Results of the 2015-2016 Campus Travel Survey

September 2016

A Research Report from the National Center for Sustainable Transportation

Eric Gudz, University of California, Davis
Drew Heckathorn, University of California, Davis
Calvin Thigpen, University of California, Davis

National Center for Sustainable Transportation

ITS UCDAVIS INSTITUTE OF TRANSPORTATION STUDIES

About the National Center for Sustainable Transportation

The National Center for Sustainable Transportation is a consortium of leading universities committed to advancing an environmentally sustainable transportation system through cutting-edge research, direct policy engagement, and education of our future leaders. Consortium members include: University of California, Davis; University of California, Riverside; University of Southern California; California State University, Long Beach; Georgia Institute of Technology; and University of Vermont. More information can be found at: ncst.ucdavis.edu.

Disclaimer

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NCST

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INSTITUTE OF TRANSPORTATION STUDIES

Research Report

Results of the 2015-16 Campus Travel Survey

September 2016

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RESULTS OF THE 2015-16 CAMPUS TRAVEL SURVEY

Institute of Transportation Studies

and

Transportation and Parking Services

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September 2016

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EXECUTIVE SUMMARY

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 eight 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 ninth administration of the campus travel survey.

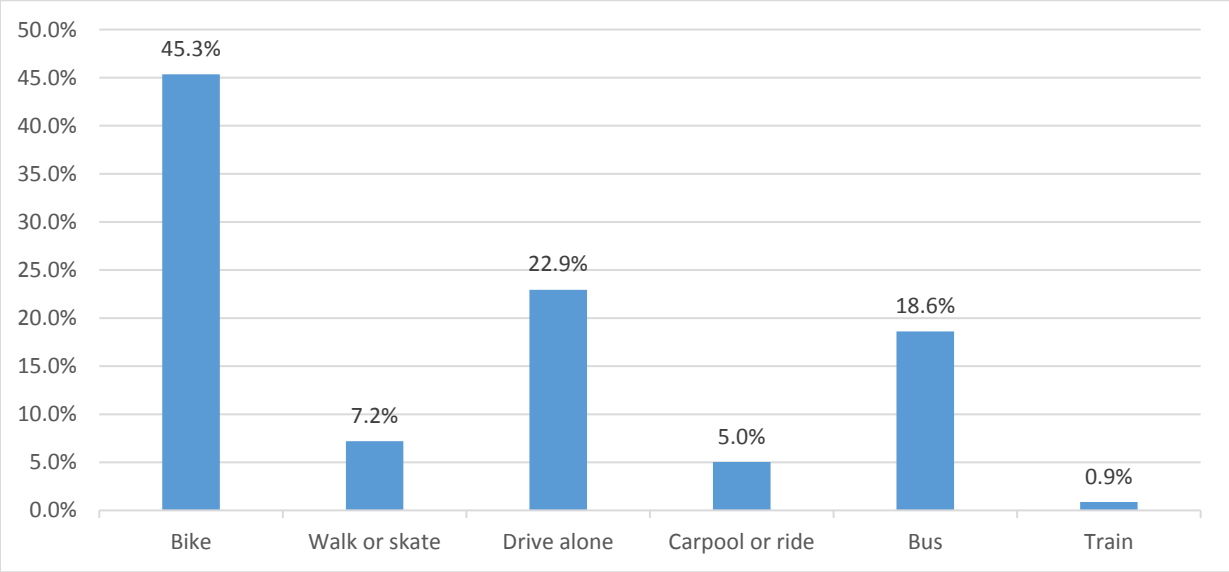
The 2015-16 survey was administered online in October 2015, distributed by email to a stratified random sample of 27,459 students, faculty, and staff (out of an estimated total population of 43,983). About 14 percent (3,789 individuals) of those contacted responded to this year's survey, with 11.5 percent actually completing it. For the statistics presented throughout this report, we weight the responses by role (freshman, sophomore, junior, senior, Master's 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 87.1 percent of people physically travel to campus (approximately 38,319 people, including those living on campus). Among these, 45 percent bike to get there, 7 percent walk or skate, 23 percent drive alone, 5 percent carpool or get a ride, 19 percent ride the bus, and 1 percent ride the train (see Figure 1). These figures represent the percent of people using each means of transportation as their primary mode (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, 2015-16



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 and 26 percent rode the bus at least once during the week for most of the distance to campus.

Change in mode share, 2014-15 to 2015-16

One of the main purposes of the Campus Travel Survey is to collect comparable data each year in order to assess trends over time. The questions and calculations used to estimate mode share in this year's survey are identical to those used in the 2014-15 survey. 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 decreased by 0.3 percentage points over the last year (after decreasing by 2.6 percentage points the previous year), while the share walking to campus increased by 0.5 percentage points. The share of the university population physically traveling to campus on an average weekday increased.

Table 1. One year change in overall mode share, 2014-15 to 2015-16

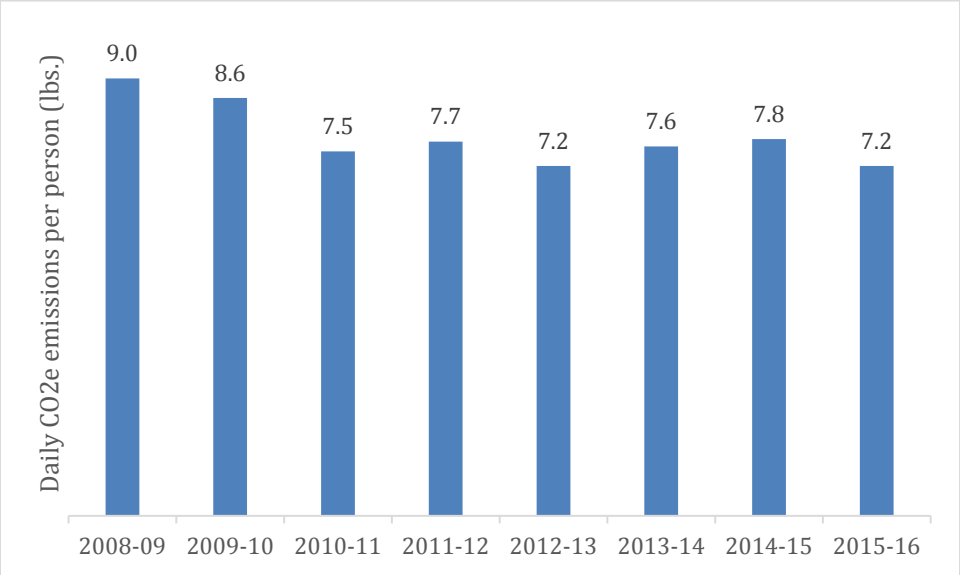
Percentage-point change in share of people doing each on an average weekday							
Years of comparison	**Physically travelling**	***Among those physically traveling to campus***					
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train
2014-15 to 2015-16	1.7%	-0.3%	0.5%	-1.5%	0.0%	1.2%	0.0%

Data are weighted for both years by role and gender.

Carbon dioxide-equivalent emissions

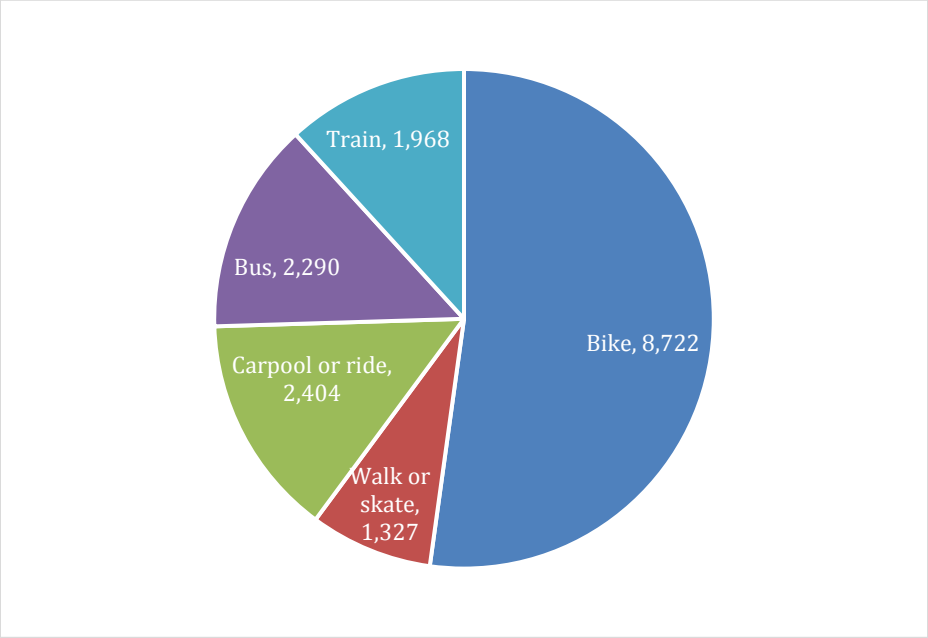
Each year, we use data on mode share, vehicle occupancy, and travel distance to estimate the amount of carbon dioxide-equivalent (CO_2e) emitted from commuting to campus. We estimate that travel by UC Davis students and employees to campus generates a total of 316,592 pounds of CO_2e on an average weekday, or 7.2 pounds of CO_2e per capita, compared to 7.8 pounds in 2014-15, 7.6 pounds in 2013-14, and 7.2 pounds in 2012-13 (see Figure 2).

Figure 2. Daily CO_2e emissions per capita, 2008-09 through 2015-16



To assess the extent that alternative transportation reduces CO_2e emissions, we consider the hypothetical case that everyone were to drive alone to campus but all else were unchanged (e.g. distances and frequency of travel). In this scenario, the campus would produce an additional 16,712 annual metric tons of CO_2e, compared to 35,901 tons overall. Figure 3 shows the contribution of each alternative, when compared to driving alone, to the total CO_2e emissions avoided.

Figure 3. Annual CO2e emissions avoided



Average Vehicle Ridership

Average vehicle ridership (AVR) is a statistic calculated at each UC campus that represents the ratio of the number of people arriving on campus to the number of personal vehicles brought to campus. If everyone drove by themselves to campus, the campus AVR would be equal to one. Values greater than 1.0 indicate more carpooling or the use of alternative modes of transportation. The official 2015-16 AVR for non-student employees living off-campus is 1.92 person-arrivals per vehicle-arrival (Table 2). The AVR for the entire campus community is 3.55 excluding on-campus residents and 4.24 including on-campus residents. This means that for every car coming to campus, there are an estimated 4.24 people coming to campus or telecommuting.

Table 2. Average vehicle ridership (AVR) 2007-08 through 2014-15

Role	*Off campus only*								
	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Student	1.67	4.76	4.28	4.49	5.29	6.05	5.59	5.66	5.13
Employee	**1.67**	**1.69**	**1.66**	**1.75**	**1.78**	**1.70**	**1.75**	**1.61**	**1.92**
Outside Davis	1.33	1.32	1.26	1.34	1.39	1.34	1.30	1.27	1.27
Within Davis	4.60	5.17	4.99	4.99	5.98	6.24	6.53	7.25	6.15
Overall	2.75	2.99	2.83	3.00	3.26	3.34	3.30	3.23	3.55
	All (on and off campus)								
	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Student	5.04	5.91	5.25	5.53	6.41	7.25	6.74	6.93	6.43
Employee	1.67	1.71	1.66	1.75	1.80	1.70	1.75	1.61	1.92
Outside Davis	1.33	1.32	1.26	1.34	1.39	1.34	1.30	1.27	1.27
Within Davis	5.61	6.32	5.99	6.04	7.14	7.36	7.74	8.75	7.54
Overall	3.20	3.51	3.30	3.51	3.78	3.82	3.80	3.77	4.24

Bold indicates the official AVR statistic reported by UC campuses. See "Appendix D: Calculation of Average Vehicle Ridership (AVR)" for details on AVR calculations.

Figure 4. Average vehicle ridership, 2007-08 through 2014-15

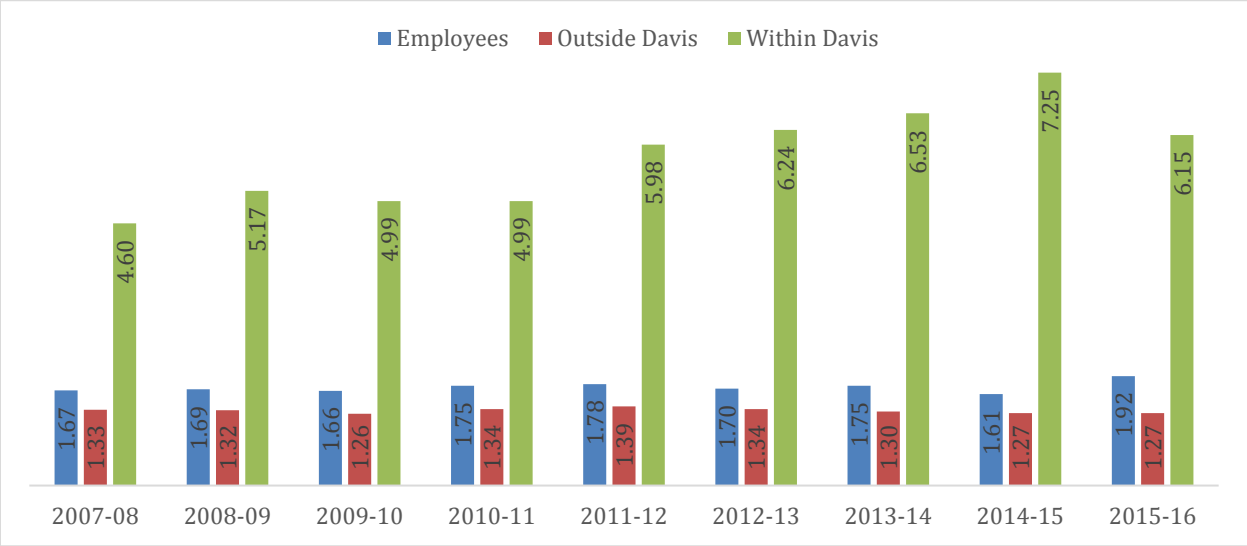


Figure 4 shows the differences in AVR between all employees, employees and students living within Davis, and employees and students living outside Davis. As shown, the 2015-16 AVR of those living in Davis is somewhat lower than in the previous year, while the AVR of those living outside Davis has remained relatively constant over time. These results suggest that there is still much progress to be made in providing housing options in Davis for all university affiliates regularly traveling to campus.

Potential for bicycling

We include a question to assess the potential mode share of biking: "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. Figure 5 shows the differences between the share of respondents who consider biking to campus to be an option and the share that actually bikes to campus on an average weekday.

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 and repair stations on campus are the most highly utilized transportation services, with over 50 percent of respondents having used them (Figure 6).

Figure 5. Share who bikes to campus compared to share who considers biking an option, by distance from campus

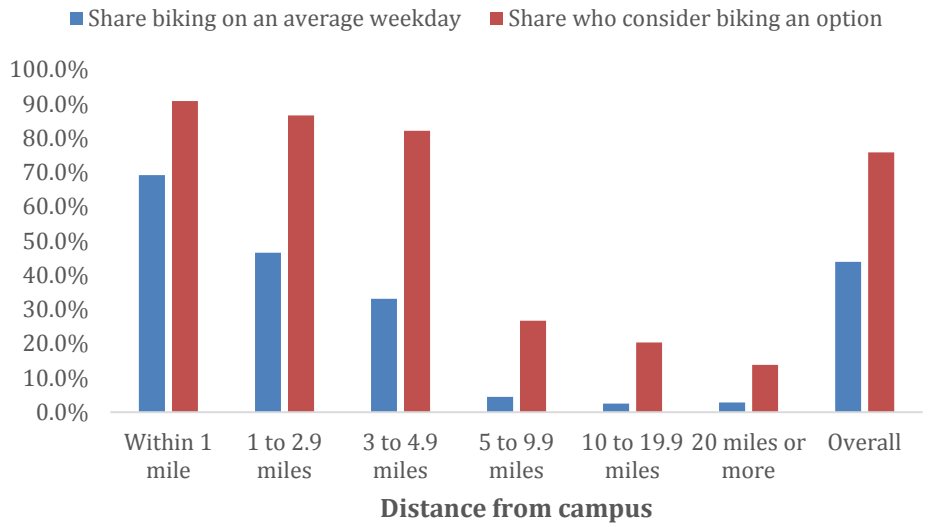
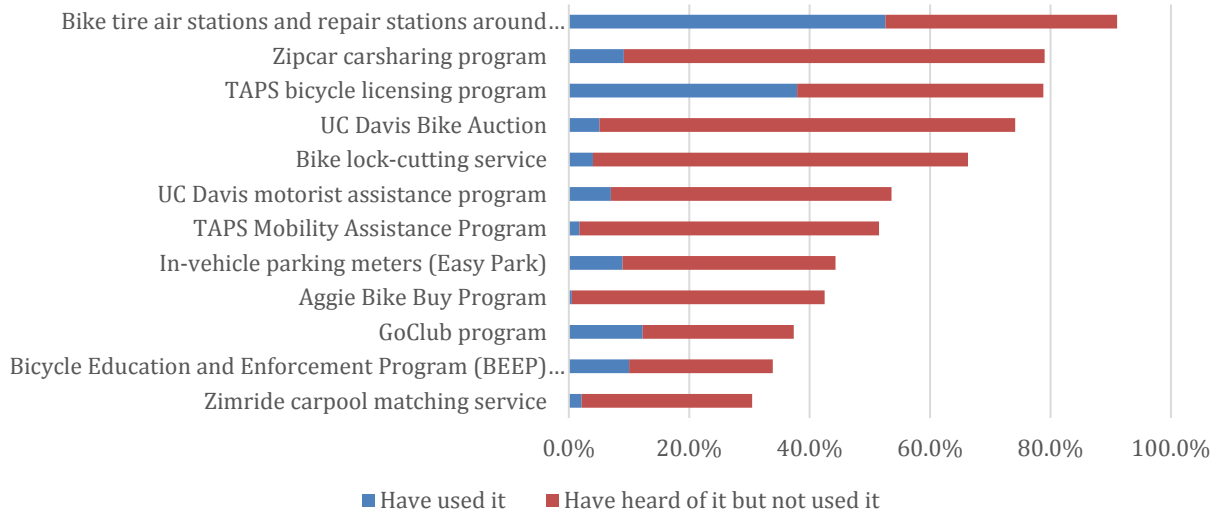


Figure 6. Familiarity with TAPS programs



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 equivalent emissions (CO_2e) 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 additional reasons to promote alternatives to driving. Some concerns include high costs of expanding parking facilities, air pollution, and traffic congestion. It is essential that campus planners and travel demand managers have current 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 seven 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 ninth 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), and seven subsequent surveys conducted in the fall of 2008-09 (Lovejoy, Handy *et al*., 2009), 2009-10 (Lovejoy, 2010), 2010-11 (Miller, 2011), 2011-12 (Miller, 2012), 2012-13 (Driller, 2013), 2013-14 (Popovich, 2014), and 2014-15 (Thigpen, 2015). The next administration of the survey is planned for October 2016.

The 2015-16 survey was administered online in October and November 2015, distributed by email to a stratified random sample of 27,429 students, faculty, and staff (out of an estimated total population of 43,983). About 15.4 percent (4,220 individuals) responded to this year's survey, with about 13.8 percent (3,789) actually completing it. For the statistics we present throughout this report, we weight the responses by role (freshman, sophomore, junior, senior, Master's 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: Survey instrument, 2015-16 Campus Travel Survey" for a full copy of the 2015-16 survey instrument. See "Appendix B: Changes from the 2014-15 survey instrument" for a summary of changes in the 2015-16 survey compared to the 2014-15 survey.) 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 (IET), and administered by Jeremy Dalbeck, and Jonathan Villavert. Staff at TAPS as well as faculty and students affiliated with the Institute of Transportation Studies provided feedback on survey content and assisted with pre-testing of 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 response rate for each of the groups. In past years, we found that response was higher among some role groups (PhD students, faculty, and staff) and lower among others (seniors and Master's/professional students). Since the 2009-10 implementation of the survey, we have varied invitation rates by stratum to account for these differences, 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 set the share of the population sampled to 62 percent (27,429 people). (See "Appendix G: Sampling Plan" for more information on this year's sampling plan.)

A stratified random sample of 27,429 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 Institutional Analysis branch of the Student Research and Information (SRI) office. Student email addresses were screened based on students' class 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 SRI 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 Payroll Personnel System (PPS) staff from the Accounting and Financial Services office. 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. PPS staff compiled two separate Excel spreadsheets, one for faculty and one for staff. Since for staff 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 staff employee, a column was added to each row with a randomly generated number between 1 and 1,000,000. Rows were then sorted by this column of random numbers, and the top 3,411 rows of staff were selected, while all 2,389 faculty in the email list were invited to participate.

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." Each person in the selected sample received an initial email inviting him or her to take the survey. Those individuals who had not completed the survey one week later were sent a reminder email. See "Appendix C: Text of the recruitment emails"

for copies of these recruitment emails.

