Appendix A

1.1 Total Ridership Impacts

1.1 The effect of BayPass on the average number of trips taken per eligible individual through Year 1 (i.e., between August 15, 2022 and June 30, 2023).

	Number of trips taken per eligible individual through Year 1								
	SFSU			SJSU			UCB		
	Control	BayPass	Effect	Control	BayPass	Effect	Control	BayPass	Effect
AC Transit	0.621	1.869	1.248***	0.086	0.755	0.669***	69.343	65.728	-3.615***
BART	12.071	20.434	8.363***	0.761	4.414	3.653***	10.003	23.815	13.812***
Caltrain	0.301	0.768	0.467***	0.109	1.051	0.942***	0.107	0.351	0.244***
Corridor 101	0.0002	0.00024	0.00004	0	0.001	0.001***	0.0002	0.0012	0.001*
East Bay	0.11	0.233	0.123***	0.006	0.045	0.039***	0.042	0.169	0.127***
GG Ferry	0.02	0.054	0.034***	0.002	0.04	0.038***	0.028	0.068	0.040***
GG Transit	0.086	0.248	0.162***	0.004	0.055	0.051***	0.104	0.182	0.078***
Napa	0.015	0.063	0.048**	0.0002	0.0052	0.005***	0.008	0.032	0.024***
SamTrans	3.357	4.679	1.322***	0.023	0.163	0.140***	0.052	0.169	0.117***
SF Muni	23.76	28.944	5.184***	0.064	0.897	0.833***	1.663	5.369	3.706***
SMART	0.006	0.009	0.003	0.0004	0.0014	0.001*	0.006	0.009	0.003
Sonoma	0.0001	0.0002	0.0001	0.00003	0.00013	0.0001	0.0002	0.0005	0.0003
Union City	0.002	0.035	0.033**	0.003	0.045	0.042***	0.004	0.009	0.005
VTA	0.105	0.27	0.165***	17.913	24.56	6.647***	0.107	0.348	0.241***
WETA	0.07	0.341	0.271***	0.001	0.013	0.012***	0.038	0.108	0.070***
Marin	0.009	0.037	0.028*	0.0002	0.0022	0.002***	0.008	0.005	-0.003
Total	**40.5333**	**57.9844**		**18.97283**	**32.04793**		**81.5134**	**96.3637**	

** = p<0.10; ** = p<0.05; *** = p<0.01*

1.2 The effect of BayPass on the average number of trips taken per eligible individual over both pilot years (i.e., between August 15, 2022 and June 30, 2024) – excluding dropouts.

	Number of trips taken per eligible individual over both pilot years (excluding dropouts)								
	SFSU			SJSU			UCB		
	Control	BayPass	Effect	Control	BayPass	Effect	Control	BayPass	Effect
AC Transit	1.587	4.21	2.623***	0.182	2.05	1.868***	150.971	143.757	-7.214***
BART	30.007	46.917	16.910***	1.607	11.86	10.253***	20.848	52.158	31.310***
Caltrain	0.677	1.605	0.928***	0.216	2.601	2.385***	0.235	0.825	0.590***
Corridor 101	0.0001	0.0011	0.001**	0	0	0	0.0004	0.0014	0.001
East Bay	0.321	0.493	0.172	0.008	0.144	0.136***	0.134	0.349	0.215***
GG Ferry	0.036	0.122	0.086***	0.003	0.093	0.090***	0.058	0.169	0.111***
GG Transit	0.192	0.392	0.200**	0.007	0.104	0.097***	0.174	0.362	0.188***
Napa	0.053	0.18	0.127**	0.005	0.015	0.01	0.027	0.065	0.038*
SamTrans	9.24	11.035	1.795**	0.074	0.359	0.285**	0.126	0.382	0.256***
SF Muni	52.606	64.576	11.970***	0.107	2.517	2.410***	3.399	12.477	9.078***
SMART	0.015	0.012	-0.003	0.001	0.002	0.001	0.013	0.025	0.012*
Sonoma	0.0003	0.0013	0.001	0.0001	0.0021	0.002***	0.001	0.0014	0.0004
Union City	0.007	0.018	0.011	0.009	0.104	0.095***	0.007	0.025	0.018*
VTA	0.256	0.449	0.193*	40.717	54.691	13.974***	0.253	0.697	0.444***
WETA	0.205	0.783	0.578***	0.002	0.03	0.028***	0.093	0.235	0.142***
Marin	0.031	0.1	0.069	0.0003	0.0043	0.004***	0.018	0.02	0.002
Total	**95.2334**	**130.8944**		**42.9384**	**74.5764**		**176.3574**	**211.5488**	

** = p<0.10; ** = p<0.05; *** = p<0.01*

1.3 The effect of of BayPass on the average number of between-operator transfers made through Year 1 (i.e., between August 15, 2022 and June 30, 2023).

	Number of between-operator transfers made per eligible individual through Year 1								
	SFSU			SJSU			UCB		
	Control	BayPass	Effect	Control	BayPass	Effect	Control	BayPass	Effect
AC Transit	0.251	0.668	0.417***	0.034	0.287	0.253***	1.528	3.389	1.861***
BART	1.888	4.036	2.148***	0.284	1.706	1.422***	1.999	4.835	2.836***
Caltrain	0.135	0.335	0.200***	0.03	0.314	0.284***	0.034	0.115	0.081***
Corridor 101	0.0001	0.0002	0.0001	0	0.001	0.001**	0.0001	0.0002	0.0001
East Bay	0.047	0.09	0.043**	0.003	0.014	0.011***	0.019	0.071	0.052***
GG Ferry	0.004	0.008	0.004***	0.0002	0.0132	0.013***	0.008	0.026	0.018***
GG Transit	0.023	0.077	0.054***	0.001	0.024	0.023***	0.056	0.1	0.044***
Napa	0.006	0.03	0.024***	0.0001	0.0031	0.003***	0.004	0.014	0.010***
SamTrans	0.348	0.592	0.244***	0.002	0.034	0.032***	0.017	0.07	0.053***
SF Muni	1.725	3.64	1.915***	0.013	0.211	0.198***	0.608	1.74	1.132***
SMART	0.002	0.003	0.001	0.0001	0.0011	0.001	0.002	0.0019	-0.0001
Sonoma	0	0.0001	0.0001	0	0	0	0.0001	0.0002	0.0001
Union City	0.001	0.018	0.017**	0.002	0.02	0.018***	0.002	0.005	0.003*
VTA	0.025	0.083	0.058***	0.23	1.297	1.067***	0.032	0.106	0.074***
WETA	0.016	0.079	0.063***	0.0002	0.0032	0.003***	0.006	0.022	0.016***
Marin	0.005	0.017	0.012	0.00003	0.00203	0.002***	0.002	0.0021	0.0001
Total	**4.4761**	**9.6763**		**0.59963**	**3.93063**		**4.3172**	**10.4974**	

** = p<0.10; ** = p<0.05; *** = p<0.01*

1.4 The effect of of BayPass on the average number of between-operator transfers made over both pilot years (i.e., between August 15, 2022 and June 30, 2024) – excluding dropouts.

