

5 | Anticipated Changes to Population

SUMMARY OF REVISIONS, MARCH 2017

This March 2017 version of Tab 5 – Anticipated Changes to Population contains the following revisions to the version provided to Santa Clara County in November, 2016:

- As directed by Santa Clara County staff, the 2018 campus residential population estimates have been revised to exclude the approved Escondido Village Graduate Residences project. This project would be under construction by 2018, but is not anticipated to be occupied until 2020. The date of occupancy of Escondido Village does not affect the projection of the number of graduate students who would be enrolled at Stanford in a given year; rather the date of occupancy of Escondido Village only affects the number of graduate students (and their spouses) who would live on the campus in a given year.
- Estimates of the 2020 campus residential population have been added to reflect conditions at full development of the existing 2000 General Use Permit. This scenario is identical to the 2018 scenario except it includes occupancy of the approved Escondido Village Graduate Residences project.
- The additional population categories identified in the VMT Report now are also presented in Section 4.1 of this Tab 5.

1.0 PURPOSE OF REPORT

This technical report is prepared to support the environmental analysis for the proposed 2018 General Use Permit. The Stanford Community Plan and 2000 General Use Permit do not present campus population totals. Rather, compliance with the 2000 General Use Permit is monitored through measurement of actual effects on the surrounding community: the number of vehicles crossing a defined cordon, the amount of water used on campus, etc. Population may be relevant, however, to forecasting future environmental impacts in an environmental impact report.

2.0 STUDENTS, FACULTY AND STAFF POPULATION PROJECTIONS

Tables 1 and 2, below, provide Stanford's student, faculty and staff populations existing as of Fall 2015, expected to exist at commencement of the proposed 2018 General Use Permit in Fall 2018, and forecasted at completion of the development proposed in the 2018 General Use Permit in Fall 2035. The student, faculty and staff populations presented in this technical report include all undergraduate and graduate students, postdoctoral scholars, and regular benefits-eligible faculty and staff. Other population categories relevant to calculation of vehicle miles traveled are presented in the accompanying technical reports prepared by Ramboll Environ (**Tab 9 – Greenhouse Gases and Energy Technical Analyses** and **Tab 10 – Air Quality and Health Risk Assessment**, respectively), and are also presented in Section 4.1, below.

To prepare this report, Stanford reviewed data provided by the Stanford Office of Institutional Research and Decision Support, including 15 years of population data for each population segment. Stanford calculated the 15-year Compound Annual Growth Rates (CAGR) for each population segment and then applied the measured CAGR to each population segment to calculate the populations anticipated in Fall 2018 and Fall 2035, with three exceptions. As further discussed below, Stanford applied a CAGR of half the historic growth rate to predict population growth for postdoctoral students. Stanford also assumed approximately 100 undergraduate students would be added each year after 2018, which is higher than the historic growth rate. Finally, Stanford assumed there would be no growth in the "Other Teaching" segment of Stanford's faculty.

Stanford anticipates that it will grow by 1,100 students, faculty and staff under the 2000 General Use Permit between Fall 2015 and Fall 2018, prior to commencement of the proposed 2018 General Use Permit. During the predicted duration of the 2018 General Use Permit between Fall 2018 and Fall 2035, Stanford anticipates that it will grow by 7,500 students, faculty and staff. These projections reflect an approximately 1.2 percent CAGR.

Table 1: Projected Growth in Academic Year Population Prior to Commencement of 2018 General Use Permit

Affiliation	Population in Fall 2015	Anticipated Population in Fall 2018	Change in Population	Growth Rate (CAGR)
Undergraduates	6,994	7,085	91	0.4%
Graduate Students, including PhDs	9,196	9,528	332	1.2%
Postdoctoral Students	2,264	2,403	139	2.0%
Faculty	2,959	3,073	114	1.3%
Staff*	8,612	8,985	373	1.4%
Other (Nonmatriculated Students)	918	977	59	2.1%
Total	30,943	32,051	1,108	1.2%

Source: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford Office of Institutional Research and Decision Support

* Refers only to staff working within the area governed by the 2018 General Use Permit.

