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Results of the 2011-12 Campus Travel Survey

June 2012

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RESULTS OF THE 2011-12 CAMPUS TRAVEL SURVEY

Institute of Transportation Studies

and

Transportation and Parking Services

University of California, Davis

Report prepared by

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About the Campus Travel Survey

The UC Davis campus travel survey is a joint effort by the Transportation & Parking Services (TAPS) and the Sustainable Transportation Center, part of the Institute of Transportation Studies at UC Davis. Since 2007 the survey has been administered 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 carbon emissions. Over the past five years, the travel survey results have been used to assess awareness and utilization of campus transportation services and estimate demand for new services designed to promote sustainable commuting at UC Davis. Data from the campus travel survey have also provided researchers with valuable insights about the effects of attitudes and perceptions of mobility options on commute mode choice. This year's survey is the sixth administration of the campus travel survey.

The 2011-12 survey was administered online in October 2011, distributed by email to a stratified random sample of 23,953 students, faculty, and staff (out of an estimated total population of 40,728). About 14.5 percent (3,468 individuals) responded to this year's survey, with about 13 percent actually completing it. For the statistics presented throughout this report, we weight the responses by role group (freshmen, sophomore, junior, senior, masters student, PhD student, faculty, and staff) and gender so that the proportion of respondents in each group reflects their proportion in the campus population.

Main findings

Overall mode share
On an average weekday, about 89 percent of people physically travel to campus (approximately 36,200 people, including those living on campus). Among these, about 46 percent bike to get there, 6 percent walk or skate, 24 percent drive alone, 6 percent carpool or get a ride, 18 percent ride the bus, and 1 percent ride the train. 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.

Figure 1. Overall mode share, 2011-12

Because some people use different travel modes on different days, the total number of regular bicyclists or transit-riders, for instance, is substantially larger than the number using each mode on any given day. In particular, about 54 percent reported biking as their primary means at least once during the week. Similarly, about 11 percent carpooled or got a ride to campus, 25 percent rode the bus, and 1.5 percent rode the train at least once during the week for most of the distance to campus.

Change in mode share, 2010-11 to 2011-12
One of the main purposes of the Campus Travel Survey is to collect comparable data each year for the assessment of trends over time. The questions and calculations used to estimate mode share in this year's survey are identical to those used in 2010-11. In addition, the results of each year are weighted by role and gender to correct for differences in response rates between subsets of the population over time. Notably, the overall share biking to campus increased by 3.3 percentage points over the last year, while the share traveling to campus in personal vehicles declined by 3.1 percentage points. Both of these changes are statistically significant. Other modes experienced small changes, however these are not significant across the population. The share physically traveling to campus on an average weekday did not change significantly.

Table 1. One year change in overall mode share, 2010-11 to 2011-12

	Percentage-point change in share of people doing each on an average weekday							Physically traveling to campus
	Among those physically traveling to campus:							
			Personal vehicle					
Years of comparison	Bike	Walk	Any	Drive alone	Carpool or ride	Bus	Train	
2010-11 to 2011-12	3.3% **	0.2%	-3.1% **	-1.1%	-2.0% **	-0.2%	0.2%	-1.0%

** Statistically significant difference with $p < 0.05$ 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.

Carbon dioxide-equivalent emissions
Each year, we use data on mode share, vehicle occupancy, and geocoded travel distance to estimate the amount of carbon dioxide-equivalent (CO_2e) emitted from commuting to campus. We estimate that UC Davis students and employees generate 7.7 pounds of CO_2e traveling to campus on an average weekday, compared to 7.5 pounds in 2010-11 and 8.6 pounds in 2009-10.

Figure 2. Daily carbon emissions per capita from commuting, 2008-09 to 2011-12
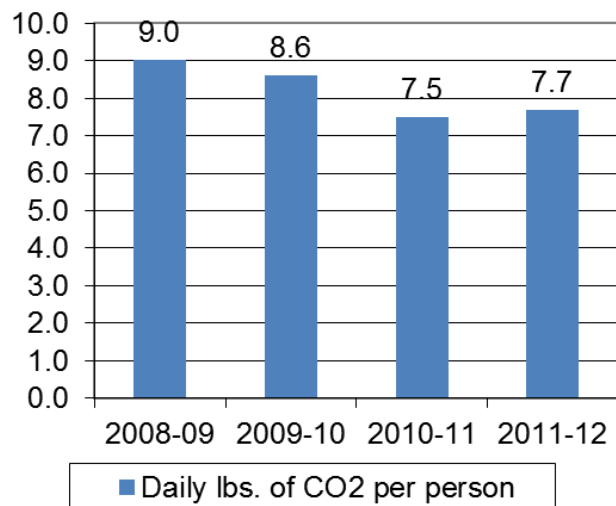
Figure 3. Annual CO₂e emissions saved
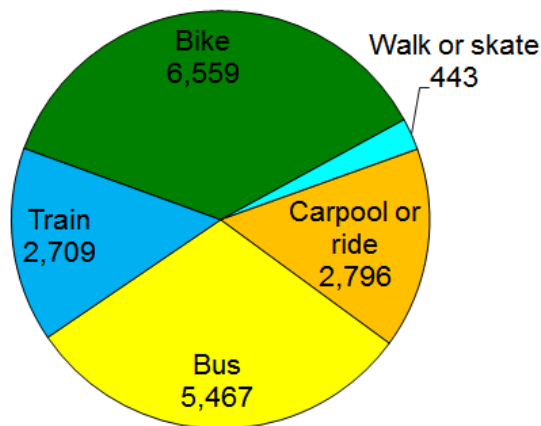
Relative to emissions that would be produced if these same travelers drove alone.

As an assessment of the extent that alternative transportation reduces CO_2e emissions, we might consider that if everyone drove alone to campus but all else were unchanged (e.g. distances and frequency of travel), then there would be an additional 17,974 annual metric tons of CO_2e generated, compared to 35,552 tons overall. Figure 3 shows the contribution of each alternative to driving alone to the total emissions saved.

Average Vehicle Ridership

Average vehicle ridership (AVR) is roughly a ratio of the number of person-arrivals to vehicle-arrivals on campus over a five-day workweek, so higher AVR values indicate more carpooling and/or use of alternative modes of transportation. The 2011-12 official AVR for non-student employees living off-campus is 1.78, up slightly from 1.75 in 2010-11. Overall AVR (for the entire campus community) is 3.78, up from 3.51 in 2010-11.

Table 2. Average Vehicle Ridership (AVR), 2007-08 through 2011-12

Role group	Off-campus only					All (on and off-campus)				
	2007-08	2008-09	2009-10	2010-11	2011-12	2007-08	2008-09	2009-10	2010-11	2011-12
Students	1.67	4.76	4.28	4.49	5.29	5.04	5.91	5.25	5.53	6.41
Employees	**1.67**	**1.69**	**1.66**	**1.75**	**1.78**	1.67	1.71	1.66	1.75	1.80
Outside Davis	1.33	1.32	1.26	1.34	1.39	1.33	1.33	1.26	1.34	1.39
Within Davis	4.6	5.17	4.99	4.99	5.98	5.61	6.32	5.99	6.04	7.14
Overall	2.75	2.99	2.83	3.00	3.26	3.2	3.51	3.3	3.51	3.78

Bold indicates the official AVR statistic reported by UC campuses.
See Appendix D for details on AVR calculations.

Figure 4 shows the differences in AVR between all employees, employees and students living within Davis, and employees and students living outside Davis. As shown, the 2011-12 AVR of those living in Davis is substantially higher than in previous years, while the AVR of those living outside Davis is only slightly higher than previous years. The share of the university population living outside of Davis has been remarkably stable at 23 percent over the five years in which the survey has been administered. These results suggest that there is still much progress to be made in encouraging those regularly traveling to campus to live within Davis.

Figure 4. Average Vehicle Ridership, 2007-08 to 2011-12
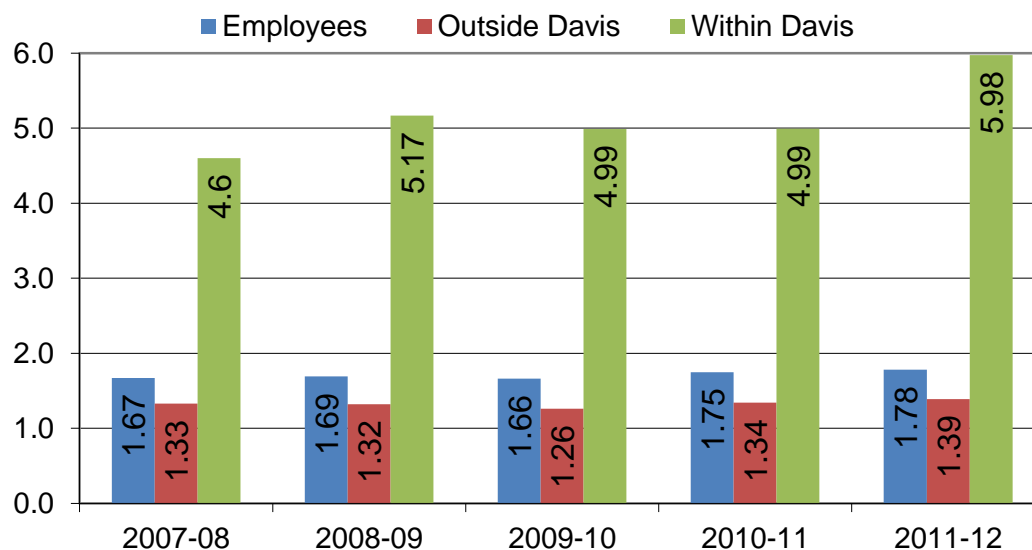
Excludes students and employees who live on-campus. West Village is considered off-campus for this analysis.

Awareness of TAPS and other transportation services

Several services that promote bicycling are well-known and highly utilized across the campus population. The bike tire air stations on campus are the most highly utilized transportation service, with over 40 percent of respondents having used them (Figure 5). Similarly, over a quarter of respondents have used the bike repair stations on campus, and over 80 percent have heard of them, despite these stations being relatively new. As of October 2011, more than a quarter of respondents had heard of the Bicycle Education and Enforcement Program (BEEP), even though it had been implemented only a few months prior. Relatively few know about certain long-standing services such as the Sacramento Region "Commuter Club" or the Enterprise Rental Car Voucher Program.

Figure 5. Awareness of TAPS and other transportation services, 2011-12
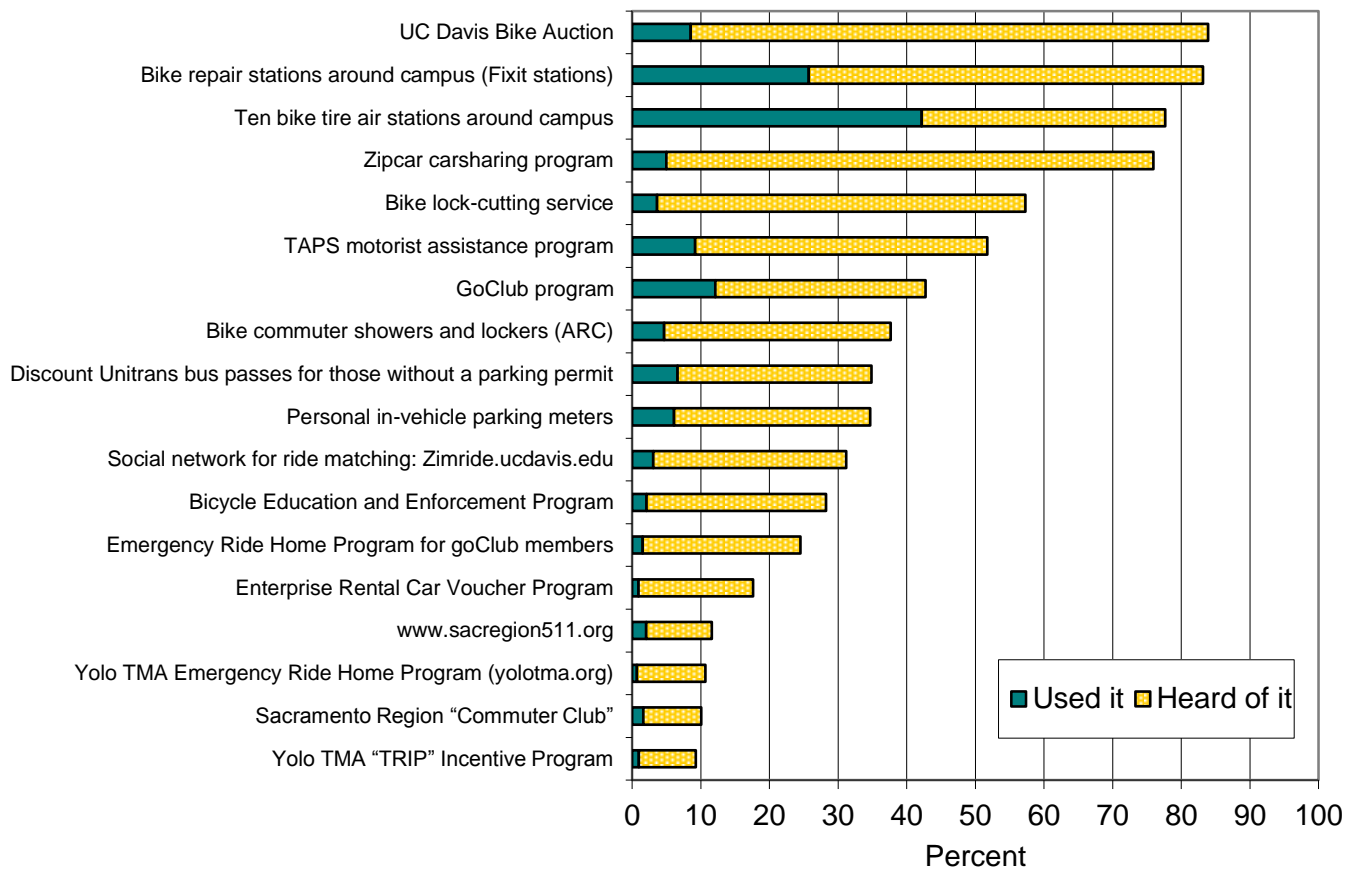
INTRODUCTION

Background

In 2003 the University of California adopted the *UC Policy on Sustainable Practices*, which charges UC campuses with the task of measuring and promoting sustainable commuting. System-wide targets for assessing the sustainability of transportation systems include annual estimation and reporting of Average Vehicle Ridership (AVR) and carbon dioxide emissions for each UC campus. The *UC Policy on Sustainable Practices* also lists mechanisms for reducing commute emissions, including the construction of on-campus housing and expansion of Transportation Demand Management (TDM) programs. In addition to the sustainable transportation goals of the University of California, many universities and colleges around the world face pressures to promote alternatives to driving. These pressures include high costs of expanding parking facilities, air pollution, and traffic congestion. It is essential that campus planners and travel demand managers have recent and accurate information about commuting at their institutions so that they may implement targeted transportation policies, evaluate the effectiveness of current services, share best practices with other institutions, and track commuting behavior over time.

About the campus travel survey

The UC Davis 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. Since 2007 the survey has been administered 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 carbon emissions. Over the past five years, the travel survey results have been used to assess awareness and utilization of campus transportation services and estimate demand for new services designed to promote sustainable commuting at UC Davis. Data from the campus travel survey have also provided researchers with valuable insights about the effects of attitudes and perceptions of mobility options on commute mode choice. This year's survey is the sixth 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), two subsequent surveys conducted in fall 2008-09 and 2009-10 (Lovejoy, Handy *et al.*, 2009 & Lovejoy, 2010), and a fifth conducted in the fall of 2010-11 (Miller, 2011). The next administration of the survey is planned for October 2012.

The 2011-12 survey was administered online in October 2011, distributed by email to a stratified random sample of 23,953 students, faculty, and staff (out of an estimated total population of 40,728). About 14.5 percent (3,468 individuals) responded to this year's survey, with about 13 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) and gender so that the proportion of respondents in each group reflects their proportion in the campus population.
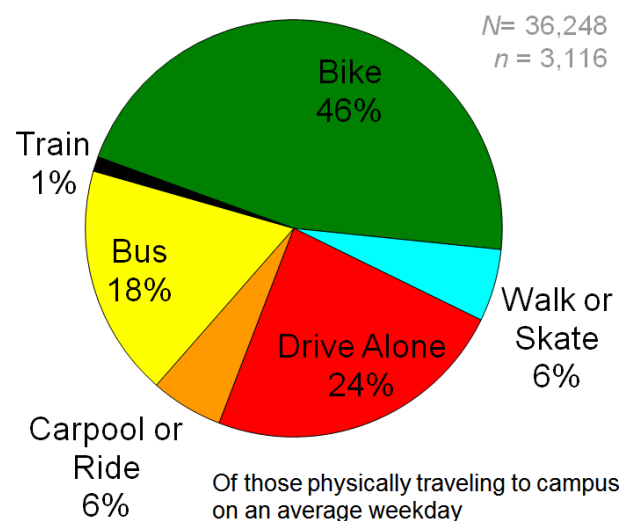
Development of the survey instrument

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 for a full copy of the 2011-12 survey instrument. See Appendix B for a summary of changes in the 2011-12 survey compared to the 2010-11 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 using the server virtualization service offered by the office of Information Educational Technology, administered by Ning Wan and Jeremy Dalbeck (a sample screenshot of the online appearance of the survey is shown in Appendix A). Staff at TAPS, and at the Office of Resource Management and Planning, as well as faculty 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 3.[1] In past years, we assumed that we might expect 20 percent of 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 3). Last year, we assumed varying response rates by stratum to account for these differences. This year, we opted to repeat this approach, assuming that response rates by stratum in previous years would remain relatively consistent. To ensure that we reached minimum sample size targets even with some variation in response rates, we expanded the share of the population sampled to 59 percent (23,953 people), about 8,249 more than were invited in 2010-11. Based on stratum sizes and response rates in previous years, expected response rates varied from just 5 percent among seniors to 30 percent among staff, as shown in

Table 3.

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[1]   For each stratum, the minimum sample size, n, was calculated as $n = \dfrac{z_{\alpha/2}^2 S^2}{e^2 + \dfrac{z_{\alpha/2}^2 S^2}{N}}$, 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 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 $+/-5\%$ ($e = 0.05$); 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 15.

Table 3. Sampling plan for 2011-12, versus 2010-11, 2009-10, 2008-09, and 2007-08

Role group	2011-12				2010-11[b]		2009-10[c]		2008-09[d]		2007-08[e]	
	Assumed population[a]	Number invited	Percent Invited	Target response	Invited	Response	Inv.	Res.	Inv.	Res.	Inv.	Res.
Students	29,387	20,653	70%	10%	45%	18%	37%	25%	38%	22%	36%	23%
Undergraduate	23,659	17,267	73%	8%	40%	17%	32%	24%	32%	20%	31%	22%
Freshmen	3,557	2,514	71%	14%	55%	23%	41%	30%	39%	22%	40%	26%
Sophomores	4,088	4,088	100%	9%	51%	16%	40%	26%	39%	21%	36%	22%
Juniors	6,717	3,832	57%	10%	35%	18%	29%	22%	31%	22%	32%	21%
Seniors	9,297	6,833	74%	5%	33%	12%	26%	19%	24%	17%	21%	20%
Graduate	5,728	3,385	59%	20%	64%	22%	60%	28%	61%	27%	60%	24%
Masters	2,082	2,082	100%	16%	100%	16%	98%	19%	86%	18%	84%	19%
PhD	3,646	1,303	36%	27%	31%	34%	39%	40%	48%	35%	48%	28%
Employees	11,341	3,300	29%	21%	23%	29%	22%	34%	31%	35%	28%	45%
Faculty	2,045	2,045	100%	16%	71%	22%	63%	27%	78%	30%	65%	37%
Staff	9,296	1,238	13%	30%	12%	37%	13%	42%	20%	39%	20%	50%
Overall percent	100%		59%	12%	39%	20%	33%	27%	36%	26%	34%	28%
Overall number	40,728	23,953			15,704	3,084	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 2010-2011 student population summary three-quarter average (available online at http://budget.ucdavis.edu/data-reports/documents/enrollment-reports/current-enrollment/eenrsum_a1011.pdf). "Seniors" includes post-baccalaureate (teaching credential) students; "Masters" includes all academic-program masters students, plus professional-program students in Master of Law, JD, MBA (full time and working professional program), Forensic Science, Master 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 (Miller, 2011).
[c] As reported in (Lovejoy, 2010).
[d] As reported in (Lovejoy, Handy, and Contreras, 2009).
[e] As reported in (Congleton, 2009).

A stratified random sample of 23,953 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 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 compiled 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 2,045 rows of faculty and 1,238 rows of staff were selected for the respective samples.

Survey administration and recruitment of participants

We invited the 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 2010-11 administration, the server on which the survey was hosted was at times unable to handle the large volume of responses, and as a result, many respondents experienced long page loading times. In an effort to prevent these issues in the 2011-12 survey, we utilized the server virtualization service offered by Information Educational Technology (IET) at UC Davis, which allows extra computing power to be added if loading time problems arise. In addition to hosting the server computing at IET, load testing was performed prior to the survey launch under various system configurations until the server demonstrated a capacity to handle the anticipated responses without page loading delays. As a result of extensive load testing and hosting the server with IET, the 2011-12 survey administration went smoothly. On Monday, Oct. 24, nine hourly batches were sent out to between 1,238 and 4,088 email addresses until all 23,953 respondents were invited. Reminder invitations were sent out the following Monday, Oct. 31.

Offering a chance to win a desirable prize is thought to increase overall response to a survey. This year, TAPS allocated $300 for incentives to participate in the 2011-12 survey, which is $50 more than the budget allocated for incentives in the 2010-11 survey. Rather than offering ten $25 Downtown Davis gift cards as in previous years, we opted to offer a drawing to win one of six $50 gift cards, under the rationale that a smaller number of more valuable prizes is more appealing, since the perceived chance of winning is very small in either case. 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 the Davis Downtown Business Association. 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 $50 Downtown Davis gift card, or if instead they preferred not to be contacted. There were 2,252 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 December 2, 2011 and issued the prize shortly thereafter.

Response rate

A total of 3,506 respondents at least commenced the survey (responding to question *Q1*), which is about 14.6 percent of those invited. This rate is substantially lower than the response rate in the 2010-11 survey (20.3 percent). Of those who began the survey, 89 percent (3,116 respondents) completed the survey through question *Q28*, which asked respondents about their mode choice on each day of the reference week. Table 4 shows response rates for this year's survey compared to the previous four surveys. As shown, overall response rates have declined from an average of 26 percent to 13 percent. This decline in response rates is likely influenced by two factors: there is an increasing proportion of invited respondents who have taken the survey in previous years and who may not feel the need to take the travel survey again; and the estimated completion time of the survey (described in the invitation email) has increased somewhat. It is recommended that future invitations to take the campus travel survey explain the importance of taking the survey each year and assure respondents that the survey will take less than ten minutes.

Table 4. Response rates for 2011-12, versus 2010-11, 2009-10, 2008-09 and 2007-08

Role group	2011-12						2010-11	2009-10	2008-09	2007-08
	Assumed Population	Number Invited	Number of Responses		Response Rate		Response Rate	Response Rate	Response Rate	Response Rate
			Target	Actual	Target	Actual[a]				
Students	29,387	20,653	2,105	2,482	10.0%	12.0%	17.9%	25.0%	22.0%	23.0%
Undergraduate	23,659	17,267	1,432	1,954	8.0%	11.3%	16.5%	24.0%	20.0%	22.0%
Freshmen	3,557	2,514	347	326	14.0%	13.0%	22.7%	30.0%	22.0%	26.0%
Sophomores	4,088	4,088	352	477	9.0%	11.7%	15.5%	26.0%	21.0%	22.0%
Juniors	6,717	3,832	364	510	10.0%	13.3%	17.5%	22.0%	22.0%	21.0%
Seniors	9,297	6,833	369	641	5.0%	9.4%	12.4%	19.0%	17.0%	20.0%
Graduate	5,728	3,385	673	528	20.0%	15.6%	21.5%	28.0%	27.0%	24.0%
Masters	2,082	2,082	325	223	16.0%	10.7%	16.0%	19.0%	18.0%	19.0%
PhD	3,646	1,303	348	305	27.0%	23.4%	33.6%	40.0%	35.0%	28.0%
Employees	11,341	3,300	693	634	21.0%	19.2%	28.7%	34.0%	35.0%	45.0%
Faculty	2,045	2,045	324	334	16.0%	16.3%	22.4%	27.0%	30.0%	37.0%
Staff	9,296	1,238	369	300	30.0%	24.2%	37.4%	42.0%	39.0%	50.0%
Overall percent	100%	59%			12.0%	13.0%	20.3%	27.0%	26.0%	28.0%
Overall number	40,728	23,953	2,798	3,116			3,084	3,569	3,577	3,849

[a] This actual response rate is based on valid responses for primary mode and gender. These cases are weighted by role and gender and used for the bulk of the analysis.