As we did for last year's 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, IET performed load testing prior to the survey launch under various system configurations until the server demonstrated a capacity to handle the anticipated responses without page loading delays. On Monday, October 26th, nine hourly batches were sent out to students, staff and faculty (between 1,740 and 4,667 email addresses in each half-hourly batch) until all student, staff and faculty respondents were invited. Reminder invitations were sent out on Monday, November 2nd to the students, staff and faculty who had not yet participated.

Offering a chance to win a desirable prize is thought to increase overall response to a survey. This year, TAPS allocated $1,500 for incentives in the form of 20 $50 Visa gift cards and a grand prize of an Amazon Fire tablet to participate in the survey. 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. 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, or if instead they preferred not to be contacted. There were 2,976 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 21 with the lowest values as the winners, who were notified via email on December 2nd, 2015 and instructed to pick up their gift cards at the TAPS office.

Response rate

A total of 4,220 respondents at least started the survey (responding to question *Q01*), representing 15.4 percent of those invited. This rate is slightly higher than last year's survey's response rate (13.7 percent). Of those who began the survey, 90 percent (3,781 respondents) completed the survey through question *Q30*, which asked respondents about their mode choice on each day of the reference week. Table 3 shows response rates for this year's survey compared to the previous seven surveys. As shown, overall response rates have gradually declined over time. This decline 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 time to complete the survey (as described in the email invite) has increased. This year, the invitations to take the campus travel survey were sent directly from Provost Hexter's email address mentioning explicitly the ways in which the survey data are used and the importance of taking and completing the survey each year. It also assured respondents that the survey would take less than ten minutes to complete.

Table 3. Response rates for 2015-16 versus 2007-08 through 2014-15

Role group	2015-16				2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10	2008-09	2007-08
	Assumed population	Number invited	Actual responses	Target response rate	Actual response rate								
Student	34,465	21,646	2,458	9.9%	11.4%	11.1%	12%	13%	12%	18%	25%	22%	23%
Undergraduate	28,191	16,618	1,775	8.7%	10.7%	10.1%	11%	12%	11%	17%	24%	20%	22%
Freshman	5,775	3,381	349	10.7%	10.3%	10.7%	11%	15%	13%	23%	30%	22%	26%
Sophomore	4,807	3,703	485	9.6%	13.1%	11.6%	12%	13%	12%	16%	26%	21%	22%
Junior	7,738	3,716	426	9.8%	11.5%	11.8%	13%	14%	13%	18%	22%	22%	21%
Senior	9,871	5,818	515	6.4%	8.9%	8.4%	9%	10%	9%	12%	19%	17%	20%
Graduate	6,274	5,028	683	13.6%	13.6%	15.5%	15%	16%	16%	22%	28%	27%	24%
Master's	2,914	2,914	256	11.7%	8.8%	10.4%	14%	11%	11%	16%	19%	18%	19%
PhD	3,360	2,114	427	16.3%	20.2%	18.3%	16%	21%	23%	34%	40%	35%	28%
Employee	9,518	5,813	1,323	12.0%	22.8%	14.2%	22%	18%	19%	29%	34%	35%	45%
Faculty	2,389	2,389	476	13.9%	19.9%	12.9%	14%	16%	16%	22%	27%	30%	37%
Staff	7,129	3,424	847	10.7%	24.7%	15.7%	30%	22%	24%	37%	42%	39%	50%
Overall percent	100%	62.4%	13.8%	10.3%	13.8%	11.4%	13%	14%	13%	20%	27%	26%	28%
Overall	43,983	27,459	3,781	2834	3781	3,507	3,663	3,982	3,116	3,084	3,569	3,577	3,849

**4,220 people began the survey, but these response rates reflect only those respondents who reported valid mode and gender (3,781)*

[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 4 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, Master's students did not meet the target response rate for a five percent margin of error. Margins of error based on responses by role group are shown later in Table 8. As in previous years, response rates were highest among staff and PhD students, and lowest among undergraduate and Master's students of all years.

Table 4. Number of valid responses by role

Role group	Population	Invited	Target	Valid role	Mode and gender	Geocoded
			(5% margin of error)	(started survey)	(weighted for bulk of analysis)	(weighted for CO2 emissions, VMT)
Students	34,465	21,646	2,138	2,752	2,466	2,178
Undergraduate	28,191	16,618	1,453	1,959	1,778	1,583
Freshman	5,775	3,381	361	413	349	334
Sophomore	4,807	3,703	356	524	485	424
Junior	7,738	3,716	366	455	429	373
Senior	9,871	5,818	370	567	515	452
Graduate	6,274	5,028	685	793	688	595
Master's	2,914	2,914	340	321	260	219
PhD	3,360	2,114	345	472	428	376
Employees	9,518	5,813	696	1,468	1,323	992
Faculty	2,389	2,389	331	526	476	378
Staff	7,129	3,424	365	942	847	614
Overall percent	100%	62%	10.3%	15.4%	13.8%	11.5%
Overall	43,983	27,459	2,834	4,220	3,789	3,170

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 *Q01*, we screened 106 respondents who failed to provide a valid role group (who were then skipped to the end of the survey - see "Appendix A: Survey instrument, 2015-16 Campus Travel Survey"). 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 graduate students, but not undergraduate students. Thus we screened graduate student and employee office locations in question *Q08* ("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 101 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 101 respondents were redirected to the end of the survey (see Appendix A: Survey instrument, 2015-16 Campus Travel Survey) and are excluded from the analysis.

In addition, we excluded respondents that indicated traveling to campus but failed to provide answers to questions about primary mode used during the reference week, as well as respondents that did not answer whether they traveled to campus during the reference week. Lastly, 21 respondents who were away all week indicated in *Q28* 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 were also excluded from the analysis.

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, sophomores, 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 to one of eight role groups based on their responses to questions *Q01* through *Q03*: freshmen, sophomores, juniors, seniors (and fifth-years and post-baccalaureate), Master's 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 projected population. As in previous surveys, the sample is disproportionately comprised of women. Men comprise 27.6 percent of the sample versus 41.1 percent of the population of undergraduate students, and 38.5 percent of respondents versus 47.6 percent of the population of graduate students.[1] 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 men and women in each role group in the population.

Although the number of valid responses varies from question to question, we use the same set of weight factors for most variables, based on the distribution of roles among the 3,789 valid responses to question *Q30*, 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 3,170 cases successfully geocoded (by cross-streets and zip code given in questions *Q18* and *Q19*; see "Appendix E: Geocoding and network distances") and with non-missing mode data from question *Q30*. (See "Appendix G: Sampling Plan" for more information on weighting and a list of weight factors by role and gender.)

[1] Figures for the composition of the campus population by gender are drawn from three sources. The student gender split was derived from the Budget and Institutional Analysis document: "FALL ENROLLMENTS BY GENDER AND STUDENT FEE LEVEL". The faculty gender split was determined using the 2013 UC Davis Fact Sheet, and the staff gender split was determined using Table 11b "Personnel Headcount by Ethnicity, Personnel Program, and Gender: Davis" from *The University of California Statistical Summary and Students and Staff, Fall 2012.*

Table 5. Unweighted gender distribution of respondents

Role group	Male	Female	Unweighted sample	Projected population
Undergraduate	27.6%	72.4%	1,778	28,191
Graduate	38.5%	61.5%	688	6,274
Faculty	49.8%	50.2%	476	2,389
Staff	30.8%	69.2%	847	7,129

Table 6. Weighted gender distribution of respondents

Role groups	Male	Female	Weighted sample	Projected population
Undergraduate	41.1%	58.9%	2,428	28,191
Graduate	47.6%	52.5%	540	6,274
Faculty	65.4%	34.5%	206	2,389
Staff	34.4%	65.6%	614	7,129

Table 5 and Table 6 show the difference in gender distribution between the unweighted and weighted results. In previous reports, we have found 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 to which it does.

Reference week

The main statistics that we report are based on questions that ask respondents about their travel activity during each of the five weekdays prior to receiving the invitation to complete the survey. We schedule the reference week for approximately the same time each year that the survey is administered, and to coincide with the biannual campus traffic counts of vehicles entering campus, usually conducted the last week in October or the first week in November (see Figure 7 for the full timeline of the survey launch and reference weeks). This was the fourth year that we asked about weekend travel, so our reference week encompasses seven days rather than five, as in past surveys. This year's reference week was October 19-25, 2015 (Monday-Sunday). As with previous years, we followed the initial email with a reminder email a week later to individuals who had not yet participated. The reminder emails were sent on Monday, November 2nd.

Figure 7. Survey launch and reference week schedule, October- November, 2015

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Oct 19 • Reference week	20	21	22	23	24	25
26 • Initial invitations sent • 2nd reference week	27	28	29	30	31	Nov 1
2 • Reminder invitations sent	3	4	5	6	7	8

Table 7 displays weather during the two reference weeks. The period from late October to mid-November was again one of the driest in history. The Halloween holiday fell on the Saturday during which initial invitations were sent, though it is unlikely this coincidence had an effect on response rates, as most individuals respond early in the week.

Table 7. Weather during reference weeks

Day	Temperature range	Mean (max) wind speed	Precipitation levels
Week 1: October 19 – 25, 2015			
Monday	53 – 75 ºF	3 (7) mph	0 in.
Tuesday	60 – 82 ºF	10 (21) mph	0 in.
Wednesday	59 – 84 ºF	7 (15) mph	0 in.
Thursday	50 – 82 ºF	4 (8) mph	0 in.
Friday	50 – 80 ºF	2 (6) mph	0 in.
Saturday	50 – 80 ºF	2 (7) mph	0 in.
Sunday	55 – 80 ºF	3 (10) mph	0 in.
Week 2: October 26 – November 1, 2015			
Monday	46 – 77 ºF	2 (7) mph	0 in.
Tuesday	55 – 71 ºF	3 (12) mph	0 in.
Wednesday	55 – 73 ºF	3 (9) mph	0 in.
Thursday	57 – 77 ºF	8 (21) mph	0 in.
Friday	59 – 86 ºF	7 (12) mph	0 in.
Saturday	50 – 84 ºF	4 (12) mph	0 in.
Sunday	57 – 68 ºF	4 (9) mph	0.3 in.

Weather data are for Davis, CA, as reported in *Weather Underground*, available online by city and date at http://www.wunderground.com/history/.

FINDINGS

This section summarizes key results from the survey. Data presented in this section 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 campus population, calculated by multiplying each response by an expansion factor based on role and gender.

Many statistics are presented by role group (freshmen, sophomores, juniors, seniors, Master's students, PhD students, faculty, or staff). Where applicable, some are broken down by students (including freshmen through PhD students), undergraduates (freshmen through senior students), graduate students (Master's and PhD students), employees (faculty and staff), within Davis (those living on campus or elsewhere in Davis among all role groups), and outside Davis (those living outside of Davis among all role groups).

Confidence intervals

Table 8 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 1.5 percent of their true value. These expectations are particularly important for mode share estimates, given that some year-to-year changes are significant, while others are not. For example, when we report later that 45.3 percent 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 that bike to campus is between 43.8 and 46.8 percent. Master's students have the highest margins of error due to low response rates.

Table 8. Margins of error, by role group

Role groups	Sample Size	Population Size	Margin of Error
Student	2,466	34,465	1.9%
Undergraduate	1,778	28,191	2.2%
Freshman	349	5,775	5.1%
Sophomore	485	4,807	4.2%
Junior	429	7,738	4.6%
Senior	515	9,871	4.2%
Graduate	688	6,274	3.5%
Master's	260	2,914	5.8%
PhD	428	3,360	4.4%
Employee	1,323	9,518	2.5%
Faculty	476	2,389	4.0%
Staff	847	7,129	3.2%
Overall	3,789	43,983	1.5%

Physical travel to campus

Table 9 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 84 percent traveling to campus on Friday. Faculty travel to campus least often, while sophomores travel to campus most often.

Table 9. Share physically traveling to campus by weekday

Role	***Share physically travelling to campus by weekday***						**Weighted sample**	**Projected population**
	Monday	Tuesday	Wed.	Thursday	Friday	No days		
Student	92.9%	92.5%	93.9%	92.7%	85.4%	1.9%	2,969	34,465
Undergraduate	94.1%	93.0%	94.7%	93.4%	86.9%	1.8%	2,429	28,191
Freshman	91.8%	89.1%	91.8%	90.6%	91.5%	3.4%	497	5,775
Sophomore	95.7%	95.2%	96.5%	94.3%	93.0%	1.7%	414	4,807
Junior	95.8%	92.2%	97.1%	94.2%	86.9%	0.9%	667	7,738
Senior	93.2%	95.0%	93.7%	94.1%	81.2%	1.8%	850	9,871
Graduate	87.6%	90.1%	90.0%	89.2%	78.5%	2.4%	540	6,274
Master's	85.4%	90.9%	91.5%	91.2%	71.9%	2.7%	251	2,914
PhD	89.5%	89.4%	88.7%	87.5%	84.2%	2.2%	289	3,360
Employee	84.4%	86.0%	86.6%	85.0%	78.8%	5.1%	820	9,518
Faculty	80.7%	82.5%	83.1%	78.8%	74.5%	5.9%	206	2,389
Staff	85.7%	87.2%	87.7%	87.1%	80.2%	4.8%	614	7,129
Overall	91.1%	91.1%	92.3%	91.0%	83.9%	2.6%	3,789	43,983
Weighted sample	3,450	3,452	3,496	3,449	3,180	100	3,789	NA
Projected population	40,048	40,068	40,585	40,031	36,918	1,157	NA	43,983

Results are based on responses to questions *Q20* and *Q21*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

In addition to trends by day of the week, there are substantial differences in the frequency of physical travel to campus among those living in different locations (Table 10). Overall, those living in Davis travel to campus more often than those living outside Davis (93 percent versus 85 percent). Master's students and PhD students living outside of Davis are least likely to travel to campus, with only about 74 percent and 75 percent, respectively, traveling to campus on an average weekday day. By contrast, 92 percent of Master's students and PhD students who live off campus in Davis travel to campus on an average weekday. (See Table 14 for the overall percent of people living in each location, by role group.)

Table 10. Physical travel to campus, by role group and residential location

Role	Overall	On campus	West Village	Off campus in Davis	Outside Davis	Weighted sample	Projected population
Student	90.4%	88.0%	82.7%	93.1%	82.2%	2,484	34,465
Undergraduate	90.8%	88.4%	82.0%	93.3%	85.5%	2,032	28,191
Freshman	87.9%	87.8%	100.0%	95.9%	81.7%	416	5,775
Sophomore	93.0%	90.8%	85.3%	94.2%	92.3%	346	4,807
Junior	92.0%	90.5%	78.7%	94.1%	87.7%	558	7,738
Senior	90.6%	90.2%	82.1%	92.2%	83.7%	711	9,871
Graduate	88.6%	83.8%	88.4%	92.1%	74.5%	452	6,274
Master's	86.8%	73.3%	86.3%	91.9%	74.2%	210	2,914
PhD	90.1%	90.9%	95.3%	92.3%	74.9%	242	3,360
Employee	89.1%	89.3%	100.0%	91.1%	86.5%	686	9,518
Faculty	85.7%	75.0%	100.0%	89.4%	76.4%	172	2,389
Staff	90.2%	100.0%	0.0%	91.9%	88.4%	514	7,129
Overall	90.1%	88.1%	82.8%	92.7%	84.7%	3,170	43,983
Weighted sample	2,857	497	112	1,810	438	3,170	NA
Projected population	39,643	6,900	1,556	25,109	6,078	NA	43,983

Results are based on responses to question *Q21* (days traveling to campus) and *Q16* (residential location). Shares are calculated by taking the average across groups of the percent of the five weekdays that each individual traveled to campus. See Table 14 for the overall percent living in each location by role group. Data are weighted by role and gender based on the 3,789 valid responses to questions Q01, Q10, and Q20-30 (see Table 53). Only 1 employee and fifteen graduate students indicated living in West Village.

About 2.6 percent of the sample did not physically travel to campus on any day during the reference week. These respondents were asked to give the reason they were away all week (Table 11). Employees were more likely to be away all week than students, with work travel and sickness/personal leave being the most common reasons given for being away.

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 12). 5.1 percent of employees were away all week (Table 11). 17.5 percent of employees did not travel to campus on an average weekday (Table 12). The most common reasons for being away from campus are working from home (telecommuting) and vacation, sickness, or personal leave.

Table 11. Share away from campus all week and reasons given, by role

Role	Share away from campus all week	*Of those away from campus all week*						Weighted sample	Projected population
		Didn't say	Study abroad or sabbatical	Telecommuting (working from home or another remote location)	Temporary appointment elsewhere	Vacation, sickness, or personal leave	Work or school-related travel or field work		
Student	1.9%	56.5%	12.2%	0.0%	6.5%	14.1%	10.7%	58	672
Undergraduate	1.8%	65.0%	13.4%	0.0%	4.0%	14.6%	3.0%	45	520
Freshman	3.4%	74.2%	0.0%	0.0%	10.7%	15.1%	0.0%	17	196
Sophomore	1.7%	80.6%	0.0%	0.0%	0.0%	19.4%	0.0%	7	80
Junior	0.9%	40.6%	59.4%	0.0%	0.0%	0.0%	0.0%	6	70
Senior	1.8%	57.3%	16.1%	0.0%	0.0%	17.7%	8.9%	15	173
Graduate	2.4%	27.3%	8.3%	0.0%	15.0%	12.3%	37.0%	13	152
Master's	2.7%	39.5%	0.0%	0.0%	15.8%	15.8%	28.9%	7	79
PhD	2.2%	14.3%	17.2%	0.0%	14.3%	8.6%	45.7%	6	74
Employee	5.1%	24.2%	8.2%	13.9%	3.0%	26.7%	24.0%	42	485
Faculty	5.9%	0.0%	28.0%	12.0%	4.7%	14.4%	40.9%	12	141
Staff	4.8%	34.1%	0.0%	14.7%	2.3%	31.8%	17.1%	30	344
Overall	2.6%	42.9%	10.5%	5.8%	5.1%	19.4%	16.3%	100	1,157
Weighted sample	100	43	10	6	5	19	16	100	NA
Projected population	1,157	497	122	68	58	224	188	NA	1,157

Results are based on responses to question *Q22*. Data are weighted by role and gender based on the 3,789 valid responses to questions Q01, Q10, and Q20-30 (see Table 53).

Table 12. 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						Weighted sample	Projected population
		Telecommuting (working from home or remotely)	Work or school-related activities elsewhere	Regularly scheduled day off	Vacation, sickness, or personal leave	Day off as part of a compressed work week	Other		
Employee	17.5%	34.5%	10.7%	16.4%	22.7%	5.0%	10.7%	820	9,518
Faculty	21.2%	53.9%	25.5%	8.1%	8.9%	0.5%	3.0%	206	2,389
Staff	16.3%	42.3%	16.7%	13.1%	17.2%	3.2%	7.6%	614	7,129
Weighted sample	144	0	0	0	0	0	0	3,789	NA
Projected population	1,669	0	0	0	0	0	0	NA	43,983

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 3,789 valid responses to questions Q01, Q10, and Q20-30 (see Table 53).

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, 82.8 percent reported locations in the central campus area (an estimated 13,095 people), including 86.9 percent of graduate students, 91.1 percent of faculty, and 76.5 percent of staff (Table 13). A total of 6.4 percent of respondents reported office locations in west campus, 3.9 percent in south campus, and 6.8 percent off-campus but within the city of Davis.

Table 13. Destination on campus, among employees and graduate students

Role	Main campus	West campus area (west of SR 113)	South campus (south of I-80)	Off campus but in Davis	Weighted sample	Projected population
Graduate	86.9%	6.9%	3.4%	2.8%	540	6,274
Master's	87.9%	6.1%	3.3%	2.8%	251	2,914
PhD	86.0%	7.6%	3.6%	2.8%	289	3,360
Employee	80.2%	6.1%	4.3%	9.4%	820	9,518
Faculty	91.1%	5.2%	1.8%	1.8%	206	2,389
Staff	76.5%	6.4%	5.1%	12.0%	614	7,129
Overall	82.8%	6.4%	3.9%	6.8%	1,360	15,792
Weighted sample	1,128	88	54	92	1,360	15,792
Projected population	13,095	1,016	623	1,072	NA	15,792

Results are based on responses to question *Q08*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

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. The four broad categories included the on campus area, the West Village apartments, off-campus elsewhere in Davis, and outside of Davis (*Q16*). The results suggest that 17.8 percent live on campus (an estimated 7,836 people), 4.3 percent live in the West Village apartments (1,880 people), 61.6 percent live elsewhere in Davis (27,089 people), and 16.3 percent live outside of Davis (7,179 people) (Table 14). Individuals who indicated that they live outside of Davis are most likely to live in the nearby cities of Sacramento, Woodland, Vacaville, West Sacramento, Dixon, Elk Grove, and Winters.

