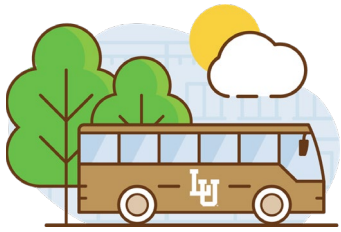




CONNECTIONS

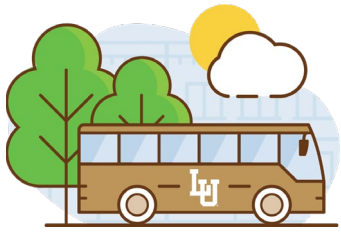
Building a Connected Community

Transit System Performance Review



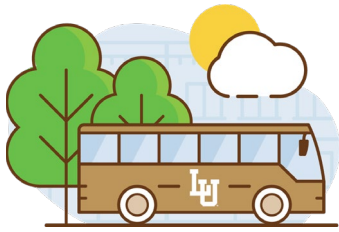
Performance Review Sections

- March 2019 (existing) Transit System
- Problem Identification
- Data Integrity
- Focus Group Outreach
- Survey Results
- Alternative Analysis
- Additional Recommendations and Items for Consideration



Transit System

An efficient and seamless transit system is essential to supporting a car-free campus and reducing reliance on the personal vehicle, integrating the three campuses, and fully utilizing all existing parking facilities.



Transit System: Deployed 2019

Route	# of Buses at Peak Hours	Monday through Friday Hours of Operation	Weekend Hours of Operation
Packer Express	1	6:30 AM to 8 PM	-
Campus Connector	5	5 Buses: 6:30 AM to 8 PM 2 Buses: 8 PM to 2:30 AM	2 Buses: 10 AM to 2:00 AM
AccessLU (Accessibility Bus)	1	6:30 AM to 10 PM	10 AM to 10 PM
Founders Way Express	1	6:30 AM to 8 PM	

What changed:

- The “Campus Connector” will run late night hours to all campuses and replaces the “T.R.A.C.S” route.
- The old “Campus Connector” and “Mountaintop Express” have been replaced with the new “Campus Connector” which will run 5 buses on the route during peak hour. This increases the number of buses running during peak hour between Asa Packer Campus and Mountaintop from 3 buses to 5 buses.
- The AccessLU is a new service that will provide on-demand service for those with accessibility limitations.



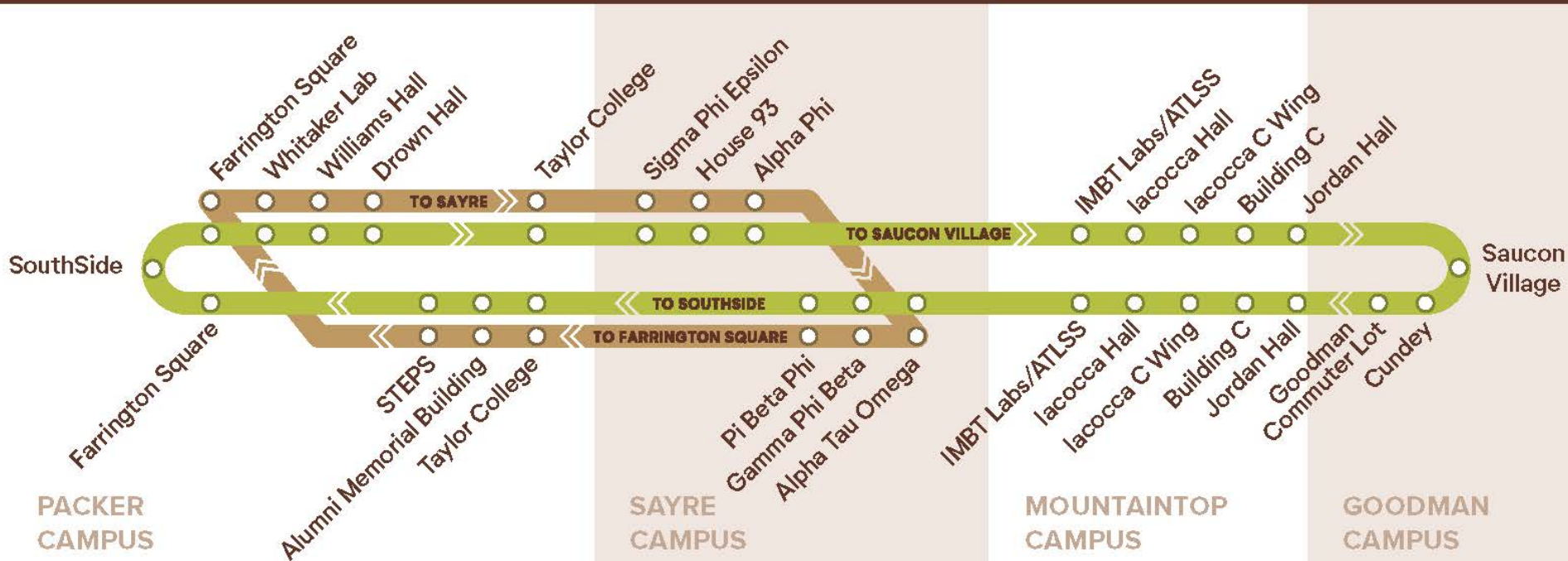
LEHIGH
UNIVERSITY



**transportation
services**



126 Goodman Drive
Bethlehem, PA 18015
(610) 758-4410



Follow us on
TWITTER!
@goLehighTransit

PACKER EXPRESS

**CAMPUS
CONNECTOR**

MONDAY – FRIDAY HOURS

1 Bus: 6:30 AM to 8 PM

**5 Buses: 6:30 AM to 8 PM
2 Buses: 8 PM to 2:30 AM**

WEEKEND HOURS

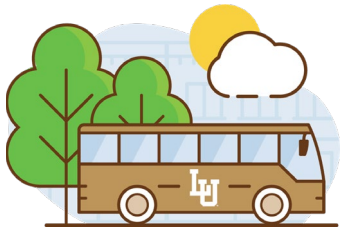
Not in service

**2 Buses:
10 AM to 2:30 AM**

TRACK US ON
bus.lehigh.edu



LEHIGH
UNIVERSITY

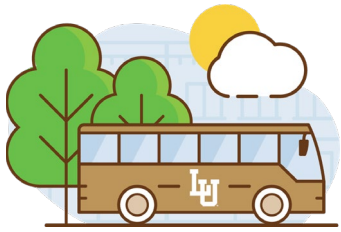


Performance Review: Problem Identification

– What we have heard:

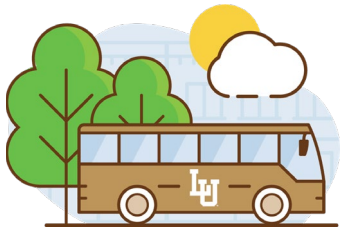
- Travel time to Goodman Commuter Lot from Asa Packer Campus takes too long.
- Bus Service reliability is not consistent (Arrival Time/Headway).
- Bus.lehigh.edu can be confusing.
- Communication over construction impacts needs to be improved.
- Class schedules are too constrained.
- The bus stops too frequently/there are too many bus stops.
- There is no room on the bus at peak times (12 PM, 2PM & 4 PM)
- Founders Way Express does not connect to the rest of the system.
- The Packer Express is not frequent enough.
- *I prefer to drive.*





Data Integrity

- Campus Connector had at least 1 of 5 buses using a ‘charter’ vehicle without counters during the month of October.
- September data cannot be relied upon due to inconsistent bus size and charter vehicles. There were a number of break downs that resulted in running 4 of 5 buses at times. The schedule was also changed at the end of the month.
- Mountaintop cell service drops and causes data to upload incorrectly.
- The University is still adjusting to new parking and transit systems.

