Appendix A: List of HOV Lanes in our Field Experiment

Here is the list of HOV lanes we consider for selecting the users in our analysis:

- California: SR-57 N, I-880 N, I-805 N, US-101 N, SR-22 E, SR-237 E, and SR-57 S.
- Washington: I-90 W, SR-520 E, Exit 11: I-90 W / Seattle, and SR-520 W.
- Massachusetts: I-93 (North Expressway), and I-93 (Southeast Expressway).
- Georgia: I-75, I-85, and I-20.

Appendix B: Additional Figures on Time Saving

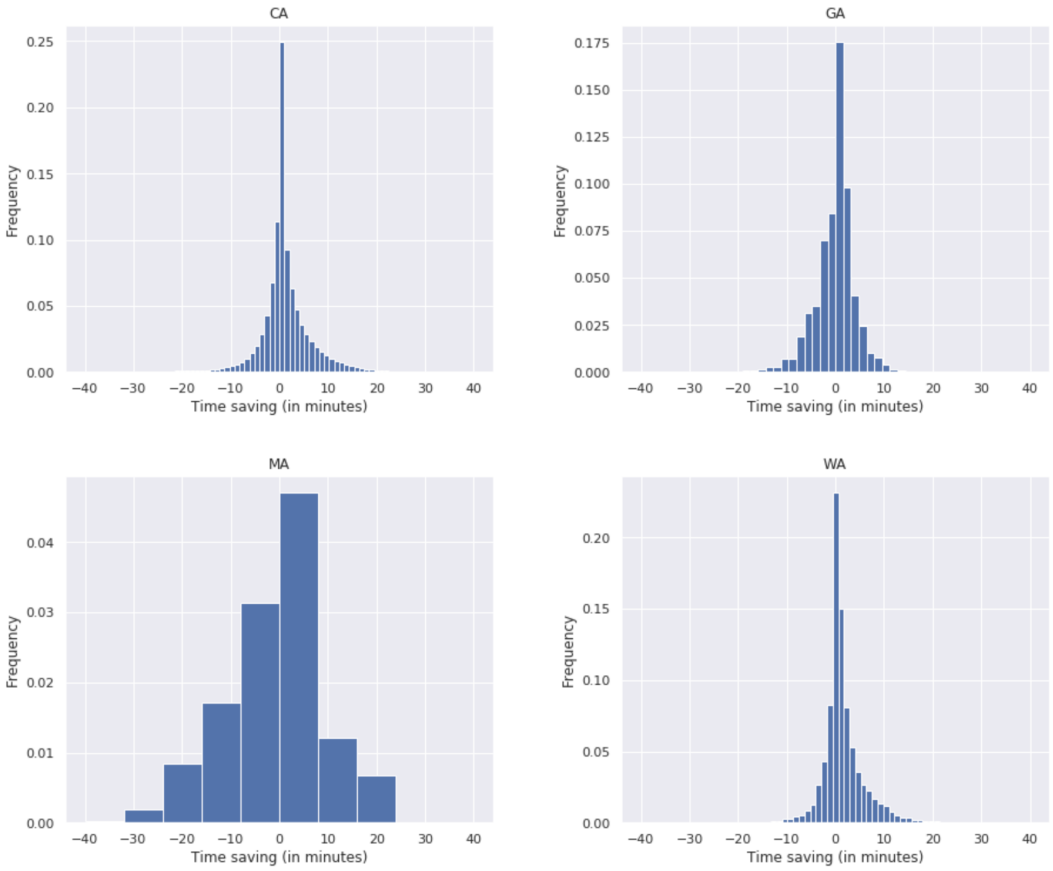


Figure 14 **Time saving distribution for each market (CA, GA, MA, WA).**

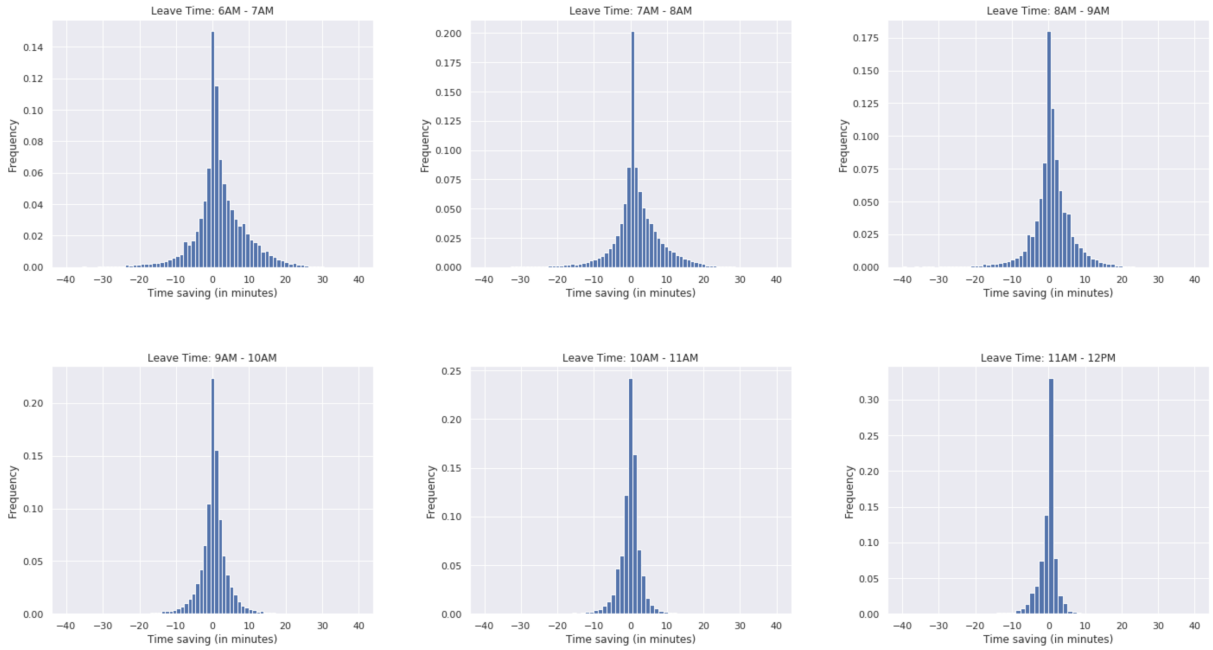
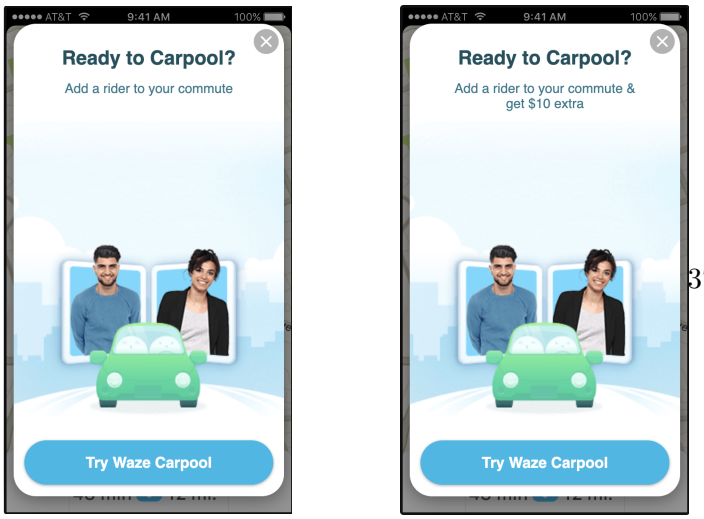