	Number of between-operator transfers made per eligible individual through both years								
	SFSU			SJSU			UCB		
	Control	BayPass	Effect	Control	BayPass	Effect	Control	BayPass	Effect
AC Transit	0.638	1.51	0.872***	0.086	0.72	0.634***	3.066	7.544	4.478***
BART	4.578	9.164	4.586***	0.617	4.426	3.809***	4.009	10.747	6.738***
Caltrain	0.323	0.671	0.348***	0.058	0.865	0.807***	0.068	0.261	0.193***
Corridor 101	0	0.001	0.001*	0	0	0	0.0001	0.0011	0.001*
East Bay	0.139	0.199	0.06	0.003	0.054	0.051***	0.059	0.149	0.090***
GG Ferry	0.007	0.022	0.015***	0.0005	0.0305	0.030***	0.02	0.067	0.047***
GG Transit	0.055	0.127	0.072*	0.002	0.048	0.046***	0.094	0.191	0.097***
Napa	0.022	0.087	0.065***	0.002	0.009	0.007	0.012	0.028	0.016
SamTrans	0.976	1.342	0.366***	0.006	0.099	0.093***	0.034	0.157	0.123***
SF Muni	4.142	8.246	4.104***	0.025	0.619	0.594***	1.232	4.096	2.864***
SMART	0.006	0.005	-0.001	0.0003	0.0013	0.001	0.004	0.009	0.005*
Sonoma	0	0.001	0.001**	0	0	0	0.0002	0.0004	0.0002
Union City	0.006	0.009	0.003	0.004	0.043	0.039***	0.003	0.011	0.008**
VTA	0.066	0.147	0.081***	0.526	3.593	3.067***	0.073	0.233	0.160***
WETA	0.041	0.18	0.139***	0.0004	0.0074	0.007***	0.014	0.051	0.037***
Marin	0.018	0.045	0.027	0.0001	0.0031	0.003***	0.005	0.009	0.004
Total	**11.017**	**21.756**		**1.3303**	**10.5183**		**8.6933**	**23.5545**	

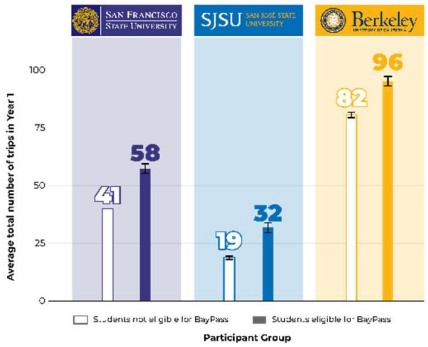
** = p<0.10; ** = p<0.05; *** = p<0.01*

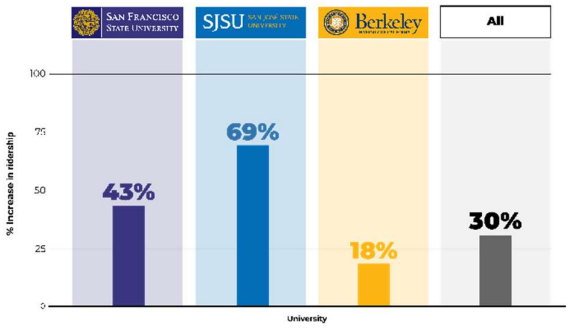
Appendix B

1. Randomized Controlled Trial Findings – Analyses of Clipper Card Public Transit Usage Data

Section 1 contains analyses of Clipper Card public transit usage data from San Francisco State University, San Jose State University and UC Berkeley, where eligibility for the Clipper BayPass was randomly assigned to students.

1.1 Total ridership impacts – number of public transit trips taken



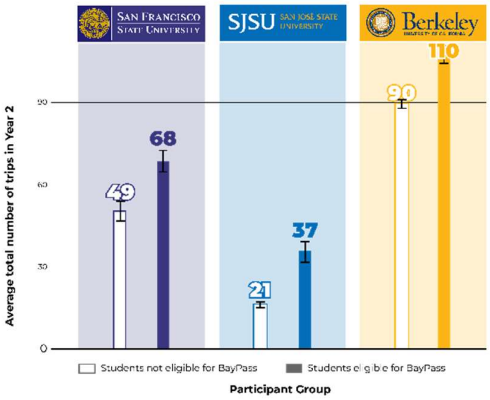


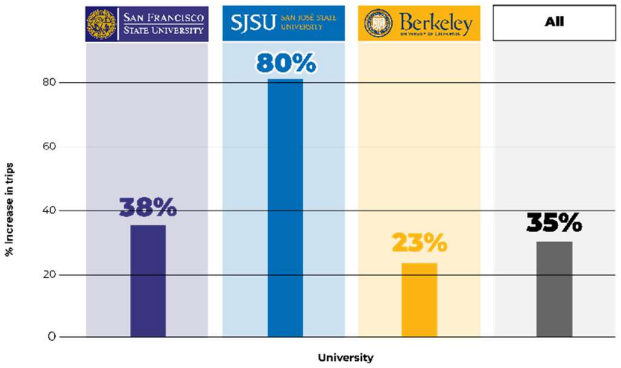
1.1.1 The effect of BayPass on the average number of trips taken per eligible individual through Year 1 (i.e., between August 15, 2022 and June 30, 2023).

	Dependent variable:				
	Number of trips taken				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	15.107***	14.856***	17.451***	13.076***	14.851***
	(0.660)	(0.632)	(1.220)	(0.925)	(1.201)
SFSU	22.764***				
	(0.765)				
UCB	62.849***				
	(0.670)				
Constant	18.592***	49.027***	40.532***	18.973***	81.514***
	(0.499)	(0.447)	(0.723)	(0.401)	(0.645)
Observations	101,649	101,649	25,046	36,389	40,214
R^2	0.090	0.005	0.008	0.005	0.004

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of trips taken in Year 1, a continuous variable. The samples include participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.1.2 The effect of BayPass on the average number of trips taken in Year 2 per eligible participant (i.e., between July 1, 2023 and June 30, 2024.)

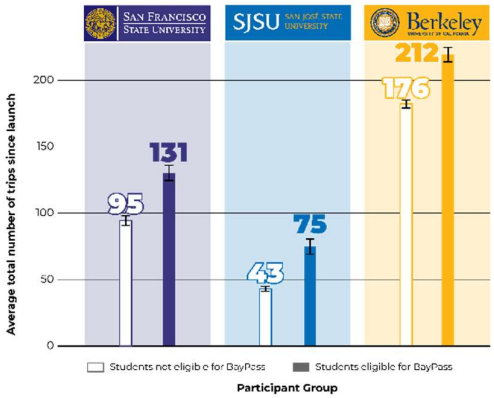


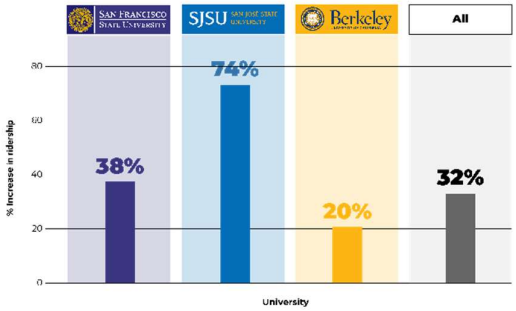


	Dependent variable:				
	Number of trips				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	18.856***	19.190***	18.497***	16.619***	20.537***
	(0.960)	(0.937)	(1.822)	(1.292)	(1.735)
SFSU	28.593***				
	(1.146)				
UCB	69.896***				
	(0.976)				
Constant	20.263***	55.134***	48.988***	20.693***	89.649***
	(0.730)	(0.672)	(1.104)	(0.567)	(0.956)
Observations	63,975	63,975	14,712	23,170	26,093
R^2	0.085	0.007	0.007	0.007	0.005

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of trips taken in Year 2, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.1.3 The effect of BayPass on the average number of trips taken over both pilot years (i.e., from August 15, 2022 – June 30, 2024) per eligible participant - excluding dropouts

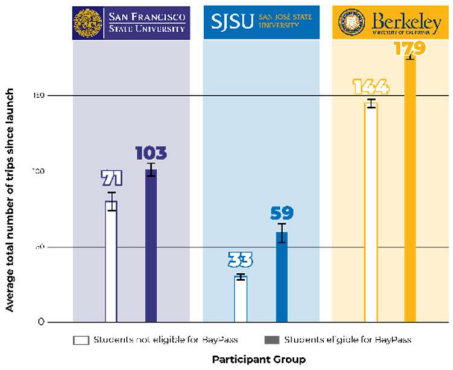


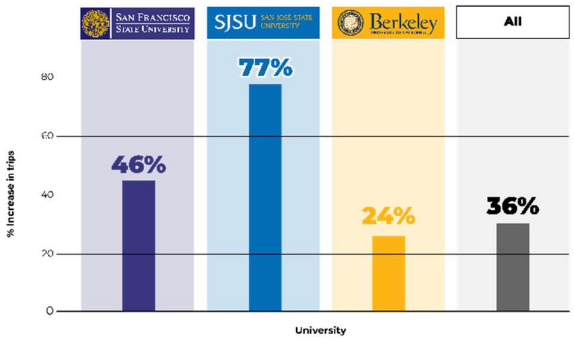


	Dependent variable:				
	Number of trips taken				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	34.301***	35.037***	35.661***	31.639***	35.194***
	(1.657)	(1.625)	(3.203)	(2.388)	(2.898)
SFSU	53.306***				
	(1.976)				
UCB	134.202***				
	(1.684)				
Constant	42.426***	109.016***	95.232***	42.938***	176.357***
	(1.259)	(1.165)	(1.940)	(1.047)	(1.597)
Observations	63,975	63,975	14,712	23,170	26,093
R^2	0.102	0.007	0.008	0.008	0.006

