UC Davis Student Housing Affordability and Insecurity Report for 2017-18

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Contents

1	Intro	duction	6
	1.1	Context and Ambitions	6
	1.2	Goals and Organization	8
	1.3	Acknowledgements	9
2	Exec	utive Summary	10
	2.1	Topics and Findings	10
	2.2	Student Housing Data Dashboard	16
	2.3	Improving the SHAIS	18
3	Met	hodology	19
	3.1	Survey Administration	20
	3.2	Survey Validity and Universe	21
	3.3	Weighting and Population Representativeness	21
	3.4	Response Rates and Measurement Error	26
	3.5	Comparability with Other Data Sources	28
4	Рори	ulation and Housing of Students in General Campus Programs	31
	4.1	Residential Location: On Campus, Off Campus in Davis, and Outside of Davis	32
	4.2	Renting, Owning, and Other Arrangements Off Campus in Davis	34
	4.3	Renters in Conventional and Bed Leases in the Private Davis Market	36
	4.4	Renters in Apartments and Detached Houses in the Private Davis Market	37
	4.5	Students in the General Davis Rental Population	39
	4.6	Location of Student Renters in Davis	42
5	Οςςι	ipant Density and Crowding	50
	5.1	Defining Crowding and Overcrowding Using Occupant Density	51
	5.2	Occupancy per Unit	52
	5.3	Occupancy per Bedroom	56
	5.4	Crowding Metrics for Students in the Private Davis Market	60
6	Hom	elessness and Housing Insecurity	70
	6.1	Homelessness	71
	6.2	Housing Insecurity	72
	6.3	Overall Housing Insecurity	75

7	Housing Problems	77
	7.1 Ranking of Highest Priority Problems, by Major Role Group	79
	7.2 Ranking of Highest Priority Problems, by Housing Arrangement	82
	7.3 Ranking of Highest Priority Problems, Given Select Amenities	86
8	Rents and Affordability	90
	8.1 Overview of Rent Statistic Types and Data	91
	8.2 Gross Rent per Person, On Campus and Off Campus	93
	8.3 Gross Rent per Person, Private Davis Market by Lease Type	95
	8.4 Gross Rent per Person, Private Davis Market by Role Group	96
	8.5 Rents by Unit Size in the Private Davis Market	98
	8.6 Affordability	105
9	Recommendations	114
	9.1 Develop a Student Housing Data Dashboard	114
	9.2 Improve SHAIS Design and Implementation	118
	9.3 Amend the Survey Instrument (Itemization)	121
Α	Survey Instrument	126
	Survey Flow	127
	Block 1: Introduction	128
	Block 2: Conclusion	131
	Block 3: Housing Circumstances and Cost	132
	Block 4: Financial Resources	143
	Block 5: Housing Insecurity	148
	Block 6: Perspectives on Housing in Davis	149
	Block 7: Perspectives on Current Housing	152
	Block 8: Demographics	154
в	Electronic Messages to Participants	156
	Initial Invitation Message	157
	Invitation Reminder 1	158
	Invitation Reminder 2	159

List of Tables

3.1 3.2	Population, sample sizes, and weighting of role groups in the SHAIS	25 27
4.1 4.2 4.3 4.4	Residential location of students in general campus programs (percentage)	34 34 35 35
4.5 4.6 4.7	Lease types held in the private Davis market (total sample and category percentages)	37
4.8 4.9 4.10	category percentages). Renters in apartments and detached houses in the Private Davis Market (estimated counts). Estimated student occupancy and unit counts in the private Davis rental market. Percentages of students and student-occupied units among all renters and rental units in	38 39 39
	the private Davis market: Two models based on total rental population estimates.	42
5.1 5.2 5.3	Mean occupants per unit in UCD Student Housing	54 56
5.4 5.5 5.6	(overview). . Mean occupants per bedroom in UCD Student Housing. . Mean occupants per bedroom in the private Davis rental market. . Estimated count of overcrowded units in the private Davis market: Two models based on	58 59 60
	alternative occupant density thresholds.	66
6.16.26.36.4	Students reporting any form of homelessness over previous 12 months (percentage) Students reporting any form of homelessness over previous 12 months (estimated counts). Students reporting any form of housing insecurity over previous 12 months (percentage). Students reporting any form of housing insecurity over previous 12 months (estimated	72 73 74
6.5	counts)	75 76
7.1 7.2 7.3	Prevalence of housing problems: All student renters and major role groups	81 83 85

7.4	Percentage of students with select in-unit and on-site amenities, by housing category.	87
7.5	Priority housing problems on campus and off campus for those WITHOUT in-unit laundry.	88
7.6	Priority housing problems on campus and off campus among those WITH laundry, kitchen,	
	and on-site parking.	89
8.1	Gross rent per person in UCD Student Housing.	93
8.2	Gross rent per person in the private Davis market.	94
8.3	Gross rent per person in private markets outside of Davis.	94
8.4	Gross rent per person in off-campus conventional leases.	95
8.5	Gross rent per person in off-campus bed leases.	96
8.6	Gross rent per person for apartments in the private Davis market.	97
8.7	Gross rent per person for detached houses in the private Davis market.	97
8.8	Gross rent per person in apartments in the private Davis market, by unit size.	100
8.9	Gross rent per person in detached houses in the private Davis market, by unit size	100
8.10	Gross rent per unit for apartments in the private Davis market, by unit size.	102
8.11	Gross rent per unit for detached houses in the private Davis market, by unit size	102
8.12	Average off-campus apartment contract rents in Davis (fall 2017).	103
8.13	Contract rent per unit for apartments in the private Davis market, by unit size	104
8.14	Contract rent per unit for detached houses in the private Davis market, by unit size.	104
8.15	Estimated students occupying affordable P3 and private Davis market apartments	107

List of Figures

4.1	Map of Davis and the UC Davis central campus area showing sampled location and unit types of SHAIS respondents, including those in university-affiliated housing and those rent-	
	ing in the private Davis market.	44
4.2	Map of Davis showing the estimated population distribution of student apartment renters	
	in the private Davis market	45
4.3	Map of Davis showing the estimated population distribution of student detached house	
	renters in the private Davis market.	46
4.4	Map of Davis showing the estimated population distribution of all student renters in the	
	private Davis market.	47
4.5	Population density of student renters in P3s, private Davis apartments, and private Davis	40
	detached houses, plotted against distance from central campus (Silo Terminal).	49
5.1	Occupant density of continuing undergraduates and graduate students in P3 apartments, private Davis apartments, and private Davis detached houses, compared to general occu-	
	pant density in the general Davis rental market.	63
5.2	Distribution of occupant densities in the private Davis rental market: Continuing under-	
	graduates and graduates in all unit types (with overcrowding thresholds).	65
5.3	Incidence of high occupant density: Percentage of apartment units with 2 or more occu-	
	pants per bedroom in the private Davis market.	68
5.4	Incidence of high occupant density: Percentage of detached houses with 2 or more occu-	
	pants per bedroom in the private Davis market.	69
8.1	Distributions of rents per bedroom for P3 and private Davis apartment residents, with	
	highlighted market-indexed affordable portions.	109

Chapter 1

Introduction

This is a report of key findings and descriptive statistics taken from an analysis of the *Student Housing Affordability and Insecurity Survey*, or SHAIS, implemented by the Associated Students of UC Davis (ASUCD) and the Graduate Student Association's (GSA).¹ The 2017-18 SHAIS attempted to collect data regarding housing affordability and insecurity issues among undergraduate and graduate students enrolled in general campus programs at the University of California, Davis. The report also makes recommendations for conducting future, periodic versions of the SHAIS.²

1.1 Context and Ambitions

The SHAIS represents a pilot effort to generate an annual housing assessment of and for UCD undergraduate and graduate students. The survey project was spearheaded by the ASUCD-GSA Joint Housing Task Force (JHTF), which the student government organizations formed in November 2016 in response to student experiences of high housing costs, overcrowding, insecurity, and homelessness. The JHTF has been chaired by Donald Gibson, who was principally responsible for incorporating JHTF priorities into the instrument and ensuring its execution.

In May 2018, the JHTF was able to distribute the survey electronically to undergraduate and graduate students. The SHAIS asked respondents a total of 68 questions in order to assess their housing and roommate circumstances, rental and utility costs, financial resources (including financial aid), experiences with various forms of housing instability or homelessness, and perspectives on housing in Davis and their par-

¹In this report, instances of the pronouns "we" and "our" should be understood as referring to the author and the ASUCD-GSA Joint Housing Task Force (JHTF) in their shared role of designing and administering the survey and making choices regarding its analysis. Suggested citation: Saper, Robert M. (2019). *UC Davis Student Housing Affordability and Insecurity Report for 2017-18*. The Associated Students of UC Davis and the Davis Graduate Student Association. Retrieved from https://gsa.ucdavis.edu/housing-survey/

²The analysis and report were generated with the statistical software *R* (R Core Team, 2018) in the *R-Studio* integrated development environment (RStudio Team, 2016) using the R-packages *bookdown* (Xie, 2018a), *gstat* (Pebesma & Graeler, 2018), *kableExtra* (Zhu, 2019), *knitr* (Xie, 2018b), *plyr* (Wickham, 2016), *raster* (Hijmans, 2019), *rethinking* (McElreath, 2016), *rgdal* (Bivand, Keitt, & Rowlingson, 2018), *rgeos* (Bivand & Rundel, 2018), *rmarkdown* (Allaire et al., 2018), and *sp* (Pebesma & Bivand, 2018).

ticular living situation. The survey invitation was distributed to 11,249 randomly selected student e-mail addresses on May 21, and the response period lasted until June 6 (15 days). There were 1,839 complete and valid questionnaire submissions, representing an effective overall response rate of 16.4 percent (responses that were incomplete or lacked a figure for housing payment were rejected as invalid).

The SHAIS was administered with the support of the UCD Office of Student Affairs in the context of Chancellor Gary May's early 2018 establishment of an *ad hoc* Affordable Student Housing Task Force (ASHTF), which was chaired by David Campbell, Associate Dean in the College of Agricultural and Environmental Sciences.³ Some preliminary results of the SHAIS were included in the ASHTF's final report, *Turning the Curve on Affordable Student Housing* (Chancellor's Affordable Student Housing Task Force, 2018). One of the main ASHTF recommendations was to implement, beginning in the 2018-19 academic year, an annual housing survey similar to the SHAIS. Ideally, then, the present report and the survey approach it represents will enjoy continued institutional support.

Prior to the Chancellor's ASHTF work, and in response to acute expressions of student concern over deteriorating levels of housing availability and affordability in Davis, the ASUCD-GSA JHTF recognized that students, the University, and the larger community lack access to detailed, representative data about students' housing circumstances. The University has not regularly tracked or published data about housing conditions for all students (i.e., for those in UCD Student Housing and the private off-campus market, including those in apartments as well as detached houses/single-family units). To date, data on student housing circumstances have been compiled sporadically,⁴ collected only for purposes of on-campus UCD Student Housing planning,⁵ focused on general market apartment conditions,⁶ or treated tangentially in other general surveys.⁷ The absence of comprehensive and regular data on student housing conditions makes it difficult to understand the scope of common problems and to make informed requests for intervention to the University and, where appropriate, to the City of Davis (or other regional partners). The JHTF suspects, moreover, that the absence of regular and comprehensive data—and an accompanying set of measurable and transparent housing priorities—is a detriment to University planning and the Uni-

³David Campbell, in his capacity as Community Studies Specialist in the Department of Human Ecology, provided support for the author's work in processing the SHAIS data and preparing the present analysis.

⁴Between 2012 and 2015, the UCD Student Housing and Dining Services Office, the Chancellor's Graduate and Professional Students Advisory Board, and the UCD Office of Graduate Studies *ad hoc* Student Family Housing Redevelopment Committee conducted standalone surveys touching on affordability, student family incomes, and/or resident satisfaction for various student groups (see, respectively: 2012-housing-survey.pdf, 2014-cgpsa-report-on-housing-survey.pdf, and 2015-student-family-housing-redevelopment-report.pdf; also see the synopsis of income and affordability data in each of these efforts as tabulated by the Student Family Housing Redevelopment Committee: 2015-student-income-section-8.pdf).

⁵A 2018 market research survey, conducted by the consulting firm Brailsford and Dunlavey on behalf of the University, collected data on student preferences and living situations, with respect to both UCD Student Housing and circumstances off campus in Davis, but the one-time effort was motivated only by the need to assess demand for on-campus housing. Moreover, the report was not designed for public consumption.

⁶The annual UCD Student Housing *Apartment Vacancy and Rental Rate Survey* (often referred to as the "Vacancy Report"), which has been conducted since 1975 and is now administered every fall by the consulting group BAE, tracks apartment vacancy rates and average apartment rents in the off-campus Davis housing market. However, the survey's purpose is to summarize general market conditions, and thus, while it collects valuable data from landlords and property owners about the city's apartment complexes, it does not tabulate responses from students or other individual Davis renters.

⁷Examples include the periodic University of California Undergraduate Experience Survey (UCUES), which in 2016 and 2018 asked general questions about homelessness to students across all UC campuses (see the UCOP UCUES website) and the UCD Institute of Transportation Studies' annual *Campus Travel Survey* (CTS), which asks some questions about residential location and parking availability but is not used to summarize student housing conditions beyond tabulations of residential location (see the ITS CTS website).

versity's ability to formulate integrated and sufficient responses to the full scope of the student body's housing needs.

At the same time, an important survey precedent exists with respect to transportation. The UC Davis Institute of Transportation Studies has conducted its annual *Campus Travel Survey* (CTS) every fall since 2007. Each year ITS publishes a semi-standardized survey report that serves as the basis for assessing the University's overall contribution to vehicle emissions and informs other planning considerations (reports are available at the ITS CTS website). The ASUCD-GSA JHTF believes student housing issues can be examined and tracked in the same fashion. A housing survey would ask about and report on a range of subtopics and produce regular statistics for ongoing problem evaluation. A comparable housing survey would similarly draw from a random sample of university students and use their experiences as the primary unit of analysis. Future iterations of such a survey might also include faculty and staff respondents (as the CTS does) in order to generate an even more comprehensive picture of the University's influence on housing in Davis and the region.

Additionally, and in line with the recommendations made by the Chancellor's Affordable Student Housing Task Force (2018, p. 24), the data drawn from an annual housing survey could be used to build a "data dashboard," consisting of a selection of regularly updated data points, that would allow the university to track its progress on student housing issues while also informing students, the City of Davis, and other regional stakeholders.

1.2 Goals and Organization

The report's organization reflects three overarching goals:

- 1. Summarize major findings from the SHAIS;
- 2. Indicate how findings fit into a larger program of assessing student housing needs; and
- 3. Offer suggestions to improve future surveying efforts.

The Executive Summary (Chapter 2) is organized according to these goals and provides an overview of the most important findings and recommendations.

Chapter 3 covers the survey's methodology and is important for understanding how the sample is used to make extrapolations to the student population. It also offers some perspective on how well the sample compares to other existing data about the student population.

Chapters 4 through 8 cover specific subtopics and findings: students' residential location and general housing circumstances, occupant density and crowding, homelessness and housing insecurity, common housing problems, and rents and affordability.

Chapter 9 makes recommendations of two types. The first set of recommendations concerns how SHAIS data and other sources can be used as part of a student housing "data dashboard." The second set of recommendations concerns critique of the survey and suggestions for improving the instrument.

Finally, Appendix A and Appendix B include the verbatim text used, respectively, for the survey instrument and the electronic messages sent to the survey audience. In many instances throughout the report,

references to specific questions in the survey instrument are accompanied by direct hyperlinks to the corresponding instrument content in Appendix A.

1.3 Acknowledgements

The ASUCD-GSA JHTF and the author wish to thank the following individuals and groups for their assistance in fielding and analyzing the survey: David Campbell, Emily Galindo, and all faculty and student members of the 2018 UCD Chancellor's Affordable Student Housing Task Force; Neil Huefner, Mayte Frias, and Timo Rico at the UCD Center for Student Affairs Assessment; Albee Wei and Susan Handy from the UCD Institute of Transportation Studies; Joyce Cleaver and associates in the UCD Office of Financial Aid and Scholarships; Matthew Palm and Farshid Haque; Matt Dulcich, Karl Engelbach, and UCD Chancellor Gary May; and Ginger Hashimoto and Stacey Winton at the City of Davis.

The analysis and recommendations contained in this report are the responsibility of the author and members of the ASUCD-GSA JHTF; they do not represent official positions of the University of California, Davis, or formal stances of the ASUCD and the GSA. The author is responsible for any errors in factual content.

Chapter 2

Executive Summary

2.1 Topics and Findings

The 2017-18 *Student Housing Affordability and Insecurity Survey* (SHAIS) was successful in many respects. Most notably, the survey provides a comprehensive view of student housing circumstances throughout Davis, both on campus and off campus. Uniquely, the survey offers a snapshot of conditions in the private Davis rental market, including student rents and occupant densities, both of which are important for informing University, City of Davis, and regional deliberations about housing needs and the creation of benchmarks for improved housing policies and interventions.

The SHAIS was designed to provide a broad, yet sufficiently focused, assessment around five main topics:

- On-campus and off-campus residential location and housing market participation;
- Crowding and housing supply;
- Housing insecurity and homelessness;
- Common housing issues, as identified by students; and
- Rents and affordability.

Several primary questions were developed for each of these topics. Below, we present each of the questions along with the report's associated key findings.

Residential Location

1. Where do students enrolled in general campus programs reside?

 About 28 percent of UCD students (9,642 individuals) are estimated to live in some form of UCD Student Housing, including residence halls, university-affiliated privatized apartments (P3s), units in the Student Housing Apartments (SHA) program, and university-owned Solano Park. When accounting for enrollment attrition throughout the academic year, the survey-derived estimate of students in UCD Student Housing is consistent with the occupancy data reported for 2017-18 by the UCD Office of Student Housing and Dining Services.

- About 10 percent of UCD students (3,350 individuals) choose to live outside of Davis. This proportion is consistent with the proportion estimated in the *Campus Travel Survey* over the past several years.
 - Graduate students live outside of Davis at the highest rate (about 22 percent or 1,182 individuals).
 - Juniors and seniors, as the largest classes, are also significant. About 7 percent of juniors and 13 percent of seniors report living outside the city, totaling an estimated 1,974 individuals.
 - The high ratio of continuing undergraduates to graduates living outside the city is in line with trends and figures estimated from *Campus Travel Survey* data and likely represents levels that are above historical averages.
- The vast majority of UCD students—about 62 percent (21,324 individuals)—occupy housing in the private Davis market (a very small portion of whom live in residences owned by their families).
- Continuing undergraduates, as the largest group of students without guaranteed access to oncampus housing, warrant special consideration from both the University and the City.
 - About 17,584 continuing undergraduates—over 51 percent of the student body—rent in the private Davis market.
 - Continuing undergraduates constitute 84 percent of student renters in Davis.

2. How are students distributed among all renters in the private Davis market?

- Of the students who rent in the private Davis market, about 69 percent (14,430 individuals) live in apartments (multi-family units) and about 29 percent (5,920 individuals) live in detached houses (single-family units).
- UCD students may represent 45 percent of all renters in the private Davis market, but they occupy only about 33 percent of the estimated number of rental units. This disproportionate unit occupancy likely indicates a segmented market, wherein, despite high demand for housing, certain properties are not made available to students or are priced and designed for non-student demographics.
- Spatial analysis of off-campus student renters in Davis (i.e., those renting in Davis and in units unaffiliated with UCD Student Housing) supports the conclusion that students are concentrated in particular private market apartment complexes.

Crowding and Housing Supply

3. At what densities do students occupy on-campus and off-campus housing types?

• As expected, freshmen occupy residence halls at higher densities than other students occupying other types of units; this is in accordance with the design of residence halls and the University's policy of housing the vast majority of freshmen.

- For all other undergraduates, however, students occupy off-campus units (both apartments and detached houses) at higher person-per-bedroom densities than university-affiliated apartments.
- In contrast, graduate students tend to occupy on-campus and off-campus units at similar densities, and their occupant densities in the private Davis market are also similar to the occupant density of the general rental population.

4. How many students live in crowded apartments and detached houses?

- Continuing undergraduates, especially juniors and seniors, are the most intensely affected by high occupant densities (i.e., crowding).
- Of all on-campus and off-campus unit types, apartments in the private Davis market tend to be the most crowded. Private, detached houses follow.
 - A conservative estimated count of the number of extremely crowded student-occupied units in Davis—based on a threshold of *more than 2* occupants per bedroom—is 199 units. Most of these, about 73 percent, are apartments.
 - Using a slightly lower threshold of *at least 2* persons per bedroom results in an estimate of 1,716 affected units, of which about 85 percent are apartments.
- Estimates of the geographic distribution of occupant density in the private Davis market suggest:
 - For those renting detached houses, there is a higher frequency of crowding in several locations just north of 5th Street in downtown Davis and in the vicinity of the intersection of Anderson Road and Covell Boulevard north of central campus, and
 - For those renting apartments, the incidence of crowding is more geographically dispersed, manifesting with similar frequencies in West Davis, North Davis, and near campus in South Davis. High frequency is also noted in apartment areas on the northern edge of downtown Davis.

Housing Insecurity and Homelessness

5. How many students have experienced homelessness or housing insecurity (or both)?

- Many UCD students report experiencing some form of housing insecurity or homelessness during the 2017-18 academic year.
 - An estimated 7 percent (2,460 individuals) report some form of temporary or sustained homelessness;
 - An estimated 15 percent (5,042 individuals) report some form of housing insecurity, such as not being able to make full rent payments or being forced to move several times;
 - Combined, an estimated 18 percent of students—6,104 individuals—experienced some form of homelessness or housing insecurity.
- Continuing undergraduates—especially juniors and seniors—are disproportionately impacted by homelessness or housing insecurity.

- Juniors represent about 28 percent of those reporting some form of homelessness (697 individuals); seniors represent about 49 percent (1,149 individuals).
- Juniors represent about 28 percent of those reporting some form of housing insecurity (1,414 individuals); seniors represent about 44 percent (2,194 individuals).
- About 28 percent of those reporting some form of homelessness indicated having slept in their automobile for at least one night (2 percent of the student population). The data imply that an estimated 688 students experienced this troubling condition, though the survey instrument was not designed to inquire further about duration or more specific circumstances.

Common Housing Problems

6. What housing problems are most frequent among students? How do they vary by housing type and location on campus and off campus?

- Housing expense is cited among all student role groups, with the exception of freshmen, as the most frequently experienced housing problem.
 - Continuing undergraduates cited expense at a rate of 45 percent, and graduate students cited expense at a rate of 47 percent.
 - Very few graduate students in Solano Park report housing expense as an issue, which is not surprising given that Solano offers some of the cheapest per-unit rents anywhere in Davis.
- Lack of in-unit laundry, the second most prominent problem, is again associated with all but freshmen.
 - Residents in Solano Park rank lack of in-unit laundry as their highest concern.
 - In the private Davis market, in-unit laundry is least available among apartments, leading respondents to rank it closely behind housing expense.
- **Overcrowding** is cited as an issue among freshmen and continuing undergraduates more frequently (23 and 15 percent, respectively) than it is for graduate students (only 4 percent).
 - Those living in residence halls, the vast majority of whom are freshmen, report overcrowding at the highest rate (24 percent).
 - Those living in private Davis apartments also report overcrowding at a high rate (17 percent). Next are students in P3 apartments (12 percent) and then students in private market detached houses (10 percent).
- **Distance to campus** is an issue for those living outside of Davis and many of those living off campus in the city.
 - For those living outside of Davis, distance is cited as a problem much more frequently (51 percent) than housing expense (36 percent). The lower ranking of expense among those living outside of Davis (compare to 49 percent of renters in the private Davis market) may result from lower rents, but a more likely factor is that students living outside of the city may

have, on average, higher household incomes and access to necessary forms of transportation and other resources.

- Distance is also an issue for many students living in the city: 21 percent of private market renters and 17 percent of those in SHA units.
- **Pests**, **management**, **maintenance**, **leasing terms**, and **on-site parking** are reported with some correspondence to privatized units, both in UCD Student Housing and off campus in Davis.
 - Pest issues are reported at higher rates in P3 and SHA units (about 21 percent) than in university-owned units (11 percent in residence halls and 5 percent in Solano Park), and they are very prominent among those in off-campus apartments and detached houses (22 and 24 percent, respectively).
 - Management issues and delayed maintenance were cited somewhat frequently among students in P3 units (9 and 13 percent, respectively). Remarkably few residents in Solano Park (only about 2 percent) reported delayed maintenance.
 - Delayed maintenance and problematic leasing terms figure prominently in the private Davis market, with 29 percent of renters reporting delayed maintenance and 26 percent reporting leasing issues. Apartment renters report leasing issues at a higher rate than those in detached houses: 28 percent versus 21 percent.
 - Lack of on-site parking is cited frequently among those in off-campus apartments and detached houses—29 and 21 percent, respectively—while frequencies among those in UCD Student Housing range between 12 and 17 percent.

Rents and Housing Affordability

7. What are average rents paid by students? How do student rents compare to general market rates?

- Students renting apartments off campus in Davis pay contract rents consistent with the University's *Apartment Vacancy and Rental Rate Survey*, though differences occur because students do not occupy units in proportion to the city's supply of unit types and sizes.
- On a per-person basis, continuing undergraduates living off campus in Davis pay the lowest rents.
- Per-person rents reflect housing costs under a *status quo* characterized by crowding, especially among continuing undergraduates, and short housing supply.
 - Average per-person gross rents (i.e., contract rent plus utilities) in the private Davis market are about \$658 for those in apartments and \$636 for those in detached houses.
 - Juniors and seniors, who make up the bulk of off-campus renters in Davis and are also more likely to occupy units at high densities, may pay even lower amounts.
 - However, gross rents per bedroom are higher than the average individual cost. For all apartments surveyed in the private Davis market, \$843 is the average cost per bedroom; for all detached houses, the average cost per bedroom is \$795.

- The difference has immediate relevance for modifying the assumptions used by the UC Office of the President (UCOP), which periodically surveys students about housing costs on a *de facto* per-person basis rather than using market-based assessments of unit or bedroom cost when determining maximum financial aid allowances for students living off campus.
- Rents outside of Davis are quite variable and, especially for continuing undergraduates, generally higher; this suggests that choosing to live outside the city is not a strong viable alternative for alleviating affordability issues (unless transportation costs were significantly reduced and transit options were to link students directly to more affordable locations).

8. How many affordable units are available to and/or are occupied by students, based on a percentof-market-rate definition of unit affordability? (*viz.* How many students pay for housing that costs 15 percent less than the mean market rent or lower?)

- The data indicate that prices for university-affiliated P3 apartments only satisfy a market-indexed definition of affordability for about 15 percent of the students living in them (about 421 out of 2,785 students).
- The supply is greater in the private Davis market, where nearly 27 percent of student renters (about 3,477 out of 13,123 students) access market-indexed affordable units.
- If low-income students are considered to be the most in need of affordable units, then the supply of on-campus and off-campus affordable apartments falls short for at least 22 percent of continuing undergraduates, or an estimated 5,500 students (this excludes any low-cost units supplied by off-campus detached houses).

9. How many students face high housing cost burdens, and to what degree, based on a percent-ofincome definition of affordability?

- The SHAIS instrument asked about various income and loan sources, but many of the resulting data are not consistent with respondents' estimated education and housing expenses. For this reason, and the reasons stated below, rates of respondents' housing cost burden are not reported.
- The concept of income-based affordability is difficult to standardize and measure for full-time college students because of their unique career stage and their varied set of resources, some of which are not 'income' in the strict sense (e.g., student loans, grants and scholarships, fee waivers), and because much uncertainty surrounds resource estimates for students who are financially dependent on their parents or other immediate family.
- It might be most useful to construct a specialized housing affordability indicator (or a set of such indicators) for UCD students that would take into account the dynamic contingencies associated with financing a full-time collegiate education. The report makes some suggestions about how this might be accomplished and how such measures may differ from conventional approaches to measuring housing cost burden. The most important criterion for developing a more refined affordability measure is that it would allow for regular evaluation of progress.

2.2 Student Housing Data Dashboard

The ASUCD-GSA JHTF designed the survey with the hope that future versions could be used to track and address the dynamics leading to—problematic housing issues. Consonant with that objective and the recommendation of the 2018 Chancellor's Affordable Student Housing Task Force (2018, p. 24), we recommend that the University develop and publish a student housing "data dashboard" that could draw on present and future survey work. Year-to-year, the dashboard should track the following data and assess progress toward the stated corresponding objectives.

- Continue tracking the **apartment vacancy rate** in the private Davis market via the annual *Apartment Vacancy and Rental Rate Survey* (cf. BAE Urban Economics, 2017a). At minimum, data should show year-to-year increased vacancy rates as a sign of better housing availability.
- Track the **contract rent per bedroom for two-bedroom apartments** in the private Davis market, and use it as a benchmark for the actual housing costs students should be expected to pay. Two-bedroom apartments are the most typical housing type occupied by students in the city, and the price for a bedroom in such units represents a realistic compromise on occupant density: it assumes that students, while sharing their unit, would still have their own private space within.
- Track the supply of affordable units available to students, both on campus and in the private Davis market, as defined by UCD Student Housing's benchmark of costing 85 percent or less of the Davis market contract rate; *price per bedroom* would offer the best measure for making comparisons. Data from the SHAIS should be used to estimate housing unit supply for students in the private market (since there is no other source, unless the *Apartment Vacancy and Rental Rate Survey* were modified to ask apartment owners/managers about student occupancy).
- Track the incidence of **housing affordability** using market-indexing and specialized definitions of cost burden that take into account students' *household wealth* or *potential scholastic budgets* (in contradistinction to income *per se*) and their degree of economic dependence on their parents or other immediate family. While measurement of housing affordability will not be easy or as accurate as one would hope, the methods proposed below would allow for the assessment of trends over time.
 - First, a survey method should be developed for assessing and reliably validating student resources. This may involve a total accounting approach, which sums merit- and need-based financial aid, fee waivers, and wages (including parental income, if the respondent meets conventional criteria for financial dependence). Or it may involve a more expedient proxy for household wealth: for instance, Pell Grant recipient status or a simple summary of personal, spousal, and parental income (again, depending on financial dependence).
 - A market-indexed metric for access to affordable units would offer an expedient use of SHAIS data. We propose cross-tabulating respondents' unit contract rent per bedroom with their potential scholastic budget or a proxy for household wealth. Students, categorized by varying wealth backgrounds (e.g., those receiving Pell Grants, or those in subsets such as very low income, low income, moderate income, etc.), as determined by a standard method that could be repeated year-to-year, could then be counted according to how their per-bedroom units).

Annual data should show increases in the portion and estimated counts of students in lowwealth categories who have access to units priced below the average market rate.

- A cost burden approach, analogous to that used by government housing agencies (cf. US Department of Housing and Urban Development, 2019), would place respondents' gross housing expense (or alternatively, to control for crowding, their unit contract rent per bedroom) into a ratio with their potential scholastic budget or a proxy for household wealth. Due to the special circumstances of financing a collegiate education, such a ratio would not be directly comparable with the income-based cost burden definitions used by HUD; however, it might offer a baseline for making year-to-year comparisons. Annual data should show a decline in the average ratio of housing cost to students' available resources.
- A complementary cost burden metric, designed specifically around the general budgetary considerations of graduate students (who are generally financially independent), would focus simply on the ratio of the average unit contract rent per bedroom (i.e., the mean per-bedroom rate for a two-bedroom apartment) to academic employment gross salary (indexed to that of half-time teaching assistants). Annual data should show, at minimum, a gradual reversal of the upward, inflation-adjusted historical trend.¹
- Track the **homelessness and housing insecurity rates**, with special emphasis on clarifying the duration and extent of specific conditions. Instances of acute homelessness should show immediate declines.
- Track the **percentages of students in each housing type who report specific housing problems**, particularly expense, absence of amenities (e.g., in-unit laundry, in-unit kitchen, and on-site parking), pests, management issues, unfair leasing terms, delayed maintenance, and overcrowding.
- Track the **residential location** of students living in UCD Student Housing, in the private Davis market, and outside of Davis.
 - On the assumption that most students, especially continuing undergraduates, would prefer to have access to housing near the main campus, data should indicate decreasing pressure for students to live outside the city.
 - Special attention should be paid to *count estimates* of continuing undergraduates living outside the city, since proportion alone will fail to capture the impact of year-to-year class-size fluctuations (this is especially relevant for senior and junior classes, which are the largest and most variable).
 - If the University were to provide or sponsor linked transportation and student housing options in nearby cities (such as Winters, Dixon, Woodland, West Sacramento, or Sacramento), then residency rates for students living at those specific locations (and making use of any specially developed modes of transportation) should also be estimated from the data and tracked as special segments of the student population living outside of Davis.
- Track the **distribution of occupancy per bedroom** across student role groups and housing types in order to measure progress on increased housing supply and reduced crowding.

¹Such a measure can be derived from existing sources without dependence on a survey like the SHAIS (see the report of the Chancellor's Affordable Student Housing Task Force, 2018, pp. 28–30).

- Within several years, data should show declines in the average occupant density, especially among continuing undergraduates in the private Davis market.
- The distribution of occupant densities should also be analyzed and modeled. In particular, over the long term, the proportion of respondents living in units with 2 persons per bedroom should decline, and the incidence of those living in units with more than 2 persons per bedroom should become very rare.
- Estimate the **portion of student renters among all renters** in the private Davis market and the **number of private market units they rent**.
 - Such estimates help put in perspective the importance of students in the life of the city, and they help generate statistics that inform knowledge about crowding and private market segmentation.
 - Estimating the total number of city renters requires consulting the City of Davis to acquire regular updates on the estimated number of rental units in the private market and modeling an estimate of the overall rental population, likely based on ratios of occupants-per-unit, as derived from data reported in the American Community Survey.

2.3 Improving the SHAIS

This 2017-18 version of the SHAIS represented a pilot effort, and, as should be expected, there is room for improvement. Specific recommendations are made in Chapter 9. Broadly, improvement efforts should do the following.

- Shorten the survey instrument to maximize response rates and completion rates, primarily by deemphasizing questions intended to tabulate generalized opinions and preferences regarding the state of housing in Davis.
- Develop simplified protocols and robust validation measures for open-ended questions, especially those that aim to geo-reference residential location, tabulate occupants in units and bedrooms, and account for income and housing expenditures.
- Develop a robust and/or simplified method of assembling diverse input data on student resources in order to produce informative assessments of housing cost burden.
- Improve the precision of certain homelessness and housing insecurity queries, perhaps harmonizing them with similar survey efforts on the basic needs of college students, and add follow-up questions regarding the duration of conditions of homelessness and housing insecurity.

Chapter 3

Methodology

This chapter addresses important aspects of the methodology used to administer and analyze the *Student Housing Affordability and Insecurity Survey*. The topics and discussion are organized as follows:

- Survey administration (distribution and data collection methods);
- Survey validity and universe;
- Weighting and population representativeness;
- Response rates and measurement error; and
- Comparability with other data sources.

Summary

- The SHAIS was distributed electronically to a random sample of about one-third of all UC Davis students enrolled in general campus programs.
- The 15-day participation window spanned from mid-May to early June of 2018.
- The overall effective response rate was 16.3 percent, with 1,839 complete and valid questionnaires received.
- Responses are sorted and tabulated by class-based constituent role groups (freshmen, sophomores, juniors, seniors, masters and professional students, and PhD students) and by aggregated role groups (all students, undergraduates, continuing undergraduates, graduate students).
- When reporting summaries for aggregated role groups, the survey sample has been weightadjusted according to the composition of the student population.
- Given the overall sample size, the smallest margin of error is 1.9 percent (at 90 percent confidence), though many estimates have higher measurement uncertainty because they reflect subsets of the sample.
- Margins of error vary among the different role groups since students from some classes were more likely to take the survey than others. Sophomores and masters and professional

students had the lowest response rates, thereby increasing uncertainty about their class-specific estimates.