Figure 15 **Time saving distribution for different leave times.**

Appendix C: Screenshots of the Encouragements

(a) Condition A (b) Condition B (c) Condition C

Figure 16 **Copy of the messages used in our field experiment for L users.**



(a) Condition A (b) Condition B

Figure 17 **Copy of the messages used in our field experiment for N users.**

Appendix D: Additional Balancedness Checks

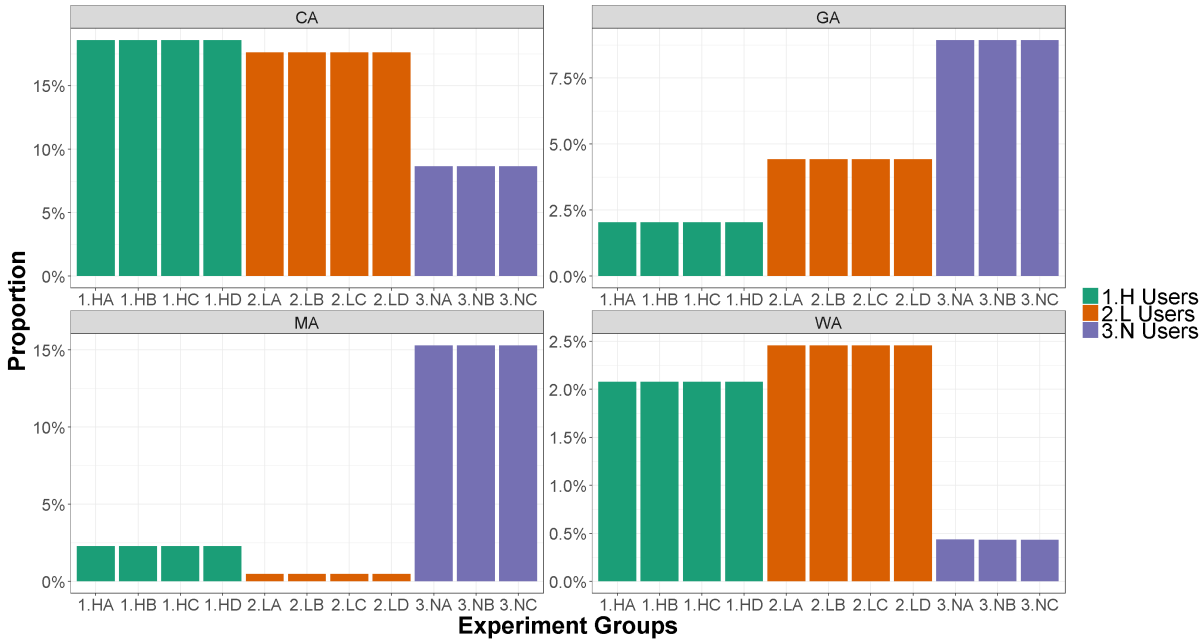
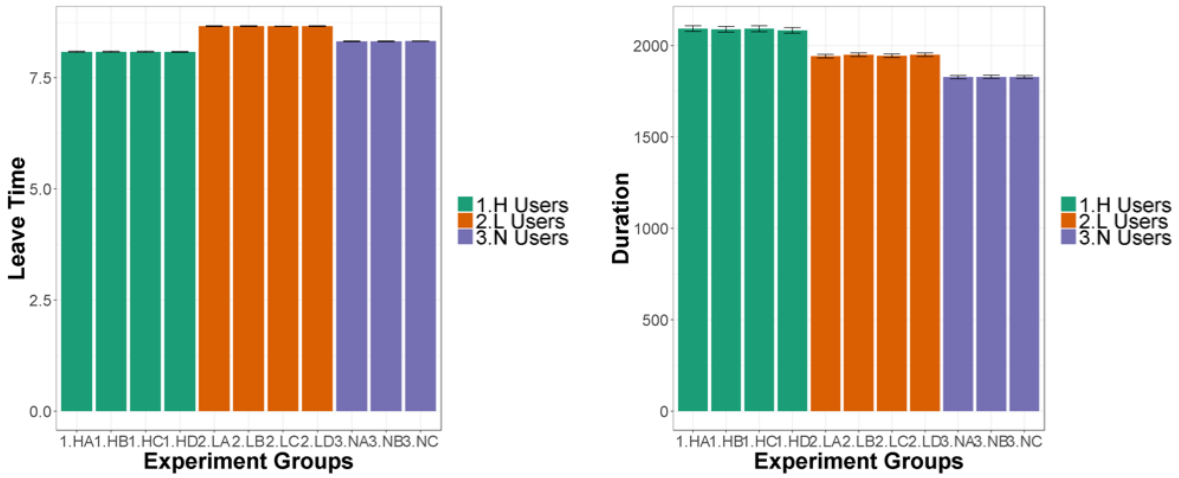


