

More Than Bike Lanes: The State of Equity & Justice in Boston's Bike Network

BACKGROUND

The Boston Cyclists Union asked a UEP Field Projects team this semester to further understand the barriers to biking that are faced by low-income and minority populations within the City of Boston – specifically within the focus areas of Dorchester, Mattapan, and Roxbury – so as to better understand how their programming can be changed to increase bike ridership for these groups.

The spatial analysis conducted was informed by the literature review and qualitative methods utilized by the research team – using bike equity and justice as a framework. Many, privileged bike advocates have often promoted their aims without consideration of low-income communities and communities of color, and bike equity and justice are seen as ways to reframe this issue to bridge disparities (Golub 2016). Using a holistic approach to understand mobility, bike justice can aid to analyze biking and transportation intersectionally with different issues such as public health and safety, police and harassment, and more.

Literature and advocacy often cites the lack of infrastructure as the main barrier to biking. However, our interviews with various bike advocates throughout Boston, youth mechanics at the organization Bikes Not Bombs, and Boston residents with the organization Union Capital Boston cited barriers to biking beyond just built infrastructure such as infrastructure quality, concerns of bicycle theft, and general safety concerns.

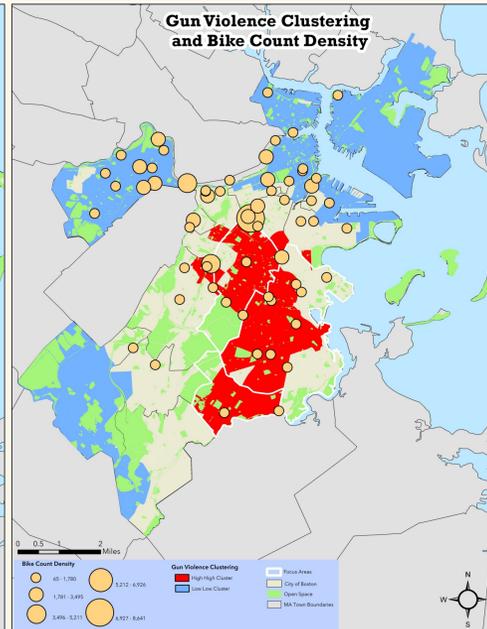
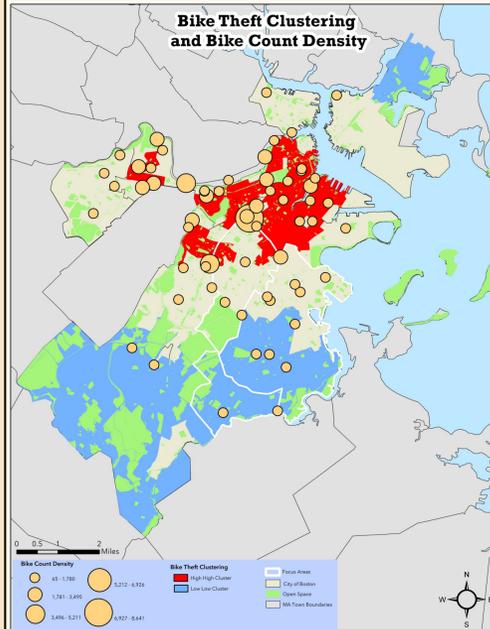
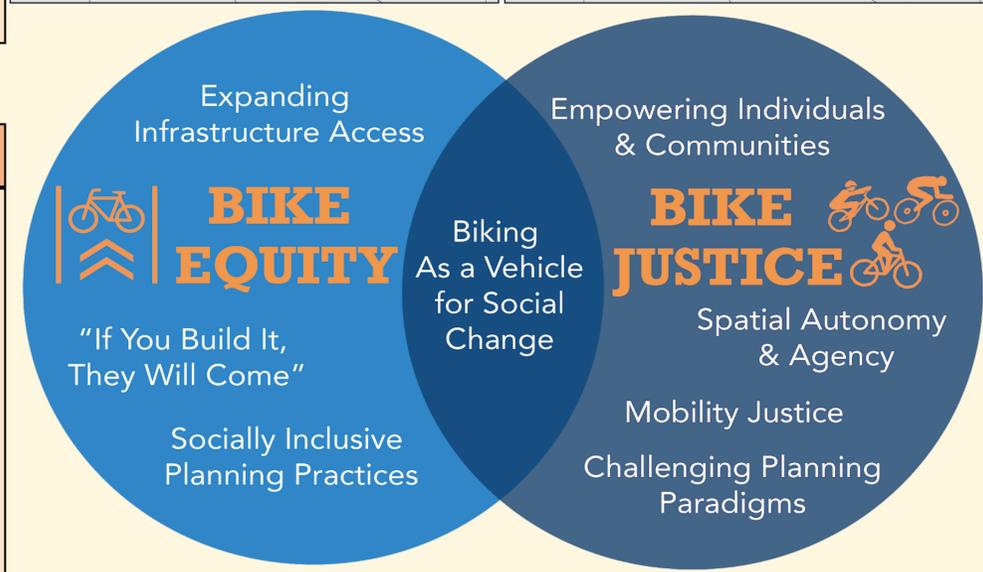
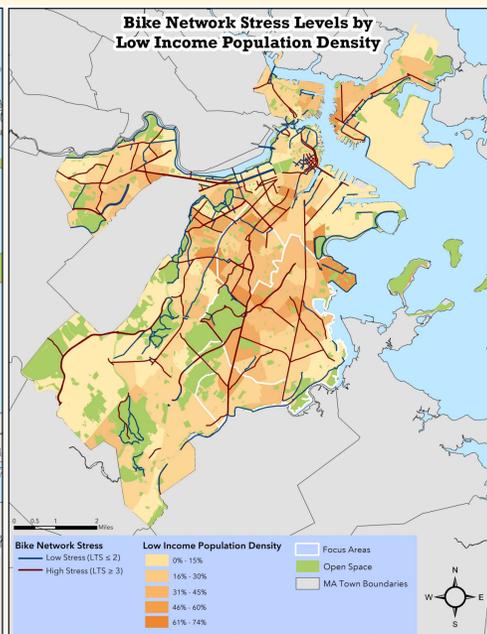
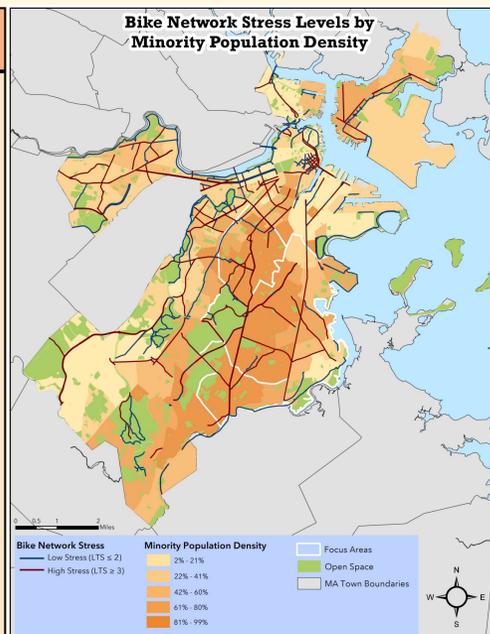
METHODOLOGY

To further understand the lived experiences of our interview participants, different datasets and mapping techniques were used.