• Weight-adjusted, population-level SHAIS estimates are comparable to other external data, including occupancy counts in UCD Student Housing, residential location in Davis and outside of Davis, apartment rents in the private Davis market, and the incidence of student homelessness in other basic needs surveys.

3.1 Survey Administration

The ASUCD-GSA JHTF administered the pilot SHAIS in late May and early June 2018. The survey opened on May 21 and concluded on June 6, giving the randomly sampled invitees a 15-day participation window.

Ideally, the survey would have been administered a little earlier in the spring quarter so that students, uninterrupted by the Memorial Day holiday and removed from the immediacy of final exams, would be better inclined to participate. An ideal starting date would be after the first week of May, with a participation window extending two weeks. (Further considerations about timing future versions are presented in Chapter 9.)

The JHTF requested that the UCD Center for Student Affairs Assessment (CSSA) provide a randomly selected, anonymous list of currently enrolled UCD undergraduate and graduate students. Accordingly, the University provided a list of 11,248 student e-mail addresses with *ucdavis.edu* domains, corresponding to approximately 33 percent of the UCD student population enrolled in general campus programs. A large sample was desired in order to minimize sampling error (i.e., standard error, or SE, and corresponding margins of error, or MOEs). The JHTF (chaired by Don Gibson and supported by Robert M. Saper in his role as graduate research assistant to the Chancellor's Affordable Student Housing Task Force) then used the University's subscription to the *Qualtrics* survey platform to write, pre-test, and refine the survey instrument.

Respondents were able to take the survey electronically, using conventional web browsers or iOS and Android mobile platforms. The audience was invited to participate via an initial e-mail message and, for those who did not begin or had not yet completed the questionnaire, two follow-up e-mail reminders (sent on May 29 and June 4). E-mail recipients accessed the instrument via unique, personalized hyperlinks that *Qualtrics* automatically generated when distributing the e-mail messages (content of the electronic messages is included in Appendix B). Within the survey flow itself, participants were greeted with an introductory message and, upon completion, a message that contained information about further involvement and participation in the gift card incentive program sponsored by ASUCD-GSA (see the Welcome Message and the Closing Message in Appendix A).

The *Qualtrics* server reported that, of the 11,248 e-mail addresses provided by CSAA, 2,415 generated survey responses (about 21.5 percent of the intended audience). Refining the responses to meet our criteria for completeness and validity (see below) further reduced the data to 1,839 respondent records. This resulted in an overall effective response rate of 16.3 percent.

3.2 Survey Validity and Universe

The **overall universe** of the survey should be thought of as '*undergraduate and graduate students enrolled in general campus progams during the 2017-18 academic year*.'

The 1,839 complete and valid records in the data-set represent students who, (1) at the time of their participation, were enrolled in UCD general campus programs, (2) completed all required survey questions, and (3) provided a valid response regarding the amount they pay for housing.

- Our choice to focus on students enrolled in general campus programs derives from an interest in surveying the population whose focus at UCD generally requires a presence on campus or nearby in the city (i.e., students who are likely to have a stake in being able to live near campus and participate in the Davis housing market). By design, students enrolled in the UC Davis School of Medicine, whose offices and classrooms are principally located in Sacramento, were not invited to participate (and records were also filtered to ensure School of Medicine students were excluded).
- 2. The analysis was *stingy* since it required that all records in the survey be complete. This allowed the meaning of proportions to be kept consistent across the analysis. To ensure completeness, we took steps in both the instrument design and in post-processing. Almost all questions in the survey instrument were mandatory (i.e., participants could not advance to the next question if they attempted to skip the present question) and included data validations that ensured responses could not be left blank or null (and which also reduced the chance of respondent input error). The cost of these stingy measures, of course, was likely a reduction in the rate of survey completion. In the data-organizing and cleaning phases, we excluded any partially completed records retained by the *Qualtrics* server.
- 3. Our final criterion for determining membership in the sample was a valid response to one of the questions about monthly housing cost (i.e., Question 32, 33, 35, or 36 in the instrument). The housing cost question was deemed essential for two reasons: first, valid text-entry data at midway through the survey interview represented a higher likelihood of respondent interest and commitment to providing complete and accurate responses; and second, having data on housing expenditures is essential for achieving key survey goals of measuring rents and student access to affordable housing. Hence, records with unexplained zero values were removed, as well as any records where impossibly high values could not be determined to be the result of simple typographical errors (however, records for very high values were retained if it could be determined, for example, that a respondent entering '\$7500 per month' probably intended to write '\$750 per month').

3.3 Weighting and Population Representativeness

The University regularly publishes headcounts of the UCD student population, including the subset of students enrolled in general campus programs (see the UCD Office of Budget and Institutional Analysis website). These population data allow proportions estimated from the survey sample to be extrapolated to real-world counts of persons affected. In using the University's student population headcounts, it is important to note that student enrollment varies over the academic year. There are headcounts for fall, winter, and spring quarters, as well as a three-quarter average. Enrollment is typically highest in the fall

and declines by the spring quarter. We opted to use the three-quarter average, as has been customary in other university-affiliated surveys, such as the CTS (cf. Wei, 2018). The reader should assume the 3Q average is being used when making population extrapolations (often denoted N), unless specified otherwise.

The University's headcounts also dis-aggregate the student population according to undergraduate class (e.g., freshman, sophomore, junior, and senior) and graduate degree objectives (e.g., academic PhD, masters, and other professional categories). This breakdown allows the survey sample to be weighted in proportion to the student body's constituent classes.

Weighting by student **role group** (*viz.* class) is important for this survey because students at various stages of their education can be expected to have differing relationships with housing. University residency requirements, age-related preferences, and the kinds of housing available to (and desired by) students at various stages of their career, will often produce commonalities within categories and important differences between categories. We know, for instance, that almost all freshmen, as first-year full time students, will live in UCD Student Housing residence halls. However, continuing undergraduates—sophomores, juniors, and seniors—are not guaranteed placement in UCD Student Housing's affiliated public-private (P3) apartment complexes (though, UCD Student Housing does offer junior, first-year transfer students guaranteed placement in the Student Housing Apartments Program). Some continuing undergraduates do find housing in P3 apartments (or opt for SHA units, if extras become available), while many others seek out housing in the private rental market (mostly, but not entirely, in Davis). Thus, when summarizing statistics for all students, or for all undergraduate students, or even just for continuing undergraduates, we can expect that the representation of students by class year will exert a strong influence on the outcome. It is therefore important to correct for imbalances in the representativeness of respondents by role group.

We use the University's 3Q student population estimates to weight the survey results according to the sizes of the principal role groups making up the student body. This means that the known portions of class membership (e.g., percentage of freshmen among those enrolled in general campus programs) are used to generate group weight factors, such that, when summarizing data for larger groups or for all students, the sample sizes of the constituent classes are effectively brought into proportion with their representation in the population. For example, freshmen represent 12.7 percent of all students in general campus programs; yet without a weighted adjustment, they, as 18.7 percent of SHAIS respondents, would be over-represented in statistics about the whole student body. Accordingly, when summarizing a survey statistic for the whole student population, the values of the statistic for freshmen are first adjusted by multiplying their quantity by 0.5895 (i.e., the ratio of the portion of freshmen in the population to the portion of freshmen in the SHAIS sample). In this example, the values of the statistic for other records would also be multiplied by their own group-specific weighting factors (e.g., one each for sophomores, juniors, seniors, masters and professional students, and PhD students). Weighting factors may be less than or greater than 1, depending on whether the role group is over-represented in the sample (less than 1) or underrepresented (greater than 1).

It is important to note that the weight factor each class receives will vary depending on the group of students being aggregated. For instance, freshmen records are assigned one weight to be used when making summaries for the whole student body (which includes all undergraduates and graduates) and another weight to be used when making summaries only for undergraduate students. Of course, no population weighting is necessary if summarizing a statistic *only* for respondents within a single class (i.e., a non-aggregated role group), because we assume that all the respondents in that role group sufficiently

represent students belonging to it (i.e., we make no further population-level distinctions within classes).¹

Below we specify the role groups and the particulars of the weighting scheme. We define six mutually exclusive and exhaustive **constituent role groups** (or non-aggregated role groups), which can be discretely tabulated using the University's student headcounts.

• Freshmen

First-year undergraduate students, for whom UCD guarantees and usually requires housing in residence halls.

• Sophomores

Second-year undergraduate students.

• Juniors

Third-year undergraduate students, some of whom are first-year transfer students who opt to live in housing guaranteed by UCD (Student Housing Apartments). They constitute the second largest class.

• Seniors

Fourth-year or greater undergraduate students. They constitute the largest class.

• Masters and Professional Students

Students in academic masters programs or in professional, general campus programs (e.g., MBA, Law, Post-baccalaureate).

• PhD Students

Graduate students in general campus academic doctoral programs.

We also define 4 *aggregated role groups*, whose summaries require that weights be assigned for the applicable constituent role groups listed above. Often, the statistics we are most interested in are for these aggregated role groups.

• All Students

Summaries for this category are a weighted aggregate of all six constituent role groups above.

• Continuing Undergraduate Students

Summaries for this category are a weighted aggregate of sophomores, juniors, and seniors. Freshmen are intentionally excluded because of their generally distinctive experience living in UCD Student Housing residence halls and their lack of exposure to the private rental market.

• All Undergraduate Students

Summaries for this category are a weighted aggregate of freshmen, sophomores, juniors, and seniors.

¹Other University population statistics, such as gender (and perhaps race/ethnicity) could also be used to weight the sample. This could be done in parallel to or in conjunction with role group weighting. In this report, though, we apply only role group weighting, since membership in each role group is large and the population portions of role groups are granular and well-documented (whereas gender and race/ethnicity is published only for undergraduates and graduates overall, not within classes). Moreover, we approach the data already with some understanding of how role group membership will produce differentiated effects specific to housing.

• All Graduate Students

Summaries for this category are a weighted aggregate of masters and professional students and PhD students.

We often report statistics for all ten role groups. The four aggregated role groups are presented in **boldface** to highlight both their general importance and the fact that their statistics are derived via population weighting.

Table 3.1 summarizes the 2017-18 role group populations and their respective size within the SHAIS sample. The table then lists the weighting factors used when adjusting any values from constituent role groups to have population-proportional representation within aggregated role groups. Listed alongside the weight factors is the resulting adjusted effective sample sizes for constituent role groups when they are used in an aggregation.

					Weight factors and effective sample sizes when aggregated to:							
	2017-18 Population		SHAIS Sample		All Students		Con't Undergrad		All Undergrad		All Graduates	
	Size (N)	Pct N_{tot}	Size (n)	$\operatorname{Pct} n_{tot}$	Wt	n_{adj}	Wt	n_{adj}	Wt	n_{adj}	Wt	n_{adj}
All Students	34250	100.0	1839	100.0								
Freshmen	4364	12.7	343	18.7	0.683	234			0.589	202		
Sophomores	5398	15.8	263	14.3	1.102	290	0.832	219	0.951	250		
Juniors	7749	22.6	378	20.6	1.101	416	0.831	314	0.950	359		
Seniors	11261	32.9	349	19.0	1.732	604	1.309	457	1.495	522		
Undergraduates, Con't	24408	71.3	990	53.8								
Undergraduates, All	28771	84.0	1333	72.5								
Masters/Pro	2315	6.8	199	10.8	0.625	124					1.075	214
PhD	3163	9.2	307	16.7	0.553	170					0.952	292
Graduates, All	5478	16.0	506	27.5								

Table 3.1: Population, sample sizes, and weighting of role groups in the SHAIS.

Notes:

* The formula for determining weight factors for each constituent role group Wt_{ij} in an aggregated role group j is the population portion of the constituent role group N_i/N_j divided by the sample portion of the constituent role group n_i/n_j .

⁺ The adjusted or effective sample size for each constituent role group $nAdj_{ij}$ in a given aggregated role group j is the product of the constituent role groups's original sample size n_i and its assigned weight value Wt_{ij} for the given aggregated role group j.

3.4 Response Rates and Measurement Error

High response rates, supposing the audience is also large, increase the likelihood that survey estimators will be near actual, real-world values. The SHAIS collected 1,839 complete and valid responses from a survey audience of 11,248 invitees, giving an overall effective response rate of 16.3 percent.²

The effective response rate was in line with other, comparable efforts to survey the UCD student body, and given the survey's strict validity requirements, was quite good. For instance, the effective response rate for the 2016-17 *Campus Travel Survey* was 14.7 percent among students, with class response rates ranging from 11.8 percent for seniors up to 24.6 percent for PhD students (Wei, 2018, p. 4). For the CTS, valid cases include those where respondents answered up to a particular question placed about halfway through the instrument. However, for the SHAIS, the ASUCD-GSA JHTF was more stringent, requiring both a valid response on a key housing cost question and *full completion of the survey* (see Section 3.2 above for details). It is important to note that the SHAIS's relatively successful response rate may have resulted from the current acuteness of housing issues.

The survey response was sufficient to produce standard errors for proportion statistics of ± 1.2 percent when summarizing for all students enrolled in general campus programs. This translates to a margin of error of ± 1.9 percent at 90 percent confidence.³ Means and proportions for individual role groups or aggregated role groups have larger SEs and MOEs as a consequence of having smaller sub-sample sizes.⁴

Differences in the response rates within student role groups produce varying levels of confidence when summarizing sub-universes. In order to provide an overall picture of the expected level of precision achieved through SHAIS data collection, Table 3.2 reports the SEs and MOEs when summarizing proportions that include all respondents within role groups (again, SEs and MOEs increase as the universe of interest becomes more narrow). For brevity, we here omit further calculation of SE and MOE for more specific cross-cutting subsets, but we often include SEs and MOEs alongside summaries of such subsets when they are presented in the report. It should also be noted that we simply followed the convention of the US Census by choosing to report MOEs at the 90 percent confidence interval.⁵

²If measuring response rate liberally in terms of respondents who entered some answers but did not complete the survey, then the gross response rate was 21.5 percent (2,415 responses).

³The SE and MOE figures quoted here assume proportions of a variable at 0.5 (50 percent). Technically, SE and MOE shrink as sampled proportions become more extreme: e.g., a proportion of 0.05 (5 percent) or 0.95 (95 percent), given our sample size of 1,839, has an associated SE of just ± 0.005 (or ± 0.05 percent). However, in order to express a general and fairly conservative sense of the uncertainty in the data, we are reporting the maximal SE and MOE.

⁴Weighting does not affect SE and MOE when making mean or proportion estimates for aggregate role groups (but it matters when calculating the estimates themselves). However, when a summary is desired for a cross-cutting subset of an aggregated group (e.g., 'all students living off campus in Davis'), then the sample n is adjusted to the sum of the relevant role group weights (e.g., those assigned when aggregating for all students). In such cases, n becomes the sum of the relevant weights for the records of interest in the category (rather than the literal count of the records in the subset), which then requires recalculation of SE and MOE based on the weight-adjusted effective n.

⁵If desired, the standard error of a mean or proportion can be calculated by dividing reported MOEs by 1.645; the SE can then be used as the basis for determining error margins at other confidence levels.

	Invited	Completed (n)	Resp Rate (%)	Std Error (%)	90 Pct MOE (%)
All Students	11248	1839	16.3	1.2	1.9
Freshmen	911	343	37.7	2.7	4.4
Sophomores	1803	263	14.6	3.1	5.1
Juniors	2436	378	15.5	2.6	4.2
Seniors	4047	349	8.6	2.7	4.4
Undergraduates, Con't	8286	990	11.9	1.6	2.6
Undergraduates, All	9197	1333	14.5	1.4	2.3
Masters/Pro	937	199	21.2	3.5	5.8
PhD	1114	307	27.6	2.9	4.7
Graduates, All	2051	506	24.7	2.2	3.7

Table 3.2: Effective response rates by role group and resulting margins of error.

Notes:

The number who completed the survey represents those who provided valid responses to all mandatory questions, including a key question on monthly housing cost, and is the same as the survey sample size (n for all students) reported elsewhere.

[†] Standard error for a proportion is calculated as $SE = \sqrt{p \times (1-p)/n}$ where p is a proportion between 0 and 1 (equivalent to between 0 and 100 percent) and n is the sample size. SE is maximal when p = 0.5. As a parameter estimate for a proportion, whose probability distribution as a consequence of many random draws is assumed to approximate normal, SE covers one standard deviation of the estimate, or about 68 percent of the potential values. Margin of error is calculated from the standard error and reduces overconfidence about the true location of the estimated value by generating a larger probability interval, in this case covering the range of values one would expect 9 out of 10 times if sampling were repeated (i.e., 90 percent Cl). On the assumption of normality, which is applicable when determining expected values or means when n is large, $MOE_{90\%} = SE \times 1.645$.

3.5 Comparability with Other Data Sources

Finally, in a number of instances, we have sought to evaluate whether the SHAIS sample approximates other information estimated about the UCD student population and the issues in question. As shown below, there are a number of very close alignments between values estimated from the SHAIS and other known data points. We highlight these matching values and parameters and direct the reader to sections of the report where they are treated. External similarities do not ensure that all data and conclusions drawn from the SHAIS are "certain," but they do increase confidence that the sample has a good likelihood of representing the general student population and broader trends.

Occupants in UCD Student Housing

The number of students who report living in UCD Student Housing units, when compared to official UCD Student Housing occupancy reports (cf. "Housing Occupancy Report," 2017), helps to gauge the representativeness of the survey sample. The official Housing Occupancy Report, which tabulates the number of total students in any University housing programs (i.e., residence halls, public-private partnership apartments, Student Housing Apartments, or Solano Park), are submitted to the California Department of Finance every fall. The reports correspond with enrollment at the beginning of the academic year. In 2017, the UCD Office of Student Housing and Dining Services reported 10,655 occupants. The estimated count based on the SHAIS responses is 9,641 (with a 90 percent CI for the sample mean between 9,050 and 10,231; see Section 4.1 in Chapter 4). At first glance, the SHAIS would appear to underestimate the count of students in UCD Student Housing. However, the survey was conducted in the spring quarter, when enrollment levels are typically at their lowest levels during the academic year. To make a more valid comparison, we calculated an attrition ratio for the difference between FQ 2017 and SQ 2018 enrollments using official UCD student headcounts. By applying the ratio of 0.9138 (SQ 32,187 / FQ 35,225) to the 2017 Housing Occupancy Report total, the occupancy count decreases from 10,655 to an adjusted spring quarter value of 9,738, which is well within the survey's 90 percent CI for the sample mean and lends external support to the representativeness of the survey sample.

Occupants in Off-campus Housing

Data from the University's *Housing Occupancy Report* and University headcounts also allow for corroboration of the number of students living outside of UCD Student Housing (either in Davis or elsewhere), while residential location data from the 2017 *Campus Travel Survey* offer a comparative source for the portion of students living outside of Davis.

As noted above, the 2017 *Housing Occupancy Report* indicates 10,655 students lived in Student Housing during fall quarter 2017. According to the fall quarter headcount, 35,225 students were enrolled in general campus programs, implying that 30.2 percent of the student body lived in UCD Student Housing units and the remaining 69.8 lived elsewhere in private Davis housing or outside of Davis (note that we used the fall quarter headcount in order to calculate percentages with the most directly synchronous data). From the SHAIS data, we estimate that those living outside of UCD Student Housing units equates to 71.9 percent of the student body (with a 90 percent CI between 70.2 and 73.6 percent); see Section 4.1 in Chapter 4. The two sources are similar, with their estimates approximating a 30-70 split between on-campus and off-campus housing choice among students enrolled in general campus programs.

According to 2017-18 CTS data (Wei, 2018, p. 25), about 11.5 percent of students (\pm 1 percent) reside

outside of Davis. From the SHAIS data, we estimate the percentage at 9.8 (with a 90 percent CI between 8.7 and 10.9 percent). There is substantial overlap in the two surveys' confidence ranges. Also note that the SHAIS percentage is in line with historical CTS data and exhibits a reasonable deviation, given the year-to-year variation in the CTS estimate over the past five iterations: 12.2 percent in 2016-17, 8.7 percent in 2015-16, 9.9 percent in 2014-15, 10.8 percent in 2013-14, and 10.0 percent in 2012-13 (Wei, 2018, p. 25). The SHAIS and CTS thus reasonably accommodate an estimate of about 10 percent of students living outside the city (though a finer-grain analysis of the CTS data up to 2016-17 indicates that the portion comprised of juniors and seniors has been growing; see the report of the Chancellor's Affordable Student Housing Task Force, 2018, pp. 35–37).

Rents in the Private Davis Market

Rent data provide another important external reference. The University's annual *Apartment Vacancy and Rental Rate Survey* (also referred to as the "Vacancy Report") asks the owners and managers of private apartment complexes in Davis how many of their units are unoccupied and the price charged for rental contracts. The responses are parsed by contract type (i.e., conventional unit leases and bed, or dormitory-style, leases) and unit size (i.e., studio, one-bedroom, two-bedroom, three-bedroom, four-bedroom, and larger "other" units). Table 8.12 in Chapter 8 reproduces the 2017 price tabulations for unit leases (see BAE Urban Economics, 2017a, p. 7).

In the SHAIS, students in private Davis apartments show rent values similar to, though not exactly the same as, the values reported in the *Vacancy Report*. It should be noted that minor differences do not threaten SHAIS validity, especially since student rents represent a particular subset of those making up the universe in the *Vacancy Report* (indeed, as explained in Sections 4.5 and 4.6 in Chapter 4 and 5.4 in Chapter 5, the off-campus housing market for students may be quite segmented and therefore deviate from the average, non-student renter experience in Davis).

According to the population-weighted SHAIS data, conventional leases average \$1,796 per unit per month, which is higher than the average reported in the *Vacancy Report* (\$1,673). Yet, on a *per-bedroom* basis, the mean SHAIS rent is \$850 \pm \$15, which is very close to, if not a bit lower than, the \$875 per-bedroom price we derived from the *Vacancy Report*. These slight discrepancies may be a consequence of students occupying Davis private market apartments in different proportions than the composition of units represented in the *Vacancy Report* (for further elaboration and discussion, see Section 8.5.3 in Chapter 8).

When broken down by unit size, SHAIS rent values track a bit high in the case of studios and one-bedrooms and are similar to, or a bit lower than, market prices in the case of two-, three-, and four-bedroom units. The mean SHAIS rate for one-bedroom units (which we combined with studio units) is $1,295 \pm 34$ (compare to 1,270 in the *Vacancy Report*). For two-bedroom units, the mean rent is 816 ± 13 (compare to 830). The mean rate for three-bedroom units tracks a bit lower than the *Vacancy Report* at 695 ± 22 (compare to 757), but for four-bedroom units it is similar at 692 ± 53 (compare to 714).

Student Housing Insecurity and Homelessness at Other Four-year Universities

The Wisconsin HOPE Lab is a non-profit organization that seeks to collect data and call attention to the basic needs insecurity of college students (conceptualized as food insecurity, housing insecurity, and homelessness). The organization's work includes annual surveys of undergraduate students across the United States (participation in the initial 2015 survey was open to all two-year schools; beginning in 2017, any four-year school could participate). Since HOPE Lab's national survey depends on the voluntary participation of individual universities and colleges (within the University of California, only the Riverside campus has thus far participated), a random sample of all US college students cannot be drawn. Nevertheless, some approximate comparisons can be made. The SHAIS shows that UCD undergraduate students experienced some form of homelessness at a rate of about 7.5 percent and some form of housing insecurity at a rate of 15 percent (18 percent if including homelessness; see Chapter 6). In comparison to other four-year participating institutions (of which there were 35 in 2017, most of them public), the UCD homelessness estimate falls well within HOPE Lab's distribution (institutional sample mean: about 9 percent of undergraduates). UCD undergraduate housing insecurity is quite a bit lower than other HOPE Lab participants (institutional sample mean: about 36 percent of undergraduates), but is in line with at least one other participating four-year school (Goldrick-Rab, Richardson, Schneider, Hernandez, & Cady, 2018, p. 12).

It is important to qualify the comparisons. First, in addition to the limitations inherent to HOPE Lab's sampling, the HOPE Lab questions on homelessness and housing insecurity were not identical to the ones used in the SHAIS instrument, though they were similar in both content and structure. Second, HOPE Lab indicates that larger, four-year flagship schools—perhaps similar in rank to UCD—tend to experience basic needs insecurity at lower rates when compared to smaller, rural, or regional colleges. Hence, while the SHAIS shows a homelessness incidence of 7.5 percent among UCD students, the California State University System, as measured in a recent independent study, averaged 11 percent (Goldrick-Rab et al., 2018, p. 5). Overall, the comparison to HOPE Lab sample of institutional averages makes the SHAIS estimates appear quite plausible, if not a bit conservative.

Chapter 4

Population and Housing of Students in General Campus Programs

This chapter summarizes general housing arrangements among students with emphasis on the tenure and kinds of units occupied and their location relative to the UCD campus. It also covers the representation of students among the general population of Davis renters. Note that here and throughout the report, the term "on campus" is used to refer to residence within the boundaries of the UCD Main Campus and West Village areas—which are outside the limits of the City of Davis—and in any units that are within the city boundaries that are affiliated with UCD Student Housing. "Off campus" refers to residence outside of the main campus area in private units unaffiliated with UCD Student Housing ("off campus" may be further specified as in Davis or outside of Davis).

The chapter's topics and discussion are organized as follows:

- Residential location: On campus, off campus in Davis, and outside of Davis;
- Renting, owning, and other arrangements in the private Davis market;
- Renters in conventional and bed leases in the private Davis market;
- Renters in apartments and detached houses in the private Davis market;
- Students in the general Davis rental population;
- Location of student renters in Davis.

Highlighted Findings

- About 28 percent of UCD students (9,642 individuals) are estimated to live in some form of UCD Student Housing, including residence halls, university-affiliated privatized apartments (P3s), units in the Student Housing Apartments (SHA) program, and university-owned Solano Park. When accounting for enrollment attrition throughout the academic year, the surveyderived estimate of students in UCD Student Housing is consistent with the occupancy data reported for 2017-18 by the UCD Office of Student Housing and Dining Services.
- About 10 percent of UCD students (3,350 individuals) choose to live outside of Davis. This proportion is consistent with the proportion estimated in the ITS *Campus Travel Survey* over

the past several years.

- Graduate students live outside of Davis at the highest rate (about 22 percent or 1,182 individuals).
- Juniors and seniors, as the largest classes, are also significant. About 7 percent of juniors and 13 percent of seniors report living outside the city, totaling an estimated 1,974 individuals.
- The high ratio of continuing undergraduates to graduates living outside the city is in line with trends and figures estimated from *Campus Travel Survey* data and likely represents levels that are above historical averages.
- The vast majority of UCD students—about 62 percent (21,324 individuals)—occupy housing in the private Davis market (a very small portion of whom live in residences owned by their families).
- Continuing undergraduates, as the largest group of students without guaranteed access to on-campus housing, warrant the special consideration of both the University and the City.
 - About 17,584 continuing undergraduates (over 51 percent of the student body) rent in the private Davis market.
 - Continuing undergraduates constitute 84 percent of student renters in the city.
- Of the students who rent in the private Davis market, about 69 percent (14,430 individuals) live in apartments (multi-family units) and about 29 percent (5,920 individuals) live in detached houses (single-family units).
- UCD students may represent 48 percent of all renters in the private Davis market, but they
 occupy only about 33 percent of the estimated number of rental units. This disproportionate unit occupancy likely indicates a segmented market, wherein, despite high demand for
 housing, certain properties are not made available to students or are priced and designed
 for non-student demographics.
- Spatial analysis of off-campus renters in Davis supports the conclusion that students are concentrated in particular private market apartment complexes.

4.1 Residential Location: On Campus, Off Campus in Davis, and Outside of Davis

Knowing where students live is of central importance for analyzing student housing problems. Such knowledge forms the basis for many other statistics in this report. Respondents were asked a number of questions that can be used to determine their residential location, including their zip code, nearest intersection, campus residence hall or apartment complex (if living in UCD Student Housing), and location relative to the campus area and the city.

For this report, three mutually exclusive residential locations are defined:

- **Davis, on campus**, which indicates residence in units owned by, governed by, or otherwise affiliated with the UC Davis Office of Student Housing and Dining Services anywhere in the Main Campus area, in the West Village area, or in Davis. There are four main categories of such units:
 - Residence halls

Large complexes housing primarily freshmen (and including academic support services), owned and operated by the university.

- Public-private partnership apartments, or P3s
 Private facilities operating for profit but under ground lease conditions set by the University.
- Student Housing Apartments, or SHAs
 Special units, usually reserved for first-year transfer students (and including academic support services), that UCD Student Housing often master leases from other owners/managers in Davis.

- Solano Park

An apartment complex housing primarily graduate students, owned and operated by the university (currently the only housing designated specifically for graduate students).

The "on campus" category also includes cooperatives and group living arrangements sanctioned by UCD Student Housing.

- **Davis, off campus**, which indicates residence in units that are within Davis but are not on the main campus and are not affiliated with the University;
- Outside of Davis, which indicates residence in units outside of Davis.

Below, Table 4.1 shows the proportions of survey respondents residing in each general location. Table 4.2 uses 2017-18 student population data (three quarter averages) to extrapolate estimated counts of students in the various role groups who live in the specified locations.

Data are based on responses to Questions 15 and 26 in the survey instrument.

Observations

About 28 percent of students in general campus programs live in UCD Student Housing, while about 62 percent live elsewhere in Davis and nearly 10 percent live outside of Davis.

Freshmen are the only role group with a majority living in UCD Student Housing (nearly 96 percent), due to the University's policy of guaranteeing housing to first-year students in residence halls. Among the remaining students, juniors experience the highest representation in UCD Student Housing units (nearly 30 percent), due to the University's policy of guaranteeing housing for first-year transfer students through the SHA program.

The survey offers residential locations for those not occupying UCD Student Housing units and living either in Davis or outside the city. An estimated 1,182 graduate students live outside of Davis (with numbers highest among masters and professional students) at double the *rate* of undergraduates. However, continuing undergraduates—especially seniors—account for the vast majority of off-campus student residents in absolute terms. Together, juniors (with about 7 percent living outside the city) and seniors (with nearly 13 percent living outside the city) total 1,974. Within the city's private market, continuing undergraduates

account for an estimated 17,881 out of 21,324 student residents, and of these, nearly half are estimated to be seniors (8,712).

	Davis, On Campus/Student Housing	Davis, Off Campus/Private	Outside Davis
All Students	28.0	62.3	9.8
Freshmen	95.9	2.9	1.2
Sophomores	18.6	78.7	2.7
Juniors	29.4	63.5	7.1
Seniors	10.0	77.4	12.6
Undergraduates, Con't	18.1	73.3	8.7
Undergraduates, All	29.9	62.6	7.5
Masters/Pro	12.1	61.3	26.1
PhD	22.1	59.6	18.2
Graduates, All	17.9	60.5	21.6

Table 4.1: Residential location of students in general campus programs (percentage).

Table 4.2: Residential location of students in general campus programs (estimated counts).

	Davis, On Campus/Student Housing	Davis, Off Campus/Private	Outside Davis
All Students	9576	21324	3350
Freshmen	4186	127	51
Sophomores	1006	4249	144
Juniors	2276	4920	554
Seniors	1129	8712	1420
Undergraduates, Con't	4411	17881	2117
Undergraduates, All	8596	18008	2168
Masters/Pro	279	1419	605
PhD	701	1885	577
Graduates, All	980	3316	1182

4.2 Renting, Owning, and Other Arrangements Off Campus in Davis

Tables 4.3 and 4.4 report the percentage and estimated counts of students in general campus programs who rent, own, or live under some other arrangement in the private Davis market. Note that the universe is composed only of student *residents in the Davis private market*. Table 4.3 gives percentages in reference to both the total student population of each role group and, in parentheses, just the selected universe of students living off campus in Davis.

Note that the only applicable respondents are those living in Davis whose housing is unaffiliated with UCD. Data are based on responses to Questions 15, 26, and 30 in the survey instrument.

Observations

Over 62 percent of all students in general campus programs live off campus in Davis. Among them, the vast majority are renters (98.1 percent). As one might expect, ownership rates are higher among graduate students (1.7 percent overall), especially PhD students (2.3 percent), who are more likely to have the requisite financial resources and long-term interests in owning a home. According to these data, nearly 1 percent of all students live in Davis under a non-rental or non-ownership arrangement (none of them being graduate students). Individual records indicate that these respondents typically live with other relatives (likely their parents) who happen to be residents in the city.

	Renters		Owners		Other	
All Students	61	(98.1)	0.3	(0.5)	0.9	(1.4)
Freshmen	2.3	(79.3)	0	(0)	0.6	(20.7)
Sophomores	77.9	(99)	0	(0)	0.8	(1)
Juniors	62.7	(98.7)	0.3	(0.5)	0.5	(0.8)
Seniors	75.6	(97.8)	0	(0)	1.7	(2.2)
Undergraduates, Con't	72	(98.4)	0.1	(0.1)	1.1	(1.5)
Undergraduates, All	61.5	(98.2)	0.1	(0.2)	1	(1.6)
Masters/Pro	60.3	(98.4)	1	(1.6)	0	(0)
PhD	57.3	(96.1)	2.3	(3.9)	0	(0)
Graduates, All	58.8	(97.2)	1.7	(2.8)	0	(0)

Table 4.3: Renters and owners off campus in Davis (total sample and category percentages).

Note:

Percentages are first given in reference to the total survey sample or sample for each role group. Percentages in parentheses represent the subset of only those students living off campus in Davis (row sums = 100 percent).

	Renters	Owners	Other
All Students	20907	116	301
Freshmen	102	0	25
Sophomores	4208	0	41
Juniors	4858	20	41
Seniors	8518	0	194
Undergraduates, Con't	17584	20	276
Undergraduates, All	17686	20	301
Masters/Pro	1396	23	0
PhD	1813	72	0
Graduates, All	3221	95	0

Table 4.4: Renters and owners off campus in Davis (estimated counts).
4.3 Renters in Conventional and Bed Leases in the Private Davis Market

Tables 4.5 and 4.6 report the percentage and estimated counts of students who rent in the private Davis market under three different lease types:

- Unit leases, or conventional leases, where the landlord issues rental contracts for the unit as a whole;
- **Bed leases**, or dormitory-style leases, where the landlord issues rental contracts to individuals, independently of the individuals' roommates or housemates; and
- **Sublets**, where individuals establish a temporary rental agreement with the primary renter of a property.

Note that the universe is composed only of student *renters* in the Davis private market (not those who own or are not obligated to pay under a formal lease agreement). Table 4.5 gives percentages in reference to both the total student population of each role group and, in parentheses, just the selected universe of students renting off campus in Davis.

Data are based on responses to Questions 15, 26, 30, and 31 in the survey instrument.

Observations

As indicated above, about 61 percent of all students in general campus programs rent in the private Davis market. These data show that about 87 percent of those renters occupy their units under conventional leases (about 54 percent of all students). About 9 percent of these renters occupy units under bed leases (almost 6 percent of all students). Very few report being in sublet agreements (about 2 percent of off-campus renters, or about 1 percent of all students).

Since this is the first public instance in which such data have been collected and reported, it cannot be known how the balance of unit and bed leases has changed over time.

