MNL8b.1 – Combinação de Variáveis TC e Estac

- ASC

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,PO,OV,V2$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 11, 2012 at 02:40:44AM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            18773     |
| Iterations completed                  8     |
| Log likelihood function       -17792.09     |
| Number of parameters                 20     |
| Info. Criterion: AIC =          1.89763     |
|   Finite Sample: AIC =          1.89763     |
| Info. Criterion: BIC =          1.90598     |
| Info. Criterion:HQIC =          1.90037     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -23869.4645  .25461  .25445 |
| Chi-squared[15]          =  12154.74640     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
+--------+--------------+----------------+--------+--------+
|Variable| Coefficient  | Standard Error |b/St.Er.|P[|Z|>z]|
+--------+--------------+----------------+--------+--------+
 A_BP    |   -2.02232246       .20975907    -9.641   .0000
```

| | | | | |
|---|---|---|---|---|
| BP_PO1 | .38727899 | .19217509 | 2.015 | .0439 |
| BP_OV1 | -6.48889903 | 1.45326526 | -4.465 | .0000 |
| BP_V21 | .01890071 | .00719245 | 2.628 | .0086 |
| A_B | .47817062 | .09199713 | 5.198 | .0000 |
| B_PO2 | .68233802 | .08636922 | 7.900 | .0000 |
| B_OV2 | -6.80026653 | .62549793 | -10.872 | .0000 |
| B_V22 | -.02142823 | .00382744 | -5.599 | .0000 |
| A_BO | -3.64965787 | .50501824 | -7.227 | .0000 |
| BO_PO3 | -1.47889417 | .56492329 | -2.618 | .0088 |
| BO_OV3 | -1.29599463 | 3.06863832 | -.422 | .6728 |
| BO_V23 | .00733412 | .02111605 | .347 | .7283 |
| A_M | -2.94860097 | .40283272 | -7.320 | .0000 |
| M_PO4 | .20864101 | .38867344 | .537 | .5914 |
| M_OV4 | -3.75712767 | 2.73241722 | -1.375 | .1691 |
| M_V24 | -.06263268 | .02156125 | -2.905 | .0037 |
| A_P | 3.64478107 | .12996637 | 28.044 | .0000 |
| P_PO5 | 1.41149003 | .12296410 | 11.479 | .0000 |
| P_OV5 | 5.88367161 | .83399499 | 7.055 | .0000 |
| P_V25 | -1.00311982 | .01657154 | -60.533 | .0000 |

MNL8b.2 – Combinação de Variáveis TC e Estac

- ASC

- TBA – Variável continua com a razão dos tempos médios de viagem em BUS e AUTO entre zona de Geração e Atracção

- Fm – Variável continua inicial sobre a frequência média horária de TC na hora de ponta da manhã (7h30-9h30)

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,FM,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 11, 2012 at 05:08:03PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            17005     |
| Iterations completed                  8     |
| Log likelihood function       -15820.86     |
| Number of parameters                 30     |
| Info. Criterion: AIC =          1.86426     |
|   Finite Sample: AIC =          1.86426     |
| Info. Criterion: BIC =          1.87792     |
| Info. Criterion:HQIC =          1.86876     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -21639.6904  .26890  .26864 |
| Chi-squared[25]          =  11637.67005     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
```

```
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
+--------+--------------+----------------+--------+--------+
|Variable| Coefficient  | Standard Error |b/St.Er.|P[|Z|>z]|
+--------+--------------+----------------+--------+--------+
 A_BP     |   -1.21946847       .30956064    -3.939   .0001
 BP_FM1   |    -.02242199       .00530495    -4.227   .0000
 BP_PO1   |     .23887959       .21281063     1.122   .2617
 BP_OV1   |   -7.05120603      1.59829293    -4.412   .0000
 BP_V21   |     .03815256       .00975298     3.912   .0001
 BP_TBA1  |    -.44270160       .15148074    -2.922   .0035
 A_B      |     .70419775       .13744706     5.123   .0000
 B_FM2    |     .00257061       .00221748     1.159   .2464
 B_PO2    |     .60915054       .09644621     6.316   .0000
 B_OV2    |   -5.26953549       .68546349    -7.688   .0000
 B_V22    |    -.02671164       .00515219    -5.185   .0000
 B_TBA2   |    -.23494775       .06347235    -3.702   .0002
 A_BO     |   -4.13093873       .74270786    -5.562   .0000
 BO_FM3   |    -.04372687       .01575458    -2.776   .0055
 BO_PO3   |    -.92105070       .59550770    -1.547   .1219
 BO_OV3   |   -3.58202811      3.42817877    -1.045   .2961
 BO_V23   |     .03796919       .02503709     1.517   .1294
 BO_TBA3  |     .43667701       .30592189     1.427   .1535
 A_M      |   -2.30097969       .59671155    -3.856   .0001
 M_FM4    |    -.02071616       .01128831    -1.835   .0665
 M_PO4    |    -.13319307       .44878445     -.297   .7666
 M_OV4    |   -4.76932866      3.05978349    -1.559   .1191
 M_V24    |    -.05164251       .02536573    -2.036   .0418
 M_TBA4   |    -.27116885       .28409391     -.955   .3398
 A_P      |    5.43705499       .18018688    30.175   .0000
 P_FM5    |    -.01489569       .00309128    -4.819   .0000
 P_PO5    |    1.55897627       .13367981    11.662   .0000
 P_OV5    |    9.24189242       .89011346    10.383   .0000
 P_V25    |   -1.04165357       .01797518   -57.950   .0000
 P_TBA5   |   -1.26950196       .07747251   -16.386   .0000
```