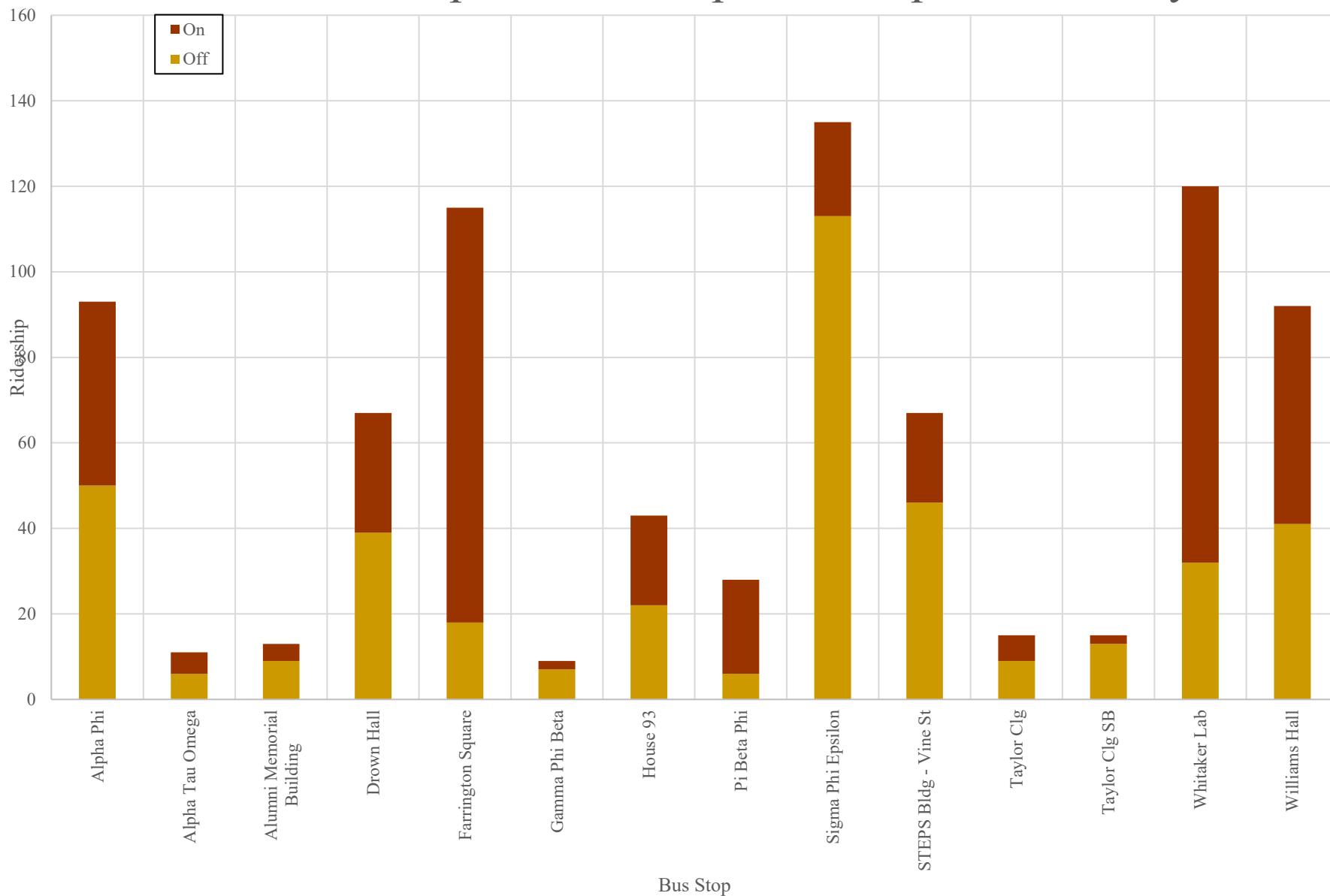


Approximate Ridership Data

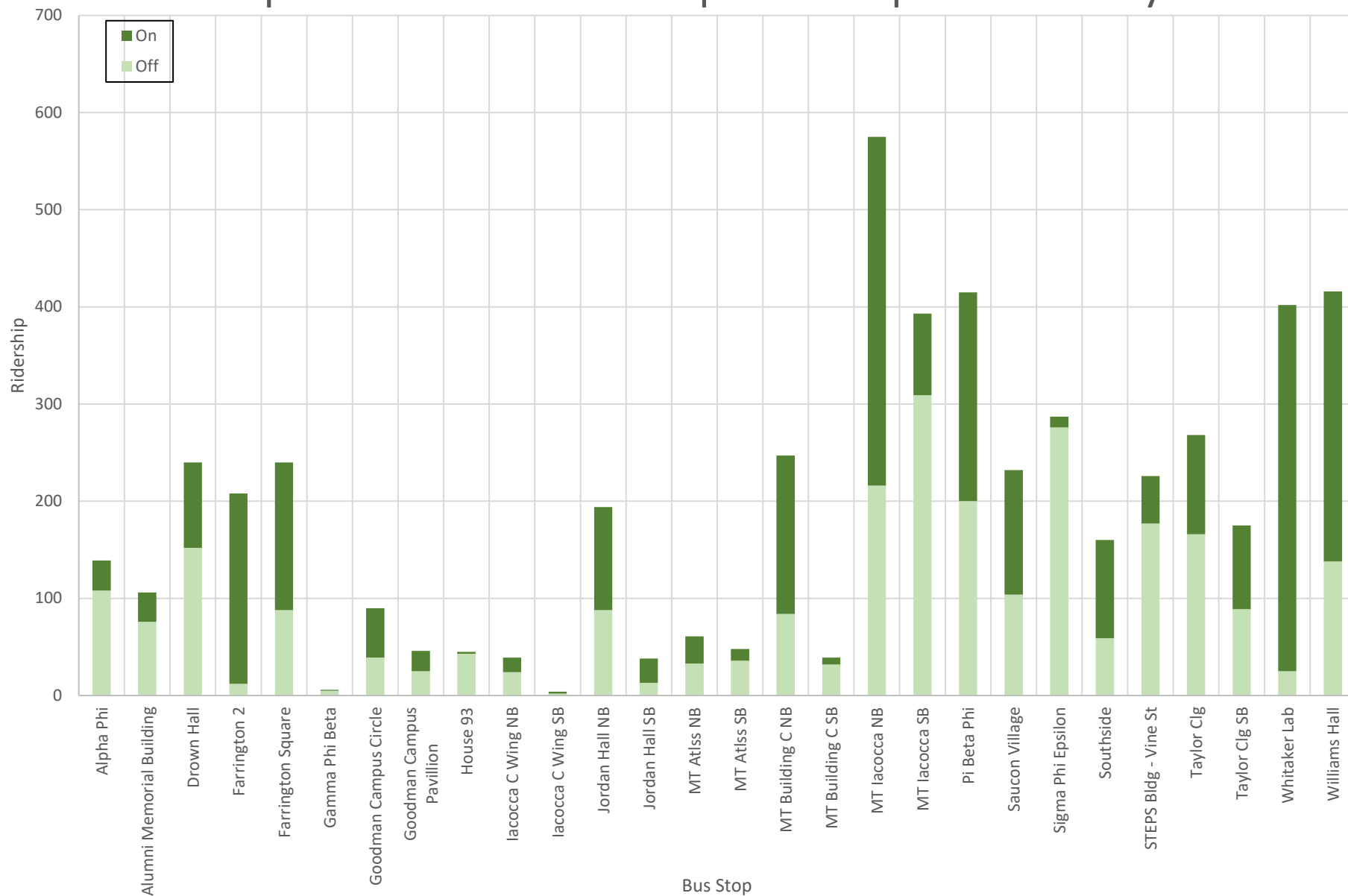
- Campus Connector: 2500 one-way trips per day
- Packer Express: 600 one-way trips per day
- Founders Express: 150 one-way trips per day

