

APPENDIX K

Place of Residence Data

MEMORANDUM

DATE October 28, 2020
TO Raphael Breines, Alison Krumbein, Charles Olson
UC Berkeley
FROM PlaceWorks
SUBJECT Place of Residence Data Summary

In an effort to quantify the number of students and faculty/staff living off-campus in various communities surrounding the UC Berkeley Campus, PlaceWorks staff reviewed a residence survey of university employees provided by UC Berkeley and Streetlight data (described below) provided by Fehr and Peers.

Streetlight data is based on 100 billion anonymized location records from smart phones and navigation devices in connected cars and trucks. It is processed along with other data sources such as parcel and road network data.

University Employee Place of Residence

The employee resident survey data for non-student employees is provided in Table 1. This data includes people in the following categories: faculty, faculty emeriti, other faculty, other academic, staff, and affiliates/non-employees. Twenty-nine percent of survey respondents live in the City of Berkeley, 15 percent live in Oakland, and 56 percent live in Alameda County as a whole. Twenty-two percent live in Contra Costa County, which is a greater proportion than for students, with four percent living in El Cerrito and four percent living in Richmond. Twenty-one percent live in other cities, including 7 percent living in San Francisco.

Student Place of Residence

Student place of residence data is not recorded in the same manner as employee data, and it is more difficult to determine the place of residence for students. This memo provides two sources of data available to approximate place of residence for students: student employee survey data and Streetlight data.

STUDENT EMPLOYEE SURVEY DATA

The university's employee place of residence survey includes undergraduate and graduate students who also work for the university. Student employee place of residence could be used to represent the place of residence patterns for all students. The employee resident survey data for student employees is provided in Table 2, with graduate and undergraduate students are shown in separate columns. Fifty-nine percent of student employees surveyed live in the City of Berkeley, six percent live in Oakland, and 73 percent live in Alameda County as a whole. Only four percent live in Contra Costa County, with no notable concentration in any particular city. Twenty-two percent live in other cities.

Table 1. Non-Student Employee Survey Data

	FACULTY	FACULTY EMERITI	OTHER FACULTY	OTHER ACADEMIC	STAFF	AFFILIATES/ NON- EMPLOYEES	TOTAL	PERCENT OF TOTAL
Alameda County								
Alameda	12	6	19	32	236	30	335	2%
Albany	63	15	45	176	251	180	730	4%
Berkeley	714	435	348	984	1,488	1,498	5,467	29%
Dublin	1	0	9	12	40	5	67	0%
Emeryville	5	2	7	33	87	37	171	1%
Fremont	6	0	11	27	70	27	141	1%
Hayward	2	3	4	24	130	20	183	1%
Livermore	1	0	4	8	30	7	50	0%
Newark	0	0	2	3	10	3	18	0%
Oakland	196	92	234	307	1585	374	2,788	15%
Piedmont	24	12	21	15	46	17	135	1%
Pleasanton	1	0	6	8	29	13	57	0%
San Leandro	3	0	14	20	196	17	250	1%
Union City	0	0	6	12	32	9	59	0%
<i>Subtotal</i>	<i>1,028</i>	<i>565</i>	<i>730</i>	<i>1,661</i>	<i>4,230</i>	<i>2,237</i>	<i>10,451</i>	<i>56%</i>
Contra Costa County								
Antioch	2	0	3	2	85	6	98	1%
Brentwood	0	0	1	5	33	3	42	0%
Clayton	0	0	1	3	8	1	13	0%
Concord	2	0	9	22	209	19	261	1%
Danville	3	5	9	9	45	8	79	0%
El Cerrito	88	44	46	133	363	119	793	4%
Hercules	2		4	11	106	11	134	1%
Kensington	66	38	32	27	70	20	253	1%
Lafayette	24	18	20	15	81	19	177	1%
Martinez	2	5	1	9	80	12	109	1%
Moraga	26	10	14	23	48	19	140	1%
Oakley	0	1	0	1	26	2	30	0%
Orinda	45	32	21	31	61	31	221	1%
Pinole	5	0	1	8	106	6	126	1%
Pittsburg	0	0	1	6	88	3	98	1%
Pleasant Hill	3	4	4	8	72	20	111	1%
Richmond	23	9	31	93	555	86	797	4%
San Pablo	0	0	2	7	149	8	166	1%
San Ramon	1	0	7	12	50	19	89	0%
Walnut Creek	27	19	24	68	200	72	410	2%

Table 1. Non-Student Employee Survey Data

<i>Subtotal</i>	319	185	231	493	2,435	484	4,147	22%
Other Cities								
Los Angeles	2	2	8	8	5	21	46	0%
San Francisco	90	42	175	207	469	264	1,247	7%
San Jose	0	1	17	20	41	36	115	1%
Remaining Cities	63	74	234	393	1,291	520	2,575	14%
<i>Subtotal</i>	155	119	434	628	1,806	841	3,983	21%
Total	1,502	869	1,395	2,782	8,471	3,562	18,581	100%

Source: University of California Berkeley, Employee Data, March 2019.