MNL8b.3 – Combinação de Variáveis TC e Estac

- ASC

- TBA – Variável continua com a razão dos tempos médios de viagem em BUS e AUTO entre zona de Geração e Atracção

- Ftl – Variável continua inicial sobre a frequência média horária de TC durante todo o horário laboral (7h30-19h30)

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,Ftl,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 11, 2012 at 05:12:28PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            17005     |
| Iterations completed                  8     |
| Log likelihood function       -15821.84     |
| Number of parameters                 30     |
| Info. Criterion: AIC =          1.86437     |
|   Finite Sample: AIC =          1.86438     |
| Info. Criterion: BIC =          1.87803     |
| Info. Criterion:HQIC =          1.86888     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -21639.6904  .26885  .26859 |
| Chi-squared[25]          =  11635.69880     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
```

```
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
+--------+--------------+----------------+--------+--------+
|Variable| Coefficient  | Standard Error |b/St.Er.|P[|Z|>z]|
+--------+--------------+----------------+--------+--------+
 A_BP     |   -1.20829693       .31118362    -3.883   .0001
 BP_FTL1  |    -.01749046       .00435422    -4.017   .0001
 BP_PO1   |     .21459157       .21269633     1.009   .3130
 BP_OV1   |   -7.04074728      1.59923358    -4.403   .0000
 BP_V21   |     .03691438       .00983013     3.755   .0002
 BP_TBA1  |    -.43939301       .15138491    -2.902   .0037
 A_B      |     .78697650       .13817646     5.695   .0000
 B_FTL2   |    -.00214272       .00183739    -1.166   .2435
 B_PO2    |     .62128631       .09643340     6.443   .0000
 B_OV2    |   -5.33281563       .68492340    -7.786   .0000
 B_V22    |    -.02594594       .00512690    -5.061   .0000
 B_TBA2   |    -.26136443       .06367809    -4.104   .0000
 A_BO     |   -4.02778230       .74074905    -5.437   .0000
 BO_FTL3  |    -.03983555       .01289555    -3.089   .0020
 BO_PO3   |    -.92468126       .59539619    -1.553   .1204
 BO_OV3   |   -3.40711664      3.42191651     -.996   .3194
 BO_V23   |     .03640361       .02498368     1.457   .1451
 BO_TBA3  |     .39410746       .30389592     1.297   .1947
 A_M      |   -2.24811070       .59651809    -3.769   .0002
 M_FTL4   |    -.01917911       .00916776    -2.092   .0364
 M_PO4    |    -.12956371       .44906212     -.289   .7729
 M_OV4    |   -4.70013501      3.05833012    -1.537   .1243
 M_V24    |    -.05285381       .02528955    -2.090   .0366
 M_TBA4   |    -.28731675       .28318313    -1.015   .3103
 A_P      |    5.48061284       .18048609    30.366   .0000
 P_FTL5   |    -.01483604       .00247365    -5.998   .0000
 P_PO5    |    1.57874011       .13403200    11.779   .0000
 P_OV5    |    9.28981445       .89136583    10.422   .0000
 P_V25    |   -1.04176867       .01798511   -57.924   .0000
 P_TBA5   |   -1.28515710       .07764774   -16.551   .0000
```

MNL8b.4 – Combinação de Variáveis TC e Estac

- ASC

Variáveis binárias de combinações entre a razão entre número de lugares pagos sobre o número total de estacionamentos e da razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (excepto P41)
- P13: Variável binária OV1=1 & PO3=1
- P33: Variável binária OV3=1 & PO3=1
- P12: Variável binária OV1=1 & PO2=1
- P22: Variável binária OV2=1 & PO2=1
- P32: Variável binária OV3=1 & PO2=1
- P21: Variável binária OV2=1 & PO2=1
- P31: Variável binária OV3=1 & PO1=1
- *P41: Variável binária OV4=1 & PO1=1 (excluída)*

- V2: Velocidade comercial equivalente por Bus em km/h (d2/T2*60)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,P13,P33,P12,P22,P32,P21,P31,V2$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 05:38:09PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            18773     |
| Iterations completed                 31     |
| Log likelihood function       -17623.10     |
| Number of parameters                 45     |
| Info. Criterion: AIC =          1.88229     |
|   Finite Sample: AIC =          1.88230     |
| Info. Criterion: BIC =          1.90108     |
| Info. Criterion:HQIC =          1.88846     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -23869.4645  .26169  .26133 |
| Chi-squared[40]          =  12492.73393     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
```

```
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -3.39553038 | .13436917 | -25.270 | .0000 |
| BP_P131 | 1.17827272 | .13248311 | 8.894 | .0000 |
| BP_P331 | 1.52336540 | .31307344 | 4.866 | .0000 |
| BP_P121 | 1.20017778 | .15708814 | 7.640 | .0000 |
| BP_P221 | 1.00805389 | .13494795 | 7.470 | .0000 |
| BP_P321 | .81275305 | .31116601 | 2.612 | .0090 |
| BP_P211 | -.78409552 | .59340390 | -1.321 | .1864 |
| BP_P311 | .98646080 | .19022313 | 5.186 | .0000 |
| BP_V21 | .02616384 | .00708536 | 3.693 | .0002 |
| A_B | -.70545907 | .05913955 | -11.929 | .0000 |
| B_P132 | 1.36876015 | .05374486 | 25.468 | .0000 |
| B_P332 | .32057196 | .20283316 | 1.580 | .1140 |
| B_P122 | 1.05608804 | .06731907 | 15.688 | .0000 |
| B_P222 | .86943896 | .05577685 | 15.588 | .0000 |
| B_P322 | .38966304 | .14044261 | 2.775 | .0055 |
| B_P212 | .55465351 | .12984921 | 4.272 | .0000 |
| B_P312 | .45930510 | .08631301 | 5.321 | .0000 |
| B_V22 | -.01831961 | .00394849 | -4.640 | .0000 |
| A_BO | -3.86767297 | .29447914 | -13.134 | .0000 |
| BO_P133 | -1.04564757 | .32676128 | -3.200 | .0014 |
| BO_P333 | -30.1749873 | .280906D+07 | .000 | 1.0000 |
| BO_P123 | .23424318 | .28432987 | .824 | .4100 |
| BO_P223 | -1.03372337 | .31948410 | -3.236 | .0012 |
| BO_P323 | .21751625 | .53695421 | .405 | .6854 |
| BO_P213 | -30.9491352 | .278198D+07 | .000 | 1.0000 |
| BO_P313 | -.36274715 | .42235762 | -.859 | .3904 |
| BO_V23 | .00989201 | .02362531 | .419 | .6754 |
| A_M | -3.62574072 | .29729091 | -12.196 | .0000 |
| M_P134 | .63833254 | .25163754 | 2.537 | .0112 |
| M_P334 | -29.4312529 | .239822D+07 | .000 | 1.0000 |
| M_P124 | .32266883 | .32319451 | .998 | .3181 |
| M_P224 | .55336449 | .25384846 | 2.180 | .0293 |
| M_P324 | .85406431 | .46734855 | 1.827 | .0676 |
| M_P214 | 1.27633909 | .39679380 | 3.217 | .0013 |
| M_P314 | -.48931442 | .49759004 | -.983 | .3254 |
| M_V24 | -.06292920 | .02261863 | -2.782 | .0054 |
| A_P | 5.19216383 | .11533849 | 45.017 | .0000 |
| P_P135 | .07899029 | .09273167 | .852 | .3943 |
| P_P335 | 1.40802024 | .21575398 | 6.526 | .0000 |
| P_P125 | -.59390532 | .10063242 | -5.902 | .0000 |
| P_P225 | -.84453496 | .09263324 | -9.117 | .0000 |
| P_P325 | -.32358658 | .16012923 | -2.021 | .0433 |
| P_P215 | -.95203359 | .24188604 | -3.936 | .0001 |
| P_P315 | -.76565444 | .11923244 | -6.422 | .0000 |
| P_V25 | -1.00932997 | .01701256 | -59.329 | .0000 |

MNL8b.5 – Combinação de Variáveis TC e Estac

- ASC

- PO: Variável continua razão entre o número de estacionamentos pagos na zona de atracção e o número total de estacionamentos existentes na zona de atracção em 2000 (TOP/TOfertaTotal)

- OV: Variável continua razão entre a oferta total de estacionamentos na zona de atracção e o número total de viagens extrapoladas feitas para a zona de atracção em 2000 (TOfertaTotal/ViagTotaisExtrapA)

- TBA: Variável continua Razão tempos médios de viagem em Bus/AUTO entre as zonas de Geração e Atracção

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,PO,OV,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 05:41:40PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            18773     |
| Iterations completed                  6     |
| Log likelihood function       -23402.93     |
| Number of parameters                 20     |
| Info. Criterion: AIC =          2.49538     |
|   Finite Sample: AIC =          2.49539     |
| Info. Criterion: BIC =          2.50374     |
| Info. Criterion:HQIC =          2.49813     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -23869.4645  .01955  .01934 |
| Chi-squared[15]          =    933.06669     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
```

