

SFU

SIMON FRASER
UNIVERSITY

SWIVEL

Redefine Your Commute

- The Swivel Team
- Introduction - The Problem
- Current Market
- The SWIVEL solution
- System Design Overview
- Project Gantt Chart
- User Interface
- Technical
- The Delegator
- Demo Video
- The Market
- Risks
- Cradle to Cradle
- Engineering Standards
- Self Reflection
- Future Plans



Outline

The Swivel Team



Mehrad
Akhavan-Kharazi
CEO



Pierre
Drego
CCO



Max
Macoveiciuc
CTO



Milos
Ratkovic
CFO



Payam
Partow
CMO

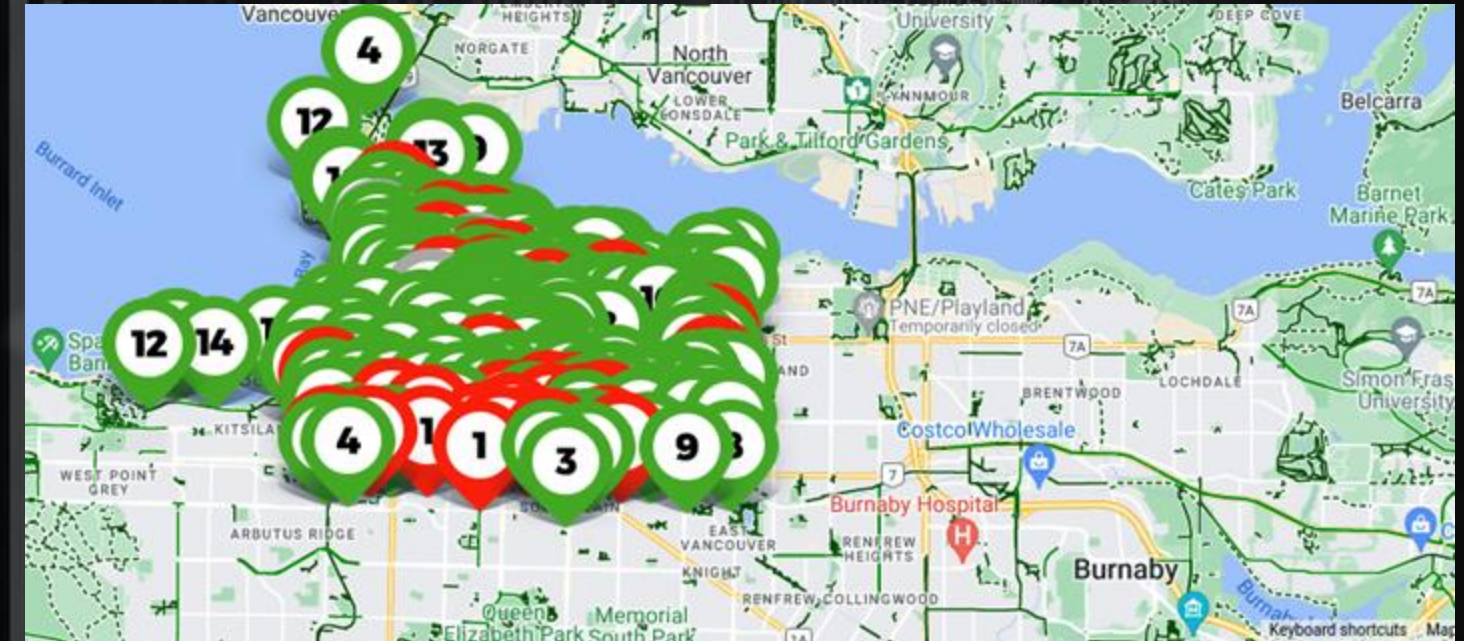


Brendan
Murray
COO

Current Bike Rental Platforms

Location Dependence

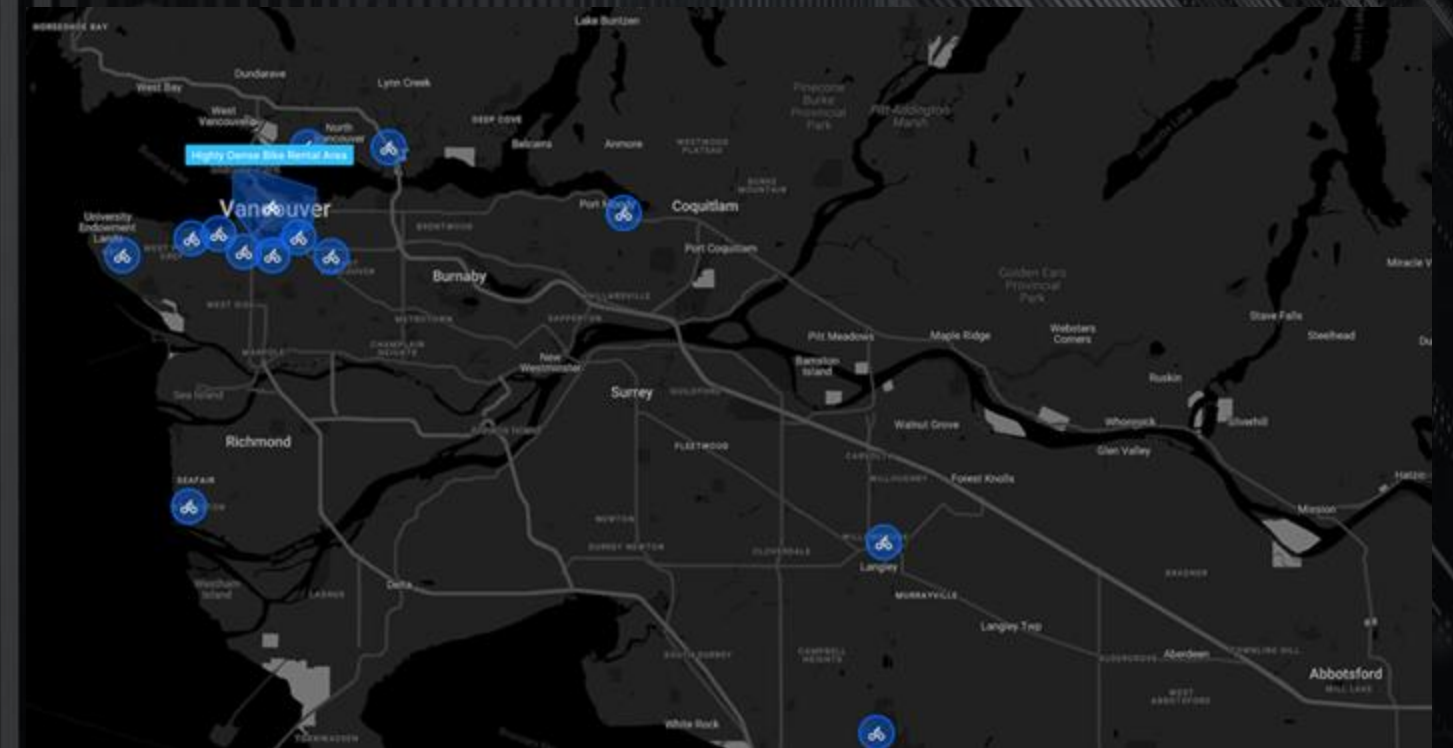
Bike rental docking stations are concentrated in the downtown core



MOBI Bike rental docking stations [1]

