

Table 1: Categorical data from the Massachusetts Travel Survey

Mode		Income		Purpose		Gender	
Bin	N	Bin	N	Bin	N	Bin	N
Rail	728	≤ 25,000	1,838	Other	1,699	Female	7,800
Drive	9,086	25,000-49,999	1,813	Recreation	2,137	Male	6,359
Bus	1,844	50,000-74,999	2,222	Shopping/errands	4,079		
Subway	2,429	75,000-99,999	2,150	Work/school	6,244		
Taxi	72	100,000-149,999	2,860				
		≥ 150,000	3,276				

Table 2: Discrete bins of continuous data from the Massachusetts Travel Survey

Age (years)			Distance (miles)			Time-of-day	
Bin	Median	N	Bin	Median	N	Bin	N
16-20	17	368	≤ 0.5	0.46	1,178	AM (06:00-9:59)	2,578
20-29	25	1,186	0.5-1	0.83	2,447	Midday (10:00-15:59)	5,758
30-39	35	2,069	1-2	1.56	3,603	PM (16:00-18:59)	3,800
40-49	45	3,321	2-4	2.96	3,365	Night (19:00-5:59)	2,023
50-59	54	4,069	4-8	5.73	2,645		
60-69	63	2,322	8-12	10.14	725		
≥ 70	75	824	≥ 12	13.91	196		

Table 3: Multinomial model results

Variable	Taxi			Bus			Subway			Rail		
	$\beta$	SE	p-value	$\beta$	SE	p-value	$\beta$	SE	p-value	$\beta$	SE	p-value
Intercept	-1.33	0.88	1.3e-01	-4.35	1.13	1.1e-04 ***	13.03	2340.50	1.0e+00	5.86	0.81	5.2e-13 ***
Age	-0.01	0.01	6.2e-01	-0.03	0.00	< 2.2e-16 ***	-0.03	0.00	< 2.2e-16 ***	-0.02	0.01	4.2e-03 **
Cost	-0.58	0.05	< 2.2e-16 ***	6.21	0.75	2.2e-16 ***	-4.58	1170.25	1.0e+00	0.30	0.08	1.3e-04 ***
Gender	-0.17	0.33	6.1e-01	-0.04	0.09	6.6e-01	0.17	0.10	7.9e-02	-0.21	0.18	2.5e-01
Income - 25,000-49,999	-2.14	0.59	2.7e-04 ***	-2.46	0.15	< 2.2e-16 ***	-0.78	0.19	4.4e-05 ***	-2.23	0.36	4.9e-10 ***
Income - 50,000-74,999	-2.13	0.53	6.1e-05 ***	-2.82	0.15	< 2.2e-16 ***	-0.74	0.19	7.1e-05 ***	-1.93	0.34	1.1e-08 ***
Income - 75,000-99,999	-3.46	0.74	2.8e-06 ***	-3.41	0.17	< 2.2e-16 ***	-0.85	0.19	7.9e-06 ***	-1.85	0.33	3.3e-08 ***
Income - 100,000-149,999	-2.53	0.53	1.7e-06 ***	-3.81	0.16	< 2.2e-16 ***	-1.39	0.18	2.6e-14 ***	-2.33	0.30	1.3e-14 ***
Income - ≥ 150,000	-1.98	0.44	7.5e-06 ***	-3.96	0.17	< 2.2e-16 ***	-1.55	0.18	< 2.2e-16 ***	-2.28	0.30	4.2e-14 ***
Trip duration	0.65	0.05	< 2.2e-16 ***	-0.16	0.00	< 2.2e-16 ***	-0.17	0.00	< 2.2e-16 ***	-0.25	0.01	< 2.2e-16 ***
Trip purpose - Recreation	-0.19	0.63	7.7e-01	2.14	0.25	< 2.2e-16 ***	2.14	0.32	2.8e-11 ***	1.93	0.71	6.7e-03 **
Trip purpose - Shopping/errands	0.13	0.57	8.2e-01	2.05	0.23	< 2.2e-16 ***	1.74	0.32	4.5e-08 ***	1.73	0.69	1.3e-02 *
Trip purpose - Work/school	0.76	0.56	1.7e-01	3.92	0.23	< 2.2e-16 ***	3.72	0.30	< 2.2e-16 ***	3.76	0.66	1.5e-08 ***
Time of day - Midday	0.03	0.50	9.6e-01	-1.11	0.13	< 2.2e-16 ***	-0.88	0.15	1.1e-08 ***	-1.28	0.28	4.6e-06 ***
Time of day - Night	1.27	0.53	1.6e-02 *	0.57	0.20	3.9e-03 **	-0.63	0.17	2.4e-04 ***	-0.22	0.31	4.8e-01
Time of day - PM	-1.92	0.70	6.2e-03 **	-0.63	0.14	3.7e-06 ***	-0.54	0.14	1.5e-04 ***	0.04	0.25	8.7e-01

McFadden  $R^2 = 0.75$ 

\* Significance level codes: '\*\*\*' 99.99%, '\*\*' 99%, '\*' 95%

Table 4: Summary statistics for joint VOT error

Model	Value of time error						McFadden $R^2$	Significant variables
	Minimum	First Quantile	Median	Mean	Third Quantile	Maximum		
Age×Trip purpose	4.98	17.59	25.03	132.78	41.07	1395.32	0.56	55 of 60
Age×Time of day	4.24	13.78	26.41	72.43	52.73	615.02	0.55	55 of 60
Distance×Age	1.96	19.95	36.22	275.93	412.00	2463.84	0.57	76 of 102
Distance×Trip purpose	2.45	15.76	25.84	307.83	515.06	2582.28	0.58	52 of 60
Distance×Time of day	5.76	11.81	40.62	1550.21	193.05	36577.78	0.56	51 of 60
Gender×Age	7.41	16.53	19.00	34.70	22.56	238.32	0.54	31 of 32
Gender×Income	7.15	11.40	15.23	16.64	19.48	32.61	0.55	28 of 28
Gender×Distance	7.19	9.33	16.08	130.11	90.80	998.04	0.55	30 of 32
Gender×Trip purpose	9.99	12.15	17.90	17.95	23.79	26.53	0.55	20 of 20
Gender×Time of day	4.00	11.70	15.98	22.33	26.36	65.54	0.53	20 of 20
Income×Age	7.19	15.96	26.47	93.19	41.43	710.53	0.56	80 of 88
Income×Distance	7.87	17.91	35.77	622.37	190.09	19865.73	0.58	75 of 88
Income×Trip Purpose	3.48	15.42	24.34	30.63	40.98	76.47	0.58	52 of 52
Income×Time of day	3.81	13.04	17.74	65.33	39.46	927.82	0.56	51 of 52
Trip purpose×Time of day	4.56	11.26	22.08	36.25	49.09	184.68	0.56	36 of 36