| nJ = sum over i, choice set sizes |

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -1.41855343 | .26385834 | -5.376 | .0000 |
| BP_PO1 | .41954748 | .19178761 | 2.188 | .0287 |
| BP_OV1 | -5.27459369 | 1.43594962 | -3.673 | .0002 |
| BP_TBA1 | -.39256954 | .12881387 | -3.048 | .0023 |
| A_B | .69087592 | .11522045 | 5.996 | .0000 |
| B_PO2 | .59564275 | .08630333 | 6.902 | .0000 |
| B_OV2 | -7.01735168 | .62474746 | -11.232 | .0000 |
| B_TBA2 | -.24464671 | .05431432 | -4.504 | .0000 |
| A_BO | -3.86228404 | .62342838 | -6.195 | .0000 |
| BO_PO3 | -1.45542613 | .58057579 | -2.507 | .0122 |
| BO_OV3 | -1.41650505 | 3.06369796 | -.462 | .6438 |
| BO_TBA3 | .18870111 | .26379345 | .715 | .4744 |
| A_M | -3.49921711 | .50584905 | -6.918 | .0000 |
| M_PO4 | .08097936 | .38984544 | .208 | .8354 |
| M_OV4 | -5.88830014 | 2.79739673 | -2.105 | .0353 |
| M_TBA4 | .18945946 | .23337425 | .812 | .4169 |
| A_P | .55612332 | .11902379 | 4.672 | .0000 |
| P_PO5 | .07381583 | .09153608 | .806 | .4200 |
| P_OV5 | -5.16733761 | .62643975 | -8.249 | .0000 |
| P_TBA5 | -.23462801 | .05545205 | -4.231 | .0000 |

MNL8b.6 – Combinação de Variáveis TC e Estac

- ASC

Variáveis binárias de combinações entre a razão entre número de lugares pagos sobre o número total de estacionamentos e da razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (excepto P41)
- P13: Variável binária OV1=1 & PO3=1
- P33: Variável binária OV3=1 & PO3=1
- P12: Variável binária OV1=1 & PO2=1
- P22: Variável binária OV2=1 & PO2=1
- P32: Variável binária OV3=1 & PO2=1
- P21: Variável binária OV2=1 & PO2=1
- P31: Variável binária OV3=1 & PO1=1
- *P41: Variável binária OV4=1 & PO1=1 (excluída)*

