Instructions to Use the Transportation Modeling Package

Installation of the R Modeling Package

- The installation of the package only involves downloading the R script and the data to one of the local directories on user's machine.

- Note that RStudio, an editor for R, is recommended to be installed on the user's machine for using this package. Users can download RStudio from the following link (https://www.rstudio.com/products/RStudio/).

Required R Libraries

- Required R libraries that should be installed before using the Transportation Planning Package on the user's machine include:
  - **MASS**
  - **ordinal**
  - **pscl**
  - **zeligChoice**
  - **AER**

Files in the Package

- In the package, you can find the data for testing and the script that contains examples for the models:
  - **trans_planning_models.r:** This script includes all models except for MDCEV models. It is recommend that users do not modify these scripts.
  - **testmodels.csv:** This comma delimited text file is provided for all models that are available in the R script for the sake of user's test.

Available Models in the R code

- Linear Regression
- Poisson Regression
- Negative Binomial Regression
- Zero-Inflated Poisson Regression
- Zero-Inflated Negative Binomial Regression
- Ordered Probit
- Multinomial Logit (MNL)

Preparing the Input Data

- To prepare the input data, you need to define these variables in your dataset:
  - **Dependent variable:** Include one column as dependent variable (Mandatory).
  - **Explanatory variables:** One column for each explanatory variable (Mandatory).
  - CSV file format is good (and recommended) for the input dataset, but you can also use other data formats such as TXT.

Preparing the Input Data (Cont.)

Sample data ("testmodels.csv")

	A	B	C	D	E	F	G	H	I
1	HHLD_ID	DRVRCNT	HHSIZE	HHVEHCN	NUMADLT	WRKCOUN	LIF_CYC	VEHCNT	OWN
2	1	1	1	1	1	1	1	1	1
3	2	2	2	2	2	1	2	2	1
4	3	3	5	7	3	3	6	4	1
5	4	1	1	1	1	0	9	1	1
6	5	2	2	2	2	1	10	2	1
7	6	2	3	2	2	2	6	2	1
8	7	1	2	1	1	1	5	1	1
9	8	3	4	4	3	1	6	4	1
10	9	2	4	2	2	1	6	2	1
11	10	2	2	2	2	2	2	2	1
12	11	2	2	3	2	2	2	3	1
13	12	1	1	1	1	1	1	1	1
14	13	1	1	1	1	0	9	1	0
15	14	2	4	2	2	1	6	2	1
16	15	2	2	4	2	1	2	4	1

- The values in the data file should be numerical, but the header (1st row) can be string.

- The input data do not include null (or missing) values.

Running the Model Using the R Script

- **Step 1:** Open the R-code "trans_planning_models.r".

- **Step 2:** Select lines for loading libraries and input data, and run ("Ctrl+R").

- **Step 3:** Select lines as required for estimating the model and run ("Ctrl+R").

Example – Results from "testmodels.csv" for Linear Regression Model

```
> summary(tmp1)

Call:
lm(formula = equation, data = data1)

Residuals:
     Min       1Q   Median       3Q      Max
-20.9593  -2.3414   0.2098   2.4463  17.0341

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  12.6548     0.2512  50.380  < 2e-16 ***
DRVRCNT       2.7994     0.1230  22.766  < 2e-16 ***
RUR           1.2896     0.2309   5.584 2.67e-08 ***
INCOME1      -1.9727     0.2464  -8.006 1.99e-15 ***
INCOME5       1.5781     0.2220   7.108 1.64e-12 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.824 on 1995 degrees of freedom
Multiple R-squared:  0.3273,  Adjusted R-squared:  0.326
F-statistic: 242.7 on 4 and 1995 DF,  p-value: < 2.2e-16
```

Links

- **MASS:** https://stat.ethz.ch/R-manual/R-devel/library/MASS/html/glm.nb.html

- **ordinal:** https://cran.r-project.org/web/packages/ordinal/ordinal.pdf

- **pscl:** http://www.inside-r.org/packages/cran/pscl/docs/print.zeroinfl

- **Zelig:** http://r.iq.harvard.edu/docs/zelig.pdf

- **AER:** https://cran.r-project.org/web/packages/AER/index.html