

2017 Transportation Survey Synopsis Report

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Conducted in coordination with:

Parking Services
Transportation Services
UD Sustainability
Bike Newark

Institutional Research Office
Department of Public Policy
Motor Vehicle Services
Siemens

Transportation Surveys, Past & Present

The University of Delaware conducted a transportation survey in 2012 to assess the needs, wants and satisfaction with parking and transportation services at that time. That survey was conducted by the relevant Facilities Departments responsible for providing bus, parking, vehicle fleet and related services, and the questions therefore reflected their interests. For example, there were many questions related to customer service and convenience, but fewer related to alternate forms of transit like bicycles or walking.

The most recent transportation survey of Fall 2017 included more stakeholder groups and captured a broader focus of transportation issues on campus. Questions related to alternate transit methods, including regional public transit, biking, walking, etc. were included. Data points to help the university accurately calculate the greenhouse gas emissions related to commuters were added for the annual Greenhouse Gas Emissions Inventory. There were also new questions related to electric vehicles and electric vehicle charging stations.

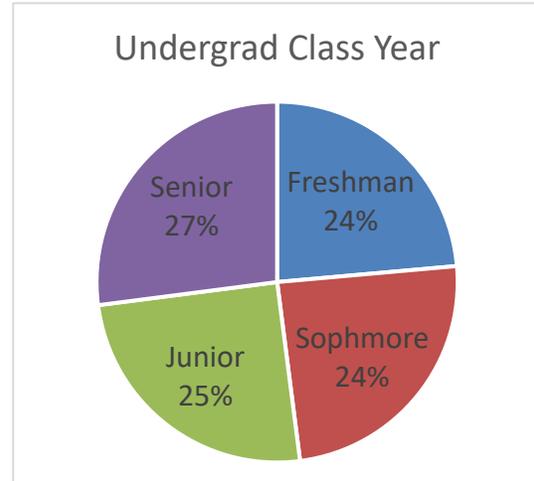
It is the intent of UD Sustainability and Transportation Services to repeat this survey, with minor edits or additions, every three years. Therefore preparations for the next survey will begin in 2019, with a launch date in 2020, contingent on uncontrolled factors such as the demands on the Institutional Research Office or major upheaval in the transportation sector necessitating a major re-working of the survey.

Survey Participation

The 2017 Transportation Survey launched somewhat later than expected in the fall semester due to flu season related delays. It was launched towards the end of October and ran through November into the last week that classes. The Institutional Research office sent it out via email to a “representative sample” of full-time students and all Faculty / Staff. Promotional efforts were made, with raffle prizes offered to survey participants (1 iPad and 1 Apple Watch for student and staff participants, respectively). The survey was promoted online via the UD Sustainability website, the Parking Services website, and via appropriate social media outlets. The Social Media Ambassadors were also recruited to help spread the word, and a UDaily article was published. As a result, responses to the survey were quite good:

- N = 1,502 Undergraduate Responses
 - Response Rate = 24.8%
- N = 2,993 Employee & Graduate Student Responses
 - Response Rate = 46.0%

Participant Breakout	N=
Undergraduate On-Campus	664
Undergraduate Off-Campus (immediately near UD)	692
Undergraduate All Other (live regionally)	141
Graduate Students	733
Permanent Faculty	531
Adjunct Faculty	7
Full-Time Staff	1,698
Misc. / Casual Wage Staff	9
Other Staff (e.g. Aramark, Barnes & Noble)	9



Among undergraduate students, there was an even mix between the class years and also students living on-campus and off-campus. “All Other” students typically include those living with their families, or those living farther afield for jobs or cheaper housing options. In the survey “Off-Campus” was described as “Non-UD housing, off-campus (immediate UD vicinity)”. We chose not to further define the categories in order to better understand undergrad student attitudes to “Off-Campus Housing” and capture any changing trends that might have implications to transportation services.

Among staff it was interesting to see such strong participation (56.7%) among full-time staff versus faculty and even graduate students. This was also the case in the 2012 survey, with 51% of total Employee & Graduate Student responses being represented by full-time staff.

Survey Results Reporting

In this survey, many of the figures are cited with a “~” before a percentage. For example, “~45%”. This indicates decimal points that are not included in the synopsis to improve the clarity and conciseness of the report. A finer level of detail is available in the raw data. Percentages are only rounded up to the next integer if they reach “X.7”, “X.8” or “X.9”.

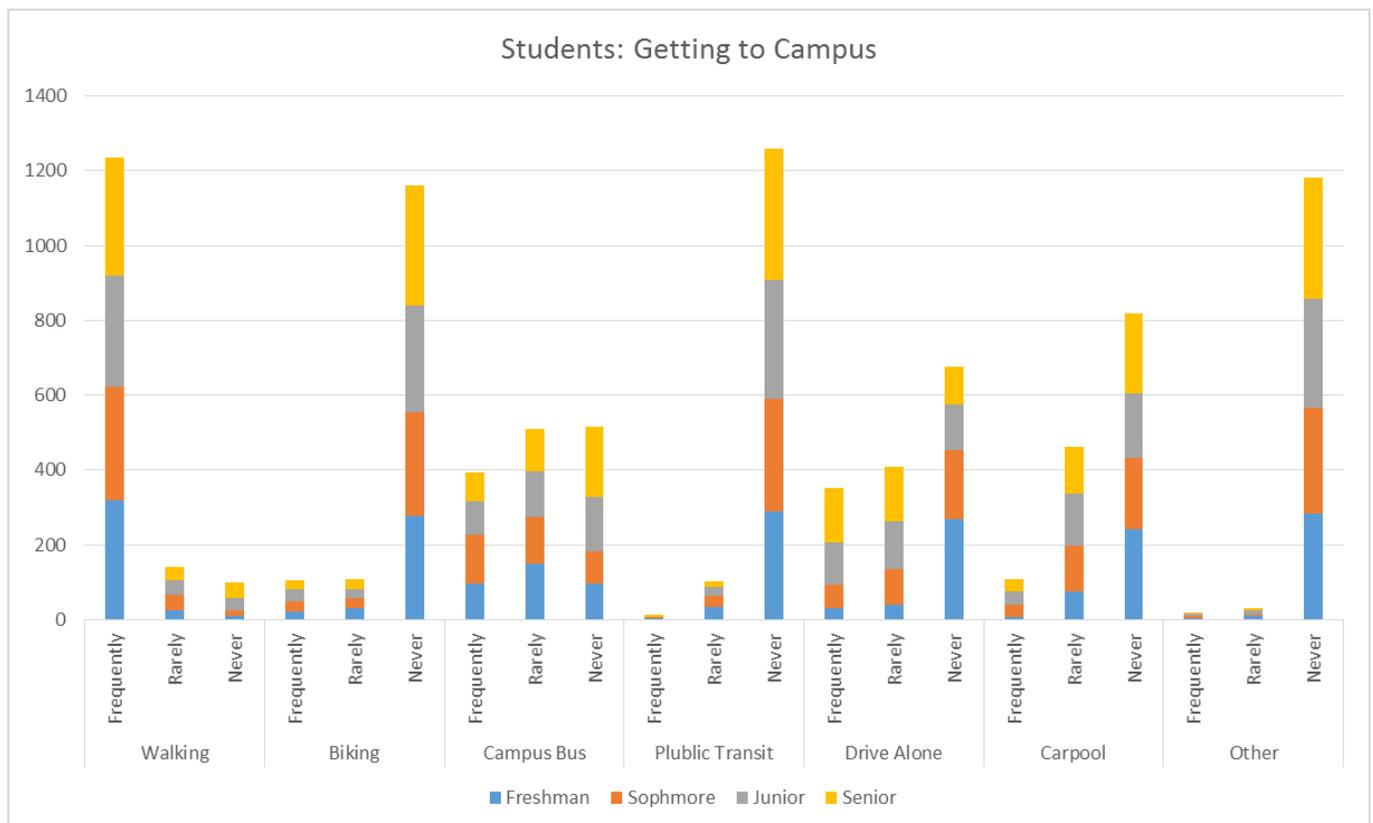
Students

Getting to Campus

It should not be surprising that students, faculty and staff get to campus in very different ways. The vast majority of students (~90% of respondents) live on campus or in the “immediate UD vicinity”, so walking is the most common way that students reach campus on their daily routines, with >80% walking “Often” or “Majority of the Time”. Biking, on the other hand, was much less popular with 84% of respondents saying that they “never” bike to class. Students seem to use the campus-provided buses based on situational convenience, with >63% reporting that they use the buses at least once per month, but only 16% of students using the bus the “Majority of the Time”. Other forms of public transit are rarely used by respondents, with only ~8% using DART, AMTRAK or other forms of local public transit.

Among drivers, ~51% of respondents report driving alone to campus, with ~24% driving alone “Often” or “Majority of the Time”. Among respondents, 41% carpool to campus at least once per month, but only ~8% do so “Often” or “Majority of the Time”.

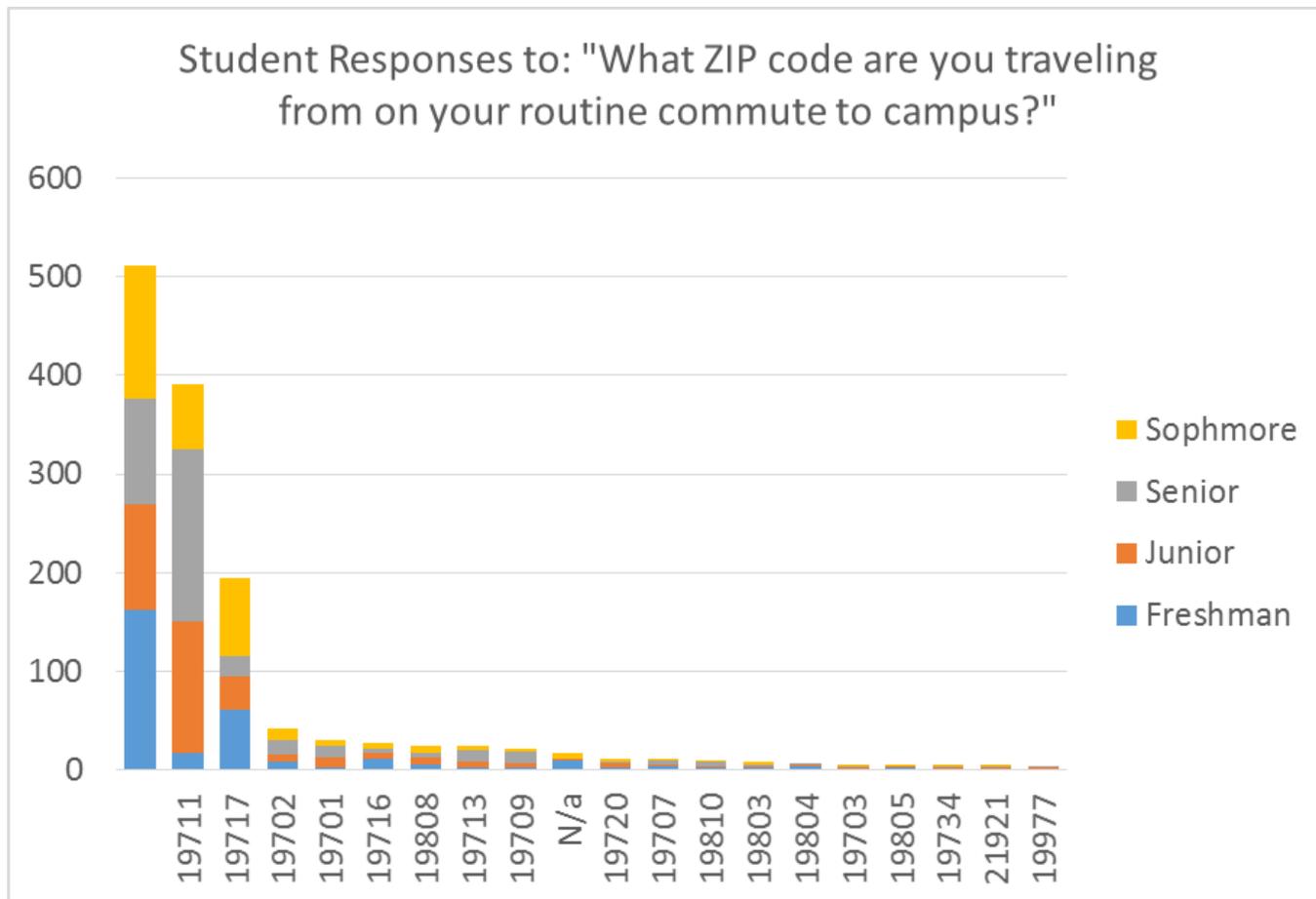
Finally, a very small selection of respondents (~4%) use “Other” methods to travel to campus, with skateboards and longboards representing 71% of the “Other” category. Interestingly, Uber was ~11% of the “Other” category. The remainder reported jogging, “scooters”, or one of the travel options captured in previous questions.



In the graph above, “Frequently” is an aggregate of “Majority of the Time (15+ days/month)” and “Often (9-14 days/month)”. Rarely aggregated “Sometimes (4-8 days/month)” and “Rarely (1-3days/month)” to improve readability of the visual information.

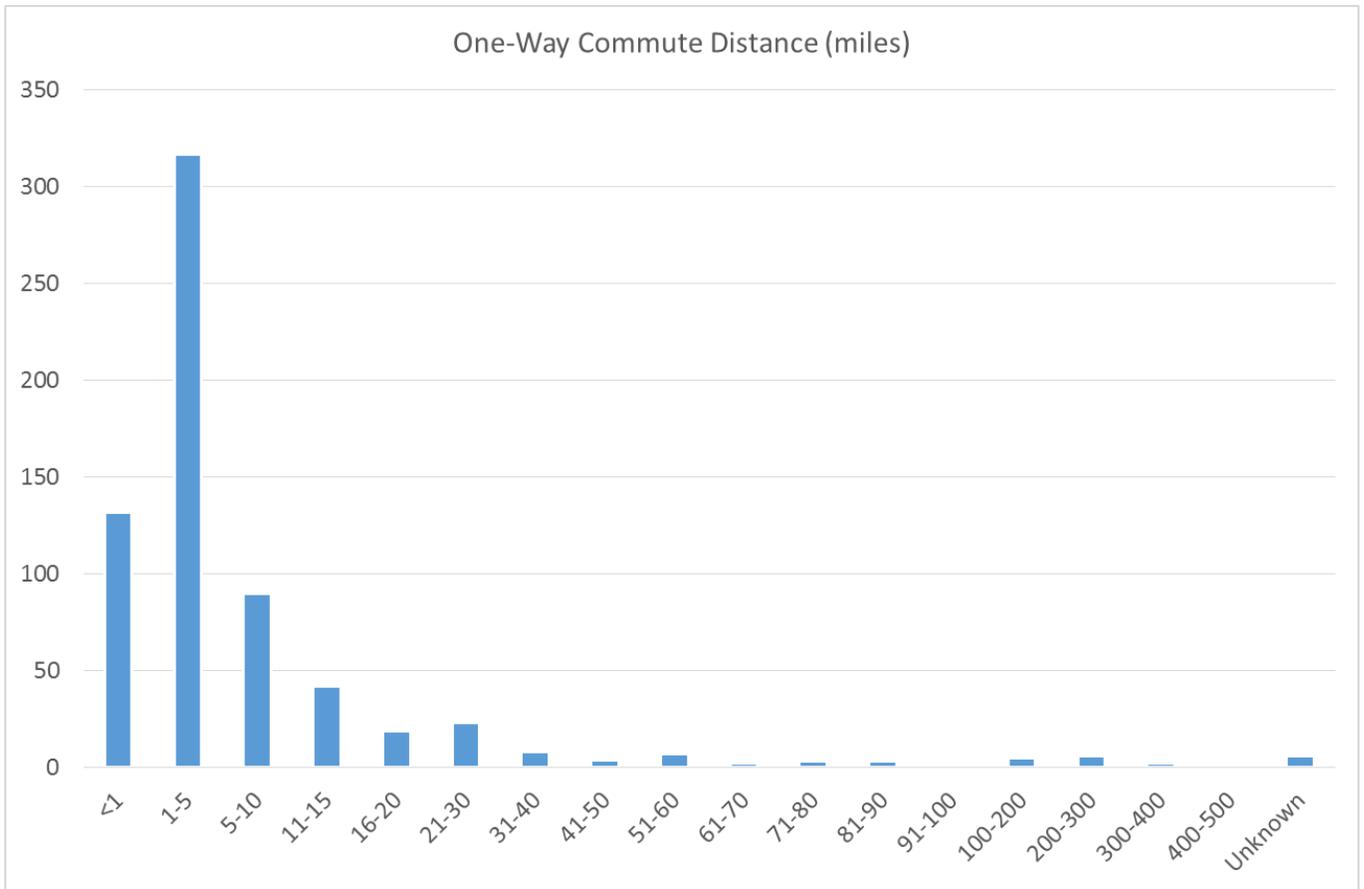
Among all travel method questions, there were interesting trends between class years. Most freshmen live on campus so live easy walking distance to academic buildings and bus stops, but freshmen are only marginally more likely to walk to class than their peers. Underclassmen (freshman and sophomores), are more likely to utilize the campus buses. Upperclassmen (juniors and seniors) are most likely to drive or carpool.