Table 5 shows the number of valid responses at three key points in the survey: those who answered the first question about role in the university, those who gave valid responses to questions about primary mode and gender, and those whose addresses were successfully geocoded in addition to meeting the previous criteria. As shown, some role groups did not meet target response rates for a five percent margin of error. Margins of error based on responses by role group are shown later in Table 19. 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. Number of valid responses, by role

Role group	Population	Invited	Target (5% margin of error)	**Valid Role** (started survey)	**Mode and Gender** (weighted for bulk of analysis)	**Geocoded** (weighted for CO_2 emissions, VMT)
Students	29,387	20,653	2,105	2,807	2,482	2,338
Undergraduate	23,659	17,267	1,432	2,189	1,954	1,834
Freshmen	3,557	2,514	347	360	326	326
Sophomores	4,088	4,088	352	524	477	428
Juniors	6,717	3,832	364	573	510	479
Seniors	9,297	6,833	369	732	641	601
Graduate	5,728	3,385	673	618	528	504
Masters	2,082	2,082	325	276	223	214
PhD	3,646	1,303	348	342	305	290
Employees	11,341	3,300	693	699	634	595
Faculty	2,045	2,045	324	363	334	312
Staff	9,296	1,238	369	336	300	283
Overall percent	100%	59%	11.7%	14.6%	13.0%	12.2%
Overall number	40,728	23,953	2,798	3,506	3,116	2,933

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.

From the responses to *Q1*, we screened 28 respondents who failed to provide a valid role group (who were then skipped to the end of the survey (see Appendix A). 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 *Q07* ("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 37 respondents who indicated that their offices were located outside of Davis. These most commonly included the Graduate School of Management center in San Ramon and the UC Davis Medical Center in Sacramento. These 37 respondents were skipped to the end of the survey (see Appendix A: Survey instrument, 2011-12 Campus Travel Survey) and are excluded from the analysis.

In addition to these screening criteria, we excluded 6 duplicate cases which were identified by matching phone numbers or email addresses. An additional 82 cases indicated traveling to campus but failed to provide answers to questions about primary mode used during the reference week, and 136 cases did not answer whether they traveled to campus during the reference week. Lastly, 3 respondents who were away all week indicated in *Q24* that they do not plan to resume travel to campus. Since our survey targets only those who regularly travel to the UC Davis campus, these respondents are excluded from the analysis.

Sociodemographic composition of respondents completing the survey

Table 6 shows the age distribution of survey respondents by role in the university. All respondents were between 18 and 80 years old.

Table 6. Age distribution of unweighted sample

Age: valid *n*	Undergraduate	Graduate	Faculty	Staff
20 years old or under	57.0%	0.0%	0.0%	0.3%
21 to 30 years old	41.6%	84.8%	0.0%	6.3%
31 to 40 years old	0.8%	12.3%	15.4%	25.4%
41 to 50 years old	0.4%	1.2%	25.1%	25.8%
51 to 60 years old	0.1%	1.5%	37.1%	32.8%
61 to 70 years old	0.1%	0.2%	20.7%	8.4%
71 to 80 years old	0.0%	0.0%	1.7%	1.0%
Unweighted Sample	1,712	480	299	287
Projected Population	23,659	5,728	2,045	9,296

For the past several years, we have asked graduate students and employees how long they have been at UC Davis—this question is useful for research about commute mode choice, since it can differentiate between those new to the university and those who have spent more time at UC Davis. This question is less pertinent for undergraduates, most of whose tenure at Davis can be predicted by class and transfer status. No faculty or staff reported being at UC Davis for less than two years—in fact, over 85 percent of employees reported being at UC Davis for more than five years.

Table 7. Duration spent at the university

How many years have you been at UC Davis (in any role)?			
	Graduate	Faculty	Staff
	Col. %	Col. %	Col. %
0 (this is my first year)	27.8%	0.0%	0.0%
1 year	17.3%	0.0%	0.0%
2 years	16.0%	3.5%	1.7%
3 years	12.8%	5.1%	4.1%

4 years	8.6%	2.2%	8.9%
5 years or more	17.5%	89.1%	85.3%
Unweighted Sample	486	313	292
Graduate	5,728	2,045	9,296

Table 8 shows the education level of employees in the unweighted sample. Expectedly, over 99 percent of faculty reported having at least one graduate degree. Staff, however, reported educational backgrounds ranging from a high school diploma to graduate degree(s).

Table 8. Education level of unweighted employee sample

What is your highest level of education?	Faculty	Staff
	Col. %	Col. %
High school diploma or equivalent	0.0%	1.4%
Some college or technical school	0.0%	14.0%
Associates degree/technical school	0.0%	9.7%
Four-year bachelor's degree	0.3%	31.3%
Some graduate school	0.3%	5.8%
Graduate degree(s)	99.4%	37.4%
Unweighted Sample	311	278
Projected Population	2,045	9,296

Since asking students about their education level is likely redundant, this year we asked undergraduates about the highest education level of either parent or guardian. The answers to this question may prove useful in research to assess the effects of parental education level and income on mode choice and residential location of undergraduates. Almost one-fifth of undergraduate respondents indicated their parents' highest education level is a high school diploma or less.

Table 9. Highest education level of undergraduate parents or guardians, unweighted sample

What is the highest level of education completed by whichever parent/guardian has the most education?	Undergraduate
	Col. %
No formal education	1.2%
Some grade school or high school	5.7%
High school diploma or equivalent	12.5%
Some college or technical school	15.5%
Associates degree/technical school	5.9%

Four-year bachelor's degree	26.0%
Some graduate school	4.0%
Graduate degree(s)	29.2%
Unweighted Sample	1,644
Projected Population	23,659

This year we attempted to take a more fine-grained approach to defining and measuring household and income characteristics. Undergraduates are least likely to live alone, while graduate students are most likely to do so. Over three-quarters of employees live with family, a partner, or others who share income, compared to less than a third of graduate students and ten percent of undergraduates.

Table 10. Household size

	Undergraduate	Graduate	Faculty	Staff
Do you live alone or with other people? Please choose all that apply.				
	Col. %	Col. %	Col. %	Col. %
Lives alone	3.9%	18.3%	11.8%	15.6%
Lives with roommate(s), housemates(s), or in a dorm	86.2%	50.6%	2.7%	6.1%
Lives with family, a partner, or others and shares income	10.0%	31.0%	85.5%	78.2%
Weighted Sample	1,810	438	156	712
Projected Population	23,659	5,728	2,045	9,296

Table 11 shows the household composition by age of those who reported living in shared-income households. Respondents were asked to report only household members other than themselves. Faculty and staff in shared-income households have an average of 0.8 children who are under six years old, and approximately 2.5 and 2.6 children under 18, respectively.

Table 11. Household composition in shared-income households

	Undergraduate	Graduate	Faculty	Staff
If you live with family, a partner, or others with whom you share some income, please indicate how many OTHER members of your household are in each age category.				
	Avg. No.	Avg. No.	Avg. No.	Avg. No.
Age under 6	0.3	0.4	0.8	0.8
Age 6-15	0.8	0.3	1.1	1.3
Age 16-17	0.4	0.1	0.6	0.5
Age 18-64	2.0	1.3	1.2	1.3
Age 65 or older	0.4	0.0	0.6	0.7
Total household members	3.9	2.1	4.3	4.6
Weighted Sample	154	119	123	519

Projected Population	2,355	1,778	1,748	7,273

Table 12 shows the income distribution for respondents who reported living in shared-income households. Approximately 42 percent of faculty reported household incomes of more than $160,000, compared to 15.7 percent of staff.

Table 12. Annual income of shared-income households

If you live with family, a partner, or others with whom you share some income, please check the category that contains your approximate annual household income before taxes.				
	Undergraduate	Graduate	Faculty	Staff
	Col. %	Col. %	Col. %	Col. %
Less than $10,000	16.4%	5.7%	0.0%	0.0%
$10,000 - $19,999	14.5%	12.4%	0.0%	0.0%
$20,000 - $29,999	14.1%	14.5%	0.0%	2.1%
$30,000 - $39,999	10.0%	14.6%	0.0%	1.7%
$40,000 - $49,999	7.4%	12.8%	0.3%	8.9%
$50,000 - $59,999	9.7%	13.1%	0.9%	9.0%
$60,000 - $79,999	8.7%	13.3%	4.0%	16.7%
$80,000 - $99,999	2.4%	6.4%	9.4%	16.8%
$100,000 - $119,999	5.7%	1.8%	16.8%	15.0%
$120,000 - $139,999	3.3%	1.9%	16.7%	8.7%
$140,000 - $159,999	1.9%	1.1%	9.9%	5.4%
$160,000 - $199,999	1.6%	0.0%	20.2%	10.3%
$200,000 or more	4.3%	2.5%	21.8%	5.4%
Weighted Sample	125	108	104	441
Projected Population	2,355	1,778	1,748	7,273

Table 13 shows the income distribution for respondents who reported living alone or with housemates or roommates who do not share income. Over 82 percent of undergraduates reported single-incomes of less than $10,000, compared to 34 percent of graduate students. Another 54 percent of graduate students in single-income households reported annual incomes between $10,000 and $30,000.

Table 13. Annual income of single-income households

If you live alone or with only roommate(s) or housemate(s), please check the category that contains your approximate annual income before taxes.				
	Undergraduate	Graduate	Faculty	Staff
	Col. %	Col. %	Col. %	Col. %
Less than $10,000	82.4%	33.9%	3.4%	0.0%

$10,000 - $19,999	8.0%	22.1%	0.0%	0.0%
$20,000 - $29,999	4.0%	31.9%	3.4%	2.0%
$30,000 - $39,999	1.3%	4.4%	0.0%	12.8%
$40,000 - $49,999	0.4%	2.3%	0.0%	19.2%
$50,000 - $59,999	0.8%	0.5%	3.4%	24.7%
$60,000 - $79,999	0.8%	0.7%	32.9%	24.3%
$80,000 - $99,999	0.8%	2.1%	25.1%	7.5%
$100,000 - $119,999	0.7%	0.5%	18.9%	7.5%
$120,000 - $139,999	0.1%	0.7%	3.4%	2.0%
$140,000 - $159,999	0.1%	0.0%	7.5%	0.0%
$160,000 - $199,999	0.1%	0.7%	2.1%	0.0%
$200,000 or more	0.6%	0.0%	0.0%	0.0%
Weighted Sample	810	199	18	125
Projected Population	21,304	3,950	297	2,023

Given the difficulty of assessing student incomes, this year we added a question to assess perceived financial dependence on parents or guardians. Approximately 10 percent and 59 percent of undergraduates and graduate students (respectively) indicated no financial dependence ("not at all"), compared to 31.5 percent and 6.5 percent who indicated complete financial dependence ("for everything").

Table 14. Level of student financial dependence on parents or guardians, unweighted sample

To what extent are you financially dependent on your parent(s)/guardian(s)?		
	Undergrad	Graduate
	Col. %	Col. %
Not at all	10.2%	58.9%
For some things	23.6%	28.4%
For most things	34.6%	6.2%
For everything	31.5%	6.5%
Unweighted Sample	1,620	465
Projected Population	23,659	5,728

Weighting responses by role and gender

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 *Q01* through *Q03*: 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. As in previous surveys, the sample is disproportionately comprised of females. In particular, males comprise about 30 percent of the sample compared with 45 percent of the population of undergraduates, and 33 percent of respondents versus 50 percent of the population of graduate students.[2] In addition to weighting by role in the university, we correct for these differences in response rates among men and women in each role group so that the share of men and women in the weighted sample is equal to the share of women in each role group in the population.

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 and gender group i in the population (for instance, female freshmen), and n_i of that group i in the sample, we apply the weight factor $W_i = (N_i/N) / (n_i/n)$ to all cases in group i. Applying the weight factors alters the apparent distribution of respondents by role and gender, 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 40,728.

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 $n = 3,116$ valid responses to question *Q29*, 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 2,933 cases successfully geocoded (by zip code and cross streets given in questions *Q18* and *Q19*; see Appendix E) and with non-missing mode data from question *Q29*. Both sets of weights are shown in Table 15.

Table 15. Weight factors, applied by role and gender

Role group (i)	Gender	Population (N)	Role and Gender[a]				Role, Gender, and Geocoded[b]			
			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	Female	1,956	233	0.64238442	8.40	150	233	0.60465773	8.40	141
	Male	1,601	93	1.31679387	17.21	122	93	1.23945970	17.21	115
Sophomores	Female	2,248	329	0.52285594	6.83	172	288	0.56221194	7.81	162
	Male	1,840	148	0.95096832	12.43	141	140	0.94626841	13.14	132
Juniors	Female	3,694	365	0.77437182	10.12	283	345	0.77114833	10.71	266
	Male	3,023	145	1.59486609	20.85	231	134	1.62443389	22.56	218
Seniors	Female	5,113	440	0.88911351	11.62	391	421	0.87466632	12.15	368
	Male	4,184	201	1.59244211	20.81	320	180	1.67379327	23.24	301
Masters	Female	1,049	146	0.54961963	7.18	80	138	0.54733172	7.60	76

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[2] Figures for the composition of the campus population by gender are drawn from "Student Headcount by Gender, Fall 2011," "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.

	Male	1,033	77	1.02654908	13.42	79	76	0.97897469	13.59	74
PhD	Female	1,837	208	0.67559697	8.83	141	198	0.66803690	9.28	132
	Male	1,809	97	1.42703508	18.65	138	92	1.41622798	19.67	130
Faculty	Female	716	156	0.35102749	4.59	55	145	0.35547768	4.94	52
	Male	1,329	178	0.57133527	7.47	102	167	0.57320395	7.96	96
Staff	Female	5,434	183	2.27190496	29.70	416	169	2.31562995	32.16	391
	Male	3,862	117	2.52526232	33.01	295	114	2.43950731	33.88	278
Overall		40,728	3,116	n/a	13.0706033	3,116	2933	n/a	13.8861234	2,933

[a] Based on valid responses to *Q09* and *Q29*.
[b] Based on valid responses to *Q09, Q29* and successful geocoding of home location (from questions *Q18-Q19*)

Table 16. Unweighted gender distribution of respondents

	Undergraduate	Graduate	Faculty	Staff
Gender (unweighted)	Col. %	Col. %	Col. %	Col. %
% male	29.6%	32.6%	53.1%	38.0%
% female	68.9%	66.3%	46.6%	59.4%
% prefer not to say/missing	1.5%	1.1%	0.3%	2.6%
Unweighted Sample	1,983	534	335	308
Projected Population	23,659	5,728	2,045	9,296

Table 17. Weighted gender distribution of respondents

	Undergraduate	Graduate	Faculty	Staff
Gender (weighted)	Col. %	Col. %	Col. %	Col. %
% male	45.0%	49.6%	65.0%	41.5%
% female	55.0%	50.4%	35.0%	58.5%
% prefer not to say/missing	0.0%	0.0%	0.0%	0.0%
Weighted Sample	1,811	438	157	711
Projected Population	23,659	5,728	2,045	9,296

Table 16 and Table 17 show the difference in gender distribution between the unweighted and weighted results. As described in last year's report, we find that women are less likely to bike and more likely to ride the bus than are men. Without correcting for differences in response rates between men and women, the estimated bike mode share might be lower (and bus mode share higher) than they are in the actual population.

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 (see the "Parking permits" section later in the report.)

Reference week

The main statistics we measure are based on questions asking respondents about their activity during each of the five weekdays 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 17-21, 2011 (Monday-Friday). 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. In 2010-11, only a single reference week was used due to server complications. In 2011-12, the same two-week approach was used as in 2008-09 and 2009-10. Initial invitations were sent Monday, Oct. 24 and reminder emails were sent the following Monday, Oct. 31. The overall timeline of the survey launch and reference week is shown in Figure 6.

Figure 6. Survey launch and reference week schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
10 Columbus Day	11	12	13	14	15	16
17 *1st reference week*	18	19	20	21	22	23
24 **Initial invitations sent** *2nd reference week*	25	26	27	28	29	30
31 **Reminder invitations sent** Halloween	Nov 1	2	3	4	5	6

Table 9 notes weather during the two reference weeks. This year, there were no notable events during either of the reference weeks; however, the Halloween holiday fell on the Monday during which reminder invitations were sent, though it is unclear whether this coincidence had an effect on response rates.

Table 18. Weather and other events occurring during survey reference weeks

Day	Temperature ranges, precipitation, and notable events	
	Week 1: October 17-21, 2011	Week 2: October 24-28, 2011
Monday	55 – 87 ℉	51 – 83 ℉
Tuesday	53 – 87 ℉	47 – 77 ℉
Wednesday	57 – 86 ℉	53 – 75 ℉
Thursday	56 – 82 ℉	38 – 74 ℉
Friday	51 – 82 ℉	42 – 78 ℉

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 and gender, 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 and genders in the sample matched the distribution in the population (so the total number in the weighted sample equals the number in the unweighted 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 and gender 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).

Confidence intervals

Table 19 shows the margin of error of findings for each role group, to the extent that the proportions and figures estimated in the report differ by role group. For statistics about the population as a whole, we are 95 percent confident that our estimates are within 1.7% of their true value. These expectations are particularly important for mode share estimates, in that some year-to-year changes are significant, while others are not. For example, when we report later that 45.8% of students and employees bike to campus, our margin of error indicates that to the extent to which the survey results are unbiased, the true share of persons biking to campus is between 44.1% and 47.5%.

Table 19. Margin of error, by role group

Role group	Population	Sample Size	Margin of Error
Students	29,387	2,482	1.9%
Undergraduate	23,659	1,954	2.1%
Freshmen	3,557	326	5.2%
Sophomores	4,088	477	4.2%
Juniors	6,717	510	4.2%
Seniors	9,297	641	3.7%
Graduate	5,728	528	4.1%
Masters	2,082	223	6.2%
PhD	3,646	305	5.4%
Employees	11,358	634	3.8%
Faculty	2,062	334	4.9%
Staff	9,296	300	5.6%
Overall	40,745	3,116	1.7%

Physical travel to campus

Table 20 shows the share of each role group who traveled to campus on each day of the reference week. For those living on campus, "travel to campus" on a given day means the respondent indicated traveling to a campus destination for school or work. Overall, about 91 percent of university affiliates physically traveled to campus on each day Monday through Thursday, with a low of about 82 percent traveling to campus on Friday. Faculty travel to campus least often, while sophomores travel to campus most often.

Table 20. Share physically traveling to campus by weekday

Role		Monday	Tuesday	Wed.	Thursday	Friday	No days	Weighted Sample	Projected Population
		Share Physically Traveling to Campus				
Student		92.2%	92.2%	93.5%	91.9%	83.3%	2.5%	2,248	29,387
Undergrad		93.0%	93.1%	93.8%	92.8%	84.9%	2.3%	1,810	23,659
Freshman		90.5%	88.6%	90.5%	88.3%	90.5%	3.6%	272	3,557
Sophomore		94.9%	94.2%	95.5%	93.6%	91.8%	2.6%	313	4,088
Junior		94.4%	93.6%	94.2%	93.3%	87.5%	1.8%	514	6,717
Senior		92.1%	93.9%	94.1%	93.9%	78.0%	2.1%	711	9,297
Graduate		88.7%	88.7%	92.3%	88.0%	76.4%	3.3%	438	5,728
Masters		90.0%	87.6%	93.6%	90.5%	64.2%	3.4%	159	2,082
PhD		88.0%	89.3%	91.5%	86.6%	83.3%	3.3%	279	3,646
Employee		86.5%	87.4%	85.9%	86.4%	79.8%	4.2%	868	11,341
Faculty		77.0%	80.0%	78.2%	81.3%	74.2%	6.9%	156	2,045
Staff		88.6%	89.0%	87.6%	87.6%	81.1%	3.7%	711	9,296
Residential location	Within Davis	92.8%	93.1%	93.8%	92.4%	85.0%	2.3%	2,402	31,390
	Outside Davis	83.3%	83.3%	83.2%	83.6%	73.2%	5.2%	714	9,338
Overall		90.6%	90.9%	91.4%	90.4%	82.3%	3.0%	3,116	40,728
Weighted Sample		2,823	2,831	2,848	2,816	2,565	94	3,116	
Projected Population		36,895	37,009	37,230	36,811	33,522	1,223		40,728

Results are based on responses to questions *Q20* and *Q21*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

In addition to trends by the day of the week, there are substantial differences in the frequency of physical travel to campus among those living in different locations. Overall, those living in Davis travel to campus more often than those living outside Davis (93 percent vs. 83 percent on Monday). Approximately 5.2 percent of those living outside Davis did not travel to campus at all during the reference week, compared to 2.3 percent of those living in Davis. Grad students and faculty living outside of Davis are least likely to travel to campus, with only about 70 percent traveling to campus on an average weekday day (Table 21). By contrast, 92 percent of grad students and 83 percent of faculty who live off campus in Davis travel to campus on an average weekday. (See Table 48 for the overall percent of people living in each location, by role group.)

Table 21. Share traveling to campus on an average weekday, by role and residential location

Role	Overall	On Campus	West Village	Off Campus in Davis	Outside Davis	Weighted Sample	Projected Population
Student	91%	90%	92%	93%	80%	2,248	29,387
Undergrad	92%	91%	91%	93%	85%	1,810	23,659
Freshman	91%	90%	80%	97%	90%	272	3,557
Sophomore	94%	98%	93%	95%	82%	313	4,088
Junior	93%	91%	91%	94%	89%	514	6,717
Senior	91%	89%	91%	92%	82%	711	9,297
Graduate	87%	87%	95%	92%	71%	438	5,728
Masters	86%	82%	93%	90%	70%	159	2,082
PhD	88%	89%	100%	93%	71%	279	3,646
Employee	86%	99%	-	89%	82%	868	11,341
Faculty	79%	88%	-	83%	69%	156	2,045
Staff	87%	100%	-	92%	84%	711	9,296
Overall	89%	91%	92%	92%	81%	3,116	40,728
Weighted Sample	2,783	420	72	1,712	578	3,116	
Projected Population	36,371	5,495	938	22,378	7,559		40,728

Results are based on responses to question *Q21* (days traveling to campus) and *Q17* (residential location). Shares are calculated as the percent of five weekdays that an individual traveled to campus; then the average over all respondents represents the share traveling to campus on an average weekday. See Table 48 for the overall percent living in each location by role group. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15). No employees and very few graduate students indicated living in West Village.