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.1.4 The effect of BayPass on the average number of trips taken per active card over both pilot years per eligible participant (i.e., from August 15, 2022 – June 30, 2024) - including dropouts



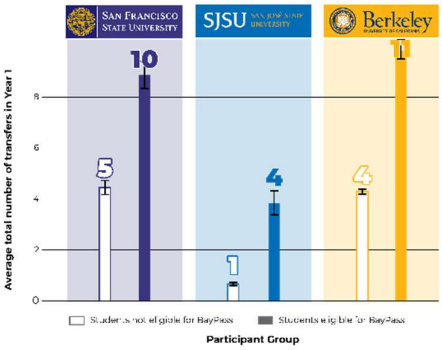


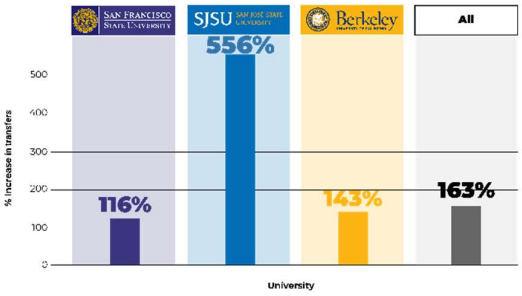
	Dependent variable:				
	Number of trips taken				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	31.511***	30.948***	32.223***	25.618***	34.976***
	(1.177)	(1.141)	(2.130)	(1.652)	(2.158)
SFSU	39.124***				
	(1.363)				
UCB	112.909***				
	(1.195)				
Constant	32.012***	86.260***	70.887***	33.117***	143.922***
	(0.889)	(0.807)	(1.263)	(0.715)	(1.159)
Observations	101,649	101,649	25,046	36,389	40,214
R^2	0.093	0.007	0.009	0.007	0.006

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples include participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.2 Total ridership impacts – number of between-operator transfer trips taken

1.2.1 The effect of BayPass on the average number of between-operator transfers made through Year 1 (i.e., between August 15, 2022 and June 30, 2023)

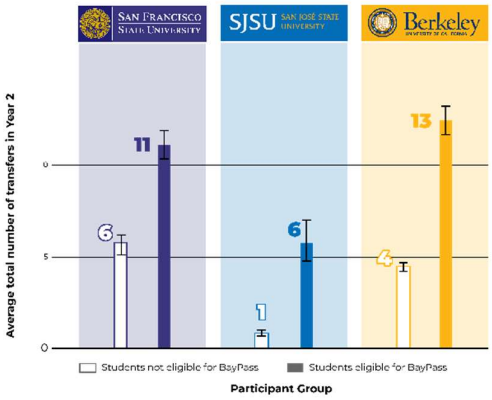


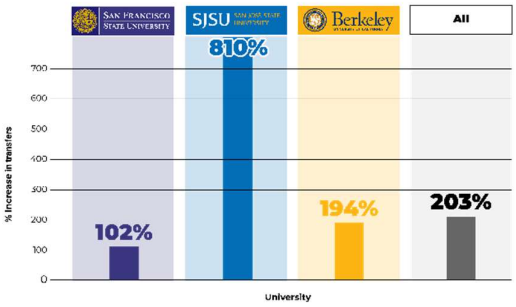


	Dependent variable:				
	Number of transfers				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	5.084***	4.919***	5.201***	3.330***	6.181***
	(0.121)	(0.125)	(0.306)	(0.161)	(0.179)
SFSU	4.247***				
	(0.141)				
UCB	4.362***				
	(0.123)				
Constant	0.270***	3.025***	4.476***	0.599***	4.316***
	(0.092)	(0.089)	(0.181)	(0.070)	(0.096)
Observations	101,649	101,649	25,046	36,389	40,214
R^2	0.036	0.015	0.011	0.012	0.029

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of between-operator transfer trips taken in Year 1, a continuous variable. The samples include participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.2.2 The effect of BayPass on the average number of between-operator transfers made in Year 2 (i.e., between July 1, 2023 and June 30, 2024)

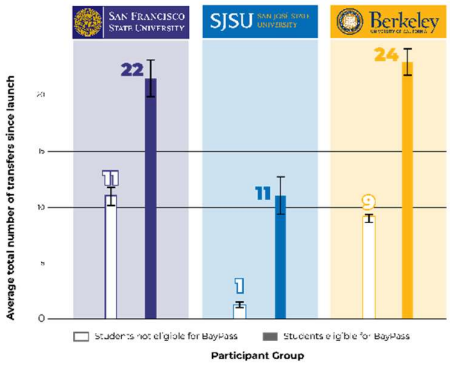


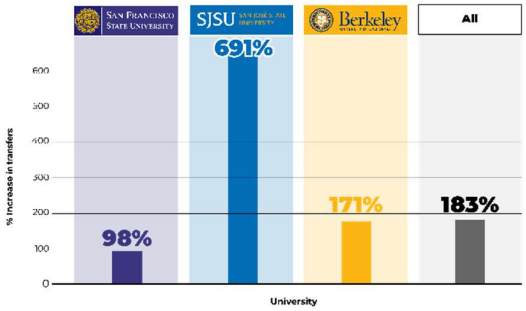


	Dependent variable:				
	Number of transfers				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	6.680***	6.590***	5.670***	4.938***	8.442***
	(0.179)	(0.192)	(0.454)	(0.243)	(0.270)
SFSU	4.898***				
	(0.214)				
UCB	4.607***				
	(0.182)				
Constant	0.275**	3.252***	5.543***	0.610***	4.347***
	(0.136)	(0.138)	(0.275)	(0.106)	(0.149)
Observations	63,975	63,975	14,712	23,170	26,093
R^2	0.038	0.018	0.010	0.018	0.036

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of between-operator transfer trips taken in Year 2, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.2.3 The effect of BayPass on the average number of between-operator transfers made over both pilot years (i.e., from August 15, 2022 – June 30, 2024) - excluding dropouts

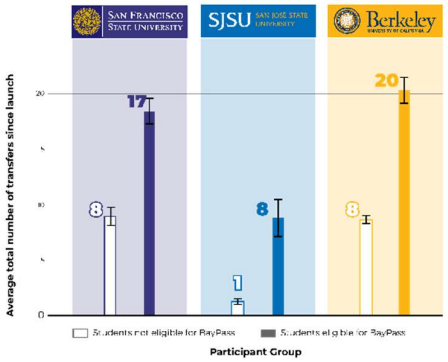


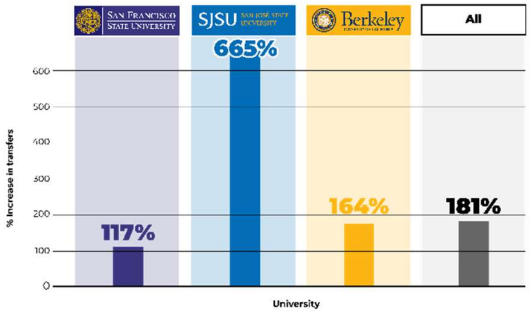


	Dependent variable:				
	Number of transfers				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	12.108***	11.958***	10.738***	9.188***	14.861***
	(0.304)	(0.326)	(0.791)	(0.446)	(0.426)
SFSU	9.744***				
	(0.363)				
UCB	8.762***				
	(0.310)				
Constant	0.769***	6.529***	11.016***	1.330***	8.695***
	(0.231)	(0.234)	(0.479)	(0.196)	(0.235)
Observations	63,975	63,975	14,712	23,170	26,093
R^2	0.046	0.021	0.012	0.018	0.045