Concerning where students are living on or around campus, we asked them, “What ZIP code are you traveling from on your routine commute to campus?” The top 20 most common responses are displayed in a chart below:



It’s not clear if students found this question confusing, or if they simply chose not to report. Non-responses represent ~39% of all responses, including “N/A”. Some students provided their off-campus home ZIPs, many of which are across the country or the world. It’s also possible that some respondents are taking online classes and are actually located quite far from campus. In future surveys the wording of this question should be reviewed to increase clarity. However the top four reported ZIP codes, which represent ~48% of total responses, are in the immediate vicinity of UD, including local neighborhoods south of I-95.

These results are echoed in a follow-up question that asked, “Approximately how many miles (one-way) is your regular commute to campus?”

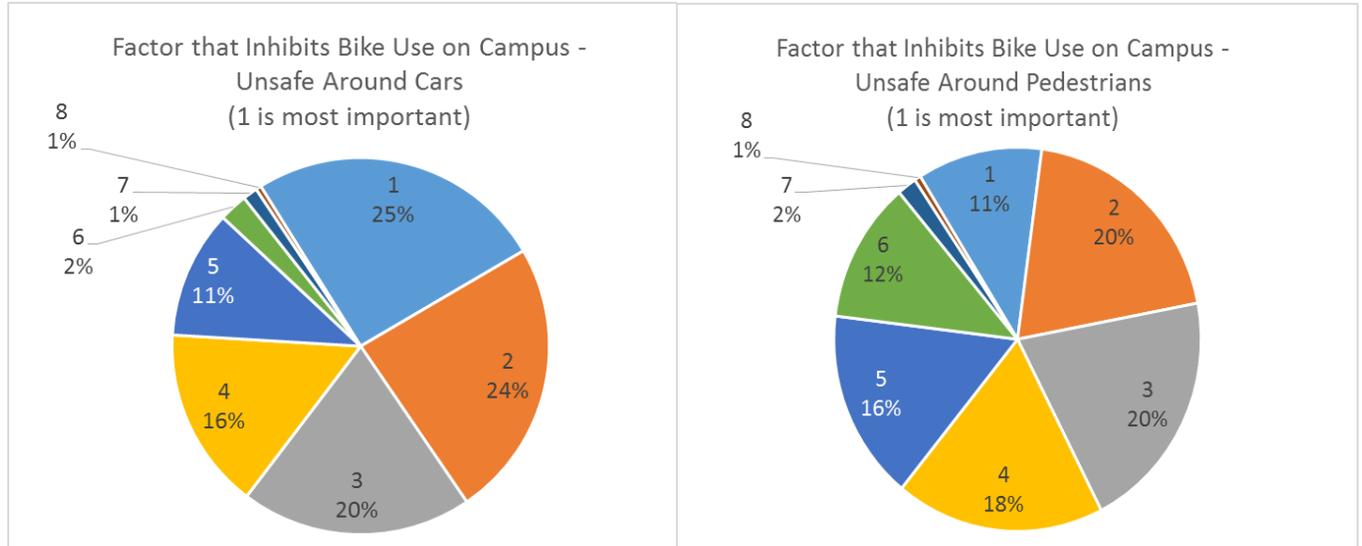


Based on the number of students who walk, bike or take the campus buses, it’s no surprise that the majority of respondents (~67%) live five or fewer miles from campus. Because students were allowed to enter letters or numbers in the short form answer to this question, we received a lot of ranges and ambiguous responses (e.g. “10 minutes”). In future surveys, we strongly suggest that all respondents are required to input numbers only, and that “miles” be stipulated next to the answer box. The question explicitly requests an estimate, so it’s perfectly fine for students to guesstimate their commute if they’re not sure.

Among some of these commuters there are almost certainly drivers, but because the survey was anonymized, it’s hard to establish how many. This begs the question, how can future iterations of this survey better examine students driving less than a mile to campus on a “regular commute”. No doubt some have very good reasons to drive (e.g. injury, disability, no access to public transit), but as parking becomes more difficult on campus, pressure will increase to improve transit options for students living immediately near the UD campus.

Biking

Biking to campus has almost identical respondents across student class years and may reflect individual enthusiasm for cycling rather than convenience or necessity. Cyclist safety was a top concern:

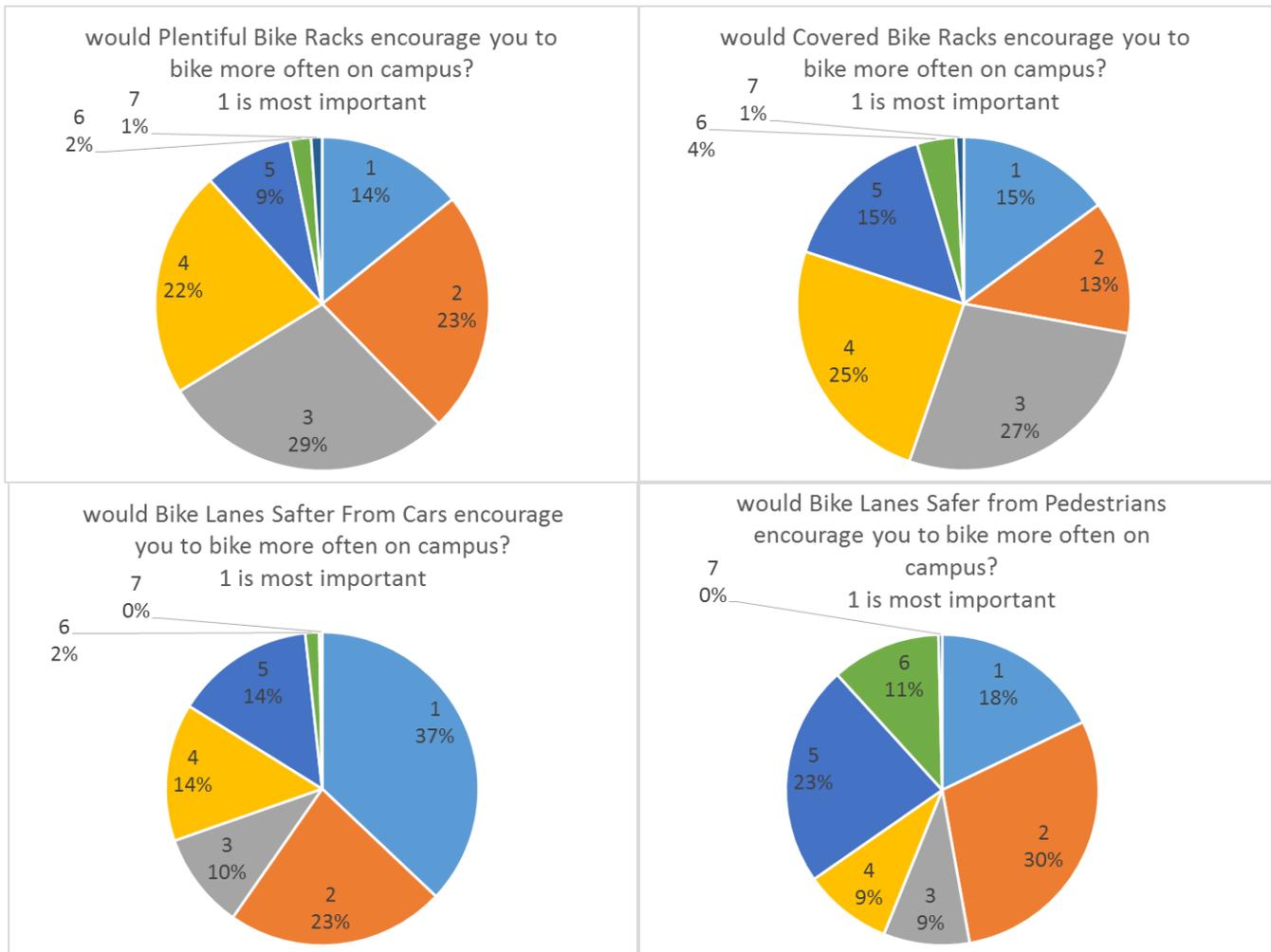


As outlined above, ~69% of respondents listed “Safety Around Cars” as a top-3 concern. “Safety Around Pedestrians” has a top-3 response of ~51%. Finally, ~28% of respondents chose “Can’t use a Bike” as a top-3 factor inhibiting their bike use.

Among “Other Factors Inhibiting Bike Use” responses, most student respondents reported they did not want or could not use a bike (~5%), followed by those that don’t own a bike (~3.5%). The remaining comments covered information captured in other questions (e.g. “Safety”), situational information unique to the respondent (e.g. “Can’t bike this year (injury)”) or specific suggestions captured in other questions (see below). Unique and relevant suggestions from students:

- “Large sewer grates at blind corners are dangerous. Not many defined bike lanes on campus. Few signs informing cyclists of road etiquette...”
- Theft and damage at bike racks
- Suggestions for bike safety and road etiquette classes
- Better lighting around bike routes for evening commuters

We also asked students questions about what would encourage them to bike more. Several responses elicited very strong responses:



Unsurprising safety remained a concern, especially related to vehicular traffic, with ~70% of student respondents listing it as a top-3 priority and ~37% listing safety from vehicles as the #1 priority. Also significant were concerns about safety from pedestrians, with ~57% of students listing this as a top-3 priority.

Abandoned bicycles on campus bike racks have been a perennial problem, but it's clear that the availability of spaces at bike racks is a leading priority among students who do not commonly cycle to campus, with ~66% listing it as a top-3 priority. Based on these results, it may be valuable to explore ways to encourage or enforce people to move their bikes from high-demand bike racks. How this could be enforced or paid for remains to be seen, but if similar rules work for cars, surely there are solutions for bikes. Also, such a system could be designed to simultaneously prevent bike abandonment.

Covered bike racks do not currently exist on campus, so this question was an exploratory one; ~55% of student respondents listed covered bike racks as a top-3 priority.

Other suggestions in this group of questions returned ambivalent results among student respondents. "Conveniently located bike racks", for example, elicited ~36% as a top-3 priority, but ~37% as a bottom-3 priority. "Convenient showers" were a bottom-3 priority for 93% of student respondents, likely reflecting their easy proximity to residences and the gym.

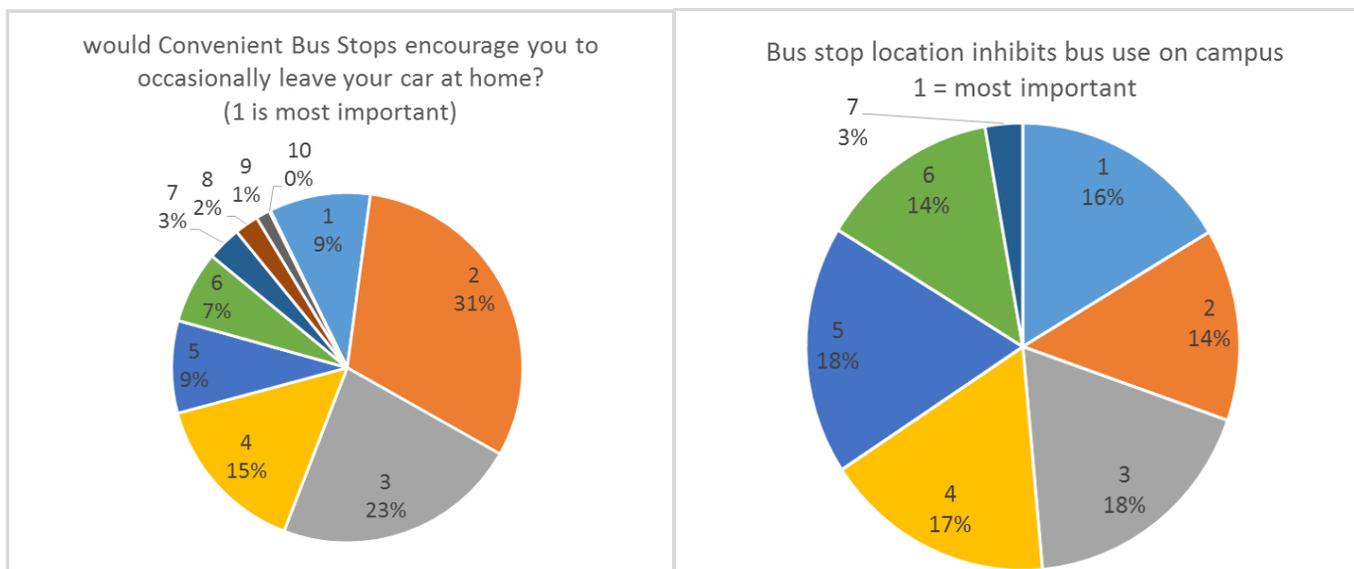
“Other” factors that would encourage more bike use on campus was a bottom-3 priority for 87% of student respondents, with theft concerns, inability to bike and inconvenience compared to other modes of transportation (including walking) cited as barriers. Unique suggestions to improve biking included:

- Bike Share
- Affordability / Financial Incentive
- Bike Maintenance infrastructure

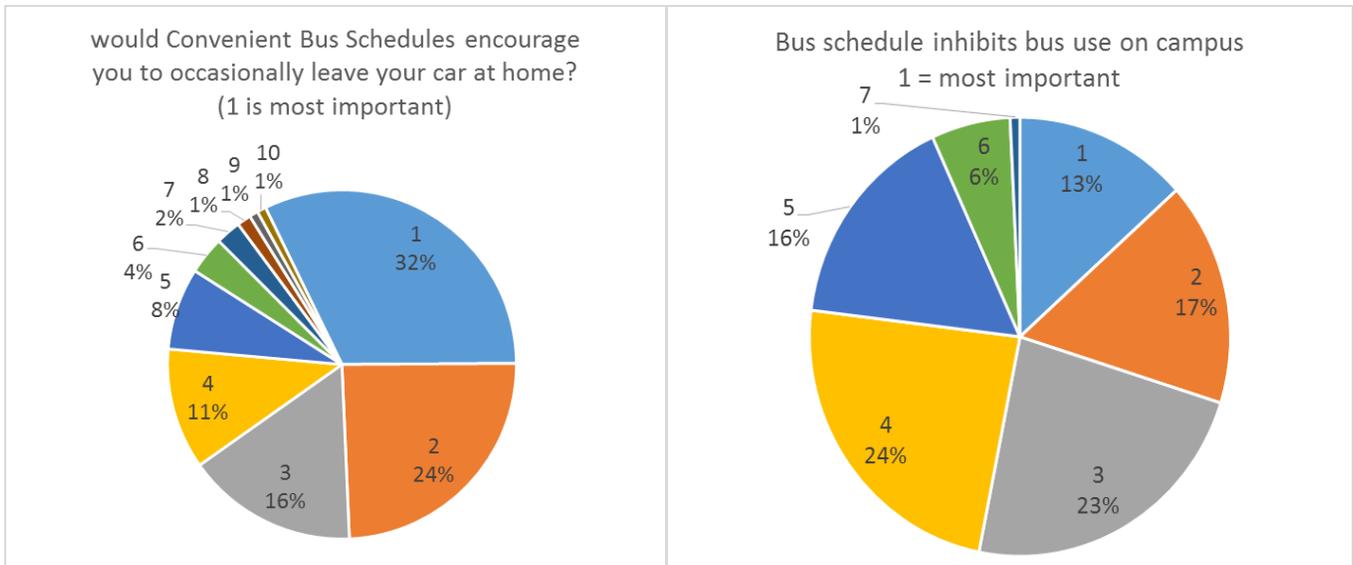
Campus Buses and Public Transit

As previously mentioned, >63% of student respondents use the campus buses at least once per month, but only 16% use the campus bus the “Majority of the Time”. Other forms of public transit are rarely used by respondents, with only ~8% using DART, AMTRAK or other forms of local public transit. It was interesting to contrast two pairs of questions asked under slightly different contexts in the survey.

One set of questions asked students who reported driving or carpooling to campus about factors that would “encourage you to occasionally leave your vehicle at home”. Another set of questions explicitly asked what would encourage more campus bus use.



While ~48% of respondents list bust stop locations as a top-3 priority, 63% of drivers rate bus stop locates as a top-3 priority, highlighting the importance of convenience for campus bus and public transit use, especially among drivers. Unsurprisingly, a similar trend is seen on questions related to bus schedules.



About 65% of student respondents cited reliable pick-ups as a top-3 priority, whereas reliable drop-offs were rated as a top-3 priority for ~53% of respondents. Overcrowding on the buses was an ambivalent priority, with ~23% of respondents listing it as a top-3 priority, but ~67% of respondents listing it as a bottom-3 priority.

We offered respondents an opportunity to provide additional feedback through an “Other” category, though 93% of respondents listed “Other” as a bottom-3 priority. Among “Other” short form feedback, 99% of respondents declined to leave feedback. Most of the responses related to preferences for other forms of transportation (e.g. “I prefer to walk”) or information captured in other questions. Some feedback provided:

- Bus drivers take breaks without informing passengers they’ll be parked at a bus stop for the break period.
- Bus schedules are confusing or users are unfamiliar with the locations of stops.
 - Non-trivial portion of this feedback explicitly admits “too lazy to look up bus schedule / information”
- Reliability of the campus buses and app to plan trips accordingly.
- Bus routes are one-way, so only convenient coming or going.