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 22). 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 22. Share away from campus all week and reasons given, by role

Role	Share away all week	Of those away all week, main reason for no travel to campus							Weighted sample away all week	Population away all week
		Study abroad	Vacation	Work or school-related travel	Work from home	Sickness or personal leave	Temporary appointment elsewhere	Sabbatical		
Student	2.5%	28.2%	15.0%	24.1%	14.2%	9.0%	9.5%	0.0%	57	741
Undergrad	2.3%	39.1%	21.9%	14.2%	2.4%	13.2%	9.3%	0.0%	42	553
Freshman	3.6%	0.0%	60.0%	20.0%	20.0%	0.0%	0.0%	0.0%	10	127
Sophomore	2.6%	16.7%	0.0%	50.0%	0.0%	33.3%	0.0%	0.0%	8	104
Junior	1.8%	49.7%	9.8%	0.0%	0.0%	20.2%	20.2%	0.0%	9	124
Senior	2.1%	47.9%	25.3%	12.6%	0.0%	7.1%	7.1%	0.0%	15	197
Graduate	3.3%	4.5%	0.0%	45.7%	39.8%	0.0%	10.0%	0.0%	14	189
Masters	3.4%	17.0%	0.0%	0.0%	65.9%	0.0%	17.0%	0.0%	5	70
PhD	3.3%	0.0%	0.0%	62.0%	30.6%	0.0%	7.4%	0.0%	9	119
Employee	4.2%	0.0%	31.3%	15.9%	14.4%	21.7%	9.3%	7.4%	37	482
Faculty	6.9%	0.0%	13.3%	32.6%	6.0%	9.6%	11.0%	27.5%	11	142
Staff	3.7%	0.0%	37.9%	9.7%	17.5%	26.2%	8.7%	0.0%	26	340
Overall	2.3%	14.8%	22.8%	20.2%	14.2%	15.1%	9.4%	3.5%	56	736
Weighted Sample	56	8	13	11	8	9	5	2	56	
Projected Population	736	109	168	149	105	111	69	26		736

Results are based on responses to question *Q22*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

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 23 shows the share of employees away from campus on an average weekday, and the reasons given. While about 4.2 percent of employees were away all week (Table 22), about 11.3 percent of employees do not travel to campus on an average weekday (Table 23). The most common reasons for being away from campus are work-related travel and working from home (telecommuting).

Table 23. Share of employees not traveling to campus on an average weekday and reason

Role	Share away from campus on an average weekday	Among those not traveling to campus, reason given:						Weighted Sample	Projected Population
		Work from home	Work or school-related travel	Regularly scheduled day off	Vacation	Sick or personal leave	Other		
Faculty	21.9%	42.5%	29.3%	2.5%	5.7%	7.8%	12.2%	156	2,045
Staff	10.2%	14.9%	21.5%	19.5%	19.3%	21.6%	3.1%	711	9,296
All employees	11.3%	25.0%	25.9%	15.3%	10.7%	18.8%	4.2%	868	11,341
Weighted Sample	98	24	25	15	11	18	4	868	
Projected Population	1,281	320	332	196	137	241	54		1,282

Results are based on responses to question *Q23* for individual days absent and on responses to *Q22* for those absent all week; reasons given in *Q22* are assumed to apply to all five weekdays. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

This year, we asked those who were away from campus all week when they expect to resume regularly traveling to campus. Several respondents indicated "never" and were screened from the analysis, since the scope of the travel survey only includes those who regularly travel to campus for school or work. Overall, 65 percent of those who were away all week expected to resume travel to campus within a week, 21.6 percent indicated one month to a quarter, and 8.7 percent indicated between one quarter and a year. Juniors were least likely to resume travel to campus within the next week, likely because of study abroad commitments. Staff were most likely to

resume travel to campus within the next week (over 90 percent).

Table 24. Among those away all week, expected resumption of regular travel to campus

| Role | Share away all week | About when do you expect to resume regular travel to campus for school or work? | | | | | Weighted Sample | Projected Population |
		Within a week	A week to a month	A month to a quarter	A quarter to a year	More than a year		
Student	2.5%	52.5%	0.0%	35.5%	10.5%	1.6%	2,248	29,387
Undergrad	2.3%	50.0%	0.0%	37.5%	10.3%	2.2%	1,810	23,659
Freshman	3.6%	83.3%	0.0%	0.0%	0.0%	16.7%	272	3,557
Sophomore	2.6%	77.3%	0.0%	11.3%	11.3%	0.0%	313	4,088
Junior	1.8%	20.2%	0.0%	69.9%	9.8%	0.0%	514	6,717
Senior	2.1%	48.6%	0.0%	38.2%	13.2%	0.0%	711	9,297
Graduate	3.3%	59.0%	0.0%	30.2%	10.9%	0.0%	438	5,728
Masters	3.4%	50.0%	0.0%	25.0%	25.0%	0.0%	159	2,082
PhD	3.3%	61.2%	0.0%	31.4%	7.4%	0.0%	279	3,646
Employee	4.2%	80.4%	6.8%	4.5%	6.6%	1.7%	868	11,341
Faculty	6.9%	57.1%	0.0%	15.0%	22.1%	5.8%	156	2,045
Staff	3.7%	90.3%	9.7%	0.0%	0.0%	0.0%	711	9,296
Overall	2.3%	65.0%	3.0%	21.6%	8.7%	1.6%	3,116	40,728
Weighted Sample	73	48	2	16	6	1	3,116	
Projected Population	955	334	29	206	83	16		40,728

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Destination on campus

Employees and graduate students were asked the location of their office, lab, or department. This was in part to screen out those whose offices or labs were outside of Davis, who are excluded from the sample for this study. Among the included respondents, about 79.6 percent reported locations in the central campus area (an estimated 13,587 people), including 85.4 percent of grad students, 93 percent of faculty, and 73.1 percent of staff (Table 25). About 8.5 percent (an estimated 1,459 people) reported locations in west campus, 5.6 percent in south campus, and 6.3 percent off-campus within the city of Davis.

Table 25. Destination on campus, among employees and graduate students

	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 Main Campus area	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	Weighted Sample	Projected Population
Graduate	85.4%	6.8%	5.1%	2.6%	438	5,728
Masters	88.9%	3.7%	6.7%	0.7%	159	2,082
PhD	83.5%	8.6%	4.2%	3.7%	279	3,646
Employee	76.7%	9.4%	5.8%	8.1%	868	11,341
Faculty	93.0%	2.4%	2.1%	2.6%	156	2,045
Staff	73.1%	11.0%	6.6%	9.4%	711	9,296
Overall	79.6%	8.5%	5.6%	6.3%	1,306	17,069
Weighted Sample	1,040	112	73	82	1,306	
Projected Population	13,587	1,459	949	1,074		17,069

Results are based on responses to question *Q07*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

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 *Q29*). 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 (later in the report, results are reported for secondary and occasional modes). Throughout this report, we refer to answers to this question as a respondent's "primary" mode, meaning what they did for most of the trip to campus. For each respondent, we calculate the share 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 share of all people using each mode on an average weekday. For the purpose of validating the method we use to calculate mode share, this year we also asked respondents about the mode they "usually" use to travel to campus. See Table 54 for a comparison of results for "usual" and "primary" modes.

Respondents are asked to report their residential location as the place from which they usually travel to campus. In some cases, respondents may travel to campus from another location (for example a family member's residence), resulting in a few seemingly dissonant primary mode choices. For example, someone may report living on campus but traveling by train to campus. Since there are very few cases in which these dissonant modes appear, results are reported as is,

and discretion should be used in interpreting these cases.

Table 26 through Table 31 show the overall mode split among those physically traveling to campus on a given weekday. Results are shown by role group in Table 26 and by role group for each category of residential location in the next five tables). (See Table 21 for a comparison of the share of people physically traveling to campus on an average weekday by role and residential location.) On an average weekday, we estimate that of those physically traveling to campus, about 46.1 percent bike (an estimated 18,762 people), 29.2 percent arrive by car (11,898 people), and 19.1 percent ride public transit (7,780 people). The share biking is highest among freshmen, most of whom live on campus.

Table 26. Share using each mode on an average weekday, by role group (all locations)

	Percent physically traveling	Of those physically traveling to campus						Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train		
Student	91.0%	52.7%	6.6%	13.2%	3.3%	23.1%	0.0%	2,248	29,387
Undergrad	92.0%	52.2%	6.5%	10.9%	3.3%	26.1%	0.0%	1,810	23,659
Freshman	91.0%	80.2%	13.2%	2.2%	1.1%	3.3%	0.0%	272	3,557
Sophomore	94.0%	53.2%	3.2%	4.3%	3.2%	36.2%	0.0%	313	4,088
Junior	93.0%	50.5%	6.5%	12.9%	3.2%	26.9%	0.0%	514	6,717
Senior	91.0%	42.9%	6.6%	15.4%	3.3%	30.8%	0.0%	711	9,297
Graduate	87.0%	55.2%	6.9%	26.4%	6.9%	4.6%	1.1%	438	5,728
Masters	86.0%	53.5%	5.8%	25.6%	5.8%	8.1%	1.2%	159	2,082
PhD	88.0%	55.7%	6.8%	26.1%	6.8%	3.4%	2.3%	279	3,646
Employee	86.0%	26.7%	3.5%	52.3%	11.6%	4.7%	1.2%	868	11,341
Faculty	79.0%	44.3%	6.3%	35.4%	8.9%	2.5%	2.5%	156	2,045
Staff	87.0%	23.0%	3.4%	55.2%	12.6%	4.6%	1.1%	711	9,296
Overall	89.0%	46.1%	5.6%	23.6%	5.6%	18.0%	1.1%	3,116	40,728
Weighted Sample	2,773	1,435	175	735	175	560	35	3,116	
Projected Population	36,248	18,762	2,288	9,610	2,288	7,322	458		40,728

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q29* (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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 27 shows the mode share among those who live in within Davis. This category includes students and employees who live on campus, off campus in Davis, and in the West Village apartments. Seniors are least likely to bike to campus from within Davis (47.8 percent) and among the most likely to ride the bus. Staff are most likely to drive alone from within Davis (35.9 percent), while freshmen are least likely to do so (1.1 percent). The train is not a viable means of traveling to campus from within Davis. Consequently, no respondents in Davis reported using this mode to travel to campus.

Table 27. Share using each mode on an average weekday, from within Davis

	Percent physically traveling	Of those physically traveling to campus						Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train		
Student	92.0%	57.6%	7.6%	8.7%	3.3%	23.9%	0.0%	2,015	26,332
Undergrad	93.0%	55.9%	7.5%	5.4%	2.2%	28.0%	0.0%	1,662	21,728
Freshman	91.0%	81.3%	13.2%	1.1%	1.1%	3.3%	0.0%	266	3,472
Sophomore	95.0%	54.7%	3.2%	3.2%	2.1%	36.8%	0.0%	302	3,948
Junior	93.0%	55.9%	6.5%	5.4%	3.2%	29.0%	0.0%	458	5,991
Senior	92.0%	47.8%	7.6%	9.8%	2.2%	33.7%	0.0%	636	8,317
Graduate	91.0%	64.8%	7.7%	19.8%	4.4%	4.4%	0.0%	352	4,604
Masters	89.0%	62.9%	6.7%	16.9%	5.6%	7.9%	0.0%	128	1,671
PhD	92.0%	65.2%	7.6%	20.7%	4.3%	2.2%	0.0%	224	2,934
Employee	89.0%	51.7%	6.7%	33.7%	5.6%	3.4%	0.0%	387	5,058
Faculty	83.0%	56.6%	7.2%	27.7%	4.8%	2.4%	0.0%	111	1,451
Staff	92.0%	50.0%	5.4%	35.9%	5.4%	3.3%	0.0%	276	3,607
Overall	92.0%	56.5%	7.6%	12.0%	3.3%	20.7%	0.0%	2,402	31,390
Weighted Sample	2,210	1,358	183	287	78	496	-	2,402	
Projected Population	28,879	17,742	2,388	3,753	1,024	6,483	-		31,390

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q29* (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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 28 shows the mode share among those who live in on campus. In this year's survey, "on campus" was defined as the area south of Russell Blvd., west of A St., north of I-80, and east of highway 113. This definition was made in an attempt to improve consistency in responses with the addition of the West Village apartments, since some respondents might consider this location on campus while others might consider it off campus. The results for those living in the West Village apartments are reported separately in Table 29.

Table 28. Share using each mode on an average weekday, from on-campus

	Percent physically traveling	Of those physically traveling to campus						Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train		
Student	90.4%	76.8%	16.1%	1.4%	1.5%	4.1%	0.1%	454	5,932
Undergrad	90.9%	77.2%	16.2%	0.5%	1.3%	4.7%	0.1%	396	5,171
Freshman	90.5%	83.6%	14.0%	0.1%	0.9%	1.2%	0.2%	250	3,269
Sophomore	97.8%	68.9%	12.4%	2.9%	1.6%	14.2%	0.0%	32	418
Junior	90.9%	61.5%	23.7%	0.0%	3.3%	11.6%	0.0%	53	694
Senior	89.3%	68.9%	20.9%	1.3%	1.3%	7.5%	0.0%	60	791
Graduate	86.7%	74.0%	15.6%	7.7%	2.7%	0.0%	0.0%	58	761
Masters	81.8%	69.0%	19.8%	9.8%	1.5%	0.0%	0.0%	17	219
PhD	88.7%	75.9%	14.1%	6.9%	3.1%	0.0%	0.0%	41	542
Employee	98.6%	95.7%	4.3%	0.0%	0.0%	0.0%	0.0%	8	108
Faculty	87.6%	56.6%	43.4%	0.0%	0.0%	0.0%	0.0%	1	12
Staff	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7	96
Overall	90.5%	77.1%	15.9%	1.4%	1.5%	4.0%	0.1%	462	6,040
Weighted Sample	418	356	73	6	7	19	0	462	
Projected Population	5,469	4,659	960	83	88	244	6		6,040

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q29* (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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15). Very few employees indicated living within the area considered "on-campus," therefore these mode splits may not be characteristic of all employees living within this area.

Table 29 shows the specific mode share among those living in the West Village apartments. Because the sample sizes in most role categories are very low, role-specific mode shares should be interpreted with some degree of caution; however, the overall mode share estimates for West Village are consistent with expectations for travel distances greater than "on campus" locations but generally less than "off campus in Davis" locations.

Table 29. Share using each mode on an average weekday, from West Village

	Percent physically traveling	Of those physically traveling to campus						Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train		
Student	92.0%	69.6%	3.3%	5.4%	2.2%	17.4%	0.0%	78	1,024
Undergrad	91.0%	71.4%	4.4%	2.2%	1.1%	19.8%	0.0%	70	912
Freshman	80.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3	43
Sophomore	93.0%	73.1%	3.2%	1.1%	2.2%	19.4%	0.0%	24	318
Junior	91.0%	68.1%	1.1%	0.0%	1.1%	28.6%	0.0%	24	308
Senior	91.0%	68.1%	11.0%	7.7%	0.0%	11.0%	2.2%	19	244
Graduate	95.0%	62.1%	0.0%	27.4%	10.5%	0.0%	0.0%	9	112
Masters	93.0%	48.4%	0.0%	36.6%	15.1%	0.0%	0.0%	6	84
PhD	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2	27
Employee	-	-	-	-	-	-	-	-	-
Faculty	-	-	-	-	-	-	-	-	-
Staff	-	-	-	-	-	-	-	-	-
Overall	92.0%	69.6%	3.3%	5.4%	2.2%	17.4%	0.0%	78	1,024
Weighted Sample	72	54	3	4	2	14	-	78	
Projected Population	942	712	33	56	22	178	-		1,024

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q29* (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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15). No employees indicated living in West Village this year. Future phases of West Village will likely include housing reserved for employees.

Table 30 shows the mode share results for those living off-campus in Davis, but excluding the West Village apartments. Among those living elsewhere in Davis, undergrads and staff are less likely to bike than grad students and faculty. Undergraduates have high bus ridership rates (35.5 percent), whereas grad students and employees in Davis who do not bike are more likely to commute by car.

Table 30. Share using each mode on an average weekday, from off-campus in Davis

	Percent physically traveling	Of those physically traveling to campus						Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train		
Student	93.0%	51.6%	5.4%	10.8%	3.2%	30.1%	0.0%	1,482	19,376
Undergrad	93.0%	49.5%	4.3%	7.5%	3.2%	35.5%	0.0%	1,197	15,645
Freshman	97.0%	47.4%	0.0%	10.3%	0.0%	41.2%	0.0%	12	161
Sophomore	95.0%	50.5%	2.1%	3.2%	3.2%	41.1%	0.0%	246	3,213
Junior	94.0%	54.3%	4.3%	6.4%	3.2%	30.9%	0.0%	382	4,988
Senior	92.0%	44.6%	5.4%	10.9%	2.2%	37.0%	0.0%	557	7,283
Graduate	92.0%	62.0%	6.5%	21.7%	4.3%	5.4%	0.0%	285	3,731
Masters	90.0%	63.3%	5.6%	16.7%	5.6%	8.9%	0.0%	105	1,367
PhD	93.0%	62.4%	6.5%	24.7%	4.3%	3.2%	0.0%	181	2,364
Employee	89.0%	50.6%	6.7%	34.8%	5.6%	3.4%	0.0%	379	4,951
Faculty	83.0%	56.6%	7.2%	27.7%	6.0%	2.4%	0.0%	110	1,439
Staff	92.0%	48.9%	5.4%	37.0%	5.4%	3.3%	0.0%	269	3,511
Overall	92.0%	51.1%	5.4%	15.2%	3.3%	25.0%	0.0%	1,861	24,326
Weighted Sample	1,712	951	101	283	61	465	-	1,861	
Projected Population	22,380	12,427	1,322	3,702	793	6,082	-		24,326

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q29* (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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 31 shows the mode share for students and employees who live outside Davis (an estimated 9,338 people). Among those physically traveling from outside Davis, 84 percent commute by car, 7.4 percent ride the bus, and 3.7 percent ride the train.

Table 31. Share using each mode on an average weekday, from outside Davis

	Percent physically traveling	Of those physically traveling to campus						Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train		
Student	80.0%	2.5%	1.3%	67.5%	12.5%	10.0%	5.0%	234	3,055
Undergrad	85.0%	2.4%	2.4%	71.8%	10.6%	9.4%	3.5%	148	1,931
Freshman	90.0%	0.0%	0.0%	66.7%	13.3%	8.9%	11.1%	6	85
Sophomore	82.0%	0.0%	0.0%	64.6%	18.3%	17.1%	0.0%	11	140
Junior	89.0%	3.4%	3.4%	70.8%	7.9%	12.4%	1.1%	56	726
Senior	82.0%	1.2%	2.4%	74.4%	12.2%	6.1%	3.7%	75	980
Graduate	71.0%	4.2%	0.0%	59.2%	16.9%	9.9%	9.9%	86	1,124
Masters	70.0%	4.3%	0.0%	67.1%	10.0%	12.9%	5.7%	31	411
PhD	71.0%	4.2%	0.0%	54.9%	21.1%	7.0%	12.7%	55	712
Employee	82.0%	3.7%	1.2%	68.3%	17.1%	6.1%	3.7%	481	6,283
Faculty	69.0%	7.2%	4.3%	60.9%	17.4%	1.4%	10.1%	45	594
Staff	84.0%	3.6%	1.2%	69.0%	16.7%	6.0%	2.4%	435	5,689
Overall	81.0%	3.7%	1.2%	67.9%	16.0%	7.4%	3.7%	714	9,338
Weighted Sample	578	26	9	485	115	53	26	714	
Projected Population	7,564	346	115	6,341	1,499	692	346		9,338

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q29* (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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 32 shows the mode share by role if we include telecommuting as a travel mode, since it is sometimes considered an alternative to physical travel. The denominator for these estimates is the number of people who physically traveled to campus plus those who worked from home on a given weekday, but excluding those who did not travel for another other reason. If working from home was indicated as a reason for not traveling to campus the entire week, we assumed that the individual did so on all five weekdays.[3]

Table 32. Share using each mode on an average weekday, including telecommuting

	Share physically traveling or working from home	Of those physically traveling to campus or working from home							Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train	Work from Home		
Student	91.0%	52.7%	6.6%	13.2%	3.3%	23.1%	0.0%	0.0%	2,248	29,387
Undergrad	92.0%	52.2%	6.5%	10.9%	3.3%	26.1%	0.0%	0.0%	1,810	23,659
Freshman	91.0%	80.2%	13.2%	2.2%	1.1%	3.3%	0.0%	0.0%	272	3,557
Sophomore	94.0%	53.2%	3.2%	4.3%	3.2%	36.2%	0.0%	0.0%	313	4,088
Junior	93.0%	50.5%	6.5%	12.9%	3.2%	26.9%	0.0%	0.0%	514	6,717
Senior	91.0%	42.9%	6.6%	15.4%	3.3%	30.8%	0.0%	0.0%	711	9,297
Graduate	87.0%	55.2%	6.9%	26.4%	5.7%	4.6%	1.1%	0.0%	438	5,728
Masters	86.0%	53.5%	5.8%	25.6%	5.8%	8.1%	1.2%	0.0%	159	2,082
PhD	88.0%	55.7%	6.8%	26.1%	5.7%	3.4%	2.3%	0.0%	279	3,646
Employee	88.0%	26.1%	3.4%	51.1%	11.4%	4.5%	1.1%	3.4%	868	11,341
Faculty	86.0%	40.7%	5.8%	32.6%	8.1%	2.3%	2.3%	8.1%	156	2,045
Staff	89.0%	22.5%	3.4%	53.9%	12.4%	4.5%	1.1%	2.2%	711	9,296
Overall	90.0%	45.6%	5.6%	23.3%	5.6%	17.8%	1.1%	1.1%	3,116	40,728
Weighted Sample	2,804	1,278	156	654	156	499	31	31	3,116	-
Projected Population	36,655	16,698	2,036	8,553	2,036	6,516	407	407	-	40,728

Results are based on responses to question *Q21* (whether they traveled to campus each day), question *Q29* (primary means of transportation each day). See footnote 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. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

While Table 26 through Table 32 present estimates for the share using various modes on an average weekday, another consideration is the share using various modes at least once on a given day during the week. Table 33 shows the share using each mode as a primary mode at least once during the five-day week. Although about 46 percent bike to campus (as their primary means of transportation, among those physically coming to campus) on an average weekday (from Table 26), about 54 percent bike to campus (as their primary means of transportation) at least once during the week (Table 33). So while about 18,762 people bike as their primary means of travel on an average day, about 20,773 people are regular bicyclists (at least once per week). The number of regular carpoolers and train-riders is also substantially greater than the average

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[3] Only employees were asked question *Q23* (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 *Q22* (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 is a lower bound estimate.

number doing it on a given day, projected to be 4,316 (versus 2,288) and 578 (versus 458) for carpooling and train-riding, respectively. In addition to those physically traveling to campus, Table 33 shows that the number of graduate students and employees who work from home at least once during the seven-day week is about twice the number working from home on an average weekday (813 compared to 407). 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 33. Percent using each as a primary mode at least once during the five-day week

	Percent physically traveling at least once	Of those physically traveling to campus at least once							Weighted Sample	Projected Population
		Bike	Walk or Skate	Drive Alone	Carpool or Ride	Bus	Train	Work from Home		
Student	95.6%	62.0%	12.1%	20.0%	9.0%	31.5%	1.0%	0.0%	2,248	29,387
Undergrad	95.9%	62.1%	12.2%	15.7%	7.8%	36.8%	0.6%	0.0%	1,810	23,659
Freshman	92.1%	91.8%	22.0%	2.8%	3.1%	6.7%	1.0%	0.0%	272	3,557
Sophomore	95.9%	65.1%	7.1%	7.1%	8.0%	48.9%	0.0%	0.0%	313	4,088
Junior	96.6%	58.9%	11.4%	17.5%	9.8%	38.2%	0.3%	0.0%	514	6,717
Senior	96.7%	52.3%	11.5%	22.9%	8.0%	41.5%	1.0%	0.0%	711	9,297
Graduate	94.5%	61.9%	11.4%	38.1%	14.0%	9.3%	2.6%	0.0%	438	5,728
Masters	95.0%	59.1%	11.8%	38.4%	12.3%	13.0%	1.5%	0.0%	159	2,082
PhD	94.2%	63.5%	11.1%	37.9%	15.0%	7.1%	3.2%	0.0%	279	3,646
Employee	92.3%	32.0%	4.5%	62.8%	17.1%	7.7%	2.9%	7.2%	868	11,341
Faculty	88.9%	49.4%	9.0%	49.9%	13.5%	4.6%	4.1%	19.3%	156	2,045
Staff	93.0%	28.3%	3.6%	65.6%	17.9%	8.4%	2.6%	4.5%	711	9,296
Lives within Davis	95.8%	67.5%	12.2%	18.3%	8.6%	29.3%	0.2%	0.7%	2,402	31,390
Lives outside Davis	90.9%	5.5%	2.1%	78.8%	20.3%	9.9%	6.3%	6.5%	714	9,338
Overall	94.7%	53.9%	10.0%	31.6%	11.2%	25.0%	1.5%	2.0%	3,116	40,728
Weighted Sample	2,950	1,589	295	933	330	739	44	62	3,116	
Projected Population	38,558	20,773	3,859	12,200	4,316	9,653	578	813		40,728

Results are based on responses to questions *Q21* (whether traveled to campus) and *Q29* (primary means of transportation each day). Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Comparison of 2011-12 mode share with 2010-11

One of the main purposes of the Campus Travel Survey is to collect comparable data each year for the assessment of trends over time. The questions and calculations used to estimate mode share in this year's survey are identical to those used in 2010-11. In addition, the results of each year shown in this analysis are weighted by role and gender to correct for differences in response rates between subsets of the population over time. Highly comparable mode share estimates for 2010-11 and 2011-12 are presented in Table 34. Data for both years are weighted by role and gender.