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of between-operator transfer trips taken over the entire study period, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.2.4 The effect of BayPass on the average number of between-operator transfers made over both pilot years (i.e., from August 15, 2022 – June 30, 2024 including dropouts)



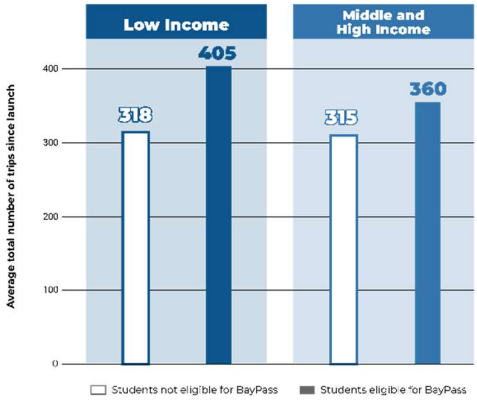


	Dependent variable:				
	Number of transfers				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	9.925***	9.649***	9.272***	6.746***	12.512***
	(0.213)	(0.224)	(0.522)	(0.295)	(0.317)
SFSU	7.262***				
	(0.247)				
UCB	7.980***				
	(0.216)				
Constant	0.419***	5.340***	7.911***	1.015***	7.652***
	(0.161)	(0.159)	(0.310)	(0.128)	(0.170)
Observations	101,649	101,649	25,046	36,389	40,214
R^2	0.040	0.018	0.012	0.014	0.037

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the average total number of between-operator transfer trips taken over the entire study period, a continuous variable. The samples include participants who either dropped out or graduated during the study period. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.3 Ridership effects by student type

Note that in section 1.3, the analyses of Clipper Trip data are only for those individuals who self-identified their household income, household size and race / ethnicity in their survey responses. This is the reason that the "observations" are much smaller than the number of observations in sections 1.1 and 1.2.



1.3.1 The effect of BayPass on the average number of trips taken by income

	Dependent variable:					
	Number of trips					
	Low income (OLS)	Low income (IPW)	Mid to high income (OLS)	Mid to high income (IPW)	(OLS)	(IPW)
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	88.333***	87.133***	44.452**	43.833**	133.588***	130.434***
	(20.810)	(22.030)	(18.578)	(19.642)	(45.550)	(48.080)
Income					-2.525	-3.001
					(18.171)	(23.615)
SFSU	89.723*		97.920*		88.491**	
	(49.025)		(54.950)		(36.405)	
UCB	83.092**		36.238		59.600**	
	(42.245)		(43.073)		(30.157)	
Treatment*Income					-44.348	-43.300
					(27.875)	(29.487)
Constant	240.049***	318.241***	276.286***	315.240***	261.108***	321.241***
	(41.022)	(17.529)	(42.601)	(15.854)	(39.941)	(38.351)
Observations	756	756	938	938	1,694	1,694
R^2	0.030	0.020	0.010	0.005	0.019	0.015

Notes: This table presents the results of six regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period and include participants from all three institutions. The samples are participants from low-income households (in column 1 and 2), mid- and high-income households (in column 3 and 4), and all participants regardless of their household income status (in column 5 and 6). Household income status is defined using 200% of 2024 poverty level threshold, adjusted for household size. For column 1 to 4, each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. For column 5 and 6, each regression includes an interaction term between treatment status and household income status. Column 1, 3, and 5 differ from column 2, 4, and 6 in specifications: the regressions in Column 1, 3, and 5 control for institutions (by including institution control variables), while the regressions in Column 2, 4, and 6 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.3.2 The effect of BayPasson the average number of trips taken by ethnicity

Note: the BayPass project evaluation team attempted to incorporate demographic information (e.g., race / ethnicity as defined by the US Census) into the analysis, but the limited sample size stymied attempts to address covariates (e.g., income) in the analysis. For these reasons, the project evaluation team was not able to estimate any effects on transit use by race-ethnicity. Had anonymized, student-level demographic data (i.e., race / ethnicity, gender identity, household income and size) been available, this analysis may have been feasible. However, the BayPass project evaluation team was unable to attain this information

	Dependent variable:									
	Number of trips									
	Asian (OLS)	Asian (IPW)	Black (OLS)	Black (IPW)	Hispanic (OLS)	Hispanic (IPW)	White (OLS)	White (IPW)	Two or more (OLS)	Two or more (IPW)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	92.376***	93.026***	139.688***	130.445**	82.878***	83.471***	7.586	7.064	56.717***	61.473***
	(11.528)	(11.941)	(48.980)	(51.105)	(18.234)	(18.953)	(13.980)	(13.512)	(21.903)	(23.104)
SFSU	4.762		54.782		79.354***		51.191		117.869*	
	(21.265)		(82.038)		(28.475)		(32.382)		(64.969)	
UCB	-1.947		180.336**		88.292***		91.417***		17.928	
	(14.806)		(76.821)		(26.101)		(26.569)		(38.632)	
Constant	249.061***	248.640***	124.040*	241.900***	180.495***	252.890***	165.625***	245.612***	212.285***	232.363***
	(13.371)	(9.370)	(72.508)	(38.783)	(23.780)	(14.949)	(25.807)	(10.494)	(37.128)	(18.209)
Observations	2,320	2,320	126	126	820	820	1,355	1,355	550	550
R^2	0.027	0.026	0.127	0.050	0.042	0.023	0.011	0.0002	0.020	0.013

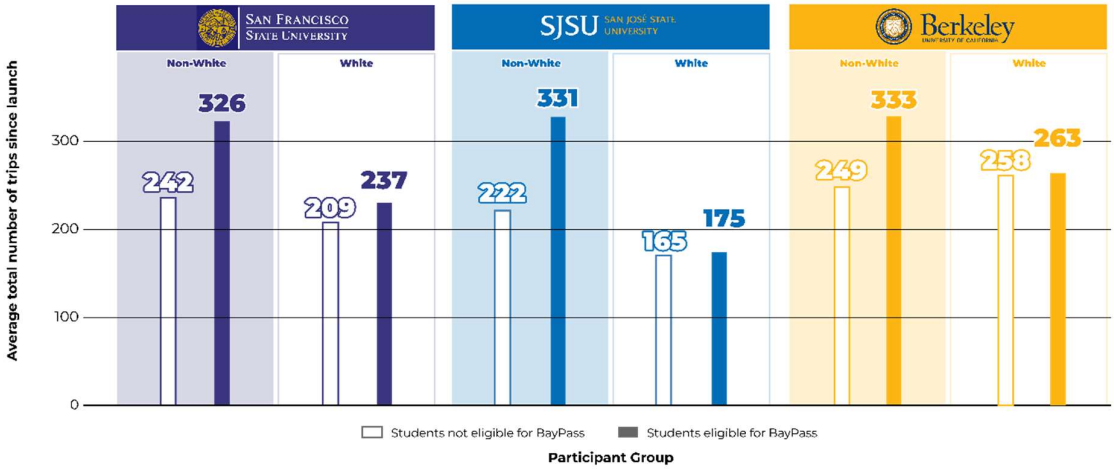
Notes: This table presents the results of ten regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period and include participants from all three institutions. The samples are participants who are Asian (in column 1 and 2), Black (in column 3 and 4), Hispanic (in column 5 and 6), White (in column 7 and 8), and participants who have two or more ethnicities (in column 9 and 10). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1, 3, 5, 7, and 9 differ from column 2, 4, 6, 8, and 10 in specifications: the regressions in Column 1, 3, 5, 7, and 9 control for institutions (by including institution control variables), while the regressions in Column 2, 4, 6, 8, and 10 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.3.3 The effect of BayPass on the average number of trips taken by white vs non-white