We also asked students what would encourage them to use the campus buses more frequently. By far “More Frequent Buses” was the most popular options, with ~45% of students listing it as the #1 priority, and 89% listing it as a top-3 priority.

More convenient bus stop locations were also popular, in line with responses seen previously: ~78% of student respondents listed this as a top-3 priority.

We asked students if “Newer / Updated Buses”, “More Free WiFi”, or “Sheltered Bus Stops” would encourage more bus use. The most popular selection among these choices was “Sheltered Bus Stops” with ~44% selecting the option as a top-3, but only 5% of respondents selecting this as their #1 option.

The most popular option to encourage more bus use, after scheduling and convenient stop locations, was “Late Night Buses”, with ~49% of students placing this in their top-3.

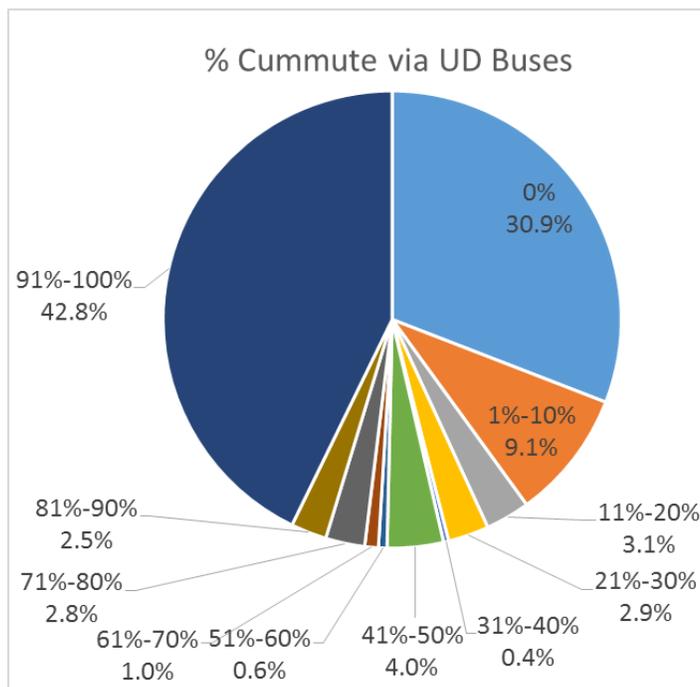
An “Other” category was offered to students in these questions, as in other groups of questions, but 93% of student respondents listed “Other” as a bottom-3 priority. Among the comments, ~67% explicitly

noted that they don't need to use the buses. The remaining comments mirrored those listed in a previous section of the survey, or reflected information captured in other survey questions:

- Bus drivers take breaks without informing passengers they'll be parked at a bus stop for the break period.
- Users are unfamiliar with the schedules and locations of stops.
- Reliability of the campus buses and app to plan trips accordingly.
- Bus routes are one-way, so only convenient coming or going.

Multi-modal Transportation

We also asked students if they use multiple modes of transportation to get to campus, and if so, we asked them to assign a percentage to each mode of transit. Just over half of student respondents (~55%) use multiple modes of transit, and among them the UD campus buses are most popular:



AMTRAK was the next most popular mode of multi-modal transit, closely followed by DART. It's important to note that very few students listed these modes of transit, <8% and <7% of multi-modal trips respectively. SEPTA, Cecil County Transit, and UniCity Buses serve relatively few students, <1% of trips each.

Among the "Other" responses in this category, almost all comments focused on walking, biking or personal car use. Megabus and Greyhound were mentioned, though it was not clear if these were being used for daily commuting to campus (as the question intended) or (semi-) regular trips to leave/return to Newark.

Uber was also mentioned as a transit option, though at this time it seems to still be a relatively rare method of commute, with only 3 comments

among 60 total comments. Nevertheless, it will be interesting to see if this mode of transportation continues or increases in subsequent surveys.

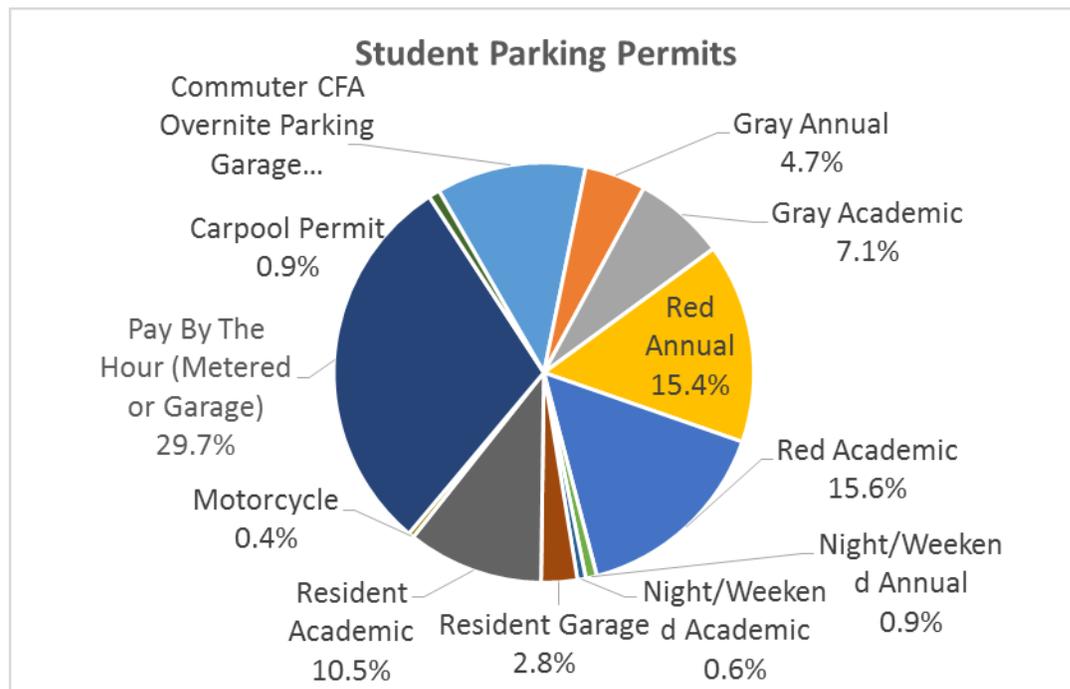
Anecdotal information from student interns indicate that Uber is a relatively expensive transit option, and likely acts as an emergency backup for students running late, etc.

Driving

As previously stated, ~47% of student respondents report they “never” drive alone to class, but ~17% drive “the majority of the time”. Among those who drive, ~47% “Park at a UD Campus Lot” with the remainder (~53%) parking off campus.

Among off-campus parking destinations, students’ homes and apartment complexes are the most popular among respondents (~24%) with Main St. Parking lots and metered parking at various locations in the area (possibly including UD meters) being the next most popular locales. The parking lots behind Grottos, Walgreens and near Buffalo Wild Wings were specific off-campus lots frequently cited. Many students also park at the homes or apartments of local friends and family.

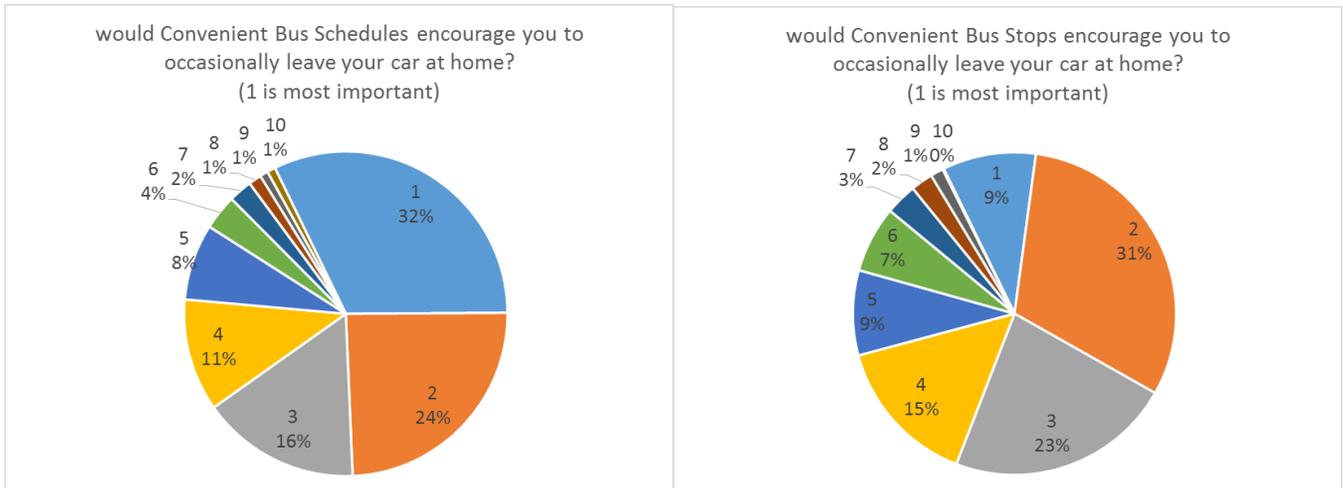
For students who do park on campus, the following permits were reported:



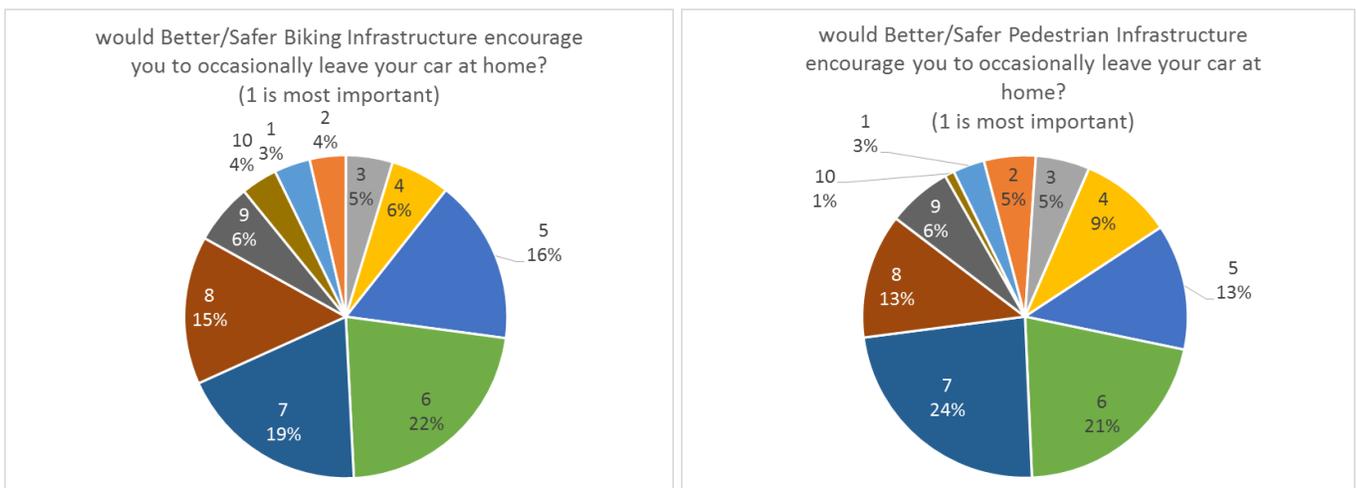
We asked students what factors were most important when choosing a parking permit. Not surprisingly, cost was a major consideration with ~93% of students listing it as a “top-3” concern. This was closely followed by the convenience of the parking permit / lot location with 92% of students listing this as a “top-3” concern. Frequency of travel and the time of day when they would need to park were lesser considerations, though “Availability of Spaces” did rate as a “top-3” concern for 51% of student respondents.

In this year’s survey we asked respondents about what would “encourage you to occasionally leave your car at home?” There were multiple reasons for this line of questioning. First and foremost, we know that the majority of students live very close to campus and are able to walk or bike. With parking spaces tight, it’s in the University’s interest to encourage those who can walk or bike to do so, whenever safe and appropriate. The University is keen to avoid building additional parking infrastructure, especially garages, due the cost of buying new land, building facilities, maintaining the lots, and enforcing parking regulations, etc. UD is also keen to reduce Scope 3 greenhouse gas emissions.

A variety of choices were presented with a 1-10 scale (1 being “most important”) of preferences for each choice. We also solicited written feedback. By far “convenient bus schedules” and “convenient bus stop locations” were the most popular selections:



Unsurprisingly, “better financial incentives” also sounded encouraging to students, with ~45% ranking it as a top-3 preference. When we were designing this survey, we suspected that pedestrian and cyclist safety would also be a priority among students and we wondered if more students were driving as a result. A recent fatal accident on campus had brought pedestrian and cyclist safety to the forefront of FREAS and local advocacy groups’ concerns. However, in this survey we did not find that safety improvements would lure students out of their cars, and so was likely not a driving factor in vehicle use.



In fact, weather seemed to be a more important factor for students, with 28% reporting weather as a top-3 priority “to occasionally leave your car at home”. Finally, ~71% of respondents reported “Nothing would encourage me to occasionally leave my car at home” as their *least important* priority, and ~13% reporting “Nothing” as a top priority. This hints that perhaps there are opportunities to encourage students to drive less, with improved bus service and financial incentives as potential areas to investigate.

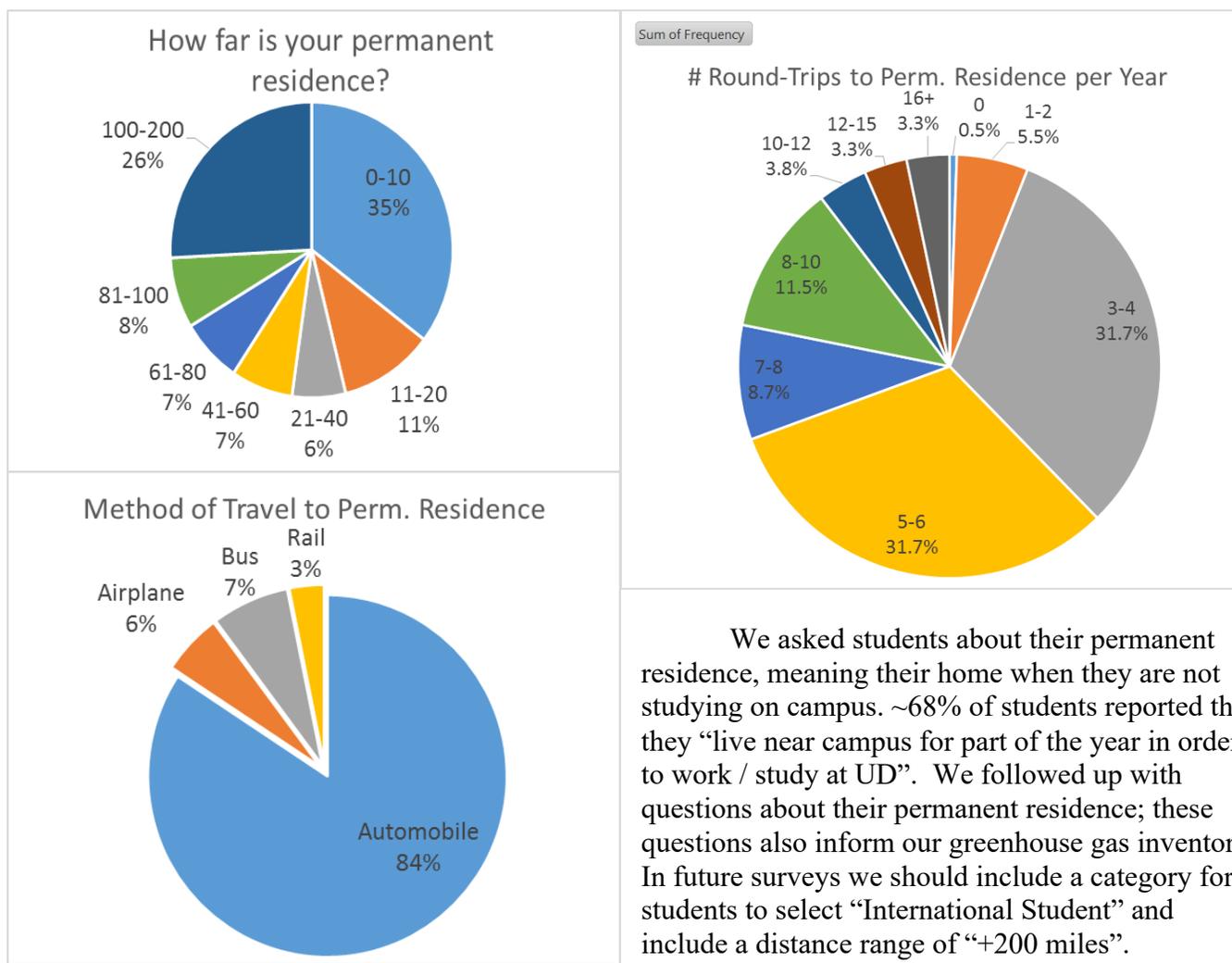
Finally, “Other” reasons that would encourage less driving elicited the lowest priority among students (~91% selecting 8-10) with most comments reflecting personal preferences or circumstances

(e.g. “I live 20min from campus”, “I don’t like to bike”) or information captured in previous questions (e.g. “Buses are inconvenient”). However, there were some informative responses:

- “I drive my car to classes if I am running late. It takes me about 20 minutes to get to my classes if I walk. Also, if the East Loop Buses were more frequent at night since it is very unsafe to walk on East Campus alone at night.”
- Multiple comments from bikers and pedestrians stating they feel unsafe around each other.
- Concerns over bike theft

Among commuters, we inquired about the type of vehicle they drive for greenhouse gas reporting purposes. Passenger cars were most common with ~83% of students. Light duty trucks and SUVs were next at 13% of respondents. Hybrid / Electric vehicles were next at ~1% of respondents (N=10). Motorized bikes and (mini)vans comprised the remainder to responses. Please note that one student reported commuting to campus in a blimp; perhaps parking services should consider aerial parking permits.

