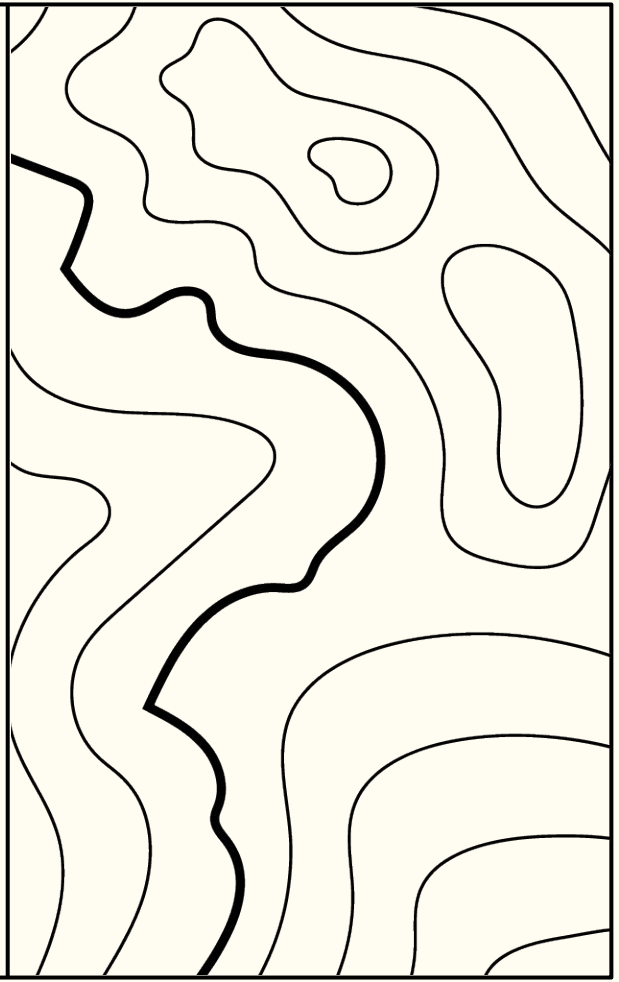
Multi-Use Trails

Logan Martin and Emma Heisig
Mr. Matthew Miller
EGR 122 - Engineering Design
2 October 2023



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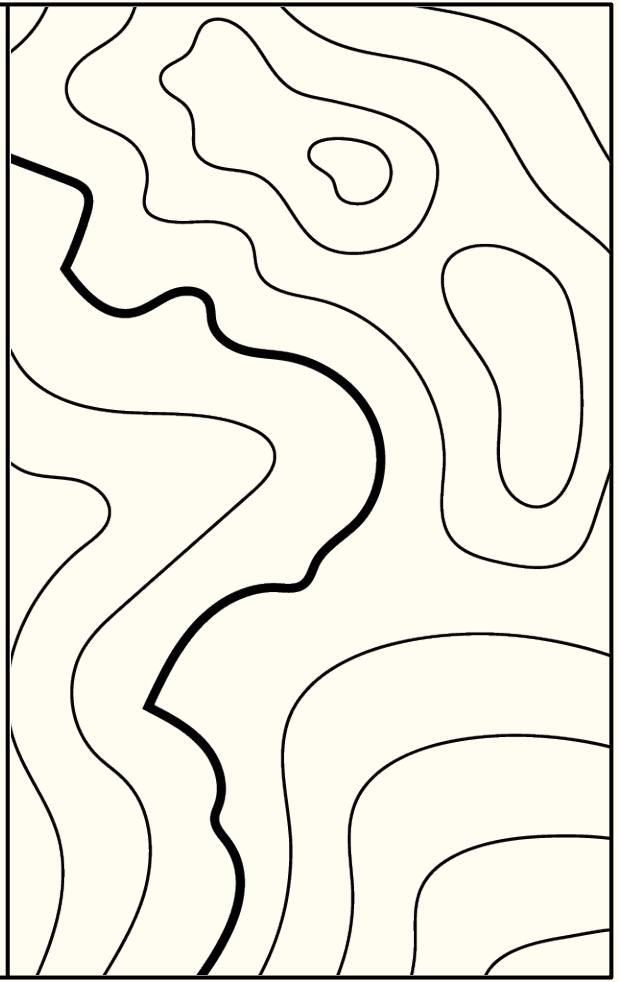


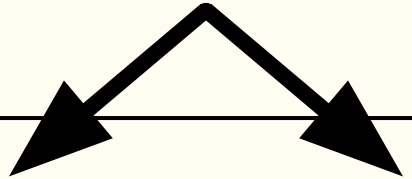
~PROBLEM~PROBLEM~PROBLEM~

Lack of, or outdated, data on how Multi-Use Trails, specifically Triangle Trails, impact the CHS community.