Total: 3250 one-way trips per day

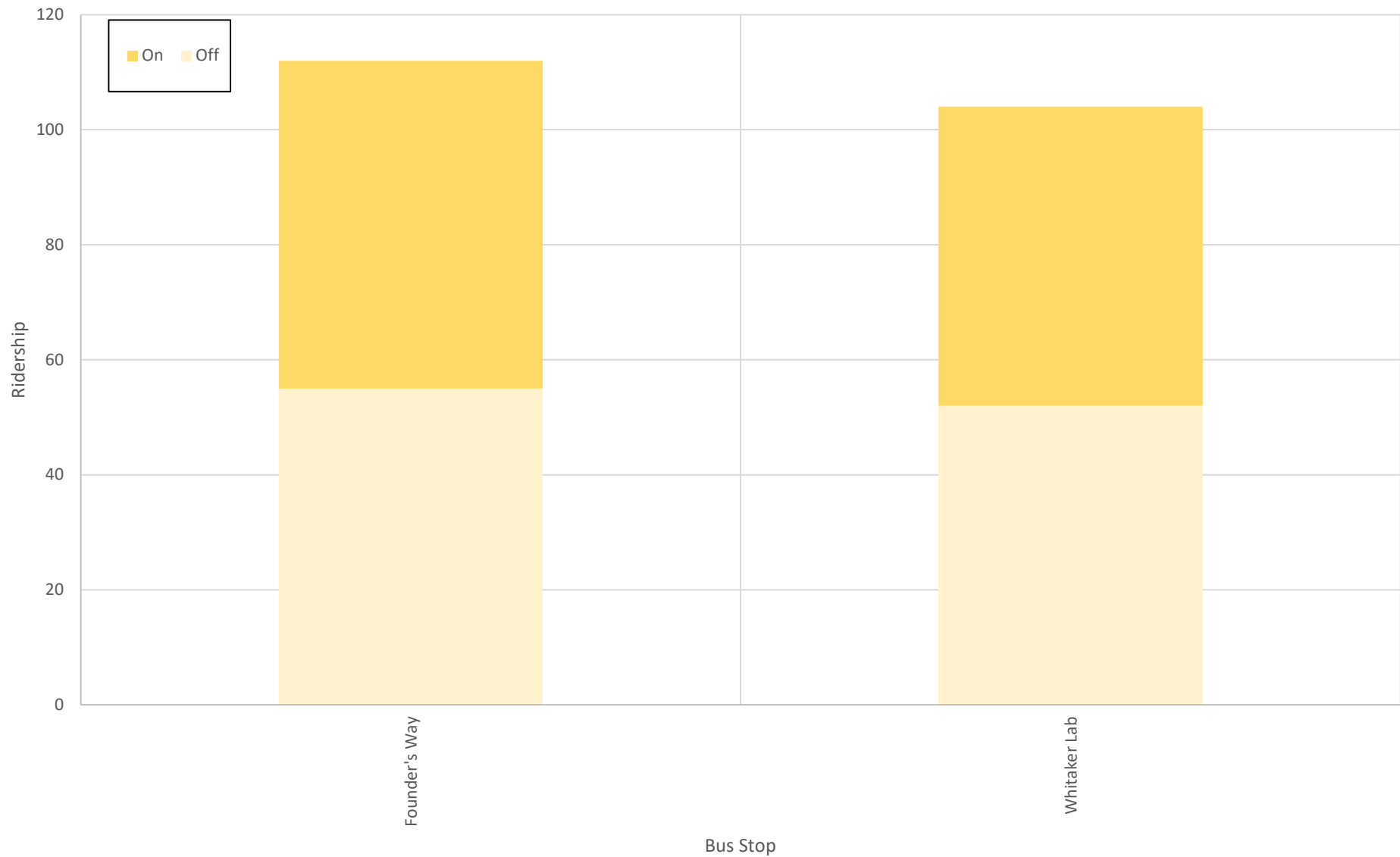
Packer Express Bus Stop Ridership on Peak Day



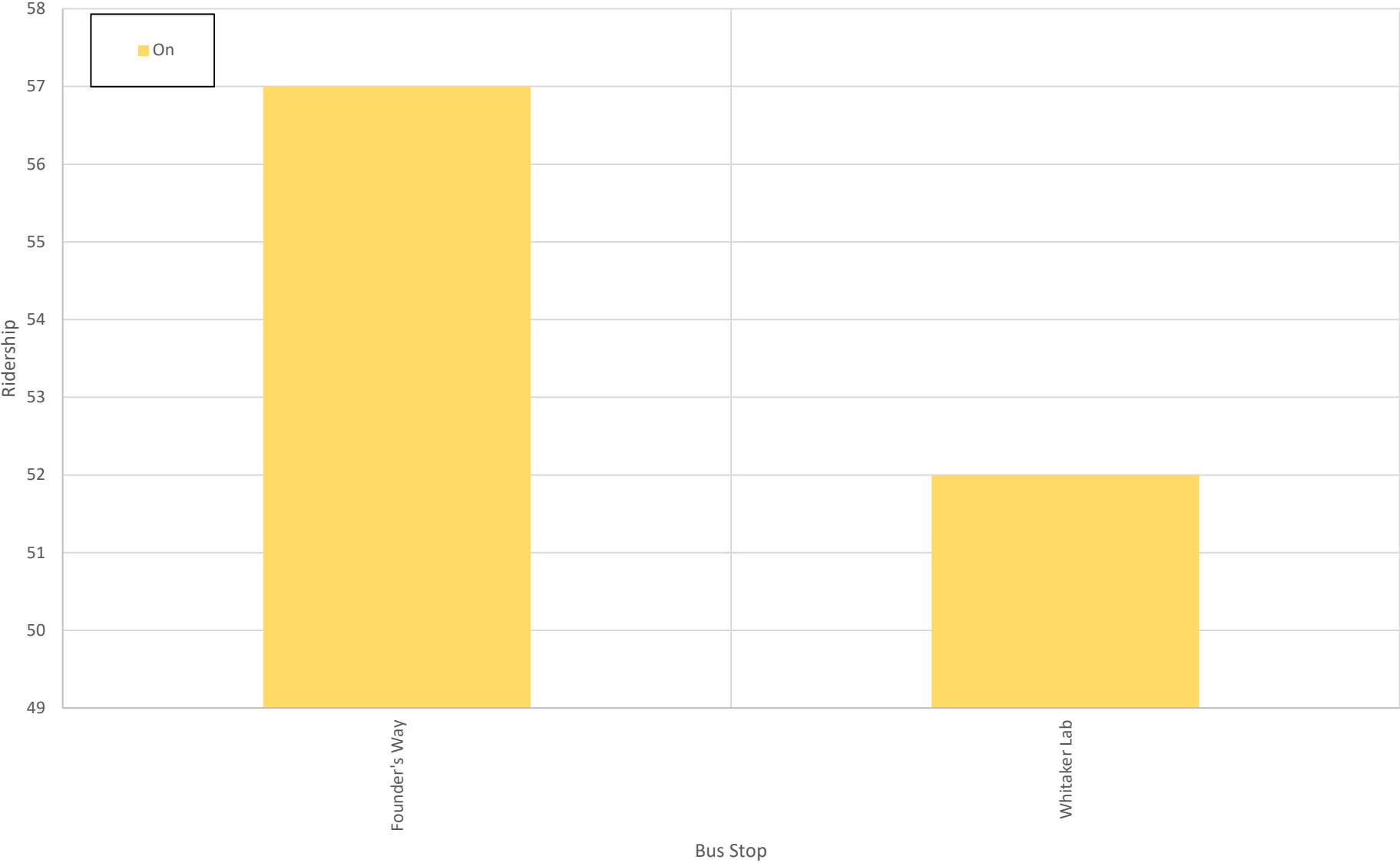
Campus Connector Bus Stop Ridership on Peak Day

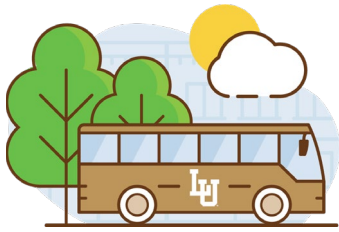


Founders Way Express Bus Stop Ridership on Peak Day



Founders Way Express Bus Stop Ridership on Peak Day

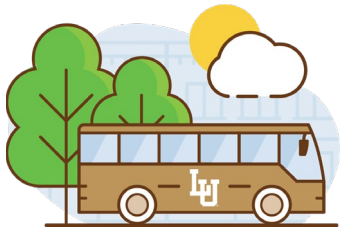




Focus Group Outreach

Session #	Session Focus	Date
1	Student Athlete Leadership #1	Thursday, September 5, 2019
2	Student Athlete Leadership #2	Friday, October 18, 2019
3	Graduate Student Senate	Wednesday, October 16, 2019
4	Faculty Senate Executive Committee	Friday, October 4, 2019
5	Student Senate - Transportation Committee	Friday, October 25, 2019
6	ERAC	Wednesday, October 9, 2019
7	Saucon Village Residents	Tuesday, October 22, 2019
8	Saucon Village Residents	Friday, November 8, 2019
9	Commuter Lot Users	Monday, October 28, 2019
10	Commuter Lot Users	Wednesday, October 30, 2019
11	Commuter Lot Users	Tuesday, November 5, 2019
12	Survey	November 18 through December 15, 2019
13	Bus Drivers & Mechanics #1	Thursday, October 17, 2019
14	Bus Drivers #2	Friday, October 18, 2019
15	Bus Drivers Access LU #3	Wednesday, October 30, 2019
16	Tom Bogari	Friday, November 15, 2019
17	Business Managers	Tuesday, October 22, 2019
18	AccessLU Users	Wednesday, November 20, 2019

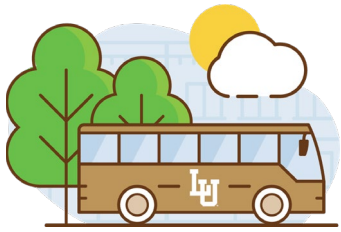




Data collected from Outreach

- Data observed from counters indicated that the last ride usually occurs at 11 PM for Mountaintop and Saucon Village. This observation was corroborated during outreach sessions with Graduate Students and Saucon Village residents.
- Buses are full at 12 PM, 2 PM and 4 PM. Sometimes drivers will only allow riders going to Mountaintop and ask them to wait for the Packer Express.
- Class times that are 50-minutes allow only 5 minutes between some classes. These are not that common - but we have heard a lot about them from user complaints.

