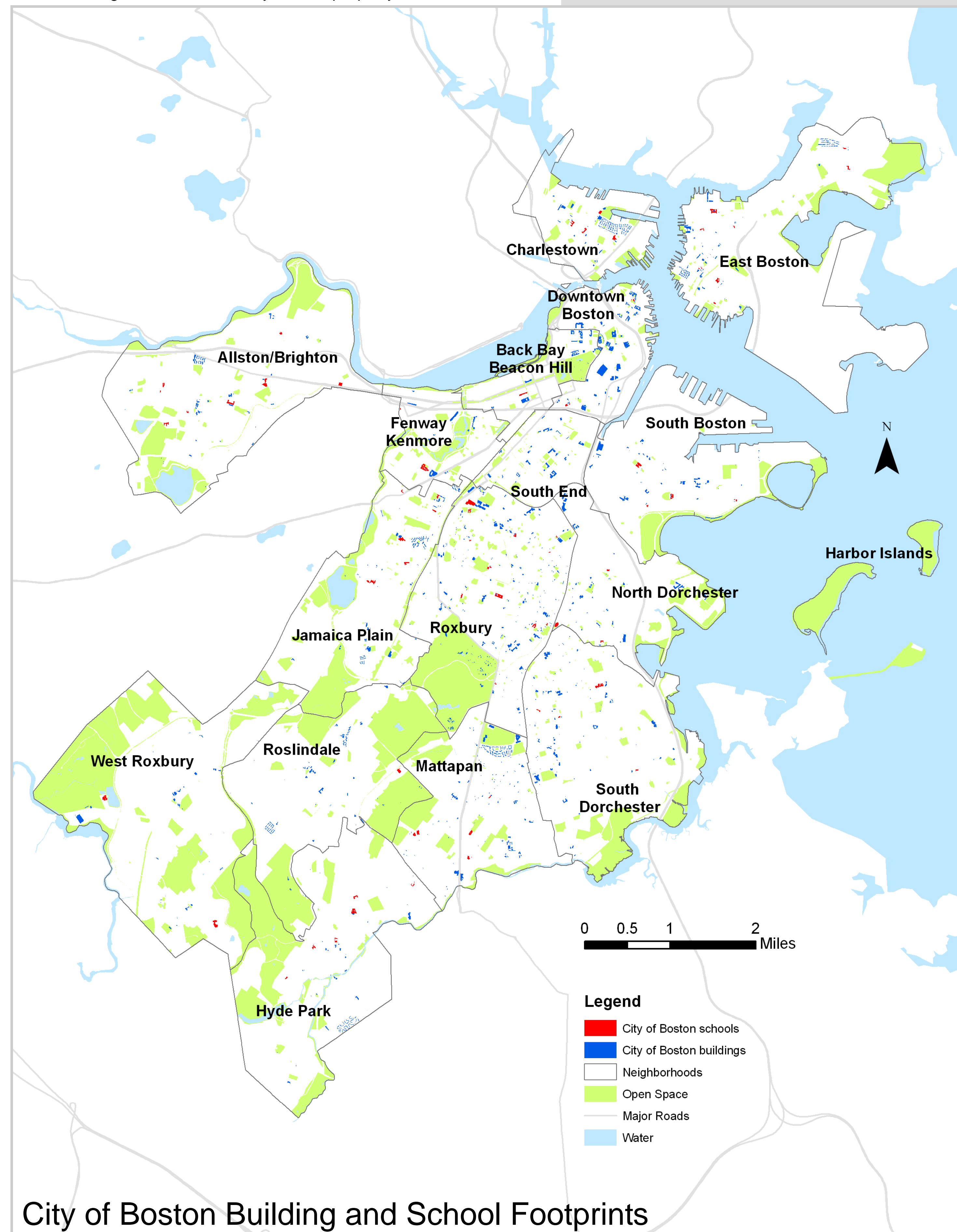
Green Retrofits for Boston Public School Rooftops



The City of Boston is interested in assessing building rooftops to understand their suitability for various green retrofits such as solar panels, green roofs, and wind micro-turbines.