Table 14. Residential location by role group

Role	On campus	West Village	Off campus in Davis	Outside Davis	Weighted sample	Projected population
Student	22.6%	5.4%	63.3%	8.7%	2,484	34,465
Undergraduate	25.3%	5.9%	61.5%	7.4%	2,032	28,191
Freshman	93.4%	0.3%	3.1%	3.2%	416	5,775
Sophomore	7.0%	10.1%	80.1%	2.9%	346	4,807
Junior	8.7%	7.7%	74.1%	9.6%	558	7,738
Senior	7.3%	5.7%	76.6%	10.4%	711	9,871
Graduate	10.7%	3.4%	71.4%	14.5%	452	6,274
Master's	9.3%	5.6%	67.7%	17.4%	210	2,914
PhD	11.9%	1.5%	74.6%	12.0%	242	3,360
Employee	0.4%	0.1%	55.5%	43.9%	686	9,518
Faculty	0.7%	0.3%	70.7%	28.2%	172	2,389
Staff	0.3%	0.0%	50.5%	49.2%	514	7,129
Overall	17.8%	4.3%	61.6%	16.3%	3,170	43,983
Weighted sample	565	135	1,952	517	3,170	NA
Projected population	7,836	1,880	27,089	7,179	NA	43,983

Results are based on responses to question *Q16*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Mode split for primary means of transportation

For physical trips to campus, mode choice was determined by responses to the statement, "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)" (*Q30*). Thus, modes identified are those used for most of the trip, and only on the way to campus at the beginning of the day. Throughout this report, we refer to 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 of five days traveled to campus, 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, we also asked respondents about the mode they "usually" use to travel to campus. See Table 35 for

a comparison of results for “usual” and “primary” modes.

Respondents were 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 (e.g. a family member’s residence), resulting in seemingly dissonant primary mode choices. Similarly, 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 15 through Table 21 show the overall mode split among those physically traveling to campus on a given weekday. Results are shown by role group and general residential location in Table 15 and by role group for each category of residential location in the next six tables. On an average weekday, we estimate that of those physically traveling to campus, 45.3 percent bike (an estimated 17,378 people), 7.2 percent walk or skate (2,757 people), 27.9 percent arrive by car (10,719 people), and 19.5 percent ride public transit (7,466 people). Freshmen, most of whom live on campus, have the highest rate of bicycling.

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

Role	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Student	88.4%	49.9%	8.1%	14.9%	4.0%	22.5%	0.7%	2,969	34,465
Undergraduate	89.2%	48.8%	8.6%	12.7%	3.6%	25.9%	0.4%	2,429	28,191
Freshman	87.4%	67.4%	22.0%	4.2%	1.9%	4.1%	0.4%	497	5,775
Sophomore	91.3%	48.2%	3.0%	8.8%	2.9%	37.2%	0.0%	414	4,807
Junior	90.6%	44.7%	5.8%	14.8%	3.1%	31.0%	0.6%	667	7,738
Senior	88.1%	41.7%	5.8%	17.9%	5.3%	28.8%	0.5%	850	9,871
Graduate	85.0%	54.8%	5.8%	25.5%	5.9%	6.1%	1.9%	540	6,274
Master's	83.4%	50.0%	5.2%	31.3%	4.1%	7.3%	2.1%	251	2,914
PhD	86.4%	58.7%	6.3%	20.6%	7.4%	5.1%	1.8%	289	3,360
Employee	82.5%	27.8%	3.8%	54.1%	9.0%	3.6%	1.6%	820	9,518
Faculty	78.8%	44.5%	5.4%	38.0%	6.0%	2.7%	3.4%	206	2,389
Staff	83.7%	22.6%	3.3%	59.2%	10.0%	3.9%	1.0%	614	7,129
Overall	87.1%	45.3%	7.2%	22.9%	5.0%	18.6%	0.9%	3,789	43,983
Weighted sample	3,301	1,497	237	757	166	614	29	3,789	NA
Projected population	38,319	17,378	2,757	8,790	1,929	7,132	334	NA	43,983

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q30* (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 and then take the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Table 16 shows the mode share among those who live within Davis. This category includes students and employees who live on campus, off campus in Davis, and in the West Village apartments. Juniors and seniors are the least likely to bike to campus (50 and 47 percent, respectively), and staff are most likely to drive alone (31.5 percent) from within Davis, while freshmen are the least likely to do so (0.1 percent). The train is not a feasible means of traveling to campus from within Davis.

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

Role	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Student	91.2%	55.5%	8.7%	7.9%	3.7%	24.2%	0.1%	2,268	31,469
Undergraduate	91.3%	53.7%	9.1%	6.0%	3.3%	27.9%	0.1%	1,881	26,105
Freshman	88.1%	71.3%	23.5%	0.1%	1.6%	3.4%	0.3%	403	5,592
Sophomore	93.1%	51.0%	2.7%	4.7%	2.8%	38.8%	0.0%	336	4,667
Junior	92.4%	50.5%	6.7%	5.9%	3.2%	33.7%	0.0%	504	6,998
Senior	91.4%	46.9%	5.7%	10.5%	4.7%	32.2%	0.0%	638	8,848
Graduate	91.0%	64.6%	6.8%	16.9%	5.5%	6.1%	0.1%	387	5,364
Master's	89.5%	62.3%	6.9%	19.2%	4.0%	7.3%	0.2%	173	2,407
PhD	92.2%	66.4%	6.7%	15.1%	6.7%	5.1%	0.0%	213	2,957
Employee	91.1%	54.3%	6.0%	30.0%	5.6%	3.9%	0.0%	385	5,335
Faculty	89.3%	59.4%	6.7%	26.8%	5.0%	2.1%	0.0%	124	1,714
Staff	91.9%	52.0%	5.7%	31.5%	5.9%	4.8%	0.0%	261	3,621
Overall	91.2%	55.4%	8.3%	11.1%	3.9%	21.2%	0.1%	2,653	36,804
Weighted sample	2,419	1,339	201	268	95	514	1	2,653	NA
Projected population	33,565	18,579	2,794	3,722	1,325	7,128	17	NA	36,804

Results are based on responses to questions *Q21* (daily travel) and *Q30* (travel mode). All mode split percentages are determined by calculating the percent of five weekdays that an individual used a specific mode and then taking the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Table 17 shows the mode share among those who live on campus, defined as the area south of Russell Blvd., west of A St., north of I-80, and east of highway 113. Bicycling and walking understandably predominate among the students who live on campus (only a few employees reported living on campus).

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

Role	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Student	88.0%	71.7%	22.6%	0.8%	1.1%	3.7%	0.2%	562	7,794
Undergraduate	88.4%	71.6%	22.8%	0.6%	1.1%	3.7%	0.2%	513	7,123
Freshman	87.8%	72.1%	24.3%	0.1%	1.0%	2.3%	0.3%	389	5,397
Sophomore	90.8%	79.5%	8.5%	1.2%	0.0%	10.9%	0.0%	24	335
Junior	90.5%	75.5%	17.4%	3.2%	1.1%	2.7%	0.0%	49	674
Senior	90.2%	61.0%	22.8%	1.6%	2.6%	12.0%	0.0%	52	717
Graduate	83.8%	71.9%	20.9%	3.1%	1.3%	2.8%	0.0%	48	671
Master's	73.3%	60.3%	29.7%	3.9%	0.0%	6.1%	0.0%	20	272
PhD	90.9%	78.2%	16.1%	2.6%	2.0%	1.0%	0.0%	29	400
Employee	89.3%	43.5%	51.7%	4.8%	0.0%	0.0%	0.0%	3	42
Faculty	75.0%	20.0%	66.7%	13.3%	0.0%	0.0%	0.0%	1	18
Staff	100.0%	56.7%	43.3%	0.0%	0.0%	0.0%	0.0%	2	24
Overall	88.1%	71.5%	22.8%	0.8%	1.1%	3.6%	0.2%	565	7,836
Weighted sample	497	356	113	4	5	18	1	565	NA
Projected population	6,900	4,934	1,570	56	76	252	12	NA	7,836

Results are based on responses to questions *Q21* and *Q30*. All mode split percentages are determined by calculating the percent of five weekdays that an individual used a particular mode and then taking the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53). Very few employees indicated living within the area considered "on-campus," therefore these mode splits may not be characteristic of all employees living in this area.

Table 18 shows the mode shares among those living in the West Village apartments. Because the sample sizes in most role groups 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 18. Share using each mode on an average weekday, from West Village

Role	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Student	82.7%	61.4%	1.9%	2.8%	1.0%	32.8%	0.0%	135	1,872
Undergraduate	82.0%	58.3%	2.2%	3.0%	1.2%	35.4%	0.0%	120	1,659
Freshman	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	1	15
Sophomore	85.3%	68.2%	2.8%	0.9%	1.4%	26.6%	0.0%	35	484
Junior	78.7%	55.4%	0.0%	3.5%	0.0%	41.1%	0.0%	43	594
Senior	82.1%	54.3%	3.8%	4.5%	2.1%	35.3%	0.0%	41	566
Graduate	88.4%	84.3%	0.0%	1.3%	0.0%	14.5%	0.0%	15	213
Master's	86.3%	79.0%	0.0%	1.7%	0.0%	19.3%	0.0%	12	163
PhD	95.3%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4	50
Employee	100.0%	60.0%	0.0%	40.0%	0.0%	0.0%	0.0%	1	8
Faculty	100.0%	60.0%	0.0%	40.0%	0.0%	0.0%	0.0%	1	8
Staff	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
Overall	82.8%	61.4%	1.9%	3.0%	1.0%	32.7%	0.0%	135	1,880
Weighted sample	112	69	2	3	1	37	0	135	NA
Projected population	1,556	956	29	47	16	508	0	NA	1,880

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q30* (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 and then take the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Table 19 shows the mode share results for those living off-campus in Davis, but excluding the West Village apartments. Among those living elsewhere in Davis, undergraduate students and staff are less likely to bike than graduate students and faculty. Undergraduate students have high bus ridership rates (36.6 percent), whereas graduate students and employees in Davis who do not bike are more likely to commute by car.

Table 19. Share using each mode on an average weekday, from off-campus within Davis

Role	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Student	89.4%	49.6%	4.5%	10.7%	4.7%	30.4%	0.0%	1,571	21,804
Undergraduate	89.5%	46.3%	4.4%	8.4%	4.3%	36.6%	0.0%	1,249	17,324
Freshman	83.7%	55.7%	1.8%	0.0%	18.3%	24.1%	0.0%	13	180
Sophomore	92.2%	46.6%	2.2%	5.5%	3.1%	42.6%	0.0%	277	3,848
Junior	90.1%	47.2%	6.1%	6.4%	3.7%	36.6%	0.0%	413	5,730
Senior	87.8%	45.1%	4.3%	11.7%	5.0%	33.9%	0.0%	545	7,565
Graduate	89.2%	62.7%	5.2%	19.5%	6.4%	6.1%	0.1%	323	4,480
Master's	91.4%	61.3%	4.9%	22.2%	4.8%	6.5%	0.3%	142	1,972
PhD	87.6%	63.8%	5.4%	17.4%	7.6%	5.8%	0.0%	181	2,508
Employee	101.7%	54.4%	5.7%	30.2%	5.7%	4.0%	0.0%	381	5,285
Faculty	93.2%	59.8%	6.2%	26.9%	5.1%	2.1%	0.0%	122	1,688
Staff	106.1%	51.9%	5.5%	31.8%	6.0%	4.8%	0.0%	259	3,597
Overall	91.5%	50.5%	4.8%	14.4%	4.9%	25.4%	0.0%	1,952	27,089
Weighted sample	1,810	915	86	261	89	459	0	1,952	NA
Projected population	25,109	12,690	1,195	3,619	1,233	6,368	5	NA	27,089

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q30* (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 and then take the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

We asked respondents who lived off-campus in Davis to identify which part of Davis they lived in by using a series of maps as references (see "Appendix A: Survey instrument, 2015-16 Campus Travel Survey"). Table 20 shows the mode share for those living off-campus in Davis (excluding West Village apartments) by their location in Davis. The results suggest that mode splits vary substantially by neighborhood. Bicycling to campus is especially prevalent among individuals living in Central and Downtown Davis. Those living in Downtown Davis are much more likely to walk to campus than individuals living elsewhere. Driving to campus is more common from the neighborhoods of West, East, and South Davis, and taking the bus to campus is more common from North and South Davis.

Table 20. Share using each mode on an average weekday, by neighborhood

Neighborhood	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
North	94.3%	42.1%	5.0%	9.2%	3.8%	40.0%	0.0%	369	5,124
South	92.9%	32.5%	2.3%	22.3%	7.4%	35.5%	0.0%	273	3,785
East	92.6%	52.2%	2.3%	21.8%	5.7%	18.0%	0.0%	369	5,126
West	91.6%	44.5%	2.7%	15.3%	7.6%	29.9%	0.0%	372	5,161
Central	92.9%	66.1%	7.1%	9.7%	2.2%	14.9%	0.0%	399	5,542
Downtown	92.5%	73.2%	13.5%	5.5%	2.3%	5.3%	0.3%	150	2,081
Overall	91.5%	50.5%	4.8%	14.4%	4.9%	25.4%	0.0%	1,952	27,089
Weighted sample	1,810	915	86	261	89	459	0	1,952	NA
Projected population	25,109	12,690	1,195	3,619	1,233	6,368	5	NA	27,089

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q30* (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 and then take the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Table 21 shows the mode share for students and employees who live outside Davis (an estimated 7,179 people). Among those traveling from outside Davis, 76.6 percent commute by car, 11.1 carpool or ride, 5.2 percent ride the bus, and 3.9 percent ride the train. Carpooling is especially prevalent among sophomores, while juniors were the most likely to take the bus from outside of Davis. PhD students were the least likely to drive alone from outside of Davis.

Table 21. Share using each mode on an average weekday, from outside Davis

Role	Physically travelling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Student	78.6%	1.9%	1.4%	74.3%	9.9%	6.7%	5.9%	216	2,996
Undergraduate	81.1%	1.6%	1.0%	76.1%	11.1%	7.0%	3.2%	150	2,086
Freshman	71.4%	18.6%	2.1%	62.8%	10.3%	0.0%	6.2%	13	183
Sophomore	89.1%	0.0%	4.2%	70.6%	25.2%	0.0%	0.0%	10	140
Junior	84.2%	0.0%	1.5%	81.8%	7.6%	9.0%	0.0%	53	740
Senior	79.7%	0.0%	0.0%	75.0%	11.7%	7.8%	5.6%	74	1,023
Graduate	72.7%	2.9%	2.3%	69.4%	6.8%	5.7%	12.9%	66	910
Master's	73.8%	2.6%	0.6%	78.8%	2.4%	6.4%	9.1%	37	507
PhD	71.4%	3.3%	4.4%	57.7%	12.3%	4.7%	17.6%	29	403
Employee	98.1%	2.3%	0.9%	78.2%	11.9%	4.2%	2.5%	301	4,183
Faculty	79.9%	7.9%	2.2%	73.3%	6.2%	4.1%	6.3%	49	675
Staff	102.0%	1.3%	0.7%	79.0%	12.8%	4.3%	1.9%	253	3,508
Overall	89.2%	2.1%	1.1%	76.6%	11.1%	5.2%	3.9%	517	7,179
Weighted sample	438	9	5	336	48	23	17	517	NA
Projected population	6,078	129	67	4,658	672	317	235	NA	7,179

Results are based on responses to question *Q21* (whether they traveled to campus each day) and question *Q30* (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 and then take the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Table 22 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.[2] Faculty are much more likely to report telecommuting during the reference week than staff.

Table 22. Share using each mode on an average weekday, including telecommuting

Role	Physically travelling	*Of those physically traveling to campus*							Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train	Work at home		
Student	88.4%	49.9%	8.1%	14.9%	4.0%	22.5%	0.7%	0.0%	2,969	34,465
Undergraduate	89.2%	48.8%	8.6%	12.7%	3.6%	25.9%	0.4%	0.0%	2,429	28,191
Freshman	87.4%	67.4%	22.0%	4.2%	1.9%	4.1%	0.4%	0.0%	497	5,775
Sophomore	91.3%	48.2%	3.0%	8.8%	2.9%	37.2%	0.0%	0.0%	414	4,807
Junior	90.6%	44.7%	5.8%	14.8%	3.1%	31.0%	0.6%	0.0%	667	7,738
Senior	88.1%	41.7%	5.8%	17.9%	5.3%	28.8%	0.5%	0.0%	850	9,871
Graduate	85.0%	54.8%	5.8%	25.5%	5.9%	6.1%	1.9%	0.0%	540	6,274
Master's	83.4%	50.0%	5.2%	31.3%	4.1%	7.3%	2.1%	0.0%	251	2,914
PhD	86.4%	58.7%	6.3%	20.6%	7.4%	5.1%	1.8%	0.0%	289	3,360
Employee	82.5%	27.8%	3.8%	54.1%	9.0%	3.6%	1.6%	4.1%	820	9,518
Faculty	78.8%	44.5%	5.4%	38.0%	6.0%	2.7%	3.4%	9.1%	206	2,389
Staff	83.7%	22.6%	3.3%	59.2%	10.0%	3.9%	1.0%	2.5%	614	7,129
Overall	87.1%	45.3%	7.2%	22.9%	5.0%	18.6%	0.9%	0.8%	3,789	43,983
Weighted sample	3,301	1,497	237	757	166	614	29	28	3,789	NA
Projected population	38,319	17,378	2,757	8,790	1,929	7,132	334	322	NA	43,983

Results are based on responses to question *Q21* (whether they traveled to campus each day), question *Q30* (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 and then take the average over all respondents. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

[2] 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.

While Table 15 through Table 22 present estimates for the share using various modes on an average weekday, Table 23 shows the share using each mode as a primary mode at least once during the five-day week. Although 45.3 percent of individuals bike to campus as their primary means of transportation on an average weekday (Table 15), 55 percent bike to campus as their primary means of transportation at least once during the week (Table 23). So while about 17,378 people bike as their primary means of travel on an average day, about 21,076 people are regular bicyclists (at least once per week). The number of regular carpoolers and train-riders is also substantially greater than the average number of people traveling by these modes on a given day, projected to be 4,040 (versus 1,929) and 565 (versus 334) for carpooling and train-riding, respectively.

Table 23. Share using each as a primary mode at least once during the reference week

Role	Physically travelling	*Of those physically traveling to campus*							Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train	Work at home		
Student	88.4%	60.0%	14.0%	21.8%	9.3%	31.9%	1.1%	0.0%	2,969	34,465
Undergraduate	89.2%	58.9%	14.9%	18.1%	8.3%	36.3%	0.8%	0.0%	2,429	28,191
Freshman	87.4%	80.6%	35.2%	5.4%	5.2%	7.8%	1.5%	0.0%	497	5,775
Sophomore	91.3%	59.8%	5.2%	12.3%	7.7%	51.6%	0.0%	0.0%	414	4,807
Junior	90.6%	53.1%	11.1%	21.0%	6.3%	42.3%	0.6%	0.0%	667	7,738
Senior	88.1%	50.4%	11.0%	26.1%	12.0%	40.2%	1.0%	0.0%	850	9,871
Graduate	85.0%	65.5%	9.7%	39.4%	13.8%	11.3%	2.6%	0.0%	540	6,274
Master's	83.4%	59.4%	9.1%	46.9%	11.0%	12.4%	2.8%	0.0%	251	2,914
PhD	86.4%	70.6%	10.1%	33.0%	16.2%	10.3%	2.5%	0.0%	289	3,360
Employee	82.5%	35.5%	6.8%	71.4%	15.5%	6.2%	2.8%	4.1%	820	9,518
Faculty	78.8%	56.9%	9.3%	58.3%	12.5%	5.5%	6.8%	9.1%	206	2,389
Staff	83.7%	28.7%	6.1%	75.6%	16.5%	6.4%	1.5%	2.5%	614	7,129
Overall	87.1%	55.0%	12.5%	32.0%	10.5%	26.6%	1.5%	0.8%	3,789	43,983
Weighted sample	3,301	1,816	413	1,056	348	879	49	28	3,789	NA
Projected population	38,319	21,076	4,796	12,263	4,040	10,204	565	322	NA	43,983

Results are based on responses to questions Q20 (whether traveled to campus) and Q30 (primary means of transportation each day). Data are weighted by role and gender based on the 3,789 valid responses to questions Q01, Q10, and Q20-30 (see Table 53).

Comparison of 2015-16 mode share with 2014-15

One of the main purposes of the Campus Travel Survey is to collect comparable data each year in order to assess trends over time. The questions and calculations used to estimate mode share in this year's survey are identical to those used in last year's survey. 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.

Table 24 shows mode share estimates for 2014-15 and 2015-16, which are very similar across the two years. Data for both years are weighted by role and gender.

