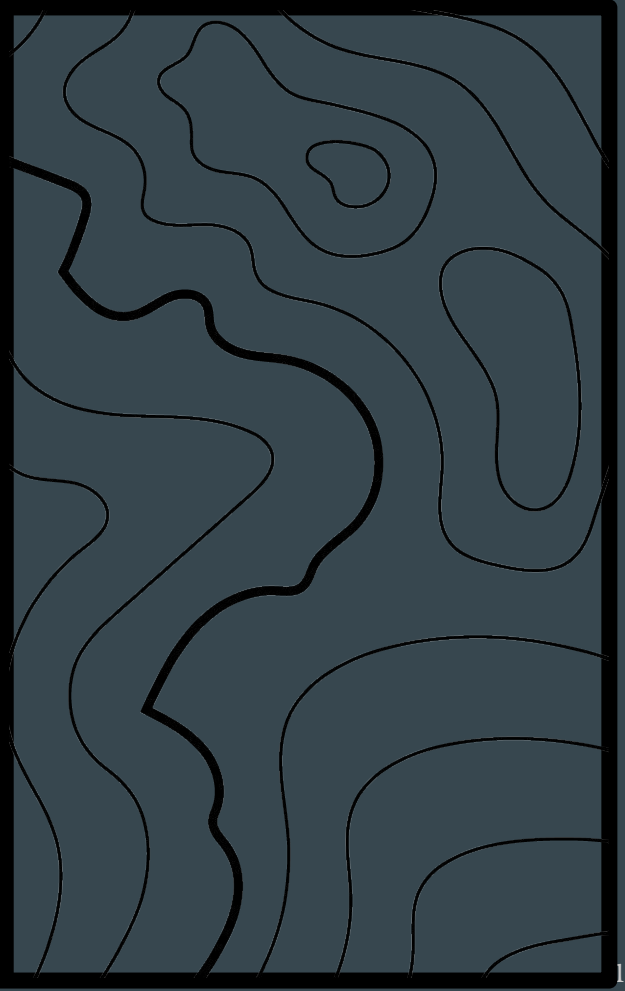
Multi-Use Trails

Logan Martin & Emma Heisig
Mr. Matthew Miller
DE Capstone Engineering
14 May 2024



What's the Problem?

Lack of, or outdated, data on how Multi-Use Trails, specifically Triangle Trails, impact the CHS community.

Why Do We Care?

- We are members of the CHS community!
- We've seen how transportation issues can affect students
- When we understand the needs of our community, we can improve our community.

Solutions and Goals

Collect data on people's opinions and usage of Triangle Trails

Be able to provide the City of Charlottesville, as well as Charlottesville City Schools, with this data

Spark meaningful change around transportation at Charlottesville High School

People Involved

UVA Link Lab:

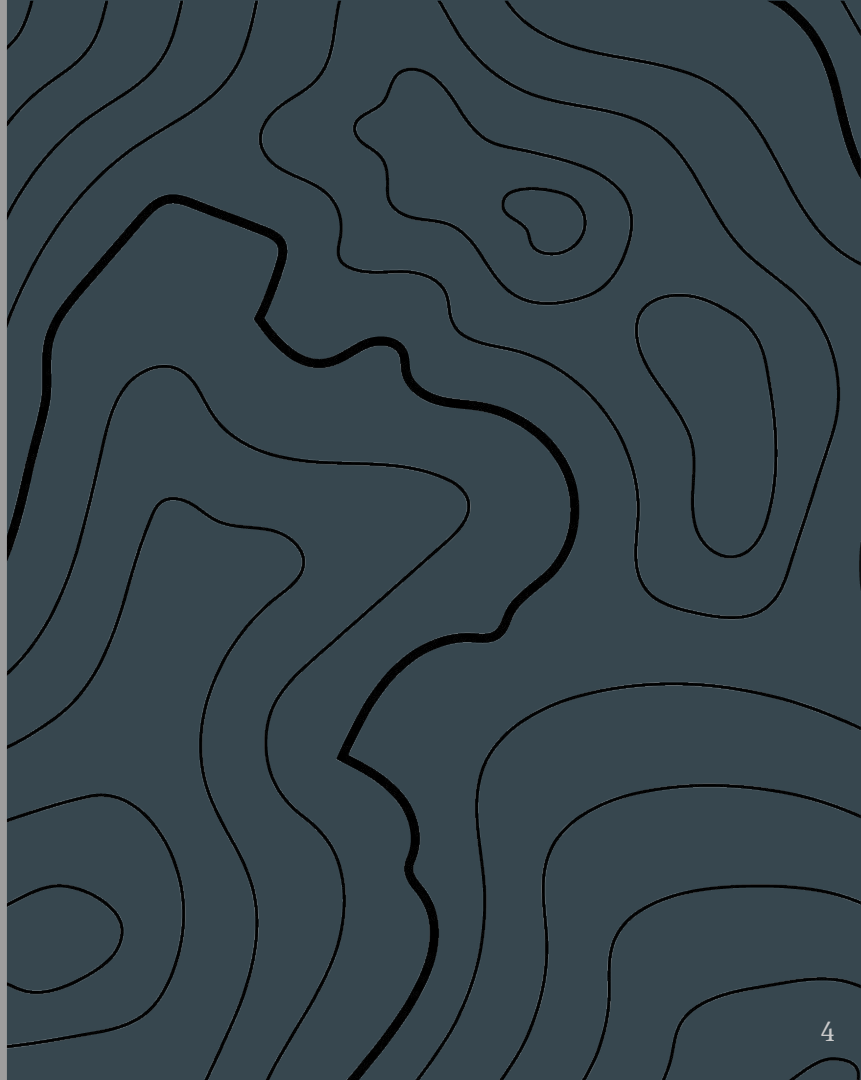
Carreen de Cardenas

Avi Hoen

City of Charlottesville:

Ben Chambers; Transportation Manager

Tommy Safranek; Bike & Ped. Coordinator



Essential Requirements - From Proposal

1	Collect data on **when** people use the trails	2	Design and build sensors **in-lab**, keeping privacy in mind
3	Find out use **patterns** of the trails	4	Analyze collected data to propose how trails could be **improved**

Non-Essential Requirements - From Proposal

1	Take community survey	2	Find out demographics of people who use the trails
3	Add physical change to Triangle Trails	4	Observe patterns immediately surrounding the trails

Timeline from Proposal

Weeks 1-3 *Research how to collect data, order parts*

Weeks 4-7 *Build and test data collection system*

Weeks 8-16 *Collect, organize, and interpret data*

Weeks 17-22 *Draw larger conclusions with guidance from experts*

Weeks 23-24 *Prepare for final presentation*

Essential Reqs.

- [x] Collect data on **when** people use the trails
- [x] Design and build sensors **in-lab**, keeping privacy in mind
- [x] Find out use **patterns** of the trails
- [x] Analyze collected data to propose how trails could be **improved**

Non-Essential Reqs.

- [x] Take community survey
- [x] Find out demographics of people who use the trails
- [ ] Add physical change to Triangle Trails
- [ ] Observe patterns immediately surrounding the trails

The Data We Collected - Part 1 of 3: Walking Need

Sanitized Walking Survey Responses

Q: Do you walk to school?

Total Respondents - 136

"No, and I don't want to." - 84 (62%)

"No, but I want to." - 13 (10%)

"Yes." - 39 (27%)

Q: Would CHS benefit from a route map?

Total Respondents: 52

"No" - 21 (40%)

"Maybe" - 3 (6%)

"Yes" - 28 (54%)

What Stops People: Distance, Time, Infrastructure

The Data We Collected - Part 2 of 3: Biking Need

Sanitized Biking Survey Responses

Q: Would you like to bike to school?