Figure 18 **Proportion in the four markets across the different conditions for each user type.**



(a) Leave time (b) Duration (in minutes)

Figure 19 **Average leave time and duration (in minutes) in the last 30 days.**

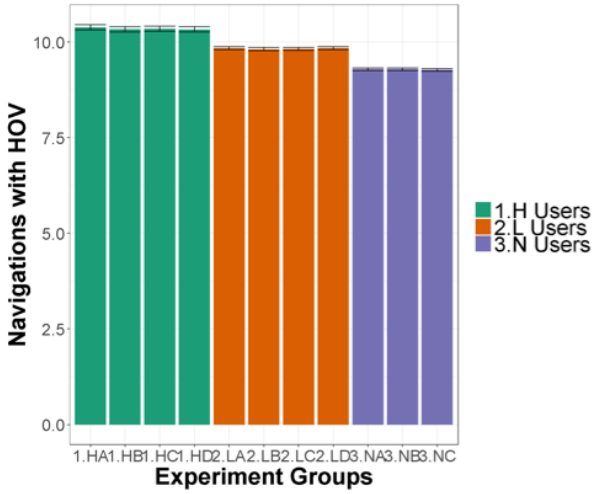


Figure 20 **Average number of navigations with a HOV lane in the last 30 days.**

Appendix E: Additional Regression Results

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)1.HA	0.884***	0.866***	1.778***	1.766***
	(0.018)	(0.019)	(0.446)	(0.448)
factor(experiment_group)1.HB	1.142***	1.128***	2.109***	2.099***
	(0.018)	(0.018)	(0.441)	(0.443)
log(avg_distance_km)		-0.430***		-0.630**
		(0.015)		(0.267)
log(avg_leave_time)		-2.814***		-4.138***
		(0.056)		(1.019)
log(days_since_waze_ob)		0.090***		0.124
		(0.007)		(0.120)
log(sessions_30d)		0.178***		0.262
		(0.010)		(0.184)
factor(market)GA		-0.556***		-1.116*
		(0.026)		(0.603)
factor(market)MA		0.327***		0.382
		(0.025)		(0.398)
factor(market)WA		0.816***		0.973**
		(0.028)		(0.419)
Constant	0.658***	6.750***	-7.222***	1.710
	(0.016)	(0.143)	(0.414)	(2.587)
Observations	1,483	1,483	1,483	1,483
R^2	0.004	0.010		
Adjusted R^2	0.003	0.004		
Log Likelihood			-335.745	-331.147
Akaike Inf. Crit.			677.490	682.295
Residual Std. Error	0.239 (df = 1480)	0.238 (df = 1473)		
F Statistic	3.090** (df = 2; 1480)	1.684* (df = 9; 1473)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 21 Regression estimates using OBR1 for H users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)2.LA	0.204***	0.194***	0.521*	0.504*
	(0.009)	(0.009)	(0.284)	(0.284)
factor(experiment_group)2.LB	0.255***	0.245***	0.634**	0.614**
	(0.009)	(0.009)	(0.283)	(0.284)
log(avg_distance_km)		-0.004		-0.014
		(0.007)		(0.195)
log(avg_leave_time)		-1.227***		-2.790***
		(0.025)		(0.723)
log(days_since_waze_ob)		0.083***		0.194*
		(0.004)		(0.107)
log(sessions_30d)		0.007		0.020
		(0.005)		(0.150)
factor(market)GA		0.119***		0.266
		(0.009)		(0.253)
factor(market)MA		-0.286***		-0.700
		(0.023)		(0.730)
factor(market)WA		-0.027**		-0.070
		(0.012)		(0.358)
Constant	0.712***	2.816***	-7.060***	-2.345
	(0.008)	(0.067)	(0.246)	(1.924)
Observations	3,386	3,386	3,386	3,386
R^2	0.0004	0.002		
Adjusted R^2	-0.0002	-0.001		
Log Likelihood			-524.557	-522.117
Akaike Inf. Crit.			1,055.114	1,064.234
Residual Std. Error	0.186 (df = 3383)	0.186 (df = 3376)		
F Statistic	0.637 (df = 2; 3383)	0.684 (df = 9; 3376)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 22 Regression estimates using OBR1 for L users.