	Dependent variable:					
	Number of trips					
	Non-white (OLS)	Non-white (IPW)	White (OLS)	White (IPW)	(OLS)	(IPW)
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	86.977***	88.559***	7.586	7.064	85.843***	88.559***
	(8.585)	(8.866)	(13.980)	(13.512)	(8.478)	(8.621)
White					-1.771	2.368
					(10.418)	(13.346)
SFSU	13.163		51.191		17.226	
	(14.742)		(32.382)		(13.347)	
UCB	20.482*		91.417***		31.859***	
	(11.846)		(26.569)		(10.769)	
Treatment*White					-77.019***	-81.495***
					(16.775)	(17.157)
Constant	227.333***	243.244***	165.625***	245.612***	219.318***	243.244***
	(10.852)	(6.929)	(25.807)	(10.494)	(10.101)	(6.737)
Observations	4,002	4,002	1,355	1,355	5,357	5,357
R^2	0.027	0.024	0.011	0.0002	0.024	0.025

Notes: This table presents the results of six regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period and include participants from all three institutions. The samples are participants who are non-white (in column 1 and 2), white (in column 3 and 4), and all participants regardless of their ethnicity (in column 5 and 6). For column 1 to 4, each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. For column 5 and 6, each regression includes an interaction term between treatment status and ethnicity. Column 1, 3, and 5 differ from column 2, 4, and 6 in specifications: the regressions in Column 1, 3, and 5 control for institutions (by including institution control variables), while the regressions in Column 2, 4, and 6 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.3.4 The effect of BayPass on the average number of trips taken by white vs non-white by university



	Dependent variable:								
	Number of trips								
	(SFSU) Non-white (1)	(SFSU) White (2)	(SFSU) All (3)	(SJSU) Non-white (4)	(SJSU) White (5)	(SJSU) All (6)	(UCB) Non-white (7)	(UCB) White (8)	(UCB) All (9)
Treatment	84.214***	28.731	84.214***	109.686***	10.841	109.686***	83.735***	4.324	83.735***
	(21.208)	(44.262)	(21.364)	(26.923)	(49.497)	(26.194)	(9.936)	(15.403)	(9.854)
White			-32.909			-57.023			9.124
			(29.660)			(36.492)			(11.655)
Treatment *White			-55.482			-98.845			-79.411***
			(47.965)			(67.286)			(18.566)
Constant	241.456***	208.547***	241.456***	221.665***	164.642***	221.665***	249.172***	258.296***	249.172***
	(12.501)	(27.678)	(12.593)	(13.450)	(27.204)	(13.086)	(6.429)	(9.550)	(6.376)
Obs	662	156	818	605	96	701	2,735	1,103	3,838
R^2	0.023	0.003	0.025	0.027	0.001	0.034	0.025	0.0001	0.020

Notes: This table presents the results of nine regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples exclude participants who either dropped out or graduated during the study period. The samples are participants from SFSU (in column 1 to 3), SJSU (in column 4 to 6), and UCB (in column 7 to 9). The samples are participants who are non-white (in column 1, 4, and 7), white (in column 2, 5, and 8), and participants regardless of their ethnicity (in column 3, 6, and 9). For column 1, 2, 4, 5, 7, and 8, each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. For column 3, 6, and 9, each regression includes an interaction term between treatment status and ethnicity. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

1.4 Attrition

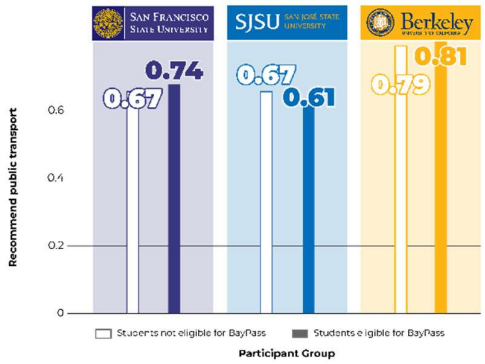
1.4.1 Observed effect of BayPass on rates of student attrition

	Count of Fall 2022 Student IDs		Count of Fall 2023 Student IDs				BayPass Eligible Rate of Attrition	Not BayPass Eligible Rate of Attrition	Difference in Attrition (% point)	Difference In Rate of Attrition (% rate)
Column Label	*a*	*b*	*c*	*d*		*Column Label*	*e*	*f*		
	BayPass Eligible	Not BayPass Eligible	BayPass Eligible	Not BayPass Eligible		*Calc.*	*(c-a)/a*	*(d-b)/b*	*e-f*	*(f-e)/e*
SFSU	8,797	16,249	5,399	9,312		SFSU	-38.63%	-42.69%	4.07%	10.52%
SJSU	6,823	29,566	4,456	18,714		SJSU	-34.69%	-36.70%	2.01%	5.80%
UCB	11,602	28,612	7,922	18,171		UCB	-31.72%	-36.49%	4.77%	15.05%

2. Randomized Controlled Trial findings – Outcomes from survey response data

2.1 Survey overall

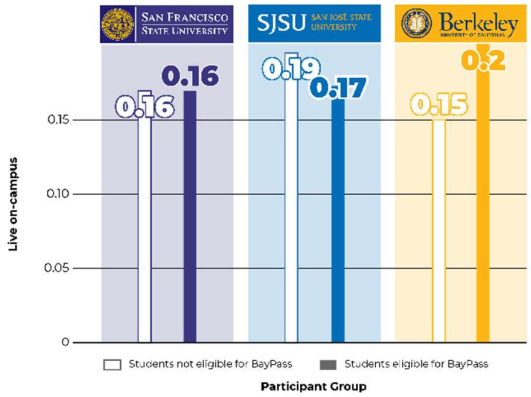
2.1.1 The effect of BayPass on whether a student would recommend public transport to friends (in Spring/Fall 2023)



	Dependent variable:				
	Recommend public transport				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	0.014	0.014	0.074**	-0.062*	0.018
	(0.014)	(0.014)	(0.036)	(0.036)	(0.016)
SFSU	0.037*				
	(0.021)				
UCB	0.147***				
	(0.017)				
Constant	0.649***	0.741***	0.666***	0.669***	0.794***
	(0.015)	(0.011)	(0.021)	(0.019)	(0.010)
Observations	4,142	4,142	745	887	2,510
R^2	0.023	0.0003	0.006	0.003	0.001

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent would recommend public transport to their friends, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.2 The effect of BayPass on whether a student lives on campus (in Spring/Fall 2023)



	Dependent variable:				
	Live on campus				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	0.026**	0.025**	-0.001	-0.010	0.046***
	(0.012)	(0.012)	(0.027)	(0.028)	(0.015)
SFSU	-0.022				
	(0.017)				
UCB	-0.018				
	(0.014)				
Constant	0.176***	0.161***	0.163***	0.185***	0.150***
	(0.012)	(0.009)	(0.015)	(0.014)	(0.009)
Observations	4,434	4,434	857	1,008	2,569
R^2	0.001	0.001	0.00000	0.0001	0.004

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent lived on campus in either Spring or Fall 2023, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.3 The effect of BayPass on whether a student lives on campus (in Spring 2023)

	Dependent variable:				
	Live on campus				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	0.038**	0.038**	0.008	-0.024	0.070***
	(0.016)	(0.015)	(0.033)	(0.035)	(0.021)
SFSU	-0.044**				
	(0.022)				
UCB	-0.014				
	(0.018)				
Constant	0.212***	0.193***	0.177***	0.228***	0.185***
	(0.016)	(0.012)	(0.019)	(0.018)	(0.013)
Observations	2,952	2,952	623	723	1,606
R^2	0.003	0.002	0.0001	0.001	0.007

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent lived on campus in Spring 2023, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.4 The effect of BayPass on whether a student lives on campus (in Fall 2023)

	Dependent variable:				
	Live on campus				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	-0.014	-0.013	-0.023	0.029	-0.022
	(0.016)	(0.015)	(0.044)	(0.037)	(0.020)
SFSU	0.032				
	(0.026)				
UCB	0.008				
	(0.020)				
Constant	0.088***	0.099***	0.123***	0.077***	0.099***
	(0.018)	(0.011)	(0.026)	(0.019)	(0.011)
Observations	1,482	1,482	234	285	963
R^2	0.002	0.0005	0.001	0.002	0.001

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent lived on campus in Fall 2023, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.5 The effect of BayPass on the average number of trips taken by whether a student lives on campus (in Spring/Fall 2023)

