MPC-603 Bicycle safety roundabouts

Description of data processing and data analyses for stated preference

Data processing

1. Prepare data for discrete choice analysis.
   1. *Script*: “create\_stated.R”
      1. Create attributes of choice alternatives. Create long dataframe. Merge survey data with attribute data. Convert values to integers (dummy coding).
      2. Subset columns for unweighted analysis.
   2. *Inputs*: “dat3.rds”
   3. *Outputs*: (Analysis/Stated preference/Data cleaning and weighting)
      1. “dat\_stated.rds”, “dat\_stated.csv”
      2. “Stated.rds”, “Stated.csv”
2. Weight data for weighted analyses.
   1. *Script*: “create\_weighted.R”
      1. Prepare target proportions of weighting variables. Prepare long survey data for weighting. Subset survey data for different weighting based on missing variables. Conduct weighting process. Combine weights together.
      2. Convert long dataframe into wide dataframe.
   2. *Inputs*: “dat\_stated.rds”, “Expected.csv” (Data/Census)
   3. *Output*: (Analysis/Stated preference/Data cleaning and weighting)
      1. “Weights[various].csv”
      2. “Stated\_MNL\_weight.rds”, “Stated\_MNL\_weight.csv”
      3. “Stated\_wide\_weight.rds”, “Stated\_wide\_weight.csv”
3. Prepare data for preference heterogeneity analysis.
   1. *Script*: “create\_hetero.R”
      1. Subset columns for heterogeneity analysis. Process some data to be numeric. Create missingness dummy variables. Convert levels of factors. Create dummy variables.
   2. *Inputs*: “dat\_stated.rds”
   3. *Outputs*: (Analysis/Stated preference/Data cleaning and weighting)
      1. “Hetero.rds”, “Hetero.csv”
4. Calculate descriptive statistics.
   1. *Script*: “describe\_data\_weights.R”
      1. Calculate descriptive statistics for dataset and weights.
   2. *Inputs*: “dat\_stated.rds”, “Hetero.rds”, “Stated\_MNL\_weight.rds”, “Stated\_wide\_weight.rds”
   3. *Outputs*: (Analysis/Stated preference/Data cleaning and weighting)
      1. none, “Descriptives.xlsx”

Data analysis

1. Stated preference analysis: MNL, unweighted
   1. *Script*: “MNL.py”
      1. Specify parameters to be estimated. Define utility equations. Estimate MNL model.
   2. *Input*: “Stated.csv”
   3. *Output*: “MNL-Weight.html”
2. Stated preference analysis: MNL, weighted
   1. *Script*: “MNL-Weight.py”
      1. Specify parameters to be estimated. Define utility equations. Estimate MNL model, with weights.
   2. *Input*: “Stated\_MNL\_weight.csv”
   3. *Output*: “MNL-Weight.html”
3. Stated preference analysis: Panel mixed MNL, unweighted
   1. *Script*: “MMNL.py”
      1. Specify parameters to be estimated. Define utility equations. Estimate panel mixed MNL model, using Monte Carlo simulation with 1000 draws.
   2. *Input*: “Stated.csv”
   3. *Output*: “MMNL.html”
4. Stated preference analysis: Panel mixed MNL, weighted
   1. *Script*: “MMNL-weights.py”
      1. Specify parameters to be estimated. Define utility equations. Estimate panel mixed MNL model, with weights, using Monte Carlo simulation with 1000 draws.
   2. *Input*: “Stated\_wide\_weight.csv”
   3. *Output*: “MMNL-weights.html”
5. Stated preference analysis: Panel mixed MNL with systematic preference heterogeneity, unweighted
   1. *Script*: “[various].py”
      1. Specify parameters to be estimated. Define utility equations. Estimate panel mixed MNL model, using Monte Carlo simulation with 1000 draws.
      2. Select restricted model with just significant parameters. Repeat process.
   2. *Input*: “Hetero.csv”
   3. *Output*: “Fourth-all.html”