To start this assessment, I looked at buildings on parcels owned by the City of Boston, to see how many potential sites existed. I classified them by footprint area which is the best data, short of visual analysis, for estimating roof area. Because there are so many building footprints to consider, I chose to focus on a subset. I chose public schools as my focus subset because they account for a number of the largest buildings owned by the city. The large school buildings are also dispersed evenly throughout the neighborhoods of Boston. Another important consideration is that Boston's Office of the Environment and facilities staff are interested in greening schools, and have existing relationships with green roof experts who specialize in building curriculum around installing green roofs. While large roof areas are not required for green roof installations, I chose to focus on size because of the impact a large installation can have, whether on energy savings or extent of stormwater mitigation.

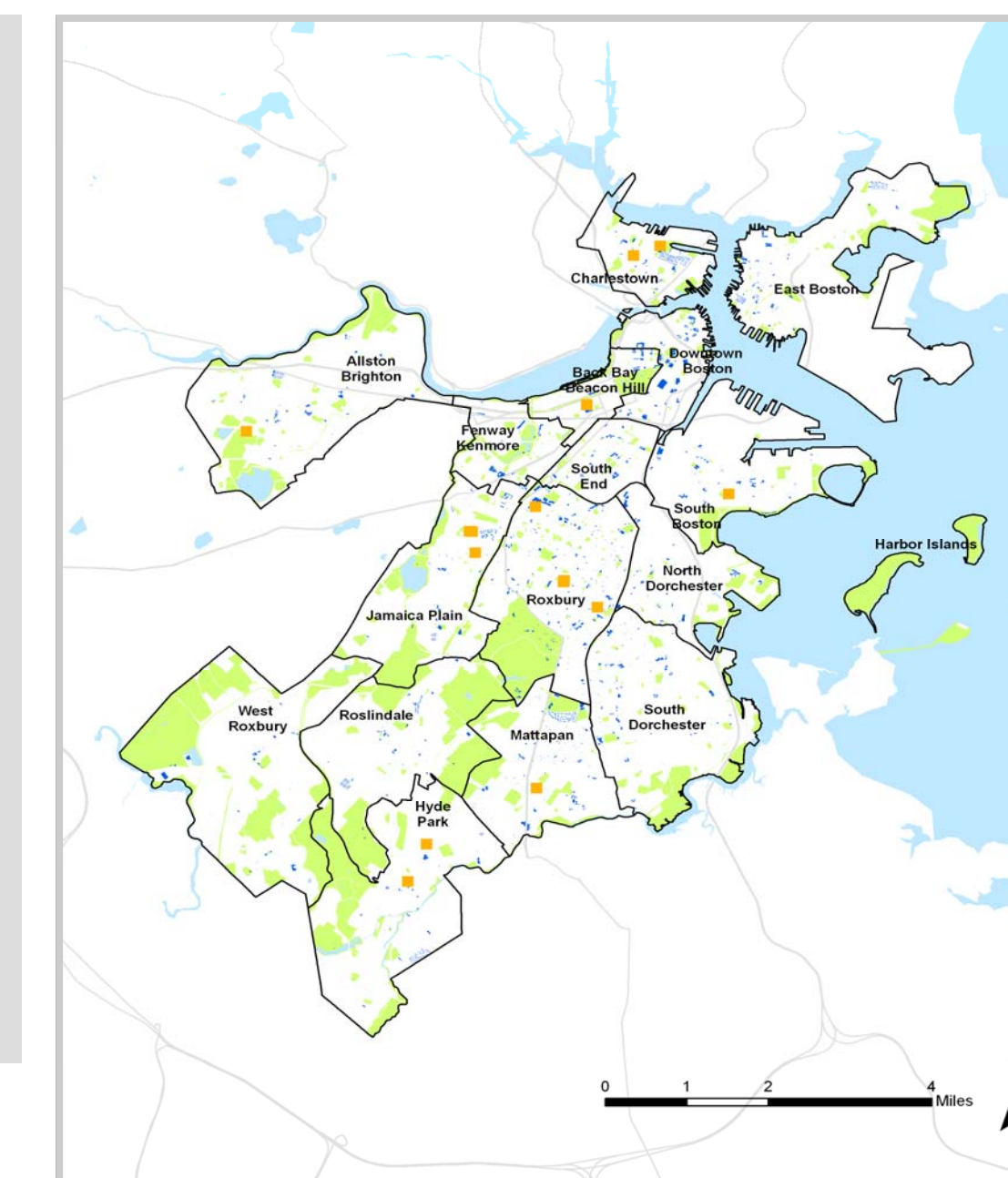
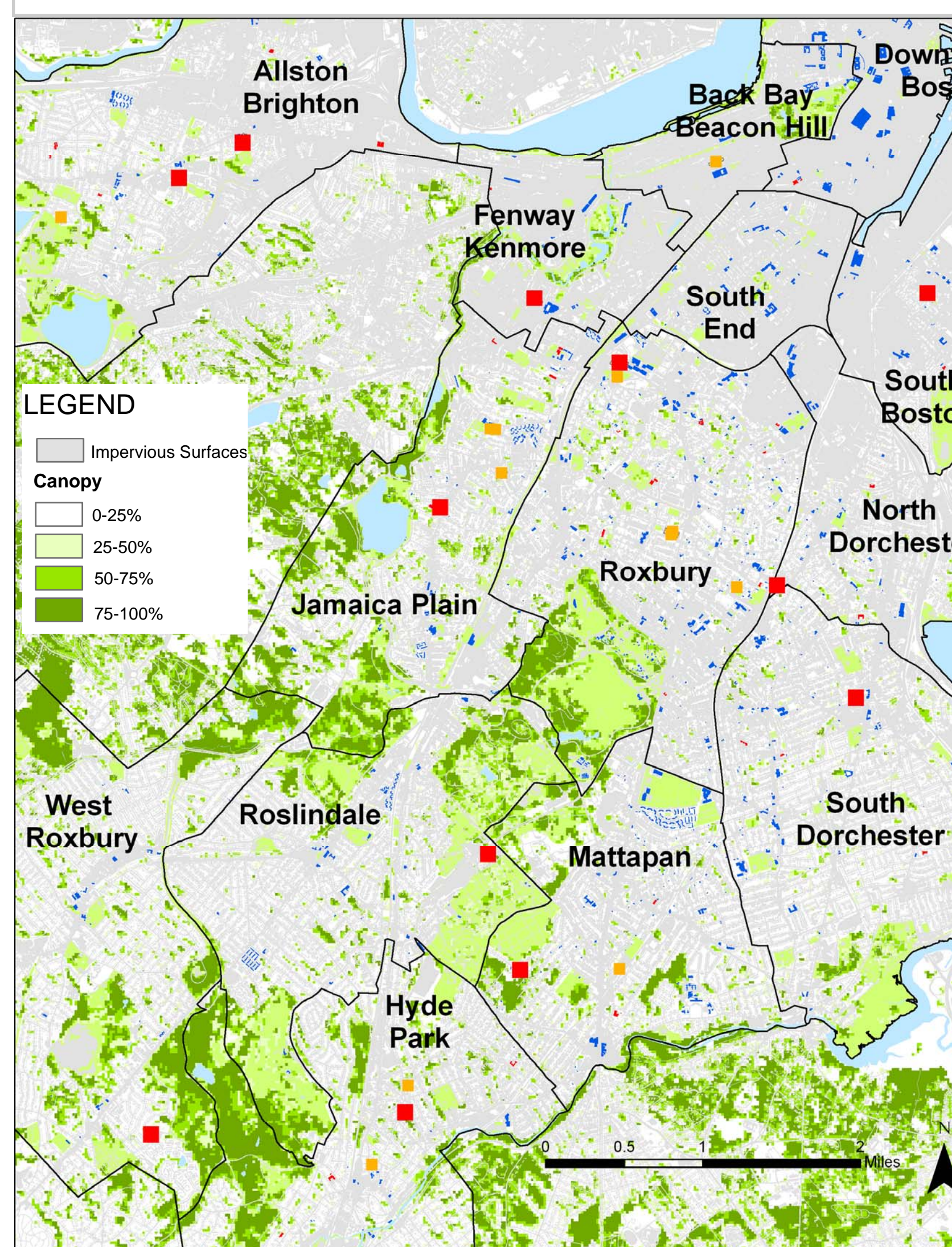
City of Boston building footprints, below in red, show the potential for hundreds of green retrofits on city owned property, shown in blue.



