

Statistical and Econometric Methods for Transportation Data Analysis

TTE 6307: Term Project

A survey of 322 commuters was in the Seattle metropolitan area. The survey's intent was to gather information on commuters' opinions of high-occupancy vehicle (HOV) lanes (lanes that are restricted for use by vehicles with 2 or more occupants). The variables available from this survey are given on the attached table. Your task is to estimate a model using one of these 5 variables:

1. Usual mode of travel: 0 if drive alone, 1 if two person carpool, 2 if three or more person, 3 if vanpool, 4 if bus, 5 if bicycle or walk, 6 if motorcycle, 7 if other.
2. Have used HOV lanes: 1 if yes, 0 if no
3. Changed departure times to work in the last year: 1 if yes, 0 if no
4. On your past five commutes to work, how often have you used HOV lanes
5. HOV lanes save all commuters time: 0 if strongly disagree, 1 if disagree, 2 if neutral, 3 if agree, 4 if agree strongly

It is important for your term paper to be well structured. Each paper should include:

- **Introduction:** including the significance of the problem and who is likely to be interested in the solution.
- **Data Description:** discuss the source of the data and provide general information on the sample (number of observations, means, etc.). There are missing observations so be careful.
- **Methodology:** describe the methodology you use (including equations estimation approach etc.) and explain why this is the most appropriate methodology.
- **Estimation Results:** describe the estimation results in detail and make sure the variables are well defined. As with all assignments in the class, include a table of the means, standard deviation and minimum/maximum of all variables, followed by a table of the model estimation results.
- **Implications of Findings:** discuss the major findings, providing supporting information (marginal effects, elasticities, etc.) if appropriate.

- **Summary and Conclusions:** briefly summarize your findings and draw appropriate conclusion.
- **Appendix:** Include software-generated results including model estimation and variable creation.

The paper should be 10 to 15 pages typed (including figures and tables). Try to be succinct and to the point but be careful not to leave out important information. Present only final model(s) (no intermediate estimations). Make sure tables are complete with detailed variable definitions, “cut and paste” software-generated results are only for the appendix.

Table 1. Variables available for your specification are (in file Ex14-1.xlsx):

Variable Number	Explanation
1	Usual mode of travel: 0 if drive alone, 1 if two person carpool, 2 if three or more person carpool, 3 if vanpool, 4 if bus, 5 if bicycle or walk, 6 if motorcycle, 7 if other
2	Have used HOV lanes: 1 if yes, 0 if no
3	If used HOV lanes, what mode is most often used: 0 in a bus, 1 in two person carpool, 2 in three or more person carpool, 3 in vanpool, 4 alone in vehicle, 5 on motorcycle
4	Sometimes eligible for HOV lane use but do not use: 1 if yes, 0 if no
5	Reason for not using HOV lanes when eligible: 0 if slower than regular lanes, 1 if too much trouble to change lanes, 2 if HOV lanes are not safe, 3 if traffic moves fast enough, 4 if forget to use HOV lanes, 5 if other
6	Usual mode of travel one year ago: 0 if drive alone, 1 if two person carpool, 2 if three or more person carpool, 3 if vanpool, 4 if bus, 5 if bicycle or walk, 6 if motorcycle, 7 if other
7	Commuted to work in Seattle a year ago: 1 if yes, 0 if no
8	Have flexible work start times: 1 if yes, 0 if no
9	Changed departure times to work in the last year: 1 if yes, 0 if no
10	On average, number of minutes leaving earlier for work relative to last year
11	On average, number of minutes leaving later for work relative to last year

Variable Number	Explanation
12	If changed departure times to work in the last year, reason why: 0 if change in travel mode, 1 if increasing traffic congestion, 2 if change in work start time, 3 if presence of HOV lanes, 4 if change in residence, 5 if change in lifestyle, 6 if other
13	Changed route to work in the last year: 1 if yes, 0 if no
14	If changed route to work in the last year, reason why: 0 if change in travel mode, 1 if increasing traffic congestion, 2 if change in work start time, 3 if presence of HOV lanes, 4 if change in residence, 5 if change in lifestyle, 6 if other
15	Usually commute to or from work on Interstate 90: 1 if yes, 0 if no
16	Usually commuted to or from work on Interstate 90 last year: 1 if yes, 0 if no
17	On your past five commutes to work, how often have you used HOV lanes
18	On your past five commutes to work, how often did you drive alone
19	On your past five commutes to work, how often did you carpool with one other person
20	On your past five commutes to work, how often did you carpool with two or more people
21	On your past five commutes to work, how often did you take a vanpool
22	On your past five commutes to work, how often did you take a bus
23	On your past five commutes to work, how often did you bicycle or walk
24	On your past five commutes to work, how often did you take a motorcycle
25	On your past five commutes to work, how often did you take a mode other than those listed in variables 18 through 24
26	On your past five commutes to work, how often have you changed route or departure time
27	HOV lanes save all commuters time: 0 if strongly disagree, 1 if disagree, 2 if neutral, 3 if agree, 4 if agree strongly
28	Existing HOV lanes are being adequately used: 0 if strongly disagree, 1 if disagree, 2 if neutral, 3 if agree, 4 if agree strongly

