

Research Report – UCD-ITS-RR-11-08

Results of the 2010-11 Campus Travel Survey

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**RESULTS OF THE 2010-11
CAMPUS TRAVEL SURVEY**

Institute of Transportation Studies

and

Transportation and Parking Services

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TABLE OF CONTENTS

Table of Contents	2
List of Tables.....	4
List of Figures.....	6
Executive summary.....	7
About the Campus Travel Survey.....	7
Main findings.....	7
Residential location and distances traveled	7
Overall mode split.....	8
Mode split among different groups.....	8
VMT and carbon emissions	9
Change in mode split, 2007-08 through 2010-11	9
Awareness of TAPS and other transportation services.....	10
Introduction.....	12
About the campus travel survey.....	12
Development of the survey instrument.....	12
Sampling procedure	12
Survey administration and recruitment of participants.....	14
Response rate	15
Screening respondents for eligibility	17
Sociodemographic composition of respondents completing the survey.....	18
Weighting responses by role	19
Imputation of responses	20
Reference week.....	21
Findings.....	22
Number traveling to campus.....	22
Destination on campus.....	24
Mode split for primary means of transportation	25
Comparison of 2010-11 mode split with 2009-10, 2008-09 and 2007-08.....	30
Secondary means of transportation and circulation on campus.....	35
Overnight bike parking	38
Number of (claimed) bikes on campus and gross movements of bikes.....	41
Carpooling and ridesharing.....	44
Number of vehicles on campus.....	45
Average Vehicle Ridership.....	46
Parking on and off campus	47
Parking permits	49
Ridership by transit provider	50
Distance to transit station.....	52
Time arriving on campus	53
Self-reported travel time	54
Residential location and distance from campus.....	55
Aggregate person-miles and vehicle-miles traveled.....	61
Carbon emissions	65
Car ownership.....	68

Vehicle type.....	69
Bicycle ownership and bike-riding aptitude	69
Drop-off in bicycling after freshman year	71
Crashes while bicycling on and off campus	72
Bicycle theft.....	74
Awareness of TAPS and other transportation programs	77
Acknowledgements.....	80
References.....	81
Appendices.....	82
Appendix A: Survey instrument, 2010-11 Campus Travel Survey.....	82
Introduction.....	83
About you (part 1).....	84
Days traveled last week	85
Days not traveled last week	85
Arrival time.....	86
Modes used last week	86
Overnight bikes.....	90
Travel time and circulator mode	90
Summer activities.....	91
Incidents.....	93
Incident follow-up.....	93
Bicycle theft.....	93
Mode share.....	97
Campus transportation programs	98
Comfort.....	98
Travel preferences.....	99
About you (part 2).....	100
Optional.....	103
Thank you!	104
Appendix B: Changes in the 2010-11 survey instrument and suggestions for the future.....	105
Appendix C: Text of the recruitment emails.....	107
Appendix D: Calculation of Average Vehicle Ridership (AVR).....	109
Appendix E: Geocoding and network distances	111
Appendix F: Fuel energy assumptions used for calculation of CO ₂ emissions	113
Appendix G: Weighting by Gender Memo	114
To: Cliff Contreras	114
From: Joshua Miller and Susan Handy.....	114
Date: May 11, 2011	114
Subject: Weighting by Gender, 2010-11 Campus Travel Survey	114
Issue	114
Method	116
Results.....	116
Next Steps.....	117

LIST OF TABLES

Table 1. Mode split, VMT, and carbon emissions by role and residential location	9
Table 2. Change in mode split, 2007-08 through 2010-11	10
Table 3. AVR, 2007-08 through 2010-11	10
Table 4: Sampling plan for 2010-11, versus 2009-10, 2008-09, and 2007-08.....	13
Table 5. Response rate, by role	15
Table 6. Response number, by role	16
Table 7. Sociodemographic characteristics of survey respondents.....	19
Table 8. Weight factors, applied by role	20
Table 9. Weather and other events occurring during survey reference week.....	21
Table 10. Percent traveling to campus by day of the week.....	22
Table 11. Percent traveling to campus on an average weekday, by role and residential location.....	23
Table 12. Percent away from campus all week and reasons given, by role	23
Table 13. Percent of employees not traveling to campus on an average weekday and reason	24
Table 14. Destination on campus, among employees and graduate students	24
Table 15. Percent using each mode on an average weekday, by role group (all locations).....	25
Table 16. Percent using each mode on an average weekday, from within Davis	26
Table 17. Percent using each mode on an average weekday, from on-campus	26
Table 18. Percent using each mode on an average weekday, from off-campus in Davis	27
Table 19. Percent using each mode on an average weekday, from outside Davis	27
Table 20. Percent using each mode on an average weekday, including telecommuting.....	27
Table 21. Comparison of mode split percentages using different denominators	29
Table 22. Percent using each as a primary mode at least once during the seven-day week	29
Table 23. Percent using each mode on an average weekday, 2007-08 through 2010-11.....	30
Table 24. Percentage-point change in overall mode shares, 2007-08 through 2010-11	31
Table 25. Percentage-point change in bike mode share, by role, 2007-08 through 2010-11	32
Table 26. Percentage-point change in walk mode share, 2007-08 through 2010-11	32
Table 27. Percentage-point change in drive-alone mode share, 2007-08 through 2010-11.....	33
Table 28. Percentage-point change in carpool mode share, 2007-08 through 2010-11	33
Table 29. Percentage-point change in personal vehicle share, 2007-08 through 2010-11.....	34
Table 30. Percentage-point change in bus mode share, 2007-08 through 2010-11	34
Table 31. Percentage-point change in train mode share, 2007-08 through 2010-11.....	35
Table 32. Percentage-point change in those physically traveling, 2007-08 through 2010-11	35
Table 33. Percent using each mode at least once as a secondary mode.....	36
Table 34. Percent biking as a secondary mode on campus on average weekday, by role	37
Table 35. Means of transportation typically used during the day to get around campus.....	38
Table 36. Percent of people with bikes on campus overnight each day, by role.....	39
Table 37. Percent with bikes on campus various numbers of nights per week, by role	40
Table 38. Time elapsed since last riding bikes stored on campus overnight	40
Table 39. Number of people with bikes on campus on an average weekday	42
Table 40. Comparison of bike counts: Rack count versus survey results.....	43
Table 41: Average carpool size	44
Table 42: Percent driving alone versus carpooling or ridesharing on an average weekday	44
Table 43. Projected vehicles arriving on an average weekday, by occupancy and role.....	45
Table 44: Average Vehicle Ridership (AVR), 2007-08 through 2010-11.....	46
Table 45. Off-campus employee AVR at Davis versus other UC campuses.....	47

Table 46: Percent of people parking on and off campus on a typical weekday, by role	48
Table 47: Projected vehicles parking on and off campus on a typical weekday, by role	48
Table 48: Percent of people with a parking permit, by role	49
Table 49: Percent with each type of parking permit	50
Table 50: Projected bus ridership for each day of the reference week	50
Table 51: Projected train ridership for each day of the reference week	51
Table 52: Number riding specific bus services at least once during the week	51
Table 53: Number riding specific train services at least once during the week	52
Table 54: Mean and median self-reported distance from home to transit station	52
Table 55: Projected number of persons driving or getting a ride to a transit station	53
Table 56: Vehicle-miles driven to transit stations for trips to and from campus	53
Table 57: Arrivals during the peak period, by day	54
Table 58: Percent arriving during the peak period on an average weekday, by role	54
Table 59: Reported number of minutes spent traveling to campus, by role	55
Table 60: Residential location by role group: on or off-campus, in or outside of Davis	55
Table 61: Role group by residential location: on or off-campus, in or outside of Davis	56
Table 62: Cities and counties where respondents live, based on geocoded addresses	56
Table 63: Average distance from campus, based on geocoded addresses, by role	57
Table 64: Cumulative percent of people living within each distance of campus, by role	58
Table 65: Primary mode on an average weekday, by distance from campus	59
Table 66: Distance from campus, by mode group	59
Table 67: Self-reported distance from campus, by role	60
Table 68: Comparison of self-reported versus estimated distances from campus, by role	60
Table 69: Total miles traveled daily and annually, by mode used	62
Table 70: Total miles traveled daily and annually, by role	62
Table 71: Vehicle-miles traveled, by mode, daily and annually	64
Table 72: Vehicle-miles traveled, by role, daily and annually	64
Table 73: Formula for calculating average weekday pounds-equivalent of CO ₂ , by mode	65
Table 74: Estimated daily carbon emissions by mode and role	66
Table 75: Estimated annual carbon emissions, by mode and role	66
Table 76: Percent with access to a car	68
Table 77: Types of vehicle technologies (fuel) used	69
Table 78: Percent who own a bike and expense paid	70
Table 79: Self-reported bike-riding aptitude by role	70
Table 80: Reasons upperclassmen bike less than as freshman	71
Table 81: Importance of reasons upperclassmen bike less than as freshman	72
Table 82: Injuries from on campus bike crashes, by role group	73
Table 83: Injuries from off campus bike crashes on way to or from campus, by role group	74
Table 84: Victims of bike theft, by role	75
Table 85: Projected monetary loss from on campus bicycle theft, by role	75
Table 86: Projected monetary loss from off campus bicycle theft, by role	76
Table 87: Awareness of transportation services	77
Table 88: Awareness of transportation services, 2007-08 through 2009-10	78
Table 89: Geocoding results	111
Table 90: Fuel energy assumptions used for calculating carbon emissions	113

LIST OF FIGURES

Figure 1. Residential location, 2010-11	7
Figure 2. Cumulative percent of people living within each distance from campus.....	8
Figure 3. Overall mode split 2010-11	8
Figure 4. Percent who have heard of each service, 2010-11.....	11
Figure 5. Number of respondents taking the survey each hour, by survey year.....	16
Figure 6. Number of respondents taking the survey each day, 2010-11	17
Figure 7. Survey launch and reference week schedule	21
Figure 8. Tree diagram depicting sources of bikes on campus on an average weekday.....	43
Figure 9. Estimated annual carbon emission savings by alternative transportation users	68
Figure 10. How bikes were locked when stolen from on campus	77
Figure 11. Sample screenshot of a page from the online survey	104

EXECUTIVE SUMMARY

About the Campus Travel Survey

The campus travel survey is a joint effort by the Transportation & Parking Services (TAPS) on campus and the Sustainable Transportation Center, part of the Institute of Transportation Studies at UC Davis. It is administered annually in the fall by a graduate student at the Institute of Transportation Studies. The main purpose of the survey is to collect data on how the UC Davis community travels to campus, including mode choice, vehicle occupancy, distances traveled, and vehicle/bicycle parking. It also offers an opportunity for TAPS to assess awareness of campus transportation services and perceptions of mobility options. This survey is the fifth administration of the Campus Travel Survey.

The 2010-11 survey was administered online in November 2010 to a stratified random sample of 15,704 students, faculty, and staff (out of an estimated total population of 40,618). About 22 percent (3,424 individuals) responded to this year's survey, with about 17 percent actually completing it. For the statistics we present throughout this report, we weight the responses by role group (freshmen, sophomore, junior, senior, masters student, PhD student, faculty, and staff) so that the proportion of respondents in each group reflects their proportion in the campus population.

Main findings

Residential location and distances traveled

About 77 percent of the (weighted) sample of respondents lives within Davis, including 15 percent who live on campus. This means that in the entire population of 40,618 campus affiliates, we estimate that about 6,137 live on campus, 25,277 live off campus in the city of Davis, and 9,204 live outside of Davis (see Figure 1).

Based on respondents' residential locations, we estimate that the average distance traveled to campus is 6.6 miles. Among those living within Davis (off campus), the average distance is 2.1 miles, and the maximum is about 7.6 miles. Because of the agricultural belt surrounding the city of Davis, those living outside of Davis are likely to live more than 10 miles away. The average distance for those outside of Davis is about 24 miles. In total, about 71 percent of the campus population lives within 3 miles of campus, 18 percent lives more than 10 miles away, and 8 percent lives more than 20 miles away (see Figure 2).

Figure 1. Residential location, 2010-11

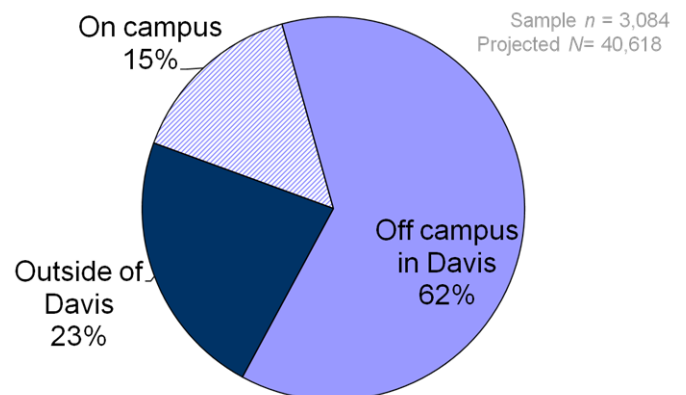
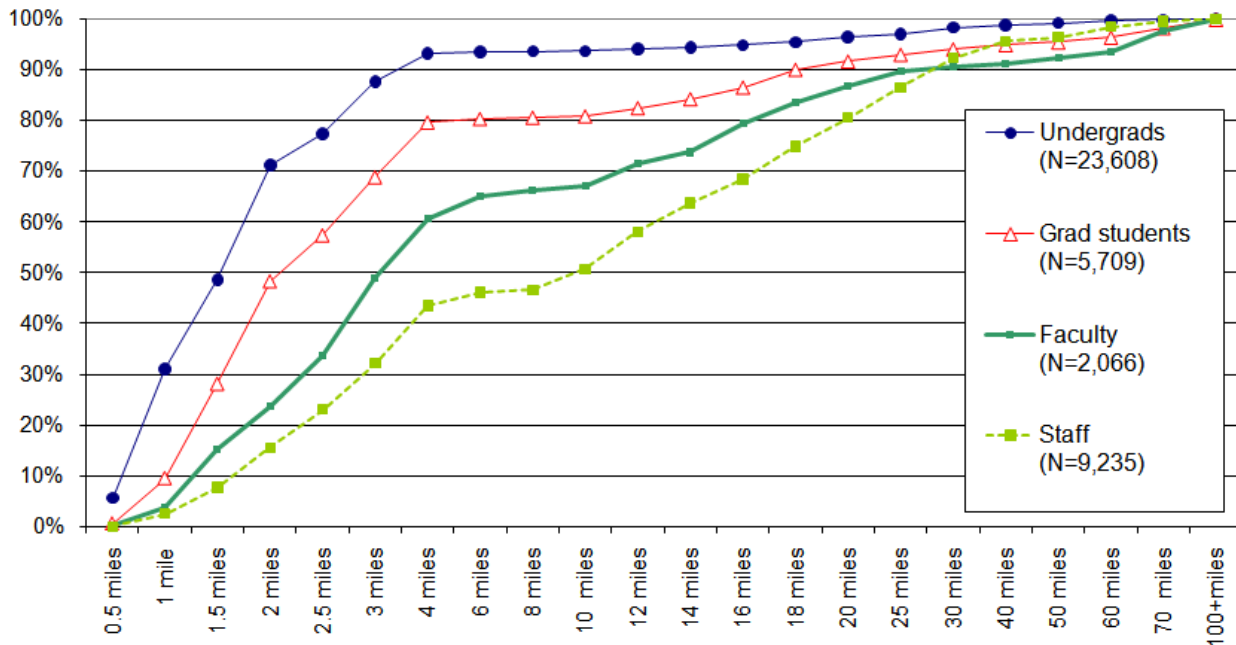


Figure 2. Cumulative percent of people living within each distance from campus



Overall mode split

On an average weekday, about 90 percent of people are physically on campus (a projected 36,475 people, including those living on campus). Among these, about 41 percent bike to get there, 33 percent arrive in personal vehicles, 20 percent ride public transit, and 6 percent walk or skate. These figures represent the percent of people primarily using each means of transportation (that is, for the greatest share of their distance) from wherever they live to their campus destination, on an average weekday.

Because some people use different travel modes on different days, the total number of regular bikers or transit-riders, for instance, is substantially larger than the number doing it on any given day. In particular, while 41 percent bike on an average day, 47 percent reported biking as their primary means at least once during the week. Similarly, about 18 percent carpooled, 25 percent rode the bus, and 1.4 percent rode the train at least once during the week as their primary means to get to campus.

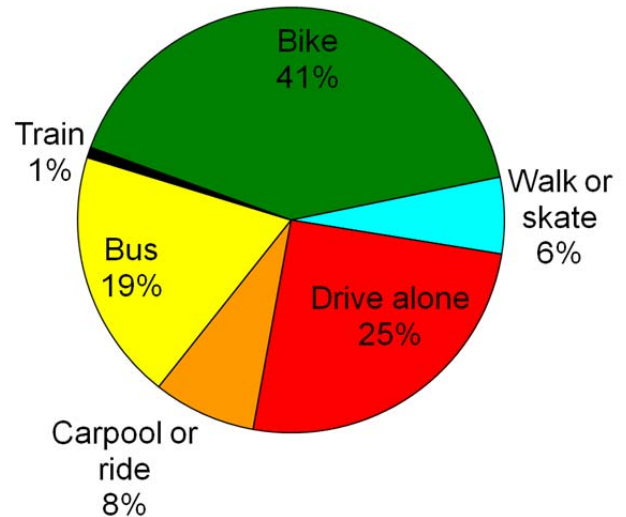
An additional number of people use some of these modes in combination with other modes. For instance, while 37 percent bike as their primary mode of travel on an average weekday (or 41 percent of those physically traveling), we estimate that 45 percent of the campus population has a bike on campus on an average weekday, a projected 18,091 people with bikes (see Table 39).

Mode split among different groups

As in previous years' surveys, the mode split varies substantially by residential location and role group. Most freshmen live on campus and therefore almost exclusively bike or walk to campus destinations. But these patterns do not persist when freshmen move off campus sophomore year. In general, anyone living off campus within the city of Davis has the greatest range of transportation options, including biking, driving, riding the bus

Figure 3. Overall mode split 2010-11

Sample n = 3,084
Projected N = 36,475



and (for some) walking. Table 1 shows that differences in mode split, annual vehicle-miles traveled (VMT) and carbon emissions are most salient between those who live within Davis and those who live outside of Davis, though there are also differences between role groups for each location. These findings suggest that one way to substantially reduce vehicle-miles traveled to campus and associated carbon emissions is to encourage UC Davis students and employees to live within Davis rather than farther away.

Table 1. Mode split, VMT, and carbon emissions by role and residential location

<i>Role</i>	Residential location (Within or Outside Davis)	Percent traveling to campus	Primary mode among those physically traveling to campus:					Work from home	Annual VMT / person	Annual tons CO ₂ / person	Estimated Population
			Bike	Walk	Bus	Train	Private Vehicle				
<i>Undergrad</i>	Within	93.5%	47.0%	6.8%	28.7%	0.3%	10.3%	n/a	105	0.14	21,794
	Outside	87.6%	2.0%	1.4%	6.4%	2.6%	75.3%	n/a	7,654	4.03	1,814
<i>Graduate</i>	Within	92.4%	55.1%	6.5%	4.8%	0.0%	25.9%	1.6%	252	0.14	4,602
	Outside	76.5%	2.9%	0.4%	3.1%	9.0%	61.1%	7.2%	5,669	3.27	1,107
<i>Faculty</i>	Within	84.8%	45.9%	6.4%	1.5%	0.1%	30.8%	3.3%	344	0.18	1,315
	Outside	73.9%	2.5%	0.0%	1.4%	5.0%	65.0%	9.3%	5,599	3.02	751
<i>Staff</i>	Within	89.0%	40.3%	3.0%	4.9%	0.1%	40.7%	0.6%	491	0.27	4,187
	Outside	82.3%	1.6%	1.0%	2.6%	1.0%	76.0%	2.7%	6,236	3.24	5,048
<i>Total</i>	Within	92.4%	47.3%	6.2%	21.0%	0.2%	17.4%	0.4%	187	0.16	31,898
	Outside	81.9%	1.9%	0.9%	3.3%	2.7%	73.0%	3.2%	6,404	3.39	8,720
	<i>Overall</i>	90.1%	37.5%	5.1%	17.2%	0.7%	29.3%	1.0%	1,521	0.85	40,618

Results are based on responses to questions *q_0008*, *q_0011*, *q_0012*, and *q_0017*. Data are weighted by role group based on 2,907 successfully geocoded responses.

VMT and carbon emissions

Based on distance from campus, mode choice, and vehicle occupancy, we generate rough estimates of the total number of vehicle-miles traveled (VMT) on the way to and from campus on an average weekday, as well as the carbon emissions associated with this travel. We estimate that the campus community covers about 377,600 miles per day roundtrip, generating about 243,700 vehicle-miles of travel in personal vehicles, and about 247,200 vehicle-miles travel overall (additionally including estimates of VMT by bus and train). Travel in personal vehicles generates an estimated 268,000 pounds-equivalent of CO₂ daily, or an average of 22.2 pounds per person arriving by vehicle. Daily users of all modes generate about 305,000 pounds-equivalent of CO₂, averaging 7.5 pounds per person campus-wide.

Change in mode split, 2007-08 through 2010-11

As seen in the last row of Table 2, there have been no statistically significant changes in the overall mode split between 2008-09 and 2010-11, the three survey years in which the survey questions measuring primary mode split have been essentially the same. Even when separated by role group, there have been remarkably few significant changes in the primary mode split between 2008-09 and 2010-11. These results suggest that some of the changes in the primary mode split between 2007-08 and later survey years may stem in part from differences in survey design rather than changes in actual travel behavior.

Perhaps the most notable change in the overall mode split that is unlikely to be affected by changes in survey design is the percent physically traveling to campus. Despite small increases (though statistically insignificant) in the percent of undergraduate students, graduate students, and employees physically travelling to campus between 2009-10 and 2010-11, the percent of those physically traveling to campus is still 3.3 percentage points lower than in 2007-08, representing about 1,300 fewer people travelling to campus on an average weekday. This change is important not only due to its overall magnitude, but also its potential environmental impact and implications for campus planning.

This trend is observed but not significant in all role groups. While it is significant among undergraduates (a decline of about 2 percent between 2007-08 and 2010-11), the percent physically travelling to campus has declined most for faculty and staff, with about 79 percent of faculty and 85 percent of staff coming to campus on an average weekday, down by about 9 and 7.5 percentage points, respectively.

Table 2. Change in mode split, 2007-08 through 2010-11

Percentage-point change in percent of people doing each on an average weekday								
Among those physically traveling to campus:								
Years of comparison	Personal vehicle					Bus	Train	Physically traveling to campus
	Bike	Walk	Any	Drive alone	Carpool or ride			
2007-08 to 2008-09	3.0% **	0.7%	-2.2% **	-4.3% **	2.1% **	1.1%	n/a	-2.7% **
2008-09 to 2009-10	-1.5%	1.1% *	1.6%	1.4%	0.2%	-1.0%	-0.2%	-1.8% **
2009-10 to 2010-11	2.0%	-1.2% *	-0.8%	-0.8%	0.0%	-0.1%	0.2%	1.2%
2007-08 to 2010-11	3.5% **	0.6%	-1.4%	-3.7% **	2.2% **	0.0%	n/a	-3.3% **
2008-09 to 2010-11	0.4%	-0.1%	0.8%	0.6%	0.2%	-1.1%	0.0%	-0.6%

Total sample sizes are 4,180 (in 2007-08), 3,929 (in 2008-09), 3,840 (in 2009-10), and 3,084 (in 2010-11).

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

Vehicles on campus

Among those arriving by personal vehicle, about 77 percent drive alone, 17 percent carpool, and 6 percent get a ride with someone who drops them off before continuing on elsewhere. The average carpool size is 2.57 people (including the driver) and the average number of people dropped off by a driver continuing on elsewhere is 1.48 passengers (excluding the driver) per vehicle. Average vehicle ridership (AVR, as calculated by the South Coast Air Quality Management District) is roughly a ratio of the number of person-arrivals to vehicle-arrivals on campus over a five-day workweek, so higher AVR values (greater than 1.0) indicate more carpooling and/or use of alternative modes of transportation. The 2010-11 AVR for non-student employees living off-campus is 1.7, up slightly from 2009-10 and 2008-09. Overall AVR (for the entire campus community) is 3.42, up from 2009-10 but still down from 2008-09 (see Table 3).

Table 3. AVR, 2007-08 through 2010-11

	2007-08	2008-09	2009-10	2010-11	Counting one vehicle for each person driving alone and a partial vehicle proportionate to the number of occupants in vehicles with more than one person, we estimate that 10,856 vehicles travel to UC Davis on
Overall	3.20	3.51	3.30	3.42	
Employees and student employees	n/a	n/a	2.31	n/a	
Employees (non-student only)	1.67	1.71	1.66	1.70	
All off-campus residents	2.75	2.99	2.83	2.94	
Off-campus employees and student employees	n/a	n/a	2.20	n/a	
Off-campus employees (non-student only)	1.67	1.69	1.66	1.70	

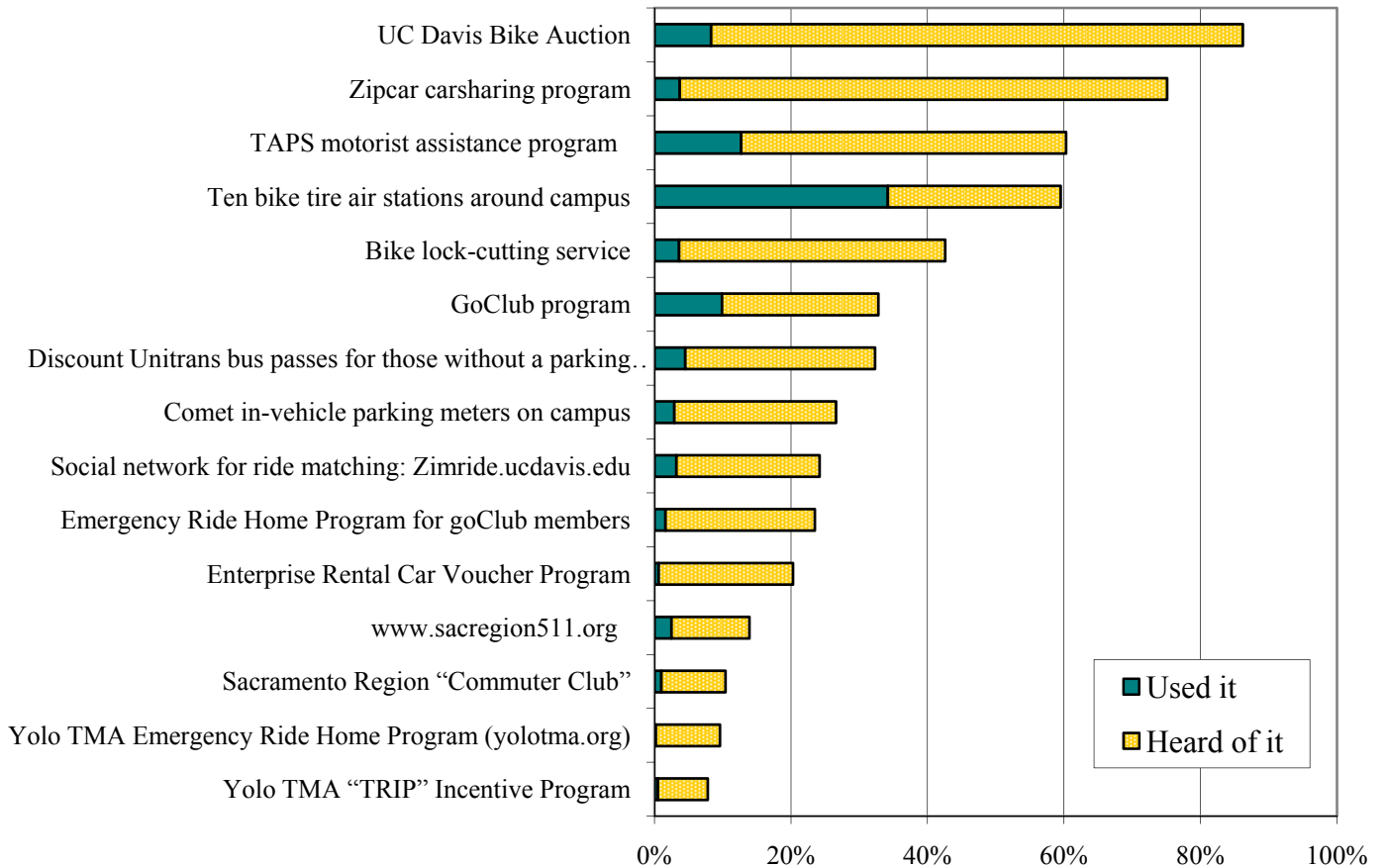
an average weekday. About 931 of these contain carpools and 700 are vehicles just dropping passenger(s) off. This means there are about 3.42 people on campus or telecommuting for every one vehicle that comes to campus during the week. Among the vehicles coming to campus, an estimated 83 percent (8,680 vehicles) park on campus, 13 percent (1,390 vehicles) park off campus, and 4 percent (416 vehicles) drop passengers off without parking.

Awareness of TAPS and other transportation services

The GoClub was newly launched in September 2009 as an overarching program for marketing alternative

transportation options on campus. As of the October 2009 survey, about 3 percent of survey respondents reported having used it and an additional 14 percent reported that they had heard of it; by the October 2010 survey, about 10 percent of survey respondents reported having used it and an additional 23 percent reported that they had heard of it (Figure 4). More than three quarters had heard of Zipcar, which was launched on campus in the fall of 2009 as well. Less than half had heard of programs such as the discount bus passes with the purchase of a parking permit, of the lock-cutting service, and of the new ride-matching network Zimride.

Figure 4. Percent who have heard of each service, 2010-11



INTRODUCTION

About the campus travel survey

The campus travel survey is a joint effort by the Transportation & Parking Services (TAPS) on campus and the Sustainable Transportation Center, part of the Institute of Transportation Studies at UC Davis, meant to be administered annually each fall by a graduate student at the Institute of Transportation Studies. The main purpose of the survey is to collect annual data on how the UC Davis community travels to campus, including mode choice, vehicle occupancy, distances traveled, and vehicle/bicycle parking. It also offers an opportunity for TAPS to assess awareness of campus transportation services and perceptions of mobility options. This year's survey is the fifth administration of the campus travel survey. The survey was first administered in the spring of 2006-07 as a pilot effort, with a second survey conducted in the fall of 2007-08 (Congleton 2009), a third conducted in the fall of 2008-09 (Lovejoy, Handy *et al.* 2009), and a fourth conducted in the fall of 2009-10. The next administration of the survey is planned for October 2011.

The 2010-11 survey was administered online in November 2010, distributed by email to a stratified random sample of 15,704 students, faculty, and staff (out of an estimated total population of 40,618). About 22 percent (3,424 individuals) responded to this year's survey, with about 17 percent actually completing it. For the statistics we present throughout this report, we weight the responses by role group (freshmen, sophomore, junior, senior, masters student, PhD student, faculty, and staff) so that the proportion of respondents in each group reflects their proportion in the campus population.

Development of the survey instrument

The content of the survey was based on the previous year's survey, retaining key questions relating to mode choice and residential location, among others. An ongoing attempt to refine question wording has meant that some variables are not directly comparable across years. (See Appendix A: Survey instrument, 2010-11 Campus Travel Survey for a full copy of the 2010-11 survey instrument. See Appendix B for a summary of changes in the 2010-11 survey compared to the 2009-10 survey, as well as suggestions for potential modifications to the survey in future years.) The online survey was prepared using the Lime Survey software (<http://www.limesurvey.org/>), hosted on a server at the Institute of Transportation Studies administered by Ning Wan (a sample screenshot of the online appearance of the survey is shown in Appendix A: Survey instrument, 2010-11 Campus Travel Survey). Staff at TAPS, at the Office of Resource Management and Planning, as well as faculty, staff, and students affiliated with the Institute of Transportation Studies provided feedback on survey content, and assisted with pre-testing the online survey.

Sampling procedure

As in previous years, the goal of the sampling procedure was to draw a sufficiently large sample for reliable statistical estimates within the following groups: freshmen, sophomores, juniors, seniors, master's/professional students, PhD students, faculty, and staff. We used standard statistical techniques to determine the minimum sample size needed for estimates with a +/- 5% margin of error, based on the assumed population size of each of the groups, shown in the first column of Table 4.1 In past years, we assumed that we might expect 20 percent of

¹ For each strata, the minimum sample size, n , was calculated as $n = \frac{z_{\alpha/2}^2 S^2}{e^2 + \frac{z_{\alpha/2}^2 S^2}{N}}$, where N is the total population, S^2 is the

population variance, $z_{\alpha/2}$ is the $(1-\alpha/2)^{\text{th}}$ percentile of the standard normal distribution for degree of certainty $1-\alpha$, and e is the acceptable margin of error of the estimate Lohr, S. L. (1999). "Sampling: Design and Analysis." This formula assumes a two-sided

those invited to complete the survey, but found that response was higher among some role groups (PhD students, faculty, and staff) and lower among others (seniors and master's/professional students) (see Table 4). Last year, we assumed varying response rates by strata to account for these differences. This year, we opted to repeat the approach used in last year's survey, assuming that response rates by strata in previous years would remain relatively consistent. In order to ensure that we reached minimum sample size targets even with some variation in response rates, we planned for just a 12 percent response among seniors, a 13 percent response among masters/professional students and up to a 34 percent response among staff, as shown in Table 4. Overall, we invited 15,704 people to complete the 2010-11 survey, or about 39 percent of the overall campus population, which was 2,382 more than were invited in 2009-10.

Table 4: Sampling plan for 2010-11, versus 2009-10, 2008-09, and 2007-08

Role group	2010-11				2009-10 ^b		2008-09 ^c		2007-08 ^d	
	Assumed population ^a	Target response	Number invited	Percent invited	Invited	Response	Invited	Response	Invited	Response
Students	29,317	16%	13,161	45%	37%	25%	38%	22%	36%	23%
Undergraduate	23,608	15%	9,530	40%	32%	24%	32%	20%	31%	22%
Freshmen	3,628	17%	2,012	55%	41%	30%	39%	22%	40%	26%
Sophomores	4,469	16%	2,269	51%	40%	26%	39%	21%	36%	22%
Juniors	6,279	17%	2,200	35%	29%	22%	31%	22%	32%	21%
Seniors	9,232	12%	3,050	33%	26%	19%	24%	17%	21%	20%
Graduate	5,709	19%	3,630	64%	60%	28%	61%	27%	60%	24%
Masters	2,073	13%	2,485 ^e	100%	98%	19%	86%	18%	84%	19%
PhD	3,636	30%	1,145	31%	39%	40%	48%	35%	48%	28%
Employees	11,301	27%	2,543	23%	22%	34%	31%	35%	28%	45%
Faculty	2,066	22%	1,464	71%	63%	27%	78%	30%	65%	37%
Staff	9,235	34%	1,079	12%	13%	42%	20%	39%	20%	50%
Overall percent	100%	18%		39%	33%	27%	36%	26%	34%	28%
Overall number	40,618	2,800	15,704		13,322	3,569	14,031	3,577	13,770	3,849

^a Population figures are based on those provided by the Budget and Institutional Analysis department. For employees, this consisted of a tabulation they prepared at our request that included a breakdown of the total number of on-campus faculty (ladder faculty plus other faculty) and on-campus staff (including academic support, senior management, MSP, and SSP). For students, figures are based on the 2009-2010 student population summary three-quarter average (available online at http://budget.ucdavis.edu/data-reports/documents/enrollment-reports/historical-enrollment/eenrsum_a0910.pdf). “Seniors” includes post-baccalaureate (teaching credential) students; “Masters” includes all academic-program masters students, plus professional-program students in Masters of Law, JD, MBA (full time and working professional program), Forensic Science, Masters of Advanced Study, and Master of Preventative Vet Med, and excluding all School of Medicine students; “PhD” includes all academic-program doctoral (D1 and D2) students, plus professional-program students in Veterinary Medicine (DVM), excluding all School of Medicine students.

^b As reported in (Lovejoy 2010).

^c As reported in (Lovejoy, Handy *et al.* 2009).

^d As reported in (Congleton 2009).

^e The number of masters students invited is greater than the number in the assumed population, because the list included Medical Center students who were later screened out.

A stratified random sample of 15,704 was drawn from ostensibly complete lists of UC Davis email addresses maintained at two different departments within the university. The sampling of student email addresses was conducted by the Student Affairs Research and Information office (SARI). Student addresses were screened based on students' level and departmental affiliation, including all academic and professional students except

test and includes a finite population correction. We assumed $S^2=0.25$ (since a binary variable assuming a given value with probability p has maximum $S^2 \approx p(1-p)$ when $p=0.5$); we assumed acceptable margin of error of $\pm 5\%$ ($e = 0.05$); and we aimed for 95% confidence level ($\alpha=0.05$ or $z_{\alpha/2} \approx 1.96$). Values of N used were those shown in Table 8.

medical students, who are not based on the Davis campus. In the case of the student sample, we received a spreadsheet from SARI containing only those names and email addresses of individuals selected for inclusion in the sample. A list of employee (faculty and staff) email addresses was drawn by Data Administration staff using the Campus Data Warehouse. Employees were screened to exclude those affiliated with the Medical Center or field stations, those without salary, Emeritus faculty, Extension School faculty, temporary employees, and employees without email addresses. Data Administration staff submitted to Joshua Miller a separate Excel spreadsheet for faculty and one for staff. Since there were more email addresses in each spreadsheet than needed according to the sampling plan, the following procedure was used to draw a random sample from each spreadsheet: since each row contained the email address for one employee, a column was added to each row with a random number generator (scale 1 to 1,000,000). Rows were then sorted by this column of random numbers, and the top 1,464 rows of faculty and 1,079 rows of staff were selected for the respective samples.

Survey administration and recruitment of participants

We invited 15,704 randomly selected students, faculty, and staff to participate in the survey via email to their UC Davis addresses. In these emails, faculty and staff recipients were addressed “Dear UC Davis Employee” and students were addressed “Dear UC Davis Student.” Everyone received two emails, an initial email inviting them to take survey and a reminder email approximately one week later, regardless of whether they had already completed it. Copies of these recruitment emails are shown in Appendix C.

In the 2008-09 administration of the survey, the initial email invitation was sent to all members of the sample at the same time, resulting in excess traffic to the web server hosting the survey in the minutes and hours immediately after the invitations were sent (see Lovejoy, *et al.* 2009). In an effort to spread this load, email invitations for the 2009-10 survey were sent in batches of approximately 1,000 per hour over two days. In particular, Lovejoy (2010) randomized the order of the email addresses and divided them into 14 batches of 1,000 or fewer (11 batches consisting of student email addresses and 3 consisting of employee email addresses). The UC Davis Postmaster sent one batch per hour as bulk mail from the address “travelsurvey@ucdavis.edu,” starting at 9am on Wednesday, November 4, 2009, and continuing through 3pm on Thursday, November 5, 2009. Reminder emails were sent in a similar batched fashion on Monday and Tuesday of the following week (November 9 - 10, 2009).

Because this approach successfully avoided server issues in 2009, the same approach was used for email invitations in 2010: email invitations for the 2010-11 survey were sent in 17 randomized batches of 1,000 per hour over two days (14 batches consisted of student email addresses and 3 consisted of employee email addresses). The UC Davis Postmaster sent one batch per hour as bulk mail from the address “travelsurvey@ucdavis.edu,” starting at 8am on Monday, November 1, 2010, and continuing through 5pm on Tuesday, November 2, 2010. Despite using the same approach as the previous year (in which there were no server issues), survey respondents began reporting slow survey loading times as early as 11:25am on Monday, November 1, 2010. Batches were promptly delayed and sent out every other hour in an attempt to prevent long survey loading times that ultimately discouraged respondents from completing the survey. Nevertheless, many respondents reported slow server response and long loading times; these respondents were encouraged to try taking the survey later in the evening, and the following message was added to the survey welcome page: "If each survey page takes a long time to load, please try taking the survey later this evening." The server performance was monitored at several points during the administration, and it was noted that no more than a few dozen respondents accessed the survey at any given time. As a result of poor server performance, the schedule of reminder emails was slightly revised: reminders were sent out in a similar batched fashion on Monday and Tuesday of the following week (November 8-9, 2010), but batches were spaced out every hour in the earlier part of the day and every hour in the afternoon. Because many reminder email recipients had already responded to the survey, there were fewer problems with server performance, though long loading times were

still reported by a few respondents.

