

Assessing Emerging Active Transportation Options at UCLA

Team Leaders

Maddie Jordan, Brooke Shimasaki

Team Members

Natalie Gonzalez, Anna Weir, Kyle Willenborg

Stakeholder

Jimmy Tran

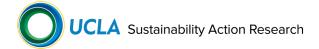


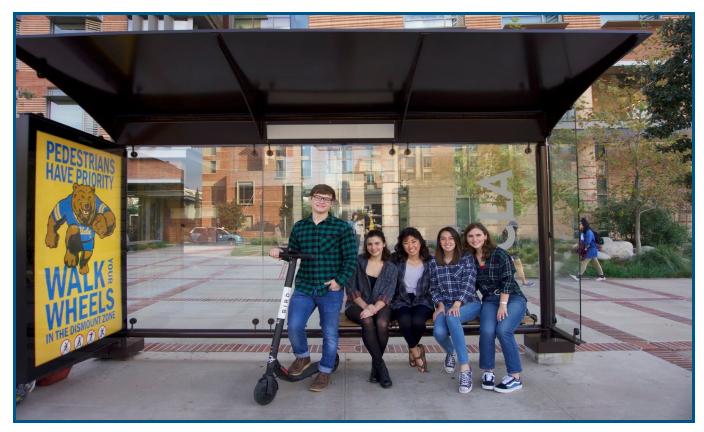
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About Us

The Sustainability Action Research (SAR) program promotes investigative and analytical methodology in order to assess and implement environmentally sustainable practices on and around the University of California Los Angeles (UCLA) campus. The student-driven research projects within SAR provide unique opportunities for students to navigate the expansive beaurocratic framework of UCLA while gaining invaluable research experience.

The 2019 SAR Transportation Team is comprised of five UCLA undergraduate students and one stakeholder. The two team leaders — Maddie Jordan and Brooke Shimasaki — utilized their specialized knowledge of environmental science, geography, information mapping, and project management to expertly guide the team's goals and acted as liaisons between the team and their stakeholder, Jimmy Tran. The three team members — Natalie Gonzalez, Anna Weir, and Kyle Willenborg — were the heart of the project, and provided exceptional and thoughtful work that truly drove the team toward success. Jimmy Tran provided the team with valuable support and guidance in his position as the Active Transportation Coordinator for UCLA Transportation and with his background in public health and urban planning. With a plethora of support from our stakeholder and SAR Directors and Advisors, the Transportation Team worked tirelessly for 20 weeks to bring about meaningful change on UCLA's campus.



From left to right: Kyle Willenborg, Anna Weir, Brooke Shimasaki, Natalie Gonzalez, Maddie Jordan

Motivation

UCLA's hustling and bustling campus community consists of students, faculty, administrative staff, medical staff, researchers, alumni, and visitors from the general public. Over 77,000 people make their way onto campus every day via various modes of transport including active modes, public transit, ride-hailing, and private single-occupancy vehicles. Overall, about 62,657 students, faculty, and staff commute to campus each day; meaning over 80% of UCLA's total population is commuting. Due to a combination of the increased traffic congestion in Los Angeles and the various transportation services offered by UCLA, more community members are choosing sustainable transportation over private, single-occupancy vehicles. In order to accommodate the university community's needs in a safe, efficient, and environmentally conscious manner, UCLA's Sustainable Transportation Plan was created. It works in tandem with existing commitments and programs such as UC Sustainability Policy, 2025 UC Carbon Neutrality, and the American College and University Presidents' Climate Commitment. The 2019 Sustainable Action Research Transportation Team strives to work in conjunction with UCLA Transportation to understand current transportation trends, specifically in regards to electric scooters, and identify potential strategies that can help the campus continue to reach green goals.

UCLA Transportation strives to accommodate transportation for those living in a one mile radius from campus. Common modes of transportation include Bruin Bus, active modes (like walking and biking), ride-hailing services, and electric scooters. Implementing infrastructure that promotes active modes of transportation is an effective way of promoting community health while reducing traffic congestion around campus. Additionally, a replacement of intra-campus ride hailing with active modes, Bruin Bus, or personal mobility devices may be another way to ease traffic on campus while promoting green alternatives.

It is no surprise that active transportation options like walking and bicycling are the most sustainable ways to travel from one place to another. Infamous for it's car culture and bad air quality, the city of Los Angeles needs to work to promote active transportation in order to reduce pollution and excessive energy consumption. UCLA recognizes this, and in the past few years has made strides to incentivize active transportation among students and faculty. One big step taken in 2017 was the launch of UCLA's Bruin Bike Share, which has 130 bikes at 18 hub locations across campus and Westwood Village. This program has been highly successful, and 500 members joined in the first month alone. The Earn-A-Bike program, which offers free bicycles for employees and graduate students who agree to give up their parking permits for two years, also continued through 2017 with 300 participants enrolled in the program. While data is not available for the most recent year, it is likely that enrollment in these programs has continued to grow. This can be inferred as UCLA has started redesigning infrastructure on and around campus to support both pedestrians and cyclists. Some efforts have included narrowing several main roadways, installing medians, adding more emerald green bike lanes, and reducing the speed limit on campus to 20 mph.

As ride-hailing companies like Uber and Lyft have grown in widespread popularity, so has the use of these services on or to campus. With over 90,000 pickups and drop-offs per week, ride-hailing has become a

convenient way for around UCLA students and faculty to make their way to or around campus. The current plan is to convert solo ride hailing trips into shared trips. One incentive to take shared trip is Lyft's promotion where all Shared Rides that are beginning or ending on UCLA's campus will cost \$5.49 in the qualifying service area.

When looking toward the future of near campus transportation, no mode of transportation seems as rapidly growing as the widely available electric scooters. Bird, Lime, and other scooter companies have provided a somewhat cheap and convenient way to travel from one end of campus to the other. With an initial base charge of \$1.00 and a rate of \$0.15 per minute, Birds can cruise around campus at 15 mph. It will be interesting to see whether the use of e-scooters could potentially replace the more environmentally harmful ride-hailing, or could replace other modes of active transport, like walking. Data needs to be collected before any meaningful conclusions can be drawn.

SAR Transportation Team works with the goal of promoting transportation modes on and around UCLA campus that are safe, efficient, and both environmentally and socially sustainable. The team works with the following research question in mind: How can community members be encouraged to embrace electric scooters as a new sustainable mode of transportation on UCLA's campus?

Methodology

Electric scooters (e-scooters) are one of the newest forms of sustainable transportation at UCLA. While they allow students to move efficiently on and around campus with minimal carbon emissions, there are still logistical elements that need to be considered, including e-scooter parking locations and rider lanes, to ensure that e-scooters remain both socially and environmentally sustainable. In order to better understand and support this sustainable mode of transportation while still being mindful of overall campus safety, the SAR Transportation team conducted an attitude survey and a spot count assessment of current e-scooter parking locations on campus. The attitude survey aimed to uncover student motivations for using e-scooters, as well as gauge their compliance concerning specific parking locations. Meanwhile the spot count assessment was conducted to identify trends in ridership, as well as assess the use of current e-scooter parking infrastructure.

Spot Count Assessment

We conducted spot counts to assess the effectiveness and use of the e-scooter parking spots. This was done on campus at all four currently designated e-scooter parking spots, and two areas of high e-scooter usage we designated as hot spots (see Appendix 1).