Table 2. Student Employee Survey Data

CITIES	GRADUATE		UNDERGRADUATE		TOTAL	
	STUDENTS	PERCENT OF TOTAL	STUDENTS	PERCENT OF TOTAL	STUDENTS	PERCENT OF TOTAL
Alameda County						
Alameda	13	<1%	30	<1%	43	<1%
Albany	428	9%	75	1%	503	4%
Berkeley	3,068	61%	3,695	58%	6,763	59%
Dublin	5	<1%	10	<1%	15	<1%
Emeryville	42	1%	13	<1%	55	<1%
Fremont	63	1%	41	1%	104	1%
Hayward	12	<1%	31	<1%	43	<1%
Livermore	5	<1%	5	<1%	10	<1%
Newark	1	<1%	7	<1%	8	<1%
Oakland	514	10%	218	3%	732	6%
Piedmont	6	<1%	3	<1%	9	<1%
Pleasanton	17	<1%	13	<1%	30	<1%
San Leandro	14	<1%	29	<1%	43	<1%
Union City	11	<1%	11	<1%	22	<1%
<i>Subtotal</i>	4,199	84%	4,181	65%	8,380	73%
Contra Costa County						
Antioch	4	<1%	13	<1%	17	<1%
Brentwood	1	<1%	3	<1%	4	<1%
Clayton	0	0%	1	<1%	1	<1%
Concord	11	<1%	17	<1%	28	<1%
Danville	3	<1%	12	<1%	15	<1%
El Cerrito	113	2%	17	<1%	130	1%
Kensington	22	<1%	4	<1%	26	<1%
Lafayette	5	<1%	6	<1%	11	<1%

Table 2. Student Employee Survey Data

CITIES	GRADUATE		UNDERGRADUATE		TOTAL	
Martinez	2	<1%	3	<1%	5	<1%
Moraga	0	0%	4	<1%	4	<1%
Oakley	0	0%	1	<1%	1	<1%
Orinda	8	<1%	5	<1%	13	<1%
Pinole	4	<1%	8	<1%	12	<1%
Pittsburg	1	<1%	6	<1%	7	<1%
Pleasant Hill	5	<1%	9	<1%	14	<1%
Richmond	48	1%	49	1%	97	1%
San Pablo	7	<1%	14	<1%	21	<1%
San Ramon	19	<1%	27	<1%	46	<1%
Walnut Creek	8	<1%	22	<1%	30	<1%
<i>Subtotal</i>	<i>261</i>	<i>5%</i>	<i>221</i>	<i>3%</i>	<i>482</i>	<i>4%</i>
Other Cities						
Los Angeles	9	0%	121	2%	130	1%
San Francisco	106	2%	105	2%	211	2%
San Jose	47	1%	93	1%	140	1%
Remaining Cities	380	8%	1,680	26%	2,060	18%
<i>Subtotal</i>	<i>542</i>	<i>11%</i>	<i>1,999</i>	<i>31%</i>	<i>2,541</i>	<i>22%</i>
Total	5,002	100%	6,401	100%	11,403	100%

Source: University of California Berkeley, Employee Data, March 2019.

STREETLIGHT DATA

Streetlight data utilizes anonymized location information from smart phones and navigation devices to provide insight into the movement of people. These data can be used in place of traffic counts to determine annual average daily traffic (AADT) levels and vehicle miles traveled (VMT).

The Streetlight data, provided in Table 3, below, represents activity to and from the UC Berkeley Campus Mondays through Thursdays during the 2018-19 academic school year. The Home Grid Visitors column represents the origin city location of trips to the campus based on GIS analysis. Eighty-three percent of trips in this category originated within the City of Berkeley.