We also inquired about the type of fuel that students use for their commutes. This also informs greenhouse gas inventories. Not surprisingly, gasoline accounts for 98% of responses.



We asked students about their permanent residence, meaning their home when they are not studying on campus. ~68% of students reported that they “live near campus for part of the year in order to work / study at UD”. We followed up with questions about their permanent residence; these questions also inform our greenhouse gas inventory. In future surveys we should include a category for students to select “International Student” and include a distance range of “+200 miles”.

Carpooling

Among drivers who reported carpooling, 16% reported carpooling with 1-2 passengers, 9% with 3-4 passengers and 1% with more than 4 passengers. The remaining 74% of drivers reported that they never carpool with passengers. Currently UD incentivizes carpooling with discounted parking permits. Better promotion of this option could impact these numbers. In future surveys it may also be helpful to quiz respondents on the carpooling system with the aim to find ways to improve the system or how we promote it.

Hybrid and Electric Vehicles

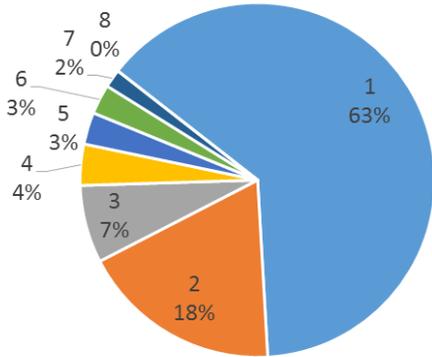
Among the 10 students who self-reported driving a hybrid / electric vehicle, we asked whether or not they used any of the existing electric vehicle charging stations on campus. None of the student respondents reported using the charging stations on campus, and all reported driving gas-hybrid electric vehicles.

In the last category of questions, we wanted to assess the attitudes students had towards purchasing (plug-in) electric vehicles, both as a potential future car and as a hypothetical asset (e.g. “if you won a free electric car...”). We asked questions about the importance of various considerations students weighed as they considered purchasing such a vehicle. We also asked questions about purchasing any kind of car, as a counterpoint.

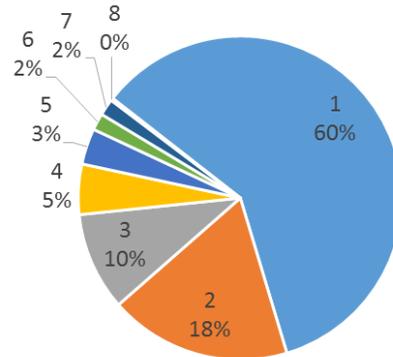
Among the 10 students who already own hybrid vehicles, we asked what their most important considerations were in their purchasing decision. Their responses were consistent: upfront cost and fuel economy were, by far, the most important factors of consideration. Practical concerns like range and reliability overrode more luxurious considerations like brand, style and even comfort. “Power / Fun to Drive” was the least important factor for students. There were 5 “Other” comments from these 10 students; 3 comments cited safety as an additional concern. The other two comments referenced information captured in other questions (e.g. “Brand”).

Below are student responses for buying “a new (to you) car” juxtaposed with similar questions for buying “a plug-in hybrid or electric car”. For brevity, we have only included responses with at least a 25% top-3 priority response for any “new (to you)” vehicle.

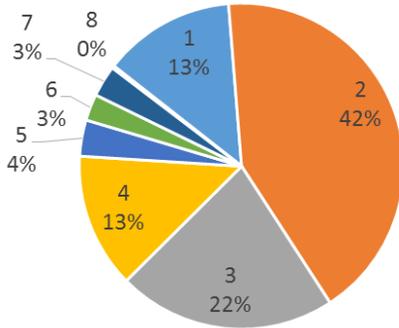
was Upfront Cost the most important factor in buying a new (to you) car?



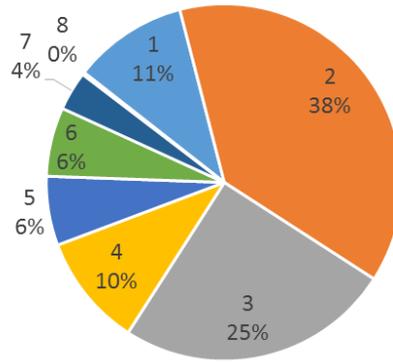
would Upfront Cost be the most important factor in considering buying hybrid / electric cars?



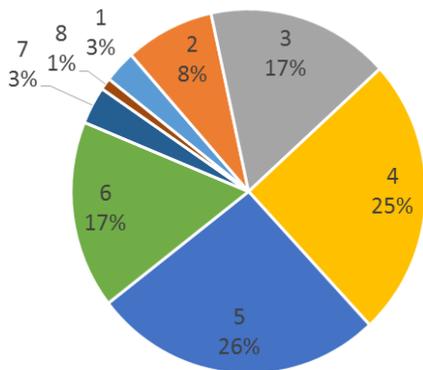
would Fuel Cost / Efficiency be the most important factor in considering buying hybrid / electric cars?



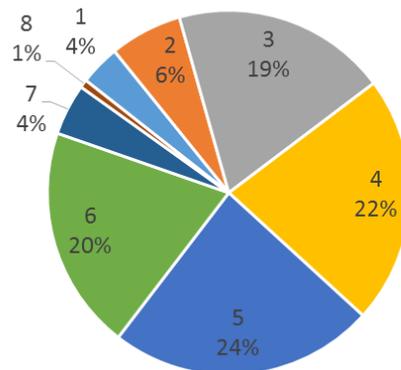
was Fuel Efficiency the most important factor in buying a new (to you) car?

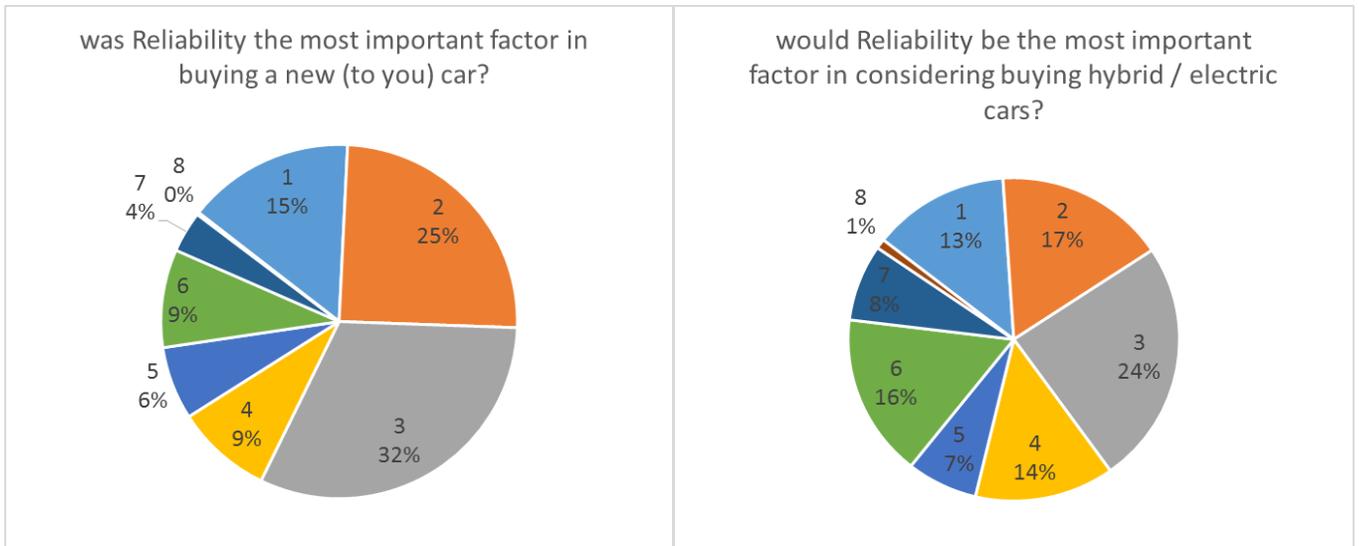


was Style the most important factor in buying a new (to you) car?



would Style be the most important factor in considering buying hybrid / electric cars?





Among student respondents, ~30% placed range as a top-3 priority for electric vehicles. It's important to note that in the section with questions about any kind of vehicle, there were no questions about vehicle range because there are relatively few debates about the range of most gasoline vehicles, whereas electric vehicles frequently confront this issue. Questions concerning vehicle charging networks will be addressed below.

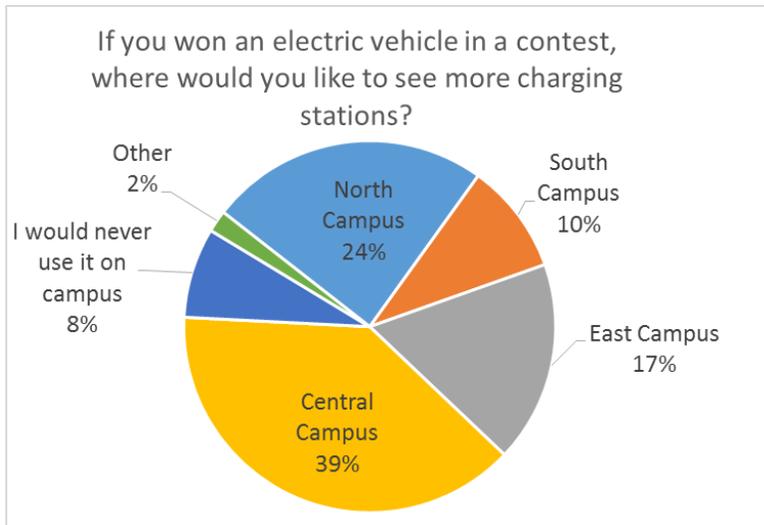
These responses confirm that upfront cost and fuel economy are top priorities for students, with reliability the third most-important consideration. But students are also interested in style over other considerations like brand or comfort. Perhaps what is most striking about the graphs above is how consistent they are regardless of the type of vehicle in question. Though some students indicated in that they would “never consider” buying an electric car (see below), for the most part students priorities do not shift when presented with an electric vs. internal combustion engine vehicle. This may indicate that students generally accept electric cars as comparable options for personal transportation; indeed for their purposes, any kind of vehicle ownership is on the table.

The exception was when students were asked about reliability, with reliability dropping as a priority for hybrid and electric vehicles. Reliability and range are competing on students' priority lists in the electric vehicle category, as ~30% of students placed range as a top-3 priority.

If that is the case, UD will need to be ready to support more electric vehicles on campus because the price, range and reliability of battery technologies has already brought the upfront cost of new electric cars below \$30,000. This trend is expected to continue. With the very low operating cost of electric vehicles, we may start to see more students adopting them in the near future.

Electric Vehicle Charging Stations

The final questions we asked related to electric vehicle charging stations. We asked students how important charging networks would be to their consideration if they were buying an electric or plug-in vehicle. Comparable numbers of students reported “Extremely Important” (12%) and “I would never buy an electric vehicle” (11%). About 30% of respondents reported access to a charging station as “extremely” or “very” important in their decision to buy an electric or plug-in vehicle.



We also asked, “If you won an electric vehicle in a contest, where would you like to see more charging stations on campus?”

UD Facilities intends to take this information into account as we plan to roll out more charging stations across campus. In the “Other” category, the parking garages were also referenced, as well as Main St., which UD does not control.

Conclusions: Student Transportation

Student respondents to our survey get to campus in a variety of ways, depending on the weather, their schedules, and convenience factors. Most student respondents live within five miles of campus, but over one third live farther out.

The University of Delaware is experiencing the same pressures to its transportation infrastructure that many other Universities struggle with. To meet President Assanis’s aspirations for campus expansion, it is easier for the University to build on land it already owns than to procure developed land from the community. Parking lots are tempting building sites.

Simultaneously, parking garages are very expensive to build and maintain, and building parking underneath a building structure can double the cost of construction. For this reason, local congestion issues, Scope 3 greenhouse gas emissions, and real or perceived availability of adequate parking spaces for permit holders, it’s in the University’s interest to encouraging students who do not require regular car use to leave their cars at home.

Based on the results of this survey, improving or expanding bus service and improving some cycling infrastructure are popular solutions among students. These solutions many also have additional benefits, like increased safety for cyclists and pedestrians. Improved night time bus service or improved exterior lighting along popular walking and biking routes could increase students’ sense of safety.

Students are also price sensitive, so incentivizing the desired behavior changes could be another successful strategy. That could mean better incentives for carpooling, for example. Or launching a bikeshare service in coordination with the City of Newark. Any encouragement of cycling should also be paired with a roll out of functional bike lanes on and around campus, though such a roll out could be years in the making.

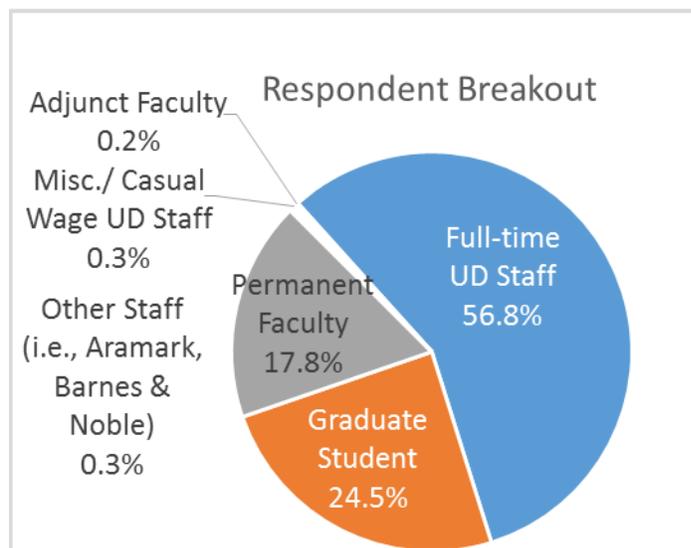
If and when new buildings are built on campus, they are likely to reduce the total number of parking permits. Even if permit prices remain the same, the scarcity of parking spaces will increase. This will also pressure students to drive less, as the convenience of driving is reduced by parking scarcity. Future survey questions could attempt to measure this by asking respondents when they are typically travelling to campus, and how long it takes them to find parking. Parking Services could use this information to communicate time and convenience factors to students, faculty and staff. For example, if it

takes more than 15 minutes to find parking during peak hours, then for most students walking would have been faster.

Finally, more electric vehicle charging stations should be deployed so that all permit holders can access them. Parking Services can work with the Sustainability program and the results of this survey to determine high-value locations. The Sustainability program should consider options for potential incentives for electric vehicles on campus, and should also communicate state or federal incentives to students, faculty and staff.