To conduct our counts, we would stand next to or near the spot and count all visible e-scooters parked within the vicinity. In doing so, we made sure to count how many were parked inside the e-scooter parking spots, as well as which were parked irresponsibly or dangerously. The spot counts were conducted for a total of ten weeks on Tuesdays, Wednesdays, and Thursdays during the mornings from 8:00 am to 11:00 am and in the evenings from 3:00 pm to 6:00 pm for a total of six counts per week.

Attitude Survey

The attitude survey was created to gather both qualitative and quantitative data, including responses to the recent introduction of e-scooters on campus, the main motivations for using e-scooters, and whether the UCLA community had any concerns with their presence on campus.

The target population for the survey was all members of the UCLA community (which includes undergraduate and graduate students, faculty members, UCLA staff, and alumni). The survey was distributed mainly through different UCLA departmental listservs, including the Department of Ecology and Evolution, the Department of Geography, and the Department of Physics . We also received a number of responses when showcasing our research at UCLA's annual Earth Day Fair. The survey was opened on the 11th of March 2019, and accepted responses for over seven weeks until it was closed on the 1st of May.

The survey was structured with three main sections (see Appendix 2). The first had general demographic questions and then asked participants whether they used e-scooters on campus. The survey was branched, and participants received different questions depending on whether they do or do not ride e-scooters. Participants who indicated that they had ridden on campus before were asked six questions about their e-scooter habits, motivations, and awareness of parking locations. Participants who had not used an e-scooter on campus were instead asked what their main deterrents were, and what they used as their main mode of transportation around campus.

Statistical tests were not conducted on our attitude survey data, and the results were displayed as percentages in pie charts to allow for visual clarity (see Appendix 3). Qualitative data from participant free responses were collated and grouped into broad categories (see Appendix 4) to further aid in the analysis.

Results and Implications

Spot Count Assessment

The spot count results allowed us to attach a numerical value to the e-scooter trends our team was observing. We observed a total of 994 e-scooters at the e-scooter parking spot areas and 1,996 e-scooters around the designated hotspots. This illustrates an aspect to be considered when looking at establishing future e-scooter parking spots, which is that the parking spots should be located in an area of high e-scooter use. Our results show that it can take four less-popular e-scooter parking spots to garner the same level of use than one hotspot of high popularity.

We can also see from our results that the average of 4.5 e-scooters around parking spots, compared to an average of 17 e-scooters at hotspots. Of those, about 1 scooter was found to be parked haphazardly at parking spots or hotspot. This means that the parking locations exhibited a 4.4% hazardous parking rate and the hotspots exhibited a 7.6% hazardous parking rate. This number may indicate that the parking spots promote a higher rate of safer parking, but we can not attribute this without uncertainty due to the inherent difference in

the number of parked e-scooters at each location. Due to the higher number of e-scooters at the hotspots, it is likely that there is less space for the e-scooters to be parked responsibly and thus more hazardous parking occurs. This may be why there is such a discrepancy between the hotspots and parking spots in this regard (see Figure 1).

Average E-scooters In Area

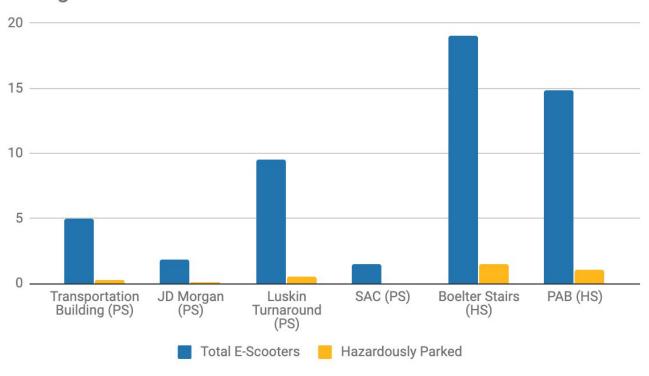


Figure 1: Graph showing the average number of e-scooters parked at each location during our spot counts. PS means the site was a designated parking spot, and HS means hotspot.

Another significant result of the spot counts was that only 15% of e-scooters within close proximity of e-scooter parking spots were actually parked within the designated boundaries (see Appendix 1). Although the amount parked in the spots rose as the quarter went on, this is still a very low number. Moving forward, we think it important for UCLA Transportation to aim for a desired percentage of e-scooters parked in the spots in order for their success to be further measured over the long term.

We believe we can attribute the lack of success of the parking spots due to three main factors. The first is that there is limited or no signage indicating the presence of the spot at each location. This is needed because the parking spots are simply painted on the floor and not many e-scooter users can see them from war away or while riding. The second factor is that the parking spots are located along the way to destinations and not at any areas of high traffic. This means people are less inclined to stop around the area of a parking spot in the first place. The third and final factor is the lack of incentive for e-scooter users to park in the parking spot. Because there are no incentives for riders to use the parking spots, whether that be a reward or a penalty, people do not feel the

need to go out of their way to safely park their e-scooters. We believe this is the most important to tackle as we move forward.

Attitude Survey

We received 214 total responses to our attitude survey, the majority of which were from undergraduate students (see Appendix 3). We were able to get responses from members of each part of the UCLA community (students, faculty, staff, and alumni), and even received responses from visitors residing in nearby Los Angeles neighborhoods. However, according to the Transportation Department's 2018 State of the Commute publication, the total campus population includes over 77,792 people, thus 219 participants represents only 0.28% of our community. Our results could have therefore been influenced by sample bias, especially since the majority of participants either saw our posting in a related listsery or came to our stall at the Earth Day fair. Participant's prior awareness of environmental issues may have meant they were more familiar with the other sustainable modes UCLA has to offer or owned their own personal e-scooter, meaning they were less inclined to choose commercial e-scooter options.

What factors do you take into consideration when choosing a transportation mode?

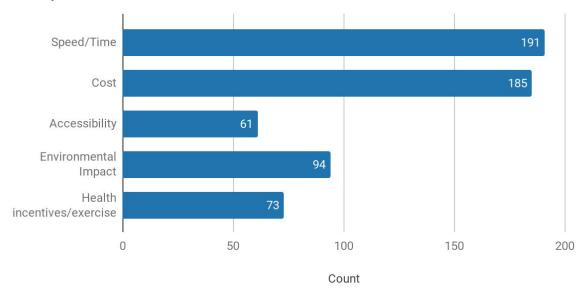


Figure 2: Graph showing results for the question "What factors do you take into consideration when choosing a transportation mode?" This question allowed participants to select more than one response.

The results of our attitude survey showed that approximately 70% of participants had never used an e-scooter on campus before, and participants prioritize both speed and cost when choosing a mode of transport (see Figure 2)

We found that e-scooters were utilized less than expected. Out of the 30% of participants who rode e-scooters on campus, 66% said that they only rode them very occasionally, and 52.3% indicated their average

trip time was only between 1-5 minutes in length. The majority of e-scooter riders said that they used them because of their speed, as they helped participants get to locations quickly (see Figure 3). This supported our finding that students prioritize speed when choosing a transportation mode, and could mean that e-scooters are primarily used as a way to quickly move between different buildings on campus on a tight schedule. However we found that only a small number of people rode e-scooters due to their cost relative to other modes, which suggests current market prices may not be viewed as ideal.