Table 35 shows percentage-point changes in the overall mode share and the results of tests for statistically significant changes over this one-year period. In this section, "private vehicle" includes those driving alone, carpooling, or getting a ride to campus.

Table 34. Comparison of mode shares, 2010-11 to 2011-12

2011-12	Share physically traveling	Of those physically traveling, share using each mode on an average weekday							Weighted sample	Projected population
		Bike	Walk	Drive alone	Carpool or ride	Private vehicle	Bus	Train		
Students	91%	52.7%	6.6%	13.2%	3.3%	16.5%	23.1%	0.0%	2,248	29,387
Undergrad	92%	52.2%	6.5%	10.9%	3.3%	14.1%	26.1%	0.0%	1,810	23,659
Graduate	87%	55.2%	6.9%	26.4%	6.9%	33.3%	4.6%	1.1%	438	5,728
Employees	85%	27.1%	3.5%	52.9%	11.8%	64.7%	4.7%	1.2%	868	11,341
Outside Davis	81%	3.7%	1.2%	67.9%	16.0%	84.0%	7.4%	3.7%	714	9,338
Within Davis	92%	56.5%	6.5%	12.0%	3.3%	15.2%	20.7%	0.0%	2,402	31,390
Overall	89%	46.1%	5.6%	23.6%	5.6%	29.2%	18.0%	1.1%	3,116	40,728

2010-11	Share physically traveling			Drive alone	Carpool or ride	Private vehicle	Bus	Train	Weighted sample	Projected population
		Bike	Walk							
Students	92%	49.0%	6.4%	14.9%	5.1%	20.0%	23.3%	0.8%	2,151	29,317
Undergrad	93%	48.4%	6.4%	11.6%	4.8%	16.5%	27.6%	0.5%	1,732	23,608
Graduate	89%	51.3%	6.5%	28.8%	6.3%	35.2%	4.7%	2.2%	419	5,709
Employees	85%	25.5%	2.6%	52.3%	14.7%	67.0%	3.7%	1.1%	829	11,301
Outside Davis	81%	2.3%	1.3%	71.0%	17.6%	88.6%	4.4%	3.4%	647	8,819
Within Davis	93%	52.8%	6.5%	13.3%	5.1%	18.4%	21.6%	0.3%	2,314	31,540
Overall	90%	42.8%	5.4%	24.7%	7.6%	32.3%	18.2%	0.9%	2,980	40,618

Data for both years are weighted by role and gender.

Table 35. One year change in overall mode share, 2010-11 to 2011-12

	Percentage-point change in share of people doing each on an average weekday							
	Among those physically traveling to campus:							
				Personal vehicle				
					Carpool			
Years of comparison	Bike	Walk	Any	Drive alone	or ride	Bus	Train	Physically traveling to campus
2010-11 to 2011-12	3.3% **	0.2%	-3.1% **	-1.1%	-2.0% **	-0.2%	0.2%	-1.0%

** Statistically significant difference with $p < 0.05$ 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.
Data for both years are weighted by role and gender.

Most notably, the overall bike share increased by 3.3 percentage points over the last year, which is significant at the five percent level. Similarly, the share traveling to campus in personal vehicles declined by 3.1 percentage points, also significant at the five percent level. Other modes experienced small changes, however these are not significant across the population. The share physically traveling to campus on an average weekday did not change significantly for any subset of the population shown in this analysis.

Table 36 shows percentage-point changes in mode share and the results of tests for statistically significant changes by role and residential location between 2010-11 and 2011-12. While the bike share increased across all groups shown, the change is only significant among undergraduates and those living within Davis, since these categories have larger sample sizes. While the share driving alone declined for each role group except employees, the share of undergraduates and those living within Davis who carpooled or got a ride declined significantly (two percentage-points overall). In addition, the share riding the bus to campus increased three percentage-points among those living outside Davis. Changes in the share traveling to campus by train, while significant, should be interpreted conservatively, since the sample of train riders is very small.

Table 36. One year change in mode share, by role and residential location

	Percentage point change from 2010-11 to 2011-12												
	Bike		Walk	Personal vehicle		Drive alone	Carpool or ride		Bus		Train	
Students	3.8%	**	0.2%	-3.5%	**	-1.7%	-1.8%	**	-0.2%		-0.8%	**
Undergraduate	3.8%	**	0.1%	-2.3%	*	-0.8%	-1.6%	**	-1.5%		-0.5%	**
Graduate	3.8%		0.4%	-1.9%		-2.4%	0.6%		-0.1%		-1.0%	
Employees	1.6%		0.9%	-2.3%		0.6%	-2.9%		1.0%		0.1%	
Outside Davis	1.4%		0.0%	-4.7%	**	-3.1%	-1.6%		3.0%	**	0.3%	
Within Davis	3.7%	**	0.0%	-3.2%	**	-1.4%	-1.9%	**	-0.9%		-0.3%[1]	**
Overall	3.3%	**	0.2%	-3.1%	**	-1.1%	-2.0%	**	-0.2%		0.2%	

*   Statistically significant difference with $p < 0.1$ in a two-category $\chi 2$ test of the frequency of those using this mode versus those using any other mode in one year versus the other.
** Statistically significant at $p < 0.05$.
[1]   The apparent significant change in train ridership among those living in Davis occurred because five weighted respondents indicating living in Davis but riding the train to campus in 2010-11, while none indicated doing so in 2011-12. The former responses are likely due to misreporting residential location or traveling from a location other than primary residence.
Data are weighted for both years by role and gender.

Circulation modes during the day

Another consideration in evaluating the number of people regularly using particular modes is whether people use a particular means of transportation or "circulation mode" to get around during the day (as opposed to getting to or from campus). We asked respondents about how they "typically get around" during the day, after arriving at the beginning of the day and before leaving school or work 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." This year, we asked separate questions to those who indicated their office is on-campus (Table 37) and those whose office is off-campus in Davis (Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01, Q09,* and *Q20-9* (see Table 15). Table 38).

Employees whose office is on the main campus are much more likely to bike as a circulation mode (24 percent of trips) than their counterparts with offices off-campus in Davis (8 percent of trips). Similarly, employees with offices off-campus in Davis are more likely to drive or ride in a vehicle as a circulation mode than those with offices on-campus (45 percent vs. 20 percent of trips).

Table 37. Circulation mode for those with on-campus lab or department

| | Percent of trips around campus (or off campus) | | | | Weighted sample |
	Bike	Walk	Vehicle	Other	
Student	48%	45%	5%	2%	2,128
Undergraduate	50%	44%	5%	2%	1,727[1]
Graduate	42%	50%	8%	1%	402
Employee	24%	55%	20%	1%	781
Faculty	32%	61%	7%	0%	149
Staff	23%	53%	23%	1%	632
Within Davis	49%	43%	6%	2%	2,267
Outside Davis	15%	62%	21%	1%	643
Overall	42%	48%	9%	2%	2,910

[1] Undergraduates are assumed to have offices or classes on-campus.
Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 38. Circulation mode for those with off-campus lab or department

| | Percent of trips around off-campus lab or department | | | | Weighted sample |
	Bike	Walk	Vehicle	Other	
Student	59%	40%	1%	0%	9
Undergraduate	n/a	n/a	n/a	n/a	0
Graduate	59%	40%	1%	0%	9
Employee	8%	44%	45%	3%	71
Faculty	37%	45%	18%	0%	4
Staff	6%	44%	47%	3%	67
Within Davis	18%	47%	34%	0%	32
Outside Davis	11%	42%	43%	4%	48
Overall	14%	44%	40%	3%	80

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Carpooling and ridesharing

Each year we ask those who indicate carpooling (multiple people in a vehicle arriving on campus together) or getting a ride to campus (where the driver continues on to another destination after the drop-off) how many other people were in the vehicle. This data enables us to accurately account for carpooling and ridesharing in our estimation of vehicle-miles traveled from person-miles traveled. The average vehicle occupancy for carpools and rides is shown in Table 39. Among those who carpooled at any point during the reference week, the average number of passengers was 2.3 (including the driver). Most people dropped off on campus were the sole passenger, with an average of 1.2 passengers dropped off per ride to campus (excluding the driver) (Table 39).

Table 39: Average carpool size

Role group	Average occupancy among those that carpooled /rode at least once		Weighted sample	
	Carpool occupants (including driver)	Ride passengers (excluding driver)	Carpoolers	Riders
Undergraduate	2.2	1.2	80	63
Graduate	2.3	1.3	44	17
Faculty	2.8	1.2	14	5
Staff	2.3	1.0	90	28
Outside Davis	2.3	1.1	111	22
Within Davis	2.3	1.2	118	91
Overall	2.3	1.2	229	112

Vehicle occupancy is based on responses to question *Q30* for those carpooling and to question *Q32* for those who got a ride. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Number of vehicles on campus

Estimates of the number of people driving alone, carpooling, and getting a ride can be combined with average vehicle occupancy findings 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 15. We estimate that 9,894 vehicles come to campus on an average weekday (Table 40). About 715 of these contain carpools and 480 are vehicles just dropping passengers off.

Table 40. Projected vehicles arriving on an average weekday, by occupancy and role

Role group	Projected number of vehicles on an average weekday				Projected Population
	Drive alone	Carpool	Ride	Total	
Students	3,650	304	274	4,228	29,387
Undergraduate	2,350	189	212	2,751	23,659
Freshmen	71	7	15	93	3,557
Sophomores	178	37	35	250	4,088
Juniors	777	65	73	915	6,717
Seniors	1,324	81	89	1,493	9,297
Graduate	1,300	115	62	1,477	5,728
Masters	451	42	16	509	2,082
PhD	849	73	46	968	3,646
Employees	5,049	411	206	5,666	11,341
Faculty	578	49	23	649	2,045
Staff	4,471	362	183	5,017	9,296
Within Davis	3,516	245	342	4,104	31,390
Outside Davis	5,182	470	137	5,790	9,338
Overall	8,698	715	480	9,894	40,728

Results are based on responses to questions *Q21* (days physically traveling to campus), *Q29* (mode of transportation used each day), *Q30* (carpool size), and *Q32* (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 defined as "Carpool or vanpool with others also going to campus (either as driver or passenger)" and ride is defined as "Get a ride (someone drops you off and continues on elsewhere)." Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

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 3.26, or 1.78 among (non-student) employees only (Table 41). This means that for every car coming to campus, there are about 3.26 off-campus people coming to campus or telecommuting. This estimate is the highest it has been in five years of campus travel survey data; however gender weights have only been applied starting in 2010-11. To the extent that results are consistent across years, relatively fewer cars came to campus in 2011-12 for each role and residential location. Table 41 shows the Average Vehicle Ridership estimates over the last five years, with the results for 2011-12.

Table 41. Average Vehicle Ridership (AVR), 2007-08 through 2011-12

Role group	Off-campus only					All (on and off-campus)				
	2007-08	2008-09	2009-10	2010-11	2011-12	2007-08	2008-09	2009-10	2010-11	2011-12
Students	1.67	4.76	4.28	4.49	5.29	5.04	5.91	5.25	5.53	6.41
Undergraduate	4.24	5.80	5.11	5.38	6.42	5.04	7.37	6.36	6.72	8.01
Freshmen	5.32	5.35	4.69	3.26	3.66	26.39	33.40	21.84	32.75	34.61
Sophomores	6.46	10.24	9.38	8.37	15.93	6.78	10.67	9.53	9.11	16.54
Juniors	4.05	6.26	5.48	5.59	6.24	4.46	6.56	6.04	6.23	6.88
Seniors	3.55	4.39	3.88	4.57	5.26	3.77	4.67	4.09	4.79	5.68
Graduate	3.43	2.81	2.57	2.79	3.14	3.94	3.21	2.95	3.18	3.45
Masters	3.22	2.71	2.6	2.73	3.34	3.49	2.94	2.84	2.94	3.57
PhD	3.55	2.86	2.56	2.82	3.03	4.2	3.36	3.01	3.33	3.39
Employees	**1.67**	**1.69**	**1.66**	**1.75**	**1.78**	1.67	1.71	1.66	1.75	1.80
Faculty	2.23	2.34	2.37	2.24	2.76	2.23	2.35	2.38	2.24	2.78
Staff	1.58	1.60	1.56	1.66	1.65	1.58	1.62	1.55	1.67	1.67
Non-student and student employees	n/a	n/a	2.20	n/a	2.45	n/a	n/a	2.31	n/a	2.59
Outside Davis	1.33	1.32	1.26	1.34	1.39	1.33	1.33	1.26	1.34	1.39
Within Davis	4.60	5.17	4.99	4.99	5.98	5.61	6.32	5.99	6.04	7.14
Overall	2.75	2.99	2.83	3.00	3.26	3.20	3.51	3.30	3.51	3.78

Bold indicates the official AVR statistic reported by UC campuses.
AVR estimates from 2010-11 and 2011-12 are weighted by role and gender.
See Appendix D for details on AVR calculations.

Table 42 shows comparable AVR statistics for 2011-12 at UC Davis with those at other UC campuses for which AVR statistics are available. At the time of this report, the most recent AVR for most UC campuses is the one documented in the *Systemwide Transportation Survey Matrix 10-11*. Dashes indicate no new AVR was available for that year. To the extent that the most

recently reported AVR statistics at other UC campuses reflect travel patterns in 2011-12, the comparison suggests that UC Davis has the highest (best) AVR of the UC campuses for which statistics are available.

Table 42. AVR at UC Davis versus other UC campuses

UC Campus	2009-10	2010-11	2011-12	Notes on reported AVR	Comparable AVR at UCD 2011-12
Irvine	1.90	1.87	-	Includes grad student employees	2.45
Los Angeles	1.64	-	-	Official (off campus employees only)	1.78
Riverside	1.55	1.53	-	Official (off campus employees only)	1.78
Santa Barbara	1.35	-	-	Averaged for faculty (1.4) and staff (1.3)	1.78
San Diego	1.60	1.60	-	Official (off campus employees only)	1.78
San Francisco	2.30	-	-	Off campus students and employees	3.26
Santa Cruz	2.29	1.94	-	Off campus students and employees	3.26

See Appendix D for details on the calculation of the Davis AVR. Other campus figures are from the Systemwide Transportation Survey Matrix 08-09, 09-10, and 10-11, available online at http://www.universityofcalifornia.edu/sustainability/trans_pres.html.

Zero-emission vehicles

For the purposes of calculating AVR statistics, we asked anyone who reported driving, carpooling, or getting a ride at any point on their way to campus during the reference week whether they used an all-electric or hydrogen fuel cell vehicle (*Q34*). As expected, only several (weighted) respondents reported using a zero-emission vehicle to travel to campus during the reference week: three drove all-electric vehicles and three drove hydrogen vehicles.

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 *Q14* and *Q15*). About 26 percent of respondents reported having an annual parking permit and 8 percent reported having a monthly or quarterly permit: a projected 10,532 and 3,304 people, respectively (Table 43). These estimates match relatively closely with TAPS's records of 8,635 annual permits and 3,485 monthly or quarterly permits issued.[4] Since not every respondent provided answers to the questions about parking permits, it is likely that missing data contributes substantially to the differences between estimated and actual parking permit totals (as opposed to necessarily indicating a survey bias). Since TAPS permit counts can be a useful tool for validating the survey results, it may be useful to make the parking permit questions mandatory (necessary to answer before continuing) in future surveys.

Table 43. Share of people with a parking permit, by role

	Has either an annual/multi-year or monthly/quarterly permit			Annual (or multi-year) permit			Monthly or quarter permit			
	Share of weighted sample	Projected population	TAPS Actual Count	Share of weighted sample	Projected population	TAPS Actual Count	Share of weighted sample	Projected population	TAPS Actual Count	Total population
Student	19.8%	5,805	5,879	9.8%	2,874	2,881	10.0%	2,931	2,998	29,387
Undergrad	16.3%	3,845	3,861	6.9%	1,639	1,732	9.3%	2,206	2,129	23,659
Freshman	9.9%	353	-	6.9%	244	-	3.1%	109	-	3,557
Sophomore	14.2%	581	-	5.5%	227	-	8.7%	354	-	4,088
Junior	17.2%	1,153	-	8.0%	538	-	9.1%	614	-	6,717
Senior	17.5%	1,628	-	6.7%	619	-	10.9%	1,009	-	9,297
Graduate	30.7%	1,761	2,018	18.7%	1,073	1,149	12.0%	688	869	5,728
Masters	37.3%	776	-	21.0%	437	-	16.3%	339	-	2,082
PhD	27.1%	988	-	17.5%	637	-	9.6%	351	-	3,646
Employee	60.4%	6,851	6,241	55.8%	6,323	5,754	4.7%	528	487	11,341
Faculty	47.7%	976	-	44.0%	900	-	3.7%	75	-	2,045
Staff	63.1%	5,869	-	58.3%	5,417	-	4.9%	452	-	9,296
Within Davis	19.0%	5,967	-	13.6%	4,274	-	5.4%	1,694	-	31,390
Outside Davis	71.5%	6,679	-	56.6%	5,284	-	14.9%	1,394	-	9,338
Overall	34.0%	13,836	12,120	25.9%	10,532	8,635	8.1%	3,304	3,485	40,728

Results are based on responses to question *Q14*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

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[4] Jeremy Dalbeck at TAPS compiled a tabulation of permits active as of October 24, 2011 by role group. There were a total of 14,734 annual, multiyear, quarterly, or monthly permits issued 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, Sodexho, and vendors).

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, they were then asked to indicate which transit service(s) they used ("Check all that apply"). Table 44 and Table 45 show the share of bus and train users who used each service at least once during the reference week. Most undergraduates who rode the bus used Unitrans, while graduate students and faculty were more evenly split between Unitrans and the shuttle that operates between UC Davis and the UC Davis Medical Center.

Table 44. Share riding specific bus services at least once during the week

Role group	Unitrans	Yolobus	UCD / UCDMC Shuttle	Amtrak motorcoach (bus)	UC Berkeley / UC Davis shuttle	Fairfield Suisun Transit	Weighted sample	Projected population
Undergraduate	93.5%	6.8%	3.1%	0.8%	0.7%	0.1%	639	8,346
Graduate	66.1%	5.0%	31.6%	0.0%	0.0%	0.0%	38	502
Faculty	88.9%	5.5%	11.1%	0.0%	0.0%	0.0%	6	83
Staff	34.2%	26.5%	26.0%	4.6%	0.0%	4.1%	55	723
Overall	87.6%	8.2%	6.4%	1.0%	0.6%	0.4%	738	9,653

Results are based on responses to questions *Q28* (whether a bus was ever used) and *Q35* (which bus services). Data are weighted by role group based on the 3,116 valid responses to question *Q29* (see Table 15).

Of those riding the train, nearly all rode the Amtrak Capitol Corridor; however a few graduate students and faculty rode Bay Area Rapid Transit. Given the relatively small sample size, the estimates for train service ridership are imprecise.

Table 45. Share riding specific train services at least once during the week

Role group	Among those who rode the train, share who used each service at least once			
	Amtrak Capitol Corridor	BART	Sacramento Regional Transit	Weighted sample
Undergraduate	100%	0%	13%	11
Graduate	87%	20%	0%	6
Faculty	80%	10%	0%	17
Staff	100%	0%	0%	44
Overall	94%	6%	3%	78

Results are based on responses to questions *Q28* (whether a train was ever used) and *Q36* (which train services). Data are weighted by role group based on the 3,116 valid responses to question *Q29* (see Table 15).

Time arriving on campus

Table 46 and Table 47 show the percent of respondents traveling to campus who arrived during the morning peak (6am-10am[5]), 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 27,186 people.

Table 46. Arrivals during the peak period, by day

Day	Share traveling to campus	Arrival time	
		6am-10am	Off-peak
Monday	90.59%	78.0%	22.0%
Tuesday	90.87%	72.3%	27.7%
Wednesday	91.41%	78.5%	21.5%
Thursday	90.38%	72.5%	27.5%
Friday	82.31%	74.9%	25.1%
Average weekday	89.00%	75.0%	25.0%
Projected population	36,248	27,186	9,062

Results are based on responses to question *Q27*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Staff are most likely to arrive on campus during peak hours (95 percent of those physically travelling), while freshmen and sophomores are least likely to arrive during peak hours (62 percent).

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[5] 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 47. Share arriving during the peak period on an average weekday, by role

Role group		Share traveling to campus	Of those physically traveling to campus, arrival time		Weighted sample	Projected population
			6am-10am	Off-peak		
Student		91%	68%	32%	2,248	29,387
Undergrad		92%	66%	34%	1,810	23,659
Freshman		91%	62%	38%	272	3,557
Sophomore		94%	62%	38%	313	4,088
Junior		93%	65%	35%	514	6,717
Senior		91%	68%	32%	711	9,297
Graduate		87%	76%	24%	438	5,728
Masters		86%	74%	26%	159	2,082
PhD		88%	77%	23%	279	3,646
Employee		86%	93%	7%	868	11,341
Faculty		79%	84%	16%	156	2,045
Staff		87%	95%	5%	711	9,296
Residential location	Within Davis	92%	72%	28%	2,402	31,390
	Outside Davis	81%	85%	15%	714	9,338
Gender	Male	89%	71%	29%	1,429	18,680
	Female	90%	78%	22%	1,687	22,048
Overall		89%	75%	25%	3,116	40,728
Weighted sample		2,773	2,080	693	3,116	
Projected population		36,248	27,186	9,062		40,728

Results are based on responses to question *Q27*. Results are based on responses to question *Q14*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Residential location

Since travel behavior varies substantially by residential location, each year respondents are asked about their residential location, defined as the place of residence from which they regularly travel to campus. This year, the four broad categories included the on campus area, the West Village apartments, off-campus elsewhere in Davis, and outside of Davis (*Q17*). The results suggest that about 15 percent live on campus (an estimated 6,028 people), 2.5 percent live in the West Village apartments (an estimated 1,018 people), 60 percent live elsewhere in Davis (24,315 people), and 23 percent live outside of Davis (9,327 people), as shown in Table 48. A comparison with results from previous surveys shows no change in this overall distribution, except that the combined share living in West Village and elsewhere in Davis this year is roughly equivalent to last year's share living off-campus in Davis (Table 48).

Table 48: Residential location by role group

| | Share living in each location | | | | | |
Role	On Campus	West Village	Off Campus in Davis	Outside Davis	Weighted Sample	Projected Population
Student	20.2%	3.5%	65.9%	10.4%	2,248	29,387
Undergrad	21.9%	3.9%	66.1%	8.2%	1,811	23,659
Freshman	91.9%	1.2%	4.5%	2.4%	271	3,557
Sophomore	10.2%	7.8%	78.6%	3.4%	313	4,088
Junior	10.3%	4.6%	74.3%	10.8%	515	6,717
Senior	8.5%	2.6%	78.3%	10.5%	711	9,297
Graduate	13.3%	2.0%	65.1%	19.6%	438	5,728
Masters	10.5%	4.0%	65.6%	19.8%	159	2,082
PhD	14.9%	0.8%	64.8%	19.5%	279	3,646
Employee	1.0%	0.0%	43.7%	55.4%	868	11,341
Faculty	0.6%	0.0%	70.4%	29.0%	156	2,045
Staff	1.0%	0.0%	37.8%	61.2%	711	9,296
Overall	14.8%	2.5%	59.7%	22.9%	3,116	40,728
Weighted Sample	461	78	1,860	714	3,116	
Projected Population	6,028	1,018	24,315	9,327		40,728

Results are based on responses to question *Q14*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 49 shows the share of residents in each location who are in each role group. For example, among those living on campus, over 98 percent are students and almost 86 percent are undergraduates. Of those living off campus in the city of Davis, roughly 80 percent are students and 20 percent are employees. Those living outside of Davis are more likely to be staff than any other role: 61 percent of those living outside of Davis are staff, even though staff accounts for just 23 percent of the total university population.