	Unit Lease		Bed Lease		Sublet	
All Students	54.1	(88.7)	5.7	(9.3)	1.2	(2)
Freshmen	1.5	(62.5)	0.9	(37.5)	0	(0)
Sophomores	67.3	(86.8)	8.7	(11.2)	1.5	(1.9)
Juniors	55	(87.7)	5.8	(9.3)	1.9	(3)
Seniors	68.8	(91)	5.7	(7.5)	1.1	(1.5)
Undergraduates, Con't	64.1	(89)	6.4	(8.9)	1.5	(2.1)
Undergraduates, All	54.6	(88.9)	5.6	(9.1)	1.2	(2)
Masters/Pro	50.8	(84.2)	7.5	(12.4)	2	(3.3)
PhD	52.1	(90.9)	4.9	(8.6)	0.3	(0.5)
Graduates, All	51.5	(87.7)	6.2	(10.6)	1	(1.7)

Table 4.5: Lease types held in the private Davis market (total sample and category percentages).

Note:

Percentages are first given in reference to the total survey sample or sample for each role group. Percentages in parentheses represent the subset of only those students who rent off campus in Davis (row sums = 100 percent).

	Unit Lease	Bed Lease	Sublet
All Students	18528	1947	412
Freshmen	64	38	0
Sophomores	3633	472	82
Juniors	4264	451	144
Seniors	7744	645	129
Undergraduates, Con't	15641	1568	355
Undergraduates, All	15704	1607	355
Masters/Pro	1175	174	47
PhD	1648	155	10
Graduates, All	2823	341	57

Table 4.6: Lease types held in the private Davis market (estimated counts).

4.4 Renters in Apartments and Detached Houses in the Private Davis Market

Tables 4.7 and 4.8 report the percentage and estimated counts of students in general campus programs who rent in the private Davis market, according to dwelling type. Three residential categories are used:

• Apartments, or multi-family units, which are defined as any units that share walls with other units (including duplexes as well as larger blocks and complexes);

- **Detached houses**, or single-family units, which are defined as units that stand alone, usually on individual lots (including conventional houses but also accessory dwelling units, sometimes referred to as "granny flats"); and
- Other, which may refer to mobile homes, boats, or non-conventional structures.

Note that the only applicable respondents are *renters* in the Davis private market (not those who own or are not obligated to pay under a formal lease agreement). Data are based on responses to Questions 15, 26, and 30 in the survey instrument.

Observations

The data show that the majority of off-campus student renters in Davis, about 69 percent, live in apartments (about 42 percent of all students). Over 28 percent of off-campus student renters (17 percent of all students) live in detached houses. If the universe were limited only to off-campus apartment and detached house renters (i.e., excluding the relatively few renters who live in other dwelling types), then the ratio becomes about 71 percent apartment residents to 29 percent detached house residents.

Undergraduate students renting off campus occupy apartments at a higher rate than graduate students (about 72 percent compared to 59 percent). The smaller population of graduate students means their demand for apartments and houses is roughly similar in absolute terms (for both types, graduate occupants number between 1,000 and 2,000). However, for the larger undergraduate population, the data suggest that the stronger demand for apartments (especially among continuing undergraduates) translates to a substantial impact on the market: about 12,600 undergraduates occupy off-campus apartments, while about 4,600 live in off-campus detached houses.

In total, then, the data show that nearly 14,500 students occupy apartments and nearly 6,000 students occupy detached houses in the private Davis rental market.

	Apartments		Detached Houses		Other	
All Students	42.3	(69.3)	17.3	(28.4)	1.4	(2.3)
Freshmen	1.7	(73.9)	0.3	(13)	0.3	(13)
Sophomores	57.8	(74.6)	18.6	(24)	1.1	(1.4)
Juniors	43.4	(69.2)	18.5	(29.5)	0.8	(1.3)
Seniors	54.2	(71.6)	19.2	(25.4)	2.3	(3)
Undergraduates, Con't	51.5	(71.5)	18.9	(26.2)	1.6	(2.2)
Undergraduates, All	44	(71.7)	16	(26.1)	1.4	(2.3)
Masters/Pro	36.2	(60)	22.1	(36.7)	2	(3.3)
PhD	31.3	(54.5)	25.1	(43.7)	1	(1.7)
Graduates, All	33.6	(57.1)	23.8	(40.5)	1.4	(2.4)

Table 4.7: Renters in apartments and detached houses in the private Davis market (total sample and category percentages).

Note:

Percentages are first given in reference to the total survey sample or sample for each role group. Percentages in parentheses represent the subset of only those students who rent off campus in Davis (row sums = 100 percent).

	Apartments	Detached Houses	Other
All Students	14495	5920	471
Freshmen	76	13	13
Sophomores	3120	1006	62
Juniors	3362	1435	62
Seniors	6098	2162	258
Undergraduates, Con't	12580	4603	381
Undergraduates, All	12656	4615	394
Masters/Pro	838	512	47
PhD	989	793	31
Graduates, All	1838	1305	77

Table 4.8: Renters in apartments and detached houses in the Private Davis Market (estimated counts).

4.5 Students in the General Davis Rental Population

The survey data can be used to estimate the *number of units* occupied by students in the private Davis market. To make this extrapolation, data are entered into the formula $N_{Unit} = N_{Occ}/D_{OccUnit}$, which depends on derivations of the student renter population (N_{Occ}) and the average occupant density per unit ($D_{OccUnit}$). We use this approach to estimate unit quantities for both apartments and detached houses (also see Chapter 5, which more fully reports on the occupant density quantities used here).

The resulting estimated counts of units can then be used in comparison with other external data, such as the City of Davis' estimates of total rental units, to assess the portion of the total Davis rental units occupied by students and the portion of the total Davis rental population represented by students.

Data are based on responses to Questions 15, 19, 26, and 30 in the survey instrument.

Observations

The overall occupant density in off-campus apartments, as calculated from the SHAIS, is 3.61 individuals per unit; in off-campus detached houses, the overall occupant density is 4.39 individuals per unit. There were an estimated 14,495 students in apartments and 6,014 students in detached houses, as calculated according to the portion of the total campus-based student population represented by off-campus apartment and detached house residents and applied to the 2017-18 three-quarter student headcount (see Section 4.4 above). Together, these figures imply that UCD students occupy about 4,015 apartment units and 1,370 detached houses in the private Davis market (about 5,385 of all rental units).

	Occupants per unit	N occupants	N units
Apartments	3.61	14495	4015
Detached Houses	4.39	6014	1370
Total		20509	5385

Table 4.9: Estimated student occupancy and unit counts in the private Davis rental market.

These values can be put into perspective with the general Davis renting population, which itself can be approximated using two sources: the rental population and rental dwelling counts in the American Community Survey, or ACS (US Census Bureau, 2016), and the City of Davis' more up-to-date (and likely more accurate) estimates of the number of rental units (provided to the author by Stacey Winton, personal communication, 2018).¹ We gain further insight by considering the proportion of Davis renters the students represent, not just the proportion of available units they occupy. There is a significant mismatch between the *population ratio* of student renters to other Davis renters and the *unit ratio* of student-occupied rental units to other rental units. This mismatch is apparent whether using only the ACS data to estimate renter population and unit counts or when combining the ACS data with the City's data to make the estimates, as explained below and summarized in Table 4.10.

To produce a rental unit estimate based on ACS data that corresponds with the timing of the survey sample, we used an unbiased linear regression of 1-year ACS rental unit count estimates covering the years 2010-2016 for the City of Davis census-designated geography (US Census Bureau, 2016, Table B25042).² For 2018, the model predicts a mean probability of 14,038 rental units. If true, UCD students occupy 38 percent of all rental units in the city (5,385 out of 14,038 total).

Likewise, to produce a rental population estimate that corresponds with the timing of the survey sample, we used an unbiased linear regression of 1-year ACS renter estimates covering the years 2010-2016 (US Census Bureau, 2016, Table B25008).³ For 2018, the model predicts a mean probable rental population of 38,990. If true, UCD students make up about 53 percent of the Davis rental population (20,509 out of 38,990; see Section 4.2 above). *However, they would have access to a disproportionately smaller number of renter units* (53 percent of renters occupying only 38 percent of all rental units).

The City's April 2018 data (S. Winton, personal communication, 2018) offer alternative, and likely more accurate, figures for unit counts. These can be used *vis-à-vis* the SHAIS data to determine the portion of private market rental units occupied by UCD students. The City estimates that in the private Davis rental market there are 11,757 multi-family units and 4,364 single-family units, for a total of 16,274 rental units. By this count, student-occupied units represent about 33 percent (5,385 out of 16,274 total units).

The City's rental unit counts serve as the basis for an alternative calculation of the number of renters in the private Davis market. This is done in conjunction with an ACS-derived estimate of the occupant density in rental units for 2018—2.80 persons per unit—as predicted using a linear regression of those ratios.⁴ When this density is multiplied by the City's unit count, the estimated renter population for Davis

⁴The linear modeling approach used to estimate unit occupant density over time mimics the approach used to estimate rental unit quantities and the renter population from ACS data (see preceding footnotes). Recalculated standard errors for each, derived single-year ratio of renters-per-unit were incorporated into the model in order to pool ACS uncertainty, thereby

¹Stacey Winton provided the City's count of rental units via e-mail exchanges on June 15 and June 19, 2018. They are based on a review of utility records: "[The City] determine[s] if a unit is a rental by comparing the site address to the utility billing address. If they are different, we assume it is a rental. Utility bills are required by our Municipal Code to go to the property owner's address. We also look at the County's homeowner exemptions on the property." According to Winton, the City's rent count data were processed in April 2018.

²We built the linear regression model of time and rental unit quantities using a Bayesian approach that incorporated flat, data-centered priors and, for each ACS 1-year sample data point, the accompanying standard errors. This approach minimizes trend exaggeration and accounts for all the measurement uncertainty reported by the Census. The model was processed using MCMC sampling in the *rethinking* package (McElreath, 2016).

³The modeling approach for time and renter population mimics the approach used to estimate rental unit quantities. See previous footnote.

becomes 45,567. This is over 6 thousand higher than the prediction made using only ACS unit estimates. If true, it is reasonable to claim that UCD students make up about 45 percent of Davis renters. While this is a more moderate portion than would be the case using ACS-only population estimate (53 percent, as quoted above), the higher City of Davis rental unit counts also imply that UCD students access only 33 percent of the rental units in the private Davis market (less than the 38 percent calculated in the ACS-only model).

conservatively estimating any trend effects. We assume that the ratio of renters-per-unit implied by the ACS can be used independently of ACS estimates of the renter population and total rental unit count *per se*; presumably, ACS ratios, being derived from within the same sampled universe, would hold independently of whether the ACS accurately extrapolated either renter or unit count estimates to the population.

	Renters						
	N_{Stu}	N_{All}	Pct_{Stu}	N _{StuUnit}	N _{AllUnit}	$Pct_{StuUnit}$	Differential
M1: ACS data	20509	38990	52.6	5385	14038	38.4	0.730
M2: ACS + City data	20509	45567	45.0	5385	16274	33.1	0.736

Table 4.10: Percentages of students and student-occupied units among all renters and rental units in the private Davis market: Two models based on total rental population estimates.

Notes:

^{*} The 'Differential' is the ratio of the percentage of student-occupied units to the percentage of the renter population comprised of students. If student supply were proportional to the off-campus student renter population, the differential would equal 1. Under near-zero vacancy conditions, differential values less than 1 indicate relative crowding and/or market segmentation.

⁺ As explained in the text, M1 estimates the Davis rental population and rental unit counts using data extrapolated to 2018 from trends in ACS 1-year samples (2010-2016). M2 extrapolates occupant density (i.e., the ratio of renters and rental units derived from the ACS) and uses it in conjunction with City of Davis 2018 rental unit counts to derive an alternative 2018 total renter population estimate.

⁺ The estimated populations of off-campus student renters in Davis and units they occupy are derived from the SHAIS. They are held constant in both models.

In either of the population scenarios used above, results are roughly similar: rental unit supply in the private Davis market does not meet student demand in proportion to students' share of the rental population. Only about 7/10^{ths} of the private units required for students—assuming students would desire occupant densities similar to the rest of the population—are made available. While this may demonstrate college students' tolerance for higher occupant densities, it is equally if not more plausible that students are crowding as the result of being forced to live in a segmented market under conditions of maximal occupancy. Market segmentation is important to note because it complicates the simple economistic view that, if the general private housing supply were to increase in Davis, then unit availability and price reductions for students (as well as other renters) would follow. Instead, planning efforts will likely need to focus on supplying units that are designed specifically for students. Further observations about market segmentation are addressed below and in Section 5.4 of Chapter 5.

4.6 Location of Student Renters in Davis

We used SHAIS geographic data to approximate where student renters occupy private apartments and detached houses in Dvis. Respondents were asked to provide the name of their residential street and the nearest cross street, as well as their zip code.⁵ These data were then used as inputs for the Google Maps geo-coding API to return latitude and longitude point locations (see the Google Maps Platform website);

⁵This method of collecting coordinate data for roadway intersections, rather than specific addresses, offers fine-grained approximations for residential location while also helping to anonymize responses.

if necessary, additional, corroborating information was used to confirm location (e.g., having indicated university-affiliated housing or private housing, living on- or off-campus, living in or outside of Davis).

The resulting maps of sampled residential locations can be used to estimate the population of students living in various parts of the city and to assess patterns in the spatial distribution of student renters.

Data are based on responses to Questions 15, 16, 17, and 26 in the survey instrument.

Observations

Figure 4.1 displays the raw sample of residential locations of renters in Davis, coded by unit type (a very small number of respondents are excluded because, though they live in Davis, they either own their dwelling or live in a dwelling without any obligation to pay rent). Students in private apartments are concentrated at various places throughout the city, most notably along Covell Boulevard due north of the central campus area, north of downtown Davis, and in South Davis. Respondents renting detached houses are more spread out. The patterns are consistent with Davis's residential zoning, which can be described as a patchwork of medium- and high-density areas interspersed amid more expansive low-density neighborhoods. Students in residence halls are located in the central campus area with exceptions at the Cuarto Area, just north of central campus at Russell Boulevard. Respondents in P3s straddle corners of the intersection of CA highway 113 and Russell Boulevard, with many at West Village, in the central campus area, and mixed alongside private market units north of Russell Boulevard. Respondents in SHAs are clustered both within the central campus area and in areas further away, including West Village and other areas west, north, and east. In general, visual inspection of the sample gives the impression that students live near campus and in north-central Davis with more frequency than they do on the east side of Davis.

The maps in Figures 4.2, 4.3, and 4.4 use quadrat counts of the point locations in the SHAIS sample,⁶ in conjunction with the University's student population headcounts and the survey weighting scheme, to estimate the geographic distribution of students renting private market units in Davis. (Note that these measures exclude any respondents in university-affiliated residence halls, P3 apartments, or SHA units.) Figure 4.2 shows the estimated distribution for apartment renters; Figure 4.3 shows the estimated distribution for those in detached houses; and Figure 4.4 aggregates the preceding figures to show the total estimated distribution of student renters in the private market.

Figure 4.2 is noteworthy because several high population areas are very prominent. These include the apartment clusters north of central campus (especially the group at grid points D2, D3, E2, and E3 and the group at D4, D5, E4, and E5) and cells in downtown Davis (G4) and in South Davis (H6). Additionally, since the map has been overlain with medium- and high-density residential zones, as specified in the City of Davis general plan, one can judge the correspondence between population levels and the placement of higher density units. While the grid cells showing student occupancy closely align with many of these higher density zoning areas, there are several higher density areas without evident student occupancy: those near F2, H2, I2, J3, J4, and K5 (these tend to be in parts of the city to the east and north of central campus).

Renter population densities can be used to further explore the geographic distribution of students in Davis. Figure 4.5 plots quadrat summaries of the estimated renter population densities for those in private

⁶That is, calculations are based on the counts and ratios of the sampled data points that fall within the individual cells making up a grid overlay. We designed the grid's resolution so as to balance granularity with areal coverage (i.e., so that coverage was sufficient enough to draw on multiple data points within each cell location).



Figure 4.1: Map of Davis and the UC Davis central campus area showing sampled location and unit types of SHAIS respondents, including those in university-affiliated housing and those renting in the private Davis market.



Figure 4.2: Map of Davis showing the estimated population distribution of student apartment renters in the private Davis market.



Figure 4.3: Map of Davis showing the estimated population distribution of student detached house renters in the private Davis market.



Figure 4.4: Map of Davis showing the estimated population distribution of all student renters in the private Davis market.

apartments, private detached houses, and P3 apartments against the quadrats' distance from central campus (i.e., the intersection nearest the Silo Unitrans Terminal). The summarized densities are in *persons per hectare* (which can be imagined as the number of students living over an area similar in size to the infield of a 400-meter athletic track). The data suggest that:

- Past a distance of 3.5 km from the campus center, students tend to occupy apartments at lower densities and frequency: less than 20 percent of student-occupied apartment areas in Davis are further than 3.5 km from central campus (to the right of the blue vertical line), and all of these areas house fewer than 20 students per hectare. This is consistent with the interpretation made above regarding students not occupying units in certain apartment areas located relatively far from campus. However, these data reveal that even where some students do access further units, they tend only to access them in small numbers.
- At the same time, areas with private apartment occupancy near campus do not seem to have the capacity to attract large concentrations of students. Apartment areas in only 2 of the high density quadrats (defined as housing more than 20 persons per hectare; data points above the gold horizontal line) are within 2 km of central campus, while the remaining high density private apartment zones are between about 2 and 3 km from central campus.
- About 35 percent of private apartment areas throughout Davis have student renter densities of less than 3 persons per hectare (data points below the red horizontal line). This likely results from the prevalence of low-density multi-family unit designs (*viz*. the infrequency of higher density apartment complexes).
- Unsurprisingly, for areas where students occupy detached houses, overall densities are quite low. They are fairly uniformly distributed between 1 and 3 km away from central campus, though some notably higher densities occur between 2.5 and 3 km away (these are also geographically associated with high density apartment areas, as indicated above in reference to Figure 4.2, perhaps a consequence of special forms of mixed low- and medium-density housing types in the general vicinity of the intersection of Anderson Road and Covell Boulevard). As is the case with student residence in private apartments, student presence in detached houses decreases with distance from central campus, especially after 3.5 km.
- P3 apartment areas are much closer to central campus than many private apartment areas (all are less than 2 km away). It is surprising, though, that student population densities in P3 areas are well below 20 students per hectare (marked by the gold horizontal line), since higher renter densities are achieved in other areas (especially in quadrats with private apartment residents that are less than 3.5 km from campus, but also in some detached house areas). This may be evidence of students tending to live at greater occupant densities in lower-priced off-campus apartments.

Thus, areas with the highest concentrations of students in on- or off-campus apartments or detached houses (excluding consideration of those in residence halls, SHAs, and Solano Park) are located between about 2 and 3 km from central campus, with students being accommodated most densely in areas with private apartments.



Figure 4.5: Population density of student renters in P3s, private Davis apartments, and private Davis detached houses, plotted against distance from central campus (Silo Terminal).

Chapter 5

Occupant Density and Crowding

This chapter summarizes student occupant density by unit and bedroom, and it explores the number of students subject to crowding. The topics and discussion are organized as follows:

- Defining crowding and overcrowding using occupant density;
- Occupancy per unit;
- Occupancy per bedroom;
- Crowding metrics for student renters in the private Davis market;
 - Relative overcrowding;
 - Estimates of overcrowded units;
 - Location of overcrowded units.

Highlighted Findings

- As might be expected, freshmen occupy residence halls at higher densities than other students occupying other types of units; this is in accordance with the design of residence halls and the University policy of housing the vast majority of freshmen.
- For all other undergraduates, however, students occupy off-campus units (both apartments and detached houses) at higher densities than university-affiliated apartments.
- In contrast, graduate students tend to occupy on-campus and off-campus units at similar densities, and their occupant densities in the private Davis market are also similar to the occupant density of the general rental population.
- Continuing undergraduates, especially juniors and seniors, are the most intensely affected by high occupant densities (i.e., crowding).
- Of all on-campus and off-campus unit types, apartments in the private Davis market tend to be the most crowded. Private, detached houses follow.
 - A conservative estimated count of the number of extremely crowded student units in Davis—based on a threshold of having *more than 2* occupants per bedroom—is 199 units. Most of these, about 73 percent, are apartments.

- Using a slightly lower threshold of *at least 2* persons per bedroom results in an estimate of 1,716 affected units, of which about 85 percent are apartments.
- Estimates of the geographic distribution of occupant density in the private Davis market suggest:
 - For those renting detached houses, there is a higher frequency of crowding in several locations just north of 5th Street in downtown Davis and in the vicinity of the intersection of Anderson Road and Covell Boulevard north of central campus, and
 - For those renting apartments, the incidence of crowding is more geographically dispersed, manifesting with similar frequencies in West Davis, North Davis, and near campus in South Davis. High frequency is also noted in apartment areas on the northern edge of downtown Davis.

5.1 Defining Crowding and Overcrowding Using Occupant Density

Residential crowding, whose assessment depends on measurements of occupant density, is a major theme of this chapter. Thus, we first elaborate on the meaning and thresholds associated with the term before turning to straightforward summaries of occupant density. The final section returns to the theme of residential crowding and presents, for exploratory purposes, alternative conclusions based on differing crowding definitions and associated metrics.

Crowding—or undesirable levels of occupant density—is a concern with respect to communicable disease transmission, negative effects on mental health, differential health outcomes for women and children, greater risk of homelessness, and personal privacy and development. Yet, evidence for correlations between such problems and high occupant densities does not converge to a definitive density threshold for "crowding" or "overcrowding" (Gray, 2001; see also Office of the Deputy Prime Minister, 2004; Shewchuk, Ojha, & Prentice, 2015). Moreover, studies usually rely on relative statistical assessments of the concept or regulatory and administrative threshold definitions (which often are not accompanied by an explanatory rationale). Furthermore, thresholds used in research or government do not typically address correspondence with subjective perceptions of crowding, nor do they overcome problems associated with confounding variables such as age, household composition, household design and size, and cultural and normative differences regarding desirable living arrangements (Gray, 2001). There is thus no universally applicable level of occupant density that distinguishes crowded and uncrowded conditions.

The US Government formally counts crowded dwellings as those with more than 1 person per room (a 'room' being expansively defined as a 'finished' space used for 'living purposes': e.g., bedrooms, kitchens, living rooms, recreation rooms, offices, and even enclosed porches suitable for year-round habitation). Dwellings with more than 1.5 persons per room are considered "severely overcrowded" (Shewchuk et al., 2015). Other measurements of crowding have also been documented in the US context (some of which might be considered more informative than the official US definition; cf. Shewchuk et al., 2015). These include occupants per unit, persons per room by unit square footage, unit square footage per person, and occupants per bedroom (Blake, Kellerson, & Simic, 2007).

In order to take best advantage of the SHAIS data, this report uses *occupants per bedroom* to define several levels of crowding.¹ First, we define two **"absolute overcrowding"** thresholds: (1) as the condition of having *at least 2* occupants per bedroom in a unit, and (2) more conservatively, as the condition of having *more than 2* occupants per bedroom in a unit. Then, we consider **"relative overcrowding"** in terms of comparative occupant density between groups (e.g., continuing undergraduates versus graduate students).

The focus on **absolute overcrowding** (either at 2 persons per bedroom or at more than 2 persons per bedroom) arises from a concern for the comfort and privacy of college students, which may be important for their psychological well-being and scholastic performance. The SHAIS data for the private Davis rental market, as discussed below, demonstrate that students are reluctant to occupy units at densities up to and greater than 2 persons per bedroom. One could argue that for college students, the vast majority of whom are single adults, the normative expectation for occupant density should not be 2 persons per bedroom, but rather 1, especially in private market units that are not designed for high-density living. One may likewise be concerned that even in generally crowded conditions, students nevertheless pay for housing at rates that would elsewhere allow them to rent their own bedroom (see Section 8.5.2 in Chapter 8).

At the same time, it is important to consider average per-bedroom densities and the distribution of such densities against other ideas of "normal." Thus, to evaluate **relative overcrowding**, external references, such as the average per-bedroom density among all renters in the private Davis market, as well as intramural references, such as the occupant density of graduate students, can be used in order to assess the degree to which all students or students in other aggregated role groups experience significantly greater densities.

The use of overcrowding thresholds is for *analytic purposes* and does not serve as representation of a consensus (either in the academic literature or among college students) about what levels of occupant density are acceptable. Accordingly, the cut-offs we employ here should not be understood as singular targets. That is, it would be inappropriate to measure progress on crowding or overcrowding only in terms of reducing the number of units with more than 2 occupants per bedroom without also reducing the number of units with more than 2 occupants per bedroom without also reducing the number of units with at least 2 occupants and the number of units with higher than average density in the general student population. In other words, a better focus for measuring success would be to cause a leftward shift (i.e., a general decrease) in the distribution of occupant densities, such that more students occupy UCD Student Housing units and off-campus units at rates that accord with designed capacity, student preferences, and the averages observed for other residents in Davis and the region.

5.2 Occupancy per Unit

Tables 5.1 and 5.2 report mean ratios of the number of total occupants per rental unit. Such measurements are useful for assessing occupant density in a general sense and making comparisons with the private housing market in Davis, though they do not control for the size of the units (i.e., number of

¹Per-bedroom occupancy is the most informative measure available through the SHAIS (*vis-à-vis* other occupant density measures used in the housing literature), since the instrument did not collect data on number of rooms beyond bedrooms and baths, nor did the SHAIS ask respondents about the square footage of their units.

bedrooms). However, occupancy per unit is very useful for making extrapolations regarding rental populations (see Section 4.5 in Chapter 4).

Table 5.1 summarizes occupancy per unit for the four main categories of UCD Student Housing arrangements: residence halls, P3 apartments, SHAs, and Solano Park apartments (see Section 4.1 in Chapter 4 for descriptions of these housing types).

Table 5.2 itemizes occupancy per unit for renters in the private Davis market, according to residency in apartments (multi-family units) and detached houses (single-family units).

Data are based on responses to Questions 15, 18, 19, 26, 28, 29, and 30 in the survey instrument.

Observations

Table 5.1 follows predictable patterns.

Freshmen make up the vast majority of those living in residence halls (and effectively zero freshmen reported living in other university housing). They occupy residence halls at a rate of about 2.6 persons per unit. This high density level is to be expected, considering that UCD Student Housing offers one-person, two-person, and three-person roommate configurations accompanied by lower housing fees if students choose to live with more roommates. Also, in response to the high demand for housing, UCD Student Housing has increased the densities in many residence halls to levels beyond their original design capacity by adding more beds (as tabulated in the "Housing Occupancy Report," 2017). It should be noted, though, that *density per unit* for residence halls—because many units are comprised of a single room—tends to approximate *density per bedroom*; this is different from apartment and detached house unit densities, where multiple bedrooms comprise many of the units.

The occupants of P3s are mostly continuing undergraduates and graduate students. The mean density for continuing undergraduates is 4.29 persons per unit, with the data suggesting that densities decrease slightly as class level increases (e.g., sophomores tend to live in P3s at higher densities than seniors). Graduate students occupy P3s at an average rate of 3.27 persons per unit, about 1 person per unit less than continuing undergraduates. The density differences may reflect divergent tendencies: undergraduate P3 residents tend to occupy 2- and 3-bedroom apartments at a rate closer to 2 persons per bedroom, while graduate P3 residents tend to occupy 1- and 2-bedroom apartments at a rate closer to 1 person per bedroom (see Section 5.3 below).

The majority of SHA occupants are juniors, which is consistent with the SHA program being designed to offer housing to first-year transfer students. Junior SHA occupants indicate an average unit density of 2.97 persons. Some other continuing undergraduates, and perhaps a few graduate students, also occupy these units, but at much higher densities (this tendency may reflect allocation of unclaimed SHA units to non-transferring continuing undergraduates and graduate students seeking to economize).

Finally, Solano Park is occupied primarily by graduate students, especially PhD students (which is to be expected, since Solano is currently the only graduate-specific student housing complex on campus). The occupant density is about 2.07 persons per unit, which is quite low in comparison to the other on-campus apartment arrangements.

		Res Halls			P3 Apts			SHAs			Solano		
	n	Mean	MOE	n	Mean	MOE	n	Mean	MOE	n	Mean	MOE	
All Students	251	2.64	0.12	150	4.09	0.24	81	3.08	0.23	24	2.10	0.30	
Freshmen	327	2.60	0.10	2	4.50	0.82	0			0			
Sophomores	13	3.77	0.77	27	4.78	1.02	7	3.57	0.79	0			
Juniors	6	1.17	0.27	41	4.20	0.31	58	2.97	0.28	3	2.33	0.55	
Seniors	3	3.00	1.64	24	4.08	0.44	5	3.40	1.12	2	2.00	0.00	
Undergraduates, Con't	20	2.96	0.63	88	4.30	0.34	61	3.07	0.27	5	2.16	0.24	
Undergraduates, All	215	2.64	0.13	102	4.31	0.31	69	3.07	0.26	6	2.16	0.22	
Masters/Pro	1	2.00		18	3.22	0.41	1	4.00		3	2.67	1.45	
PhD	1	4.00		37	3.30	0.28	1	4.00		27	2.00	0.32	
Graduates, All	2	2.94	0.82	55	3.27	0.22	2	4.00	0.00	29	2.07	0.31	

Table 5.1: Mean occupants per unit in UCD Student Housing.

Notes:

* The sample size n is population weight-adjusted for aggregated role groups. Because of weighting, the sum of n for constituent role groups may not total to the reported n for the aggregated groups they comprise.

⁺ Margins of error are computed at 90 percent confidence. In some instances, MOE may not be reported due to there being only a small sample of exactly equal values. Small *n* figures are included to provide a thorough view of the response distributions, but generalizations should only be made for role groups with larger sample sizes.

Table 5.2 shows that, in general, private market rental apartments in Davis host students at lower unit densities than detached houses (but this is simply an artifact of houses having, on average, more bedrooms).

Within the private market, undergraduates tend to occupy both apartments and detached houses at a density of over 1 more person per unit than graduate students (3.79 v. 2.41 in the case of apartments and 4.67 v. 3.42 in the case of detached houses).

Apartment unit densities in the private Davis market are lower than they are for apartments available through UCD Student Housing (see Table 5.1). Here we make a comparison with P3 apartments because P3s are the most common university-affiliated apartment type and because P3s are leased by both continuing undergraduate and graduate students. When considering all students, off-campus apartment residents occupy units at an average rate of 3.61 persons per unit, whereas for P3s the figure is 4.07 persons per unit. When considering just continuing undergraduate students, off-campus apartment residents occupy units at an average rate of 3.79 persons per unit, whereas for P3s the rate is 4.29 persons per unit. Among graduate students, off-campus apartment residents occupy units at an average rate of 3.79 persons per unit, whereas for P3s the rate is 4.29 persons per unit.

The differences do not mean that on-campus housing is more crowded than off-campus housing, since the higher densities in on-campus housing are likely the result of designing relatively large student units that comfortably accommodate more residents than those in the private market. Crowding is better understood by measuring and comparing occupancy per bedroom (next section).

	A	partmer	nts	Det	Detached Houses			
	n	Mean	MOE	n	Mean	MOE		
All Students	778	3.61	0.08	318	4.39	0.14		
Freshmen	6	2.67	1.01	1	7.00			
Sophomores	152	4.01	0.19	49	4.80	0.32		
Juniors	164	3.77	0.17	70	4.83	0.29		
Seniors	189	3.69	0.17	67	4.49	0.30		
Undergraduates, Con't	510	3.79	0.10	187	4.66	0.17		
Undergraduates, All	586	3.78	0.09	214	4.67	0.16		
Masters/Pro	72	2.58	0.23	44	3.52	0.28		
PhD	96	2.24	0.15	77	3.35	0.26		
Graduates, All	170	2.41	0.13	121	3.42	0.19		

Table 5.2: Mean occupants per unit in the private Davis rental market.

Notes:

* The sample size *n* is population weight-adjusted for aggregated role groups. Because of weighting, the sum of *n* for constituent role groups may not total to the reported *n* for the aggregated groups they comprise.

⁺ Margins of error are computed at 90 percent confidence. In some instances, MOE may not be reported due to there being only a small sample of exactly equal values. Small n figures are included to provide a thorough view of the response distributions, but generalizations should only be made for role groups with larger sample sizes.

5.3 Occupancy per Bedroom

Tables 5.3, 5.4, and 5.5 report ratios of respondents' unit occupancy to the number of bedrooms in their respective units. This measure of occupant density allows one to generate relative measures of crowding between various housing arrangements and in relationship to external sources (e.g., the American Community Survey). Also, given a threshold for overcrowding, knowing the number of occupants per bedroom allows one to estimate how many students occupy overcrowded units and, through extrapolation, how many overcrowded units (or so called "mini-dorms") are in the private Davis market.

Table 5.3 summarizes occupancy per bedroom for all students in UCD Student Housing and rental units in the private Davis market. No differentiation is made for apartments and detached houses. Such aggregated data may be useful for making comparisons with ACS data (which does not include tabulations of occupancy by both unit type and number of bedrooms).²

Table 5.4 summarizes occupancy per bedroom for the four main categories of UCD Student Housing arrangements: residence halls, P3s, SHAs, and Solano Park apartments (see Section 4.1 in Chapter 4 for descriptions of these housing types).

²ACS table B25042, for instance, does not differentiate whether those occupying 2-bedroom units are in detached houses or multi-family units. Only a total count for all rental units can be derived.

Table 5.5 itemizes occupancy per bedroom for renters in the private Davis market according to apartments (multi-family units) and detached houses (single-family units).

Data are based on responses to Questions 15, 18, 19, 26, 28, 29, 30, and 43 in the survey instrument.

Observations

At the highest level, the data show average higher occupancy per bedroom among students living in UCD Student Housing. However, this is primarily the result of the high occupant densities of freshmen living in residence halls. The data in Table 5.4 show that freshmen occupy residence hall units at a rate of 2.18 persons per bedroom, whereas the mean occupant density for all other constituent role groups in all other housing types never exceeds 2.

In fact, the data show that occupancy per bedroom for other role groups is generally higher in private market units, especially so for continuing undergraduates. Below, we make a comparison of private unit types (i.e., apartments and detached houses) with P3 apartments because P3s are the most common university-affiliated apartment type and because P3s are leased by both continuing undergraduate and graduate students. (For graduate students, it is also important to consider Solano Park in comparison with private market units.)

The data for continuing undergraduates show a mean on-campus density of 1.33 persons per bedroom and a mean private market density of 1.62 persons per bedroom. When making the comparison between P3s and private Davis units, we observe that continuing undergraduates occupy P3s at a rate of 1.37 persons per bedroom, in contrast to 1.66 persons per bedroom in private market apartments and 1.52 persons per bedroom in private market detached houses.

The contrast is not as stark for graduate students. The data show an average on-campus occupant density of 1.28 persons per bedroom and an average private market density of 1.24 persons per bedroom. These averages are effectively the same, given the uncertainty around their estimates. However, when comparing P3s with the private market, occupant densities in private apartments are likely a bit higher. The mean P3 density is 1.18 occupants per bedroom, while off-campus apartments have an average density of 1.28 (the average density for detached houses is 1.20, effectively the same as P3 units). The situation is reversed when comparing densities in Solano Park: there, graduate students tend to live 1.48 per bedroom (though with a high degree of uncertainty about the estimate). The higher occupant density of Solano Park units may result from Solano's appeal to budget renters, who might be willing to endure more occupants to reduce costs, and the complex's orientation to graduate students, who are more likely to cohabitate with partners and children.

We explore the implications of these and other per-bedroom occupancy rates for crowding in the next section.