Table 24. Comparison of mode shares, 2014-15 to 2015-16

Role	Physically travelling	*Of those physically traveling, share using each mode on an average weekday*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
2015-16									
Student	88.4%	49.9%	8.1%	14.9%	4.0%	22.5%	0.7%	2,969	34,465
Undergraduate	89.2%	48.8%	8.6%	12.7%	3.6%	25.9%	0.4%	2,429	28,191
Graduate	85.0%	54.8%	5.8%	25.5%	5.9%	6.1%	1.9%	540	6,274
Employee	82.5%	27.8%	3.8%	54.1%	9.0%	3.6%	1.6%	820	9,518
Outside Davis	89.2%	2.1%	1.1%	76.6%	11.1%	5.2%	3.9%	517	7,179
Within Davis	91.2%	55.4%	8.3%	11.1%	3.9%	21.2%	0.1%	2,653	36,804
Overall	87.1%	45.3%	7.2%	22.9%	5.0%	18.6%	0.9%	3,789	43,983
2014-15									
Student	87.6%	53.7%	8.1%	12.6%	3.7%	21.4%	0.5%	2,581	31,207
Undergraduate	88.2%	52.6%	8.4%	10.9%	3.3%	24.5%	0.2%	2,105	25,450
Graduate	84.7%	58.7%	6.4%	20.4%	5.5%	6.9%	2.0%	476	5,757
Employee	79.3%	20.8%	2.6%	60.8%	9.0%	5.0%	1.8%	926	11,198
Outside Davis	79.3%	2.4%	1.9%	75.7%	10.7%	5.7%	3.6%	829	10,140
Within Davis	87.8%	58.0%	8.1%	9.8%	3.4%	20.7%	0.1%	2,638	32,265
Overall	85.4%	45.6%	6.7%	24.4%	5.0%	17.4%	0.9%	3,507	42,405

Data are weighted for both years by role and gender (see Table 53).

Table 25 shows percentage-point changes in the overall mode share. This past year the rate of bicycling decreased by 0.3 percentage points. Less people drove alone to school in 2015-16 than 2014-15, while more people took the bus. The share of the campus community physically traveling to campus increased by 1.7 percentage points.

Table 25. One year change in overall mode share, 2014-15 to 2015-16

Percentage-point change in share of people doing each on an average weekday							
Years of comparison	**Physically travelling**	***Among those physically traveling to campus***					
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train
2014-15 to 2015-16	1.7%	-0.3%	0.5%	-1.5%	0.0%	1.2%	0.0%

Data are weighted for both years by role and gender (see Table 53).

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 occupancies for carpools and rides are shown in Table 26. Among those who carpooled at any point during the reference week, the average number of passengers was 2.5 (including the driver). Most people dropped off on campus were the sole passenger, with an average of 1.5 passengers dropped off per ride to campus (excluding the driver).

Table 26. Average carpool size

Role	***Average occupancy for those that carpooled or got a ride at least once***		***Weighted sample***		***Projected population***	
	Carpool	Ride	Carpoolers	Riders	Carpoolers	Riders
Undergraduate	2.6	1.5	268	212	3,714	2,939
Graduate	2.3	1.6	58	24	810	332
Faculty	3.2	1.4	15	10	209	135
Staff	2.3	1.4	70	28	968	394
Outside Davis	2.6	1.7	77	23	1,072	320
Within Davis	2.5	1.5	334	251	4,629	3,480
Overall	2.5	1.5	411	274	5,701	3,800

Vehicle occupancy is based on responses to question *Q31* for those carpooling and to question *Q32* for those who got a ride. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

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. 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 53. We estimate that 9,519 vehicles come to campus on an average weekday (Table 27). About 563 of these contain carpools and 576 are vehicles just dropping passengers off.

Table 27. Projected vehicles arriving on an average weekday, by occupancy and role

Role	***Projected number of vehicles on an average weekday***				**Projected population**
	Drive alone	Carpool	Ride	Total	
Student	4,090	333	445	4,868	34,465
Undergraduate	2,794	236	365	3,394	28,191
Freshman	97	11	53	161	5,775
Sophomore	297	39	54	390	4,807
Junior	912	62	100	1,074	7,738
Senior	1,488	136	158	1,782	9,871
Graduate	1,296	101	81	1,478	6,274
Master's	710	31	28	769	2,914
PhD	586	69	53	708	3,360
Employee	4,290	236	131	4,657	9,518
Faculty	789	27	22	838	2,389
Staff	3,501	214	109	3,825	7,129
Outside Davis	4,658	230	80	4,968	7,179
Within Davis	3,722	330	497	4,548	36,804
Overall	8,380	563	576	9,519	43,983

Results are based on responses to questions *Q21* (days physically traveling to campus), *Q30* (mode of transportation used each day), *Q31* (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 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Average Vehicle Ridership

Average vehicle ridership (AVR) is a statistic calculated at each UC campus that represents the ratio of the number of people arriving on campus to the number of personal vehicles brought to campus. 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 for employees who telecommute, who adopt a compressed work week schedule, or who use a zero-emission vehicle to commute to campus (see "Appendix D: Calculation of Average Vehicle Ridership (AVR)" for details on the calculation of AVR). If everyone drove alone to campus, the campus AVR would be equal to one. Values greater than one indicate more carpooling, bus or train use, or the use of active modes of transportation. Among those traveling from off-campus, AVR is estimated to be 3.55 campus-wide, and 1.92 among non-student employees only (Table 28). This means that for every car coming to campus, there are an estimated 3.55 off-campus people coming to campus or telecommuting. This ratio is slightly higher than it was last year. Table 28 shows the AVR estimates over the last nine years.

Table 28. Average vehicle ridership (AVR) 2007-08 through 2015-16

Role	*Off campus only*							
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Student	4.76	4.28	4.49	5.29	6.05	5.59	5.66	5.13
Undergraduate	5.80	5.11	5.38	6.42	7.23	6.44	6.33	5.88
Freshman	5.35	4.69	3.26	3.66	5.06	2.31	4.24	2.71
Sophomore	10.24	9.38	8.37	15.93	17.51	10.93	10.64	10.93
Junior	6.26	5.48	5.59	6.24	7.85	6.59	6.64	6.24
Senior	4.39	3.88	4.57	5.26	5.62	5.85	5.31	4.77
Graduate	2.81	2.57	2.79	3.14	3.55	3.57	3.99	3.45
Master's	2.71	2.60	2.73	3.34	3.15	2.76	3.04	3.11
PhD	2.86	2.56	2.82	3.03	3.84	4.32	4.78	3.81
Employee	**1.69**	**1.66**	**1.75**	**1.78**	**1.70**	**1.75**	**1.61**	**1.92**
Faculty	2.34	2.37	2.24	2.76	3.06	3.24	2.81	2.77
Staff	1.60	1.56	1.66	1.65	1.52	1.54	1.49	1.74
Non-student and student employees	NA	2.20	NA	2.45	2.51	2.58	2.57	2.88
Outside Davis	1.32	1.26	1.34	1.39	1.34	1.30	1.27	1.27
Within Davis	5.17	4.99	4.99	5.98	6.24	6.53	7.25	6.15
Overall	2.99	2.83	3.00	3.26	3.34	3.30	3.23	3.55
	All (on and off campus)							
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Student	5.91	5.25	5.53	6.41	7.25	6.74	6.93	6.43
Undergraduate	7.37	6.36	6.72	8.01	8.77	7.96	7.92	7.60
Freshman	33.40	21.84	32.75	34.61	33.67	15.45	31.58	32.88
Sophomore	10.67	9.53	9.11	16.54	18.88	11.86	11.94	11.62
Junior	6.56	6.04	6.23	6.88	8.30	7.41	7.20	6.68
Senior	4.67	4.09	4.79	5.68	5.96	6.14	5.67	5.07
Graduate	3.21	2.95	3.18	3.45	4.03	3.88	4.40	3.77
Master's	2.94	2.84	2.94	3.57	3.43	2.92	3.35	3.34
PhD	3.36	3.01	3.33	3.39	4.47	4.75	5.28	4.23
Employee	1.71	1.66	1.75	1.80	1.70	1.75	1.61	1.92
Faculty	2.35	2.38	2.24	2.78	3.06	3.24	2.81	2.78
Staff	1.62	1.55	1.67	1.67	1.52	1.55	1.49	1.74
Non-student and student employees	NA	2.31	NA	2.59	2.64	2.69	2.70	3.02
Outside Davis	1.32	1.26	1.34	1.39	1.34	1.30	1.27	1.27
Within Davis	6.32	5.99	6.04	7.14	7.36	7.74	8.75	7.54
Overall	3.51	3.30	3.51	3.78	3.82	3.80	3.77	4.24

Bold indicates the official AVR statistic reported by UC campuses. AVR estimates from 2010-11 through 2015-16 are weighted by role and gender. See "Appendix D: Calculation of Average Vehicle Ridership (AVR)" for details on AVR calculations.

Table 29 shows AVR statistics for 2015-16 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 15-16*. 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 2015-16, the comparison suggests that UC Davis has the highest (best) AVR for all the UC campuses.

Table 29. AVR at UC Davis versus other UC campuses

UC Campus	2010-11	2013-14	2014-15	2015-16	Notes on reported AVR	Comparable UC Davis AVR 2015-16
Berkeley	-	-	-	-	-	1.92
Irvine	1.87	1.92	-	1.51	Includes grad student employees	2.88
Los Angeles	-	1.67	1.68	1.68	Official (off campus employees only)	1.92
Merced	-	-	-	-	-	1.92
Riverside	1.53	1.58	-	-	Official (off campus employees only)	1.92
San Diego	1.60	-	-	-	Official (off campus employees only)	1.92
San Francisco	-	2.34	-	-	Off campus students and employees	3.55
Santa Barbara	-	1.35	-	1.47	Averaged for faculty (1.4) and staff (1.3)	1.92
Santa Cruz	1.94	2.17	2.56	1.43	Off campus students and employees	3.55

See "Appendix D: Calculation of Average Vehicle Ridership (AVR)" for details on the calculation of the Davis AVR. Other campus figures are from the Systemwide Transportation Survey Matrix 10-11, 13-14,14-15, and 15-16 as communicated by University of California administration.

Parking permits

Whether or not they reported having a car, all respondents were asked whether they currently have a UC Davis parking permit, and if so which type (question *Q15*). About 17.4 percent of respondents reported having an annual parking permit and 6.0 percent reported having a monthly or quarterly permit: a projected 7,644 and 2,661 people, respectively (Table 30). This year we also asked respondents whether they had a daily parking permit (either purchased or received through the GoClub program) or an in-vehicle EasyPark Personal Parking Meter. About 4.8 percent of the population, or a projected 2,132 people have a daily permit. 1.5 percent of respondents, or a projected 644 people, indicated owning an in-vehicle parking meter.

Table 30. Share of people with a parking permit, by role

Role	Either annual or monthly/quarterly permit		Annual or multi-year permit		Monthly or quarterly permit		Daily or GoClub daily permit		EasyPark in-vehicle parking meter		Projected population
	Share of sample	Projected population	Share of sample	Projected population	Share of sample	Projected population	Share of sample	Projected population	Share of sample	Projected population	
Student	15.4%	5,313	9.7%	3,343	5.7%	1,970	3.0%	1,050	1.5%	526	34,465
Undergraduate	13.1%	3,696	7.9%	2,240	5.2%	1,456	1.3%	366	1.6%	458	28,191
Freshman	4.2%	244	3.7%	215	0.5%	30	0.0%	0	0.4%	21	5,775
Sophomore	10.1%	484	6.4%	307	3.7%	177	0.7%	31	1.0%	48	4,807
Junior	15.4%	1,192	10.3%	795	5.1%	396	1.3%	100	2.0%	153	7,738
Senior	18.0%	1,776	9.3%	923	8.6%	853	2.4%	235	2.4%	235	9,871
Graduate	25.8%	1,618	17.6%	1,103	8.2%	514	10.9%	685	1.1%	69	6,274
Master's	31.5%	917	20.2%	590	11.2%	327	6.2%	180	1.5%	43	2,914
PhD	20.9%	701	15.3%	513	5.6%	187	15.0%	505	0.8%	25	3,360
Employee	52.4%	4,991	45.2%	4,301	7.3%	690	11.4%	1,082	1.2%	117	9,518
Faculty	44.5%	1,063	41.1%	983	3.4%	81	17.9%	428	1.9%	44	2,389
Staff	55.1%	3,928	46.5%	3,318	8.5%	609	9.2%	654	1.0%	73	7,129
Outside Davis	67.7%	6,076	52.0%	4,664	15.7%	1,412	4.7%	419	1.2%	106	8,975
Within Davis	12.1%	4,218	8.5%	2,970	3.6%	1,249	4.9%	1,714	1.5%	538	34,983
Overall	23.4%	10,304	17.4%	7,644	6.0%	2,661	4.8%	2,132	1.5%	644	43,983

Results are based on responses to question *Q15*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Ridership by transit provider

If respondents indicated that they rode a bus or a train at any point on their way to campus any day during the prior week, they were asked to indicate which transit service(s) they used ("Check all that apply"). Table 31 and Table 32 show the share of bus and train users who used each service at least once during the reference week. Of the 879 respondents who indicated riding the bus in the past week, most reported using Unitrans at least once, followed distantly by use of Yolobus and the UCD/UCDMC shuttle.

Table 31. Share using specific bus services at least once during the week

Role	***Of those riding the bus to campus at least once***					**Weighted sample**	**Projected population**
	Unitrans	Yolobus	UCD/UCDMC shuttle	Sacramento Regional Transit	UCD/UC Berkeley shuttle		
Undergraduate	86.3%	7.8%	3.0%	0.8%	2.1%	786	9,118
Graduate	83.2%	5.6%	9.6%	0.0%	1.6%	52	603
Faculty	70.3%	8.1%	18.9%	2.8%	0.0%	9	104
Staff	53.9%	23.9%	20.5%	1.7%	0.0%	33	379
Overall	84.9%	8.2%	4.1%	0.8%	2.0%	879	10,204

Results are based on responses to questions *Q29* (whether a bus was ever used) and *Q38* (which bus services). Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Of the 49 respondents who indicated riding the train in the past week, nearly all rode the Amtrak Capitol Corridor (Table 32). Given the relatively small sample size, the weighted and projected estimates for train service ridership have large uncertainty relative to their estimated size.

Table 32. Share using specific train services at least once during the week

Role	***Of those riding the train to campus at least once***			**Weighted sample**	**Projected population**
	Amtrak	BART	Sacramento Regional Transit		
Undergraduate	69.3%	18.8%	11.9%	18	205
Graduate	81.5%	18.5%	0.0%	12	140
Faculty	89.5%	10.5%	0.0%	11	128
Staff	75.3%	5.9%	18.8%	8	92
Overall	76.6%	15.4%	8.0%	49	565

Results are based on responses to questions *Q29* (whether a train was ever used) and *Q39* (which train services). Data are weighted by role group based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

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 the set of cross-streets nearest where they live and their zip code, if outside of Davis, in questions *Q18* and *Q19*. This information was geocoded in ArcGIS, enabling a variety of spatial analyses (see "Appendix E: Geocoding and network distances" 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. 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 for these groups should be interpreted as likely over-estimates of the actual distance traveled. Table 33 and Table 34 summarize distances traveled by role group, showing that employees tend to travel from farther away than students. The median distance traveled among students is about 1.7 miles, versus 2.8 among faculty and 4.61 among staff (Table 33).

Table 33. Average distance from campus, by role group

Role	Geocoded	*Of those geocoded, distance from campus (miles)*				Weighted sample	Projected population
		Mean	Median	Minimum	Maximum		
Student	88.3%	3.99	1.69	0.47	100.84	2,484	34,465
Undergraduate	89.0%	3.58	1.62	0.47	88.62	2,032	28,191
Freshman	95.7%	1.61	0.77	0.47	46.68	416	5,775
Sophomore	87.4%	2.46	1.78	0.47	30.99	346	4,807
Junior	86.9%	3.91	1.87	0.47	88.62	558	7,738
Senior	87.8%	5.01	1.87	0.61	74.49	711	9,871
Graduate	86.5%	5.87	1.88	0.49	100.84	452	6,274
Master's	84.2%	6.32	1.87	0.59	88.12	210	2,914
PhD	87.9%	5.47	1.91	0.49	100.84	242	3,360
Employee	75.0%	11.21	3.19	0.59	94.97	686	9,518
Faculty	79.4%	9.48	2.75	0.59	84.52	172	2,389
Staff	72.5%	11.79	4.61	0.59	94.97	514	7,129
Outside Davis	63.7%	24.67	18.35	1.47	100.84	517	7,179
Within Davis	90.4%	1.83	1.77	0.47	64.99	2,653	36,804
Overall	83.7%	5.56	1.91	0.47	100.84	3,170	43,983
Weighted sample	2,652	NA	NA	NA	NA	NA	NA

Distances are calculated as the shortest-time network distance between respondents' geocoded cross-streets (given in questions *Q18* and *Q19* or contact information provided at the end of the survey) and a centroid on campus near the Silo (see "Appendix E: Geocoding and network distances"). Data are weighted by role and gender group for the 3,170 cases successfully geocoded and with non-missing mode choice data in question *Q30*.

While 90 percent of undergraduates live within 3 miles of campus, only 57 percent of faculty and 42 percent of staff do (Table 34). About 18 percent of the campus population lives more than 10 miles away, and 8 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 34. Cumulative percent of people living within each distance from campus, by role

Distance from campus	Overall	Students		Employees	
		Undergraduate	Graduate	Faculty	Staff
Less than 0.5 miles	0.1%	0.2%	0.2%	0.0%	0.0%
1 mile	20.9%	33.7%	15.1%	4.8%	3.3%
1.5 miles	32.5%	45.7%	33.3%	14.8%	8.5%
2 miles	51.9%	69.9%	54.3%	25.9%	19.2%
2.5 miles	65.2%	83.6%	67.4%	40.2%	30.9%
3 miles	75.0%	90.4%	79.8%	57.4%	41.7%
4 miles	79.9%	92.5%	84.5%	69.3%	49.2%
6 miles	80.9%	92.9%	85.4%	73.3%	50.3%
8 miles	81.4%	93.0%	85.7%	74.3%	51.6%
10 miles	82.1%	93.1%	85.9%	74.6%	54.9%
12 miles	83.9%	93.4%	86.9%	78.0%	60.1%
14 miles	85.0%	93.7%	87.6%	79.6%	63.4%
16 miles	87.3%	94.3%	89.7%	82.8%	69.9%
18 miles	90.0%	95.1%	92.4%	86.5%	76.5%
20 miles	92.1%	95.7%	93.6%	88.4%	83.4%
25 miles	93.9%	96.7%	94.8%	91.3%	87.8%
30 miles	96.1%	98.2%	95.3%	92.9%	93.3%
40 miles	97.0%	98.8%	95.8%	93.4%	95.9%
50 miles	97.7%	99.3%	96.6%	93.7%	97.2%
60 miles	98.5%	99.7%	97.6%	94.4%	98.4%
70 miles	99.2%	99.9%	99.0%	97.4%	99.0%
100 miles	100.0%	100.0%	99.8%	100.0%	100.0%
More than 100 miles	100.0%	100.0%	100.0%	100.0%	100.0%
Weighted sample	3,170	2,032	452	172	514
Projected population	43,983	28,191	6,274	2,389	7,129
Group's percent of the overall population	100.0%	64.1%	14.3%	5.4%	16.2%

Distances are calculated as the shortest-time network distance between geocoded cross-streets (given in questions *Q18* and *Q19* or contact information provided at the end of the survey) and a centroid on campus near the Silo. Data are unweighted. See "Appendix E: Geocoding and network distances" for more details.

Usual mode to campus and between campus destinations

For the purpose of validating the method we use to calculate mode share, we 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 35 shows the share "usually" using each mode among those physically traveling 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 mode.

Table 35. Usual mode, by distance from campus

Distance group	Physically traveling	*Of those physically traveling to campus*						Weighted sample	Projected population
		Bike	Walk or skate	Drive alone	Carpool or ride	Bus	Train		
Within 1 mile	94.6%	76.2%	17.4%	1.1%	1.1%	4.3%	0.0%	767	10,648
1 to 2.9 miles	97.3%	52.4%	1.8%	12.2%	2.8%	30.6%	0.1%	1,727	23,958
3 to 4.9 miles	99.5%	37.1%	0.0%	37.1%	5.8%	20.0%	0.0%	153	2,128
5 to 9.9 miles	100.0%	3.7%	0.0%	79.9%	12.5%	4.0%	0.0%	33	453
10 to 19.9 miles	98.5%	1.9%	0.0%	76.0%	13.7%	7.6%	0.9%	263	3,646
20 miles or more	99.1%	2.6%	0.0%	75.6%	7.6%	4.1%	10.1%	227	3,150
Overall	97.0%	48.9%	5.1%	21.5%	3.9%	19.7%	0.9%	3,170	43,983
Weighted sample	3,075	1,500	157	658	120	605	26	3,170	0
Projected population	42,664	20,815	2,174	9,131	1,660	8,396	364	0	43,983

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* or contact information provided at the end of the survey) and a centroid on campus near the Silo (see "Appendix E: Geocoding and network distances"). Data are weighted by role group and gender for the 3,170 cases successfully geocoded and with non-missing mode choice data in question *Q30* (see Table 53).

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, located at the Silo. We assume respondents take the fastest path to and from campus on the days they report having traveled to campus. This method likely underestimates the true number of miles traveled to and from campus because it does not take into account side trips that respondents might make on the way to or from campus (e.g. stopping at the store, picking up children, or visiting 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 (e.g. going to lunch or to an off-site meeting).