Table 49. Role group by residential location

Role	Among those who are living in this location, share who are in this role group: On Campus	West Village	Off Campus in Davis	Outside Davis	Weighted Sample	Projected Population	This role group's share of the population
Student	98.2%	100.0%	79.6%	32.7%	2,248	29,387	72.2%
Undergrad	85.6%	89.1%	64.3%	20.7%	1,811	23,659	58.1%
Freshman	54.1%	4.2%	0.7%	0.9%	271	3,557	8.7%
Sophomore	6.9%	31.0%	13.2%	1.5%	313	4,088	10.0%
Junior	11.5%	30.1%	20.5%	7.8%	515	6,717	16.5%
Senior	13.1%	23.8%	29.9%	10.5%	711	9,297	22.8%
Graduate	12.6%	10.9%	15.3%	12.0%	438	5,728	14.1%
Masters	3.6%	8.2%	5.6%	4.4%	159	2,082	5.1%
PhD	9.0%	2.7%	9.7%	7.6%	279	3,646	9.0%
Employee	1.8%	0.0%	20.4%	67.3%	868	11,341	27.8%
Faculty	0.2%	0.0%	5.9%	6.4%	156	2,045	5.0%
Staff	1.6%	0.0%	14.4%	60.9%	711	9,296	22.8%
Overall	100.0%	100.0%	100.0%	100.0%	3,116	40,728	100.0%
Weighted Sample	461	78	1,860	714	3,116		
Projected Population	6,028	1,018	24,315	9,327		40,728	

Results are based on responses to question *Q14*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Distance from campus

For the purpose of estimating vehicle-miles traveled and carbon dioxide emissions from travel to campus, respondents were asked 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 in questions *Q18* through *Q19*. This information was geocoded in ArcGIS, enabling a variety of spatial analyses (see Appendix E for details on the methodology).

We used the geocoded addresses to estimate the distance respondents travel (along a shortest-time route) to get to campus (in particular, to the Silo) on a daily basis (see Appendix E). While using a shortest-time route 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. Since some pedestrians and bicyclists may choose routes based on shortest distance, the estimated distances might be interpreted as upper bounds. Table 50 and Table 51 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 1.7 miles, versus 2.9 among faculty and 11.3 among staff (Table 50).

Table 50. Average distance from campus, based on geocoded addresses, by role

| Role | Percent geocoded | Among those successfully geocoded, distance from campus (in miles): | | | | Weighted Sample | Projected Population |
		Mean	Median	Minimum	Maximum		
Student	94%	4.6	1.7	0.4	515.4	2,248	29,387
Undergrad	94%	3.6	1.7	0.4	109.6	1,811	23,659
Freshman	100%	1.4	0.8	0.8	42.3	271	3,557
Sophomore	90%	2.6	1.7	0.5	73.2	313	4,088
Junior	94%	4.2	1.8	0.4	109.6	515	6,717
Senior	94%	4.5	1.8	0.4	82.3	711	9,297
Graduate	95%	8.5	1.9	0.5	515.4	438	5,728
Masters	96%	8.1	1.9	0.6	92.9	159	2,082
PhD	95%	8.7	2.0	0.5	515.4	279	3,646
Employee	94%	13.2	9.2	0.5	179.2	868	11,341
Faculty	93%	11.2	2.9	0.6	133.2	156	2,045
Staff	94%	13.6	11.3	0.5	179.2	711	9,296
Outside Davis	92%	24.6	17.7	1.3	515.4	714	9,327
Off Campus in Davis	93%	2.1	1.9	0.4	6.6	1,860	24,315
Overall	94%	7.0	2.0	0.4	515.4[1]	3,116	40,728
Weighted Sample	2,929						

Distances are calculated as the shortest-time network distance between respondents' geocoded cross-streets (given in questions *Q18* and *Q19*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role and gender group for the 2,929 cases successfully geocoded and with non-missing mode choice data in question *Q29*.

[1] Respondent reported working from home all week. Presumably, regular travel to campus originates at a closer location.

While about 88 percent of undergraduates live within 3 miles of campus, only 52 percent of

faculty and 26 percent of staff do (Table 51). About 15 percent of the campus population lives more than 10 miles away, and 7 percent more than 20 miles away. Note that the threshold for living within Davis is about 5 miles, and that very few people live 5 to 10 miles from campus, given the agricultural belt that surrounds Davis. That is, once they live outside of Davis, it is likely that they live more than 10 miles away.

Table 51. Cumulative percent of people living within each distance of campus, by role

		Students		Employees	
Distance from campus	Overall	Undergraduate	Graduate	Faculty	Staff
0.5 miles or less	0.4%	0.6%	0.2%	0.0%	0.0%
1 mile	24.6%	33.3%	17.4%	3.5%	2.8%
1.5 miles	36.4%	46.4%	31.1%	12.2%	5.3%
2 miles	56.0%	70.3%	49.2%	22.4%	9.2%
2.5 miles	63.8%	76.5%	59.6%	35.6%	17.7%
3 miles	75.0%	87.9%	68.0%	52.2%	25.8%
4 miles	82.9%	93.0%	79.3%	67.9%	38.5%
6 miles	83.6%	93.1%	79.7%	72.4%	39.6%
8 miles	83.9%	93.2%	79.9%	73.4%	39.9%
10 miles	84.8%	93.4%	80.9%	75.0%	44.9%
12 miles	86.5%	93.9%	82.4%	76.9%	54.4%
14 miles	87.8%	94.2%	84.4%	78.8%	60.8%
16 miles	89.5%	94.7%	86.5%	82.4%	67.5%
18 miles	91.3%	95.2%	89.3%	84.3%	76.7%
20 miles	92.9%	96.1%	90.8%	87.2%	82.0%
25 miles	94.5%	97.0%	92.6%	88.8%	87.6%
30 miles	95.9%	98.4%	93.6%	89.1%	91.2%
40 miles	96.7%	98.9%	94.3%	89.4%	94.3%
50 miles	97.3%	99.4%	94.7%	90.1%	96.5%
60 miles	98.0%	99.6%	95.1%	92.0%	98.6%
70 miles	99.1%	99.8%	98.4%	95.5%	99.3%
100 miles	99.8%	99.9%	99.6%	99.7%	99.6%
More than 100 miles	100.0%	100.0%	100.0%	100.0%	100.0%
Weighted sample	3,007	1,900	512	312	283
Projected population	40,728	23,659	5,728	2,045	9,296
Group's percent of the overall population	100.0%	58.1%	14.1%	5.0%	22.8%

Distances are calculated as the shortest-time network distance between geocoded cross-streets (given in questions *Q18* and *Q19*) and a centroid on campus near the Silo (see Appendix E). Data are unweighted. Distances less than 1 mile from campus have different shares compared to last year due to a change in assumed distance from campus destinations for those who reported living in the "on campus" area. See "Appendix E: Geocoding and network distances" for more details.

Table 52. Distance from campus, by mode group

Mode group	Percent "usually" using this mode	Mean distance	Median distance	Minimum distance	Maximum distance	Weighted sample	Projected Population
Bike	46.0%	2.2	1.5	0.4	515.4[1]	1,214	16,881
Walk or skate	6.1%	1.8	0.8	0.4	133.2[2]	162	2,254
Drive alone	23.3%	16.5	12.5	0.8	179.2	615	8,557
Carpool or ride	5.6%	15.6	11.9	1.0	92.9	147	2,042
Bus	17.5%	3.7	1.9	0.8	39.6	461	6,412
Train	0.9%	44.4	48.4	0.8	75.8	23	321
Overall	100.00%	7.0	2.0	0.4	515.4	2,623	36,467

Mode data are based on responses to question *Q26* (usual mode of transportation) and distance data are calculated network distances between the geocoded cross-streets (given in *Q18* and *Q19*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role and gender group for the 2,929 cases successfully geocoded and with non-missing mode choice data in question *Q29*.

[1] Respondent reported working from home all week. Presumably, regular travel to campus originates at a closer location.

[2] Respondent reported walking from a location other than primary residence.

Table 53. Primary mode on an average weekday, by distance from campus

Distance group	Percent physically traveling	Among those physically traveling to campus, share who:						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Within 1 mile	91%	72%	19%	2%	1%	5%	0%	594	8,254
1 to 2.9 miles	93%	54%	3%	13%	4%	27%	0%	1,403	19,509
3 to 4.9 miles	90%	42%	1%	33%	5%	19%	0%	272	3,780
5 to 9.9 miles	80%	3%	5%	75%	13%	4%	0%	50	690
10 to 19.9 miles	84%	4%	1%	66%	17%	10%	2%	356	4,950
20 miles or more	78%	3%	2%	70%	13%	5%	8%	255	3,544
Overall	90%	46%	6%	23%	6%	17%	1%	2,929	40,728
Weighted sample	2,639	1,214	162	615	147	461	23	2,929	
Projected population	36,467	16,881	2,254	8,557	2,042	6,412	321		40,728

Mode data are based on responses to question *Q29*, and distance data are calculated network distances between the geocoded cross-streets (given in *Q18* and *Q19*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role group and gender for the 2,929 cases successfully geocoded and with non-missing mode choice data in question *Q29* (see Table 15).

For the purpose of validating the method we use to calculate mode share, this year we also asked respondents about the mode they "usually" use to travel to campus (*Q26*). This variable captures what respondents consider to be their "usual" mode, even if they traveled to campus using a different primary mode during the reference week. In addition, this variable captures the mode usually used by respondents who did not travel to campus during the reference week. For each distance category, Table 54 shows the share "usually" using each mode among those physically travelling to campus. The resulting mode share estimates derived from the "usual" mode question are very close to the estimates derived from the standard "reference week" primary

mode questions. This consistency is important, since it indicates the mode share estimates of the campus travel survey adequately capture what respondents consider to be their "usual" travel.

Table 54. Usual mode, by distance from campus

Distance group	Percent physically traveling	Usual mode of those physically traveling to campus						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Within 1 mile	91%	77%	17%	1%	0%	5%	0%	587	8,254
1 to 2.9 miles	93%	58%	3%	11%	2%	26%	0%	1,388	19,509
3 to 4.9 miles	90%	44%	1%	31%	4%	19%	0%	269	3,780
5 to 9.9 miles	80%	3%	0%	78%	16%	3%	0%	49	690
10 to 19.9 miles	84%	4%	1%	65%	17%	11%	2%	352	4,950
20 miles or more	78%	3%	0%	70%	11%	5%	11%	252	3,544
Overall	90%	48%	5%	24%	5%	17%	1%	2,899	40,728
Weighted sample	2,612	1,259	127	622	127	444	33	2,899	
Projected population	36,696	17,689	1,790	8,737	1,779	6,237	464		40,728

Mode data are based on responses to question *Q26*, and distance data are calculated network distances between the geocoded cross-streets (given in *Q18* and *Q19*) and a centroid on campus near the Silo (see Appendix E). Data are weighted by role group and gender for the 2,929 cases successfully geocoded and with non-missing mode choice data in question *Q29* (see Table 15).

Aggregate person-miles and vehicle-miles traveled to campus

For estimates of the number of miles traveled to and from campus, we rely on the calculated distances between respondents' geocoded home locations and a centroid on campus. We assume respondents take the fastest 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 pick up children, or visit friends), diversions from the shortest time path for a more pleasant or less congested route, 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 to and from campus 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 traveled 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 her miles as bike miles and 80 percent as driving miles. Summed across all respondents, this figure represents the number of 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 of working from home or for other reasons. We weight and expand all responses by role group and gender to estimate the total person-miles traveled to campus by 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 *Q39* and *Q40* about the number of weeks and average number of days per week traveled to campus during the summer, but assuming respondents used the same modes as during the survey reference week throughout the summer. For example, 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 during 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 person-miles traveled, by mode and role, are shown in Table 55 and Table 56. We estimate that the campus population travels about 383,000 miles to and from campus on an average weekday. We see that trips in cars account for a disproportionately high share of miles (70 percent of miles but 30 percent of people) as do train trips (5.7 percent of miles but 1.1 percent of people), whereas biking, walking, and bus account for a disproportionately low share of miles. Considering role groups, employees cover a disproportionately high share of miles (60 percent of miles, while comprising only 30 percent of the population). Travel avoided by working from home reduces the potential miles traveled by about 4 percent, to the extent that this activity truly replaces physical trips to campus that otherwise would have taken place.

Table 55. Total miles traveled daily and annually, by mode used

Mode group	Aggregate round-trip person-miles traveled		Percent of total daily miles traveled	Percent of total people	Projected population
	Daily	Annually			
Bike	52,583	13,145,738	13.73%	46.19%	18,762
Walk	3,550	887,471	0.93%	5.63%	2,288
Personal vehicle	267,830	66,957,518	69.94%	29.29%	11,898
Drive alone	220,050	55,012,408	57.46%	23.66%	9,610
Carpool or ride	47,780	11,945,110	12.48%	5.63%	2,288
Bus	37,323	9,330,873	9.75%	18.03%	7,322
Train	21,677	5,419,372	5.66%	1.13%	458
Work from home	-14,955	-3,738,722	-3.91%	0.79%	321
Other no travel	-79,350	-19,837,602	-20.72%	9.65%	3,919
Overall	382,964	95,740,972	100.00%	100.00%	40,728

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 *Q21* and *Q29*, among others. "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 and gender group for the 2,929 cases successfully geocoded and with non-missing mode choice data in question *Q29* (see Table 15). Daily estimates are based on 250 weekdays per year (5 days per week in the 36-week academic year and 14-week summer).

Table 56. Total miles traveled daily and annually, by role

Role	Aggregate round-trip person-miles traveled		Percent of total daily miles traveled	Percent of total people	Projected population
	Daily	Annually			
Students	171,352	42,838,088	44.7%	72.3%	29,387
Undergraduate	121,346	30,336,501	31.7%	58.2%	23,659
Freshmen	6,231	1,557,746	1.6%	8.8%	3,557
Sophomores	14,814	3,703,552	3.9%	10.1%	4,088
Juniors	38,968	9,742,074	10.2%	16.5%	6,717
Seniors	61,333	15,333,128	16.0%	22.9%	9,297
Graduate	50,006	12,501,587	13.1%	14.1%	5,728
Masters	18,254	4,563,380	4.8%	5.1%	2,082
PhD	31,753	7,938,206	8.3%	9.0%	3,646
Employees	229,737	57,434,344	60.0%	27.9%	11,341
Faculty	26,087	6,521,825	6.8%	5.0%	2,045
Staff	203,650	50,912,519	53.2%	22.9%	9,296
Outside Davis	312,033	78,008,181	81.5%	22.7%	9,227
Within Davis	89,057	22,264,251	23.3%	77.6%	31,501
On campus	6,721	1,680,333	1.8%	15.3%	6,232
West Village	2,044	511,074	0.5%	2.7%	1,099
Off campus	80,291	20,072,844	21.0%	59.5%	24,171
Overall	382,964	95,740,972	100.0%	100.0%	40,728

All data are weighted (and expanded) by role and gender group for the 2,929 cases successfully geocoded and with non-missing mode choice data in question *Q29* (see Table 15).

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 *Q30* and *Q32* 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 miles × 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 is assumed to be one.

In addition to VMT for personal vehicles, we estimate VMT for buses and trains for the purpose of calculating the carbon dioxide equivalent emissions generated from commuting to campus (see next section). 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 2010 figures from the National Transit Database, Unitrans provided 7,538,677 annual passenger miles and 743,234 vehicle revenue miles, suggesting an average of about 10.14 passengers per mile (up from 9.72 passengers per mile in 2008; see Miller, 2011).[6] Thus, for someone who lives 10 miles from campus and traveled by bus all five weekdays, average bus VMT per day is (10 miles × 2) / 10.14 = 1.97 vehicle-miles. In general, each mile someone travels by bus contributes 1 / 10.14 ≈ 0.099 vehicle-miles per passenger-mile.

We estimate 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 had an average of 89.9 passengers per mile in FY 2010-11.[7] So if a respondent lives 100 miles from campus and traveled by train all five days, her average train VMT per day is estimated to be (100 miles × 2) / 89.9 = 2.22 vehicle-miles. In general, each mile someone travels by train contributes 1 / 89.9 ≈ 0.011 vehicle-miles per passenger-mile.

Our estimates for vehicle-miles traveled, by mode and role, are shown in Table 57 and Table 58. We estimate that travel to campus in personal vehicles contributes about 245,000 miles to VMT on an average weekday or 61.4 million VMT annually. Including estimates of VMT on buses and trains raises the total to 249,000 miles on an average weekday or 62.3 million miles annually. Those driving alone account for 24 percent of the population, 57 percent of person-miles traveled, and 88 percent of VMT, while those carpooling or getting a ride account for 6 percent of the population, 12 percent of person-miles traveled, and 10 percent of VMT. On an average weekday, about 52 percent of the population contributes no VMT. Employees, and especially staff, contribute the most VMT (60 percent of all VMT), corresponding to living farther away,

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[6] U.S. Department of Transportation, Federal Transit Administration, 2010 National Transit Database, Annual Transit Profile, Unitrans - City of Davis/ASUCD (NTD ID 9142) (http://www.ntdprogram.gov/ntdprogram/pubs/profiles/2010/agency_profiles/9142.pdf).

[7] *Capitol Corridor Intercity Passenger Rail Service Business Plan Update FY 2012-13 – FY 2013-14*, Appendix C (http://www.capitolcorridor.org/included/docs/business_plans/12_14_Business_Plan.pdf).

which in turn corresponds to more driving in lower-occupancy vehicles. In particular, those coming from outside Davis account for 23 percent of the campus population, 82 percent of person-miles traveled, and 93 percent of VMT.

Table 57. Vehicle-miles traveled, by mode, daily and annually

Mode	Daily		Annually		Percent of total VMT	Percent of total people	Population projection
	Total VMT	VMT per person	Total VMT	VMT per person			
No vehicle (bike, walk or skate)	0	0	0	0	0.00%	51.69%	21,050
Personal vehicles	245,413	20.6	61,353,147	5,156.6	98.43%	29.21%	11,898
Drive alone	220,050	22.9	5,012,408	5,724.5	88.25%	23.60%	9,610
Carpool or ride	25,363	11.1	6,340,739	2,771.2	10.17%	5.62%	2,288
Bus	3,681	0.5	920,204	125.7	1.48%	17.98%	7,322
Train	241	0.5	60,282	131.7	0.10%	1.12%	458
Total	249,335	6.1	62,333,634	1,530.5	100.00%	100.00%	40,728

Mode groups are the estimated number using each means of transportation on a typical weekday during the reference week, based on responses to questions *Q21* and *Q29*. Vehicle-miles are calculated as described in the text, drawing on data from questions *Q21, Q29, Q18*, and the average number of passengers per mile on Unitrans and Amtrak's Capitol Corridor. All data are weighted (and expanded) by role and gender group for the 2,929 cases successfully geocoded (based on *Q18*) and with non-missing mode choice data in question *Q29* (see Table 15).

Table 58. Vehicle-miles traveled, by role, daily and annually

Role	Daily		Annually		Percent of total VMT	Percent of total people	Population projection
	Total VMT	VMT per person	Total VMT	VMT per person			
Students	87,676	2.98	21,919,076	746	35.47%	72.15%	29,387
Undergraduate	61,593	2.60	15,398,328	651	24.92%	58.09%	23,659
Freshmen	1,681	0.47	420,163	118	0.68%	8.73%	3,557
Sophomores	4,615	1.13	1,153,787	282	1.87%	10.04%	4,088
Juniors	19,697	2.93	4,924,199	733	7.97%	16.49%	6,717
Seniors	35,601	3.83	8,900,178	957	14.40%	22.83%	9,297
Graduate	26,083	4.55	6,520,748	1,138	10.55%	14.06%	5,728
Masters	11,036	5.30	2,759,106	1,325	4.47%	5.11%	2,082
PhD	15,047	4.13	3,761,642	1,032	6.09%	8.95%	3,646
Employees	161,658	14.25	40,414,558	3,564	65.40%	27.85%	11,341
Faculty	13,960	6.83	3,489,962	1,707	5.65%	5.02%	2,045
Staff	147,698	15.89	36,924,595	3,972	59.76%	22.82%	9,296
Outside Davis	229,430	24.87	57,357,532	6,217	92.82%	22.65%	9,227
Within Davis	19,904	0.63	4,976,102	158	8.05%	77.35%	31,501
On campus	192	0.03	47,920	8	0.08%	15.30%	6,232
West Village	178	0.16	44,449	40	0.07%	2.70%	1,099
Off campus	19,535	0.81	4,883,732	202	7.90%	59.35%	24,171
Total	249,335	6.12	62,333,634	1,530	100.00%	100.00%	40,728

Vehicle-miles are calculated as described in the text, drawing on data from questions *Q21, Q29, Q18*, and the average number of passengers per mile on Unitrans and Amtrak's Capitol Corridor. All data are weighted (and expanded) by

role and gender group for the 2,929 cases successfully geocoded (based on *Q18*) and with non-missing mode choice data in question *Q29* (see Table 15).

Carbon dioxide-equivalent emissions

As in 2010-11, we estimate the amount of greenhouse gases produced by campus travelers by assuming that each means of transportation generates a certain quantity of carbon dioxide-equivalent (CO_2e) per person-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 CO_2e 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 those 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 59.

Table 59. Formula for calculating average weekday pounds of CO_2e, by mode

Mode			
Driving alone	1.1 lbs / mile	×	aggregated average weekday person-miles traveled (or equivalently, vehicle-miles traveled) by driving alone
Carpool / ride	1.1 lbs / mile	×	aggregated average weekday carpool/ride vehicle-miles traveled (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
Bus (low)	0.091 lbs / mile	×	aggregated average weekday person-miles traveled by bus
Train	0.46 lbs / mile	×	aggregated average weekday person-miles by train

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 CO_2 generated are based on comparable figures of miles traveled annually.

Table 60. Daily pounds of CO_2e emitted, by mode and role

Role	Pounds-equivalent of CO_2e generated on an average weekday					Total CO_2e	Average lbs. / person	Percent of total CO_2e	Percent of total people	Projected Population
	Drive alone	Carpool or ride	Bus (high)	Bus (low)	Train					
Students	85,378	8,105	23,470	2,373	4,963	121,917	4.15	38.89%	72.15%	29,387
Undergraduate	60,652	4,570	20,699	2,093	1,324	87,246	3.69	27.83%	58.09%	23,659
Freshmen	1,432	368	372	38	157	2,329	0.65	0.74%	8.73%	3,557
Sophomores	3,873	644	4,644	470	-	9,161	2.24	2.92%	10.04%	4,088
Juniors	19,418	1,466	6,426	650	303	27,613	4.11	8.81%	16.49%	6,717
Seniors	35,929	2,093	9,258	936	864	48,143	5.18	15.36%	22.83%	9,297
Graduate	24,726	3,535	2,771	280	3,639	34,671	6.05	11.06%	14.06%	5,728
Masters	10,826	1,117	1,503	152	613	14,058	6.75	4.48%	5.11%	2,082
PhD	13,900	2,418	1,268	128	3,027	20,613	5.65	6.57%	8.95%	3,646
Employees		19,794		1,023	5,008		16.89	61.11%	27.85%	11,341

	Drive alone	Carpool or ride	Bus (high)	Bus (low)	Train	Total CO₂e	Average tons / person	Percent of total CO₂e	Percent of total people	Projected Population
	156,677		10,121			191,600				
Faculty	14,049	1,223	272	27	1,910	17,454	8.53	5.57%	5.02%	2,045
Staff	142,627	18,571	9,849	996	3,098	174,146	18.73	55.55%	22.82%	9,296
Outside Davis	224,747	25,486	15,557	1,573	9,965	275,755	29.89	87.96%	22.65%	9,227
Within Davis	17,308	2,413	18,034	1,823	7	37,762	1.20	12.04%	77.35%	31,501
On campus	101	80	249	25	3	432	0.07	0.14%	15.30%	6,232
West Village	125	32	318	32	4	479	0.44	0.15%	2.70%	1,099
Off campus	17,082	2,301	17,468	1,766	-	36,851	1.52	11.75%	59.35%	24,171
Overall	242,055	27,899	33,591	3,396	9,972	313,517	7.70	100.00%	100.00%	40,728

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). Total and average are based on the "high" estimate of bus emissions.

