

# Who's Up for a Walk?

## Assessing Income and Walkable Neighborhoods in and around Northampton, MA

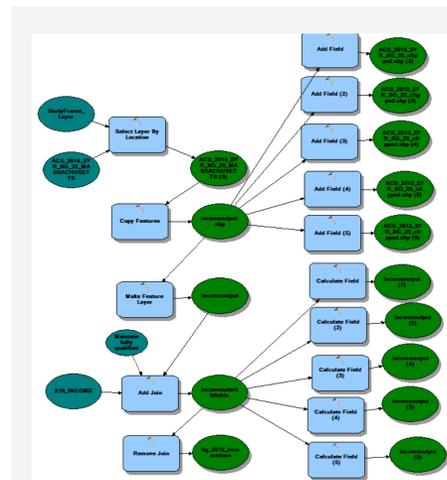


### Why Walkability?

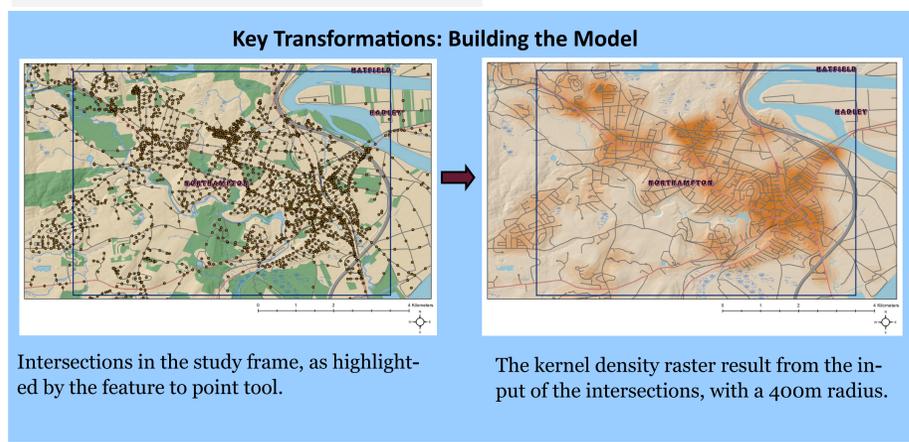
Walkable neighborhoods are associated with a host of benefits, including those to health, the environment, finances and communities.<sup>1</sup> Those who live in walkable neighborhoods weigh 6-10 less than their counterparts in “sprawling neighborhoods.”<sup>2</sup> Walkable access to amenities is linked with promotion of happiness.<sup>3</sup> Moreover, walking more reduces pollution, as 82% of carbon dioxide emissions stem from burning fossil fuels.<sup>4</sup> Walking more even adds to communities--studies have shown that for each 10 minutes spent driving during an individual's commute, they spend 10% less time engaged in community activities.<sup>5</sup> For these and likely other reasons, the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) are pushing to improve walkability in cities to “combat obesity, promote fitness and increase sustainability.”<sup>6</sup>

Since walkable neighborhoods are so beneficial, improving access to such neighborhoods could have a marked improvement on society. In order to determine how walkability in neighborhoods can be enhanced, I've decided to take a look at Northampton, Massachusetts and some of the surrounding towns to see who currently lives in walkable neighborhoods.

Walkability is the effectiveness of a community's design that makes people more apt to walk to destinations than seek other forms of transportation. Other GIS trailblazers have looked at different ways of modelling “walkability” using population density, job density and diversity—in terms of percentage of residents who lived within a defined walking distance of a destination with “diverse uses.” However, for my purposes, I chose to focus on my model of “walkability” as a matter of intersection density, which is the number of intersections in an area. Intersection density is closely correlated with block size—for instance, a greater intersection density corresponds with smaller blocks.<sup>7</sup> Moreover, smaller blocks are associated with higher walkability.<sup>8</sup> Walkable neighborhoods are well-connected through intersections, which provide direct and convenient routes to a wide variety of destinations. Northampton is a mid-size city in Western Massachusetts, with a “downtown” city area likely to have more intersections than its sprawling, rural areas. I'd expect the walkability to be greater in such a city area than those farther afield from shops and other businesses.