Offering a chance to win a desirable prize is thought to increase overall response to a survey. This year, TAPS allocated \$250 for incentives to participate in the 2010-11 survey, which is \$100 more than the budget allocated for incentives in the 2008-09 and 2009-10 surveys. Rather than offering one iPod nano as in previous years, we opted to offer a drawing to win one of ten \$25 Downtown Davis gift cards. These cards are accepted at more than 200 businesses located in Davis and are expected to appeal to all demographics and roles in the UC Davis community. Entry into this drawing was mentioned in the initial and follow-up recruitment emails, as well as on the first welcome page of the online survey, where the mention of the Downtown Davis gift cards was hyperlinked to "Gift Cards" section on the website of the Davis Downtown Business Association, which sells these gift cards. On the final page of the survey, respondents were asked to indicate whether it would be okay for us to contact them again (1) with questions about their survey or (2) if they win the drawing for a \$25 Downtown Davis gift card, or if instead they preferred not to be contacted. There were 2,283 respondents who indicated they were willing to be contacted if they won the drawing and provided contact information. We assigned each of these respondents a random number and selected the ten with the lowest values as the winners, who were notified via email on January 9, 2010 and issued the prize shortly thereafter.

Response rate

A total of 3,448 respondents at least commenced the survey (responding to question *q_0001*), which was just under 22 percent of those invited. This rate is substantially lower than the response rate in the 2009-10 survey (32 percent). Of those that began the survey, 90 percent (3,084 respondents) completed the survey through question *q_0017*, which asked respondents about their mode choice on each day of the reference week. About 21.5 percent of those who started the survey did not complete the survey. This attrition is substantially higher than that observed in the 2009-10 survey (13 percent). Table 5 shows response rates for *q_0001*, survey completion, and two other key points in the survey: question *q_0017* on mode choice and questions *q_0008-11* on residential location (and in particular whether the responses given were successfully geocoded). As shown, in the more restricted sets, some role groups did not meet target response rates. As in previous years, response rates were highest among staff and PhD students, and lowest among sophomores, juniors, seniors, and masters/professional students.

Table 5. Response rate, by role

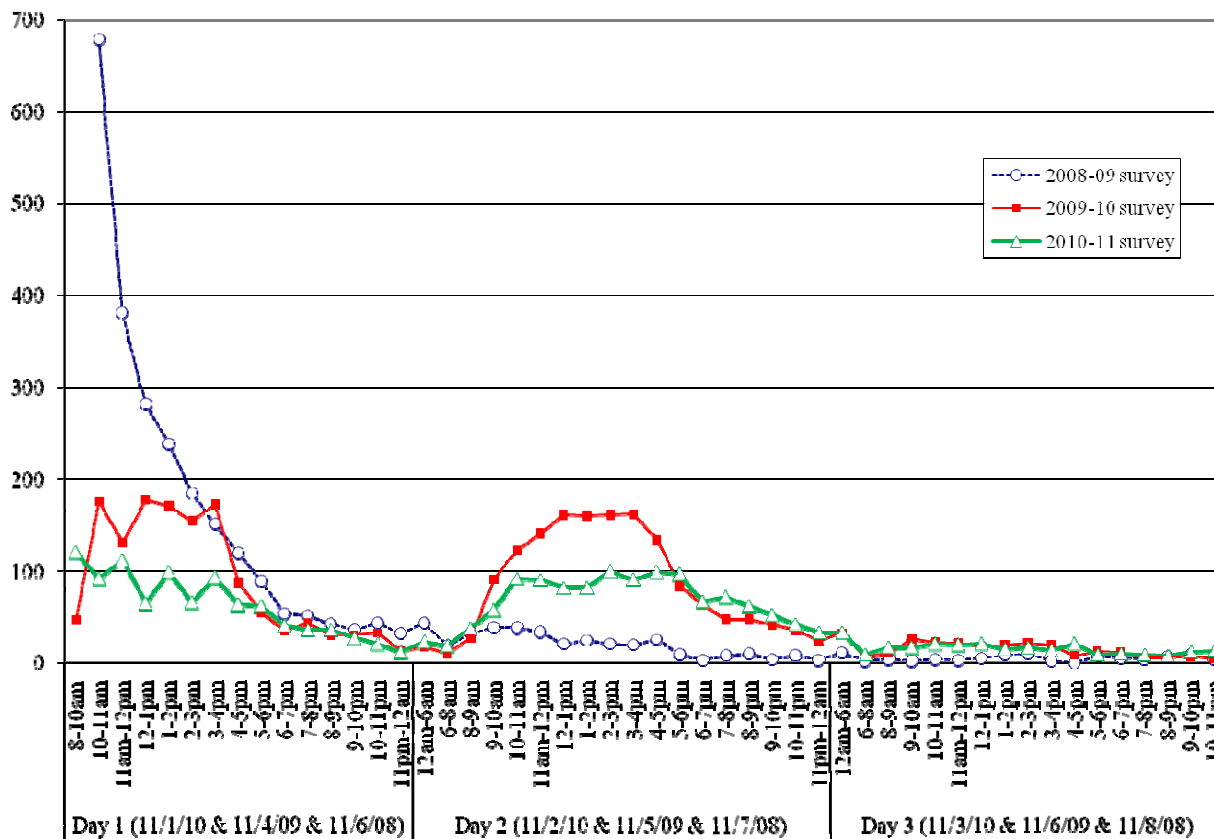
	Assumed population	Number invited	Target response	Actual responses (percent valid responses)			
				<i>q_0001</i>	<i>q_00017</i>	Completed	<i>q_0017</i> and <i>q_0008-11</i>
Students	29,317	13,161	16%	19.8%	17.9%	15.3%	16.8%
Undergraduate	23,608	9,530	15%	18.1%	16.5%	13.6%	15.4%
Freshmen	3,628	2,012	18%	24.5%	22.7%	18.8%	21.3%
Sophomores	4,469	2,269	16%	17.3%	15.5%	12.3%	14.9%
Juniors	6,279	2,200	17%	19.0%	17.5%	14.5%	16.1%
Seniors	9,232	3,050	12%	13.7%	12.4%	10.4%	11.6%
Graduate	5,709	3,630	19%	24.5%	21.5%	19.8%	20.4%
Masters	2,073	2,485	13%	18.6%	16.0%	14.2%	14.9%
PhD	3,636	1,145	30%	37.3%	33.6%	31.7%	32.3%
Employees	11,301	2,543	15%	31.7%	28.7%	26.5%	27.3%
Faculty	2,066	1,464	22%	24.8%	22.4%	20.4%	21.0%
Staff	9,235	1,079	34%	41.2%	37.4%	34.8%	35.8%
Overall percent	100.0%	37.2%	18.0%	21.8%	20.3%	17.1%	18.5%
Overall number	40,618	15,704	2,800	3,419	3,084	2,684	2,907

Table 6. Response number, by role

	Assumed population	Number invited	Target response	Actual responses (number of valid responses)			
				q_0001	q_00017	Completed	q_0017 and q_0008-11
Students	29,317	13,161	2,107	2,612	2,353	2,010	2,213
Undergraduate	23,608	9,530	1,434	1,723	1,571	1,293	1,472
Freshmen	3,628	2,012	348	493	456	379	428
Sophomores	4,469	2,269	354	393	351	279	337
Juniors	6,279	2,200	363	419	386	318	354
Seniors	9,232	3,050	369	418	378	317	353
Graduate	5,709	3,630	673	889	782	717	741
Masters	2,073	2,485	325	462	397	354	371
PhD	3,636	1,145	348	427	385	363	370
Employees	11,301	2,543	693	807	731	674	694
Faculty	2,066	1,464	324	363	328	298	308
Staff	9,235	1,079	369	444	403	376	386
Overall percent	100.0%	37.2%	18.0%	21.8%	20.3%	17.1%	18.5%
Overall number	40,618	15,704	2,800	3,419	3,084	2,684	2,907

Because the email invitations for the 2010-11 survey were staggered similarly to those for the 2009-10 survey, the responses are equally spread out over time as in 2009-10. It is important to note that only about 100 respondents commenced the survey in a given hour, even during the busiest period, compared to more than 200 respondents who commenced the survey within any given hour in 2009-10 and 679 who successfully accessed the survey in the first hour after the launch in 2008-09 (see Figure 5).

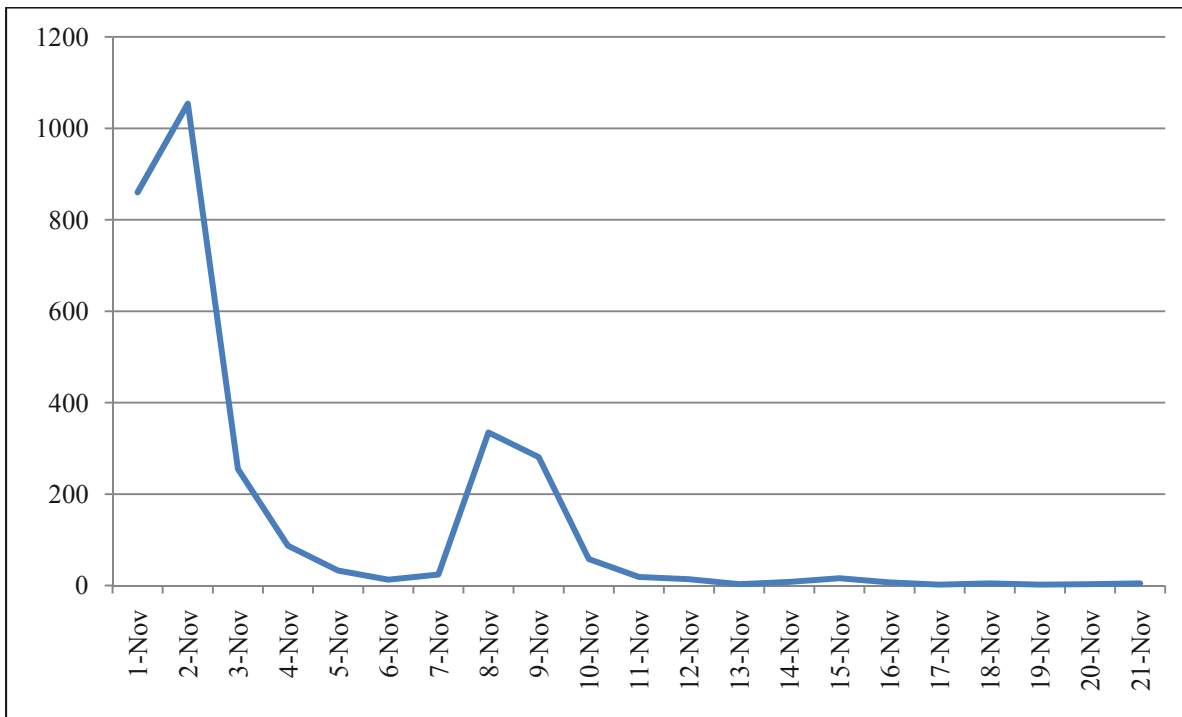
Figure 5. Number of respondents taking the survey each hour, by survey year



Even though peak server traffic for this year was about half of last year's, there is evidence that traffic to the survey website greatly slowed server performance. Replies to the invitations sent from travelsurvey@ucdavis.edu were set to forward to Joshua Miller's UC Davis email account. Approximately ten invitation recipients replied via email to report technical difficulties, and others reported technical difficulties in their comment at the end of the survey. This inability of the server to properly handle even a relatively small number of simultaneous responses indicates that its level of performance has declined. Because poor server performance increases the burden on respondents and lowers the rate of survey completion, for the administration of next year's survey, we intend to either outsource the server computing or upgrade the server.

Figure 6 depicts how responses were spread over the three weeks after the initial launch on November 1. About 62 percent took the survey during the first two days (on the days the initial email invitations were sent). The reminder emails sent on November 8 and 9 generated a substantial bump in responses, with 616 (20 percent of the overall sample) taking the survey on those days. Although we continued to collect responses through November 21, fewer than 3 percent of respondents took the survey after November 10, 2010 (Veterans' Day).

Figure 6. Number of respondents taking the survey each day, 2010-11



Screening respondents for eligibility

While incomplete survey responses were retained in the dataset, cases were excluded based on two criteria: role and office location. In particular, we wanted to include only respondents who are current students or employees affiliated with the campus in Davis (rather than in locations beyond the campus or city of Davis) and whose role at UC Davis is known. Although the sample frame was supposed to only include current students and employees affiliated with the main campus, we have learned that university records are not always accurate, either due to a student or employee's recent change in status or due to ambiguity about the geographic location associated with a nominal departmental affiliation. We have attempted to improve our screening of these exceptions in recent surveys through more explicit questions about roles and office locations.

In particular, we added the option to indicate "retiree" in question *q_0001*, which was recommended in last

year's report. From the responses to *q_0001*, we screened 3 recent graduates and 5 retirees (who were then skipped to the end of the survey, see Appendix A: Survey instrument, 2010-11 Campus Travel Survey) and received 14 write-in descriptions of “other” roles (compared with 13 in 2009-10 and 211 in 2008-09). Out of these 14 write-in descriptions, 6 respondents' roles were determined by their email addresses, 6 more were successfully re-coded into the standard categories, and 2 were screened due to missing answers for almost all questions (these 2 respondents also did not provide email addresses, so their roles could not be determined. Because we planned to weight the results by role group (freshmen, sophomore, junior, etc.), we excluded these from the analysis).

Regarding office locations, we intended to include in the sample anyone who usually travels to campus regularly, even if temporarily stationed elsewhere -- such as for sabbatical, teaching abroad, field work, a joint appointment at another campus, or on leave (bereavement, maternity, etc.) -- but exclude those whose main work is elsewhere. We thought this was a potential issue for employees and grad students, and not undergraduates. Thus we screened graduate student and employee office locations in question *q_0005* (“Where is your office, lab, or department? That is, wherever you usually spend your time when you travel to work or school at UC Davis.”) There were 80 respondents who indicated that their offices were located outside of Davis, including 52 graduate students and 28 employees. All but one of these wrote a description of their office location in question *q_0006*. These included the following locations:

- Emeryville, CA
- Geneva, Switzerland
- Irvine, CA
- Mather, CA
- Orland, CA
- Parlier, CA
- Rancho Cordova, CA
- Redding, CA
- Sacramento, CA
- Salinas, CA
- San Diego, CA
- San Ramon, CA / Bishop Ranch
- UC Davis Medical Center (Sacramento, CA)

These 80 respondents were skipped to the end of the survey (see Appendix A: Survey instrument, 2010-11 Campus Travel Survey) and are excluded from the analysis.

Sociodemographic composition of respondents completing the survey

Table 7 shows sociodemographic characteristics of the unweighted sample. As in previous surveys, the sample is disproportionately comprised of females. In particular, males comprise about 27 percent of the sample compared with 46 percent of the population of undergraduates; 36 percent of respondents versus 49 percent of the population of graduate students; and 43 percent of respondents versus 57 percent of the population of employees.² This may mean that there is bias in the results presented in this report for any responses that tend to differ by gender.

In particular, we find that women respondents are substantially less likely to bike than are men (38 percent versus 46 percent doing so on an average weekday among women versus men, respectively), and somewhat more likely to ride the bus (16 percent versus 10 percent). This means that the estimated bike mode share may be lower, while the bus mode share may be higher than they are in the actual population.³

² Figures for the composition of the campus population by gender are drawn from “Student Headcount by Gender, Fall 2010,” “Employees by Gender and Ethnicity, Fall 2009,” and “Teaching Faculty by Gender, Fall 2009” available on the *UC Davis Facts* website, online at <http://facts.ucdavis.edu/>. These population counts include medical (non-Davis campus) affiliates who are excluded from the survey sample. In addition, the employee count includes employed students, who are not included as employees in the survey sample.

³ These differences are statistically significant (with p-value < 0.05) based on a t-test of equivalence of means among the female versus male segments of the sample, in particular of the mean share of weekdays that respondents biked and rode the bus, respectively. There was also a statistically significant difference (with p-value < 0.05) in the share telecommuting (1 percent among women versus 2 percent among men). There were no statistically significant differences by gender in the share driving alone, walking, or carpooling.

Table 7. Sociodemographic characteristics of survey respondents

Characteristic	Role group			
	Undergraduates	Graduate students	Employees	All
Gender: valid <i>n</i>	1,571	782	731	3,084
% male	26.9%	35.9%	43.1%	33.0%
% female	69.7%	60.5%	53.9%	63.6%
% other/missing	3.4%	3.6%	3.0%	3.4%
Age: valid <i>n</i>	1,273	681	625	2,579
% 20 years old or under	66.1%	0.1%	0.0%	32.7%
% 21 to 30 years old	32.4%	82.5%	9.6%	40.1%
% 31 to 40 years old	1.1%	14.1%	24.6%	10.2%
% 41 to 50 years old	0.3%	2.2%	25.3%	6.9%
% 51 to 60 years old	0.0%	0.9%	27.7%	6.9%
% 61 to 70 years old	0.1%	0.1%	12.2%	3.0%
% 71 to 80 years old	0.0%	0.0%	0.6%	0.2%
Household size: valid <i>n</i>	1,264	684	654	2,602
% alone	2.4%	18.3%	14.8%	9.7%
% 2 people	14.5%	43.3%	44.0%	29.5%
% 3 to 5 people	47.5%	37.7%	40.1%	43.0%
% 6 or more people	5.8%	0.7%	1.1%	3.3%
% in a dormitory	29.9%	0.0%	0.0%	14.5%
Highest level of education: valid <i>n</i>	1,272	694	663	2,629
% High school or less	44.9%	0.1%	1.1%	22.0%
% Some college	44.2%	0.1%	7.1%	23.2%
% 2-year degree	7.0%	0.0%	4.7%	4.6%
% Bachelor's degree	3.9%	20.6%	18.1%	11.9%
% Some grad school	0.0%	52.7%	3.0%	14.7%
% Grad degree	0.1%	26.4%	66.1%	23.7%
Total household income: valid <i>n</i>	903	586	611	2,100
\$0 to \$4,999	28.8%	15.5%	0.0%	16.7%
\$5,000 to \$9,999	8.1%	3.9%	0.0%	4.6%
\$10,000 to \$19,999	12.8%	10.6%	0.3%	8.6%
\$20,000 to \$29,999	7.6%	17.9%	0.7%	8.5%
\$30,000 to \$39,999	6.0%	14.0%	5.2%	8.0%
\$40,000 to \$59,999	7.8%	14.3%	12.8%	11.0%
\$60,000 to \$79,999	7.9%	9.6%	13.6%	10.0%
\$80,000 to \$99,999	6.0%	4.9%	13.9%	8.0%
\$100,000 to \$119,999	4.5%	4.3%	14.4%	7.3%
\$120,000 to \$139,999	2.4%	1.4%	10.3%	4.4%
\$140,000 to \$159,999	2.2%	1.2%	9.7%	4.1%
\$160,000 to \$179,999	1.1%	1.2%	5.4%	2.4%
\$180,000 to \$199,999	1.6%	0.2%	3.9%	1.9%
\$200,000 or more	3.2%	1.0%	9.8%	4.5%
Total respondents (total <i>n</i>)	1,571	782	731	3,084

The statistics shown are unweighted, based on responses to questions *q_0007*, *q_0079*, *q_0080*, *q_0088*, *q_0089*, and *q_0090*. Question *q_0090* (income) was asked of students this year, and from the responses it is evident that some students answered for themselves while others included the income of their parents. Percentages reported are among valid (non-missing) responses to each question. Question *q_0007* (gender) included an "other" option for respondents who do not identify as male or female; since some respondents may have chosen to leave this answer blank rather than choose "other", "other" and "missing" are shown as one category.

Other biases may exist if there are other ways that the sample of respondents differs systematically from the rest of the population, though we have few ways of knowing the extent that it does. One attribute we can verify is the portion of the sample that owns parking permits, which we find matches the portion in the overall population (based on TAPS's records of permits issued), though with "A" permit-holders slightly over-represented relative to "C" permit-holders. (See the "Parking permits" section later in the report.)

Weighting responses by role

For the purposes of analysis, we assume that respondents are roughly similar to the rest of the population within their role group (freshmen, sophomore, etc.) with respect to socio-demographics or other attributes that may matter for transportation choices. For this reason, we weight the sample by role group. In particular, as described above, respondents were assigned one of eight role categories based on their responses to questions q_{0001} through q_{0003} : freshmen, sophomores, juniors, seniors (and fifth-years and post-baccalaureate), masters students (and professional students such as law and business and Ed.D. or CANDEL), PhD students, faculty, or staff (including Post-docs). All results presented in this report are weighted to be representative of the campus population by these role groups. That is, we apply a weight factor to each case in a given role group so that the group's proportion in the sample is the same as their proportion in the overall population.

To accomplish this, the appropriate weight factor is a ratio of the population share to the sample share for each role group. That is, with N total population, n in the sample, and N_i in role group i in the population (for instance, freshmen), and n_i of role group i in the sample, we apply the weight factor $W_i = (N_i/N) / (n_i/n)$ to all cases in role group i . Applying the weight factors alters the apparent distribution of respondents by role, but the overall sample size is unchanged. In instances where we would like to expand the sample to a projection of the full population, we weight each case by an *expansion* factor E_i , equal to (N_i / n_i) . Applying the expansion factors alters both the distribution of respondents by role, and inflates the sample to the size of the population, or 40,618.

Although the number of valid responses varies from question to question (that is, n and n_i), we use the same set of weight factors for most variables, based on the distribution of roles among the $n=3,084$ valid responses to question q_{0017} , the main question relating to mode choice on each day during the travel week. However, for variables relying on geocoding of respondents' residential location, we generated a separate set of weight factors, based on the 2,907 cases successfully geocoded (by zip code and cross streets given in questions q_{0009} and q_{0011} , or on-campus residence name given in q_{0010} ; see Appendix E) and with non-missing mode data from question q_{0017} . Both sets of weights are shown in Table 8.

Table 8. Weight factors, applied by role

Role group (i)	Population (N)	Based on valid responses to question q_{0017}				Based on valid responses to question q_{0017} and successful geocoding of home location (from responses to questions q_{0009} - q_{0011})			
		Valid responses (n)	Weight factor $(N_i/N)/(n_i/n)$	Expansion factor (N_i/n_i)	Weighted sample size	Valid responses (n)	Weight factor $(N_i/N)/(n_i/n)$	Expansion factor (N_i/n_i)	Weighted sample size
Freshmen	3,628	456	0.6040853	7.95614035	275	428	0.643604902	8.476635514	275
Sophomores	4,469	351	0.96671637	12.7321937	339	337	1.006876693	13.2611276	339
Juniors	6,279	386	1.23509116	16.2668394	477	354	1.346737816	17.73728814	477
Seniors	9,232	378	1.85438468	24.4232804	701	353	1.985715037	26.1529745	701
Masters	2,073	397	0.3964648	5.22166247	157	371	0.42424939	5.587601078	157
PhD	3,636	385	0.71706575	9.44415584	276	370	0.746135983	9.827027027	276
Faculty	2,066	328	0.47824706	6.29878049	157	308	0.509302062	6.707792208	157
Staff	9,235	403	1.73991362	22.9156328	701	386	1.81654194	23.92487047	701
Overall	40,618	3,084	1	13.7036316	3,084	2907	1	13.97248022	3,084

Imputation of responses

In some cases, incomplete responses to q_{0017} (the question about primary mode used for each day traveled to campus) were provided. In cases where respondents indicated that they only used one mode to travel to campus

for the week (*q_0016*), it was assumed that the missing responses to *q_0017* were the same as the mode indicated in *q_0016*. In cases where multiple modes were indicated, responses were imputed by alternating through each mode indicated in *q_0016* for each missing answer to *q_0017*. It is important to note that responses were only imputed in near-complete cases for days that the respondent indicated traveling to campus in *q_0012* (which days of the reference week the respondent traveled to campus). Out of the 3,084 valid responses to *q_0017*, only about one percent of cases required any imputation.

Reference week

The main statistics we measure are based on questions asking respondents about their activity during each of the seven days of the week prior to receiving the invitation to complete the survey. We plan for the reference week to be approximately the same each year that the survey is administered, and also coinciding with the campus’s biannual traffic counts (of vehicles entering campus), usually conducted the last week in October or the first week in November every other year. Therefore, this year’s initial reference week was October 25-31, 2010 (Monday-Sunday). In 2008-09 and 2009-10, the reference week was updated on the Sunday after the launch (and just before reminder emails were distributed), such that respondents would refer to the most recent week when completing the survey. This year, due to server complications, we opted not to change the reference week. Initial invitations were sent Monday, Tuesday and Wednesday (November 1-3) and reminder emails were sent the following Monday and Tuesday (November 8 and 9). The overall timeline of the survey launch and reference week is shown in Figure 7.

Figure 7. Survey launch and reference week schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
18	19	20	21	22	23	24
25 Reference Week	26	27	28	29	30	31 Halloween
1 ← Election Day →	2	3	4	5	6	7
	Initial invitations sent					
8 ← Reminder emails sent →	9	10	11 Veteran’s Day holiday	12	13	14

Table 9 notes weather and other events occurring during the reference week. One notable weather event occurred during the reference week: there was

moderate to heavy rain at times on Monday. Aside from about 0.5 inch of rain on Monday, there were few notable events around the reference week: the Halloween holiday fell on a Sunday, and the midterm election on Tuesday, November 2 occurred outside the reference week.

Table 9. Weather and other events occurring during survey reference week

Day	Temperature ranges, precipitation, and notable events
	Reference Week: October 25-31, 2010
Monday	52 – 66 °F Rain (0.5 inches)
Tuesday	44 – 67 °F
Wednesday	36 – 65 °F
Thursday	48 – 66 °F
Friday	52 – 64 °F
Saturday	54 – 63 °F Wind (up to 20.7 mph)
Sunday	50 – 70 °F Halloween holiday

Weather data are for Sacramento, as reported in the *Farmer’s Almanac*, available online by city and date at <http://www.almanac.com/weatherhistory>.

FINDINGS

This section summarizes some of the results from the survey. Throughout this section, data presented are weighted by role, as described above. When “unweighted sample” size is reported it reflects the number of actual respondents in this category; “weighted sample” size reflects the number that would be in each category if the distribution of roles in the sample matched the distribution in the population (so the total number in the weighted sample equals the number in the weighted sample, but numbers within subgroups may change). “Projected population” size is a projection of the weighted proportions to the full population size, effectively multiplying each response by an expansion factor by role group.

Many statistics are presented by role group as defined above (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, or staff). In addition, some are also broken down by students (including freshmen through PhD student role-group categories), undergraduates (freshmen through senior role-group categories), graduate students (masters and PhD student role-group categories), employees (faculty and staff role-group categories), within Davis (those living on campus or elsewhere in Davis among all role-group categories), and outside Davis (those living outside of Davis among all role-group categories).

Number traveling to campus

About 91 percent of the sample physically travels to campus Monday through Thursday, with a low of about 83 percent traveling to campus on Friday (Table 10). On weekends, students and faculty are more likely to travel to campus than are staff, with about a quarter of graduate students coming on weekends and almost 1 in 5 faculty.

Table 10. Percent traveling to campus by day of the week

Role group	Percent physically traveling to campus								Weighted sample	Projected population
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	No days		
Students	93.1%	93.7%	94.8%	93.5%	84.5%	23.7%	20.2%	2.1%	2,226	29,317
Undergrad	94.0%	94.3%	95.6%	93.9%	86.1%	23.0%	19.2%	2.1%	1,792	23,608
Graduate	89.5%	91.4%	91.5%	91.7%	77.8%	26.2%	24.1%	2.0%	433	5,709
Employees	85.7%	85.9%	85.8%	84.4%	79.7%	13.8%	10.1%	5.2%	858	11,301
Faculty	81.4%	80.8%	79.9%	79.0%	75.6%	19.8%	16.5%	4.9%	157	2,066
Staff	86.6%	87.1%	87.1%	85.6%	80.6%	12.4%	8.7%	5.2%	701	9,235
Outside Davis	81.7%	84.7%	83.7%	83.7%	73.5%	9.0%	5.5%	5.2%	677	9,075
Within Davis	93.8%	93.7%	94.9%	93.2%	86.0%	24.2%	20.5%	2.1%	2,352	31,543
Overall	91.1%	91.5%	92.3%	90.9%	83.2%	20.9%	17.4%	2.9%	3,084	40,618
Weighted sample	2,808	2,823	2,846	2,805	2,566	645	536	90	3,084	
Projected population	36,985	37,183	37,479	36,940	33,789	8,492	7,053	1,187		40,618

Results are based on responses to questions q_{0008} and q_{0012} . Data are weighted by role group based on the 3,084 valid responses to question q_{0017} (see Table 8).

In addition to trends by the day of the week, there are substantial differences in the percent traveling to campus among those living in different locations. In particular, among all role groups, those living outside of Davis are less likely to travel to campus on an average weekday (81 percent) than those living in Davis (92 percent). Grad students and faculty living outside of Davis are the least likely to come to campus, with less than three-quarters coming to campus on an average day (74 percent of graduate students and 72 percent of faculty). By contrast, 92 percent of grad students and 84 percent of faculty who live in Davis come to campus on an average weekday. (See Table 60 for the overall percent of people living in each location by role group.)

Table 11. Percent traveling to campus on an average weekday, by role and residential location

Role group	Overall	Among those living:			Weighted sample	Projected population
		On campus	Off campus in Davis	Beyond Davis		
Students	92.09%	92.76%	93.37%	82.56%	2,176	29,317
Undergraduate	92.95%	92.49%	93.71%	87.95%	1,754	23,608
Freshmen	94.38%	94.20%	98.95%	93.33%	270	3,628
Sophomores	96.53%	90.91%	97.09%	97.65%	334	4,469
Juniors	91.91%	90.18%	93.00%	86.11%	464	6,279
Seniors	91.35%	88.67%	92.31%	86.34%	686	9,232
Graduate	88.50%	95.01%	91.96%	73.58%	422	5,709
Masters	85.30%	87.74%	89.59%	70.36%	152	2,073
PhD	90.32%	97.55%	93.36%	75.53%	270	3,636
Employees	84.20%	87.92%	87.95%	80.85%	848	11,301
Faculty	79.44%	0.00% ^a	84.30%	71.93%	153	2,066
Staff	85.30%	100.00% ^b	89.09%	82.16%	695	9,235
Overall	89.89%	92.72%	92.22%	81.45%	3,024	
Weighted sample	3,024	458	1,891	675	3,024	
Projected population	40,618	6,152	25,400	9,067		40,618

Results are based on responses to question *q_0012* (days traveling to campus) and *q_0008* (residential location). Percentages are calculated as the percent of five weekdays that an individual traveled to campus; then the average over all respondents represents the percent traveling to campus on an average weekday. See Table 60 for the overall percent living in each location by role group. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

^a No respondents indicated being faculty and living on campus.

^b Three staff reported living on campus and traveling to work each day of the reference week.

About 3 percent of the sample did not physically travel to campus on any days during the reference week. These respondents were asked to give the reason they were away all week (Table 12). Employees were more likely to be away all week than students, with work travel and vacation being the most common reasons given for being away.

Table 12. Percent away from campus all week and reasons given, by role

Role group	Percent away all week	Among those away all week, percent away for:								Weighted sample	Projected population
		Work / school-related travel or field work	Study abroad	Vacation	Sick or personal leave	Telecommuting (from home or other location)	Temp. appointment elsewhere	Sabbatical	Other/ missing		
Students	2.0%	4.8%	59.3%	8.3%	3.5%	7.9%	5.5%	0.0%	10.8%	2,227	29,316
Undergrad	2.0%	0.0%	73.2%	8.4%	4.3%	0.0%	4.9%	0.0%	9.2%	1,792	23,608
Graduate	1.8%	25.2%	0.0%	7.8%	0.0%	41.7%	7.8%	0.0%	17.4%	435	5,708
Employees	5.1%	21.6%	0.0%	23.5%	10.1%	12.9%	1.0%	2.2%	28.5%	855	11,301
Faculty	4.5%	56.4%	0.0%	0.0%	12.9%	5.9%	5.9%	12.9%	5.9%	155	2,066
Staff	5.2%	14.3%	0.0%	28.5%	9.6%	14.3%	0.0%	0.0%	33.3%	700	9,235
Overall	2.9%	13.3%	29.7%	15.4%	6.8%	10.5%	3.2%	1.2%	19.8%	3,082	40,618
Weighted sample	88	11	27	14	6	9	3	1	17		
Projected population	1,186	155	358	187	80	123	39	13	231		40,618

Results are based on responses to question *q_0013*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017*.

Employees (and not students) who were away from campus just some of the days during the week were also asked to give the reason they did not travel to campus for each weekday they were away. Table 13 shows the percent of employees away from campus on an average weekday, and the reasons given. While about 5 percent of employees were away all week (Table 12), about 16 percent of employees do not travel to campus on an average weekday (Table 13). The most common reasons for being away from campus are work travel or other off-campus work commitments, as well as working from home (telecommuting).

Table 13. Percent of employees not traveling to campus on an average weekday and reason

Role group	Percent of employees away from campus	Among those not coming to campus, reason given:								Total employees:	
		Off-campus work / travel	Work from home	Vacation	Sick	Regular day off	Furlough	CWW	Other / missing	Weighted sample	Projected population
Faculty	20.67%	36.52%	25.97%	1.77%	3.55%	4.93%	0.00%	0.00%	27.27%	157	2,066
Staff	14.59%	10.60%	13.23%	18.22%	6.11%	11.91%	0.53%	1.33%	38.08%	701	9,235
All employees	15.70%	16.47%	16.11%	14.50%	5.53%	10.33%	0.41%	1.03%	35.63%	858	11,301
Weighted sample	170	28	27	25	9	18	1	2	61	858	
Projected population	2,240	369	361	325	124	231	9	23	798		11,301

Results are based on responses to question *q_0014* for individual days absent and on responses to *q_0013* for those absent all week; reasons given in *q_0013* are assumed to apply to all five weekdays. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Destination on campus

Employees and graduate students were asked the location of their office, lab, or department (in question *q_0005*). This was in part to screen out those whose offices or labs were outside of Davis (see above), who are excluded from the sample for this study. Among the included respondents, about 83 percent reported locations in the central campus area (a projected 14,112 people), including 90 percent of grad students, 92 percent of faculty, and 77 percent of staff (Table 14). About 17 percent (a projected 2,898 people) reported locations in west campus, south campus, or off-campus within the city of Davis, including 10 percent of grad students, 8 percent of faculty, and 23 percent of staff.

Table 14. Destination on campus, among employees and graduate students

Role group	Central campus area	West campus area (west of SR 113)	South campus area (south of I-80)	Off-campus but in Davis	Weighted sample	Projected population
Grad students	90%	5%	3%	2%	433	5,709
Masters	90%	3%	5%	3%	157	2,073
Phd	90%	6%	3%	1%	276	3,636
Employees	80%	8%	3%	10%	859	11,301
Faculty	92%	4%	3%	1%	157	2,066
Staff	77%	8%	3%	12%	702	9,235
Overall	83%	7%	3%	7%		
Weighted sample	1,072	86	40	94	1,292	
Projected population	14,112	1,134	529	1,235		17,010

Results are based on responses to question *q_0005*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Mode split for primary means of transportation

For physical trips to campus, mode choice was determined by asking respondents to “Please select which means of transportation you used on your way to your first campus destination each day. (If you used more than one means, select whatever you did for most of the distance)” (question *q_0017*). Thus the modes identified are those used for *most* of the trip, and only on the way *to* campus at the beginning of the day. (Throughout this report, we refer to this as a respondent’s “primary” mode, meaning what they did for most of the trip to campus.) For each respondent, we calculate the percent of days out of the five-day week that a given mode was used as a primary mode. (For instance, if someone biked one day, her bike share for the week would be 20 percent.) The overall mode split represents the average shares across all respondents, which is equivalent to the percent of all people using each mode on an average weekday.

Table 15 through Table 19 show the overall mode split among those physically traveling to campus on a given weekday (broken down by role group in Table 15; and further broken down by both residential location and role group in the next four tables). (See Table 11 for a comparison of the percent of people physically traveling to campus on an average weekday by role and residential location.) On an average weekday, we estimate that among those physically traveling to campus, about 41 percent of people bike (a projected 15,025 people), 33 percent arrive by car (12,057 people), and 20 percent ride public transit (7,255 people). The percent biking is highest among freshmen (most of whom live on campus), and among grad students and faculty living off-campus within the city of Davis. Among those living off-campus within the city of Davis, undergrads are least likely to bike (Table 18). With high Unitrans use, they are about equally likely to bike as ride the bus. By contrast, grad students and employees in Davis who do not bike are most likely to drive or get a ride. The overwhelming majority (89 percent) of those living outside Davis drive or get a ride, though the percentage is somewhat lower among graduate and undergraduate students (80 percent and 85 percent, respectively; Table 15). Train ridership differs markedly by role, with 11.6 percent of grad students living outside of Davis riding on an average weekday, compared with 2.6 percent of undergrads, 7.5 percent of faculty, and 1.2 percent of staff.

Table 15. Percent using each mode on an average weekday, by role group (all locations)

Role group	Percent physically traveling	Among those physically traveling, percent using:							Weighted sample	Projected population
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train		
Students	91.9%	47.2%	6.6%	0.4%	15.3%	5.3%	24.5%	0.8%	2,226	29,317
Undergraduate	92.8%	46.5%	6.8%	0.5%	11.8%	5.0%	29.0%	0.4%	1,792	23,608
Freshmen	94.3%	73.4%	15.9%	0.5%	1.7%	1.7%	6.5%	0.3%	275	3,628
Sophomores	96.5%	45.3%	3.0%	0.0%	7.3%	5.7%	38.6%	0.2%	339	4,469
Juniors	91.6%	42.5%	5.4%	0.6%	13.8%	5.1%	31.8%	0.8%	477	6,279
Seniors	91.2%	38.8%	5.9%	0.7%	16.9%	5.9%	31.4%	0.4%	701	9,232
Graduate	88.4%	50.2%	5.8%	0.1%	30.4%	6.4%	4.9%	2.1%	433	5,709
Masters	85.0%	48.2%	5.9%	0.0%	33.1%	4.9%	5.2%	2.7%	157	2,073
PhD	90.3%	51.3%	5.8%	0.2%	29.0%	7.2%	4.8%	1.7%	276	3,636
Employees	84.3%	24.3%	2.6%	0.0%	53.6%	14.8%	3.7%	1.0%	858	11,301
Faculty	79.3%	37.7%	4.8%	0.0%	43.6%	9.5%	1.8%	2.5%	157	2,066
Staff	85.4%	21.5%	2.1%	0.0%	55.7%	15.9%	4.1%	0.7%	701	9,235
Overall	89.8%	41.2%	5.5%	0.3%	25.3%	7.8%	19.1%	0.8%	3,084	40,618
Weighted sample	2,769	1,141	154	9	700	215	528	23	3,084	
Projected population	36,475	15,025	2,023	114	9,225	2,833	6,955	300		40,618

Results are based on responses to question *q_0012* (whether they traveled to campus each day) and question *q_0017* (primary means of transportation each day). All mode split percentages are calculated as follows: we first calculate the percent of five weekdays that an individual used a particular mode. Then the average over all respondents represents the percent using this mode on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 16. Percent using each mode on an average weekday, from within Davis

Role group	Percent physically traveling	Among those physically traveling, percent using:							Weighted sample	Projected population
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train		
On campus	92.7%	73.5%	16.4%	0.5%	2.1%	1.3%	6.0%	0.2%	458	6,032
Off campus (within Davis)	92.2%	45.8%	4.2%	0.3%	16.4%	6.2%	26.9%	0.2%	1,891	24,906
Students	93.2%	52.1%	7.0%	0.4%	9.5%	4.4%	26.4%	0.2%	1,947	25,637
Undergraduate	93.4%	50.4%	7.0%	0.4%	6.7%	4.2%	30.8%	0.3%	1,610	21,199
Freshmen	94.4%	75.4%	15.9%	0.4%	0.3%	1.0%	6.7%	0.1%	262	3,445
Sophomores	96.5%	47.3%	2.8%	0.0%	4.7%	5.0%	40.2%	0.0%	318	4,188
Juniors	92.5%	47.6%	5.8%	0.3%	7.4%	4.3%	34.3%	0.3%	420	5,532
Seniors	92.0%	43.4%	6.3%	0.8%	10.0%	5.1%	34.0%	0.5%	610	8,034
Graduate	92.4%	59.9%	7.0%	0.1%	22.5%	5.3%	5.1%	0.0%	337	4,438
Masters	89.4%	58.7%	7.2%	0.0%	23.9%	4.7%	5.4%	0.1%	120	1,580
PhD	94.0%	60.6%	6.9%	0.2%	21.8%	5.6%	4.9%	0.0%	217	2,858
Employees	88.0%	46.9%	4.3%	0.0%	34.7%	9.5%	4.6%	0.1%	406	5,347
Faculty	83.9%	54.8%	7.5%	0.0%	29.4%	6.4%	1.8%	0.1%	96	1,264
Staff	89.2%	44.5%	3.3%	0.0%	36.3%	10.5%	5.4%	0.1%	310	4,083
Overall	92.3%	51.2%	6.6%	0.3%	13.6%	5.2%	22.8%	0.2%	2,353	30,985
Weighted sample	2,172	1,113	143	7	295	114	496	5	2,353	
Projected population	28,610	14,660	1,879	93	3,881	1,499	6,535	62		30,985

Results are based on responses to question *q_0012* (whether they traveled to campus each day) and question *q_0017* (primary means of transportation each day). All mode split percentages are calculated as follows: we first calculate the percent of five weekdays that an individual used a particular mode. Then the average over all respondents represents the percent using this mode on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8). The "Within Davis" designation includes those living on campus.

