**MBTA MINORITY BUS RIDERSHIP**

**Does Census Data Predict Who Rides the Bus?**

**INTRODUCTION**

Public transportation provides access to jobs, education and other services for people who are unable to drive, who cannot afford to drive or who wish not to drive. Those who cannot afford a car, often minority populations, must use public transportation to move from place to place (Kramer & Goldstein 2015). Fast, reliable and comfortable public transportation is necessary for the equitable mobility of groups who rely on public transportation due to lack of other options (Wellman 2015).

In order to operate public transportation that does not disadvantage minority riders, public transportation administrators must understand the minority ridership on their buses. According to a study by Kamer and Goik in 2015, there are two ways to understand the minority ridership on bus routes. Public transportation administrators can either examine U.S. census data for the bus service areas or conduct a rider census survey to find the percentage of minority riders on their buses. The study examined the two methods and found that, because minorities disproportionately ride buses, U.S. census data was inaccurate when compared to rider census data. The study therefore, suggested that public administrators conduct a rider census survey in order to understand when service improvements will disadvantage minorities (Kamer & Goik 2015).

The current analysis seeks to examine if minority populations disproportionately ride the bus when compared to the white population in the Boston Area in order to understand if U.S. census data is predictive of minority ridership.

**METHODOLOGY**

This analysis examined the MBTA key bus routes and all MBTA bus routes with a daily ridership of over 100 passengers. The analysis used MBTA rider census data, MassGIS bus stop and bus route data and 2010 U.S. census block and population data.

In order to find service areas for the key bus routes, a network analysis on the key routes’ bus stops was conducted using Massachusetts streets. The census block polygons intersecting the service area polygons generated from the network analysis were then selected. For all bus routes with daily ridership over 100 passengers, a simple analysis was conducted to find the service area. For these 121 bus routes, the census blocks within a quarter mile radius of the bus stops’ bus stops were selected to create the bus routes’ service areas.

After finding the service areas for key bus routes and for all bus routes, the average percent census minority for each bus’ service area was calculated. The U.S. census minority data was then compared to the MBTA ridership data for each of these routes, to see if the census minority population data predicted the bus minority ridership. A field was created for every route by dividing the MBTA rider minority percentage by the U.S. census minority percentage. This number was then multiplied by 100, indicating the census minority data, as a percentage of the U.S. census minority population within each bus service area. These percentages were then mapped, along with several individual bus routes and the bus routes with the highest disparity between minority bus ridership and the minority population in the service area.

**RESULTS**

This analysis found that census data only predicts minority ridership 7.5% of the time. The only buses where U.S. census minority percentages predict rider minority percentages are on buses 28, 50, 503, 34, 505, 132, 10, 36, and 50. The minority ridership percentage is between 85% and 115% of the U.S. census minority percentage for these buses. Buses 11, 9, and 92 have ridership minority below the U.S. census minority, and data for buses 40, 97, 105, 429 and 236 was incomplete, as the MBTA percentage minority data was not available for these bus routes. The rest of the bus routes (88%) 104/121 have a higher percent minority ridership than percent minority in their service area.

Among key bus routes, census data can only be used for bus 15 to predict ridership, and even on bus 15, the rider minority percentage is 111% of the census minority percentage in the service area. On all other bus routes, the rider minority percentage is over 115% of the census minority percentage in the service area.

Finally, the analysis found that around 18% (22/121) percent of buses have over two times as large a percent minority ridership as minority living in the service area. The bus route with the highest ridership disparity is Bus 93 that runs from Haymarket, through Downtown Sullivan.

**REFERENCES**


MBTA, “Rider Census Data (Boston, MBTA, 2017).”

MBTA Bus Route 1, “Wikipedia Commons (8 November 2009).”


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