#### Philadelphia Household Travel Survey Transportation Modeling

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**Purpose:**

The purpose of this assignment is to reinforce your understanding of transportation modeling. Several of the questions will require you to use the DVRPC household travel survey and the transit ridership data used in class.

1. Using the 2012 Philadelphia household travel survey, plot a histogram of the total number of trips people made (P\_TOT\_TRIPS). Describe the distribution of trip-making.
2. Create a new variable that equals 1 if a person did not take any trips (hint: *dat$newvariable <- as.integer(dat$P\_TOT\_TRIPS == 0)*). How many people in the sample took no trips? Summarize the race, age, and income of those who took trips on the survey day vs. those that did not.
3. Create a table showing the percent of people who did not take a trip by the reason they did not take a trip (remember to use the data dictionary to find variables).

The following questions use the station-level transit ridership data used in class.

1. Plot a histogram of heavy rail ridership and a histogram of the natural log of heavy rail ridership. Describe the two plots.
2. Plot a scatter plot of heavy rail ridership (y axis) against the jobs within a half mile of stations. Describe the relationship.
3. Plot a scatter plot of the natural log of heavy rail ridership (y axis) against the natural log of people within a half mile of stations. Describe the relationship.
4. Predict station level ridership (linear) as a function of jobs within a half mile, population within a half mile, whether the station is a terminal, whether it connects to an airport. Provide the output of the regression.
5. Describe the statistical relationship between the variables and transit ridership.
6. Plot the predicted ridership against the error terms and provide a graphic in your homework. Describe this residual plot.
7. Add the dummy variable for whether the station is a heavy rail station. Does this improve the model? Explain your answer.