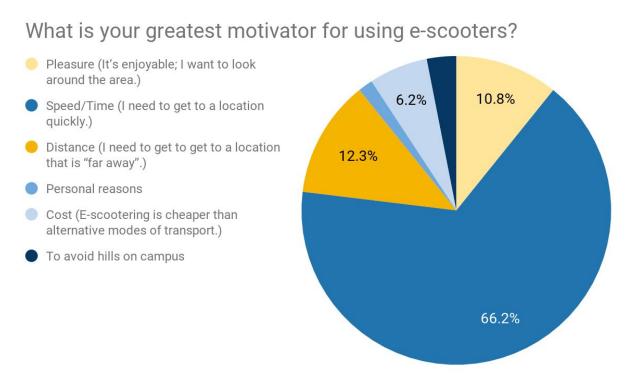


Figure 3: Graph showing results for the question "What is your greatest motivator for using e-scooters?"

The attitude survey also helped us further understand the effectiveness of the recently-designated e-scooter parking locations. 73.8% of riders said that they did not use the parking locations on campus, and 51% said this was because they were unaware these parking spots even existed. A lack of parking incentives and the inconvenient placement of these spots, far away from typical campus destinations, were also ranked fairly high. This suggests that UCLA Transportation could improve spot utilization either through collaborating with e-scooter companies to impose fines if riders park outside designated zones, or by creating more parking locations at popular campus destinations.

Questions for non-riders provided invaluable information about how the wider UCLA community views e-scooters. We found that 87.4% of non-riders used walking as their primary mode of transportation. This is slightly more than riders, 75.4% of whom indicated they would walk if e-scooters were not available on

campus. This slight difference shows that any changes in e-scooter presence on campus could subsequently cause a change in the number of students using UCLA-run services such as the Bruin Bus or Bruin Bike Share.

There were numerous reasons for why participants did not use e-scooters, with the slight majority being the cost (see Figure 4). This question received the highest number of free responses in the survey, with nearly 20% of participants writing in their own reasons for why they did not like using e-scooters on campus.

What is your main reason for NOT using e-scooters?

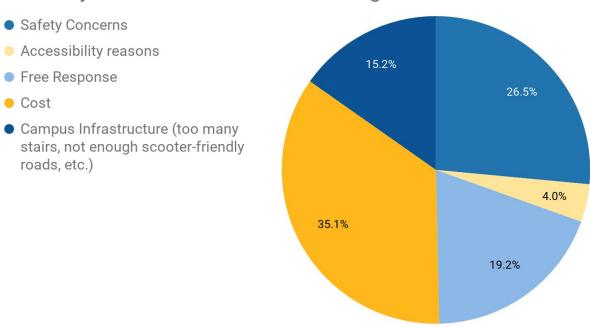


Figure 4: Graph showing responses to "What is your main reason for not using e-scooters?"

We grouped these responses into five broad categories: issues with e-scooter companies, lack of a US driver's licence, a preference for other modes, the fear of being ticketed, and the negative social connotations associated with e-scooter use. 41.3% of free responses fell into this last category, and answers such as "They are horribly annoying and unsafe", "I'm not that lazy", and "does not represent my personality" showed participants believed e-scooter usage was intrinsically tied to how they were perceived by their peers (see Appendix 4). This illustrated how important it is to change the campus-wide narrative that e-scooters are unsafe, unhealthy, or embarrassing, as it is preventing a substantial number of students form utilizing this sustainable mode.

Story Map & Messaging

From the minimal use of parking spots across campus to the negative attitudes shared by many of our survey participants, our team believes that the UCLA community would benefit from changes in the current

campus-wide messaging directed at e-scooter riders. Posters on campus often are not very effective at communicating the specific ways students can ride safely, and intense verbiage, such as "Obey the Law," could further deter students out of fear that their usage may be considered illegal. This messaging might be a factor in the persistent negative narrative associated with the new transportation mode.

We looked to the city of Santa Monica as an example of positive messaging regarding e-scooters, which coincidentally was the location of the first e-scooter pilot programs in October 2017. Recently the city launched an initiative called "Take the Friendly Road" as part of their commitment to Vision Zero, a global movement to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all. The messaging used in this campaign has positive connotations and is based on their fundamental belief that a "friendly" Santa Monica is a safe Santa Monica. Advertisements such as "The E-scooter Rules to Know Before you Go" are simple yet eye-catching, and offer straightforward tips on how to ride safely. This messaging has a light-hearted tone and is intended to encourage riders to practice safe habits in order to support the well-being of their community, rather than intimidate them and prevent them from using the devices in the first place. By adopting more positive, straightforward, and concrete instructions in signage, UCLA could change the way dockless vehicles are operated on campus as well as reduce the negative associations with e-scooter usage.

E-scooters are a promising addition to UCLA's sustainable transportation fleet, attractive not only because of their accessibility but also their low environmental impacts. However, with such negative perceptions prevalent among the community, they are at risk of becoming socially unsustainable. UCLA Transportation recognizes this, and have been working to pilot designated parking spots and implement campus-wide signage. However, the Transportation Department cannot change individual rider habits on their own. Riders have to make a conscious choice for change, and this change can come from a greater knowledge of how to successfully and safely navigate our campus. Our team has created a story map (see Appendix 5) using spatial data of transportation modes on campus, including designated e-scooter parking locations to encourage students to park in safe zones that do not interfere with walkways, stairs, or doors. The goal of this is to provide accessible information to help the community navigate our campus, as well as to show how e-scooters can be promoted in a positive, safety-oriented way. Our hope is that this resource, and our project as a whole, will help foster a positive perception of this fast, fun, and sustainable mode in the UCLA community, as well as encourage more students to opt for environmentally-friendly forms of transportation such as Bruin-Bike and the Bruin Bus.

Conclusion

As the first SAR Transportation Team, we faced many challenges as we learned to navigate the ways to commute to and across our 419 acre campus. We started our project with a fresh perspective and were eager to learn about sustainable transportation options, but our lack of preparation caused our project to have a slow start as we struggled to figure out where to begin. We were initially drawn to studying dockless devices as they were the newest mode of transport and had very few regulations, but held the potential to become a sustainable option for students to commute from one side of campus to the other. However, given that dockless devices are

run by private companies, we were unable to access to data concerning the average ride time on our campus or where they were being parked. This forced our team to get creative with the way we collected information through our spot counts and our attitude survey, but these presented challenges of their own.

Our spot counts involved a trial and error process in which we had to decide on our area of study, what would be designated as hazardous, and what time of day would be appropriate to conduct each observation. Ultimately, we finalized our research design which allowed us to effectively assess parking spot during peak commute times. Our attitude survey presented more challenges that forced our team to cross paths with another student research group who were also studying dockless devices on campus. Shortly before we were scheduled to release our survey, the LA Grand Challenges Transportation Team released their own survey which also questioned students about their electric scooter usage. As a result, our team decided to revisit our survey design and adjusted it to avoid collecting overlapping data with this other team. This inspired us to focus on the way students felt about the presence of these devices, and what caused them to use or not use them as a means of travel.