First and Last Mile Problem

The travel distance to and from the docking station or bike rental shop



Vancouver Bike rental locations

Lack of Robustness

Limited business hours and negotiable rates



SWIVEL

Our Solution

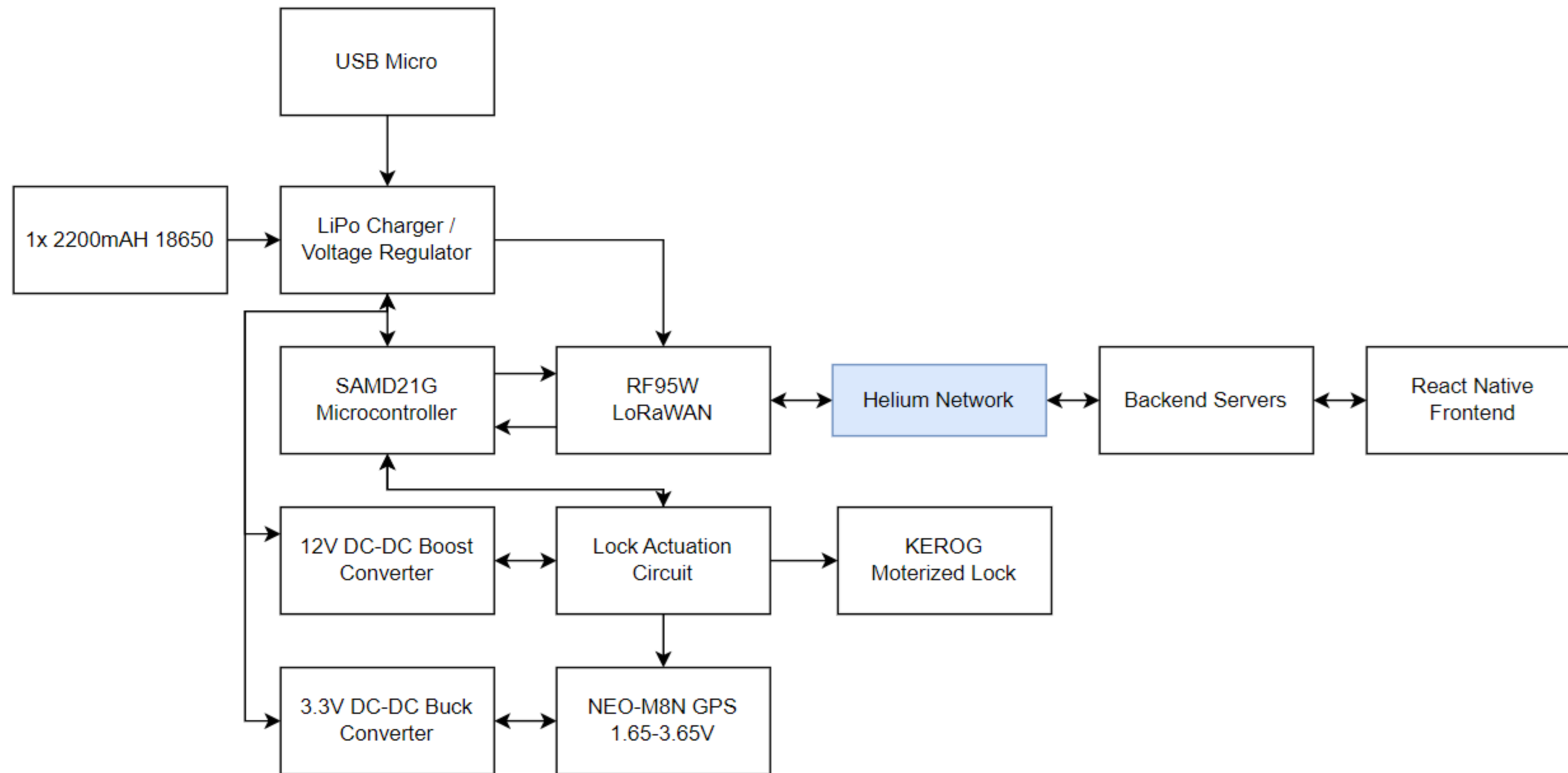
Convenient and Remote Access To Bikes

Scalable and Crowdsourced

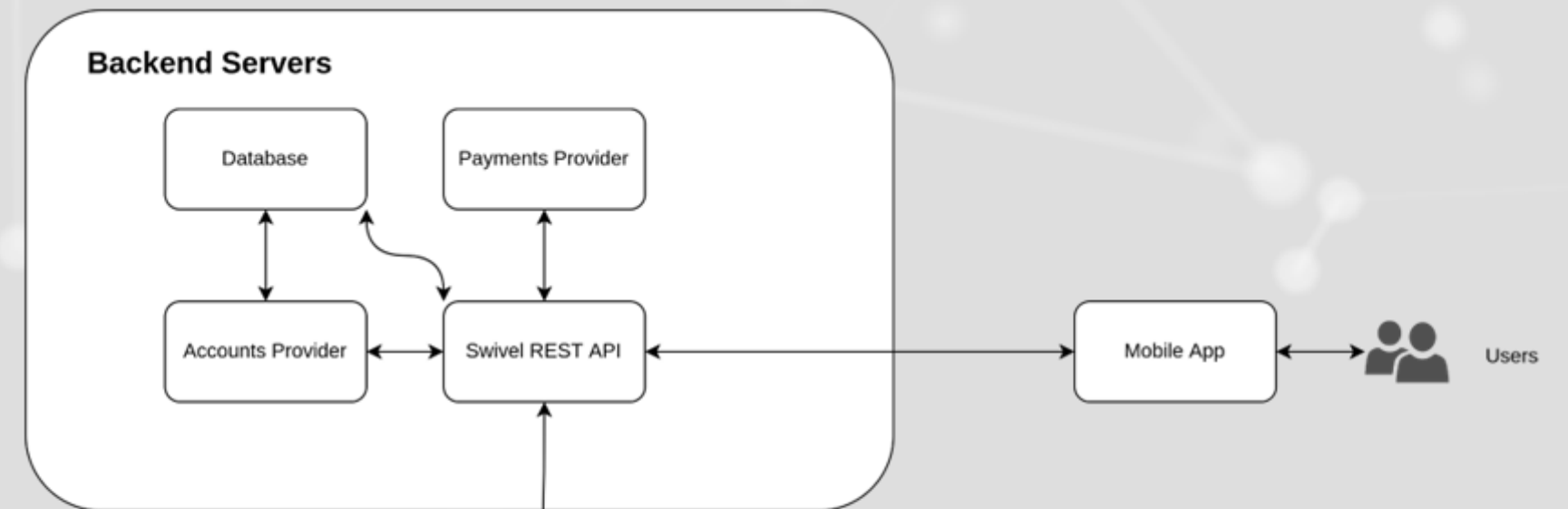
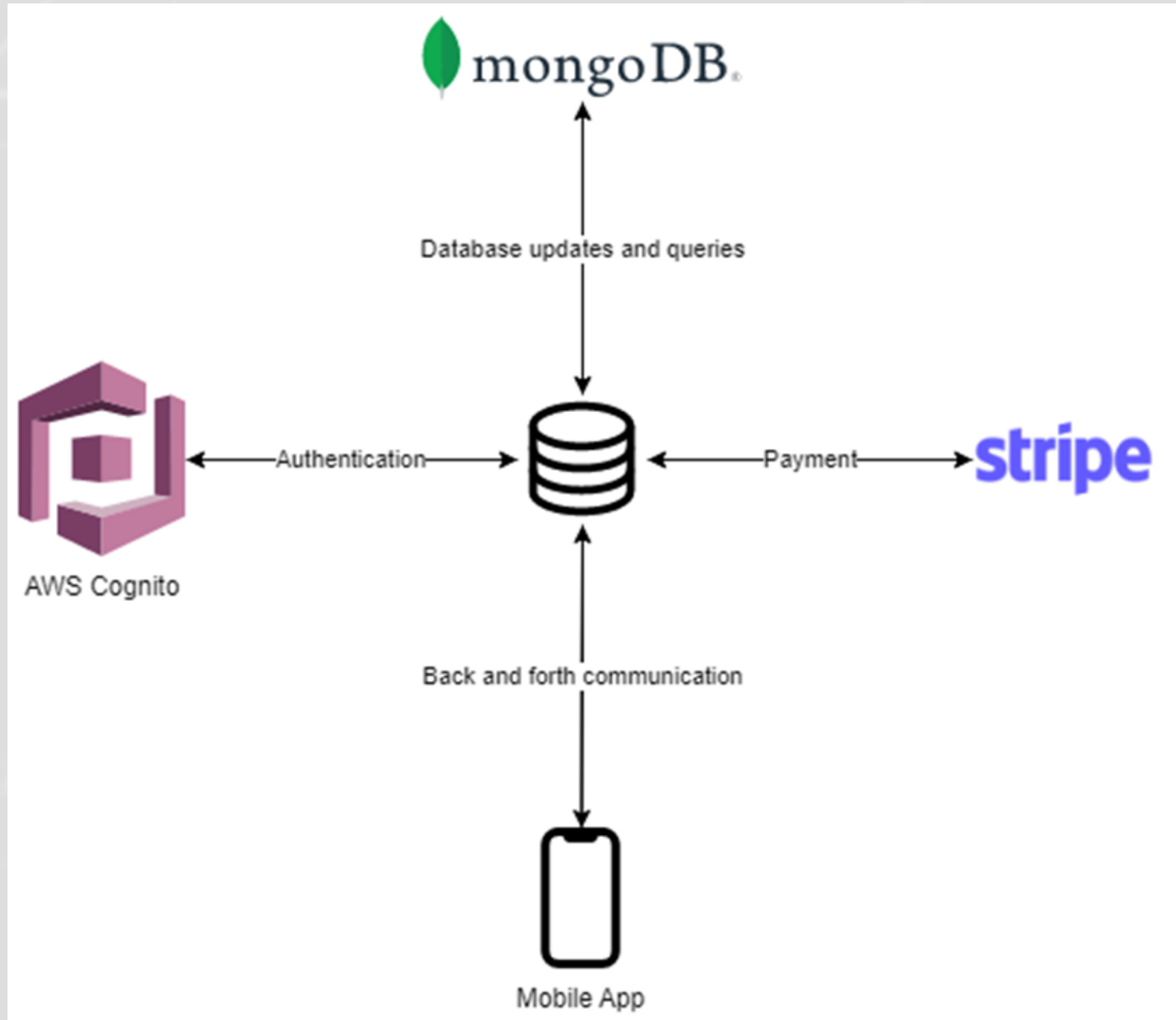
Dockless Design