Faculty, Staff and Graduate Students

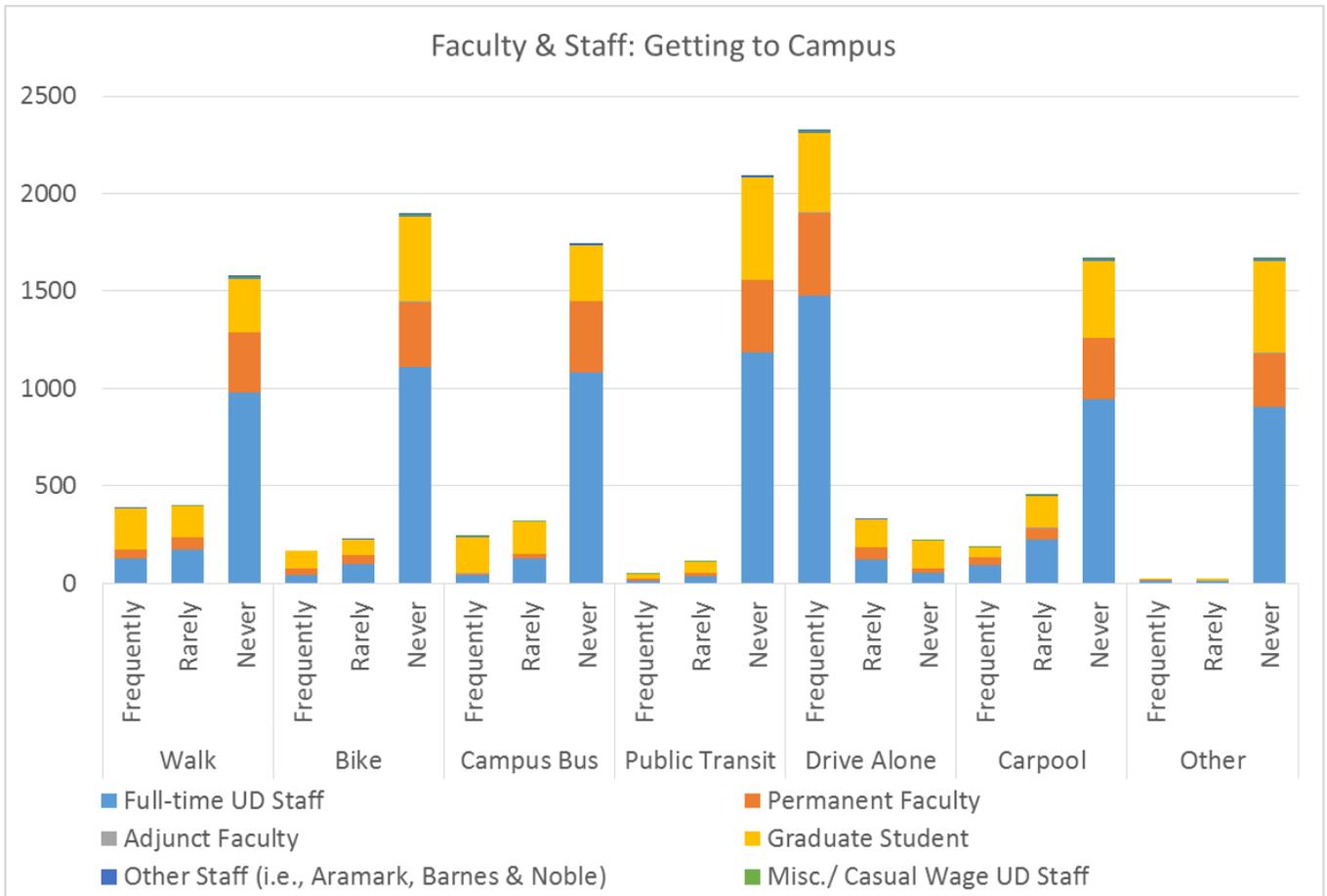
Among faculty, staff and graduate student respondents we had a mix of responses from UD community members in different roles. Full-time staff by far made up the largest portion of respondents, with graduate student represented next. In future surveys it may be beneficial to reach out to more staff groups to encourage participation, as improved transportation access can have implications for recruitment and retainment of staff.



Getting to Campus

Among UD undergraduate students we saw very consistent results across class years when it came to campus travel. Most students walk. But the picture is more complicated among UD's diverse faculty, staff and graduate student population. The vast majority of respondents (~92%) report driving to campus at least once per month, with (~75%) driving alone to campus the "Majority of the Time". Walking is the next most common form of travel to campus, with ~33% of respondents walking at least once per month and ~12% of respondents on the hoof the "Majority of the Time." The third most common form of transit is the UD Campus Buses with ~10% of respondents choosing this transit the "Majority of the Time" or "Often".

Biking is not as popular among this group, with ~83% reporting that they "Never" bike to campus, and only ~5% of respondents biking the "Majority of the Time". Carpooling, in contrast, is relatively more popular among faculty, staff and graduates, but on an inconsistent basis. ~5% of respondents carpool "Majority of the Time", but ~15% carpool "Rarely". Finally, non-UD Public Transit option are rarely used by these respondents, with ~93% reporting that they "Never" use public transit. In the "Other" category, only ~3% of respondents provided a comment and many comments cover options captured in other questions. Motorcycles are the most common "Other" transit option, representing ~19% of the comments.

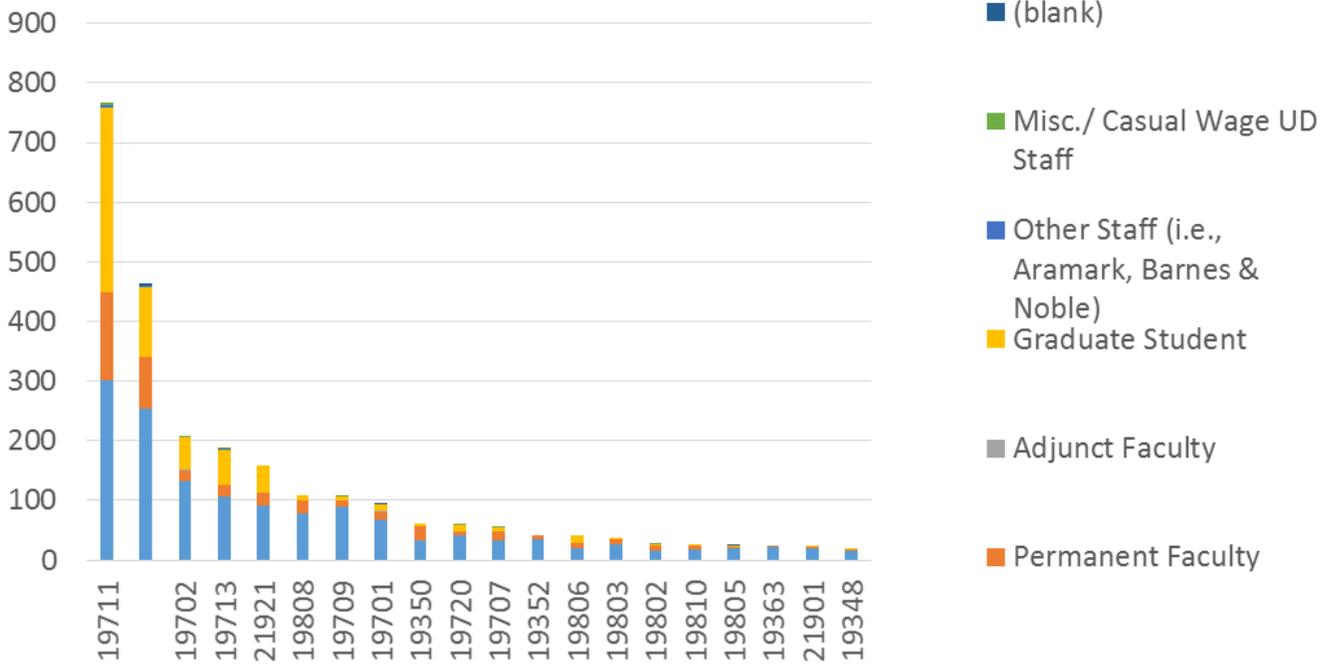


In the graph above, “Frequently” is an aggregate of “Majority of the Time (15+ days/month)” and “Often (9-14 days/month)”. Rarely aggregated “Sometimes (4-8 days/month)” and “Rarely (1-3days/month)” to improve readability of the visual information.

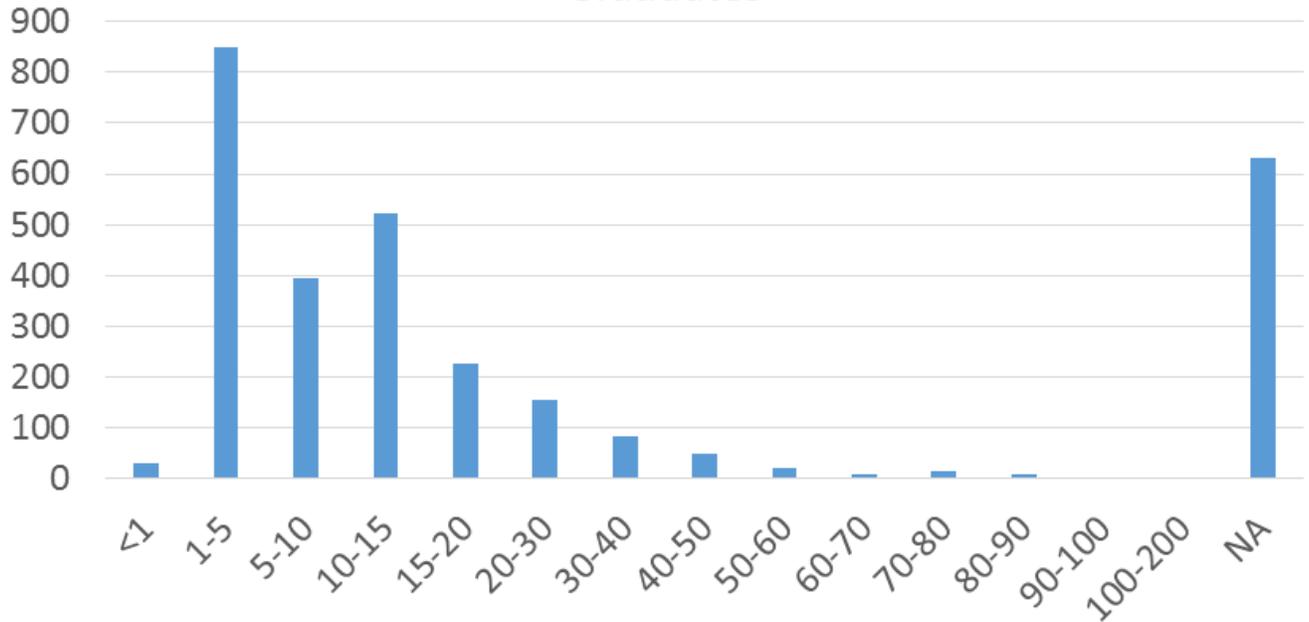
For the series of questions concerning commuting distances, there were many fewer confusing or missing responses in the Faculty, Staff and Graduates survey. It’s not surprising that most respondents live near the University of Delaware, but for a variety of reasons there are also many residences farther afield from the core Newark campus. For example, many “popular” ZIP codes reported by Faculty, Staff and Graduates line up along the I-95 corridor between Baltimore, MD and Philadelphia, PA. Delaware itself was also well-represented, with numerous ZIP codes reported down state.

The Top-20 reported ZIP codes are captured in a graph below, and juxtaposed with respondent estimates of their one-way commute distance:

Faculty, Staff, Grads: What ZIP Code are you traveling from on your routine commute to campus?"



One-Way Commuter Distance (miles): Faculty, Staff, Graduates



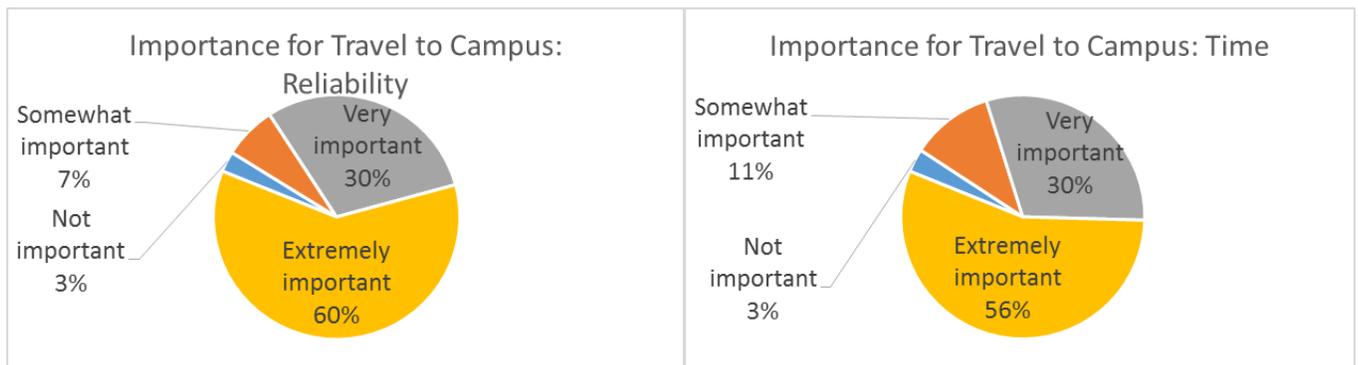
We repeated the same methodology as the undergraduate student survey and aggregated blank, unclear or “don’t know” answers into an “N/A” category. About 21% of respondents either did not provide an estimated distance for their commute or their answers were not clear (e.g. “about 5 minutes”). In future surveys it’s recommended that we restrict this answer to numbers only, clarify that they are measured in “miles” and include wording that encourages rough estimates.

About 29% of Faculty, Staff and Graduates reported that they live within five miles of campus, and ~42% of all respondents live within 10 miles of the Newark campus. ~60% of respondents live within fifteen miles of campus. With so many faculty, staff and graduates so close to campus, perhaps there are opportunities for “Park and Ride” or other similar programs to serve cities or towns where many of our community members are living.

When it comes to travelling to campus, many Faculty, Staff and Graduates have additional concerns than a traditional undergraduate. Some folk have children or care for family members and require flexibility in their travel arrangements. Others are obliged to transport heavy or bulky equipment or materials for their work routine. Still others work at multiple UD locations, such as the Lewes campus or Extension offices. All of these scenarios complicate their transportation needs and may explain why such a high proportion of this group drive to campus on a daily basis.

We asked respondents about the factors important to them while deciding how to “travel to campus”. By far “Convenience” was the top priority, with ~93% of respondents reporting it as “Extremely Important” or “Very Important”.

“Reliability” and “Time” were the next most important factors:



The survey also asked about cost and comfort. Cost accrued ~68% from respondents as “Extremely” or “Very” important. Respectively, comfort accrued ~55%. It’s clear that, compared to students, this respondent group is relatively less cost sensitive. However, it’s telling that “Time” and “Reliability” were top priorities after convenience because they are each components of convenience. As such, it may be possible to encourage more public transit use if the options are either more timely or more reliable. “Other” responses to this question help flesh out other important factors of “Convenience”, as well as additional concerns when determining how to “Travel to Campus”:

- Safety (~17%)
- Flexibility, including option to respond to childcare or family health care needs (~12%)
- Weather (~9%)
- Environment impact (~8%)
- Health, including exercise (~6%)

- ADA or Health-Related Accessibility (~5%)
- Need a car for work, including hauling equipment (~5%)

While on Campus

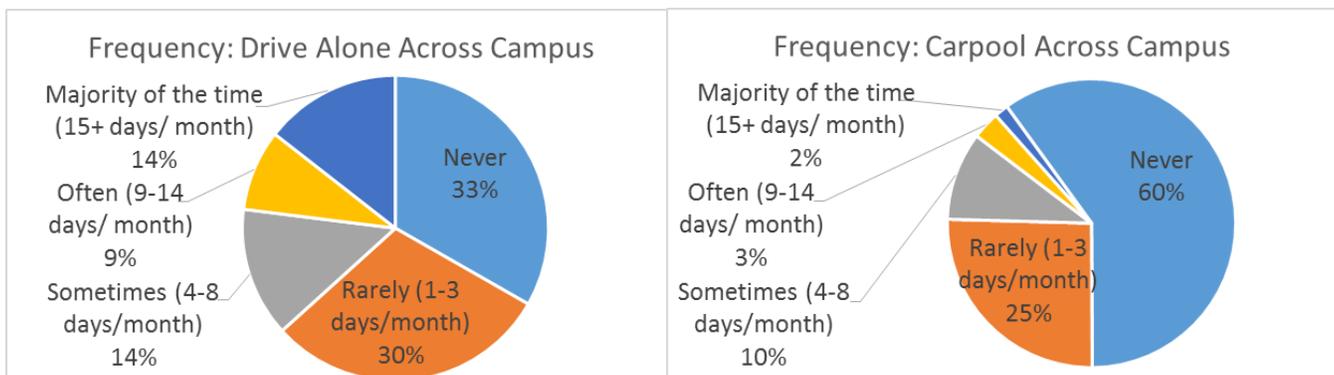
Because faculty, staff and graduates are more likely to be on campus year-round, we asked them additional questions concerning how they travel across campus during the course of their working day. We explicitly mentioned that these were trips for meetings or lunch, to separate this group of questions from those related to commuting.

Not surprisingly, the majority (~68%) walk across campus the “Majority of the Time (15+ days / month)”, with an additional ~11% walking “Often (9-14 days / month)”. Only ~3% of respondents “Never” walk across campus.

Cycling across campus was much less popular, even when compared to undergraduate student cycling. Only ~5% of respondents report cycling the “Majority of the Time” or “Often”. ~86% “Never” cycle across campus.

UD Buses were somewhat more popular for occasional trips, with ~24% of respondents riding the buses “Rarely” or “Sometimes”, but only ~7% riding the “Majority of the Time” or “Often”. Feedback on bus service is discussed below.

There are interesting disparities between those who drive alone across campus, and those that carpool. To some degree a disparity will always exist because sometimes you’re the only person traveling to a meeting. However, it may be beneficial to improve certain services to reduce single-use trips.