Table 2: Projected Growth in Academic Year Population during 2018 General Use Permit

Affiliation	Anticipated Population in Fall 2018	Anticipated Population in Fall 2035	Change in Population	Growth Rate (CAGR)
Undergraduates	7,085	8,785	1,700	1.3%
Graduate Students, including PhDs	9,528	10,728	1,200	0.7%
Postdoctoral Students	2,403	3,364	961	2.0%
Faculty	3,073	3,862	789	1.4%
Staff*	8,985	11,423	2,438	1.4%
Other (Nonmatriculated Students)	977	1,397	420	2.1%
Total	32,051	39,560	7,509	1.2%

Source: Stanford University Land Use and Environmental Planning Office, in consultation with the Stanford Office of Institutional Research and Decision Support

* Refers only to staff working within the area governed by the 2018 General Use Permit.

2.1 Undergraduates

Prior to Fall 2018, undergraduates are anticipated to grow at the historic 15-year CAGR of 0.4%. After that, Stanford estimates that by Fall 2035, the total population of undergraduate students may increase by up to 1,700. This would occur gradually over time, at a growth rate of approximately 100 undergraduates per year. This is a higher rate of growth than the historic rate. Stanford plans a modest expansion of undergraduate enrollments in recognition of the fact that applications to Stanford have increased while spaces available have not, resulting in one of the lowest rates of admission in the nation. Providing a reasonable increase in the number of talented students for whom a Stanford education is accessible has therefore become an increasing priority.

2.2 Graduate Students

Based on the historic CAGR for this population segment, Stanford anticipates that the total campus population of graduate students will increase by 330 by Fall 2018, and by an additional 1,200 by Fall 2035. Again, these increases would not occur all at once, rather total graduate student enrollment (including both master's candidates and doctorate candidates) would grow gradually between Fall 2018 and Fall 2035, at a rate of approximately 70 graduate students per year. The 1,200 total growth projection includes the 300 new Knight-Hennessy scholars, [announced in Spring 2016](#).

2.3 Postdoctoral Students

Postdoctoral students (postdocs) refers to are trainees with doctoral degrees who are involved in research projects and who have appointments for the purpose of advanced studies and training under mentorship of a Stanford faculty member.

Although postdoc growth at Stanford has been strong in the last 10–15 years, trends show the growth to be leveling off for medicine, biology, and engineering. Other key limitations are the number of faculty, available research work and grant funding. Based on these trends and limitations, as well as their professional judgment, Stanford administration projects the postdoc growth to year 2035 at a 2.0% CAGR, about half the historic CAGR experienced during the last 15 years. This projected growth rate would result in an increase in the total campus population of postdoctoral student population by 140 by Fall 2018, and by an additional 960 by 2035. Like the other populations, the total population of postdoctoral students would grow gradually between Fall 2018 and Fall 2035.

2.4 Faculty

Faculty refers to professoriate faculty members and regular benefits-eligible employees in academic/instructional positions, including Academic Council faculty, Center fellows, Medical Center line faculty, lecturers, acting professors, coaches, some emeriti and teaching fellows.

Professoriate faculty from the School of Medicine is expected to grow by the historic CAGR of 2.4%. Professoriate faculty from all other schools is projected to follow the historic CAGR of 1.2%.

Faculty also includes Other Teaching, which comprises lecturers and senior lecturers; visiting, consulting and acting professors; coaches; emeritus faculty on recall and research assignments; artists-in-residence; course associates; teaching specialists and teaching fellows. The Other Teaching population fluctuated in the last 15 years, with a historic CAGR of -1.1%. It is assumed that this group would remain steady at its existing population of about 810 from Fall 2018 until Fall 2035. No increase is assumed.

Altogether, the combined CAGR for faculty growth from Fall 2018 to Fall 2035 is projected to be 1.4%.

2.5 Staff

Staff refers to regular benefits-eligible employees generally in nonacademic positions such as human resources, information technology, facilities, financial aid, etc.

Staff growth within the area governed by the 2018 General Use Permit is projected to be 1.4% based on historic CAGR.