Mobile Application Software

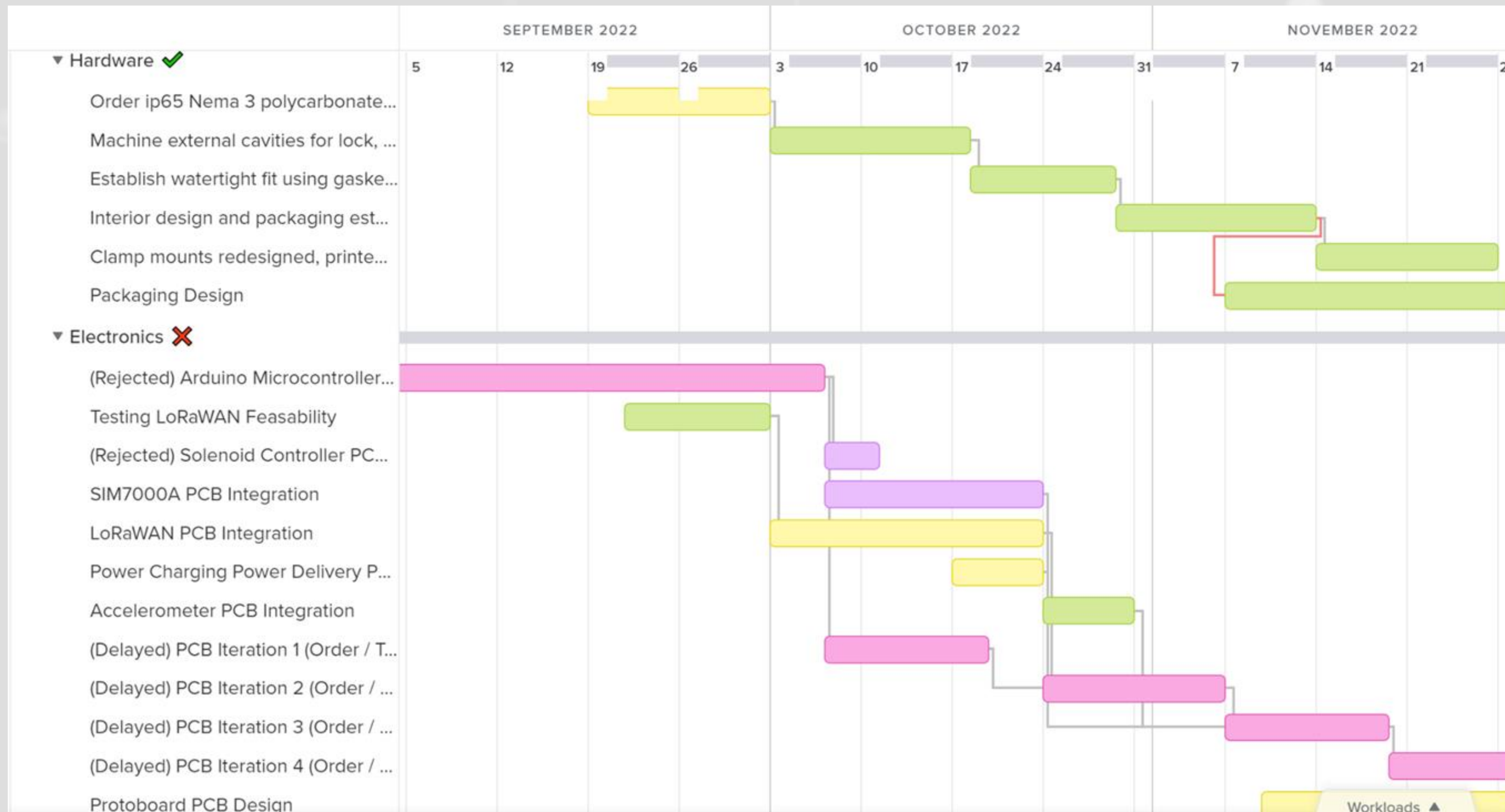
System Design Overview



Software Design Overview



Project Gantt Chart



Project Gantt Chart

❌ Firmware

(?) LoRaWAN / Helium Integration

Anti-Theft Firmware Integration

(Delayed) Advanced Low-Power Mo...

(Delayed) Bluetooth Integration

(Delayed) Algorithms For Bluetooth ...