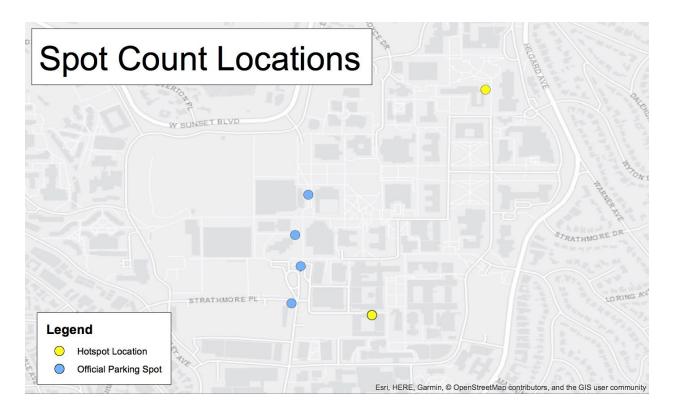
Our final challenge resulted from the time scale of our project. We only had two quarters to start and finish our project, but since it took us a long amount of time to determine what our project would ultimately look like, we had a very short time span for execution. A longer time period could have allowed us to design a comprehensive campaign, but due to the time constraints we were unable to launch this.

Now that we have laid the groundwork for a SAR Transportation Team, our hope is that future teams will have a foundation that they can build off from. As UCLA designates more space on campus for e-scooters and dockless scooter companies begin to implement reduced speed areas on campus, a future SAR Team could be influential in shaping the way these devices are presented on our campus. As these devices are given an official space at UCLA, this team could continue our work by continuing to study the effectiveness of parking spots as they are tested in other areas, such as popular destination points in both North and South Campus. Our survey indicated that students would be more inclined to park in these spots if there was an incentive, which the team could study to determine what kind of incentive causes the largest difference in parking behaviors. Lastly, a future team could take over the campaign that we ourselves were unable to execute due to time constraints. If we had been given more time, we could have worked closely with UCLA Transportation to promote dockless devices as a sustainable transportation option. In the next year, there is potential for the Transportation Team to change the state of the campus commute by promoting safe ways to utilize the mode less traveled.

Appendices

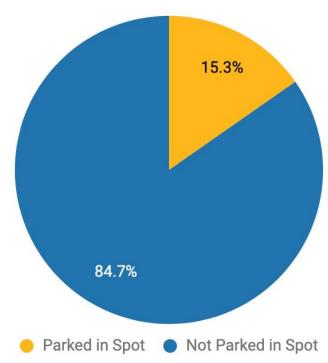
Appendix 1: Spot Count Map, Results, and Data

Map of Spot-Count Locations



Spot Count Results

E-Scooter Spot Count Data



Spot Count Raw Data

DAY, TIME (DATE)	NAME	TOTAL	INSIDE STALL	OUTSIDE STALL	HAZARDOUS / RECKLESS / ABNORMAL
Wednesday Morning (2/20)	all	1	0	1	0
Wednesday Afternoon (2/20)	anna	2	1	1	0
Thursday Morning (2/21)	kyle	0	0	0	0
Thursday Afternoon (2/21)	anna	7	2	5	1
Tuesday Morning (2/26)	Brooke	7	1	6	0
Tuesday Afternoon (2/26)	Natalie	0	0	0	0

Wednesday Morning (2/27)	Maddie	5	0	5	0
Wednesday Afternoon (2/27)	anna	3	0	3	0
Thursday Morning (2/28)	kyle	1	0	1	0
Thursday Afternoon (2/28)	anna	6	3	3	0
Tuesday Morning (3/5)	Brooke	13	4	9	0
Tuesday Afternoon (3/5)	Natalie	2	0	2	1
Wednesday Morning (3/6)	Maddie	1	0	1	0
Wednesday Afternoon (3/6)	anna	3	1	2	2
Thursday Afternoon (3/7)	anna	2	0	2	1
Tuesday Morning (3/12)	Brooke	6	0	6	0
Wednesday Morning (3/13)	maddie	9	4	5	0
Wednesday Afternoon (3/13)	anna	9	4	5	0
Thursday Afternoon (3/14)	anna	39	13	26	0
Tuesday Morning (4/2)	Kyle	1	0	1	0
Tuesday Afternoon (4/2)	Brooke	4	0	4	0
Wednesday Morning (4/3)	Maddie	4	0	4	2
Thursday Morning (4/4)	Maddie	3	0	3	0
Thursday Afternoon (4/4)	anna	1	0	1	0
Tuesday Morning (4/9)	Kyle	5	0	5	0
Tuesday Afternoon (4/9)	Brooke	11	1	10	1

Wednesday Morning (4/10)	Maddie	16	6	10	1
Wednesday Afternoon (4/10)	Natalie	1	0	1	0
Thursday Morning (4/11)	maddie	4	0	4	0
Thursday Afternoon (4/11)	anna	5	0	5	0
Tuesday Morning (4/16)	Kyle	4	1	3	0
Wednesday Morning (4/17)	maddie	6	0	6	0
Wednesday Afternoon (4/17)	Natalie	1	0	1	0
Thursday Morning (4/18)	maddie	1	0	1	0
Thursday Afternoon (4/18)	anna	0	0	0	
Tuesday Afternoon (4/23)	Brooke	12	0	12	0
Wednesday Morning (4/24)	maddie	3	0	3	0
Wednesday Afternoon (4/24)	Natalie	0	0	0	0
Thursday Morning (4/25)	maddie	1	1	0	0
Thursday Afternoon (4/25)	anna	0	0	0	0
Tuesday Morning (4/30)	Kyle	3	0	0	0
Tuesday Afternoon (4/30)	Brooke	15	2	13	1
Wednesday Morning (5/1)	maddie	6	0	6	2
Wednesday Afternoon (5/1)	Natalie	10	2	8	0
Thursday morning (5/2)	maddie	7	1	6	1
Thursday Afternoon (5/2)	anna	4	0	4	0

Tuesday Morning (5/7)	Kyle	5	3	2	1
Tuesday afternoon (5/7)	Brooke	7	2	5	0
Wednesday Morning (5/8)	maddie	3	0	3	0
Wednesday Afternoon (5/8)	Natalie	0	0	0	0
Thursday Morning (5/9)	maddie	2	1	1	0
Thursday Afternoon (5/9)	anna	3	0	3	0
Tuesday Morning (5/14)	Kyle	3	1	2	0
Tuesday afternoon (5/14)	Brooke	12	2	10	2
Wednesday Morning (5/15)	maddie	6	1	5	0
Wednesday Afternoon (5/15)	Natalie	0	0	0	0
Thursday Morning (5/16)	maddie	3	1	2	0
Thursday Afternoon (5/16)	anna	3	0	3	0

Parking Spot - Transportation Building

DAY, TIME (DATE)	NAME	TOTAL	INSIDE STALL	OUTSIDE STALL	HAZARDOUS / RECKLESS / ABNORMAL
Wednesday Morning (2/20)	all	3	0	3	0
Wednesday Afternoon (2/20)	anna	0	0	0	0
Thursday Morning (2/21)	kyle	3	1	2	0
Thursday Afternoon (2/21)	anna	3	0	3	0
Tuesday Morning (2/26)	Brooke	3	1	2	0