This rate of staff growth may be conservative given that some staff will move from the academic campus in unincorporated Santa Clara County to a new administrative campus in Redwood City. However, it is unknown how many staff who relocate to Redwood City already would be located outside of the academic campus at locations such as the Stanford Research Park, and it is unknown whether positions on the academic campus would be back-filled. Therefore, Stanford has not taken credit for moving staff to Redwood City in estimating its future growth under the proposed 2018 General Use Permit.

2.6 Nonmatriculated Students

Nonmatriculated graduate students are students taking graduate courses or engaged in graduate-level research or training but who are not seeking a degree. This group is assumed to grow at the historic CAGR of 2.1%.

Nonmatriculated undergraduates are undergraduates who are auditing classes and are not seeking a degree. This group had no specific trend over the last 15 years, but their numbers have been historically very low (about 5 per year) and are not expected to grow beyond the existing total.

3.0 CAMPUS RESIDENT POPULATION PROJECTIONS

For the purposes of this application, the term “on-campus” refers to the area governed by the 2018 General Use Permit. Stanford estimated the on-campus residential population anticipated to exist by Fall 2018 at commencement of the proposed 2018 General Use Permit, and forecasted the on-campus resident population at completion of the development proposed in the 2018 General Use Permit in Fall 2035. These projections consider the increase in housing units and student beds anticipated to be constructed through completion of the 2000 General Use Permit and under the proposed 2018 General Use Permit. Based on current and historic occupancy rates, Stanford estimates that, in addition to Stanford graduate students, 10% of graduate student housing would continue to be occupied by couples (2% Stanford student spouses and 8% non-Stanford student spouses) resulting in 1.1 residents per graduate student bed. Stanford also estimates that 2.57 residents would occupy each faculty and staff housing unit. Faculty and staff resident household size was obtained from the 2016 Commute Survey conducted by Stanford’s Office of Parking and Transportation.

Table 3: Projected Growth in Academic Year Residential Population Through 2035

Affiliation	Fall 2015 On-Campus Residential Population	Housing Units/ Student Beds Added by Fall 2018 and Resulting Residential Population in 2018	Housing Units/ Student Beds Added by Fall 2020 and Resulting Residential Population in 2020	Housing Units/ Student Beds Added under 2018 General Use Permit and Resulting Residential Population in 2035
Undergraduates	6,401 existing beds occupied	216 beds added at Lagunita	0 beds added	1,700 beds added
	6,401 undergraduates living on campus	6,617 undergraduates living on campus	6,617 undergraduates living on campus	8,317 undergraduates living on campus
Graduate Students, including PhDs (see note below)	5,001 existing beds occupied	200 beds added at Highland Hall	2,020 beds added at EVGR	900 beds added
	5,001 graduates living on campus plus 644 non-student spouses and 420 children	5,205 graduates living on campus plus 660 non-student spouses and 420 children	7,265 graduates living on campus plus 822 non-student spouses and 420 children	8,183 graduates living on campus plus 894 non-student spouses and 420 children
Postdoctoral Scholars	28 existing beds occupied	0 units added	0 units added	N/A - included with faculty/ staff
	28 postdocs living on campus	28 postdocs living on campus	28 postdocs living on campus	
Faculty/ Staff	937 existing faculty/staff housing units built	0 units added	0 units added	550 units
	937 faculty/staff living on campus plus 1,471 other family members	937 faculty/staff living on campus plus 1,471 other family members	937 faculty/staff living on campus plus 1,471 other family members	1,515 faculty/staff/postdocs living on campus plus 2,335 other family members
Total	14,902	15,338	17,560	21,664

Source: Stanford University Land Use and Environmental Planning Office, in consultation with Stanford University Residential and Dining Enterprises.

Note: Based on Fall 2015 data, in graduate student housing that is not occupied by children, couples make up approximately 10% of graduate on-campus contract holders, and 20% of these graduate student couples include student spouses, while 80% include non-student spouses. Therefore, the 2,220 new graduate units constructed between Fall 2015 and Fall 2020 are projected to house 44 student spouses and 178 non-student spouses in addition to the 2,220 graduate student contract holders. In Fall 2035, the additional proposed 900 graduate student beds are projected to add 18 student spouses and 72 non-student spouses in addition to the 900 graduate student contract holders. Since no increase in graduate student families is projected based on the historic decrease in applications for graduate student family housing, the number of children and spouses associated with graduate student family housing units remains the same throughout the projections. Table 3 does not include Resident Fellow units. Very few were added during the 2000 General Use Permit.