	UCD	Student	Housing	Private Davis Market			
	n	Mean	MOE	n	Mean	MOE	
All Students	505	1.73	0.05	1121	1.56	0.02	
Freshmen	329	2.24	0.06	8	1.45	0.33	
Sophomores	47	1.48	0.13	204	1.70	0.06	
Juniors	108	1.24	0.06	237	1.63	0.05	
Seniors	34	1.34	0.13	264	1.57	0.05	
Undergraduates, Con't	173	1.32	0.06	712	1.62	0.03	
Undergraduates, All	392	1.78	0.06	818	1.62	0.03	
Masters/Pro	23	1.35	0.26	120	1.26	0.06	
PhD	66	1.26	0.09	176	1.23	0.05	
Graduates, All	88	1.28	0.09	298	1.24	0.04	

Table 5.3: Mean occupants per bedroom in UCD Student Housing and the private Davis rental market (overview).

Notes:

* The sample size n is population weight-adjusted for aggregated role groups. Because of weighting, the sum of n for constituent role groups may not total to the reported n for the aggregated groups they comprise.

⁺ Margins of error are computed at 90 percent confidence. In some instances, MOE may not be reported due to there being only a small sample of exactly equal values. Small *n* figures are included to provide a thorough view of the response distributions, but generalizations should only be made for role groups with larger sample sizes.

		Res Halls			P3 Apts			SHAs			Solano		
	n	Mean	MOE	n	Mean	MOE	n	Mean	MOE	n	Mean	MOE	
All Students	251	2.18	0.07	150	1.31	0.06	81	1.17	0.06	24	1.46	0.24	
Freshmen	327	2.25	0.06	2	1.12	0.21	0			0			
Sophomores	13	1.92	0.23	27	1.30	0.14	7	1.32	0.29	0			
Juniors	6	1.17	0.27	41	1.35	0.10	58	1.14	0.07	3	1.83	0.27	
Seniors	3	1.44	0.48	24	1.37	0.17	5	1.23	0.36	2	1.00	0.00	
Undergraduates, Con't	20	1.64	0.20	88	1.34	0.08	61	1.17	0.08	5	1.41	0.29	
Undergraduates, All	215	2.19	0.07	102	1.34	0.07	69	1.17	0.07	6	1.41	0.27	
Masters/Pro	1	2.00		18	1.12	0.11	1	1.00		3	2.67	1.45	
PhD	1	1.00		37	1.22	0.09	1	1.00		27	1.33	0.18	
Graduates, All	2	1.53	0.41	55	1.18	0.07	2	1.00	0.00	29	1.48	0.24	

Table 5.4: Mean occupants per bedroom in UCD Student Housing.

Notes:

* The sample size n is population weight-adjusted for aggregated role groups. Because of weighting, the sum of n for constituent role groups may not total to the reported n for the aggregated groups they comprise.

⁺ Margins of error are computed at 90 percent confidence. In some instances, MOE may not be reported due to there being only a small sample of exactly equal values. Small *n* figures are included to provide a thorough view of the response distributions, but generalizations should only be made for role groups with larger sample sizes.

	Α	partmer	nts	Det	Detached Houses			
	n	Mean	MOE	n	Mean	MOE		
All Students	778	1.61	0.03	318	1.45	0.04		
Freshmen	6	1.33	0.35	1	2.33			
Sophomores	152	1.73	0.08	49	1.63	0.10		
Juniors	164	1.68	0.06	70	1.54	0.09		
Seniors	189	1.61	0.05	67	1.45	0.09		
Undergraduates, Con't	510	1.66	0.04	187	1.52	0.05		
Undergraduates, All	586	1.66	0.03	214	1.52	0.05		
Masters/Pro	72	1.28	0.08	44	1.25	0.11		
PhD	96	1.27	0.07	77	1.17	0.06		
Graduates, All	170	1.27	0.05	121	1.20	0.06		

Table 5.5: Mean occupants per bedroom in the private Davis rental market.

Notes:

* The sample size *n* is population weight-adjusted for aggregated role groups. Because of weighting, the sum of *n* for constituent role groups may not total to the reported *n* for the aggregated groups they comprise.

⁺ Margins of error are computed at 90 percent confidence. In some instances, MOE may not be reported due to there being only a small sample of exactly equal values. Small n figures are included to provide a thorough view of the response distributions, but generalizations should only be made for role groups with larger sample sizes.

5.4 Crowding Metrics for Students in the Private Davis Market

One of the SHAIS's chief concerns is to establish and track the rates at which students are crowding into apartment units and detached houses in the private Davis market. The survey data can address this by comparing how extensively, and with what intensity, students are occupying the available bedrooms in their units *vis-à-vis* other students and the general rental population in Davis. It is important to note that we are not making a definitive statement about which levels of occupant density should be used for administrative definitions of crowded conditions; rather, the aim is to explore and to describe how occupant density varies—with the understanding of course that higher occupant densities are less desirable.

As discussed in Section 5.1 above, one component of our assessment is **relative overcrowding**, which we measure as student occupant density in comparison to other known rates. Specifically, we consider the degree to which student bedroom occupant density exceeds the Davis renter average and, by way of an intramural comparison, the degree to which undergraduate bedroom occupant density exceeds the rates for graduate students.

The analysis defines **absolute overcrowding** with respect to an occupant density of 2 persons per bedroom. The rationale for focusing on 2 persons per bedroom is two-fold:

- Some may interpret sharing a private bedroom—especially if unrelated adults are paying for a living space in a unit not designed for high-density occupancy—as *feeling* overcrowded. This subjectivist sense of the concept is supported by survey responses. Among renters in the private Davis market, those not reporting "overcrowding" averaged 1.45 persons per bedroom (with only 27 percent indicating their units housed 2 or more occupants per bedroom), whereas those who did report "overcrowding" averaged 1.92—or nearly 2—persons per bedroom (with 64 percent indicating 2 or more occupants per bedroom).³
- We also observe a strong modality of unit occupant density at 2 persons per bedroom, especially among undergraduates, and then a sharp reduction in any higher rates (see Figure 5.1). This stark drop-off in the distribution suggests strong reluctance to intensify occupant density beyond rates equivalent to 'doubling up' in private bedrooms. This level of occupant density merits consideration as a general expression of maximal tolerance.

In other words, it would appear that students tend to experience 'tripling up' in a private market bedroom as *unacceptable* and 'doubling up' as *very undesirable*. Thus, *in order to explore the sensitivity* of crowding incidence to this distinction, we employ absolute crowding thresholds of at *least 2* persons per bedroom (all occupants at least 'doubling up' or worse) and *more than 2* persons per bedroom (all occupants 'doubling up' or worse).

Relative Overcrowding

According to the 2016 ACS (which, as a 5-year average, effectively describes conditions in 2014), renters in Davis⁴ occupied units at an average rate of 1.22 persons per bedroom (90-percent CI: 1.12-1.32).⁵ Because the ACS does not offer unit counts by number of bedrooms for different *classes of units* (i.e., multi-family and single-family units), the derived bedroom density figure for the city cannot be further developed to distinguish between those living in apartments and those living in detached houses (though such distinctions can be made within the SHAIS data).

As seen in Section 5.3 above, the average occupant density for all students in off-campus units is about

³The occupant densities reported here include responses from all students renting in the private Davis market. They are not population weight-adjusted. For those not reporting overcrowding, non-adjusted n = 873; for those reporting overcrowding, non-adjusted n = 137 (total n = 1,010). We also note that respondents in units with 2 persons per bedroom (n = 212) were nearly twice as likely to report overcrowding as those living with 1.5-1.8 persons per bedroom (n = 218): 22 percent versus 11 percent. See Chapter 7 for a presentation of respondents' identification of common housing problems.

⁴For the ACS, 'renters in Davis' necessarily encompasses students in P3s or SHAs that are located beyond the Main Campus and West Village areas, generally including units north of Russell Boulevard and east of A Street.

⁵The average number of renters per bedroom in Davis is based on ACS tables B25033 and B25042, from which, respectively, we drew the total population in all rental units and derived the total number of bedrooms in rental units. The total number of bedrooms is the sum-product of (1) the count of units with studio, 1-bedroom, 2-bedroom, 3-bedroom, 4-bedroom, and 5 or more bedrooms and (2) the units' respective number of bedrooms. In the case of studios, 1 bedroom was assigned, and in the tally of units having '5 bedrooms or more,' 5 bedrooms were assigned (NB: assigning only 5 when some units may have more than 5 should not result in a significant under-count of total bedrooms, since units with 5 or more bedrooms are quite rare). When counting units in each bedroom size category, the standard errors for each size category were multiplied by the number of indicated bedrooms and then aggregated (as the square root of the sum of the squares of the resulting standard error values for each bedroom size category; see the methodological guidance in US Census Bureau, 2018, pp. 51–57). The 5-year data for 2016 indicate a total renter population (R) of 37,260 ($SE = \pm 1136$). We derived a total bedroom count (B) of 30,562 ($SE = \pm 1122$). The estimated ratio ($\hat{D} = \hat{R}/\hat{B}$) is 1.22 persons per bedroom ($SE = \pm 0.06$). With a 90-percent MOE, the true value is expected to fall between 1.12 and 1.32.

1.56 persons per bedroom (90-percent CI: 1.53-1.58).⁶ We can further dis-aggregate this value into apartment and detached house categories: the survey shows an average density of 1.61 persons per bedroom in apartments (90-percent CI: 1.58-1.64) and 1.45 persons per bedroom in detached houses (90-percent CI: 1.41-1.49).

On average, then, students occupy private market bedrooms in Davis at a density higher than the city average, and this appears to be true in the aggregate (i.e., for all apartments and houses) and when discretely comparing either student apartment occupant density or detached house occupant density to the city average. The lower city average of 1.22 persons per bedroom, moreover, should be understood as reflecting strong influence from more heavily crowded student units (since, as discussed in Section 4.5 in Chapter 4, students make up a significant portion of the city's off-campus renters). Consequently, one might think of "normal"—that is, non-student—per-bedroom occupancy in the private Davis market as averaging somewhere below 1.22 persons.

Breaking down the survey data by the major student role groups, we find that occupant density for continuing undergraduates in the private Davis market is significantly higher than it is for graduate students and the general rental population. For all unit types, continuing undergraduates occupy bedrooms at an average rate of 1.62 (90-percent Cl: 1.59-1.65) and graduate students occupy bedrooms at an average rate of 1.24 (90-percent Cl: 1.21-1.28). Hence, average graduate student per-bedroom occupancy tends to resemble that of the general rental population in the city, while continuing undergraduates experience significantly higher occupant densities.

The pattern also holds when the data are broken down by apartments and detached houses. Figure 5.1 plots the distribution summaries (boxes and whiskers), medians (thick, horizontal black lines), and means (dots with vertical 90-percent MOE bars) for the weight-adjusted sample of continuing undergraduates and graduates in the private Davis rental market. The plot compares student occupant densities for apartments (navy bars) and detached houses (gold bars) to both UCD Student Housing P3s (white bars) and the ACS-derived average for the city (thick, white, horizontal line with 90-percent MOE in sky blue). The "boxes" represent the 2 middle quartiles (i.e., 50 percent) of the distribution of reported densities for each universe, and the dashed "whiskers" represent the extent of upper and lower quartiles.⁷

For apartments, the average continuing undergraduate occupant density is 1.66 persons per bedroom (90-percent CI: 1.62-1.70) and the average graduate student rate is 1.28 persons per bedroom (90-percent CI: 1.23-1.33). For detached houses, we observe an average continuing undergraduate occupant density of 1.52 persons per bedroom (90-percent CI: 1.47-1.57) and an average graduate student density of 1.20 persons per bedroom (90-percent CI: 1.15-1.26). When these averages are compared with the general Davis rate of 1.22 persons per bedroom (90-percent CI: 1.12-1.32), it appears as though graduate student per-bedroom occupancy for both apartments and detached houses approximates the overall city average (though slightly better for houses, whose bedrooms tend to be a little less densely occupied). Also note that the vast majority of graduate students occupy units at a rate less than 1.5 persons per bedroom, with a rate of 1 person per bedroom. For continuing undergraduates, though, occupancy density is significantly higher for both apartments and detached houses when compared to either the city average or to

⁶For our purposes, the universe of off-campus renters excludes students in P3s or SHAs located outside the boundaries of the Main Campus or West Village. Here and throughout the report, those units are considered to be on campus.

⁷A few high-density outliers were excluded to improve visualization.



Occupant density distributions for major role groups on campus and off campus in Davis

Figure 5.1: Occupant density of continuing undergraduates and graduate students in P3 apartments, private Davis apartments, and private Davis detached houses, compared to general occupant density in the general Davis rental market.

graduate student occupant densities. Moreover, for a large majority of continuing undergraduate renters in private apartments, densities are 1.5 persons per bedroom or greater, with about 25 percent reporting densities of at least 2 persons per bedroom.

A modal comparison also demonstrates the difference. For continuing undergraduates, the mode in Davis off-campus apartments is 2 occupants per bedroom (37 percent of respondents). While the mode among detached house residents is 1 occupant per bedroom (24 percent of respondents), it is closely followed by 2 persons per bedroom and other higher-density rates (18 percent report 2 persons per bedroom; 14 percent report 1.66 persons; 11 percent report 1.33 persons; and 11 percent report 1.5 persons). In contrast, the mode for graduates in both apartments and detached houses is 1 person per bedroom (for 61 percent of apartment residents and 53 percent of detached house residents). Only 20 percent of graduate students in apartments report 2 occupants per bedroom; only 9 percent of those in detached houses report densities of 2 per bedroom.

Fixed-Threshold Overcrowded Unit Estimates

Fixed overcrowding thresholds allow estimation of the number of students in extreme housing density situations. They also allow us to address the issue of so-called "mini-dorms," or private units where residents intensify occupant density in order to reduce individual rent costs and/or where landlords encourage such behavior. Accordingly, we can ask, 'How many overcrowded units are there in Davis?' and the analysis can shed light on the quantities of both apartments and detached houses that are affected by extremely high occupant densities.

According to the survey data, about 4.6 percent of students in private market apartments in Davis live in units with *greater than 2 persons per bedroom*. In detached houses, the data indicate 5.6 percent of students live in units with more than 2 occupants per bedroom.

These quantities increase sharply once a threshold of *at least 2 persons per bedroom* is used to designate overcrowded units: 40.4 percent of those living in apartments and 21.8 percent of those living in detached houses.

The difference corresponds with a marked drop-off in the frequency of occupant densities above 2 persons per bedroom in the private Davis market and offers evidence that students resist exceeding that threshold. The density plots in Figure 5.2, which show a combination of apartment and detached house occupant densities for graduate students (gold) and continuing undergraduate students (blue), attest to this phenomenon. While virtually no graduate students choose to live at rates of more than 2 per bedroom (red dashed line), the vast majority of undergraduates also attempt to avoid such levels (only 5.7 percent are estimated to do so). At the same time, the highest peak indicates continuing undergraduates are much more likely than graduate students to crowd *up to* a level of 2 occupants per unit. Indeed—when apartments and detached houses are considered together—nearly one-third (32.8 percent) of continuing undergraduates live in units with 2 persons per bedroom, while only 14.9 percent of graduate students do so. Alternatively, when the overcrowding threshold is defined as *at least 2 occupants per bedroom* (blue dashed line), then about 38.5 percent of undergraduates renting in the private Davis market can be said to be living in overcrowded conditions.

Some observers may be concerned by Davis's mini-dorm phenomenon, believing that extreme student crowding affects detached, single-family houses, whose owners seek to exploit high student demand without concern for neighborhood norms or occupant safety. However, as shown below, more apartments

Occupant density distribution for continuing undergraduates and graduates (shown with overcrowding thresholds)



Figure 5.2: Distribution of occupant densities in the private Davis rental market: Continuing undergraduates and graduates in all unit types (with overcrowding thresholds).

tend to be overcrowded than houses, suggesting that apartments should be as much of the mini-dorm conversation as single-family dwellings. We use both of the overcrowding thresholds indicated above to estimate the number of such overcrowded units. The higher of these thresholds (more than 2 occupants per bedroom) gives a conservative estimate and allows one to imagine the 'worst' mini-dorms as detached houses or apartment units where unrelated adults are not just 'doubling up' (as some might assume college students are comfortable doing) but 'tripling up.' The lower threshold (at least 2 occupants per bedroom) provides an estimate of the number of units in which students are at least 'doubling up.'

We use the *average unit density for respondents in overcrowded units* in conjunction with the populationlevel count of affected students to derive an estimate of the number of mini-dorm units. We divide average unit density into the count of overcrowded students, thereby determining, at the population level, how many units fit the overcrowded definition:

$$N_{UnitOC} = N_{StuOC} / Dens_{UnitOC}$$

where N_{UnitOC} is the over-crowded unit count estimate, N_{StuOC} is the estimated count of students in overcrowded units, and $Dens_{UnitOC}$ is the survey-derived mean unit occupant density for the respondents' in overcrowded units.

N_{StuOC}	$Dens_{UnitOC}$	N_{UnitOC}
d (density	> 2 persons per	bedroom)
667	4.60	145
338	6.26	54
density	\geq 2 persons per	· bedroom)
5854	4.00	1464
1313	5.24	251
	N _{StuOC} d (density 667 338 d (density 2 5854 1313	N_{StuOC} $Dens_{UnitOC}$ d (density > 2 persons per6674.603386.26d (density \geq 2 persons per58544.0013135.24

Table 5.6: Estimated count of overcrowded units in the private Davis market: Two models based on alternative occupant density thresholds.

Table 5.6 demonstrates the dramatic impact of threshold choice. Using the conservative overcrowding threshold, about 199 total units in the private Davis market can be considered problematic; nearly 73 percent of them are apartments. The estimate climbs to 1,716 total units when overcrowding is defined as at least 2 persons per bedroom; in this case, about 85 percent of these are apartments.

Estimating the number of overcrowded units can be useful as a method to determine, at minimum, how many new bedrooms should be built to meet student needs. Using the average number of bedrooms in apartments and detached houses, as derived from the SHAIS sample of all student-occupied units in the private Davis market, allows us to estimate how many new bedrooms would have to be constructed simply to provide all those living in overcrowded units their own space.⁸

• Using the higher, more conservative overcrowding threshold:

⁸However, as noted above, alleviating crowding at its extremes should not be the sole policy objective; rather, an ameliorative approach should focus on building enough appropriately designed units to decrease occupant densities at all levels exceeding the average for residents in the Davis private market. Indeed, only building enough units to match the supply deficit for those in overcrowded units would likely fall well short of the overall student demand for lower occupant densities.

- Apartments only furnish 338 bedrooms (2.33 average bedrooms per apartment \times 145 overcrowded apartments), leaving a need for 329 more bedrooms to cover the balance of the 667 affected students.
- Houses furnish 170 bedrooms (3.15 average bedrooms per detached house \times 54 overcrowded houses), leaving a need for 168 more bedrooms to cover the balance of the 338 affected students.
- Using the lower overcrowding threshold:
 - Apartments furnish 3,411 bedrooms (2.33 average bedrooms per apartment × 1464 overcrowded apartments), leaving a need for 2,443 more bedrooms to cover the balance of the 5,854 affected students.
 - Houses furnish 791 bedrooms (3.15 average bedrooms per detached house \times 251 overcrowded houses), leaving a need for 522 more bedrooms to cover the balance of the 1,313 affected students.

Location of Crowded Units

The maps in Figures 5.3 and 5.4 use quadrat counting and ratios (see methodology notes in Section 4.6 in Chapter 4) to estimate the percentage of apartments and detached houses whose residents experience 2 or more persons per bedroom (the lower overcrowding threshold). In the case of apartments, the estimates show very high concentrations of densely occupied units throughout the spatial distribution: on the northern edge of downtown (F4), near campus (D5), and in several clusters in West Davis (B4), North Davis (D2 and D3), and South Davis (G5). In the case of detached houses (Figure 5.4), densely occupied units appear to be more clustered. Few are found in the low-density residential band spanning east to west between Russell Boulevard/5th Street and Covell Boulevard. However, high concentrations are evident 2-3 kilometers north of central campus along Covell Boulevard (D2). Other high concentration zones emerge on the northeast corner of the Main Campus (F5) and especially on the northern edge of downtown (F4 and G4).



Figure 5.3: Incidence of high occupant density: Percentage of apartment units with 2 or more occupants per bedroom in the private Davis market.



Figure 5.4: Incidence of high occupant density: Percentage of detached houses with 2 or more occupants per bedroom in the private Davis market.

Chapter 6

Homelessness and Housing Insecurity

This chapter summarizes rates of homelessness and housing insecurity. The topics and discussion are organized as follows:

- Homelessness;
- Housing insecurity; and
- Overall housing insecurity (homelessness and housing insecurity combined).

Highlighted Findings

- Many UCD students report experiencing some form of housing insecurity or homelessness during the 2017-18 academic year.
 - An estimated 7 percent (2,460 individuals) report some form of temporary or sustained homelessness;
 - An estimated 15 percent (5,042 individuals) report some form of housing insecurity, such as not being able to make full rent payments or being forced to move several times;
 - Combined, an estimated 18 percent percent of students—6,104 individuals experienced some form of homelessness or housing insecurity.
- Continuing undergraduates—especially juniors and seniors—are disproportionately impacted by homelessness or housing insecurity.
 - Juniors represent about 28 percent of those reporting some form of homelessness (697 individuals); seniors represent about 49 percent (1,149 individuals).
 - Juniors represent about 28 percent of those reporting some form of housing insecurity (1,414 individuals); seniors represent about 44 percent (2,194 individuals).
- About 28 percent of those reporting some form of homelessness indicated having slept in their automobile for at least one night (2 percent of the student population). The data imply

that an estimated 688 students experienced this troubling condition, though the survey instrument was not designed to inquire further about duration or more specific circumstances.

It is important to note that, while respondents were asked whether in their present housing situation 'they were homeless' (see Question 26 in the survey instrument) they were also asked whether they experienced any of a series of conditions that constitute homelessness over the past 12 months. It is responses to the latter that are summarized below. By taking this approach, homelessness—and in similar fashion, housing insecurity—could be tabulated based on the presence of objective conditions rather than more ambiguous interpretations. The approach also allows us to generate a picture of homelessness and housing insecurity as phenomena that may affect students not just in a single form or permanently, but at various moments throughout the year. The specific conditions qualifying one as "homeless" or "housing insecure" are detailed in the respective sections below.

In the final section, the enumerated "homelessness" and "housing insecurity" conditions are analyzed jointly to give an overall picture of the incidence of general housing insecurity.

6.1 Homelessness

This report defines "homelessness" as the respondent having experienced, at any point during the previous 12 months, one or more of the following conditions (as assessed in Question 62 in the survey instrument):

- Being "thrown out" of one's home by family or housemates;
- Being legally evicted;
- Staying in a shelter;
- Staying in an auto, library, public/campus building, tent or other place not meant as housing;
- Not knowing where they were going to sleep for one or more nights;
- Staying temporarily with an acquaintance while looking for housing ("couch surfing"); or simply
- Not having a home.

Tables 6.1 and 6.2 summarize positive responses (percentage responding affirmatively and population count extrapolations, respectively).

The "itemized responses" columns represent the differentiated forms of homelessness listed above. Respondents were able to select as many or as few as applied (including "none"), meaning that some indicated that they experienced multiple forms of homelessness, while others indicated only one experience or no experience of homelessness at all.

The first column, labeled "any homeless," summarizes the quantity of those who indicated *at least one* of the itemized forms of homelessness. Thus, the first column gives a binomial measure of those in each role group who were affected by homelessness in at least one form.

Observations

Using the conditions defined above, the data show that about 7.2 percent of all Davis students report experiencing some form of homelessness during the past year. If the estimate is extrapolated to the
entire population, then about 2,460 total students experienced homelessness. The rate is highest for continuing undergraduates (8.4 percent) with the data showing the highest instances among juniors and seniors (9 and 10.6 percent, respectively). This means an estimated 697 juniors and an estimated 1,194 seniors have found themselves homeless. Seniors alone make up nearly half of all those estimated to experience homelessness.

Among the conditions qualifying respondents as homeless, the three with the highest frequency are 'couch surfing' (3.9 percent of the student body), 'not knowing where to sleep for at least one night' (3.2 percent of the student body), and 'having slept in an auto, library, public building, tent, or other place not meant as housing' (2 percent of the student body).

Extrapolating for those who report 'having slept in an auto, library, public building, tent or other place not meant as housing' results in an estimated 688 affected students. Of these, the vast majority (634) were undergraduates, with juniors (246) and seniors (355) making up the bulk of their number.

	temize	ed responses						
	Any Homeless	Thrown out	Formally evicted	Stayed in shelter	Slept in car, etc.	Uncertain sleep loc.	Couch surfed	No home
All Students	7.2	0.8	0.2	0.1	2.0	3.2	3.9	1.5
Freshmen	2.3	0.9	0.0	0.0	0.3	1.2	0.3	0.0
Sophomores	3.0	0.4	0.4	0.0	0.4	1.5	1.5	0.8
Juniors	9.0	1.3	0.3	0.3	3.2	4.8	4.5	1.6
Seniors	10.6	0.9	0.3	0.0	3.2	4.0	6.3	2.3
Undergraduates, Con't	8.4	0.9	0.3	0.1	2.5	3.7	4.7	1.7
Undergraduates, All	7.5	0.9	0.3	0.1	2.2	3.3	4.0	1.5
Masters/Pro	5.5	0.5	0.0	0.0	1.0	2.0	2.5	1.5
PhD	5.5	0.3	0.0	0.0	1.0	2.9	3.6	1.3
Graduates, All	5.5	0.4	0.0	0.0	1.0	2.5	3.1	1.4

Table 6.1: Students reporting any form of homelessness over previous 12 months (percentage).

Note:

⁶ Respondents' itemized resposes are not mutually exclusive, and row sums of itemized responses should not be expected to equal the statistic for "any homeless."

6.2 Housing Insecurity

This report defines being "housing insecure" as having experienced, at any point during the previous 12 months, one or more of the following conditions (as assessed in Question 61 in the survey instrument):

Table 6.2: Students reporting any form of homelessness over previous 12 months (estimated counts	Table 6.2:	: Students	reporting any	form of h	nomelessness	over previous	12 months	(estimated	counts).
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		Itemized responses						
	Any Homeless	Thrown out	Formally evicted	Stayed in shelter	Slept in car, etc.	Uncertain sleep loc.	Couch surfed	No home
All Students	2460	280	73	20	688	1093	1325	498
Freshmen	102	38	0	0	13	51	13	0
Sophomores	164	21	21	0	21	82	82	41
Juniors	697	102	20	20	246	369	348	123
Seniors	1194	97	32	0	355	452	710	258
Undergraduates, Con't	2055	220	73	20	621	903	1140	422
Undergraduates, All	2157	258	73	20	634	954	1153	422
Masters/Pro	128	12	0	0	23	47	58	35
PhD	175	10	0	0	31	93	113	41
Graduates, All	303	22	0	0	54	139	171	76

Note:

Respondents' itemized resposes are not mutually exclusive, and row sums of itemized responses should not be expected to equal the statistic for "any homeless."

- Not being able to pay the full amount of rent;
- Not being able to pay the full amount of utilities;
- Moving two or more times;
- "Doubling up" in a bedroom (without a lease agreement for the room); or
- Moving in with other people due to financial problems.

Tables 6.3 and 6.4 summarize positive responses (percentage responding affirmatively and population count extrapolations, respectively).

The "itemized responses" columns represent the differentiated forms of housing insecurity listed above. Respondents were able to select as many or as few as applied (including "none"), meaning that some indicated that they experienced multiple forms of housing insecurity, while others indicated only one experience or no experience of housing insecurity at all.

The first column, labeled "any insecurity," summarizes the quantity of those who indicated *at least one* of the itemized forms of housing insecurity. Thus, the first column gives a binomial measure of those in each role group who were affected by housing insecurity in at least one form.

Table 6.3:	Students	reporting ar	v form	of housing	insecurity	over previous	12 months	(percentage).
10010 0101	oracino	reporting at	,	01 110 00 0110	moceancy	over previous		(percentage)

		ľ	temize	ed res	ponse	S
	Any Insecurity	Short rent	Short utilities	Moved 2+ times	Doubled up	Moved, re finances
All Students	14.7	3.4	4.2	3.8	5.2	4.7
Freshmen	4.1	0.9	0.0	1.2	1.5	0.6
Sophomores	9.9	1.1	1.5	1.9	5.7	3.0
Juniors	18.3	4.8	5.6	4.5	6.6	6.6
Seniors	19.5	4.9	7.2	4.6	6.9	5.7
Undergraduates, Con't	17.0	4.0	5.4	4.0	6.5	5.4
Undergraduates, All	15.0	3.5	4.6	3.5	5.8	4.7
Masters/Pro	15.6	3.5	3.5	6.0	2.0	7.0
PhD	11.4	2.6	1.6	4.2	2.6	2.9
Graduates, All	13.2	3.0	2.4	5.0	2.4	4.7

Note:

Respondents' itemized resposes are not mutually exclusive, and row sums of itemized responses should not be expected to equal the statistic for "any insecure."

Observations

Using the conditions defined above, the data show that about 14.7 percent of all students report experiencing some form of housing insecurity during the past year. If the estimate is extrapolated to the entire population, then about 5,042 total students experienced housing insecurity. As with homelessness, the rate is highest for continuing undergraduates (17.0 percent) with the data showing the highest instances among juniors and seniors (18.3 and 19.5 percent, respectively). In absolute terms, an estimated 1,414 juniors and 2,194 seniors experienced housing insecurity. Together, members of these two largest classes make up over 70 percent of UCD students estimated to experience housing insecurity.

Among the conditions qualifying respondents as housing insecure, the three with the highest frequency are 'doubling up without a lease agreement' (5.2 percent reporting), 'moving because of financial reasons' (4.7 percent reporting), and 'being unable to pay the full amount of utilities' (4.2 percent reporting).

Extrapolating for those who report 'doubling up without a lease agreement' results in an estimated 1,787 affected students. Of these, the vast majority (1,658) were undergraduates, with juniors (512) and seniors (774)—and also some sophomores (308)—making up the bulk of their number. This suggests that there are significant amounts of students who, throughout the academic year, find themselves seeking or relying on temporary housing while looking for a new place to live.

	Itemized responses							
	Any Insecurity	Short rent	Short utilities	Moved 2+ times	Doubled up	Moved, re finances		
All Students	5042	1181	1452	1292	1787	1603		
Freshmen	178	38	0	51	64	25		
Sophomores	534	62	82	103	308	164		
Juniors	1414	369	430	348	512	512		
Seniors	2194	549	807	516	774	645		
Undergraduates, Con't	4142	979	1319	967	1595	1322		
Undergraduates, All	4320	1017	1319	1018	1658	1347		
Masters/Pro	361	81	81	140	47	163		
PhD	361	82	52	134	82	93		
Graduates, All	721	164	133	274	129	256		

Table 6.4: Students reporting any form of housing insecurity over previous 12 months (estimated counts).

Note:

Respondents' itemized resposes are not mutually exclusive, and row sums of itemized responses should not be expected to equal the statistic for "any insecure."

6.3 Overall Housing Insecurity

In the final section of this chapter, we combine the responses on homelessness and housing insecurity to produce measures of overall housing insecurity. Table 6.5 reports both percentages and estimated counts of any of those affected by at least one of the homelessness or housing insecurity conditions itemized in Questions 61 and 62 in the survey instrument.

Observations

This summary of 'housing insecurity, broadly conceived' shows that 17.8 percent of all students—or an estimated 6,104 individuals—experience, at least temporarily, some form of homelessness or housing insecurity. As expected based on the preceding sections, continuing undergraduates are affected most (20.5 percent, or an estimated 5,010 students). However, graduate students also tend to experience some form of housing insecurity at high rates (15.3 percent, or an estimated 840 students), with higher rates among masters and professional students (17.6 percent) than PhD students (13.7 percent).

The most outstanding quantities, however, regard the junior and senior classes. Over 1 in 5 from each of these role groups report some form of homelessness or housing insecurity, with seniors reporting at a rate nearing 1 in 4. This suggests that juniors and seniors, the great majority of whom rent in the private Davis market (see Chapter 4), face considerable obstacles and should be of special concern for future housing

interventions.

Moreover, the tendency for housing insecurity rates to increase with class level is likely related to the financial strain young adults experience as they move through the four-year degree timeline. In the first few years of attendance, students and their families may be more willing to take on the financial burden of tuition/fees, housing, board, materials, and other costs, but as time advances, awareness of the full cost burden (perhaps in conjunction with an aversion to increased student loan debt) may encourage money-saving behaviors with respect to housing (e.g., doubling up, living temporarily in one's car, continually moving in order to seek cheaper accommodations, etc.).

Initial ignorance of the "real price of college" (Goldrick-Rab & Kendall, 2016) may—in the context of UCD's particular student housing configuration *vis-à-vis* the Davis private market—intensify behaviors associated with housing insecurity. Students' increased likelihood of experiencing housing insecurity as they progress through their degree makes it all the more imperative that University and regional partners collaborate to provide a sufficient supply of affordable housing, that specialized support services be devised, and that the university fully inform students and their families about the financial implications of attending UCD and living in Davis. As further discussed in Chapter 9, this also means that future survey efforts should be attuned to the consequences of individuals' deteriorating housing circumstances during the full length of the academic year, since students may experience higher degrees of housing security (or optimism about the sustainability of their housing circumstances) before having to confront accumulating housing costs and other housing-related burdens.

	Percentage	Estimated Count
All Students	17.8	6104
Freshmen	5.8	254
Sophomores	11.0	595
Juniors	21.2	1640
Seniors	24.6	2775
Undergraduates, Con't	20.5	5010
Undergraduates, All	18.3	5265
Masters/Pro	17.6	407
PhD	13.7	433
Graduates, All	15.3	840

Table 6.5: Students reporting any form of homelessness or housing insecurity over previous 12 months (percentage and estimated counts).

Chapter 7

Housing Problems

This chapter summarizes students' experience of major housing problems, as selected from a pre-defined list of potential issues. For this chapter, *only private market renters and fee-paying residents in units affiliated with UCD Student Housing are included* (not owners and not those who live under special arrangements). The chapter's topics and discussion are organized as follows:

- Ranking of highest priority problems, by major role group;
- Ranking of highest priority problems, by housing arrangement; and
- Ranking of highest priority problems, given select amenities.

Highlighted Findings

- Housing expense is cited among all student role groups, with the exception of freshmen, as the most frequently experienced housing problem.
 - Continuing undergraduates cited expense at a rate of 45 percent, and graduate students cited expense at rate of 47 percent.
 - However, very few graduate students in Solano Park report housing expense as an issue, which is not surprising given that Solano offers some of the cheapest per-unit rents anywhere in Davis.
- Lack of in-unit laundry, the second most prominent problem, is again associated with all but freshmen.
 - Residents in Solano Park rank lack of in-unit laundry as their highest concern.
 - In the private Davis market, in-unit laundry is least available among apartments, leading respondents to rank it closely behind housing expense.
- Overcrowding is cited as an issue among freshmen and continuing undergraduates more frequently (23 and 15 percent, respectively) than it is for graduate students (only 4 percent).
 - Those living in residence halls, the vast majority of whom are freshmen, report overcrowding at the highest rate (24 percent).