Table 5: Summary of individual variable model estimation results

Variable	VOT	Travel time				Travel cost			
		$\beta$	SE	z-value	p-value	$\beta$	SE	z-value	p-value
<b>Age model, <math>McFadden R^2 = 0.54</math></b>									
16-20	14.2	-0.09	5.58e-03	-16.66	< 2.2e-16 ***	-0.39	8.62e-02	-4.55	5.5e-06 ***
20-29	82.8	-0.10	3.48e-03	-28.98	< 2.2e-16 ***	-0.07	1.93e-02	-3.80	1.5e-04 ***
30-39	39.1	-0.15	4.10e-03	-35.97	< 2.2e-16 ***	-0.23	2.49e-02	-9.09	< 2.2e-16 ***
40-49	50.9	-0.16	3.70e-03	-43.49	< 2.2e-16 ***	-0.19	1.80e-02	-10.54	< 2.2e-16 ***
50-59	58.6	-0.16	3.29e-03	-47.33	< 2.2e-16 ***	-0.16	1.43e-02	-11.16	< 2.2e-16 ***
60-69	56.0	-0.15	3.96e-03	-38.51	< 2.2e-16 ***	-0.16	1.85e-02	-8.82	< 2.2e-16 ***
$\geq 70$	35.4	-0.17	7.00e-03	-24.17	< 2.2e-16 ***	-0.29	4.27e-02	-6.71	1.9e-11 ***
<b>Gender, <math>McFadden R^2 = 0.53</math></b>									
Female	50.4	-0.14	2.45e-03	-58.68	< 2.2e-16 ***	-0.17	1.20e-02	-14.34	< 2.2e-16 ***
Male	48.1	-0.15	2.66e-03	-54.65	< 2.2e-16 ***	-0.18	1.26e-02	-14.39	< 2.2e-16 ***
<b>Income model, <math>McFadden R^2 = 0.55</math></b>									
$\leq 25,000$	26.9	-0.09	2.62e-03	-35.56	< 2.2e-16 ***	-0.21	3.15e-02	-6.59	4.5e-11 ***
25,000-49,999	33.2	-0.14	4.14e-03	-34.37	< 2.2e-16 ***	-0.26	3.21e-02	-7.99	1.3e-15 ***
50,000-74,999	42.2	-0.15	4.11e-03	-37.19	< 2.2e-16 ***	-0.22	2.52e-02	-8.61	< 2.2e-16 ***
75,000-99,999	32.3	-0.16	4.46e-03	-36.36	< 2.2e-16 ***	-0.30	2.90e-02	-10.38	< 2.2e-16 ***
100,000-149,999	50.1	-0.18	4.48e-03	-39.41	< 2.2e-16 ***	-0.21	1.86e-02	-11.36	< 2.2e-16 ***
$\geq 150,000$	71.7	-0.18	4.14e-03	-42.63	< 2.2e-16 ***	-0.15	1.27e-02	-11.64	< 2.2e-16 ***
<b>Mode model, <math>McFadden R^2 = 0.65</math></b>									
Rail	10.4	-0.18	6.48e-03	-28.51	< 2.2e-16 ***	-1.07	6.66e-02	-16.04	< 2.2e-16 ***
Drive	4.0	0.05	5.30e-03	8.85	< 2.2e-16 ***	0.71	1.98e-02	35.73	< 2.2e-16 ***
Bus	5.9	-0.16	3.68e-03	-42.25	< 2.2e-16 ***	-1.57	5.55e-02	-28.27	< 2.2e-16 ***
Subway	6.6	-0.17	3.96e-03	-43.66	< 2.2e-16 ***	-1.57	5.01e-02	-31.28	< 2.2e-16 ***
Taxi	52.2	0.99	3.93e-02	25.13	< 2.2e-16 ***	1.14	3.78e-02	30.03	< 2.2e-16 ***
<b>Travel distance model, <math>McFadden R^2 = 0.55</math></b>									
$\leq 0.5$	28.0	-0.25	1.05e-02	-23.54	< 2.2e-16 ***	-0.53	6.24e-02	-8.45	< 2.2e-16 ***
0.5-1	25.5	-0.19	5.59e-03	-34.71	< 2.2e-16 ***	-0.46	4.39e-02	-10.43	< 2.2e-16 ***
1-2	34.1	-0.16	3.44e-03	-46.37	< 2.2e-16 ***	-0.28	2.79e-02	-10.08	< 2.2e-16 ***
2-4	32.6	-0.13	2.75e-03	-47.50	< 2.2e-16 ***	-0.24	2.50e-02	-9.61	< 2.2e-16 ***
4-8	57.1	-0.13	3.47e-03	-38.36	< 2.2e-16 ***	-0.14	1.38e-02	-10.16	< 2.2e-16 ***
8-12	157.8	-0.11	5.22e-03	-21.42	< 2.2e-16 ***	-0.04	9.95e-03	-4.27	2.0e-05 ***
$\geq 12$	291.3	-0.10	8.36e-03	-11.54	< 2.2e-16 ***	-0.02	1.11e-02	-1.80	7.2e-02
<b>Trip purpose model, <math>McFadden R^2 = 0.55</math></b>									
Other	41.5	-0.28	1.03e-02	-26.72	< 2.2e-16 ***	-0.40	4.08e-02	-9.79	< 2.2e-16 ***
Recreation	54.6	-0.16	4.30e-03	-37.08	< 2.2e-16 ***	-0.17	1.97e-02	-8.86	< 2.2e-16 ***
Shopping/errands	42.2	-0.16	3.35e-03	-48.09	< 2.2e-16 ***	-0.23	1.93e-02	-11.83	< 2.2e-16 ***
Work/school	70.2	-0.12	2.27e-03	-54.59	< 2.2e-16 ***	-0.11	9.86e-03	-10.73	< 2.2e-16 ***
<b>Time-of-day model, <math>McFadden R^2 = 0.53</math></b>									
AM	17.2	-0.14	3.79e-03	-36.60	< 2.2e-16 ***	-0.48	3.27e-02	-14.79	< 2.2e-16 ***
Midday	53.3	-0.15	2.88e-03	-53.32	< 2.2e-16 ***	-0.17	1.41e-02	-12.26	< 2.2e-16 ***
PM	57.5	-0.15	3.22e-03	-45.51	< 2.2e-16 ***	-0.15	1.56e-02	-9.83	< 2.2e-16 ***
Night	91.8	-0.12	3.24e-03	-37.99	< 2.2e-16 ***	-0.08	1.24e-02	-6.52	7.2e-11 ***

\* Significance level codes: '\*\*\*\*' 99.99%, '\*\*\*' 99%, '\*\*' 95%

Table 6: Summary of parametric fitting results

Variable	Model		Parameters					$R^2$
	Unit	Function	$\alpha$	$\beta$	$b$	$\mu$	$\sigma$	
Income	\$10,000	$VOT(x) = e^{\alpha+\beta x}$	3.232	0.051				0.741
Travel distance	Miles	$VOT(x) = e^{\alpha+\beta x}$	3.124	0.183				0.984
Age	Years	$VOT(x) = \frac{b}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$			3235.246	54.077	22.466	0.999

