TRANSPORTATION PROFILE: UNIVERSITY OF DELAWARE SURVEY ANALYSIS

TRANSPORTATION SURVEYS (2010-2022)

In 2010, 2012, 2013, 2017, and 2022, the University of Delaware conducted transportation surveys, with the latest effort launched by the Transportation Subcommittee in November 2022 and completed in December 2022. The results for the 2022 survey are summarized below.

Primary means of transport on campus:

- 62.40% of undergraduates walk, compared to 59.11% of faculty, staff, and graduate students.
- 12.52% of undergraduate drive alone, compared to 18.32% of faculty, staff, and graduate students.
- 4.27% of undergraduates cycle, compared to 6.18% of faculty, staff, and graduate students.
- 11.08% of undergraduates use the shuttle bus, compared to 10.60% of faculty, staff, and graduate students.
- 6.99% of undergraduates carpool/vanpool, compared to 5.26% of faculty, staff, and graduate students.
- 2.63% of undergraduates use a skateboard or longboard, compared to 0.53% of faculty, staff, and graduate students.

As shares proportionate to each group, the results for undergraduates are shown in **FIGURE 1**, and the results for faculty, staff, and graduate students are shown in **FIGURE 2**. Please note that the percentages are slightly different in the figures than the data presented above based on Microsoft Excel calculations for rounding-up and -down numerical values.

FIGURE 1. Primary Means of Transport on Campus: Undergraduates (2022)

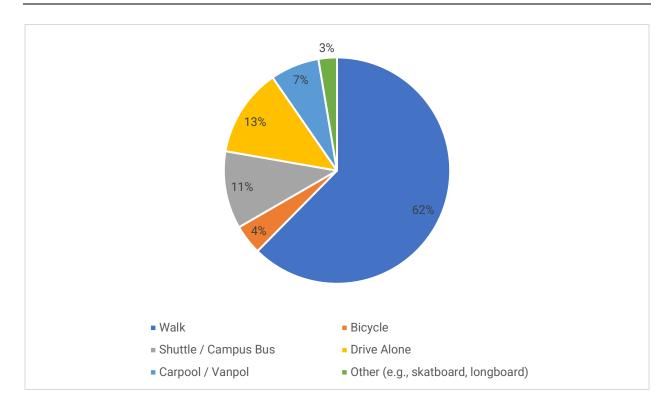
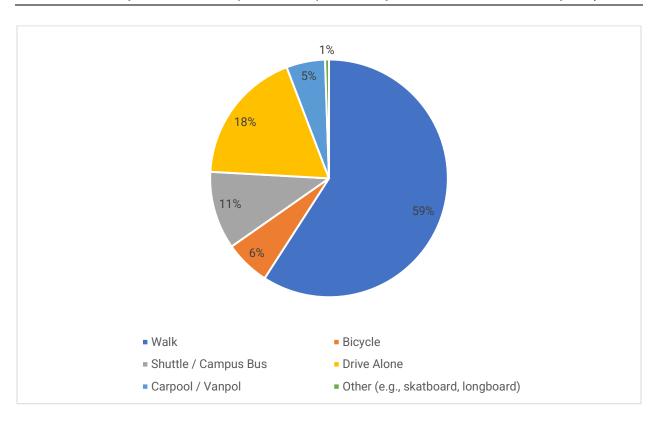


FIGURE 2. Primary Means of Transport on Campus: Faculty, Staff, Graduate Students (2022)



The 2022 transportation survey had a problem with the formatting of a key question which asked respondents to attribute percentages to different modes of transport in commuting to and from campus. Given that these data could not be used, data for a separate question is used as a substitute in an effort to compare like-with-like over time. The substitute data are based on responses to the following question, "Once you are on campus, which methods do you use for getting around? Walk, bicycle, longboard/skateboard, campus bus, drive alone, carpool or vanpool." Comparable results, which ask for commuting to and from campus for the years 2010, 2012, 2013, and 2017, are presented in **TABLE 1**.