We estimate the number of miles traveled to and from campus each day as the doubled network distance

between respondents' geocoded home locations and the Silo on campus (as described in "Appendix E: Geocoding and network distances"), multiplied by 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 miles traveled would be 20 miles; by contrast, if she traveled to campus only one day, her average daily miles traveled would be 4 miles. We then attribute miles traveled 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 miles traveled by each mode on an average weekday.

To estimate the number of 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. To estimate summer travel, we rely on responses to questions *Q33* and *Q34* about the number of weeks and average number of days per week traveled to campus during the summer, 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)]. In order to estimate the daily miles traveled by each person on an average day we calculate a weighted average of summer and academic-year travel.

Vehicle-miles traveled (VMT) is the miles traveled for each vehicle. Since different vehicles traveling to campus have varying occupancy (i.e. car vs bus vs train), person-miles traveled (PMT) accounts for both vehicles use and occupancy per mile. To estimate PMT 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 each vehicle-mile traveled contributes a fractional person-mile equivalent to one divided by vehicle occupancy. We assume that travel by walking, biking, or skating contributes no PMT. Vehicle occupancy for carpooling and getting a ride varies for each respondent, as reported in questions *Q31* 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 PMT would be (10 miles × 2) / 3 = 6.67 miles. Vehicle 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 PMT for personal vehicles, we estimate PMT 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. We estimated average bus occupancy based on annual ridership data from Unitrans, since 85% of all bus riders use Unitrans. According to FY 2015-16 figures from Unitrans, Unitrans had an average of about 4.66 passengers per mile.[3] Thus, for someone who lives 10 miles from campus and traveled by bus all five weekdays, average bus PMT per day is (10 miles × 2) / 4.66 ≈ 4.3 person-miles.

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 85.7 passengers per mile in FY 2015-16.[4] If a respondent lives 100 miles from campus and traveled by train all five days, her average train PMT per day is estimated

[3] Palmere, A. Unitrans Quarterly Report to the City of Davis, April-June 2016.

[4] Capitol Corridor Joint Powers Authority. Capitol Corridor Intercity Passenger Rail Service Business Plan Update FY 2016-17- FY 2017-18, Appendix C. http://www.capitolcorridor.org/wp-content/uploads/2016/05/CCJPA_Business_Plan_2016-2017.pdf.

to be (100 miles × 2) / 85.7 = 2.33 person-miles.

Our estimates for person-miles traveled, by mode and role, are shown in Table 36 and Table 37.

Carbon dioxide-equivalent emissions

We estimate the amount of greenhouse gases produced by campus travelers by assuming that each travel mode generates a certain quantity of carbon dioxide-equivalent (CO_2e) emissions per person-mile traveled, and multiplying this quantity by 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. For Unitrans (about 85% of bus use for the entire campus), we use emissions estimates specific to the Unitrans fuel mix and passenger occupancy. For other bus services and Amtrak we estimate emissions based on national travel fuel use[5] and emissions averages[6][7] (Table 38).

This is the third year where we estimate two sets of bus emissions, one for Unitrans and one for other bus services. Unitrans emissions are lower than national averages, because of more reliance on compressed natural gas (CNG) rather than diesel fuel for Unitrans buses, and because of the relatively high numbers of riders per bus, on average. In particular, for fiscal year 2015, Unitrans buses consumed 362,074 therms of CNG while providing 926,911 vehicle-miles of service. Assuming 11.7 pounds of carbon per therm of CNG[8] then Unitrans operations generated 4,236,273 pounds of carbon in fiscal year 2015, or 4.57 pounds per vehicle-mile of service, about 3/4th of the national average. These estimates are used to calculate emissions for the portion of the population that used Unitrans, while the national average is used for the bus (other) estimates.

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 estimates 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.

[5] Neff, J., and M. Dickens. *2015 Public Transportation Fact Book*. Washington, D.C., 2015.
[6] U.S. Energy Information Administration. Carbon Dioxide Emissions Coefficients by Fuel. http://www.eia.gov/environment/emissions/co2_vol_mass.cfm.
[7] U.S. Energy Information Administration. United States Electricity Profile 2014. http://www.eia.gov/electricity/state/unitedstates/.
[8] Palmere, A. Unitrans Quarterly Report to the City of Davis, April-June 2016.

Table 36. Person-miles-traveled (PMT), daily and annually, by mode group

Mode	Daily		Annually		Share of total PMT	Share of population	Projected population
	Total PMT	PMT per person	Total PMT	PMT per person			
No travel	0	0.0	0	0	0.0%	9.9%	4,340
No vehicle (bike, walk, or skate)	0	0.0	0	0	0.0%	49.0%	21,570
Personal vehicles	245,883	23.7	53,715,609	5,177	98.2%	23.6%	10,376
Drive alone	228,322	27.2	49,965,576	5,963	91.2%	19.1%	8,380
Carpool or ride	17,561	8.8	3,750,034	1,878	7.0%	4.5%	1,997
Bus	4,259	0.6	882,975	119	1.7%	16.9%	7,445
Train	296	1.2	59,911	238	0.1%	0.6%	252
Total	250,438	5.7	54,658,496	1,243	100.0%	100.0%	43,983

Mode groups are the estimated number using each means of transportation on a typical weekday, based on responses to questions *Q21* and *Q30*. Vehicle-miles are calculated as described in the text, drawing on data from questions *Q21, Q30, Q18*, *Q19,* and the average number of passengers per mile on Unitrans and Amtrak's Capitol Corridor. All data are weighted by role and gender group for the 3,170 cases successfully geocoded (based on *Q18* and *Q19*) and with non-missing mode choice data in question *Q30* (see Table 53).

Table 37. Person-miles-traveled (PMT), daily and annually, by role group

Role	Daily		Annually		Share of total PMT	Share of Population	Projected population
	Total PMT	PMT per person	Total PMT	PMT per person			
Student	115,805	3.36	22,919,809	665	46.2%	78.4%	34,465
Undergraduate	86,879	3.08	17,093,957	606	34.7%	64.1%	28,191
Freshman	5,411	0.94	1,006,716	174	2.2%	13.1%	5,775
Sophomore	7,097	1.48	1,351,111	281	2.8%	10.9%	4,807
Junior	28,805	3.72	5,365,759	693	11.5%	17.6%	7,738
Senior	45,566	4.62	9,370,371	949	18.2%	22.4%	9,871
Graduate	28,927	4.61	5,825,852	929	11.6%	14.3%	6,274
Master's	16,877	5.79	3,363,928	1,154	6.7%	6.6%	2,914
PhD	12,050	3.59	2,461,924	733	4.8%	7.6%	3,360
Employee	134,633	14.15	31,738,687	3,335	53.8%	21.6%	9,518
Faculty	19,737	8.26	4,233,291	1,772	7.9%	5.4%	2,389
Staff	114,896	16.12	27,505,396	3,858	45.9%	16.2%	7,129
Outside Davis	224,790	31.31	49,063,762	6,835	89.8%	16.3%	7,179
Within Davis	25,648	0.70	5,594,734	152	10.2%	83.7%	36,804
On Campus	211	0.03	41,206	5	0.1%	17.8%	7,836
West Village	291	0.15	57,733	31	0.1%	4.3%	1,880
Off Campus	25,147	0.93	5,495,795	203	10.0%	61.6%	27,089
Overall	250,438	5.69	54,658,496	1,243	100.0%	100.0%	43,983

Vehicle-miles are calculated as described in the text, drawing on data from questions *Q21, Q30, Q18*, *Q19,* 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 3,170 cases successfully geocoded (based on *Q18* and *Q19*) and with non-missing mode choice data in question *Q30* (see Table 53).

Table 38. Formula for calculating average weekday pounds of CO2e emissions

Mode	Formula
Drive 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 person-miles traveled (this is the equivalent of adjusting person-miles by the reported carpool size)
Bus (Unitrans)	4.57 lbs / mile × aggregated average weekday person-miles traveled by bus
Bus (other)	6.3 lbs / mile × aggregated average weekday person-miles traveled by bus
Train	39.96 lbs / mile × aggregated average weekday person-miles by train

Using these assumptions, we estimate that travel to campus generates a total of 316,592 pounds of CO_2e on an average weekday, or 7.2 pounds per person (Table 39), and about 35,901 metric tons of CO_2e annually, or 0.82 metric tons per person (Table 40). Some air quality reporting standards require us to not include Unitrans emissions as part of the aggregate calculation. Tables 43 and 44 show the emissions results if Unitrans is not included. Undergraduate students, particularly 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 16.2 percent of the population and contributing 43.6 percent of CO_2e on an average weekday.

To assess the extent that alternative transportation reduces CO_2e emissions, we consider the hypothetical case that everyone were to drive alone to campus but all else were unchanged (e.g. distances and frequency of travel). In this scenario, the campus would produce an additional 16,712 annual metric tons of CO_2e, compared to 35,901 tons overall (Table 43).
Figure 8 shows the contribution of each alternative, when compared to driving alone, to the total CO_2e emissions avoided.

Table 39. Daily pounds of CO_2e emitted, by mode and role

Role	***Pounds-equivalent of CO_2e generated on an average weekday***						**Average lbs per person**	**Share of total CO_2e**	**Share of population**	**Projected population**
	Drive alone	Carpool	Ride	Bus	Train	Total CO_2e				
Student	118,483	7,185	3,300	17,277	7,650	153,895	4.47	48.6%	78.4%	34,465
Undergraduate	87,288	6,104	2,767	15,673	2,891	114,723	4.07	36.2%	64.1%	28,191
Freshman	5,428	572	163	207	330	6,701	1.16	2.1%	13.1%	5,775
Sophomore	6,165	1,026	201	3,100	0	10,493	2.18	3.3%	10.9%	4,807
Junior	28,772	2,688	506	4,999	0	36,965	4.78	11.7%	17.6%	7,738
Senior	46,922	1,819	1,897	7,366	2,561	60,565	6.14	19.1%	22.4%	9,871
Graduate	31,195	1,080	534	1,603	4,759	39,171	6.24	12.4%	14.3%	6,274
Master's	18,784	275	119	880	1,983	22,040	7.56	7.0%	6.6%	2,914
PhD	12,411	806	415	724	2,777	17,132	5.10	5.4%	7.6%	3,360
Employee	144,159	8,096	1,619	4,639	4,183	162,697	17.09	51.4%	21.6%	9,518
Faculty	21,665	740	151	527	1,685	24,768	10.37	7.8%	5.4%	2,389
Staff	122,494	7,356	1,468	4,112	2,498	137,929	19.35	43.6%	16.2%	7,129
Outside Davis	240,440	13,449	2,749	8,624	11,819	277,081	38.60	87.5%	16.3%	7,179
Within Davis	22,202	1,832	2,170	13,292	15	39,511	1.07	12.5%	83.7%	36,804
On Campus	100	21	76	187	9	393	0.05	0.1%	17.8%	7,836
West Village	143	6	30	622	0	801	0.43	0.3%	4.3%	1,880
Off Campus	21,958	1,805	2,064	12,483	6	38,316	1.41	12.1%	61.6%	27,089
Overall	262,641	15,281	4,920	21,916	11,834	316,592	7.20	100.0%	100.0%	43,983

Data are weighted for both years by role and gender (see Table 53).

Table 40. Annual tons of CO_2e emitted, by mode and role

Role	*Annual tons of CO_2e emissions*						Average tons per person	Share of total CO_2e	Share of population	Projected population
	Drive alone	Carpool	Ride	Bus	Train	Total CO_2e				
Student	13,436	815	374	1,959	868	17,451	0.51	48.6%	78.4%	34,465
Undergraduate	9,898	692	314	1,777	328	13,009	0.46	36.2%	64.1%	28,191
Freshman	616	65	19	24	37	760	0.13	2.1%	13.1%	5,775
Sophomore	699	116	23	352	0	1,190	0.25	3.3%	10.9%	4,807
Junior	3,263	305	57	567	0	4,192	0.54	11.7%	17.6%	7,738
Senior	5,321	206	215	835	290	6,868	0.70	19.1%	22.4%	9,871
Graduate	3,537	123	61	182	540	4,442	0.71	12.4%	14.3%	6,274
Master's	2,130	31	13	100	225	2,499	0.86	7.0%	6.6%	2,914
PhD	1,407	91	47	82	315	1,943	0.58	5.4%	7.6%	3,360
Employee	16,347	918	184	526	474	18,450	1.94	51.4%	21.6%	9,518
Faculty	2,457	84	17	60	191	2,809	1.18	7.8%	5.4%	2,389
Staff	13,891	834	167	466	283	15,641	2.19	43.6%	16.2%	7,129
Outside Davis	27,265	1,525	312	978	1,340	31,421	4.38	87.5%	16.3%	7,179
Within Davis	2,518	208	246	1,507	2	4,480	0.12	12.5%	83.7%	36,804
On Campus	11	2	9	21	1	45	0.01	0.1%	17.8%	7,836
West Village	16	1	3	70	0	91	0.05	0.3%	4.3%	1,880
Off Campus	2,490	205	234	1,416	1	4,345	0.16	12.1%	61.6%	27,089
Overall	29,783	1,733	558	2,485	1,342	35,901	0.82	100.0%	100.0%	43,983

Data are weighted for both years by role and gender (see Table 53)

Table 41. Daily pounds of CO2e emitted, by mode and role (not including Unitrans)

Role	***Pounds-equivalent of CO_2e generated on an average weekday***						**Average lbs per person**	**Share of total CO_2e**	**Share of population**	**Projected population**
	Drive alone	Carpool	Ride	Bus	Train	Total CO_2e				
Student	118,483	7,185	3,300	4,677	7,650	149,218	4.33	48.5%	78.4%	34,465
Undergraduate	87,288	6,104	2,767	3,599	2,891	111,124	3.94	36.1%	64.1%	28,191
Freshman	5,428	572	163	17	330	6,684	1.16	2.2%	13.1%	5,775
Sophomore	6,165	1,026	201	131	0	10,361	2.16	3.4%	10.9%	4,807
Junior	28,772	2,688	506	1,288	0	35,677	4.61	11.6%	17.6%	7,738
Senior	46,922	1,819	1,897	2,163	2,561	58,401	5.92	19.0%	22.4%	9,871
Graduate	31,195	1,080	534	1,077	4,759	38,094	6.07	12.4%	14.3%	6,274
Master's	18,784	275	119	611	1,983	21,429	7.35	7.0%	6.6%	2,914
PhD	12,411	806	415	467	2,777	16,665	4.96	5.4%	7.6%	3,360
Employee	144,159	8,096	1,619	4,228	4,183	158,469	16.65	51.5%	21.6%	9,518
Faculty	21,665	740	151	477	1,685	24,291	10.17	7.9%	5.4%	2,389
Staff	122,494	7,356	1,468	3,751	2,498	134,178	18.82	43.6%	16.2%	7,129
Outside Davis	240,440	13,449	2,749	8,235	11,819	268,846	37.45	87.4%	16.3%	7,179
Within Davis	22,202	1,832	2,170	670	15	38,841	1.06	12.6%	83.7%	36,804
On Campus	100	21	76	30	9	363	0.05	0.1%	17.8%	7,836
West Village	143	6	30	17	0	784	0.42	0.3%	4.3%	1,880
Off Campus	21,958	1,805	2,064	622	6	37,694	1.39	12.3%	61.6%	27,089
Overall	262,641	15,281	4,920	8,905	11,834	307,687	7.00	100.0%	100.0%	43,983

Data are weighted for both years by role and gender (see Table 53)

Table 42. Annual tons of CO_2e emitted, by mode and role (not including Unitrans)

Role	***Annual tons of CO_2e emissions***						**Average tons per person**	**Share of total CO_2e**	**Share of population**	**Projected population**
	Drive alone	Carpool	Ride	Bus	Train	Total CO_2e				
Student	13,436	815	374	530	868	16,921	0.49	48.5%	78.4%	34,465
Undergraduate	9,898	692	314	408	328	12,601	0.45	36.1%	64.1%	28,191
Freshman	616	65	19	2	37	758	0.13	2.2%	13.1%	5,775
Sophomore	699	116	23	15	0	1,175	0.24	3.4%	10.9%	4,807
Junior	3,263	305	57	146	0	4,046	0.52	11.6%	17.6%	7,738
Senior	5,321	206	215	245	290	6,623	0.67	19.0%	22.4%	9,871
Graduate	3,537	123	61	122	540	4,320	0.69	12.4%	14.3%	6,274
Master's	2,130	31	13	69	225	2,430	0.83	7.0%	6.6%	2,914
PhD	1,407	91	47	53	315	1,890	0.56	5.4%	7.6%	3,360
Employee	16,347	918	184	479	474	17,970	1.89	51.5%	21.6%	9,518
Faculty	2,457	84	17	54	191	2,755	1.15	7.9%	5.4%	2,389
Staff	13,891	834	167	425	283	15,216	2.13	43.6%	16.2%	7,129
Outside Davis	27,265	1,525	312	934	1,340	30,487	4.25	87.4%	16.3%	7,179
Within Davis	2,518	208	246	76	2	4,404	0.12	12.6%	83.7%	36,804
On Campus	11	2	9	3	1	41	0.01	0.1%	17.8%	7,836
West Village	16	1	3	2	0	89	0.05	0.3%	4.3%	1,880
Off Campus	2,490	205	234	71	1	4,274	0.16	12.3%	61.6%	27,089
Overall	29,783	1,733	558	1,010	1,342	34,891	0.79	100.0%	100.0%	43,983

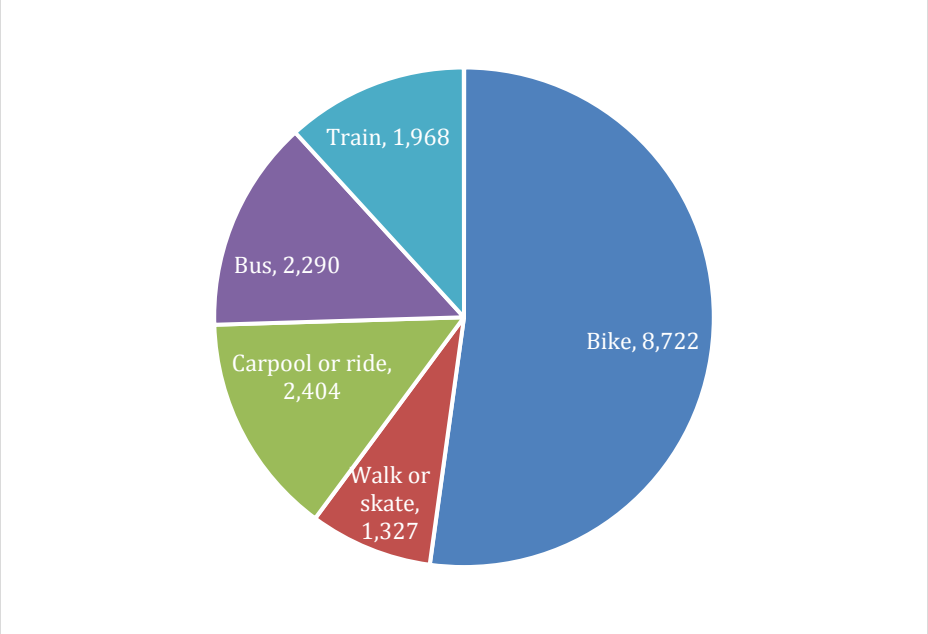
Data are weighted for both years by role and gender (see Table 53)

Table 43. Annual tons of CO2e emissions avoided compared to driving alone

Role	Annual tons of CO2e avoided						Average savings/person	Projected population
	Bike	Walk or skate	Carpool or ride	Bus	Train	Total		
Students	6,843	983	1,023	1,953	1,272	12,076	0.35	34,465
Undergraduate	5,313	827	824	1,813	481	9,256	0.33	28,191
Freshman	875	254	71	26	55	1,281	0.22	5,775
Sophomore	975	70	129	395	0	1,569	0.33	4,807
Junior	1,318	319	332	569	0	2,538	0.33	7,738
Senior	2,145	183	292	822	426	3,868	0.39	9,871
Graduate	1,531	157	200	141	792	2,820	0.45	6,274
Master's	634	46	39	76	330	1,126	0.39	2,914
PhD	896	110	160	65	462	1,694	0.50	3,360
Employees	1,879	344	1,381	337	696	4,636	0.49	9,518
Faculty	674	96	222	38	280	1,311	0.55	2,389
Staff	1,205	248	1,158	298	416	3,325	0.47	7,129
Outside Davis	464	473	2,071	603	1,966	5,577	0.78	7,179
Within Davis	8,258	854	334	1,687	2	11,135	0.30	36,804
On campus	991	315	4	23	1	1,335	0.17	7,836
West Village	332	10	1	80	0	423	0.23	1,880
Off campus	6,935	529	328	1,585	1	9,378	0.35	27,089
Overall	8,722	1,327	2,404	2,290	1,968	16,712	0.38	43,983

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)
Bus savings = 1.1 lbs./mile – 4.57 lbs./mile*annual bus PMT. "Unitrans" estimates are used to conservatively estimate savings.
Train savings = 1.1 lbs./mile – 39.96 lbs./mile*annual train PMT

Figure 8. Annual CO2e emissions avoided by using alternative transportation modes



Driver's license, car and bicycle access

All respondents were asked whether they have a driver's license as well as if they have access to a bicycle for riding to campus. About 86 percent of those living within Davis have a driver's license, compared to 96 percent of those living outside Davis (Table 44). Car access varies substantially by residential location: only about 52 percent of those living in Davis have access to a car, compared to 92 percent of those living outside Davis. About 76 percent of university affiliates indicated they have the option to bike to campus, and those who live in Davis have substantially higher rates of bike access (87 percent compared to 17 percent for those outside of Davis). Overall, more people consider bicycling to be a feasible option to get to campus (33,358) than those who consider driving to be a feasible option (25,730), though these rates are substantially different among those living outside Davis.