Table 7: Joint multinomial model results

Variables	Travel cost			Travel time		
	$\beta_C$	$SE_C$	p-value $_C$	$\beta_T$	$SE_T$	p-value $_T$
<b>Age×Trip purpose, McFadden <math>R^2 = 0.56</math></b>						
Rail (intercept)	1.51	0.07	< 2.2e-16 ***			
Bus (intercept)	1.52	0.04	< 2.2e-16 ***			
Subway (intercept)	1.74	0.04	< 2.2e-16 ***			
Taxi (intercept)	-4.43	0.17	< 2.2e-16 ***			
16-20×Other	-4.48	1672.93	1.0e+00	-1.27	194.96	9.9e-01
20-29×Other	-0.77	0.22	5.5e-04 ***	-0.27	0.05	7.7e-09 ***
30-39×Other	-0.41	0.13	9.6e-04 ***	-0.25	0.02	< 2.2e-16 ***
40-49×Other	-0.42	0.07	2.0e-09 ***	-0.3	0.02	< 2.2e-16 ***
50-59×Other	-0.34	0.06	4.1e-08 ***	-0.27	0.02	< 2.2e-16 ***
60-69×Other	-1.2	0.29	4.0e-05 ***	-0.31	0.04	1.3e-14 ***
≥ 70×Other	-0.05	0.06	4.5e-01	-0.23	0.05	1.2e-06 ***
16-20×Recreation	-1.66	0.48	5.5e-04 ***	-0.13	0.02	1.1e-07 ***
20-29×Recreation	-0.07	0.03	3.5e-02 *	-0.13	0.01	< 2.2e-16 ***
30-39×Recreation	-0.2	0.06	7.4e-04 ***	-0.16	0.01	< 2.2e-16 ***
40-49×Recreation	-0.13	0.03	1.4e-05 ***	-0.18	0.01	< 2.2e-16 ***
50-59×Recreation	-0.19	0.04	2.0e-05 ***	-0.16	0.01	< 2.2e-16 ***
60-69×Recreation	-0.28	0.06	3.2e-06 ***	-0.16	0.01	< 2.2e-16 ***
≥ 70×Recreation	-0.32	0.09	3.2e-04 ***	-0.18	0.01	< 2.2e-16 ***
16-20×Shopping/errands	-0.73	0.31	1.9e-02 *	-0.1	0.02	2.8e-11 ***
20-29×Shopping/errands	-0.07	0.05	1.3e-01	-0.12	0.01	< 2.2e-16 ***
30-39×Shopping/errands	-0.42	0.08	5.0e-07 ***	-0.16	0.01	< 2.2e-16 ***
40-49×Shopping/errands	-0.3	0.05	3.0e-11 ***	-0.18	0.01	< 2.2e-16 ***
50-59×Shopping/errands	-0.16	0.03	3.3e-10 ***	-0.17	0.01	< 2.2e-16 ***
60-69×Shopping/errands	-0.18	0.03	1.5e-09 ***	-0.16	0.01	< 2.2e-16 ***
≥ 70×Shopping/errands	-0.57	0.11	6.7e-08 ***	-0.18	0.01	< 2.2e-16 ***
16-20×Work/school	-0.26	0.09	4.8e-03 **	-0.08	0.01	< 2.2e-16 ***
20-29×Work/school	-0.06	0.02	2.0e-02 *	-0.09	0	< 2.2e-16 ***
30-39×Work/school	-0.14	0.03	7.9e-08 ***	-0.13	0	< 2.2e-16 ***
40-49×Work/school	-0.1	0.02	4.4e-08 ***	-0.13	0	< 2.2e-16 ***
50-59×Work/school	-0.12	0.02	2.1e-12 ***	-0.14	0	< 2.2e-16 ***
60-69×Work/school	-0.1	0.02	2.5e-06 ***	-0.14	0.01	< 2.2e-16 ***
≥ 70×Work/school	-0.05	0.06	3.7e-01	-0.13	0.02	< 2.2e-16 ***
<b>Age×Time of day, McFadden <math>R^2 = 0.55</math></b>						
Rail (intercept)	1.4	0.07	< 2.2e-16 ***			
Bus (intercept)	1.38	0.04	< 2.2e-16 ***			
Subway (intercept)	1.62	0.04	< 2.2e-16 ***			
Taxi (intercept)	-4.49	0.16	< 2.2e-16 ***			
16-20×AM	-0.54	0.3	7.4e-02	-0.09	0.01	2.9e-09 ***
20-29×AM	-0.63	0.12	8.2e-08 ***	-0.11	0.01	< 2.2e-16 ***
30-39×AM	-0.44	0.07	4.6e-10 ***	-0.14	0.01	< 2.2e-16 ***
40-49×AM	-0.45	0.06	3.1e-12 ***	-0.15	0.01	< 2.2e-16 ***
50-59×AM	-0.67	0.07	< 2.2e-16 ***	-0.15	0.01	< 2.2e-16 ***
60-69×AM	-0.41	0.1	3.1e-05 ***	-0.14	0.01	< 2.2e-16 ***
≥ 70×AM	-0.03	0.08	7.0e-01	-0.15	0.02	< 2.2e-16 ***
16-20×Midday	-0.28	0.12	1.5e-02 *	-0.1	0.01	< 2.2e-16 ***
20-29×Midday	-0.05	0.03	1.1e-01	-0.1	0.01	< 2.2e-16 ***
30-39×Midday	-0.16	0.04	1.5e-05 ***	-0.15	0.01	< 2.2e-16 ***
40-49×Midday	-0.27	0.03	9.8e-15 ***	-0.18	0.01	< 2.2e-16 ***
50-59×Midday	-0.14	0.02	2.5e-12 ***	-0.16	0	< 2.2e-16 ***
60-69×Midday	-0.14	0.02	1.9e-09 ***	-0.15	0.01	< 2.2e-16 ***
≥ 70×Midday	-0.42	0.08	5.7e-08 ***	-0.18	0.01	< 2.2e-16 ***
16-20×Night	-0.47	0.17	7.2e-03 **	-0.09	0.01	3.1e-15 ***
20-29×Night	0	0.02	8.4e-01	-0.09	0.01	< 2.2e-16 ***
30-39×Night	-0.13	0.04	6.1e-04 ***	-0.13	0.01	< 2.2e-16 ***
40-49×Night	-0.05	0.02	6.7e-03 **	-0.12	0.01	< 2.2e-16 ***
50-59×Night	-0.1	0.02	3.2e-05 ***	-0.14	0.01	< 2.2e-16 ***
60-69×Night	-0.19	0.06	8.4e-04 ***	-0.15	0.01	< 2.2e-16 ***
≥ 70×Night	-0.47	0.24	5.1e-02	-0.18	0.03	4.8e-08 ***
16-20×PM	-0.48	0.2	2.0e-02 *	-0.08	0.01	1.1e-15 ***
20-29×PM	-0.13	0.06	2.2e-02 *	-0.11	0.01	< 2.2e-16 ***
30-39×PM	-0.29	0.06	5.2e-07 ***	-0.15	0.01	< 2.2e-16 ***
40-49×PM	-0.2	0.04	5.9e-08 ***	-0.17	0.01	< 2.2e-16 ***
50-59×PM	-0.12	0.02	3.6e-08 ***	-0.15	0.01	< 2.2e-16 ***
60-69×PM	-0.12	0.03	9.4e-05 ***	-0.16	0.01	< 2.2e-16 ***

Table 7: Joint multinomial model results (*continued*)