Tuesday Afternoon (2/26)	Natalie	2	1	1	0
Wednesday Morning (2/27)	Maddie	1	0	1	0
Wednesday Afternoon (2/27)	anna	1	0	1	0
Thursday Morning (2/28)	kyle	0	0	0	0
Thursday Afternoon (2/28)	anna	1	0	1	0
Tuesday Morning (3/5)	Brooke	2	1	1	0
Tuesday Afternoon (3/5)	Natalie	0	0	0	0
Wednesday Morning (3/6)	maddie	1	0	1	0
Wednesday Afternoon (3/6)	anna	1	0	1	0
Thursday Afternoon (3/7)	anna	3	0	3	0
Tuesday Morning (3/12)	Brooke	0	0	0	0
Wednesday Morning (3/13)	maddie	2	0	2	0
Wednesday Afternoon (3/13)	anna	3	2	1	0
Thursday Afternoon (3/14)	anna	1	0	1	0
Tuesday Morning (4/2)	Kyle	3	0	3	0
Tuesday Afternoon (4/2)	Brooke	3	0	4	0
Wednesday Morning (4/3)	maddie	3	1	2	1
Thursday Morning (4/4)	maddie	4	0	4	0
Thursday Afternoon (4/4)	anna	1	0	1	0
Tuesday Morning (4/9)	Kyle	4	3	1	0

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Tuesday Afternoon (4/9)	Brooke	1	1	0	0
Wednesday Morning (4/10)	maddie	1	0	1	0
Wednesday Afternoon (4/10)	Natalie	0	0	0	0
Thursday Morning (4/11)	maddie	4	0	4	0
Thursday Afternoon (4/11)	anna	4	1	3	0
Tuesday Morning (4/16)	Kyle	3	0	3	1
Wednesday Morning (4/17)	maddie	3	0	3	0
Wednesday Afternoon (4/17)	Natalie	0	0	0	0
Thursday Morning (4/18)	maddie	1	0	1	0
Thursday Afternoon (4/18)	anna	3	3	0	0
Wednesday Morning (4/24)	maddie	2	1	1	0
Wednesday Afternoon (4/24)	Natalie	0	0	0	0
Thursday Morning (4/25)	maddie	1	0	1	0
Thursday Afternoon (4/25)	anna	1	0	1	0
Tuesday Morning (4/30)	Kyle	0	0	0	0
Tuesday Afternon (4/30)	Brooke	0	0	0	0
Wednesday Morning (5/1)	maddie	2	1	1	0
Wednesday Afternoon (5/1)	Natalie	0	0	0	0
Thursday morning (5/2)	maddie	6	2	4	0
Thursday Afternoon (5/2)	anna	0	0	0	0

Tuesday Morning (5/7)	Kyle	1	1	0	0
Tuesday afternoon (5/7)	Brooke	2	1	1	0
Wednesday Morning (5/8)	maddie	5	0	5	1
Wednesday Afternoon (5/8)	Natalie	2	0	2	0
Thursday Morning (5/9)	maddie	4	0	4	0
Thursday Afternoon (5/9)	anna	2	1	1	0
Tuesday Morning (5/14)	Kyle	0	0	0	0
Tuesday afternoon (5/14)	Brooke	0	0	0	0
Wednesday Morning (5/15)	maddie	4	1	3	0
Wednesday Afternoon (5/15)	Natalie	0	0	0	0
Thursday Morning (5/16)	maddie	3	1	2	0
Thursday Afternoon (5/16)	anna	2	1	1	0

Parking Spot - JD Morgan

DAY, TIME (DATE)	NAME	TOTAL	INSIDE STALL	OUTSIDE STALL	HAZARDOUS / RECKLESS / ABNORMAL
Tuesday Morning (2/26)	Brooke	16	0	16	0
Tuesday Afternoon	Natalie	5	0	5	0
Wednesday Morning (2/27)	Maddie	4	1	3	0
Wednesday Afternoon (2/27)	anna	10	2	8	0
Thursday Morning (2/28)	kyle	8	0	8	2
Thursday Afternoon	anna	7	0	7	0

(2/28)					
Tuesday Morning (3/5)	Brooke	5	1	4	1
Tuesday Afternoon (3/5)	Natalie	1	1	0	0
Wednesday Morning (3/6)	maddie	3	0	3	0
Wednesday Afternoon (3/6)	anna	6	1	5	0
Thursday Afternoon (3/7)	anna	2	0	2	0
Tuesday Morning (3/12)	Brooke	7	0	7	0
Wednesday Morning (3/13)	maddie	7	0	7	0
Wednesday Afternoon (3/13)	anna	1	0	1	0
Thursday Afternoon (3/14)	anna	6	0	6	0
Tuesday Morning (4/2)	Kyle	9	2	7	1
Tuesday Afternoon (4/2)	Brooke	12	0	12	2
Wednesday Morning (4/3)	maddie	21	1	20	0
Thursday Morning (4/4)	maddie	18	2	16	0
Thursday Afternoon (4/4)	anna	8	1	7	0
Tuesday Morning (4/9)	Kyle	6	1	5	2
Tuesday Afternoon (4/9)	Brooke	7	0	7	0
Wednesday Morning (4/10)	maddie	18	4	14	0
Wednesday Afternoon (4/10)	Natalie	2	0	2	0
Thursday Morning (4/11)	maddie	34	0	34	0

Thursday Afternoon (4/11)	anna	8	0	8	2
Tuesday Afternoon (4/16)	Brooke	11	2	9	0
Wednesday Morning (4/17)	maddie	20	0	20	2
Wednesday Afternoon (4/17)	Natalie	1	0	1	0
Thursday Morning (4/18)	maddie	23	2	21	0
Thursday Afternoon (4/18)	anna	3	0	3	0
Tuesday Afternoon (4/23)	Brooke	15	0	15	0
Wednesday Morning (4/24)	maddie	13	1	12	1
Wednesday Afternoon (4/24)	Natalie	0	0	0	0
Thursday Morning (4/25)	maddie	7	1	6	0
Thursday Afternoon (4/25)	anna	1	0	1	0
Tuesday Morning (4/30)	Kyle	2	1	1	0
Tuesday Afternon (4/30)	Brooke	9	2	7	1
Wednesday Morning (5/1)	maddie	17	3	14	0
Wednesday Afternoon (5/1)	Natalie	1	0	1	0
Thursday morning (5/2)	maddie	19	0	19	2
Thursday Afternoon (5/2)	anna	11	0	11	1
Tuesday Morning (5/7)	Kyle	8	3	5	2
Tuesday afternoon (5/7)	Brooke	5	0	5	0
Wednesday Morning (5/8)	maddie	25	4	21	0

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Wednesday Afternoon (5/8)	Natalie	3	0	3	0
Thursday Morning (5/9)	maddie	22	3	19	0
Thursday Afternoon (5/9)	anna	3	0	3	2
Tuesday Morning (5/14)	Kyle	5	2	3	0
Tuesday afternoon (5/14)	Brooke	13	2	11	0
Wednesday Morning (5/15)	maddie	26	3	23	5
Wednesday Afternoon (5/15)	Natalie	4	1	3	0
Thursday Morning (5/16)	maddie	13	0	13	0
Thursday Afternoon (5/16)	anna	3	0	3	2