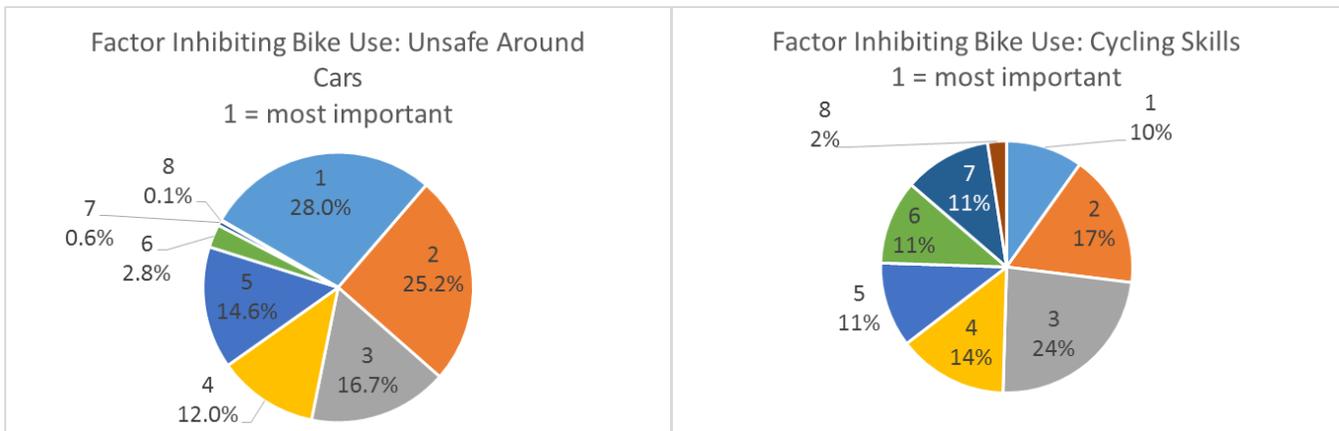


Other sections of this report address factors inhibiting cycling, UD buses or other options available for short campus trips. Please refer to the following sections for additional information.

Biking

Biking is a very different topic for faculty and staff than for (most) graduates and undergraduates. Respondents reported two main reasons: professional attire expectations and health. Many folk noted that their offices expected professional dress that did not mesh well with cycling, whether it was a question of

dirt and grime from the road or access to showers. This may be part of the reason why only 17% of respondents report cycling to campus at all, and among cyclists the largest group (~7% of total) report cycling “Rarely”.



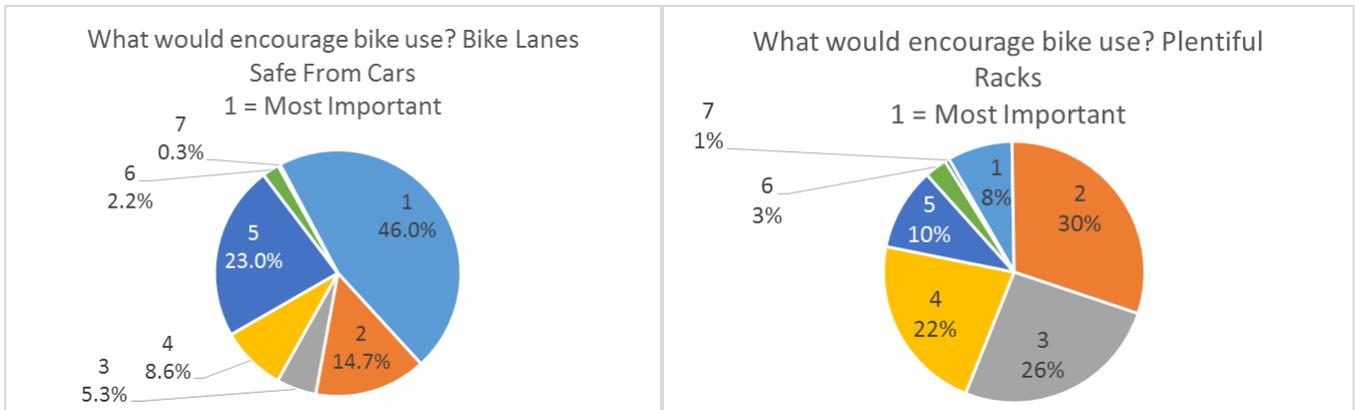
Professional attire concerns can be remedied with outreach to offices and education for faculty and staff on the locations of showers and changing areas for their use. The “Little Bob” north of Main St., for example, has faculty and staff shower and locker facilities. Other buildings on campus may also have shower facilities available for faculty and staff, though at this time a comprehensive list is not readily available. Outreach to managers, and “Tips and Tricks” for would-be cyclists would also help to educate both parties on their options without sacrificing and appropriate level of professionalism.

Under the “health” category, we received additional feedback from faculty, staff and graduates on why they were not able to bike to work. Some folk have children or family members they care for on a regular basis, others have health concerns, and some are obliged to transport bulky or heavy equipment on a regular basis. Finally the weather can pose a non-trivial barrier to cycling during the hottest and coldest months of the year.

Among factors inhibiting bicycle use, “Safety from Cars” was a major (~70%) top-3 priority. The next largest top-3 priority was “Cycling Skills” at ~51%, echoing a lack of confidence among potential bicyclists. A full ~36% listed “Can’t Ride a Bike” as a top-3 priority. “Convenient Bike Routes” accrued ~37% as a top-3 priority. Finally respondents offered additional feedback in the “Other” section:

- Distance from work (~25% of comments)
- No bike (~18% of comments)
- Attire / Showers (~6% of comments)
- Bike Storage (~4% of comments)

When we asked respondents what would encourage more bike use, safety and convenience were top concerns:



Covered bike racks do not currently exist on campus (unless someone keeps their bike in their office), but did receive ~56% as a top-3 priority. Surprisingly the convenience of the location of the bike rack was less important, with ~24% as a top-3 priority. Depending on where you work on campus, it is true that parking is not necessarily convenient, so perhaps many faculty and staff are used to walking a short distance once they arrive on campus. Finally, “Safety from Pedestrians” accrued ~46% as a top-3 priority,

In the previous section of questions concerning current bike use, professional attire and access to showers came up in the comments, but in this section it only accrued 17% as a top-3 priority. There were a fair number of comments in the “Other” category:

- Will Not / Cannot Bike (~35% of comments)
- Distance from home (~15% of comments)
- Want Bikeshare (~8% of comments)

Feedback:

- “During winter, Grounds does not clear bike spaces of snow, but often piles snow to block the bike spaces”
- “Hotline to remove old bikes”
- Bike Safety Lessons / “Cyclists are dangerous”
- More Bike Lanes
- Theft

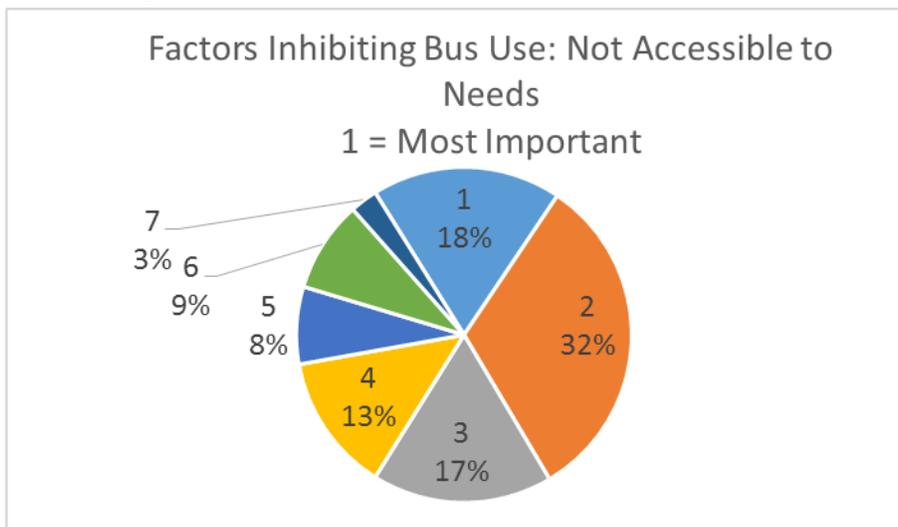
Campus Buses and Public Transit

We asked identical questions concerning the UD Bus service to all survey participants. Among faculty, staff and graduates, we saw slightly different priorities from the undergraduate student population. As previously mentioned, ~10% of these respondents use the UD Bus systems “Often” or the “Majority of the Time.” Given the greater distances many folk in this group travel on a day-to-day basis, it makes sense that an implicitly local service will not serve all commuters.

However, once faculty, staff and graduates are on campus, ~31% report that they use buses to travel across campus for meetings, lunch, etc. Of this ~31%, about 18% report using the buses “rarely”. Situational convenience, or non-routine trips for meetings or appointments may account for such

infrequent use of UD Campus buses. Outreach efforts to increase familiarity with the buses could help, especially with the App that is freely available.

We asked respondents to weigh in on factors that currently inhibit bus use on campus. We did stipulate whether UD Bus use was for commuting or day-to-day transit needs. Among students, the convenient locations of bus stops were a top priority, but among faculty, staff and graduates accessibility is more important:



We did not explicitly define “accessibility” in the context of this question, though we did receive some comments throughout the survey concerning accessibility for less-able members of the community. For example, older faculty or staff provided comments about the length of time they might have to stand, or the distances they might need to walk, relative to their health and ability.

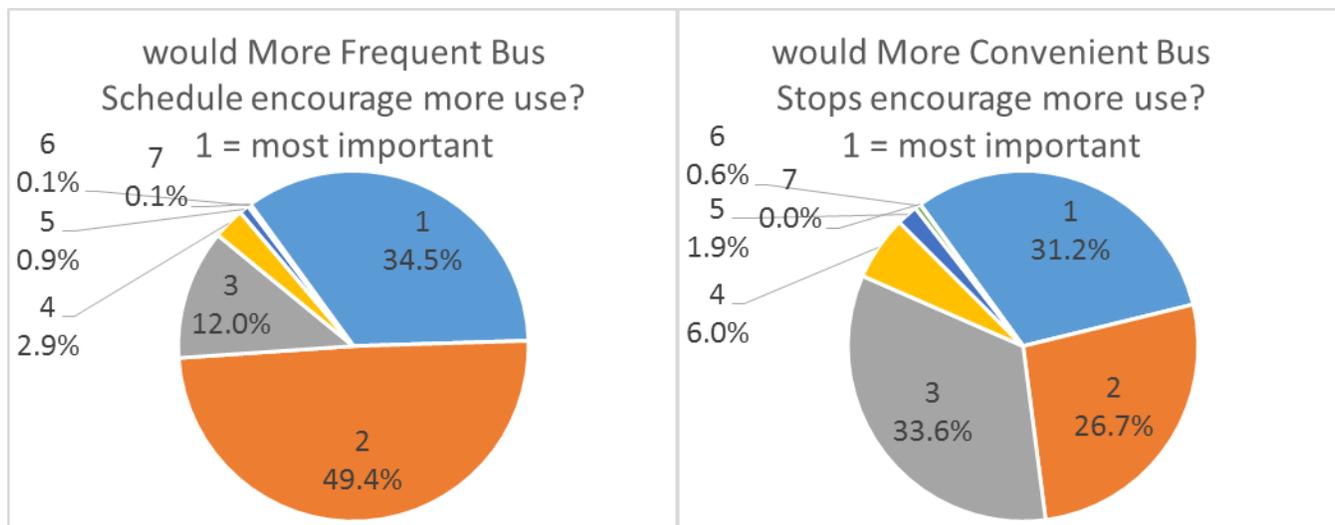
After accessibility, the next most prominent concern about factors inhibiting bus use was bus stop locations. ~62% of respondents listed this as a top-3 concern. Among driving commuters, bus stop location was a top-3 priority for ~60% of respondents.

Bus predictability was the next most important factor for respondents. Bus schedules aggregated ~47% as a top-3 concern. Reliability, both as scheduled pick-up time and drop-off time, similarly aggregated ~46% and ~45% respectively as top-3 priorities.

In contrast, “Buses are Full” aggregated ~86% as a *bottom-3* priority. Among “Other” responses, over half of comments (N=375) indicated that they did not need bus service at all. This aligns with findings from questions concerning on-campus transportation, which have already been discussed in this report. Many faculty, staff and graduates walk while they’re on campus. Among feedback from the “Other” comments:

- Confusion over bus schedules and reading / accessing bus schedules (~7%)
- “West loop buses are sometimes not listed in the app or webpage”
- Child care or need to haul equipment (each ~2%)
- 1-way bus loops inhibit round-trips
- Need more or better transfers to other transit options
- “No buses from Wilmington AMTRAK” (UD buses or other buses)
- “Buses are not suitable for my position at UD”
- “Buses are for students”
- “Don’t like riding buses” / “Public buses aren’t safe”

Just as with the undergraduate survey, we also asked what would encourage more UD Bus use on campus. The response was essentially unanimous, and unsurprising for a group that values timeliness and convenience:



About 96% of respondents listed a more frequent bus schedule as a top-3 priority, with over 80% ranking bus schedules as a top-2 priority. Next, ~91% chose more convenient bus stop locations as a top-3 priority with over half of respondents listing it as a top-2 priority. The next most popular initiative is telling – Sheltered Bus Stops with ~55% rating it as a top-3 priority. There are currently few sheltered bus stops on the UD campus; many bus stops are simply a sign on a post with no benches or other amenities. For faculty and staff who currently find the bus systems intimidating or unwelcoming, shelters at strategic or popular bus stops may be a way to encourage all users.

Respondents who chose “Other” and offered comments (N=281), many stated that they did not want or need bus service (~56% of comments). Other echoed issues that were also captured in other banks of questions:

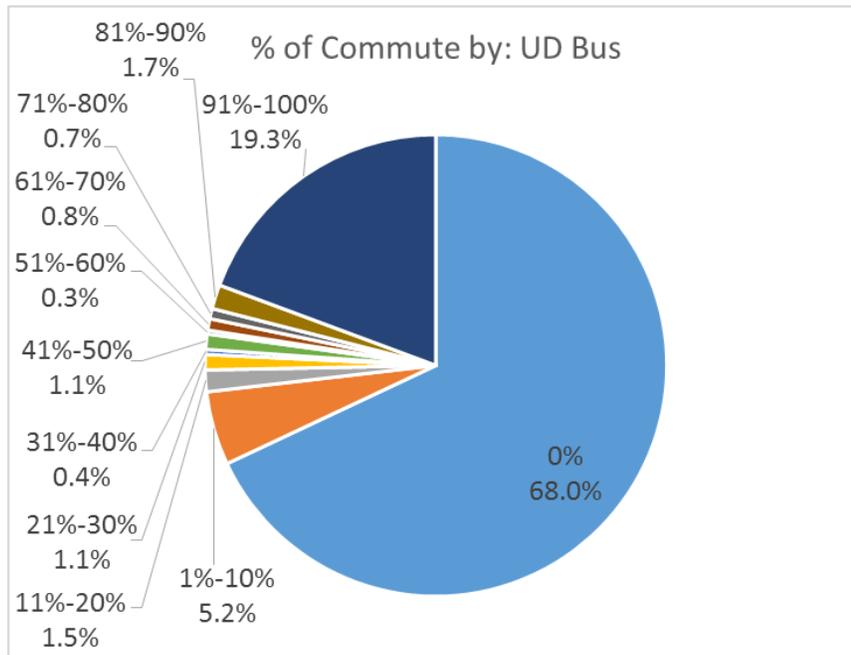
- Need flexibility for child care or to care for a sick family member
- Desire for information / schedules available at bus stops
- One-way loops are inconvenient for round-trips
- Work late, too dark or unsafe at bus stops
- Accessibility

Multimodal Transportation

We asked our faculty, staff and graduates what percentage of their time they spent in multimodal transit options. For example, what percent of their commute was spent walking, on a bus, or in a car, etc. This helps us determine how people are reaching the campus, and also informs our greenhouse gas inventory.

What we found was that, among those who use public transit, they either use it the majority of the time or not at all. For example, among those who reported riding UD buses to campus for their commute,

~19% reported riding 91%-100% of the time, which was the largest percentage group of all other riders combined. ~68% reported never riding the UD Buses for commuting purposes.



Among other public transit options, ridership is even lower. ~93% of respondents “Never” use DART for commuting; ~98% “Never” used UniCity Bus for commuting. ~2% of respondents use AMTRAK, 31 total respondents (~1%) use SEPTA and 6 total respondents (~0.5%) use Cecil County Transit. Among respondents for these local transit options, we see the same pattern where riders either use them very rarely (< 20% of the time) or very frequently (>80% of the time), with very few intermediate riders.

Feedback from this bank of questions was very interesting.

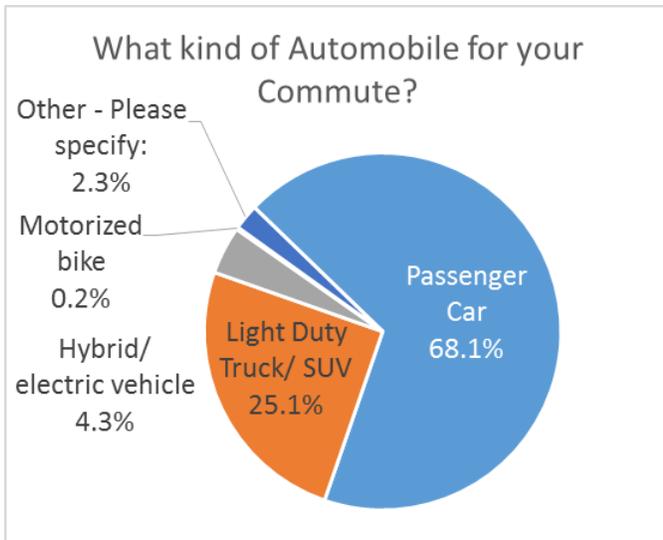
Some faculty, staff or graduates park their cars some distance from campus and walk or cycle the rest of the way in. Others combine personal vehicles and a public transit option. Finally, some folk do combine public transit options, like AMTRAK and SEPTA, as the questions hoped to unveil.