4.0 OTHER POPULATIONS

4.1 Other Worker Populations

Other population segments relevant to calculation of vehicle miles traveled are presented in the technical reports prepared by Fehr and Peers and Ramboll Environ (**Tab 8 – Transportation: Vehicle Miles Traveled**, **Tab 9 – Greenhouse Gases and Energy Technical Analyses**, and **Tab 10 – Air Quality and Health Risk Assessment**). These other population segments also are included in the daily cordon counts used to describe existing numbers of campus trips and to calculate future trip generation rates under the proposed 2018 General Use Permit. The other population segments are presented separate from the faculty, staff and student populations because many members of these populations do not work on the campus on a daily or year-round basis, or are not directly employed by Stanford. Definitions for each of these other population segments are as follows:

- Contingent – salaried workers with roles that are comparable to Academic staff and Other Teaching, working less than 50% FTE and/or working less than six months
- Casual – hourly workers less than 50% FTE and working no more than 980 hours a year, including summer camp staff, summer grounds/facilities work, special projects in academic units
- Temporary workers – hourly workers at 50% FTE or more working no longer than six months, including summer camp staff, summer grounds/facilities work, special projects in academic units
- Other nonemployee academic affiliates – affiliated teaching staff, adjunct professors, visiting scholars, typically not full time, approximately half of this category of workers are 20% FTE
- Third-party contract workers – food service workers at on-campus cafeterias and childcare center workers
- Janitorial contract workers – working off-peak hour morning and evening shifts
- Construction contract workers – related to ongoing construction projects on campus

Stanford estimated the average number of these population segments who were present on the campus in Fall 2015, as some of these segments fluctuate throughout the year. Contingent, casual and temporary workers were estimated to total 4,450 workers on average, although these populations tend to peak during summer when the faculty, staff and student population is reduced. Stanford also determined that there were about 300 third-party contract workers, 240 janitorial contract workers, and 1,200 construction workers coming to campus.

The growth rate assumed for the contingent, casual, temporary, and non-employee affiliate population segments is the same as that for regular benefits-eligible non-academic employees (i.e. staff, at 1.4% CAGR). Third-party and janitorial contract workers were estimated to grow at the same rate as occupied academic and academic support square footage (8.1% from Fall 2015 to Fall 2018, and 22.1% from Fall 2018 to Fall 2035). Construction contract workers are expected to stay constant, as this has been the trend during the 2000 General Use Permit and construction is expected to continue at historic rates under the 2000 General Use Permit.

Other Workers totaled 8,826 in Fall 2015, are expected to total 9,166 in Fall 2018, and 11,267 in Fall 2035.

Tab 8 – Transportation: Vehicle Miles Traveled identifies the commute frequency for each of these Other Worker Populations. The commute frequency refers to the number of days per week a worker travels to campus, and accounts for part-time workers, alternative work schedules, and telecommuting. For third party contractors, janitorial and construction workers, the VMT report conservatively assumes that these workers traveled to campus every work day.

Tables 4 and 5, below, present both the total number of workers within each population category, and the estimated daily population for each population category based on their commute frequency. Stanford anticipates that the daily population of Other Workers will grow by 185 under the 2000 General Use Permit between Fall 2015 and Fall 2018, prior to commencement of the proposed 2018 General Use Permit. During the predicted duration of the 2018 General Use Permit between Fall 2018 and Fall 2035, Stanford anticipates that the daily population of Other Workers population will grow by 1,074.