Table 61. Annual tons of CO₂e emitted, by mode and role

	Annual tons of CO₂e					Total CO₂e	Average tons / person	Percent of total CO₂e	Percent of total people	Projected Population
Role	Drive alone	Carpool or ride	Bus (high)	Bus (low)	Train					
Students	9,682	919	2,661	269	563	13,825	0.47	38.89%	72.15%	29,387
Undergraduate	6,878	518	2,347	237	150	9,893	0.42	27.83%	58.09%	23,659
Freshmen	162	42	42	4	18	264	0.07	0.74%	8.73%	3,557
Sophomores	439	73	527	53	-	1,039	0.25	2.92%	10.04%	4,088
Juniors	2,202	166	729	74	34	3,131	0.47	8.81%	16.49%	6,717
Seniors	4,074	237	1,050	106	98	5,459	0.59	15.36%	22.83%	9,297
Graduate	2,804	401	314	32	413	3,932	0.69	11.06%	14.06%	5,728
Masters	1,228	127	170	17	70	1,594	0.77	4.48%	5.11%	2,082
PhD	1,576	274	144	15	343	2,337	0.64	6.57%	8.95%	3,646
Employees	17,767	2,245	1,148	116	568	21,727	1.92	61.11%	27.85%	11,341
Faculty	1,593	139	31	3	217	1,979	0.97	5.57%	5.02%	2,045
Staff	16,174	2,106	1,117	113	351	19,748	2.12	55.55%	22.82%	9,296
Outside Davis	25,486	2,890	1,764	178	1,130	31,270	3.39	87.96%	22.65%	9,227
Within Davis	1,963	274	2,045	207	1	4,282	0.14	12.04%	77.35%	31,501
On campus	11	9	28	3	0	49	0.01	0.14%	15.30%	6,232
West Village	14	4	36	4	0	54	0.05	0.15%	2.70%	1,099
Off campus	1,937	261	1,981	200	-	4,179	0.17	11.75%	59.35%	24,171
Overall	27,449	3,164	3,809	385	1,131	35,552	0.87	100.00%	100.00%	40,728

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). Total and average are based on the "high" estimate of bus emissions for a conservative (upper-bound) emissions estimate.

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.

Using these assumptions, we estimate that travel to campus generates a total of 313,517 pounds of CO_2e on an average weekday, or 7.7 per person (Table 60), and about 35,552 metric tons of CO_2e annually, or 0.87 per person (Table 61). These estimates have changed very little from 2010-11 (See Miller, 2011). Undergraduates, but especially freshmen and sophomores, contribute much less to campus-wide CO_2e emissions than their share of the population. Employees, and especially staff, contribute the most CO_2e relative to their share of the campus population, comprising 28 percent of the population while contributing 61 percent of CO_2e on an average day.

As an assessment of the extent that alternative transportation reduces CO_2e 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 travelled to campus), then there would be an additional 17,974 metric tons (annually) of CO_2e generated (Table 62). Figure 7 shows the share of emissions savings from each alternative to driving alone.

Table 62. Annual tons of CO_2e saved compared with driving alone

Role	Annual tons of CO_2e saved					Total CO_2e saved	Average savings / person	Projected Population
	Bike	Walk or skate	Carpool or ride	Bus	Train			
Students	4,496	350	739	1,521	1,893	8,998	0.31	29,387
Undergraduate	3,426	285	380	824	1,669	6,584	0.28	23,659
Freshmen	381	58	41	75	30	584	0.16	3,557
Sophomores	630	27	24	89	374	1,144	0.28	4,088
Juniors	1,141	81	124	266	518	2,130	0.32	6,717
Seniors	1,275	119	191	393	747	2,725	0.29	9,297
Graduate	1,070	65	359	697	223	2,414	0.42	5,728
Masters	344	23	122	228	121	838	0.40	2,082
PhD	726	42	237	469	102	1,576	0.43	3,646
Employees	2,063	93	2,057	3,946	816	8,976	0.79	11,341
Faculty	424	32	225	334	22	1,037	0.51	2,045
Staff	1,639	61	1,832	3,613	794	7,939	0.85	9,296
Outside Davis	880	-	2,661	5,092	1,254	9,887	1.07	9,227
Within Davis	5,679	443	135	375	5,372	12,004	0.38	31,501
On campus	642	132	4	12	1,409	2,198	0.35	6,232
West Village	180	10	2	5	1,254	1,451	1.32	1,099
Off campus	4,858	301	129	358	2,709	8,355	0.35	24,171
Overall	6,559	443	2,796	5,467	2,709	17,974	0.44	40,728

Bike savings = 1.1 lbs./mile*annual person-miles biked
Walk or skate savings = 1.1 lbs./mile*annual person-miles walked or skated
Carpool or ride savings = 1.1 lbs./mile*(carpool or ride PMT - carpool or ride VMT)
Bus savings = (1.1 lbs./mile - 0.091 lbs./mile)*annual bus PMT
"Low" estimates are used to conservatively estimate savings.
Train savings = (1.1 lbs./mile - 0.46 lbs./mile)*annual train PMT

Figure 7. Annual tons of CO$_2$e saved by alternative transportation users
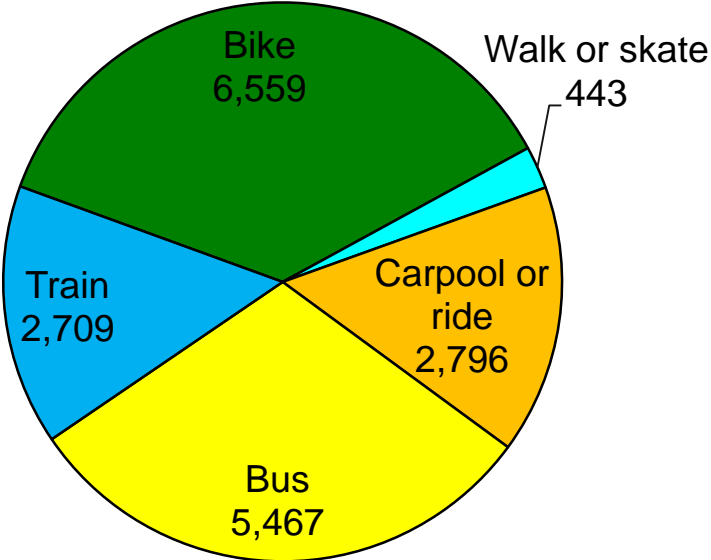
Relative to emissions that would be produced
if these same travelers drove alone.

Driver's license, car and bicycle access

All respondents were asked whether they have a driver's license, have access to a car for driving to campus, and have access to a bicycle for riding to campus. Over 90 percent of those living within Davis have a driver's license, while over 99 percent of those living outside Davis have a license. Car access varies substantially by residential location: less than 70 percent of those in Davis have access to a car, compared to 97 percent of those living outside Davis. About 82 percent of university affiliates have access to a bicycle, and those who live in Davis have substantially higher rates of bicycle access (86.8 percent compared to 66.3 percent). Overall, more people have access to a bicycle (33,456) than to a car (30,964), though these rates are substantially different among only those living outside Davis.

Table 63. Driver's license, car and bicycle access

		Have a driver's license	Have access to a car	Have access to a bike	Weighted Sample	Projected Population
Student		89.9%	66.8%	84.0%	2,248	29,387
Undergrad		89.3%	62.0%	84.0%	1,810	23,659
Freshman		76.7%	20.6%	93.4%	272	3,557
Sophomore		84.1%	45.4%	92.5%	313	4,088
Junior		92.1%	67.6%	82.7%	514	6,717
Senior		94.4%	77.5%	77.5%	711	9,297
Graduate		92.6%	85.6%	83.9%	438	5,728
Masters		94.9%	85.3%	77.9%	159	2,082
PhD		91.3%	85.7%	87.4%	279	3,646
Employee		99.1%	97.8%	77.4%	868	11,341
Faculty		98.3%	97.4%	85.3%	156	2,045
Staff		99.3%	97.9%	75.7%	711	9,296
Residential	Within Davis	90.6%	69.3%	86.8%	2,402	31,390
location	Outside Davis	99.1%	97.0%	66.3%	714	9,338
Overall		92.5%	76.0%	82.1%	3,116	40,728
Weighted Sample		2,882	2,369	2,560	3,116	
Projected Population		37,673	30,964	33,456		40,728

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Injuries resulting from bike falls or crashes on and off campus

All respondents who indicated biking on campus at some point in the last year 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." Table 64 shows that of the 59 percent of respondents who indicated biking on campus within the last year, 14.4 percent (an estimated 3,424) said they experienced bike crash on campus that resulted in personal injury, and 7.5 percent (an estimated 1,785) experienced a crash off campus on the way between home and campus. Freshmen and sophomores who ride a bike on campus are much more likely to experience bike crashes resulting in injury than others on campus, with about 26 percent reporting an injury in the last year, versus 7.2 percent and 3.6 percent among PhD students and faculty, respectively. Furthermore, about 8 and 13 percent of freshmen and sophomores who rode a bike on campus experienced a crash on the way between home and campus.

Table 64. Injuries resulting from bike falls or crashes

| | | Of those riding a bike on campus in the last year, share who experienced a fall or crash that resulted in personal injury | | | | | | | |
| | Share who rode a bike on campus in the last year | Biking on campus | | Biking off campus, between home and campus | | Role group share of population | Role group share of injuries | Population who biked in the last year | Campus population |
		Share	Projected number of persons	Share	Projected number of persons				
Student	63.9%	16.3%	3,057	8.7%	1,629	72.2%	89.9%	18,775	29,387
Undergrad	62.7%	18.3%	2,712	9.1%	1,356	58.1%	78.1%	14,834	23,659
Freshman	43.0%	26.2%	401	8.0%	123	8.7%	10.1%	1,530	3,557
Sophomore	74.1%	25.6%	775	13.0%	393	10.0%	22.4%	3,028	4,088
Junior	62.6%	16.5%	693	7.4%	311	16.5%	19.3%	4,202	6,717
Senior	63.7%	14.4%	851	8.7%	514	22.8%	26.2%	5,924	9,297
Graduate	68.8%	8.8%	345	7.0%	276	14.1%	11.9%	3,939	5,728
Masters	61.7%	12.3%	158	8.3%	107	5.1%	5.1%	1,284	2,082
PhD	72.6%	7.2%	190	6.4%	169	9.0%	6.9%	2,647	3,646
Employee	46.6%	8.4%	443	3.8%	202	27.8%	12.4%	5,289	11,341
Faculty	62.6%	3.6%	46	2.7%	34	5.0%	1.5%	1,279	2,045
Staff	43.2%	9.9%	396	4.2%	168	22.8%	10.8%	4,017	9,296
Residential location — Within Davis	68.6%	15.0%	3,232	7.9%	1,699	77.1%	94.7%	21,526	31,390
Residential location — Outside Davis	27.3%	9.2%	235	4.2%	107	22.9%	6.6%	2,552	9,338
Overall	58.6%	14.4%	3,424	7.5%	1,785	100.0%	100.0%	23,862	40,728

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

This year, all respondents who indicated experiencing a bike fall or crash that resulted in injury were asked about the extent to which this incident reduced their current bicycling frequency (Table 65). Of those who experienced such an incident, about 88 percent indicated that they do not bike any less as a result; however, 9.0 percent indicated biking "somewhat less often," 0.9 percent indicated biking "much less often," and 2.6 percent indicated that they "don't bike anymore" as a result of the fall or crash.

Table 65. Effects of bike falls or crashes on biking frequency

|		Has this fall or crash caused you to bike less frequently now?							
		No, it has not caused me to bike any less		Yes, it has caused me to bike somewhat less often		Yes, it has caused me to bike much less often		Yes, and it is why I don't bike anymore	
		Of those who had a bike crash	Population	Of those who had a bike crash	Population	Of those who had a bike crash	Population	Of those who had a bike crash	Population
Student		87.2%	2,524	9.2%	266	1.0%	29	2.5%	74
Undergrad		86.5%	2,160	9.7%	243	1.2%	29	2.6%	65
Freshman		89.4%	212	10.6%	25	0.0%	-	0.0%	-
Sophomore		91.7%	667	5.6%	41	2.6%	19	0.0%	-
Junior		82.4%	535	9.6%	63	1.6%	10	6.4%	42
Senior		84.5%	745	12.9%	114	0.0%	-	2.6%	23
Graduate		91.9%	364	5.9%	23	0.0%	-	2.2%	9
Masters		90.1%	131	9.9%	14	0.0%	-	0.0%	-
PhD		93.0%	234	3.5%	9	0.0%	-	3.5%	9
Employee		89.3%	417	8.1%	38	0.0%	-	2.6%	12
Faculty		72.4%	44	7.6%	5	0.0%	-	20.0%	12
Staff		91.9%	373	8.1%	33	0.0%	-	0.0%	-
Residential location	Within Davis	86.9%	2,703	9.4%	292	0.9%	29	2.8%	86
	Outside Davis	95.3%	238	4.7%	12	0.0%	-	0.0%	-
Overall		87.5%	2,941	9.0%	303	0.9%	29	2.6%	86

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Self-reported bicycling aptitude

Question *Q47* 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 1.6 percent (an estimated 546) indicated that they cannot ride a bike, and 5.6 percent of respondents indicated that they could but were "not very confident" doing so. Overall, over 92 percent of respondents indicated that they were "somewhat" or "very confident" riding, which mostly held across all role groups. Among all roles, freshmen and master's students are least likely to report being "very confident," and women are significantly less likely to report being "very confident" than men.

Table 66. Self-reported bicycling aptitude

		How would you rate your ability to ride a bike? In particular, we are interested whether you know how 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 or am physically unable		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	
		Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample
Student		2.0%	37	5.9%	112	20.4%	385	71.7%	1,354
Undergrad		1.9%	29	5.8%	87	20.5%	310	71.8%	1,086
Freshman		2.0%	4	5.5%	12	28.5%	63	64.0%	143
Sophomore		1.4%	4	5.7%	15	17.3%	46	75.6%	202
Junior		3.2%	14	6.0%	27	21.0%	93	69.9%	310
Senior		1.2%	7	5.7%	33	18.6%	108	74.6%	432
Graduate		2.1%	8	6.5%	25	20.1%	75	71.3%	268
Masters		2.8%	4	8.2%	11	21.5%	28	67.5%	89
PhD		1.7%	4	5.6%	14	19.3%	47	73.4%	179
Employee		0.7%	5	4.9%	40	13.4%	108	81.0%	650
Faculty		0.7%	1	3.6%	5	14.3%	20	81.4%	114
Staff		0.7%	5	5.2%	35	13.2%	88	80.9%	537
Residential location	Within Davis	1.7%	35	5.1%	104	18.1%	373	75.1%	1,550
	Outside Davis	1.1%	7	7.5%	47	19.1%	120	72.3%	455
Gender	Male	0.9%	10	2.9%	35	11.3%	136	84.9%	1,019
	Female	2.1%	32	7.8%	116	24.0%	358	66.1%	985
Overall		1.6%	42	5.6%	151	18.3%	493	74.5%	2,004

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Bicycling potential

This year we included a question to assess the potential mode share of biking. In *Q50*, respondents were asked, "What options are available to you for getting to campus?" Answers to this question might be used as a proxy for the highest potential share of each mode, since those who don't consider a mode as viable will be very unlikely to choose it. Figure 8 shows the differences between the share of respondents who consider biking to campus an option and the share actually biking to campus on an average weekday. Among those living within a mile of campus, there is almost no difference between the potential for biking and actual biking. Among those living between one and three miles from campus, however, there is a 20 percentage-point gap; this gap increases to more than 35 percentage-points among those living three to five miles from campus. The gaps between the share who consider biking an option and the share who actually bike indicate that in the right conditions, the bike share for those living between one and three miles from campus could be 20 percentage-points higher, and the bike share for those between three and five miles from campus could be up to 35 percentage-points higher.

Note that for these distances, 26 percent and 19 percent ride the bus to campus, while 16 percent and 38 percent travel by car. Thus, identifying and implementing policies that incentivize shifts toward biking to campus from between one and five miles from campus could have substantial VMT and CO_2e benefits. Note that for distances greater than five miles, over 82 percent of respondents travel to campus by car; therefore, while there is a gap between the "potential" and actual bike share, it is likely that the key determinants of mode choice are distance and travel time—both of which are not easily influenced by policy.

Figure 8. Share who consider biking to campus an option vs. share actually biking, by distance
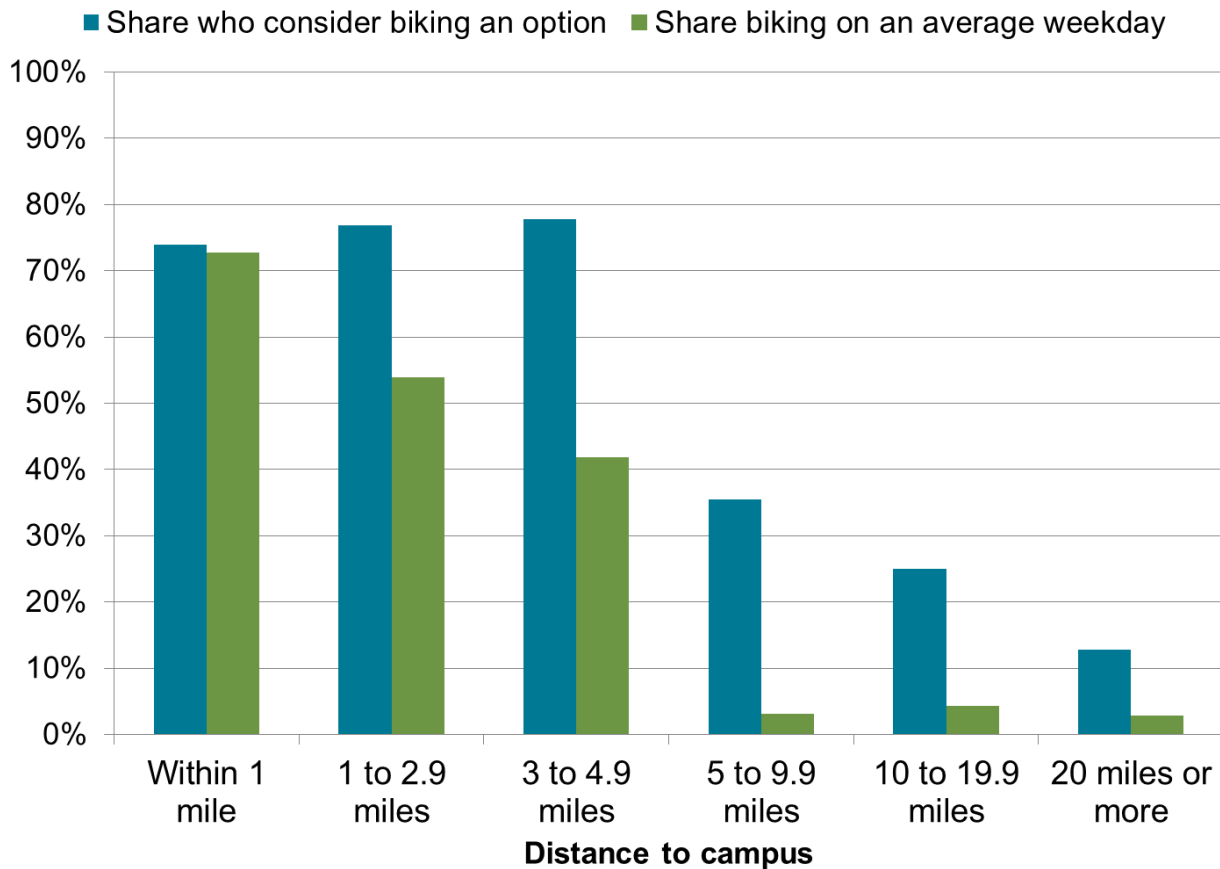
Perceptions of bicycle enforcement and safety walking and biking on campus

In addition to bicycling aptitude, this year we asked respondents several questions about their perceptions of bicycle traffic law enforcement and safety walking and biking on campus. These questions were presented in the form of statements with Likert-scale responses, and respondents were asked to rate their level of agreement or disagreement with each statement. To the extent that the weighted sample is representative of the university population, the counts shown in the "Weighted Sample" columns can be multiplied by a factor of 13 to estimate the number of persons in each role group and residential location who agree or disagree with these statements. For example, about 3,800 students and employees (292 times 13) are estimated to strongly disagree with the statement, "bicycle traffic laws are adequately enforced on campus" (Table 67).

66

About 40 percent of the sample agreed or strongly agreed that "bicycle traffic laws are adequately enforced on campus." About 30 percent indicated they were neutral or unsure, 17 percent disagreed, and over 11 percent strongly disagreed (Table 67). Employees and seniors are most likely to disagree, while freshmen are most likely to agree that there is adequate enforcement. These findings align with the relatively common free-response comment among non-freshmen that there is substantial need for better bicycle education and enforcement for new students, particularly freshmen.

Table 67. Perceptions of bicycle traffic law enforcement on campus

| | | Bicycle traffic laws are adequately enforced on campus. | | | | | | | | |
| | | Strongly disagree | | Disagree | | Neutral or don't know | | Agree | | Strongly agree | |
		Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample
Student		9.1%	168	16.1%	298	31.7%	587	33.0%	610	10.1%	186
Undergrad		8.4%	124	15.9%	235	32.1%	475	33.2%	492	10.4%	154
Freshman		0.9%	2	9.9%	21	31.4%	66	41.7%	88	16.1%	34
Sophomore		5.1%	13	14.0%	36	31.3%	80	39.3%	100	10.4%	27
Junior		8.4%	37	15.2%	67	32.6%	144	33.5%	148	10.3%	46
Senior		12.6%	72	19.5%	111	32.2%	184	27.2%	155	8.5%	48
Graduate		11.9%	44	17.0%	63	30.4%	113	32.0%	118	8.6%	32
Masters		13.4%	17	16.5%	21	35.1%	45	25.9%	33	9.1%	12
PhD		11.2%	27	17.2%	42	27.9%	67	35.3%	85	8.4%	20
Employee		15.7%	124	21.0%	165	25.5%	200	28.2%	222	9.6%	76
Faculty		14.0%	20	23.7%	33	19.9%	28	33.4%	47	8.9%	12
Staff		16.1%	104	20.4%	132	26.6%	172	27.1%	175	9.8%	63
Residential location	Within Davis	9.4%	189	16.3%	327	30.5%	613	33.7%	676	10.1%	202
	Outside Davis	16.3%	103	21.7%	137	27.8%	175	24.8%	156	9.5%	60
Overall		11.1%	292	17.6%	463	29.9%	788	31.5%	832	9.9%	262

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 68 and Table 69 summarize the levels of agreement and disagreement about the safety of biking and walking on campus. Overall, a higher share of students and employees feel safe walking on campus than biking.