Table 7 Regression estimates for OBR1 when comparing the differences.

	OLS HA - HC vs. LA - LC	OLS HB - HC vs. LB - LC	OLS HA - HC vs. NB - NA	OLS HB - HC vs. NB - NA	OLS LA - LC vs. NB - NA	OLS LB - LC vs. NB - NA
H	0.0002	0.0002	0.0001	0.0001		
	(0.0004)	(0.0004)	(0.0004)	(0.0004)		
L					−0.0002	−0.0002
					(0.0003)	(0.0003)
A	0.001***		−0.0003		−0.0003	
	(0.0003)		(0.0002)		(0.0002)	
H × A	0.001**		0.003***			
	(0.001)		(0.001)			
B		0.001***		−0.0003		−0.0003
		(0.0003)		(0.0002)		(0.0002)
H × B		0.001*		0.003***		
		(0.001)		(0.001)		
L × A					0.001***	
					(0.0004)	
L × B						0.002***
						(0.0004)
Constant	0.001***	0.001***	0.002***	0.002***	0.002***	0.002***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Observations	121,297	121,011	153,122	153,103	208,217	207,950
R^2	0.0003	0.0004	0.0004	0.0004	0.0001	0.0002
Residual Std. Error	0.046 (df = 121293)	0.048 (df = 121007)	0.042 (df = 153118)	0.042 (df = 153099)	0.041 (df = 208213)	0.041 (df = 207946)
F Statistic	13.730*** (df = 3; 121293)	14.307*** (df = 3; 121007)	18.928*** (df = 3; 153118)	18.974*** (df = 3; 153099)	5.951*** (df = 3; 208213)	10.399*** (df = 3; 207946)

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

	Dependent variable:			
	OBR1			
	OLS		*logistic*	
	(1)	(2)	(3)	(4)
factor(experiment_group)3.NA	0.007	0.006	0.215	0.208
	(0.009)	(0.009)	(0.273)	(0.275)
log(avg_distance_km)		0.006		0.191
		(0.008)		(0.247)
log(avg_leave_time)		-0.009		-0.255
		(0.037)		(1.102)
log(days_since_waze_ob)		0.003		0.102
		(0.005)		(0.165)
log(sessions_30d)		0.013*		0.415*
		(0.007)		(0.219)
factor(market)GA		0.006		0.122
		(0.013)		(0.356)
factor(market)MA		-0.022*		-0.721*
		(0.012)		(0.371)
factor(market)WA		-0.038		-13.332
		(0.045)		(577.622)
Constant	0.030***	-0.036	-3.468***	-5.684**
	(0.006)	(0.095)	(0.203)	(2.868)
Observations	1,660	1,660	1,660	1,660
R^2	0.0004	0.007		
Adjusted R^2	-0.0002	0.003		
Log Likelihood			-244.530	-238.384
Akaike Inf. Crit.			493.060	494.767
Residual Std. Error	0.181 (df = 1658)	0.180 (df = 1651)		
F Statistic	0.621 (df = 1; 1658)	1.533 (df = 8; 1651)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 23 Regression estimates using OBR1 for N users.

Table 8 Regression estimates for CTR including interaction terms with average time saving.