- Those living in private Davis apartments also report overcrowding at a high rate (17 percent). Next are students in P3 apartments (12 percent) and then students in private market detached houses (10 percent).
- **Distance to campus** is an issue for those living outside of Davis and many of those living off campus in the city.
 - For those living outside of Davis, distance is cited as a problem much more frequently (51 percent) than housing expense (36 percent). The lower ranking of expense among those living outside of Davis (compare to 49 percent of renters in the private Davis market) may result from lower rents, but a more likely factor is that students living outside of the city may have, on average, higher household incomes and access to necessary forms of transportation and other resources.
 - Distance is also an issue for many students living in the city: 21 percent of private market renters and 17 percent of those in SHA units.
- Pests, management, maintenance, leasing terms, and on-site parking are reported with some correspondence to privatized units, both in UCD Student Housing and off campus in Davis.
 - Pest issues are reported at higher rates in P3 and SHA units (about 21 percent) than in university-owned units (11 percent in residence halls and 5 percent in Solano Park), and they are very prominent among those in off-campus apartments and detached houses (22 and 24 percent, respectively).
 - Management issues and delayed maintenance were cited somewhat frequently among students in P3 units (9 and 13 percent, respectively). Remarkably few residents in Solano Park (only about 2 percent) reported delayed maintenance.
 - Delayed maintenance and problematic leasing terms figure prominently in the private Davis market, with 29 percent of renters reporting delayed maintenance and 26 percent reporting leasing issues. Apartment renters report leasing issues at a higher rate than those in detached houses: 28 percent versus 21 percent.
 - Lack of on-site parking is cited frequently among those in off-campus apartments and detached houses—29 and 21 percent, respectively—while frequencies among those in UCD Student Housing range between 12 and 17 percent.

The data for all summaries of housing problems are drawn from Question 72 in the survey instrument. (Amenity data also use responses to Question 71; see notes further below.)

In Question 72, respondents were asked to select any of up to 19 itemized problems that they experience in their current housing arrangement (and were also allowed to select 'none' or 'other'). The itemized options, and the coding used to summarize them in subsequent tables, are:

- Rent/mortgage is too expensive ('Expensive');
- No in-unit kitchen ('No Kitchen');
- No in-unit washer and dryer ('No Laundry');

- It is difficult to find parking ('Limited Parking');
- There are unaddressed pest issues (e.g. mold, bugs) ('Pests');
- There are unaddressed maintenance issues (e.g., broken heat or AC, fixtures, plumbing, electrical, etc.) ('Maintenance');
- Being treated poorly by the landlord/leasing company ('Management');
- Poor lease terms and/or being required to sign lease months in advance of move-in ('Lease Terms');
- Concerns with the neighborhood (e.g., crime, noise, public drunkenness) ('Neighborhood Safety');
- Concerns with the safety of the structure ('Structure Safety');
- Overcrowding or having to share bedrooms ('Overcrowding');
- Being too far from campus ('Campus Distance');
- Being too far from amenities (shopping, entertainment, etc.) ('Amenity Distance');
- Pet policy prohibits pets ('Pet Policy');
- Rules are overly restrictive ('Restrictions');
- Poor access to transit/travel routes ('Transit Access');
- Poor access to public schools ('Schools');
- Being too far from parks and green spaces ('Parks');
- Not being able to choose housemates/roommates ('Roommate Choice').

Some respondents may have selected many problems, while others selected only a few or none. On average, respondents reported having 2.75 of the listed problems, with 268 of the survey's 1,839 respondents reporting no problems (and just 1, perhaps unreliable, respondent selecting all 19 options). In the following summaries, these issues are ranked according to the population weight-adjusted percentage of respondents who indicated having them. The percentages offer a scalar representation of the extent to which student renters, both on campus and off campus, experience common problems across housing types, and the ranked presentation offers a relative view of problem priorities. The tables also include the mean gross rent paid per person for the selected sub-universe.¹

7.1 Ranking of Highest Priority Problems, by Major Role Group

The first column of Table 7.1 ranks reported problems for all students who rent in any form (whether on campus, off campus, or outside the city). Columns 2-4 segregate the student renting population according to 3 major role groups: freshmen, continuing undergraduates, and graduate students (but without distinguishing location relative to campus, housing type, etc.). This choice of role groups was made in order to reflect three potentially divergent categories of housing experience, as influenced by students' age and general aspects of the housing types available to them (e.g., almost all freshmen are housed in residence halls; continuing undergraduates are more likely to be first-time renters and to tolerate higher levels of crowding; and graduate students likely have more housing market experience and age-distinctive preferences).

Observations

The data show that **housing expense** is the most cited concern among all students, both overall and within

¹Gross rent per person reflects the cost respondents pay for their share of monthly contract rent, utilities, and any mandatory housing fees. It is an individualized price, not the price per unit or price per bedroom.

major role groups. Freshmen are slightly less concerned about housing cost than other students, while in the case of continuing undergraduates and graduate students nearly half (45.3 percent and 46.7 percent, respectively) report housing expense as a problem.

Ranked second, **lack of in-unit washer and dryer** is reported by about 35 percent of all students. The issue is very pronounced among continuing undergraduates (39.6 percent reporting), the majority of whom rent in the Davis private market. Nearly a third of graduate students (30.6 percent) also report the issue. The matter is less pronounced among freshmen, perhaps because laundry facilities, while not included in student units, are nevertheless easily accessible on-site in residence halls.

For freshmen, the lack of in-unit kitchens ranks in second place (31.5 percent reporting); it is virtually a non-existent issue for continuing undergraduates and graduate students.

In terms of rank order, many issues faced by continuing undergraduates mirror those experienced by graduate students, though they tend to occur with more frequency (i.e., higher percentages) among continuing undergraduates. Top-ranking issues include **maintenance delays**, **persistent pests**, **limited parking**, **restrictive pet policies**, **neighborhood safety**, and **distances to campus and amenities**.

One notable difference regards **overcrowding**, which is reported by 14.6 percent of continuing undergraduates and only 4.0 percent of graduate students. That continuing undergraduates report subjective experiences of overcrowding at higher rates than graduate students is consistent with the role group's much greater exposure to higher occupant densities (see Section 5.4 in Chapter 5). Freshmen register overcrowding most frequently (23.3 percent), which is directly reflective of high-density living in UCD Student Housing residence halls.

It is notable that certain potential problems, such as access to transit, parks, and good schools, are not frequently cited (though lack of transit access is more frequently indicated than the others).

All Students		Freshme	n	Con't Undergr	aduates	Graduates		
Mean rent/perso	on = \$779	Mean rent/perso	on = \$1072	Mean rent/perso	on = \$686	Mean rent/person = \$949		
n = 1734	1	n = 337	,	n = 929	1	n = 472		
Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	
Expensive	44.0	Expensive	33.2	Expensive	45.3	Expensive	46.7	
No Laundry	35.0	No Kitchen	31.5	No Laundry	39.6	No Laundry	30.6	
Maintenance	22.1	Pet Policy	24.5	Limited Parking	25.3	Lease Terms	20.0	
Limited Parking	22.0	Overcrowding	23.3	Maintenance	24.4	Maintenance	19.7	
Campus Distance	19.9	Restrictions	16.9	Campus Distance	23.1	Campus Distance	17.8	
Lease Terms	19.2	No Laundry	15.2	Pests	22.0	Pet Policy	16.7	
Pests	19.0	Limited Parking	15.2	Lease Terms	21.9	Neighborhood Safety	14.1	
Pet Policy	18.7	Amenity Distance	14.0	Pet Policy	18.1	Pests	13.5	
Neighborhood Safety	14.6	Neighborhood Safety	12.8	Neighborhood Safety	15.1	Limited Parking	12.8	
Overcrowding	14.0	Maintenance	12.0	Overcrowding	14.6	Management	11.2	
Management	10.6	Pests	9.0	Management	12.1	Restrictions	8.3	
Amenity Distance	9.7	Roommate Choice	8.7	Amenity Distance	9.4	Amenity Distance	7.8	
Restrictions	9.0	Campus Distance	4.1	Structure Safety	9.0	Structure Safety	7.4	
Structure Safety	8.0	Lease Terms	2.9	Restrictions	7.7	Roommate Choice	6.0	
Roommate Choice	5.2	Parks	2.9	Transit Access	4.5	Transit Access	5.5	
No Kitchen	4.7	Structure Safety	2.6	Roommate Choice	4.4	Parks	4.6	
Transit Access	4.4	Transit Access	2.3	Parks	3.6	Overcrowding	4.0	
Parks	3.7	Management	1.2	No Kitchen	1.0	Schools	1.0	
Schools	0.6	Schools	1.2	Schools	0.4	No Kitchen	0.0	

Table 7.1: Prevalence of housing problems: All student renters and major role groups

Notes:

* Respondents could select as many of the 19 issues listed as they wished (or as few as 0).

⁺ Mean rent/person reflects monthly gross rents (i.e., contract rent plus utilities and any mandatory housing fees) for the respondents in the specified universe.
⁺ The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

7.2 Ranking of Highest Priority Problems, by Housing Arrangement

The following tables provide finer detail about housing problems according to particular housing arrangements.

Table 7.2 focuses on unit types and programs in UCD Student Housing, breaking down the sample according to those who live in residence halls, P3s, SHAs, and Solano Park (see Section 4.1 in Chapter 4 for descriptions of these housing types). Since the vast majority of freshmen live in residence halls, the problem ranking for residence halls will closely resemble the second column of Table 7.1 above.

Table 7.3 focuses on housing that is unaffiliated with the university. The first three categories concern renters in Davis: all Davis renters combined, Davis renters in apartments (multi-family units), and Davis renters in detached houses (single-family units). The last column features renters living outside of Davis; as such it offers some generalized perspective beyond the particular context of the city.

Observations

Most outstanding in Table 7.2 is the dramatically lower percentage of Solano Park residents who report **housing expense** as an issue (only 4.7 percent, compared to clear majorities in P3s and SHAs and over a third of those in residence halls).

Lack of in-unit washer and dryer also figures prominently, though the percentages reporting this issue are much higher in SHAs and in Solano Park (44.8 and 59.6 percent, respectively) than in P3s (20.1 percent). Neighborhood safety concerns are also higher for SHAs and Solano Park (25.7 and 21.7 percent, respectively, versus 12.3 percent for P3s).

In P3s and SHAs, which are owned and managed by private companies, there are higher percentages of respondents reporting **pest issues** than in the other housing types (20.8 and 21.3 percent, whereas in residence halls and Solano park the respective figures are 10.9 and 4.7 percent). **Management issues** are relatively more frequent for P3s (9.2 percent reporting, compared with 4.7 or less for the other types), as are issues of **delayed maintenance** (13.5 percent reporting, though 13.2 percent in residence halls and 8.9 percent in SHAs also report delayed maintenance; only 2.3 percent report delayed maintenance in Solano Park).

Finally, **overcrowding** figures prominently among those in residence halls (23.5 percent), as expected based on freshmen reporting in Table 7.1 above. Overcrowding also figures prominently for those in P3s (11.9 percent). However, few SHA and Solano Park residents cite overcrowding as an issue.

Res Hall	Res Halls P3 Apts		SHA Progr	am	Solano Park			
Mean rent/perso	n = \$1083	Mean rent/perso	on = \$867	Mean rent/perso	n = \$1133	Mean rent/person = \$839		
n = 251		n = 150)	n = 81		n = 24	n = 24	
Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	
Expensive	34.3	Expensive	56.0	Expensive	56.6	No Laundry	59.6	
No Kitchen	32.3	Lease Terms	24.9	No Laundry	44.8	Pet Policy	30.8	
Pet Policy	26.4	Pests	20.7	Pet Policy	26.5	Restrictions	26.4	
Overcrowding	23.5	No Laundry	19.9	Neighborhood Safety	25.7	Neighborhood Safety	21.7	
Limited Parking	16.7	Maintenance	13.4	Pests	21.3	Amenity Distance	14.1	
No Laundry	16.2	Limited Parking	12.9	Campus Distance	17.0	Limited Parking	11.7	
Restrictions	15.8	Neighborhood Safety	12.2	Lease Terms	14.9	Expensive	4.7	
Amenity Distance	14.0	Overcrowding	11.9	Limited Parking	11.6	Pests	4.7	
Maintenance	13.2	Pet Policy	11.8	Amenity Distance	9.5	Management	4.7	
Neighborhood Safety	12.5	Amenity Distance	11.0	Maintenance	8.9	Transit Access	4.7	
Pests	10.9	Management	9.1	Transit Access	5.4	Maintenance	2.3	
Roommate Choice	10.6	Restrictions	6.9	Restrictions	4.3	Lease Terms	2.3	
Campus Distance	3.1	Roommate Choice	6.2	Management	4.2	Structure Safety	2.3	
Parks	2.7	Transit Access	4.2	Roommate Choice	4.1	Overcrowding	2.3	
Lease Terms	2.6	Campus Distance	3.1	Structure Safety	2.7	No Kitchen	0.0	
Structure Safety	2.6	Structure Safety	2.9	Schools	1.4	Campus Distance	0.0	
Transit Access	2.1	Parks	1.5	Overcrowding	1.4	Schools	0.0	
Management	0.8	Schools	0.5	Parks	1.4	Parks	0.0	
Schools	0.8	No Kitchen	0.0	No Kitchen	0.0	Roommate Choice	0.0	

Table 7.2: Prevalence of housing problems: UC Davis Student Housing.

Notes:

* Respondents could select as many of the 19 issues listed as they wished (or as few as 0).

⁺ Mean rent/person reflects monthly gross rents (i.e., contract rent plus utilities and any mandatory housing fees) for the respondents in the specified universe.
⁺ The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

The problems cited among those living in the private, off-campus housing arrangements covered in Table 7.3 reflect many of the general patterns already observed for the major role groups in Table 7.1. This is to be expected given that most students (in all role groups except freshmen) live off campus.

Housing expense figures prominently (48.6 percent reporting overall), though it is less pronounced in Davis detached houses (40.8 percent) and outside Davis (36 percent) than in Davis apartments (52.4 percent). The reduced incidence of high housing expense among students living outside Davis is worth noting, especially since their per-person gross rents may be higher (but this is likely because such students have, on average, greater access to resources and are less likely to economize by crowding).

Unsurprisingly, **distance to campus** is highly significant for all off campus groups. Among those living outside of Davis, it is the highest-ranking issue, with many more reporting distance to campus as a problem than housing expense (50.9 percent versus 36.0 percent). For those in Davis, slightly more than 20 percent report campus distance as an issue.

Lack of in-unit washer and dryer figures prominently (about 44 percent reporting overall), even vying for first place with housing expense for those living in private Davis apartments. However, it is reported at nearly half the rate for Davis houses and outside Davis, an artifact of Davis apartments being more likely to lack this amenity.

Delayed maintenance is a high-ranking problem (28.7 percent reporting overall), approaching or exceeding 30 percent for those in Davis apartments or detached houses. **Limited parking** is also reported as problematic across all categories (26.7 percent reporting overall, with 29.2 percent of Davis apartment renters reporting the issue and about 21 percent of Davis detached house renters and those living outside Davis reporting it).

For those renting in Davis, **persistent pests** and **problematic lease terms** are especially pronounced. Among those in Davis apartments, 22.2 percent report pest issues, and among those in Davis houses, 24.1 percent report pest issues. In contrast, only 9.5 percent of those renting outside of Davis report the problem. Similarly, leasing practices in Davis result in problems for 28.2 of Davis apartment renters and 21.0 percent of Davis detached house renters. In contrast, only 4.1 percent of those living outside of Davis indicate poor lease terms as a problem. (Lease terms emerged as an especially prominent issue during the recent work of the Chancellor's Affordable Student Housing Task Force; see "Turning the Curve on Affordable Student Housing" (2018, pp. 32–34).

Finally, **overcrowding** is cited prominently among those in Davis apartments (17.1 percent). For those in Davis detached houses, it is also pronounced, but less salient (9.5 percent). This difference is consistent with the difference in occupant density between Davis apartments and detached houses observed in Chapter 5. In contrast to these self-reported measures of overcrowding, only 4 percent of those renting outside of Davis report the issue (perhaps this lower rate is to be expected, given that average gross rents for respondents in this category demonstrate their ability to spend more on housing even while living further away from campus).

All Davis Renters		Davis Apartr	nents	Davis Hou	ses	Outside Da	avis
Mean rent/perso	on = \$682	Mean rent/perso	on = \$684	Mean rent/perso	on = \$678	Mean rent/person = \$1023	
n = 1229	Э	n = 831		n = 367		n = 98	
Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting
Expensive	48.5	No Laundry	52.4	Expensive	40.8	Campus Distance	50.9
No Laundry	44.0	Expensive	52.2	Maintenance	30.7	Expensive	36.0
Maintenance	28.7	Limited Parking	29.1	Pet Policy	27.6	No Laundry	25.7
Limited Parking	26.6	Lease Terms	28.1	No Laundry	25.9	Limited Parking	21.0
Lease Terms	25.9	Maintenance	27.8	Pests	24.1	Neighborhood Safety	18.3
Pests	22.9	Pests	22.2	Campus Distance	23.6	Maintenance	15.8
Campus Distance	21.4	Campus Distance	20.8	Lease Terms	21.0	Pet Policy	11.4
Pet Policy	19.1	Overcrowding	17.0	Limited Parking	20.5	Transit Access	11.1
Overcrowding	15.0	Pet Policy	15.4	Management	13.4	Pests	9.5
Neighborhood Safety	14.7	Neighborhood Safety	15.3	Structure Safety	11.5	Management	9.4
Management	14.5	Management	15.0	Neighborhood Safety	11.5	Structure Safety	7.7
Structure Safety	10.9	Structure Safety	10.2	Overcrowding	9.5	Amenity Distance	7.7
Amenity Distance	9.3	Amenity Distance	9.6	Restrictions	9.1	Restrictions	5.4
Restrictions	8.6	Restrictions	8.1	Amenity Distance	8.5	Parks	4.2
Parks	4.7	Parks	4.8	Parks	4.8	Lease Terms	4.1
Roommate Choice	4.0	Roommate Choice	3.4	Transit Access	4.3	Overcrowding	4.0
Transit Access	3.7	Transit Access	3.2	Roommate Choice	3.0	Roommate Choice	2.9
Schools	0.4	Schools	0.4	Schools	0.5	Schools	1.7
No Kitchen	0.1	No Kitchen	0.1	No Kitchen	0.0	No Kitchen	0.0

Table 7.3: Prevalence of housing problems: Off campus renters in Davis and outside Davis.

Notes:

* Respondents could select as many of the 19 issues listed as they wished (or as few as 0).

⁺ Mean rent/person reflects monthly gross rents (i.e., contract rent plus utilities and any mandatory housing fees) for the respondents in the specified universe.
⁺ The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

7.3 Ranking of Highest Priority Problems, Given Select Amenities

Survey respondents, in addition to identifying housing problems, also indicated whether their units had the following three amenities: **in-unit kitchens**, **in-unit laundry**, and **reserved on-site parking**. Such amenities can often be taken for granted, if one lives in a unit with them. Or, in their absence, individuals may feel an acute loss of convenience and incur extra costs associated with obtaining meals or exercising agency in their diet, allotting time and funds for laundromats, or paying parking fees. Yet, everything else being equal, having access to such amenities likely goes hand-in-hand with paying increased rent. From a planning perspective, including them in units also increase the cost of construction. It is important, then, to control for the presence or absence of such amenities so assessments can be made regarding how valuable they are to students. (Indeed, even though the Student Family Housing Redevelopment Committee heavily emphasized reducing amenities in new UCD Student Housing units to increase affordability, it was nevertheless agreed that installing in-unit laundry was valuable enough to warrant a modest increase in monthly rent; see Student Family Housing Redevelopment Committee, 2015, p. 30.)

To offer a simple quantification of how many on-campus and off-campus apartment and detached house residents in Davis have access to these amenities, Table 7.4 simply cross-tabulates rental housing arrangements and amenity presence.

The remaining tables focus only on P3 residents and on renters who live off-campus in the private Davis market. Table 7.5 tabulates the already familiar problem rankings of the previous sections, but only among a universe of those who report not having in-unit laundry facilities. This is done because the absence of in-unit laundry is highlighted as a problem by many students across housing types and is often listed only second to concerns over housing affordability. Since it appears to be the most universally desired amenity (and since, of the three amenities, it is the least available), we wanted to provide a glimpse of its importance by controlling for those who do not have access to it.

In contrast, Table 7.6, selects a universe of respondents who have access to all the amenities in question. Such a summary offers insight on the resulting relevance of the other problems in the list, and, by virtue of the accompanying summary of gross rents, it offers an appreciation of the rental market's pricing for units with the amenities.

The presence of the three amenities is determined using Question 71 in the survey instrument.

Observations

Table 7.4, which covers UCD Student Housing apartment units (P3s and SHAs) and apartments and detached houses in the private Davis market, shows that virtually all units, on-campus or off-campus, are equipped with kitchens. Nearly all respondents also report access to on-site parking (with those in P3s reporting the lowest rate of access at 92.7 percent).² However, access to in-unit laundry is quite varied. In UCD Student Housing, about two-thirds of P3s (66.8 percent) have an in-unit washer and dryer while less than half of SHAs (45.7 percent) have in-unit laundry. Off campus, less than a third of apartments (only 30.5 percent) have in-unit laundry facilities, while nearly two-thirds of student-occupied detached houses include a washer and dryer (65.5 percent).

²It should be noted that some respondents, despite stating that on-site parking is included in their housing arrangement, also express that they experience difficulty finding a place to park their vehicles.

Table 7.5 clearly reflects the significance of on-site laundry facilities. Among all off-campus renters in Davis without an in-unit washer and dryer, it is the highest ranking problem with nearly 75 percent reporting it as an issue (housing expense is second, with 50 percent of these respondents reporting it as an issue). The same pattern is true for those in P3s without access to in-unit laundry, though lack of on-site laundry access is relevant to a lower percentage (59 percent).

Table 7.6, by presenting sub-universes in which respondents have access to all three amenities, shows housing expense, lease terms, maintenance, and distance to campus emerging as the most significant problems (compare with Tables 7.2 and 7.3 above).

There are two other outstanding aspects, the first regarding parking and the second regarding amenity pricing. First, despite claiming to have access to some form of on-site parking, many respondents report that parking is a problem (especially apartment renters: 15.5 percent of those in P3s and 23.1 percent of those in off-campus apartments; only 12.4 percent of those in detached houses). Though it is possible that some landlords falsely claim to offer guaranteed on-site parking or that some units offer exclusive, though still limited parking, it is difficult to know the true source of the apparent discrepancy.

Finally, for off-campus renters the mean gross rents paid among those with access to the three on-site amenities are not drastically higher than the rents paid by those who lack access to an in-unit washer and dryer (compare to Table 7.5). Among all student renters in the private Davis market, those with full amenities pay an average individual gross rent of \$690 per month, and those lacking access to an in-unit washer and dryer pay an average of \$625—a difference of \$65.

	UCD Stu	Ident Housing	Off-campus Renters in Davis		
	P3 Apts	SHA Program	Apartments	Houses	
	n = 150	n = 81	n = 778	n = 318	
In-unit Laundry	66.8	45.7	30.4	65.5	
In-unit Kitchen	100.0	98.6	99.4	98.9	
On-site Parking	92.7	95.2	95.1	95.8	

Table 7.4: Percentage of students with select in-unit and on-site amenities, by housing category.

Notes:

The sample sizes (n) for each unierse are population weighte-adjusted (and may be more or less than the literal number of responsents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n =1839).

		Off-campus Renters in Davis							
P3 Apts	5	All Rente	rs	Apt Rente	ers	House Ren	ters		
Mean rent/perso	on = \$711	Mean rent/perso	on = \$624 Mean rent/person = \$632 Mean rent/person =		on = \$586				
n = 50		n = 657		n = 542		n = 110			
Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting		
No Laundry	59.0	No Laundry	74.1	No Laundry	74.8	No Laundry	72.0		
Expensive	33.7	Expensive	50.8	Expensive	52.4	Expensive	44.3		
Pests	24.9	Limited Parking	31.1	Limited Parking	30.6	Pet Policy	34.2		
Pet Policy	22.5	Maintenance	28.8	Maintenance	28.8	Limited Parking	34.2		
Neighborhood Safety	18.1	Lease Terms	26.8	Lease Terms	28.0	Pests	32.5		
Maintenance	15.7	Pests	24.6	Pests	23.1	Maintenance	29.9		
Overcrowding	14.6	Campus Distance	20.4	Campus Distance	20.4	Lease Terms	21.6		
Lease Terms	12.5	Pet Policy	19.8	Overcrowding	19.6	Campus Distance	20.5		
Limited Parking	7.8	Overcrowding	18.7	Pet Policy	17.0	Overcrowding	15.1		
Restrictions	5.6	Neighborhood Safety	14.2	Neighborhood Safety	14.6	Management	14.1		
Structure Safety	4.4	Management	13.0	Management	12.9	Structure Safety	14.0		
Amenity Distance	3.5	Structure Safety	11.6	Structure Safety	11.0	Restrictions	14.0		
Roommate Choice	3.5	Amenity Distance	8.9	Amenity Distance	8.9	Neighborhood Safety	11.9		
Parks	3.3	Restrictions	8.3	Restrictions	7.2	Amenity Distance	8.2		
Management	2.2	Parks	6.0	Parks	5.7	Parks	7.2		
Transit Access	1.1	Roommate Choice	2.3	Roommate Choice	2.6	Roommate Choice	1.1		
No Kitchen	0.0	Transit Access	1.9	Transit Access	2.0	Schools	1.0		
Campus Distance	0.0	Schools	0.4	Schools	0.3	Transit Access	0.5		
Schools	0.0	No Kitchen	0.2	No Kitchen	0.2	No Kitchen	0.0		

Table 7.5: Priority housing problems on campus and off campus for those WITHOUT in-unit laundry.

Notes:

* Respondents could select as many of the 19 issues listed as they wished (or as few as 0).

⁺ Mean rent/person reflects monthly gross rents (i.e., contract rent plus utilities and any mandatory housing fees) for the respondents in the specified universe.

⁺ The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

		Off-campus Renters in Davis						
P3 Apts		All Renters		Apt Rente	ers	House Renters		
Mean rent/perso	on = \$955	Mean rent/perso	on = \$692	Mean rent/perso	on = \$719	Mean rent/perso	on = \$655	
n = 93		n = 440		n = 224		n = 200	1	
Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	Problem	Pct Reporting	
Expensive	64.5	Expensive	44.0	Expensive	50.4	Expensive	37.8	
Lease Terms	26.8	Maintenance	28.1	Lease Terms	27.1	Maintenance	30.4	
Pests	18.7	Lease Terms	23.9	Maintenance	25.5	Campus Distance	25.4	
Limited Parking	15.3	Campus Distance	22.3	Limited Parking	23.1	Pet Policy	24.6	
Amenity Distance	13.9	Pests	20.0	Pests	20.2	Lease Terms	20.1	
Management	12.8	Pet Policy	18.5	Campus Distance	20.1	Pests	18.7	
Maintenance	11.9	Limited Parking	18.0	Management	19.0	Management	12.5	
Overcrowding	10.3	Management	16.0	Neighborhood Safety	15.4	Limited Parking	12.4	
Neighborhood Safety	9.3	Neighborhood Safety	14.5	Pet Policy	11.8	Neighborhood Safety	11.4	
Roommate Choice	8.2	Structure Safety	9.4	Overcrowding	10.1	Structure Safety	10.0	
Pet Policy	7.0	Amenity Distance	9.2	Restrictions	10.0	Amenity Distance	8.5	
Restrictions	6.8	Overcrowding	8.9	Amenity Distance	9.9	Overcrowding	6.5	
Transit Access	5.4	Restrictions	8.4	Structure Safety	8.1	Transit Access	6.0	
Campus Distance	4.2	Transit Access	6.0	Transit Access	5.8	Restrictions	5.9	
Structure Safety	2.4	Roommate Choice	6.0	Roommate Choice	4.9	Roommate Choice	4.2	
No Laundry	0.6	Parks	2.7	Parks	2.0	Parks	3.7	
Parks	0.6	No Laundry	0.8	No Kitchen	0.0	No Laundry	1.7	
No Kitchen	0.0	Schools	0.1	No Laundry	0.0	Schools	0.3	
Schools	0.0	No Kitchen	0.0	Schools	0.0	No Kitchen	0.0	

Table 7.6: Priority housing problems on campus and off campus among those WITH laundry, kitchen, and on-site parking.

Notes:

 * Respondents could select as many of the 19 issues listed as they wished (or as few as 0).

⁺ Mean rent/person reflects monthly gross rents (i.e., contract rent plus utilities and any mandatory housing fees) for the respondents in the specified universe.

⁺ The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

Chapter 8

Rents and Affordability

This chapter presents summaries and analysis for rents. It also includes an analysis of housing affordability, as determined relative to mean market prices, and then concludes with preliminary considerations for improving the measurement of housing cost burden and affordable unit availability in future versions of the SHAIS. The chapter's topics and discussions are organized as follows:

- Overview of rent statistic types and data;
- Gross per-person rents, including:
 - Gross rent per person, on campus and off campus;
 - Gross rent per person, private Davis market by lease type;
 - Gross rent per person, private Davis market by role group;
- Rents by unit size in the private Davis market, including:
 - Gross rent per person, by unit size;
 - Gross rent per unit, by unit size;
 - Contract rent per unit, by unit size;
- Affordability, including:
 - Market-indexed affordability assessments;
 - Challenges for assessing income-based affordability; and
 - Developing a specialized housing affordability metric for UCD students.

Highlighted Findings

- Students renting apartments off campus in Davis pay contract rents consistent with the University's *Apartment Vacancy and Rental Rate Survey*, though differences occur because students do not occupy units in proportion to the city's supply of unit types and sizes.
- On a per-person basis, continuing undergraduates living off campus in Davis experience the lowest cost of housing among all students.
- On a per-person basis, off campus graduate students pay substantially more than continuing undergraduates (about \$382 more for apartments and \$335 more for detached houses). In large part, this is because undergraduates occupy units at higher densities.

- In the private Davis rental market, students pay far less on a *per-person* basis than the average cost of their units on a *per-bedroom* basis.
 - It could be argued that the discrepancy (e.g., a \$246 difference for two-bedroom apartments) is large and indicates that students are crowding—perhaps overcrowding—into units in order to reduce costs; however, the association between cost and unit occupant density should be studied more closely, since the quantities considered are only based on averages.
 - The discrepancy has immediate relevance for modifying the assumptions used by the UC Office of the President (UCOP), which periodically surveys students about housing costs on a *de facto* per-person basis rather than using market-based assessments of unit or bedroom cost when determining maximum financial aid allowances for offcampus students.
- The occupancy of affordable units (indexed as costing 15 percent of the mean market rate or less) is higher in the private Davis rental market than in university-affiliated housing:
 - Almost 27 percent of students living in off-campus apartments benefit from affordable pricing.
 - Only about 15 percent of students living in P3 apartments benefit from affordable pricing.
- If low-income students are considered to be the most in need of affordable units, then the supply of on-campus and off-campus affordable apartments in Davis falls short for as many as 5,500 students (excluding off-campus detached houses).
- Further work needs to be done to develop an affordability measure for college students based on 'cost burden.' Specialized metrics that refine cost burden and market-indexed approaches (and potentially combine them) might be developed to track progress on affordable student housing.

8.1 Overview of Rent Statistic Types and Data

To tabulate data on rents and affordability, respondents were asked to report the amount they pay for housing, as well as utilities. To help parse the variety of payment arrangements and compile comparable data across them, housing payment questions were tailored to contingencies in the survey instrument's logic flow. In general terms:

 Students in UCD Student Housing residence halls (effectively all freshmen) were not asked about their rent, since it is an independently known quantity (easily applied to each record according to the number of students sharing each respondent's room); the same was true for students in the SHA program (usually juniors who are first-year transfer students)¹;

¹Utilities are bundled in UCD Student Housing residence halls and SHA bills, and these housing arrangements also include academic and residential support programs (which partly explains their higher cost relative to average market rents). Here, the

- Students in other UCD Student Housing apartments (i.e., P3s or Solano Park), as well as those in other forms of on-campus housing (e.g., on-campus cooperatives), were asked about individual rent and utility payments, since rates may vary depending on ownership, lease types (unit or bed), and number of bedrooms;
- Students renting off campus were asked about their lease types (unit, bed, or sublet) and, depending on their response, were directed to account for their individual rent and utility responsibility (if in a bed lease or sublet) or their individual rent and utility responsibility as a portion of overall costs (if in a conventional unit lease).

In the first sets of summarized statistics below, we report *individualized gross rent*, which is the combined cost of the monthly contract rent, utilities, and any mandatory fees. We report gross rent for several reasons: first, gross rent reflects the full housing cost; second, gross rent would be the actual qualifying statistic (as a portion of income) for subsidized housing if students were eligible under conventional affordable housing subsidy programs²; and third, gross rents allow for comparability across UCD Student Housing and the private market, since some UCD Student Housing lease types bundle utilities (and it is conceivable that some private lease arrangements also do so).

Another set of rent statistics uses additional SHAIS data (e.g., number of adult roommates, number of bedrooms, portion of rent the respondent is responsible for) to derive rent figures for *whole units*. These per-unit estimates and their distributions—in contrast to per-person rents—provide a fuller picture of the actual rental costs faced by students under the assumption that off-campus renters would, under conditions of sufficient supply, seek occupancy at a rate of 1 person per bedroom (whereas per-person gross rents do not account for any deflationary representation of cost due to increased numbers of roommates per unit or bedroom, i.e., crowding).

Whole-unit rents are calculated in terms of both *gross rent* and *contract rent* (simply, the nominal contract price without consideration of utilities). When reporting contract rents, a universe of only conventional (unit) lease types in the private Davis market is used. This exclusion of bed-leased units is expedient because (1) the SHAIS sample for bed leases is relatively small and (2) SHAIS-derived unit lease prices can be readily compared to the unit lease prices featured in the annual *Apartment Vacancy and Rental Rate Survey* (2017a), which the report summarizes discretely from bed-lease rent data.

Data are based on responses to Questions 18, 19, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, and 40 in the survey instrument.

rent prices used for residence halls and SHAs are adjusted so as not to include the cost of meal plans (though such plans are mandatory for students in residence halls). Further, since students in these units pay their UCD Student Housing bill quarterly and since the leases are not for a full year, the prices had to be derived by dividing the total bill for the academic year by the respective lease length: 9 months in the case of residence halls and 10.5 months in the case of SHAs.

²Under federal legislation and rules set by the US Department of Housing and Urban Development (HUD), full-time college students under the age of 24 are not eligible for government-subsidized housing programs (unless they have dependent children, are married, or are veterans) because they are considered, by default, financially dependent on their parents (see US Department of Housing and Urban Development, 2016).

8.2 Gross Rent per Person, On Campus and Off Campus

Tables 8.1, 8.2, and 8.3 report gross rents for students who reside, respectively, in UCD Student Housing units, in the private Davis market, and outside of Davis. The tables report the sample mean, the 90 percent MOE of the sample mean, and the standard deviation of the sampled rents about the mean.

Observations

On-campus freshmen and juniors have higher average gross rents than other students (Table 8.1), which is to be expected since their housing types (residence halls for freshmen and SHAs for many junior transfer students) are offered as part of the University's staffed housing experience, which provides academic and residential support services. For general comparability of average UCD Student Housing rents (outside of residence halls and SHAs) with rents in the private Davis rental market, the gross rents of sophomores, seniors, continuing undergraduates as an aggregated group, masters/professional students, PhD students, and graduate students as an aggregated group would be most appropriate.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	616	1008	15	214
Freshmen	329	1075	9	99
Sophomores	49	979	67	283
Juniors	111	1011	39	250
Seniors	35	905	71	255
Undergraduates, Con't	195	977	32	260
Undergraduates, All	524	1024	17	205
Masters/Pro	24	941	108	323
PhD	68	831	36	182
Graduates, All	92	862	40	232

Table 8.1: Gross rent per person in UCD Student Housing.

Notes:

The sample sizes (n) for aggregated role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ Sample size is small for masters and professional students.