TABLE 1. Transportation Survey Results (2010, 2012, 2013, 2017, 2022)

N/A 36 (0.91%)

TABLE 1 presents aggregated data from **TABLES H1-H4** in **Appendix H**, in which the data presented in **Appendix H** provide more specific data on how students, faculty, and staff responded to the transportation surveys, as well as the response rates (**TABLE H5**). For example, when students, faculty, and staff were asked, "How often do you use each of the following ways to get to class? Walk, Bicycle, Campus Bus, Drive Alone, Carpool, Public Transportation, Other (e.g., skateboard)," they were presented with the following options: Majority, Often, Sometimes, Rarely, and Never. For **TABLE 1**, the number of responses for each mode of transport category that responded 'Majority', 'Often', and 'Sometimes' were combined to indicate the number of undergraduates, faculty, staff, and graduate students who commute using those means. 'Rarely' and 'Never'—given the low frequency of usage of a particular mode of transport or never using it—were removed from the data altogether as the focus is to determine the distribution of transport use. Thus, the purpose for analyzing the data like this is to compare the data across time and explore commuting patterns.

The percentages in **TABLE 1** are based on each transportation mode's portion of the overall types of transportation each year, with the percentages for undergraduates strictly representing the undergraduate share of transportation, and the percentages for faculty, staff, and graduate students exclusively representing their modes of transportation. Percentages are rounded to the second decimal place. For example, in 2017, undergraduates used the following forms of transport in descending order of popularity: walking (45.08%), campus bus/shuttle (19.72%), driving alone (18.34%), carpool/vanpool (9.95%), cycling (4.94%), skateboarding/longboarding (1.11%), and public transport (0.86%).

The 2010 Transportation Survey aggregated data for undergraduate students, graduate students, and employees (staff and faculty). In turn, the data presented in the 2010 column in **TABLE 1** do not offer a fair representation of how undergraduate students travel versus how graduate students, faculty, and staff travel.

The 2013 Transportation Survey is limited in terms of comparison as it does not ask the same or similar questions as other surveys. Instead, it asks faculty, staff, and students whether they ever use the University of Delaware campus bus /shuttle, and whether they ever drive alone to campus. Only those who responded 'Yes' are counted in **TABLE 1**. Therefore, the percentages for 2013 are not a fair representation of the distribution across diverse modes of transportation given the limited data. Nevertheless, they provide some insight into the popularity of the shuttle/campus bus and driving alone.

The 2022 Transportation Survey, however, offers greater insights into commuting patterns and choices made by undergraduate and graduate students, faculty, and staff. For example, **TABLE 2** shows the tabulated results of responses to, "Which factors inhibit your bike use (or any non-gas-powered transportation such as a skateboard) around campus? Select all that apply."

TABLE 2. Inhibiting Factors for Bicycle Use Around Campus (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
I don't own a bicycle	867	997
I don't know how to use a bicycle	54	86
My bicycling skills are not good enough for the road	134	341
Don't know the rules of the road	71	121
I feel unsafe sharing the road with cars	383	1,016
I feel unsafe around pedestrians	182	228
I cannot afford a bicycle	77	82
I can't find convenient bike routes	113	353
Nothing inhibits my bike use on campus	140	357
Other - Please specify	74	593

Among 'Other' comments for faculty, staff, and graduate students, some expressed concerns about:

- Bad weather.
- Long commute distance.
- · Accessibility (disability, age, ill health, physical ability).
- Existing bicycle lanes being unprotected, not well maintained (e.g., trash, overhanging branches), and not well-connected.
- Lack of bicycle sheltered storage and security (e.g., concerns about bicycle theft).
- Lack of integration of bicycles into public transportation (e.g., SEPTA trains).
- Lack of bikeshare program.
- Concerns about sweating, appropriate clothing, and physical ability.
- Lack of bicycle parking.
- Preference for walking.

For undergraduates, some comments included:

- Concerns about bicycle theft.
- Preference for walking.
- Live too far away from campus.
- It would be easier if there were bicycle lanes.
- Bad weather.

In a separate question, when asked what would encourage faculty, staff, and graduate students to cycle around campus, some comments included:

- A bikeshare program with baskets and e-bikes.
- Bicycle lanes (especially on main roads).
- Increased amount of and improved bicycle tool stations (some are broken).
- Safe, secure, abundant, and convenient bicycle storage (including surveillance).
- Bicycle lessons (e.g., learning how to cycle).

For undergraduates responding to the same question, some comments included:

- Bicycle stations (e.g., bicycle pumps; some are in disrepair).
- A bikeshare program with e-bikes or e-scooters.
- Bicycle lessons.
- · Bicycle lanes.
- Bicycle safety (e.g., reduced theft, surveillance of stations).
- Sheltered bicycle storage.
- Bicycle storage/racks on buses.