Table 68. Perceptions of safety biking on campus

		I feel safe biking on campus.								
		Strongly disagree		Disagree		Neutral or don't know		Agree		Strongly agree	
		Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample
Student		3.5%	64	10.8%	197	18.0%	329	41.4%	756	26.3%	481
Undergrad		3.4%	49	10.3%	151	17.0%	248	41.3%	602	28.0%	409
Freshman		2.8%	6	4.6%	10	12.3%	26	52.3%	110	28.0%	59
Sophomore		1.5%	4	10.5%	26	13.1%	33	44.5%	112	30.4%	76
Junior		3.2%	14	9.4%	41	19.8%	86	37.6%	163	29.9%	130
Senior		4.5%	26	13.1%	74	18.3%	103	38.6%	218	25.5%	144
Graduate		4.0%	15	12.5%	46	22.0%	81	41.8%	154	19.7%	73
Masters		6.2%	8	10.0%	13	27.3%	35	42.1%	54	14.5%	19
PhD		2.9%	7	13.8%	33	19.1%	46	41.7%	100	22.5%	54
Employee		4.9%	37	14.0%	105	21.2%	159	37.3%	279	22.5%	168
Faculty		1.1%	1	13.3%	18	16.2%	22	42.3%	57	27.0%	36
Staff		5.8%	35	14.2%	87	22.3%	137	36.2%	222	21.5%	132
Residential location	Within Davis	3.1%	62	11.1%	220	15.8%	314	42.8%	849	27.2%	540
	Outside Davis	6.6%	39	13.8%	81	29.5%	174	31.6%	186	18.5%	109
Overall		3.9%	101	11.7%	302	18.9%	488	40.2%	1,035	25.2%	649

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

While most respondents indicated feeling safe biking on campus, a substantial share of respondents indicated they do not feel safe biking on campus. More than 15 percent of respondents strongly disagreed or disagreed with the statement, "I feel safe biking on campus." An additional 19 percent indicated they were neutral or unsure about the statement. Those who live outside Davis are significantly less likely to feel safe biking on campus than those who live in Davis.

Table 69. Perceptions of safety walking on campus

		I feel safe walking on campus.								
		Strongly disagree		Disagree		Neutral or don't know		Agree		Strongly agree	
		Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample	Share of Responses	Weighted Sample
Student		1.5%	28	4.5%	85	8.8%	166	46.8%	881	38.3%	721
Undergrad		1.7%	25	4.3%	65	8.9%	133	46.3%	695	38.9%	583
Freshman		0.6%	1	2.8%	6	11.3%	24	53.8%	113	31.5%	67
Sophomore		0.9%	2	4.4%	11	7.8%	20	49.1%	126	37.8%	97
Junior		1.6%	7	4.2%	19	7.8%	35	45.0%	203	41.4%	187
Senior		2.5%	14	5.0%	29	9.2%	54	43.3%	252	40.0%	233
Graduate		0.7%	3	5.2%	20	8.7%	33	49.1%	186	36.3%	138
Masters		1.6%	2	7.2%	9	7.3%	10	49.2%	65	34.7%	46
PhD		0.3%	1	4.2%	10	9.4%	23	49.0%	121	37.1%	92
Employee		0.4%	3	3.1%	25	6.8%	55	44.8%	359	44.9%	360
Faculty		0.2%	0	4.1%	6	5.0%	7	42.6%	60	48.1%	68
Staff		0.4%	3	2.9%	19	7.2%	47	45.3%	298	44.3%	292
Residential location	Within Davis	1.1%	23	4.1%	84	8.4%	172	46.5%	949	39.8%	814
	Outside Davis	1.2%	8	4.0%	26	7.6%	48	45.4%	290	41.8%	267
Overall		1.2%	31	4.1%	109	8.2%	220	46.2%	1,240	40.3%	1,080

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see

Table 15).

While a substantial majority of respondents indicated feeling safe walking on campus, there is still substantial room for improvement in perceptions of walking safety. More than 5 percent of respondents strongly disagreed or disagreed with the statement, "I feel safe walking on campus." An additional 8 percent indicated they were neutral or unsure about the statement.

Table 70 shows significant gender differences related to bike confidence and perceptions of safety. Men are significantly more likely than women to report being "very confident riding a bike" and to strongly agree with the statements "I feel safe biking on campus" and "I feel safe walking on campus." These findings both highlight the importance of weighting by gender for the findings presented in this report and support the findings of existing research that bike confidence and safety are particularly important issues among women.

Table 70. Gender differences in bike confidence and perceptions of safety walking and biking on campus

| | | Male | Female |
| | | (A) | (B) |
Question	Response		
How would you rate your ability to ride a bike? In particular, we are interested whether you know how 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		A
	I can ride a bike, but I am not very confident doing so		A
	I am somewhat confident riding a bike		A
	I am very confident riding a bike	B	
I feel safe biking on campus.	Strongly disagree		A
	Disagree		A
	Neutral or don't know		A
	Agree		
	Strongly agree	B	
I feel safe walking on campus.	Strongly disagree		
	Disagree		
	Neutral or don't know		A
	Agree		A
	Strongly agree	B	

Results are based on two-sided tests with significance level .05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

Bicycle theft

Table 71 shows the incidence of bicycle theft and vandalism on the UC Davis campus between October 21, 2010 and October 21, 2011, the year before the first reference week. Among the 58.6 percent of the weighted sample who rode a bike on campus during this period, about 9.7 percent reported their entire bike was stolen, 6.5 percent reported parts of their bike were stolen, and 2.9 percent reported their bike was vandalized. Since these categories were not mutually exclusive, the same respondent could indicate an entire bike theft, a partial bike theft, and a vandalism—therefore these percentages should not be added to reflect the total incidence of bike theft and vandalism. Overall, we estimate about 2,321 people had an entire bike stolen from on campus during this period.

Table 71: Incidence of bike theft, by role

		Have you been the victim of bicycle theft or vandalism on the UC Davis campus in the past year (Oct. 21, 2010 - Oct. 21, 2011)?					
			Of those who rode a bike on campus in the last year				
		Rode bike on campus in last year	Yes, my entire bike was stolen	Yes, but only parts of my bike were stolen	My bike was vandalized	Weighted Sample	Projected Population
Student		63.9%	10.8%	6.6%	3.3%	2,248	29,387
Undergrad		62.7%	10.8%	7.2%	3.2%	1,810	23,659
Freshman		43.0%	3.5%	2.8%	1.6%	272	3,557
Sophomore		74.1%	9.4%	8.4%	3.0%	313	4,088
Junior		62.6%	9.6%	8.1%	2.9%	514	6,717
Senior		63.7%	14.8%	7.2%	3.9%	711	9,297
Graduate		68.8%	10.3%	4.4%	3.5%	438	5,728
Masters		61.7%	9.7%	3.2%	0.5%	159	2,082
PhD		72.6%	10.7%	4.8%	4.8%	279	3,646
Employee		46.6%	6.0%	5.6%	1.3%	868	11,341
Faculty		62.6%	5.1%	3.8%	1.0%	156	2,045
Staff		43.2%	6.3%	6.3%	1.4%	711	9,296
Residential location	Within Davis	68.6%	9.5%	6.1%	2.9%	2,402	31,390
	Outside Davis	27.3%	12.1%	8.4%	1.5%	714	9,338
Overall		58.6%	9.7%	6.5%	2.9%	3,116	40,728
Weighted Sample		1,826	178	118	53	3,116	
Projected Population		23,867	2,321	1,548	692		40,728

Results are based on responses to questions *Q44* (theft in the last year). Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Based on the survey results, seniors are most likely to have experienced a bike theft in the last year, while freshmen have the lowest incidence of bicycle theft—yet even a low rate of 3.5 percent among freshmen who bike is substantial, since most freshmen have only been on campus a month or two at the time the survey is administered each year.

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 72 summarizes the responses for each service, and Table 73 compares responses for the past five years, for those items that appeared on each of the surveys. TAPS launched the GoClub, Zimride, and Zipcar programs in the fall of 2009, and the Bicycle Education and Enforcement Program in the fall of 2011.

Table 72. Awareness of transportation services

Service	Have used it	Have only heard of it	Never heard of it
Ten bike tire air stations around campus	42.2%	35.5%	22.4%
Bike repair stations around campus (Fixit stations)	25.7%	57.4%	16.8%
GoClub program	12.1%	30.7%	57.2%
TAPS motorist assistance program	9.2%	42.6%	48.2%
UC Davis Bike Auction	8.5%	75.4%	16.1%
Discount Unitrans passes for those without a permit	6.6%	28.2%	65.1%
Personal in-vehicle parking meters	6.1%	28.6%	65.3%
Zipcar carsharing program	5.0%	70.9%	24.1%
Bike commuter showers and lockers (ARC)	4.7%	33.0%	62.3%
Bike lock-cutting service	3.6%	53.7%	42.7%
Social network for ride matching: Zimride.ucdavis.edu	3.1%	28.1%	68.8%
Bicycle Education and Enforcement Program	2.1%	26.2%	71.8%
www.sacregion511.org	2.1%	9.5%	88.4%
Sacramento Region "Commuter Club"	1.6%	8.5%	89.9%
Emergency Ride Home Program for goClub members	1.5%	23.0%	75.5%
Yolo TMA "TRIP" Incentive Program	1.0%	8.3%	90.7%
Enterprise Rental Car Voucher Program	0.9%	16.7%	82.4%
Yolo TMA Emergency Ride Home Program	0.7%	10.0%	89.3%

Results are based on responses to question *Q46*. Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 73. Awareness of transportation services, 2007-08 through 2011-12

	Percent who have heard of it			
Service	2011-12	2010-11	2009-10	2008-09
UC Davis Bike Auction	83.9%	86.3%	81.5%	84.3%
Ten bike tire air stations around campus	77.6%	59.6%	55.1%	58.3%
Zipcar carsharing program	75.9%	75.1%	57.3%	n/a
Bike lock-cutting service	57.3%	42.7%	40.9%	49.0%
TAPS motorist assistance program	51.7%	60.3%	51.3%	49.0%
GoClub program	42.8%	32.8%	17.5%	n/a
Discount Unitrans bus passes for those without a parking permit	34.8%	32.3%	30.2%	n/a
Comet in-vehicle parking meters on campus	34.7%	26.5%	24.3%	34.2%
Social network for ride matching: Zimride.ucdavis.edu	31.2%	24.2%	15.4%	n/a
Emergency Ride Home Program for goClub members	24.5%	23.6%	16.3%	n/a
Enterprise Rental Car Voucher Program	17.6%	20.3%	19.8%	n/a
www.sacregion511.org	11.6%	13.9%	12.3%	13.50%

Yolo TMA Emergency Ride Home Program (yolotma.org)	10.7%	9.6%	9.5%	n/a
Sacramento Region "Commuter Club"	10.1%	10.4%	10.2%	n/a
Yolo TMA "TRIP" Incentive Program	9.3%	7.9%	8.9%	n/a

As in Table 72, data for 2011-12 are based on responses to question *Q46*. See Miller (2011) for results from 2010-11, Lovejoy (2010) for results from 2009-10, Lovejoy, *et al.* (2009) for results from 2008-09, and Congleton (2009) for results from 2007-08.

This year, we included the "Bicycle Education and Enforcement Program" on the list of TAPS and other transportation services of which we measure awareness. As shown in Table 74, 2.1 percent of respondents (an estimated 710 in the population) indicated that they had used the program. Overall, staff are most likely to have heard of the program, and graduate students are least likely to have used it.

Table 74. Bicycle Education and Enforcement Program

Are you familiar with any of these programs?		Bicycle Education and Enforcement Program					
		It's new to me		I've heard of it, but never used it		I've used it	
		Share of Responses	Projected Population	Share of Responses	Projected Population	Share of Responses	Projected Population
Student		76.9%	18,691	21.3%	5,175	1.8%	439
Undergrad		76.7%	14,927	21.3%	4,135	2.0%	388
Freshman		77.0%	2,069	20.5%	551	2.5%	68
Sophomore		71.4%	2,399	26.3%	884	2.3%	78
Junior		78.4%	4,481	19.3%	1,102	2.3%	132
Senior		77.8%	5,977	20.8%	1,598	1.4%	109
Graduate		77.5%	3,764	21.4%	1,040	1.0%	51
Masters		77.2%	1,320	22.0%	376	0.8%	14
PhD		77.7%	2,444	21.1%	664	1.2%	36
Employee		59.1%	5,853	38.1%	3,772	2.7%	271
Faculty		67.7%	1,227	29.0%	525	3.3%	60
Staff		57.2%	4,627	40.2%	3,247	2.6%	211
Residential location	Within Davis	74.3%	19,453	23.8%	6,240	1.8%	481
	Outside Davis	63.4%	5,091	33.7%	2,707	2.9%	229
Gender	Male	70.9%	10,912	27.4%	4,213	1.7%	261
	Female	72.5%	13,632	25.2%	4,734	2.4%	449
Overall		71.8%	24,544	26.2%	8,947	2.1%	710

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Transfer students

In previous years, several students have indicated "transfer student" as a write-in response to questions about undergraduate status. This year, we asked undergraduates about transfer status directly, for two reasons: first, to reduce the possibility of some students feeling marginalized as a result of transfer status and second, to address the research question of whether travel behavior

differs between transfer and non-transfer student. Controlling for differences in response rates by gender, approximately 1 percent of sophomores, 39 percent of juniors, and 36 percent of seniors transferred to UC Davis from another college, university, or community college.

Table 75. Share of transfer students

	Did you transfer to UC Davis from a college, university, or community college?					
	Yes		No			
	Row %	Count	Row %	Count	Weighted Sample	Projected Population
Sophomore	1.0%	3	99.0%	297	300	4,088
Junior	39.1%	200	60.9%	310	510	6,717
Senior	35.6%	247	64.4%	446	694	9,297
Overall	29.9%	450	70.1%	1,054	1,504	20,102

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Since the question about transfer students was introduced in the 2011-12 survey, we tested whether transfer students use different modes to get to campus than their non-transfer peers. No significant differences were found in "usual mode" to campus, though tests of the reference week mode share questions yielded two significant differences: non-transfer juniors who live in Davis were significantly more likely to drive alone to campus than their transfer-student peers, and non-transfer seniors who live outside Davis were significantly more likely to drive alone than their transfer-student peers. Though unsubstantiated, these differences may indicate that students newer to Davis have less auto-oriented mode choices, but that these lapse over time.

Graduate programs

Table 76 shows the share of graduate students in each program. Approximately half of graduate student respondents are PhD students, 16% are Master's students, another 16% are Law students, and 14% are Veterinary students.

Table 76. Graduate students by program

		Column %	Weighted Sample
What type of graduate program are you in?	Master's	16.4%	72
	PhD	49.5%	217
	Law	16.3%	71
	MBA	3.7%	16
	Veterinary	13.7%	60
	Ed.D. or CANDEL	0.5%	2
	Total	100.0%	438

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 77 shows the usual travel mode used to get to campus by graduate students who live in Davis. Usual travel shares are not shown for those living outside Davis, since most drive alone to campus and no significant differences were found between graduate programs.

Table 77. Usual travel from within Davis, by graduate program

What mode of transportation do you usually use to travel to campus for school or work?	Within Davis											
	What type of graduate program are you in?											
	Master's		PhD		Law		MBA		Veterinary		Total	
	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count
Bike	76.5%	41	78.6%	136	56.5%	36	71.5%	7	49.4%	25	69.9%	244
Walk or Skate	6.7%	4	8.1%	14	5.1%	3	10.9%	1	2.6%	1	6.6%	23
Drive Alone	8.9%	5	10.1%	17	28.9%	18	0.0%	0	41.2%	21	17.6%	62
Carpool or Ride	0.0%	0	1.2%	2	5.2%	3	11.7%	1	6.7%	3	2.8%	10
Bus	7.9%	4	2.0%	3	4.3%	3	5.9%	1	0.0%	0	3.1%	11
Train	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Among those who live in Davis, Master's and PhD students are more likely to bike to campus (77% and 79%) than Veterinary and Law students (49% and 57%). Similarly, Law and Veterinary students (29% and 41%) are significantly more likely than Master's or PhD students (9% and 10%) to drive alone to campus from within Davis. While these differences merit further exploration in a larger sample, they may be explained if there are systematic differences by graduate role group in distance from campus. Table 78 displays the results of tests for significant differences in the usual travel proportions shown in Table 77.

Table 78. Significance tests for usual travel from within Davis, by graduate program

What mode of transportation do you usually use to travel to campus for school or work? (If you usually use more than one mode of transportation, please select the one you usually use for most of the distance).	Within Davis				
	What type of graduate program are you in?				
	Master's	PhD	Law	MBA	Veterinary
	(A)	(B)	(C)	(D)	(E)
Bike	E	C E			
Walk or Skate					
Drive Alone			A B	.^{b}	A B
Carpool or Ride	.^{b}				
Bus					.^{b}
Train	.^{b}	.^{b}	.^{b}	.^{b}	.^{b}

Results are based on two-sided tests with significance level 0.05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.
a. This category is not used in comparisons because the sum of case weights is less than two.
b. This category is not used in comparisons because its column proportion is equal to zero or one.
c. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.
d. Cell counts of some categories are not integers. They were rounded to the nearest integers before performing column proportions tests.

Student employees

Table 79 shows the share of student employees in each role group. Approximately 23% of sophomores, 26% of juniors, 38% of seniors, 29% of Master's students, and 70% of PhD students are also student employees.

Table 79. Student employees by role

	As a student, are you also a paid employee of UC Davis?				
	Yes		No		
	Row %	Count	Row %	Count	Total
Sophomore	22.8%	68	77.2%	231	300
Junior	26.4%	131	73.6%	365	497
Senior	38.3%	262	61.7%	421	684
Masters	29.2%	43	70.8%	104	148
PhD	70.3%	177	29.7%	75	252
Total	36.3%	682	63.7%	1,198	1,879

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Controlling for graduate program, no significant differences in usual travel were found between graduate students who are paid employees of UC Davis and those who are not. Among undergraduates, however, several significant differences in usual travel were identified: among those who live in Davis, juniors who are also student employees are significantly more likely to

ride the bus (38%) than non-employees (27%). Conversely, seniors who are paid employees are significantly more likely to bike (58% vs. 48%) and less likely to ride the bus (25% vs. 38%) than non-employees. Though there is not a clear reason for these differences, the effects of being a student employee on travel behavior may be an issue worth exploring in future surveys. One potential explanation could be if a substantial share of junior respondents are employees of Unitrans and therefore choose the bus over biking, while more senior respondents are research assistants and do not experience this effect.

Table 80. Usual travel from within davis among upperclassmen, by student employee status

What mode of transportation do you usually use to travel to campus for school or work?	Within Davis							
	Junior				Senior			
	As a student, are you also a paid employee of UC Davis?				As a student, are you also a paid employee of UC Davis?			
	Yes		No		Yes		No	
	Col %	Count	Col %	Count	Col %	Count	Col %	Count
Bike	52.6%	64	60.2%	191	58.1%	139	48.0%	172
Walk or Skate	3.2%	4	6.2%	20	4.6%	11	6.3%	23
Drive Alone	5.8%	7	4.5%	14	9.3%	22	7.1%	25
Carpool or Ride	.6%	1	1.7%	5	2.8%	7	.9%	3
Bus	37.8%	46	27.2%	86	25.1%	60	37.6%	135

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9* (see Table 15).

Table 81 displays the results of tests for significant differences in the usual travel proportions shown in Table 77.

Table 81. Significance Tests for Usual Travel from Within Davis, Upperclassmen Employees

Comparisons of Column Proportions[b,c]

What mode of transportation do you usually use to travel to campus for school or work?	Within Davis			
	Junior		Senior	
	As a student, are you also a paid employee of UC Davis?		As a student, are you also a paid employee of UC Davis?	
	Yes	No	Yes	No
	(A)	(B)	(A)	(B)
Bike			B	
Walk or Skate				
Drive Alone				
Carpool or Ride				
Bus	B			A

Results are based on two-sided tests with significance level 0.05. For each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion.

Comparisons of Column Proportions[b,c]

a. This category is not used in comparisons because its column proportion is equal to zero or one.

b. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

c. Cell counts of some categories are not integers. They were rounded to the nearest integers before performing column proportions tests.

Transportation limitations

This year, in an effort to gain a better understanding of the mobility needs of the UC Davis population, we asked respondents whether they have any temporary or permanent physical conditions that limit their ability to use certain modes of transportation. Overall, about 3 percent of respondents indicated they have a transportation limitation (see Table 82). Freshmen and Master's students were least likely to report a transportation limitation, while staff and faculty were most likely to report a limitation.

Table 82. Transportation Limitations

	Do you have any temporary or permanent physical conditions that limit your ability to walk, bike, drive, or use public transit?				
	Yes		No		
	Row %	Count	Row %	Count	Valid Responses
Freshman	0.7%	2	99.3%	262	264
Sophomore	1.9%	6	98.1%	301	307
Junior	2.0%	10	98.0%	499	509
Senior	2.2%	15	97.8%	681	696
Masters	0.4%	1	99.6%	156	157
PhD	3.3%	9	96.7%	263	272
Faculty	5.1%	8	94.9%	145	153
Staff	5.8%	40	94.2%	643	683
Overall	3.0%	90	97.0%	2,951	3,041

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9*.

Of those who indicated a physical condition which limits their ability to use certain modes of transportation, we asked to what degree their condition limits walking, biking, driving, and riding public transportation. Conditions most commonly limit or prevent biking or walking (87% and 82% with some limitation), compared to only 24% for driving and 31% for public transportation (see Table 83).

Table 83. Transportation Limitations by Mode

Please rate the degree to which these conditions limit your ability to walk, bike, drive, or use public transit.	Temporarily prevents		Temporarily limits		Generally prevents (long term)		Generally limits (long term)		No limitation		Valid Responses
	Row %	Count	Row %	Count	Row %	Count	Row %	Count	Row %	Count	
Walk	11.2%	9	35.3%	29	12.2%	10	23.3%	19	18.0%	15	83
Bike	24.4%	19	27.6%	22	19.7%	16	15.5%	12	12.7%	10	80
Drive	5.7%	4	11.2%	8	4.0%	3	3.0%	2	76.2%	55	72
Public Transit	5.4%	4	11.7%	8	4.4%	3	9.2%	7	69.2%	49	71

Data are weighted by role and gender based on the 3,116 valid responses to questions *Q01*, *Q09*, and *Q20-9*.

ACKNOWLEDGEMENTS

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APPENDICES

Appendix A: Survey instrument, 2011-12 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 9 at the end of this Appendix shows a sample screenshot of a page from the online version of the survey. As in the 2008-09 and 2009-10 surveys, the dates of the reference week changed after one week.

Welcome to the 2011-12 Campus Travel Survey!

This annual survey is intended for <u>everyone</u> who regularly travels to UC Davis for school or work. This research effort provides campus planners with valuable feedback on how people get to campus and their experiences with various transportation programs. <u>Your</u> feedback is important to us! The survey takes 15-25 minutes to complete. Doing so is 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. You must be at least 18 years old to complete this survey.

In appreciation for your time, we're offering anyone who completes the survey entry into a drawing to win one of <u>six $50 Downtown Davis gift cards</u>!

Thanks for participating!

Role, screening, and gender

First, we have a few questions about you.

Q01.   What is your primary role at UC Davis?*
Undergraduate student (including Post-baccalaureate)
Graduate student
Faculty
Staff
Visiting Scholar
Post doc
Recent graduate
Retiree

[If faculty]
Q02.   What is your current faculty status?
Ladder-rank (senate)
Non-ladder rank (non-senate)

[If undergraduate student]
Q03.   What year are you?*
Freshman
Sophomore
Junior
Senior
Fifth-year senior
Post-baccalaureate
Visiting / exchange student
Other: _____

[If sophomore, junior, senior, fifth-year, post-bac]

Q04.   Did you transfer to UC Davis from a college, university, or community college?
　　　Yes
　　　No

[If graduate student]
Q05.   What type of graduate program are you in?*
　　　Master's
　　　PhD
　　　Law
　　　MBA
　　　Veterinary
　　　Ed.D. or CANDEL
　　　Other: _____

[For graduate and undergraduate students only]
Q06.   As a student, are you also a paid employee of UC Davis?
　　　Yes
　　　No

[If employee or grad student]
Q07.   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 Main Campus area-- 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.]
Q08.   Where outside of Davis is your office, lab, or department?
　[write-in]

　　　　　　

General information

Q09.   What is your gender?
　　　Male
　　　Female
　　　Prefer not to say
　　　No answer

Q10.   Do you have any temporary or permanent physical conditions that limit your ability to walk, bike, drive, or use public transit?
　　　Yes/No

　　　[If yes]

Q11. **Please rate the degree to which these conditions limit your ability to walk, bike, drive, or use public transit:**

	Temporarily *limits*	Temporarily *prevents*	Generally *limits* (long term)	Generally *prevents* (long term)	No limitation
Walk	○	○	○	○	○
Bike	○	○	○	○	○
Drive	○	○	○	○	○
Public transit	○	○	○	○	○

Q12. **Do you currently have a driver's license? [Yes/No]**

[If yes]
Q13. **Do you have access to a car (for driving to campus, if you wanted to use it)?**
> Yes
> No

[If yes]
Q14. **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]
Q15. **Which type of parking permit do you have?**
> [Dropdown list:]

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

Q16. **Do you own or have access to a functioning bike (for bicycling to campus destinations, if you wanted to use it, regardless of whether it is practical for you to do so)?**
> Yes
> No

Q17.   Where do you live now?