For students living off campus in Davis (Table 8.2), gross rents per person appear to be substantially lower than on-campus rates (though with greater variation). For continuing undergraduates, off-campus rents are substantially cheaper at an average of about \$603 per month (compare to \$888 per month paid by on-campus seniors). Graduate students appear to pay, on average, a bit more for off-campus apartments (compare \$918 off campus to \$874 on campus). However, there is much greater variation in the rents graduate students pay for off-campus housing, and the lower cost of on-campus housing results, in part, from the exceptionally low rents charged at Solano Park.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	1010	653	15	303
Freshmen	8	966	206	354
Sophomores	204	595	26	228
Juniors	237	585	21	192
Seniors	264	615	30	293
Undergraduates, Con't	705	602	16	253
Undergraduates, All	713	604	15	255
Masters/Pro	120	879	58	386
PhD	176	954	49	396
Graduates, All	297	922	37	391

Table 8.2: Gross rent per person in the private Davis market.

Notes:

The sample sizes (n) for aggregated role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ Sample size is small for freshmen.

For students living outside of Davis (Table 8.3), gross rents per person may be higher than rates in the private Davis market and are comparable with rates in UCD Student Housing (but note the small sample sizes for undergraduate role groups). However, there is high variability in the gross rents paid among students living outside of Davis; standard deviations are particularly great among graduate students.

From these data, it is generally clear that continuing undergraduates living off campus in Davis experience the lowest cost of housing among all students *on a per-person basis*.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	117	1023	104	627
Freshmen	0			
Sophomores	2	664	331	285
Juniors	14	808	162	369
Seniors	18	977	208	535
Undergraduates, Con't	34	909	126	466
Undergraduates, All	34	909	118	466
Masters/Pro	40	1026	140	536
PhD	43	1255	226	902
Graduates, All	83	1138	132	733

Table 8.3: Gross rent per person in private markets outside of Davis.

Notes:

- * The sample sizes (n) for aggregated role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).
- ⁺ Sample size is small or non-existent for all constituent undergraduate role groups.

8.3 Gross Rent per Person, Private Davis Market by Lease Type

Tables 8.4 and 8.5 report the mean, MOE of the mean, and standard deviation of gross rents among students who reside in the private Davis housing market under, respectively, unit (conventional) and bed (dormitory-style) leases.

Observations

The means and standard deviations show that, in a per-person basis, there are unlikely to be significant differences between rents paid under conventional and dormitory-style leases in the private Davis market. Sample sizes for dormitory-style leases are small, which is consistent with the observed relative infrequency of these lease types in Davis generally (cf. BAE Urban Economics, 2017a).

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	891	647	16	298
Freshmen	5	1111	282	383
Sophomores	177	577	28	229
Juniors	208	577	22	188
Seniors	240	609	28	263
Undergraduates, Con't	625	593	15	237
Undergraduates, All	630	595	15	240
Masters/Pro	101	897	66	400
PhD	160	968	53	410
Graduates, All	261	938	41	405

Table 8.4: Gross rent per person in off-campus conventional leases.

Note:

^{*} The sample sizes (n) for aggregate role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

[†] Sample size is small for freshmen, who are unlikley to reside in off-campus units.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	99	670	34	213
Freshmen	3	723	44	46
Sophomores	23	711	65	188
Juniors	22	666	77	221
Seniors	20	570	67	182
Undergraduates, Con't	65	640	41	199
Undergraduates, All	68	642	38	197
Masters/Pro	15	812	137	322
PhD	15	774	35	82
Graduates, All	31	802	67	230

Table 8.5: Gross rent per person in off-campus bed leases.

Notes:

* The sample sizes (n) for aggregate role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ Sample size is small for all constituent role groups.

8.4 Gross Rent per Person, Private Davis Market by Role Group

Tables 8.6 and 8.7 report the mean, MOE of the mean, and standard deviation of gross rents for students who reside in the private Davis housing market in, respectively, apartments (multi-family units) and detached houses (single-family units).

Observations

The data show that it may be, on average, slightly cheaper on a *per-person* basis to rent space in detached houses than it is to rent in apartments (\$636 versus \$658, with similar variability about the means). Moreover, graduate students pay substantially more than continuing undergraduates (perhaps \$382 more for those living in apartments and \$335 more for those living in detached houses), likely because undergraduates occupy units at higher densities (see Section 5.4 in Chapter 5).

See further analysis and observations about the discrepancies between per-person gross rents and perunit gross rents in Section 8.5.2 further below.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	683	658	19	322
Freshmen	6	1051	251	373
Sophomores	153	603	33	248
Juniors	165	578	26	206
Seniors	189	623	38	317
Undergraduates, Con't	507	606	20	274
Undergraduates, All	513	609	19	277
Masters/Pro	72	950	85	437
PhD	97	1032	62	369
Graduates, All	170	994	50	399

Table 8.6: Gross rent per person for apartments in the private Davis market.

Notes:

The sample sizes (n) for aggregate role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ Sample size is small for freshmen, who are unlikley to reside in off-campus units.

Table 8.7: Gross rent per person for detached houses in the private Davis market.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Students	326	636	30	333
Freshmen	3	342	318	335
Sophomores	51	542	41	180
Juniors	71	608	46	236
Seniors	72	545	47	243
Undergraduates, Con't	194	563	27	228
Undergraduates, All	197	562	25	229
Masters/Pro	46	793	92	381
PhD	83	965	95	524
Graduates, All	129	898	69	476

Notes:

- * The sample sizes (n) for aggregate role groups (boldface) are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).
- ⁺ Sample size is small for freshmen, who are unlikley to reside in off-campus units.

8.5 Rents by Unit Size in the Private Davis Market

The following section summarizes rents for apartments (multi-family units) and detached houses (single-family units) in the private Davis market. Rents are tabulated by *unit size*, as determined by number of bedrooms in each unit (whereas in the previous rent sections, per-person rents were summarized without cross-tabulating the data by number of bedrooms).

As in the preceding sections, Tables 8.8 and 8.9 report gross rent *per person*, only now cross-tabulated by the number of bedrooms in respondents' units.

In contrast to preceding sections, Tables 8.10, 8.11, 8.13, and 8.14 report rents according to the price of the unit itself. Doing so overcomes the deflationary effects of crowding, since it allow units to be priced independently of the number of occupants. Moreover, rents based on unit size can be compared to other information about the private Davis market, such as the average rents reported in the *Apartment Vacancy and Rental Rate Survey* (*viz.* "Vacancy Report," BAE Urban Economics, 2017a). Section 8.5.3 is especially relevant in this respect, since like the *Vacancy Report*, it summarizes *contract rents* (rather than gross rents).

Of course, SHAIS-derived rent statistics are conditional on the experience of the UCD student population and do not represent the entire Davis rental population. It would thus be invalid to infer that the detached house rents paid by students reflect rents for detached houses in the city generally. However, with respect to apartment rents, the *Vacancy Report* does permit comparison between general city rents and student rents. Such a comparison can be quite informative. As discussed below, students do not occupy private market apartments in proportion to the city's supply of unit types and sizes, which suggests that the annual *Vacancy Report* should not automatically be assumed to represent the market as it exists for UCD students.

It is important to note how the data in Tables 8.8, 8.9, 8.10, 8.11, 8.13, and 8.14 have been aggregated. The rent distributions for 'all apartments' and 'all detached houses' include units with any number of bedrooms (including units with as many as 5 or more bedrooms). However, *only units with up to 4 bedrooms are used to derive price-per-bedroom statistics*, as this represents the vast majority of cases and offers categories that are comparable with the ACS and the *Vacancy Report*. Note that studio apartments are counted as having one bedroom and are merged with one bedroom units (this increases the effective sample size for units designed for only one-person or coupled living).

8.5.1 Gross Rent per Person, by Unit Size

Tables 8.8 and 8.9 report the mean, MOE of the mean, and standard deviation of gross rents paid per person in the private Davis market for apartments and detached houses, respectively. Rents are itemized by the number of bedrooms making up the units.

Observations

On an averaged, per-person basis, it may be slightly more expensive to rent an apartment in the private Davis market than a detached house (on average, the apartment gross rent is \$658 per person and the detached house gross rent is \$636). However, the sample for detached houses is skewed by the prevalence of three-bedroom houses and some large houses, likely special cases, that have 5 or more bedrooms (NB: such large units are included in the 'all apartment' and 'all houses' totals but are not itemized). The sample for apartments is skewed by having a larger proportion of one-bedroom and two-bedroom units.

The picture is different when individual gross rents for apartments and detached houses are compared by number of bedrooms. There appears to be a detached house 'premium,' with average prices for houses being higher than apartments for one-, two-, and three-bedroom units. Interestingly, four-bedroom houses appear to cost significantly less per person than four-bedroom apartments. This may result from differences in design quality for high-density units: large apartments are more likely built with features and amenities intended to accommodate dense living among unrelated adults.

Overall, as indicated by relatively large standard deviations, there is a high degree of variation in the prices students pay for both apartments and houses. However, there is a substantial difference between the average price paid for one-bedroom or studio units—well above \$900 for both types—and the prices paid for larger units. The vast majority of students living in any two-bedroom or larger units pay less than the average prices of studio and one-bedroom units.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Apartments	683	658	19	322
One Bedroom or Studio	114	939	72	468
Two Bedroom	341	625	23	274
Three Bedroom	154	569	30	254
Four Bedroom	70	637	36	199

Table 8.8: Gross rent per person in apartments in the private Davis market, by unit size.

Notes:

* The sample sizes (n) for each universe are population weightadjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ The statistics for all units also include units that have 5 or more bedrooms (but such large units are not itemized).

	n	Mean (\$)	MOE (\$)	Std Dev (\$)
All Houses	326	636	30	333
One Bedroom	14	959	219	402
Two Bedroom	74	661	67	355
Three Bedroom	133	659	50	360
Four Bedroom	77	538	39	219

Table 8.9: Gross rent per person in detached houses in the private Davis market, by unit size.

Notes:

* The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ The statistics for all units also include units that have 5 or more bedrooms (but such large units are not itemized).

8.5.2 Gross Rent per Unit, by Unit Size

In this and the following section, rent statistics for students in the private Davis market are tabulated *per unit* (i.e., the total combined contract rent and utility payments of all occupants in respondents' units, not just the amount paid individually by each respondent). Tables 8.10 and 8.11 report the mean, MOE

of the mean, and standard deviation of gross rents paid for apartments and detached houses. Rents are itemized by the number of bedrooms making up the units.

Observations

The data show that, on average, whole-unit gross rents for detached houses are higher than apartments. However, once broken down per bedroom, price differences between the two housing types become less pronounced. Average per bedroom gross rents may be slightly higher for two- and three-bedroom houses, while in general students appear to pay more per bedroom for apartments than for houses.

More significantly, when unit gross rents are compared to per-person gross rents (see Section 8.5.1 above), we also observe that for:

• One-bedroom and studio units:

Apartments cost \$1,400 for the space, while individuals report paying \$939; One-bedroom detached houses (though few) cost \$1280 for the space, while individuals report paying \$959;

• Two-bedroom units:

Apartments cost \$873 per bedroom, while individuals report paying \$627; Detached houses cost \$921 per bedroom, while individuals report paying \$661;

• Three-bedroom units:

Apartments cost \$737 per bedroom, while individuals report paying \$565; Detached houses cost \$807 per bedroom, while individuals report paying \$659;

• Four-bedroom units:

Apartments cost \$738 per bedroom, while individuals report paying \$637; Houses cost \$714 per bedroom, while individuals report paying \$538.

In each instance, individuals pay less—on average—than the per-room cost of their units. Lower perperson gross rents are to be expected to some degree, given that even under ideal housing circumstances some individuals would choose to double-up in private, off-campus units in order to save money or cohabit as couples (though the survey shows little prevalence of the latter among undergraduates). It could be argued that the discrepancies are large and indicate that students are crowding into units in order to reduce costs and to maximize the limited housing supply; however, the association between cost and unit occupant density should be studied more closely before drawing a definitive conclusion.

Nevertheless, such discrepancies may have immediate relevance for modifying the assumptions used by the UC Office of the President (UCOP) in determining the maximum allowance of financial aid for students living off campus. According to the Chancellor's Affordable Student Housing Task Force report (2018, pp. 26–28), UCOP may use surveys of individualized student rents (such as those derived from the triannual Undergraduate Cost of Attendance Survey) to estimate the off-campus cost of living, rather than referencing market rates. As a consequence, off-campus students requiring need-based support to cover their housing costs may not be eligible to receive financial aid that is sufficient to cover the cost of an average bedroom—even in a multi-room apartment or house. If this approach serves to price students out of housing, it may reinforce the *status quo* of crowding as a cost-saving behavior and contribute to housing insecurity.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)	Mean/Bedroom (\$)
All Apartments	614	1916	34	545	843
One Bedroom or Studio	110	1400	38	240	1400
Two Bedroom	312	1745	28	322	872
Three Bedroom	139	2210	44	346	737
Four Bedroom	53	2954	113	555	738

Table 8.10: Gross rent per unit for apartments in the private Davis market, by unit size.

Note:

The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

Table 8.11: Gross rent per unit for detached houses in the private Davis market, by unit size.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)	Mean/Bedroom (\$)
All Houses	243	2367	72	699	795
One Bedroom	12	1280	188	297	1280
Two Bedroom	63	1842	91	446	921
Three Bedroom	104	2420	99	640	807
Four Bedroom	64	2857	106	548	714

Note:

The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

8.5.3 Contract Rent per Unit, by Unit Size

In this section, we focus on contract rents in order to facilitate comparison of SHAIS student renter data with other sources. First, we present rent data reproduced from the 2017 *Apartment Vacancy and Rental Rate Survey* (BAE Urban Economics, 2017a), and then we proceed to summarize the student contract rents for apartments and detached houses. Rents are summarized by unit size, as measured by number of bedrooms.³

³It is important to note that the SHAIS sample of contract rents in this section is drawn only from renters in *conventional unit leases*. We use this reduced universe because the *Vacancy Report* segments its rent reporting into conventional and bed lease types without offering a blended summary; at the same time, the SHAIS' sample of bed leases is not sufficient to generate a discrete and meaningful breakdown by unit size. Hence, we simply exclude bed lease comparisons in favor of making a more robust and straightforward comparison among estimates of conventionally leased units.

The 2017 *Vacancy Report* estimates off campus Davis rental rates by surveying property owners and managers about the price and size and quantity of units they offer. Table 8.12 reproduces the average rent figures for conventionally leased apartments, including the sample sizes.⁴ To aid our analysis, we added the average price per bedroom in the final column.⁵

Tables 8.13 and 8.14 report the mean, MOE of the mean, and standard deviation of student contract rents in the private Davis market for apartments and detached houses. Rents are itemized by the number of bedrooms making up the units.

	n	Weighted avg (\$)	Min (\$)	Max (\$)	Per bedroom (\$)	
Studio	197	1035	468	1600	1035	
One-bedroom	2614	1270	625	1725	1270	
Two-bedroom	3745	1660	789	2600	830	
Three-bedroom	1090	2270	804	2860	757	
Four-bedroom	455	2858	2035	3950	714	
Other (larger)	21	3511	2495	3995		
All Units	8122	1673	468	3995	878	

Table 8.12: Average off-campus apartment contract rents in Davis (fall 2017).

Notes:

* Source: Apartment Vacancy and Rental Rate Survey (2017a).

⁺ Per-bedroom rates are not listed in the *Vacancy Report* but are derived from its data (see text for details).

[‡] The per-bedroom rate for 'all units' is derived from sample size and average rate data that excludes 'other, larger' units, since it is not known how many total bedrooms such units represent.

Observations

The average apartment rents reported by students in Table 8.13 appear to skew over \$100 higher than the market average in the *Vacancy Report*; yet, on a per-bedroom basis, student rents are closer (if not a bit less) than the average per-bedroom rate derived from the *Vacancy Report*.

⁴The sample sizes formally belong to those units whose owners/managers reported *vacancy* information, not necessarily *rent* information. However, since the *Vacancy Report* does not offer sample sizes for its rent calculation inputs—yet draws on the same pool of apartment owner/manager respondents—we assume that the unit sample for vacancy sufficiently approximates the sample for rents.

⁵The Vacancy Report does not list per-bedroom rates, so we derive them by dividing the average rent reported for units of each size category (one-bedroom, two-bedroom, etc.) by their respective number of bedrooms (1, 2, etc.). Moreover, the Vacancy Report's overall average unit rent is weighted to include all unit sizes, even exceptionally large units for which no per-bedroom itemization is possible. In order to derive an approximate overall per-bedroom rate, we use the survey's reported values only for units ranging from studios and one-bedrooms up to four-bedrooms. That is, average rent per bedroom = $\Sigma(Units_{sz} \times R_{sz})/\Sigma(Units_{sz} \times Beds_n)$, where $Units_{sz}, R_{sz}$, and $Beds_n$ are vectors for, respectively, the sample size of apartments in each size category (up to 4 bedrooms), the average, weighted rents reported for each size category, and the number of bedrooms associated with each size category (i.e., 1 for studios, then 1, 2, 3, and 4).

	n	Mean (\$)	MOE (\$)	Std Dev (\$)	Mean/Bedroom (\$)
All Apartments	614	1794	32	517	789
One Bedroom or Studio	110	1295	34	218	1295
Two Bedroom	312	1631	26	300	816
Three Bedroom	139	2084	43	340	695
Four Bedroom	53	2767	106	521	692

Table 8.13: Contract rent per unit for apartments in the private Davis market, by unit size.

Note:

The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

Table 8.14: Contract rent per unit for detached houses in the private Davis market, by unit size.

	n	Mean (\$)	MOE (\$)	Std Dev (\$)	Mean/Bedroom (\$)
All Houses	243	2212	68	660	743
One Bedroom	12	1172	176	279	1172
Two Bedroom	63	1725	86	423	862
Three Bedroom	104	2259	94	608	753
Four Bedroom	64	2674	99	513	669

Notes:

The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ Sample size is small for one-bedroom houses.

An important factor underlies this apparent discrepancy, as observed through a comparison of sample sizes: according to the SHAIS, students do not occupy the variously sized apartments in the private Davis market in the same proportions that such unit sizes are represented in the *Vacancy Report*. While studios and one-bedrooms account for over a third of the private units in the city, only about 18 percent of apartment-renting students live in such units (likely representing a segment of the student population that can pay a high premium to do so). Occupancy for two-bedroom units is a better, if still skewed, match, with about 51 percent of apartment-renting students living in the reported 46 percent of city units of this size. However, over 22 percent of student apartment renters live in three-bedroom units, while such units account for less than 14 percent of the city total; and, nearly 9 percent of student apartment renters live in four-bedroom units, though these account for less than 6 percent of the city total. In general, then, students are economizing by disproportionately occupying larger apartment units relative to the housing supply while some pay very high premiums for units with fewer bedrooms (i.e., for greater privacy). It must also be noted that disproportionate occupancy provides yet further evidence for market segmentation—*viz*. students do not enjoy equal access to all units in the private Davis market—meaning that it cannot simply be assumed that the general market conditions summarized in reports like the *Apart*-

ment Vacancy and Rental Rate Survey capture the full experience of students (also see Sections 4.5 and 4.6 in Chapter 4 and 5.4 in Chapter 5).

The additional data in Table 8.14 show that, without adjusting for the difference in number of bedrooms comprising houses and apartments, whole-unit rents for detached houses tend to exceed those of whole apartments by over \$400. However, on a per-bedroom basis, rents in houses with two- and three-bedrooms (with three-bedroom configurations being the most common) are estimated to be a bit lower than their apartment equivalents, though margins of error are fairly expansive. In general then, on a per-bedroom basis, rents for detached houses average \$46 less than rents for apartments. However, uncertainty about the estimates for both housing types suggests the average difference could be somewhat greater or, on the contrary, quite minimal.

8.6 Affordability

Housing affordability is a major motivating concern of the SHAIS. The concept is commonly assessed using two approaches.

- 1. Market-indexed affordability. Here, the unit price (or per-bedroom price), when compared to the average market rate, determines whether an individual or household is living in an affordable or non-affordable scenario. This definition is used by UCD Student Housing, which aims to supply (or incentivize the construction of) some apartment units to students that are priced at least 15 percent lower than the average rate in the private Davis rental market. An advantage of this definition is that it allows for an evaluation of a relatively fixed, low-cost unit supply, since the number of qualifying units or bedrooms can be tallied independently of individual income circumstances. Further, placing unit cost in relationship to market rates facilitates the development of planning objectives that can adapt to the limitations of actual, market-determined construction and maintenance costs (e.g., quotas for the quantity of low-price units can be pursued in conjunction with the construction of higher-price units to offset costs). The major disadvantage of the market-price affordability approach is that it does not consider the relationship between individuals' housing cost and income or wealth levels—which is typically the focus of claims made about the harmfulness of excessive housing costs.
- 2. Income-based affordability. Here, the portion of an individual's income required for housing determines whether they are living in an affordable or non-affordable scenario. The US Department of Housing and Urban Development (HUD), when applying this conceptualization, uses gross income and gross housing costs (US Department of Housing and Urban Development, 2019). Individuals in households that spend 30 percent or more of their gross monthly income on housing (including utilities) are categorized as "cost burdened," and individuals in households that spend 50 percent of more on housing are categorized as "extremely cost burdened." A primary appeal of the income-based, cost burden approach is that it considers individualized circumstances and the relative nature of affordability. Some disadvantages, however, are that the cost burden thresholds may be outdated, since regional, national, and worldwide trends show an increase in the portion of household budgets consumed by housing (i.e., everyone pays a greater portion of their incomes for housing than what was once assumed to be normal), and that the resulting normative definition of prices may not be sufficient to cover the actual costs, on average, of contemporary construction

and maintenance (even for modest unit types). Moreover, a ratio of cost-to-income does not in itself capture the magnitude of the burden *vis-à-vis* wealth; housing costs are more burdensome at 30 percent of a low-income person's resources than at 30 percent of a high-income person's resources (the latter being at greater liberty to spend more).

For reasons explained below, this iteration of the SHAIS was only able to produce assessments consistent with the first conceptualization of housing affordability (i.e., market-indexed affordability). First, we report findings for the market-indexed conceptualization. Then we elaborate on the methodological issues surrounding income-based affordability assessment for full-time college students. Finally, given the outcomes of this pilot effort and the issues identified, we make a proposal for developing unique affordability metrics that, in the future, might be better suited for tracking progress in reducing the prevalence of housing cost burden among UCD students.

8.6.1 Market-indexed Affordability Assessments

SHAIS data allow us to use the market-indexed conceptualization of affordability to estimate the proportion of students living in affordable scenarios. We make a general comparison for all students who report living in either P3s or the private Davis market. These housing types represent the predominant and most readily comparable 'at-market' options for on-campus and off-campus living. Note that other on-campus options, including SHAs and residence halls, are priced well above the mean market price; however, the rental agreements at Solano Park—with uniform per-bedroom pricing at \$453 (two-bedroom units) and \$766 (one-bedroom units)—make it the most affordable on-campus option and perhaps the most affordable option for a large swathe of students in any Davis complex.

Also note that we opt to analyze market-indexed affordability in terms of *per-bedroom* pricing (instead of per-unit pricing or per-person pricing) because per-bedroom rates, by reflecting an ideal one-student-perroom scenario for those living in apartments, control for the deflationary impact of crowding while also retaining unit-based information (i.e., since per-bedroom prices are derived by dividing total unit contract rent by the number of bedrooms in the unit).

Moreover, we opt to report market-indexed statistics based on *contract rent* values (as opposed to gross rent values). Contract rents are useful under a market-relative conceptualization because they allow for indexing and comparability *vis-à-vis* the 2017 *Apartment Vacancy and Rental Rate Survey* (BAE Urban Economics, 2017a).

For 2017-18 academic year, we defined the "affordable" contract rent per bedroom as \$706 per month. This value corresponds to 85 percent of one-half the two-bedroom market rate, as reported in the *Vacancy Report* [BAE Urban Economics (2017a), p. 7; also see Table 8.12].⁶ It corresponds to 'fifteen percent of market rate,' which is the threshold used by UCD Student Housing—as well as some other University of California campuses—when defining the maximum desired price for affordable units (cf. Student Family Housing Redevelopment Committee, 2015, pp. 41–43). We believe it is appropriate to base the index value on the price of two-bedroom units, since these are the most typical unit size (both in the general market and as occupied by students; see Section 8.5.3 above) and since they represent a modest, though

⁶That is: $706 = 0.85 \times (1660 \div 2)$.

comfortable, living situation (i.e., two unrelated residents each having separate sleeping quarters). Moreover, we think it is best to derive the reference value from the *Vacancy Report* instead of the SHAIS itself because the former's methodology attempts to make a comprehensive survey of all off-campus apartment rents for the whole Davis population (whereas the SHAIS can only report based on a sample of apartments occupied by students); thus, rates in the *Vacancy Report* offer a better benchmark when the goal is to make comparisons with the general Davis housing market.

Table 8.15:	Estimated student	s occupying affordabl	e P3 and private	Davis market a	partments.
10010 0.10.	Estimated stadent	s occupying anorausi	c i o una private	Duvis market u	partificities.

	n	Pct in Affordable Units	N in Affordable Units	N in All Units
P3 Apartments	150	15.1	421	2785
Davis Apartments	705	26.5	3477	13123

Notes:

* The sample sizes (n) for each universe are population weight-adjusted (and may be more or less than the literal number of respondents); they are proportional to the population of students in general campus programs as a portion of the full survey sample (n = 1839).

⁺ Affordable units are defined as those where the price per-bedroom is less than or equal to 85 percent of the average per-bedroom rate for a two-bedroom apartment in the private Davis market (\$706), as reported for conventional leases in the *Apartment Vacancy and Rental Rate Survey* (2017a).

Observations

Table 8.15 shows that an estimated 2,785 students (from all classes and role groups) live in universitysponsored P3s, but of these only about 15 percent—or 421 individuals—benefit from pricing at or below \$706 per bedroom per month. About 13,058 students are estimated to rent private market apartments elsewhere in Davis. Of these, about 26 percent—or an estimated 3,433 students—are estimated to benefit from pricing at or below \$706 per bedroom.

The apparent disparity in the availability of affordable P3 bedrooms (about 1 on campus for every 8 found off campus) is explored further in the distribution density plots of Figure 8.1. The bulk of P3 occupants (top panel) dwell in units priced well above the market mean of \$830 per-bedroom for a two-bedroom unit (indeed, an estimated 71 percent of the represented P3 units are priced above the market mean). As shown by the shaded area, few students in P3s benefit from affordable pricing at 85 percent or less than the benchmark, though a denser cluster near that threshold (dashed vertical line) does show that UCD Student Housing and its P3 partners attempt to make a number of units available at or near their stated affordability objective. However, under the assumption that occupancy ratios approximate supply ratios, which is reasonable given that UCD Student Housing's 2017 occupancy tallies show full capacity ("Housing Occupancy Report," 2017), it appears that students seeking on-campus apartments not only find few within an affordable price range, but also that most university-affiliated units are quite expensive relative to the prices offered in the Davis rental market.

In contrast, the bottom panel of Figure 8.1 shows that, among students renting private Davis market apartments, there is a much smaller portion paying above the indexed market mean. The central tendency (i.e., peak) of the distribution suggests that many students commonly occupy units priced a bit *below* the indexed market mean (though still above the affordability threshold), and according to the data this is
true for the majority (59 percent below the indexed market mean). On average, then, students may have access to somewhat cheaper private apartments than the Davis rental population generally. Most importantly, the distribution of sampled rents demonstrates that the presence of a relatively modest proportion of extremely high-priced units (small peak at around \$1,400 and some prices extending much higher) plays a role in skewing the student mean higher than the central tendency. *This is in contrast to the P3 sample of prices, which shows the largest concentration of prices above the market-index value (i.e., a majority of the prices extending higher than the market-indexed mean).*

Thus, when the P3 and private apartment distributions are compared: it appears that for P3s, high average prices are driven more by the relative absence of affordable and lower-priced units and the presence of many that are priced between \$900 and \$1,400 per bedroom. Whereas, for private market apartments, high average prices are driven by a central tendency (i.e., peak) that only slightly exceeds the affordability index and the presence of some very high-end units (with prices concentrated between \$1,200 and \$1,600 and a portion that extends even higher).

As indicated above, market-indexed definitions of affordability do not, on their own, account for the cost burdens that households experience. It would be informative, for instance, to know how many students in low-income categories benefit from housing at prices at or below 85 percent of the market index. While the SHAIS did attempt to collect income and budgetary data, the nature of the data for full-time college students (as well as consistency issues that arose due to instrument limitations; see next section), made it difficult to produce robust income-based tabulations. Nevertheless, it is still informative to consider *the degree to which market-indexed affordability is desirable as a function of general student need*. In its annual report, the UCD Office of Financial Aid and Scholarships publishes the quantities of students who fall into different categories of "Expected Family Contribution" (EFC), as determined by their annual Free Application for Federal Student Aid (FAFSA). EFC is a *pro forma* measure of the annualized resources the federal government expects a student's parents (or family claiming the student as a dependent) to be able to contribute to educational expenses based on a review of the parents'/families' household income and assets. EFC is also used by various levels of government and the University to determine eligibility for need-based aid, such as Federal Pell Grants. The measure can thus serve as a proxy for students' socio-economic background.

According to the 2016-17 Aid Year Report (Agee, Deborah G & Office of Financial Aid and Scholarships Staff, 2018, p. 45), there were 12,190 undergraduate students in the two lowest EFC categories (6,226 reported an EFC of \$0 while another 5,964 did not exceed the Pell Grant EFC eligibility threshold of \$5,234).⁷ If the low-income undergraduate population is adjusted by removing proportions of freshmen (who must live in residence halls) and continuing undergraduates living outside of Davis,⁸ then there remain an estimated 9,386 low-income students who must be accommodated in private market apartments or other Davis housing. However, according to the SHAIS estimates, university-affiliated apartments and apartments in the private Davis market provide affordable units for only about 3,854 students. This simple model⁹

⁷These undergraduate students from low-income backgrounds amount to about 43 percent of the estimated 28,036 undergraduates enrolled during the 2016-17 year.

⁸The 3Q average headcount for undergraduate students in 2016-17 was 28,036. Freshmen, who are required to live in residence halls, accounted for about 4,320 (15.4 percent), and according to the SHAIS (which, though covering the following year, offers a reasonable basis for estimation), continuing undergraduates living outside of Davis account for 2,117 students. This results in an estimated population of 21,599 continuing undergraduates living in Davis, or about 77 percent of undergraduates.

⁹The assessed need for an additional 5,500 reduced-rate bedrooms ignores graduate students and assumes that low-income undergraduates would be the first to occupy the cheapest units. The EFC counts are also for the academic year preceding the



Rents in UCD P3 apartments

Price per bedroom (any unit size)

Rents in private Davis apartments



Price per bedroom (any unit size)



leaves a deficit of about 5,500 undergraduates from low-income backgrounds who do not have access to a supply of affordable units (NB: the supply of detached houses deemed affordable is not counted here).

8.6.2 Challenges for Assessing Income-based Affordability

In conducting the SHAIS, we encountered several conceptual and practical challenges that hamper effective assessment of income-based housing affordability.

First and foremost, the special circumstances of full-time college attendance make it difficult to fit students into the HUD-derived cost burden framework. Many college students—the majority of whom are young adults who have not yet established independent households—rely on budgetary supplements from their parents (or other immediate family), which arguably requires that their income and housing costs be combined, *viz*. that they and their parents/families be accounted for together as constituting a singular, relevant household. Moreover, college attendance marks a financially distinctive period in one's life-course and is often understood as an 'investment' or as time taken away from what would otherwise be a more regular period of gainful employment and regular income (for this reason, HUD does not generally extend Section 8 Assisted Housing to enrolled college students under the age of 24; cf. Broton & Goldrick-Rab, 2014; US Department of Housing and Urban Development, 2016).

To conduct an income-based assessment of affordability, analytic choices and associated trade-offs have to be made. Should the entire income and housing cost of students' parents also be included in the monthly budget and housing expense of financially dependent students? Or should students receiving financial support from their parents simply be considered as individuals who have a quantity of supplemental income? Further, if financially dependent students receive enough funds to cover their educational and housing expenses—but little else—should they be considered 'cost-burdened'? Or, to eliminate the complication of dependent students altogether, should only students in independent households (mostly graduate students) be used to constitute the universe of students considered relevant for assessing income-based affordability (at the expense of ignoring large portions of the undergraduate population, many of whom come from low-income backgrounds)? How can the difference between financially dependent and independent students be transcended? Can they be analyzed jointly, or should they each be addressed as discrete sub-populations?

Another matter is accommodating student loans as a resource. Usually, in an income-based affordability assessment of non-student households, debts and liabilities would not be regarded as income. Yet, the special circumstances of full-time college attendance ('college as an investment') require many students to borrow funds in order to cover tuition and fees as well as room and board. Should the funds be considered income? If they are considered income, then is the incidence of cost burden among students conceptually the same as the incidence of cost burden in other populations, such as all those living in Davis or all those living in California? In the first instance, one must resolve whether students, as a special demographic, are cost-burdened if they receive enough funds to cover their expenses (even if they have little extra to

survey, when student enrollments were lower. Hence, even though this approach ignores detached houses as a source of affordable unit supply, it still leads to a conservative, generalized estimate of unmet need.

spare). Then one must decide how loans, if supplementing cost coverage, detract from affordability or add to cost burden.

In any case, the special circumstance of full-time college attendance, especially if debts are accounted for as resources, severely compromises the potential comparability between student resources and incomes in other populations. It also brings into focus an important question: Given that measures of student housing cost burden are unlikely to be comparable with normative versions of the concept, could a distinctive, specialized measure be developed that might better serve student interests? We address this question further below.

The SHAIS was initially designed to approximate student resources by tabulating each respondent's average monthly *scholatic budget*, which might consist of personal wages or salary, parental income, fee waivers, and merit-based and need-based grants—as well as student loans.

To account for parental resources, respondents were asked to report their parents'/families' annual gross incomes *if they contributed to the student's educational expenses*, but the instrument failed to ask either (1) how much the parents/families contribute directly or (2) how much the parents/families also have to spend on their respective housing (see Questions 50 and 53 in the survey instrument). As a result, though it is possible to combine personal and parental incomes into income values for singular 'dependent student households,' the missing information about parental contributions and housing costs would compromise comparability with independent student households. A further complication is that some respondents likely overlooked the question about parental income and questions about other resources, as explained below.

Practically, it is difficult to ask sufficient survey questions about student budgets, since their monetary sources are manifold (e.g., part-time job, academic employment, income from parents, partner income, savings, fee waivers, grants, and student loans) and are known in quantities corresponding to various payout periods (financial aid per year, per quarter; wages per hour or salaries per month; parental incomes per hour, per week, per month, or per year). Even if respondents provide accurate reports of these disparate sources, there is no guarantee—once appropriately scaled and summed—that their periodized average will be consistent with known expenses (e.g., at a minimum, equaling average total monthly tuition and housing costs). Indeed, nearly 21 percent of SHAIS respondents who attempted to report their monetary sources failed to sufficiently account for the average monthly cost of their respective fees and tuition (let alone their reported cost of housing). The instrument itself is partly to blame for this illogical outcome, since it did not offer a mechanism that allowed respondents to cross-check their incomes and budgets with known tuition and housing expenditures. At the same time, the instrument automatically skipped respondents over income input screens if they first failed to identify their income sources in Question 50. Unfortunately, this instrument limitation resulted in 172 respondents (over 9 percent of the total sample) reporting no sources of income or scholastic budget at all—and an unknown number of incomplete responses vis-à-vis the full list of potential monetary sources.