One of the barriers cited to biking by youth mechanics at Bikes Not Bombs was the lack of quality bike infrastructure in their neighborhoods. Data through the City of Boston classifies the current Existing Bike Network into the types of bike lanes that each lane is considered (protected, painted markings, etc.) and also utilizes Level of Traffic Stress (LTS) Methodology (Furth, Mekuria, Nixon 2012) to determine the stress associated with certain lanes. The scores of LTS range from 1 to 4 with scores of 1 and 2 being considered low stress and scores of 3 and 4 being considered high stress. Examples of lanes with low stress (LTS ≤ 2) can be considered completely separated lanes and paths for bikes and pedestrians or lanes/paths that are protected and divided from vehicle traffic. High stress lanes (LTS ≥ 3) can be considered bike lanes that require interaction with vehicles such as lanes that are not protected and only utilize painted markers to signify their existence. Using this classification on the Existing Bike Network shapefile, lanes with Low Stress were highlighted in dark blue and High Stress highlighted in dark red. To further analyze the locations of High Stress Networks, utilizing Census data through the City of Boston – densities of minority populations and low-income populations were symbolized in addition to highlighting the focus areas of Dorchester, Mattapan, and Roxbury.

Another barrier to biking cited by the youth mechanics at Bikes Not Bombs was the worry of their bike being stolen. Utilizing crime data from the City of Boston, bike thefts were sorted out and a Local Moran's I cluster analysis was run to understand where most of the thefts were occurring. Further, the City has created Bike Count Data which counted the number of bikes at specific intersections throughout the span of a day on multiple days. This data was symbolized with dot density over the cluster analysis to understand if there might be a relationship between instances of bike theft and high bike ridership.

In addition to the worry of bike theft, general safety concerns were mentioned by multiple interview participants. Using Boston Crime Data, crimes which involved a shooting were sorted out and another Local Moran's I cluster analysis was run to understand where violence might be occurring. Bike count densities were also overlaid over the cluster analysis to understand how these instances of violence might affect bike ridership.



DISCUSSION

The stress network maps have indicated that higher stress parts of Boston's Bike Network are in areas where there are also higher densities of low-income and minority populations. This further backs up the experiences of our interview participants who cited having to travel to other parts of Boston or into other cities surrounding Boston, like Cambridge, to get access to more quality infrastructure.

The cluster analysis of bike theft indicates that higher instances of bike theft occur where there are also higher densities of bike ridership. While this makes sense, where there are more bikes there is more chance of theft, there is also lower densities of bike ridership where there are lower instances of bike theft, begging the question – *Is bike theft affecting the amount of bike ridership in certain areas or are there lower instances of bike theft because there is low bike ridership in certain areas?* Similarly, in the cluster analysis of gun violence – it can be seen that there tends to be lower ridership densities in places with high instances of gun violence. Though there are higher densities of ridership on the borders of areas with high gun violence, a similar question could be posed here – *Are low densities of bike ridership due to high instances of gun violence or vice versa?*

Despite these questions that arise from our analysis – the lived experiences of our interview participants and many who have had similar experiences throughout Boston are undeniable and bring up important issues to be addressed by the Boston Cyclists Union, the City of Boston, and other advocacy organizations.

Taking this spatial analysis and qualitative research into account, recommendations from the research team to the Boston Cyclists Union included the need for a transparent and concrete organizational commitment and definition of bike justice and to develop and create social networks for change with other bike, transit, public health, and related organizations in Boston.

*"I don't advocate for just biking, I want better infrastructure for everyone. We need to get buy-in from pedestrians to have better infrastructure in general. When we, as bikers, separate ourselves, it becomes an issue."
— Michelle Cook, Roxbury Rides*

DATASETS AND REFERENCES

- Furth, P. G., Mekuria, M. C., Nixon, H. (2012) *Low Stress Bicycling and Network Connectivity* (Report No. 11-19) San Jose, CA: Mineta Transportation Institute.
- Golub, Aaron. (2016). *Bicycle justice and urban transformation : Biking for all?* (Routledge, equity, justice, and the sustainable city series).
- City of Boston, Analyze Boston & Vision Zero Datasets: *Boston Crime Data, Boston Bike Count Data, Existing Bike Network, City of Boston Social Vulnerability Populations.*
- Coordinate System: NAD State Plane Massachusetts 2011
- Projection: Lambert Conformal Conic

Cartographer: Miranda Briseño

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