Table 44. Driver's license, car and bicycle access

Role	Driver's license	Access to a car	Access to a bike	Weighted sample	Projected population
Students	85.4%	49.6%	80.7%	2,484	34,465
Undergraduate	83.6%	44.1%	80.8%	2,032	28,191
Freshman	65.7%	11.9%	86.8%	416	5,775
Sophomore	81.3%	32.9%	88.9%	346	4,807
Junior	88.2%	50.6%	78.6%	558	7,738
Senior	91.5%	63.3%	75.1%	711	9,871
Graduate	93.4%	74.5%	80.3%	452	6,274
Master's	92.1%	78.2%	74.5%	210	2,914
PhD	94.5%	71.2%	85.2%	242	3,360
Employees	97.9%	90.6%	58.2%	686	9,518
Faculty	98.5%	92.1%	73.9%	172	2,389
Staff	97.6%	90.1%	52.9%	514	7,129
Outside Davis	96.4%	91.7%	16.5%	517	7,179
Within Davis	86.4%	52.0%	87.4%	2,653	36,804
Overall	88.1%	58.5%	75.8%	3,170	43,983
Weighted sample	2,792	1,854	2,404	3,170	NA
Projected population	38,734	25,730	33,358	NA	43,983

Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, *Q13-14,* and *Q20-30* (see Table 53). Car access reflects those respondents who indicated they have the option to drive alone to campus.

Self-reported bicycling aptitude

Question *Q46* asked all respondents to rate their ability to ride a bike, specifying that we were interested in "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." Approximately 2.2 percent indicated that they cannot ride a bike, and 8.4 percent of respondents indicated that they could but were "not very confident" doing so. Overall, about 89 percent of respondents indicated that they were "somewhat" or "very confident" riding. Among all groups, freshmen are least likely to report being "very confident," and women are substantially less likely to report being "very confident" than men (Table 45).

Table 45. Self-reported bicycling aptitude, by role group

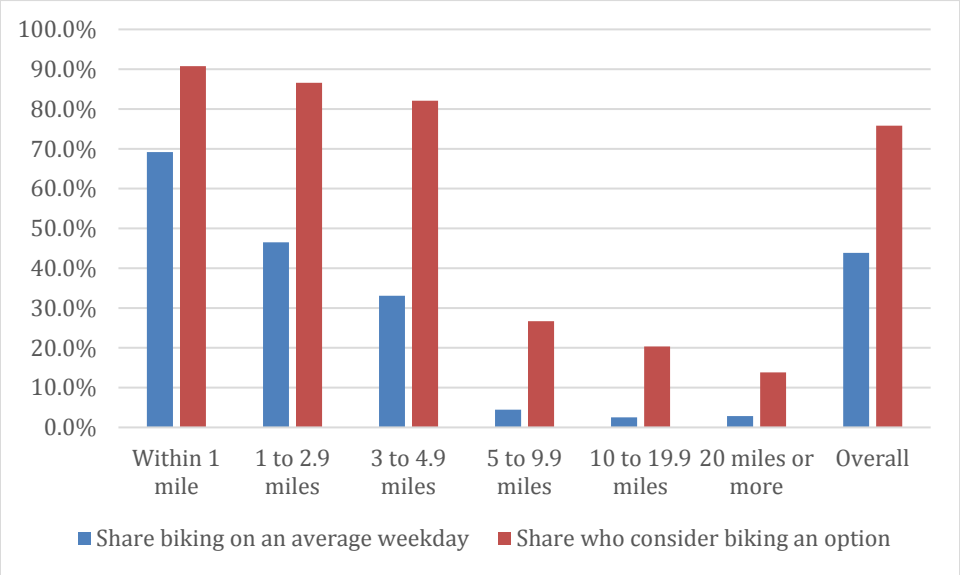
Role	***Self-rated ability to ride a bike***				**Weighted sample**
	I cannot ride a bike at all because I do not know how.	I can ride a bike, but I am not very confident doing so.	I am somewhat confident riding a bike.	I am very confident riding a bike.	
Student	2.6%	8.7%	21.0%	67.6%	2,969
Undergraduate	2.8%	8.9%	21.8%	66.5%	2,429
Freshman	3.7%	10.4%	30.0%	55.8%	497
Sophomore	1.2%	6.3%	22.3%	70.2%	414
Junior	2.8%	8.4%	21.2%	67.6%	667
Senior	3.1%	9.6%	17.1%	70.2%	850
Graduate	1.8%	8.1%	17.6%	72.5%	540
Master's	3.0%	7.9%	21.1%	68.0%	251
PhD	0.8%	8.3%	14.6%	76.3%	289
Employee	0.9%	7.4%	18.0%	73.8%	820
Faculty	0.5%	5.3%	13.8%	80.4%	206
Staff	1.0%	8.0%	19.4%	71.6%	614
Male	1.8%	4.2%	10.7%	83.3%	1,601
Female	2.6%	11.6%	27.6%	58.2%	2,188
Overall	2.2%	8.4%	20.3%	69.0%	3,789

Results are based on responses to questions *Q46*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Potential for bicycling

We include a question to assess the potential mode share of biking. In *Q14*, 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 do not consider a particular mode as viable will be very unlikely to choose it. Figure 9 shows the differences between the share of respondents who consider biking to campus an option and the share that actually bikes to campus on an average weekday. About 85 to 90 percent of respondents living less than 5 miles from the center of campus (i.e. living in Davis) consider bicycling an option, with a steep drop in the perceived availability, and corresponding mode share, of bicycling beyond that distance.

Figure 9. Potential for bicycling



Results are based on responses to questions *Q14*, *Q18*, *Q19*, *Q21*, and *Q30*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Perceptions of bicycle traffic law enforcement and safety biking on campus

In addition to bicycling aptitude, we ask respondents questions about their perceptions of bicycle traffic law enforcement and safety 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.

About 39 percent of the sample agreed or strongly agreed that, "bicycle traffic laws are adequately enforced on campus" (Table 46). About 31 percent indicated they were neutral or unsure, 17 percent disagreed, and almost 13 percent strongly disagreed. Employees and graduate students are most likely to disagree, while freshmen and sophomores are most likely to agree that there is adequate enforcement.

Table 46. Perceptions of bicycle traffic law enforcement on campus

Role	***"Bicycle traffic laws are adequately enforced on campus."***					**Weighted sample**
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Student	10.5%	16.2%	31.1%	30.2%	12.0%	2,969
Undergraduate	9.0%	16.3%	30.4%	31.6%	12.7%	2,429
Freshman	1.1%	14.6%	33.0%	36.2%	15.1%	497
Sophomore	6.7%	15.5%	25.6%	37.7%	14.4%	414
Junior	11.1%	13.7%	34.4%	27.9%	12.9%	667
Senior	13.2%	19.9%	27.9%	28.8%	10.3%	850
Graduate	16.7%	15.7%	34.3%	24.2%	9.1%	540
Master's	13.9%	16.0%	38.8%	23.6%	7.7%	251
PhD	19.1%	15.4%	30.6%	24.7%	10.2%	289
Employee	21.3%	19.3%	31.4%	19.3%	8.7%	820
Faculty	25.5%	16.9%	26.1%	21.7%	9.9%	206
Staff	19.8%	20.1%	33.3%	18.5%	8.3%	614
Male	13.5%	17.2%	29.9%	27.1%	12.3%	1,601
Female	12.4%	16.6%	32.2%	28.3%	10.5%	2,188
Overall	12.9%	16.9%	31.2%	27.8%	11.3%	3,789

Results are based on responses to question *Q44*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Table 47 summarizes the levels of agreement and disagreement about the safety of biking on campus. While most respondents indicated feeling safe biking on campus, about 19 percent of respondents strongly disagreed or disagreed with the statement, "I feel safe biking on campus." An additional 23 percent indicated they were neutral or unsure about the statement.

Table 47. Perceptions of safety biking on campus

Role	*"I feel safe biking on campus."*					Weighted sample
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Student	5.7%	12.9%	21.4%	36.1%	24.0%	2,969
Undergraduate	5.2%	12.6%	21.9%	36.6%	23.7%	2,429
Freshman	2.8%	11.2%	19.8%	41.7%	24.6%	497
Sophomore	3.4%	10.9%	16.8%	39.6%	29.4%	414
Junior	4.9%	12.3%	25.2%	35.1%	22.5%	667
Senior	7.7%	14.6%	23.2%	33.3%	21.2%	850
Graduate	7.8%	13.9%	18.8%	34.1%	25.4%	540
Master's	9.5%	15.3%	20.8%	32.0%	22.4%	251
PhD	6.4%	12.8%	17.2%	35.8%	27.8%	289
Employee	8.6%	14.0%	29.8%	27.6%	19.9%	820
Faculty	9.5%	14.7%	22.9%	27.3%	25.7%	206
Staff	8.3%	13.8%	32.2%	27.8%	18.0%	614
Male	4.3%	10.0%	20.6%	35.0%	30.1%	1,601
Female	7.8%	15.4%	25.3%	33.6%	17.8%	2,188
Overall	6.3%	13.1%	23.2%	34.2%	23.1%	3,789

Results are based on responses to question *Q45*. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01*, *Q10*, and *Q20-30* (see Table 53).

Awareness of TAPS and other transportation programs

Respondents were presented a list of services and asked to indicate, "It's new to me and I would like to know more," "I've heard of it, but never used it," or "I've used it." Table 48 summarizes the responses for each service, and Table 49 compares responses for the past six years, for those items that appeared on each of the surveys. The most utilized services in 2015-16 were the bike tire air stations, TAPS bicycle licensing program, and the GoClub program.

Table 48. Awareness of transportation services

Service	Have used it	Have only heard of it	Have never heard of it
Bike tire air stations and repair stations around campus	52.6%	38.5%	8.9%
TAPS bicycle licensing program	37.9%	40.9%	21.2%
GoClub program	12.3%	25.1%	62.6%
Bicycle Education and Enforcement Program (BEEP) and bike safety video	10.0%	23.9%	66.1%
TAPS motorist assistance program	9.2%	69.9%	21.0%
Zipcar carsharing program	8.9%	35.4%	55.7%
In-vehicle parking meters (Easy Park)	7.0%	46.6%	46.4%
UC Davis Bike Auction	5.1%	69.0%	25.9%
Bike lock-cutting service	4.0%	62.3%	33.7%
Zimride carpool matching service	2.1%	28.3%	69.5%
TAPS Mobility Assistance Program	1.7%	49.8%	48.5%
Aggie Bike Buy Program	0.5%	42.0%	57.5%

Results are based on responses to question Q41. Data are weighted by role and gender based on the 3,789 valid responses to questions *Q01, Q10*, and *Q20-30* (see Table 53).

Table 49. Awareness of transportation services, 2009-10 through 2015-16

Service	Change 2014-15 to 2015-16	Percent who have heard of it or used it						
		2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10
Zimride carpool matching service	**-36.5%**	30.5%	67.0%	38.3%	41.0%	31.2%	24.2%	15.4%
TAPS motorist assistance program	**-25.8%**	53.6%	79.4%	52.5%	58.6%	51.7%	60.3%	51.3%
Zipcar carsharing program	**-11.2%**	79.0%	90.2%	77.7%	81.9%	75.9%	75.1%	57.3%
Bike lock-cutting service	**-17.1%**	66.3%	83.4%	57.6%	62.5%	57.3%	42.7%	40.9%
GoClub program	**-31.5%**	37.4%	68.9%	45.6%	45.4%	42.8%	32.8%	17.5%
In-vehicle parking meters (Easy Park)	**-23.5%**	44.3%	67.8%	37.4%	36.1%	34.7%	-	-
Emergency Ride Home Program for goClub members	**-**	-	-	24.6%	25.9%	24.5%	23.6%	16.3%
UC Davis Bike Auction	**-15.1%**	74.1%	89.2%	78.8%	83.2%	83.9%	86.3%	81.5%
Bike commuter showers and lockers (ARC)	**-**	-	-	34.8%	36.3%	37.7%	-	-
Bicycle Education and Enforcement Program (BEEP) and bike safety video	**-35.7%**	33.9%	69.6%	31.1%	23.9%	28.3%	-	-
Discount transit passes for those without a parking permit	**-**	-	-	24.9%	27.4%	34.8%	32.3%	30.2%
TAPS Mobility Assistance Program	**-29.5%**	51.5%	81.0%	33.4%	-	-	-	-
Aggie Bike Buy Program	**-22.2%**	42.5%	64.7%	34.1%	30.2%	-	-	-
Bike tire air stations and repair stations around campus	**-4.3%**	91.1%	95.4%	91.0%	91.6%	-	-	-
TAPS bicycle licensing program	**-12.1%**	78.8%	90.9%	-	-	-	-	-

Data for 2015-16 are based on responses to question *Q41*. See Thigpen (2015) for results from 2014-15, Popovich (2014) for results from 2013-14, Driller (2013) for results from 2012-13, Miller (2012) for results from 2011-12, 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.

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APPENDICES

Appendix A: Survey instrument, 2015-16 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. As in past surveys, the dates of the reference week changed after one week.

Welcome to the 2015-16 Campus Travel Survey!

This annual survey is intended for everyone 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. Your feedback is important to us! Participating in this research survey takes 5-10 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.

We're going to ask you questions in the following areas:

- Your role at UC Davis
- Your travel to and from campus
- Your experience with campus transportation programs and infrastructure
- Some background information about you

To reward you for your time and input, you will be entered into a drawing for twenty $50 Visa debit gift cards and one Amazon Fire Tablet grand prize! If you are unable to complete the survey but would like to be included in the drawing, please email us at travelsurvey@ucdavis.edu to be entered.

Thanks for participating!

Eric M. Gudz, Graduate Student, Institute of Transportation Studies (emgudz@ucdavis.edu)
Susan Handy, Professor, Institute of Transportation Studies (slhandy@ucdavis.edu)
Cliff Contreras, Director, Transportation and Parking Services

Section 1. **Role**

First, we have a few questions about your role at UC Davis.

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 (federation)
- ❍ Unsure

[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: _____

[if visiting scholar]

Q06. What is your campus role? *

- ❍ Freshman
- ❍ Sophomore
- ❍ Junior
- ❍ Senior
- ❍ Master's student
- ❍ PhD student
- ❍ Post-doc
- ❍ Faculty
- ❍ Other: _____

[For graduate and undergraduate students only]

Q07. As a student, are you also a paid employee of UC Davis?

- ❍ Yes
- ❍ No

[If employee or grad student]

Q08. 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) *

- ❍ 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]

Q09. Where outside of Davis is your office, lab, or department?
[write-in]

Section 2. Background information about you

Next, we have a few questions about you.

Q10. I identify as…

- ❍ Female
- ❍ Male
- ❍ _____ (please specify)

Q11. Do you have any temporary or permanent physical conditions that limit your ability to walk, bike, drive, or use public transit?

	Yes	No
Walk	◯	◯
Bike	◯	◯
Drive	◯	◯
Use public transit	◯	◯

Q12. Where were you born?

- ❍ In California
- ❍ Outside of California, but in the United States
- ❍ Outside the Unites States, from: _____

Q13. Do you currently have a driver's license?

- ❍ Yes, a CA driver's license
- ❍ Yes, a non-CA driver's license
- ❍ No

Q14. What options are available to you for getting to campus, whether or not you use them on a regular basis?

- ☐ Walk
- ☐ Skate or skateboard
- ☐ Bike
- ☐ Electric bike
- ☐ 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

[If has access to a car]

Q15. Do you currently have a UC Davis parking permit?

- ☐ **No**, I don't have one

Yes, I have (select type):

- ☐ Annual (or multi-year) permit

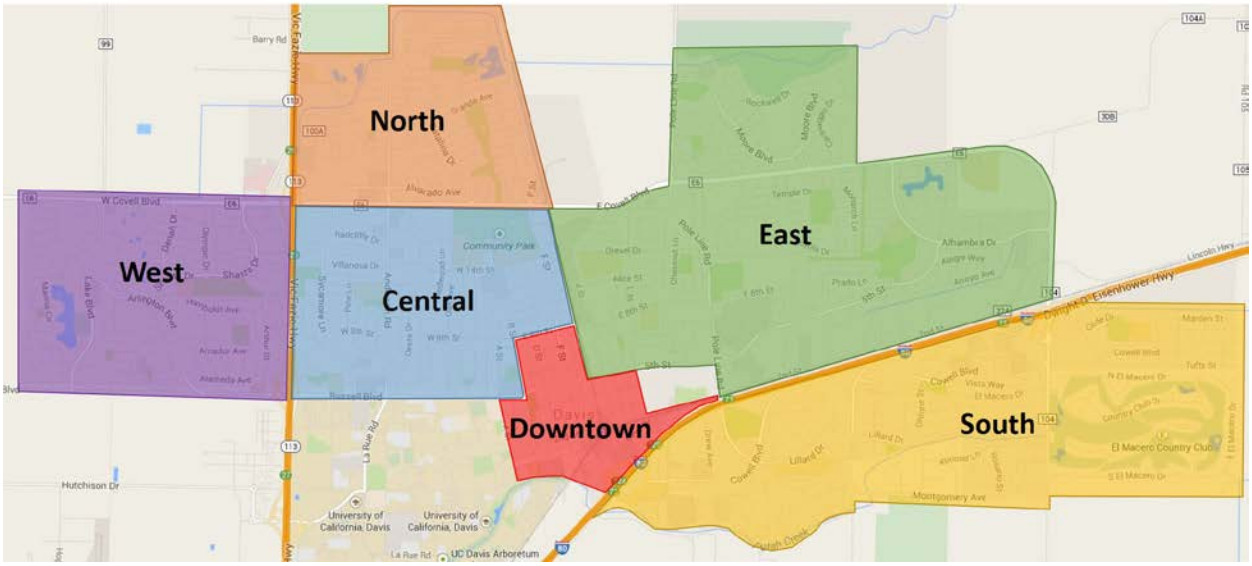
☐ Monthly or quarter permit
☐ Daily permit
☐ Complimentary GoClub parking permit
☐ EasyPark Personal in-vehicle parking meter

Q16. Where do you live now?