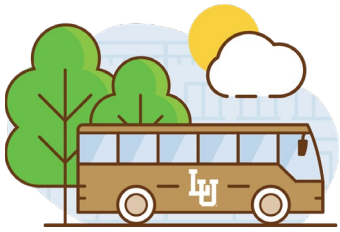




Commuter Lot Users

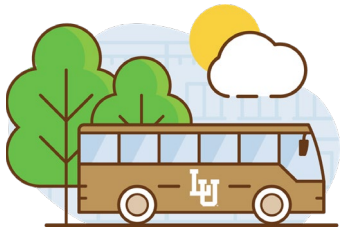
- Founders Way Commuter Lot is the favorite of Faculty/Staff.
- The direct Whitaker to Founders Way route is preferred due to reliability and predictability. They do not want to have to sit on bus for multiple stops. They like it being direct.
- If the Founders Way was expanded, it would open the system up to more Faculty/Staff on the west side of campus. Currently users are predominantly from Zoellner and locations closer to Whitaker.
- Goodman is not an ideal location for a commuter lot due to travel time.
- Bus driver should not idle in commuter lot at any time.
- Founders Way Express route time is closer to 15 minutes. Riders would prefer pick-up times to be consistently on the 15 at Whitaker. 4:00, 4:15, 4:30, 4:45 etc.
- Incentives and permit fee persuaded users to try commuter lot.





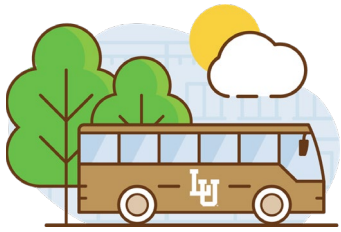
Survey Highlights

- Packer Express has roughly 50% of riders compared to Campus Connector (meaning it is very popular) and we should consider reducing the headway to alleviate volume issues we have been having.
- Most popular bus stops are STEPS, Whitaker, Farrington, Williams and Drown.
- Least popular bus stops are Jordan Hall, ATO, Gamma Phi, ATLSS, Pi Phi, Cundey, Iacocca C Wing and House 93.



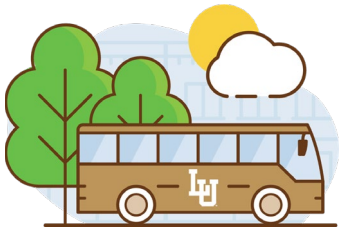
Survey Highlights

- Riders think SouthSide should be eliminated (83%) House 93 (25%), Gamma Phi (21%), Iacocca C Wing (19%)
- Riders prefer Transit Buses to Shuttle Buses (42% to 26%)
- Riders prefer Forward Facing Seats to Side Facing (40% to 20%). 2% indicated standing is preferred.
- Heat & AC, WiFi and enough room on the bus was the notable amenities requested.



Survey Highlights

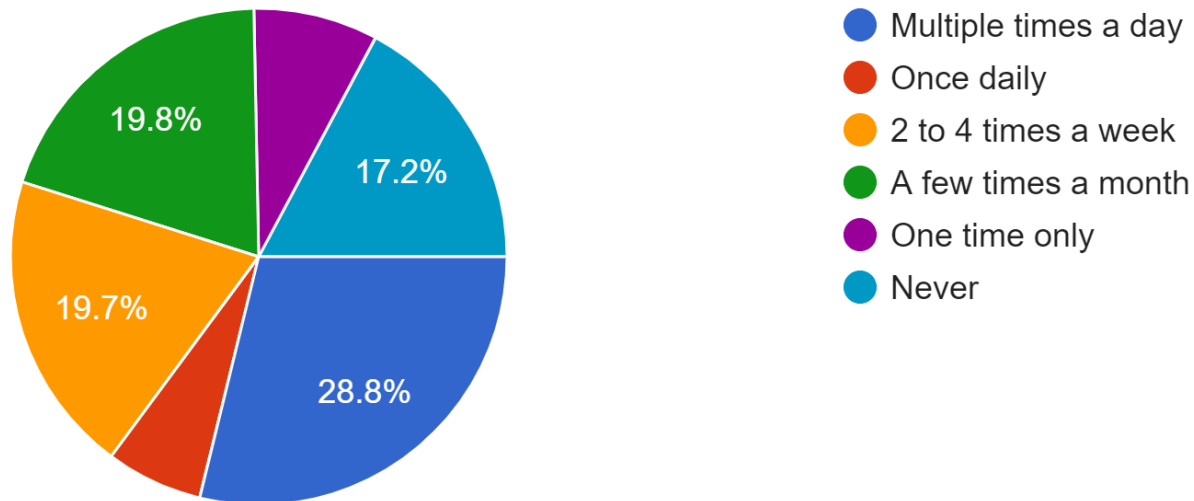
- Farrington Square (58%) is the priority bus shelter location. Followed by Williams (44%) and Alumni Building (25%).
- 69% use bus.lehigh.edu; 24% find it reliable
- 62% use the Transportation website.
- Majority (77%) agree to somewhat agree that Transportation website has valuable information.
- Generally, lack of accurate timing was the complaint about the website and tracker.
- 62% would like the tracking tool to provide real-time alerts. Followed by 19% via text message.

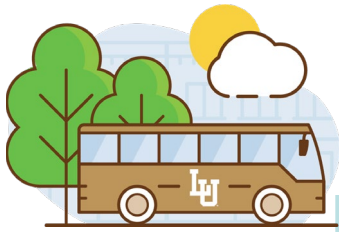


Transit System User Profiles

How often do you typically take the Lehigh University Transit System?

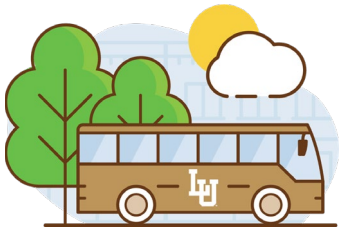
1,221 responses





Transit System Users

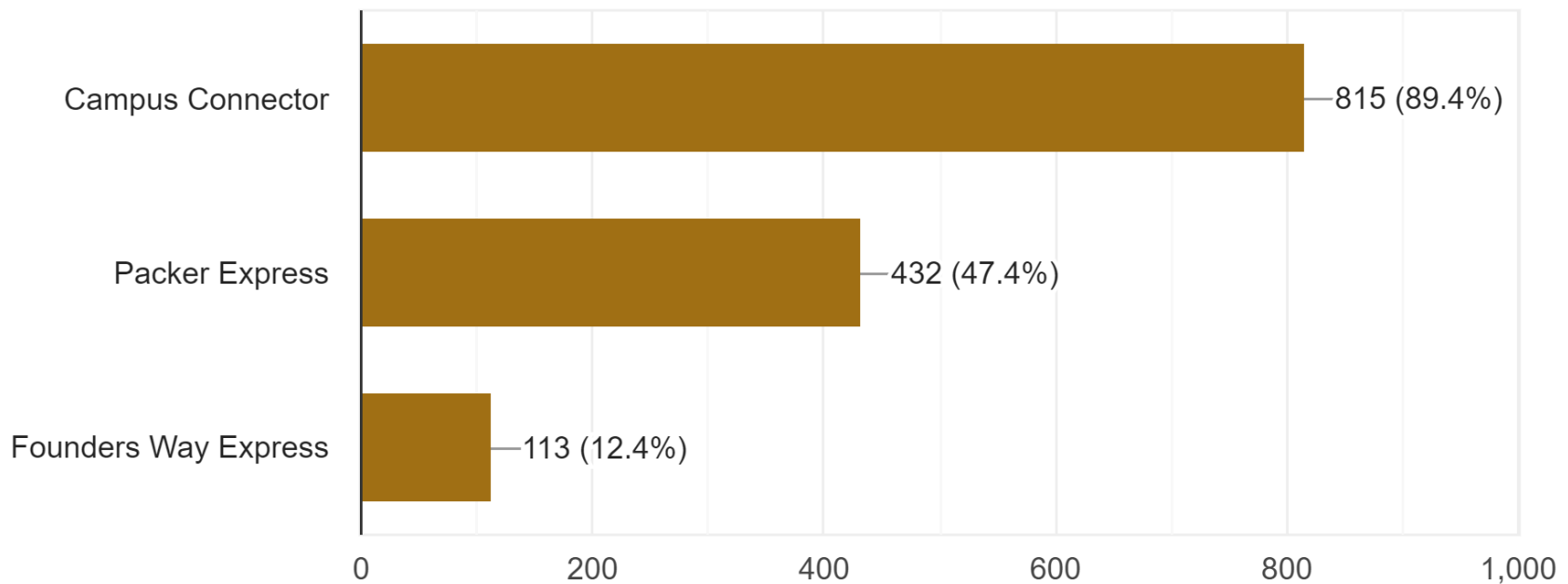
Transit System Survey User Breakdown	
User	Count Of User
Contractor/Visitor	25
Departmental	2
First Year student	2
FS	387
On-Campus Vendor	2
Retiree	3
RGT	30
Smart Card	8
Student	174
Visitor	1
Wage	10
Total Permittees that completed survey	644
Total Surveys Completed	1200