Encrypted Communication

❌ Software

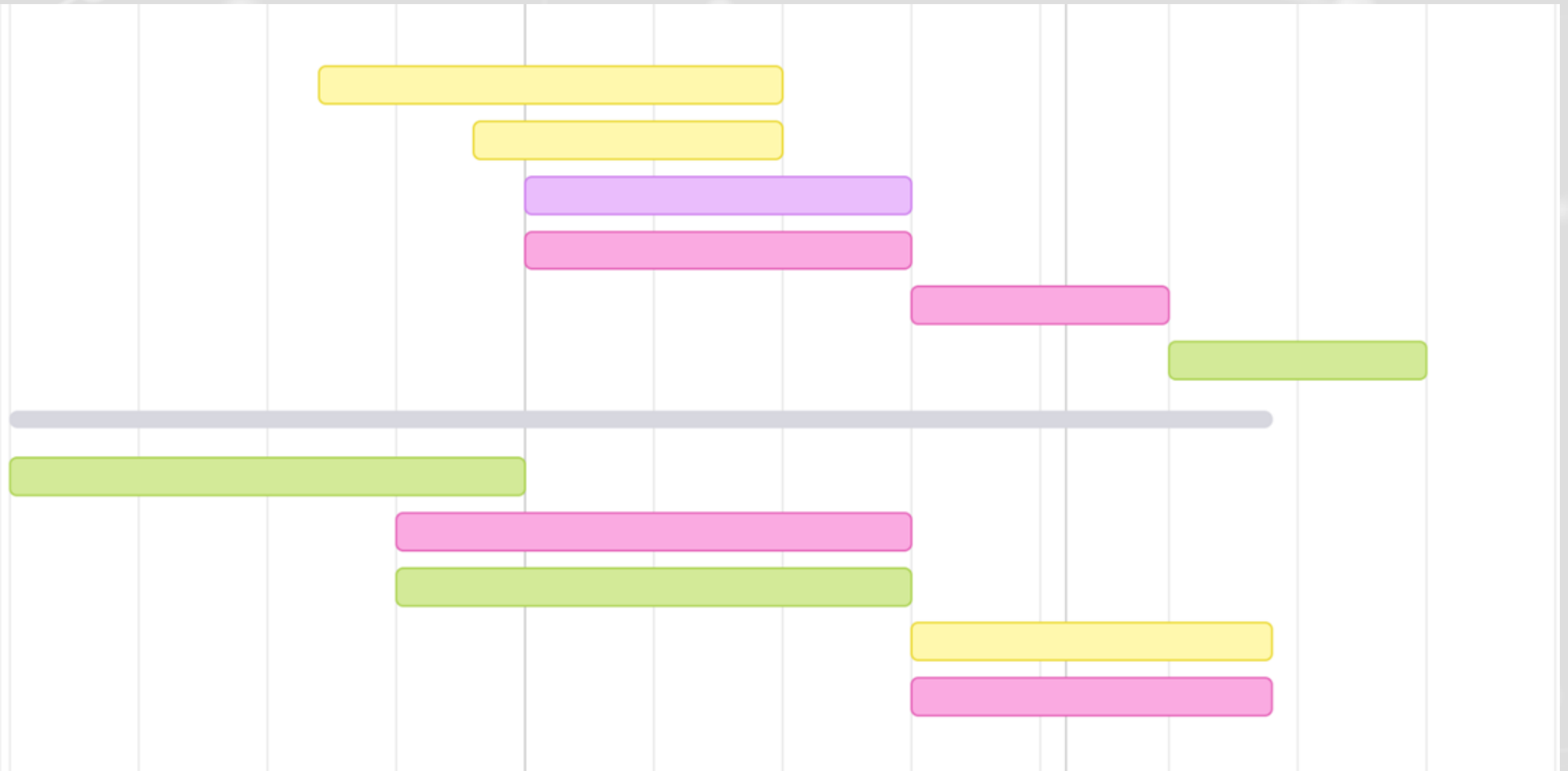
Accounts

(Delayed) Payments

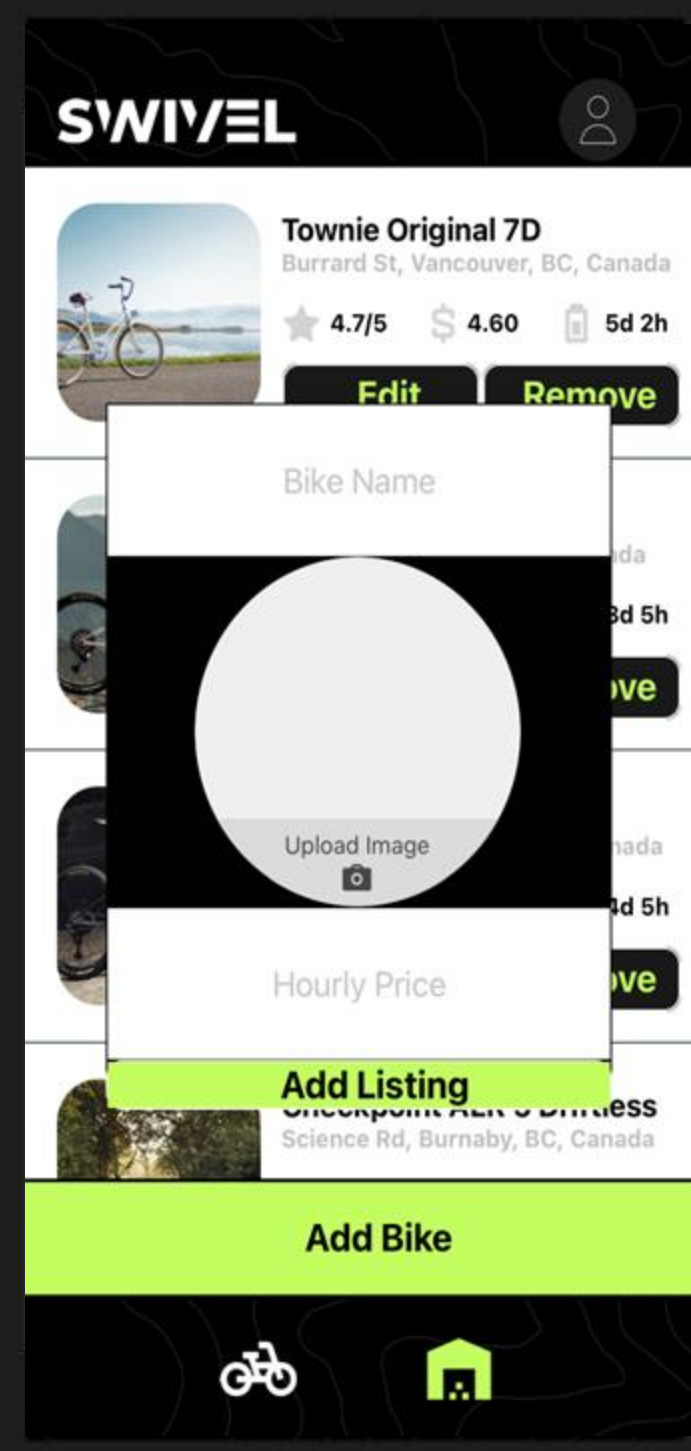
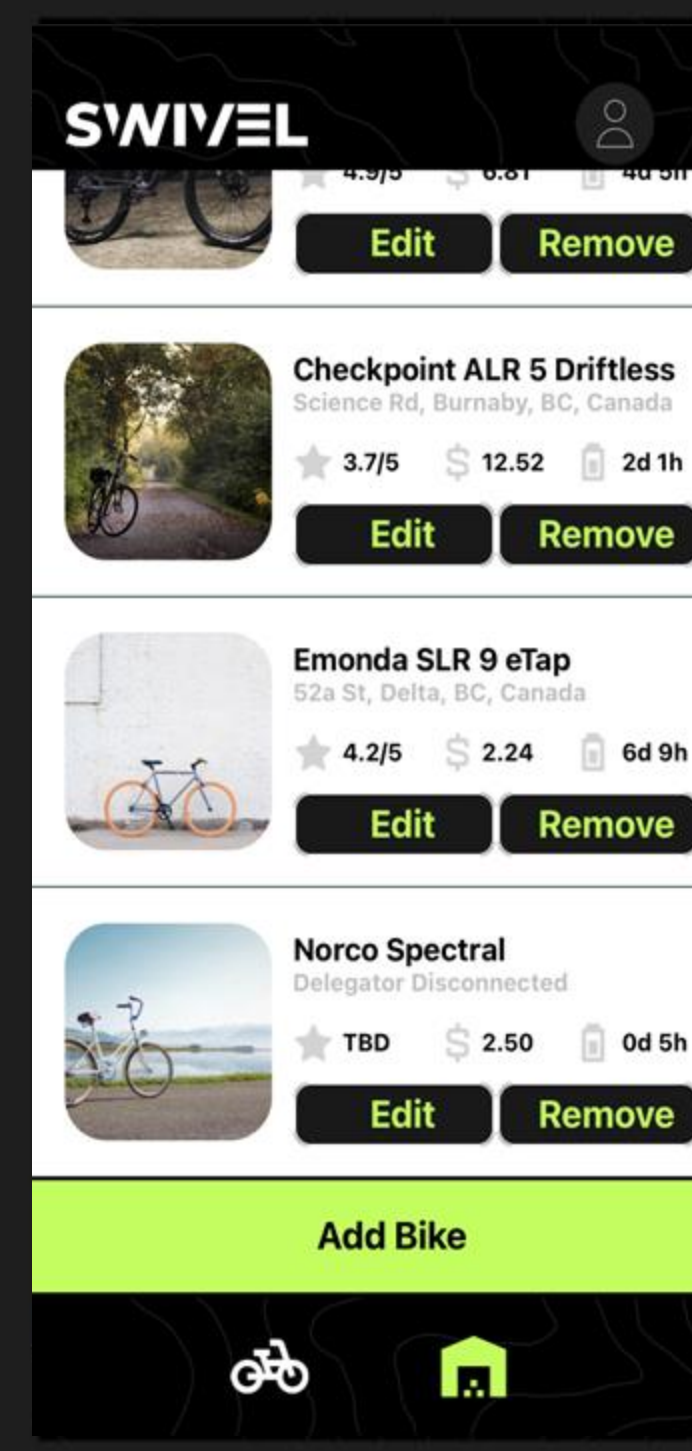
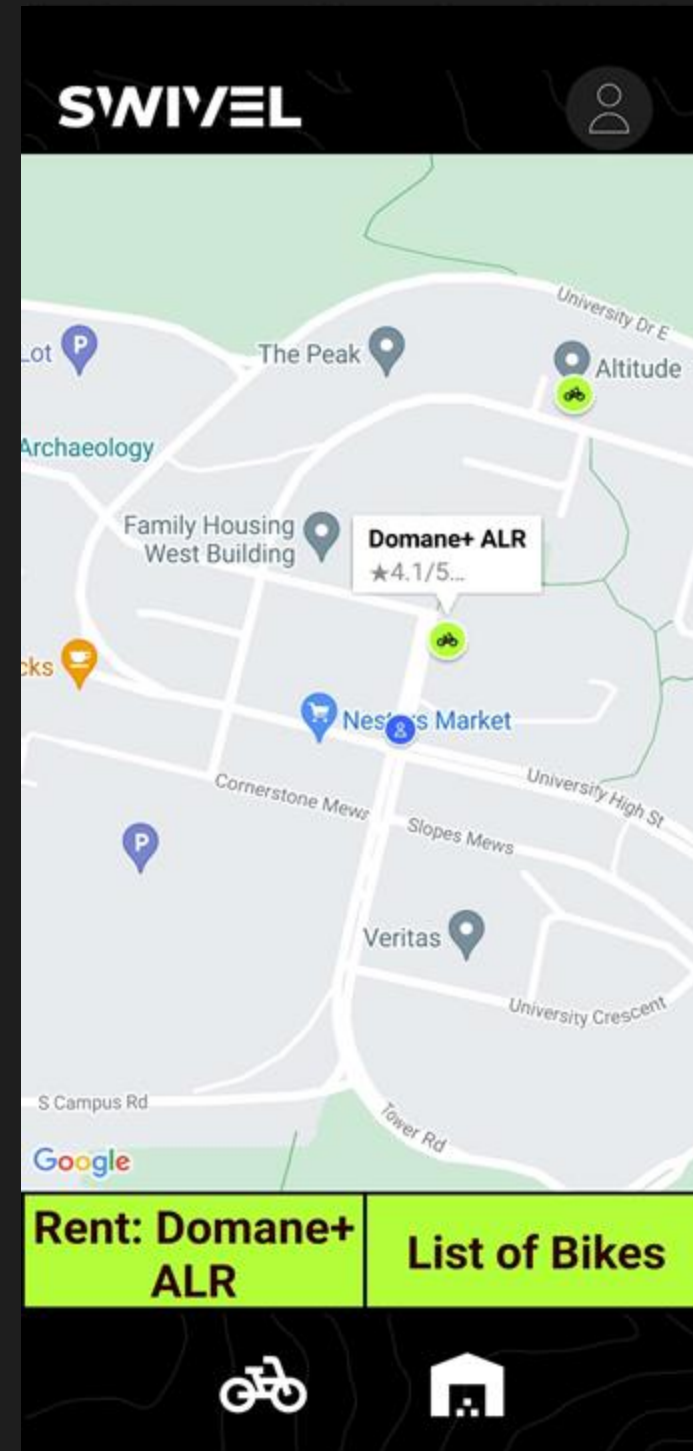
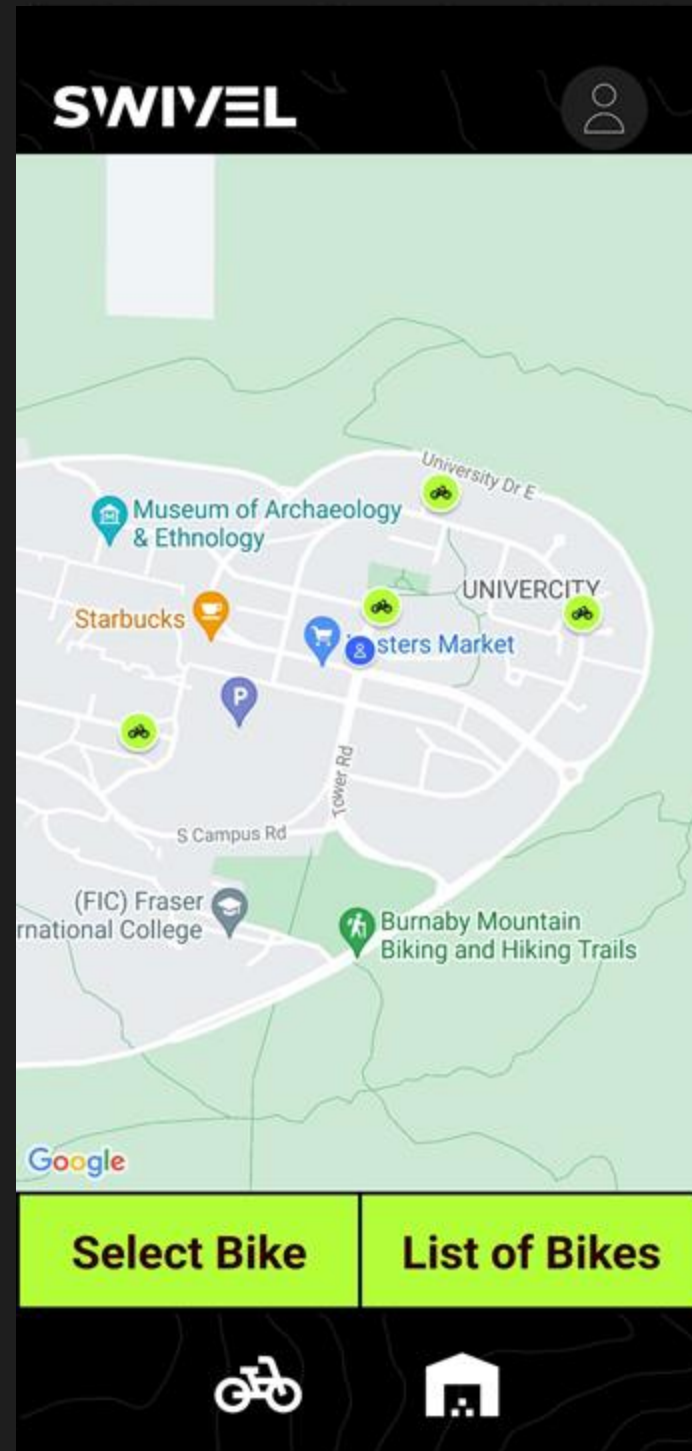
Ability to Pick A Bike For Rent

(Changed Scope) Ability to Add & ...

(Rejected) App Bluetooth Integrati...