- TBA: Variável continua Razão tempos médios de viagem em Bus/AUTO entre as zonas de Geração e Atracção

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,P13,P33,P12,P22,P32,P21,P31,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 05:45:37PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            18773     |
| Iterations completed                 31     |
| Log likelihood function       -22889.16     |
| Number of parameters                 45     |
| Info. Criterion: AIC =          2.44331     |
|   Finite Sample: AIC =          2.44332     |
| Info. Criterion: BIC =          2.46211     |
| Info. Criterion:HQIC =          2.44948     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -23869.4645  .04107  .04061 |
| Chi-squared[40]          =   1960.61506     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
```

```
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -2.20954906 | .23771149 | -9.295 | .0000 |
| BP_P131 | .95428255 | .14166941 | 6.736 | .0000 |
| BP_P331 | 1.38269711 | .31494774 | 4.390 | .0000 |
| BP_P121 | .96953461 | .15848717 | 6.117 | .0000 |
| BP_P221 | .81158246 | .13928510 | 5.827 | .0000 |
| BP_P321 | .72776594 | .31047702 | 2.344 | .0191 |
| BP_P211 | -.93993628 | .59376430 | -1.583 | .1134 |
| BP_P311 | .99046868 | .18941388 | 5.229 | .0000 |
| BP_TBA1 | -.55950554 | .13239485 | -4.226 | .0000 |
| A_B | -.32431188 | .10296565 | -3.150 | .0016 |
| B_P132 | 1.23748285 | .05836785 | 21.201 | .0000 |
| B_P332 | .26713082 | .20320120 | 1.315 | .1886 |
| B_P122 | 1.03098594 | .06746986 | 15.281 | .0000 |
| B_P222 | .81497461 | .05722135 | 14.242 | .0000 |
| B_P322 | .48654278 | .14015996 | 3.471 | .0005 |
| B_P212 | .53560954 | .13011567 | 4.116 | .0000 |
| B_P312 | .61585048 | .08582083 | 7.176 | .0000 |
| B_TBA2 | -.35232532 | .05786192 | -6.089 | .0000 |
| A_BO | -4.19337482 | .50164538 | -8.359 | .0000 |
| BO_P133 | -.94010009 | .34849546 | -2.698 | .0070 |
| BO_P333 | -30.1493472 | .282011D+07 | .000 | 1.0000 |
| BO_P123 | .26838826 | .28283626 | .949 | .3427 |
| BO_P223 | -.98128722 | .32630484 | -3.007 | .0026 |
| BO_P323 | .11740409 | .53666379 | .219 | .8268 |
| BO_P213 | -30.8687709 | .269562D+07 | .000 | 1.0000 |
| BO_P313 | -.47457746 | .41767927 | -1.136 | .2559 |
| BO_TBA3 | .25987098 | .28634733 | .908 | .3641 |
| A_M | -4.64224920 | .44350864 | -10.467 | .0000 |
| M_P134 | .78370203 | .26983029 | 2.904 | .0037 |
| M_P334 | -29.2516738 | .231787D+07 | .000 | 1.0000 |
| M_P124 | .60680576 | .31914290 | 1.901 | .0573 |
| M_P224 | .78302399 | .25350417 | 3.089 | .0020 |
| M_P324 | 1.04507652 | .46483532 | 2.248 | .0246 |
| M_P214 | 1.44822700 | .39533658 | 3.663 | .0002 |
| M_P314 | -.28975673 | .49418948 | -.586 | .5577 |
| M_TBA4 | .22276575 | .23924117 | .931 | .3518 |
| A_P | -.30537149 | .10250768 | -2.979 | .0029 |
| P_P135 | .70336374 | .06318941 | 11.131 | .0000 |
| P_P335 | 2.43891484 | .14061236 | 17.345 | .0000 |
| P_P125 | 1.09699059 | .06959930 | 15.762 | .0000 |
| P_P225 | .63209979 | .06096895 | 10.368 | .0000 |
| P_P325 | 2.10601912 | .10803528 | 19.494 | .0000 |
| P_P215 | -.52202140 | .19274182 | -2.708 | .0068 |
| P_P315 | 1.04464265 | .08309711 | 12.571 | .0000 |
| P_TBA5 | -.46420567 | .05711396 | -8.128 | .0000 |

MNL8b.7 – Combinação de Variáveis TC e Estac

- ASC

Variáveis binárias de combinações entre a razão entre número de lugares pagos sobre o número total de estacionamentos e da razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (excepto P41)
- P13: Variável binária OV1=1 & PO3=1
- P33: Variável binária OV3=1 & PO3=1
- P12: Variável binária OV1=1 & PO2=1
- P22: Variável binária OV2=1 & PO2=1
- P32: Variável binária OV3=1 & PO2=1
- P21: Variável binária OV2=1 & PO2=1
- P31: Variável binária OV3=1 & PO1=1
- *P41: Variável binária OV4=1 & PO1=1 (excluída)*

- TBA: Variável continua Razão tempos médios de viagem em Bus/AUTO entre as zonas de Geração e Atracção

- V2: Velocidade comercial equivalente por Bus em km/h (d2/T2*60)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,P13,P33,P12,P22,P32,P21,P31,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 05:50:17PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            18773     |
| Iterations completed                 31     |
| Log likelihood function       -17442.24     |
| Number of parameters                 50     |
| Info. Criterion: AIC =          1.86355     |
|   Finite Sample: AIC =          1.86357     |
| Info. Criterion: BIC =          1.88443     |
| Info. Criterion:HQIC =          1.87041     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -23869.4645  .26927  .26888 |
| Chi-squared[45]          =  12854.44275     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
```