Variables	Travel cost			Travel time		
	$\beta_C$	$SE_C$	p-value <sub>C</sub>	$\beta_T$	$SE_T$	p-value <sub>T</sub>
$\geq 70 \times PM$	-0.15	0.07	5.0e-02 *	-0.16	0.02	< 2.2e-16 ***
<b>Distance<math>\times</math>Age, McFadden <math>R^2 = 0.57</math></b>						
Rail (intercept)	1.57	0.07	< 2.2e-16 ***			
Bus (intercept)	1.8	0.05	< 2.2e-16 ***			
Subway (intercept)	1.85	0.05	< 2.2e-16 ***			
Taxi (intercept)	-4.2	0.21	< 2.2e-16 ***			
< 0.5 $\times$ 16-20	-0.39	0.4	3.3e-01	-0.14	0.04	1.3e-03 **
0.5-1 $\times$ 16-20	-0.57	0.41	1.7e-01	-0.13	0.03	4.3e-05 ***
1-2 $\times$ 16-20	-0.12	0.11	2.6e-01	-0.12	0.01	< 2.2e-16 ***
2-4 $\times$ 16-20	-2.54	0.62	4.6e-05 ***	-0.11	0.01	< 2.2e-16 ***
4-8 $\times$ 16-20	-0.17	0.16	2.9e-01	-0.06	0.01	2.5e-09 ***
8-12 $\times$ 16-20	-32.8	3976.68	9.9e-01	-6.28	760.52	9.9e-01
$\geq 12 \times 16-20$	-0.58	3035.51	1.0e+00	-0.74	1418.32	1.0e+00
< 0.5 $\times$ 20-29	0.1	0.07	2.0e-01	-0.32	0.04	2.0e-14 ***
0.5-1 $\times$ 20-29	-0.09	0.13	4.6e-01	-0.12	0.01	< 2.2e-16 ***
1-2 $\times$ 20-29	-0.01	0.06	8.8e-01	-0.12	0.01	< 2.2e-16 ***
2-4 $\times$ 20-29	-0.15	0.07	2.2e-02 *	-0.1	0.01	< 2.2e-16 ***
4-8 $\times$ 20-29	-0.03	0.02	1.6e-01	-0.1	0.01	< 2.2e-16 ***
8-12 $\times$ 20-29	-0.15	0.07	2.7e-02 *	-0.12	0.02	7.9e-11 ***
$\geq 12 \times 20-29$	0	0.03	8.9e-01	-0.05	0.01	5.4e-06 ***
< 0.5 $\times$ 30-39	-0.15	0.12	2.1e-01	-0.26	0.02	< 2.2e-16 ***
0.5-1 $\times$ 30-39	-0.33	0.09	2.5e-04 ***	-0.2	0.01	< 2.2e-16 ***
1-2 $\times$ 30-39	-0.54	0.11	1.7e-06 ***	-0.17	0.01	< 2.2e-16 ***
2-4 $\times$ 30-39	-0.41	0.1	3.8e-05 ***	-0.13	0.01	< 2.2e-16 ***
4-8 $\times$ 30-39	-0.42	0.09	2.6e-06 ***	-0.17	0.01	< 2.2e-16 ***
8-12 $\times$ 30-39	-0.04	0.03	1.3e-01	-0.11	0.01	6.7e-16 ***
$\geq 12 \times 30-39$	-0.04	0.04	2.6e-01	-0.16	0.05	5.3e-04 ***
< 0.5 $\times$ 40-49	-1.02	0.18	5.4e-09 ***	-0.27	0.03	< 2.2e-16 ***
0.5-1 $\times$ 40-49	-0.51	0.09	3.5e-09 ***	-0.25	0.01	< 2.2e-16 ***
1-2 $\times$ 40-49	-0.22	0.05	2.4e-06 ***	-0.18	0.01	< 2.2e-16 ***
2-4 $\times$ 40-49	-0.14	0.03	2.9e-05 ***	-0.14	0.01	< 2.2e-16 ***
4-8 $\times$ 40-49	-0.12	0.03	7.7e-06 ***	-0.13	0.01	< 2.2e-16 ***
8-12 $\times$ 40-49	-0.03	0.02	1.2e-01	-0.12	0.01	< 2.2e-16 ***
$\geq 12 \times 40-49$	-0.01	0.02	5.6e-01	-0.09	0.02	3.1e-09 ***
< 0.5 $\times$ 50-59	-0.54	0.12	6.1e-06 ***	-0.27	0.02	< 2.2e-16 ***
0.5-1 $\times$ 50-59	-0.37	0.07	5.1e-08 ***	-0.21	0.01	< 2.2e-16 ***
1-2 $\times$ 50-59	-0.31	0.06	2.2e-07 ***	-0.17	0.01	< 2.2e-16 ***
2-4 $\times$ 50-59	-0.2	0.04	2.5e-06 ***	-0.14	0.01	< 2.2e-16 ***
4-8 $\times$ 50-59	-0.19	0.03	4.0e-11 ***	-0.16	0.01	< 2.2e-16 ***
8-12 $\times$ 50-59	-0.02	0.01	1.4e-01	-0.11	0.01	< 2.2e-16 ***
$\geq 12 \times 50-59$	-0.11	0.04	1.6e-02 *	-0.2	0.05	1.6e-05 ***
< 0.5 $\times$ 60-69	-0.55	0.17	1.3e-03 **	-0.22	0.02	< 2.2e-16 ***
0.5-1 $\times$ 60-69	-0.91	0.16	1.7e-08 ***	-0.15	0.01	< 2.2e-16 ***
1-2 $\times$ 60-69	-0.27	0.06	4.3e-06 ***	-0.17	0.01	< 2.2e-16 ***
2-4 $\times$ 60-69	-0.29	0.07	8.7e-05 ***	-0.15	0.01	< 2.2e-16 ***
4-8 $\times$ 60-69	-0.12	0.03	9.0e-06 ***	-0.14	0.01	< 2.2e-16 ***
8-12 $\times$ 60-69	-0.05	0.03	9.2e-02	-0.11	0.01	3.1e-14 ***
$\geq 12 \times 60-69$	0.02	0.02	2.0e-01	-0.09	0.02	4.1e-06 ***
< 0.5 $\times$ $\geq 70$	-2.13	0.29	3.7e-13 ***	-0.11	0.03	1.2e-03 **
0.5-1 $\times$ $\geq 70$	-0.54	0.22	1.2e-02 *	-0.22	0.03	< 2.2e-16 ***
1-2 $\times$ $\geq 70$	-0.29	0.08	2.4e-04 ***	-0.18	0.01	< 2.2e-16 ***
2-4 $\times$ $\geq 70$	-0.28	0.1	6.9e-03 **	-0.16	0.01	< 2.2e-16 ***
4-8 $\times$ $\geq 70$	-0.08	0.04	7.6e-02	-0.13	0.02	< 2.2e-16 ***
8-12 $\times$ $\geq 70$	-0.83	0.77	2.8e-01	-0.47	0.34	1.7e-01
$\geq 12 \times \geq 70$	-1.18	5663.96	1.0e+00	-0.58	928.72	1.0e+00
<b>Distance<math>\times</math>Trip purpose, McFadden <math>R^2 = 0.58</math></b>						
Rail (intercept)	1.62	0.07	< 2.2e-16 ***			
Bus (intercept)	1.89	0.05	< 2.2e-16 ***			
Subway (intercept)	1.88	0.05	< 2.2e-16 ***			
Taxi (intercept)	-4.04	0.21	< 2.2e-16 ***			
< 0.5 $\times$ Other	-3.3	0.66	5.3e-07 ***	-0.22	0.09	2.0e-02 *
0.5-1 $\times$ Other	-2.8	0.38	2.8e-13 ***	-0.16	0.03	1.6e-06 ***
1-2 $\times$ Other	-1.09	0.37	3.2e-03 **	-0.29	0.03	< 2.2e-16 ***
2-4 $\times$ Other	-0.53	0.15	2.6e-04 ***	-0.23	0.02	< 2.2e-16 ***
4-8 $\times$ Other	-0.3	0.08	1.5e-04 ***	-0.28	0.04	9.8e-12 ***
8-12 $\times$ Other	-0.01	0.02	6.0e-01	-0.11	0.02	1.9e-13 ***

Table 7: Joint multinomial model results (*continued*)