	OLS	Logistic
HA	0.0002	0.498*
	(0.008)	(0.276)
HB	-0.007	0.338
	(0.008)	(0.273)
HC	0.005	0.277
	(0.008)	(0.437)
LA	0.02***	0.982***
	(0.002)	(0.113)
LB	0.016***	0.867***
	(0.002)	(0.114)
log(avg_time_saving + 1)	0.002	0.115
	(0.002)	(0.09)
log(avg_distance)	0.005***	0.183***
	(0.001)	(0.033)
log(avg_leave_time)	0.015***	0.564***
	(0.003)	(0.123)
log(days_since_joined)	-0.002***	-0.068***
	(0.0004)	(0.0316)
log(sessions_30d)	0.001*	0.049*
	(0.001)	(0.026)
GA	-0.008***	-0.6312***
	(0.001)	(0.045)
MA	-0.006***	-0.22***
	(0.002)	(0.081)
WA	-0.008***	-0.342***
	(0.001)	(0.057)
HA × log(avg_time_saving + 1)	0.009**	0.166
	(0.004)	(0.143)
HB × log(avg_time_saving + 1)	0.013***	0.253*
	(0.004)	(0.141)
HC × log(avg_time_saving + 1)	-0.003	-0.191
	(0.004)	(0.207)
LA × log(avg_time_saving + 1)	-0.001	-0.093
	(0.002)	(0.107)
LB × log(avg_time_saving + 1)	0.002	-0.0003
	(0.002)	(0.108)
Constant	-0.021**	-5.716***
	(0.009)	(0.15)
Observations	181,282	181,282
R^2	0.005	0.006
Log Likelihood		-21,912.35
Residual Std. Error	0.1161 (df = 181262)	
F Statistic	49.383*** (df = 19;181282)	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Note. OLS corresponds to Equation (3), whereas Logistic corresponds to Equation (4).

Appendix F: Carpool Adoption Results

For H users

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)1.HA	-0.069	-0.068	-1.993	-0.587
	(0.071)	(0.071)	(2.833)	(3.361)
factor(experiment_group)1.HB	-0.110	-0.107	-36.282	-36.649
	(0.071)	(0.071)	(6,286.937)	(8,668.560)
log(avg_distance_km)		0.046		1.011
		(0.058)		(4.046)
log(avg_leave_time)		-0.418*		-23.323
		(0.216)		(15.468)
log(days_since_waze_ob)		0.037		2.548
		(0.026)		(2.326)
log(sessions_30d)		-0.023		-2.941
		(0.040)		(3.277)
factor(market)GA		0.260***		5.873*
		(0.099)		(3.401)
factor(market)MA		-0.022		-34.117
		(0.097)		(21,996.050)
factor(market)WA		-0.023		-35.110
		(0.107)		(22,801.640)
Constant	0.110*	0.659	-10.850***	25.747
	(0.061)	(0.549)	(2.004)	(46.293)
Observations	1,483	1,483	1,483	1,483
R^2	0.002	0.010		
Adjusted R^2	0.0003	0.004		
Log Likelihood			-13.850	-9.509
Akaike Inf. Crit.			33.699	39.018
Residual Std. Error	0.037 (df = 1480)	0.037 (df = 1473)		
F Statistic	1.229 (df = 2; 1480)	1.672* (df = 9; 1473)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 24 Regression estimates using TSO30 for H users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)1.HA	-0.207	-0.217	-2.005	-2.006
	(0.142)	(0.142)	(1.640)	(1.688)
factor(experiment_group)1.HB	-0.251*	-0.262*	-2.892	-3.004
	(0.141)	(0.141)	(1.832)	(1.881)
log(avg_distance_km)		0.099		1.267
		(0.115)		(1.897)
log(avg_leave_time)		-0.956**		-13.361**
		(0.431)		(6.543)
log(days_since_waze_ob)		0.096*		1.816*
		(0.051)		(1.019)