On the UC Davis campus (includes Cuarto and the area east of SR 113, south of Russell Blvd, west of A St, and north of I-80)

Off-campus, in the West Village apartments

Off-campus elsewhere, in the city of Davis

Outside of Davis

[If resides outside of Davis]

Q18.   What is your zip code?

Zip code:_____

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

Q19.   What is an intersection near your home? (Please answer for where you live locally. This information will be used to calculate the approximate distance you travel to campus. It will be kept confidential and will not be identified with you.)

Your street: _____

Nearest cross-street:_____

Days traveled last week

Consider your activities during the five weekdays last week, from Monday (Oct. 17) through Friday (Oct. 21). If you have a day planner, it might be useful to look at the last week's activities as you complete this section.

Q20.   Did you go somewhere on campus any of the weekdays 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

No, I was away all week, Oct. 17 – Oct. 21

Q21.   On which days last week did you go somewhere on campus 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.)
Please choose *all* that apply:
- ❑ Monday
- ❑ Tuesday
- ❑ Wednesday
- ❑ Thursday
- ❑ Friday

Days not traveled last week

About the days you did not travel to campus last week

[If no travel to campus all week]

Q22.   What was the main reason you did not go to campus destinations last week for school or work?

Study abroad

Vacation

Work- or school-related travel or field work

Telecommuting (working from home or another remote location)
Sickness or personal leave
Temporary appointment elsewhere (internship, visiting scholar, teaching appointment, exchange program, etc.)
Sabbatical
PELP (Planned Educational Leave Program)
Other: _____ [mandatory]

[For faculty, visiting scholar, staff, post-doc]
Q23.   What was the main reason you did not travel to work? Please answer for each day individually.
Telecommuting (working from home or another remote location)
Work or school-related activities elsewhere (field work, meetings, teaching appointment, etc.)
Regularly scheduled day off
Vacation
Sick or personal leave
START or furlough day
Day off as part of a compressed work week (i.e. 4/40, 9/80, or 3/36)
Other: _____ [mandatory]

[If no travel to campus all week]
Q24.   About when do you expect to resume regular travel to campus for school or work?
Within a week
A week to a month
A month to a quarter
A quarter to a year
More than a year
Never

Usual travel to campus

Q25.   When you are regularly traveling to campus, about how many days per week do you typically travel to campus for school or work?
Less than once a week
1 day per week
2 days per week
3 days per week
4 days per week
5 days per week or more

Q26.   What mode of transportation do you usually use to travel to campus for school or work? (If you usually use more than one mode of transportation, please select the one you usually use for most of the distance).
Bike
Walk
Skate or skateboard
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 (the driver continues on elsewhere)
Bus
Train or light rail

Arrival time

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

[For any days that traveled]
Q27. On each of the days that you traveled to campus, what time did you arrive at your first destination?

	Between 6am and 10am	Either before 6am or after 10am
Monday	○	○
Tuesday	○	○
Wednesday	○	○
Thursday	○	○
Friday	○	○

Modes used last week

[If traveled at least one day last week]
Q28. First think back to the entire week (Monday, Oct. 17 - Friday, Oct. 21). 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 or skateboard
- ❑ 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 (the driver continues on elsewhere)
- ❑ Bus
- ❑ Train or light rail
- ❑ Other: _____

[For any days that traveled]
Q29. 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 (driver continued onelsewhere)	Bus	Train / light rail
Monday	○	○	○	○	○	○	○	○	○
Tuesday	○	○	○	○	○	○	○	○	○
Wednesday	○	○	○	○	○	○	○	○	○

Thursday	○	○	○	○	○	○	○	○	○
Friday	○	○	○	○	○	○	○	○	○

[If carpooled last week]

Q30.   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 people
    9 people
    10 people
    11 people
    12 or more

[If carpooled last week]

Q31.   During the times when you carpooled with others last week, how many people in each category were in your carpool or vanpool? Please describe the persons OTHER than yourself.

    UC Davis (non-student) employees: ___
    UC Davis students: ___
    Adults who are NOT employees or students of UC Davis (friends, family, significant others, etc): ___
    Kids: ___
    Other: ___

[If got a ride last week]

Q32.   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 people
    8 people
    9 people
    10 people
    11 or more

[If got a ride last week]

Q33.   During the times when you got a ride on your way to campus last week and the driver continued on elsewhere, how many people in each category drove or rode with you? Please describe the persons OTHER than yourself.

    UC Davis (non-student) employees: ___
    UC Davis students: ___

Adults who are NOT employees or students of UC Davis (friends, family, significant others, etc): ___
Kids: ___
Other: ___

[If checked motorcycled, drove alone, carpooled, or got a ride last week]
Q34. Did you use a zero emission vehicle to get to campus last week?
   No [default]
   Yes, it is an all-electric vehicle
   Yes, it is a hydrogen fuel cell vehicle

[If rode the bus last week]
Q35. Which bus service(s) did you use on your way to campus last week? (Please check all that apply.)
   ❑ Unitrans
   ❑ Yolobus
   ❑ UCD/UCDMC Shuttle
   ❑ Sacramento Regional Transit
   ❑ Amtrak motorcoach (bus)
   ❑ UC Berkeley - UC Davis Shuttle
   ❑ Muni
   ❑ Fairfield Suisun Transit
   ❑ Davis Community Transit
   ❑ AC Transit
   ❑ Other: _____

 [If rode the train last week]
Q36. Which train service(s) did you use on your way to campus last week? (Check all that apply.)
   ❑ Amtrak Capitol Corridor
   ❑ BART
   ❑ Sacramento Regional Transit
   ❑ Muni
   ❑ Caltrain
   ❑ Other: _____

Circulator mode

 [If office is on campus]
Q37. 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 *walk* between different destinations around campus.	[slider with 0%, 10%, 20%, …, 100% of the time]
I *bike* between different destinations around campus.	[slider with 0%, 10%, 20%, …, 100% of the time]
I *ride in a vehicle* 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%.

[Technically off-campus, but within the city of Davis]

Q38. After arriving at your office, lab, or department, how do you typically get around before returning home?

I *walk* between different destinations during the workday.	[slider with 0%, 10%, 20%, …, 100% of the time]
I *bike* between different destinations during the workday.	[slider with 0%, 10%, 20%, …, 100% of the time]
I *ride in a vehicle* to get to different destinations during the workday.	[slider with 0%, 10%, 20%, …, 100% of the time]
I use another means to get to different destinations during the workday.	[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 13 - September 16, 2011.

Q39. 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 13 – September 16)
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"]
Q40. 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 or more

Now think back on the last year, from October 21, 2010 through October 21, 2011.

Q41.   Did you ride a bicycle on campus at least once during this period?
Yes
No

Q42.   During this period, did you experience a fall or crash that resulted in <u>personal injury to you</u> while...

	Yes	No
Biking on campus	○	○
Biking off campus, on my way between home and campus	○	○

[If answered "yes" to previous question]
Q43.   Has this fall or crash caused you to bike less frequently now?
No, it has not caused me to bike any less
Yes, it has caused me to bike somewhat less often
Yes, it has caused me to bike much less often
Yes, and it is why I don't bike anymore

Bicycle theft

Q44.   Have you been the victim of bicycle theft or vandalism on the UC Davis campus in the past year (October 21, 2010 through October 21, 2011)? If you experienced multiple incidents of bike theft or vandalism on campus in the past year, please check all that apply.
Yes, my entire bike was stolen
Yes, but only parts of my bike were stolen (seat, wheel, accessories)
No, but my bike was vandalized (damaged but not stolen)
No, I had a bike on campus in the past year but did not experience a theft or vandalism
Not applicable: I haven't had a bike on campus in the last year

[If answered "yes" to previous question]
Q45.   Has this theft or vandalism caused you to bike less frequently now?
No, it has not caused me to bike any less
Yes, it has caused me to bike somewhat less often
Yes, it has caused me to bike much less often
Yes, and it is why I don't bicycle anymore

Campus transportation programs

Q46.   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	○	○	○
Ten bike tire air stations around campus	○	○	○
Bike repair stations around campus (Fixit stations)	○	○	○
Bike commuter showers and lockers (ARC)			
Emergency Ride Home Program for goClub members	○	○	○

Enterprise Rental Car Voucher Program	○	○	○
Bicycle Education and Enforcement Program			
Zipcar carsharing program	○	○	○
Social network for ride matching: Zimride.ucdavis.edu	○	○	○
Discount Unitrans bus passes for those without a parking permit	○	○	○
Personal in-vehicle parking meters	○	○	○
TAPS motorist assistance program	○	○	○
Bike lock-cutting service	○	○	○
UC Davis Bike Auction	○	○	○
Yolo TMA "TRIP" Incentive Program	○	○	○
Yolo TMA Emergency Ride Home Program (yolotma.org)	○	○	○
Sacramento Region "Commuter Club"	○	○	○
www.sacregion511.org	○	○	○

Comfort

Q47. How would you rate your ability to ride a bike? In particular, we are interested whether you know how 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 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

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.

Q48. To what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It is important for me to get regular physical exercise.	1	2	3	4	5
I tend to use one means of transportation for all of my daily travel.	1	2	3	4	5
Travel time is generally wasted time.	1	2	3	4	5
I like riding a bike.	1	2	3	4	5
Bicycle traffic laws are adequately enforced on campus.	1	2	3	4	5
I tend to choose my means of travel out of habit, without consciously evaluating other options.	1	2	3	4	5
I like walking.	1	2	3	4	5

Q49. To what extent do you agree or disagree with the following statements? (continued)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I like using public transit.	1	2	3	4	5

I need a car to do many of the things I like to do.		1		2		3		4	5
I like driving.		1		2		3		4	5
I often need to use my own vehicle to travel to different sites during the day.		1		2		3		4	5
I feel safe biking on campus.		1		2		3		4	5
I already bicycle for transportation as often as I can.		1		2		3		4	5
I try to limit my driving to improve air quality.		1		2		3		4	5

Q50. What options are available to you for getting to campus?
- ❑ Bike
- ❑ Walk
- ❑ Skate or skateboard
- ❑ 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 (the driver continues on elsewhere)
- ❑ Bus
- ❑ Train or light rail

About you

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 community as a whole. Your answers are confidential and will not be used for any other purposes.

[If grad, faculty, staff]
Q51. 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
   4 years
   5 or more

Q52. In what year were you born?
   [Numerical write-in]
   Help text: e.g. 1980

[Employees]
Q53. 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)

[Undergraduate student]

Q54. What is the highest level of education completed by whichever parent/guardian has the most 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)

Q55. Do you live alone or with other people? Please choose *all* that apply:
❑   I live alone [Exclusive option]
❑   I live with roommate(s), housemate(s), or in a dorm
❑   I live with family, a partner, or others with whom I share some income -- *we'll call them your household*

Q56. If you live with family, a partner, or others with whom you share some income, please indicate how many _OTHER_ members of your <u>household</u> are in each age category.
❑   age under 6: _____
❑   age 6-15: _____
❑   age 16-17: _____
❑   age 18-64: _____
❑   age 65 or older: _____

Q57. *If you live with family, a partner, or others with whom you share some income*, please check the category that contains your approximate annual *household* income before taxes. *If you live alone, with only roommate(s) or housemate(s), or in a dorm,* please check the category that contains *your own* approximate annual income before taxes.
Less than $10,000
$10,000 - $19,999
$20,000 - $29,999
$30,000 - $39,999
$40,000 - $49,999
$50,000 - $59,999
$60,000 - $79,999
$80,000 - $99,999
$100,000 - $119,999
$120,000 - $139,999
$140,000 - $159,999
$160,000 - $199,999
$200,000 or more

[To undergraduate, graduate students]
Q58.   To what extent are you financially dependent on your parents?
Not at all
For some things
For most things
For everything

Q59.   If TAPS provided a convenient location where you could drop off a non-functioning bicycle for donation or disposal, free of charge and with no paperwork, do you think you would utilize this service?
Yes, and I currently have a bike that I would like to donate or dispose of.
Yes, and I expect to have a bike at some point that I will want to donate or dispose of.
No, I wouldn't utilize this service.

Optional

[If indicated that work/school location is outside Davis (in q_0005)]
Q60.   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 $50 Downtown Davis gift card, if you wish.

[If indicated that recently graduated (in *Q1*)]
Q61.   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 $50 Downtown Davis gift card, if you wish.

[If indicated "retiree" (in *Q1*)]
Q62.   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 $50 Downtown Davis gift card, if you wish.

Q63.   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 $50 Downtown Davis gift card.

[If yes, okay to contact]
Q64.   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.
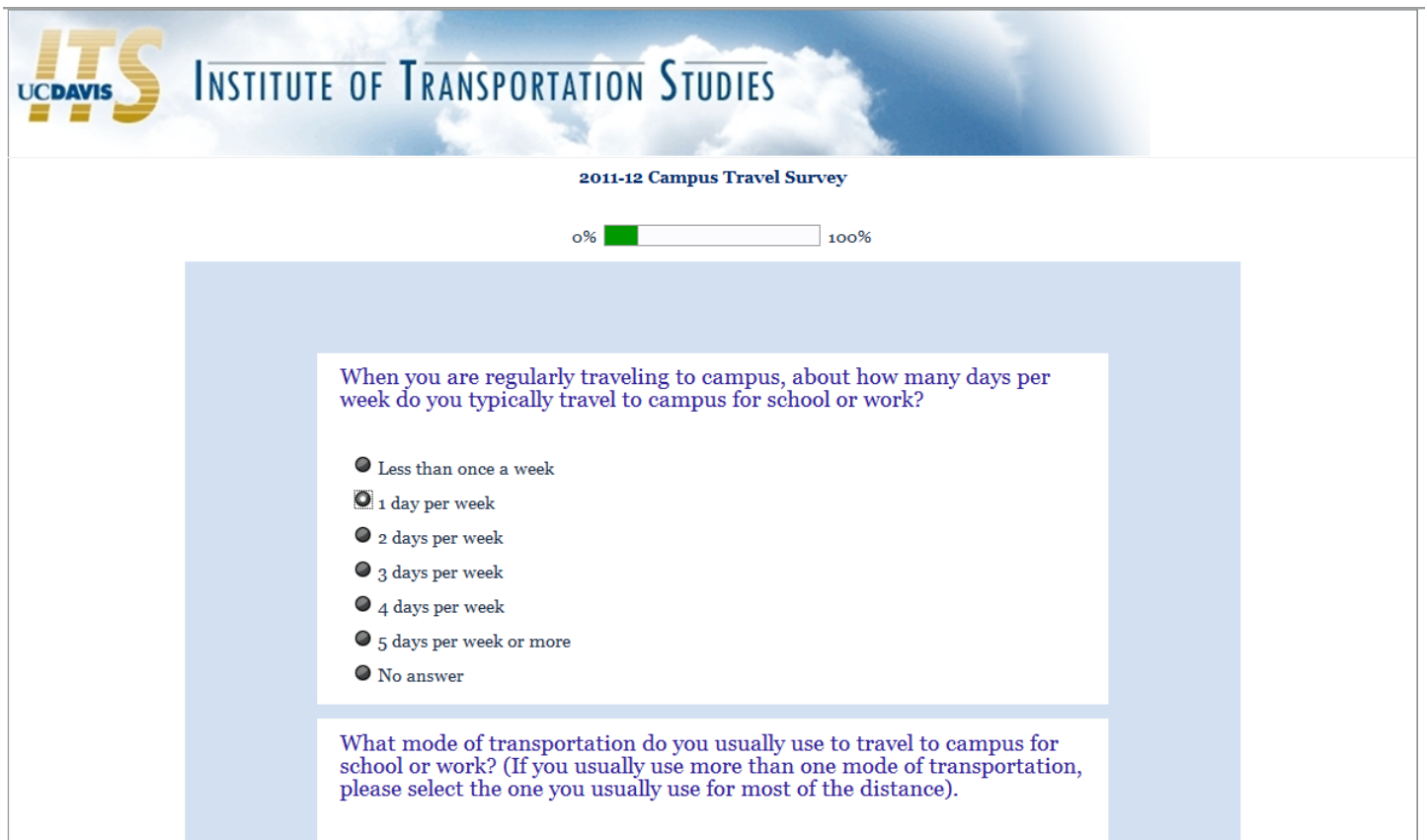Name: _____
Daytime phone number: _____
Email address: _____

Q65.   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 9. Sample screenshot of a page from the online survey

Appendix B: Changes in the 2011-12 survey instrument and suggestions for the future

- The greatest change to this year's survey draft is that it is substantially shorter than previous surveys.
- There were two additional one-time research sections that were only asked to specific role groups and are excluded from the report and Appendix A (see next section).
- A few questions were added to cover issues that have not been addressed in previous surveys:
  - Transfer students (1 q)
  - Several questions about typical travel behavior (3 q), including one question about "usual mode".
  - "Zero emission vehicle" question (1 q), replaced alternative fuel vehicle question for simplicity
- New question for students about degree of financial dependence on parents
- Many sections have been substantially condensed, and some have been eliminated altogether. The following sections have been eliminated:
  - On-campus residential location
  - Distance to transit
  - Overnight bikes
  - Self-reported travel time
  - Travel preferences
  - Reasons for living outside Davis
  - Reasons for biking less as upperclassmen
  - Monetary value of bikes owned and stolen
- The following sections have been substantially reduced, with the new number of questions in parentheses.
  - Bike crashes (2 q)
  - Bike theft (2 q)
  - Summer (2 q)
- The reference week has been shortened to five weekdays. Data on the weekend is not used for AVR or CO_2 estimation, and previous survey years have provided data about weekend travel to campus.
- The first reference week was moved up to October 17-21, with the second reference week taking place during Oct. 24-28.

One-time research sections

West Village Questions
An additional ~15 questions related to the new West Village Apartments were asked only to sophomores, juniors, and seniors.

Social Networking and Transportation
An additional ~15 questions about social networking and transportation were asked only to students.

Recommendations for the 2012-13 survey
- Communicate to students and employees in the email invitation that the survey will take less than 10 minutes to complete.
- Keep the survey short (less than 10 minutes), which should be attainable without the one-time research sections in this year's survey.
- Retain the "usual mode" question, as it is helpful for validating reference week results and may enable better comparisons between recent survey years.
- Include a few questions about specific transportation programs, either existing programs or those on the cusp of implementation.

Appendix C: Text of the recruitment emails

Initial recruitment email:
From: Campus Travel Survey <travelsurvey@ucdavis.edu>
To: <...@ucdavis.edu>
Subject: 2011-12 Campus Travel Survey

Dear UC Davis Student [Employee],

You are invited to participate in the 2011-2012 UC Davis Campus Travel Survey. This research effort provides campus planners with valuable feedback on how people get to campus and their experiences with various transportation programs. This annual survey is intended for everyone who regularly travels to UC Davis for school or work. Your feedback is important to us! The survey takes 15-25 minutes to complete. Doing so is 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. You must be at least 18 years old to complete this survey.

In appreciation for your time, we're offering anyone who completes the survey entry into a drawing to win one of six $50 Downtown Davis gift cards!

To start the survey, click on the link below:
http://travel.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

From: Campus Travel Survey <travelsurvey@ucdavis.edu>
To: <...@ucdavis.edu>
Subject: 2011-12 Campus Travel Survey

Dear UC Davis Student [Employee],

Last week we invited you to take the 2011-12 Campus Travel Survey. If you finished the survey last week, thank you! Your responses have been recorded, and you can disregard the rest of this message. If not, we encourage you to complete the survey today. Data from this research effort provides valuable feedback about the travel preferences of the entire UC Davis community, and your response matters to us. The survey takes 15-25 minutes to complete. Doing so is 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. You must be at least 18 years old to complete this survey.

In appreciation for your time, we're offering anyone who completes the survey entry into a drawing to win one of six $50 Downtown Davis gift cards!

To start the survey, click on the link below:

http://travel.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."[8] We attempt to adhere to the AQMD formula, although our overall survey methodology deviates to some extent from that prescribed by the AQMD.[9] 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 *Q29* in the 2011-12 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 *Q21* and *Q23* for any respondents who traveled some days and telecommuted other days. But for respondents who indicated no travel during any of the five days of the reference week (in *Q21*) and then indicated the reason for no travel was telecommuting (in *Q22*), 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 *Q21* and *Q22*).

> *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 *Q29*). 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 or fuel cell vehicle for their travel during the reference week (in question *Q34*).

> *Fractional carpool arrivals* = A count of the fractions of vehicle-arrivals accounted for those

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

[9] 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.

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 *Q29*) we add to the arrival count a fraction equal to one divided by the total number of people in the carpool (using *Q30*) or the number of passengers dropped off by the driver (using *Q32*). We exclude from the count any arrivals by a respondent who has indicated using an all-electric or hydrogen vehicle (in question *Q34*).

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 and gender based on the 3,116 valid responses to question *Q29* (see Table 15).

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 *Q06*) 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, West Village, 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 most addresses. 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.

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). For those living off campus in Davis (excluding West Village) and outside Davis, distances were calculated from the geocoded 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.

This year we opted to exclude the question about on campus residential location, choosing instead to define "on campus" as the area north of I-80, west of A St., east of SR-113, and south of Russell Blvd. "Network distance from campus" as computed in GIS is inevitably a rough estimate, since we have typically assume in these calculations that all respondents travel to a central campus location. This year, we assigned an average distance from campus destinations for all on-campus respondents equal to the mean calculated network distance for the weighted sample of 463 on-campus respondents in the 2010-11 survey. This distance is equal to 0.77 miles and reflects our best estimate of the average distance from residential locations within

the "on campus" area to campus destinations.

For the respondents living in the West Village apartments, we assumed that distance from campus is equal to the calculated network distance from the center of the West Village complex to the Silo (traveling along Hutchison Drive). This distance is equal to 1.3 miles and reflects our best estimate of the average distance from residential locations in West Village to campus destinations.

Comparability with results from previous surveys
We used the same procedures to geocode and calculate network distances as were used in the 2010-11, 2009-10 and 2008-09 Campus Travel Surveys, so results from the 2011-12 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 geocode 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: Imputation and valid responses

To make the most out of the available data, the following process was used to impute missing data to question *Q29*, the primary mode used to get to campus for each day of the reference week:

1. Missing answers were only coded for days on which the respondent indicated traveling to campus (*Q21*) but did not indicate a primary mode.
2. In cases where all answers were missing for *Q28* and *Q29*, the answer to Q26 about "usual mode" was imputed for each day traveled in *Q29*.
3. In cases where only one answer was given for *Q28* (all modes used to get to campus), missing answers to *Q29* were recoded as this answer.
4. In one case where usual mode was listed and only some answers to *Q29* were missing, the missing modes were imputed so that the "usual" mode made up the majority and the "secondary" mode made up the minority of days traveled.
5. Finally, in any cases with a valid answer to *Q26*, this answer ("usual mode") was imputed for *Q29*.

After all reasonable imputations had been done, 83 cases were excluded because they contained too many missing answers to be usable. An additional 138 respondents were excluded due to missing answers for question *Q20*, about whether the respondent traveled to campus during the reference week. Table 84 shows the number of valid cases for each major step in the data validation process. Starting with 3,468 initial responses, cases were excluded due to missing or invalid data, resulting in 3,116 responses which had valid answers for role, gender, *Q20*, and general residential location. These 3,116 cases were selected for the bulk of the weighted analysis in this report.

Table 84. Valid responses

Variable Name (Description)	Valid Cases (N = 3,468)
Role (8 categories)	3,468
valid_gender (if known male or female)	3,256
valid_Q20 (whether traveled to campus)	3,330
valid_physical (physically traveled)	3,223
valid_res (general residential location)	3,392
include (valid case, include in unweighted analysis)	3,242
validMG (post imputation, use for weighted analysis)	3,116