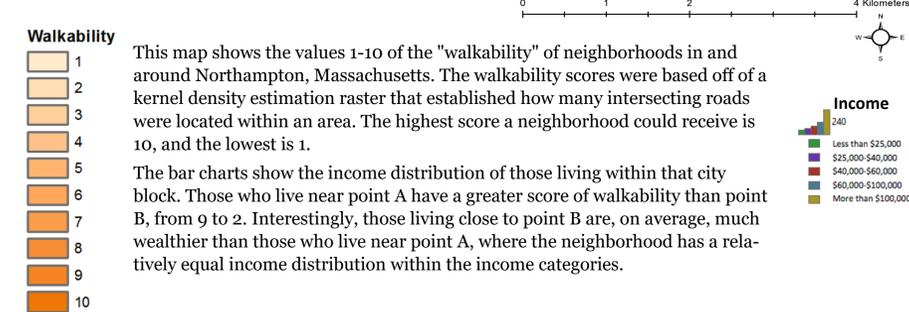
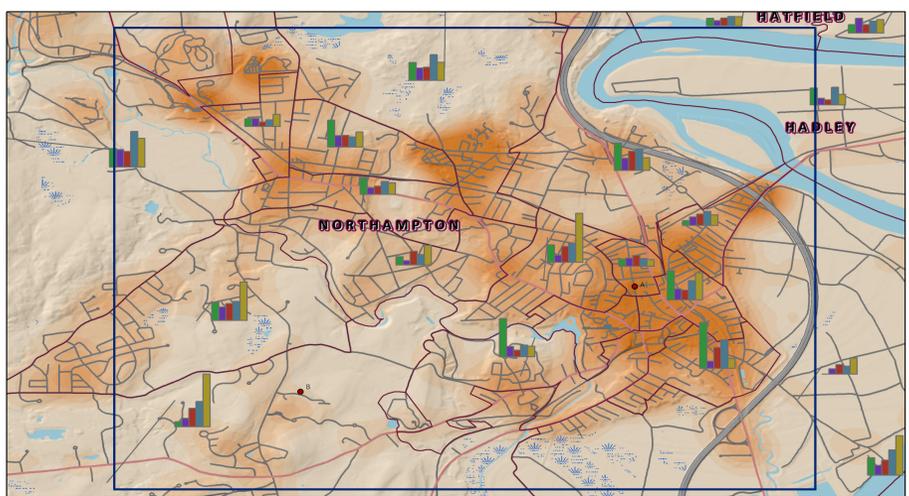


Model built to add and calculate fields to divide the income earned by residents into brackets.



Intersections in the study frame, as highlighted by the feature to point tool.

The kernel density raster result from the input of the intersections, with a 400m radius.



This map shows the values 1-10 of the "walkability" of neighborhoods in and around Northampton, Massachusetts. The walkability scores were based off of a kernel density estimation raster that established how many intersecting roads were located within an area. The highest score a neighborhood could receive is 10, and the lowest is 1.

The bar charts show the income distribution of those living within that city block. Those who live near point A have a greater score of walkability than point B, from 9 to 2. Interestingly, those living close to point B are, on average, much wealthier than those who live near point A, where the neighborhood has a relatively equal income distribution within the income categories.

### Results

There is a loose correlation between income level and the walkability of neighborhoods within this study area, showing primarily Northampton, but also snippets of neighboring towns Hatfield, Hadley and Easthampton. Areas with lower walkability scores seemed to generally have a higher percentage of those with an income greater than \$100,000, suggesting that these individuals may live in bigger houses on bigger chunks of land, and may primarily get around by car (though driving may be what Northampton residents do, generally, anyway). Within the area of the map with the highest walkability scores, there were more people who were making less than \$25,000, suggesting that these lower-income individuals may live in these areas. One reason may be due to low-income housing in the city center. Or, perhaps these families live downtown so they have greater access more establishments, either to save on gas or to prevent them from driving at all. There do also seem to be a decent quantity of those in the middle income ranges living within the highly walkable area, suggesting that these may be working professionals who moved to the center of town as it gentrifies. Again, most of these neighborhoods seem to have a smattering of income levels, suggesting that this correlation between income level and walkability of neighborhoods is not strong, and that the question would require more analysis and perhaps a less car-friendly subject area.

GEOID Data	<\$25K	\$25-40K	\$40-60K	\$60-100K	\$100K+
T0000250118216001	77	136	78	110	124
T0000250118216002	162	60	76	116	166
T0000250118216003	296	103	108	92	137
T0000250118216004	71	73	41	61	112
T0000250118216005	64	75	69	79	60
T0000250118216006	159	64	145	173	449