Variable Number	Explanation
29	HOV lanes should be open to all traffic: 0 if strongly disagree, 1 if disagree, 2 if neutral, 3 if agree, 4 if agree strongly
30	Converting some regular lanes to HOV lanes is a good idea: 0 if strongly disagree, 1 if disagree, 2 if neutral, 3 if agree, 4 if agree strongly
31	Converting some regular lanes to HOV lanes is a good idea only if it is done before traffic congestion becomes serious: 0 if strongly disagree, 1 if disagree, 2 if neutral, 3 if agree, 4 if agree strongly
32	Gender: 1 if male, 0 if female
33	Age in years: 0 if under 21, 1 if 22 to 30, 2 if 31 to 40, 3 if 41 to 50, 4 if 51 to 64, 5 if 65 or greater
34	Annual household income (US dollars per year): 0 if no income, 1 if 1 to 9,999, 2 if 10,000 to 19,999, 3 if 20,000 to 29,999, 4 if 30,000 to 39,999, 5 if 40,000 to 49,999, 6 if 50,000 to 74,999, 7 if 75,000 to 100,000, 8 if over 100,000
35	Highest level of education: 0 if did not finish high school, 1 if high school, 2 if community college or trade school, 3 if college/university, 4 if post college graduate degree
36	Number of household members
37	Number of adults in household (aged 16 or more)
38	Number of household members working outside the home
39	Number of licensed motor vehicles in the household
40	Postal zip code of work place
41	Postal zip code of home
42	Type of survey comment left by respondent regarding opinions on HOV lanes: 0 if no comment on HOV lanes, 1 if comment not in favor of HOV lanes, 2 comment positive toward HOV lanes but critical of HOV lane policies, 3 comment positive toward HOV lanes, 4 neutral HOV lane comment

NOLOGIT INPUT COMMANDS

```
read;nvar=42;nobs=322;file=C:\Users\Ex14-1.xlsx$
skip$
freq;rhs=x1$
freq;rhs=x2$
freq;rhs=x17$
freq;rhs=x27$
freq;rhs=x9$
```

NOLOGIT OUTPUT

```
|-> read;nvar=42;nobs=322;file=C:\Users\Ex14-1.txt$
Reading data file as space delimited format.
|-> skip$
|-> histogram;rhs=x1$
```

```
|-> freq;rhs=x1$
```

```
-----
Deleted          1 observations with missing data. N is now          321
-----
```

```
-----
Frequency Table for          X1
Sample size                   321
-----
```

Value	Sample Frequency	Sample Proportion
X1= 0	247	.7695
X1= 1	43	.1340
X1= 2	6	.0187
X1= 3	3	.0093
X1= 4	16	.0498
X1= 6	0	.0000

```
|-> freq;rhs=x2$
```

```
-----
Deleted          3 observations with missing data. N is now          319
-----
```

```
-----
Frequency Table for          X2
Sample size                   319
-----
```

Value	Sample Frequency	Sample Proportion
X2= 0	94	.2947
X2= 1	223	.6991

```
|-> freq;rhs=x9$
```

```
-----
Deleted      32 observations with missing data. N is now      290
-----
```

```
-----
Frequency Table for      X9
Sample size              290
-----
```

Value	Sample Frequency	Sample Proportion
X9= 0	187	.6448
X9= 1	101	.3483

```
|-> freq;rhs=x17$
```

```
-----
Deleted      31 observations with missing data. N is now      291
-----
```

```
-----
Frequency Table for      X17
Sample size              291
-----
```

Value	Sample Frequency	Sample Proportion
X17= 0	219	.7526
X17= 1	7	.0241
X17= 2	6	.0206
X17= 3	7	.0241
X17= 4	9	.0309
X17= 5	37	.1271

```
|-> freq;rhs=x27$
```

```
-----
Deleted      6 observations with missing data. N is now      316
-----
```

```
-----
Frequency Table for      X27
Sample size              316
-----
```

Value	Sample Frequency	Sample Proportion
X27= 0	79	.2500
X27= 1	70	.2215
X27= 2	34	.1076
X27= 3	92	.2911
X27= 4	36	.1139