```
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -2.57377222 | .27940526 | -9.212 | .0000 |
| BP_P131 | .98166501 | .14467559 | 6.785 | .0000 |
| BP_P331 | 1.27637737 | .32367010 | 3.943 | .0001 |
| BP_P121 | 1.07396771 | .16149028 | 6.650 | .0000 |
| BP_P221 | .85384078 | .14286438 | 5.977 | .0000 |
| BP_P321 | .78917485 | .31176666 | 2.531 | .0114 |
| BP_P211 | -.88849428 | .59438713 | -1.495 | .1350 |
| BP_P311 | 1.04190564 | .19090201 | 5.458 | .0000 |
| BP_V21 | .02073579 | .00725302 | 2.859 | .0043 |
| BP_TBA1 | -.46503385 | .14051593 | -3.309 | .0009 |
| A_B | .06526361 | .12257505 | .532 | .5944 |
| B_P132 | 1.18193354 | .05959719 | 19.832 | .0000 |
| B_P332 | .10250578 | .20520879 | .500 | .6174 |
| B_P122 | .93412188 | .06945195 | 13.450 | .0000 |
| B_P222 | .72422880 | .05931623 | 12.210 | .0000 |
| B_P322 | .36826145 | .14092361 | 2.613 | .0090 |
| B_P212 | .45699493 | .13082509 | 3.493 | .0005 |
| B_P312 | .51040276 | .08696350 | 5.869 | .0000 |
| B_V22 | -.02324046 | .00400940 | -5.796 | .0000 |
| B_TBA2 | -.43589178 | .06097736 | -7.148 | .0000 |
| A_BO | -4.29248870 | .63763505 | -6.732 | .0000 |
| BO_P133 | -.94253293 | .35403226 | -2.662 | .0078 |
| BO_P333 | -30.0419195 | .278846D+07 | .000 | 1.0000 |
| BO_P123 | .29764814 | .29574219 | 1.006 | .3142 |
| BO_P223 | -.95652741 | .33510583 | -2.854 | .0043 |
| BO_P323 | .20977691 | .53949941 | .389 | .6974 |
| BO_P213 | -30.8887824 | .276662D+07 | .000 | 1.0000 |
| BO_P313 | -.40483358 | .42629024 | -.950 | .3423 |
| BO_V23 | .01256367 | .02391288 | .525 | .5993 |
| BO_TBA3 | .23719120 | .30996432 | .765 | .4441 |
| A_M | -3.81707254 | .54715239 | -6.976 | .0000 |
| M_P134 | .68741598 | .27601985 | 2.490 | .0128 |
| M_P334 | -29.3522794 | .233351D+07 | .000 | 1.0000 |
| M_P124 | .36024231 | .33196424 | 1.085 | .2778 |
| M_P224 | .58789149 | .26764774 | 2.197 | .0281 |
| M_P324 | .82585928 | .47018718 | 1.756 | .0790 |
| M_P214 | 1.29391871 | .40031368 | 3.232 | .0012 |
| M_P314 | -.50674391 | .49923136 | -1.015 | .3101 |
| M_V24 | -.06123466 | .02286157 | -2.678 | .0074 |
| M_TBA4 | .10398060 | .25052899 | .415 | .6781 |
| A_P | 7.78430291 | .19045515 | 40.872 | .0000 |
| P_P135 | -.48398695 | .10175993 | -4.756 | .0000 |
| P_P335 | 1.07007000 | .21712506 | 4.928 | .0000 |
| P_P125 | -.98725261 | .10802432 | -9.139 | .0000 |

| | | | | |
|---|---|---|---|---|
| P_P225 | -1.20207309 | .09887679 | -12.157 | .0000 |
| P_P325 | -.17211595 | .15926793 | -1.081 | .2798 |
| P_P215 | -1.09539830 | .23795214 | -4.603 | .0000 |
| P_P315 | -.45189139 | .12265793 | -3.684 | .0002 |
| P_V25 | -1.05733376 | .01782932 | -59.303 | .0000 |
| P_TBA5 | -1.48349997 | .07986567 | -18.575 | .0000 |

MNL8b.8 – Combinação de Variáveis TC e Estac

- ASC

- PO: Variável continua razão entre o número de estacionamentos pagos na zona de atracção e o número total de estacionamentos existentes na zona de atracção em 2000 (TOP/TOfertaTotal)

- OV: Variável continua razão entre a oferta total de estacionamentos na zona de atracção e o número total de viagens extrapoladas feitas para a zona de atracção em 2000 (TOfertaTotal/ViagTotaisExtrapA)

- TBA: Variável continua Razão tempos médios de viagem em Bus/AUTO entre as zonas de Geração e Atracção

- V2: Velocidade comercial equivalente por Bus em km/h (d2/T2*60)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 05:56:25PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            18773     |
| Iterations completed                  8     |
| Log likelihood function       -17625.22     |
| Number of parameters                 25     |
| Info. Criterion: AIC =          1.88038     |
|   Finite Sample: AIC =          1.88039     |
| Info. Criterion: BIC =          1.89082     |
| Info. Criterion:HQIC =          1.88381     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -23869.4645  .26160  .26140 |
| Chi-squared[20]          =  12488.49658     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
```