Total Respondents - 147

"I would not" - 95 (65%)

"Yes, but I can't" - 32 (22%)

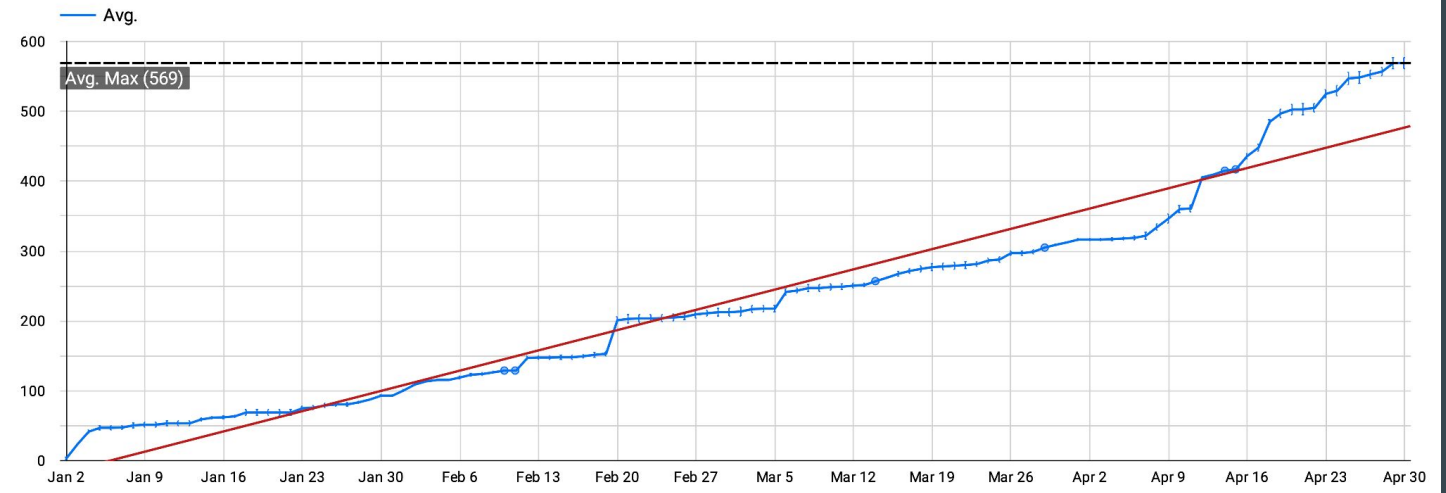
"I already do." - 20 (13%)

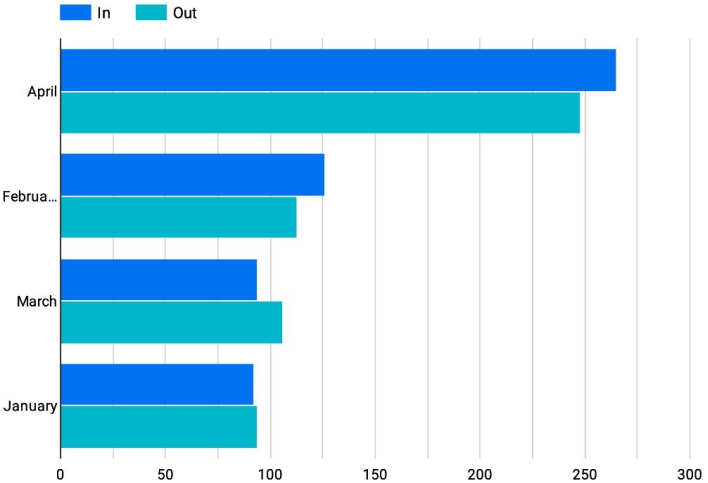
Q: Would CHS benefit from more bike racks?

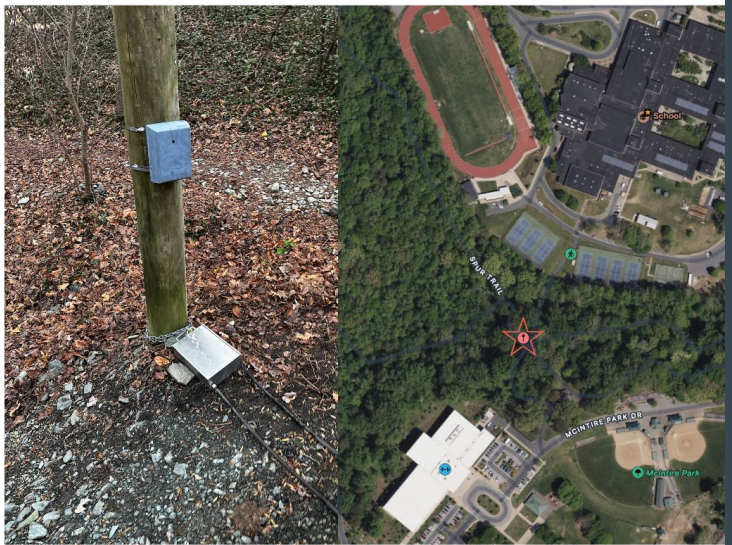
"No" - 39 (27%)