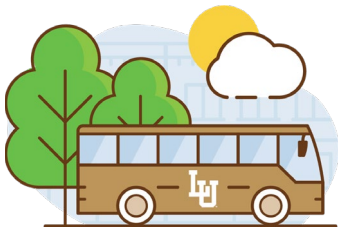


Bus Routes

Which bus route(s) do you utilize? (Check all that apply)

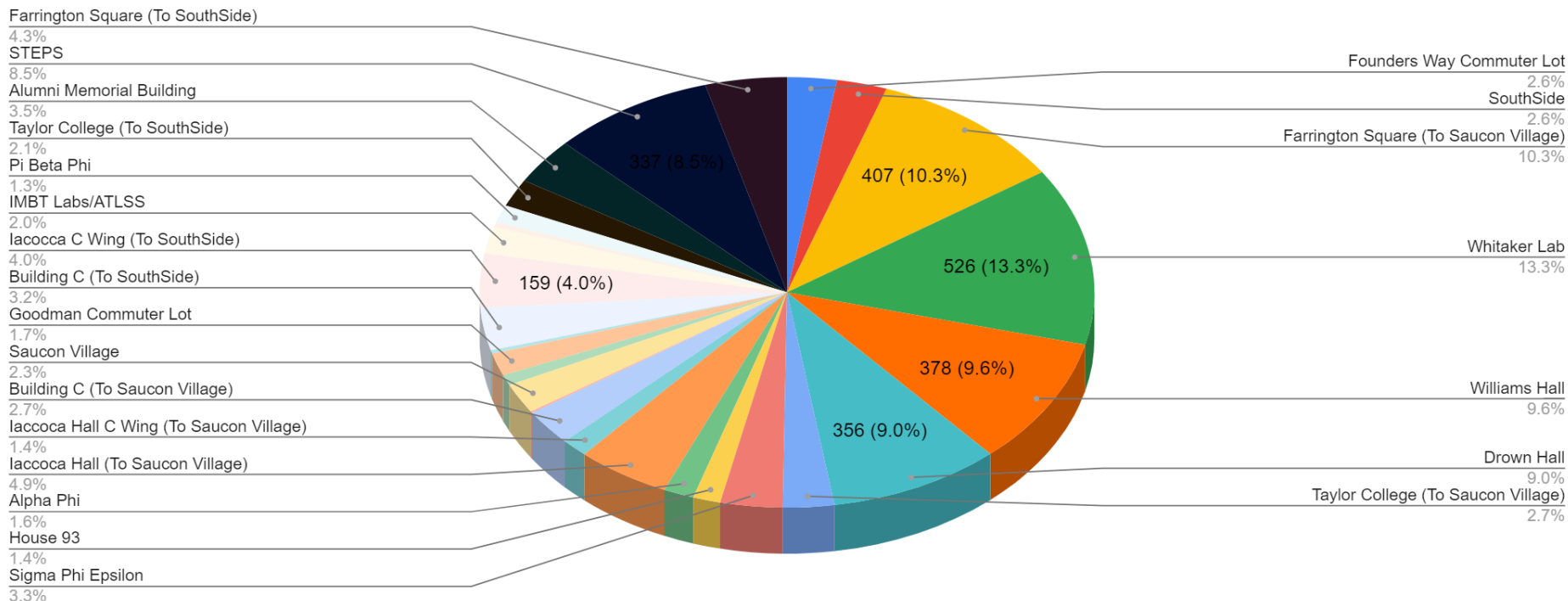
912 responses

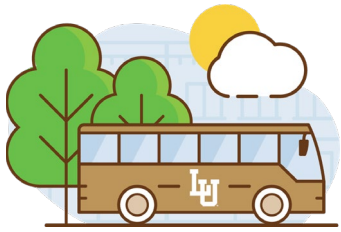




Bus Stops Utilized

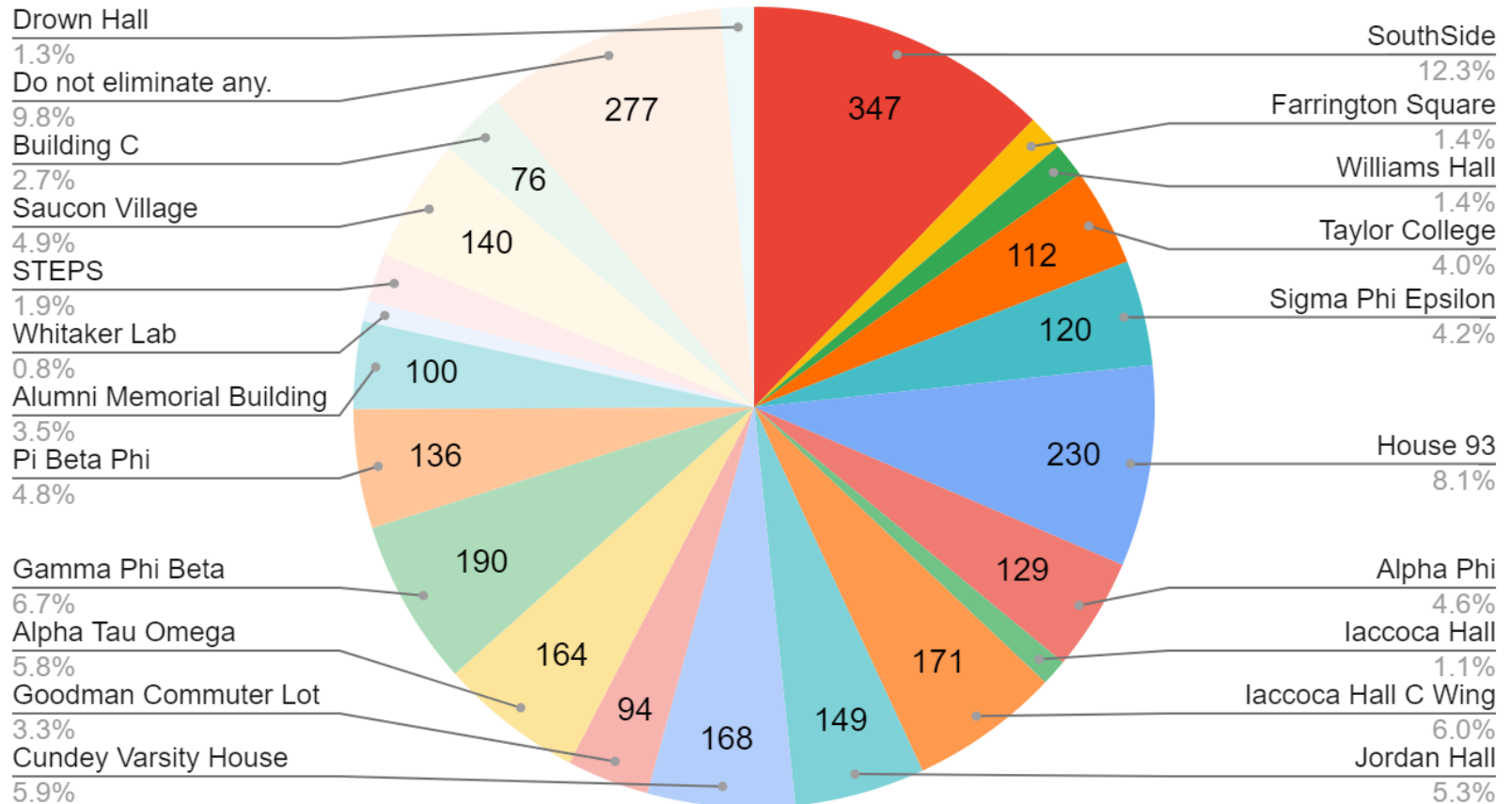
Bus Stop Utilized

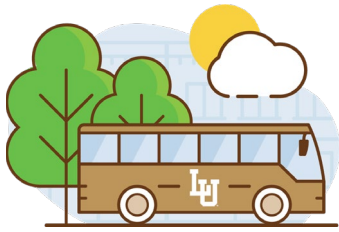




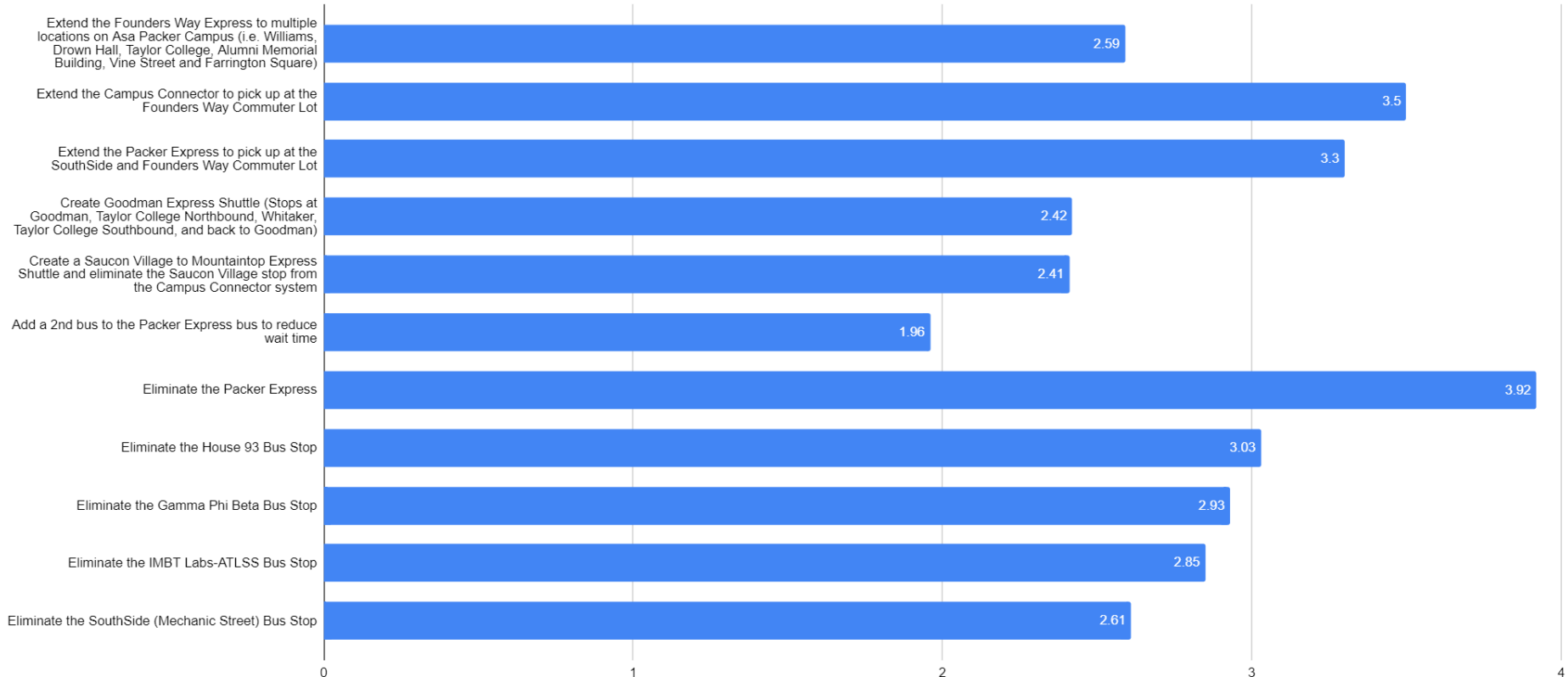
Bus Stops to be Eliminated

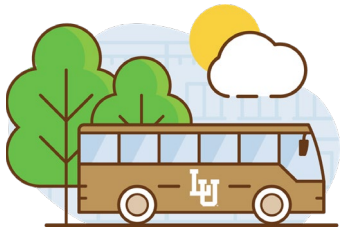
Bus Stop to be Eliminated





Route Changes

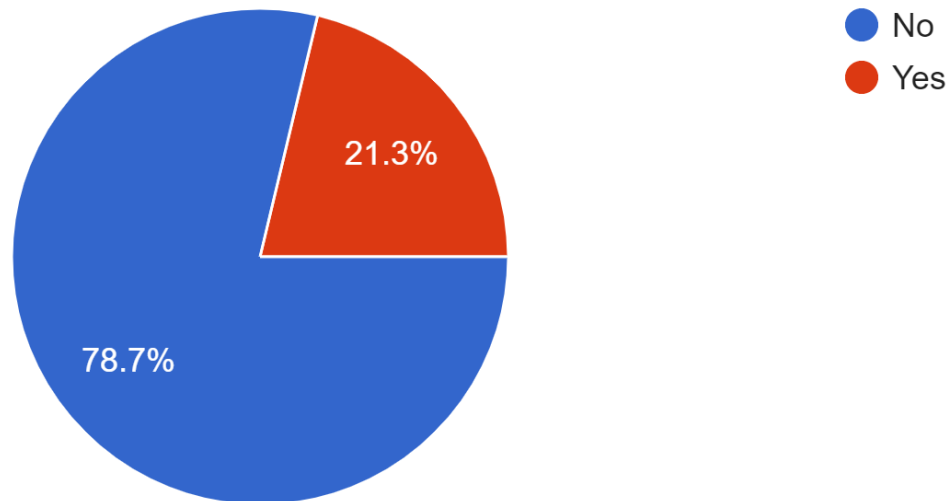