Table 17. Percent using each mode on an average weekday, from on-campus

Role group	Percent physically traveling	Among those physically traveling, percent using:							Weighted sample	Projected population
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train		
Students	92.8%	73.2%	16.5%	0.5%	2.2%	1.3%	6.1%	0.2%	455	5,993
Undergraduate	92.5%	72.9%	16.1%	0.6%	2.1%	1.3%	6.9%	0.2%	408	5,374
Freshmen	94.2%	76.8%	16.7%	0.4%	0.2%	0.9%	4.8%	0.2%	250	3,293
Sophomores	90.9%	66.0%	15.3%	0.0%	1.3%	4.0%	13.3%	0.0%	32	421
Juniors	90.2%	69.6%	12.1%	0.0%	3.9%	1.2%	12.5%	0.8%	70	922
Seniors	88.7%	63.2%	18.8%	2.3%	9.0%	1.5%	5.3%	0.0%	56	738
Graduate	95.0%	75.7%	20.3%	0.0%	2.6%	1.4%	0.0%	0.0%	47	619
Masters	87.7%	64.7%	29.4%	0.0%	5.1%	0.7%	0.0%	0.0%	12	158
PhD	97.6%	79.5%	17.2%	0.0%	1.7%	1.7%	0.0%	0.0%	35	461
Employees	87.9%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3	40
Faculty	0.0% ^a	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
Staff	100.0% ^b	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3	40
Overall	92.7%	73.5%	16.4%	0.5%	2.1%	1.3%	6.0%	0.2%	458	6,032
Weighted sample	425	312	70	2	9	5	26	1	458	
Projected population	5,593	4,112	917	27	116	72	338	11		6,032

Results are based on responses to question *q_0012* (whether they traveled to campus each day) and question *q_0017* (primary means of transportation each day). All mode split percentages are calculated as follows: we first calculate the percent of five weekdays that an individual used a particular mode. Then the average over all respondents represents the percent using this mode on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

^a No faculty in our sample indicated living on campus.

^b Three staff in our sample indicated living on campus, and all three reported biking to their campus destination on each weekday of the reference week.

Table 18. Percent using each mode on an average weekday, from off-campus in Davis

Role group	Percent physically traveling	Among those physically traveling, percent using:							Weighted sample	Projected population
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train		
Students	93.2%	45.7%	4.2%	0.4%	11.7%	5.3%	32.5%	0.2%	1,489	19,611
Undergraduate	93.4%	42.9%	4.0%	0.4%	8.3%	5.2%	38.8%	0.3%	1,201	15,818
Freshmen	98.9%	46.8%	0.0%	0.0%	4.3%	3.2%	45.7%	0.0%	11	145
Sophomores	97.1%	45.3%	1.5%	0.0%	5.1%	5.1%	43.0%	0.0%	286	3,767
Juniors	93.0%	43.2%	4.6%	0.4%	8.1%	4.9%	38.5%	0.2%	350	4,610
Seniors	92.3%	41.4%	5.1%	0.7%	10.1%	5.4%	36.7%	0.5%	554	7,296
Graduate	92.4%	57.2%	4.8%	0.2%	25.9%	6.0%	6.0%	0.0%	288	3,793
Masters	89.6%	58.0%	4.7%	0.0%	26.0%	5.2%	6.0%	0.1%	107	1,409
PhD	93.4%	56.7%	4.8%	0.3%	25.8%	6.4%	5.9%	0.0%	181	2,384
Employees	88.0%	46.4%	4.3%	0.0%	35.0%	9.6%	4.6%	0.1%	402	5,295
Faculty	84.3%	54.8%	7.5%	0.0%	29.4%	6.4%	1.8%	0.1%	96	1,264
Staff	89.1%	43.8%	3.3%	0.0%	36.7%	10.6%	5.5%	0.1%	306	4,030
Overall	92.2%	45.8%	4.2%	0.3%	16.4%	6.2%	26.9%	0.2%	1,891	24,906
Weighted sample	1,744	799	73	5	285	108	470	4	1,891	
Projected population	22,968	10,520	958	66	3,760	1,425	6,188	51		24,906

Results are based on responses to question q_{0012} (whether they traveled to campus each day) and question q_{0017} (primary means of transportation each day). All mode split percentages are calculated as follows: we first calculate the percent of five weekdays that an individual used a particular mode. Then the average over all respondents represents the percent using this mode on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question q_{0017} (see Table 8).

Table 19. Percent using each mode on an average weekday, from outside Davis

Role group	Percent physically traveling	Among those physically traveling, percent using:							Weighted sample	Projected population
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train		
Students	82.6%	2.5%	1.8%	0.0%	70.1%	13.1%	6.9%	5.6%	233	3,074
Undergraduate	88.0%	2.0%	2.5%	0.0%	70.9%	13.7%	8.4%	2.6%	146	1,923
Graduate	73.6%	3.6%	0.5%	0.0%	68.5%	11.9%	3.9%	11.6%	87	1,151
Employees	80.8%	2.0%	1.1%	0.0%	71.8%	20.4%	2.8%	1.9%	443	5,837
Faculty	71.9%	3.3%	0.0%	0.0%	71.5%	15.9%	1.9%	7.5%	57	750
Staff	82.2%	1.9%	1.2%	0.0%	71.8%	20.9%	3.0%	1.2%	386	5,087
Overall	81.4%	2.2%	1.3%	0.0%	71.2%	17.8%	4.3%	3.2%	677	8,911
Weighted sample	705	15	13	0	523	106	30	18	862	
Projected population	7,605	167	136	0	5,638	1,143	324	197		9,297

Results are based on responses to question q_{0012} (whether they traveled to campus each day) and question q_{0017} (primary means of transportation each day). All mode split percentages are calculated as follows: we first calculate the percent of five weekdays that an individual used a particular mode. Then the average over all respondents represents the percent using this mode on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question q_{0017} (see Table 8).

Table 20 reports the mode split if we include telecommuting as a travel mode (sometimes considered virtual travel), as done in Lovejoy (2010), Lovejoy, *et al.* (2009) and Congleton (2008), presented here for comparison purposes. The denominator here is all people who physically traveled to campus plus those who worked from home on a given weekday, but excluding those not traveling for any other reason, based on responses to questions q_{0013} and q_{0014} . If working from home was indicated in q_{0013} as the reason for not traveling to campus the entire week, we assumed that the individual did so on all five weekdays.⁴

⁴ Only employees were asked question q_{0014} (reasons for not traveling to campus on particular days of the week), and so only employees could indicate telecommuting on these days. Both employees and students were asked question q_{0013} (reason for not traveling to campus the entire week), and could indicate working from home as the reason for being away all week. Thus student telecommuting is only measured if it was done the entire week, and therefore the percent of students working from home (shown in Table 20) may be underestimated.

Table 20. Percent using each mode on an average weekday, including telecommuting

Role group	Percent physically traveling or telecommuting	Among those physically traveling or telecommuting percent using:							Work from home	Weighted sample	Projected population
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train			
Students	92.4%	46.9%	6.5%	0.4%	15.2%	5.2%	24.4%	0.7%	0.6%	2,226	29,317
Undergraduate	92.8%	46.5%	6.8%	0.5%	11.8%	5.0%	29.0%	0.4%	0.0%	1,792	23,608
Freshmen	94.3%	73.4%	15.9%	0.5%	1.7%	1.7%	6.5%	0.3%	0.0%	275	3,628
Sophomores	96.5%	45.3%	3.0%	0.0%	7.3%	5.7%	38.6%	0.2%	0.0%	339	4,469
Juniors	91.6%	42.5%	5.4%	0.6%	13.8%	5.1%	31.8%	0.8%	0.0%	477	6,279
Seniors	91.2%	38.8%	5.9%	0.7%	16.9%	5.9%	31.4%	0.4%	0.0%	701	9,232
Graduate	91.1%	48.8%	5.6%	0.1%	29.5%	6.2%	4.8%	2.0%	2.9%	433	5,709
Masters	86.9%	47.2%	5.7%	0.0%	32.4%	4.8%	5.0%	2.7%	2.1%	157	2,073
PhD	93.5%	49.6%	5.6%	0.2%	28.0%	7.0%	4.6%	1.7%	3.4%	276	3,636
Employees	86.8%	23.6%	2.5%	0.0%	52.0%	14.4%	3.6%	1.0%	2.9%	858	11,301
Faculty	85.4%	35.0%	4.5%	0.0%	40.5%	8.9%	1.6%	2.4%	7.1%	157	2,066
Staff	87.1%	21.1%	2.1%	0.0%	54.6%	15.6%	4.0%	0.7%	2.0%	701	9,235
Within Davis	92.8%	51.0%	6.5%	0.3%	13.5%	5.2%	22.7%	0.2%	0.5%	2,395	31,543
On campus	92.8%	73.5%	16.4%	0.5%	2.1%	1.3%	6.0%	0.2%	0.0%	451	5,937
Off campus	92.8%	45.5%	4.1%	0.3%	16.3%	6.2%	26.8%	0.2%	0.6%	1,944	25,606
Beyond Davis	84.7%	2.1%	1.3%	0.0%	68.4%	17.1%	4.1%	3.1%	3.9%	689	9,075
Overall	91.0%	40.7%	5.5%	0.3%	25.0%	7.7%	18.8%	0.8%	1.2%	3,084	40,618
Weighted sample	2,805	1,142	154	9	701	215	529	23	33	3,084	
Projected population	36,950	15,040	2,025	114	9,234	2,835	6,962	300	440		40,618

Results are based on responses to question *q_0012* (whether they traveled to campus each day), question *q_0017* (primary means of transportation each day), and questions *q_0013* and *q_0014* (reasons for not traveling, including telecommuting). See footnote 5 regarding student telecommuting. All mode split percentages are calculated as follows: we first calculate the percent of five weekdays that an individual used a particular mode. Then the average over all respondents represents the percent using this mode on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

As an overview of the differences between Table 15 and

Table 20 reports the mode split if we include telecommuting as a travel mode (sometimes considered virtual travel), as done in Lovejoy (2010), Lovejoy, *et al.* (2009) and Congleton (2008), presented here for comparison purposes. The denominator here is all people who physically traveled to campus plus those who worked from home on a given weekday, but excluding those not traveling for any other reason, based on responses to questions *q_0013* and *q_0014*. If working from home was indicated in *q_0013* as the reason for not traveling to campus the entire week, we assumed that the individual did so on all five weekdays.

Table 20, Table 21 shows how the mode split percentages appear different, depending on who is included in the equation. For instance, we project that about 15,040 people bike to campus as their primary means of travel on a typical weekday, which represents just over 41 percent of everyone physically traveling to campus on a given day, just under 41 percent of those either physically traveling or telecommuting, and about 37 percent of the entire campus population (including those not traveling for other reasons).

Table 21. Comparison of mode split percentages using different denominators

Among... (denominator used):	Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train	Work from home	Other non- travel	Denominator:	
										As percent of the total population	Projected population included
Total population	37.0%	5.0%	0.3%	22.7%	7.0%	17.1%	0.7%	1.1%	9.0%	100.0%	40,618
Those traveling or telecommuting	40.7%	5.5%	0.3%	25.0%	7.7%	18.8%	0.8%	1.2%	n/a	91.0%	36,950
Those physically traveling only	41.2%	5.5%	0.3%	25.3%	7.8%	19.1%	0.8%	n/a	n/a	89.8%	36,475
Population projection	15,040	2,025	114	9,234	2,835	6,962	300	440	3,668		40,618

While Table 15 through Table 21 present estimates for the percent using various modes on an average weekday, another consideration is the percent using various modes at least once on a given day during the week. Table 22 shows the percent using each mode as a primary mode at least once during the seven-day week (including Saturday and Sunday, although this addition does not affect these numbers substantially). We see, for instance, that although about 41 percent bike to campus (as their primary means of transportation, among those physically coming to campus) on an average weekday (from Table 15), about 47 percent bike to campus (as their primary means of transportation) at least once during the week (Table 22). So while about 15,040 people bike as their primary means of travel on an average day, about 18,495 people are regular bikers (at least once per week). The number of regular carpoolers and train-riders is also substantially greater than the average number doing it on a given day, projected to be 6,954 (versus 2,835) and 558 (versus 300) for carpooling and train-riding, respectively. In addition to those physically traveling to campus, Table 22 shows that the number of graduate students and employees who work from home at least once during the seven-day week is more than three times the number working from home on an average weekday (1,360 compared to 440). These findings indicate that a substantial number of graduate students and employees work from home a few days a week, while a much smaller number work from home more than a few days a week.

Table 22. Percent using each as a primary mode at least once during the seven-day week

Role group	At least once during the seven-day week:								Work from home	Weighted sample	Projected population
	Percent physically traveling	Among those traveling, percent using each as a primary mode:									
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train			
Students	97.9%	55.4%	14.2%	1.0%	25.6%	16.9%	33.0%	1.3%	499	2,226	29,317
Undergraduate	97.9%	55.7%	15.2%	1.2%	20.6%	16.4%	39.2%	0.9%	0	1,792	23,608
Freshmen	99.3%	81.7%	34.9%	1.3%	3.0%	10.9%	13.7%	1.1%	0	275	3,628
Sophomores	99.4%	60.3%	7.6%	0.0%	16.4%	18.1%	55.0%	0.3%	0	339	4,469
Juniors	96.9%	48.4%	10.8%	1.0%	22.8%	16.8%	40.2%	1.8%	0	477	6,279
Seniors	97.4%	48.4%	14.2%	1.8%	27.8%	17.5%	41.0%	0.5%	0	701	9,232
Graduate	98.0%	54.2%	10.1%	0.2%	46.4%	18.8%	7.4%	2.9%	499	433	5,709
Masters	98.5%	51.4%	10.4%	0.0%	46.4%	15.4%	8.4%	3.5%	131	157	2,073
PhD	97.7%	55.8%	9.9%	0.3%	46.4%	20.8%	6.8%	2.5%	368	276	3,636
Employees	94.9%	25.5%	3.8%	0.0%	61.6%	19.4%	4.5%	1.8%	861	858	11,301
Faculty	95.1%	36.5%	6.1%	0.0%	53.1%	15.9%	2.6%	4.3%	334	157	2,066
Staff	94.8%	23.1%	3.3%	0.0%	63.5%	20.2%	4.9%	1.2%	527	701	9,235
Outside Davis	94.8%	2.9%	1.8%	0.0%	71.5%	22.2%	4.6%	4.2%	853	677	8,911
Within Davis	97.9%	60.3%	13.9%	0.8%	25.3%	16.4%	31.1%	0.6%	486	2,352	30,974
Overall	97.1%	46.9%	11.2%	0.7%	35.9%	17.6%	24.9%	1.4%	1,360	3,084	40,618
Weighted sample	2,994	1,404	336	21	1,074	528	746	42		3,084	
Projected population	39,432	18,495	4,430	276	14,149	6,954	9,828	558	1,360		40,618

Average weekday projected population	36,475	15,025	2,023	114	9,225	2,833	6,955	300	440	40,618
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Results are based on responses to questions *q_0012* (whether traveled to campus) and *q_0017* (primary means of transportation each day). Data are weighted by role group based on the 3,084 valid responses to question *q_0017*.

Comparison of 2010-11 mode split with 2009-10, 2008-09 and 2007-08

While one of the main purposes of the Campus Travel Survey is to collect comparable data each year for the assessment of trends over time, as we refine how to best collect information such as mode choice, we have made some changes each year of the survey, potentially compromising comparisons across years. With that caveat in mind, meaningful comparisons can be made. First, there are almost no differences between the 2010-11, 2009-10 and 2008-09 surveys in the way they measure mode splits. There is more difference between these and the earlier 2007-08 survey (see Lovejoy, *et al.* 2009). In particular, the 2007-08 respondents were not given the options of train/rail, getting a ride, or skating, but they were given the option of “other” as well as “more than one of these,” generating an additional category of ambiguously multimodal commuters (in 2007-08) who in later years were forced to indicate a single primary mode used for most of the trip. Another addition to the 2009-10 and 2010-11 surveys was the choice of “motorcycle/ scooter” as its own mode category. (In the 2008-09 survey, motorcyclists were expected to choose “drive alone” as their means of travel. For the purposes of analysis in this report, we still group the motorcyclists with those driving alone.)

Roughly comparable mode split estimates for all four years are presented in Table 23. (See Lovejoy, *et al.* 2009 for more information on the preparation of the 2007-08 mode splits.) Table 23 shows the percentage-point change across years (and tests for statistically significant changes), from 2007-08 to 2008-09, 2008-09 to 2009-10, 2009-10 to 2010-11, and finally across the three-year span from 2007-08 to 2010-11.

Table 23. Percent using each mode on an average weekday, 2007-08 through 2010-11

Year and role group	Percent physically traveling to campus	Among those physically traveling to campus, percent by:							Weighted sample
		Bike	Walk or skate	Personal vehicle			Bus	Train	
				Any	Drive alone	Carpool or ride			
2007-08 Overall	93.1%	37.7%	4.9%	34.5%	29.0%	5.5%	19.1%	n/a	4,180
Undergrad	94.7%	40.6%	6.0%	20.0%	16.7%	4.1%	28.8%	n/a	2,437
Grad	88.4%	55.4%	6.0%	24.4%	23.8%	3.4%	7.1%	n/a	570
Faculty	88.2%	39.5%	2.9%	46.6%	45.3%	6.7%	2.1%	n/a	479
Staff	92.9%	20.1%	2.1%	66.1%	60.3%	10.1%	4.4%	n/a	1,235
2008-09 Overall	90.4%	40.8%	6.0%	32.3%	24.7%	7.6%	20.2%	0.8%	3,929
Undergrad	93.4%	46.0%	7.9%	15.4%	10.8%	4.6%	30.3%	0.4%	2,246
Grad	89.0%	52.7%	5.4%	33.1%	28.1%	5.1%	6.8%	2.0%	553
Faculty	80.7%	40.0%	4.5%	49.9%	42.5%	7.4%	2.7%	2.9%	522
Staff	86.4%	19.8%	1.7%	72.2%	55.2%	17.0%	5.5%	0.8%	797
2009-10 Overall	88.6%	39.2%	7.2%	33.9%	26.1%	7.8%	19.2%	0.6%	3,840
Undergrad	91.5%	43.9%	9.0%	17.8%	12.5%	5.3%	29.1%	0.2%	2,235
Grad	87.4%	51.4%	5.2%	37.1%	29.0%	8.0%	4.9%	1.5%	523
Faculty	79.3%	36.7%	6.3%	50.8%	39.5%	11.3%	2.3%	3.9%	392
Staff	83.9%	19.4%	3.6%	72.7%	59.0%	13.7%	4.0%	0.4%	549
2010-11 Overall	89.8%	41.2%	5.9%	33.1%	25.3%	7.8%	19.1%	0.8%	3,084
Undergrad	92.8%	46.5%	7.3%	16.8%	11.8%	5.0%	29.0%	0.4%	1,792
Grad	88.4%	50.2%	5.9%	36.9%	30.4%	6.4%	4.9%	2.1%	433
Faculty	79.3%	37.7%	4.8%	53.1%	43.6%	9.5%	1.8%	2.5%	328
Staff	85.4%	21.5%	2.1%	71.6%	55.7%	15.9%	4.1%	0.7%	403

Results from 2010-11 are based on responses to questions *q_0012* (whether traveled to campus) and *q_0017* (primary mode each day) and are weighted by role based on the 3,084 valid responses to *q_0017* (see Table 8). Results from 2009-10, 2008-09 and 2007-08 data are similarly calculated and weighted, as described in Lovejoy (2010) and Lovejoy, *et al.* (2009).

The changes in mode split from 2009-10 to 2010-11 largely seem to cancel out the changes from 2008-09 to 2009-10. As seen in the last row of Table 24, there have been no statistically significant changes in the overall mode split between 2008-09 and 2010-11, the three survey years in which the survey questions measuring primary mode split have been essentially the same. Even when separated by role group, there have been remarkably few significant changes in the primary mode split between 2008-09 and 2010-11. Table 25 through Table 32 show the percentage-point changes in the number using each mode on an average weekday across survey years for more detailed role-group categories. Between 2008-09 and 2010-11, no role group had a statistically significant change in the percent biking, driving alone, carpooling, using a personal vehicle, or physically traveling to campus. Even in this period, though, there were some notable changes.

Table 24. Percentage-point change in overall mode shares, 2007-08 through 2010-11

Years of comparison	Percentage-point change in percent of people doing each on an average weekday							
	Among those physically traveling to campus:							Physically traveling to campus
	Bike	Walk	Personal vehicle			Bus	Train	
Any			Drive alone	Carpool or ride				
2007-08 to 2008-09	3.0% **	0.7%	-2.2% **	-4.3% **	2.1% **	1.1%	n/a	-2.7% **
2008-09 to 2009-10	-1.5%	1.1% *	1.6%	1.4%	0.2%	-1.0%	-0.2%	-1.8% **
2009-10 to 2010-11	2.0%	-1.2% *	-0.8%	-0.8%	0.0%	-0.1%	0.2%	1.2%
2007-08 to 2010-11	3.5% **	0.6%	-1.4%	-3.7% **	2.2% **	0.0%	n/a	-3.3% **
2008-09 to 2010-11	0.4%	-0.1%	0.8%	0.6%	0.2%	-1.1%	0.0%	-0.6%

Total sample sizes are 4,180 (in 2007-08), 3,929 (in 2008-09), 3,840 (in 2009-10), and 3,084 (in 2010-11).

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

The share of freshman walking to campus increased by about 4 percentage points, and the share of juniors taking the bus to campus decreased by 6.4 percentage points (both significant at the ten percent level). In addition, the share of freshman taking the train to campus decreased by 0.3 percentage points (significant at the five percent level), though there was no statistically significant change in overall bus or train ridership over any of the years.

Table 25. Percentage-point change in bike mode share, by role, 2007-08 through 2010-11

Role group	Percentage point change						Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11		2007-08	2008-09	2009-10	2010-11
Students ^a	4.1% **	-2.0%	1.9%	3.9% **	-0.1%		2,812	2,589	2,503	2,353
Undergraduate ^a	5.4% **	-2.1%	2.5%	5.9% **	0.5%		2,308	2,096	2,046	1,571
Freshmen	-0.1%	-2.8%	2.4%	-0.5%	-0.4%		418	422	527	456
Sophomores	10.2% **	-2.4%	5.0%	12.8% **	2.6%		445	387	471	351
Juniors	4.6%	-0.4%	4.8%	9.0% **	4.4%		399	385	383	386
Seniors	4.7%	-0.9%	3.0%	6.8% *	2.1%		356	315	401	378
Graduate ^a	-2.7%	-1.4%	-1.1%	-5.2%	-2.5%		504	492	457	782
Masters	-2.2%	0.3%	-1.1%	-3.0%	-0.8%		261	287	338	397
PhD	-2.8%	-2.2%	-1.1%	-6.1% *	-3.3%		412	604	512	385
Employees ^a	-0.2%	-0.9%	1.9%	0.9%	1.0%		1,079	965	899	731
Faculty	0.6%	-3.4%	1.1%	-1.7%	-2.3%		422	421	311	328
Staff	-0.3%	-0.4%	2.1%	1.4%	1.7%		1,147	689	461	403
Outside Davis ^a	-0.3%	-0.5%	0.0%	-0.8%	-0.5%		888	741	705	677
Within Davis ^a	2.8% **	-1.5%	1.9%	3.2% **	0.4%		3,004	2,812	2,583	2,352
Overall ^a	3.0% **	-1.5%	2.0%	3.5% **	0.4%		3,891	3,553	3,402	3,084

^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

These results suggest that some of the changes in the primary mode split between 2007-08 and later survey years may be influenced in part by differences in survey design rather than changes actual travel behavior. Perhaps the most notable change in the overall mode split that is unlikely to be affected by changes in survey design is the percent physically traveling to campus. Despite small increases (though statistically insignificant) in the percent of undergraduate students, graduate students, and employees physically travelling to campus between 2009-10 and 2010-11, the percent of those physically traveling to campus is still substantially (and significantly) lower than in 2007-08 (see Table 32).

Table 26. Percentage-point change in walk mode share, 2007-08 through 2010-11

Role group	Percentage point change						Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11		2007-08	2008-09	2009-10	2010-11
Students ^a	1.0%	0.8%	-1.2%	0.6%	-0.4%		2,812	2,589	2,503	2,353
Undergraduate ^a	1.4% *	1.0%	-1.6% *	0.8%	-0.6%		2,308	2,096	2,046	1,571
Freshmen	2.7%	3.9% *	0.0%	6.6% **	3.9% *		418	422	527	456
Sophomores	-0.6%	1.2%	-0.6%	0.0%	0.6%		445	387	471	351
Juniors	-0.5%	0.1%	-0.3%	-0.7%	-0.2%		399	385	383	386
Seniors	3.0%	0.3%	-3.3% *	0.1%	-3.0%		356	315	401	378
Graduate ^a	-0.7%	-0.4%	0.9%	-0.2%	0.6%		504	492	457	782
Masters	-1.5%	0.5%	0.7%	-0.3%	1.1%		261	287	338	397
PhD	-0.4%	-0.8%	1.1%	-0.1%	0.3%		412	604	512	385
Employees ^a	-0.1%	1.8% **	-1.4%	0.4%	0.4%		1,079	965	899	731
Faculty	1.5%	1.6%	-1.3%	1.9%	0.4%		422	421	311	328
Staff	-0.4%	1.8% **	-1.4%	0.1%	0.5%		1,147	689	461	403
Outside Davis ^a	0.1%	1.3% **	-0.5%	0.9% **	0.8%		888	741	705	677
Within Davis ^a	0.7%	0.8%	-1.2%	0.3%	-0.5%		3,004	2,812	2,583	2,352
Overall ^a	0.7%	1.1% *	-1.2% *	0.6%	-0.1%		3,891	3,553	3,402	3,084

- ^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).
- ^{*} Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.
- ^{**} Statistically significant at $p < 0.05$.

Table 27. Percentage-point change in drive-alone mode share, 2007-08 through 2010-11

Role group	Percentage point change						Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11		2007-08	2008-09	2009-10	2010-11
Students ^a	-3.9% **	1.4%	-0.2%	-2.7% **	1.2%		2,812	2,589	2,503	2,353
Undergraduate ^a	-5.9% **	1.6%	-0.7%	-4.9% **	1.0%		2,308	2,096	2,046	1,571
Freshmen	-1.2%	1.0%	-1.4%	-1.6%	-0.4%		418	422	527	456
Sophomores	-6.3% **	0.5%	0.1%	-5.6% **	0.7%		445	387	471	351
Juniors	-7.9% **	-0.2%	1.2%	-6.9% **	1.0%		399	385	383	386
Seniors	-6.3% **	3.4%	-3.9%	-6.8% **	-0.5%		356	315	401	378
Graduate ^a	4.3%	1.0%	1.4%	6.7% **	2.3%		504	492	457	782
Masters	3.8%	-0.4%	2.4%	5.7%	1.9%		261	287	338	397
PhD	4.5%	1.6%	0.9%	6.9% **	2.5%		412	604	512	385
Employees ^a	-4.6% **	2.6%	-2.0%	-4.0% *	0.6%		1,079	965	899	731
Faculty	-2.8%	-3.0%	4.0%	-1.7%	1.1%		422	421	311	328
Staff	-5.1% **	3.8%	-3.3%	-4.6%	0.5%		1,147	689	461	403
Outside Davis ^a	-3.1%	5.2% **	-2.9%	-0.8%	2.3%		888	741	705	677
Within Davis ^a	-3.3% **	0.1%	0.4%	-2.7% **	0.5%		3,004	2,812	2,583	2,352
Overall ^a	-4.3% **	1.4%	-0.8%	-3.7% **	0.6%		3,891	3,553	3,402	3,084

- ^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).
- ^{*} Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.
- ^{**} Statistically significant at $p < 0.05$.

Table 28. Percentage-point change in carpool mode share, 2007-08 through 2010-11

Role group	Percentage point change						Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11		2007-08	2008-09	2009-10	2010-11
Students ^a	0.7%	1.1% *	-0.5%	1.3% **	0.6%		2,812	2,589	2,503	2,353
Undergraduate ^a	0.5%	0.7%	-0.3%	0.9%	0.4%		2,308	2,096	2,046	1,571
Freshmen	0.1%	0.6%	-0.5%	0.3%	0.2%		418	422	527	456
Sophomores	0.8%	0.8%	0.1%	1.7%	0.8%		445	387	471	351
Juniors	0.7%	1.7%	-1.0%	1.4%	0.7%		399	385	383	386
Seniors	0.6%	-0.3%	-0.3%	0.0%	-0.6%		356	315	401	378
Graduate ^a	1.6%	3.0% *	-1.6%	3.0% **	1.4%		504	492	457	782
Masters	1.8%	2.4%	-2.1%	2.2%	0.3%		261	287	338	397
PhD	1.6%	3.3% **	-1.3%	3.5% **	2.0%		412	604	512	385
Employees ^a	5.8% **	-2.1%	1.5%	5.3% **	-0.5%		1,079	965	899	731
Faculty	0.7%	3.8% *	-1.7%	2.8%	2.1%		422	421	311	328
Staff	6.9% **	-3.3%	2.2%	5.8% **	-1.1%		1,147	689	461	403
Outside Davis ^a	6.0% **	-3.1%	2.8%	5.6% **	-0.4%		888	741	705	677
Within Davis ^a	1.2% **	1.0%	-0.5%	1.7% **	0.4%		3,004	2,812	2,583	2,352
Overall ^a	2.1% **	0.2%	0.0%	2.2% **	0.2%		3,891	3,553	3,402	3,084

- ^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).

- * Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.
- ** Statistically significant at $p < 0.05$.

Table 29. Percentage-point change in personal vehicle share, 2007-08 through 2010-11

Role group	Percentage point change						Sample size ^a					
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11	2007-08	2008-09	2009-10	2010-11			
Students ^a	-3.2%	**	2.5%	**	-0.7%	-1.4%	1.8%	2,812	2,589	2,503	2,353	
Undergraduate ^a	-5.4%	**	2.3%	**	-1.0%	-4.0%	**	1.4%	2,308	2,096	2,046	1,571
Freshmen	-1.0%		1.6%		-1.9%	-1.3%		-0.3%	418	422	527	456
Sophomores	-5.5%	**	1.3%		0.2%	-4.0%		1.5%	445	387	471	351
Juniors	-7.2%	**	1.5%		0.2%	-5.5%	*	1.7%	399	385	383	386
Seniors	-5.7%	*	3.2%		-4.2%	-6.8%	**	-1.0%	356	315	401	378
Graduate ^a	6.0%	**	3.9%		-0.2%	9.7%	**	3.7%	504	492	457	782
Masters	5.6%		1.9%		0.3%	7.9%	**	2.3%	261	287	338	397
PhD	6.0%	**	4.9%	*	-0.5%	10.5%	**	4.4%	412	604	512	385
Employees ^a	1.2%		0.5%		-0.5%	1.3%		0.1%	1,079	965	899	731
Faculty	-2.1%		0.9%		2.3%	1.1%		3.2%	422	421	311	328
Staff	1.8%		0.5%		-1.1%	1.2%		-0.6%	1,147	689	461	403
Outside Davis ^a	2.9%		2.1%		-0.2%	4.8%	**	1.9%	888	741	705	677
Within Davis ^a	-2.0%	*	1.1%		-0.1%	-1.0%		1.0%	3,004	2,812	2,583	2,352
Overall ^a	-2.2%	**	1.6%		-0.8%	-1.4%		0.8%	3,891	3,553	3,402	3,084

^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

Table 30. Percentage-point change in bus mode share, 2007-08 through 2010-11

Role group	Percentage point change						Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11	2007-08	2008-09	2009-10	2010-11	
Students ^a	0.9%	-1.1%	-0.2%	-0.4%	-1.3%	2,812	2,589	2,503	2,353	
Undergraduate ^a	1.5%	-1.1%	-0.1%	0.2%	-1.2%	2,308	2,096	2,046	1,571	
Freshmen	0.8%	-1.9%	-0.2%	-1.3%	-2.2%	418	422	527	456	
Sophomores	-1.2%	0.3%	-4.6%	-5.4%	-4.2%	445	387	471	351	
Juniors	5.3%	-1.1%	-5.3%	-1.1%	-6.4%	399	385	383	386	
Seniors	1.7%	-3.0%	4.4%	3.0%	1.4%	356	315	401	378	
Graduate ^a	-0.4%	-1.9%	0.0%	-2.2%	-1.9%	504	492	457	782	
Masters	0.8%	-2.2%	-1.1%	-2.4%	-3.3%	261	287	338	397	
PhD	-1.0%	-1.8%	0.6%	-2.2%	-1.2%	412	604	512	385	
Employees ^a	1.0%	-1.4%	0.0%	-0.3%	-1.4%	1,079	965	899	731	
Faculty	0.6%	-0.4%	-0.5%	-0.4%	-0.9%	422	421	311	328	
Staff	1.2%	-1.6%	0.1%	-0.3%	-1.5%	1,147	689	461	403	
Outside Davis ^a	-0.8%	-1.9%	0.0%	-2.6%	**	-1.9%	888	741	705	677
Within Davis ^a	1.2%	-0.5%	-0.5%	0.1%	-1.0%	3,004	2,812	2,583	2,352	
Overall ^a	1.1%	-1.0%	-0.1%	0.0%	-1.1%	3,891	3,553	3,402	3,084	

^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

Table 31. Percentage-point change in train mode share, 2007-08 through 2010-11

Role group	Percentage point change					Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11	2007-08	2008-09	2009-10	2010-11
Students ^a	n/a	-0.2%	0.3% **	n/a	0.1% **	2,812	2,589	2,503	2,353
Undergraduate ^a	n/a	-0.1%	0.2%	n/a	0.1%	2,308	2,096	2,046	1,571
Freshmen	n/a	-0.3%	0.0%	n/a	-0.3% **	418	422	527	456
Sophomores	n/a	-0.2%	0.1%	n/a	-0.1%	445	387	471	351
Juniors	n/a	0.3%	0.4%	n/a	0.6%	399	385	383	386
Seniors	n/a	-0.3%	0.3%	n/a	0.0%	356	315	401	378
Graduate ^a	n/a	-0.5%	0.6%	n/a	0.1%	504	492	457	782
Masters	n/a	-0.8%	1.5%	n/a	0.7%	261	287	338	397
PhD	n/a	-0.4%	0.1%	n/a	-0.2%	412	604	512	385
Employees ^a	n/a	-0.2%	0.0%	n/a	-0.2%	1,079	965	899	731
Faculty	n/a	1.1%	-1.4%	n/a	-0.3%	422	421	311	328
Staff	n/a	-0.4%	0.3%	n/a	-0.1%	1,147	689	461	403
Outside Davis ^a	n/a	-0.9%	0.6%	n/a	-0.3%	888	741	705	677
Within Davis ^a	n/a	0.0%	0.2%	n/a	0.1%	3,004	2,812	2,583	2,352
Overall ^a	n/a	-0.2%	0.2%	n/a	0.0%	3,891	3,553	3,402	3,084

^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).

^b The 2007-08 survey did not measure trips to campus specifically by train.

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

Table 32. Percentage-point change in those physically traveling, 2007-08 through 2010-11

Role group	Percentage point change					Sample size ^a			
	2007-08 to 2008-09	2008-09 to 2009-10	2009-10 to 2010-11	2007-08 to 2010-11	2008-09 to 2010-11	2007-08	2008-09	2009-10	2010-11
Students ^a	-1.0%	-1.7% *	1.2%	-1.6% **	-0.6%	2,812	2,589	2,503	2,353
Undergraduate ^a	-1.3%	-1.8% *	1.2%	-1.9% **	-0.6%	2,308	2,096	2,046	1,571
Freshmen	-0.4%	-1.5%	0.5%	-1.4%	-1.1%	418	422	527	456
Sophomores	-0.9%	0.3%	-0.1%	-0.8%	0.2%	445	387	471	351
Juniors	-1.7%	-0.3%	-0.2%	-2.2%	-0.5%	399	385	383	386
Seniors	-1.9%	-3.9%	3.7% *	-2.1%	-0.2%	356	315	401	378
Graduate ^a	0.5%	-1.5%	1.0%	-0.1%	-0.6%	504	492	457	782
Masters	3.4%	-0.8%	-1.5%	1.1%	-2.3%	261	287	338	397
PhD	-0.9%	-1.9%	2.4%	-0.4%	0.5%	412	604	512	385
Employees ^a	-6.7% **	-2.3%	1.2%	-7.7% **	-1.1%	1,079	965	899	731
Faculty	-7.5% **	-1.3%	0.0%	-8.9% **	-1.3%	422	421	311	328
Staff	-6.4% **	-2.5%	1.5%	-7.5% **	-1.0%	1,147	689	461	403
Outside Davis ^a	-5.4% **	0.2%	-0.4%	-5.6% **	-0.2%	888	741	705	677
Within Davis ^a	-1.9% **	-2.0% **	1.2%	-2.7% **	-0.8%	3,004	2,812	2,583	2,352
Overall ^a	-2.7% **	-1.8% **	1.2%	-3.3% **	-0.6%	3,891	3,553	3,402	3,084

^a For statistical tests, we used the unweighted sample for the eight basic role group categories (freshmen, sophomores, juniors, seniors, masters students, PhD students, faculty, and staff), but the weighted sample for consolidated groups (students, undergraduates, grad students, employees, outside Davis, within Davis, and overall).

* Statistically significant difference with $p < 0.1$ in a two-category χ^2 test of the frequency of those using this mode versus those using any other mode in one year versus the other.

** Statistically significant at $p < 0.05$.

Secondary means of transportation and circulation on campus

Another consideration in evaluating the number of people regularly using particular modes is whether people

use a particular means of transportation for some portion of the trip to campus, but not as a primary means of transportation for most of the way (as reported in question *q_0017*). While this year’s survey did not ask respondents to provide a detailed accounting of what different (multiple) modes they typically use to get to campus (as in the 2008-09 survey; see Lovejoy, *et al.*, 2009), it did include one question asking respondents to indicate “all the different means of transportation you used at some point on your way to school or work, from the moment you left home to when you arrived at your first destination on campus -- even if it was just for part of the way -- on any day last week. (Check all that apply.)” (See question *q_0016*.) We might infer that any means of transportation indicated in question *q_0016* but not in question *q_0017* (where respondents report their primary means of transportation for most of the distance on each day) was used by the respondent as a secondary mode, at least once at some point during the reference week (though we have no way of knowing how frequently each was used, or in combination with what other modes).

Table 33 shows the percent who reported using a given mode at least once during the week in question *q_0016*, but who did *not* identify that mode as their primary means of transportation for most of the distance on any day (question *q_0017*). For instance, although about 47 percent biked as a primary means of transportation at some point during the week (Table 22), an additional 5 percent of respondents apparently biked in combination with some other means of transportation at least once during the week (Table 33). By this estimate, a projected 20,341 bike at least once a week, either as a primary or secondary mode. Clearly, walking is the most commonly reported secondary mode, with about 40 percent of respondents reporting walking for some portion of their trip. Relative to the number using it as a primary mode, skating is especially common as a secondary mode, approximately doubling the total number doing so for transportation at least once per week (to about 563). Similarly considering those who report riding a train or light rail but not as a primary mode increases the projected total number of train riders by about 16 percentage points (to 649, consisting of both Sacramento Regional Transit and Capitol Corridor Amtrak riders) and of carpoolers by 30 percentage points (to 9,006).