Because of the the above unresolved conceptual ambiguities and validity threats, we have opted NOT to estimate and report rates of cost burden and extreme cost burden under an income-based conceptualization of affordability. However, experience with the highlighted issues and instrument shortcomings lead us to make recommendations for future work.

8.6.3 Developing a Specialized Housing Affordability Metric for UCD Students

The approach used above in Section 8.6.1 to compare the supply of below-market housing to the population of low-income students (i.e., those with low EFC values) helps to confirm that the present UC Davis student housing affordability crisis is quite substantial. The approach, moreover, holds some promise for modeling affordable supply deficits according to need and for planning future construction and housing fee schedules. We propose that aspects of such an approach could also be used in lieu of a more conventional income-based metric of housing cost burden. As already discussed, conventional income-based measurements of cost burden, when applied to the circumstances of full-time college students, are quite difficult to standardize and make comparable to the general population. Further, it is not clear that comparing instances of cost burden with the general population would serve a useful purpose, given: (1) that UC Davis serves a high number of students from low-income backgrounds (nearly half of the undergraduate student body, as defined by EFC values and Pell Grant eligibility); (2) that the experience of cost burden for students, especially undergraduates who rely on loans and are dependent on their parents, will likely not conform to notions of normal or ideal household expense ratios; and (3) that the incidence of cost burden and extreme cost burden in Davis (BAE Urban Economics, 2017b, pp. 72–80) and throughout California and the country (California Department of Housing and Community Development, 2017, p. 25; Kimberlin, 2017; Levin & Christopher, 2017), especially for low-income households, is itself quite high and not worthy of emulation. Thus, in tracking the University's progress on housing affordability, the aim might best be conceived as better meeting student needs, not simply matching or doing better than prevailing incidence rates of cost burden elsewhere (even if comparability were achievable).

An income-based or budget-based assessment of cost burden should be sensitive to the unique financial circumstances of student populations and be capable of detecting year-to-year improvement toward a realistic set of objectives, such as reducing the rate of low-income students living in high-priced units or generally decreasing the average ratio of housing cost to household income/wealth, as approximated by a metric like EFC. Measurement aimed toward such incremental ameliorative objectives would be consistent with the "Turning the Curve" approach (Chancellor's Affordable Student Housing Task Force, 2018, pp. 12–15).

Multiple measures of affordability could be used in parallel and in tandem. In particular, we advocate keeping the conventional market-index approach used above. Having a market-indexed definition of affordable unit pricing provides guidance for making fee schedules (especially for University-influenced P3 partners) and assessing the unmet balance of low-cost units or bedrooms, even though the per-bedroom price deemed affordable will usually move higher year-to-year due to inflation (and will do so without any necessary correlation to changes in student and parent incomes). Analysis can also be aided (if cross-tabulating, for instance) by defining categories of affordability based on market-indexed price ranges (e.g., affordable at 85 percent or lower than the market index, "moderate-cost" at 85 to 100 percent of the market index, etc.).

With respect to student resources, one approach might be simply to distinguish financially dependent and independent students and to sum personal/spousal and parental/familial incomes accordingly. This 'household wealth' estimate might sufficiently approximate a metric like EFC (which is what the UCD Office of Financial Aid and Scholarships uses when distinguishing levels of need among undergraduates; cf. Agee, Deborah G & Office of Financial Aid and Scholarships Staff, 2018, p. 45) and allow for segmentation of the student population into categories such as "lowest income," "low income," "middle income," etc. These segments could then be cross-tabulated with respondents' housing prices to determine whether, over time, greater portions of low-income students are living in affordable units, as categorized by market-indexing. In our view, this hybrid use of market-indexing and 'household wealth' might be the most expedient way to work with a specialized student version of cost burden.

A more complicated approach—akin to that initially attempted in this version of the SHAIS—would be to approximate students' 'potential scholastic resources' (in contradistinction to incomes *per se*). This would be estimated using carefully validated amounts that respondents report having available from grants, fee waivers, personal income, and savings (but not necessarily loans)—as well as a household-adjusted measure of parental or familial income (i.e., based on financial dependence/independence).¹⁰ In this case, housing cost could be put into a ratio with respondents' estimated scholastic resources, and over time, lower ratios would become more frequent.

Finally, while ethnic and racial categories have not been featured in this report, we do believe they should be considered, especially with respect to the concept of affordability (they may also be important in further exploring crowding levels and housing insecurity and homelessness). With the current data, it is possible to summarize the proportions and estimated counts of students in general racial and ethnic categories that do or do not reside in market-indexed affordable units. However, without reliable incomebased data, such reporting would decontextualize the experiences of the members of those groups, and it is precisely the correlation between racial/ethnic disadvantage and economic disadvantage that drives interest in differentiated experiences of housing cost burden. Thus, once a clear formula for standardizing respondents' approximate 'household wealth' or 'potential scholastic resources' can be developed, future survey reports might tally the average ratios (or cross-tabulations) of housing-expense-to-resources for ethnic and racial groups. Then, over time, policy outcomes can be measured in terms of decreased average rates of burden for all groups generally and for any groups that, once an initial comparison is made, are particularly high among their peers.

None of the specialized approaches described above would result in a stable price point for unit affordability or a normative cost burden ratio, but they offer promise for tracking progress on affordability in ways that are directly relevant to the needs of the student population. Average housing costs will likely increase year-to-year, and incomes will vary too; nevertheless, the moving target of affordability can be assessed using the ratios and portions of students who are adversely or favorably affected by the supply and pricing of student-oriented housing and the associated amounts of resources at their disposal.

¹⁰Additionally, quite apart from the SHAIS or similar surveys, the University should track the ratio of graduate student academic employment salaries (most expediently, the gross income of half-time teaching assistants) to the mean per-bedroom cost of two-bedroom apartments in the private Davis market. Though the University cannot unilaterally control student incomes, UCD administrators can petition the UC system for levels of compensation for academic employment that are adjusted year-to-year not just for statewide CPI inflation but also for the additional—and historically quite excessive—inflationary pressures of the Davis rental market. In the pragmatic spirit of "Turning the Curve," this may not mean achieving a ratio of gross housing cost to gross income at the HUD ideal of 30 percent or less, but it would mean ensuring that the ratio does not exceed its current level and that it declines over time (see Chancellor's Affordable Student Housing Task Force, 2018, pp. 28–30).

Chapter 9

Recommendations

This final chapter of the report makes recommendations for future work. We focus on two major aspects. First, in Section 9.1 we offer some suggestions on how the SHAIS, in conjunction with other data-tracking efforts, can be used to develop a year-to-year "data dashboard" for student housing conditions. Such a tool could be used by UCD Student Housing and other elements of the administration, in cooperation with student government associations and advisory bodies, the City of Davis, and other regional partners, to track long-term progress on major housing problems.

Then we address important issues relevant to data-gathering and specific knowledge targets that became apparent during the SHAIS pilot. We cover these broadly in Section 9.2, and then in Section 9.3 we detail modifications to the survey instrument (which can itself be referenced in Appendix A).

9.1 Develop a Student Housing Data Dashboard

The Chancellor's Affordable Student Housing Task Force (2018, p. 24) recently suggested developing a "data dashboard" for on-campus and off-campus student housing conditions. There are multiple data sources that could contribute to an annually updated set of key indicators about vacancy rates, rent trends, affordability, occupancy densities, crowding, homelessness, housing insecurity, and widely experienced housing problems. Some existing sources include the *Apartment Vacancy and Rental Rate Survey* and the state-mandated (but usually unpublished) *Occupancy Report*, which both provide important (and likely quite accurate) year-to-year data about rental availability in the private Davis market, averages and ranges of market-based rents (which can be dis-aggregated by number of bedrooms and conventional versus bed leases), and counts of students in each type of university-affiliated housing (which can be put into perspective using official university headcounts). Other relevant estimates, such as the quantity of students living outside of the city (and in other particular cities), can also be derived from the annual CTS, if not more directly via the UCD Office of Budget and Institutional Analysis or the UCD Office of the Registrar.

However, an instrument like the SHAIS is necessary to probe more deeply (albeit broadly enough to characterize general student experiences) on matters like homelessness, insecurity, crowding, and affordability, especially with respect to the vast majority of students whose university experience entails living outside the purview of UCD Student Housing. To this end, we put forward the following suggestions for a data dashboard that will incorporate the above-referenced sources while also working to incorporate the important knowledge that can be gained and tracked through the present survey. For each of the following, we indicate what metrics could be tracked and how progress, measured year-to-year, could be evaluated.

- 1. Track the **apartment vacancy rate** in the private Davis market, as is already accomplished each year in the *Apartment Vacancy and Rental Rate Survey*. Going back to at least 2000, the report has stated that a 'healthy' private market should have a vacancy rate of about 5 percent, even though Davis has (in the interim) never experienced such rates of unit availability. In recent, consecutive years, the rate has hit rock bottom at 0.2 percent. An increase in housing supply that meets student needs should result in higher vacancy rates over time, though it may not be realistic to achieve 5 percent. At minimum, the dashboard should show year-to-year improvements, especially now that Chancellor Gary May has stated that, since 2020 enrollment targets have already been met, future increases will be limited (see the University's response to *Turning the Curve on Affordable Student Housing* on the UCD Leadership website). However, the apartment vacancy rate as a measure of raw housing supply is only one among several measures that should be used to assess overall market quality and housing availability.
- 2. Track contract rents per bedroom for two-bedroom apartments in the private Davis market, and use the average as a benchmark for the actual housing costs students should be expected to pay. There are two key reasons why choosing 'one-half the cost of a two-bedroom apartment' would be useful. First, two-bedroom apartments are the most common housing type occupied by students in the city. Second, the price for a bedroom in such units represents a realistic compromise on occupant density: it assumes that students, by sharing their unit but not their bedroom, would not be paying a premium for a studio or one-bedroom unit while still gaining a reasonable amount of privacy and quiet space for study. The average contract rent per bedroom can be determined using the annual *Apartment Vacancy and Rental Rate Survey*, though a parallel figure from the SHAIS should also be tracked because it will reflect student experiences (in contradistinction to the averages reported by the owners and property managers of Davis apartment complexes).

While over time there is no precise formula for determining how the average price should behave, the data dashboard should nevertheless determine whether rent inflation is in line with or exceeds other measures of year-to-year inflation (e.g., the statewide California CPI). Increases in the price of this benchmark could then be used as the basis for local cost-of-living adjustments in financial aid calculations and for the salaries of student employees.

3. Track the **supply of affordable units** available to students both on campus and off campus using UCD Student Housing's benchmark of costing 85 percent or less of the mean Davis market contract rate (preferably indexed to the average contract rate for two-bedroom units, since they are the most prevalent in the private Davis market). When tabulating student rental costs, price per bedroom would serve as the best datum for achieving consistency across various housing arrangements and controlling for crowding and cost-sharing. SHAIS-derived prices for student-occupied units should be used to estimate affordable unit supply in the private market (since there is no other source, unless the annual *Apartment Vacancy and Rental Rate Survey* were modified to ask apartment complex owners and landlords about student-occupied units). For university-affiliated housing, Student Housing records could also be used as a source (and SHAIS survey data might be used to corroborate).

Over time, data should show higher *absolute counts* of *low-income* students living in affordable units (*proportions* in affordable units should not be used, since year-to-year variations in the size of continuing undergraduate cohorts will generate absolute differences in effect size). The causes of such a positive outcome, however, will also have to be analyzed. Ideally, such improvements might result from a general increase in affordable unit supply, initiated both by the University's sponsorship of new, economical units (or the ability to charge less for existing units because of incomes from newer units) and the application of affordable unit quotas on new, private student-centered apartment complexes in the city.

4. Track the incidence of housing cost burden using a yet-to-be determined measure of students' household wealth or 'potential scholastic budget' that, while being similar in approach to the income-based measure used by HUD, appropriately considers the special life circumstances of financially dependent and independent college students (see the preceding discussion in Sections 8.6.2 and 8.6.3 of Chapter 8). Admittedly, deriving this measure of affordability could be difficult due to variation in the public and private funding students receive, the ambiguity of whether educational loans represent income or detract from income, clarifying the contributions of familial wealth for educational and room and board expenses, and survey noise resulting from respondent estimation about funding sources and expenditures. If a satisfactory resource formula or proxy—such as receipt of Pell Grants—can be devised and a robust validation procedure put into the SHAIS survey instrument, then annual data should show reductions of housing-cost-to-resource ratios and/or, among those who are resource deficient, increased access to affordable units (as determined by market-indexing).

Of course income, not just the supply of low-cost units, plays a key role when considering affordability in terms of cost burden. For graduate students, University of California compensation policies can play a role, since keeping student employee salaries in step with *local* annual inflation (including housing market inflation) will help to close the yawning gap that has emerged between housing cost in Davis and student salaries. To that end, the dashboard should track the ratio of graduate student academic employment salaries (simplified by using the salary for half-time teaching assistants) to the mean per-bedroom cost of two-bedroom apartments in the private Davis market. In the spirit of "Turning the Curve," this may not mean achieving a ratio of gross housing cost to gross income at the HUD ideal of 30 percent or less, but it would mean ensuring that the ratio does not exceed its current level and declines over time (see Chancellor's Affordable Student Housing Task Force, 2018, pp. 28–30).

5. Track **homelessness and housing insecurity rates** using a diverse set of conditions to assess incidence. Special emphasis should be placed on clarifying the duration or extent of such conditions (especially homelessness). Moreover, special care should be used to harmonize these questions with similar, large-scale efforts to measure the same (e.g., the Wisconsin HOPE Lab's annual, nationwide survey of undergraduate students, cf. Goldrick-Rab et al., 2018). *It is important that homelessness and housing insecurity be assessed late in the academic year, since students may not initially experience all the consequences of underlying contributing factors.* Over time, rates of homelessness and insecurity should decrease, though direct interventions for troubling conditions should show evidence of more immediate results (for instance, there should be immediate reductions in the number of students who report sleeping in their automobiles or other places not intended as housing).

- 6. Track the percentages of students in each housing type who report specific housing problems, particularly expense, absence of amenities (e.g., in-unit laundry, in-unit kitchen, and on-site parking), pests, management issues, unfair leasing terms, delayed maintenance, and overcrowding. "Roommate conflict" should also be added to the list of potential problems. These statistics offer measures of the breadth of students' subjective experience, which can be evaluated both in terms of problem prevalence and problem ranking. Over time, the quantities of students reporting any of the above problems—especially expense, overcrowding, management issues, and unfair lease conditions—should decline.
- 7. Track the residential location of students living in UCD Student Housing, in the private Davis market, and outside of Davis. In the near term, the number of those living outside of Davis should not increase, while longer term, smaller numbers should live outside the city (especially continuing undergraduates, who have begun to live outside of Davis at higher rates in recent years due to housing affordability and supply issues; see Chancellor's Affordable Student Housing Task Force, 2018, pp. 35–37). Special attention should be paid to the estimated *count* of sophomores, juniors, and seniors living outside the city, since proportion alone will fail to capture the impact of year-to-year fluctuations in cohort size (this is especially relevant for senior and junior classes, which are the largest and have the greatest year-to-year variability).

If the University makes deliberate efforts to provide or sponsor linked transportation and student housing options in nearby cities (such as Winters, Dixon, Woodland, West Sacramento, or Sacramento) then residency rates for students living at those specific locations (and taking specific advantage of university-sponsored transportation options) should also be estimated from the data and tracked as special segments of the external population.

- 8. Track the **distribution of occupancy rates per bedroom** across student role groups and housing types in order to measure progress on supply-to-demand ratios and crowding reduction. Within several years, data should show declines in the average occupancy per bedroom, especially among continuing undergraduates, in the private Davis market. Additionally, the distribution of occupant densities (not just the estimated means) should be modeled and analyzed. In particular, over the long term, the proportion of respondents living in units with 2 persons per bedroom should decline, and the incidence of those living in units with more than 2 persons per bedroom should become extremely rare.
- 9. Estimate and track the **portion of student renters among all renters** in the private Davis market and the **number of private market units they rent**. Such estimates help to situate the importance of students in the life of the city, and they generate statistics that inform knowledge about crowding and market segmentation. Estimating the total number of city renters requires consulting with the City of Davis to acquire regular updates on the estimated number of rental units in the private market; it also requires estimating the city's rental population, likely using models based on data from the ACS.

9.2 Improve SHAIS Design and Implementation

In this section, we offer general guidance for revising key aspects of the survey instrument and its administration. Specifically, we address timing, question prioritization, and length reduction.

Survey Timing

We believe the best time to administer the SHAIS would be during the spring quarter, preferably in May, with the participation window ending before Memorial Day weekend. It is also reasonable to administer the SHAIS at other times, especially if in conjunction with other well-established survey efforts, but time-sensitive issues (especially student experiences regarding housing insecurity and homelessness) will need to be considered.

Spring administration is sensible because many of the questions in the SHAIS are designed to evaluate respondents 'housing experience' by asking them to 'look back' over the 'past 12 months.' Ideally, then, respondents should be reflecting from a position where they have been in their current housing arrangement for the majority of a year's time and are still in that arrangement at the time of the survey interview. The yearlong look-back period should be bracketed by the general housing turnover that occurs at the end of each academic year (such that respondents are looking back on the period from June of the previous year, when many students move into new housing, to May of the current year, after which time sufficient experience will have accumulated with respect to one's current housing arrangement to provide informed survey responses). Late spring is also an opportune time because respondents are likely to have begun planning their housing for the upcoming academic year, positioning them to reflect on the current state of housing supply, roommate selection, potential rent increases, and so forth (such timing might be especially relevant in the case of freshmen, who would otherwise have little exposure to the private Davis housing market).

Additionally—and perhaps most importantly—an end-of-year survey is more likely to capture the full extent of student housing problems, especially since there may be a time-dependent relationship with respect to housing insecurity and homelessness. That is, earlier in the academic year, students in precarious financial situations (or experiencing other difficulties, such as roommate conflict) may not yet have realized the full extent of housing disruptions they will eventually be exposed to. An earlier survey, then, might underestimate the full prevalence of these issues (also see Section 6.3 in Chapter 6 for further discussion of how continuing undergraduates demonstrate a time-dependent relationship with housing insecurity and homelessness, as assessed via cohort-by-cohort comparison).

Finally, the ASUCD-GSA JHTF's ambition is to generate an annual survey with a large sampled audience (at least one-third of the student body). Students are already frequently asked to take other surveys that might compete for their attention. The most notable is the *Campus Travel Survey*, which is conducted during the fall quarter each year.

However, if for cost-saving and other pragmatic reasons, core elements of the SHAIS could be usefully combined with established surveys that are reliably administered in other quarters (such as the CTS), then the benefits of institutionalization might outweigh the adverse effects of earlier timing. In fact, fall administration would offer some advantages: the University's initial student headcounts, UCD *Vacancy Report* data, and UCD *Occupancy Report* data are also tabulated for that moment in time, thus facilitating better data synchronization across sources and earlier publication of survey results. However, future

survey designers should still be sure to address the time-sensitive concerns outlined above, possibly by developing a brief, auxiliary (or follow-up) spring housing survey with a narrow set of topics (i.e., specifically addressing student experiences of housing insecurity and homelessness, as well as common housing problems).

Shorten Instrument Length and Streamline Priorities

Shorter survey interviews likely produce better response rates and higher frequencies of completed responses. Even though the overall response rate for this iteration of the SHAIS was as good as, if not a bit better than, other student body surveys (see Response Rates and Measurement Error in Chapter 3), the number of individuals who started, but did not complete, the survey suggests that length and/or complexity were discouraging factors (22.6 percent of all those who at least viewed the first question on the *Qualtrics* platform did not answer all the required questions).¹ Moreover, if the absolute size of the survey audience is to remain at only one-third of those enrolled in general campus programs, and if role group response rates remain similar in the future, then margins of error—especially for sophomores and masters/professional students—will frequently exceed ± 5 percent at 90 percent confidence. Thus, taking steps to reduce instrument length will likely aid in the refinement of measurement precision.

Prior to distributing the SHAIS, the ASUCD-GSA JHTF tested the instrument among members of the Chancellor's Affordable Student Housing Task Force and several student affiliates of the ASUCD and the GSA. Their feedback suggested that the interview required 10-12 minutes of respondents' time. However, metadata from *Qualtrics* show a median time to completion of over 12 minutes (a measure, moreover, that includes many who skipped over responses on financial resources). Efforts should thus be made to reduce the instrument length, such that future pre-tests indicate response times entirely under 10 minutes.

As detailed further below, significant length reductions could result from simplifying questions regarding geography for on-campus residents, implementing a map widget for those living off campus (if reliable programming were available for both web-based and mobile versions of the *Qualtrics* survey platform), simplifying questions designed to collect information on housemates and roommates, simplifying questions on rent and rent share, simplifying questions designed to assess income and expenses, and discarding several questions related to housing preferences. At the same time, efforts should be made to expand on the topic of homelessness and housing insecurity. Below is a general overview of these recommendations, each of which is translated into specific instrument annotations in Section 9.3 further below.

 Residential Location. Some questions regarding residential location can be reordered and their logic flow arranged such that the survey becomes less complicated and the data less prone to error during post-processing and geo-coding. For students in on-campus residence halls or other university-affiliated units, generalized point geographies can be assigned automatically (for instance, the latitude and longitude of the centroid of the Segundo complex would be assigned in post-processing for anyone indicating residence there). For those indicating residence in housing not affiliated with the University, it is still desirable to collect user-defined location data. If

¹Many respondents chose to discontinue their survey responses once they landed on Question 52 regarding family income. While some respondents may have been reluctant to share such personal information, the drop-out effect may also result from respondent uncertainty about the value itself. Generally, then, we advise avoiding questions that require referencing information external to the respondent's immediate knowledge (which, as this case indicates, may frustrate evaluation of income-based measures of housing affordability).

possible via the *Qualtrics* platform, this would be best implemented via a graphical widget/applet that allows respondents to "drop a pin" on an OpenStreetMap or Google Maps layer. This should reduce question complexity about identifying the 'cross streets' of one's 'nearest intersection' while also preempting the need for manual error correction during the geo-coding process. Survey planners should be certain that such a widget/applet functions reliably on conventional browsers and mobile browsers running all the major operating system platforms (i.e., Windows, Macintosh OSX, Android, iOS).

2. Roommates and Housemates. A particular difficulty emerges in asking respondents to make a careful, analytic distinction between "roommates" (those who share one's bedroom) and "housemates" (those who share a housing unit, but not necessarily the same bedroom). In the existing instrument, a logic flow spread out over several questions asks about the number of housemates and roommates, but responses were not always parsimonious (and consequently required time-intensive data cleaning). Future revisions should carefully consider the language deployed, but additionally it might be best to reduce these questions to a single input screen that asks respondents to itemize numbers of residents in discretely labeled rooms in their unit (e.g., "Housemates in your bedroom," "Housemates in bedroom 2," etc.). Complications may arise in unique housing circumstances (e.g., for individuals living in large cooperatives or sorority and fraternity houses), which will warrant the creation of specialized logic flows.

The input screen should also feature dynamically updated summaries of user input, allowing the respondent to validate information about those living in their unit.

- 3. **Rents**. Rent payment data is currently collected through branching logic that sorts respondents by those with standardized and already-known housing fees (i.e., those in residence halls and SHAs) and those for whom rent and mortgage payments are not known in advance. For the latter category, questions about rent are also segmented by conventional and bed lease types, which, in the case of the former, requires the respondent to indicate their own payment percentage as well as the total unit rent. Future versions could reduce complexity by having all respondents (excluding those in residence halls and SHAs) simply report the total monthly cost and their personal total monthly cost.
- 4. Income and Expenses. A major objective of the SHAIS was to assess affordability. On its own, the concept of affordability is polysemous (and maybe not substantive enough for making rigorous objective comparisons; cf. Hulchanski (1995)). However, the concept is further muddled by the unique economic circumstances of college students, which require multiple strands of information to evaluate, including gross housing costs and diverse components of monthly income and budget. The approach taken in the initial survey design was to tabulate all sources of funds, including contributions from family members and student loans (dividing them into monthly periods if necessary). It was decided that 'income' should mean all funds available for monthly expenditures (a monthly 'scholastic budget'), and that all student incomes (whether derived from existing assets, incoming cash flow, or loans) would be sufficient to cover, at minimum, the periodized cost of tuition and housing. This assumption has the benefit of allowing fee waivers to be counted, automatically, as a known quantity of income. Once each respondent's monthly budget was estimated, then the ratio of their monthly gross housing cost to monthly budget could be used to identify the cost-burdened and extremely cost-burdened.

The necessary questions, in their current form, constitute a substantial portion of the survey instrument (though their necessity and formulation also needs to be reconsidered in light of the challenges presented in Section 8.6.2 of Chapter 8). It would be ideal if, in a fashion similar to the suggestions made regarding the itemization of housemates, the salient data could be collected through a single screen of input. Moreover, to aid in validation, the form should feature dynamic summarization of user input such that tallies of total monthly income and expenses could be easily verified by the respondent. Housing payments and utilities (and perhaps tuition and fees) would be automatically entered into the dynamic summarization based on previous responses about housing expenses (and the respondent's degree program).

- 5. Homelessness and Housing Insecurity. Some of the most outstanding findings of the SHAIS regard the frequency of homelessness and other forms of housing insecurity. However, these data were collected from only two questions. Several of the responses represent especially troublesome conditions, especially if they are frequently experienced or sustained. For this reason, branch logic featuring follow-up questions about the duration of homelessness and housing insecurity conditions might be developed. Moreover, special attention should be paid to how these types of questions are asked in similar, large-scale efforts (e.g., the Wisconsin HOPE Lab's annual, nationwide survey of undergraduate students; cf. Goldrick-Rab et al., 2018) with an objective of maximizing potential comparability of findings with rates at other institutions.
- 6. Housing Problems and Preferences. Finally, this report devoted only one chapter to generalized housing problems (Chapter 7). However, additional survey data could be summarized regarding what students value about their current housing and their opinions about the condition of housing on campus and off campus. Future survey planners will have to determine the value of these questions and their associated priorities, since removing them represents one of the most straightforward ways to reduce the length of the instrument. In the next section, many of these questions are earmarked for removal.

9.3 Amend the Survey Instrument (Itemization)

The following is an itemization of specific suggestions for amending the survey instrument. Important changes that would reduce survey length and improve data collection are emphasized in bold text. The verbatim content of the existing instrument and its logic flow can be viewed in Appendix A.²

- Q3. On primary student role. Retain.
- Q4. On whether a California resident. Retain.
- Q5. On whether an international student. Retain.
- Q6. On whether an academic employee. Retain for future analysis.
- Q7. On birth year and month. Retain.

²Some instrument questions (e.g., Q1 and Q2) are simply instructional messages for the respondent. They are excluded here under the assumption that future revisions will consider them in their overall context and in light of any reorganization of the survey's logic flow.

- Q9. On undergraduate class. Retain.
- Q10. On whether a transfer student. Retain.
- Q11. On graduate student program type. Retain. **Modify** back-end data piping, if necessary, to import current-year degree-program tuition costs in a dynamic income-expense worksheet (see below).
- Q12. Respondent in School of Medicine. Retain.
- Q13. Open-ended commentary. Retain.
- Q15. On residential location. **Update with** a map widget if possible (see previous section). **Change sequence** so it is presented after indicating housing type. Display to those who are not in Student Housing residence halls, P3 apartments, SHAs, or Solano Park (since residence on campus will be assumed along with automatic geographic coordinates).
- Q17. **Discard** if the modifications to Q15 can be made.
- Q18. On identification of kinds of individuals occupying unit. **Modify** by integrating information with all housemate and roommate queries on a dynamic tally worksheet.
- Q19. On total unit occupants. **Combine** with other housemate and roommate queries on a dynamic tally worksheet.
- Q20. On whether respondent partner is a UCD student. **Combine** with other housemate and roommate queries on a dynamic tally worksheet.
- Q21. On how many UCD students live in unit. **Combine** with other housemate and roommate queries on a dynamic tally worksheet.
- Q22. On how many unrelated, non-UCD students (adults) live in unit. **Combine** with other housemate and roommate queries on a dynamic tally worksheet.
- Q23. On how many respondent children/dependents live in unit. **Combine** with other housemate and roommate queries on a dynamic tally worksheet. **Modify** by permitting respondents to indicate whether other individuals' dependents live in the unit.
- Q24. On how many other adults share respondent bedroom. **Combine** with other housemate and roommate queries on a dynamic tally worksheet.
- Q25. On how many other UCD students share respondent bedroom. **Combine** with other housemate and roommate queries on a dynamic tally worksheet.
- Q26. On current housing type. Retain.
- Q27. On UCD residence hall. Retain.
- Q28. On UCD-affiliated apartment complex. Retain. *Modify* as necessary for changes due to new construction or new master leases.
- Q29. On distinguishing between P3 and SHA in common complexes. Retain.
- Q30. On renting or owning. Retain.
- Q31. On lease type. Retain.

- Q32. On amount of respondent (owner) mortgage. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q33. On amount paid for whole unit (conventional lease renter). **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q34. On percentage of contract rent paid by respondent (conventional lease renter). **Discard** and substitute with itemized individual amounts, along with other housing payment queries on a dynamic expense worksheet.
- Q35. On amount respondent (bed lease renter) pays for housing. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q36. On amount respondent (special circumstance) pays for housing. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q37. On explanation of special housing payment. Retain.
- Q38. On whether certain utilities are bundled in the housing payment. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q39. On amount the whole unit (conventional lease renter) pays for itemized utilities. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q40. On amount respondent (special circumstance) pays for itemized utilities. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q41. On amount respondent (renter or owner) pays for personal property insurance. **Combine** with other housing payment queries on a dynamic expense worksheet.
- Q42. On whether respondent-owner rents out rooms in unit. Discard.
- Q43. On number of baths and converted bedrooms. Retain for future analysis.
- Q44. On duration of current residence. Discard.
- Q45. On duration of current homelessness. **Discard** (because can be addressed via modified homelessness question below).
- Q47. On quarters employed. Discard.
- Q48. On hours paid to work per week. Retain. Change sequence to follow income questions.
- Q49. On personal monthly income. **Combine** with other income queries on a dynamic income-expense worksheet.
- Q50. On itemized forms of income. **Modify** such that the query centers only on 'fee waivers for academic student employment' and allows the respondent to itemize the quarters they received fee waivers (i.e, combine with subsequent). Update survey logic and data piping so that expense amounts for tuition are canceled out by fee waivers in a dynamic single-page income/expense worksheet (see Q52 and following).
- Q51. On receipt of fee waivers. **Combine** with preceding.

- Q52. On shared payment with spouse or partner. Retain. **Combine** with other income queries on a dynamic income-expense worksheet.
- Q53. On receiving direct financial support from family. **Discard** in lieu of replacement with a new question asking for the EFC value in the respondent's annual FAFSA paperwork (can reference the previous year if the respondent is a graduating senior). Alternatively, **retain** if the question is rewritten simply to ask how much (either on an annual or average monthly basis) the respondent's family contributes to expense payments. If retained, combine with other income queries on a dynamic income-expense worksheet.
- Q54. On receiving grants and fellowships. Simplify to all amounts received. **Combine** with other income queries on a dynamic income-expense worksheet.
- Q55. On receiving student loans from multiple sources. Simplify to all loans taken out by the student. **Combine** with other income queries on a dynamic income-expense worksheet.
- Q56. On receiving funds borrowed on your behalf by parents. Simplify to all amounts borrowed from others. **Combine** with the following and other income queries on a dynamic income-expense work-sheet.
- Q57. On receiving funds borrowed from family or friends. Simplify to all amounts borrowed from others. **Combine** with the preceding and other income queries on a dynamic income-expense worksheet.
- Q58. On receiving HCV vouchers. Retain for future analysis. **Combine** with other income queries on a dynamic income-expense worksheet.
- Q59. On living in a subsidized unit. Retain for future analysis.
- Q61. On experiencing housing insecurity. Retain. Expand with follow-up questions on frequency or duration for selections as appropriate.
- Q62. On experiencing homelessness. Retain. For the query on 'staying in auto, library, etc.' change to: 'Had to stay in an auto, library, public/campus building, tent or other place not meant as housing (not as part of a recreational activity).' Also expand with follow-up questions on frequency or duration for selections as appropriate.
- Q63. On knowing other homeless students. Discard.
- Q65. On housing perspectives outside of Davis. Retain for future analysis.
- Q66. On housing perspectives in Davis. Retain for future analysis.
- Q67. On housing perspectives relative to campus resources. Discard.
- Q68. On alternative scenario pricing for individuals. Discard.
- Q69. On alternative scenario pricing for families. Discard.
- Q71. On presence of key amenities. Retain. Restrict parking query to 'guaranteed' on-site parking only.
- Q72. On itemization of housing problems. Retain. Add 'roommate conflict' as a choice. Consider removing choices regarding access to schools, parks, and transit/travel routes (unless there is a clear hypothesis to investigate) since virtually no respondents select these issues in significant numbers.

- Q73. On valuable features of current housing. **Discard**.
- Q74. On general housing satisfaction. Discard.
- Q76. On gender. As recommended by CSAA. Retain as is. Keep optional.
- Q77. On sexual orientation. As recommended by CSAA. Retain as is. Keep optional.
- Q78. On race and/or ethnicity. As recommended by CSAA. Retain as is. Keep optional.

For all questions, the instrument should be reviewed to devise the least complicated format and to ensure error-reducing validation measures (especially in text-entry fields, most notably those asking for dollar amounts).

Appendix A

Survey Instrument

Below is the content of the 2017-18 ASUCD-GSA *Student Housing Affordability and Insecurity Survey* (SHAIS) instrument. There were 68 questions.¹ However, the survey's branching logic caused participants to automatically skip certain questions and sections based on their preceding answers.² The appearance of 43 (of the 68 total) questions was contingent on data entered. However, data validation measures did enforce *mandatory responses for all applicable questions*, with the exception of Questions 13, 76, 77, and 78. The median respondent answered 43 questions (63 percent of those written); the maximum number a respondent answered was 56 (82 percent of those written).

The *Qualtrics* platform automatically formats its electronic surveys so they can be viewed with conventional Internet browsers and mobile devices (including iOS and Android). To preserve a sense of how the questions were electronically presented, the survey questions are grouped by the screens they appeared on (though the conditional logic of many questions means that not all those grouped on a screen were necessarily displayed). The logic conditions are also included with each question. The reader may assume that the default question mode was single-selection multiple choice; non-default question types are noted.

¹The mechanics of the *Qualtrics* platform required that all discrete messages and content be written as the text of numbered questions; for this reason, a total of 78 question objects are enumerated.

²For instance, those living in residence halls did not have to be asked about their rent because standardized values could be imputed in post-processing.

Survey Flow

The Survey Flow offers an overview of the instrument's principal topics and their order of presentation. Note that an early logical branch was designed to filter and exclude any ineligible participants (i.e., from any non-student accounts that were mistakenly sent the survey invitation; no such cases were recorded).

- Block 1: Introduction (12 Questions)
 - Branch: If 'What is your primary role at UC Davis? I am not a student' Is Selected
 - * Block 2: Conclusion (1 Question)
 - * EndSurvey.
- Block 3: Housing Circumstances and Cost (32 Questions)
- Block 4: Financial Resources (14 Questions)
- Block 5: Housing Insecurity (4 Questions)
- Block 6: Perspectives on Housing in Davis (6 Questions)
- Block 7: Perspectives on Current Housing (5 Questions)
- Block 8: Demographics (4 Questions)
- Block 2: Conclusion (1 Question)
 - End Survey.

Block 1: Introduction

New screen

(Q1) ASUCD-GSA UC Davis Housing Affordability and Insecurity Survey (2017-18)

Thanks for taking the next few minutes to give input on housing affordability and insecurity issues confronting UC Davis students.