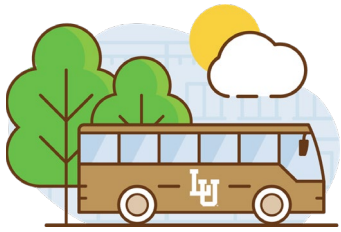


New Bus Stops

Do you believe any new bus stops are needed?

912 responses

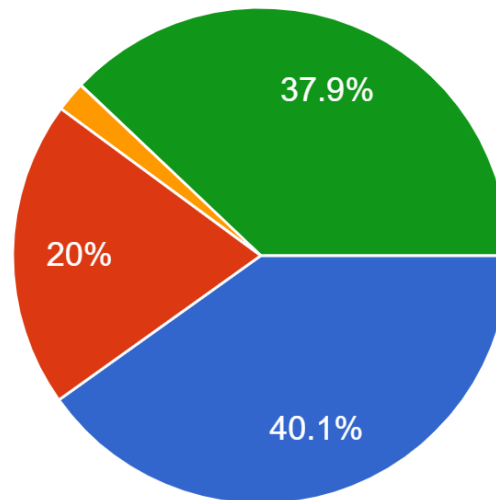




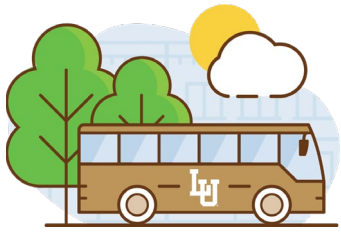
Bus Comfort

What types of seats do you prefer?

912 responses



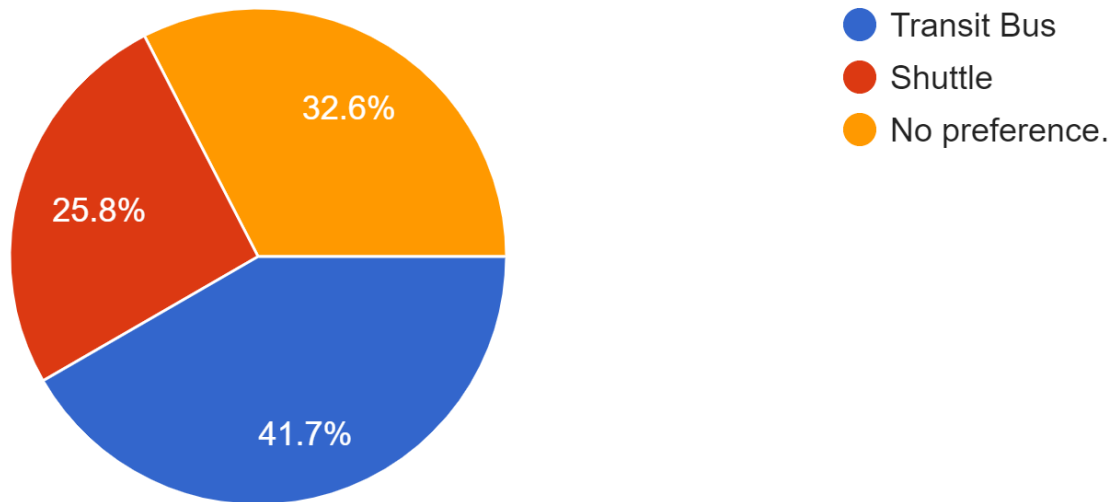
- Forward Facing Seats
- Side Facing Seats
- Standing
- No preference

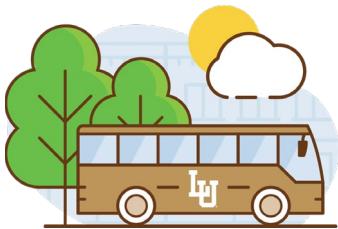


Vehicle Selection

We have transit buses (longer) and shuttle (shorter) buses. What type do you prefer?