Table 33. Percent using each mode at least once as a secondary mode

Role group	At least once during the seven-day week:								Weighted sample	Projected population
	Percent physically traveling	Among those traveling, percent using each mode at least once but not as a primary mode on any days:								
		Bike	Walk	Skate	Drive alone	Carpool or ride	Bus	Train		
Students	97.9%	5.1%	34.7%	0.9%	4.3%	6.5%	5.6%	0.2%	2,226	29,317
Undergraduate	97.9%	5.1%	37.5%	1.1%	4.8%	7.4%	6.6%	0.2%	1,792	23,608
Freshmen	99.3%	3.0%	38.3%	0.7%	1.1%	6.3%	8.1%	0.4%	275	3,628
Sophomores	99.4%	9.6%	40.5%	1.4%	4.8%	10.2%	8.2%	0.3%	339	4,469
Juniors	96.9%	5.3%	34.9%	1.3%	7.5%	6.3%	6.3%	0.0%	477	6,279
Seniors	97.4%	3.6%	37.6%	1.0%	4.4%	7.2%	5.4%	0.3%	701	9,232
Graduate	98.0%	5.1%	22.9%	0.3%	1.9%	2.9%	1.4%	0.3%	433	5,709
Masters	98.5%	5.2%	24.8%	0.2%	2.2%	5.2%	2.5%	0.2%	157	2,073
PhD	97.7%	5.1%	21.8%	0.3%	1.8%	1.5%	0.8%	0.3%	276	3,636
Employees	94.9%	3.6%	16.9%	0.2%	2.8%	1.9%	1.4%	0.2%	858	11,301
Faculty	95.1%	4.1%	14.8%	0.0%	4.6%	1.2%	1.2%	0.3%	157	2,066
Staff	94.8%	3.5%	17.4%	0.2%	2.4%	2.1%	1.4%	0.2%	701	9,235
Outside Davis	94.8%	10.1%	25.5%	0.5%	3.9%	1.6%	2.0%	0.6%	677	8,911
Within Davis	97.9%	3.1%	31.0%	0.8%	3.8%	6.2%	5.1%	0.1%	2,352	30,974
Overall	97.1%	4.7%	29.6%	0.7%	3.8%	5.2%	4.4%	0.2%	3,084	40,618
Weighted sample	2,994	140	887	22	115	156	131	7	3,084	
Projected population	39,432	1,846	11,686	287	1,510	2,052	1,721	91		40,618

Results are based on responses to questions *q_0012* (whether traveled to campus), *q_0016* (all means of transportation used to get to campus any days during the seven-day reference week) and compared with *q_0017* (primary means each day). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 34. Percent biking as a secondary mode on campus on average weekday, by role

Role group	Physically traveling to campus	Among those physically traveling to campus			Weighted sample	Projected population
		Bike was primary mode	Other primary mode, then biked on campus	Other primary mode, and did not bike on campus		
Students	91.9%	47.2%	8.2%	44.6%	2,226	29,317
Undergraduate	92.8%	46.5%	8.9%	44.6%	1,792	23,608
Freshmen	94.3%	71.9%	6.2%	21.9%	275	3,628
Sophomores	96.5%	45.9%	12.3%	41.9%	339	4,469
Juniors	91.6%	42.5%	10.0%	47.5%	477	6,279
Seniors	91.2%	39.6%	7.4%	52.9%	701	9,232
Graduate	88.4%	50.4%	5.3%	44.3%	433	5,709
Masters	85.0%	48.6%	5.5%	45.9%	157	2,073
PhD	90.3%	51.4%	5.2%	43.4%	276	3,636
Employees	84.3%	25.2%	7.4%	67.3%	858	11,301
Faculty	79.3%	38.1%	8.6%	53.4%	157	2,066
Staff	85.4%	22.5%	7.2%	70.3%	701	9,235
Outside Davis	81.4%	1.7%	16.4%	81.8%	689	9,075
Within Davis	92.3%	51.5%	5.9%	42.5%	2,395	31,543
On campus	92.2%	72.7%	5.4%	21.9%	1,944	25,606
Off campus	92.7%	46.4%	6.0%	47.6%	451	5,937
Overall	89.8%	41.9%	8.0%	50.2%	3,084	40,618
Weighted sample	2,769	1,159	220	1,390	3,084	
Projected population	36,475	15,267	2,900	18,308		40,618

Results are based on responses to questions *q_0012* and *q_0018*. We first calculate the percent of five weekdays that an individual biked, and then the average over all respondents represents the percent biking on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Focusing on biking in particular, the survey explicitly asked all respondents about whether they biked after arriving on campus each day, regardless of their primary means of transportation *to* campus each day (question *q_0017*). Table 34 shows that on average weekday, in addition to the people biking as their primary means of transportation to campus, about 8 percent of people (a projected 2,900) bike on campus after arriving by some other means, with a high of 12 percent of sophomores doing so and a low of 5 percent of masters students doing so.

Finally, question *q_0036* asked respondents about how they “typically get around campus (or off campus)” during the day, after arriving at the beginning of the day and before leaving campus for the last time. This question did not ask about what respondents actually did during each day of the reference but rather to report their typical behavior. In the 2009-10 survey, respondents were asked to rate on a five-point scale from “never” to “always” the frequency that they walk, bike, or ride in a vehicle to get to different destinations around campus. In the 2010-11 survey, respondents were asked to estimate the percentage of trips that they use each mode to “get around campus (or off campus) before leaving campus for the last time.” Staff who live outside of Davis are most likely to drive or ride in a vehicle to get around campus during the day (32 percent of trips), compared to about 10 percent for faculty living off-campus in Davis or outside of Davis. Undergraduates and graduate students were least likely to drive or get a ride around campus (3 percent and 6 percent of trips, respectively).

Table 35. Means of transportation typically used during the day to get around campus

By role group	By housing location	After arriving on campus at the beginning of your day, how do you typically get around campus (or off campus) before leaving campus for the last time? Please estimate the percentage of trips you use each mode to get around campus (or off campus).				Weighted sample
		Bike	Walk	Ride in a vehicle	Other mode	
<i>Undergraduate</i>	On campus	65.7%	29.3%	2.1%	1.0%	382
	Off campus in Davis	42.4%	52.3%	3.7%	1.3%	1,160
	Outside Davis	17.9%	75.7%	5.0%	1.4%	141
	Total	45.6%	49.0%	3.5%	1.3%	1,682
<i>Graduate</i>	On campus	57.9%	36.1%	4.0%	1.2%	47
	Off campus in Davis	36.3%	58.6%	4.6%	0.5%	281
	Outside Davis	20.5%	65.7%	12.8%	1.0%	87
	Total	35.4%	57.5%	6.2%	0.7%	415
<i>Faculty</i>	Off campus in Davis	34.5%	54.4%	9.8%	0.8%	95
	Outside Davis	16.7%	69.7%	10.9%	1.9%	55
	Total	28.0%	60.0%	10.2%	1.2%	150
<i>Staff</i>	On campus	65.0%	35.0%	0.0%	0.0%	3
	Off campus in Davis	31.8%	50.7%	15.9%	1.7%	294
	Outside Davis	11.2%	55.3%	31.7%	0.9%	374
	Total	20.5%	53.2%	24.6%	1.2%	672
<i>Overall</i>	On campus	64.9%	30.1%	2.3%	1.0%	433
	Off campus in Davis	39.3%	53.1%	6.1%	1.2%	1,830
	Outside Davis	14.3%	62.3%	21.7%	1.1%	657
	Total	37.5%	51.8%	9.1%	1.2%	2,919

Results are based on responses to question *q_0036*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8). There is no category for faculty living on campus, since no faculty in our sample reported living on campus.

Overnight bike parking

Question *q_0031* asked respondents if they left “a bike on campus overnight any nights last week,” and if so which nights. This information can be used to estimate the total number of bikes on campus that are not abandoned, by day of the week. We find that about 17 percent report leaving a bike overnight at least once during the reference week, with somewhat fewer leaving bikes over the weekend. Overall, about 14 percent leave bikes overnight on the average weekday, a projected 5,454 bikes (Table 36). About 47 percent of these belong to people living on campus, about 35 percent belong to students living off-campus, (30 percent to undergrads and 5 percent to grad students) and 18 percent belong to employees (3.7 percent to faculty and 14.5 percent to staff). Of bicycles left overnight on campus by those living off-campus, About 60 percent belong to people living (off-campus) within Davis, and 40 percent belong to people living outside of Davis.

Table 36. Percent of people with bikes on campus overnight each day, by role

Role group	Percent with a bike on campus overnight on:							At least one night	Weekday avg.	Total	
	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.			Weighted sample	Projected population
Living on campus	42.2%	42.1%	42.4%	42.5%	42.7%	42.0%	40.8%	46.2%	42.4%	459	6,052
Living off campus	9.0%	8.2%	9.2%	8.5%	7.9%	6.9%	6.7%	11.9%	8.5%	2,569	33,833
Students	8.9%	8.1%	9.0%	8.5%	7.4%	6.3%	6.0%	19.7%	8.4%	1,724	22,704
Undergraduate	10.0%	9.0%	10.0%	9.5%	8.1%	6.7%	6.5%	22.6%	9.3%	1,348	17,749
Freshmen	20.6%	17.6%	17.6%	14.7%	14.7%	11.8%	11.8%	64.5%	17.1%	21	271
Sophomores	15.0%	14.7%	14.7%	14.7%	11.8%	10.9%	10.5%	21.9%	14.2%	303	3,985
Juniors	10.3%	9.1%	8.8%	10.0%	8.8%	6.9%	6.6%	13.5%	9.4%	394	5,189
Seniors	7.1%	5.9%	8.2%	6.5%	5.6%	4.4%	4.4%	12.7%	6.6%	630	8,304
Graduate	4.9%	5.0%	5.3%	4.8%	5.2%	4.8%	4.3%	7.4%	5.0%	376	4,956
Masters	3.4%	3.7%	4.0%	3.1%	4.2%	3.7%	2.8%	6.8%	3.7%	140	1,848
PhD	5.8%	5.8%	6.1%	5.8%	5.8%	5.5%	5.2%	7.8%	5.8%	236	3,107
Employees	9.1%	8.4%	9.6%	8.6%	8.8%	8.1%	8.0%	10.3%	8.9%	845	11,130
Faculty	10.3%	10.0%	9.7%	10.0%	9.7%	9.4%	8.8%	10.7%	10.0%	153	2,009
Staff	8.8%	8.0%	9.5%	8.3%	8.5%	7.8%	7.8%	10.2%	8.6%	692	9,120
Outside Davis	13.3%	12.7%	13.4%	12.7%	12.6%	11.7%	11.7%	13.6%	12.9%	676	8,910
In Davis off campus	7.4%	6.6%	7.7%	7.0%	6.2%	5.1%	4.9%	11.3%	7.0%	1,892	24,923
Overall	14.0%	13.3%	14.2%	13.7%	13.2%	12.2%	11.8%	17.0%	13.7%	3,084	40,619
Weighted sample	432	412	438	421	406	376	365	526	422	3,084	
Projected population	5,585	5,324	5,666	5,447	5,247	4,867	4,726	6,820	5,454		40,619
Living on campus	2,556	2,548	2,565	2,569	2,585	2,541	2,467	2,799	2,565		6,052
Living off campus	3,029	2,776	3,101	2,878	2,662	2,326	2,259	4,021	2,889		33,833

Results are based on responses to question *q_0031* (nights during reference week that bike left on campus overnight). Data by role group is shown for those living off campus, either in Davis or outside Davis. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 37 shows the total number of nights respondents reported leaving their bikes overnight per week. Among those living off campus and leaving a bike overnight at least once during the week, just over half stored their bike on campus overnight all seven days of the week. The remainder left a bike overnight only some days, including 22 percent who left a bike overnight just one day of the week.

Table 37. Percent with bikes on campus various numbers of nights per week, by role

Role group	Percent leaving overnight at least once	Among those leaving a bike overnight on campus at least once, percent leaving it this number of nights during the week:							Total	
		1	2	3	4	5	6	7	Weighted sample	Projected population
Living on campus	46.2%	6.7%	1.8%	1.5%	0.8%	1.9%	1.7%	85.7%	459	6,052
Living off campus	11.9%	22.3%	8.0%	5.6%	5.1%	7.1%	1.2%	50.8%	2,569	33,833
Students	19.7%	16.6%	6.2%	4.3%	3.7%	4.5%	1.5%	63.2%	2,226	29,317
Undergraduate	22.6%	16.1%	5.6%	4.3%	3.8%	4.7%	1.6%	63.8%	1,793	23,609
Freshmen	64.5%	3.1%	1.4%	1.0%	0.3%	2.1%	2.1%	90.1%	276	3,629
Sophomores	21.9%	22.0%	10.4%	5.2%	11.7%	5.2%	0.0%	45.5%	339	4,470
Juniors	13.5%	15.4%	7.7%	9.6%	3.9%	15.4%	1.9%	46.2%	477	6,278
Seniors	12.7%	37.5%	8.4%	6.2%	4.2%	2.0%	2.0%	39.6%	701	9,232
Graduate	7.4%	23.4%	13.9%	3.8%	2.1%	2.1%	0.0%	54.6%	433	5,708
Masters	6.8%	36.9%	14.9%	11.3%	0.0%	0.0%	0.0%	36.9%	157	2,073
PhD	7.8%	16.7%	13.5%	0.0%	3.2%	3.2%	0.0%	63.5%	276	3,635
Employees	10.3%	11.0%	2.0%	2.0%	1.1%	6.5%	0.5%	76.9%	858	11,302
Faculty	10.7%	5.9%	0.0%	0.0%	5.9%	2.7%	2.7%	82.8%	157	2,067
Staff	10.2%	12.2%	2.4%	2.4%	0.0%	7.3%	0.0%	75.5%	701	9,235
Outside Davis	13.6%	4.5%	0.0%	0.0%	3.1%	8.2%	0.5%	83.8%	676	8,910
In Davis off campus	11.3%	30.0%	11.4%	8.1%	6.0%	6.6%	1.5%	36.5%	1,892	24,923
Overall	17.0%	15.7%	5.5%	3.9%	3.3%	4.9%	1.4%	65.5%	3,084	40,619
Weighted sample	526	14	5	3	3	4	1	59	3,084	
Projected population	6,922	185	65	46	39	57	16	772		40,619
Living on campus	2,799	87	23	19	10	25	22	1,109		6,052
Living off campus	4,021	106	38	27	24	34	6	243		33,833

Results are based on responses to questions *q_0031* (nights during reference week that left a bike on campus overnight). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 38. Time elapsed since last riding bikes stored on campus overnight

Role group	Among those who left a bike on campus overnight at least once during the week, percent who rode it within the last:					Total who left a bike overnight at least once:	
	1 day	2-7 days	8-14 days	15-30 days	More than 30 days ago	Weighted sample	Projected population
Living on campus	82.8%	7.2%	0.8%	2.1%	7.1%	208	2,733
Living off campus	60.5%	26.1%	5.7%	1.9%	5.8%	302	3,973
Students	75.2%	14.4%	1.9%	2.2%	6.2%	430	5,668
Undergraduate	75.7%	14.1%	1.9%	2.2%	6.1%	398	5,246
Freshmen	85.1%	5.5%	0.0%	2.1%	7.3%	174	2,291
Sophomores	68.0%	20.0%	5.3%	2.6%	4.0%	72	954
Juniors	74.5%	21.6%	0.0%	1.9%	1.9%	63	829
Seniors	64.6%	20.8%	4.2%	2.0%	8.4%	89	1,172
Graduate	68.2%	18.5%	2.1%	3.3%	7.8%	32	422
Masters	70.7%	22.1%	0.0%	3.6%	3.6%	11	140
PhD	67.0%	16.7%	3.2%	3.2%	9.9%	21	282
Employees	43.3%	37.6%	12.3%	0.5%	6.2%	86	1,138
Faculty	57.3%	17.3%	11.4%	2.7%	11.4%	17	220
Staff	40.0%	42.5%	12.5%	0.0%	5.0%	70	918
Outside Davis	57.5%	31.5%	7.7%	0.5%	2.7%	92	1,213
In Davis off campus	61.7%	23.7%	4.8%	2.6%	7.2%	210	2,760

Overall	69.9%	18.3%	3.7%	2.0%	6.2%	517	6,806
Weighted sample	361	95	19	10	32	517	
Projected population	4,754	1,247	249	133	423		6,806
Living on-campus	2,264	196	23	57	193		2,733
Living off-campus	2,402	1,037	226	77	231		3,973

Results are based on responses to questions *q_0031* (nights during reference week that left a bike on campus overnight) and *q_0033* (time elapsed since riding this bike). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 38 shows responses to question *q_0033*, “About how long has it been since you rode this bike?” with respondents choosing between the five categories shown. Most people ride the bike they leave on campus overnight somewhat regularly, with about 70 percent riding it within the last day, 88 percent riding within the last week, and 92 percent within the last two weeks (or 61 percent, 87 percent, and 92 percent, respectively, among those living off-campus). About 6 percent reported that the bike had been idle for a month or more (about 423 bikes), with the highest incidence among faculty, PhD students, and seniors.

Number of (claimed) bikes on campus and gross movements of bikes

A physical count of the total number of bikes parked on campus bike racks was last conducted by TAPS on June 4, 2009, including counts at 10:00am (13,933 bikes), 2:00pm (15,554 bikes), and 5:00am (to capture a nighttime baseline, 10,168 bikes).⁵ These counts included bikes parked around on-campus residences, but only included bikes visible from the outdoors in typical bike parking areas. In addition, it is unknown from these counts what percent of the bikes are abandoned, as well as the extent of gross movements of bikes during the day. The survey data provide some estimates of these figures.

In particular, we can estimate the total number of people bringing (or having) bikes on campus on an average weekday by combining responses of how many rode a bike as their primary mode (question *q_0017*), how many rode a bike as a circulator mode (*q_0017*), and how many left a bike on campus overnight (with or without riding it, question *q_0031*), each night of the reference week. In total, we estimate that 45 percent of the campus population has a bike on campus on an average weekday, a projected 18,091 people with bikes during the day. In addition, we estimate that 15 percent of the campus population stores a bike on campus overnight on an average weeknight, a projected 6,032 bikes (included in the daily total of 18,091). We estimate that of all the 18,091 people reporting having a bike on campus on average weekday, only about 7 percent left their bike idle on campus (1,290 bikes), and the remaining 93 percent (16,801) rode it at some point during the day. (See Table 39 and Figure 8.)

The estimated figure of 18,091 total (claimed) bikes on campus includes 35 percent of the campus population who have ridden a bike from home as their primary means of transportation (14,098 bikes), 2 percent who have brought a bike for use on campus during the day after using some other mode to get there (808 bikes), 5 percent who have stored a bike on campus overnight for use during the day after using some other mode to get there (1,894 bikes), and 3 percent who have a bike stored on campus without riding it that day (1,290 bikes). Among the bikes people intentionally store on campus overnight on a typical weekday (a projected 6,032 bikes), about 79 percent are ridden at some point during the day. Among those using a bike to get around campus during the day after using some other means of transportation to get to campus (about 7 percent of the campus community, or 2,702 people on an average weekday), about 70 percent leave this bike on campus overnight, though this figure is somewhat lower among graduate students (57 percent).

⁵ For more information, contact David Takemoto-Weerts at TAPS regarding the Bike Parking Utilization Survey.

Table 39. Number of people with bikes on campus on an average weekday

Role group	Bike on campus only during the day				Bike left on campus overnight				Total with bikes	Weighted sample	Projected population
	No bike	Ridden as primary mode	Ridden as circulator mode	Total	Ridden as primary mode	Ridden as circulator mode	Not ridden	Total			
		48.8%	31.4%		2.1%	33.5%					
Students	48.8%	31.4%	2.1%	33.5%	9.3%	5.0%	3.4%	17.6%	51.2%	2,226	29,317
Undergraduate	48.1%	29.4%	2.1%	31.5%	11.0%	5.6%	3.8%	20.4%	77.4%	1,792	23,608
Graduate	52.1%	39.8%	2.0%	41.8%	2.0%	2.5%	1.6%	6.1%	47.9%	433	5,709
Employees	72.6%	18.0%	1.8%	19.8%	1.2%	3.8%	2.6%	7.6%	27.4%	858	11,301
Faculty	63.4%	26.6%	2.1%	28.7%	1.3%	4.0%	2.6%	7.9%	36.6%	157	2,066
Staff	74.7%	16.0%	1.7%	17.8%	1.1%	3.8%	2.6%	7.5%	25.3%	701	9,235
Outside Davis	84.9%	1.0%	4.0%	5.0%	0.3%	7.6%	2.3%	10.1%	15.1%	689	9,075
Within Davis	47.9%	34.9%	1.3%	36.1%	8.9%	3.7%	3.4%	16.0%	52.1%	2,395	31,543
Off campus	52.7%	36.1%	1.2%	37.3%	3.1%	3.9%	3.0%	10.0%	47.3%	1,944	25,606
On Campus	27.0%	29.6%	1.5%	31.1%	33.7%	3.1%	5.1%	41.9%	73.0%	451	5,937
Overall	55.5%	27.7%	2.0%	29.7%	7.0%	4.7%	3.2%	14.9%	44.5%	3,084	40,618
Weighted sample	1,710	854	61	916	216	144	98	458	1,374	3,084	
Projected population	22,527	11,251	808	12,059	2,848	1,894	1,290	6,032	18,091		40,618

Results are based on responses to questions *q_0017* (primary means of transportation to campus), *q_0018* (whether biked on-campus only), and *q_0031* (whether left a bike on campus overnight). Percentages in each category are calculated by first calculating the percent of five weekdays that an individual had a bike (or not), and then the average over all respondents represents the percent with a bike on an average weekday. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Comparing these projections to the numbers of bikes counted on bike racks by TAPS, we find that our daytime total is substantially higher than the TAPS counts and that our overnight figure is substantially lower (see Table 40). As for the daytime figures, the results from the two surveys are not exactly comparable statistics, since ours is an estimate of those who had a bike on campus at *any* moment during the day, rather than the snapshot of bikes on campus at a particular hour, which ought to be substantially lower.⁶ By contrast, we might expect the nighttime figures to be more comparable, because we do not expect bikes to move around much at night, and therefore the 5am snapshot could be compared to the number reporting leaving a bike overnight. Yet we find a discrepancy of about 4,000 more nighttime bikes in the June 2009 rack count than the projected number owned by campus community members according to the 2010-11 Campus Travel Survey. To the extent that the figures from the two surveys are comparable, this discrepancy may be interpreted as an estimate of the total number of abandoned bikes on campus at any given time: about 4,000 bikes, or around 40 percent of the nighttime total. If this number are abandoned and idle, they might be deducted from the 10am and 2pm snapshot counts from TAPS, meaning that the number of un-abandoned bikes parked at 10am and 2pm would be about 10,000 and 11,500, respectively.

⁶ Other reasons we might expect the estimates from the Campus Travel Survey to be higher than the TAPS bike rack counts include: people parking bikes in places other than visible outdoor parking areas (only the latter were counted in the TAPS count); to differences in the number of people biking in the fall versus the spring (some attrition is expected, especially among undergraduates, on the other hand the overall campus population would have grown somewhat); or to measurement error in either survey.

Figure 8. Tree diagram depicting sources of bikes on campus on an average weekday

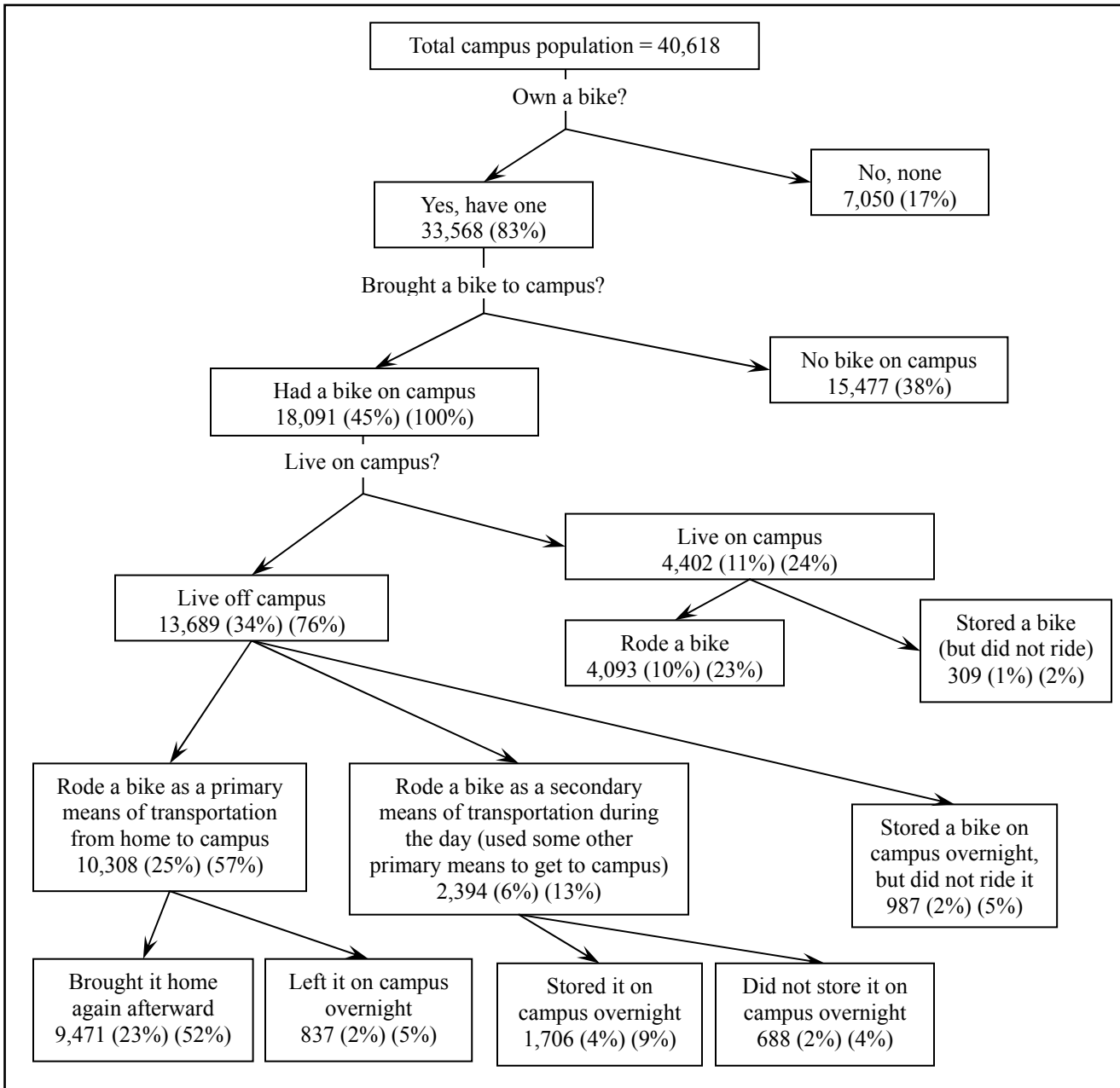


Table 40. Comparison of bike counts: Rack count versus survey results

Estimated number of bikes on campus:	Data source:	
	Bike Rack Utilization Count, June 2009	Campus Travel Survey 2010-11 (projections, October 2010)
Overnight	10,168 (5am count)	6,032 (left overnight, on an average weekday)
During the day	13,933 (10am count)	18,091 (at any point during the day, on an average weekday)
	15,554 (2pm count)	

Carpooling and ridesharing

Among those physically traveling to campus on an average weekday, we estimate about 33 percent arrive by personal vehicle (including carpooling, getting a ride, and driving alone in a car, motorcycle or scooter) (see Table 15 and Table 42). Among these, about 77 percent drive alone, 17 percent carpool, and 6 percent get a ride with someone who drops them off (Table 42). Within all role groups, those coming from outside Davis are more likely to drive alone than those coming from within Davis (80 percent versus 72.5 percent of those arriving in personal vehicles). Among those living within Davis and arriving by car, undergrads are especially likely to be dropped off (19 percent) and least likely to drive alone, although the majority do (61 percent).

Table 41: Average carpool size

Role group	Average occupancy among those that carpoled /rode at least once		Weighted sample	
	Carpool occupants (including driver)	Ride passengers (excluding driver)	Carpoolers	Riders
Undergraduate	2.59	1.55	275	239
Graduate	2.27	1.26	66	37
Faculty	2.76	1.25	22	8
Staff	2.65	1.36	137	38
Outside Davis	2.74	1.16	154	34
Within Davis	2.51	1.52	335	285
Overall	2.57	1.48	500	321

Vehicle occupancy is based on responses to question *q_0019* for those carpooling and to question *q_0020* for those who got a ride. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 42: Percent driving alone versus carpooling or ridesharing on an average weekday

	Percent physically traveling	Among those traveling, percent in personal vehicles	Among those in vehicles, percent:				Ride: 2+ dropped	Weighted sample	Projected population
			Driving alone	Carpool of 2	Carpool of 3+	Ride: 1 dropped			
Students	91.92%	20.56%	74.36%	12.46%	3.18%	8.93%	1.06%	2,226	29,317
Undergraduate	92.78%	16.80%	70.22%	13.01%	4.16%	11.34%	1.27%	1,792	23,608
Freshmen	94.25%	3.40%	50.68%	9.59%	13.70%	23.29%	2.74%	275	3,628
Sophomores	96.52%	12.93%	56.16%	20.55%	9.13%	9.59%	4.57%	339	4,469
Juniors	91.55%	18.90%	72.75%	11.38%	3.89%	11.68%	0.30%	477	6,279
Seniors	91.22%	22.80%	74.05%	11.96%	2.29%	10.94%	0.76%	701	9,232
Graduate	88.38%	36.87%	82.55%	11.36%	1.25%	4.17%	0.67%	433	5,709
Masters	85.04%	38.03%	87.07%	10.12%	0.93%	1.71%	0.16%	157	2,073
PhD	90.29%	36.25%	80.00%	12.06%	1.43%	5.56%	0.95%	276	3,636
Employees	84.30%	68.41%	78.33%	13.78%	5.02%	2.66%	0.22%	858	11,301
Faculty	79.33%	53.11%	82.05%	11.00%	3.33%	3.04%	0.58%	157	2,066
Staff	85.41%	71.59%	77.76%	14.20%	5.28%	2.60%	0.16%	701	9,235
Outside Davis	81.45%	89.01%	79.98%	12.93%	5.36%	1.73%	0.00%	677	8,911
Undergraduate	87.98%	84.56%	83.79%	11.02%	1.09%	4.10%	0.00%	146	1,923
Graduate	73.58%	80.41%	85.22%	11.55%	2.12%	1.11%	0.00%	87	1,151
Faculty	71.93%	87.38%	81.82%	10.43%	5.88%	1.87%	0.00%	57	750
Staff	82.16%	92.76%	77.42%	14.18%	7.45%	0.95%	0.00%	386	5,087
Off campus in Davis	92.22%	22.58%	72.51%	13.36%	2.59%	10.26%	1.28%	1,892	24,923
Undergraduate	93.71%	13.44%	61.44%	13.57%	5.79%	17.03%	2.18%	1,202	15,826
Graduate	91.96%	31.88%	81.23%	11.36%	0.79%	5.85%	0.77%	289	3,804
Faculty	84.30%	35.82%	82.12%	11.59%	0.33%	4.64%	1.32%	96	1,260
Staff	89.09%	47.32%	77.63%	14.82%	0.54%	6.47%	0.54%	306	4,033
On campus	92.72%	3.35%	61.66%	10.51%	11.78%	12.34%	3.70%	459	6,051

Overall	89.80%	33.06%	76.51%	13.17%	4.17%	5.54%	0.61%	3,084	40,618
Weighted sample	2,769	915	700	121	38	51	6	3,084	
Projected population	36,475	12,057	9,225	1,588	503	668	73		40,618

Results are based on responses to questions *q_0012* (days physically traveling), *q_0017* (mode used), *q_0019* (carpool size), and *q_0020* (number given a ride). Motorcyclists are included with those driving alone. All Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Both those arriving in carpools (multiple people in the vehicle arriving on campus together) and those getting a ride to campus (where the driver continues on to another destination after the drop-off) were asked how many other people were in the vehicle. The percent of vehicle users arriving in 2- and 3-plus-person carpools and of those getting a ride as the sole passenger or multiple passengers dropped off are shown in Table 42. The average vehicle occupancy for carpools and rides is shown in Table 41. Among those who carpooled at any point during the reference week, the average number of passengers was 2.57 (including the driver). Most people dropped off on campus were the sole passenger dropped (Table 42), with an average of 1.48 passengers dropped off per ride to campus (excluding the driver) (Table 41).

Number of vehicles on campus

The results on the number of people driving alone, carpooling, getting a ride, and the number of people per vehicle can be combined to estimate the total number of vehicles arriving on campus. In particular, we estimate the total number of vehicles as the number of people driving alone, plus fractional vehicles counted in proportion to vehicle occupancy. That is, if a respondent reports arriving in a four-person carpool, we count this as 0.25 vehicles arriving on campus on behalf of that respondent. We weight and expand the sample to project the total number of vehicles for the entire campus population, using the expansion factors shown in Table 8. We estimate that 10,856 vehicles come to campus on an average weekday, or about one vehicle for every 3.36 people traveling to campus (Table 43). About 931 of these contain carpools and 700 are vehicles just dropping passenger(s) off. (Note that these estimates are the number of vehicles arriving, regardless of whether or where those vehicles are parked. See Table 47 for an estimate of the number of vehicles actually parking on campus on a typical weekday.)

Table 43. Projected vehicles arriving on an average weekday, by occupancy and role

Role group	Projected number of vehicles on an average weekday				Ratio of total people to total vehicles	Ratio of physically traveling people to total vehicles	Projected Population	Percent physically traveling to campus
	Drive alone	Carpool	Ride	Total				
Students	4,120	399	521	5,040	5.82	5.35	29,317	91.9%
Undergraduate	2,584	286	438	3,308	7.14	6.62	23,608	92.8%
Freshmen	59	10	28	97	37.32	35.18	3,628	94.3%
Sophomores	313	74	66	453	9.86	9.52	4,469	96.5%
Juniors	791	74	128	993	6.33	5.79	6,279	91.6%
Seniors	1,421	128	216	1,765	5.23	4.77	9,232	91.2%
Graduate	1,536	113	83	1,732	3.30	2.91	5,709	88.4%
Masters	584	36	12	632	3.28	2.79	2,073	85.0%
PhD	952	77	71	1,100	3.31	2.98	3,636	90.3%
Employees	5,105	533	179	5,816	1.94	1.64	11,301	84.3%
Faculty	714	55	29	798	2.59	2.05	2,066	79.3%
Staff	4,391	478	150	5,018	1.84	1.57	9,235	85.4%
Outside Davis	5,167	507	112	5,785	1.57	1.28	9,075	81.4%
Within Davis	3,879	404	587	4,870	6.48	5.98	31,543	92.3%
Off campus	3,763	389	562	4,714	5.43	5.01	25,606	92.2%
On Campus	116	15	26	157	37.90	35.14	5,937	92.7%
Overall	9,225	931	700	10,856	3.74	3.36	40,618	89.8%

Results are based on responses to questions *q_0012* (days physically traveling to campus), *q_0017* (mode of transportation used each day), *q_0019* (carpool size), and *q_0020* (number given a ride). “Drive alone” includes driving alone in a vehicle as well as driving a motorcycle or scooter. The distinction between carpools and rides is whether the driver’s destination is campus: Carpool is “Carpool or vanpool with others also going to campus (either as driver or passenger)” and rides are “Get a ride (someone drops you off and continues on elsewhere).” All data are weighted (and expanded) by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Average Vehicle Ridership

Average vehicle ridership (AVR) is a statistic calculated at each UC campus representing a ratio of the number of people arriving on campus to the number of personal vehicles brought to campus. In particular, we use a formula developed by the South Coast Air Quality Management District, intended to count weekday arrivals of employees from off-campus (only) and making adjustments (credits) for employees who telecommute, who adopt a compressed work week schedule, or who use a zero-emissions vehicle to commute to campus (see Appendix D for details on the calculation of AVR). In general, a way to interpret AVR is that if everyone drove by themselves to campus, the campus AVR would be one, and so higher values (greater than 1.0) indicate more carpooling or use of alternative modes of transportation. Among those traveling from off campus, campus-wide AVR is estimated to be 2.94, or 1.70 among (non-student) employees only. This means that for every car coming to campus, there are about 2.94 off-campus people coming to campus or telecommuting. This estimate is up somewhat from 2009-10, meaning relatively fewer cars came to campus in 2010-11.

Table 44: Average Vehicle Ridership (AVR), 2007-08 through 2010-11

Role group	Off-campus only				All (on and off-campus)			
	2007-08	2008-09	2009-10	2010-11	2007-08	2008-09	2009-10	2010-11
Students	1.67	4.76	4.28	4.41	5.04	5.91	5.25	5.38
Undergraduate	4.24	5.80	5.11	5.34	5.04	7.37	6.36	6.62
Freshmen	5.32	5.35	4.69	3.57	26.39	33.40	21.84	35.18
Sophomores	6.46	10.24	9.38	8.94	6.78	10.67	9.53	9.52
Juniors	4.05	6.26	5.48	5.20	4.46	6.56	6.04	5.79
Seniors	3.55	4.39	3.88	4.56	3.77	4.67	4.09	4.77
Graduate	3.43	2.81	2.57	2.69	3.94	3.21	2.95	3.01
Masters	3.22	2.71	2.60	2.69	3.49	2.94	2.84	2.85
PhD	3.55	2.86	2.56	2.69	4.20	3.36	3.01	3.10
Employees	1.67	1.69	1.66	1.70	1.67	1.71	1.66	1.70
Faculty	2.23	2.34	2.37	2.21	2.23	2.35	2.38	2.21
Staff	1.58	1.60	1.56	1.62	1.58	1.62	1.55	1.62
Non-student and student employees	n/a	n/a	2.20	n/a	n/a	n/a	2.31	n/a
Outside Davis	1.33	1.32	1.26	1.31	1.33	1.33	1.26	1.31
Within Davis	4.60	5.17	4.99	4.93	5.61	6.32	5.99	5.93
Overall	2.75	2.99	2.83	2.94	3.20	3.51	3.30	3.42

See Appendix D for details on AVR calculations.

Table 45 compares the employee AVR at UC Davis with that at other UC campuses for which statistics are available. The comparison suggests that UC Davis draws more vehicles per (non-student) employee than UC San Francisco, UC Irvine, and UC Santa Cruz, but fewer than UC San Diego and UC Riverside. UC Davis and UCLA have very similar employee AVR (1.70 and 1.67, respectively) and overall campus AVR (which includes students) (2.94 and 2.90, respectively).

Table 45. Off-campus employee AVR at Davis versus other UC campuses

UC Campus	2007-08	2008-09	2009-10	2010-11
Irvine	n/a	1.82	1.90	1.90*
Los Angeles	n/a	1.58	1.67	1.67
Riverside	n/a	1.53	1.55	1.55*
San Diego	n/a	1.69	1.60	1.60*
San Francisco	n/a	n/a	2.20	2.23
Santa Cruz	n/a	1.80	1.89	1.89*
Davis, non-student employees only	1.67	1.69	1.66	1.70
Davis, including student employees	n/a	n/a	2.20	n/a

See Appendix D for details on the calculation of the Davis AVR. Other campus figures are from the Systemwide Transportation Survey Matrix 08-09 and 09-10, available online at http://www.universityofcalifornia.edu/sustainability/trans_pres.html.

*At the time of this report, the most recent AVR for most UC campuses is the one documented in the Systemwide Transportation Survey Matrix 09-10.

Parking on and off campus

Question *q_0021* asked “Where did you (or whoever drove you) park?” among the choices: on campus, off-campus in Davis, outside of Davis, or being dropped off while the driver continued on elsewhere. It was asked (once) of any respondent who indicated having driven, carpoled, gotten a ride, or rode a motorcycle or scooter to campus on any day during the reference week (question *q_0017*), and therefore did not give respondents a chance to indicate parking in different places on different days, if they had done so (the questionnaire advised, “If it was different on different days, please indicate what you did most often”). Therefore, to estimate the number parking in each location on an average weekday, we assume that wherever they indicated parking in question *q_0021* is where they parked anytime they drove, carpoled, or got a ride to campus on any day during the week.

Table 46 shows an estimated percent of people parking in each location on an average weekday while Table 47 shows the estimated number of vehicles parking in each location on an average weekday. The number of vehicles differs from the number of people depending on how many people arrived in each vehicle. We estimate total numbers of vehicles by counting each person who drove alone as contributing one vehicle, while each person who carpoled or got a ride as contributing a partial vehicle in inverse proportion to the total number of occupants (e.g. a respondent reporting arriving in a carpool of two is assumed to generate 0.5 vehicles).

Among those arriving by vehicle, we estimate that about 76 percent of people (and 83 percent of vehicles) park on campus on an average weekday, a projected 8,680 vehicles (carrying 9,149 people). For calibration, we can compare this figure to counts conducted by TAPS. In particular, a vehicle count conducted October 18-20, 2010 (the week just prior to the first reference week for the survey) indicates that there were 6,023 vehicles parked on average (at a 74 percent average utilization rate) in the parking areas in the core of campus included in their study, and potentially 2,904 additional vehicles parked in areas not included in their study, if the same utilization rate is assumed.⁷ However, their counts also include university, service, and vendor vehicles (whereas our figures do not); using daily average utilization rates from the TAPS figures, we estimate that 116 vehicles parked in restricted spaces, 132 parked in Diamond E / Vendor spaces, and 35 parked in loading zones. Assuming our survey does not include these vehicles, the adjusted TAPS estimate is equal to 8,927 minus 283 vehicles, or 8,644 vehicles parking on campus (based on the count data) compared to 8,680 vehicles (based on our Campus Travel Survey data). In this case, the TAPS vehicle counts from October 18-20 match up very closely with our survey projections for vehicles parking on campus on a typical day (with a difference of less

⁷ For more information, see the “TAPS Parking Space Utilization Survey: October 18-20, 2010” (available from George Lamb at TAPS).

than half a percentage point).