Undergraduates were also asked, "What changes would encourage you to (occasionally) leave your vehicle home? Select all that apply," and these results are presented in **TABLE 3**.

TABLE 3. Leaving Private Vehicle at Home: Undergraduates (2022)

	Undergraduates
Convenient bus schedule	234
Convenient bus stop location	230
Interconnection with other public transportation options	79
Better financial incentive	142
Better/safer biking infrastructure	61
Better/safer pedestrian infrastructure	131
Nothing would motivate me	78

And both groups—undergraduate students, and graduate students, faculty, and staff—were asked, "Which factors inhibit your bus use on campus? Select all that apply," and these results are shown in **TABLE 4**.

TABLE 4. Inhibiting Factors for Bus Use Around Campus (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
The buses are not accessible to my needs	242	605
There is no bus stop near me or my destination	382	762
There is no bus scheduled when I need it	367	533
I cannot rely on the bus to pick up on time	580	669
I cannot rely on the bus to reach my destination on time	492	638
Buses are full when I need them	58	66
Nothing inhibits my bus use on campus	349	677
Other - Please specify	88	361

With regard to 'Other' comments, some comments from faculty, staff, and graduate students included:

- Preference for walking.
- The bus taking longer than walking, cycling, or driving.
- Infrequent buses, and they stop for too long (e.g., Gore Hall), or skip bus stops.

- Bus service not operating during breaks or weekends, and lack of late-night service.
- Not knowing the bus is available for faculty and staff too.
- Not knowing about the bus app (DoubleMap) for live monitoring and availability.
- The bus app (DoubleMap) does not show when a bus service will start or end.
- Lack of disabled access (including seating).
- Lack of knowledge of bus routes, frequency, and availability.
- Lack of bus stops near apartment complexes (e.g., West and East Main Street, STAR Campus, Amtrak station, South Academy, Early Learning Center) and Bob Carpenter/Lil Bob (gym) building.

For undergraduates, some comments included:

- Bus routes and times are confusing, and general lack of information about buses in operation (e.g., the app is hard to use, unsure if the service is free).
- Buses are unreliable.
- Bus stops are inconveniently placed.
- · Lack of late-night service.
- Buses stop for too long at particular stops (e.g., Gore Hall).
- No bus service to Bob Carpenter/Lil Bob (gym) building.
- Infrequent services (e.g., only once every 30 minutes).
- Buses don't wait for students they see running for the bus.

When asked what would encourage faculty, staff, and graduate students to use the bus system more often, some comments included:

- Bus stops and routes near apartment complexes (including Rittenhouse Station, Colonial Gardens, West Knoll, One Easton, Courtyard, Stonegate, Studio Green, Waverly, West Creek Village, Oak Tree), Morris Library, East Main Street, The Grove, Elkton Road, South College Avenue, Suburban Plaza, Barksdale, STAR campus, train station, and Lewes campus.
- Early morning service (e.g., 5-8AM) and late-night service (e.g., 8PM onward).
- Consistent schedule.
- Physical maps and improved app (DoubleMap).
- Greater communication about the services offered and how to use them (e.g., video guide).
- More frequent buses and more stops on existing routes.
- Safer bus stops on Academy Street.

And for undergraduates, in response to the same question, some comments included:

- A more understandable schedule/app.
- Improved access to off-campus housing.
- Bus stops further down Marrows Road, at Courtyard apartments, and an East Main Street bus route.
- Blue lights at bus stops.
- Better bus stops (e.g., sheltered).
- Consistent and reliable schedules.
- Sustainable buses.

Another question was, "Which factors would encourage you to purchase an electric vehicle in the near future? Select all that apply," and the responses can be found in **TABLE 5.**

TABLE 5. Electric Vehicle Purchase Incentives (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Lower cost to purchase vehicle	723	1,654
Financial incentives	494	1,342
Worry about gasoline prices	440	613
More electric vehicle charging stations on	437	1,275
campus		
I do not intend to purchase an electric vehicle	420	537
Protect the plant/reduce greenhouse gas	458	1,055
emissions		
Other - Please specify	27	185

In terms of 'Other' comments, some from faculty, staff, and graduate students included:

- Concerns regarding end-of-life treatment of electric vehicles (batteries in particular), including sources of materials.
- Some already own an electric vehicle or are on a waitlist.
- The need for more publicly available electric vehicle chargers.
- Do not have a personal electric vehicle charger (e.g., live in an apartment complex, or cost too high).