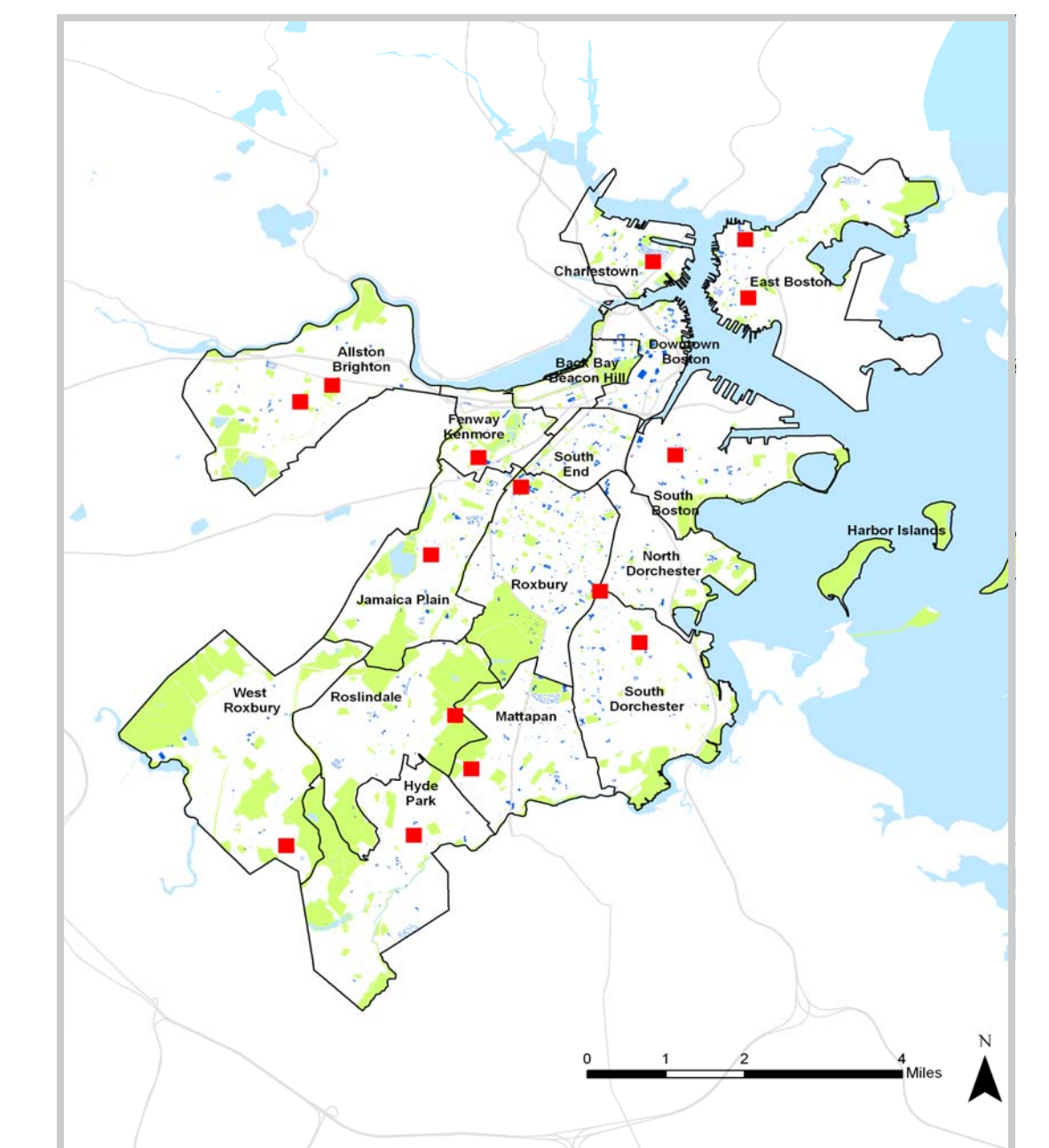
For further study:

- Boston Water and Sewer is a source of extensive data on water management for the city. This data can help with the analysis to decide whether green roofs would be more useful installations in terms of mitigating environmental issues.
- Similar analyses have studied Urban Heat Island effect as a factor for green roof suitability. If this data can be accessed for Boston, this will be an important analysis to conduct.
- While wind power is a consideration in the early stages of this study, the preliminary research indicates that the existing technology for micro-turbines installed on buildings is not mature enough to make broad recommendations. Currently, several sites have experienced damage to buildings as a result of vibration from turbines.

This map shows the locations of schools with an impervious surface layer and a canopy cover layer. This data can be used for a raster analysis to weight these two surfaces and assess whether to prioritize the installation of green roofs to manage run-off. These layers illustrate the potential for this analysis.



The orange squares represent the location of the schools with a building footprint area between 25,000 and 40,000 square feet.



The red squares represent the location of the schools with a building footprint area greater than 40,000 square feet.