Table 46: Percent of people parking on and off campus on a typical weekday, by role

Role group	Percent arriving by vehicle	Among those arriving by vehicle, percent of people parking:				Weighted sample	Projected population
		On campus	Off campus in Davis	Outside Davis	Drop off (did not park)		
Students	18.9%	72.5%	12.8%	2.0%	12.7%	951	29,317
Undergraduate	15.6%	68.9%	14.2%	2.1%	14.8%	704	23,608
Freshmen	3.2%	53.1%	14.3%	6.1%	26.5%	49	3,628
Sophomores	12.5%	69.6%	12.6%	4.4%	13.3%	135	4,469
Juniors	17.3%	67.8%	17.3%	1.0%	13.9%	202	6,279
Seniors	20.8%	71.7%	12.9%	1.3%	14.2%	318	9,232
Graduate	32.6%	82.6%	8.9%	1.6%	6.9%	247	5,709
Masters	32.3%	85.4%	4.5%	2.2%	7.9%	89	2,073
PhD	32.7%	81.0%	11.4%	1.3%	6.3%	158	3,636
Employees	57.7%	81.0%	14.1%	1.6%	3.3%	637	11,301
Faculty	42.1%	87.1%	5.9%	3.0%	4.0%	101	2,066
Staff	61.1%	79.9%	15.7%	1.3%	3.2%	536	9,235
Outside Davis	72.5%	83.4%	12.5%	2.5%	1.5%	590	9,075
Within Davis	17.4%	71.6%	13.4%	1.1%	13.8%	969	25,606
Overall	29.7%	75.9%	13.4%	1.8%	8.9%	1,588	40,618
Weighted sample	471	358	63	9	42	1,588	
Projected population	12,057	9,149	1,610	220	1,078		40,618

Results are based on responses to questions *q_0017* (mode used) and to question *q_0021* (parking location). The parking location indicated in question *q_0021* is assumed to be true for all days that the respondent arrived in a vehicle. As with mode split, we calculated the share of the five days that each respondent parked, and then the average of this over all respondents is equivalent to the share of all respondents parking on an average weekday. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 47. Projected vehicles parking on and off campus on a typical weekday, by role

Role group	Total vehicles	Vehicles parking:			
		On campus	Off campus in Davis	Outside Davis	Drop off (did not park)
Students	4,852	4,024	515	27	286
Undergraduate	3,165	2,539	386	13	228
Freshmen	92	74	4	0	14
Sophomores	432	373	27	9	24
Juniors	934	702	161	3	68
Seniors	1,707	1,390	194	0	123
Graduate	1,687	1,485	130	14	58
Masters	609	577	14	4	14
PhD	1,077	908	115	9	44
Employees	5,634	4,655	802	47	130
Faculty	778	704	40	8	26
Staff	4,856	3,951	762	39	104
Outside Davis	5,600	4,716	789	38	58
Within Davis	4,688	3,810	485	36	357
Percent of total	100%	82.77%	12.56%	0.70%	3.96%
Total number	10,486	8,680	1,317	73	416

Results are based on responses to questions *q_0017* (mode used), *q_0019* (carpool size), *q_0020* (number given a ride), and *q_0021* (parking location). All data are weighted (and expanded) by role group based on the 3,084 valid responses to question *q_0017*.

Among those parking vehicles on campus, we estimate that about 46 percent are staff, 29 percent are undergraduate students, 17 percent are graduate students, and 8 percent are faculty. About 54 percent of vehicles parking on campus bring people traveling from outside Davis, while 44 percent bring people from within Davis.

A projected 1,317 vehicles park off-campus in the city of Davis on an average weekday (carrying 1,610 people), and 416 vehicles dropped passengers off on campus without parking (dropping off a projected 1,078 people).

Parking permits

Whether or not they had a car, all respondents were asked whether they currently have a UC Davis parking permit, and if so which type (questions *q_0083* and *q_0084*). About 30 percent of respondents reported having a monthly, quarterly, or annual parking permit, a projected 12,026 people (Table 48). This matches very closely with TAPS’s records of 12,035 monthly, quarterly, and annual permits issued.⁸ TAPS records and the survey results also indicate that about 72.1 percent and 70.5 percent of the permits issued are either “C” or “A” permits, but those with “C” permits are slightly under-represented in the survey data, with about 2.4 “C” permit holders for every “A” permit holder in the survey sample, compared to about 2.7 “C” permits for every “A” permit issued by TAPS.⁹ (See Table 49.)

Table 48. Percent of people with a parking permit, by role

Role group	Annual (or multi-year)	Monthly or quarter	Daily	None	Weighted sample	Projected population
Students	9.9%	7.3%	2.0%	80.8%	1,871	29,317
Undergraduate	7.0%	6.9%	0.9%	85.2%	1,484	23,608
Freshmen	1.8%	1.8%	0.0%	96.4%	224	3,628
Sophomores	5.9%	4.4%	0.4%	89.4%	273	4,469
Juniors	8.1%	6.3%	1.8%	83.9%	397	6,279
Seniors	8.8%	10.3%	1.0%	79.8%	590	9,232
Graduate	21.2%	9.0%	5.9%	63.8%	387	5,709
Masters	22.7%	11.4%	4.5%	61.4%	132	2,073
PhD	20.4%	7.8%	6.7%	65.1%	255	3,636
Employees	53.3%	6.0%	3.0%	37.7%	777	11,301
Faculty	49.3%	3.6%	2.9%	44.3%	140	2,066
Staff	54.2%	6.6%	3.0%	36.3%	637	9,235
Living outside Davis	57.4%	14.4%	2.5%	25.8%	872	9,075
Living off-campus in Davis	14.0%	5.4%	2.8%	77.8%	2,306	25,606
Overall	22.7%	6.9%	2.3%	68.1%	2,648	40,618
Weighted sample	600	184	60	1,804	2,648	
Projected population	9,203	2,822	920	27,672		40,618

Results are based on responses to questions *q_0083*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

⁸ Jeremy Dalbeck at TAPS compiled a tabulation of permits active as of October 25, 2010 by role group as on file in January 2011. There were a total of 12,035 annual, multiyear, quarterly, or monthly permits issued as of October 25, 2010 to individuals whose role was on record as any of: undergraduate student, graduate student, employee, new employee, other program, or visiting scholar (notably excluding retirees, contractors, Sodexo, and vendors). As found in the survey data, this is about 29.6 percent of the campus population.

⁹ The TAPS records may include permits issued to people not included in the survey, especially vendors and contractors, which may affect the relative numbers of different permit types. Only standard "A" and "C" permits are included in this comparison. Carpool, bike commuter, and other types of "A" and "C" permits are excluded.

Table 49. Percent with each type of parking permit

	Percent	Projected population
Percent with any permit	31.86%	12,941
Among those with any permit, percent with:		
A permit	20.91%	2,706
2-person A carpool permit	6.33%	819
3-person A carpool permit	0.69%	89
Bike commuter A permit	0.30%	38
C permit	49.40%	6,393
2-person C carpool permit	5.16%	668
3-person C carpool permit	0.21%	27
K permit	0.66%	86
L permit	6.37%	824
M permit	0.45%	58
N permit	0.89%	115
Vanpool permit	0.42%	54
Complimentary commuter or GoClub permit	5.02%	650
Disabled permit	1.63%	210
Retiree permit	0.27%	35
Comet	0.22%	29
On-campus residence permit (wrote-in)	1.06%	138
Weighted sample	3,084	
Projected population	40,618	40,618

Results are based on responses to questions *q_0084*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Ridership by transit provider

If respondents indicated that they rode a bus (or a train) at any point on their way to campus any days during the prior week (question *q_0016*), they were then asked to indicate which bus (or train) service(s) they used (“Check all that apply”). In previous years, we did not ask about which services were used on each day; therefore we only knew which bus and train services people used at least once on their way to campus during the prior week. In response to requests from campus staff for daily transit ridership information, this year we asked respondents who indicated using a bus or train service to get to campus at least once during the reference week on which day they used each service. Table 50 and Table 51 show the projected number of riders for each bus and train service, respectively, on each day of the reference week, October 25-31. These figures exclude anyone riding a bus or train not as their primary means of transportation, such as if they drove to Davis, then rode Unitrans to the campus core.

Table 50. Projected bus ridership for each day of the reference week

Bus Service	Projected ridership (UCD students, faculty, and staff traveling to campus) on each day of the reference week, Oct. 25-31							Weekly rides (person-days)
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
Unitrans	7,336	7,538	7,824	7,778	7,213	967	551	39,208
Yolobus	380	465	363	354	346	339	265	2,512
Sacramento Regional Transit	39	47	49	39	78	8	8	268
UCD/UCDMC Shuttle	192	259	258	243	217	16	16	1,201
Fairfield Suisun Transit	0	0	0	0	24	0	0	24
Davis Community Transit	29	29	29	29	29	0	0	145
UC Berkeley / UC Davis Shuttle	0	0	9	13	61	0	0	83
Amtrak Motorcoach (bus)	29	0	0	0	24	24	0	78
AC Transit	9	9	9	9	9	16	16	80

Muni (bus)	0	0	24	0	0	24	0	49
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Results are based on responses to questions *q_0026*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Many more people ride Unitrans than any other service, with a projected 11,268 riding at least once per week and riding Unitrans a projected 39,208 times per week as their primary means of transportation to campus (Table 50). Unitrans riders are predominately undergraduates, comprising over 92 percent of average daily riders. Out of the three train services that respondents reported using as their primary means of getting to campus, Amtrak Capitol Corridor accounts for over 85 percent of weekly ridership. Sacramento Regional Transit and BART account for nine percent and six percent of weekly ridership, respectively.

Table 51. Projected train ridership for each day of the reference week

Train Service	Projected ridership (UCD students, faculty, and staff traveling to campus) on each day of the reference week, Oct. 25-31								Weekly rides (person-days)
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Amtrak Capitol Corridor	356	303	297	272	314	13	21	1,577	
Sacramento Regional Transit	23	23	23	23	23	23	23	160	
BART	45	29	5	6	16	6	0	108	
Muni (train)	0	0	0	0	0	0	0	0	
Caltrain	0	0	0	0	0	0	0	0	

Results are based on responses to questions *q_0028*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 52. Number riding specific bus services at least once during the week

Role group	Among those used a bus at least once, percent who at least once used:										Total bus users:	
	Unitrans	Yolobus	UCD/ UCDMC Shuttle	Sac. Regional Transit	Amtrak bus	Fairfield Suisun Transit	Berkeley / Davis Shuttle	Davis Com. Transit	Other ^a	Projected population		
Students	89.4%	7.6%	2.5%	0.4%	0.7%	0.2%	0.6%	0.2%	0.8%	923	12,159	
Undergrad	90.5%	7.6%	2.2%	0.3%	0.6%	0.2%	0.5%	0.3%	0.7%	875	11,529	
Fresh.	77.7%	13.6%	3.9%	2.9%	1.0%	0.0%	1.9%	0.0%	0.0%	62	819	
Soph.	95.6%	5.8%	1.3%	0.0%	0.0%	0.0%	0.4%	0.4%	0.0%	218	2,865	
Juniors	88.3%	6.6%	2.5%	0.5%	0.5%	0.0%	1.0%	0.5%	1.0%	243	3,205	
Seniors	91.1%	8.4%	2.1%	0.0%	1.1%	0.5%	0.0%	0.0%	1.1%	352	4,640	
Graduate	70.7%	7.1%	8.3%	1.5%	2.3%	0.0%	1.5%	0.0%	2.3%	48	629	
Masters	80.0%	10.0%	2.0%	0.0%	2.0%	0.0%	0.0%	0.0%	2.0%	20	261	
PhD	64.1%	5.1%	12.8%	2.6%	2.6%	0.0%	2.6%	0.0%	2.6%	28	368	
Employees	30.7%	10.4%	10.4%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	97	1,283	
Faculty	27.6%	10.3%	10.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14	183	
Staff	31.3%	10.4%	10.4%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	84	1,100	
Outside Davis	17.1%	17.3%	23.9%	4.5%	3.6%	0.0%	0.9%	0.0%	3.6%	82	1,083	
Within Davis	90.1%	7.0%	1.4%	0.4%	0.4%	0.2%	0.5%	0.2%	0.5%	919	12,098	
Overall	83.8%	7.9%	3.2%	0.7%	0.7%	0.2%	0.5%	0.2%	0.7%	1,021	13,441	
Weighted sample	856	80	33	7	7	2	5	2	7	1,021		
Projected population	11,268	1,058	435	95	88	24	71	29	96		13,441	

^a "Other" includes Muni and AC Transit, a projected 65 and 31 riders, respectively in the population.

Results are based on responses to questions *q_0016* (whether a bus was ever used) and *q_0025* (which bus services). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 53. Number riding specific train services at least once during the week

Role group	Among those used a train at least once, percent who at least once used:					Total train users:	
	Amtrak Capitol Corridor	Sac. Regional Transit	BART	Muni	Caltrain	Weighted sample	Projected population
Students	83.8%	0.0%	8.4%	0.0%	0.0%	34	451
Undergraduate	72.8%	0.0%	12.1%	0.0%	0.0%	20	268
Freshmen	85.7%	0.0%	0.0%	0.0%	0.0%	4	56
Sophomores	100.0%	0.0%	0.0%	0.0%	0.0%	2	25
Juniors	85.7%	0.0%	28.6%	0.0%	0.0%	9	114
Seniors	33.3%	0.0%	0.0%	0.0%	0.0%	6	73
Graduate	100.0%	0.0%	2.9%	0.0%	0.0%	14	182
Masters	100.0%	0.0%	6.7%	0.0%	0.0%	6	78
PhD	100.0%	0.0%	0.0%	0.0%	0.0%	8	104
Employees	78.1%	9.6%	14.9%	0.0%	0.0%	18	238
Faculty	93.8%	0.0%	12.5%	0.0%	0.0%	8	101
Staff	66.7%	16.7%	16.7%	0.0%	0.0%	10	137
Outside Davis	88.3%	5.1%	4.0%	0.0%	0.0%	34	447
Within Davis	69.1%	0.0%	23.4%	0.0%	0.0%	18	237
Overall	81.8%	3.3%	10.6%	0.0%	0.0%	52	689
Weighted sample	43	2	6	0	0	52	
Projected population	564	23	73	0	0		689

Results are based on responses to questions *q_0016* (whether a train was ever used) and *q_0027* (which train services). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Distance to transit station

In order to address multimodal transit trips, we asked respondents who indicated riding the bus or train about how they got from home to the transit station; in particular, we asked whether they drove or got a ride to the transit station (*q_0029*), and if so, how many miles they live from this transit station (*q_0030*). Table 54 shows the mean and median distance driven (or being driven) to a transit station for undergraduates, graduate students, faculty, and staff. In general, the mean distance to transit is greater than median distance because of a few respondents who reported relatively long distances (e.g. 55 miles driven to transit). While these long distances may or may not be accurately reported, the median distance serves as an informative indicator of distance. Overall, undergraduates who reported driving or getting a ride to transit traveled a mean distance of 9.24 miles and a median distance 4 miles, compared to a mean of 16.06 miles and a median of 8 miles for staff. In addition to variation between role groups, there is a substantial difference between the median distance traveled to transit on weekdays versus on weekends: those who drove or got a ride to a transit station on their way to campus on the weekend live a median distance of only 1 mile from their transit stop, compared to a median distance of 5 or 6 miles for those who drove or got a ride to a transit station on weekdays.

Table 54. Mean and median self-reported distance from home to transit station

Role		Miles to transit station, of those who indicated driving or getting a ride to the transit station on their way to campus							Overall
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
Undergraduate	Mean	11.8	9.2	12.4	7.9	8.3	0.9	2.1	9.2
	Median	5.0	5.0	5.0	3.0	5.0	1.0	0.0	4.0
Graduate	Mean	8.9	7.6	8.9	7.5	5.8	3.0	3.0	7.8
	Median	7.0	6.0	6.0	6.0	5.0	3.0	3.0	6.0
Faculty	Mean	8.3	12.7	8.0	16.9	7.5	n/a	n/a	11.1
	Median	11.0	5.0	10.0	11.8	7.5	n/a	n/a	9.0
Staff	Mean	17.6	13.5	16.4	16.2	17.6	n/a	n/a	16.1
	Median	12.0	5.0	6.0	5.0	12.0	n/a	n/a	8.0
Overall	Mean	12.4	10.1	12.5	9.7	10.4	1.0	2.1	10.5

	Median	5.0	5.0	6.0	5.0	5.0	1.0	1.0	5.0
Projected population		593	653	541	627	481	87	63	

No faculty or staff reported driving or getting a ride to a transit station on their way to campus on Saturday or Sunday. Results are based on responses to question *q_0030* (miles to transit station) and reflect the average self-reported distance from home to the transit station during the week of Oct. 25-31. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 6).

Table 55 shows the projected number of persons from each role group driving or getting a ride to a transit station on their way to campus in a given week. These projections can be multiplied by the mean distance for each role group on each day in order to estimate the total, weekly number of miles that UC Davis students and employees drive or are driven to a transit station as part of their trip to campus. If we assume that trips home from campus are on average similar to trips to campus, we can estimate the total vehicle miles driven (VMT) to and from transit stations as part of student and employee trips to and from campus. Table 56

Table 55. Projected number of persons driving or getting a ride to a transit station

Role group	Projected number of persons driving or getting a ride to a transit station on their way to campus on each day of the reference week, Oct. 25-31						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Undergraduate	384	348	314	413	322	82	58
Graduate	76	113	81	74	31	5	5
Faculty	19	31	31	25	13	0	0
Staff	115	160	115	115	115	0	0
Overall	593	653	541	627	481	87	63

No faculty or staff reported driving or getting a ride to a transit station on their way to campus on Saturday or Sunday. Results are based on responses to question *q_0029* and reflect the projected number of persons driving or getting a ride to a transit station on a given day during the week of Oct. 25-31. Those traveling on different days are not necessarily the same persons; therefore the total number of unique persons driving or getting a ride to a transit station over the course of the week is not necessarily equal to the sum of the estimates for each day. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 6).

Table 56. Vehicle-miles driven to transit stations for trips to and from campus

Role group	Projected vehicle miles traveled driving or getting a ride to transit for trips to and from campus on each day of the reference week, Oct. 25-31							Weekly
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
Undergraduate	9,028	6,387	8,399	6,530	5,644	140	268	36,397
Graduate	1,358	1,714	1,429	1,121	361	31	31	6,046
Faculty	315	800	504	850	189	0	0	2,658
Staff	4,033	4,336	3,758	3,712	4,033	0	0	19,872
Overall	14,734	13,237	14,093	12,214	10,293	172	301	65,043

No faculty or staff reported driving or getting a ride to a transit station on their way to campus on Saturday or Sunday. Results are based on responses to question *q_0030* (distance from transit station) and reflect the projected number of persons driving or getting a ride to a transit station on a given day during the week of Oct. 25-31. These estimates are representative of a given week to the extent that travel behavior from Oct. 25-31 is similar to overall travel patterns. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 6).

Time arriving on campus

Table 57 and Table 58 show the percent of respondents traveling to campus who arrived during the morning

peak (6am-10am¹⁰), by day and by role group. Among those traveling to campus on an average weekday, about three-quarters arrive during this period, or a projected 26,272 people.

Table 57. Arrivals during the peak period, by day

Day	Percent on campus	Arrival time	
		6am-10am	Off-peak
Monday	91.06%	74.91%	25.09%
Tuesday	91.54%	71.02%	28.98%
Wednesday	92.27%	75.16%	24.84%
Thursday	90.94%	70.83%	29.17%
Friday	83.19%	72.78%	27.22%
Saturday	20.91%	29.20%	70.80%
Sunday	17.36%	19.03%	80.97%
Average weekday	89.80%	72.95%	27.05%
Projected population	36,014	26,272	9,742

Results are based on responses to question *q_0015*, which had a weighted sample size of 3,084. Data are weighted (and expanded) by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 58. Percent arriving during the peak period on an average weekday, by role

Role group	Percent on campus	Of those physically traveling to campus, arrival time		Unweighted sample	Projected population
		6am-10am	Off-peak		
Freshmen	94.25%	60.39%	39.61%	430	3,420
Sophomores	96.52%	66.44%	33.56%	339	4,314
Juniors	91.55%	69.22%	30.78%	353	5,749
Seniors	91.22%	69.15%	30.85%	345	8,421
Masters	85.04%	75.42%	24.58%	338	1,763
PhD	90.29%	81.25%	18.75%	348	3,283
Faculty	79.33%	89.15%	10.85%	260	1,639
Staff	85.41%	93.40%	6.60%	344	7,888
Overall	89.80%	76.01%	23.99%	2,756	36,475
Projected population	36,475	27,727	8,749		40,618

Results are based on responses to question *q_0015*. "Overall" figures are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Self-reported travel time

Question *q_0034* asked respondents to indicate how many minutes it usually takes them to get from home to their first campus destination. In the 2009-10 survey, answer choices were given as categories of five-minute intervals up to an hour, then 1-2 hours, or 2 hours or more. This year, we used a write-in field instead of categories. The average minutes spent ranges from 10.5 minutes among freshmen to 30 minutes among staff (Table 59). About 17 percent report spending more than a half hour, with a high among staff at 28 percent.

¹⁰ This period was chosen to match the peak period defined by the SCAQMD for the purposes of adjusting AVR calculations for off-peak travel, which we do not currently do but wanted to have the option of doing so should we elect to in the future (see Appendix D).

Table 59: Reported number of minutes spent traveling to campus, by role

Role group	Average minutes	Percent reporting...				Weighted sample	Projected population
		Less than 10 minutes	10-29 minutes	30-59 minutes	1 hour or more		
Students	17.7	16%	72%	9%	3%	2,128	28,044
Undergraduate	16.9	17%	71%	9%	2%	1,706	22,481
Freshmen	10.5	44%	53%	3%	1%	261	3,430
Sophomores	16.5	11%	80%	9%	0%	315	4,150
Juniors	18.2	14%	73%	10%	4%	457	6,035
Seniors	18.6	12%	74%	11%	3%	673	8,866
Graduate	21.0	12%	73%	10%	6%	422	5,563
Masters	23.3	9%	73%	10%	7%	150	1,984
PhD	19.7	13%	73%	10%	5%	272	3,579
Employees	29.4	6%	67%	22%	6%	826	10,887
Faculty	24.8	10%	68%	14%	9%	151	1,997
Staff	30.4	5%	67%	23%	5%	675	8,890
Outside Davis	43.8	1%	44%	39%	16%	654	8,616
Within Davis	14.4	17%	78%	5%	0%	2,252	29,673
On campus	9.9	42%	57%	1%	0%	428	5,627
Off campus	15.4	11%	83%	6%	0%	1,826	24,045
Overall	21.0	13%	70%	13%	4%	2,956	40,618
Weighted sample		391	2,078	375	111	2,956	
Projected population		5,153	27,367	4,945	1,468		40,618

Results are based on responses to question *q_0034*, which were then divided into the four categories shown above. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Residential location and distance from campus

The survey included several ways of measuring respondents' residential locations and how far they typically travel to get to campus. The first way was to ask them whether they lived on campus, elsewhere in Davis, or outside of Davis (question *q_0008*). The results suggest that about 15 percent live on campus (a projected 6,137 people), 62 percent live elsewhere in Davis (25,278 people), and 23 percent live outside of Davis (9,204 people), as shown in Table 60. A comparison with results from the 2009-10, 2008-09, and 2007-08 surveys shows no change in this overall distribution (Table 60).

Table 60: Residential location by role group: on or off-campus, in or outside of Davis

Role group	On campus	Off campus in Davis	Outside of Davis	Off campus (in and outside of Davis)	In Davis (on and off-campus)	Weighted sample	Population projection
Students	20.85%	68.24%	10.91%	79.15%	89.09%	2,226	29,317
Undergraduate	23.20%	68.32%	8.48%	76.80%	91.52%	1,792	23,608
Freshmen	92.36%	4.24%	3.41%	7.64%	96.59%	275	3,628
Sophomores	9.53%	85.49%	4.98%	90.47%	95.02%	339	4,469
Juniors	15.12%	75.07%	9.80%	84.88%	90.20%	477	6,279
Seniors	8.09%	80.62%	11.29%	91.91%	88.71%	701	9,232
Graduate	11.14%	67.85%	21.01%	88.86%	78.99%	433	5,709
Masters	8.00%	69.92%	22.08%	92.00%	77.92%	157	2,073
PhD	12.91%	66.68%	20.40%	87.09%	79.60%	276	3,636
Employees	0.46%	47.07%	52.46%	99.54%	47.54%	858	11,301
Faculty	0.31%	61.92%	37.77%	99.69%	62.23%	157	2,066
Staff	0.50%	43.82%	55.68%	99.50%	44.32%	701	9,235
Overall	15.11%	62.23%	22.66%	84.89%	77.34%	3,084	40,618
Weighted sample	466	1,919	699	2,618	2,385	3,084	
Projected population	6,137	25,278	9,204	34,481	31,414		40,618
Overall 2008-09	14.40%	62.20%	23.40%	85.60%	76.60%	3,740	40,209

Overall 2007-08 14.80% 62.30% 22.90% 85.20% 77% 4,052 39,562

For 2010-11, results are based on responses to question *q_0008* and are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8). Previous years' data are based on results from the 2009-10, 2008-09, and 2007-08 Campus Travel Surveys (see Lovejoy (2010), Table 54; Lovejoy, *et al.* (2009), Table 31; and Congleton (2009), Table 3-3, respectively).

Table 61 shows what percent of residents in each location are in each role group. For instance, among those living on campus, over 99 percent are students and almost 89 percent are undergraduates. Of the 25,278 living off campus in the city of Davis, 79 percent are students and 21 percent are employees. Employees, particularly staff, are more likely to live outside of Davis: 56 percent of the 9,204 living outside of Davis are staff, though staff accounts for just 23 percent of the total university population.

Table 61. Role group by residential location: on or off-campus, in or outside of Davis

Role group	Among those who are living in this location, percent who are in this role group:				This role group's percent of the total population	
	On campus	Off campus in Davis	Outside of Davis	Off campus (in and outside of Davis)		
Students	99.15%	78.99%	35.05%	67.35%	82.94%	72.18%
Undergraduate	88.84%	63.69%	21.92%	52.63%	68.62%	58.12%
Freshmen	54.35%	0.61%	1.35%	0.80%	11.13%	8.93%
Sophomores	6.91%	15.09%	2.44%	11.74%	13.49%	11.00%
Juniors	15.40%	18.61%	6.74%	15.47%	17.98%	15.46%
Seniors	12.11%	29.39%	11.42%	24.63%	26.01%	22.73%
Graduate	10.32%	15.30%	13.14%	14.72%	14.32%	14.06%
Masters	2.69%	5.72%	5.01%	5.54%	5.13%	5.10%
PhD	7.62%	9.57%	8.13%	9.19%	9.19%	8.95%
Employees	0.85%	21.01%	64.95%	32.65%	17.06%	27.82%
Faculty	0.10%	5.05%	8.55%	5.98%	4.08%	5.09%
Staff	0.75%	15.98%	56.33%	26.67%	13.00%	22.74%
Overall	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Weighted sample	466	1,919	699	2,618	2,385	3,084
Projected population	6,137	25,278	9,204	34,481	31,414	40,618

Results are based on responses to question *q_0008*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

The survey also asked respondents more detailed information about where they live, including their zip code, if outside of Davis, and the set of cross-streets nearest where they live (or the name of their on-campus residences) in questions *q_0009* through *q_0011*. This information was geocoded in ArcGIS, enabling a variety of spatial analyses (see Appendix E for details on the methodology). Table 62 shows the counties where respondents report living, among those who gave answers that could be successfully geocoded, which was about 94 percent of all respondents. Of these, about 97 percent live in Yolo, Sacramento, or Solano counties, and the remainder (an estimated 1,269) live elsewhere.

Table 62. Counties where respondents live, based on geocoded addresses

County	Percent	Population
ALAMEDA	0.6%	241
CONTRA COSTA	0.7%	279
EL DORADO	0.3%	114
MARIN	0.0%	19
NAPA	0.1%	36
NEVADA	0.1%	24
PLACER	0.6%	257

SACRAMENTO	12.8%	5,216
SAN FRANCISCO	0.1%	48
SAN JOAQUIN	0.2%	65
SAN MATEO	0.0%	17
SANTA CLARA	0.1%	26
SOLANO	3.1%	1,251
SONOMA	0.2%	72
SUTTER	0.1%	52
YOLO	81.0%	32,882
YUBA	0.0%	18
Overall	100.0%	40,618

Locations are based on the geocoded cross-streets (given in questions *q_0009* and *q_0011*, or dorm name given in *q_0010*) and the city and county area that the point was within or nearest (see Appendix E). Data are weighted by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017*.

We also used the geocoded addresses to estimate the distance respondents must travel (along a shortest-time route) to get to campus (in particular, to the Silo) on a daily basis (see Appendix E). Table 63 and Table 64 summarize distances traveled by role group, showing that employees, especially staff, tend to travel from farther away. The median distance traveled among students is about 1.8 miles, versus 3.0 among faculty and 9.3 among staff (Table 63). While about 87 percent of undergraduates live within 3 miles of campus, only 49 percent of faculty and 32 percent of staff do (Table 64). About 18 percent of the campus population lives more than 10 miles away and 8 percent more than 20 miles away (a projected 7,350 people and 3,214 people, respectively). Note that the threshold for living within Davis is about 5 miles, and that very few people live 5 to 10 miles from campus. That is, once they live outside of Davis, it is likely that they live more than 10 miles away, given the agricultural belt that surrounds Davis.

Table 63. Average distance from campus, based on geocoded addresses, by role

Role group	Percent successfully geocoded	Among those successfully geocoded, distance from campus (in miles):				Weighted sample	Projected population
		Mean	Median	Minimum	Maximum		
Students	93.8%	4.4	1.8	0.4	113.9	2,098	29,317
Undergraduate	93.5%	3.7	1.7	0.4	113.9	1,690	23,608
Freshmen	93.9%	1.5	0.7	0.5	45.7	260	3,628
Sophomores	96.0%	3.0	1.8	0.5	47.6	320	4,469
Juniors	91.7%	4.6	1.8	0.5	113.9	449	6,279
Seniors	93.4%	4.4	1.8	0.4	112.3	661	9,232
Graduate	95.1%	7.3	2.1	0.4	100.4	409	5,709
Masters	93.5%	8.4	2.1	0.4	100.4	148	2,073
PhD	96.1%	6.7	2.0	0.5	74.1	260	3,636
Employees	95.4%	12.4	7.5	0.4	95.6	809	11,301
Faculty	93.9%	11.4	3.0	0.4	94.3	148	2,066
Staff	95.8%	12.6	9.3	0.8	95.6	661	9,235
Outside Davis	90.0%	24.1	18.2	1.4	113.9	624	8,720
Within Davis	95.5%	1.9	1.8	0.4	7.6	2,283	31,898
Off campus	96.1%	2.1	1.9	0.4	7.6	1,847	25,801
On campus	93.2%	0.8	0.6	0.4	1.3	436	6,097
Overall	94.3%	6.6	1.9	0.4	113.9	2,907	40,618

Distances are calculated as the shortest-time network distance between respondents' geocoded cross-streets (given in questions *q_0009* and *q_0011*, or dorm name given in *q_0010*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017*.

Table 64. Cumulative percent of people living within each distance of campus, by role

Distance from campus	Overall	Students		Employees	
		Undergraduate	Graduate	Faculty	Staff
0.5 miles or less	3.0%	5.6%	0.5%	0.3%	0.0%
1 mile	18.9%	31.0%	9.4%	3.9%	2.6%
1.5 miles	34.4%	48.6%	28.1%	15.3%	7.8%
2 miles	52.9%	71.1%	48.3%	23.7%	15.5%
2.5 miles	60.4%	77.4%	57.4%	33.8%	23.1%
3 miles	71.4%	87.6%	68.8%	49.0%	32.1%
4 miles	79.7%	93.2%	79.6%	60.7%	43.5%
6 miles	80.8%	93.5%	80.3%	64.9%	46.1%
8 miles	81.1%	93.6%	80.6%	66.2%	46.6%
10 miles	81.9%	93.7%	80.8%	67.2%	50.8%
12 miles	83.9%	94.1%	82.5%	71.4%	58.0%
14 miles	85.5%	94.3%	84.2%	73.7%	63.7%
16 miles	87.6%	94.8%	86.5%	79.5%	68.4%
18 miles	90.1%	95.4%	90.0%	83.4%	74.9%
20 miles	92.1%	96.5%	91.6%	86.7%	80.6%
25 miles	93.8%	97.1%	93.0%	89.6%	86.5%
30 miles	95.6%	98.3%	94.1%	90.6%	92.2%
40 miles	96.6%	98.8%	94.9%	91.2%	95.6%
50 miles	97.1%	99.2%	95.4%	92.2%	96.4%
60 miles	98.0%	99.7%	96.4%	93.5%	98.4%
70 miles	99.1%	99.8%	98.2%	97.7%	99.5%
100 miles	99.9%	99.9%	99.9%	100.0%	100.0%
More than 100 miles	100.0%	100.0%	100.0%	100.0%	100.0%
Weighted sample	2,907	1,472	741	308	386
Projected population	40,618	23,608	5,709	2,066	9,235
Group's percent of the overall population	100.0%	58.1%	14.1%	5.1%	22.7%

Distances are calculated as the shortest-time network distance between respondents' geocoded cross-streets (given in questions *q_0009* and *q_0011*, or dorm name given in *q_0010*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017*.

Table 65 and Table 66 show the correspondence between distance and mode choice. In particular, Table 65 shows the percent of people using each mode as their primary means of transportation on an average weekday, among those who live various distances from campus. Table 66 shows distance from campus, among those who reported using each mode as their primary means of transportation at least once during the reference week. For instance, we see that the percent of people biking on an average weekday drops from 71 percent, to 49 percent, to 32 percent at the thresholds of 1 mile, 3 miles, and 5 miles from campus, respectively, while walking drops from 22 percent to 3 percent at the 1-mile versus 3-mile threshold, respectively (Table 65). Bus use is most prevalent among those within 1 to 5 miles of campus (within Davis), while the train attracts a substantial share (6 percent) only among those living 20 miles away or farther – which makes sense, given the locations of the train stations along the Amtrak Capitol Corridor. From the converse perspective, among those who biked as their primary mode at least once, 25 percent live within 1 mile, 91 percent within 3 miles, and 99 percent within 5 miles; while about 49 percent of train users (those who rode the train at least one weekday) live 20 miles away or more (Table 66). Among those arriving in personal vehicles, carpooling (or getting a ride) is less likely from greater

distances: the percent of vehicle users who carpool or get a ride drops from almost 38 percent among those living within 1 mile to about 20 percent among those living 20 or miles away (Table 65); and the average (and median) distance among those driving alone is 11.4 miles (and 3.6 miles) versus 8.4 miles (2.3 miles) among those carpooling or getting a ride (Table 66).

Table 65. Primary mode on an average weekday, by distance from campus

Distance group	Percent physically traveling	Among those physically traveling to campus, percent who:							Weighted sample	Projected population	
		Bike	Walk	Skate	Drive, carpool, or ride			Bus			Train
					Overall	Among these, percent who carpool/ ride					
Within 1 mile	92.1%	70.8%	21.7%	0.6%	4.9%	37.5%	1.8%	0.2%	481	6,339	
1 to 2.9 miles	92.5%	48.9%	3.4%	0.3%	18.6%	34.3%	28.6%	0.3%	1,651	21,746	
3 to 4.9 miles	92.0%	32.3%	1.1%	0.1%	42.8%	23.6%	23.7%	0.0%	297	3,906	
5 to 9.9 miles	90.0%	10.4%	1.8%	0.0%	87.8%	31.0%	0.0%	0.0%	45	587	
10 to 19.9 miles	85.5%	1.2%	1.3%	0.0%	90.9%	23.0%	4.7%	1.9%	344	4,527	
20 miles or more	75.6%	0.7%	0.9%	0.0%	88.8%	19.4%	3.5%	6.1%	267	3,512	
Overall	90.1%	41.6%	5.6%	0.3%	32.6%	26.6%	19.1%	0.8%	3,084	40,618	
Weighted sample	2,780	1,157	157	8	905	241	530	23	3,084		
Projected population	36,608	15,240	2,066	100	11,917	3,170	6,981	303		40,618	

Mode data are based on responses to question *q_0017* and distance data are calculated network distances between the geocoded cross-streets (given in *q_0009* and *q_0011*, or dorm name given in *q_0010*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017* (see Table 8).

Table 66. Distance from campus, by mode group

Mode group	Percent using this mode at least one weekday	Among those using this mode as their primary means of transportation at least one weekday during the reference week:								Weighted sample
		Mean distance	Median distance	Maximum distance	Percent living within:					
					1 mile	3 miles	5 miles	10 miles	20 miles	
Bike	49.2%	1.8	1.5	72.9	25.3%	90.7%	98.9%	99.3%	99.9%	3,084
Walk	11.8%	1.6	0.9	74.1	53.6%	94.5%	97.0%	98.1%	99.2%	3,084
Skate	0.7%	1.6	1.8	3.1	28.6%	90.5%	100.0%	100.0%	100.0%	3,084
Drive alone	36.6%	11.4	3.6	113.9	4.5%	43.1%	55.9%	59.2%	82.7%	3,084
Carpool or ride	18.5%	8.3	2.3	100.4	8.2%	63.2%	73.0%	75.1%	90.7%	3,084
Bus	26.0%	2.7	1.9	26.6	3.7%	84.4%	96.3%	96.3%	98.8%	3,084
Train	1.5%	32.1	19.8	79.0	6.7%	31.1%	33.3%	33.3%	51.1%	3,084
Work from home	3.3%	21.8	16.0	95.6	2.9%	28.2%	36.9%	37.9%	62.1%	3,084
Other no travel	21.3%	10.4	2.5	113.9	12.8%	60.7%	68.9%	70.7%	85.2%	3,084
Overall		6.6	1.9	113.9	15.6%	69.1%	78.8%	80.2%	91.4%	3,084
Weighted sample	3,084				481	2,132	2,429	2,474	2,817	3,084
Projected population	40,618				7,086	27,369	31,331	31,868	36,751	

Mode data are based on responses to question *q_0017* (primary means of transportation each day during the reference week) and distance data are calculated network distances between the geocoded cross-streets (given in *q_0009* and *q_0011*, or dorm name given in *q_0010*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017*, except for those in the first column showing the percent using this mode, which are weighted by role group for the 3,084 valid responses to question *q_0017* (see Table 8).

This year’s survey also asked respondents to estimate the number of miles it is “from where you’re living to the UC Davis campus (one-way)?” (and specifying “for where you live locally, from where you would come to school or work at UC Davis on a daily basis” to avoid having students report their parents’ home addresses) in question *q_0035*. In general, these self-reported distances

(Table 67) are slightly longer than distances estimated from respondents' geocoded addresses.

A comparison including just cases for which both sets of data are non-missing shows that the figures are closer, but still with longer self-reported distances, on average (Table 68). In particular, about half of respondents (48 percent) have a higher self-reported distance than a calculated distance and for the other half it is lower. However, for those cases where the self-reported distances are higher, the discrepancy tends to be greater than when they are lower. Across all respondents, the self-reported distance is greater than the calculated distance by an average of 0.79 miles, or by 36 percent of the calculated distance.