```
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -1.43726480 | .29006403 | -4.955 | .0000 |
| BP_PO1 | .26475830 | .19554447 | 1.354 | .1758 |
| BP_OV1 | -5.81582766 | 1.48842882 | -3.907 | .0001 |
| BP_V21 | .01410619 | .00735774 | 1.917 | .0552 |
| BP_TBA1 | -.39072950 | .14185243 | -2.754 | .0059 |
| A_B | 1.00573740 | .12602531 | 7.980 | .0000 |
| B_PO2 | .56718285 | .08789320 | 6.453 | .0000 |
| B_OV2 | -6.23472817 | .64327417 | -9.692 | .0000 |
| B_V22 | -.02559308 | .00389096 | -6.578 | .0000 |
| B_TBA2 | -.34869786 | .05957241 | -5.853 | .0000 |
| A_BO | -4.07645832 | .69902422 | -5.832 | .0000 |
| BO_PO3 | -1.35198916 | .57237843 | -2.362 | .0182 |
| BO_OV3 | -1.64767674 | 3.15643881 | -.522 | .6017 |
| BO_V23 | .01202795 | .02170793 | .554 | .5795 |
| BO_TBA3 | .25327553 | .29822119 | .849 | .3957 |
| A_M | -3.01427497 | .54595269 | -5.521 | .0000 |
| M_PO4 | .20689982 | .39424070 | .525 | .5997 |
| M_OV4 | -4.10614684 | 2.83434750 | -1.449 | .1474 |
| M_V24 | -.06179512 | .02179679 | -2.835 | .0046 |
| M_TBA4 | .06390937 | .25144791 | .254 | .7994 |
| A_P | 5.68776851 | .17625587 | 32.270 | .0000 |
| P_PO5 | 1.03026072 | .12554648 | 8.206 | .0000 |
| P_OV5 | 8.68054986 | .87368764 | 9.936 | .0000 |
| P_V25 | -1.05557122 | .01750117 | -60.314 | .0000 |
| P_TBA5 | -1.34957585 | .07451142 | -18.112 | .0000 |

MNL8b.2a – Combinação de Variáveis TC e Estac

- ASC

- TBA – Variável continua com a razão dos tempos médios de viagem em BUS e AUTO entre zona de Geração e Atracção

- Fm0 : Frequencia média horária de TC potencialmente à disposição entre a zona de geração e de atracção entre as 7:30 e as 9:30 (nfreq730930/2) ***sem zeros***

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,FM0,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 06:04:41PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            12756     |
| Iterations completed                  8     |
| Log likelihood function       -11666.79     |
| Number of parameters                 30     |
| Info. Criterion: AIC =          1.83393     |
|   Finite Sample: AIC =          1.83394     |
| Info. Criterion: BIC =          1.85146     |
| Info. Criterion:HQIC =          1.83979     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -16066.6671  .27385  .27351 |
| Chi-squared[25]          =   8799.74427     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
```

```
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -2.10772060 | .40938162 | -5.149 | .0000 |
| BP_FM01 | -.00598020 | .00635524 | -.941 | .3467 |
| BP_PO1 | .23489488 | .24250468 | .969 | .3327 |
| BP_OV1 | -5.66268929 | 1.85390256 | -3.054 | .0023 |
| BP_V21 | .06970352 | .01120816 | 6.219 | .0000 |
| BP_TBA1 | -.30107471 | .18735783 | -1.607 | .1081 |
| A_B | .10205816 | .16818459 | .607 | .5440 |
| B_FM02 | .01301096 | .00268395 | 4.848 | .0000 |
| B_PO2 | .85046336 | .10568269 | 8.047 | .0000 |
| B_OV2 | -2.56923389 | .76651985 | -3.352 | .0008 |
| B_V22 | -.01069099 | .00573197 | -1.865 | .0622 |
| B_TBA2 | -.30027620 | .07459250 | -4.026 | .0001 |
| A_BO | -3.77223484 | .86687151 | -4.352 | .0000 |
| BO_FM03 | -.05386121 | .01980774 | -2.719 | .0065 |
| BO_PO3 | -.81048667 | .63096524 | -1.285 | .1990 |
| BO_OV3 | -3.01979785 | 3.73059152 | -.809 | .4182 |
| BO_V23 | .01693403 | .02974448 | .569 | .5691 |
| BO_TBA3 | .33879271 | .33756644 | 1.004 | .3156 |
| A_M | -1.73005797 | .80249035 | -2.156 | .0311 |
| M_FM04 | .00551750 | .01357477 | .406 | .6844 |
| M_PO4 | -1.44982262 | .56439614 | -2.569 | .0102 |
| M_OV4 | -5.76543465 | 3.54572959 | -1.626 | .1039 |
| M_V24 | -.01874215 | .02904131 | -.645 | .5187 |
| M_TBA4 | -.77967971 | .37777699 | -2.064 | .0390 |
| A_P | 5.49065930 | .22044190 | 24.908 | .0000 |
| P_FM05 | -.00558475 | .00417218 | -1.339 | .1807 |
| P_PO5 | 1.17805873 | .16546331 | 7.120 | .0000 |
| P_OV5 | 9.63987756 | 1.07492952 | 8.968 | .0000 |
| P_V25 | -1.05616541 | .02236639 | -47.221 | .0000 |
| P_TBA5 | -1.30684658 | .09313778 | -14.031 | .0000 |

MNL8b.3a – Combinação de Variáveis TC e Estac

- ASC

- TBA – Variável continua com a razão dos tempos médios de viagem em BUS e AUTO entre zona de Geração e Atracção

- Ftl0 : Frequencia média horária de TC potencialmente à disposição entre a zona de geração e de atracção entre as 7:30 e as 19:30 (nfreq7301930/12) ***sem zeros***