912 responses

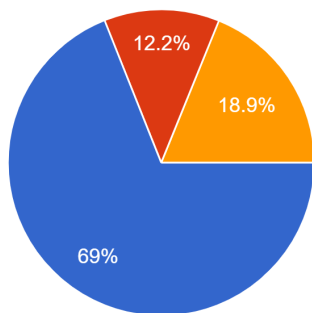




Bus.lehigh.edu

Do you use bus.lehigh.edu?

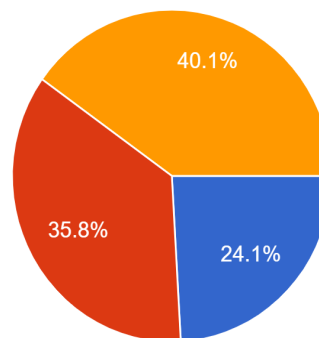
912 responses



● Yes
● No
● Sometimes

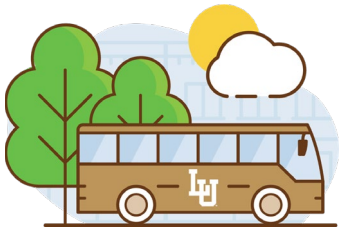
Do you believe bus.lehigh.edu is a reliable tracking tool?

900 responses



● Yes
● No
● Sometimes

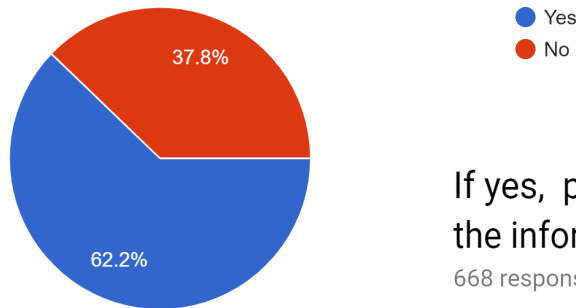




Transportation Website

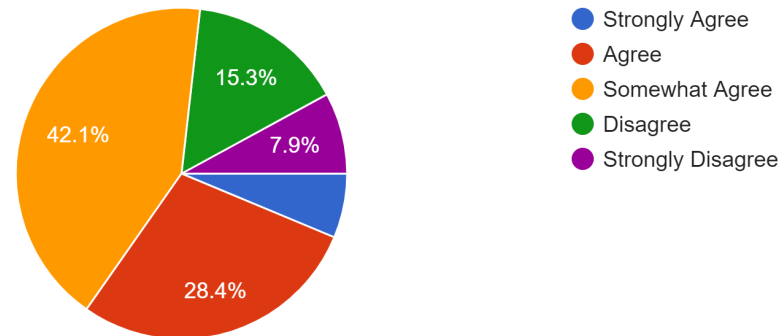
Have you visited Lehigh University's Transportation Services website?

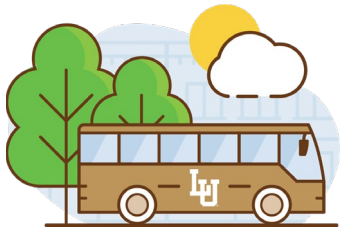
912 responses



If yes, please rank how much you agree with the following statement: "I find the information on Lehigh University's ...sportation Services website valuable."

668 responses

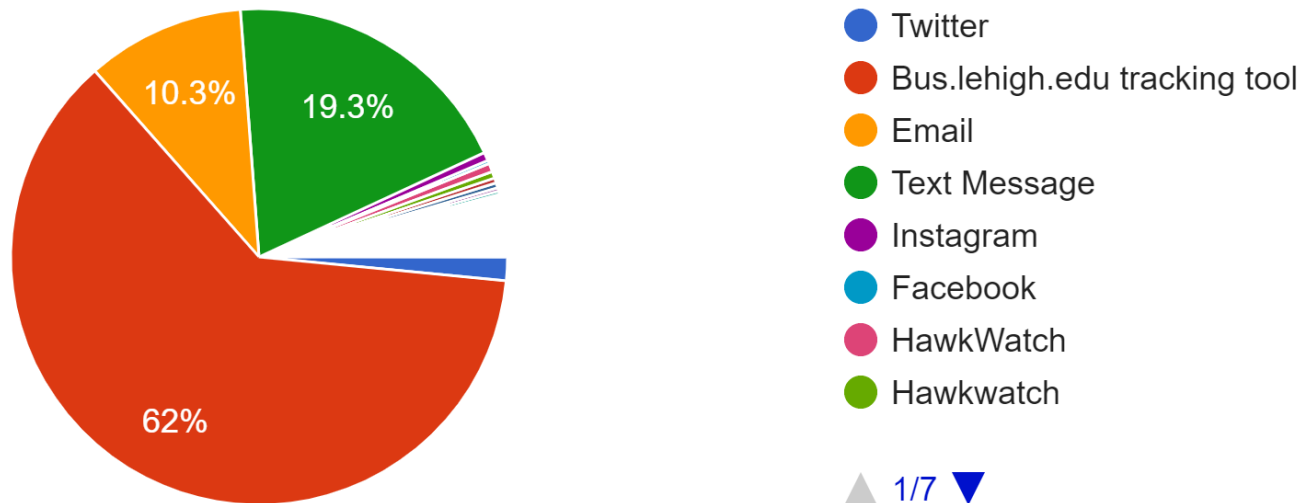


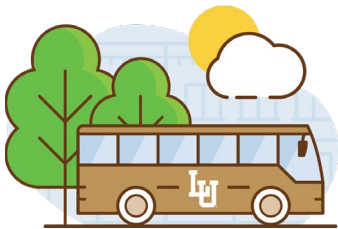


Method of Communication

I prefer to get real-time alerts, route delays, and other timely information on the transit system via:

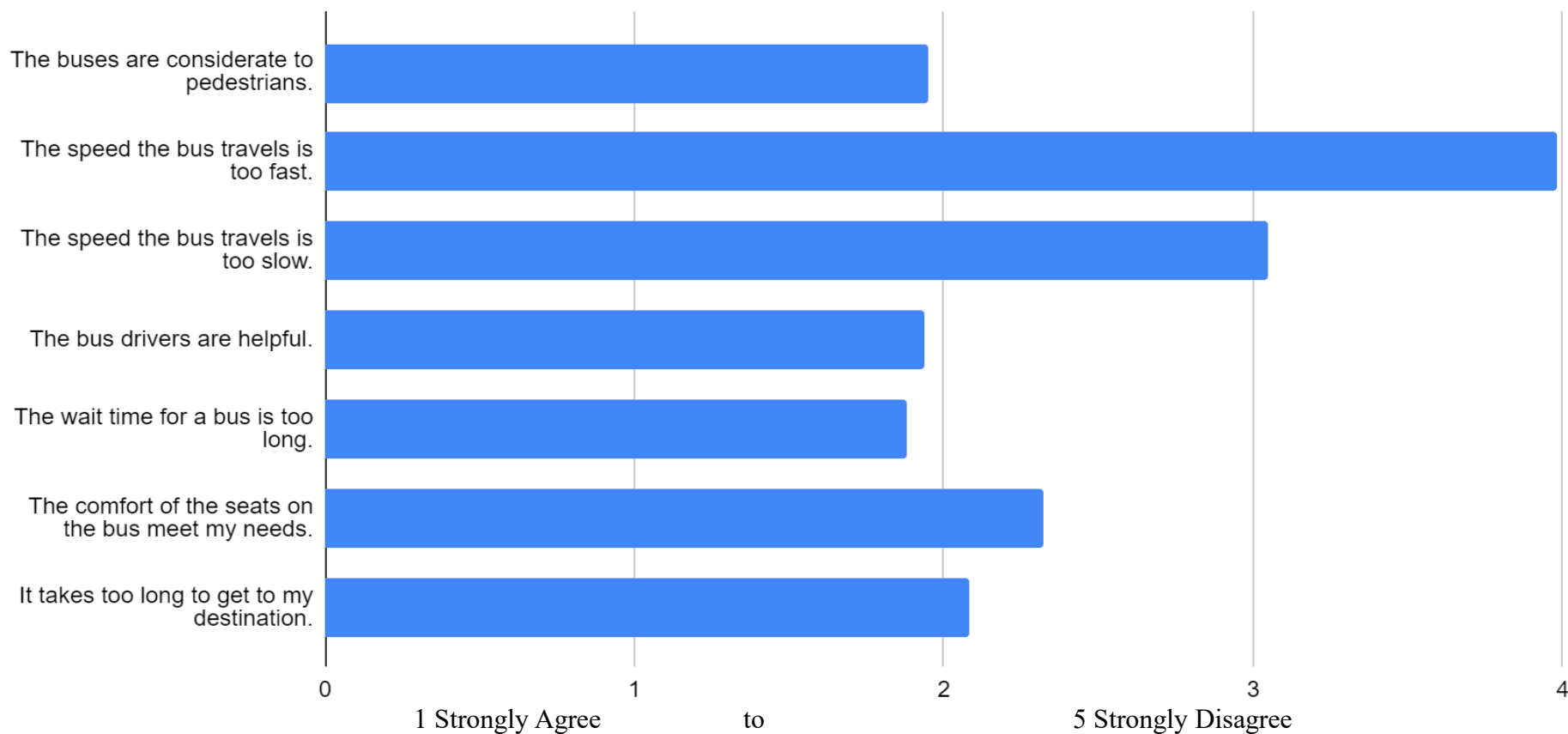
912 responses

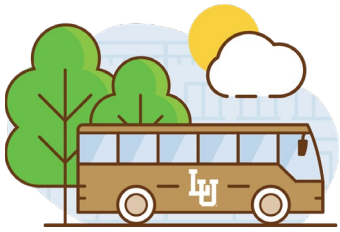




General Operations

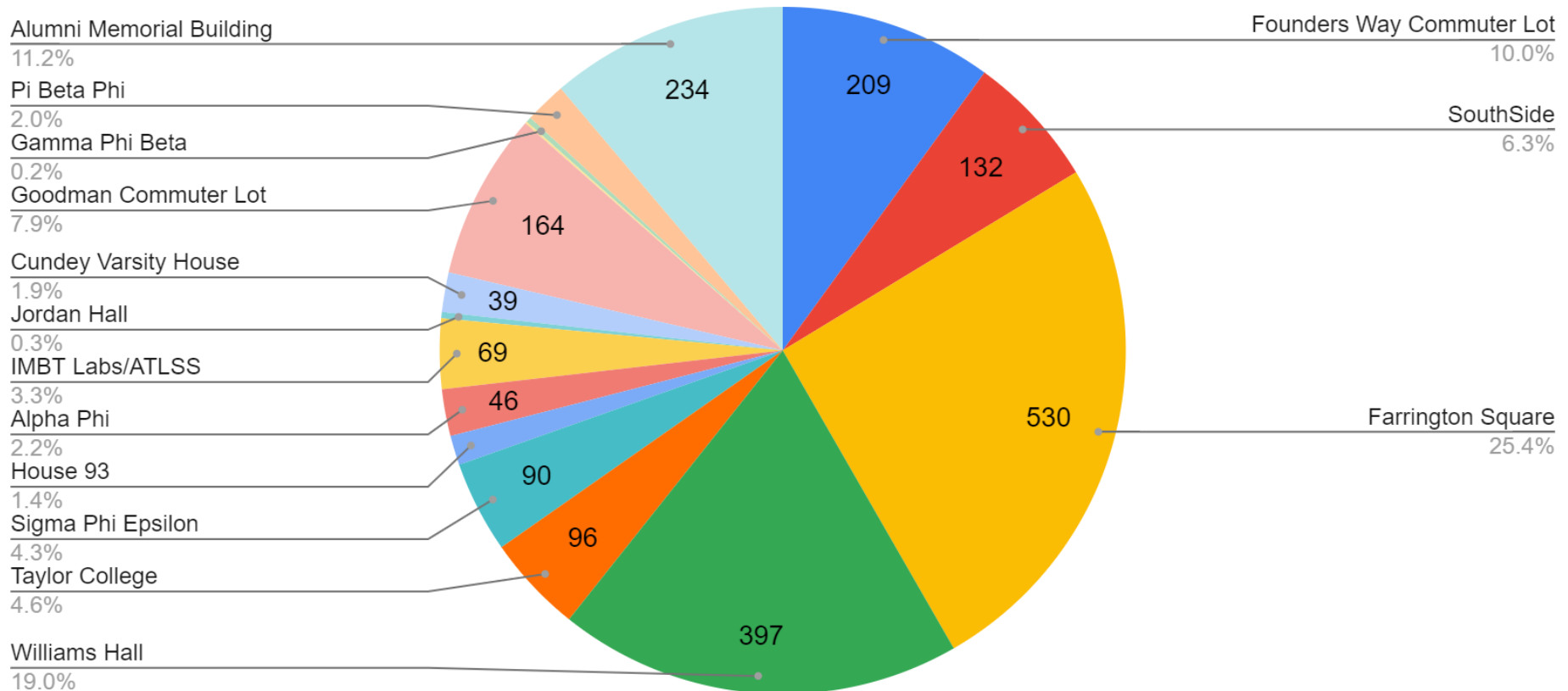
General Operations

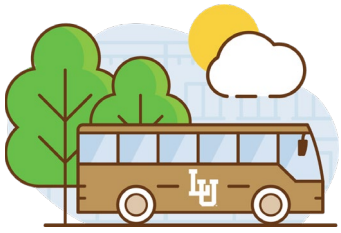




Shelter Locations

Preferred shelter locations

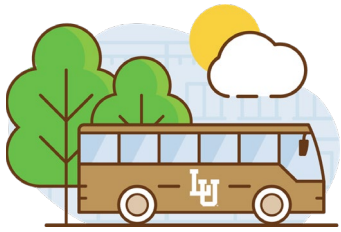




Performance Review: Alternatives for Assessment

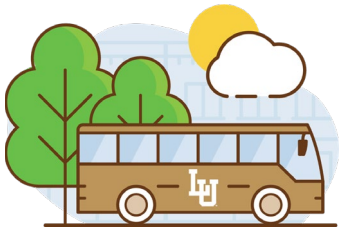
- Extend either the Campus Connector or Packer Express to Founders Way Commuter Lot
- Extend the Founders Way Express to additional locations on Asa Packer Campus
- Add a Goodman to Asa Packer Campus Express
- Add a Saucon Village to Mountaintop Express Shuttle
- Add a Goodman stop before Saucon Village
- Eliminate stops on campus with low ridership
- Add additional buses to the system to reduce headway
- Eliminate the Packer Express
- Service Mountaintop, Goodman and Saucon Village with TapRide or Lyft at night
- Service lower ridership stops with TapRide or Lyft





Contingent Improvements

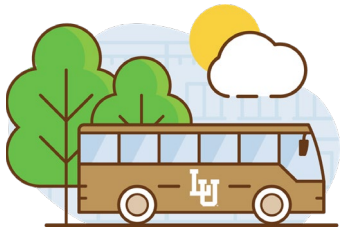
- Bus stop signage update
- Distribution of new postcards to campus
- Implementation of Bus Tracking Tool (DoubleMap) to properly sync vehicles on route.
- Implement TapRide for AccessLU
- AccessLU to run only on weekdays
- Founders Way Route must be consistent – Filmore or Hayes?
Drivers and riders prefer Filmore.



Night Time Improvements (Applies to All Top Alternatives)

- Stop running Campus Connector at 8 PM
- Run Packer Express until 2:30 AM
- Run TapHawk from at least 8 PM until 12 AM to service Saucon Village, Mountaintop and Goodman.
- Basis of recommendations:
 - Last pickup at Mountaintop and Saucon Village was consistently recorded at 11 PM. The Campus Connector was going to Mountaintop, Saucon Village and Goodman without any riders from 11 PM to 2:30 AM. This not an efficient use of a driver or vehicle.
 - Campus Connector headway at night is 35-minutes. If we can run the Packer Express instead, riders will experience an 18-minute headway at night. We will get more ridership by focusing a consistent route on Asa Packer and Sayre. For those that need rides at Mountaintop, Saucon Village or Goodman, the TapHawk will offer free on-demand service.
 - This will provide more efficiency for the 2nd vehicle that operates at night and increase ridership.
 - It is recommended that at least 2 drivers are deployed at night for logistical reasons. Repairs, break downs, or sick call-outs require at least 2 drivers to be scheduled.





Communication and Reliability

- The most ubiquitous theme of all the outreach sessions performed. Drivers concur that lack of communication has been a major issue for rider satisfaction.
- If the current method of communication is Twitter, it needs to become more detailed. I.E. If you are running smaller buses today because of a break down, tell them. It is recommended that Transportation begin practicing communications now to work out kinks of messaging once we deploy DoubleMap.
- When drivers idle it is a major cause of frustration for riders. Especially while using the tracker, it is unpredictable.



CONNECTIONS

Building a Connected Community