Variables	Travel cost			Travel time		
	$\beta_C$	$SE_C$	p-value <sub>C</sub>	$\beta_T$	$SE_T$	p-value <sub>T</sub>
$\geq 12 \times \text{Other}$	-0.11	0.14	4.2e-01	-0.21	0.09	1.6e-02 *
$< 0.5 \times \text{Recreation}$	-1.79	0.21	$< 2.2\text{e-}16$ ***	-0.17	0.03	2.5e-09 ***
$0.5\text{-}1 \times \text{Recreation}$	-0.41	0.08	9.7e-07 ***	-0.23	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{Recreation}$	-0.3	0.07	4.4e-06 ***	-0.18	0.01	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{Recreation}$	-0.24	0.06	9.0e-05 ***	-0.14	0.01	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{Recreation}$	-0.13	0.03	8.4e-05 ***	-0.14	0.01	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{Recreation}$	-0.02	0.02	2.6e-01	-0.11	0.01	1.1e-15 ***
$\geq 12 \times \text{Recreation}$	-0.01	0.03	8.3e-01	-0.09	0.02	1.8e-04 ***
$< 0.5 \times \text{Shopping/errands}$	-1.13	0.17	6.8e-11 ***	-0.19	0.02	$< 2.2\text{e-}16$ ***
$0.5\text{-}1 \times \text{Shopping/errands}$	-0.97	0.14	9.1e-13 ***	-0.16	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{Shopping/errands}$	-0.4	0.06	1.8e-10 ***	-0.17	0.01	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{Shopping/errands}$	-0.29	0.05	2.4e-08 ***	-0.15	0.01	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{Shopping/errands}$	-0.15	0.03	7.7e-08 ***	-0.15	0.01	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{Shopping/errands}$	-0.03	0.02	1.4e-01	-0.12	0.01	$< 2.2\text{e-}16$ ***
$\geq 12 \times \text{Shopping/errands}$	0	0.02	8.6e-01	-0.11	0.02	3.6e-06 ***
$< 0.5 \times \text{Work/school}$	0.02	0.06	7.7e-01	-0.25	0.02	$< 2.2\text{e-}16$ ***
$0.5\text{-}1 \times \text{Work/school}$	-0.19	0.05	1.3e-04 ***	-0.18	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{Work/school}$	-0.11	0.03	1.9e-04 ***	-0.14	0	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{Work/school}$	-0.15	0.03	1.6e-07 ***	-0.12	0	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{Work/school}$	-0.12	0.02	1.6e-12 ***	-0.13	0	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{Work/school}$	-0.05	0.01	2.7e-04 ***	-0.12	0.01	$< 2.2\text{e-}16$ ***
$\geq 12 \times \text{Work/school}$	-0.02	0.02	1.7e-01	-0.09	0.01	$< 2.2\text{e-}16$ ***
<b>Distance<math>\times</math>Time of day, McFadden <math>R^2 = 0.56</math></b>						
Rail (intercept)	1.49	0.07	$< 2.2\text{e-}16$ ***			
Bus (intercept)	1.73	0.05	$< 2.2\text{e-}16$ ***			
Subway (intercept)	1.75	0.05	$< 2.2\text{e-}16$ ***			
Taxi (intercept)	-4.27	0.21	$< 2.2\text{e-}16$ ***			
$< 0.5 \times \text{AM}$	-0.38	0.12	2.5e-03 **	-0.29	0.02	$< 2.2\text{e-}16$ ***
$0.5\text{-}1 \times \text{AM}$	-0.55	0.11	1.0e-06 ***	-0.2	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{AM}$	-0.32	0.07	1.9e-06 ***	-0.15	0.01	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{AM}$	-0.55	0.1	1.1e-08 ***	-0.11	0.01	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{AM}$	-0.55	0.08	6.4e-11 ***	-0.14	0.01	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{AM}$	-0.03	0.03	3.8e-01	-0.07	0.01	2.5e-12 ***
$\geq 12 \times \text{AM}$	-0.37	248.07	1.0e+00	-0.55	73.09	9.9e-01
$< 0.5 \times \text{Midday}$	-0.61	0.11	2.2e-08 ***	-0.25	0.02	$< 2.2\text{e-}16$ ***
$0.5\text{-}1 \times \text{Midday}$	-0.5	0.07	1.1e-11 ***	-0.2	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{Midday}$	-0.36	0.05	8.0e-13 ***	-0.16	0	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{Midday}$	-0.39	0.06	1.2e-10 ***	-0.15	0	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{Midday}$	-0.1	0.02	1.4e-08 ***	-0.14	0.01	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{Midday}$	-0.06	0.02	1.4e-03 **	-0.14	0.01	$< 2.2\text{e-}16$ ***
$\geq 12 \times \text{Midday}$	0.01	0.01	6.7e-01	-0.09	0.01	6.7e-16 ***
$< 0.5 \times \text{Night}$	-0.8	0.22	3.0e-04 ***	-0.14	0.02	9.3e-10 ***
$0.5\text{-}1 \times \text{Night}$	-0.08	0.06	1.6e-01	-0.17	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{Night}$	-0.11	0.04	6.3e-03 **	-0.15	0.01	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{Night}$	-0.1	0.03	3.5e-03 **	-0.12	0.01	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{Night}$	-0.07	0.02	2.8e-03 **	-0.12	0.01	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{Night}$	-0.02	0.02	3.1e-01	-0.1	0.01	$< 2.2\text{e-}16$ ***
$\geq 12 \times \text{Night}$	-0.03	0.02	1.8e-01	-0.09	0.01	2.0e-10 ***
$< 0.5 \times \text{PM}$	-0.23	0.1	1.5e-02 *	-0.28	0.02	$< 2.2\text{e-}16$ ***
$0.5\text{-}1 \times \text{PM}$	-0.68	0.11	1.6e-10 ***	-0.18	0.01	$< 2.2\text{e-}16$ ***
$1\text{-}2 \times \text{PM}$	-0.18	0.04	6.4e-05 ***	-0.17	0.01	$< 2.2\text{e-}16$ ***
$2\text{-}4 \times \text{PM}$	-0.12	0.03	2.2e-04 ***	-0.13	0	$< 2.2\text{e-}16$ ***
$4\text{-}8 \times \text{PM}$	-0.16	0.03	1.1e-08 ***	-0.14	0.01	$< 2.2\text{e-}16$ ***
$8\text{-}12 \times \text{PM}$	-0.03	0.02	9.4e-02	-0.12	0.01	$< 2.2\text{e-}16$ ***
$\geq 12 \times \text{PM}$	-0.05	0.04	2.6e-01	-0.14	0.04	1.5e-04 ***
<b>Gender<math>\times</math>Age, McFadden <math>R^2 = 0.54</math></b>						
Rail (intercept)	1.44	0.07	$< 2.2\text{e-}16$ ***			
Bus (intercept)	1.36	0.04	$< 2.2\text{e-}16$ ***			
Subway (intercept)	1.65	0.04	$< 2.2\text{e-}16$ ***			
Taxi (intercept)	-4.33	0.16	$< 2.2\text{e-}16$ ***			
Female $\times$ 16-20	-0.27	0.11	1.1e-02 *	-0.1	0.01	$< 2.2\text{e-}16$ ***
Male $\times$ 16-20	-0.49	0.12	4.7e-05 ***	-0.09	0.01	$< 2.2\text{e-}16$ ***
Female $\times$ 20-29	-0.04	0.02	5.7e-02	-0.1	0	$< 2.2\text{e-}16$ ***
Male $\times$ 20-29	-0.14	0.04	1.7e-04 ***	-0.11	0.01	$< 2.2\text{e-}16$ ***
Female $\times$ 30-39	-0.22	0.03	5.8e-12 ***	-0.15	0.01	$< 2.2\text{e-}16$ ***
Male $\times$ 30-39	-0.24	0.04	2.0e-09 ***	-0.15	0.01	$< 2.2\text{e-}16$ ***

Table 7: Joint multinomial model results (*continued*)

Variables	Travel cost			Travel time		
	$\beta_C$	SE <sub>C</sub>	p-value <sub>C</sub>	$\beta_T$	SE <sub>T</sub>	p-value <sub>T</sub>
Female×40-49	-0.18	0.02	3.1e-15 ***	-0.16	0	< 2.2e-16 ***
Male×40-49	-0.2	0.03	1.2e-13 ***	-0.16	0.01	< 2.2e-16 ***
Female×50-59	-0.16	0.02	2.2e-16 ***	-0.15	0	< 2.2e-16 ***
Male×50-59	-0.16	0.02	2.2e-16 ***	-0.16	0	< 2.2e-16 ***
Female×60-69	-0.17	0.03	1.1e-10 ***	-0.15	0.01	< 2.2e-16 ***
Male×60-69	-0.16	0.02	1.8e-10 ***	-0.16	0.01	< 2.2e-16 ***
Female×≥ 70	-0.28	0.06	2.9e-06 ***	-0.17	0.01	< 2.2e-16 ***
Male×≥ 70	-0.29	0.06	9.8e-07 ***	-0.17	0.01	< 2.2e-16 ***
<b>Gender×Income, McFadden <math>R^2 = 0.55</math></b>						
Rail (intercept)	1.49	0.07	< 2.2e-16 ***			
Bus (intercept)	1.37	0.04	< 2.2e-16 ***			
Subway (intercept)	1.66	0.04	< 2.2e-16 ***			
Taxi (intercept)	-4.29	0.16	< 2.2e-16 ***			
Female×< 25,000	-0.17	0.04	1.9e-05 ***	-0.09	0	< 2.2e-16 ***
Male×< 25,000	-0.27	0.05	1.6e-07 ***	-0.1	0	< 2.2e-16 ***
Female×25,000-49,999	-0.16	0.03	2.0e-06 ***	-0.14	0.01	< 2.2e-16 ***
Male×25,000-49,999	-0.48	0.07	9.9e-12 ***	-0.15	0.01	< 2.2e-16 ***
Female×50,000-74,999	-0.17	0.03	6.4e-10 ***	-0.16	0.01	< 2.2e-16 ***
Male×50,000-74,999	-0.3	0.05	9.0e-11 ***	-0.15	0.01	< 2.2e-16 ***
Female×75,000-99,999	-0.26	0.04	4.1e-13 ***	-0.17	0.01	< 2.2e-16 ***
Male×75,000-99,999	-0.35	0.05	3.0e-14 ***	-0.16	0.01	< 2.2e-16 ***
Female×100,000-149,999	-0.2	0.02	6.7e-16 ***	-0.18	0.01	< 2.2e-16 ***
Male×100,000-149,999	-0.22	0.03	2.2e-16 ***	-0.18	0.01	< 2.2e-16 ***
Female×≥ 150,000	-0.2	0.02	< 2.2e-16 ***	-0.19	0.01	< 2.2e-16 ***
Male×≥ 150,000	-0.11	0.01	5.4e-13 ***	-0.17	0.01	< 2.2e-16 ***
<b>Gender×Distance, McFadden <math>R^2 = 0.55</math></b>						
Rail (intercept)	1.52	0.07	< 2.2e-16 ***			
Bus (intercept)	1.71	0.05	< 2.2e-16 ***			
Subway (intercept)	1.77	0.05	< 2.2e-16 ***			
Taxi (intercept)	-3.9	0.21	< 2.2e-16 ***			
Female×< 0.5	-0.64	0.09	2.8e-13 ***	-0.24	0.01	< 2.2e-16 ***
Male×< 0.5	-0.39	0.08	3.6e-06 ***	-0.25	0.02	< 2.2e-16 ***
Female×0.5-1	-0.48	0.06	3.6e-15 ***	-0.19	0.01	< 2.2e-16 ***
Male×0.5-1	-0.42	0.06	8.3e-13 ***	-0.2	0.01	< 2.2e-16 ***
Female×1-2	-0.22	0.03	5.3e-12 ***	-0.15	0	< 2.2e-16 ***
Male×1-2	-0.38	0.05	4.0e-15 ***	-0.17	0.01	< 2.2e-16 ***
Female×2-4	-0.18	0.03	1.1e-11 ***	-0.13	0	< 2.2e-16 ***
Male×2-4	-0.4	0.06	6.7e-12 ***	-0.13	0	< 2.2e-16 ***
Female×4-8	-0.12	0.02	4.6e-13 ***	-0.13	0	< 2.2e-16 ***
Male×4-8	-0.16	0.02	1.2e-13 ***	-0.13	0	< 2.2e-16 ***
Female×8-12	-0.05	0.01	1.1e-03 **	-0.11	0.01	< 2.2e-16 ***
Male×8-12	-0.03	0.01	5.4e-03 **	-0.11	0.01	< 2.2e-16 ***
Female×≥ 12	-0.01	0.01	6.2e-01	-0.08	0.01	6.7e-16 ***
Male×≥ 12	-0.03	0.02	5.7e-02	-0.11	0.01	< 2.2e-16 ***
<b>Gender×Trip purpose, McFadden <math>R^2 = 0.55</math></b>						
Rail (intercept)	1.48	0.07	< 2.2e-16 ***			
Bus (intercept)	1.47	0.04	< 2.2e-16 ***			
Subway (intercept)	1.7	0.04	< 2.2e-16 ***			
Taxi (intercept)	-4.31	0.16	< 2.2e-16 ***			
Female×Other	-0.67	0.09	9.6e-13 ***	-0.28	0.02	< 2.2e-16 ***
Male×Other	-0.28	0.04	2.3e-11 ***	-0.26	0.01	< 2.2e-16 ***
Female×Recreation	-0.15	0.02	4.8e-10 ***	-0.16	0.01	< 2.2e-16 ***
Male×Recreation	-0.22	0.03	1.1e-11 ***	-0.16	0.01	< 2.2e-16 ***
Female×Shopping/errands	-0.2	0.02	< 2.2e-16 ***	-0.16	0	< 2.2e-16 ***
Male×Shopping/errands	-0.29	0.03	< 2.2e-16 ***	-0.17	0.01	< 2.2e-16 ***
Female×Work/school	-0.1	0.01	1.6e-13 ***	-0.12	0	< 2.2e-16 ***
Male×Work/school	-0.11	0.01	< 2.2e-16 ***	-0.13	0	< 2.2e-16 ***
<b>Gender×Time of day, McFadden <math>R^2 = 0.53</math></b>						
Rail (intercept)	1.36	0.07	< 2.2e-16 ***			
Bus (intercept)	1.32	0.04	< 2.2e-16 ***			
Subway (intercept)	1.58	0.04	< 2.2e-16 ***			
Taxi (intercept)	-4.39	0.16	< 2.2e-16 ***			
Female×AM	-0.51	0.04	< 2.2e-16 ***	-0.14	0	< 2.2e-16 ***
Male×AM	-0.45	0.05	< 2.2e-16 ***	-0.14	0.01	< 2.2e-16 ***
Female×Midday	-0.16	0.02	< 2.2e-16 ***	-0.15	0	< 2.2e-16 ***