~PROBLEM~PROBLEM~PROBLEM~

Solution

Collect data on people's



Opinion's & Usage

of Tri△ngle Tr△ils

Link Lab Mentors

Avi Hoen
(zdf2uz@virginia.edu)

Carreen de Cardenas
(cad3ev@virginia.edu)

Customer

Benjamin Chambers, the Transportation Planning Manager for the City of Charlottesville

“I’m Ben Chambers, the Transportation Planning Manager for the City of Charlottesville. I’ve been working with CAT and Virginia Department of Rail and Public Transportation to design our next batch of bus shelters around the City. This topic has been an ongoing discussion with CAT for years and we’re excited to have state support to move forward with these locations.

However, beyond this set of bus shelters, CAT does not have any current plans for which stops to tackle next or which amenities would work best at specific stops. It sounds like we could use your help! I’d love to hear more about your capstone project. If you’d like, I’d be happy to have you come by our office at Neighborhood Development Services in City Hall to talk through what you’re working on and provide you with some feedback. Let me know when would work best for you and I’ll schedule us a conference room to work in.

In the meantime, if you have any questions about bus stops, CAT, or transportation in the City in general, please ask and I’ll do my best to get you some answers.”

Email Correspondence from 8 September 2023

Essential Requirements

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

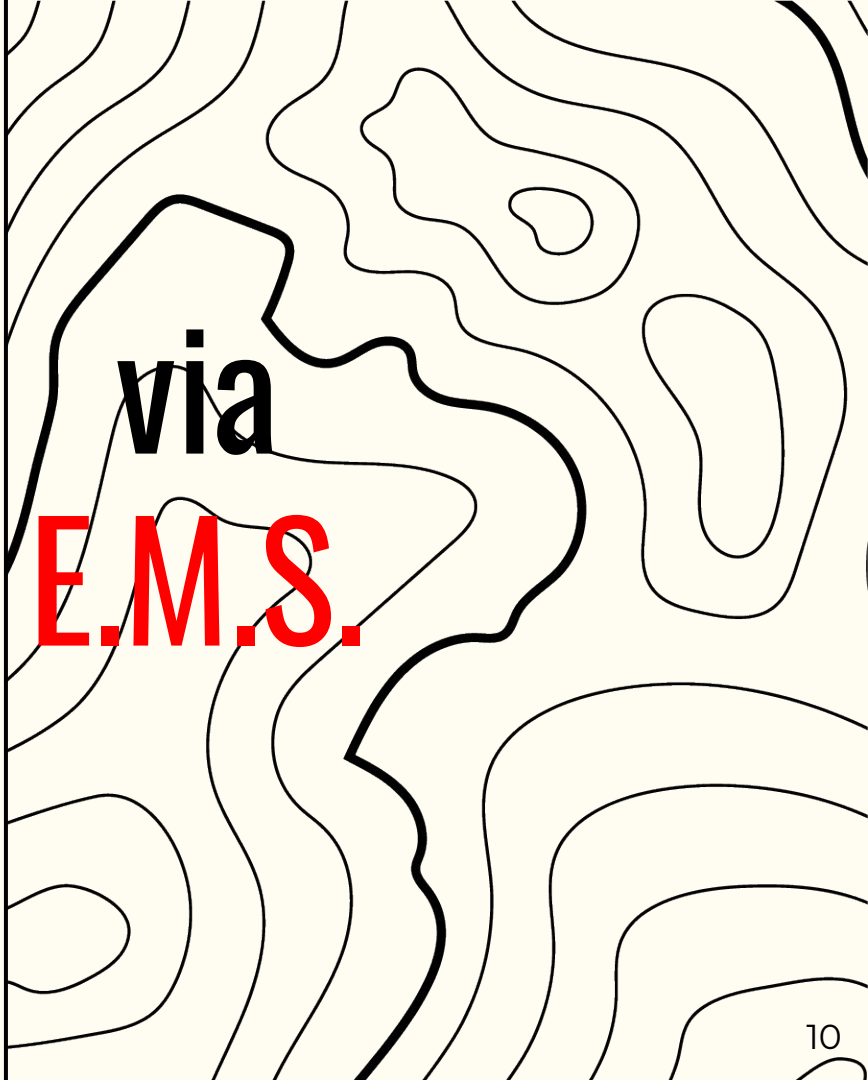
1	Take community survey	2	Find out demographics of people who use the trails
3	Add physical change to Triangle Trails	4	Observe patterns immediately surrounding the trails