	Dependent variable:					
	Number of trips					
	Live on campus (OLS)	Live on campus (IPW)	Live off campus (OLS)	Live off campus (IPW)	(OLS)	(IPW)
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	61.929***	72.262***	62.073***	63.591***	59.710***	63.591***
	(13.831)	(14.850)	(8.864)	(8.801)	(8.533)	(8.486)
Live on campus					-91.121***	-88.396***
					(12.342)	(16.069)
SFSU	60.971***		-5.369		7.411	
	(20.413)		(12.963)		(11.369)	
UCB	134.880***		-35.087***		-5.524	
	(16.210)		(10.444)		(9.138)	
Treatment*Live on campus					24.327	8.670
					(20.226)	(20.549)
Constant	63.067***	146.072***	254.799***	234.468***	235.933***	234.468***
	(13.811)	(11.681)	(9.138)	(6.683)	(8.257)	(6.444)
Observations	754	754	3,680	3,680	4,434	4,434
R^2	0.128	0.031	0.016	0.014	0.030	0.030

Notes: This table presents the results of six regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples include participants from all three institutions. The samples are participants who lived on campus in either Spring or Fall 2023 (in column 1 and 2), participants who lived off campus in either Spring or Fall 2023 (in column 3 and 4), and all participants regardless of their housing locations (in column 5 and 6). For column 1 to 4, each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. For column 5 and 6, each regression includes an interaction term between treatment status and housing location. Column 1, 3, and 5 differ from column 2, 4, and 6 in specifications: the regressions in Column 1, 3, and 5 control for institutions (by including institution control variables), while the regressions in Column 2, 4, and 6 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

The effect of BayPass on the average number of trips taken by whether a student lives on campus (in Spring 2023)

	Dependent variable:					
	Number of trips					
	Live on campus (OLS) (1)	Live on campus (IPW) (2)	Live off campus (OLS) (3)	Live off campus (IPW) (4)	(OLS) (5)	(IPW) (6)
Treatment	70.028***	83.333***	73.470***	70.190***	69.702***	70.190***
	(14.454)	(15.517)	(10.216)	(10.354)	(9.794)	(9.901)
Live on campus					-68.685***	-65.370***
					(13.004)	(17.207)
SFSU	48.100**		-6.341		7.458	
	(21.108)		(14.286)		(12.282)	
UCB	112.021***		-67.522***		-29.586***	
	(16.773)		(11.907)		(10.142)	
Treatment*Live on campus					29.588	13.142
					(20.906)	(21.733)
Constant	63.962***	128.431***	229.582***	193.801***	207.369***	193.801***
	(13.941)	(12.394)	(10.209)	(7.916)	(9.092)	(7.569)
Observations	615	615	2,337	2,337	2,952	2,952
R^2	0.128	0.045	0.036	0.019	0.038	0.031

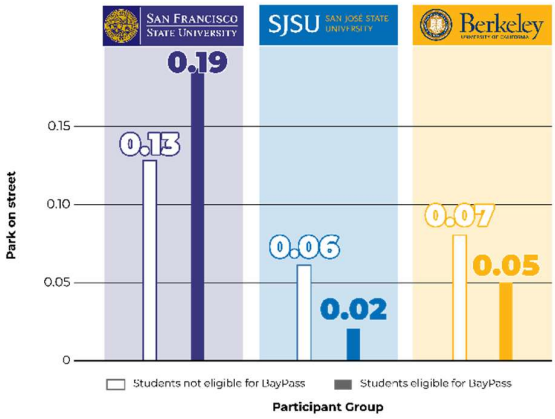
Notes: This table presents the results of six regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples include participants from all three institutions. The samples are participants who lived on campus in Spring 2023 (in column 1 and 2), participants who lived off campus in Spring 2023 (in column 3 and 4), and all participants regardless of their housing locations (in column 5 and 6). For column 1 to 4, each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. For column 5 and 6, each regression includes an interaction term between treatment status and housing location. Column 1, 3, and 5 differ from column 2, 4, and 6 in specifications: the regressions in Column 1, 3, and 5 control for institutions (by including institution control variables), while the regressions in Column 2, 4, and 6 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.6 The effect of BayPass on the average number of trips taken by whether a student lives on campus (in Fall 2023)

	Dependent variable:					
	Number of trips					
	Live on campus (OLS) (1)	Live on campus (IPW) (2)	Live off campus (OLS) (3)	Live off campus (IPW) (4)	(OLS) (5)	(IPW) (6)
Treatment	70.288*	45.731	51.956***	57.803***	50.931***	57.803***
	(39.930)	(41.923)	(15.804)	(15.416)	(15.590)	(15.242)
Live on campus					-94.447***	-91.992**
					(28.493)	(36.346)
SFSU	118.353*		3.080		11.213	
	(60.197)		(25.289)		(23.659)	
UCB	224.135***		-5.350		14.467	
	(49.437)		(19.181)		(18.092)	
Treatment*Live on campus					12.550	-12.072
					(52.186)	(49.989)
Constant	41.487	211.337***	305.322***	303.329***	291.493***	303.329***
	(45.765)	(30.380)	(17.291)	(11.563)	(16.515)	(11.433)
Observations	139	139	1,343	1,343	1,482	1,482
R^2	0.154	0.009	0.008	0.010	0.019	0.021

Notes: This table presents the results of six regression analyses. In each regression, the outcome is the average total number of trips taken over the entire study period, a continuous variable. The samples include participants from all three institutions. The samples are participants who lived on campus in Fall 2023 (in column 1 and 2), participants who lived off campus in Fall 2023 (in column 3 and 4), and all participants regardless of their housing locations (in column 5 and 6). For column 1 to 4, each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. For column 5 and 6, each regression includes an interaction term between treatment status and housing location. Column 1, 3, and 5 differ from column 2, 4, and 6 in specifications: the regressions in Column 1, 3, and 5 control for institutions (by including institution control variables), while the regressions in Column 2, 4, and 6 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.7 The effect of BayPass on demand for street parking (in Spring 2023/Fall 2023/Spring 2024)



	Dependent variable:				
	Demand for street parking				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	-0.004	-0.012*	0.069***	-0.033**	-0.016**
	(0.007)	(0.007)	(0.023)	(0.015)	(0.008)
SFSU	0.102***				
	(0.011)				
UCB	0.016*				
	(0.009)				
Constant	0.049***	0.078***	0.126***	0.057***	0.070***
	(0.008)	(0.005)	(0.014)	(0.008)	(0.005)
Observations	6,506	6,506	1,052	1,081	4,373
R^2	0.016	0.0005	0.009	0.005	0.001

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent usually parked on the street near campus, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.8 The effect of BayPass on demand for private garage parking (in Spring 2023/Fall 2023/Spring 2024)

	Dependent variable:				
	Demand for private garage parking				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	0.002	0.002	-0.009	0.007	0.003
	(0.003)	(0.003)	(0.006)	(0.009)	(0.004)
SFSU	-0.010*				
	(0.005)				
UCB	-0.003				
	(0.004)				
Constant	0.018***	0.015***	0.012***	0.016***	0.015***
	(0.004)	(0.002)	(0.004)	(0.005)	(0.002)
Observations	6,506	6,506	1,052	1,081	4,373
R^2	0.001	0.0001	0.002	0.001	0.0001

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent usually parked in a private garage/lot, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.9 The effect of BayPass on demand for university garage parking (in Spring 2023/Fall 2023/Spring 2024)

	Dependent variable:				
	Demand for uni garage parking				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	0.006	0.006	-0.012	0.036	0.003
	(0.006)	(0.007)	(0.017)	(0.027)	(0.006)
SFSU	-0.117***				
	(0.011)				
UCB	-0.158***				
	(0.009)				
Constant	0.195***	0.071***	0.084***	0.186***	0.037***
	(0.008)	(0.005)	(0.010)	(0.014)	(0.004)
Observations	6,506	6,506	1,052	1,081	4,373
R^2	0.050	0.0001	0.0005	0.002	0.0001

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is whether the respondent usually parked in a university garage/lot, coded as a binary variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.10 The effect of BayPass on the number of driving trips in a typical day (in Spring 2024)