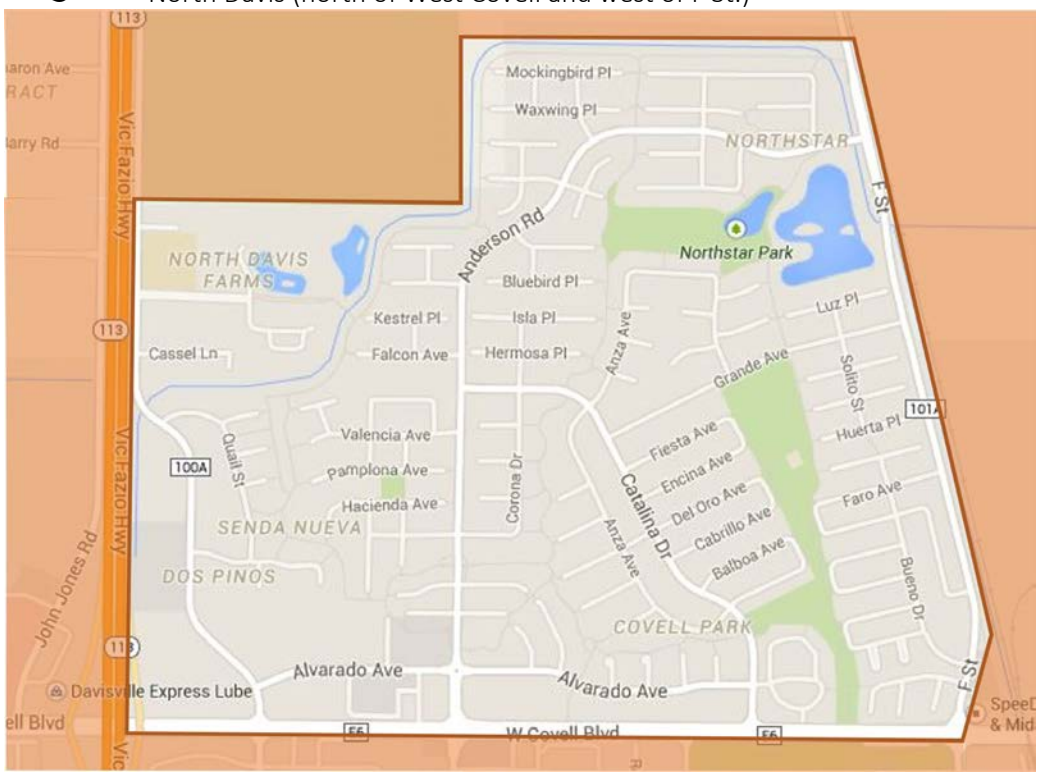
❍ On the UC Davis campus (includes Cuarto and the area east of SR 113, south of Russell Blvd, west of A St, and north of I-80)
❍ Off-campus, in the West Village apartments
❍ Off-campus elsewhere, in the city of Davis
❍ Outside of Davis

[If resides off-campus in the city of Davis]

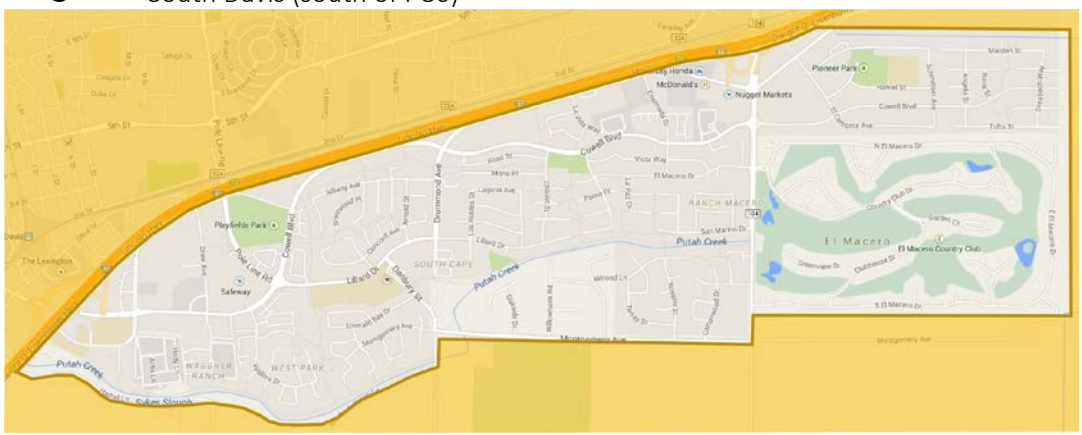
Q17. Which part of Davis do you live in? (scroll down to see all options)



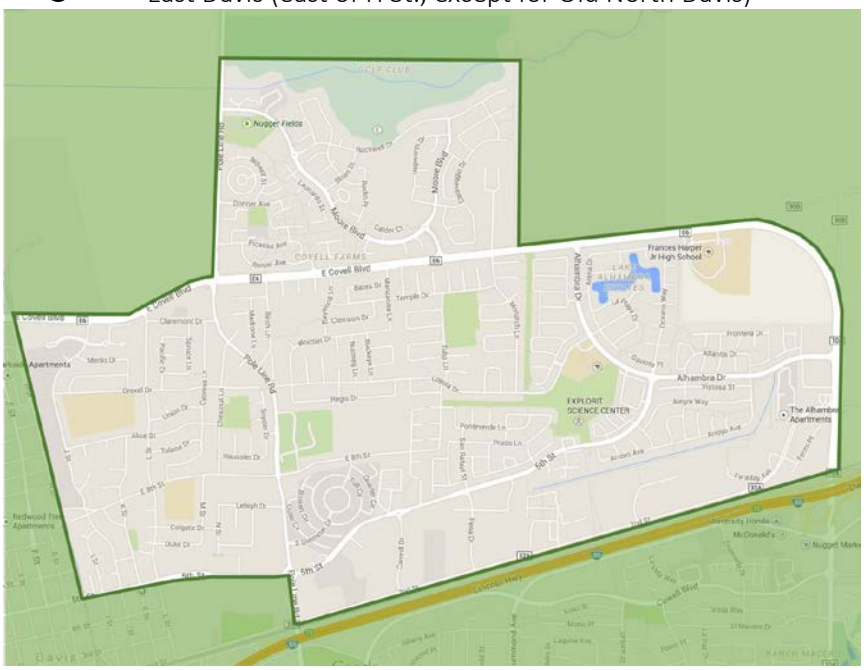
- North Davis (north of West Covell and west of F St.)



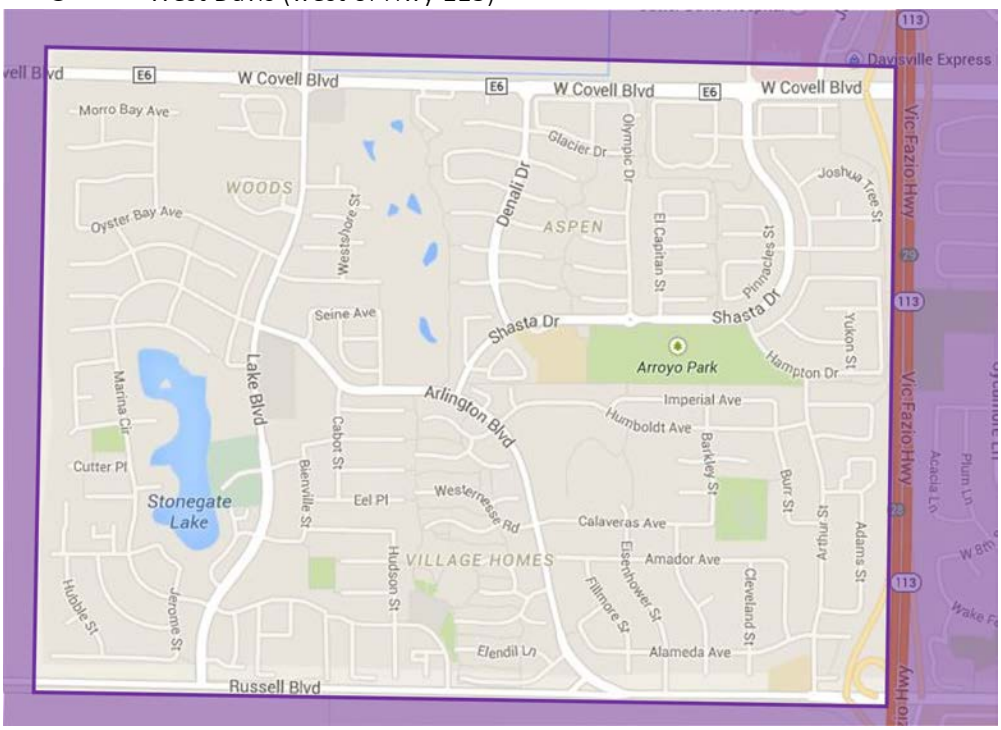
- South Davis (south of I-80)



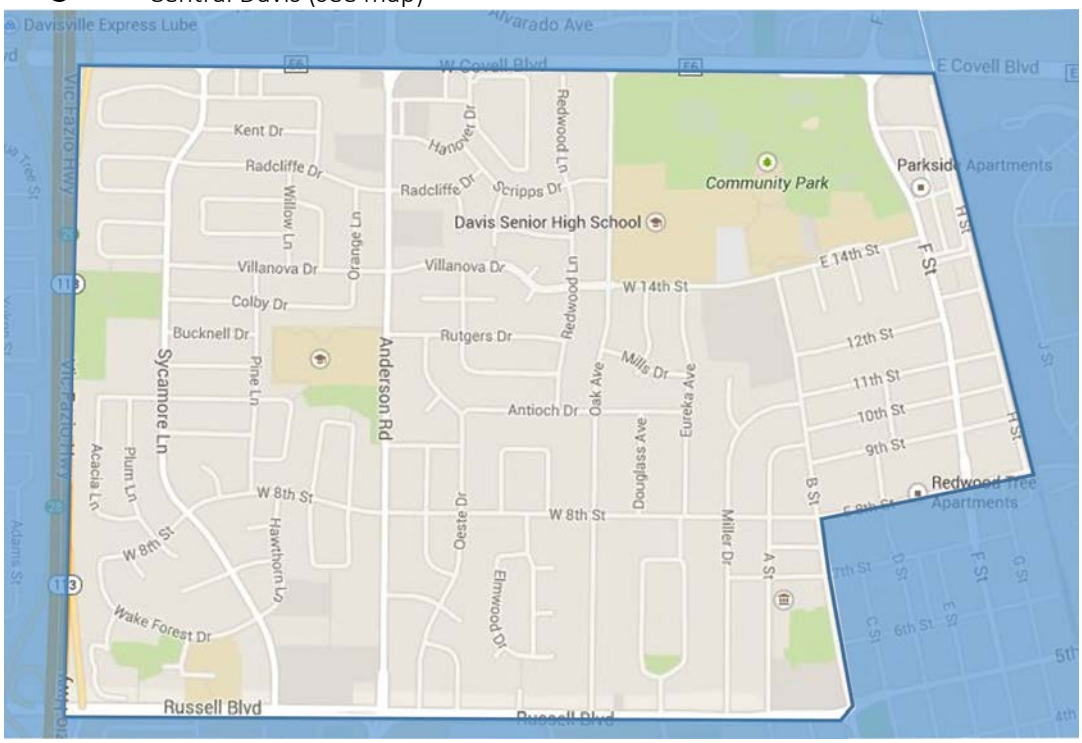
❍ East Davis (east of H St., except for Old North Davis)



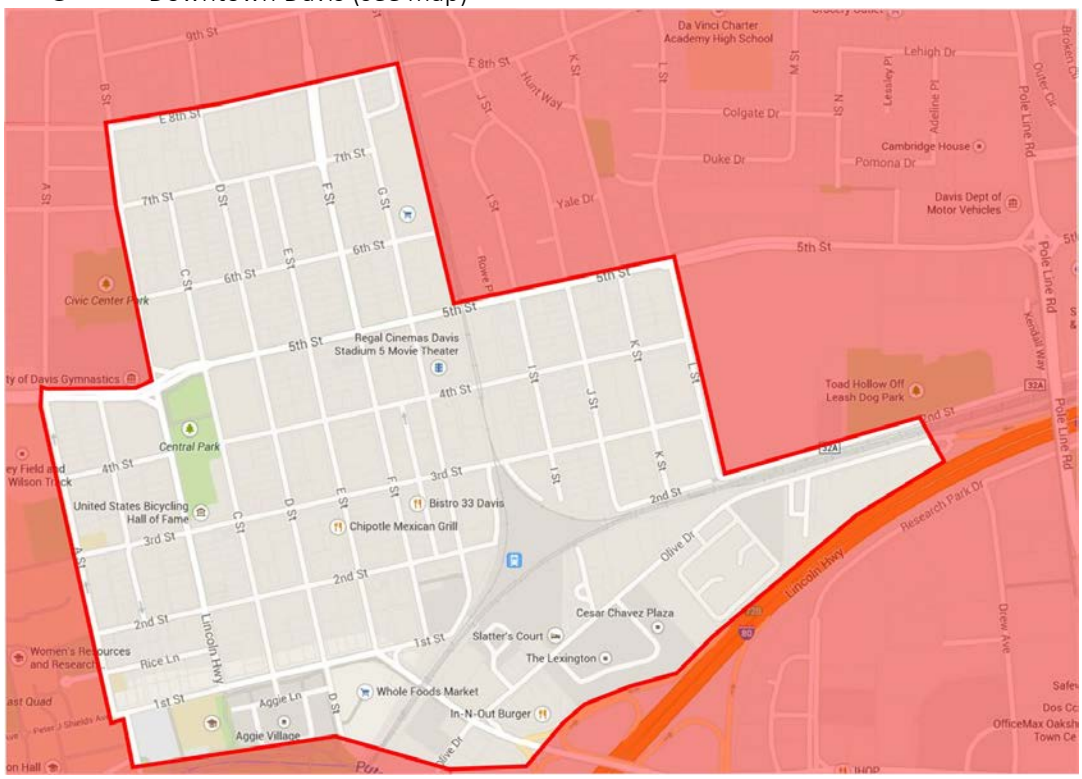
❍ West Davis (west of Hwy 113)



❍ Central Davis (see map)



❍ Downtown Davis (see map)



❍ Not sure

❍ Other (my location is not in any of these areas)

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

Q18. What intersection is nearest to your home? (Please answer for where you live locally, when you are traveling to campus on a regular basis. This information will only be used to calculate the approximate distance you travel to campus and to help plan facility needs around campus. It will be kept confidential and will not be used in any other way.)

Your street: _____

Nearest cross-street: _____

[If resides outside of Davis]

Q19. What is your zip code?

Each answer must be between 00000 and 99999

Zip Code: _____

Section 3. **Travel to campus - days traveled last week**

Consider your activities during the last week, from Monday (Oct. 19) through Sunday (Oct. 25). If you have a day planner, it might be useful to look at the last week's activities as you complete this section.

[If does not work outside of Davis]

Q20. **Did you go somewhere on campus any day last week (Oct. 19 - 25) for school or work? If you live on campus, but went to other campus locations for school or work, please count those trips. 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. 19 – Oct. 25

[If went to campus last week]

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.)***

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

Section 4. Travel to Campus - Days not traveled last week

[If no travel to campus all week, for all role groups]

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

- ❍ Study abroad or sabbatical
- ❍ Vacation, sickness, or personal leave
- ❍ Work or school-related travel or field work
- ❍ Telecommuting (working from home or another remote location)
- ❍ Temporary appointment elsewhere (internship, visiting scholar, teaching appointment, exchange program, etc.)
- ❍ Other: _____

[For faculty, visiting scholar, staff, post-doc, if travelled to campus between 1 and 4 weekdays of the reference week]

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, meeting, teaching appointment, etc.)
- ❍ Regularly scheduled day off
- ❍ Vacation, sickness, or personal leave
- ❍ Day off as part of a compressed work week (i.e. 4/40, 9/80, or 3/36 schedule)
- ❍ Other

[If no travel to campus all week]

Q24. Do you expect to resume regular travel to campus for school or work this academic year?

- ❍ Yes
- ❍ No

Section 5. Travel to Campus - 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
- ❍ 6 days per week
- ❍ 7 days per week

Q26. What means 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).

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

Q27. What means of transportation do you usually use to travel between on-campus destinations?

- ❍ Walk
- ❍ Skate or skateboard
- ❍ Bike or electric bike
- ❍ Motorcycle or scooter
- ❍ Drive alone in a car (or other vehicle)
- ❍ Carpool or vanpool (either as driver or passenger)
- ❍ Get a ride (someone drops you off and continues on elsewhere)
- ❍ Bus
- ❍ Other: _____

[if staff]

Q28. When do you typically arrive on campus?

[write-in]

(For example, 8:30 am)

Section 6. Travel to Campus - Modes used last week

Consider how you traveled to campus last week.

[If traveled at least one day last week and will resume travel this year]
Q29. First think back to the entire week (Monday, Oct. 19 - Sunday, Oct. 25). 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 that week.*

- ☐ Walk
- ☐ Skate or skateboard
- ☐ Bike or electric bike
- ☐ Motorcycle or scooter
- ☐ Drive alone in a car (or other vehicle)
- ☐ Carpool or vanpool with others going to campus (either as driver or passenger)
- ☐ Get a ride (the driver continues on elsewhere)
- ☐ Bus
- ☐ Train or light rail
- ☐ Taxi services
- ☐ Uber or Lyft Services
- ☐ Other: _____

[For any days that respondent traveled]
Q30. Next, consider each day specifically. 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.)*

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Walk	○	○	○	○	○	○	○
Skate or skateboard	○	○	○	○	○	○	○
Bike or electric bike	○	○	○	○	○	○	○
Motorcycle or scooter	○	○	○	○	○	○	○
Drive alone in a car (or other vehicle)	○	○	○	○	○	○	○
Carpool or vanpool with others also going to campus (either as driver or passenger)	○	○	○	○	○	○	○
Get a ride (someone drops you off and continues on elsewhere)	○	○	○	○	○	○	○
Bus	○	○	○	○	○	○	○
Train or light rail	○	○	○	○	○	○	○

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Taxi Services	○	○	○	○	○	○	○
Uber or Lyft Services	○	○	○	○	○	○	○

[If carpooled last week]

Q31. 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 people

[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 people

Section 7. **Travel to campus – in the summer**

Now consider this past summer, from June 14- September 19, 2015.

[for everyone unless not resuming travel to campus this year]

Q33. **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.)

- ❍ All summer / 14 weeks (June 14 – September 19)
- ❍ 13 weeks
- ❍ 12 weeks
- ❍ 11 weeks
- ❍ 10 weeks
- ❍ 9 weeks
- ❍ 8 weeks
- ❍ 7 weeks
- ❍ 6 weeks (equivalent to just ONE summer session, I or II)
- ❍ 5 weeks
- ❍ 4 weeks
- ❍ 3 weeks
- ❍ 2 weeks
- ❍ 1 week
- ❍ None

[For any answer other than "None"]

Q34. **During this period, how many days per week were you typically on campus?**

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

Section 8. Travel to campus – more details about mode

[If motorcycled, drove alone, carpooled, or got a ride last week]

Q35. Which type of vehicle did you use to get to campus last week?

- ❍ Gasoline or diesel vehicle
- ❍ Conventional hybrid vehicle (does not plug into the electricity grid)
- ❍ Plug-in hybrid electric vehicle
- ❍ All-electric vehicle
- ❍ CNG fueled vehicle
- ❍ Biofuel vehicle
- ❍ Hydrogen fuel cell vehicle

[If lives outside of Davis, motorcycled, drove alone, carpooled, or got a ride last week, or usually drives to campus]

Q36. When you drive to Davis for school or work, do you park on campus or off-campus?

- ❍ On-campus
- ❍ Off campus

[If park off-campus]

Q37. How do you get from your parked car to campus?

- ❍ Walk
- ❍ Bike
- ❍ Skateboard
- ❍ Bus
- ❍ Taxi
- ❍ Lyft or Uber Services
- ❍ Other: _____

[If rode the bus last week]

Q38. Which bus service(s) did you use on your way to campus last week?

- ☐ Unitrans
- ☐ Yolobus
- ☐ UCD / UCDMC Shuttle
- ☐ Sacramento Regional Transit
- ☐ UC Berkeley / UC Davis shuttle
- ☐ Other:

[If rode the train last week]

Q39. Which train service(s) did you use on your way to campus last week?

- ☐ Amtrak Capitol Corridor
- ☐ BART
- ☐ Sacramento Regional Transit
- ☐ Other: _____

[If lives in East Davis, Central Davis, or downtown Davis, and biked to school or work at least once in the past week or usually bikes to campus]

Q40. For your usual route to campus, which of the following streets do you bike on between A St and L St? Check all that apply.

- ☐ 1st St
- ☐ 2nd St
- ☐ 3rd St
- ☐ 4th St
- ☐ 5th St
- ☐ 6th St
- ☐ 7th St
- ☐ 8th St
- ☐ Alice St
- ☐ Drexel Dr
- ☐ 14th St
- ☐ Covell Blvd
- ☐ A St
- ☐ B St
- ☐ C St
- ☐ D St
- ☐ E St
- ☐ F St
- ☐ G St
- ☐ H St
- ☐ I St
- ☐ J St
- ☐ K St
- ☐ Not sure
- ☐ Other: _____

Section 9. **Campus transportation programs, infrastructure, and improvements**

Q41. **Are you familiar with any of these campus programs?**

	I've never heard of it	I've heard of it, but never used it	I've used it
GoClub program	○	○	○
Aggie Bike Buy Program	○	○	○
Bike tire air stations and repair stations around campus	○	○	○
Bicycle Education and Enforcement Program (BEEP) and bike safety video	○	○	○
Zipcar carsharing program	○	○	○
Zimride carpool matching service	○	○	○
In-vehicle parking meters (Easy Park)	○	○	○
UC Davis motorist assistance program	○	○	○
TAPS Bike lock-cutting service	○	○	○
UC Davis Bike Auction	○	○	○
TAPS Mobility Assistance Program	○	○	○
TAPS bicycle licensing program	○	○	○

Q42. **If you would like to learn more about any of these programs, please follow the link to the TAPS website at the end of the survey.**

[if motorcycled, drove alone, carpooled, or got a ride last week]

Q43. **We are interested to know how the following would influence your decision to drive or ride in a personal vehicle for your travel to campus. To what extent do you agree or disagree with the following statements?**

	Strongly Disagree	*Somewhat Disagree*	*Somewhat Agree*	*Strongly Agree*
I would drive less if the bicycle pathways and trails between my home and campus were more comfortable.	○	○	○	○
I would drive less if provided an electrical bike for free.	○	○	○	○

I would drive less if the campus monthly parking permits were changed to 20 daily parking permits that last for months.	○	○	○	○
I would carpool with three additional friends going to campus if our campus provided a vehicle for free.	○	○	○	○
I would drive less if there were more bicycle tire pumps and repair stations around campus.	○	○	○	○
I would drive less if the monthly parking permit fee increased by $20.	○	○	○	○
I would drive less if the daily parking permit fee increased by $2.	○	○	○	○
I would drive less if discount coupons for car share and ride share services were provided (e.g. Zipcar, Lyft, and Uber).	○	○	○	○
I would drive less if more places to shower were made available on campus.	○	○	○	○
I would drive less if Unitrans scheduled more buses during peak traffic hours.	○	○	○	○
I would drive less if campus offered a free short-term bike sharing program.	○	○	○	○
I would drive less if the train or light rail fares were cheaper for UC Davis students, faculty, and staff (e.g. Amtrak).	○	○	○	○

Section 10. More background information about you – opinions about travel

Not too much further!