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,Ftl0,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 06:07:18PM.|
| Dependent variable              Choice      |
| Weighting variable                None      |
| Number of observations             12756    |
| Iterations completed                   8    |
| Log likelihood function       -11675.49     |
| Number of parameters                  30     |
| Info. Criterion: AIC =          1.83529     |
|   Finite Sample: AIC =          1.83530     |
| Info. Criterion: BIC =          1.85282     |
| Info. Criterion:HQIC =          1.84115     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -16066.6671  .27331  .27297 |
| Chi-squared[25]          =   8782.35771     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
|       These 2 models are simple MNL models. |
```

```
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -2.18590108 | .41596027 | -5.255 | .0000 |
| BP_FTL1 | -.00261416 | .00532970 | -.490 | .6238 |
| BP_PO1 | .21499566 | .24238913 | .887 | .3751 |
| BP_OV1 | -5.73183684 | 1.85550315 | -3.089 | .0020 |
| BP_V21 | .07125961 | .01145481 | 6.221 | .0000 |
| BP_TBA1 | -.26760017 | .18767360 | -1.426 | .1539 |
| A_B | .27298654 | .17020829 | 1.604 | .1087 |
| B_FTL2 | .00510811 | .00225917 | 2.261 | .0238 |
| B_PO2 | .86301904 | .10562455 | 8.171 | .0000 |
| B_OV2 | -2.70344561 | .76508311 | -3.534 | .0004 |
| B_V22 | -.01201106 | .00577085 | -2.081 | .0374 |
| B_TBA2 | -.34993469 | .07508663 | -4.660 | .0000 |
| A_BO | -3.55877212 | .86226765 | -4.127 | .0000 |
| BO_FTL3 | -.05033358 | .01624812 | -3.098 | .0019 |
| BO_PO3 | -.80323763 | .63006645 | -1.275 | .2024 |
| BO_OV3 | -2.68785669 | 3.70836953 | -.725 | .4686 |
| BO_V23 | .01149803 | .02980162 | .386 | .6996 |
| BO_TBA3 | .25862492 | .33500876 | .772 | .4401 |
| A_M | -1.64202248 | .80627404 | -2.037 | .0417 |
| M_FTL4 | .00154024 | .01128744 | .136 | .8915 |
| M_PO4 | -1.44326323 | .56440102 | -2.557 | .0106 |
| M_OV4 | -5.83650971 | 3.53961223 | -1.649 | .0992 |
| M_V24 | -.01983074 | .02919163 | -.679 | .4969 |
| M_TBA4 | -.80201297 | .37844526 | -2.119 | .0341 |
| A_P | 5.57659755 | .22068183 | 25.270 | .0000 |
| P_FTL5 | -.00853873 | .00336601 | -2.537 | .0112 |
| P_PO5 | 1.21527563 | .16652242 | 7.298 | .0000 |
| P_OV5 | 9.67874621 | 1.07719118 | 8.985 | .0000 |
| P_V25 | -1.05685625 | .02237024 | -47.244 | .0000 |
| P_TBA5 | -1.33189449 | .09343464 | -14.255 | .0000 |

MNL8b.2b – Combinação de Variáveis TC e Estac

- ASC

- TBA – Variável continua com a razão dos tempos médios de viagem em BUS e AUTO entre zona de Geração e Atracção

- Fm1 : Frequencia média horária de TC potencialmente à disposição entre a zona de geração e de atracção entre as 7:30 e as 9:30 (nfreq730930/2) ***com valores em GA muito proximas***

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,Fm1,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 06:09:18PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            17005     |
| Iterations completed                  8     |
| Log likelihood function       -15822.13     |
| Number of parameters                 30     |
| Info. Criterion: AIC =          1.86441     |
|   Finite Sample: AIC =          1.86441     |
| Info. Criterion: BIC =          1.87806     |
| Info. Criterion:HQIC =          1.86891     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -21639.6904  .26884  .26858 |
| Chi-squared[25]          =  11635.12519     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
```

```
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -1.53723867 | .32944019 | -4.666 | .0000 |
| BP_FM11 | .00098096 | .00521132 | .188 | .8507 |
| BP_PO1 | .13826100 | .21190655 | .652 | .5141 |
| BP_OV1 | -6.96138565 | 1.60156525 | -4.347 | .0000 |
| BP_V21 | .03762157 | .01012913 | 3.714 | .0002 |
| BP_TBA1 | -.34087782 | .15422843 | -2.210 | .0271 |
| A_B | .41995568 | .14374119 | 2.922 | .0035 |
| B_FM12 | .01346918 | .00231410 | 5.820 | .0000 |
| B_PO2 | .60290666 | .09635693 | 6.257 | .0000 |
| B_OV2 | -4.90206737 | .68948413 | -7.110 | .0000 |
| B_V22 | -.02340456 | .00515616 | -4.539 | .0000 |
| B_TBA2 | -.17033049 | .06380079 | -2.670 | .0076 |
| A_BO | -4.39685890 | .77869085 | -5.646 | .0000 |
| BO_FM13 | -.01103121 | .01416875 | -.779 | .4362 |
| BO_PO3 | -1.02158511 | .58742135 | -1.739 | .0820 |
| BO_OV3 | -3.33507942 | 3.41698345 | -.976 | .3290 |
| BO_V23 | .03333940 | .02643583 | 1.261 | .2073 |
| BO_TBA3 | .49763243 | .30644912 | 1.624 | .1044 |
| A_M | -2.67321170 | .63599488 | -4.203 | .0000 |
| M_FM14 | .00527131 | .01065395 | .495 | .6208 |
| M_PO4 | -.18946831 | .44671025 | -.424 | .6715 |
| M_OV4 | -4.29182051 | 3.07056568 | -1.398 | .1622 |
| M_V24 | -.05576197 | .02566968 | -2.172 | .0298 |
| M_TBA4 | -.17233509 | .28709316 | -.600 | .5483 |
| A_P | 5.34762879 | .18385496 | 29.086 | .0000 |
| P_FM15 | -.00798250 | .00328738 | -2.428 | .0152 |
| P_PO5 | 1.52902039 | .13312461 | 11.486 | .0000 |
| P_OV5 | 9.06866085 | .89124499 | 10.175 | .0000 |
| P_V25 | -1.03406499 | .01788697 | -57.811 | .0000 |
| P_TBA5 | -1.23380754 | .07754000 | -15.912 | .0000 |