For undergraduates, some comments included:

- Parking is too expensive.
- Clean energy sources for the electricity for charging stations.

Other survey questions from the 2022 Transportation Survey also shed light on the types of vehicles that are used on campus, in addition to the use of the University's electric vehicle charging stations and these responses are presented in **TABLES 6-13**.

TABLE 6. Vehicle Fuel Type (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Gasoline	557	1,732
Partially gasoline powered hybrid vehicle	17	139
Electric plug-in hybrid vehicle	3	30
All electric vehicle	5	50
Other - please specify	7	26

TABLE 7. Do you currently use one of UD's electric vehicle charging stations? (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Yes	1	35
No	7	45

TABLE 8. Which charging station do you most often use? (2022)

	Undergraduates	Faculty, Staff, and Graduate
		Students
Behind Pearson	0	23
Hullihen	0	4
Perkins	0	4
CFA Garage	1	N/A

TABLE 9. How often do you use a charging station on campus? (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Rarely (1-7 days/month)	1	30
Sometimes (8-14 days/month)	1	10
Often (14+ days/month)	1	2
Daily	0	3

TABLE 10. Approximately how long do you use a UD charging station per charging session? (2022)

	Undergraduates	Faculty, Staff, and Graduate
		Students
1 to 2 hours	1	6
2 to 4 hours	0	22
4 to 6 hours	1	7
6 to 8 hours	0	5

TABLE 11. How important is access to a charging station for your typical commute? (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Not important	3	25
Somewhat important	1	29
Extremely important	4	25

TABLE 12. Would more charging stations on campus benefit your commute on a regular basis? (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Never	3	10
Rarely (1-3 days/month)	0	9
Sometimes (4-15 days/month)	3	25
Majority of the times (15+ days/month)	2	36

TABLE 13. What is the most important factor for you when using a charging station? Select all that apply (2022)

	Undergraduates	Faculty, Staff, and Graduate Students
Easy to use	3	17
Easy to find	3	24
Convenient location on campus	3	50
Convenient location in parking lot	3	34
Affordable	3	25
Fast charging	2	26
Always available (not overcrowded)	2	47

The 2022 Transportation Survey also provided respondents with the opportunity to submit general comments. These comments were collated and aggregated based on a qualitative review of common themes across responses and were selected on the basis that they had not appeared in previous highlighted comments, as indicated earlier.

General comments from faculty, staff, and graduate students included:

- Advocate for more SEPTA, MARC, and Amtrak trains (e.g., daily trains) to and from Newark to Philadelphia and Wilmington, including discounted tickets/passes for faculty, staff, and students.
- All parking lots need more electric vehicle chargers.
- Frustration regarding the survey being ableist (e.g., assuming everyone can cycle) and relating only to Newark Campus.
- The telephone number on UD shuttles/website needs to not be connected to the UDPD.
- Lights for walking should be timed better in Newark (e.g., quicker for pedestrians).
- Parking pricing needs to be diversified to reflect salaries (e.g., graduate students and low-paid faculty and staff should be charged less for parking than high-paid staff, faculty, and students). Generally, cost of parking permits was complained about. Some argued that employees and students (only those receiving stipends) should not pay for parking.
- Wheelchair access to buses should be improved.
- Lack of penalties for drivers (including buses) who disrespect cyclists. Education needs to be improved (including for pedestrians being oblivious to cyclists).

- Increased enforcement of cyclist violations.
- Cyclists shouldn't be cycling on walk-your-bike trails.
- More bicycle racks at Spencer Lab.
- Solar canopies are needed for electric vehicle charging stations.
- Need for affordable housing on campus to promote walkability.
- The ability to work remotely has improved their quality of life (reducing costs for parking for hybrid telecommuting positions are very welcome).
- The bicycle lane on Delaware Avenue desperately needs to open up.
- No charging stations at Trabant Garage, and there needs to be more in 53C lot.
- City pay kiosk machines are frequently broken.
- Wish for fully electric buses.
- Insufficient parking on campus for those with disabilities.
- Elevators at the CFA parking garage need regularly cleaning.
- More needs to be done to promote carpooling and make it clearer what the incentives are.
- East loop campus bus is unbearably long, unreliable, and only one bus circulates this
 route.
- No bicycle lane on Kirkwood Highway and there should be one.
- Delivery trucks parked in the turn lane into Trabant garage block the ADA access from the garage to the Trabant Center.