"Yes" - 108 (73%)

What Stops People: Distance, Time, Infrastructure







The Data We Collected - Part 3 of 3: Triangle Trail

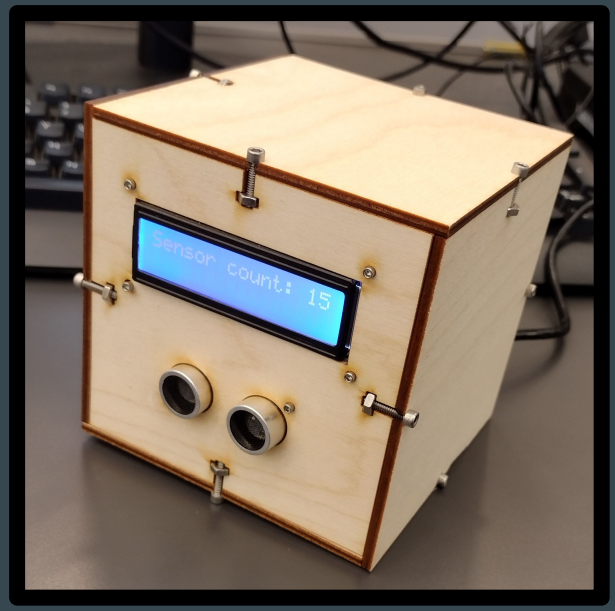
The Physical Counter: Intro - Part 1 of 2

Why we made this:

To better understand the design of a data collection counter.

What makes a "Good" counter?

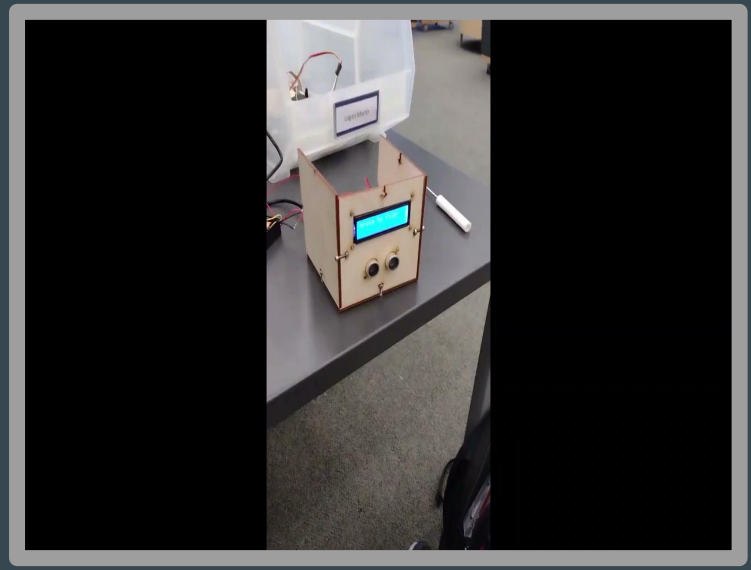
Having a long-range sensor, high battery power, reliable data collection and storage, and a way to reset the data on the counter.



The Physical Counter: Redesign - Part 2 of 2

Downsides:

- No Battery
  - Needs to be plugged into computer to work.
- No Storage of data
- Short-range sensor
- Annoyances w/ Physical Assembly



What we set out to Fix:

Adding an external battery & save data

Conclusion, Q&A

Big thanks to our mentors, Mr. Safranek, Mr. Miller, and others who helped with this project!