Table 7: Joint multinomial model results (*continued*)

Variables	Travel cost			Travel time		
	$\beta_C$	$SE_C$	p-value <sub>C</sub>	$\beta_T$	$SE_T$	p-value <sub>T</sub>
Male×Midday	-0.19	0.02	< 2.2e-16 ***	-0.16	0	< 2.2e-16 ***
Female×Night	-0.06	0.02	2.0e-05 ***	-0.12	0	< 2.2e-16 ***
Male×Night	-0.1	0.02	2.6e-07 ***	-0.12	0	< 2.2e-16 ***
Female×PM	-0.17	0.02	2.8e-14 ***	-0.15	0	< 2.2e-16 ***
Male×PM	-0.14	0.02	8.9e-11 ***	-0.14	0	< 2.2e-16 ***
Rail (intercept)	1.54	0.07	< 2.2e-16 ***			
Bus (intercept)	1.48	0.04	< 2.2e-16 ***			
Subway (intercept)	1.75	0.05	< 2.2e-16 ***			
Taxi (intercept)	-4.47	0.17	< 2.2e-16 ***			
< 25,000×16-20	-0.66	0.37	7.0e-02	-0.06	0.01	1.6e-09 ***
25,000-49,999×16-20	-0.77	0.3	9.2e-03 **	-0.1	0.02	3.2e-10 ***
50,000-74,999×16-20	-0.9	0.41	2.7e-02 *	-0.1	0.02	1.4e-09 ***
75,000-99,999×16-20	-0.62	0.24	1.0e-02 *	-0.08	0.01	3.8e-10 ***
100,000-149,999×16-20	-0.08	0.13	5.0e-01	-0.1	0.01	9.5e-12 ***
≥ 150,000×16-20	-0.41	0.14	5.0e-03 **	-0.19	0.03	1.5e-11 ***
< 25,000×20-29	-0.04	0.05	4.2e-01	-0.08	0.01	< 2.2e-16 ***
25,000-49,999×20-29	0.01	0.03	5.8e-01	-0.09	0.01	< 2.2e-16 ***
50,000-74,999×20-29	-0.08	0.05	1.2e-01	-0.11	0.01	< 2.2e-16 ***
75,000-99,999×20-29	-0.1	0.06	1.1e-01	-0.09	0.01	< 2.2e-16 ***
100,000-149,999×20-29	-0.21	0.06	1.5e-03 **	-0.15	0.01	< 2.2e-16 ***
≥ 150,000×20-29	-0.08	0.04	4.3e-02 *	-0.12	0.01	< 2.2e-16 ***
< 25,000×30-39	-0.56	0.15	2.0e-04 ***	-0.09	0.01	< 2.2e-16 ***
25,000-49,999×30-39	-0.28	0.09	1.9e-03 **	-0.16	0.01	< 2.2e-16 ***
50,000-74,999×30-39	-0.1	0.04	9.1e-03 **	-0.15	0.01	< 2.2e-16 ***
75,000-99,999×30-39	-0.4	0.1	2.3e-05 ***	-0.16	0.01	< 2.2e-16 ***
100,000-149,999×30-39	-0.24	0.05	4.8e-06 ***	-0.17	0.01	< 2.2e-16 ***
≥ 150,000×30-39	-0.26	0.05	1.3e-08 ***	-0.18	0.01	< 2.2e-16 ***
< 25,000×40-49	-0.42	0.09	3.4e-06 ***	-0.09	0.01	< 2.2e-16 ***
25,000-49,999×40-49	-0.32	0.08	5.1e-05 ***	-0.14	0.01	< 2.2e-16 ***
50,000-74,999×40-49	-0.26	0.06	4.1e-06 ***	-0.17	0.01	< 2.2e-16 ***
75,000-99,999×40-49	-0.22	0.05	7.4e-07 ***	-0.19	0.01	< 2.2e-16 ***
100,000-149,999×40-49	-0.31	0.05	6.7e-09 ***	-0.2	0.01	< 2.2e-16 ***
≥ 150,000×40-49	-0.15	0.02	7.4e-14 ***	-0.22	0.01	< 2.2e-16 ***
< 25,000×50-59	-0.17	0.06	4.3e-03 **	-0.1	0	< 2.2e-16 ***
25,000-49,999×50-59	-0.31	0.07	1.3e-05 ***	-0.16	0.01	< 2.2e-16 ***
50,000-74,999×50-59	-0.21	0.05	4.1e-05 ***	-0.17	0.01	< 2.2e-16 ***
75,000-99,999×50-59	-0.43	0.07	1.3e-10 ***	-0.21	0.01	< 2.2e-16 ***
100,000-149,999×50-59	-0.18	0.03	5.8e-12 ***	-0.19	0.01	< 2.2e-16 ***
≥ 150,000×50-59	-0.12	0.02	2.7e-10 ***	-0.18	0.01	< 2.2e-16 ***
< 25,000×60-69	-0.02	0.04	5.5e-01	-0.09	0.01	< 2.2e-16 ***
25,000-49,999×60-69	-0.36	0.1	4.9e-04 ***	-0.17	0.01	< 2.2e-16 ***
50,000-74,999×60-69	-0.39	0.09	1.9e-05 ***	-0.16	0.01	< 2.2e-16 ***
75,000-99,999×60-69	-0.33	0.07	4.1e-06 ***	-0.21	0.01	< 2.2e-16 ***
100,000-149,999×60-69	-0.24	0.05	1.8e-06 ***	-0.19	0.01	< 2.2e-16 ***
≥ 150,000×60-69	-0.14	0.03	9.2e-07 ***	-0.19	0.01	< 2.2e-16 ***
< 25,000×≥ 70	-0.56	0.15	2.1e-04 ***	-0.13	0.01	< 2.2e-16 ***
25,000-49,999×≥ 70	-0.33	0.11	2.6e-03 **	-0.21	0.02	< 2.2e-16 ***
50,000-74,999×≥ 70	-0.48	0.12	8.3e-05 ***	-0.25	0.03	< 2.2e-16 ***
75,000-99,999×≥ 70	-0.27	0.1	6.3e-03 **	-0.19	0.02	< 2.2e-16 ***
100,000-149,999×≥ 70	-0.05	0.07	4.9e-01	-0.18	0.02	6.9e-15 ***
≥ 150,000×≥ 70	-1.22	0.4	2.2e-03 **	-0.15	0.02	6.0e-12 ***
Rail (intercept)	1.61	0.07	< 2.2e-16 ***			
Bus (intercept)	1.83	0.05	< 2.2e-16 ***			
Subway (intercept)	1.88	0.05	< 2.2e-16 ***			
Taxi (intercept)	-4.37	0.21	< 2.2e-16 ***			
< 25,000×< 0.5	-0.44	0.18	1.5e-02 *	-0.14	0.02	1.5e-14 ***
25,000-49,999×< 0.5	-0.4	0.16	1.2e-02 *	-0.27	0.03	< 2.2e-16 ***
50,000-74,999×< 0.5	-0.03	0.08	7.2e-01	-0.28	0.02	< 2.2e-16 ***
75,000-99,999×< 0.5	-1.05	0.22	2.4e-06 ***	-0.32	0.04	1.3e-12 ***
100,000-149,999×< 0.5	-1.02	0.19	4.2e-08 ***	-0.31	0.03	< 2.2e-16 ***
≥ 150,000×< 0.5	-0.68	0.15	2.9e-06 ***	-0.31	0.03	< 2.2e-16 ***
< 25,000×0.5-1	-0.52	0.13	5.1e-05 ***	-0.1	0.01	< 2.2e-16 ***
25,000-49,999×0.5-1	-0.31	0.1	1.8e-03 **	-0.21	0.01	< 2.2e-16 ***
50,000-74,999×0.5-1	-0.39	0.1	2.0e-04 ***	-0.23	0.01	< 2.2e-16 ***
75,000-99,999×0.5-1	-0.81	0.17	1.7e-06 ***	-0.25	0.02	< 2.2e-16 ***
100,000-149,999×0.5-1	-0.61	0.11	8.1e-08 ***	-0.27	0.02	< 2.2e-16 ***