General comments from undergraduate students included:

- Unreliable bus service (e.g., shuttle never comes).
- Add a bus stop at the Newark Park and Ride next to McVey Elementary School.
- Cyclists and skaters on sidewalks are hazardous to pedestrians.
- Campus should be car-free.
- Concerns about lack of bus services in operation at night.
- Buses don't stop at the regular stops on their route when they are full and students who are waiting to use this service are left stranded and likely to be late to class.
- Lack of information about how to use the bus service.
- Appreciation for the walkability of Main Campus.
- No bus stop near UD's Health Center.
- Bus routes should occasionally go to shopping centers to help students obtain the supplies they need.
- Academy Street cross walk near Perkins is dangerous.
- Parking should be free or discounted as it presents additional financial burdens to students already paying a lot in tuition.
- Buses should operate more frequently than every 30 minutes.
- More crosswalks on South Main Street.
- The bus app (DoubleMap) doesn't update itself regularly enough to show bus availability and times.
- Appreciation for the new bicycle lane.

Collectively, the results presented here from the Transportation Surveys across several years help to inform the goals and recommendations that this Transportation Master Plan puts forward.

REFERENCES

TABLE H1. 2010 Transportation Survey Results

Mode of Transport	Frequency (%)
Drive alone	2,385 (55.8%)
Carpool	209 (4.9%)
Dropped off / picked up by another	104 (2.4%)
Walk	991 (23.2%)
Bicycle	178 (4.2%)
Skateboard	8 (0.2%)
Moped/Scooter	4 (0.1%)
Motorcycle	9 (0.2%)
UD Shuttle / Campus Bus	174 (4.1%)
DART Bus / City of Newark Transit	14 (0.3%)
SEPTA/DART Regional Rail	22 (0.5%)
Total	4,126 (96.5%)

TABLE H2. 2013 Transportation Survey Results: Students, Faculty, and Staff

	Undergraduate Students	Faculty, Staff, and Graduate Students	
Shuttle / Campus Bus	Yes: 711 (68.7%)	Yes: 743 (32.5%)	
	No: 279 (27%)	No: 1,469 (64.3%)	
Drive Alone	Yes: 694 (67.1%)	Yes: 2,108 (92.3%)	
	No: 337 (32.6%)	No: 171 (7.5%)	

TABLE H3. 2012 and 2017 Transportation Survey Results: Undergraduates

2012	2017

Walk	Never: 14 (1.6%)	Never: 98 (6.5%)
	Rarely: 19 (2.1%)	Rarely: 71 (4.7%)
	Sometimes: 17 (1.9%)	Sometimes: 70 (4.7%)
	Often: 23 (2.6%)	Often: 138 (9.2%)
	Majority: 261 (29.5%)	Majority: 1,097 (73%)
Bicycle	Never: 214 (24.2%)	Never: 1,160 (77.2%)
	Rarely: 33 (3.7%)	Rarely: 70 (4.7%)
	Sometimes: 16 (1.8%)	Sometimes: 38 (2.5%)
	Often: 12 (1.4%)	Often: 35 (2.3%)
	Majority: 23 (2.6%)	Majority: 70 (4.7%)
Shuttle / Campus Bus	Never: 170 (19.2%)	Never: 514 (34.2%)
	Rarely: 70 (7.9%)	Rarely: 332 (22.1%)
	Sometimes: 14 (1.6%)	Sometimes: 177 (11.8%)
	Often: 14 (1.6%)	Often: 163 (10.9%)
	Majority: 34 (3.8%)	Majority: 231 (15.4%)
Drive Alone	Never: 125 (14.1%)	Never: 677 (45.1%)
	Rarely: 81 (9.1%)	Rarely: 228 (15.2%)
	Sometimes: 47 (5.3%)	Sometimes: 179 (11.9%)
	Often: 29 (3.3%)	Often: 110 (7.3%)
	Majority: 41 (4.6%)	Majority: 242 (16.1%)