User Interface

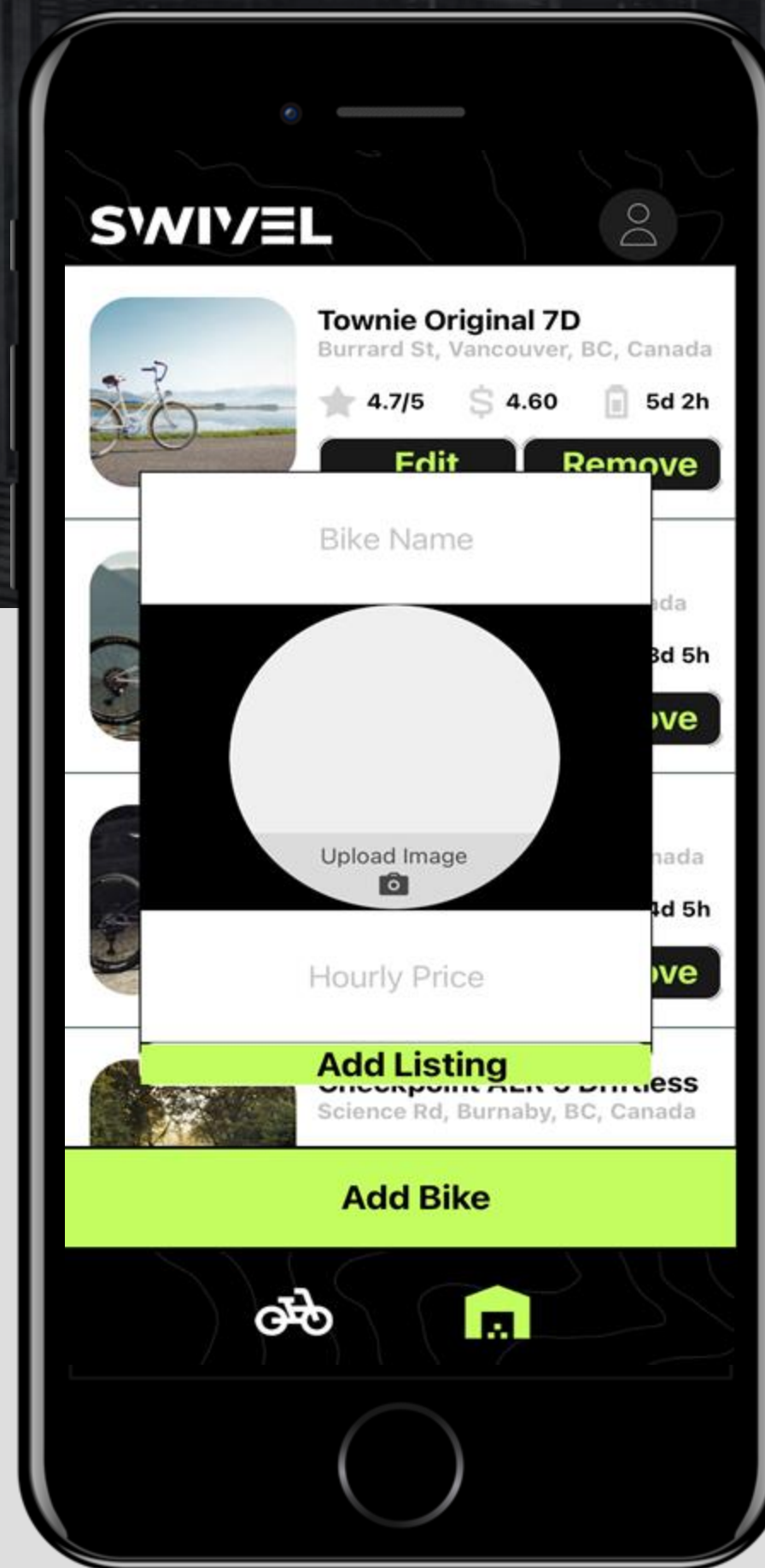




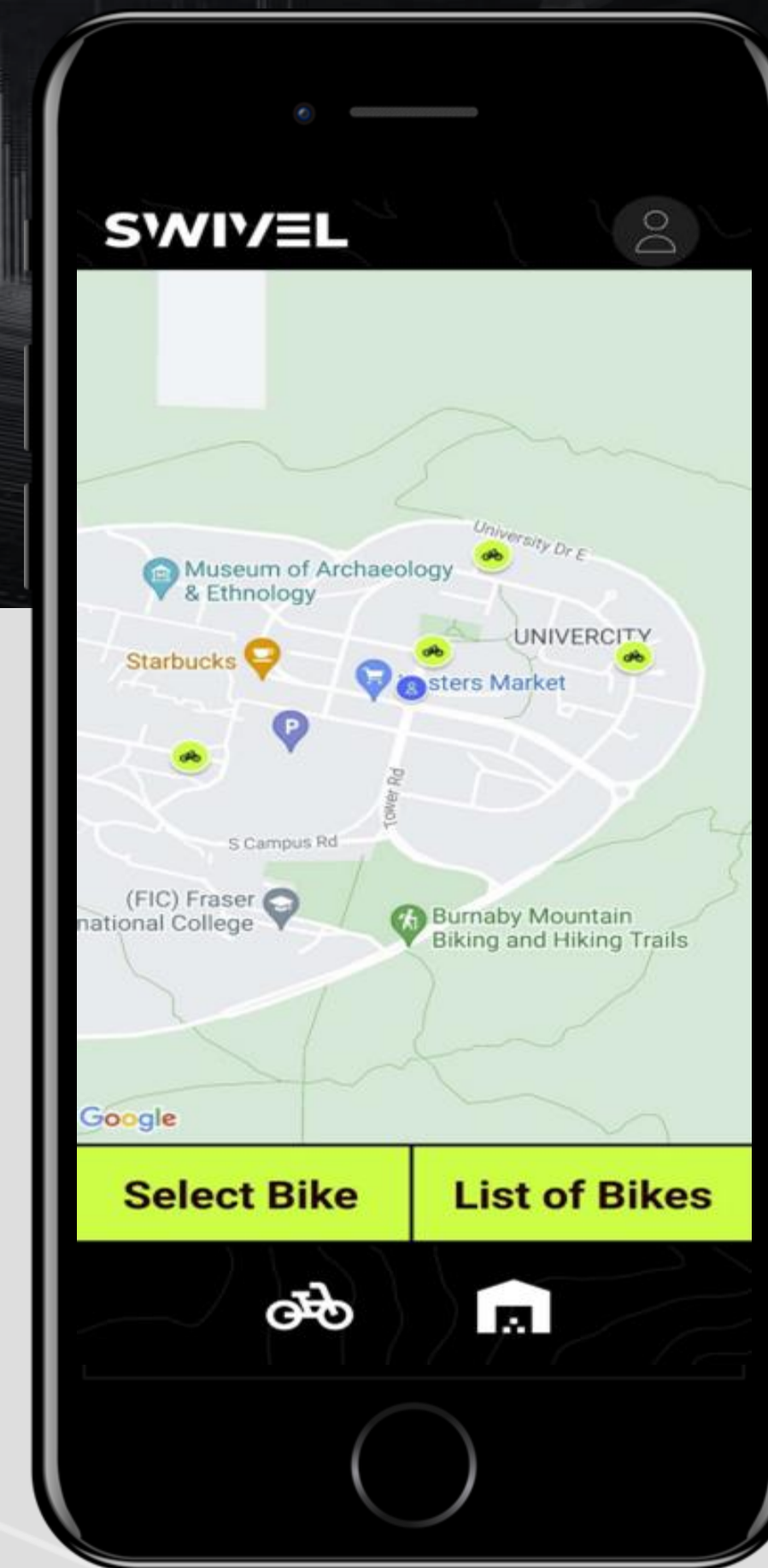
The Delegator



Technical Details



Carrier Interface



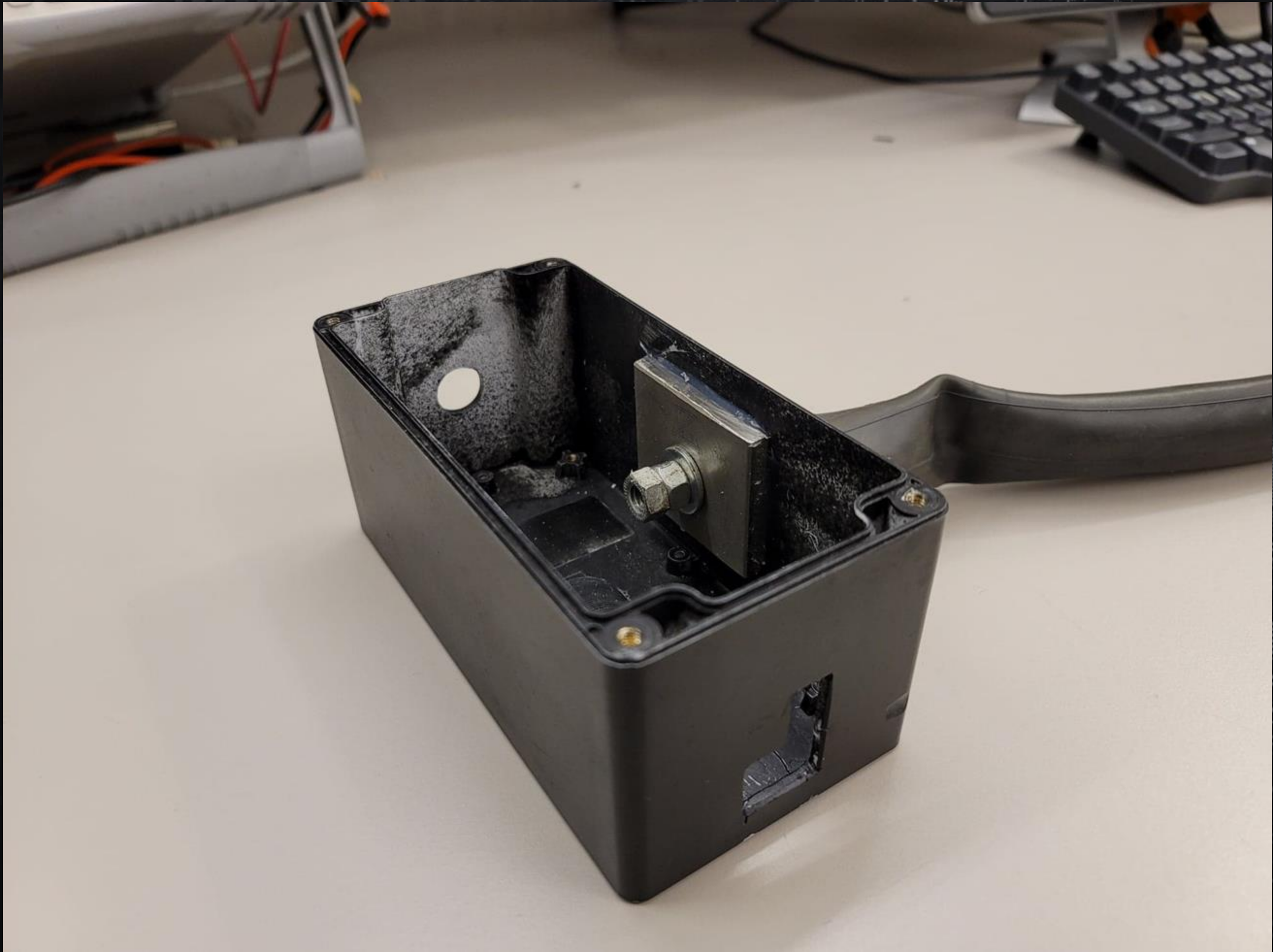