The Traveler Attributes columns represent the number of devices travelling from one of the listed cities to the UC Berkeley Campus based on trip purpose, either Home Based Work (HBW), Home Based Other (HBO), or Non Home Based (NHB). Trips classified as HBW remained on campus for more than 8 hours and are assumed to be staff and students. Trips classified as HBO remained on campus for fewer than 8 hours and are assumed to be students and visitors. Trips classified as NHB are assumed to be some students and visitors. The distribution of origin cities in the Traveler Attributes columns were varied from the employee survey and Home Grid Visitors analyses.

The Trip Purpose columns represent the number of devices travelling from one of the listed cities to the UC Berkeley Campus based on trip purpose (HBW, HBO, or NHB) by distribution of trips from the city in which the trip originated.

The data sets were compiled and evaluated. Through the analysis, staff determined that the employee survey data and the Home Grid Visitors data are most likely to be representative of the distribution of which cities students reside. The other categories were less clear on whether the city where a given trip originated was in fact the location of residence and whether the trips represent students, staff, or visitors. Therefore, while those data are able to quantify trip and traffic activity to a high level of detail, they data do not serve to quantify the number of people living off-campus.

Table 3. Streetlight Data

CITIES	HOME GRID VISITORS ^a	HBW TRAVELER ATTRIBUTES (8+ HOURS) ^b	HBO TRAVELER ATTRIBUTES (<8 HOURS) ^c	NHB TRAVELER ATTRIBUTES ^d	HBW TRIP PURPOSE (8+ HOURS) ^b	HBO TRIP PURPOSE (<8 HOURS) ^c	NHB TRIP PURPOSE ^d
Alameda County							
Alameda	466	71,020	156,973	136,213	58	29	13
Albany	1,803	18,193	37,787	34,278	143	51	112
Berkeley	47,689	0	0	0	0	0	0
West Berkeley	0	27,992	63,388	89,212	364	206	438
Emeryville	385	22,331	42,837	75,281	181	96	61
Downtown Oakland	0	72,583	140,326	226,985	81	26	136
North Oakland	0	49,600	121,801	142,520	574	208	541
Oakland	3,025	0	0	0	0	0	0
Oakland Hills	0	22,524	48,965	37,322	123	90	75
West Oakland	0	25,864	85,788	144,431	28	21	71
San Leandro/East Oakland	130	397,975	933,031	879,968	419	155	223
Richmond Field Station	0	116	136	412	0	0	-
Rockridge/Claremont	0	8,865	24,378	28,318	189	103	291
East Alameda County	0	393,787	736,888	818,765	4	46	28
South Alameda County	0	701,298	1,382,169	1,320,891	134	48	79
<i>Subtotal</i>	<i>53,498</i>	<i>1,812,148</i>	<i>3,774,467</i>	<i>3,934,596</i>	<i>2,298</i>	<i>1,079</i>	<i>2,068</i>
Contra Costa County							
Berkeley Hills/Kensington		10,913	27,816	20,580	464	102	141
Concord	85	316,223	720,853	663,049	146	39	58
East Contra Costa County		387,762	904,139	627,714	45	19	7
El Cerrito	1,180	23,788	65,343	57,708	420	169	149
Richmond	763	188,043	472,764	401,584	190	173	155
Walnut Creek/Lafayette/Danville	401	402,972	832,808	830,742	426	150	220
<i>Subtotal</i>	<i>2,429</i>	<i>1,329,701</i>	<i>3,023,723</i>	<i>2,601,377</i>	<i>1,691</i>	<i>652</i>	<i>730</i>

Table 3. Streetlight Data

CITIES	HOME GRID VISITORS ^a	HBW TRAVELER ATTRIBUTES (8+ HOURS) ^b	HBO TRAVELER ATTRIBUTES (<8 HOURS) ^c	NHB TRAVELER ATTRIBUTES ^d	HBW TRIP PURPOSE (8+ HOURS) ^b	HBO TRIP PURPOSE (<8 HOURS) ^c	NHB TRIP PURPOSE ^d
Other Counties							
Buffer		11,918	19,984	28,291	-	-	-
Marin County		202,745	481,215	537,397	28	16	17
Napa County		163,527	352,687	367,714	-	5	5
Mountain House/Tracy/Manteca		289,737	671,525	547,784	-	5	5
San Francisco	672	858,255	1,826,409	2,548,600	139	98	99
San Mateo County		887,722	1,799,179	2,060,274	11	47	47
Santa Clara County	26	2,761,161	4,825,581	5,315,880	33	27	45
Solano County		517,775	1,173,084	1,005,886	55	20	13
Sonoma County		507,932	1,073,465	1,036,810	10	1	6
Remaining Cities	1,168						
<i>Subtotal</i>	<i>1,866</i>	<i>6,200,772</i>	<i>12,223,129</i>	<i>13,448,636</i>	<i>276</i>	<i>219</i>	<i>237</i>
Total	57,793	9,342,621	19,021,319	19,984,609	4,265	1,950	3,035

Source: Fehr and Peers, May 2020.