Carpool	Never: 184 (20.8%)	Never: 820 (54.6%)
	Rarely: 46 (5.2%)	Rarely: 282 (18.8%)
	Sometimes: 32 (3.6%)	Sometimes: 179 (11.9%)
	Often: 26 (2.9%)	Often: 83 (5.5%)
	Majority: 12 (1.4%)	Majority: 26 (1.7%)
Public Transportation (e.g., train, DART bus)	Never: 279 (31.5%)	Never: 1,258 (83.8%)
	Rarely: 9 (1%)	Rarely: 89 (5.9%)
	Sometimes: 1 (0.1%)	Sometimes: 13 (0.9%)
	Often: 3 (0.3%)	Often: 6 (0.4%)
	Majority: 2 (0.2%)	Majority: 6 (0.4%)
Other (e.g., skateboard)	Never: 255 (28.8%)	Never: 1,183 (78.8%)
	Rarely: 5 (0.6%)	Rarely: 16 (1.1%)
	Sometimes: 1 (0.1%)	Sometimes: 15 (1%)
	Often: 3 (0.3%)	Often: 11 (0.7%)
	Majority: 4 (0.5%)	Majority: 6 (0.4%)

TABLE H4. 2012 and 2017 Transportation Survey Results: Faculty, Staff, and Graduate Students

	2012	2017
Walk	Never: 1,317 (53.2%)	Never: 1,575 (52.6%)
	Rarely: 176 (7.1%)	Rarely: 269 (9%)

	Sometimes: 79 (3.2%)	Sometimes: 128 (4.3%)
	Often: 57 (2.3%)	Often: 112 (3.7%)
	Majority: 137 (5.5%)	Majority: 272 (9.1%)
Bicycle	Never: 1,413 (57.1%)	Never: 1,896 (63.3%)
	Rarely: 117 (4.7%)	Rarely: 160 (5.3%)
	Sometimes: 54 (2.2%)	Sometimes: 66 (2.2%)
	Often: 36 (1.5%)	Often: 48 (1.6%)
	Majority: 115 (4.6%)	Majority: 122 (4.1%)
Shuttle / Campus Bus	Never: 1,390 (56.1%)	Never: 1,744 (58.2%)
	Rarely: 98 (4%)	Rarely: 215 (7.2%)
	Sometimes: 56 (2.3%)	Sometimes: 103 (3.4%)
	Often: 36 (1.5%)	Often: 52 (1.7%)
	Majority: 143 (5.7%)	Majority: 189 (6.3%)
Drive Alone	Never: 145 (5.9%)	Never: 222 (7.4%)
	Rarely: 150 (6.1%)	Rarely: 187 (6.2%)
	Sometimes: 135 (5.5%)	Sometimes: 143 (4.8%)
	Often: 130 (5.3%)	Often: 159 (5.3%)
	Majority: 1,763 (71.2%)	Majority: 2,167 (72.4%)
Carpool	Never: 1,291 (52.1%)	Never: 1,668 (55.7%)
	Rarely: 190 (7.7%)	Rarely: 340 (11.4%)

	Sometimes: 76 (3.1%)	Sometimes: 113 (3.8%)
	Often: 39 (1.6%)	Often: 61 (2%)
	Majority: 122 (4.9%)	Majority: 124 (4.1%)
Public Transportation (e.g., train, DART bus)	Never: 1,567 (63.3%)	Never: 2,093 (69.9%)
	Rarely: 47 (1.9%)	Rarely: 88 (2.9%)
	Sometimes: 16 (0.6%)	Sometimes: 23 (0.8%)
	Often: 9 (0.4%)	Often: 17 (0.6%)
	Majority: 21 (0.8%)	Majority: 29 (1%)
Other (e.g., skateboard)	N/A	Never: 1,666 (55.6%)
		Rarely: 12 (0.4%)
		Sometimes: 13 (0.4%)
		Often: 10 (0.3%)
		Majority: 13 (0.4%)

TABLE H5. 2010, 2012, 2013, 2017, and 2022 Total Survey Responses

	2010	2012	2013	2017	2022
Undergraduate Students	1,865	886	1,035	1,497	1,461
Faculty, Staff, and Graduate Students	Full-time and Part-time Employees: 1,761	Faculty: 1,856	Faculty: 451	Faculty: 538	Faculty: 424
		Staff: 1,321	Staff: 1,220	Staff: 1,716	Staff: 1,331
	Graduate Students: 644	Graduate Students: 555	Graduate Students: 612	Graduate Students: 733	Graduate Students: 913

Total : 4,275	Total: 2,453	Total: 2,281	Total: 2,987	Total : 4,129
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