log(sessions_30d)		-0.048		-1.049
		(0.080)		(1.363)
factor(market)GA		0.156		1.310
		(0.197)		(2.296)
factor(market)MA		-0.146		-30.434
		(0.193)		(3,277.346)
factor(market)WA		-0.148		-30.602
		(0.214)		(3,696.379)
Constant	0.329***	1.576	-8.635***	6.562
	(0.121)	(1.097)	(1.162)	(18.128)
Observations	1,483	1,483	1,483	1,483
R^2	0.002	0.009		
Adjusted R^2	0.001	0.003		
Log Likelihood			-48.469	-42.775
Akaike Inf. Crit.			102.939	105.551
Residual Std. Error	0.073 (df = 1480)	0.073 (df = 1473)		
F Statistic	1.602 (df = 2; 1480)	1.508 (df = 9; 1473)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 25 Regression estimates using TSO180 for H users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)1.HA	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(55,213.420)	(55,361.150)
factor(experiment_group)1.HB	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(54,944.340)	(55,095.030)
log(avg_distance_km)		0.000		-0.000
		(0.000)		(44,899.540)
log(avg_leave_time)		0.000		-0.000
		(0.000)		(167,672.500)
log(days_since_waze_ob)		0.000		0.000
		(0.000)		(19,972.960)
log(sessions_30d)		0.000		-0.000
		(0.000)		(31,103.190)
factor(market)GA		0.000		-0.000
		(0.000)		(76,670.480)
factor(market)MA		0.000		-0.000
		(0.000)		(75,298.660)
factor(market)WA		0.000		-0.000
		(0.000)		(83,411.820)
Constant	0.000	0.000	-53.132	-53.132
	(0.000)	(0.000)	(47,169.780)	(427,190.300)
Observations	1,483	1,483	1,483	1,483
Log Likelihood			-0.000	-0.000
Akaike Inf. Crit.			6.000	20.000
Residual Std. Error	0.000 (df = 1480)	0.000 (df = 1473)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 26 Regression estimates using TCR30 for H users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)1.HA	-0.110	-0.121	-34.282	-36.166
	(0.101)	(0.101)	(3,883.756)	(5,602.931)
factor(experiment_group)1.HB	0.008	-0.004	0.137	-0.331
	(0.100)	(0.100)	(2.315)	(2.384)
log(avg_distance_km)		0.167**		6.470**
		(0.082)		(3.157)
log(avg_leave_time)		-0.179		-6.323
		(0.305)		(9.074)
log(days_since_waze_ob)		0.049		2.124
		(0.036)		(1.458)
log(sessions_30d)		-0.030		-1.319
		(0.057)		(1.786)
factor(market)GA		-0.058		-35.033
		(0.140)		(13,153.660)
factor(market)MA		-0.035		-33.795
		(0.137)		(12,657.230)
factor(market)WA		-0.080		-34.436
		(0.152)		(15,482.000)
Constant	0.110	-0.294	-10.850***	-30.950
	(0.086)	(0.778)	(2.004)	(25.335)
Observations	1,483	1,483	1,483	1,483
R^2	0.002	0.007		
Adjusted R^2	0.001	0.001		
Log Likelihood			-25.504	-20.683
Akaike Inf. Crit.			57.008	61.365
Residual Std. Error	0.052 (df = 1480)	0.052 (df = 1473)		
F Statistic	1.428 (df = 2; 1480)	1.140 (df = 9; 1473)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 27 Regression estimates using TCR180 for H users.