Notes:

- a. Home Grid Visitors represents the origin city location of trips to the campus based on GIS analysis.
- b. HBW = Home-based work. These devices remained on campus for more than 8 hours and are assumed to be staff and students.
- c. HBO = Home-based other. These devices remained on campus for fewer than 8 hours and are assumed to be students and visitors.
- d. NHB = Non-home based. These devices are assumed to represent some students and visitors.

SUMMARY

Table 4 summarizes the data above. As shown in Table 4, both datasets show the majority of students living in Alameda County, ranging from 59 percent based on the student employee survey data to 93 percent based on the Streetlight data. The student employee survey data and Streetlight data both only show 4 percent of people living in Contra Costa County.

Table 4. Summary

	UNIVERSITY SURVEY DATA		STREETLIGHT DATA		AVERAGE PERCENT OF TOTAL
	TOTAL STUDENTS	PERCENT OF TOTAL STUDENTS	"HOME GRID VISITORS"	PERCENT OF TOTAL "HOME GRID VISITORS"	
Alameda County					
Alameda	43	<1%	466	1%	1%
Albany	503	4%	1,803	3%	4%
Berkeley	6,763	59%	47,689	83%	71%
Dublin	15	<1%	0	0%	0.1%
Emeryville	55	<1%	385	1%	1%
Fremont	104	1%	0	0%	0.5%
Hayward	43	<1%	0	0%	0.2%
Livermore	10	<1%	0	0%	0.0%
Newark	8	<1%	0	0%	0.0%
Oakland	732	6%	3,025	5%	6%
Piedmont	9	<1%	0	0%	0.0%
Pleasanton	30	<1%	0	0%	0.1%
San Leandro	43	<1%	130	0%	0.3%
Union City	22	<1%	0	0%	0.1%
<i>Subtotal</i>	<i>8,380</i>	<i>73%</i>	<i>53,498</i>	<i>93%</i>	<i>83%</i>
Contra Costa County					
Antioch	17	<1%	0	0%	0.1%
Brentwood	4	<1%	0	0%	0.0%
Clayton	1	<1%	0	0%	0.0%
Concord	28	<1%	85	0%	0.2%
Danville	15	<1%	0	0%	0.1%
El Cerrito	130	1%	1,180	2%	2%
Hercules	0	0%	0	0%	0.0%
Kensington	26	<1%	0	0%	0.1%

Table 4. Summary

	UNIVERSITY SURVEY DATA		STREETLIGHT DATA		AVERAGE PERCENT OF TOTAL
	TOTAL STUDENTS	PERCENT OF TOTAL STUDENTS	"HOME GRID VISITORS"	PERCENT OF TOTAL "HOME GRID VISITORS"	
Lafayette	11	<1%	0	0%	0.0%
Martinez	5	<1%	0	0%	0.0%
Moraga	4	<1%	0	0%	0.0%
Oakley	1	<1%	0	0%	0.0%
Orinda	13	<1%	0	0%	0.1%
Pinole	12	<1%	0	0%	0.1%
Pittsburg	7	<1%	0	0%	0.0%
Pleasant Hill	14	<1%	0	0%	0.1%
Richmond	97	1%	763	1%	1%
San Pablo	21	<1%	0	0%	0.1%
San Ramon	46	<1%	0	0%	0.2%
Walnut Creek	30	<1%	401	1%	0.5%
<i>Subtotal</i>	<i>482</i>	<i>4%</i>	<i>2429</i>	<i>4%</i>	<i>4%</i>
Other Cities and Counties					
Los Angeles	130	1%		0%	1%
San Francisco	211	2%	672	1%	2%
San Jose	140	1%	26	0%	1%
Remaining Cities	2,060	18%	1,168	2%	10%
<i>Subtotal</i>	<i>2,541</i>	<i>22%</i>	<i>1,866</i>	<i>3%</i>	<i>13%</i>
Total	11,403	100%	57,793	100%	100%

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