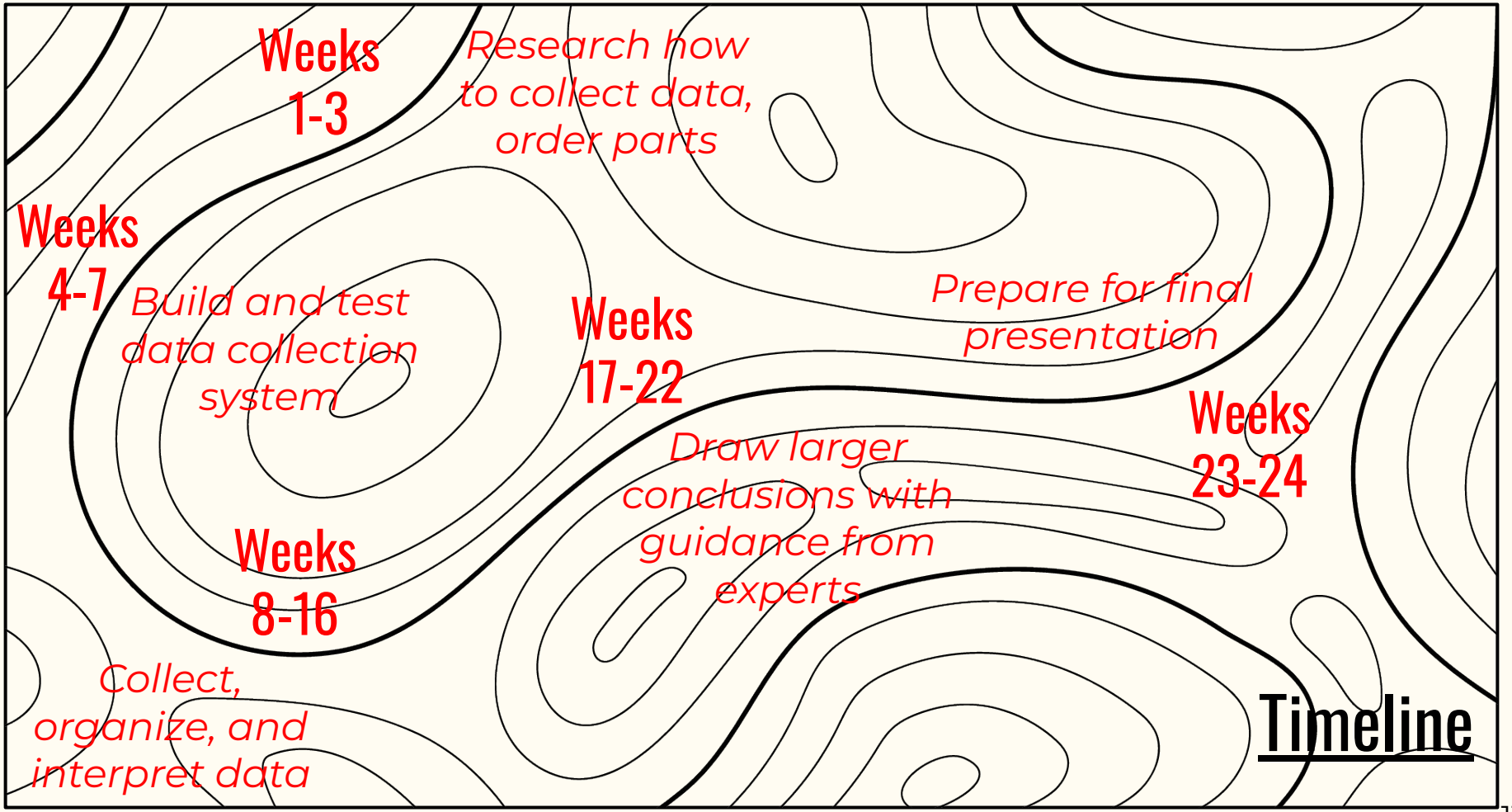
How Will We Measure Success?

Getting data that is **useful** to transit and civil planners. This is so Triangle Trails, and multi-use trails in general, can be improved effectively.

How Will We Meet Success?

- **E**ffectively using time
- **M**eeting regularly with mentors and clients
- **S**tudying how to interpret data.




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
Timeline

Materials and Budget pt. 1

Raspberry Pi as trail camera
- 24/7
- Constant video feed

3D Printer, Laser Cutter, Paper Printer
Raspberry Pi (Pico v. Zero)
Camera Modules
Battery Harnesses and Batteries
IR Sensors

Materials and Budget pt. 2

Some sensors available from Link Lab

Force Sensitive Resistor
Pressure Sensor
Casing for Force Sensitive/Resistor
Trail Camera
Additional Sensors Beyond Lab Stock

Patterns,
Organized and Visualized Data, &
of course, a
Review of Methodology

Deliverables

Q & A