**Visualization Design**

Kuan-Chun Chiu, Aadit Bhatia, Emily Nguyen

Group 28

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Visualization 1:

Visualization 1 is a bar chart showing the sidewalk and bike path density in all Boston neighborhoods, where the x-axis is the density and y-axis is the neighborhood names. We choose to use a side-by-side car chart since this graph involves two categorical features, which are neighborhood and transit type (sidewalk & bike path). We make the bar chart horizontal so the neighborhood names are easier to read as they are horizontally displayed. We also use two different colors, blue and green, to distinguish the density bar between sidewalks and bike paths. Lastly, we increasingly sort the bars based on the sidewalk density, so readers can find the neighborhoods with the lowest sidewalk density on top while find those with the highest density at the bottom.

Visualization 2:

Visualization 2 is a Boston map showing the distribution of sidewalks and bike paths across all neighborhoods. We design two layers for the graph, where the first layer shows the sidewalks while the second shows the bike paths, and the layers can be dropped if wanted. In this way, users can freely decide to view both the sidewalk and bike path, or only view one of the two transit options, or only view the Boston map with both layers dropped. The distribution of the sidewalks and bike paths are distinguished using two different colors, blue and red. We also make the transparency lower to 0.8 so it’s easier to see the path distribution in the busy area with overlapping paths. Lastly, we added a hover function that shows the neighborhood name, and a click function that shows the number of sidewalks and bike paths in the particular neighborhood.

Visualization 3:

Visualization 3 is a Boston map showing the transit friendliness index of all neighborhoods. The magnitude of the transit index between different neighborhoods is denoted with different colors, using a color palette that progresses from light yellow, light green, light blue, to dark blue. On a scale from 0.0 to 1.0, the higher the index score is, the darker the color a neighborhood gets, while the neighborhoods with lower index score get light yellow or green. Thus, by simply looking at the colors, readers can easily understand the walkability rating for each Boston neighborhoods. A transit index legend bar is provided on the top right corner for clarity. We also added a hover function that shows the name, index score, and sidewalk & bike path density for each neighborhood.

Visualization 4:

Visualization 4 is a lollipop chart showing the transit friendliness index for all Boston neighborhoods, where the x-axis is the index and y-axis is the neighborhood names. We make this chart horizontal instead of vertical so the neighborhood names are easier to read. We decreasingly sort the graph based on the index score, so users can find the neighborhood with the highest index on top and those with the lowest index at the bottom. We added a slider function below the graph, that as the index score increases on the slider, only the neighborhoods whose index is higher than or equal to the slider value will remain on the chart, while the rest turns into light grey. This helps the readers to only focus on their target neighborhoods based on the index value, and exclude all other irrelevant neighborhoods that don’t meet the criteria.

Visualization 5:

Visualization 5 is a scatter plot showing the relationship between the neighborhood area and transit friendliness index, where the x-axis is the area and y-axis is the index. We choose to use a scatter plot because this visualization involves two numerical continuous values, area and index. Next, we didn’t lower the transparency level since there’s only 23 data points representing the 23 Boston neighborhoods, so no data overlapping exists. We include a linear trend line in the plot to indicate the general negative linear trend between the area and index, which helps the readers to understand the relationship between the two variables.