For L users

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)2.LA	-0.066	-0.067	-3.123	-3.123
	(0.047)	(0.047)	(2.451)	(2.458)
factor(experiment_group)2.LB	-0.047	-0.048	-1.665	-1.673
	(0.047)	(0.047)	(2.002)	(2.013)
log(avg_distance_km)		0.013		0.598
		(0.035)		(1.916)
log(avg_leave_time)		-0.133		-6.553
		(0.131)		(6.737)
log(days_since_waze_ob)		0.005		0.261
		(0.019)		(1.061)
log(sessions_30d)		-0.006		-0.378
		(0.027)		(1.478)
factor(market)GA		0.009		0.319
		(0.047)		(2.257)
factor(market)MA		-0.055		-30.827
		(0.116)		(6,681.456)
factor(market)WA		-0.037		-30.002
		(0.062)		(3,490.333)
Constant	0.084**	0.323	-11.391***	0.587
	(0.039)	(0.347)	(1.417)	(18.694)
Observations	3,386	3,386	3,386	3,386
R^2	0.001	0.001		
Adjusted R^2	-0.00000	-0.002		
Log Likelihood			-36.709	-35.590
Akaike Inf. Crit.			79.418	91.180
Residual Std. Error	0.038 (df = 3383)	0.038 (df = 3376)		
F Statistic	0.997 (df = 2; 3383)	0.426 (df = 9; 3376)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 28 Regression estimates using TSO30 for L users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)2.LA	-0.055	-0.058	-1.161	-1.239
	(0.069)	(0.070)	(1.531)	(1.534)
factor(experiment_group)2.LB	-0.053	-0.055	-1.090	-1.147
	(0.070)	(0.070)	(1.531)	(1.535)
log(avg_distance_km)		-0.035		-0.839
		(0.052)		(1.254)
log(avg_leave_time)		-0.135		-3.316
		(0.194)		(4.777)
log(days_since_waze_ob)		-0.004		-0.095
		(0.028)		(0.680)
log(sessions_30d)		0.006		0.135
		(0.039)		(0.974)
factor(market)GA		-0.051		-1.397
		(0.070)		(2.105)
factor(market)MA		-0.124		-30.643
		(0.172)		(4,144.059)
factor(market)WA		-0.102		-30.105
		(0.093)		(2,164.773)
Constant	0.126**	0.559	-10.577***	-0.087
	(0.058)	(0.514)	(1.158)	(12.515)
Observations	3,386	3,386	3,386	3,386
R^2	0.0002	0.001		
Adjusted R^2	-0.0004	-0.002		
Log Likelihood			-73.692	-71.769
Akaike Inf. Crit.			153.383	163.538
Residual Std. Error	0.057 (df = 3383)	0.057 (df = 3376)		
F Statistic	0.354 (df = 2; 3383)	0.384 (df = 9; 3376)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 29 Regression estimates using TSO180 for L users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)2.LA	-0.042	-0.043	-34.352	-35.579
	(0.030)	(0.030)	(4,218.892)	(6,042.965)
factor(experiment_group)2.LB	-0.024	-0.025	-1.663	-1.740
	(0.030)	(0.030)	(2.830)	(2.861)
log(avg_distance_km)		0.021		2.852
		(0.022)		(3.428)
log(avg_leave_time)		-0.149*		-18.369
		(0.083)		(11.374)
log(days_since_waze_ob)		0.0005		-0.438
		(0.012)		(1.572)
log(sessions_30d)		0.012		1.777
		(0.017)		(2.297)
factor(market)GA		-0.022		-35.147
		(0.030)		(9,338.689)
factor(market)MA		-0.039		-35.544
		(0.073)		(27,210.510)
factor(market)WA		-0.016		-33.996
		(0.039)		(13,138.460)
Constant	0.042*	0.241	-12.780***	10.493
	(0.025)	(0.219)	(2.002)	(30.353)
Observations	3,386	3,386	3,386	3,386
R^2	0.001	0.002		
Adjusted R^2	0.00002	-0.0005		
Log Likelihood			-15.613	-12.813
Akaike Inf. Crit.			37.227	45.626
Residual Std. Error	0.024 (df = 3383)	0.024 (df = 3376)		
F Statistic	1.036 (df = 2; 3383)	0.830 (df = 9; 3376)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 30 Regression estimates using TCR30 for L users.

	Dependent variable:			
	formula1	formula2	formula1	formula2
	OLS	*OLS*	*logistic*	*logistic*
	(1)	(2)	(3)	(4)
factor(experiment_group)2.LA	-0.049	-0.049	-1.735	-1.779
	(0.051)	(0.051)	(2.002)	(2.010)
factor(experiment_group)2.LB	-0.047	-0.048	-1.665	-1.771
	(0.052)	(0.052)	(2.002)	(2.009)
log(avg_distance_km)		0.006		0.418
		(0.038)		(1.772)
log(avg_leave_time)		-0.152		-6.995
		(0.144)		(6.343)
log(days_since_waze_ob)		-0.013		-0.608
		(0.020)		(0.850)
log(sessions_30d)		0.029		1.263
		(0.029)		(1.206)
factor(market)GA		-0.064		-33.231
		(0.051)		(4,122.958)
factor(market)MA		-0.088		-34.106
		(0.127)		(11,061.380)
factor(market)WA		-0.058		-32.932
		(0.068)		(5,708.430)
Constant	0.084*	0.364	-11.391***	0.925
	(0.043)	(0.379)	(1.417)	(16.542)
Observations	3,386	3,386	3,386	3,386
R^2	0.0003	0.002		
Adjusted R^2	-0.0003	-0.001		
Log Likelihood			-43.579	-40.488
Akaike Inf. Crit.			93.159	100.975
Residual Std. Error	0.042 (df = 3383)	0.042 (df = 3376)		
F Statistic	0.510 (df = 2; 3383)	0.635 (df = 9; 3376)		
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 31 Regression estimates using TCR180 for L users.