Q44. We'd like to ask about your opinions with respect to travel. There are no right or wrong answers; we want only your true opinions. To what extent do you agree or disagree with the following statements?

	Strongly disagree	Somewhat Disagree	Neutral or Not Sure	Somewhat Agree	Strongly agree
Travel time is generally wasted time.	○	○	○	○	○
Environmental concerns affect the choices I make about my daily travel.	○	○	○	○	○
I like riding a bike.	○	○	○	○	○
Bicycle traffic laws are adequately enforced on campus.	○	○	○	○	○
I need a car to do many of the things I like to do.	○	○	○	○	○
My schedule makes it hard or impossible for me to use public transportation.	○	○	○	○	○
I like driving.	○	○	○	○	○
I drive more than I want to.	○	○	○	○	○

Q45. To what extent do you agree or disagree with the following statements? (continued)

	Strongly disagree	Slightly Disagree	Neutral or Not Sure	Slightly Agree	Strongly agree
I feel safe biking on campus.	○	○	○	○	○
I like using public transit.	○	○	○	○	○
I often need to use my own vehicle to travel to different sites during the day.	○	○	○	○	○
I already bicycle as often as I can.	○	○	○	○	○
I try to limit my driving as much as possible.	○	○	○	○	○
Getting around is easier than ever with my smartphone	○	○	○	○	○
I like to arrive on campus with a professional appearance.	○	○	○	○	○
I drive more than I need to.	○	○	○	○	○
I feel stressed after my trip to campus.	○	○	○	○	○

[If not physically limited from biking]

Q46. **How would you rate your ability to ride a bike? In particular, we are interested in 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

Q47. **We are interested in your *familiarity* with and *use* of these *transportation services*. Please check the single most appropriate answer for each service below:**

	I have never	I have heard	I have used it…

	heard of it	of it but I've never used it	…when traveling away from home	...in Davis	…in Davis AND when traveling away from home
Carsharing (*e.g.* Zipcar, City CarShare)	○	○	○	○	○
Peer-to-peer carsharing (*e.g.* Relay Rides, FlightCar)	○	○	○	○	○
On-demand ride services (*e.g.* Uber, Lyft)	○	○	○	○	○
Dynamic carpooling (*e.g.* Zimride, Carma)	○	○	○	○	○
Peer-to-peer carpooling (e.g. arranged through Facebook or Craigslist)	○	○	○	○	○
Bikesharing (*e.g.* Bay Area Bike Share)	○	○	○	○	○
Regular taxi services	○	○	○	○	○

[If answered "I have used it" to any of the above options for Q47]

Q48. Please indicate *how often* you use the following transportation services.

	I used it in the past, but I don't use it anymore	I use it less than once a **month**	I use it 1-3 times a **month**	I use it 1-2 times a **week**	I use it 3-4 times a **week**	I use it 5 or more times a **week**
Carsharing (*e.g.* Zipcar, City CarShare)	○	○	○	○	○	○
Peer-to-peer carsharing (*e.g.* Relay Rides, FlightCar)	○	○	○	○	○	○
On-demand ride services (*e.g.* Uber, Lyft)	○	○	○	○	○	○
Dynamic carpooling (e.g. Zimride, Carma)	○	○	○	○	○	○
Peer-to-peer carpooling (e.g. arranged through Facebook or Craigslist)	○	○	○	○	○	○
Bikesharing (*e.g.* Bay Area Bike Share)	○	○	○	○	○	○
Regular taxi services	○	○	○	○	○	○

[If student]

Q49. How important were the following features of UC Davis and the Davis community in *your decision to attend UC Davis* compared to *other universities you could have attended*?

	Not at all Important	Somewhat Important	Fairly Important	Very Important
Better academics (e.g. overall reputation, availability of majors)	○	○	○	○
More affordable	○	○	○	○
Easier to get around by bike	○	○	○	○
Preferred the university's student body size or class sizes	○	○	○	○
Better extracurricular opportunities (e.g. to conduct research, study abroad, visit nearby cities, or participate in activities, sports, or Greek life)	○	○	○	○
Preferred the Davis community as a place to live	○	○	○	○
Better weather/climate	○	○	○	○
Other: _____	○	○	○	○

Section 11. More background information about you – demographic characteristics

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, post-doc]

Q50. How many full years have you been at UC Davis (in any role)?

- ❍ 0 (this is my first year)
- ❍ 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 years
- ❍ 6-10 years
- ❍ 11-15 years
- ❍ 16-20 years
- ❍ More than 20 years

Q51. In what year were you born?

[Numerical write-in]
For example: 1980

Q52. Which of the following best describes your race?

- ❍ Black or African American
- ❍ Asian
- ❍ White
- ❍ Mexican or Hispanic
- ❍ American Indian or Alaska Native
- ❍ Native Hawaiian or other Pacific Islander
- ❍ Multiracial
- ❍ Other _____

[Employees and NOT an undergrad]

Q53. What is your highest level of education completed?

- ❍ No formal education
- ❍ Grade school or junior high school
- ❍ High school diploma or equivalent
- ❍ Associates degree or technical school certificates
- ❍ Four-year bachelor's degree
- ❍ 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
- ❍ Grade school or junior high school
- ❍ High school diploma or equivalent
- ❍ Associates degree or technical school certificates
- ❍ Four-year bachelor's degree
- ❍ Graduate degree(s)

Q55. Do you live alone or with other people? Please choose *all* that apply.

- ☐ I live alone
- ☐ 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*

[if lives with family, partner or others that share income]

Q56. 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.

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

[for all]

Q57. As you know, California is becoming a more expensive place to live. We want to understand how this is impacting the Davis Community. About how much do you spend on housing per month?

[numerical write-in]
help text: "e.g. $800"

Q58. About what percentage of your monthly budget do you spend on housing?

- ❍ Under 20 %
- ❍ 20 %
- ❍ 21 – 50 %
- ❍ Over 50 %

[To undergraduate and graduate students that have access to a car]

Q59. You indicated that you have access to a car. How much financial support do you receive from your parent(s)/guardian(s) for driving related expenses such as gas, insurance, and vehicle maintenance?

- ❍ None at all
- ❍ For some things
- ❍ For most things
- ❍ For everything

Section 12. Optional

[If indicated that work/school location is outside Davis (in Q07)]
Q60. Thank you for taking this shortened version of the 2015-16 Campus Travel Survey. Since your office or department is outside of UC Davis, we do not need any further information from you at this time.

[If indicated that recently graduated (in Q01)]
Q61. Thank you for taking this shortened version of the 2015-16 Campus Travel Survey. Since you are no longer a student at UC Davis, we do not need any further information from you at this time.

[If indicated "retiree" in (Q01)]
Q62. Thank you for taking this shortened version of the 2015-16 Campus Travel Survey. Since you are no longer an employee of UC Davis, we do not need any further information from you at this time.

Q63. Is it okay for us to contact you again in the future?

- ❍ No, I prefer not to be contacted again.
- ❍ Yes, with question about my survey or if I win the drawing for a $50 gift card.

[If yes, okay to contact]
Q64. Please provide the following contact information. This information will ONLY be used for the purposes you specified.

Name: _____
Campus 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.
Write-in:_____

[If access to bike = YES]
Q66. This fall, the UC Davis Institute of Transportation Studies will be studying the physiological response to bicycling. This study would ask you to ride your bicycle on a few different routes while measuring your physiological response. Participants will be compensated for their time. Your participation is voluntary and your responses will be completely confidential. Please indicate if you would like to participate in this study:

- ❍ Yes, I would like to participate in this study.
- ❍ No, I would prefer not to be contacted again.

[if yes to bicycle study]
Q67. Please enter your contact information in the space below so that the research team can get in touch with you.
Name: _____
Campus email address: _____

[If live outside of Davis]
Q68. Researchers at the UC Davis Institute of Transportation Studies are working with UC Davis Transportation and Parking Services to evaluate a prospective program for commuters like you. This study will ask you more detailed questions about how you travel to and from campus. Participants will be entered into a raffle to win a $100 prepaid debit card. Your participation is voluntary and your responses will be completely confidential. Please indicate if you would like to participate in this study:

- ❍ Yes, I would like to participate in this survey
- ❍ No, I would prefer not to be contacted again

[If "yes" to question above]

Q69. Please enter your contact information in the space below so that the research team can get in touch with you:

Name: _____

Campus email address: _____

Q70. Thanks for completing this survey!

We know your time is valuable. The results of this survey will be used both to help the campus improve its transportation system and services and for research purposes.

To learn more about TAPS programs and services, please click [here].

respondents to proceed are denoted here with an asterisk. As in past surveys, the dates of the reference week changed after one week.

Appendix B: Changes from the 2014-15 survey instrument

1. The following one-time sections have been eliminated:
    a. Bicycle light ownership
2. The following sections have been reduced:
    a. Demographics
    b. Bike crash/theft questions
3. The following section was repeated from last year:
    a. Use of 5th Street as Bicycle Route to Campus
        i. Individuals who lived in Central, Downtown, or East Davis and had biked at least once in the past week were asked about whether or not they use 5th street during their commute to campus.

The reference week was scheduled for the same week as the previous year's survey, October 25 - November 1 (see Figure 7 for additional details).

Appendix C: Text of the recruitment emails

Initial recruitment email:
From: Campus Travel Survey <travelsurvey@ucdavis.edu>
To: <...@ucdavis.edu>
Subject: Message from Provost Hexter- 2015-2016 Campus Travel Survey

Dear UC Davis Student [Employee],

You are invited to help shape the future of the UC Davis Community by participating in the 2015-2016 UC Davis Campus Travel Survey. This annual survey provides campus planners and researchers with valuable feedback on how people get to campus and their experiences with various transportation programs. **Your feedback is important for improving the UC Davis Campus Community and shaping the future of transportation on campus.** This year's survey is particularly important as the campus begins updating its Long Range Development Plan. Transportation will be one of the most important issues that will be considered as part of the planning process.

UC Davis Transportation and Parking Services (TAPS) and graduate students from the Institute of Transportation Studies have used the results from this survey to:

- Track changes in the way that people get to campus from year to year
- Prioritize bike infrastructure improvements on campus
- Estimate UCD's greenhouse gas emissions
- Better understand the factors that encourage biking in our community
- Develop new TAPS programs to serve the campus community

Participating in this research survey takes 10 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. We're going to ask you questions in the following areas:

- Your role at UC Davis
- Your travel to and from campus
- Your experience with campus transportation programs and infrastructure
- Some background information about you

To reward you for your time and input, you will be entered into a drawing to **win one of twenty $50 Visa Debit gift cards and one Amazon Fire Tablet grand prize!** If you are unable to complete the survey but would like to be included in the drawing, please email us at travelsurvey@ucdavis.edu to be entered.

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

Thank you for participating in this year's survey.

Sincerely,
Ralph J. Hexter
Provost and Executive Vice Chancellor

Reminder recruitment email:
From: Campus Travel Survey <travelsurvey@ucdavis.edu>
To: <...@ucdavis.edu>
Subject: Message from Provost Hexter- 2015-2016 Campus Travel Survey

Dear UC Davis Student [Employee],

Last week you were invited to take the 2015-2016 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. This annual survey provides campus planners and researchers with valuable feedback on how people get to campus and their experiences with various transportation programs. **Your feedback is important for improving the UC Davis Campus Community and shaping the future of transportation on campus**. This year's survey is particularly important as the campus begins updating its Long Range Development Plan. Transportation will be one of the most important issues that will be considered as part of the planning process.

UC Davis Transportation and Parking Services (TAPS) and graduate students from the Institute of Transportation Studies have used the results from this survey to:

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

Thank you for participating in this year's survey.

Sincerely,
Ralph J. Hexter
Provost and Executive Vice Chancellor

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 alone to campus, the campus AVR would be equal to one. 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."[9] We attempt to adhere to the AQMD formula, although our overall survey methodology deviates to some extent from that prescribed by the AQMD.[10] 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-emission vehicles (ZEV).

In particular, we use the following formula:

$$AVR = \frac{Total\ weekly\ arrivals}{weekly\ vehicle\ arrivals} = \frac{arrivals\ by\ all\ modes + employee\ telecommuting\ days + CWW\ days}{drive\ alone\ arrivals + fractionalcarpool\ arrivals}$$

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 *Q30* in the 2015-16 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 *Q20*) 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 *Q23*).

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 *Q30*). 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 *Q35*).

Fractional carpool arrivals = A count of the fractions of vehicle-arrivals accounted for those arriving in carpools (or getting rides) for each day Monday through Friday. In particular, for each day a respondent carpools (or gets a ride, using *Q30*) we add to the arrival count a fraction equal to one divided by the total

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[9] As of September 2016, this rule is available online (http://www.aqmd.gov/docs/default-source/rule-book/reg-xxii/rule-2202.pdf?sfvrsn=4).

[10] 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.

number of people in the carpool (using *Q31*) 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 *Q35*).

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 3,789 valid responses to question *Q30* (see Table 53Table 53).

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. We include a question about whether student respondents are also paid employees of UC Davis (question *Q07*) 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. 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 the statistical computing language, R, 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.

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.

We assign an average distance from campus destinations for all on-campus respondents equal to the mean calculated network distance for on-campus respondents. 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 Campus Travel Surveys from 2008-09 through 2014-15, so results from the 2015-16 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 *Q30*, 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 *Q29* and *Q30*, the answer to *Q29* about "usual mode" was imputed for each day traveled in *Q30*.
3. In cases where only one answer was given for *Q29* (all modes used to get to campus), missing answers to *Q30* were recoded as this answer.
4. In one case where usual mode was listed and only some answers to *Q30* 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.

Table 50 shows the number of valid cases for each major step in the data validation process. Starting with 4,220 initial responses who provided a valid role, cases were excluded due to missing or invalid data, resulting in 3,789 responses that had valid answers for role, gender, and whether the individual traveled to campus, and general residential location. These 3,789 cases were selected for the bulk of the weighted analysis in this report, with the remainder using the 3,170 cases that had valid answers for role, gender, whether the individual traveled to campus, and general residential location.

Table 50. Valid responses

Variables (description)	Valid cases (N = 4,220)
Role (8 categories)	4,220
Gender (male/female)	3,924
Traveled to campus	3,938
Physically traveled	3,817
Residential location	3,996
Role + Gender (for weighted analysis)	3,789
Role + Gender + Residential location (for geocoded weighted analysis)	3,170

Appendix G: Sampling Plan

Table 51 and Table 52 show the percent of the campus population invited to take the survey, by role, and the expected response rates based on response rates in previous years. This year, expected response rates varied from four percent among seniors to 25 percent among staff.

Table 51. Sampling plan for 2007-08 through 2015-16, percent invited

Role	2015-16		2015-16	2014-15[b]	2013-14	2012-13	2011-12	2010-11	2009-10	2008-09	2007-08
	Population[a]	Number invited	Percent invited								
Students	34,465	21,629	63%	89%	77%	83%	70%	45%	37%	38%	36%
Undergraduate	28,191	16,598	59%	90%	78%	86%	73%	40%	32%	32%	31%
Freshmen	5,775	3,374	58%	100%	88%	100%	71%	55%	41%	39%	40%
Sophomores	4,807	3,708	77%	100%	100%	100%	100%	51%	40%	39%	36%
Juniors	7,738	3,735	48%	64%	59%	68%	57%	35%	29%	31%	32%
Seniors	9,871	5,781	59%	98%	77%	87%	74%	33%	26%	24%	21%
Graduate	6,274	5,031	80%	86%	74%	70%	59%	64%	60%	61%	60%
Masters	2,914	2,914	100%	85%	100%	100%	100%	100%	98%	86%	84%
PhD	3,360	2,117	63%	86%	59%	53%	36%	31%	39%	48%	48%
Employees	9,518	5,800	61%	28%	38%	37%	29%	23%	22%	31%	28%
Faculty	2,389	2,389	100%	100%	89%	100%	100%	71%	63%	78%	65%
Staff	7,129	3,411	48%	15%	24%	21%	13%	12%	13%	20%	20%
Overall percent	100%	-	62%	73%	66%	70%	59%	39%	33%	36%	34%
Overall number	43,983	27,429	-	30,815	27,798	28,838	23,953	15,704	13,322	14,031	13,770

[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 2014-2015 student population summary three-quarter average (available online at http://budget.ucdavis.edu/data-reports/documents/enrollment-reports/eenrsum_a1415.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. 2007-08 through 2014-15 displayed percent of population group invited compared to actual response rates.

[b] See Thigpen (2015) for results from 2014-15, Popovich (2014) for results from 2013-14, Driller (2013) for results from 2012-13, Miller (2012) for results from 2011-12, 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.

Table 52. Sampling plan for 2007-08 through 2015-16, response rates

Role	2015-16		2015-16	2014-15[b]	2013-14	2012-13	2011-12	2010-11	2009-10	2008-09	2007-08
	Population[a]	Number invited	Target response	Actual Response							
Students	34,465	21,629	10%	11%	12%	13%	12%	18%	25%	22%	23%
Undergraduate	28,191	16,598	9%	10%	11%	12%	11%	17%	24%	20%	22%
Freshmen	5,775	3,374	11%	11%	11%	15%	13%	23%	30%	22%	26%
Sophomores	4,807	3,708	10%	12%	12%	13%	12%	16%	26%	21%	22%
Juniors	7,738	3,735	10%	12%	13%	14%	13%	18%	22%	22%	21%
Seniors	9,871	5,781	6%	8%	9%	10%	9%	12%	19%	17%	20%
Graduate	6,274	5,031	14%	16%	15%	16%	16%	22%	28%	27%	24%
Masters	2,914	2,914	10%	10%	14%	11%	11%	16%	19%	18%	19%
PhD	3,360	2,117	16%	18%	16%	21%	23%	34%	40%	35%	28%
Employees	9,518	5,800	12%	14%	22%	18%	19%	29%	34%	35%	45%
Faculty	2,389	2,389	13%	13%	14%	16%	16%	22%	27%	30%	37%
Staff	7,129	3,411	11%	16%	30%	22%	24%	37%	42%	39%	50%
Overall percent	100%	-	10%	11%	13%	14%	13%	20%	27%	26%	28%
Overall number	43,983	27,429	2,834	3,389	3,663	3,982	3,116	3,084	3,569	3,577	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 2014-2015 student population summary three-quarter average (available online at http://budget.ucdavis.edu/data-reports/documents/enrollment-reports/eenrsum_a1415.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. 2007-08 through 2014-15 displayed percent of population group invited compared to actual response rates.

[b] See Thigpen (2015) for results from 2014-15, Popovich (2014) for results from 2013-14, Driller (2013) for results from 2012-13, Miller (2012) for results from 2011-12, 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.

Appendix H: Weighting by role and gender

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 43,983.

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 = 3,789 valid responses to question *Q30*, the main question relating to mode choice on each day during the travel week. For variables relying on geocoding of respondents' residential location, we generated a separate set of weight factors, based on the 3,170 cases successfully geocoded (by cross streets and zip code given in questions Q18 and Q19; see "Appendix E: Geocoding and network distances"). Both sets of weights are shown in Table 53.

Table 53. Weight factors, applied by role and gender

Role	Gender	Population (N)	*Factors by role, gender, and mode*				*Factors by role, gender, mode, and geocoded*			
			Valid responses (n)	Weight factor (Ni/N)/(ni/n)	Expansion factor (Ni/ni)	Weighted sample size	Valid responses (n)	Weight factor (Ni/N)/(ni/n)	Expansion factor (Ni/ni)	Weighted sample size
Freshman	Female	3,673	249	1.271	14.751	316	238	1.112	15.433	265
	Male	2,102	100	1.811	21.020	181	96	1.578	21.896	151
Sophomore	Female	3,057	373	0.706	8.196	263	338	0.652	9.044	220
	Male	1,750	112	1.346	15.625	151	86	1.467	20.349	126
Junior	Female	4,341	305	1.226	14.233	374	263	1.190	16.506	313
	Male	3,397	124	2.360	27.395	293	110	2.226	30.882	245
Senior	Female	5,538	360	1.325	15.383	477	315	1.267	17.581	399
	Male	4,333	155	2.408	27.955	373	137	2.280	31.628	312
Master's	Female	1,574	152	0.892	10.355	136	130	0.873	12.108	113
	Male	1,340	108	1.069	12.407	115	89	1.085	15.056	97
PhD	Female	1,714	271	0.545	6.325	148	235	0.526	7.294	124
	Male	1,646	157	0.903	10.484	142	141	0.841	11.674	119
Faculty	Female	824	239	0.297	3.448	71	184	0.323	4.478	59
	Male	1,565	237	0.569	6.603	135	194	0.581	8.067	113
Staff	Female	4,677	586	0.688	7.981	403	425	0.793	11.005	337
	Male	2,452	261	0.809	9.395	211	189	0.935	12.974	177
Overall	-	43,983	3,789	0.000	11.608	3,789	3,170	0.000	13.875	3,170

[a] Based on valid responses to *Q10* and *Q30*

[b] Based on valid responses to *Q10*, *Q30* and successful geocoding of home location (from questions *Q18-Q19*)