Renter Interface

The Delegator





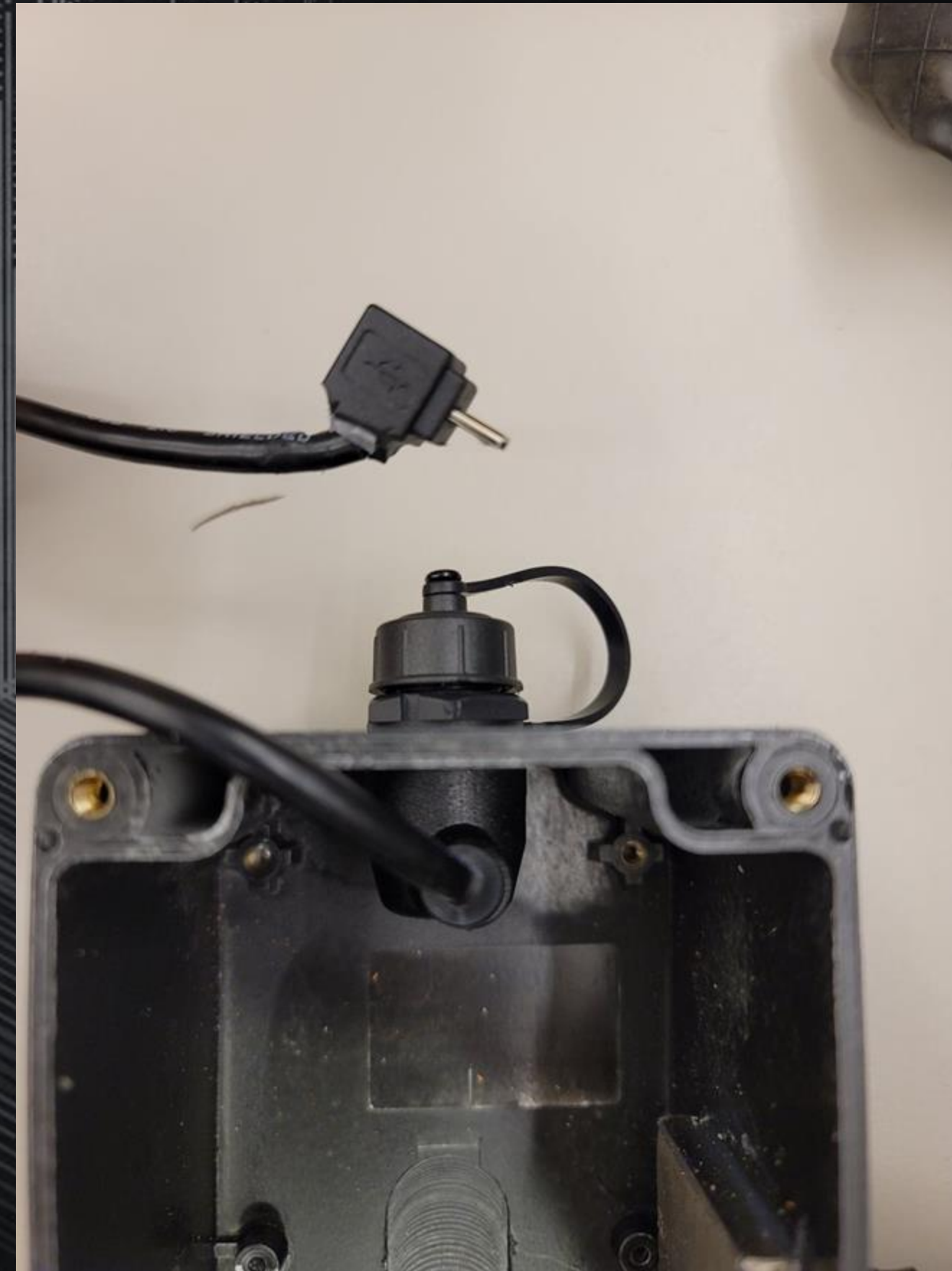




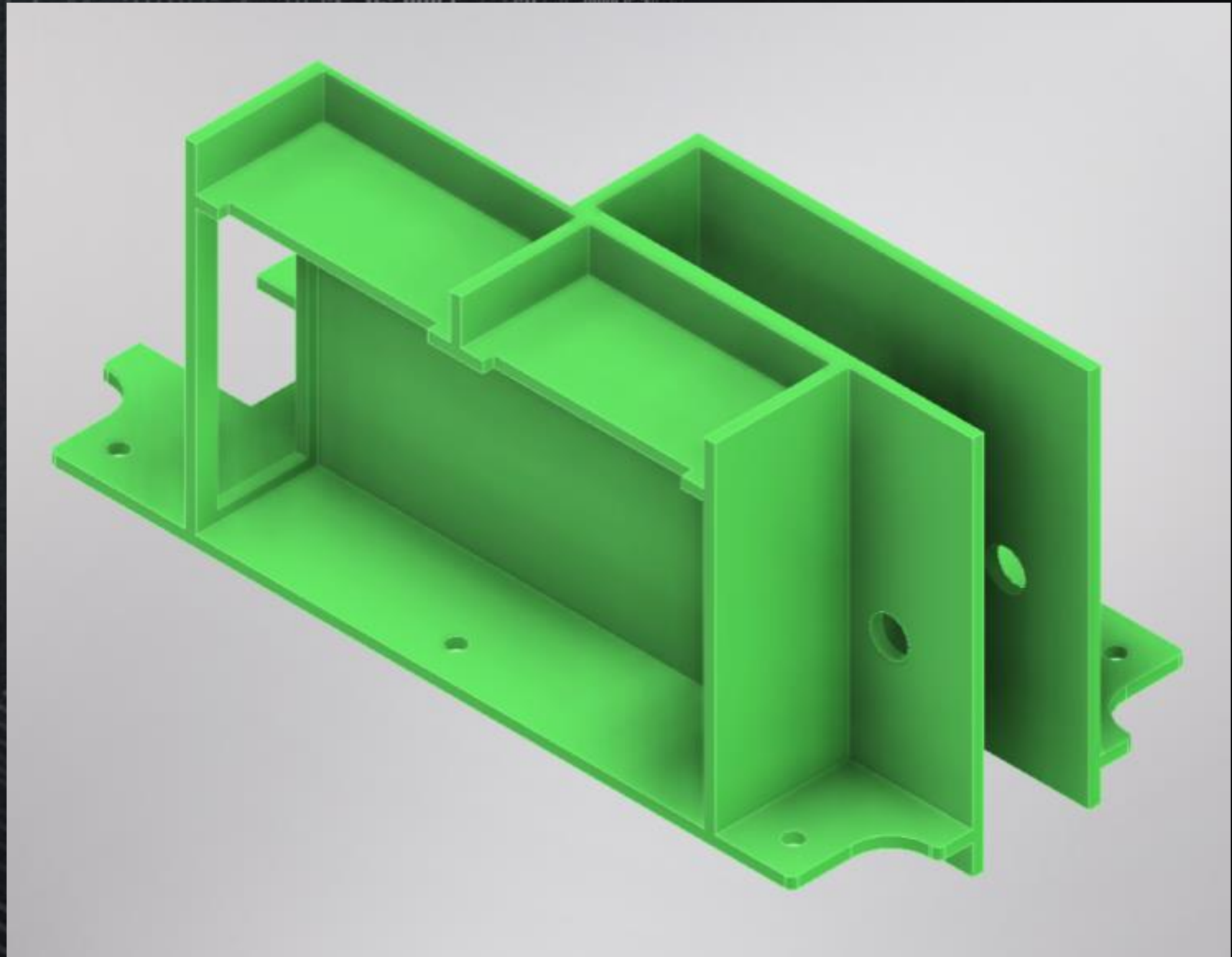
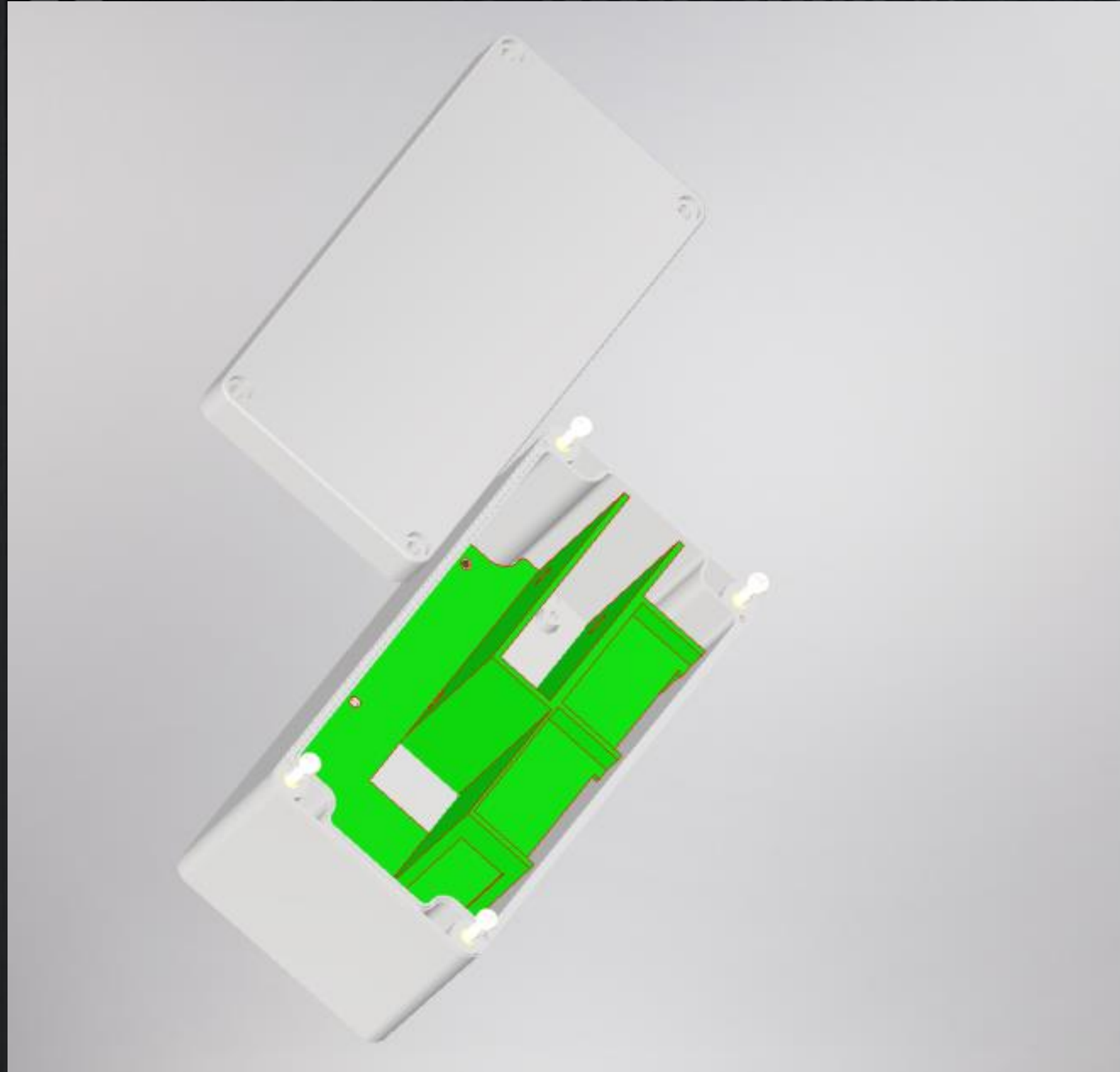