	Dependent variable:				
	Number of driving trips in a typical day				
	(Aggregated - OLS)	(Aggregated - IPW)	(SFSU)	(SJSU)	(UCB)
	(1)	(2)	(3)	(4)	(5)
Treatment	0.019	0.021	0.017	0.185	0.009
	(0.028)	(0.030)	(0.118)	(0.179)	(0.028)
SFSU	-0.063				
	(0.073)				
UCB	-0.198***				
	(0.062)				
Constant	0.310***	0.138***	0.247***	0.255**	0.116***
	(0.061)	(0.024)	(0.080)	(0.103)	(0.018)
Observations	1,435	1,435	157	76	1,202
R^2	0.013	0.0003	0.0001	0.014	0.0001

Notes: This table presents the results of five regression analyses. All five regressions were conducted using OLS. In each regression, the outcome is the number of driving trips made in a typical day, a continuous variable. The samples include participants from all three institutions (in column 1 and 2), SFSU (in column 3), SJSU (in column 4), and UCB (in column 5). Each regression compares the BayPass treatment group to the control group (i.e., those who were not offered the BayPass). The means in the control group are displayed in the row labelled "Constant" and the figures in the rows labelled "Treatment" represent the average difference in means between the control group and the treatment group. Column 1 and 2 differ in their specifications: the regression in Column 1 controls for institutions (by including institution control variables), while the regression in Column 2 uses Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

2.1.12 Whether participants agree that the Clipper BayPass helps them get to and from new locations in the Bay Area (in Spring 2023)

Level of agreement	SFSU (n = 313)	SJSU (n = 372)	UCB (n = 929)
Strongly disagree	14 (4.5%)	19 (5.1%)	12 (1.3%)
Somewhat disagree	7 (2.2%)	8 (2.2%)	4 (0.4%)
Neither agree nor disagree	17 (5.4%)	28 (7.5%)	14 (1.5%)
Somewhat agree	38 (12%)	83 (22%)	99 (11%)
Strongly agree	237 (76%)	234 (63%)	800 (86%)

2.1.13 Whether participants agree that since receiving the Clipper BayPass, they are more likely to use public transportation options in the Bay Area (in Spring 2023)

Level of agreement	SFSU (n = 312)	SJSU (n = 368)	UCB (n = 929)
Strongly disagree	13 (4.2%)	19 (5.2%)	11 (1.2%)
Somewhat disagree	10 (3.2%)	6 (1.6%)	3 (0.3%)
Neither agree nor disagree	15 (4.8%)	35 (9.5%)	20 (2.2%)
Somewhat agree	35 (11%)	62 (17%)	74 (8.0%)
Strongly agree	239 (77%)	246 (67%)	821 (88%)

*2.2 B*alance tables comparing SFSU, SJSU and UCB survey respondent populations to overall student populations

These tables compare the public transit use (specifically average number of trips and number of transfers) of individuals who responded to the surveys versus the entire population of individuals.

2.2.1 Comparing full study sample to survey sample (excluding dropouts)

2.2.2 Comparing full study sample to survey sample (including dropouts)

Characteristic	N	**full**, N = 101,649[1]	**survey**, N = 8,034[1]	p-value[2]
Number of trips	109,683	95 (173)	245 (252)	<0.001
Number of transfers	109,683	5 (22)	17 (40)	<0.001

[1] Mean (SD)

[2] Welch Two Sample t-test

2.2.4 Comparing full study sample to survey sample, by treatment (excluding dropouts)

2.2.5 Comparing full study sample to survey sample, by treatment (including dropouts)

Characteristic	**full, control**, N = 74,427[1]	**full, treatment**, N = 27,222[1]	**survey, control**, N = 5,095[1]	**survey, treatment**, N = 2,939[1]	**full, control vs. survey, control**	**full, treatment vs. survey, treatment**
num_trips	84 (159)	124 (203)	221 (239)	288 (268)	<0.001	<0.001
num_transfers	4 (16)	10 (31)	11 (32)	26 (49)	<0.001	<0.001

Appendix B

Sensitivity analysis

Sensitivity analyses are used to test the robustness of a particular model under different assumptions.

In the case of the Clipper BayPass evaluation, we want to understand how the potential use of other payment methods (besides university-issued Clipper cards or the Clipper BayPass) could be impacting our understanding of how the Clipper BayPass influences travel behaviour.

In other words, we want to make sure that the increase in the number of trips taken associated with receiving the BayPass is actually because BayPass holders are using public transit more and not because BayPass holders are simply using other payment methods less frequently than those who have the standard university Clipper card (creating a false treatment effect).

We used four slightly different approaches to estimate the prevalence of alternative card use.

For approach 1 and 2, we assumed:

- 'always using other cards' to mean 100% of the time
- 'often using other cards' to mean 70% of the time
- 'sometimes using other cards' to mean 40% of the time
- 'rarely using other cards' to mean 10% of the time
- 'not applicable' to mean 0% of the time

For approach 3 and 4, we assumed:

- 'always using other cards' to mean 60 trips over an academic year
- 'often using other cards' to mean 48 trips over an academic year
- 'sometimes using other cards' to mean 12 trips over an academic year
- 'rarely using other cards' to mean 3 trips over an academic year
- 'not applicable' to mean 0 trips

Estimation approaches:

1. In the first approach, we computed the percentage of control (i.e., no BayPass) and treatment (i.e., received BayPass) students from each university who use other cards (based on findings from the survey results). We used those percentages to randomly select individuals from the trip data and then adjusted their number of trips taken by multiplying using the average frequency of use of other cards.
2. In the second approach, we took an additional step where we computed and defined the quintiles of number of trips taken (for the entire sample) and calculated the percentage of control and treatment students from each university using other cards who fall into each of the defined quintiles. We then used those percentages to randomly select individuals from the trip data from each quintile proportionally and adjusted their number of trips taken (by multiplying using the average frequency of use of other cards).

3. In the third approach, we computed the percentage of control and treatment students from each university who use other cards (again based on survey results) and used those percentages to randomly select individuals from the trip data. We then adjusted their number of trips taken by adding the average number of trips taken using other cards. **The third approach is similar to the first approach, except for the use of addition rather than multiplication.** This approach is likely better suited for the data, as there are many participants who took 0 trips (which means that multiplication fails to adjust their number of trips in the sensitivity analysis).
4. In the fourth approach, we took an additional step where we computed and defined the quintiles of number of trips taken (for the entire sample) and calculated the percentage of control and treatment students from each university using other cards who fall into each of the defined quintiles. We then used those percentages to randomly select individuals from the trip data from each quintile proportionally and adjusted their number of trips taken by adding the average number of trips taken using other cards in each quintile in each group for each of the universities. **The fourth approach is similar to the second approach, except for the use of addition rather than multiplication, and for the use of quintile-specific adjustment. <u>The fourth approach is our recommended/preferred approach (i.e., the one that is most likely to provide realistic estimates)</u>.**

These four approaches correspond to the numbered outcome variables in the regression tables below. The first and 6th columns (original) show the average treatment effect without any adjustment. Columns 2 - 5 and 7 - 10 correspond to the estimation approaches described above (i.e., column 2 = approach 1, column 3 = approach 2, column 4 = approach 3, column 5 = approach 4). The coefficients in the table show what the average treatment effect would be if a given percentage of students were to use other travel cards (calculated using the methods described above).

Though the treatment effect size is slightly smaller under these assumptions, overall it is still close in magnitude to the original treatment effect (column 1 and 6), and all of the adjusted coefficients are statistically significant at the 0.1% level.