MNL8b.3b – Combinação de Variáveis TC e Estac

- ASC

- TBA – Variável continua com a razão dos tempos médios de viagem em BUS e AUTO entre zona de Geração e Atracção

- Ftl1 : Frequencia média horária de TC potencialmente à disposição entre a zona de geração e de atracção entre as 7:30 e as 19:30 (nfreq7301930/12) ***com valores em GA muito proximas***

- V2 – Variável continua para velocidade comercial equivalente de BUS em km/h

- Variáveis continuas:
- Razão entre número de lugares pagos sobre o número total de estacionamentos (PO)
- Razão entre a oferta de lugares de estacionamentos e o total de viagens extrapoladas (OV)

```
DISCRETECHOICE
;Lhs=MTRP
;Choices=Bp,B,Bo,M,P,A[1]
;Rh2=ONE,Ftl1,PO,OV,V2,TBA$
+---------------------------------------------+
| Discrete choice and multinomial logit models|
+---------------------------------------------+
Normal exit from iterations. Exit status=0.
+---------------------------------------------+
| Discrete choice (multinomial logit) model   |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 15, 2012 at 06:11:36PM.|
| Dependent variable               Choice     |
| Weighting variable                 None     |
| Number of observations            17005     |
| Iterations completed                  8     |
| Log likelihood function       -15833.06     |
| Number of parameters                 30     |
| Info. Criterion: AIC =          1.86569     |
|   Finite Sample: AIC =          1.86570     |
| Info. Criterion: BIC =          1.87935     |
| Info. Criterion:HQIC =          1.87020     |
| R2=1-LogL/LogL*  Log-L fncn  R-sqrd  RsqAdj |
| Constants only  -21639.6904  .26833  .26807 |
| Chi-squared[25]          =  11613.25808     |
| Prob [ chi squared > value ] =   .00000     |
| Response data are given as ind. choice.     |
| Number of obs.= 95426, skipped**** bad obs. |
+---------------------------------------------+

+---------------------------------------------+
| Notes No coefficients=> P(i,j)=1/J(i).      |
|       Constants only => P(i,j) uses ASCs    |
|         only. N(j)/N if fixed choice set.   |
|         N(j) = total sample frequency for j |
|         N    = total sample frequency.      |
```

```
|       These 2 models are simple MNL models. |
|       R-sqrd = 1 - LogL(model)/logL(other)  |
|       RsqAdj=1-[nJ/(nJ-nparm)]*(1-R-sqrd)   |
|         nJ   = sum over i, choice set sizes |
+---------------------------------------------+
```

| Variable | Coefficient | Standard Error | b/St.Er. | P[\|Z\|>z] |
|---|---|---|---|---|
| A_BP | -1.58988751 | .33415642 | -4.758 | .0000 |
| BP_FTL1 | .00235878 | .00433197 | .545 | .5861 |
| BP_PO1 | .12949236 | .21182304 | .611 | .5410 |
| BP_OV1 | -6.98200539 | 1.60189549 | -4.359 | .0000 |
| BP_V21 | .03856265 | .01027000 | 3.755 | .0002 |
| BP_TBA1 | -.32132012 | .15465174 | -2.078 | .0377 |
| A_B | .54052294 | .14509721 | 3.725 | .0002 |
| B_FTL2 | .00665261 | .00192470 | 3.456 | .0005 |
| B_PO2 | .60930527 | .09630089 | 6.327 | .0000 |
| B_OV2 | -5.11943736 | .68783685 | -7.443 | .0000 |
| B_V22 | -.02354339 | .00516737 | -4.556 | .0000 |
| B_TBA2 | -.19826321 | .06412254 | -3.092 | .0020 |
| A_BO | -4.28507058 | .78276032 | -5.474 | .0000 |
| BO_FTL3 | -.01263823 | .01165194 | -1.085 | .2781 |
| BO_PO3 | -1.02052016 | .58733074 | -1.738 | .0823 |
| BO_OV3 | -3.36153910 | 3.40592131 | -.987 | .3237 |
| BO_V23 | .03142113 | .02651728 | 1.185 | .2360 |
| BO_TBA3 | .46686062 | .30744748 | 1.519 | .1289 |
| A_M | -2.59754325 | .63970364 | -4.061 | .0000 |
| M_FTL4 | .00149157 | .00879900 | .170 | .8654 |
| M_PO4 | -.18506553 | .44688311 | -.414 | .6788 |
| M_OV4 | -4.40824954 | 3.06238125 | -1.439 | .1500 |
| M_V24 | -.05629346 | .02571701 | -2.189 | .0286 |
| M_TBA4 | -.18848595 | .28814637 | -.654 | .5130 |
| A_P | 5.40730573 | .18426553 | 29.345 | .0000 |
| P_FTL5 | -.00887011 | .00264140 | -3.358 | .0008 |
| P_PO5 | 1.55022027 | .13360097 | 11.603 | .0000 |
| P_OV5 | 9.06148745 | .89103664 | 10.170 | .0000 |
| P_V25 | -1.03484310 | .01788342 | -57.866 | .0000 |
| P_TBA5 | -1.25210358 | .07780092 | -16.094 | .0000 |