In other portions of the survey, there were a number of comments related to transit options between Wilmington and Newark, but several respondents to this question explicitly mention SEPTA service from Wilmington. For example, one comment reads, “SEPTA from Wilmington to Newark in mornings.” It is recommended that more information about these transit options be promoted by UD Sustainability and Parking Services to encourage more riders consider the option.

Finally Uber (~2% of comments) and Megabus (~0.7% of comments) were also captured, but no one mentioned ZIP cars. Future surveys should include these options to determine if these options will increase in popularity in the future, as they have impacts on traffic and parking.

Driving

For drivers, we asked what kind of vehicle they typically use. Passenger cars are popular, as well as trucks / SUVs. There are more hybrid / electric vehicle owners among faculty, staff and graduates. Minivans were the most common vehicle reported under the “Other” category at ~15%. Most of the remaining “Other” responses were captured in different questions. In this survey some folk who reported that they do not drive or own vehicles were nevertheless asked questions about vehicle use. In future surveys we should exclude these respondents from non-applicable questions.



Gasoline was the most common type of fuel by far, representing ~97% of respondents. ~1% of respondents reported using diesel and electricity, respectively.

We also asked about parking permits, preferred parking and priorities related to choosing a permit. Students are very price- and convenience-sensitive when it comes to parking, but faculty, staff and graduates are more likely to spend more total hours on campus on any given weekday, and express more diverse needs. About 80% of

respondents report that they park at a UD Campus lot.

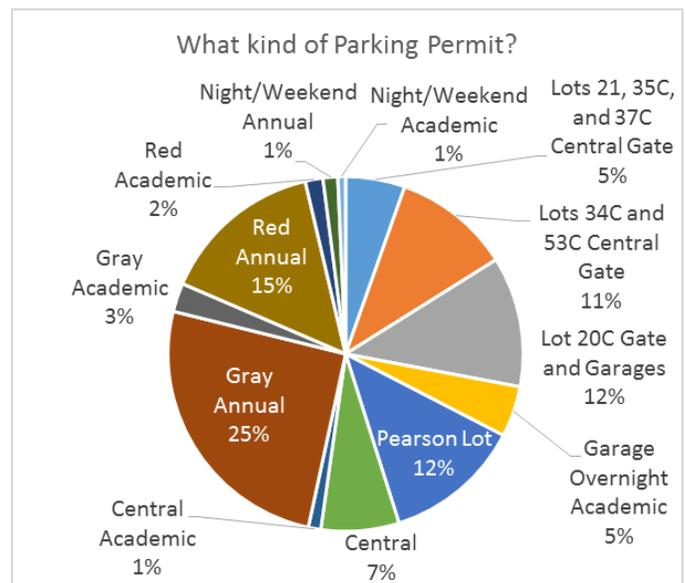
Respondents ranked convenience as their top priority in choosing a parking permit, with ~94% ranking it as a top-3 priority. Unsurprisingly, cost was the next most important consideration with ~80% choosing it as a top-3 priority. The next most important topic was parking availability, with a top-3 accrual of ~59%, but only ~6% of respondents listed this as their top priority.

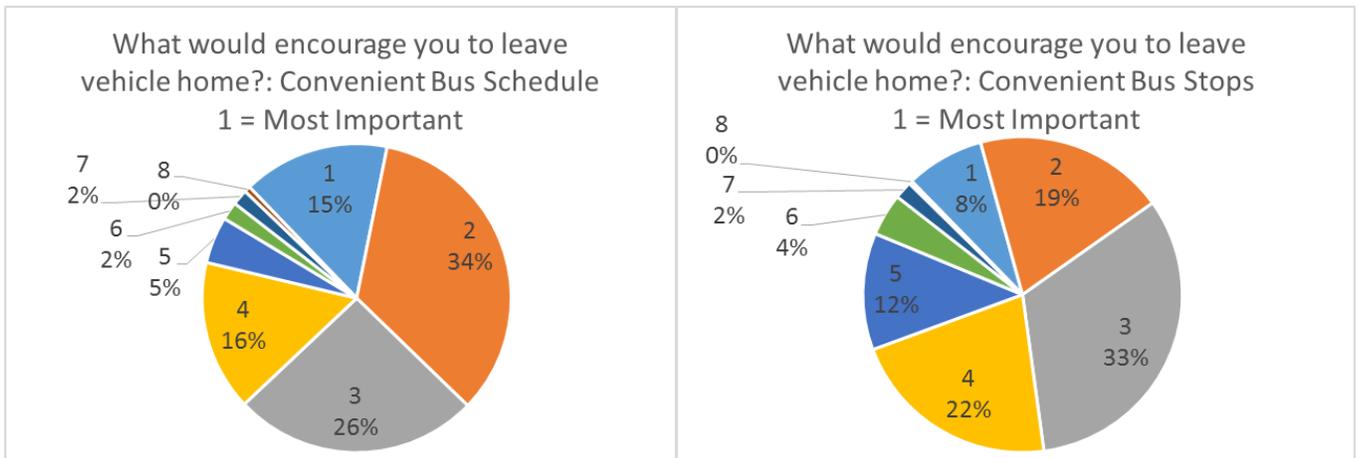
The “Other” category only had 77 comments (out of N=2994), but there was important feedback. We have heard throughout the faculty, staff and graduates survey that some folk need to haul heavy gear for work, or that they have health concerns that impact how they travel to work. These considerations are also echoed in parking decisions, among others:

- Covered parking (~12%)
- (Un)loading heavy supplies (~7%)
- Proximity to office for ADA, health, child care, or family emergency reasons (~7%)
- Safety / risk of damage to vehicle (~5%)
- Electric vehicle charging station (~3%)

We also asked this group where they typically parked off-campus, if they did so. City of Newark Lots were, by far, the most common (>22%), and “street meters” (UD or City of Newark) also popular (~10%). Some people also park in the driveways or their local friends or family.

Like students, we also asked faculty, staff and graduate drivers what would encourage them to (occasionally) leave their vehicles at home. The most common responses related to bus service.





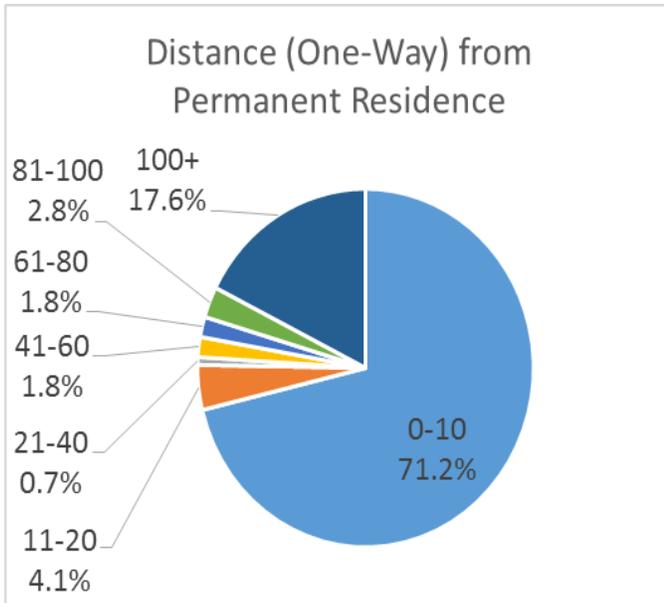
Among respondents, convenient bus schedules were at top-3 priority (~75%), and convenient bus stop locations were the next most popular top-3 priority (~60%). Notably, the next highest ranked top-3 priority was “Nothing would motivate me to leave my vehicle at home” at ~47%. Finally, “A Financial Incentive” accrued ~45% as a top-3 priority. Questions about safer or better biking and walking infrastructure garnered relatively less support with ~52% and ~75% respectively as a *bottom-3* priority.

Feedback in the “Other” category focused mainly on the distances of commutes and real or perceived time other transit options would require to reach work (~31%). The necessity of flexibility for child care, caring for a loved one, the need to drive for work, and hauling heavy equipment were also core concerns (~15%). Additional feedback:

- Trains from Philly, Baltimore and/or Wilmington
- “Better incentives to carpool”
- Park & Ride near bus stops
- Teleportation device

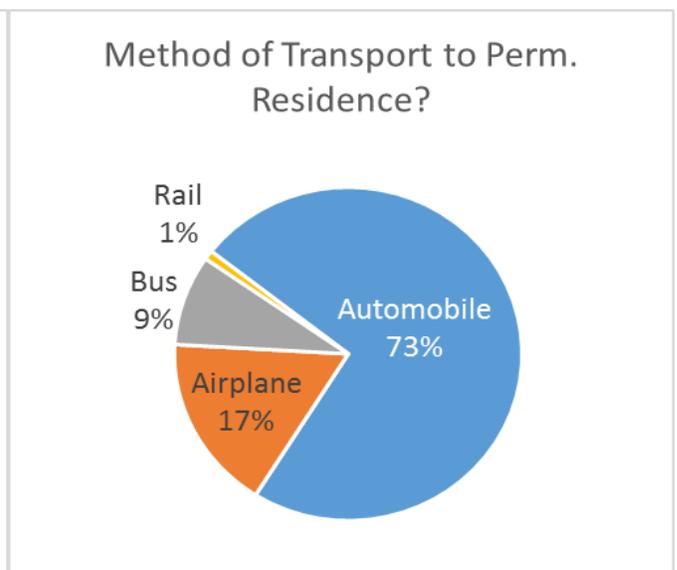
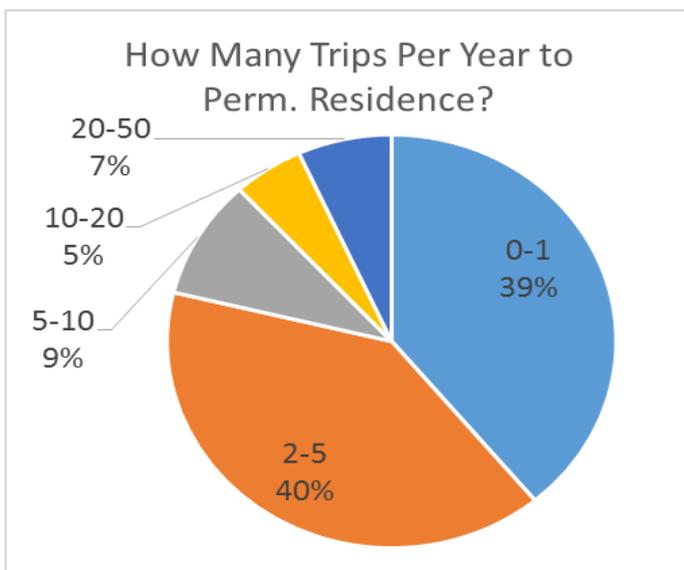
Unlike undergraduate students, a larger portion to faculty, staff and graduates live near the UD Newark Campus full-time. There is nevertheless ~29% of this group that only live near campus for a portion of the year and return to their permanent residence the rest of the time. This is also reflected in some of the ZIP codes respondents provided in another section of the survey. Most people who live far from campus are in the USA and may reflect academics, recruiters, and Extension faculty / staff.

Please note, the proportion of respondents who report living near the UD campus, and the proportion of respondents who report living within 10 miles of campus appear to be the same. They are not the exact same persons. N=2527 for the question “Do you live near campus for part of the year in order to work / study at UD?” And N=716 for the question “About how many miles (one-way) is your permanent residence from campus?”



We asked the “Distance (One-Way)” question in an ambiguous way on purpose. We wanted all respondents to consider the question, even if they lived close to campus. In this way we were able to collect more data about commuting behaviors beyond the previously discussed questions. The responses to this question echo a similar previous question that asked respondents to give a specific distance for a one-way commute, but offering distance ranges removes some of the confusion and inconsistency. You cannot choose “about 10 minutes” in this question.

To ask how many faculty, staff and graduates actually live part-time near campus, we asked the follow-up question about how many trips they take to their permanent residence each year. For this question, N=118.

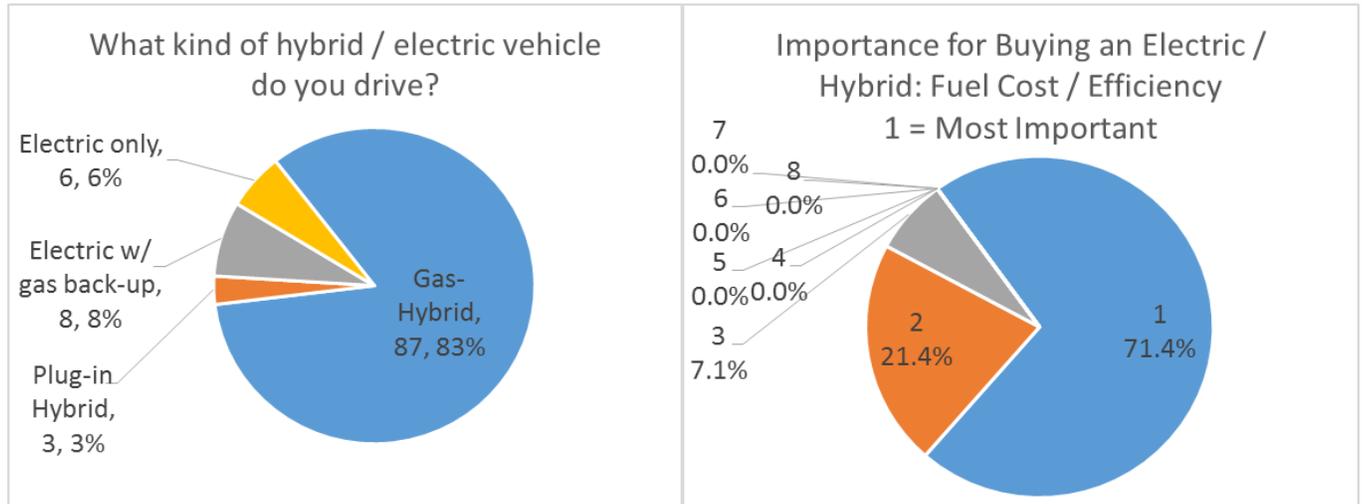


Carpooling

Among drivers, ~21% report carpooling at least occasionally. We asked respondents how many people typically carpool with them. About half of carpoolers ride with one passenger, and the other half ride with two passengers. Less than 1% of carpoolers ride with more than two passengers.

Hybrid and Electric Vehicles

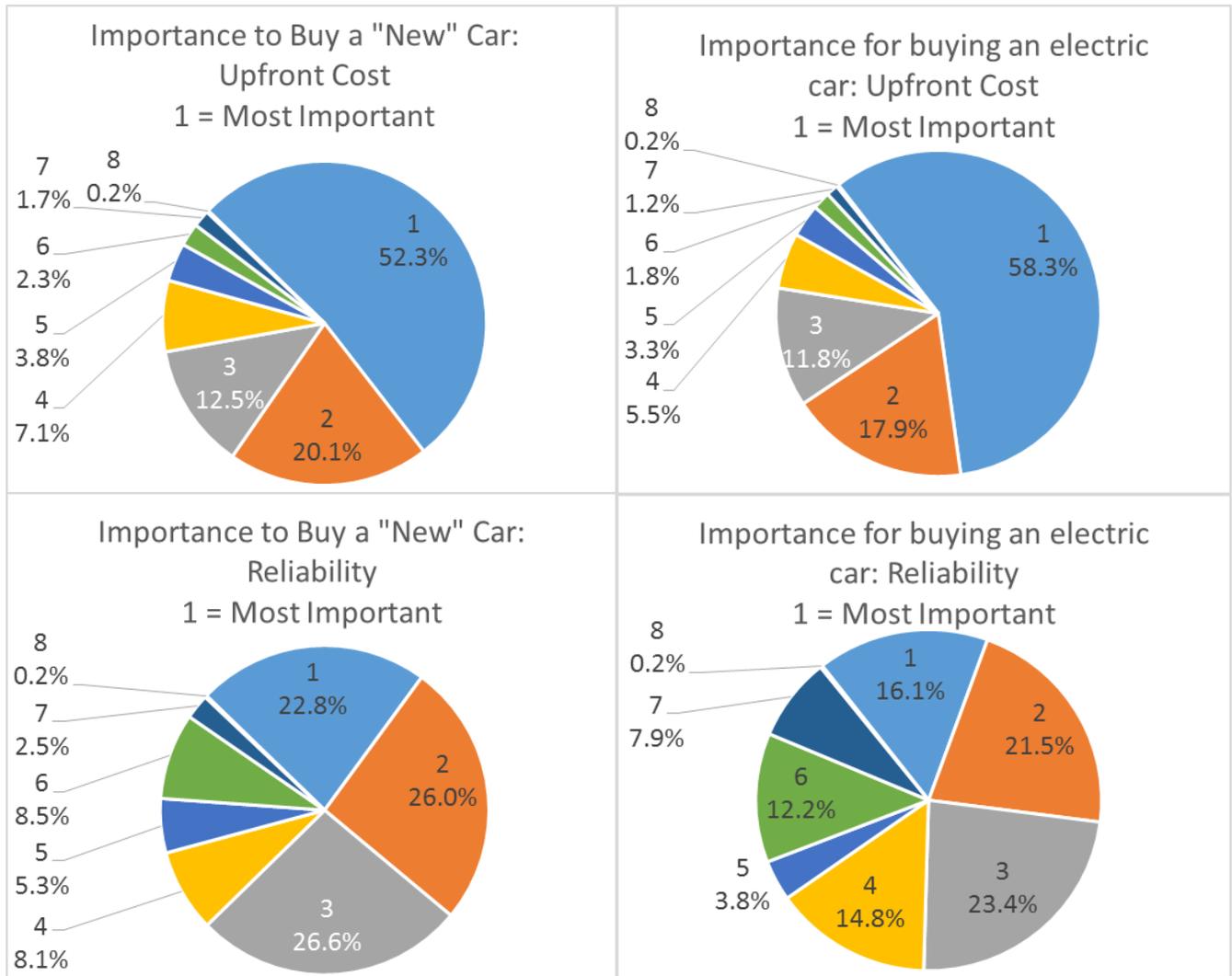
There are more faculty, staff and graduate respondents that drive hybrid or electric vehicles on campus (N=104), as compared to undergraduate respondents. We asked respondents who already owned hybrid or electric vehicles what their priorities were when considering their purchase. Among those who already owned an electric car, their priorities were surprising.