Table 7: Joint multinomial model results (*continued*)

Variables	Travel cost			Travel time		
	$\beta_C$	SE <sub>C</sub>	p-value <sub>C</sub>	$\beta_T$	SE <sub>T</sub>	p-value <sub>T</sub>
$\geq 150,000 \times 0.5-1$	-0.31	0.06	8.7e-08 ***	-0.26	0.01	< 2.2e-16 ***
< 25,000 $\times 1-2$	-0.11	0.06	6.8e-02	-0.11	0	< 2.2e-16 ***
25,000-49,999 $\times 1-2$	-0.67	0.15	1.4e-05 ***	-0.15	0.01	< 2.2e-16 ***
50,000-74,999 $\times 1-2$	-0.43	0.11	1.8e-04 ***	-0.18	0.01	< 2.2e-16 ***
75,000-99,999 $\times 1-2$	-0.19	0.05	1.1e-04 ***	-0.19	0.01	< 2.2e-16 ***
100,000-149,999 $\times 1-2$	-0.23	0.05	2.7e-06 ***	-0.21	0.01	< 2.2e-16 ***
$\geq 150,000 \times 1-2$	-0.29	0.05	4.8e-08 ***	-0.2	0.01	< 2.2e-16 ***
< 25,000 $\times 2-4$	-0.41	0.13	1.2e-03 **	-0.09	0	< 2.2e-16 ***
25,000-49,999 $\times 2-4$	-0.17	0.06	4.4e-03 **	-0.13	0.01	< 2.2e-16 ***
50,000-74,999 $\times 2-4$	-0.23	0.06	2.9e-04 ***	-0.13	0.01	< 2.2e-16 ***
75,000-99,999 $\times 2-4$	-0.2	0.05	1.6e-04 ***	-0.15	0.01	< 2.2e-16 ***
100,000-149,999 $\times 2-4$	-0.34	0.07	3.6e-06 ***	-0.16	0.01	< 2.2e-16 ***
$\geq 150,000 \times 2-4$	-0.18	0.04	1.7e-06 ***	-0.16	0.01	< 2.2e-16 ***
< 25,000 $\times 4-8$	-0.57	0.13	1.2e-05 ***	-0.12	0.01	< 2.2e-16 ***
25,000-49,999 $\times 4-8$	-0.07	0.03	3.3e-02 *	-0.11	0.01	< 2.2e-16 ***
50,000-74,999 $\times 4-8$	-0.15	0.03	7.9e-06 ***	-0.16	0.01	< 2.2e-16 ***
75,000-99,999 $\times 4-8$	-0.11	0.03	6.8e-04 ***	-0.12	0.01	< 2.2e-16 ***
100,000-149,999 $\times 4-8$	-0.13	0.03	6.0e-07 ***	-0.15	0.01	< 2.2e-16 ***
$\geq 150,000 \times 4-8$	-0.14	0.02	1.4e-08 ***	-0.16	0.01	< 2.2e-16 ***
< 25,000 $\times 8-12$	-0.13	0.11	2.2e-01	-0.1	0.02	1.6e-07 ***
25,000-49,999 $\times 8-12$	-0.06	0.04	2.1e-01	-0.12	0.02	7.2e-09 ***
50,000-74,999 $\times 8-12$	-0.02	0.03	4.5e-01	-0.09	0.01	< 2.2e-16 ***
75,000-99,999 $\times 8-12$	-0.16	0.09	5.5e-02	-0.16	0.03	2.8e-10 ***
100,000-149,999 $\times 8-12$	-0.04	0.02	4.4e-02 *	-0.13	0.01	< 2.2e-16 ***
$\geq 150,000 \times 8-12$	-0.01	0.01	3.3e-01	-0.11	0.01	< 2.2e-16 ***
< 25,000 $\times \geq 12$	0.05	0.02	6.9e-03 **	-0.06	0.02	1.7e-04 ***
25,000-49,999 $\times \geq 12$	-0.85	1.26	5.0e-01	-0.57	0.63	3.7e-01
50,000-74,999 $\times \geq 12$	-0.32	0.19	9.9e-02	-0.47	0.22	3.7e-02 *
75,000-99,999 $\times \geq 12$	-0.02	0.04	6.2e-01	-0.08	0.02	3.1e-07 ***
100,000-149,999 $\times \geq 12$	-0.01	0.02	7.5e-01	-0.09	0.02	1.9e-08 ***
$\geq 150,000 \times \geq 12$	-0.01	0.02	6.8e-01	-0.11	0.02	9.7e-09 ***
Rail (intercept)	1.59	0.07	< 2.2e-16 ***			
Bus (intercept)	1.6	0.05	< 2.2e-16 ***			
Subway (intercept)	1.8	0.05	< 2.2e-16 ***			
Taxi (intercept)	-4.6	0.17	< 2.2e-16 ***			
< 25,000 $\times$ Other	-0.9	0.27	8.3e-04 ***	-0.15	0.02	< 2.2e-16 ***
25,000-49,999 $\times$ Other	-1.42	0.46	2.3e-03 **	-0.34	0.05	1.0e-11 ***
50,000-74,999 $\times$ Other	-0.56	0.13	3.6e-05 ***	-0.31	0.03	< 2.2e-16 ***
75,000-99,999 $\times$ Other	-1	0.19	1.2e-07 ***	-0.28	0.03	< 2.2e-16 ***
100,000-149,999 $\times$ Other	-0.51	0.09	2.1e-08 ***	-0.35	0.03	< 2.2e-16 ***
$\geq 150,000 \times$ Other	-0.25	0.05	4.9e-08 ***	-0.3	0.02	< 2.2e-16 ***
< 25,000 $\times$ Recreation	-0.73	0.1	8.9e-13 ***	-0.1	0.01	< 2.2e-16 ***
25,000-49,999 $\times$ Recreation	-0.22	0.09	1.9e-02 *	-0.15	0.01	< 2.2e-16 ***
50,000-74,999 $\times$ Recreation	-0.21	0.06	1.9e-04 ***	-0.19	0.01	< 2.2e-16 ***
75,000-99,999 $\times$ Recreation	-0.2	0.05	1.7e-04 ***	-0.19	0.01	< 2.2e-16 ***
100,000-149,999 $\times$ Recreation	-0.23	0.04	2.2e-08 ***	-0.22	0.02	< 2.2e-16 ***
$\geq 150,000 \times$ Recreation	-0.14	0.03	2.9e-08 ***	-0.22	0.01	< 2.2e-16 ***
< 25,000 $\times$ Shopping/errands	-0.08	0.04	1.7e-02 *	-0.1	0	< 2.2e-16 ***
25,000-49,999 $\times$ Shopping/errands	-0.58	0.1	4.8e-09 ***	-0.2	0.01	< 2.2e-16 ***
50,000-74,999 $\times$ Shopping/errands	-0.37	0.06	6.1e-09 ***	-0.21	0.01	< 2.2e-16 ***
75,000-99,999 $\times$ Shopping/errands	-0.36	0.07	1.3e-07 ***	-0.25	0.01	< 2.2e-16 ***
100,000-149,999 $\times$ Shopping/errands	-0.26	0.04	1.7e-12 ***	-0.24	0.01	< 2.2e-16 ***
$\geq 150,000 \times$ Shopping/errands	-0.33	0.04	< 2.2e-16 ***	-0.24	0.01	< 2.2e-16 ***
< 25,000 $\times$ Work/school	-0.14	0.05	9.6e-03 **	-0.09	0.01	< 2.2e-16 ***
25,000-49,999 $\times$ Work/school	-0.09	0.03	5.6e-03 **	-0.12	0	< 2.2e-16 ***
50,000-74,999 $\times$ Work/school	-0.11	0.03	6.0e-05 ***	-0.12	0	< 2.2e-16 ***
75,000-99,999 $\times$ Work/school	-0.2	0.03	8.6e-09 ***	-0.13	0	< 2.2e-16 ***
100,000-149,999 $\times$ Work/school	-0.14	0.02	2.2e-10 ***	-0.15	0	< 2.2e-16 ***
$\geq 150,000 \times$ Work/school	-0.07	0.01	4.1e-08 ***	-0.14	0	< 2.2e-16 ***
Rail (intercept)	1.46	0.07	< 2.2e-16 ***			
Bus (intercept)	1.43	0.04	< 2.2e-16 ***			
Subway (intercept)	1.65	0.05	< 2.2e-16 ***			
Taxi (intercept)	-4.57	0.17	< 2.2e-16 ***			
< 25,000 $\times$ AM	-0.36	0.12	2.3e-03 **	-0.09	0.01	< 2.2e-16 ***
25,000-49,999 $\times$ AM	-0.96	0.13	9.4e-13 ***	-0.14	0.01	< 2.2e-16 ***
50,000-74,999 $\times$ AM	-0.35	0.08	2.1e-05 ***	-0.13	0.01	< 2.2e-16 ***