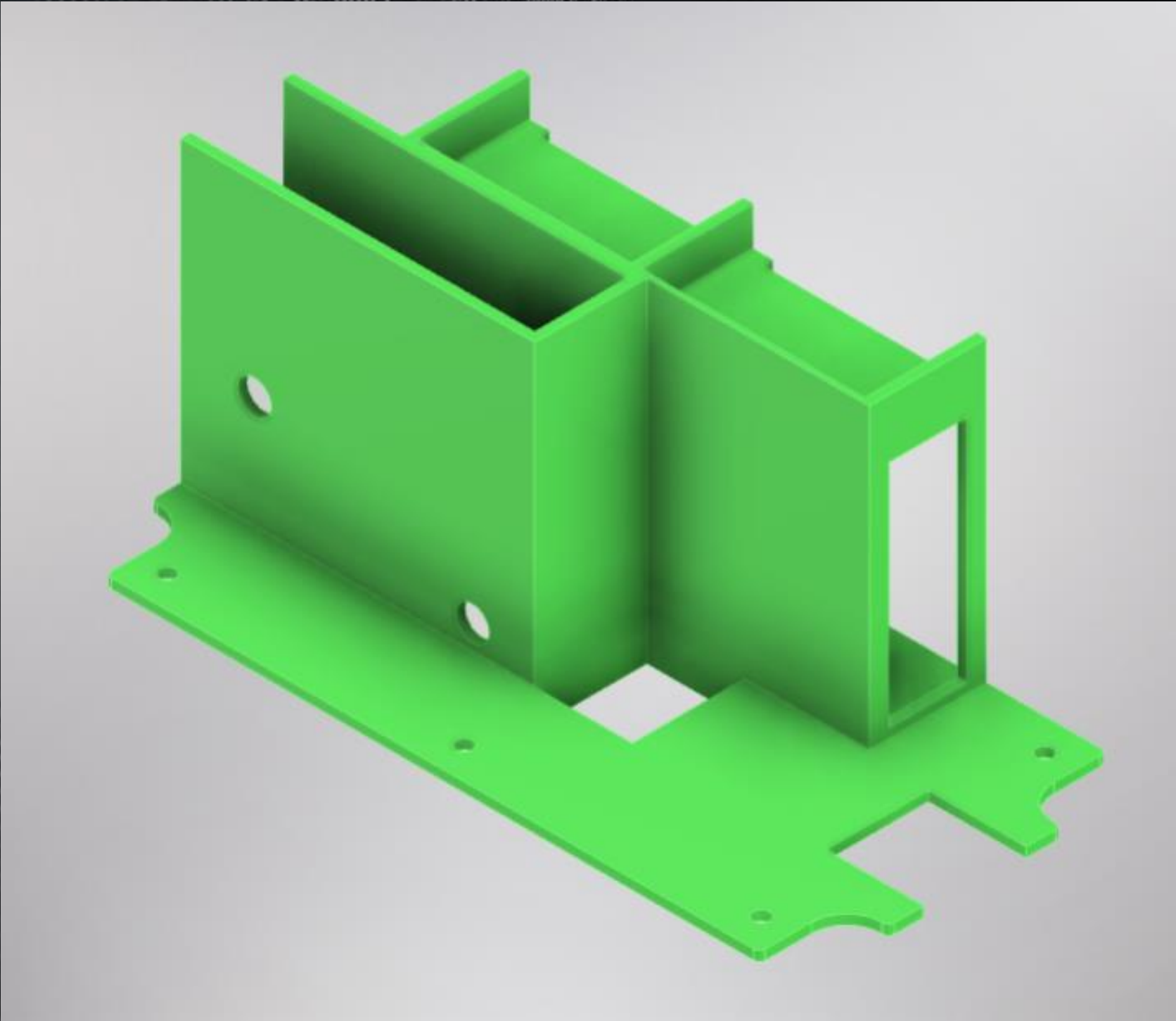
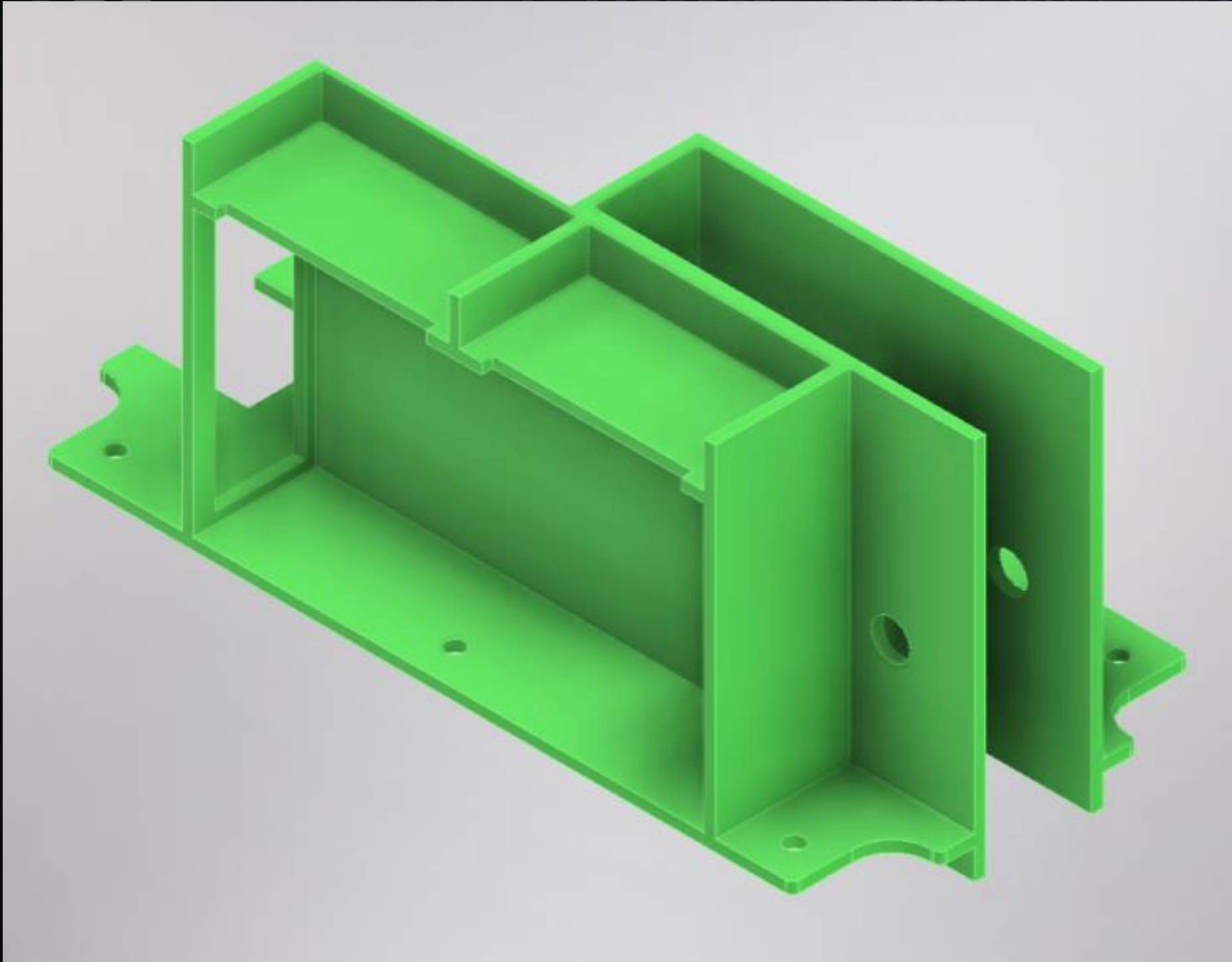
Delegator mounts and modular micro USB cable for charging.