Table 4: Projected Growth in Other Worker Population Prior to Commencement of 2018 General Use Permit

Affiliation	Commute Frequency	Total Population in Fall 2015	Daily Campus Population in Fall 2015	Anticipated Total Population in Fall 2018	Anticipated Daily Campus Population in Fall 2018	Change in Population	Change in Daily Campus Population
Casual	20%	2,080	416	2,167	433	87	17
Contingent	52%	980	510	1,021	531	41	21
Temporary	78%	1,390	1,084	1,448	1,129	58	45
Non-employee academic affiliates, 20% FTE	17%	1,259	214	1,312	223	53	9
Non-employee academic affiliates, FTE	85%	1,377	1,170	1,435	1,220	58	49
Third-party contract workers	100%	300	300	324	324	24	24
Janitorial contract workers	100%	240	240	259	259	19	19
Construction contract workers	100%	1,200	1,200	1,200	1,200	0	0
Total	NA	8,826	5,134	9,166	5,320	340	185

Table 5: Projected Growth in Other Worker Population during 2018 General Use Permit

Affiliation	Commute Frequency	Anticipated total Population in Fall 2018	Anticipated Daily Campus Population in Fall 2018	Anticipated Total Population in Fall 2035	Anticipated Daily Campus Population in Fall 2035	Change in Population	Change in Daily Campus Population
Casual	20%	2,167	433	2,746	549	579	116
Contingent	52%	1,021	531	1,294	673	273	142
Temporary	78%	1,448	1,129	1,835	1,431	387	302
Non-employee academic affiliates, 20% FTE	17%	1,312	223	1,662	283	350	59
Non-employee academic affiliates, FTE	85%	1,435	1,220	1,818	1,545	383	326
Third-party contract workers	100%	324	324	396	396	72	72
Janitorial contract workers	100%	259	259	316	316	57	57
Construction contract workers	100%	1,200	1,200	1,200	1,200	0	0
Total	NA	9,166	5,320	11,267	6,393	2,101	1,074

4.2 School-aged Children

Finally, Stanford has calculated the additional number of school-aged children anticipated to reside on its campus lands in unincorporated Santa Clara County by 2035. Stanford student families would continue to be housed in existing units in Escondido Village. The number of applications for student family housing has generally declined over the last 15 years, and therefore no new graduate student family housing is anticipated from now through 2035.

Under the proposed 2018 General Use Permit, Stanford proposes 550 new housing units that could be occupied by faculty and staff, including postdoctoral students and medical residents. These housing units are expected to be multi-family units. Based on the Palo Alto Unified School District's November 2015 demographer's report, multi-family housing generates 0.50 school-aged students per residence. Application of these ratios to the 550 units proposed for the 2018 General Use Permit results in 275 additional school-aged children.

5.0 ALTERNATIVE APPROACH USED TO TEST POPULATION PROJECTIONS

Due to the many factors that influence population and that result in periodic fluctuations, population metrics are more challenging to predict and track than square footage or housing units. As explained above, Stanford has estimated its future population increases based on a comprehensive review of historic data. To test whether these population projections appear to be reasonable in light of the amount of additional building space that Stanford proposes, Stanford also compared the historic and projected population densities (population per 1,000 square feet) that occurred in 2000 at commencement of the 2000 General Use Permit, that are expected in 2018 at commencement at the proposed 2018 General Use Permit, and that are predicted in 2035 at completion of the proposed 2018 General Use Permit.

Table 6 shows that the population density that existed on the Stanford campus in 2000 was 3.14 persons per 1,000 square feet of academic and academic support space. Similarly, the population density that is expected to exist on the Stanford campus in 2018 is 3.13 persons per 1,000 square feet of academic and academic support space. The population density predicted to occur in 2035, based on the projections presented in this document and the proposed amount of net new academic and academic support space, would be 3.16 persons per 1,000 square feet. This density is somewhat higher than the existing and historic densities, indicating that the population projections are reasonable.

Table 6: Stanford University Population Density Comparison over Time

	Fall 2000	Fall 2018 (Projected)	Fall 2035 (Projected)
Standard Academic Year Population	25,821	32,051	39,560
Permitted academic square footage	8,220,391	10,255,391	12,530,391
Approximate density	3.14 persons per 1,000 sf	3.13 persons per 1,000 sf	3.16 persons per 1,000 sf

Source: Stanford University Land Use and Environmental Planning Office