B1. The effect of BayPass on the average number of trips taken (Year 1 aggregated)

	Dependent variable:									
	Number of trips (OLS - original)	Number of trips (OLS - adjusted 1)	Number of trips (OLS - adjusted 2)	Number of trips (OLS - adjusted 3)	Number of trips (OLS - adjusted 4)	Number of trips (IPW - original)	Number of trips (IPW - adjusted 1)	Number of trips (IPW - adjusted 2)	Number of trips (IPW - adjusted 3)	Number of trips (IPW - adjusted 4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	15.107***	9.771***	7.352***	12.207***	12.246***	14.856***	9.929***	7.218***	12.037***	12.075***
	(0.660)	(0.762)	(0.813)	(0.663)	(0.671)	(0.632)	(0.706)	(0.734)	(0.634)	(0.639)
SFSU	-40.085***	-47.518***	-45.713***	-41.016***	-41.184***					
	(0.743)	(0.858)	(0.915)	(0.746)	(0.755)					
SJSU	-62.849***	-72.419***	-67.870***	-63.804***	-63.830***					
	(0.670)	(0.774)	(0.826)	(0.673)	(0.681)					
Constant	81.440***	93.881***	94.975***	85.810***	85.798***	49.027***	56.246***	59.383***	52.836***	52.772***
	(0.498)	(0.574)	(0.613)	(0.499)	(0.506)	(0.447)	(0.499)	(0.519)	(0.448)	(0.452)
Obs	101,649	101,649	101,649	101,649	101,649	101,649	101,649	101,649	101,649	101,649
R^2	0.090	0.085	0.067	0.089	0.087	0.005	0.002	0.001	0.004	0.004

Notes: This table presents the results of ten regression analyses. Column 1-5 and column 6-10 differ in their specifications: the regressions in Column 1-5 control for institutions (by including institution control variables), while the regressions in Column 6-10 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B2. The effect of BayPass on the average number of trips taken (Year 1 SFSU)

	Dependent variable:				
	Number of trips (original)	Number of trips (adjusted 1)	Number of trips (adjusted 2)	Number of trips (adjusted 3)	Number of trips (adjusted 4)
	(1)	(2)	(3)	(4)	(5)
Treatment	17.451***	13.476***	11.094***	14.297***	14.392***
	(1.220)	(1.329)	(1.408)	(1.224)	(1.243)
Constant	40.532***	45.062***	47.948***	44.061***	43.860***
	(0.723)	(0.788)	(0.834)	(0.725)	(0.736)
Observations	25,046	25,046	25,046	25,046	25,046
R^2	0.008	0.004	0.002	0.005	0.005

Notes: This table presents the results of five regression analyses. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B3. The effect of BayPass on the average number of trips taken (Year 1 SJSU)

	Dependent variable:				
	Number of trips (original)	Number of trips (adjusted 1)	Number of trips (adjusted 2)	Number of trips (adjusted 3)	Number of trips (adjusted 4)
	(1)	(2)	(3)	(4)	(5)
Treatment	13.076***	12.571***	6.997***	10.986***	11.025***
	(0.925)	(1.028)	(1.270)	(0.931)	(0.969)
Constant	18.973***	20.937***	27.172***	22.235***	22.197***
	(0.401)	(0.445)	(0.550)	(0.403)	(0.420)
Observations	36,389	36,389	36,389	36,389	36,389
R^2	0.005	0.004	0.001	0.004	0.004

Notes: This table presents the results of five regression analyses. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B4. The effect of BayPass on the average number of trips taken (Year 1 UCB)

	Dependent variable:				
	Number of trips (original)	Number of trips (adjusted 1)	Number of trips (adjusted 2)	Number of trips (adjusted 3)	Number of trips (adjusted 4)
	(1)	(2)	(3)	(4)	(5)
Treatment	14.851***	5.329***	5.003***	11.582***	11.583***
	(1.201)	(1.436)	(1.454)	(1.204)	(1.205)
Constant	81.514***	95.163***	95.653***	85.991***	85.989***
	(0.645)	(0.771)	(0.781)	(0.647)	(0.647)
Observations	40,214	40,214	40,214	40,214	40,214
R^2	0.004	0.0003	0.0003	0.002	0.002

Notes: This table presents the results of five regression analyses. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B5. The effect of BayPass on the average number of trips taken (Year 2 aggregated)

	Dependent variable:									
	Number of trips (OLS - original)	Number of trips (OLS - adjusted 1)	Number of trips (OLS - adjusted 2)	Number of trips (OLS - adjusted 3)	Number of trips (OLS - adjusted 4)	Number of trips (IPW - original)	Number of trips (IPW - adjusted 1)	Number of trips (IPW - adjusted 2)	Number of trips (IPW - adjusted 3)	Number of trips (IPW - adjusted 4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	18.856***	13.059***	11.090***	16.083***	16.055***	19.190***	13.945***	11.732***	16.493***	16.463***
	(0.960)	(1.097)	(1.145)	(0.963)	(0.969)	(0.937)	(1.036)	(1.063)	(0.939)	(0.942)
SFSU	-41.303***	-48.439***	-46.200***	-41.923***	-41.765***					
	(1.110)	(1.268)	(1.324)	(1.113)	(1.121)					
SJSU	-69.896***	-79.570***	-74.861***	-70.512***	-70.255***					
	(0.976)	(1.116)	(1.165)	(0.979)	(0.986)					
Constant	90.159***	102.993***	103.426***	94.169***	94.144***	55.134***	62.847***	65.498***	58.786***	58.893***
	(0.727)	(0.830)	(0.867)	(0.729)	(0.734)	(0.672)	(0.743)	(0.762)	(0.673)	(0.676)
Obs	63,975	63,975	63,975	63,975	63,975	63,975	63,975	63,975	63,975	63,975
R^2	0.085	0.080	0.065	0.084	0.082	0.007	0.003	0.002	0.005	0.005

Notes: This table presents the results of ten regression analyses. Column 1-5 and column 6-10 differ in their specifications: the regressions in Column 1-5 control for institutions (by including institution control variables), while the regressions in Column 6-10 use Inverse Probability Weighting (IPW) to re-weight the sample. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B6. The effect of BayPass on the average number of trips taken (Year 2 SFSU)

	Dependent variable:				
	Number of trips (original)	Number of trips (adjusted 1)	Number of trips (adjusted 2)	Number of trips (adjusted 3)	Number of trips (adjusted 4)
	(1)	(2)	(3)	(4)	(5)
Treatment	18.497***	13.752***	10.452***	15.343***	15.090***
	(1.822)	(1.958)	(2.061)	(1.825)	(1.839)
Constant	48.988***	54.300***	57.460***	52.517***	52.734***
	(1.104)	(1.186)	(1.248)	(1.106)	(1.114)
Observations	14,712	14,712	14,712	14,712	14,712
R^2	0.007	0.003	0.002	0.005	0.005

Notes: This table presents the results of five regression analyses. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B7. The effect of BayPass on the average number of trips taken (Year 2 SJSU)

	Dependent variable:				
	Number of trips (original)	Number of trips (adjusted 1)	Number of trips (adjusted 2)	Number of trips (adjusted 3)	Number of trips (adjusted 4)
	(1)	(2)	(3)	(4)	(5)
Treatment	16.619***	16.411***	11.813***	14.531***	14.447***
	(1.292)	(1.431)	(1.682)	(1.299)	(1.337)
Constant	20.693***	22.779***	28.426***	23.955***	24.198***
	(0.567)	(0.627)	(0.738)	(0.569)	(0.586)
Observations	23,170	23,170	23,170	23,170	23,170
R^2	0.007	0.006	0.002	0.005	0.005

Notes: This table presents the results of five regression analyses. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.

B8. The effect of BayPass on the average number of trips taken (Year 2 UCB)

	Dependent variable:				
	Number of trips (original)	Number of trips (adjusted 1)	Number of trips (adjusted 2)	Number of trips (adjusted 3)	Number of trips (adjusted 4)
	(1)	(2)	(3)	(4)	(5)
Treatment	20.537***	10.443***	11.012***	17.553***	17.701***
	(1.735)	(2.045)	(2.046)	(1.739)	(1.737)
Constant	89.649***	103.787***	103.450***	93.722***	93.644***
	(0.956)	(1.127)	(1.127)	(0.958)	(0.957)
Observations	26,093	26,093	26,093	26,093	26,093
R^2	0.005	0.001	0.001	0.004	0.004

Notes: This table presents the results of five regression analyses. Standard errors are presented in parentheses, and *** indicates that a coefficient is significant on a 1%-level, ** on a 5%-level, and * on a 10%-level.