Table 67. Self-reported distance from campus, by role

Role group	Minimum	Maximum	Mean	Median	Weighted sample	Projected population
Students	0.0	300	5.3	2.0	2,105	27,729
Undergraduate	0.0	120	4.5	1.8	1,686	22,199
Freshmen	0.0	96	2.4	0.5	253	3,326
Sophomores	0.0	55	3.1	2.0	310	4,087
Juniors	0.0	120	5.1	2.0	453	5,970
Seniors	0.0	85	5.5	2.0	669	8,817
Graduate	0.0	300	8.4	2.5	420	5,530
Masters	0.0	300	10.6	3.0	150	1,979
PhD	0.0	75	7.2	2.5	270	3,551
Employees	0.0	1,100	14.8	8.7	825	10,865
Faculty	0.0	1,100	17.0	4.0	152	1,997
Staff	0.5	100	14.3	10.0	673	8,868
Outside Davis	1.0	1,100	26.9	20.0	652	8,590
Within Davis	0.0	312	2.4	2.0	2,230	29,375
Off campus	0.0	312	2.7	2.0	1,813	23,877
On campus	0.0	96	1.3	0.8	417	5,498
Overall	0.0	1,100	7.9	2.0	2,930	40,618

Results are based on responses to question *q_0035*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 68. Comparison of self-reported versus estimated distances from campus, by role

Role group	Average difference	Average percent difference	Percent of respondents whose self-reported distance is higher	Weighted sample	Projected population
Students	0.51	38%	43%	2,115	29,181
Undergraduate	0.46	41%	39%	1,693	23,361
Freshmen	0.83	151%	31%	253	3,489
Sophomores	-0.01	2%	36%	312	4,306
Juniors	0.32	17%	42%	455	6,280
Seniors	0.62	33%	41%	673	9,286
Graduate	0.72	27%	59%	422	5,820
Masters	1.16	33%	60%	151	2,084
PhD	0.48	24%	58%	271	3,736
Employees	1.51	31%	61%	829	11,437
Faculty	1.97	67%	58%	153	2,115
Staff	1.41	23%	62%	676	9,322
Outside Davis	1.60	10%	60%	643	8,877
Within Davis	0.57	43%	46%	2,301	31,741
Off campus	0.56	29%	48%	1,878	25,910
On campus	0.57	107%	35%	423	5,831
Overall	0.79	36%	48%	2,944	40,618

Self-reported distances are based on responses to question *q_0035* and estimated distances are calculated as the shortest-time network distance between respondents' geocoded cross-streets (given in questions *q_0009* and *q_0011*, or dorm name given in *q_0010*) and a centroid on campus near the Silo (see Appendix E). Only the 2,776 cases with non-missing data for both sets of variables are included in this table. Data are weighted by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017* (see Table 8).

Aggregate person-miles and vehicle-miles traveled

For estimates of the numbers of miles traveled, we rely on the calculated distances between respondents' geocoded home locations and a centroid on campus (rather than the self-reported distances discussed above). We assume respondents take this shortest path to and from campus on the days they report having traveled to campus, which likely underestimates the true number of miles traveled to and from campus, since it does not take into account side trips respondents might make on the way to or from campus (for instance stopping at the store, to pickup children, or visit friends), or trips away from campus during the middle of the day (such as to go to lunch or to an off-site meeting).

We estimate the number of miles (person-miles, versus vehicle-miles, described below) traveled each day as the doubled network distance between respondents' geocoded home location and the Silo on campus (as described in Appendix E), multiplied times the percent of weekdays a respondent travels to campus. Thus, if a person lives 10 miles from campus and traveled to campus all five days, her average daily person-miles would be 20 miles; by contrast, if she traveled to campus only one day, her average daily person-miles would be 4 miles. We then attribute person-miles to each mode based on the share of weekdays a respondent used each mode. Thus, if a respondent biked one day and drove four, we count 20 percent of his miles as bike miles and 80 percent as driving miles. Summed across all respondents, this represents the person-miles traveled by each mode on an average weekday. We also report miles avoided for those who do not travel to campus on a given day, either because working from home or for other reasons. We weight and expand all responses by role group to estimate a projection of the total person-miles traveled in the entire population.

To estimate the number of person-miles traveled annually, we first assume that respondents travel the same number of days per week and using the same modes as in the reference week for the entire 36 weeks of the academic year. Then to estimate summer travel, we rely on responses to questions *q_0037* and *q_0038* about the number of weeks and average number of days per week traveled to campus during the summer, but assuming they used the same modes used during the survey reference week throughout the summer. For instance, annual miles biked = (distance from campus × 2) × (share of days biked during reference week) × [(36 weeks × 5 days/week) + (weeks traveled to campus during the summer × days/week traveled per summer)]. Estimates of person-miles traveled during the summer are taken into account along with person-miles traveled during the academic year in order to estimate the daily person-miles traveled by each person on an average day.

Our estimates for the number of miles traveled, by mode and role, are shown in Table 69 and Table 70. We estimate that the campus population travels about 377,638 miles on an average weekday. We see that trips in cars account for a disproportionate share of the miles (74 percent of miles but 30 percent of people) as do train trips (4.7 percent of miles but 0.7 percent of people), relative to biking, walking, and bus use. Considering role groups, employees cover a disproportionate share

of miles (55 percent of miles, while comprising only 28 percent of the population). Miles avoided by employees working from home reduces the total miles traveled by almost 7 percent, to the extent that this activity truly replaces physical trips to campus that otherwise would have taken place.

Table 69. Total miles traveled daily and annually, by mode used

Mode group	Aggregate round-trip Miles traveled		Percent of total daily miles traveled	Percent of total people	Projected population
	Daily	Annually			
Bike	43,970	10,992,448	11.64%	37.05%	15,048
Walk	5,647	1,411,835	1.50%	5.00%	2,031
Skate	229.82	57,456	0.06%	0.28%	116
Personal vehicle	278,063	69,515,796	73.63%	29.52%	11,991
Drive alone	214,433	53,608,190	56.78%	22.58%	9,173
Carpool or ride	63,630	15,907,607	16.85%	6.94%	2,818
Bus	32,073	8,018,367	8.49%	17.22%	6,993
Train	17,655	4,413,676	4.68%	0.74%	300
Work from home	-25,852	-6,462,989	-6.85%	1.07%	435
Other no travel	-72,937	-18,234,334	-19.31%	9.12%	3,704
Overall	377,638	94,409,579	100.00%	100.00%	40,618

Mode groups are the estimated number using each means of transportation on a typical weekday during the reference week. Person-miles are calculated as described in the text, drawing on data from questions *q_0012*, *q_0008-11*, *q_0017*, and *q_0037-8*. “Overall” miles includes those for all physical travel, not including miles avoided by those not traveling to campus by working from home or for other reasons. All data are weighted (and expanded) by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017* (see Table 8). Daily estimates are based on 250 weekdays per year (5 days per week in the 36-week academic year and 14-week summer).

Table 70. Total miles traveled daily and annually, by role

Role	Aggregate round-trip Miles traveled		Percent of total daily miles traveled	Percent of total people	Projected population
	Daily	Annually			
Students	171,708	42,926,960	45.47%	72.18%	29,317
Undergraduate	120,679	30,169,759	31.96%	58.12%	23,608
Freshmen	7,538	1,884,428	2.00%	8.93%	3,628
Sophomores	19,363	4,840,830	5.13%	11.00%	4,469
Juniors	37,078	9,269,599	9.82%	15.46%	6,279
Seniors	56,700	14,174,903	15.01%	22.73%	9,232
Graduate	51,029	12,757,201	13.51%	14.06%	5,709
Masters	19,041	4,760,211	5.04%	5.10%	2,073
PhD	31,988	7,996,990	8.47%	8.95%	3,636
Employees	205,930	51,482,619	54.53%	27.82%	11,301
Faculty	27,915	6,978,722	7.39%	5.09%	2,066
Staff	178,016	44,503,897	47.14%	22.74%	9,235
Outside Davis	286,653	71,663,178	75.91%	22.66%	9,204
Within Davis	90,986	22,746,401	24.09%	77.34%	31,415
Off campus	84,274	21,068,622	22.32%	62.23%	25,278
On campus	6,711	1,677,779	1.78%	15.11%	6,137
Overall	377,638	94,409,579	100.00%	100.00%	40,618

Person-miles are calculated as described in the text, drawing on data from questions *q_0012*, *q_0008-11*, *q_0017*, and *q_0037-8*. “Overall” miles includes those for all physical travel, not including miles avoided by those not traveling to campus by working from home or for other reasons. All data are weighted (and expanded) by role group for the 2,907 cases successfully geocoded (based on *q_0008-11*) and with non-missing mode choice data in question *q_0017* (see Table 8).

Vehicle-miles traveled (VMT) accounts for vehicle use and occupancy per mile. To estimate VMT, we assume that each person-mile contributes a fractional vehicle-mile equivalent to one divided by vehicle occupancy, for any travel in a personal vehicle or public transit vehicle (including driving alone, carpooling, getting a ride, riding a bus, and riding a train). We assume that travel by walking, biking, or skating contributes no VMT. Vehicle occupancy for carpooling and getting a ride varies for each respondent, as reported in questions *q_0019* and *q_0020* for those carpooling/vanpooling or getting a ride, respectively. If a respondent lives 10 miles from campus and traveled in a 3-person carpool all five weekdays, her average daily VMT would be $(10 \text{ miles} \times 2) / 3 = 6.67$ miles. Occupancy for those driving alone and for those who got a ride and were the only person dropped off on campus by the person giving them a ride was assumed to be one.

For bus and train occupancy, we assume average occupancy for all trips on those modes. In particular, we estimated average bus occupancy based on annual ridership data from Unitrans, since the majority of bus riders use Unitrans. According to 2008 figures from the National Transit Database, Unitrans provided 6,847,971 annual passenger miles and 704,711 vehicle revenue miles, suggesting an average of about 9.72 passengers per mile (up from 8.90 passengers per mile in 2007; see Lovejoy, *et al.* 2009).¹¹ Thus, for someone who lives 10 miles from campus and traveled by bus all five weekdays, average VMT per day is $(10 \text{ miles} \times 2) / 9.72 = 2.06$ vehicle-miles. In general, each mile someone travels by bus contributes $1 / 9.72 \approx 0.103$ vehicle-miles per passenger-mile.

We estimated train occupancy based on annual ridership data from Amtrak’s Capitol Corridor, since they provide the majority of train rides to campus. According to figures in the Capitol Corridor Business Plan Update, the Capitol Corridor provided 110,036,259 passenger-miles and 1,183,109 train-miles of service in FY 2008-09, suggesting an average of about 85.6 passengers per mile (down from about 93.0 in FY 2007-08; see Lovejoy, *et al.* 2009).¹² So if a respondent lives 100 miles from campus and traveled by train all five days, her average VMT per day is estimated to be $(100 \text{ miles} \times 2) / 85.6 = 2.34$ vehicle-miles. In general, each mile someone travels by train contributes $1 / 85.6 \approx 0.0117$ vehicle-miles per passenger-mile.

Our estimates for vehicle-miles traveled, by mode and role, are shown in Table 71 and Table 72. We estimate that travel to campus in personal vehicles contributes about 243,661 miles to VMT on an average weekday or 60.9 million VMT annually. Including estimates of VMT on buses and trains raises the total to 247,167 miles on an average weekday or 61.8 million miles annually. Those driving alone account for 23 percent of the population, 57 percent of person-miles traveled, and 87 percent of VMT, while those carpooling or getting a ride account for 7 percent of the population, 17 percent of person-miles traveled, and 12 percent of VMT. About 53 percent of the population contributes no VMT. Employees, and especially staff, contribute the most VMT, corresponding to living farther away, which in turn corresponds to more driving in lower-

¹¹ U.S. Department of Transportation, Federal Transit Administration, 2008 National Transit Database, Annual Transit Profile, Unitrans - City of Davis/ASUCD (NTD ID 9142) (<http://www.ntdprogram.gov/ntdprogram/data.htm>).

¹² *Capitol Corridor Intercity Passenger Rail Service Business Plan Update FY 2010-11 – FY 2011-12*, Appendix C (http://www.capitolcorridor.org/about_ccjpa/business_plan.php).

occupancy vehicles. In particular, those coming from outside Davis account for 23 percent of the campus population, 76 percent of person-miles traveled, and 90 percent of VMT.

Table 71. Vehicle-miles traveled, by mode, daily and annually

Mode	Daily			Annually			Percent of total people	Population projection
	Total VMT	VMT per person	Percent of total VMT	Total VMT	VMT per person	Percent of total VMT		
No vehicle (bike, skate, walk, no travel)	0	0.0	0.00%	0	0	0.00%	52.52%	21,334
Personal vehicles	243,661	20.3	98.58%	60,915,375	5,080	98.58%	29.52%	11,991
Drive alone	214,433	23.4	86.76%	53,608,190	5,844	86.76%	22.58%	9,173
Carpool or ride	29,229	10.4	11.83%	7,307,185	2,593	11.83%	6.94%	2,818
Bus	3,300	0.5	1.34%	824,935	118	1.34%	17.22%	6,993
Train	206	0.7	0.08%	51,562	172	0.08%	0.74%	300
Total	247,167	6.1	100.00%	61,791,871	1,521	100.00%	100.00%	40,618

Mode groups are the estimated number using each means of transportation on a typical weekday during the reference week, based on responses to questions *q_0012* and *q_0017*. Vehicle-miles are calculated as described in the text, drawing on data from questions *q_0012*, *q_0017*, *q_0019-20*, *q_0009-11*, and the average number of passengers per mile on Unitrans and Amtrak's Capitol Corridor. All data are weighted (and expanded) by role group for the 2,907 cases successfully geocoded (based on *q_0009-11*) and with non-missing mode choice data in question *q_0017* (see Table 8).

Table 72. Vehicle-miles traveled, by role, daily and annually

Role	Daily			Annually			Percent of total people	Population projection
	Total VMT	VMT per person	Percent of total VMT	Total VMT	VMT per person	Percent of total VMT		
Students	94,384	3.22	37.87%	23,595,999	805	37.87%	72.18%	29,317
Undergraduate	64,651	2.74	25.94%	16,162,639	685	25.94%	58.12%	23,608
Freshmen	2,207	0.61	0.89%	551,668	152	0.89%	8.93%	3,628
Sophomores	6,896	1.54	2.77%	1,723,886	386	2.77%	11.00%	4,469
Juniors	19,996	3.18	8.02%	4,998,884	796	8.02%	15.46%	6,279
Seniors	35,553	3.85	14.26%	8,888,200	963	14.26%	22.73%	9,232
Graduate	29,733	5.21	11.93%	7,433,360	1,302	11.93%	14.06%	5,709
Masters	10,739	5.18	4.31%	2,684,810	1,295	4.31%	5.10%	2,073
PhD	18,994	5.22	7.62%	4,748,550	1,306	7.62%	8.95%	3,636
Employees	152,783	13.52	61.29%	38,195,873	3,380	61.29%	27.82%	11,301
Faculty	18,636	9.02	7.48%	4,658,966	2,255	7.48%	5.09%	2,066
Staff	134,148	14.53	53.82%	33,536,907	3,632	53.82%	22.74%	9,235
Outside Davis	223,371	24.27	89.61%	55,842,861	6,067	89.61%	22.66%	9,204
Within Davis	23,796	0.76	9.55%	5,949,011	189	9.55%	77.34%	31,415
Off campus	23,579	0.93	9.46%	5,894,823	233	9.46%	62.23%	25,278
On campus	217	0.04	0.09%	54,188	9	0.09%	15.11%	6,137
Total	247,167	6.14	100.00%	61,791,871	1,521	100.00%	100.00%	40,618

Vehicle-miles are calculated as described in the text, drawing on data from questions *q_0012*, *q_0017*, *q_0019-20*, *q_0009-11*, and the average number of passengers per mile on Unitrans and Amtrak's Capitol Corridor. All data are weighted (and expanded) by role group for the 2,907 cases successfully geocoded (based on *q_0009-11*) and with non-missing mode choice data in question *q_0017* (see Table 8).

As one assessment of the extent that alternative transportation reduces campus-wide VMT, we might consider that if everyone drove alone to campus but all else were unchanged (e.g. the distances traveled and frequency that people came to campus), then VMT would be equivalent to the number of person-miles traveled. Thus comparing VMT to person-miles, we might conclude

that there are 130,471 fewer vehicle-miles traveled each day (or 32,094,387 miles annually) as a result of using alternative transportation. On the other hand, there are 249,261 more vehicle-miles traveled each day than there would have been if everyone biked or walked.

Carbon emissions

As in 2009-10, we estimate the amount of CO₂ produced by campus travelers by assuming that each means of transportation generates a certain quantity of carbon (pounds-equivalent) per mile traveled, and multiplying this times our estimate of miles traveled by each mode on an average weekday. In particular, we assume driving alone generates 1.1 pounds-equivalent of CO₂ per vehicle-mile (regardless of vehicle type), and that carpooling/getting a ride, riding a bus, and riding a train produce some fractional amount of the emissions produced for the entire vehicle, adjusted for the total number of passengers in the vehicle. For carpooling and getting rides, we adjust vehicle occupancies based on occupancies reported by the respondents themselves. For transit, we assume average occupancies apply for all respondents. We consider estimates based on national averages (provided by TravelMatters.org) as well as an alternative (lower) estimate for buses based on Unitrans data, as summarized in Table 73.

Table 73. Formula for calculating average weekday pounds-equivalent of CO₂, by mode

Mode		
Driving alone	1.1 lbs / mile	× aggregated average weekday person-miles traveled (or equivalently, vehicle-miles traveled) by driving alone (from Table 69 or Table 71)
Carpool / ride	1.1 lbs / mile	× aggregated average weekday carpool/ride vehicle-miles traveled (from Table 62, this is the equivalent of adjusting person-miles by the reported carpool size)
Bus (high)	0.90 lbs / mile	× aggregated average weekday person-miles traveled by bus (from Table 61) x 0.90 lbs. / mile
Bus (low)	0.091 lbs / mile	× aggregated average weekday person-miles traveled by bus (from Table 61)
Train	0.46 lbs / mile	× aggregated average weekday person-miles by train (from Table 61)

The “low” estimate for bus emissions is based on annual fuel use and passenger-miles of service at Unitrans, as described in Lovejoy, *et al.* (2009). All other estimates are drawn from the *TravelMatters* website, Individual Emissions Calculator Methodology, available online at <http://www.travelmatters.org/calculator/individual/methodology>, which is meant to capture national averages. Annual estimates of CO₂ generated are based on comparable figures of miles traveled annually.

Table 74. Estimated daily carbon emissions by mode and role

Role group	Pounds-equivalent of CO ₂ generated on an average weekday										
	Among those using personal vehicles			Among those using public transit				Average lbs. / person	Percent of total CO ₂	Percent of total people	Projected population
	Drive alone	Carpool or ride	Average lbs. / user ^a	Bus (high) ^b	Bus (low) ^b	Train	Total ^c				
Students	89,963	10,837	18.2	22,880	2,313	5,216	128,896	4.4	42.26%	72.18%	29,317
Undergraduate	60,181	8,226	18.6	21,185	2,142	1,591	91,183	3.9	29.89%	58.12%	23,608
Freshmen	1,665	689	20.2	536	54	207	3,097	0.9	1.02%	8.93%	3,628
Sophomores	5,795	1,156	12.4	4,984	504	251	12,186	2.7	4.00%	11.00%	4,469
Juniors	18,719	2,486	19.5	6,045	611	1,088	28,338	4.5	9.29%	15.46%	6,279
Seniors	34,001	3,896	19.7	9,621	973	44	47,562	5.2	15.59%	22.73%	9,232
Graduate	29,781	2,611	17.4	1,695	171	3,626	37,713	6.6	12.36%	14.06%	5,709
Masters	11,114	593	17.5	470	48	1,706	13,882	6.7	4.55%	5.10%	2,073
PhD	18,668	2,018	17.4	1,225	124	1,920	23,831	6.6	7.81%	8.95%	3,636
Employees	145,914	21,314	25.7	5,986	605	2,905	176,119	15.6	57.74%	27.82%	11,301
Faculty	18,213	2,202	23.5	389	39	1,260	22,065	10.7	7.23%	5.09%	2,066
Staff	127,701	19,112	26.0	5,597	566	1,645	154,054	16.7	50.51%	22.74%	9,235
Outside Davis	216,817	27,660	36.7	8,012	810	8,048	260,536	28.3	85.42%	22.66%	9,204
Within Davis	19,059	4,492	5	20,854	2,109	73	44,479	1.4	14.58%	77.34%	31,415
Off campus	18,950	4,424	4.4	20,369	2,059	66	43,809	1.7	14.36%	62.23%	25,278
On campus	110	68	0.9	486	49	7	670	0.1	0.22%	15.11%	6,137
Overall	235,876	32,152	268,028	28,866	2,919	8,121	305,015	7.5	100.00%	100.00%	40,618
Projected population	9,228	2,845	12,073	6,967	6,967	292					40,618
Average lbs. / person	25.6	11.3	22.2	4.1	0.4	27.8		7.5			
Percent of total people (mode share ^a)	22.72%	7.00%	29.72%	17.15%	17.15%	0.72%				100.00%	
Percent of total CO ₂	77.33%	10.54%	87.87%	9.46%	0.96%	2.66%			100.00%		

^a Estimated number of (or percent of) users of this mode on average weekday, as shown in Table 15. For instance, from Table 15, a total of 25.3% drive alone plus 7.8% carpool/ride is a total of 33.1% using a personal vehicle among those physically traveling, times 89.8% physically traveling to campus, means 29.7% of the total population using a personal vehicle on an average weekday, or .297 times 40,618 people equals a projected 12,073 total people using personal vehicles.

^b High estimates assume 0.90 pounds/passenger-mile (as estimated by TravelMatters.org). Low estimates assume 0.091 pounds/passenger-mile, as estimated using Unitrans data on annual fuel use and passenger-miles of service provided as described in Lovejoy, *et al.* (2009).

^c Total and average are based on the “high” estimate of bus emissions.

Table 75. Estimated annual carbon emissions, by mode and role

Role group	Metric tons-equivalent of CO ₂ generated annually						Average tons / person ^b	Percent of total ^b CO ₂	Percent of total people	Population projection
	Drive alone	Carpool or ride	Bus (high) ^a	Bus (low) ^a	Train	Total ^b				
Students	10,202	1,229	2,595	262	592	14,617	0.50	42.26%	72.18%	29,317
Undergraduate	6,824	933	2,402	243	180	10,340	0.44	29.89%	58.12%	23,608
Freshmen	189	78	61	6	23	351	0.10	1.02%	8.93%	3,628
Sophomores	657	131	565	57	28	1,382	0.31	4.00%	11.00%	4,469
Juniors	2,123	282	686	69	123	3,213	0.51	9.29%	15.46%	6,279
Seniors	3,856	442	1,091	110	5	5,393	0.58	15.59%	22.73%	9,232
Graduate	3,377	296	192	19	411	4,277	0.75	12.36%	14.06%	5,709
Masters	1,260	67	53	5	193	1,574	0.76	4.55%	5.10%	2,073
PhD	2,117	229	139	14	218	2,702	0.74	7.81%	8.95%	3,636
Employees	16,546	2,417	679	69	329	19,972	1.77	57.74%	27.82%	11,301
Faculty	2,065	250	44	4	143	2,502	1.21	7.23%	5.09%	2,066
Staff	14,481	2,167	635	64	186	17,469	1.89	50.51%	22.74%	9,235
Outside Davis	24,587	3,137	909	92	913	29,544	3.21	85.42%	22.66%	9,204

Within Davis	2,161	509	2,365	239	8	5,044	0.16	14.58%	77.34%	31,415
Off campus	2,149	502	2,310	234	8	4,968	0.20	14.36%	62.23%	25,278
On campus	12	8	55	6	1	76	0.01	0.22%	15.11%	6,137
Total	26,748	3,646	3,273	331	921	34,588	0.85	100.00%	100.00%	40,618

^a High estimates assume 0.90 pounds/passenger-mile (as estimated by TravelMatters.org). Low estimates assume 0.091 pounds/passenger-mile, as estimated using Unitrans data on annual fuel use and passenger-miles of service provided as described in Lovejoy, *et al.* (2009).

^b Total and average are based on the “high” estimate of bus emissions.

Table 76. Estimated tons of carbon emissions saved annually compared with driving alone

	Bike	Walk or skate	Carpool or ride	Bus ^a	Train	Total	Projected Population
Freshman	373.31	92.28	43.00	63.39	30.68	602.66	3,628
Sophomore	658.63	65.71	108.90	608.08	38.06	1,479.39	4,469
Junior	738.70	67.33	189.13	702.72	157.32	1,855.21	6,279
Senior	997.44	118.40	211.57	1,139.87	6.43	2,473.71	9,232
Masters	386.85	28.83	65.32	55.72	246.55	783.27	2,073
PhD	655.65	70.32	180.39	148.00	285.14	1,339.49	3,636
Faculty	341.32	23.15	315.86	46.12	184.26	910.71	2,066
Staff	992.06	223.94	2,730.97	660.55	241.04	4,848.57	9,235
Total	5,143.95	689.95	3,845.15	3,424.45	1,189.49	14,293.00	40,618

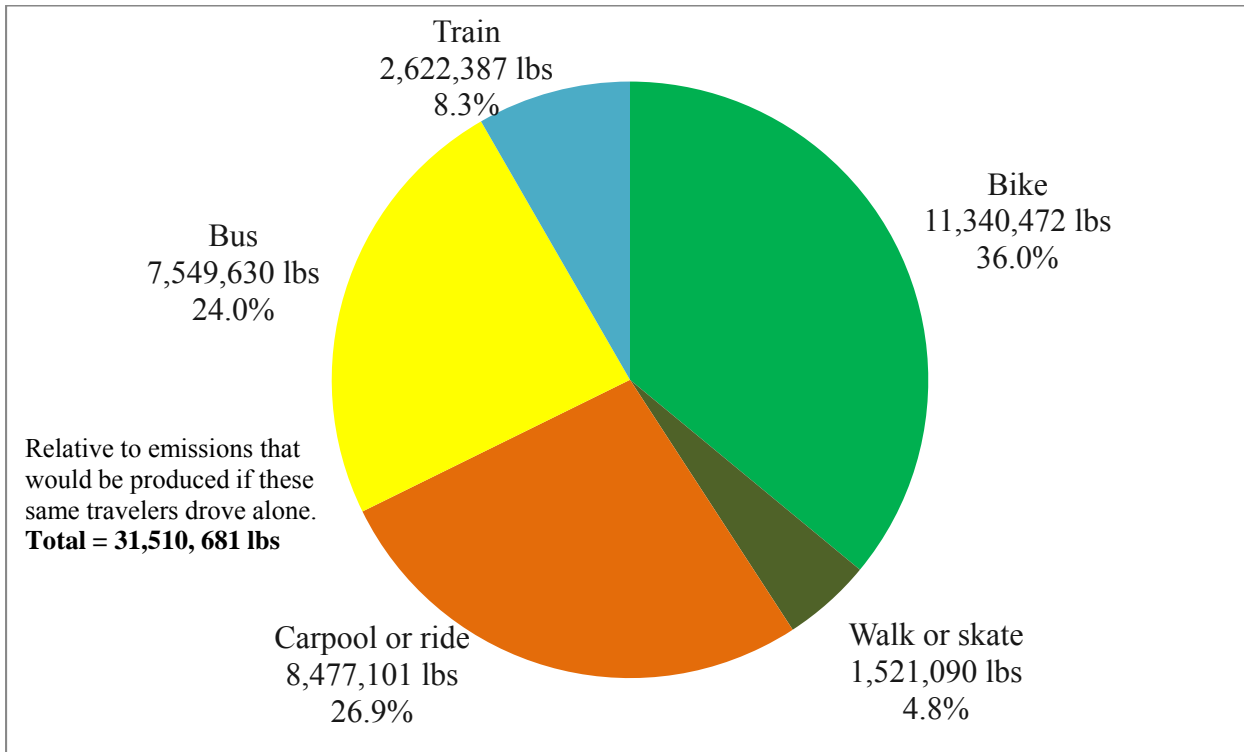
^a Emissions saved from riding the bus are based on the low (Unitrans) estimate of 0.091 pounds/passenger-mile.

We do not take into account emissions associated with the manufacture of bicycles or vehicles, or of home energy use for those working from home, assuming that biking, walking, skating, working from home, or otherwise not traveling contributes no emissions. As with our estimates of total miles traveled on which these are based, side trips made on the way to or from campus, and any trips made in the middle of the day are not taken into account. See Lovejoy, *et al.* (2009) for additional caveats regarding the assumptions made estimating overall carbon emissions.

Using these assumptions, we estimate that travel to campus generates a total of 305,015 pounds-equivalent of carbon on an average weekday, or 7.5 per person (Table 74) and about 34,588 metric tons-equivalent annually, or 0.85 per person (Table 75). This is down somewhat from the 2009-10 estimate of 346,854 pounds-equivalent daily (or 8.6 per person) and 34,834 metric tons annually (or 0.87 per person) (See Lovejoy, *et al.*, 2009). Undergraduates, but especially freshmen and sophomores, contribute much less to campus-wide CO₂ emissions than their share of the population. Employees, and especially staff, contribute the most CO₂ relative to their share of the campus population, comprising 28 percent of the population while contributing 58 percent of CO₂ on an average day.

Again, as an assessment of the extent that alternative transportation reduces carbon emissions, we might consider that if everyone drove alone to campus but all else were unchanged (e.g. the distances traveled and frequency that people came to campus), then there would be 431,000 pounds-equivalent (daily) or 48,881 metric tons-equivalent (annually) of CO₂ generated, and so we might conclude that there are 126,000 pounds saved (daily) or 14,293 tons saved (annually) as a result of using alternative transportation (Table 76). Figure 9 shows the contribution of each alternative mode (any alternative to driving alone) to the total estimated carbon emissions saved.

Figure 9. Estimated annual carbon emission savings by alternative transportation users



Car ownership

All respondents were asked whether they “have access to a car (for driving to campus, if you wanted to use it)” (question *q_0082*). About three-quarters of respondents indicated that they have access to a car (Table 77). Among undergraduates, the percent with cars grow substantially each class level, from 13 percent among freshmen to 77 percent among seniors. Those living off-campus within Davis are less likely to have a car than those living outside Davis (77 percent versus 97 percent).

Table 77. Percent with access to a car

Role group	Percent with access	Weighted sample	Projected population
Students	65.85%	1,839	29,317
Undergraduate	60.69%	1,450	23,608
Freshmen	12.56%	223	3,628
Sophomores	53.76%	266	4,469
Juniors	68.88%	392	6,279
Seniors	77.15%	569	9,232
Graduate	85.09%	389	5,709
Masters	84.21%	133	2,073
PhD	85.55%	256	3,636
Employees	96.03%	780	11,301
Faculty	96.38%	138	2,066
Staff	95.95%	642	9,235
Outside Davis	96.85%	604	9,075
Within Davis	68.09%	1,971	31,543
On campus	28.84%	371	5,937

Off campus	77.19%	1,600	25,606
Overall	74.84%	2,619	40,618
Weighted sample	1,960	2,619	
Projected population	30,183		40,618

Results are based on responses to question *q_0082*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017*.

Vehicle type

Anyone who reported driving, carpooling, or getting a ride at any point on their way to campus during the reference week (based on question *q_0015*) was asked to indicate the fuel type or technology (questions *q_0022*) of the vehicle they used. About 92.2 percent used a regular gasoline vehicle (Table 78), 1.5 percent used a regular diesel vehicle, about 5 percent of respondents reported using a hybrid, and another 1.3 percent reported using an alternative-fuel vehicle (plug-in hybrid, all electric, biodiesel, or natural gas) (Table 78). Note that the percentages shown are the percent of people using these vehicles at any point during the week, *not* necessarily the percent of vehicles arriving on a typical weekday (due to varying numbers of days that respondents might travel to campus and varying occupancies per vehicle).

Table 78. Types of vehicle technologies (fuel) used

	Percent using a vehicle	Among those using a vehicle at least once, percent using:							Weighted sample	Projected population
		Gasoline	Diesel	Hybrid	Plug-in hybrid	All electric	Biodiesel	Natural gas		
Overall	54.13%	92.18%	1.54%	4.96%	0.21%	0.31%	0.36%	0.44%	3,084	40,618
Weighted sample	1,669	1,539	26	83	4	5	6	7	3,084	
Projected population	21,988	20,269	338	1,090	47	67	80	96		40,618

Results are based on responses to question *q_0016* (for whether any vehicle was used) and *q_0022* (type of vehicle technology). Percent using a vehicle includes those who indicated driving alone, carpooling, getting a ride, or riding a motorcycle/scooter at any point on their way to campus at least once during the reference week (question *q_0016*), whether or not as their primary means of transportation on a given day. All data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Bicycle ownership and bike-riding aptitude

This year, we asked whether respondents “own (or have access to) a functioning bike” (question *q_0085*) and if so, how much they spent on it (question *q_0086*). In the 2009-10 survey, respondents were asked to choose among price categories; this year, in an attempt to more precisely estimate the average and total values of bicycles ridden to campus, we asked respondents to estimate a specific dollar value. Overall, about 82.6 percent have access to a bike. Faculty spend most on their bikes, followed by staff, grad students, and undergraduates.

Question *q_0067* asked all respondents to rate their ability to ride a bike, specifying that we were interested “whether you know how or are physically able to ride a bike, regardless of whether it is practical or desirable for you to do so as a means of transportation to campus.” Approximately 0.73 percent indicated that they are physically unable to ride a bike, a projected 263 people (or 184 living within Davis) (Table 80).

Table 79. Percent who own a bike and expense paid

Role group	Percent owning a bike	Among those who own a bike			Most expensive bike used to travel to campus	Weighted sample	Projected population
		Average value	Median value	Percent of total value			
Students	83.16%	\$197.55	\$130	59.12%	\$3,500	1,817	19,454
Undergrad	82.86%	\$185.27	\$120	43.48%	\$3,500	1,435	15,257
Freshmen	91.36%	\$157.48	\$120	6.21%	\$2,000	220	2,562
Sophomores	90.94%	\$182.08	\$120	8.59%	\$1,000	265	3,068
Juniors	81.19%	\$195.15	\$120	12.26%	\$3,500	388	4,083
Seniors	76.87%	\$192.59	\$130	16.43%	\$1,500	562	5,544
Graduate	84.29%	\$242.20	\$150	15.64%	\$2,500	382	4,197
Masters	82.17%	\$243.47	\$150	5.14%	\$2,200	129	1,373
PhD	85.38%	\$241.59	\$150	10.49%	\$2,500	253	2,824
Employees	81.36%	\$331.37	\$250	40.88%	\$3,000	762	8,020
Faculty	85.40%	\$374.62	\$300	8.71%	\$3,000	137	1,512
Staff	80.48%	\$321.33	\$200	32.17%	\$3,000	625	6,508
Outside Davis	72.94%	\$277.66	\$150	24.12%	\$3,000	595	5,575
Within Davis	85.74%	\$226.36	\$150	75.88%	\$3,500	1,943	21,508
Overall	82.63%	\$236.92	\$150	100.00%	\$3,500		27,474
Weighted sample	2,131					2,579	

Results are based on responses to question *q_0085* (whether owns a bike) and *q_0086* (amount spent on bike). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

An additional 2 percent of respondents indicated that they did not know how to ride a bike at all, a projected 707 people (or 606 living within Davis). Six percent of respondents indicated that they were “not very confident” riding, making for a projected 2,239 people living within Davis who do not know how or are not confident riding a bike. Overall, over 91 percent of people indicated that they were “somewhat” or “very confident” riding, which mostly held across all role groups. The percent reporting that they were “very confident” was lowest among freshman, juniors, and masters students (60 percent, 67 percent, and 65 percent, respectively), and highest among faculty (80 percent).

Table 80. Self-reported bike-riding aptitude by role

Role group	Cannot ride because do not know how	Cannot ride because physically unable	Can ride, but not very confident	Somewhat confident	Very confident	Weighted sample	Projected population
Students	2.4%	0.4%	6.3%	20.7%	70.2%	1,943	29,317
Undergraduate	2.3%	0.5%	6.2%	20.4%	70.6%	1,543	23,608
Freshmen	2.1%	0.4%	9.0%	28.2%	60.3%	234	3,628
Sophomores	0.7%	0.7%	2.7%	20.9%	75.0%	292	4,469
Juniors	3.9%	0.0%	7.8%	21.7%	66.7%	411	6,279
Seniors	2.2%	0.7%	5.8%	16.2%	75.3%	606	9,232
Graduate	2.5%	0.3%	6.8%	22.0%	68.5%	400	5,709
Masters	1.4%	0.0%	7.8%	26.1%	64.8%	142	2,073
PhD	3.1%	0.4%	6.2%	19.8%	70.5%	258	3,636
Employees	1.0%	1.5%	5.9%	16.3%	75.3%	798	11,301
Faculty	0.7%	2.1%	3.5%	14.0%	79.7%	143	2,066
Staff	1.1%	1.4%	6.4%	16.8%	74.4%	655	9,235
Outside Davis	1.1%	1.0%	7.3%	19.5%	71.1%	620	9,075
Within Davis	2.2%	0.7%	6.0%	19.2%	71.9%	2,078	31,543
Overall	2.0%	0.7%	6.2%	19.4%	71.7%	2,741	40,618
Weighted sample	54	20	170	532	1,965	2,741	
Projected	800	296	2,519	7,884	29,119		40,618

population

Results are based on responses to question *q_0067*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Drop-off in bicycling after freshman year

In the results of previous campus travel surveys, it has become apparent that sophomores tend to bicycle less frequently to campus than freshman. In fact, among undergraduates, the share of trips to campus using a bicycle as a primary mode tends to decrease as class increases: sophomores are more likely to take the bus to campus, and juniors and seniors are more likely to drive (see Table 15 for more information). In an attempt to better understand this trend, this year we asked sophomores, juniors, and seniors, "Do you bike to class as often now as you did your freshman year?" (*q_0068*), and if not, "Why do you bike less now? Please indicate whether each of the following is true or not, and if it is true, please rate how important a reason it is for why you are biking less now." (*q_0069*). Overall, about 23 percent of sophomores, juniors, and seniors reported bicycling to campus less often now than they did their freshman year, a projected 4,672 students. Of these students, Table 81 shows the percent who indicated each of the ten reasons was true for why they bike to campus less often now than in their freshman year. About 85 percent indicated that moving off campus or further away from campus is a reason they bike to campus less often (a projected 3,980 students), and six percent indicated suffering an injury or illness that makes biking more difficult (a projected 283 students). The percentages do not add up to 100 percent, because most respondents indicated that several of the reasons were true.

Table 81. Reasons upperclassmen bike less than as freshman

	Of those who indicated biking less than they did their freshman year, percent who indicated the following reason was true:												
	I moved off campus or farther away	My bike doesn't work very well or needs repairs	My bike was stolen	I got sick of biking	I decided biking was dangerous	Now I have a car	Now I have friends with cars	Now I can get a campus parking permit (or the people I ride with have parking permits)	I now have work or other obligations that make it less convenient to bike	I suffered an injury or illness that makes biking more difficult	Percent of role group who bike less now	Projected population who bike less now	
Sophomore	92%	34%	6%	28%	11%	32%	56%	25%	27%	7%	31.3%	1,401	
Junior	86%	38%	20%	34%	14%	45%	53%	37%	36%	5%	18.7%	1,171	
Senior	80%	37%	21%	26%	9%	48%	51%	38%	35%	7%	22.8%	2,100	
Overall	85%	36%	16%	29%	11%	43%	53%	34%	33%	6%	23.4%	4,672	
Projected population	3,980	1,698	760	1,336	506	1,995	2,468	1,590	1,539	283		4,672	

Results are based on responses to question *q_0068* and *q_0069*. Data are weighted (and expanded) by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 82 shows the importance of each reason for not biking as frequently as freshman year. Of undergraduates who reported biking less now than their freshman year, more than one third (35

percent) of those who indicated moving off campus or farther from campus cited this as "extremely important" for why they bike to campus less often, and another third (32.5 percent) considered it "important" (1,433 and 1,318 students, respectively). More than 36 percent (a projected 553 students) indicated that personal experience of bicycle theft was "extremely important" in why they bike less often now. Upperclassmen who bike less now were more likely to rate personally having a car as "extremely important" than having friends with cars (16 percent to 4 percent).

Table 82. Importance of reasons upperclassmen bike less than as freshman

Reason for biking less than as a freshman	Of upperclassmen who bike less often than as freshman, percent who rate each reason as:				Projected Population
	Not at all important	Somewhat important	Important	Extremely important	
I moved off campus or farther away	8.1%	24.1%	32.5%	35.3%	4,054
My bike doesn't work very well or needs repairs	24.2%	32.7%	23.4%	19.7%	2,753
My bike was stolen	35.5%	9.2%	18.9%	36.4%	1,518
I got sick of biking	30.3%	42.4%	21.7%	5.7%	2,104
I decided biking was dangerous	43.7%	30.0%	21.2%	5.1%	1,378
Now I have a car	34.2%	28.9%	20.7%	16.2%	2,551
Now I have friends with cars	55.1%	32.6%	7.9%	4.3%	2,970
Now I can get a campus parking permit (or the people I ride with have parking permits)	45.3%	19.2%	21.5%	14.0%	2,305
I now have work or other obligations that make it less convenient to bike	35.0%	24.1%	21.4%	19.5%	2,360
I suffered an injury or illness that makes biking more difficult	55.0%	13.4%	20.7%	10.9%	1,220

Results are based on responses to question *q_0068* and *q_0069*. Data are weighted (and expanded) by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Crashes while bicycling on and off campus

All respondents were asked if they experienced "a fall or crash that resulted in personal injury to you" while "biking on campus" or biking "between home and campus" at any point within the last year. Table 83 shows that about 12.9 percent of applicable respondents said they experienced an on campus bike crash that resulted in personal injury within the last year. About 6 percent of these required a hospital visit, a projected 198 individuals overall. Table 83 shows the incidence of on campus injuries by role group. Undergraduates are much more likely to experience injuries than others on campus, with a full quarter reporting an injury in the last year, versus 17 percent and 9 percent of graduate students and employees, respectively. Students were more likely than employees to require a hospital visit but less likely to file a police report.