Table 7: Joint multinomial model results (*continued*)

Variables	Travel cost			Travel time		
	$\beta_C$	$SE_C$	p-value $_C$	$\beta_T$	$SE_T$	p-value $_T$
75,000-99,999×AM	-0.69	0.1	1.0e-12 ***	-0.16	0.01	< 2.2e-16 ***
100,000-149,999×AM	-0.53	0.07	4.9e-15 ***	-0.16	0.01	< 2.2e-16 ***
≥ 150,000×AM	-0.41	0.06	6.3e-12 ***	-0.17	0.01	< 2.2e-16 ***
< 25,000×Midday	-0.18	0.04	4.0e-05 ***	-0.09	0	< 2.2e-16 ***
25,000-49,999×Midday	-0.28	0.05	3.6e-08 ***	-0.16	0.01	< 2.2e-16 ***
50,000-74,999×Midday	-0.19	0.03	9.0e-09 ***	-0.18	0.01	< 2.2e-16 ***
75,000-99,999×Midday	-0.21	0.03	8.6e-10 ***	-0.2	0.01	< 2.2e-16 ***
100,000-149,999×Midday	-0.27	0.03	2.4e-15 ***	-0.22	0.01	< 2.2e-16 ***
≥ 150,000×Midday	-0.19	0.02	6.7e-16 ***	-0.21	0.01	< 2.2e-16 ***
< 25,000×Night	-0.14	0.07	4.6e-02 *	-0.09	0.01	< 2.2e-16 ***
25,000-49,999×Night	-0.03	0.02	2.0e-01	-0.11	0.01	< 2.2e-16 ***
50,000-74,999×Night	-0.12	0.04	8.9e-03 **	-0.12	0.01	< 2.2e-16 ***
75,000-99,999×Night	-0.18	0.05	5.5e-04 ***	-0.13	0.01	< 2.2e-16 ***
100,000-149,999×Night	-0.07	0.02	2.5e-03 **	-0.13	0.01	< 2.2e-16 ***
≥ 150,000×Night	-0.09	0.02	8.5e-06 ***	-0.15	0.01	< 2.2e-16 ***
< 25,000×PM	-0.27	0.08	7.3e-04 ***	-0.1	0.01	< 2.2e-16 ***
25,000-49,999×PM	-0.44	0.09	1.2e-06 ***	-0.14	0.01	< 2.2e-16 ***
50,000-74,999×PM	-0.32	0.07	1.1e-06 ***	-0.16	0.01	< 2.2e-16 ***
75,000-99,999×PM	-0.42	0.06	8.7e-11 ***	-0.15	0.01	< 2.2e-16 ***
100,000-149,999×PM	-0.16	0.03	1.5e-08 ***	-0.18	0.01	< 2.2e-16 ***
≥ 150,000×PM	-0.09	0.02	2.5e-07 ***	-0.17	0.01	< 2.2e-16 ***
Rail (intercept)	1.44	0.07	< 2.2e-16 ***			
Bus (intercept)	1.49	0.04	< 2.2e-16 ***			
Subway (intercept)	1.69	0.04	< 2.2e-16 ***			
Taxi (intercept)	-4.65	0.17	< 2.2e-16 ***			
Other×AM	-0.26	0.05	6.0e-08 ***	-0.28	0.02	< 2.2e-16 ***
Recreation×AM	-0.63	0.16	1.1e-04 ***	-0.15	0.01	< 2.2e-16 ***
Shopping/errands×AM	-0.36	0.1	2.4e-04 ***	-0.17	0.01	< 2.2e-16 ***
Work/school×AM	-0.4	0.04	< 2.2e-16 ***	-0.11	0	< 2.2e-16 ***
Other×Midday	-0.39	0.07	1.4e-07 ***	-0.27	0.02	< 2.2e-16 ***
Recreation×Midday	-0.31	0.05	6.3e-12 ***	-0.16	0.01	< 2.2e-16 ***
Shopping/errands×Midday	-0.23	0.03	< 2.2e-16 ***	-0.16	0	< 2.2e-16 ***
Work/school×Midday	-0.09	0.01	2.7e-11 ***	-0.15	0	< 2.2e-16 ***
Other×Night	-0.27	0.09	2.3e-03 **	-0.23	0.02	< 2.2e-16 ***
Recreation×Night	-0.09	0.02	4.0e-07 ***	-0.16	0.01	< 2.2e-16 ***
Shopping/errands×Night	-0.12	0.03	2.8e-04 ***	-0.15	0.01	< 2.2e-16 ***
Work/school×Night	-0.04	0.02	2.6e-02 *	-0.09	0	< 2.2e-16 ***
Other×PM	-0.89	0.15	2.6e-09 ***	-0.33	0.03	< 2.2e-16 ***
Recreation×PM	-0.7	0.1	5.7e-12 ***	-0.15	0.01	< 2.2e-16 ***
Shopping/errands×PM	-0.22	0.04	2.8e-08 ***	-0.18	0.01	< 2.2e-16 ***
Work/school×PM	-0.07	0.01	3.2e-07 ***	-0.13	0	< 2.2e-16 ***

\* Significance level codes: '\*\*\*' 99.99%, '\*\*' 99%, '\*' 95%