Parking Spot - Luskin Turnaround

DAY, TIME (DATE)	NAME	TOTAL	INSIDE STALL	OUTSIDE STALL	HAZARDOUS / RECKLESS / ABNORMAL
Tuesday Morning (2/26)	Brooke	1	1	0	0
Tuesday Afternoon (2/26)	Natalie	0	0	0	0
Wednesday Morning (2/27)	Maddie	1	0	1	0
Wednesday Afternoon (2/27)	anna	3	0	3	0
Thursday Morning (2/28)	kyle	3	0	3	0
Thursday Afternoon (2/28)	anna	3	0	3	0
Tuesday Morning (3/5)	Brooke	2	0	2	0
Tuesday Afternoon (3/5)	Natalie	2	0	2	0

Wednesday Morning (3/6)	maddie	1	0	1	0
Wednesday Afternoon (3/6)	anna	0	0	1	0
Thursday Afternoon (3/7)	anna	1	0	1	0
Tuesday Morning (3/12)	Brooke	0	0	0	0
Wednesday Morning (3/13)	maddie	0	0	0	0
Wednesday Afternoon (3/13)	anna	0	0	0	0
Thursday Afternoon (3/14)	anna	3	0	3	0
Tuesday Morning (4/2)	Kyle	0	0	0	0
Tuesday Afternoon (4/2)	Brooke	0	0	0	0
Wednesday Morning (4/3)	maddie	1	0	1	0
Thursday Morning (4/4)	maddie	0	0	0	0
Thursday Afternoon (4/4)	anna	9	3	6	0
Tuesday Morning (4/9)	Kyle	1	0	1	0
Tuesday Afternoon (4/9)	Brooke	4	0	4	1
Wednesday Morning (4/10)	maddie	1	0	1	0
Wednesday Afternoon (4/10)	Natalie	3	1	2	0
Thursday Morning (4/11)	maddie	0	0	0	0
Thursday Afternoon (4/11)	anna	0	0	0	0
Tuesday Morning (4/16)	Kyle	1	0	0	0
Tuesday Afternoon (4/16)	Brooke	0	0	0	0

Wednesday Morning (4/17)	maddie	3	0	3	0
Wednesday Afternoon (4/17)	Natalie	2	2	0	0
Thursday Morning (4/18)	maddie	2	0	2	0
Thursday Afternoon (4/18)	anna	2	0	2	0
Tuesday Afternoon (4/23)	Brooke	1	1	0	0
Wednesday Morning (4/24)	maddie	1	0	1	0
Wednesday Afternoon (4/24)	Natalie	0	0	0	0
Thursday Morning (4/25)	maddie	1	1	0	0
Thursday Afternoon (4/25)	anna	0	0	0	0
Tuesday Morning (4/30)	Kyle	3	1	2	0
Tuesday Afternon (4/30)	Brooke	0	0	0	0
Wednesday Morning (5/1)	maddie	1	0	1	0
Wednesday Afternoon (5/1)	Natalie	2	0	2	0
Thursday morning (5/2)	maddie	1	0	1	0
Thursday Afternoon (5/2)	anna	2	0	2	0
Tuesday Morning (5/7)	Kyle	1	1	0	0
Tuesday afternoon (5/7)	Brooke	2	1	1	0
Wednesday Morning (5/8)	maddie	3	1	2	1
Wednesday Afternoon (5/8)	Natalie	3	2	1	0
Thursday Morning (5/9)	maddie	3	2	1	0

Thursday Afternoon (5/9)	anna	2	0	2	0
Tuesday Morning (5/14)	Kyle	2	2	0	0
Tuesday afternoon (5/14)	Brooke	0	0	0	0
Wednesday Morning (5/15)	maddie	2	1	1	0
Wednesday Afternoon (5/15)	Natalie	2	2	0	0
Thursday Morning (5/16)	maddie	0	0	0	0
Thursday Afternoon (5/16)	anna	2	0	2	0

Parking Spot - Public Affairs Building

					HAZARDOUS / RECKLESS /
DAY, TIME (DATE)	NAME	TOTAL	CLUMPS	ASTRAY	ABNORMAL
Wednesday Morning (2/20)	all	14	2	1	0
Wednesday Afternoon (2/20)	anna	28	2	0	9
Thursday Morning (2/21)	kyle	13	3	0	0
Thursday Afternoon (2/21)	anna	25	3	3	2
Tuesday Morning (2/26)	Brooke	22	2	4	2
Tuesday Afternoon (2/26)	Natalie	4	0	4	2
Wednesday Morning (2/27)	Maddie	11	1	0	0
Wednesday Afternoon (2/27)	anna	27	4	3	4
Thursday Morning (2/28)	kyle	34	2	3	3
Thursday Afternoon	anna	23	3	1	2

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(2/28)					
Tuesday Afternoon (3/5)	Natalie	1	0	0	0
Wednesday Morning (3/6)	maddie	2	0	0	1
Wednesday Afternoon (3/6)	anna	9	2	1	0
Thursday Afternoon (3/7)	anna	12	2	2	0
Tuesday Morning (3/12)	Brooke	11	3	0	1
Wednesday Morning (3/13)	maddie	18	3	1	0
Wednesday Afternoon (3/13)	anna	23	3	2	5
Thursday Afternoon (3/14)	anna	8	1	3	0
Tuesday Morning (4/2)	Kyle	8	2	0	2
Tuesday Afternoon (4/2)	Brooke	17	2	0	0
Wednesday Morning (4/3)	maddie	21	4	1	1
Thursday Morning (4/4)	maddie	21	4	1	0
Thursday Afternoon (4/4)	anna	15	1	5	0
Tuesday Morning (4/9)	Kyle	24	3	3	3
Tuesday Afternoon (4/9)	Brooke	19	3	2	0
Wednesday Morning (4/10)	maddie	38	3	0	3
Wednesday Afternoon (4/10)	Natalie	23	1	2	4
Thursday Morning (4/11)	maddie	21	3	3	1
Thursday Afternoon (4/11)	anna	22	3	6	1

Tuesday Morning (4/16)		26	2	7	0
Tuesday Afternoon (4/16)	Brooke	20	2	2	0
Wednesday Morning (4/17)	maddie	28	3	2	0
Wednesday Afternoon (4/17)	Natalie	2	0	2	1
Thursday Morning (4/18)	maddie	23	2	1	0
Thursday Afternoon (4/18)	anna	23	3	0	0
Tuesday Afternoon (4/23)	Brooke	22	2	0	0
Wednesday Morning (4/24)	maddie	10	2	0	0
Wednesday Afternoon (4/24)	Natalie	3	1	1	0
Thursday Morning (4/25)	maddie	15	2	0	0
Thursday Afternoon (4/25)	anna	11	2	1	5
Tuesday Morning (4/30)	Kyle	14	3	2	3
Tuesday Afternon (4/30)	Brooke	19	3	1	2
Wednesday Morning (5/1)	maddie	17	3	0	1
Wednesday Afternoon (5/1)	Natalie	10	2	2	1
Thursday morning (5/2)	maddie	20	3	5	0
Thursday Afternoon (5/2)	anna	32	3	3	8
Tuesday Morning (5/7)	Kyle	30	3	2	3
Tuesday afternoon (5/7)	Brooke	9	9	0	0
Wednesday Morning (5/8)	maddie	41	2	2	1