Your answers will be treated with strict privacy and confidentiality. Any information gathered will only be reported in the aggregate, and you will never individually be identified in the results. If you have questions about the survey at any time, you may contact Don Gibson: [e-mail address omitted for this report].

The survey should take about 10 minutes to complete, and after submitting your responses you will be able to enter a raffle to win 1 of 10 \$50 Amazon or \$50 CoffeeHouse gift cards.

Click >> to begin.

New screen

(Q2) Let us begin by determining your relationship to UC Davis.

Q3. What is your primary role at UC Davis?

- Undergraduate student (1)^a
- Graduate or professional student (including post-baccalaureate) (2)
- I am not a student (3)

Skip to: Q8 If Q3 = 3

^aNumerals following response choices indicate the corresponding codes used in the logic flow; e.g., the "Skip to" statement here is triggered if a respondent answers "I am not a student."

New screen

Q4. How are your university fees and tuition assessed?

- I am a California resident paying in-state fees. (1)
- I am paying out-of-state tuition and fees. (2)

Q5. Are you an international student?

(i.e., you did not grow up in the US, and you are a citizen of another country.)

• Yes (1)

• No (2)

Q6. Have you been a paid employee of UC Davis during the current 2017-18 academic year?

- Yes (I have been a GSR, TA, AI, reader, student assistant, paid intern, or other UC Davis employee) (1)
- No (2)

Q7. When were you born?

Text entry (var="Born")

- Birth Month (1-12) (1) _____
- Birth Year (yyyy) (2) _____

New screen

Display the Following Question:

If Q3 = 3

(Q8) At this time, the survey is only for UC Davis students. In the future, regular housing surveys may also include faculty, staff, and other university affiliates. You may still proceed if you wish to register a comment on university housing, to express interest in further research, or to enter the prize drawing.

Skip to: End of Block If Q8 Is Displayed

New screen

Display the Following Question:

If Q3 = 1

Q9. Which year are you?

- Freshman (1)
- Sophomore (2)
- Junior (3)
- Senior (4)
- Fifth-year senior (or greater) (5)
- Visiting/Exchange student (6)

Display the Following Question:

If Q9 = 3

Or Q9 = 4

Or Q9 = 5

Q10. Did you transfer to UC Davis from a community college or other college/university?

- Yes (1)
- No (2)

New screen

Display the Following Question:

If Q3 = 2

Q11. What type of graduate, professional, or post-baccalaureate program are you in?

- Masters (1)
- Ph.D. (2)
- Law (3)
- MBA (4)
- Veterinary (5)
- Ed.D. or CANDEL (6)
- Post-baccalaureate teaching credential (7)
- Other (8) _____ *Text entry*

Display the Following Question:

If Q3 = 2

Q12. Is your major program part of the UC Davis School of Medicine?

- Yes (1)
- No (2)

Skip to: Block 3

Block 2: Conclusion

New screen

Q13. If you have additional concerns about student housing, feel free to share them here. *Text entry*

New screen

Closing Message

Thank you for completing the 2017-18 ASUCD-GSA Housing Survey! Your response has been recorded.

If you would like to participate in **future ASUCD-GSA student housing research**, please go to this Google Form [link omitted from report].

To enter the gift card raffle, please go to this Google Form [link omitted from report].

If you have any further questions about this survey, you may contact Don Gibson ([e-mail address omitted for this report]), graduate student chair of the ASUCD-GSA Joint Housing Task Force.

At this time, we also encourage you to leave comments for the Chancellor's Affordable Student Housing Task Force at this UC Davis website: https://leadership.ucdavis.edu/strategic-plan/student-housing/student-housing.

End Survey Flow

Block 3: Housing Circumstances and Cost

New screen

(Q14) Now we will focus on your housing circumstances and costs.

Q15. Where do you currently live?

(Please refer to the map below for on-campus and off-campus boundaries.)

- On-campus in Davis (1)
- Off-campus in Davis (2)
- Outside of Davis (3)

(Q16) UC Davis campus area is highlighted in yellow. Included areas are east of CA-113, north of I-80, south of Russell Blvd., and generally west of A St. and the railroad. West Village and Cuarto are also included. Map contains information from OpenStreetMap, made available here under the Open Database License (ODbL).



Q17. What intersection is nearest to your current housing?

(Again, any information gathered here or elsewhere in the survey will remain anonymous; for this question, only a general location, not a specific address, will be recorded.) *Text entry*

- Your street (do not include address number) (1) _____
- Nearest cross street (2) ______
- Zip Code (3) _____

New screen

Q18. With whom do you share your current unit/house?

(Check any that apply.)

- At least one other UC Davis student (1)
- At least one other adult who is NOT a UC Davis student and is NOT my spouse/partner (2)
- My spouse/partner (3)
- My children or other dependents (4)
- My parents (or relatives other than spouse/partner or children/dependents) (5)
- I rent a room in a unit/house where the owner, who is UNRELATED, also lives (6)
- I live alone (7) Exclusive of other choices

Q19. In total, how many people live in your unit/house?

(Include YOURSELF, your SPOUSE/PARTNER, any CHILDREN/DEPENDENTS, and any other HOUSE-MATES.)

Text entry

• Number of individuals (1) ______ (var="Total occupants")

New screen

Display the Following Question:

If Q18 = 1

And Q18 = 3

Q20. Is your spouse/partner also a UC Davis student?

- Yes (1)
- No (2)

New screen

Display the Following Question:

If Q18 = 1

Q21. In total, how many other UC DAVIS STUDENTS live in your unit/house?

(Do not include yourself.) *Text entry*

• Number of individuals (1) (var="UCD housemates")

Display the Following Question:

If Q18 = 2

Q22. How many UNRELATED adult housemates who are NOT UC Davis students live in your unit/house?

(If you have a spouse/partner, do not include your spouse/partner.) Text entry

• Number of individuals (1) _____ (var="Non-UCD housemates")

Display the Following Question:

If Q18 = 4

Q23. How many of your CHILDREN (or other DEPENDENTS) live in your unit/house? *Text entry*

• Number of individuals (1) _____ (var="Children or dependents")

Display the Following Question:

lf Q18 != 7

Q24. BEDROOM. How many other ADULTS share your BEDROOM (or studio) with you? (Include other students and/or your spouse/partner, if applicable). *Text entry*

• Number of individuals (1) _____ (var="Adult roommates")

Display the Following Question:

lf Q18 = 1

Q25. BEDROOM. How many other UC DAVIS STUDENTS share your BEDROOM (or studio) with you?

(Include spouse/partner, if applicable.) Text entry

• Number of individuals (1) ______ (var="UCD roommates")

New screen

Q26. What kind of housing do you currently live in?

- UCD residence hall/dorm (1)
 - (i.e., in Segundo, Tercero, or Cuarto)
- UCD-affiliated student housing apartment (2) (i.e., 8th and Wake, Adobe Apartments, Arlington Farm, Atriums at La Rue, Colleges at La Rue, Lexington, Living Groups at La Rue Parkway, Primero Grove, Russell Park, Solano Park, West Village)
- Co-op housing (3) (Baggins End Domes, Tri-Cooperatives, other)
- Fraternity or sorority house (4) (but not in Living Groups at La Rue Parkway)
- Non-UCD multi-family (5) (apartment/condo/duplex/triplex)
- Non-UCD house or townhouse (6) (stand-alone or abutting house, cottage, "granny flat," or guesthouse)
- Trailer/mobile home (7)
- Center (senior, disability, etc.) (8)
- Emergency housing or shelter (9)
- No stable residence/homeless (10)

Skip to: Q45 If Q26 = 10

Skip to: Q45 If Q26 = 9

New screen

Display the Following Question:

lf Q26 = 1

Q27. Which UCD residence hall complex do you live in?

Drop-down list

- Segundo (1)
- Tercero (2)
- Cuarto (3)

Skip to: Q43 If Q27 = 1

Skip to: Q43 If Q27 = 2

Skip to: Q43 If Q27 = 3

New screen

Display the Following Question:

If Q26 = 2

Q28. Which UCD-affiliated apartment complex do you live in?

Drop-down list

- 8th and Wake (1)
- Adobe Apartments (2)
- Arlington Farm (3)
- The Atriums at La Rue (4)
- The Colleges at La Rue (5)
- The Lexington (6)
- Living Groups at La Rue Parkway (7)
- Primero Grove (8)
- Russell Park (9)
- Solano Park (10)
- West Village (11)

Skip to: Q38 If Q28 = 2

Skip to: Q38 If Q28 = 3

Skip to: Q38 If Q28 = 6

Skip to: Q38 If Q28 = 8

Skip to: Q38 If Q28 = 10

Display the Following Question:

If Q28 = 5

Or Q28 = 11

Q29. Is your housing lease through UC Davis Student Housing?

(i.e., you make room/board payments to the UC Regents)

- Yes, I pay the UC Regents for my housing. (1)
- No, I pay the apartment management company, not the UC Regents. (2)

Skip to: Q38 If Q29 = 1

New screen

Display the Following Question:

If Q26 = 3

Or Q26 = 5

Or Q26 = 6

Or Q26 = 7

Or Q26 = 8

Or Q26 = 4

Q30. Do you rent or own your current housing unit/house?

- I rent (1)
- I am a homeowner (2)
- Someone else owns or rents the unit/house, but I am not obligated to pay to live there (3)
- Other/Special circumstance (4)

New screen

Display the Following Question:

If Q30 = 1

Or Q29 = 2

Or Q28 = 4

Or Q28 = 7

Or Q28 = 9

Or Q28 = 1

Q31. How is your lease agreement arranged?

- Conventional rental: One lease agreement covers the entire unit. (1)
- By the bed/dormitory style: Each occupant has their own contract and pays the property owner/manager independently. (2)
- Sublet: I make payments in accordance with a sublease agreement. (3)

New screen

Display the Following Question:

If Q30 = 2

Q32. How much was your most recent monthly mortgage payment?

Be sure to include any required fees or other amounts (such as HOA fees, mortgage interest, mortgage insurance, monthly portion of property tax, homeowners insurance, etc.). Do not include optional, extra principal payments.

Text entry

• Monthly cost (\$) (1) _____ (var="Mortgage payment")

Display the Following Question:

lf Q31 = 1

Q33. How much was the most recent monthly rent for the WHOLE UNIT/HOUSE?

For this question, do not divide the total cost among housemates. Be sure to include any mandatory fees added on top of the base rent price (e.g., a utility fee). But do not include any utilities you or your housemates pay in separate bills.

Text entry

• Monthly cost (\$) (1) _____ (var="Unit rent")

Display the Following Question:

lf Q31 = 1

Q34. What PERCENTAGE of the housing costs are you PERSONALLY responsible for?

For this question, report how the cost is divided for you. If you share responsibility with a spouse/partner, write in your combined percentage.

Text entry

• Percentage (%) (1) _____ (var="Personal portion of housing costs")

New screen

Display the Following Question:

If Q31 = 2

Or Q31 = 3

Q35. How much was your most recent monthly rent?

Include only your payment; do not add up what you and any other housemates pay. Be sure to include any mandatory fees added on top of the base rent price (e.g., a utility fee). But do not include utilities you pay in separate bills.

Text entry

• Monthly cost (\$) (1) _____ (var="Individual rent")

New screen

Display the Following Question:

lf Q30 = 4

Q36. How much was your most recent monthly housing payment?

• Cost (\$) (1) _____ (var="Special housing payment")

Display the Following Question:

If 'How much was your most recent monthly housing payment? Special housing payment' Is Displayed

Q37. Please explain your housing payment agreement. *Text entry*

New screen

Display the Following Question:

If Q26 != 1

And Q26 != 10

And Q26 != 9

Q38. Which utilities and services are included/bundled in your housing payment? (Select any that apply.)

- Water/Sewage/Garbage (1)
- Electricity (2)
- Gas (3)
- Internet (4)
- None of the above (5) *Exclusive of other choices*

Display the Following Question:

- If 'How much was your most recent monthly mortgage payment? Be sure to include any required fees or... Mortgage payment' Is Displayed
- Or 'How much was the most recent monthly rent for the WHOLE UNIT/HOUSE? For this question, do not d... Unit rent' Is Displayed

Or Q28 = 10

Q39. How much does your WHOLE UNIT/HOME pay for the following utilities each month?

Use the most RECENT bills as reference. (Write in amounts only for utilities that are not bundled in the housing payment.)

Text entry, gridded (var="Monthly cost (\$)")

- Water/Sewage/Garbage (1) ______
- Electricity (2) _____
- Gas (3) _____
 Internet (4) _____

Total summed on-screen for convenience of respondent

Display the Following Question:

- If 'How much was your most recent monthly housing payment? Special housing payment' Is Displayed
- Or 'How much was your most recent monthly rent? Include only your payment; do not add up what you a ... Individual rent' Is Displayed

Or Q28 = 2

Or Q28 = 3

Or Q28 = 6

Or Q28 = 8

Or Q29 = 1

Q40. How much do you pay for the following utilities each month?

Use the most RECENT bills as reference. (Write in amounts only for utilities/services that are not bundled in the housing payment.)

Text entry, gridded (var="Monthly cost (\$)")

- Water/Sewage/Garbage (1)
- Electricity (2) _____
- Gas (3) _____

• Internet (4) _____

Total summed on-screen for convenience of respondent

Display the Following Question:

If Q30 != 2

Q41. How much do you pay for renters/personal property insurance each month?

• Monthly cost (\$) (1) _____ (var="Renters insurance")

New screen

Display the Following Question:

If Q30 = 2

Q42. Do you rent out any of the bedrooms in your home? If so, how many bedrooms do you rent out?

- Yes, the number of rooms I rent out is: (1) ______ Text entry
- No (2)

New screen

Q43. Indicate how many of each kind of room is in your unit/house: *Text entry, gridded*

- Original bedrooms (2) (not converted from other rooms) Enter 0 for studio apartments.
- Converted bedrooms (3) (transformed from closets, garages, living rooms, etc.)
- Full bathrooms (with shower/tub) (1) Do not include half-baths (toilet only).

Display the Following Question:

If Q26 != 10

And Q26 != 9

Q44. How long have you lived in your current unit/home? Text entry (var="Time in unit/home")

- Years (1) ____
- Months (0-11) (2) _____

New screen

Display the Following Question:

If Q26 = 10

Or Q26 = 9

Q45. You stated that currently you have no stable housing, are homeless, or are living in a shelter. For how long have you been in this situation?

Text entry (var="Time in housing insecurity")

- Years (1) ____
- Months (0-11) (2) ______

Block 4: Financial Resources

New screen

(Q46) Next, we will assess your financial situation and how you pay for housing.

You may need to consult your pay stubs and, if applicable, ask your spouse/partner or your parents/other family about their income. (Again, any information gathered here or elsewhere in the survey will remain anonymous.)

New screen

Q47. If you worked within the past 12 months, during which academic quarters did you have a job?

(Choose all that apply.) Choose multiple

- Spring quarter 2018 (1)
- Winter quarter 2018 (2)
- Fall quarter 2017 (3)
- Summer 2017 (4)
- I was not employed during any of the times above (5) *Exclusive of other choices*

Display the Following Question:

If Q47 = 3

Or Q47 = 2

Or Q47 = 1

Q48. In your most recent job, how many hours were you paid to work each week? *Text entry*

Hours worked per week (1) ______

Display the Following Question:

If Q47 = 3

Or Q47 = 2

Or Q47 = 1

Or Q47 = 4

Q49. What is your gross monthly income (pay before-tax)?

If your income has been regular over the past 12 months, use your most recent pay stub as a
reference, OR ELSE divide your total annual income by 12. (Do not include wages or salary of a spouse, domestic partner, or any roommates.) *Text entry*

Personal monthly income (\$) (1) ______

New screen

Q50. How do you currently cover your expenses, including housing and your UC Davis fees/tuition?

(Choose all that apply.)

Choose multiple

- I make direct payments from my earnings or savings. (1)
- I make payments with my credit card. (2)
- I use funds from student loans. (3)
- I use funds from scholarships, fellowships, or grants. (4)
- I have received fee waivers for academic student employment (TA, GSR, AI, Reader, etc.) (5) Display this Item If Q3 = 2
- A spouse/partner pays directly from their earnings, savings, or other resources. (6)
- My parents (or other family) pay directly from their earnings, savings, or other resources (this includes college savings accounts they set up for me). (7)
- My parents took out loans on my behalf (e.g., Federal PLUS loans, home equity loans, other).
 (8)
- I borrow money from parents (or other family). (9) (It is not a gift: you and parents/family clearly understand the money is to be paid back.)
- I borrow money from friends or acquaintances. (10) (It is not a gift: you and friends/acquaintances clearly understand the money is to be paid back.)
- I receive HCV/Section 8 affordable housing vouchers. (11)

New screen

Display the Following Question:

If Q50 = 5

Q51. For which 2017-18 academic quarters did you receive FEE WAIVERS as part of your academic student employment?

(Check all that apply.) Choose multiple

- Spring 2018 (1)
- Winter 2018 (2)
- Fall 2017 (3)

Display the Following Question:

If Q50 = 6

Q52. You stated that your spouse or domestic partner helps cover your housing and university expenses. What is their gross monthly income (pay before-tax)?

If they had a regular income over the past 12 months, use their most recent pay stub as a reference, OR ELSE divide their total annual income by 12.

Text entry

• Partner monthly income (\$) (1) _____

Display the Following Question:

If Q50 = 7

Or Q50 = 9

Q53. You stated that your parents (or other family) help cover your housing and university expenses. What is their gross monthly income (pay before-tax)?

If they had a regular income over the past 12 months, use their most recent pay stub as a reference, OR ELSE divide their total annual income by 12.

Text entry

Parental monthly income (\$) (1) ______

New screen

Display the Following Question:

If Q50 = 4

Q54. You stated that you use SCHOLARSHIPS, FELLOWSHIPS, or GRANTS to cover your housing and university expenses. How much in scholarships, fellowships, or grants did you receive for the 2017-18 academic year?

(Please distinguish between sources.) Text entry, gridded (var="Amount awarded")

- UC Davis merit-based scholarships/fellowships/grants (1) ______
- External merit-based scholarships/fellowships/grants (2) _____
- Government need-based grants (3) ____
- UC Davis general or need-based grants (4) ______
- Other need-based grants (5) ______

Total summed on-screen for convenience of respondent

Display the Following Question:

If Q50 = 3

Q55. You stated that you use STUDENT LOANS to cover your housing and university expenses. How much in student loans did you borrow for the 2017-18 academic year? (Please distinguish between government, university, and other bank sources.) Text entry, gridded (var="Amount borrowed")

- Government-issued student loans (1) ______
- University-issued student loans (3) ______
- Private bank-issued student loans (2)

Total summed on-screen for convenience of respondent

Display the Following Question:

If Q50 = 8

Q56. You stated that YOUR PARENTS took out LOANS to cover your housing and university expenses. How much in loans did they borrow on your behalf for the 2017-18 academic year? (If they took out a loan in a previous year but you are still using the funds this year, just include the portion used for this year).

Text entry (var="Amount borrowed")

Parent borrowing (\$) (1) _____

Display the Following Question:

If Q50 = 9

Or Q50 = 10

Q57. You stated that you BORROW money from parents (or other family) and/or friends and acquaintances. Over the past 12 months, how much have you borrowed from them in order to cover your housing and university expenses?

(Please distinguish between sources.)

Text entry, gridded (var="Amount borrowed")

- Borrowed from parents/family (1) ______
 Borrowed from friends/acquaintances (2) ______

Total summed on-screen for convenience of respondent </div>

New screen

Display the Following Question:

If Q50 = 11

Q58. You stated that you receive HCV/Section 8 affordable housing vouchers. How much do you receive in HCV/Section 8 rent support each month?

Text entry (var="Amount received each month")

• HCV-Section 8 (1) _____

Display the Following Question:

lf Q30 = 1

Q59. Do you live in a unit/house that is subsidized (offered as "affordable housing" with reduced rent)?

- Yes (1)
- No (2)
- Unsure (3)

Block 5: Housing Insecurity

New screen

(Q60) Now we will ask a few questions about housing insecurity.

Q61. Within the last 12 months, did you do any of the following?

(Check any that apply.) *Choose multiple*

- Did not pay the full amount of rent (1)
- Did not pay the full amount of utilities (2)
- Moved 2 or more times (3)
- Doubled up in a bedroom (without a lease agreement for the room) (4)
- Moved in with other people due to financial problems (5)
- None of the above (6) *Exclusive of other choices*

Q62. Within the last 12 months, did any of the following happen to you?

(Check any that apply.) *Choose multiple*

- Thrown out of home by family or housemates (1)
- Legally evicted (2)
- Stayed in a shelter (3)
- Stayed in an auto, library, public/campus building, tent or other place not meant as housing (4)
- Did not know where I was going to sleep for one or more nights (5)
- Stayed temporarily with an acquaintance while looking for housing ("couch surfed") (6)
- Did not have a home (7)
- None of the above (8) Exclusive of other choices

Q63. Within the last 12 months, have you personally known another UC Davis student who has become homeless, even if for a brief period?

- Yes, I know at least one other UC Davis student who has experienced homelessness (1)
- No (or I have only heard indirectly about homeless students) (2)

Block 6: Perspectives on Housing in Davis

New screen

(Q64) Now we will ask a few questions about on-campus and off-campus housing.

Display the Following Question:

If Q15 = 3

Q65. You indicated that you live outside of Davis. What were your main reasons for choosing to live outside of Davis?

(Choose up to 2.)

Choose multiple, limited

- More cost effective (1)
- I could not find housing to meet my needs in Davis (2)
- Ability to live with spouse/partner or closer to family (3)
- Job opportunities for spouse/partner outside of Davis (4)
- Cultural opportunities/lifestyle choice (5)
- Other. Please list: (6) _____ Text entry

Q66. What has been most challenging about finding a place to live in Davis? (Choose up to 3.) *Choose multiple, limited*

- Lack of units that fit my price range (1)
- Having to sign a lease many months before I will live there (2)
- Cost of the security deposit (3)
- Having to sign a lease for too long or short a period (4)
- High move-in fees (5)
- I do not have credit history (6)
- My income is not high enough to sign a lease independently (or at all) (7)
- Lack of reliable landlords (8)
- Difficulty of finding housemates/roommates (9)
- Other. Please list: (10) _____ Text entry
- I never had a major challenge finding a place to live in Davis (11) *Exclusive of other choices*
- I have not tried to find housing in Davis (12) Exclusive of other choices

Q67. How much do you AGREE or DISAGREE with the following statements?

(You can also choose "No Basis or Uncertain" if you feel you do not have enough information to answer.)

Gridded items with scale selection

Likert scale for each item:

- Mostly Disagree (1)
- Somewhat Disagree (2)
- Neutral (3)
- Somewhat Agree (4)
- Mostly Agree (5)
- No Basis or Uncertain (6)

Items:

- In Davis, the quality of off-campus housing is better than average. (1)
- It is more affordable to live in a UC Davis Student Housing apartment than in an off-campus apartment in Davis. (2)
- The quality of UC Davis Student Housing is better than off-campus housing. (3)
- Living outside of Davis would greatly inhibit my ability to attend classes, teach, or do research. (4)

Display this Item If Q15 = 1 Or Q15 = 2

• Living outside of Davis has greatly inhibited my ability to attend classes, teach, or do research. (7)

Display this Item If Q15 = 3

• I would live outside of Davis if the housing savings were greater than the transportation expenses to/from campus. (5)

Display this Item If Q15 = 1 Or Q15 = 2

- I save more on housing by living outside of Davis, even considering the costs of transportation to/from campus. (8)
 - Display this Item If Q15 = 3
- I would like to live outside of Davis to experience other cultural opportunities/lifestyle choices. (6)

Display this Item If Q15 = 1 Or Q15 = 2

 Living outside of Davis better satisfies my cultural preferences/lifestyle choices. (9) Display this Item If Q15 = 3

Display the Following Question:

If Q30 != 2

And Q23[1] = 0

Q68. Consider the following ways to rent a room in a shared apartment. Given your housing needs, how LIKELY would you be to live in each one?

(Hypothetical prices exclude utilities and board/meal plan.)^{*a*} Gridded items with scale selection

Likert scale for each item:

- Certainly (1)
- Very likely (2)
- Somewhat likely (3)
- Somewhat unlikely (4)
- Very unlikely (5)
- Certainly not (6)

Items:

- Student Housing apartment with your own bedroom \$747 per month (1)
- Student Housing apartment sharing your bedroom \$642 per month (2)
- Off-campus apartment with your own bedroom \$830 per month (3)
- Off-campus apartment sharing your bedroom \$415 per month (4)
- Outside of Davis apartment with your own bedroom \$689 per month (6)
- Outside of Davis apartment sharing your bedroom \$344 per month (7)

Display the Following Question:

If Q30 != 2

And Q23[1] >= 1

Q69. Consider the following ways to rent a 2-bedroom apartment for your family. Given your housing needs, how LIKELY would you be to live in each one?

(Hypothetical prices exclude utilities and board/meal plan.)

Gridded items with scale selection

Likert scale for each item:

- Certainly (1)
- Very likely (2)
- Somewhat likely (3)
- Somewhat unlikely (4)
- Very unlikely (5)
- Certainly not (6)

Items:

- Student Housing apartment \$1162 per month (1)
- Off-campus apartment \$1660 per month (3)
- Outside of Davis apartment \$1378 per month (6)

^{*a*}The branch logic of this question was faulty, causing most respondents to pass over it. This was an experimental question that utilized average unit rents taken from other surveys and sources (i.e., Student Housing's 2017-18 approved P3 rent schedules, BAE/UC Davis Student Housing's 2017 Vacancy Report, and January 2018 average rents for Sacramento, CA, from RentJungle.com). While it is unfortunate not to have access to this affordability preference measure, it was also perhaps beneficial for survey completion rates that this complicated question was effectively omitted.

Block 7: Perspectives on Current Housing

New screen

(Q70) Now we will ask a few questions about your current housing experience.

Q71. Do you have these features in your current housing?

Gridded items with binary selection (choices="Yes" or "No")

- In-unit washer and dryer (1)
- In-unit kitchen (2)
- Included or optional on-site parking (3)

Q72. Do you experience any of the following as PROBLEMS or DEFICIENCIES in your current housing?

(Select ALL that apply.)

Choose multiple, unlimited, items randomized on individual questionnaires

- Expensive rent/mortgage (1)
- No in-unit kitchen (2)
- No in-unit washer and dryer (3)
- Difficult to find parking (4)
- Unaddressed pest issues (e.g. mold, bugs) (5)
- Unaddressed maintenance issues (e.g., broken heat or AC, fixtures, plumbing, electrical, etc.)
 (6)
- Poor treatment by landlord/leasing company (7)
- Poor lease terms/required to sign months in advance of move-in (8)
- Neighborhood concerns (e.g., crime, noise, public drunkenness) (9)
- Safety concerns with structure (10)
- Overcrowding/sharing bedrooms (11)
- Too far from campus (12)
- Too far from amenities (shopping, entertainment, etc.) (13)
- No pets allowed (14)
- Overly restrictive rules (15)
- Poor access to transit/travel routes (16)
- Poor access to public schools (17)
- Far from parks and green spaces (18)
- Could not choose my housemates/roommates (19)
- Other. Please list: (20) _____ Text entry
- None of the above (21) Exclusive of other choices

Display the Following Question:

If Q26 != 9

And Q26 != 10

Q73. What are the most valuable features of your current housing?

(Choose up to 5.)

Choose multiple, limited, items randomized on individual questionnaires

- Neighborhood quality/safety (1)
- Housing quality/on-site amenities (2)
- Social atmosphere (3)
- Reasonable lease conditions/flexibility (4)
- My preferred housing type (apartment, house, condo, etc.) (5)
- Proximity to preferred K-12 schools (6)
- Access to parks and green spaces (7)
- Access to transit/travel routes (8)
- Regular access to parking (9)
- Proximity to classes/campus (10)
- Reasonable cost of housing (11)
- Safety and security features of the building (12)
- Ability to choose my own roommates (13)
- Additional living space (14)
- Quiet study space (15)
- Private/single bedroom (16)
- In-unit washer and dryer (17)
- In-unit kitchen (18)
- None of the above (19) Exclusive of other choices

Q74. How much do you AGREE or DISAGREE with the following statements?

Gridded items with scale selection

Likert scale for each item:

- Mostly Disagree (1)
- Somewhat Disagree (2)
- Neutral (3)
- Somewhat Agree (4)
- Mostly Agree (5)

Items:

- I am satisfied with my current housing arrangement. (1)
- The price I pay for housing is worth the opportunity to study at UC Davis. (2)

Block 8: Demographics

New screen

(Q75) Almost done. Now we will ask some optional questions about your social identity. (Again, any information gathered here or elsewhere in the survey will remain anonymous.)^{*a*}

Q76. How do you describe your gender?

- Male (1)
- Female (2)
- Trans Male (3)
- Trans Female (4)
- Intersex (5)
- Intersex Male (6)
- Intersex Female (7)
- Genderqueer (8)
- Two Spirit (9)
- Agender (10)
- Other. Write in (optional): (11) _____ Text entry
- Decline to state (12)

Q77. How do you describe your sexual orientation?

- Heterosexual/Straight (1)
- Gay (2)
- Lesbian (3)
- Bisexual (4)
- Queer (5)
- Questioning (6)
- Not listed above (7)

Q78. How do you describe your race and/or ethnicity?

(You may choose multiple.) *Choose multiple, unlimited*

- African/African American/Black (1)
- American Indian/Alaskan Native (2)
- Caucasian/White (3)
- Chicano/a/x (4)
- Chinese/Chinese American (5)

- East Indian/Pakistani (6)
- Filipino/Filipino American (7)
- Hispanic or Latino/a/x (8)
- Hmong (9)
- Iu-Mien (10)
- Japanese/Japanese American (11)
- Korean/Korean American (12)
- Laotian (13)
- Mexican/Mexican American (14)
- Middle Eastern (15)
- Pacific Islander (16)
- Russian (17)
- Ukrainian (18)
- Vietnamese/Vietnamese American (19)
- Other. Write in (optional): (20) _____ Text entry
- Decline to state (21) Exclusive of other choices

Skip to: Block 2

^aQuestions 76-78, along with Question 13 in the Conclusion, did not have mandatory responses.

Appendix B

Electronic Messages to Participants

The following is the content of the electronic invitation, reminder, and follow-up messages that were sent to undergraduate and graduate students. The messages were sent via the *Qualtrics* web-based survey platform to students' university-affiliated e-mail addresses. The initial e-mail list, drawn as a random sample of the registered student population, was provided by the UCD Center for Student Affairs Assessment (CSAA), and included 11,248 e-mail addresses (approximately one-third of the UCD student population).

The electronic messages consist of an initial invitation and two reminders, the first reminder sent a week after the survey launch and the second two weeks after the survey launch. Within the survey flow itself, participants were also greeted with an introductory message and, upon completion, a message of gratitude that contained information about further involvement and participation in the gift card incentive program sponsored by ASUCD-GSA (see the Welcome Message and the Closing Message in Appendix A).

Initial Invitation Message

The following initial invitation message was distributed to the full complement of sampled e-mail addresses on Monday, May 21, 2018 at about 3:30 PM.¹ The e-mail subject line was: **Take the UC Davis Student Housing Affordability and Insecurity Survey (ASUCD-GSA)**.



Dear UC Davis Student,

The Associated Students of UC Davis (ASUCD) and the Graduate Student Association (GSA)—with endorsement from the Chancellor's Office and Student Housing—invite you to participate in a survey on **housing affordability** and **insecurity issues**.

The survey should take about **10 minutes to complete**, and you are eligible to win 1 of 10 **\$50 Amazon** or **\$50 CoffeeHouse gift cards**.

We hope this will be the first in a series of ongoing, annual surveys that track major housing problems and the university's progress in addressing them. Your input will be key to our success.

Follow this link to the Survey:

[Qualtrics-generated URL]

Or copy and paste the URL below into your internet browser:

[Qualtrics-generated URL]

On your behalf,

ASUCD-GSA Joint Housing Task Force

If you have questions about this survey, you may contact ASUCD-GSA Joint Housing Task Force chair, Don Gibson: don-gibson@ucdavis.edu.

If you wish only to enroll in the gift card drawing, use this Google Form [link omitted for report]. Follow this link to opt out of future ASUCD-GSA survey e-mails: [Qualtrics-generated URL]



¹The *Qualtrics* server automatically tailored each recipient e-mail with URLs to begin the survey or to opt out of further communication; glosses indicate their location in the message. We also provided a URL so respondents could access Google Forms to enter their name and e-mail address in the incentive drawing (thus ensuring that those who entered the contest would keep their personal identification information separate from any data they provided in the SHAIS). The messages were written using HTML (rather than plain text) so that an abstract graphical header and footer, featuring horizontal strips composed of stylized blue and gold triangles, could be inserted above and below the text in order to increase visual appeal.

Invitation Reminder 1

The following reminder message, sent 8 days after the survey's launch, was distributed to any members of the initial e-mail list who had not yet begun or completed the survey (10,033, less failed and bounced). The message was sent on Tuesday, May 29, 2018, at about 7:45 AM (one day after the Monday observation of Memorial Day). The e-mail subject line was: **REMINDER: Take the UC Davis Student Housing Affordability and Insecurity Survey (ASUCD-GSA)**.



Dear UC Davis Student,

This is a reminder that ASUCD-GSA requests your participation in the **2017-18 UC Davis Student Housing Affordability and Insecurity Survey** (which we first distributed on May 21). Please share your input about your housing experiences before the survey closes on June 4.

Follow this link to the Survey:

[Qualtrics-generated URL]

Or copy and paste the URL below into your internet browser:

[Qualtrics-generated URL]

The survey should take about **10 minutes to complete**, and remember, you are eligible to win 1 of **10 \$50 Amazon** or **\$50 CoffeeHouse gift cards**.

On your behalf,

ASUCD-GSA Joint Housing Task Force

If you have questions about this survey, you may contact ASUCD-GSA Joint Housing Task Force chair, Don Gibson: dongibson@ucdavis.edu.

If you wish only to enroll in the gift card drawing, use this Google Form [link omitted for report]. Follow this link to opt out of future ASUCD-GSA survey e-mails: [Qualtrics-generated URL]



Invitation Reminder 2

The following reminder message, sent two weeks after the survey's launch, was distributed to any members who received the first reminder and had not yet begun or completed the survey (9,695, less failed and bounced). The message was sent on June 4, 2018 at about 7:45 AM. It was the last reminder, though the survey window was extended until the morning of June 6. The e-mail subject line was: **REMINDER: Take the UC Davis Student Housing Affordability and Insecurity Survey (ASUCD-GSA)**.



Dear UC Davis Student,

This is a final reminder that ASUCD-GSA requests your participation in the **2017-18 UC Davis Student Housing Affordability and Insecurity Survey** (which we first distributed on May 21). Please share your input about your housing experiences before the **survey closes tomorrow night**.

Follow this link to the Survey:

[Qualtrics-generated URL]

Or copy and paste the URL below into your internet browser:

[Qualtrics-generated URL]

The survey should take about 10 minutes to complete, and remember, you are eligible to win 1 of 10 **\$50 Amazon** or **\$50 CoffeeHouse gift cards**.

On your behalf,

ASUCD-GSA Joint Housing Task Force

If you have questions about this survey, you may contact ASUCD-GSA Joint Housing Task Force chair, Don Gibson: don-gibson@ucdavis.edu.

If you wish only to enroll in the gift card drawing, use this Google Form [link omitted for report]. Follow this link to opt out of future ASUCD-GSA survey e-mails: [Qualtrics-generated URL]



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