Table 83. Injuries from on campus bike crashes, by role group

Role group	Percent “applicable” (biked on campus in the last year)	Among applicable population, percent injured on campus	Among injuries, percent occurring on campus	Among on campus injuries				Weighted sample	Projected population
				Percent in which a police report was filed	Percent requiring a hospital visit	Projected number of police reports filed	Projected number of hospital visits		
Students	72.3%	23.9%	61.4%	0.8%	6.4%	24	198	1,869	29,317
Undergraduate	72.8%	25.4%	62.5%	0.9%	6.3%	24	172	1,486	23,608
Freshmen	66.9%	22.3%	73.5%	0.0%	1.9%	0	8	196	3,628
Sophomores	92.1%	34.0%	71.9%	1.1%	4.3%	11	43	286	4,469
Juniors	63.7%	24.8%	59.8%	2.2%	6.7%	13	40	383	6,279
Seniors	72.0%	21.7%	56.8%	0.0%	10.0%	0	82	621	9,232
Graduate	70.4%	17.4%	55.4%	0.0%	6.9%	0	27	383	5,709
Masters	63.6%	15.1%	58.0%	0.0%	7.7%	0	9	136	2,073
PhD	74.2%	18.5%	54.8%	0.0%	6.5%	0	18	247	3,636
Employees	53.4%	8.9%	54.6%	7.7%	0.0%	23	0	793	11,301
Faculty	63.4%	7.7%	38.9%	0.0%	0.0%	0	0	146	2,066
Staff	51.2%	9.2%	57.1%	9.1%	0.0%	23	0	647	9,235
Outside Davis	32.4%	12.6%	50.5%	6.5%	6.5%	12	24	616	9,075
Within Davis	77.5%	21.6%	63.0%	1.0%	5.8%	35	309	2,003	31,543
Overall	66.9%	20.8%	62.2%	1.3%	5.8%	47	198	2,662	40,618
Weighted sample	1,781	370	230	3	13			3,084	
Projected population	27,174	5,646	3,514	47	198	47	198		40,618

Results are based on responses to questions *q_0045* (whether experienced an injury), *q_0046* (hospital visits), and *q_0047* (police reports). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 84 shows the incidence of off campus injuries and related hospital visits and police reports by role group. Over 90 percent of these injuries occurred within the city of Davis. About 4.5 percent of applicable respondents said they experienced an off campus bike crash on their way between home and campus that resulted in personal injury within the last year. About 6 percent of these required a hospital visit, a projected 106 individuals overall. Students are much more likely to experience injuries than others off campus, with 14 percent reporting an injury in the last year, versus 5 percent of employees. Faculty were the most likely to require a hospital visit (33 percent), and graduate students were the most likely to file a police report (5 percent).

Table 84. Injuries from off campus bike crashes on way to or from campus, by role group

Role group	Percent “applicable” (biked to or from campus in the last year)	Among applicable population, percent injured off campus	Among injuries, percent occurring off campus	Among off campus injuries				Weighted sample	Projected population
				Percent in which a police report was filed	Percent requiring a hospital visit	Projected number of police reports filed	Projected number of hospital visits		
Students	72.3%	14.0%	38.6%	0.8%	7.0%	9	81	1,869	29,317
Undergraduate	72.8%	14.8%	37.5%	0.0%	5.9%	0	56	1,486	23,608
Freshmen	66.9%	11.3%	26.5%	0.0%	0.0%	0	0	196	3,628
Sophomores	92.1%	14.6%	28.1%	0.0%	0.0%	0	0	286	4,469
Juniors	63.7%	17.3%	40.2%	0.0%	7.1%	0	20	383	6,279
Seniors	72.0%	14.6%	43.2%	0.0%	8.7%	0	36	621	9,232
Graduate	70.4%	10.8%	44.6%	5.0%	12.6%	9	24	383	5,709
Masters	63.6%	9.9%	42.0%	6.7%	13.3%	4	7	136	2,073
PhD	74.2%	11.2%	45.2%	4.2%	12.5%	6	17	247	3,636
Employees	53.4%	5.2%	45.4%	0.0%	18.0%	0	26	793	11,301
Faculty	63.4%	5.9%	61.1%	0.0%	33.3%	0	26	146	2,066
Staff	51.2%	5.0%	42.9%	0.0%	0.0%	0	0	647	9,235
Outside Davis	32.4%	8.0%	49.5%	0.0%	0.0%	0	0	616	9,075
Within Davis	77.5%	12.5%	37.0%	0.8%	0.0%	9	0	2,003	31,543
Overall	66.9%	12.0%	37.8%	0.8%	6.4%	9	106	2,662	40,618
Weighted sample	1,781	213	81	1	5			3,084	
Projected population	27,174	3,254	1,229	9	106	9	106		40,618

Results are based on responses to questions *q_0045* (whether experienced an injury), *q_0049* (hospital visits), and *q_0050* (police reports). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Bicycle theft

Table 85 shows the number of respondents who report having been the victim of a bicycle theft on the UC Davis campus. About 17 percent of the total campus population has experienced a theft at some point (almost a fifth of those who have ever brought a bike to campus). Among those who have brought a bike on campus, about 7.3 percent reported that they experienced a theft in the last year, but only 31.6 percent reported the theft to campus police. Overall, we project about 2,519 people had a bike stolen within the last year, and that about 796 would have been reported to police. Actual records from Campus Police indicate 480 bike thefts reported during the corresponding period (November 1, 2009 through October 31, 2010).¹³ UC Davis Bicycle Program Coordinator David Takemoto-Weerts and Police Lieutenant Matthew Carmichael suggested that one reason for the discrepancy might be that many people think they have reported a theft when they have not actually filed an official report. A new online reporting system may increase the number filing reports in the future.

Based on the survey results, undergraduates were most likely to experience thefts, with about a third of seniors with bikes on campus having ever experienced a theft; however, sophomores were most likely to have experienced bike theft within the last year, at 16.5%. Since we ask about the time period from November to the next November, it is likely that many of the thefts reported by sophomores within the last year occurred when they were freshmen. Overall, almost one in ten undergraduates (approximately 9.5%) experienced an on campus bicycle theft within the last year.

¹³ Tabulation reported by Lieutenant Matthew Carmichael, UC Davis Police Department.

Table 85: Victims of bike theft, by role

Role group	Percent ever had a bike on campus	Among applicable population, percent that:			Weighted sample	Projected population
		Ever had a theft	Had a theft last year	Reported theft police last year		
Students	87.36%	19.11%	8.75%	30.72%	2,001	29,317
Undergraduate	88.25%	20.28%	9.47%	30.83%	1,592	23,608
Freshmen	89.08%	3.30%	2.36%	40.00%	238	3,628
Sophomores	95.71%	18.62%	16.55%	41.67%	303	4,469
Juniors	83.73%	16.29%	7.43%	23.08%	418	6,279
Seniors	87.36%	30.20%	9.76%	24.07%	633	9,232
Graduate	83.86%	14.29%	5.83%	30.00%	409	5,709
Masters	80.00%	12.93%	5.17%	33.33%	145	2,073
PhDs	85.98%	14.98%	6.17%	28.57%	264	3,636
Employees	78.63%	21.96%	3.32%	38.10%	805	11,301
Faculty	81.94%	26.27%	4.24%	20.00%	144	2,066
Staff	77.91%	20.97%	3.11%	43.75%	661	9,235
Living outside Davis	61.94%	22.37%	4.11%	50.00%	628	9,075
Living in Davis off campus	91.87%	20.45%	7.53%	32.50%	1,735	25,382
Living on campus	90.68%	14.72%	9.44%	20.59%	397	6,162
Overall	84.85%	19.87%	7.31%	31.61%	3,084	40,618
Weighted sample	2,381	473	174	55	3,084	
Projected population	34,466	6,847	2,519	796		40,618

Results are based on responses to questions *q_0051* (theft ever), *q_0052* (theft in the last year), and *q_0053* (reported to police). Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 86 shows the projected monetary losses due to bicycle theft on the UC Davis campus from November, 2009 to November, 2010. Out of 3,084 valid responses, 174 respondents reported having been the victim of a bicycle theft on the UC Davis campus in the last year. Overall, we project that 2,290 people have suffered a monetary loss from having a bike stolen from on the UC Davis campus in the last year. This year, we asked respondents about the value of their bicycle that was stolen from on campus (*q_0058*). We estimate that the total monetary loss from on campus theft in the last year alone is \$596,471. Table 86 also shows that if the total monetary loss of bicycle theft were divided across the overall campus population, it would amount to about \$14.68 per student and employee.

Table 86. Projected monetary loss from on campus bicycle theft, by role

Role group	Projected monetary loss from on campus bike theft	Projected number of bikes stolen from on campus	Monetary value per bike stolen (\$)	Average monetary loss per capita
Freshman	\$21,690	72	\$301.25	\$5.98
Sophomore	\$217,628	637	\$341.65	\$48.70
Junior	\$63,742	342	\$186.38	\$10.15
Senior	\$150,731	708	\$212.90	\$16.33
Masters	\$22,083	73	\$302.50	\$10.65
PhD	\$45,171	189	\$239.00	\$12.42
Faculty	\$18,554	63	\$294.50	\$8.98
Staff	\$59,282	206	\$287.78	\$6.42
Overall	\$596,471	2,290	\$260.47	\$14.68

Results are based on responses to *q_0052* (on-campus theft in the last year) and *q_0058* (value of bike stolen). Data are expanded by role group based on the 3,084 valid responses to question *q_0017* (see Table 8). "Average monetary loss per capita" is a measure of the monetary loss for that role group divided by its population (including those who were not victims of bicycle theft). In order to avoid overestimating monetary losses from bicycle theft, we interpreted missing answers to *q_0058* as a value of \$0, rather than imputing the average. For this reason, we expect our estimate to be a lower bound of the true monetary losses from bicycle theft.

Table 87 shows the projected monetary losses due to bicycle theft that students and employees were the victims of away from campus (off campus in the city of Davis or outside Davis) from November, 2009 to November, 2010. Out of 3,084 valid responses, 165 respondents reported having been the victim of a bicycle theft off campus in the last year. Overall, we project that 2,177 people have had a bike stolen from off campus in the last year. This year, we asked respondents about the value of their bicycle that was stolen from off campus (*q_0065*). We estimate that the total monetary loss from off campus theft (of which UC Davis students and employees were the victims) in the last year alone is \$501,394. Table 86 also shows that if the total monetary loss of bicycle theft were divided across the overall campus population, it would amount to about \$12.34 per student and employee. Overall, from November, 2009 to November, 2010, the UC Davis campus population is estimated to have lost \$1.1 million worth of bicycles, approximately 54% of which resulted from on campus bicycle theft and 46% from off campus bicycle theft.

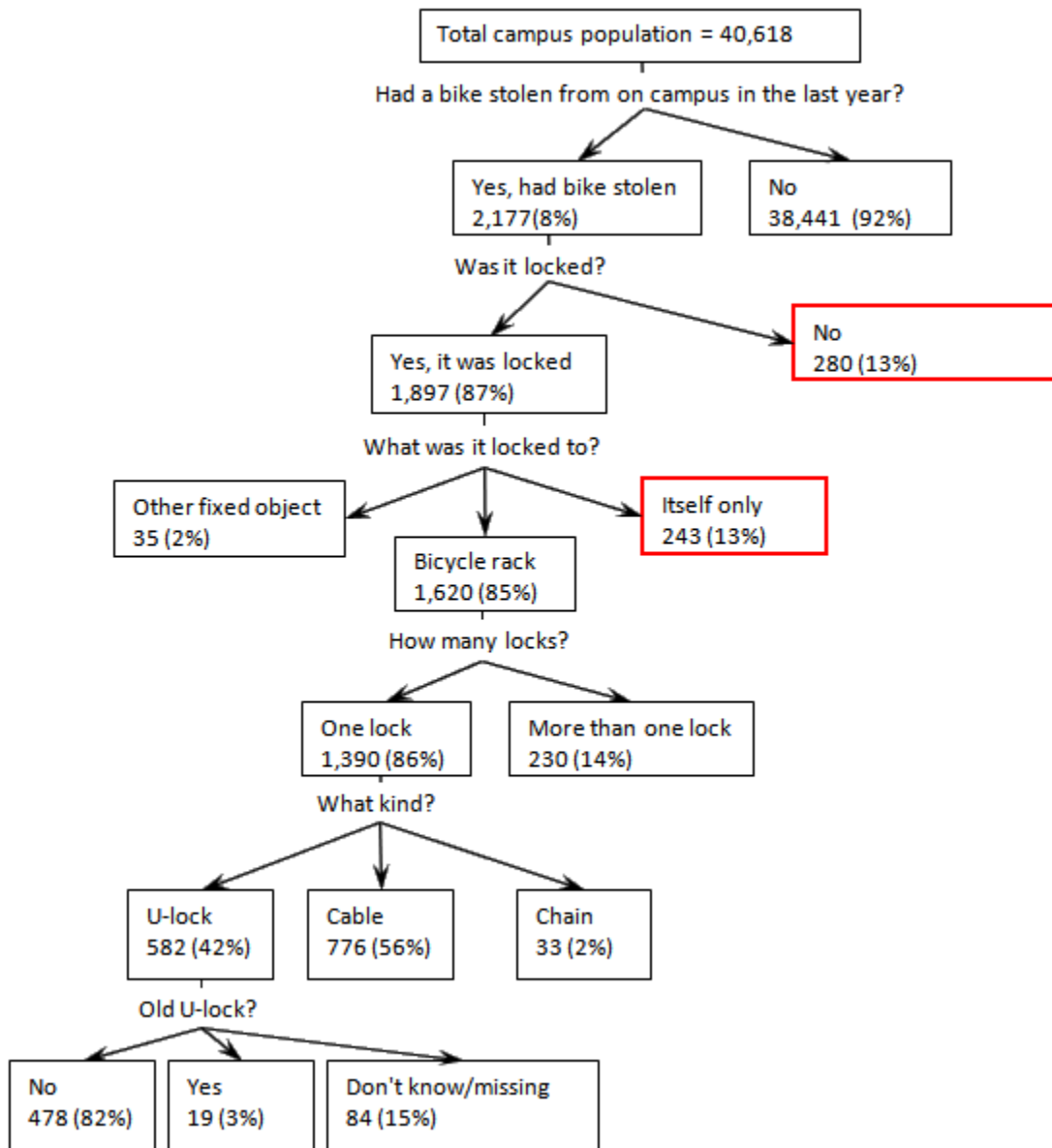
Table 87. Projected monetary loss from off campus bicycle theft, by role

Role group	Projected monetary loss from off campus bike theft	Projected number of bikes stolen from off campus	Monetary value per bike stolen (\$)	Average monetary loss per capita
Freshman	\$1,200	16	\$75.00	\$0.33
Sophomore	\$34,222	166	\$206.15	\$7.66
Junior	\$29,503	163	\$181.00	\$4.70
Senior	\$208,864	855	\$244.29	\$22.62
Masters	\$23,998	104	\$230.75	\$11.58
PhD	\$59,156	264	\$224.07	\$16.27
Faculty	\$41,189	82	\$502.31	\$19.94
Staff	\$103,200	527	\$195.83	\$11.17
Overall	\$501,394	2,177	\$230.31	\$12.34

Results are based on responses to *q_0059* (off-campus theft in the last year) and *q_0065* (value of bike stolen). Data are expanded by role group based on the 3,084 valid responses to question *q_0017* (see Table 8). "Average monetary loss per capita" is a measure of the monetary loss for that role group divided by its population (including those who were not victims of bicycle theft).

Figure 10 shows a breakdown of how bicycles were locked when they were stolen from on campus. An estimated 280 bicycles were not locked, and an additional 243 were not locked only to the bike itself. These 523 estimated bike thefts may not pose a substantial concern since substantial efforts were not made to secure the bike to a bike rack or other fixed object; however, an estimated 776 bikes were locked to a bike rack with a cable, and an estimated 478 were locked to a bike rack with a new U-lock when they were stolen. These thefts are of particular concern because the bikes could not simply be carried off.

Figure 10. How bikes were locked when stolen from on campus



Awareness of TAPS and other transportation programs

Respondents were presented a list of services and asked to indicate, “It’s new to me,” “I’ve heard of it, but never used it,” or “I’ve used it.” Table 88 summarizes the responses for each service, and Table 89 compares responses for the past three years, for those items that appeared on each of the surveys. TAPS launched the GoClub, Zimride, and Zipcar programs in the Fall of 2009.

Table 88. Awareness of transportation services

Service	Have used it	Have only heard of it	Never heard of it	Weighted sample
GoClub program	9.9%	22.9%	67.2%	2,633
Emergency Ride Home Program for goClub members	1.6%	21.9%	76.4%	2,610
Discount Unitrans bus passes for those without a parking permit	4.5%	27.8%	67.7%	2,599
Yolo TMA “TRIP” Incentive Program	0.5%	7.3%	92.1%	2,591

Yolo TMA Emergency Ride Home Program (yolotma.org)	0.2%	9.4%	90.4%	2,589
Sacramento Region “Commuter Club”	1.0%	9.4%	89.6%	2,591
www.sacregion511.org	2.5%	11.4%	86.1%	2,580
TAPS motorist assistance program	12.7%	47.6%	39.7%	2,608
Comet in-vehicle parking meters on campus	2.9%	23.7%	73.5%	2,596
Social network for ride matching: Zimride.ucdavis.edu	3.2%	21.0%	75.8%	2,594
Zipcar carsharing program	3.7%	71.4%	24.9%	2,614
Enterprise Rental Car Voucher Program	0.6%	19.7%	79.7%	2,590
Ten bike tire air stations around campus	34.2%	25.3%	40.4%	2,604
Bike lock-cutting service	3.6%	39.0%	57.3%	2,609
UC Davis Bike Auction	8.3%	77.9%	13.7%	2,614

Results are based on responses to question *q_0070*. Data are weighted by role group based on the 3,084 valid responses to question *q_0017* (see Table 8).

Table 89. Awareness of transportation services, 2007-08 through 2009-10

Service	Percent who have heard of it			
	2010-11	2009-10	2008-09	2007-08
GoClub program	32.8%	17.5%	n/a	n/a
Carpool/vanpool program	n/a	n/a	62.9%	56.9%
24 free parking days for carpoolers/ transitpoolers	n/a	n/a	34.1%	24.5%
Online ridematching service	n/a	n/a	32.8%	26.3%
Emergency Ride Home Program for goClub members	23.6%	16.3%	n/a	n/a
Emergency ride home service	n/a	n/a	39.4%	29.7%
Discount Unitrans bus passes for those without a parking permit	32.3%	30.2%	n/a	n/a
Discounted transit passes	n/a	n/a	43.8%	28.4%
Yolo TMA “TRIP” Incentive Program	7.9%	8.9%	n/a	n/a
Yolo TMA Emergency Ride Home Program (yolotma.org)	9.6%	9.5%	n/a	n/a
Yolo TMA Commuter Club	n/a	n/a	n/a	n/a
Sacramento Region “Commuter Club”	10.4%	10.2%	n/a	n/a
www.sacregion511.org	13.9%	12.3%	13.5%	10.3%
TAPS motorist assistance program	60.3%	51.3%	49.0%	n/a
Comet in-vehicle parking meters on campus	26.5%	24.3%	34.2%	n/a
Social network for ride matching: Zimride.ucdavis.edu	24.2%	15.4%	n/a	n/a
Zipcar carsharing program	75.1%	57.3%	n/a	n/a
Enterprise Rental Car Voucher Program	20.3%	19.8%	n/a	n/a
Ten bike tire air stations around campus	59.6%	55.1%	58.3%	n/a
Bike lock-cutting service	42.7%	40.9%	49.0%	n/a
UC Davis Bike Auction	86.3%	81.5%	84.3%	n/a

As in Table 88, data for 2010-11 are based on responses to question *q_0070*. See Lovejoy (2010) for results from 2009-10, Lovejoy, *et al.* (2009) for results from 2008-09, and Congleton (2009) for results from 2007-08.

Table 90. Change in use and awareness of transportation programs, 2009-10 to 2010-11

Service	Used it			Heard of it		
	2009-10	2010-11	Percentage-point change	2009-10	2010-11	Percentage-point change
UC Davis Bike Auction	8.0%	8.3%	0.3%	73.5%	77.9%	4.4%
Zipcar carsharing program	1.5%	3.7%	2.2%	55.8%	71.4%	15.6%
Ten bike tire air stations around campus	31.9%	34.2%	2.3%	23.2%	25.3%	2.1%
TAPS motorist assistance program	8.5%	12.7%	4.2%	42.8%	47.6%	4.8%
Bike lock-cutting service	3.3%	3.6%	0.3%	37.6%	39.0%	1.4%
Discount Unitrans bus passes for those without a parking permit	4.7%	4.5%	-0.2%	25.5%	27.8%	2.3%
Comet in-vehicle parking meters on campus	2.9%	2.9%	0.0%	21.4%	23.7%	2.3%
Enterprise Rental Car Voucher Program	0.9%	0.6%	-0.3%	18.9%	19.7%	0.8%
GoClub program	3.2%	9.9%	6.7%	14.3%	22.9%	8.6%
Emergency Ride Home Program for GoClub members	1.0%	1.6%	0.6%	15.3%	21.9%	6.6%
Social network for ride matching: Zimride.ucdavis.edu	1.2%	3.2%	2.0%	14.3%	21.0%	6.7%
www.sacregion511.org	1.8%	2.5%	0.7%	10.5%	11.4%	0.9%
Sacramento Region "Commuter Club"	0.6%	1.0%	0.4%	9.6%	9.4%	-0.2%
Yolo TMA Emergency Ride Home Program (yolotma.org)	0.5%	0.2%	-0.3%	9.0%	9.4%	0.4%
Yolo TMA "TRIP" Incentive Program	0.7%	0.5%	-0.2%	8.2%	7.3%	-0.9%

Results are based on responses to *q_0070*.

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APPENDICES

Appendix A: Survey instrument, 2010-11 Campus Travel Survey

Below is the full text of the survey instrument, shown without the formatting as it would have appeared to online survey-takers. Notes about the conditional display of questions based on respondents' prior answers are shown in brackets. Answer options that were offered as checkboxes in the online survey (allowing respondents to select more than one response) are denoted here with a . Answer options that were implemented either as radio buttons or as part of a dropdown list in the online survey (allowing respondents to select only one response) are denoted here with a . Questions that were required for respondents to proceed are denoted here with an asterisk (only the first three questions).

Figure 11 at the end of this Appendix shows a sample screenshot of a page from the online version of the survey. In the 2008-09 and 2009-10 surveys, the dates of the reference week changed after one week. In this year's survey, the reference week was not changed from Oct. 25-31 (see the Other biases may exist if there are other ways that the sample of respondents differs systematically from the rest of the population, though we have few ways of knowing the extent that it does. One attribute we can verify is the portion of the sample that owns parking permits, which we find matches the portion in the overall population (based on TAPS's records of permits issued), though with "A" permit-holders slightly over-represented relative to "C" permit-holders. (See the "Parking permits" section later in the report.)

Weighting responses by role
section for more details).

Welcome to the 2010-11 Campus Travel Survey!

If you already took this year's survey, thank you! But please don't take it more than once.

This survey provides campus planners with valuable feedback on how people get to campus and their experiences with various transportation programs. It should take less than 15 minutes to complete. Doing so is entirely voluntary, and we assure you that all responses are confidential and the results will only be published in the aggregate, without connection to any individual. **Please do not take this survey if you are under 18 years old.**

As a token of our appreciation, we're offering anyone who completes the survey entry into a drawing to win one of [ten \\$25 Downtown Davis gift cards!](#)

Note to Firefox users: if you take this survey using Mozilla Firefox, you may encounter formatting errors. To avoid any potential issues, please use a different browser.

Thanks for participating!

Introduction

q_0001: What is your primary role at UC Davis?*

- Undergraduate student (including Post-bac)
- Graduate student
- Faculty
- Staff
- Visiting Scholar
- Post doc
- Recent graduate
- Retiree

[If undergraduate student]

q_0002: What year are you?*

- Freshman
- Sophomore
- Junior
- Senior
- Fifth-year senior
- Post-bac
- Visiting / exchange student
- Other: _____

[If graduate student]

q_0003: What type of graduate program are you in?*

- Master's
- PhD
- Law
- MBA
- Veterinary
- Ed.D. or CANDEL
- Other: _____

[For students only]

q_0004: As a student, are you also a paid employee of UC Davis?

- Yes
- No

[If employee or grad student]

q_0005: Where is your office, lab, or department? (That is, wherever you usually spend your time when you travel to work or school at UC Davis)

- On the Davis campus, in the Central campus area (including everything on this map) -- this is most people
- On the Davis campus, in the West campus area (west of SR 113)
- On the Davis campus, in the South campus area (south of I-80)
- Technically off-campus, but within the city of Davis
- Outside of Davis

[If located outside of Davis, ask this question, then skip to end, to “Optional” page.]

q_0006: Where outside of Davis is your office, lab, or department?

[write-in]

About you (part 1)

Next, we have a few questions about you.

q_0007: What is your gender?

- Male
- Female
- Other
- No answer

q_0008: Where do you live?

- On the UC Davis campus
- In a UC Davis residence hall or other UC Davis housing off campus
- Off-campus in the city of Davis (not in UC Davis housing)
- Outside of Davis

[If resides outside of Davis]

q_0009: What is your zip code?

Zip code: _____

[If resides on campus or in UC Davis residence hall or UC Davis housing off campus]

q_0010: What is the name of your campus residence?

[Dropdown list:]

- | | | |
|----------------------------------------------|------------------------------------------------|-------------------------------------|
| <input type="radio"/> Agrarian Effort co-op | <input type="radio"/> Gilmore Hall | <input type="radio"/> Primero Grove |
| <input type="radio"/> Alder Hall | <input type="radio"/> Kearney Hall | <input type="radio"/> Regan Hall |
| <input type="radio"/> Atriums at La Rue Park | <input type="radio"/> La Rue Park living group | <input type="radio"/> Russell Park |
| <input type="radio"/> Baggins End co-op | <input type="radio"/> Laben Hall | <input type="radio"/> Ryerson Hall |
| <input type="radio"/> Bixby Hallf | <input type="radio"/> Lysle Leach Hall | <input type="radio"/> Solano Park |
| <input type="radio"/> Castilian Hall | <input type="radio"/> Malcolm Hall | <input type="radio"/> Thille Hall |
| <input type="radio"/> Colleges at La Rue | <input type="radio"/> Miller Hall | <input type="radio"/> Thompson Hall |
| <input type="radio"/> Davis Student Co-op | <input type="radio"/> Orchard Park | <input type="radio"/> Thoreau Hall |
| <input type="radio"/> Domes | <input type="radio"/> Pierce Co-op | <input type="radio"/> Webster Hall |
| <input type="radio"/> Emerson Hall | <input type="radio"/> Pierce Hall | <input type="radio"/> Other: _____ |

[If resides off campus (in Davis or outside of Davis)]

q_0011: What is an intersection near your home? (Please answer for where you live locally. This information will only be used to calculate the approximate distance you travel to campus. It will be kept confidential and will not be used in any other way.)

Your street: _____

Nearest cross-street: _____

Days traveled last week

Consider your activities during the seven days last week, from Monday (Oct. 25) through Sunday (Oct. 31). If you have a day planner, it might be useful to look at the last week's activities as you complete this section.

q_0012: Did you go somewhere on campus any of the seven days last week for school or work? (If you went to a UC Davis office or lab that is technically off-campus, but within the city of Davis, please count that as well.)*

- Yes, I traveled to campus destinations for school or work last week (check all that apply):
 - Monday
 - Tuesday
 - Wednesday
 - Thursday
 - Friday
 - Saturday
 - Sundayor
- No, I was away all week, Oct. 25 – Oct. 31

Days not traveled last week

About the days you did not travel on campus last week

[If no travel to campus all week]

q_0013: What was the main reason you did not go to campus destinations last week for school or work?

- Study abroad
- PELP (Planned Educational Leave Program)
- Sabbatical
- Temporary appointment elsewhere (internship, visiting scholar, teaching appointment, exchange program, etc.)
- Telecommuting (working from home or another remote location)
- Work- or school-related travel or field work
- Vacation
- Sickness or personal leave
- Other: _____

q_0014: What was the main reason you did not travel to work? Please answer for each day individually.

- Work or school-related activities elsewhere (field work, meetings, teaching appointment, etc.)
- Telecommuting (working from home or another remote location)
- START or furlough day
- Regularly scheduled day off
- Day off as part of a compressed work week (i.e. 4/40, 9/80, or 3/36)
- Vacation
- Sick or personal leave
- Other: _____

Arrival time

On the days you were on campus last week for school or work

[For any days that traveled]

q_0015: What time did you arrive at your first destination?

	Between 6am and 10am	Either before 6am or after 10am
Monday	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday	<input type="checkbox"/>	<input type="checkbox"/>
Thursday	<input type="checkbox"/>	<input type="checkbox"/>
Friday	<input type="checkbox"/>	<input type="checkbox"/>
Saturday	<input type="checkbox"/>	<input type="checkbox"/>
Sunday	<input type="checkbox"/>	<input type="checkbox"/>

Modes used last week

[If traveled at least one day last week]

q_0016: First think back to the entire week (Monday, Oct. 25 - Sunday, Oct. 31). Please tell us *all* the different means of transportation you used at some point on your way to school or work, from the moment you left home to when you arrived at your first destination on campus -- even if it was just for part of the way -- on any day last week. (Check all that apply.)

- Bike
- Walk
- Skate
- Motorcycle or scooter
- Drive alone in a car (or other vehicle)
- Carpool or vanpool with others also going to campus (either as driver or passenger)
- Get a ride (someone drops you off and continues on elsewhere)
- Bus
- Train or light rail
- Other: _____

[For any days that traveled]

q_0017: Next, consider each day specifically. Please select the **primary** means of transportation you used on your way to your first campus destination each day. (If you used more than one means, select whatever you did for **most of the distance**.)

	Biked	Walked	Skated	Motorcycle or scooter	Drove myself (arrived alone)	Carpooled or vanpooled (arrived with others)	Got a ride (dropped off by someone going elsewhere)	Bus	Train / light rail
Monday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thursday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saturday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[For any days that traveled]

q_0018: On any of these days, did you ride a bike on campus after traveling by some *other* means most of the distance from home to campus?

	No, because I was already biking	No, I did not bike	Yes, I switched to biking after using some other means
Monday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thursday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saturday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[If checked carpool in q_0016]

q_0019: During the times when you carpooled with others last week, how many people on average were in your carpool or vanpool (including yourself)?

- 2 (you plus one other person)
- 3 people
- 4 people
- 5 people
- 6 people
- 7 people
- 8 or more

[If checked got a ride in q_0016]

q_0020: During the times when you got a ride on your way to campus last week, how many people on average did your driver drop off?

- 1 (just you)
- 2 people
- 3 people
- 4 people
- 5 people
- 6 people
- 7 or more

[If checked motorcycle, drove alone, carpooled, or got a ride in q_0016]

q_0021: Where did you (or whoever drove you) park? (If it was different on different days, please indicate what you did most often.)

- On the UC Davis campus
- Within Davis, but not on campus
- Outside of Davis
- I was dropped off (and the driver went elsewhere)

[If checked motorcycled, drove alone, carpooled, or got a ride in q_0016]

q_0022: Was this vehicle a hybrid, alternative fuel, or electric vehicle?

No, it is a regular:

- Gasoline vehicle
- Diesel vehicle

Yes, it is:

- Hybrid
- Plug-in hybrid
- All electric
- Biodiesel
- Natural gas
- Hydrogen fuel cell
- Other: _____

[If gasoline/hybrid vehicle]

q_0023: What do you estimate to be the fuel economy (miles per gallon) of this vehicle between your home and first destination on campus?

[numerical write-in] mpg

[If diesel/biodiesel vehicle]

q_0024: What do you estimate to be the fuel economy (miles per gallon) of this vehicle between your home and first destination on campus?

[numerical write-in] mpg

[If checked bus in q_0016]

q_0025: Which bus service did you use on your way to campus last week? (Please check all that apply.)

- Unitrans
- Yolobus
- Sacramento Regional Transit
- UCD/UCDMC Shuttle
- Fairfield Suisun Transit
- Davis Community Transit
- UC Berkeley - UC Davis Shuttle
- Amtrak motorcoach (bus)
- AC Transit
- Muni
- Other: _____

[For each bus service selected in previous question]

q_0026: On which days did you ride ___?

[only for days respondent traveled in q_0012]

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

[If checked train in q_0016]

q_0027: Which train service did you use on your way to campus last week? (Check all that apply.)

- Amtrak Capitol Corridor
- Sacramento Regional Transit
- BART
- Muni
- Caltrain
- Other: _____

[For each train service selected in previous question]

q_0028: On which days did you ride ___?

[only for days respondent traveled in q_0012]

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

[If checked bus or train in q_0016]

q_0029: On any of the days that you took the bus or train, did you drive or get a ride from home to wherever you boarded the bus/train?

[only for days respondent used bus/train in q_0027-28]

Yes, I drove or got a ride to get there (check all that apply):

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

or

No, I used another means to get there

q_0030: Approximately how far did you drive or ride to get to the bus/train? Please give us your best guess of the number of miles it was.

[for each of the days respondent selected in q_0029]

Monday [numerical write-in] *miles*

Tuesday [numerical write-in] *miles*

Wednesday [numerical write-in] *miles*

Thursday [numerical write-in] *miles*

Friday [numerical write-in] *miles*

Saturday [numerical write-in] *miles*

Sunday [numerical write-in] *miles*

Overnight bikes

q_0031: Did you leave a bike on campus overnight any nights last week?

No, not any nights last week

Yes, I had a bike on campus overnight (check all that apply):

Monday night

Tuesday night

Wednesday night

Thursday night

Friday night

Saturday night

Sunday night

[If left bike any nights last week]

q_0032: What are your reasons for storing this bike on campus overnight? (Check all that apply.)

I used another means of transportation to get home

It is more convenient to store my bike on campus

I feel it is safer to store my bike on campus

My bicycle was not in rideable condition

I never left campus (stayed on campus overnight)

Other (write-in)

[If left bike any nights last week]

q_0033: About how long has it been since you rode this bike?

One day or less

2 to 7 days

8 to 14 days

15 to 30 days

31 days or more

Travel time and circulator mode

Now consider your normal routine, whatever you do most often when you travel to UC Davis.

[Everyone, even if no travel last week]

q_0034: About how many minutes does it usually take to get from where you live to your first campus destination on a given day (door-to-door)?
[numerical write-in]

[Everyone, even if no travel last week]

q_0035: How many miles would you estimate it is from where you're living to the UC Davis campus (one-way)? (Please answer for where you live locally, from where you would come to school or work at UC Davis on a daily basis.)
[numerical write-in]

[Everyone, even if no travel last week]

q_0036: After arriving on campus at the beginning of your day, how do you typically get around campus (or off campus) before leaving campus for the last time?

I <i>walk</i> between different destinations around campus.	[slider with 0%, 10%, 20%, ..., 100% of the time]
I <i>bike</i> between different destinations around campus.	[slider with 0%, 10%, 20%, ..., 100% of the time]
I ride in a <i>vehicle</i> to get to different destinations around campus.	[slider with 0%, 10%, 20%, ..., 100% of the time]
I use another means to get to different destinations around campus.	[slider with 0%, 10%, 20%, ..., 100% of the time]

Note: these should add up to 100%.

Summer activities

Now consider this past summer, from June 16 - September 19, 2010.

q_0037: How much time did you spend at UC Davis over the summer? We're interested in the number of weeks you spent last summer traveling to and from campus destinations on a regular basis. Please estimate how many weeks you were on campus at least once a week during this period. If you went to a UC Davis office or lab that is technically off-campus, but within the city of Davis, please count that as well.
(Note: There were a total of 14 weeks in the academic summer.)

[Dropdown list:]

- All summer / 14 weeks (June 14 – September 19)
- 13 weeks
- 12 weeks (equivalent to Summer Session I and Summer Session II)
- 11 weeks
- ...
- 7 weeks
- 6 weeks (equivalent to just ONE summer session, I or II)
- 5 weeks
- ...
- 1 week
- None

[For any answer other than “none”]

q_0038: During this period, how many days per week were you typically on campus?

[Dropdown list:]

- 1 day per week
- 2 days per week
- 3 days per week
- 4 days per week
- 5 days per week
- 6 days per week
- 7 days per week

q_0039: About how many of the days that you would typically travel to campus (per your answer in the previous question) did you not travel to campus? Please estimate a total for the weeks you previously indicated. (This number could include vacation, holidays, sick/personal days, trips to conferences, etc.)

[numerical write-in]

q_0040: Did you live the same distance from campus during the summer as you do now?

- Yes
- No, I lived farther
- No, I lived closer

[if lived somewhere different during summer]

q_0041: How many miles would you estimate it is from where you lived during the summer to the UC Davis campus (one-way)? (Please answer for where you lived locally, from where you would come to school or work at UC Davis on a regular basis.)

[numerical write-in] miles

q_0042: Did you usually use the same mode(s) of transportation to get to campus during the summer as you usually do now?

- Yes
- No

[If travel patterns changed]

q_0043: How was your use of each mode different during the summer?

	Used <i>less</i> during the summer	No change [default answer]	Used <i>more</i> during the summer
Bike	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motorcycle or scooter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drive alone in a car (or other vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carpool or vanpool with others also going to campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Get a ride (driver continues on elsewhere)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Train or light rail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Incidents

Now think back on the last year, from November 1, 2009 through November 1, 2010.

q_0044: Did you ride a bicycle on campus at least once during this period?

- Yes
- No

q_0045: During this period, did you experience a fall or crash that resulted in personal injury to you while...

	Yes	No	No Answer
Biking on campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biking off campus, on my way between home and campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Incident follow-up

[If on-campus bike crash, shown q_0041-42]

About your on-campus bike crash

q_0046: Did you require a hospital visit?

- Yes
- No

q_0047: Was there a police report filed for this incident?

- Yes
- No

[If off-campus bike crash, then shown questions q_0043-44]

About your off-campus bike crash

q_0048: Was it in Davis?

- Yes, it happened within the city of Davis.
- No, it happened somewhere outside of Davis.

q_0049: Did you require a hospital visit?

- Yes
- No

q_0050: Was there a police report filed for this incident?

- Yes
- No

Bicycle theft

q_0051: Have you ever been the victim of a bicycle theft *on* the UC Davis campus?

- Yes
- No

- Not applicable: I have never had a bike on campus

[If theft ever]

q_0052: Have you been the victim of a bicycle theft on the UC Davis campus in the past year (November 1, 2009 through November 1, 2010)?

- Yes
- No
- Not applicable: I haven't had a bike on campus in the last year

[If theft in the last year]

q_0053: Did you report this theft to campus police?

- Yes
- No

q_0054: At the time your bicycle was stolen, was it locked?

- Yes, locked outdoors
- No, unlocked outdoors
- Indoors, but not locked with a bike lock
- Indoors and locked with a bike lock
- Other

[If locked outdoors, indoors, other]

q_0055: At the time your bicycle was stolen, what was it locked *with*? (Check all that apply.)

- U-lock 
- Cable 
- Chain 
- O-lock 

Combination lock



Key lock

Other [write-in]

q_0056: Was this the old type of U-lock with an axial pin tumbler? (These were found to be vulnerable to being picked with a Bic pen.)

- No, it was a new U-lock [default answer]
- Yes, it was an old U-lock
- I don't know
- No answer

[If locked outdoors, indoors, other]

q_0057: At the time your bicycle was stolen, how was it locked?

- To a bicycle rack
- To a pole, bench, tree, or other fixed object outdoors
- To itself only, outdoors
- To itself only, indoors
- It was indoors, and locked to a fixed object inside
- It was indoors, but not otherwise locked with a bike lock

[If stolen from on campus in the past year]

q_0058: What was the approximate monetary value of your bicycle when it was stolen? [If you had more than one bicycle stolen, please indicate the highest value.]

\$(numerical write-in)

q_0059: Have you been the victim of a bicycle theft *off campus* in the past year (November 1, 2009 through November 1, 2010)?

- Yes
- No

[If theft off campus in the last year]

q_0060: Did you report this theft to the police?

- Yes
- No

q_0061: At the time your bicycle was stolen, was it locked?

- Yes, locked outdoors
- No, unlocked outdoors
- Indoors, but not locked with a bike lock
- Indoors and locked with a bike lock

- Other

[If locked outdoors, indoors, other]

q_0062: At the time your bicycle was stolen, what was it locked *with*? (Check all that apply.)