100% of respondents (N=98) to these questions rated Fuel Cost / Fuel Economy as a top-3 priority, with ~71% listing it as the #1 priority. This is literally the only unanimous response to any question in the survey. Upfront cost was the next highest priority, with ~65% of respondents listing this as a top-3 priority. Reliability was also important for respondents, with an accrual of ~56% as a top-3 priority.

Surprisingly, range was relatively less important, with ~34% of respondents listing it as a top-3 priority, but a full 20% of respondents listing it as their #2 priority. Style and comfort were still secondary to practical concerns. We speculated that “Fun to Drive” would be relatively more important to members of our community who may have owned multiple cars over the course of their lifetime. This was not the case, “Fun to Drive” was a bottom-3 priority, at ~89%.

For comparison, we asked all faculty, staff and graduates about their priorities in buying a new (to you) car and an electric car. With many more responses in these categories, we have a greater understanding of general attitudes about these vehicles. Among undergraduate students, the core priorities were consistent: upfront cost and reliability. Faculty, staff and graduate priorities were more closely aligned with undergraduate when it came to standard vehicles than electric vehicles, with upfront cost and reliability being the most important priorities.



What's interesting is that for electric cars, some users seem less concerned with reliability than for standard cars. It's not clear why. It could be that other priorities were competing with reliability, or that user attitudes towards the new technology are more permissive. In future surveys, it might be interesting to further investigate this topic with a follow-up question.

Fuel economy, in contrast, was the unanimous top-3 priority among electric vehicle owners, but among respondents it accrued ~73% top-3 priority for buying a standard vehicle and ~70% for proposed electric vehicle purchases. At the time that this survey was conducted, fuel prices were relatively low. It will be interesting to see if / how future fuel prices impact this question, whether higher or lower.

It would also be interesting to ask respondents how much they think it costs to charge a typical electric vehicle, versus filling a tank of gas, and asking this question again after the actual price of electric vehicle charging is revealed to them. The cost of charging an electric vehicle depends on factors like battery size, charging capacity, etc., but it is still typically at least 80% cheaper than refueling a gasoline vehicle.

Style and comfort were still middling priorities for vehicle purchases, and brand was one of the lowest priorities (~59% bottom-3). Similar to questions about electric vehicles, "Fun to Drive" was the lowest priority for both standard and electric vehicles.

Among respondents, ~92% listed “Other” was the lowest priority for standard vehicles. Feedback was surprisingly straightforward:

- Safety (~34% of comments)
- Utility / Specific Features, e.g. towing, snow handling (~19%)
- Seating capacity (~15% of comments)

The “Other” category for purchasing an electric vehicle also ranked lowest in priority (~89%), with feedback:

- Don’t want (25%)
- Location of charging stations (17%)
- Safety (12%)
- Availability of charging stations (7%)

Electric Vehicle Charging Stations

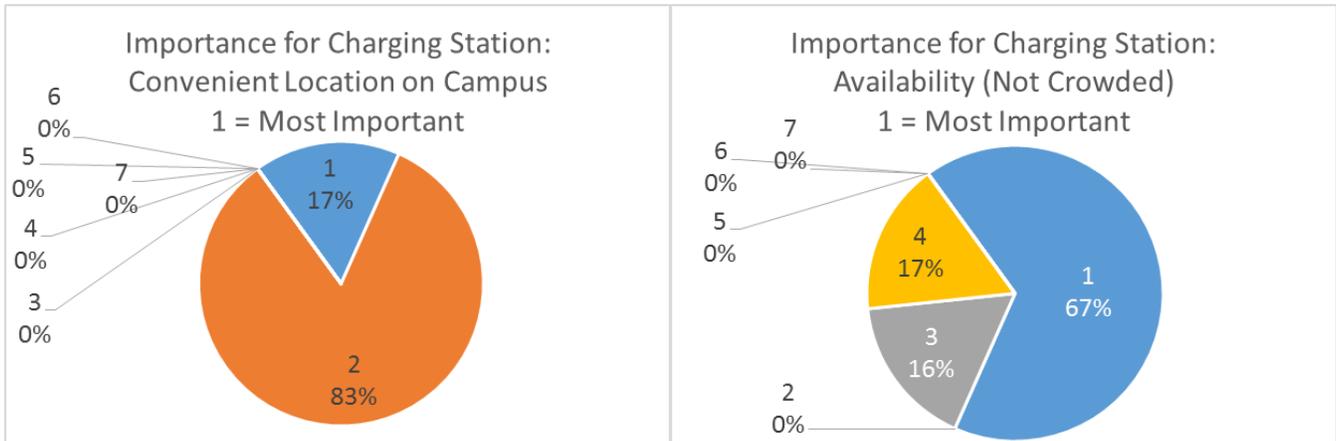
Among those that already can plug in their vehicles, about 35% report that they use the electric vehicle charging stations on campus, but the total number of respondents was very low, N=6. In contrast, 11 respondents with vehicles that plug in reported that they do not use the charging stations on campus. In future surveys as electric vehicles become more common on campus, it will be interesting to see if this portion changes. Also, it’s important to note that this survey did not necessarily capture every electric vehicle owner on campus, only a “representative sample.” We know, anecdotally, that more than six vehicles regularly use our existing charging stations.

The Pearson Lot chargers are the most popular, with the Hullihen lot reported next. No one in this survey mentioned using the Perkins Garage charging stations, so perhaps better promotion of its location would be helpful, though anecdotally (via complaints to Parking Services) this station does get used and is sometimes overcrowded.

Among the 6 respondents who reported using charging stations on campus, 4 (~66%) use the charging stations Daily or Often (+4 days / week). A third of these respondents must use the charging stations to get home. Though there are not enough responses to make strong statistical conclusions about electric vehicle owner needs on campus, it is nevertheless important to understand current needs.

Currently it is proposed that UD maintains a 1:10 ratio of electric vehicles to charging ports. However, if future drivers absolutely need to charge their vehicles to get home, this ratio will need to change. Also, parking enforcement will also need to be implemented to ensure vehicles that are finished charging do not monopolize charging stations.

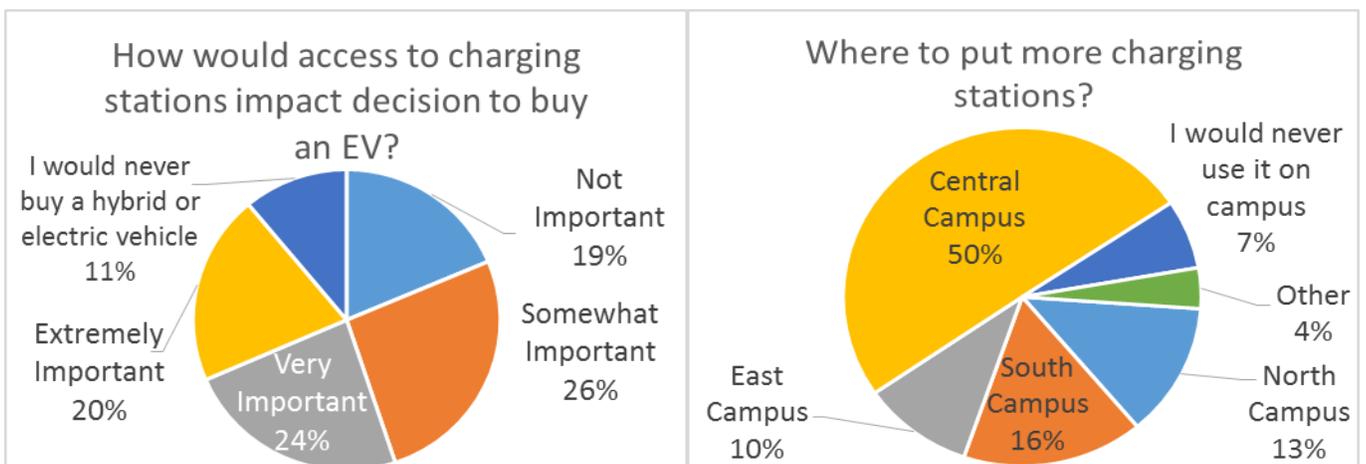
Questions about the importance of charging stations and priorities concerning them were similarly inhibited by few responses. However the responses we did collect were telling. Among electric vehicles owners, several topics were clear top priorities:



Other top-3 priorities included “Convenient Location in Parking Lot” (~50%) and “Affordability” (~33%). It should be no surprise that convenience will be a high priority for faculty, staff and graduates, as this sentiment is echoed among all commuters regardless of transit type.

Electric vehicle charging stations require robust electrical infrastructure, so it’s likely that most will, by necessity, be installed near buildings. However, it is also important to note that demand for charging stations will be high in a variety of parking lots to serve community members who work all over our campus. So placing many stations in one or two lots will not necessarily encourage electric vehicle adoption on campus. If UD wants to encourage electric vehicle adoption as part of a larger carbon reduction strategy, installing charging stations widely instead of intensely in parking lots would benefit that strategy.

We also asked all faculty, staff and graduates about how charging stations would impact their decision to buy an electric vehicle. We also wanted to give all respondents opportunity to reject electric vehicles outright, since they may not be appropriate or preferred by all drivers.



Concerning the preferred locations of electric vehicle charging stations, we welcomed additional feedback through an “Other” comments box. Here are the top-5 suggestions we received out of all comments (N=56):

- All Parking Lots (~30%)
- Trabant Garage (~9%)
- DBI (~7%)
- CFA (~7%)
- Gray Lots (~7%)

Conclusions: Faculty, Staff and Graduate Students

Among faculty, staff and graduates, getting to campus is predicated on convenience and the best use of their time. These are not surprising or unique findings, but they do pose a challenge to improving transportation services, including parking services. As the campus expands, infilling will likely mean fewer total parking spaces available and more traffic congestion. It will become increasingly more difficult and more expensive to reach campus, especially for single-occupant drivers.

Fortunately this survey offers insights to solutions. Support among faculty, staff and graduates for improved bus service are unanimous. And while it’s true that not everyone who can take the bus will, improved educational and outreach efforts can help ensure that those who will ride the bus do.

As a starting point, many comments scattered throughout the survey commented on difficulties reading or accessing bus schedules. Weather-related deterrents could be combatted with bus shelters built at strategic or popular stops, and information about bus schedules could be posted there as well. Even more frequent UDaily articles about “bus basics” could help. Based on the comments in the survey, it seemed that students were much more likely to be familiar with the bus service than even long-time employees.

Final Conclusions

This survey provided additional insights into the behaviors, preferences and concerns of the UD community surrounding a variety of transportation issues. It also looked forward to infrastructure needs and new technologies that we anticipate will shift the resources and services UD provides for our students, faculty and staff.

We saw that a huge portion of our community lives within 10 miles of campus, and a major portion of our community lives within five miles of campus. We saw that, among students, walking to campus or riding the UD Buses were the most prevalent form of transportation, with single-occupant drivers a close third. Among faculty, staff and graduates, driving alone is by far the most prevalent form of commute, with a mixture of transit options when folk traverse the campus.

Given the relatively short distances many people are taking on their commutes, we saw broad support for improved bus service. There was also non-trivial feedback that many people struggle to access information about local bus routes and schedules (both UD Buses and local public transit options). It is recommended that UD Sustainability and UD Auxiliary Services work together to improve

communications about existing bus services (both on campus and beyond) to gauge the potential of expanded ridership. We understand that just because people support bus service, that doesn't automatically translate into personal behavior change. Improving information and communication services will help those willing and able users to adjust their habits in time for the next transportation survey, at which point hopefully we can measure impact.

Without significant investment in UD buses (new buses, more drivers, etc.), there are limited options to expanding service. However, this results of this survey will be used to improve existing services. Efforts are also underway to seek opportunities to integrate the UD bus system better with surrounding bus networks, including allowing local residents to ride. Currently non-UD community members are not permitted on UD buses. Should this effort be successful, much better services will be available for UD community members travelling beyond the campus, and for community members wishing to travel to or through the campus.

Walking is also a very popular transit option on campus, indeed the #1 mode of transportation for undergraduates. For faculty, staff and graduates on campus, it's also the top way to get to meetings, grab lunch, or otherwise get around campus. UD is famous for its beautiful central campus, including the pedestrian "Green". However this survey did highlight safety concerns between pedestrians and other modes of transit, especially cyclists. Cyclists also expressed their own safety concerns about pedestrians and vehicle traffic. A transportation safety assessment was recently completed for the UD campus. This report recommends that the campus heed the recommendations in that report, and action as many as it can.

One surprise from the survey was the popularity of bicycling on campus, or rather, that cycling was not more popular. There are basic infrastructure challenges – bike racks are typically full, there is poor enforcement of broken or abandoned bicycles during semester, and there are no formal covered storage spaces on campus. It is not clear, however, if improving infrastructure would dramatically increase cycling on and around campus. A non-trivial number of respondents reported that they could not bicycle (had never learned, could not for health reasons) or that they had no interest in cycling. Among staff, especially, there were concerns about professional attire. By far safety from vehicles and pedestrians was the top inhibiting factor cited by the community. However, with limited room for road expansion through the major arteries crossing campus, UD will have to ask itself if it wants to promote buses, bikes or pedestrian access. In some places, there is simply not enough room to do all three.

UD does not own or maintain all of the main roads on campus, so advocating for major changes that do not impede evacuation routes or other public services is a non-trivial challenge. In the short term, better information and outreach could help would-be bikers learn the rules of the road and increase their skills and confidence. This could help the vanguard of new cyclists take advantage of the infrastructure, bike trails and other local resources that already exist.

Driving to campus will become increasingly difficult in future years. The reason is simple: the campus aspires to grow. As it does, more people will be coming to campus while pressure on space for new buildings will almost inevitably fall on parking lots. Parking garages are a limited solution because of their great cost, especially if they are incorporated under a new building. Encourages those who can come to campus by other means will become increasingly urgent in the future, unless additional space can be found surrounding campus. However, local neighborhoods will not be thrilled to replace homes with parking lots. The only other option is to procure existing parking capacity from the local community, which would probably necessitate a bus ride from the parking lot to campus. At which point driver

convenience (a driving factor of vehicular commute, as revealed in this survey) is severely impacted. UD will need to decide which transit methods it wants to strategically support in the next ten to twenty years, and it will need to invest accordingly.

Tied to congestion and parking issues are the interconnected concerns over climate change. Commuters are a non-trivial source of campus greenhouse gas emissions. Encouraging more folk to walk or bike to campus, where and when appropriate, can have the added benefit of relieving pressure on local roads, parking services and local air quality. UD Sustainability could definitely do more to communicate options or partner with local organizations to help would-be cyclists or walkers find buddies, receive safety trainings, etc. to overcome some of the trepidation uncovered in this survey.

Working with local transit authorities to better connect UD Buses with other local bus services would also help, as there were many comments throughout the survey commenting on the poor connections between bus services. Some of these efforts have already begun within Transportation Services, as discussed above.

It is unlikely that there will ever be a single transportation method for the campus. Our needs are too diverse. But it is the intent of this survey to help our community plan for the future and support those transit options that best serve the UD and Newark communities now and into the future. This synopsis has provided as many results and as much valuable information as possible, but does not constitute a major analysis of the 2017 UD Transportation Survey. It hopes, instead, to guide subject matter experts towards the topics and raw data that they need to pursue deeper study.

Recommendations made are the opinions of the UD Sustainability Program, and strived to base those recommendations off the views expressed broadly by community members in the survey. As such, recommendations do not reflect the views of opinions of any other group or institution on the UD campus. Finally, there are at least twenty-three intentional puns in this synopsis. Good hunting.