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Wednesday Afternoon (5/8)	Natalie	16	2	3	1
Thursday Morning (5/9)	maddie	28	3	3	2
Thursday Afternoon (5/9)	anna	22	2	2	0
Tuesday Morning (5/14)	Kyle	27	3	0	2
Tuesday afternoon (5/14)	Brooke	15	4	2	0
Wednesday Morning (5/15)	maddie	39	3	4	2
Wednesday Afternoon (5/15)	Natalie	28	1	3	8
Thursday Morning (5/16)	maddie	18	1	0	0
Thursday Afternoon (5/16)	anna	22	2	2	0

Hotspot - Boelter Stairs

DAY, TIME (DATE)	NAME	TOTAL	CLUMPS	ASTRAY	HAZARDOUS / RECKLESS / ABNORMAL
Wednesday Morning (2/20)	all	12	2	1	1
Wednesday Afternoon (2/20)	anna	15	3	2	0
Thursday Morning (2/21)	kyle	2	1	1	1
Thursday Afternoon (2/21)	anna	18	4	0	0
Tuesday Morning (2/26)	Brooke	15	2	3	0
Tuesday Afternoon (2/26)	Natalie	14	0	4	2
Wednesday Morning (2/27)	Maddie	11	2	0	2
Wednesday Afternoon (2/27)	anna	18	4	2	2
Thursday Morning	kyle	16	3	0	0

(2/28)						
Thursday Afternoon (2/28)	anna	7	2	2	1	
Tuesday Morning (3/5)	Brooke	9	2	0	0	
Tuesday Afternoon (3/5)	Natalie	23	5	2	1	
Wednesday Morning (3/6)	maddie	12	2	0	1	
Wednesday Afternoon (3/6)	anna	14	3	3	1	
Thursday Afternoon (3/7)	anna	11	2	2	2	
Tuesday Morning (3/12)	Brooke	14	3	1	0	
Wednesday Morning (3/13)	maddie	11	2	0	0	
Wednesday Afternoon (3/13)	anna	19	2	6	9	
Thursday Afternoon (3/14)	anna	9	1	6	0	
Tuesday Morning (4/2)	Kyle	9	2	0	1	
Tuesday Afternoon (4/2)	Brooke	6	1	0	0	
Wednesday Morning (4/3)	maddie	16	3	0	0	
Thursday Morning (4/4)	maddie	8	2	0	1	
Thursday Afternoon (4/4)	anna	15	3	6	1	
Tuesday Morning (4/9)	Kyle	19	3	3	0	
Tuesday Afternoon (4/9)	Brooke	7	2	0	0	
Wednesday Morning (4/10)	maddie	19	4	0	0	
Wednesday Afternoon (4/10)	Natalie	13	4	0	1	

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Thursday Morning (4/11)	maddie	19	3	1	0
Thursday Afternoon (4/11)	anna	25	2	10	2
Tuesday Morning (4/16)	Kyle	17	3	4	2
Tuesday Afternoon (4/16)	Brooke	19	2	4	2
Wednesday Morning (4/17)	maddie	21	2	4	1
Wednesday Afternoon (4/17)	Natalie	14	3	2	2
Thursday Morning (4/18)	maddie	18	3	1	2
Thursday Afternoon (4/18)	anna	12	2	6	0
Tuesday Afternoon (4/23)	Brooke	15	3	1	0
Wednesday Morning (4/24)	maddie	11	2	2	1
Wednesday Afternoon (4/24)	Natalie	7	1	5	0
Thursday Morning (4/25)	maddie	14	3	1	0
Thursday Afternoon (4/25)	anna	18	2	6	3
Tuesday Morning (4/30)	Kyle	13	3	2	3
Tuesday Afternon (4/30)	Brooke	7	1	2	0
Wednesday Morning (5/1)	maddie	15	2	3	0
Wednesday Afternoon (5/1)	Natalie	7	3	0	1
Thursday morning (5/2)	maddie	16	3	1	1
Thursday Afternoon (5/2)	anna	20	3	8	3
Tuesday Morning (5/7)	Kyle	21	4	5	2

Brooke	10	2	1	0
maddie	34	3	2	0
Natalie	27	2	3	1
maddie	27	3	0	0
anna	17	1	6	2
Kyle	15	3	0	2
Brooke	12	2	0	0
maddie	17	2	0	2
Natalie	17	2	0	1
maddie	13	3	1	2
anna	17	1	6	2
	maddie Natalie maddie anna Kyle Brooke maddie Natalie maddie	maddie 34 Natalie 27 maddie 27 anna 17 Kyle 15 Brooke 12 maddie 17 Natalie 17 maddie 13	maddie 34 3 Natalie 27 2 maddie 27 3 anna 17 1 Kyle 15 3 Brooke 12 2 maddie 17 2 Natalie 17 2 maddie 13 3	maddie 34 3 2 Natalie 27 2 3 maddie 27 3 0 anna 17 1 6 Kyle 15 3 0 Brooke 12 2 0 maddie 17 2 0 Natalie 17 2 0 maddie 13 3 1

Appendix 2: Attitude Survey

Questions for all participants

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	SUSTAINABLE ACTION RESEARCH TRANSPORTATION TEAM.	
	We are the UCLA Sustainability Action Research Transportation Team! There are various ways of getting around campus and e-scooters have become the most recent sustainable mode. Through our project, we are trying to better understand trends and attitudes associated with e-scooter and other modes of transit here on campus. For those apart of the UCLA community, we would appreciate your support in taking this short survey about your own transportation preferences. Thanks! * Required Which best describes you? * Undergraduate student Graduate student Faculty UCLA staff	
p	Other:	
	What factors do you take into consideration when choosing a transportation mode? * Speed/Time Cost Health incentives/exercise Environmental Impact Accessibility Other: Have you ever used an e-scooter on campus OR as a way to get to/from campus? * Yes, I use e-scooters on campus. No, I don't use e-scooters.	

Questions for participants who use e-scooters on campus

How frequently do you use e-scooters?*
Multiple times a day
Once a day
Multiple time a week
Once a week
Only occasionally

What is your average trip time on an e-scooter?
1 - 5 minutes
6 - 10 minutes
11 - 15 minutes
more than 15 minutes
What is your greatest motivator for using e-scooters?*
Speed/Time (I need to get to a location quickly.)
Distance (I need to get to get to a location that is "far away".)
Cost (E-scootering is cheaper than alternative modes of transport.)
Pleasure (It's enjoyable; I want to look around the area.)
Other
:::
If e-scooters were not available on campus, what would be your primary mode of transportation?
○ Walking
Personal skateboard, bike, scooter etc.
Bus (city bus or BruinBus)
Bus (city bus or BruinBus) Ride hailing (Uber, Lyft, etc.)
Ride hailing (Uber, Lyft, etc.)