- U-lock 
- Cable 
- Chain 
- O-lock 
- Combination lock 
- Key lock 
- Other [write-in]

q_0063: Was this the old type of U-lock with an axial pin tumbler? (These were found to be vulnerable to being picked with a Bic pen.)

- No, it was a new U-lock [default answer]
- Yes, it was an old U-lock
- I don't know
- No answer

[If locked outdoors, indoors, other]

q_0064: At the time your bicycle was stolen, how was it locked?

- To a bicycle rack

- To a pole, bench, tree, or other fixed object outdoors
- To itself only, outdoors
- To itself only, indoors
- It was indoors, and locked to a fixed object inside
- It was indoors, but not otherwise locked with a bike lock

[If stolen from off campus in the past year]

q_0065: What was the approximate monetary value of your bicycle when it was stolen from off campus?

[If you had more than one bicycle stolen from off campus, please indicate the highest value.]

\$(numerical write-in)

Mode share

q_0066: During the last seven days, on how many days did you:

- Drive or ride in a car? 0 1 2 3 4 5 6 7 days
- Ride a bicycle? 0 1 2 3 4 5 6 7 days
- Ride on a bus or train? 0 1 2 3 4 5 6 7 days
- Walk outdoors for more than 10 minutes at a time? 0 1 2 3 4 5 6 7 days

q_0067: How would you rate your ability to ride a bike? In particular, we are interested whether you know how or are physically able to ride a bike, regardless of whether it is practical or desirable for you to do so as a means of transportation to campus.

- I cannot ride a bike at all because I do not know how
- I cannot ride a bike at all because I am physically unable to do so
- I can ride a bike, but I am not very confident doing so
- I am somewhat confident riding a bike
- I am very confident riding a bike

[For sophomores, juniors, seniors]

q_0068: Do you bike to class as often now as you did your freshman year?

- Yes, I bike just as often now as I did as a freshman
- No, I bike *more often* now than I did as a freshman
- No, I bike *less often* now than I did as a freshman
- I did not bicycle at UC Davis as a freshman
- No Answer

[For those who answered "less often" in the previous question]

q_0069: Why do you bike less now? Please indicate whether each of the following is true or not, and if it is true, please rate how important a reason it is for why you are biking less now.

	<i>Not True</i>	<i>True</i>	<i>Not at all important</i>	<i>Somewhat important</i>	<i>Important</i>	<i>Extremely important</i>
I moved off campus or farther away	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My bike doesn't work very well or needs repairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My bike was stolen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I got sick of biking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I decided biking was dangerous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now I have a car	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now I have friends with cars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now I can get a campus parking permit (or the people I ride with have parking on campus)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I now have work or other obligations that make it less convenient to bike	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I suffered an injury or illness that makes biking more difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Campus transportation programs

q_0070: Are you familiar with any of these programs?

	It's new to me	I've heard of it, but never used it	I've used it
GoClub program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Ride Home Program for goClub members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discount Unitrans bus passes for those without a parking permit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yolo TMA "TRIP" Incentive Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yolo TMA Emergency Ride Home Program (yolotma.org)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sacramento Region "Commuter Club" www.sacregion511.org	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TAPS motorist assistance program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comet in-vehicle parking meters on campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social network for ride matching: Zimride.ucdavis.edu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zipcar carsharing program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enterprise Rental Car Voucher Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ten bike tire air stations around campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bike lock-cutting service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UC Davis Bike Auction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comfort

q_0071: In general, how comfortable would you be riding a bicycle in the following kinds of streets in daylight and good weather?

	Uncomfortable and I wouldn't ride on it	Uncomfortable but I'd ride on it	Comfortable
an off-street bicycle path	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a quiet residential street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a two-lane local street with a bicycle lane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a narrow two-lane local street without a bicycle lane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a four-lane street with a bicycle lane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a four-lane street without a bicycle lane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[if knows how to ride a bicycle and is not physically unable]

q_0072: For how many years of your life would you say that you bicycled regularly? By regularly, we mean that you usually rode a bicycle at least once per week. Please think about your entire life, including your childhood.

[numerical write-in] years

Travel preferences

We'd like to ask about your preferences with respect to travel and the environment. Please indicate your feelings about the following statements. There are no right or wrong answers; we want only your true opinions.

q_0073: Do you agree or disagree with the following statements? [answer code]

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
[1] It is important for me to get regular physical exercise.	1	2	3	4	5
[5] I try to limit my driving to help improve air quality.	1	2	3	4	5
[13] Travel time is generally wasted time.	1	2	3	4	5
[11] I like riding a bike.	1	2	3	4	5
[6] I try to limit my driving as much as possible.	1	2	3	4	5
[3] I drive more than I want to.	1	2	3	4	5
[12] I like walking.	1	2	3	4	5

q_0074: Do you agree or disagree with the following statements? (continued)

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly agree</i>
[2] I enjoy physical exercise.	1	2	3	4	5
[10] I like taking transit.	1	2	3	4	5
[7] I need a car to do many of the things I like to do.	1	2	3	4	5
[9] I like driving.	1	2	3	4	5
[8] I often need to use my own vehicle to travel to different sites during the day.	1	2	3	4	5
[4] I drive more than I need to.	1	2	3	4	5
[14] There is adequate bicycle parking at my campus destinations.	1	2	3	4	5

[For employees only]

q_0075: How often do you run errands on your way to or from work?

	<i>Never</i>	<i>Less than once a week</i>	<i>One to four times a week</i>	<i>Daily</i>
Drop off children on way in to work?	1	2	3	4
Pick up children on the way home?	1	2	3	4

Shop for groceries on the way home?	1	2	3	4
Stop for other errands	1	2	3	4
Go out for dining/entertainment on the way home?	1	2	3	4
Visit friends on the way home?	1	2	3	4

q_0076: When you are choosing what form of travel (e.g. drive, walk, bike) to use for a trip, how important are the following factors in your decision?

	<i>Not at all important</i>	<i>Somewhat important</i>	<i>Important</i>	<i>Extremely important</i>
Physical fitness	1	2	3	4
Travel distance	1	2	3	4
Speed of travel	1	2	3	4
Convenience of travel	1	2	3	4
Cost of travel	1	2	3	4
Cost of parking	1	2	3	4
Enjoyment of travel	1	2	3	4
Environmental benefits	1	2	3	4
Traffic	1	2	3	4
Weather	1	2	3	4

About you (part 2)

Finally, this section asks a few more questions about you. We use this information to help understand travel choices and how the people taking the survey might represent the UC Davis as a whole. Your answers are confidential and will not be used for any other purposes.

[For employees and grad students who live outside of Davis]

q_0077: How important are each of the following factors in your decision NOT to live in the city of Davis?

	Not at all important	Somewhat important	Important	Extremely important
Living with someone whose workplace or school is located outside of Davis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire for urban environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire for rural environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to family or friends who live outside of Davis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire for better weather/topography	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Infrequent trips to campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[For undergraduate students who live outside of Davis]

q_0078: How important are each of the following factors in your decision NOT to live in the city of Davis?

	Not at all important	Somewhat important	Important	Extremely important

Living with parents whose home is located outside of Davis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Living with someone other than parents whose workplace or school is located outside of Davis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire for urban environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire for rural environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of housing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to family or friends who live outside of Davis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire for better weather/topography	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Infrequent trips to campus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

q_0079: What best describes the place you are living? (Please answer for where you live locally.)

- In a dorm
- Alone in an apartment, house, or other unit
- In an apartment, house, or other unit with roommates or housemates
- In an apartment, house, or other unit with my family or partner (or others with whom I share some income -- not including conventional roommates)
- In an apartment, house, or other unit with both a family/partner and roommates/housemates

[If not living in a dorm or alone]

q_0080: How many people live with you? (Please answer for where you live locally.)

- 1 other person with you (2 people total)
- 2 other people (3 including you)
- 3 other people (4 including you)
- 4 other people (5 including you)
- 5 other people (6 including you)
- 6 other people (7 including you)
- 7 other people (8 including you)
- 8 other people (9 including you)
- 9 or more other people (10 or more including you)

[If not living in a dorm or alone]

q_0081: How many people of each age category are there where you live (including yourself)? (Please answer for where you live locally.)

age under 6: _____
age 6-15: _____
age 16-17: _____
age 18-64: _____
age 65 or older: _____

q_0082: Do you have access to a car (for driving to campus, if you wanted to use it)?

- Yes
- No

q_0083: Do you currently have a UC Davis parking permit?

- No, I don't have one

Yes, I have:

- Annual (or multi-year) permit
- Monthly or quarter permit
- Daily permits (such as complimentary GoClub parking permit)

[If has parking permit]

q_0084: Which type of parking permit do you have?

[Dropdown list:]

- A permit
- 2-person A Carpool permit
- 3-person A Carpool permit
- Bike commuter A permit
- C permit
- 2-person C Carpool permit
- 3-person C Carpool permit
- K permit
- L permit
- M permit
- N permit
- Vanpool permit
- Complimentary commuter or GoClub permit
- Disabled permit
- Retired permit

q_0085: Do you own (or have access to) a functioning bike?

- Yes
- No

[If owns a bike]

q_0086: Approximately how much did you spend on your bike? If you have more than one, please tell us about the bike you would use for transportation to/on campus.

[\$numerical write-in]

q_0087: How many years have you been at UC Davis (in any role)?

[dropdown list]

- 0 (this is my first)
- 1 year
- 2 years
- 3 years
- [... each year listed ...]
- 18 years
- 19 years
- 20 years or more

q_0088: In what year were you born?

[Dropdown list]

- 1992
- [... all years listed between...]
- 1901
- 1900

q_0089: What is your highest level of education?

- No formal education
- Some grade school or high school
- High school diploma or equivalent
- Some college
- Associate degree or technical school certificates
- Bachelors' degree
- Some graduate school
- Graduate degree(s)

[For employees only]

q_0090: What is the approximate total annual combined income of all the working adults in your household (write an average if it varies from year to year)?
\$[numerical write-in]

q_0091: How regularly do you wear a helmet when you ride a bicycle to campus?

- Never
- Rarely
- Usually
- Always

Optional

[If indicated that work/school location is outside Davis (in q_0005)]

q_0092: Since your office or department is outside of Davis, we do not need any further information from you at this time. But thanks for volunteering to participate! You are still eligible to enter the drawing for a \$25 Downtown Davis gift card, if you wish.

[If indicated that recently graduated (in q_0001)]

q_0093: Since you are no longer a student at UC Davis, we do not need any further information from you at this time. But thanks for volunteering to participate! You are still eligible to enter the drawing for a \$25 Downtown Davis gift card, if you wish.

[If indicated "retiree" (in q_0001)]

q_0094: Since you are no longer an employee of UC Davis, we do not need any further information from you at this time. But thanks for volunteering to participate! You are still eligible to enter the drawing for a \$25 Downtown Davis gift card, if you wish.

q_0095: Is it okay for us to contact you again in the future? Please check all that apply:

- No, I prefer not to be contacted again.
- Yes, with questions about my survey.
- Yes, if I win the drawing for a \$25 Downtown Davis gift card.

[If yes, okay to contact]

q_0096: If you answered “yes” to any of the above questions, please provide the following contact information. This information will ONLY be used for the purposes you specified.

Name: _____

Daytime phone number: _____

Email address: _____

q_0097: Optional: Is there anything else you would like to tell us about transportation at UC Davis? We welcome any additional comments in the space below.

Thank you!

Thank you for completing this survey!

Figure 11. Sample screenshot of a page from the online survey

ITS UC DAVIS
INSTITUTE of TRANSPORTATION STUDIES

2010-11 Campus Travel Survey

0% 100%

*What is your primary role at UC Davis?

- Undergraduate student (including Post-bac)
- Graduate student
- Faculty
- Staff
- Visiting scholar
- Post doc
- Recent graduate
- Retiree

*What type of graduate program are you in?

- Master's
- PhD
- Law
- MBA
- Veterinary
- Ed.D. or CANDEL
- Other:

*Where is your office, lab, or department? (That is, wherever you usually spend your time when you travel to work or school at UC Davis)

- On the Davis campus, in the **Central campus** area (including everything on [this map](#) (right click to open in a new tab)) -- **this is most people**
- On the Davis campus, in the **West campus** area (west of SR 113)
- On the Davis campus, in the **South campus** area (south of I-80)
- Technically off-campus, but **within the city of Davis**
- Outside of Davis**

[Exit and clear survey] Previous Next

Appendix B: Changes in the 2010-11 survey instrument and suggestions for the future

The following changes were new in the 2010-11 survey:

- Role questions (*q_0001*): as recommended in the 2009-10 report, we offered “retiree” as an answer option to *q_0001*, and we excluded respondents who indicated this choice from the analysis.
- In the future, we may refine options given to respondents who were away all week (question *q_0012*) to distinguish between those permanently/normally away from campus and those temporarily away from campus.
- We eliminated the question about vehicle type (truck, car, etc.), replaced it with a more direct question about fuel type of the vehicle, and also asked respondents to estimate the fuel economy of the gasoline or diesel vehicle they traveled to campus in during the reference week (*q_0023* and *q_0024*). Due to concerns about the inaccuracy of self-reported fuel economy, we would recommend discontinuing *q_0023* and *q_0024* for the 2010-11 survey.
- As suggested in the 2009-10 report, we asked bus and train riders to indicate which service(s) they used on each day (*q_0026* and *q_0028*). The responses to these questions proved cumbersome to analyze, so we recommend that these questions are revised or removed for the 2010-11 survey.
- We asked respondents who indicated riding the bus or train whether they drove or got a ride to the transit station (*q_0029*), and if so, how many miles they live from this transit station (*q_0030*). This question is part of our ongoing efforts to capture multimodal travel (especially travel that generates VMT and GHG emissions) without making the survey too cumbersome.
- We replaced a vague question about intent to bring bicycles home with a more direct question, "What are your reasons for storing this bike on campus overnight?" (*q_0032*).
- We changed the answer format of the question about the number of minutes it takes to get to campus to a numerical write-in, rather than a categorical choice. The purpose of this change was twofold: to obtain more precise answers, and to enable comparisons between self-reported time and GIS-estimated time by role and housing location.
- We revised the question about typical circulator mode to instead ask respondents to estimate in percent how much they typically use each mode to get around campus (*q_0039*).
- We removed the one-time questions about detailed Unitrans use (which lines, type of ticket among grad students).
- Regarding crashes, this year we only asked about bicycle crashes, although we still distinguished between on- and off-campus incidents, asked whether the incident required a hospital visit, and asked if a police report was filed.
- Regarding bike theft, we added several questions about where the bicycle was, what it was locked to, what kind of lock was being used, and the value of the bicycle when it was stolen. We asked the same questions about bicycles stolen off campus (*q_0051-65*). This sort of detail was meant to be a one-time

section, and we recommend that the bicycle theft section be substantially simplified for next year's survey.

- The attitudinal and behavioral questions *q_0066*, *q_0071*, *q_0073*, and *q_0074*, and *q_0076* are unique to the 2010-11 survey (replacing *Q0066* through *Q0068* in the 2009-10 survey). Though the results to these questions are not discussed in detail in the report, it is anticipated that the data will be used in future statistical analysis.
- In the results of each campus travel survey, it has become apparent that when freshmen become sophomores, they tend to bicycle less frequently to campus, opting to take the bus instead. In an attempt to better understand this trend, this year we asked sophomores directly, "Do you bike to class as often now as you did your freshman year?" (*q_0068*), and if not, "Why do you bike less now? Please indicate whether each of the following is true or not, and if it is true, please rate how important a reason it is for why you are biking less now." (*q_0069*). These questions can be excluded from next year's survey.
- Given the disproportionate number of staff who live outside of Davis and the substantially higher tendency of those living outside of Davis to drive alone to campus, this year we asked employees who lived outside of Davis about their reasons for living outside of Davis (*q_0077*). We also asked all employees about whether they typically run certain types of errands on the way home from campus. We hope to use these results in future analysis to inform the reasons employees are more likely to live outside of Davis or drive to campus.
- We moved several important partitioning questions to earlier in the survey, including questions on gender and housing location (*q_0007* and *q_0008*, respectively).
- We did not ask graduate students question *q_0004* about whether they are paid employees of UC Davis for AVR calculation. Next year, we will ask both undergraduate and graduate students whether they are paid employees.

A few ongoing challenges include the following:

- How to reduce the burden on respondents, with particular attention to reducing the perceived time cost and effort required to complete the survey.
- How to measure multimodal travel, without the survey becoming too cumbersome.
- How to measure typical and summer travel, without the survey becoming too cumbersome.
- How (and whether) to measure daily transit ridership by agency, without the survey becoming too cumbersome.
- How to properly define telecommuting, perhaps an increasingly fuzzy concept as more people work anywhere, anytime without thinking of it as replacing a physical trip. Assessing the extent that remote work replaces a physical trip is challenging, as is finding appropriate language for referencing this kind of work.

Appendix C: Text of the recruitment emails

Initial recruitment email:

From: Campus Travel Survey <travelsurvey@ucdavis.edu>

To: <...@ucdavis.edu>

Subject: 2010-11 Campus Travel Survey

Dear UC Davis Student [Employee],

You have been selected as part of a small group of students, faculty, and staff to participate in the 2010-2011 UC Davis Campus Travel Survey. This survey provides campus planners with valuable feedback on how people get to campus and their experiences with transportation programs. It should take less than 15 minutes to complete. As a token of our appreciation, we're offering anyone who completes the survey entry into a drawing to win one of ten \$25 Downtown Davis gift cards!

<http://davisdowntown.com/news/gift-cards>

Please do not take the survey if you are under 18 years old.

To start the survey, click on the link below:

<http://survey.its.ucdavis.edu>

Thanks for your participation in this year's survey!

Best regards,

Joshua Miller, Graduate student, Institute of Transportation Studies

Susan Handy, Professor, Institute of Transportation Studies

Cliff Contreras, Director, Transportation and Parking Services

Reminder recruitment email

From: Campus Travel Survey <travelsurvey@ucdavis.edu>

To: <...@ucdavis.edu>

Subject: 2010-11 Campus Travel Survey

Dear UC Davis Student [Employee],

Last week we invited you to take the 2010-11 Campus Travel Survey. If you have already done so, thank you! And you can disregard this message. If not, I would like to encourage you to take the survey.

You may have tried to take the survey already and stopped due to long loading times; please forgive us for our slow servers in this time of tight budgets. Please try the survey again, and contact travelsurvey@ucdavis.edu if you still experience delays.

Your responses will provide valuable feedback on how people get to campus and their experiences with

transportation programs. It should take less than 20 minutes to complete. Because the survey asks about your activities last week, the sooner you take it, the easier it might be to recall those answers. As a token of our appreciation, we're offering anyone who completes the survey entry into a drawing to win one of ten \$25 Downtown Davis gift cards!

<http://davisdowntown.com/news/gift-cards>

Please do not take the survey if you are under 18 years old.

To start the survey, click on the link below:

<http://survey.its.ucdavis.edu>

Thanks for your participation in this year's survey!

Best regards,

Joshua Miller, Graduate student, Institute of Transportation Studies

Susan Handy, Professor, Institute of Transportation Studies

Cliff Contreras, Director, Transportation and Parking Services

Appendix D: Calculation of Average Vehicle Ridership (AVR)

AVR (average vehicle ridership) is a ratio of the number of person-arrivals to private-vehicle-arrivals. If everyone drove by themselves to campus, the campus AVR would be 1.0. Higher AVR values (greater than 1.0) indicate more carpooling and/or use of alternative modes of transportation.

To compare AVR statistics on the Davis campus with other UC campuses, we calculate AVR using a standard formula developed by the South Coast Air Quality Management District (AQMD) in “Rule 2202 – On Road Motor Vehicle Mitigation Options.”¹⁴ We attempt to adhere to the AQMD formula, although our overall survey methodology deviates to some extent from that prescribed by the AQMD.¹⁵ The AQMD formula excludes weekend travel (considering Monday through Friday only) and excludes on-campus residents (considering travel among off-campus residents only). It includes adjustments for vehicle occupancy and the use of zero-emissions vehicles (ZEV).

In particular, we use the following formula:

$$AVR = \frac{\text{Total weekly arrivals}}{\text{Weekly vehicle arrivals}} = \frac{(\text{Arrivals by all modes}) + (\text{Employee telecommuting days}) + (\text{CWW days})}{(\text{Drive alone arrivals}) + (\text{Fractional carpool arrivals})}$$

with:

Arrivals by all modes = a count of all respondents arriving by bus, driving, carpooling, getting a ride, walking, biking, skating, and riding transit on Monday, plus the same for Tuesday, Wednesday, etc. through Friday (using question *q_0017* in the 2010-11 survey).

Employee telecommuting days = a count of respondents telecommuting on Monday, plus those doing so on Tuesday, etc. through Friday. These are based on responses to questions *q_0012* and *q_0014* for any respondents who traveled some days and telecommuted other days. But for respondents who indicated no travel during any of the seven days of the reference week (in *q_0012*) and then indicated the reason for no travel was telecommuting (in *q_0013*), we assume the respondent telecommuted all five days of the reference week.

Employee CWW days = a count of respondents reporting that they did not travel on Monday because they had a CWW (compressed work week) day off, plus those who did so for Tuesday, Wednesday, etc. through Friday (using responses to questions *q_0012* and *q_0014*).

Drive-alone arrivals = a count of respondents arriving by driving alone on Monday, plus those doing so on Tuesday, Wednesday, etc. through Friday (using responses to *q_0017*). As an adjustment for the use of ZEV vehicles, we exclude from the count any arrivals by a respondent who has indicated using an all electric vehicle for their travel during the reference week (in question *q_0022*). (We would have also excluded those indicating use of a hydrogen fuel cell vehicle in question *q_0022*, but none did.)

¹⁴ As of May 1, 2010, this rule is available online (at http://www.aqmd.gov/trans/doc/regform/all_registration.pdf).

¹⁵ For instance, the AQMD specifies that response to the survey must be 90 percent response rate, whereas we rely on surveying only a sample and weighting the responses.

Fractional carpool arrivals = A count of the fractions of vehicle-arrivals accounted for those arriving in carpools (or getting rides) for each day Monday through Friday. In particular, for each day a respondent carpools (or gets a ride, using *q_0017*) we add to the arrival count a fraction equal to one divided by the total number of people in the carpool (using *q_0019*) or the number of passengers dropped off by the driver (using *q_0020*). We exclude from the count any arrivals by a respondent who has indicated using an all-electric vehicle (in question *q_0022*).

In all cases, the estimated number of arrivals for the entire campus community is a projection. In particular, we weight (and expand) the sample responses by role, based on the 3,084 valid responses to question *q_0017* (see Table 8).

We calculate AVR both excluding and including on-campus residents, and by each role group. The AQMD and most other UC campuses exclude on-campus residents and most only calculate AVR for employees rather than for students. The inclusion of student employees can greatly change AVR statistics, though to a different extent at different campuses. As we did last year, this year we included a question about whether student respondents are also paid employees of UC Davis (question *q_0004*) to allow us to estimate AVR including student employees.

Appendix E: Geocoding and network distances

We used the ESRI Streetmap USA dataset to do all of the geocoding and network route assignments. It is based on the TIGER/Line 2000 streets dataset produced by the U.S. Census Bureau, and has been enhanced by ESRI and Tele Atlas. The Streetmap dataset was released by ESRI in 2006, but it only represents the ground condition as of 2000. As a result, parts of some rapidly developing areas such as Natomas, West Sacramento, and Elk Grove are not fully represented. This made it difficult to geocode some of the addresses in these areas. However, in all of these locations there were at least some roads present before the most recent development occurred. If the exact street was not available, then we geocoded the point to the nearest pre-existing road. In all cases, the differences were minor and expected to be negligible.

Geocoding residential locations

We used address information to geocode points to the ESRI Streetmap USA dataset. First, we used SPSS to filter out empty records. Then we used Microsoft Excel to divide the data into separate tables for each subcategory (On Campus, Off Campus in Davis, and Outside Davis), and concatenate the street names into a single field. This allowed us to input the data into an appropriate address locator that would be able to automatically geocode as many addresses as possible.

Inputting the data directly into an address locator resulted in successful matching of about half the addresses (matched automatically, see Table 91). Because there was the potential for a small percentage of addresses to be matched incorrectly by the address locator, we also manually verified that the match address was the same as the input address. We geocoded unmatched addresses by manually placing points in the correct locations, or by modifying the input addresses so that they matched correctly using an automatic address locator. In total, about 94 percent of the sample provided addresses that we could successfully geocode.

Table 91. Geocoding results

	Number of records (unweighted sample)	Percent of records
Matched automatically	1,545	50.10%
Matched manually	1,362	44.16%
Total matched	2,907	94.26%
Unmatched	177	5.74%
Total	3,084	100.00%

Network distance

The network route assignments were created using the ArcGIS Network Analyst extension and the ESRI Streetmap USA dataset (the same dataset used to geocode the residential locations). All distances were calculated from the residential location points to a point located on the UC Davis campus at the corner of Hutchison Drive and California Avenue, near the Silo. The network route assignments were calculated by optimizing for the fastest travel times (based on assumptions about the expected speed of travel on each facility type), which was deemed to produce more realistic routes than optimizing for distance, because it produces routes that favor major roads and highways where possible. While this is especially appropriate for those traveling by car, manual inspection of alternative routes indicated that the shortest-time routes also seemed to be more realistic for bike and walk trips, where differences existed. Note that in this analysis, we used the street network, which was *not* augmented to include additional bike- and pedestrian-only links,

which are especially prevalent in Davis.

Comparability with results from previous surveys

We used the same procedures to geo-code and calculate network distances as were used in the 2009-10 and 2008-09 Campus Travel Surveys, so results from the 2010-11 survey should be comparable with these surveys. Because the 07-08 survey employed a different method both to collect data on the respondents' residential locations (allowing respondents to click on a map versus typing cross streets into a text field); to geo-code points; and to calculate network distances, the estimated distances and calculations based on them (miles traveled and emissions) are not comparable to later survey years.

Appendix F: Fuel energy assumptions used for calculation of CO₂ emissions

We calculate pounds equivalent of carbon per gallon of fuel = mass of carbon per unit energy × energy per gallon of fuel × oxidation rate × molecular weight of carbon, as done by the Environmental Protection Agency (see <http://www.epa.gov/otaq/climate/420f05001.htm#carbon>). We assume inputs for this formula as shown in Table 92.

Table 92. Fuel energy assumptions used for calculating carbon emissions

Item	Value	Source
Mass of carbon per unit energy for diesel fuel	19.95 Tg Carbon / QBtu	U.S. Environmental Protection Agency, <i>2009 U.S. Greenhouse Gas Inventory Report</i> , Table A-39 (Distillate Fuel), available online: http://epa.gov/climatechange/emissions/usinventoryreport.html
Mass of carbon per unit energy for CNG	14.47 Tg Carbon / QBtu	U.S. Environmental Protection Agency, <i>2009 U.S. Greenhouse Gas Inventory Report</i> , Table A-31 (Natural Gas), available online: http://epa.gov/climatechange/emissions/usinventoryreport.html
Energy per gallon diesel	138,691 Btu/gallon	U.S. Department of Energy, Energy Information Administration, online Energy Calculator, available online: http://www.eia.doe.gov/kids/energyfacts/science/energy_calculator.html
Energy per cubic ft CNG	1,028 Btu/ cubic foot	U.S. Department of Energy, Energy Information Administration, online Energy Calculator, available online: http://www.eia.doe.gov/kids/energyfacts/science/energy_calculator.html
Oxidation rate	0.99	U.S. Environmental Protection Agency, Emission Facts (EPA420-F-05-001 February 2005), available online: http://www.epa.gov/otaq/climate/420f05001.htm#carbon
Molecular weight of carbon	44/12 ≈ 3.667	U.S. Environmental Protection Agency, Emission Facts (EPA420-F-05-001 February 2005), available online: http://www.epa.gov/otaq/climate/420f05001.htm#carbon

Appendix G: Weighting by Gender Memo

To: Cliff Contreras

From: Joshua Miller and Susan Handy

Date: May 11, 2011

Subject: Weighting by Gender, 2010-11 Campus Travel Survey

Issue

Since the 2007-08 academic year, data from the annual campus travel survey has been used to estimate the overall mode split of students and employees physically traveling to campus on an average weekday. Data are usually weighted by role group (freshmen, sophomore, ... , staff) to account for differences in response rates, since mode split tends to vary substantially by role. This year we noticed a gender bias in the response rates to the 2010-11 survey--females are substantially overrepresented among undergraduates, graduate students, faculty, and staff, while males are substantially underrepresented. This bias would not matter if females and males had the same transportation patterns when controlling for role group; however, we have observed that controlling for role group, females are on average significantly less likely to bike and more likely to ride the bus to campus than males (see Table 94).

Table 7 shows gender characteristics of the unweighted sample compared to the population. While the sample is disproportionately comprised of females for each group, the bias is smallest for staff and largest for undergraduates (4.4 and 16.9 percentage points between sample and population proportions, respectively).¹⁶ This may mean that there is bias in the results presented in this report for any responses that tend to differ by gender. With regard to mode split, this means that the estimated bike mode share is likely lower than its true value, while the estimated bus mode share is likely higher than its true value.¹⁷

Table 93. Gender percentages among survey respondents compared to population

Gender	Role group							
	Undergraduate		Graduate		Faculty		Staff	
	Sample	Population	Sample	Population	Sample	Population	Sample	Population
% male	27.7%	44.6%	37.6%	50.9%	53.1%	64.9%	37.1%	41.5%
% female	72.3%	55.4%	62.4%	49.1%	46.9%	35.1%	62.9%	58.5%
Valid n	1,442	23,608	728	5,709	303	2,066	380	9,235

¹⁶ Figures for the composition of the campus population by gender are drawn from “Student Headcount by Gender, Fall 2010,” “Employees by Gender and Ethnicity, Fall 2010,” and “Teaching Faculty by Gender, Fall 2010” available on the *UC Davis Facts* website, online at <http://facts.ucdavis.edu/>. These population counts include medical (non-Davis campus) affiliates who are excluded from the survey sample. In addition, the employee count includes employed students, who are not included as employees in the survey sample.

¹⁷ These differences are statistically significant (with p-value < 0.05) based on a t-test of equivalence of means among the female versus male segments of the sample, in particular of the mean share of weekdays that respondents biked and rode the bus, respectively. There was also a statistically significant difference (with p-value < 0.05) in the share telecommuting (1 percent among women versus 2 percent among men). There were no statistically significant differences by gender in the share driving alone, walking, or carpooling.

Table 94. Comparison of mode split, physical travel, and carbon emissions, by gender

Role	Residential location	Gender	Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train	Work from home	Other no travel	Annual tons of CO ₂
<i>Undergrad</i>	Within Davis	Female	43.6%	7.7%	6.0%	4.4%	31.3%	0.1%	0.0%	6.9%	0.15
		Male	54.4%	6.4%	6.5%	3.4%	22.8%	0.6%	0.0%	5.9%	0.12
		Total	46.7%	7.3%	6.2%	4.1%	28.8%	0.3%	0.0%	6.6%	0.14
	Outside Davis	Female	1.8%	2.0%	64.5%	10.4%	5.4%	3.0%	0.0%	12.9%	4.09
		Male	2.7%	0.0%	59.1%	16.1%	8.8%	1.6%	0.0%	11.8%	4.11
		Total	2.0%	1.4%	63.0%	12.0%	6.3%	2.6%	0.0%	12.6%	4.10
	Total	Female	40.4%	7.2%	10.5%	4.9%	29.3%	0.4%	0.0%	7.3%	0.45
		Male	50.5%	5.9%	10.5%	4.4%	21.7%	0.6%	0.0%	6.3%	0.42
		Total	43.3%	6.8%	10.5%	4.7%	27.1%	0.5%	0.0%	7.1%	0.44
<i>Graduate</i>	Within Davis	Female	50.7%	5.4%	24.8%	5.9%	5.3%	0.0%	1.4%	6.3%	0.17
		Male	61.4%	8.8%	14.9%	3.5%	3.7%	0.0%	2.0%	5.6%	0.11
		Total	54.8%	6.7%	21.1%	5.0%	4.7%	0.0%	1.6%	6.1%	0.14
	Outside Davis	Female	3.6%	0.3%	55.9%	6.6%	2.9%	7.7%	5.6%	17.3%	3.06
		Male	1.5%	0.6%	47.7%	11.6%	3.6%	11.9%	9.7%	13.3%	3.83
		Total	2.9%	0.4%	53.4%	8.2%	3.1%	9.0%	6.9%	16.1%	3.30
	Total	Female	40.8%	4.4%	31.4%	6.1%	4.8%	1.7%	2.3%	8.7%	0.78
		Male	51.4%	7.5%	20.4%	4.9%	3.7%	2.0%	3.3%	6.9%	0.73
		Total	44.7%	5.5%	27.4%	5.6%	4.4%	1.8%	2.6%	8.0%	0.76
<i>Faculty</i>	Within Davis	Female	40.5%	7.7%	24.2%	6.4%	1.0%	0.2%	4.7%	15.3%	0.17
		Male	51.2%	4.9%	25.9%	5.0%	2.0%	0.0%	2.3%	8.6%	0.18
		Total	46.7%	6.0%	25.2%	5.6%	1.6%	0.1%	3.3%	11.5%	0.18
	Outside Davis	Female	3.0%	0.0%	51.5%	14.1%	2.0%	3.3%	8.9%	17.4%	3.08
		Male	2.0%	0.0%	55.2%	9.2%	0.8%	7.2%	10.0%	15.6%	2.97
		Total	2.5%	0.0%	53.2%	11.9%	1.4%	5.0%	9.4%	16.6%	3.03
	Total	Female	24.4%	4.4%	35.9%	9.7%	1.4%	1.5%	6.5%	16.2%	1.42
		Male	35.9%	3.4%	35.0%	6.3%	1.6%	2.2%	4.7%	10.8%	1.05
		Total	30.5%	3.8%	35.4%	7.9%	1.5%	1.9%	5.5%	13.3%	1.22
<i>Staff</i>	Within Davis	Female	34.6%	2.7%	37.3%	7.8%	5.8%	0.0%	0.2%	11.5%	0.32
		Male	48.7%	3.4%	23.9%	11.3%	3.9%	0.3%	0.5%	7.9%	0.20
		Total	40.8%	3.0%	31.4%	9.4%	5.0%	0.1%	0.3%	9.9%	0.27
	Outside Davis	Female	1.0%	0.7%	61.7%	18.2%	2.4%	0.1%	1.5%	14.4%	3.24
		Male	3.1%	1.8%	52.0%	14.8%	3.1%	3.1%	5.2%	16.9%	3.21
		Total	1.6%	1.1%	58.6%	17.1%	2.6%	1.1%	2.7%	15.2%	3.23
	Total	Female	14.6%	1.5%	51.8%	14.0%	3.8%	0.1%	1.0%	13.2%	2.06
		Male	27.7%	2.7%	36.9%	12.9%	3.5%	1.6%	2.7%	12.1%	1.59
		Total	19.5%	1.9%	46.3%	13.6%	3.7%	0.6%	1.6%	12.8%	1.88
<i>Overall</i>	Within Davis	Female	43.5%	6.8%	12.5%	5.1%	24.2%	0.1%	0.3%	7.5%	0.17
		Male	54.3%	6.2%	12.3%	4.9%	14.9%	0.4%	0.6%	6.4%	0.14
		Total	47.1%	6.6%	12.4%	5.0%	21.1%	0.2%	0.4%	7.2%	0.16
	Outside Davis	Female	1.6%	0.9%	60.9%	14.7%	3.1%	2.0%	2.3%	14.6%	3.39
		Male	2.7%	1.1%	53.2%	13.9%	3.9%	4.4%	5.4%	15.4%	3.42
		Total	2.0%	1.0%	58.4%	14.4%	3.3%	2.8%	3.3%	14.9%	3.40
	Total	Female	34.3%	5.5%	23.1%	7.2%	19.6%	0.5%	0.7%	9.1%	0.87
		Male	43.6%	5.1%	20.8%	6.8%	12.6%	1.2%	1.6%	8.3%	0.82
		Total	37.4%	5.4%	22.3%	7.0%	17.3%	0.8%	1.0%	8.8%	0.86

Not all of these differences have been tested for statistical significance.

Table 94 shows the differences in mode split, physical travel and telecommuting, and estimated annual carbon emissions by gender. The differences in the percent of males and females biking to campus from within Davis tend to be about 10 percent for each role group.

Method

To address this potential gender bias, we created a new set of weights that adjusts for the underrepresentation of male undergraduates, graduates, faculty, and staff.

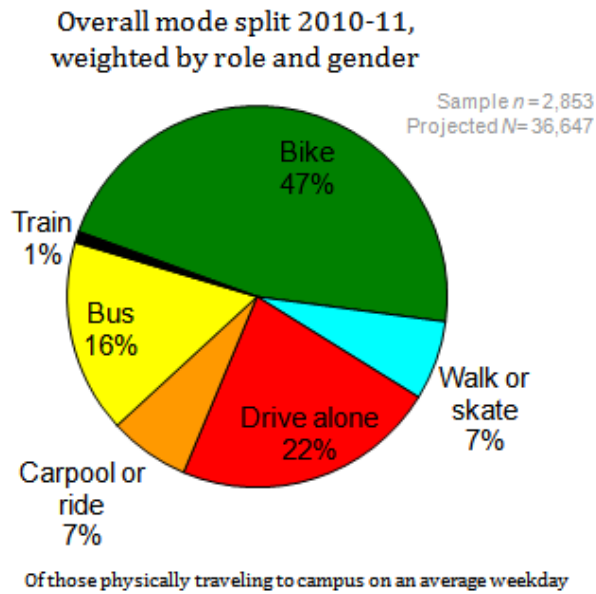
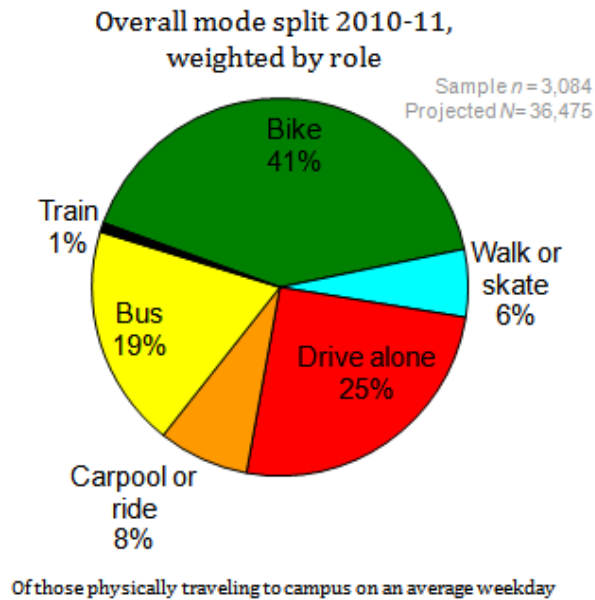
Table 95. Weight and expansion factors, by role and gender

Role group	Population (N)	Based on valid responses to q_0017, successful geocoding, and gender			
		Valid responses (n)	Weight factor (N _i /N)/(n _i /n)	Expansion factor (N _i /n _i)	Weighted sample size
<i>Undergraduate</i>	23,608	1442	1.149945	16.371706	1,658
Female	13,067	1043	0.879984	12.528284	918
Male	10,541	399	1.855633	26.418546	740
<i>Graduate</i>	5,709	728	0.550823	7.842033	401
Female	2,906	454	0.449597	6.400881	204
Male	2,803	274	0.718548	10.229927	197
<i>Faculty</i>	2,066	303	0.478929	6.818482	145
Female	725	142	0.358619	5.105634	51
Male	1,341	161	0.585041	8.329193	94
<i>Staff</i>	9,235	380	1.707012	24.302632	649
Female	5,399	239	1.586714	22.589958	379
Male	3,836	141	1.910921	27.205674	291
Overall	40,618	2,853	1.000000	14.236944	2,853

The expansion factors in boldface type are those used to estimate the results in the next section.

Results

The following figures show the comparison between mode split results weighted only by role (used in the 2008-09, 2009-10, and 2010-11 reports) in comparison to results weighted by role and gender. We find that weighting by gender substantially impacts the mode split results: of those physically traveling to campus on an average weekday, 47 percent versus 41 percent bike, 16 percent versus 19 percent ride the bus, and 22 percent versus 25 percent drive alone. We think that mode split estimates are more heavily influenced by applying gender weights than other aspects of the report.



Next Steps

For the purpose of comparability to the previous two surveys (which were not weighted by gender), we report this year's results weighted primarily by role, with this separate section that summarizes the differences in results when weighted by role and gender. Given the substantial difference in mode split and potential effects on VMT and carbon emissions, however, we think it is important to apply gender weights in our analysis of future survey results. In summer 2011, we plan to create gender weights for previous survey data to correct for potential gender biases in previous years and obtain consistent results across surveys.