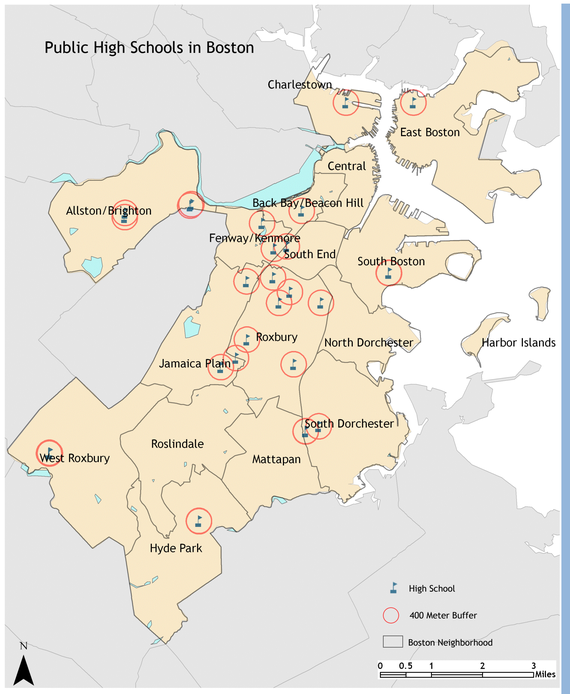
Indicators of Community Health for Public High Schools in Boston, MA

Rebecca S. Hession - May 5, 2010
Urban & Environmental Policy & Planning
Introduction to GIS - Prof. B. Parmenter

Source: Massachusetts GIS, the Boston Redevelopment Authority and Reference USA
Data Frame: Mass State Plane, Mainland, NAD 83

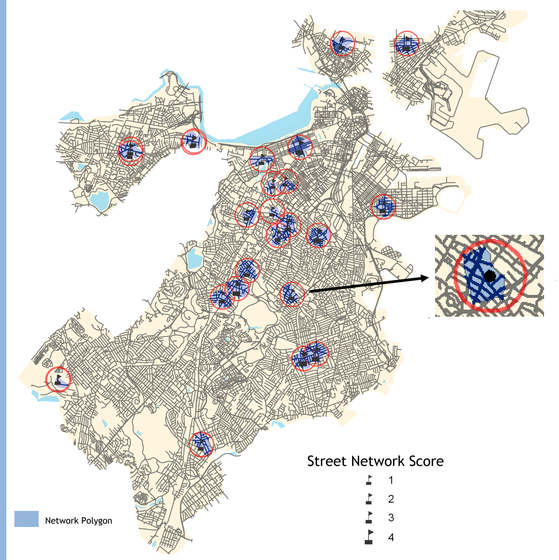


OVERVIEW

Rising obesity rates among U.S. school children represent a considerable public health risk. Two of the most commonly cited causes for the increased rates are decreased physical activity and high calorie/poor nutrient diets. This poster demonstrates how spatial analysis may be used to inform policy around the city's response to the obesity crisis.

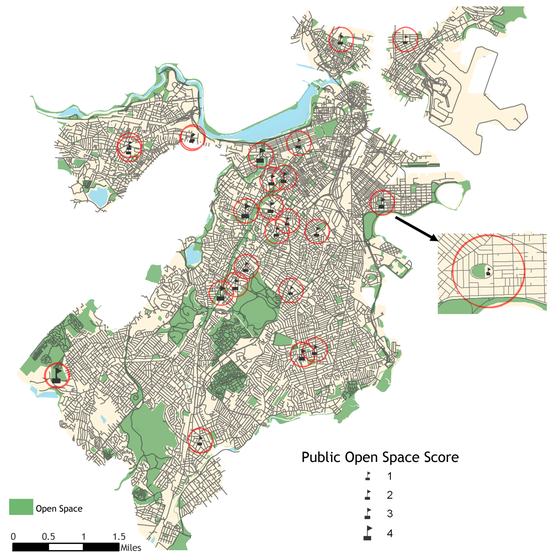
OBJECTIVE

GIS was used to assess three factors of neighborhood health for each of Boston's 35 high schools. Using a 400 meter buffer, each school was scored by a ratio of walkability, acres of public open space and concentration of fast food restaurants. Walkabilty and quantity of open space are identified as two characteristics that promote physical activity. Concentration of fast food restaurants is identified as a deterrent to healthy meal options.



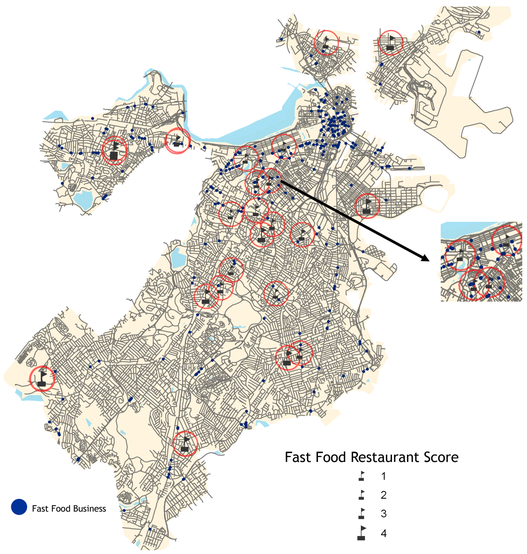
School Buffer to Street Network Ratio

In an urban landscape, access to a gridded street system is important for pedestrian movement. Non-walkable streets (e.g. highways) were removed from the grid and Network Analyst was used to create a ratio of walkable streets to the 400 meter buffer zone around each school. Each school then received a score based on its percent walkability. The scores range from one to four with four representing the greatest percent of walkable streets within a school's buffer.



Sum Acres of Public Open Space

Access to open space for recreation is an important asset in urban environments. An overlay-intersect analysis was conducted to determine the quantity of public open space in school. If some parcels did not fit completely within the buffer, only those acres that did fit were counted toward the total number of acres. Each school then received a score based on the number of acres within its buffer.



Fast Food Restaurants

The presence of inexpensive fast food businesses near high schools can be attractive to young consumers and also pose a challenge when it comes to promoting healthy meal options in schools. The names and coordinates of fast food restaurants in Boston were accessed using Reference USA. Each location was added to the map and a count was conducted to determine the number of businesses within each school's buffer. Schools with the fewest fast food options received the highest score.

Street Score

1 = 15.5 - 27.2%
2 = 27.3 - 48.2
3 = 48.2 - 52.2
4 = 52.3 - 61.1

Acres Score

1 = <10 acres
2 = 10 - 21
3 = 22 - 37
4 = 28 - 64

Fast Food Score

1 = 7-8 businesses
2 = 3-6
3 = 1-2
4 = 0

Conclusion

Using three criteria to assess community health around Boston's public high schools provides interesting information about the characteristics of each school. While walkability, amount of open space and concentration of fast food restaurants do not cover all aspects of community health. It is useful to see how GIS analysis may be used as a tool for public health officials, planners, politicians and educators when developing strategies to address the growing rate of obesity among youth.