	Do you use the designated e-scooter parking locations on campus?*
	Yes
	○ No
	If no, why don't you use these locations?
	I was unaware of these locations
	Locations are far from my destination
	There are no incentives to park in the locations
	Other
Qu	estions for participants who did not use e-scooters on campus
	What is the main reasons that you do NOT use e-scooters?*
	Cost
	Safety Concerns
	Campus Infrastructure (too many stairs, not enough scooter-friendly roads, etc.)
	Accessibility reasons
	Other
	::: What is your primary mode of transportation around campus?*
	Walking
	Personal skateboard, bike, scooter etc.
	Bus (city bus or BruinBus)
	Ride hailing (Uber, Lyft, etc.)
	Carpool
	Orive alone
	Other

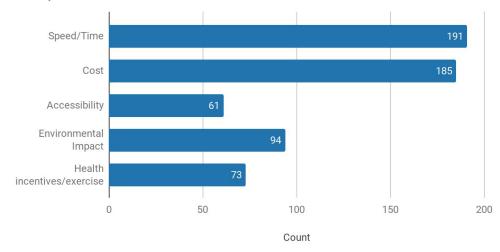
Appendix 3: Attitude Survey Results

Questions for all participants

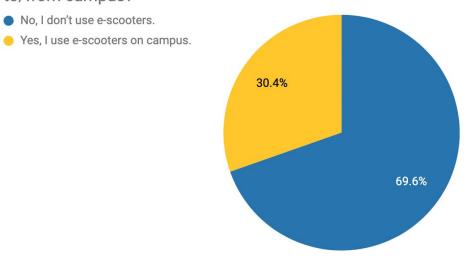
Which best describes you?	Count
Undergraduate student	186
Graduate student	12
Visitor	3
Faculty	4
Alumni	4
UCLA Staff	5

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What factors do you take into consideration when choosing a transportation mode?

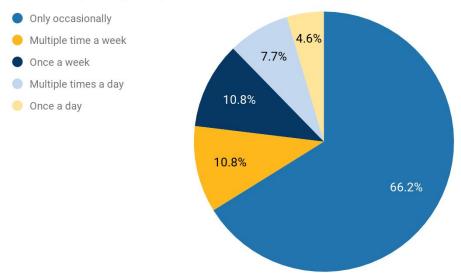


Have you ever used an e-scooter on campus OR as a way to get to/from campus?

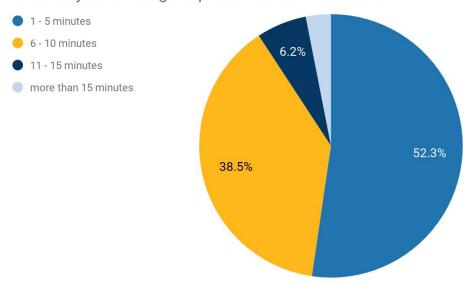


Questions for participants who use e-scooters on campus

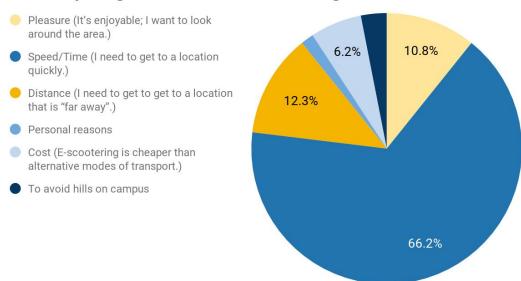




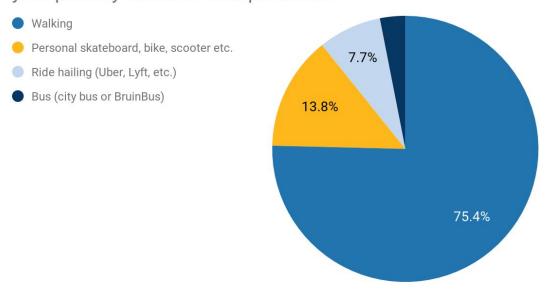
What is your average trip time on an e-scooter?



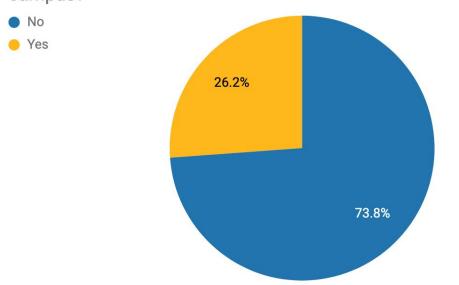
What is your greatest motivator for using e-scooters?



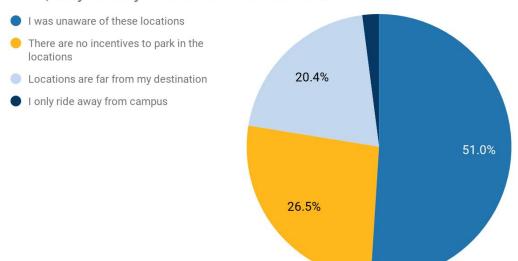
If e-scooters were not available on campus, what would be your primary mode of transportation?



Do you use the designated e-scooter parking locations on campus?

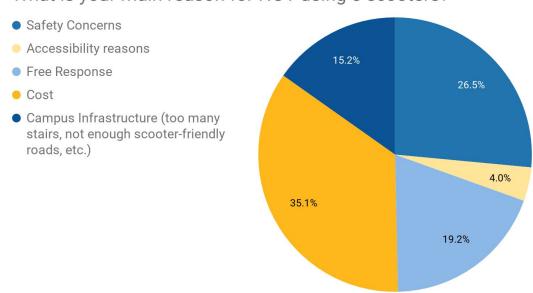




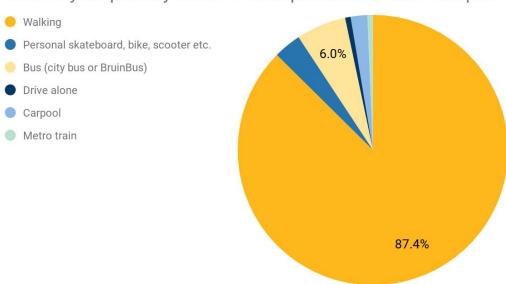


Questions for participants who did not use e-scooters on campus

What is your main reason for NOT using e-scooters?



What is your primary mode of transportation around campus?



Appendix 4: Grouped Free Response Answers

What is your main reason for NOT using e-scooters?

ISSUES WITH COMPANIES	DRIVER'S LICENCE	PREFER OTHER MODES	FEAR OF BEING TICKETED	SOCIAL CONNOTATIONS OF E-SCOOTER USE
e-scooter app confused me	no drivers license	Prefer to walk	Don't want to get a ticket	They're literally the worst
The companies are unresponsive and nearly half of the scooters you unlock are damaged in some way or may not have enough battery. Because the company may not reply to your complaint of an unusable scooter, you essentially lose the \$1 is cost to unlock. Much easier to jump on the campus shuttle.	I don't have a driver's license	It seems excessive since walking is free and good for you	Afraid of getting a ticket for not having a helmet, also not allowed to drive them most places they'd be convenient to	I hate birds and everything they stand for. Also cost.
	Don't have an American driver's license, so I can't	I don't want to get used to it because walking is a source of exercise for me	Don't really want to and a lot of restrictions/tickets	don't want someone to catch me wiping out on video and have it go viral
	Don't have drivers license	I would rather walk to anywhere around campus than use one.		I don't like them
		I like to walk		They are horribly annoying and unsafe
		exercise		not that lazy
		I own a bike		does not represent my personality
		I have a bike		I'm not that lazy.
				Don't need to
				Don't want to
				Don't see a benefit
				Don't know how

Appendix 5: Story Map Screenshots