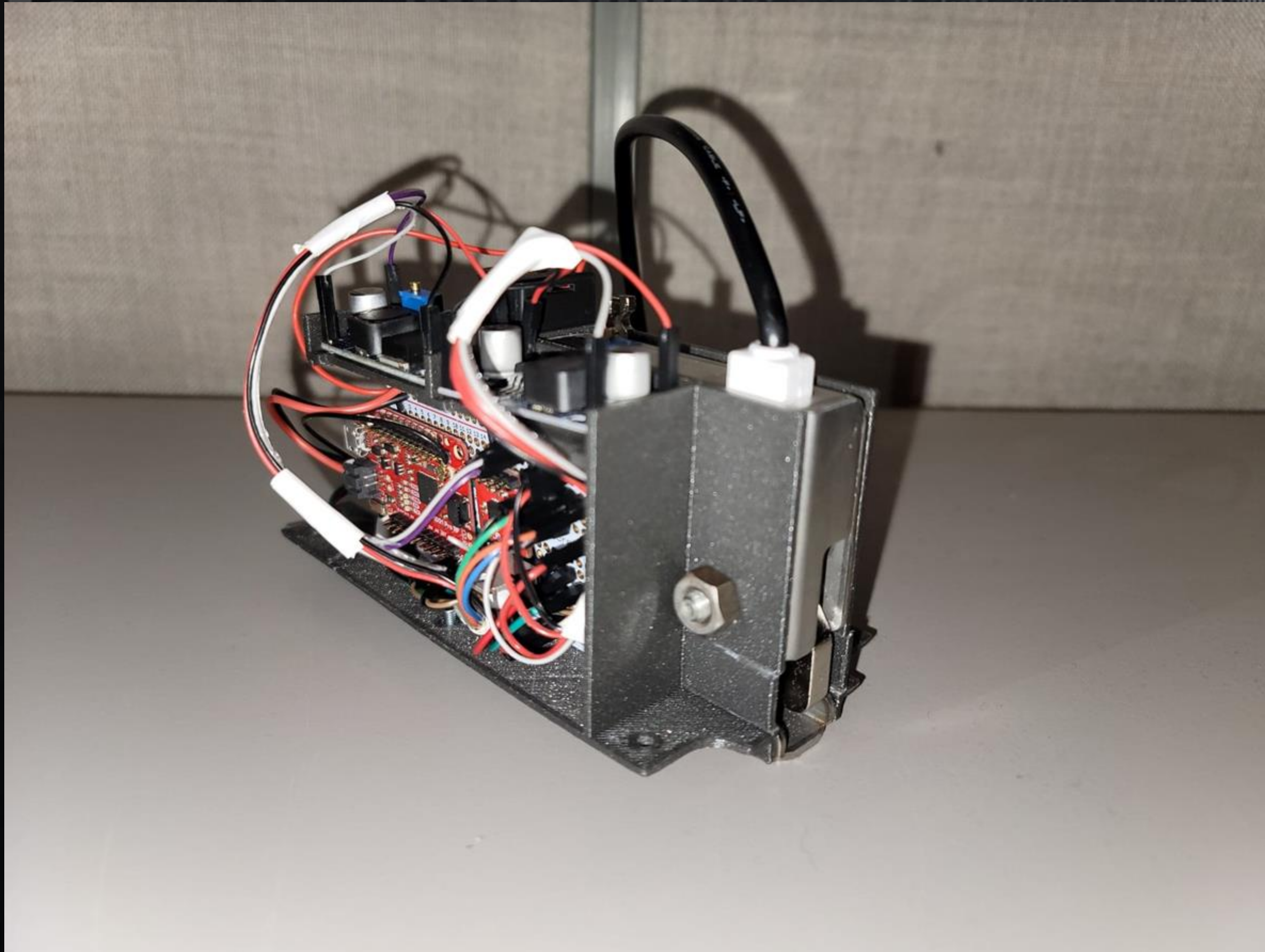
Packaging and our solution - A mounting rack.



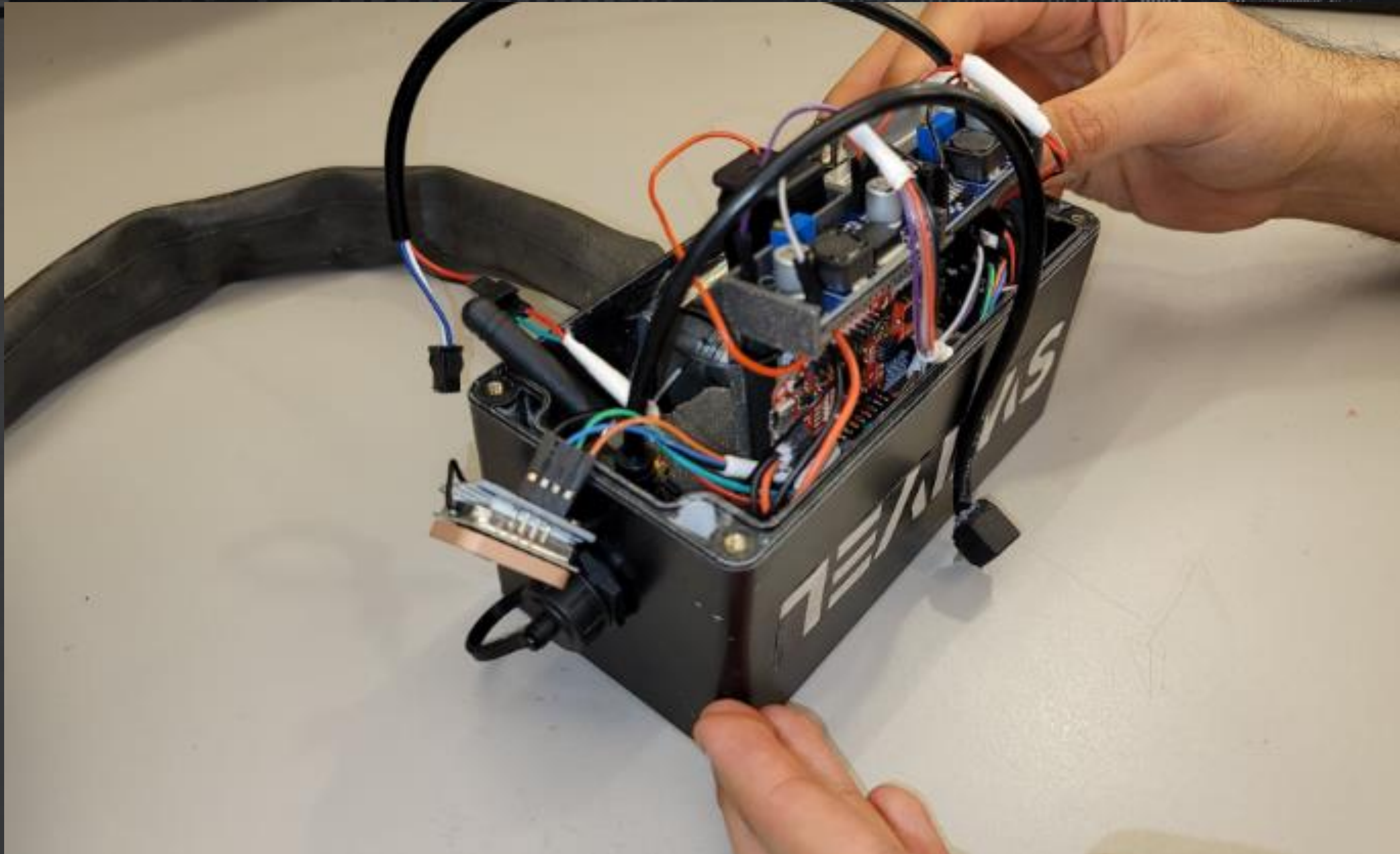
The Mounting Rack:



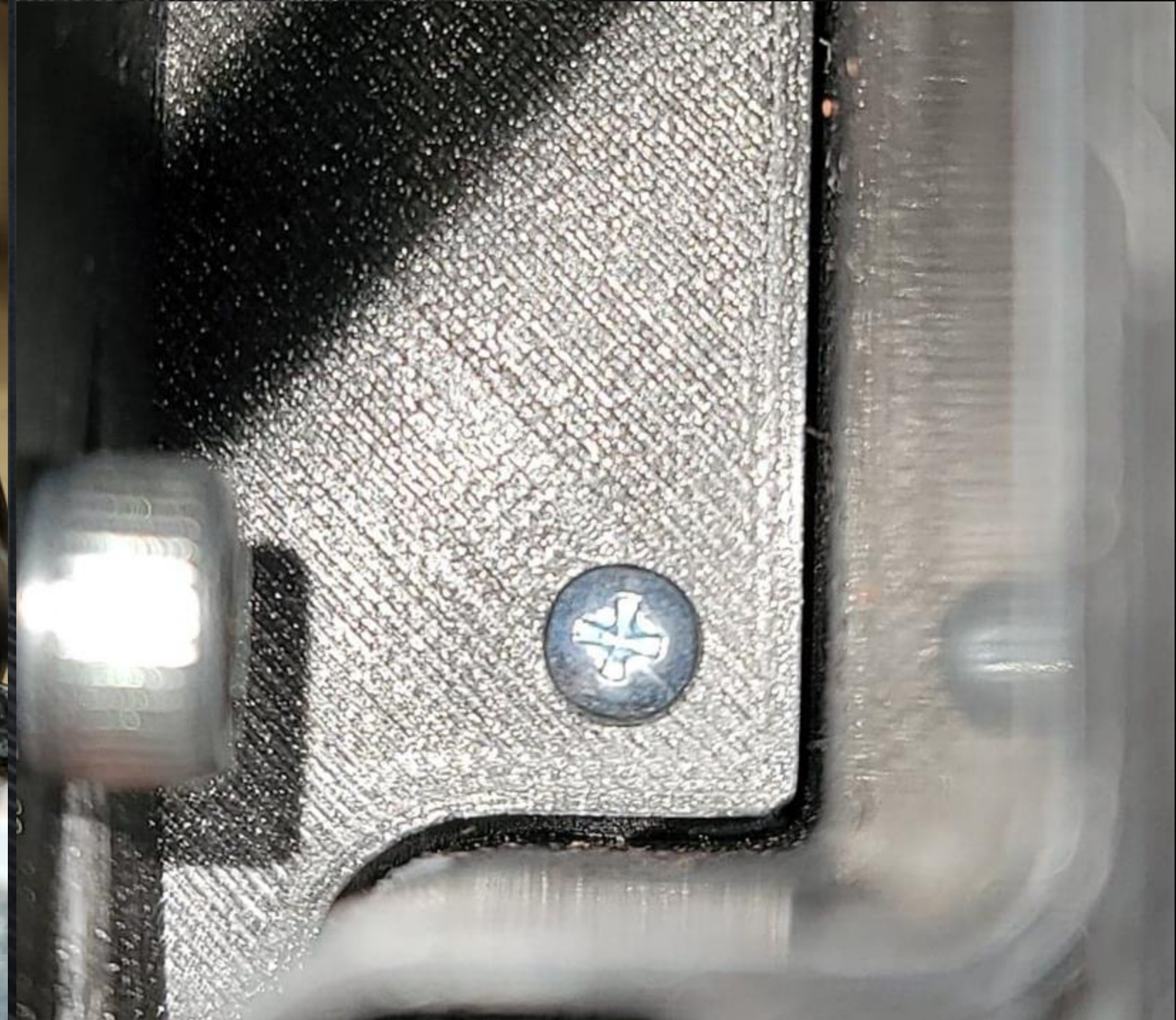
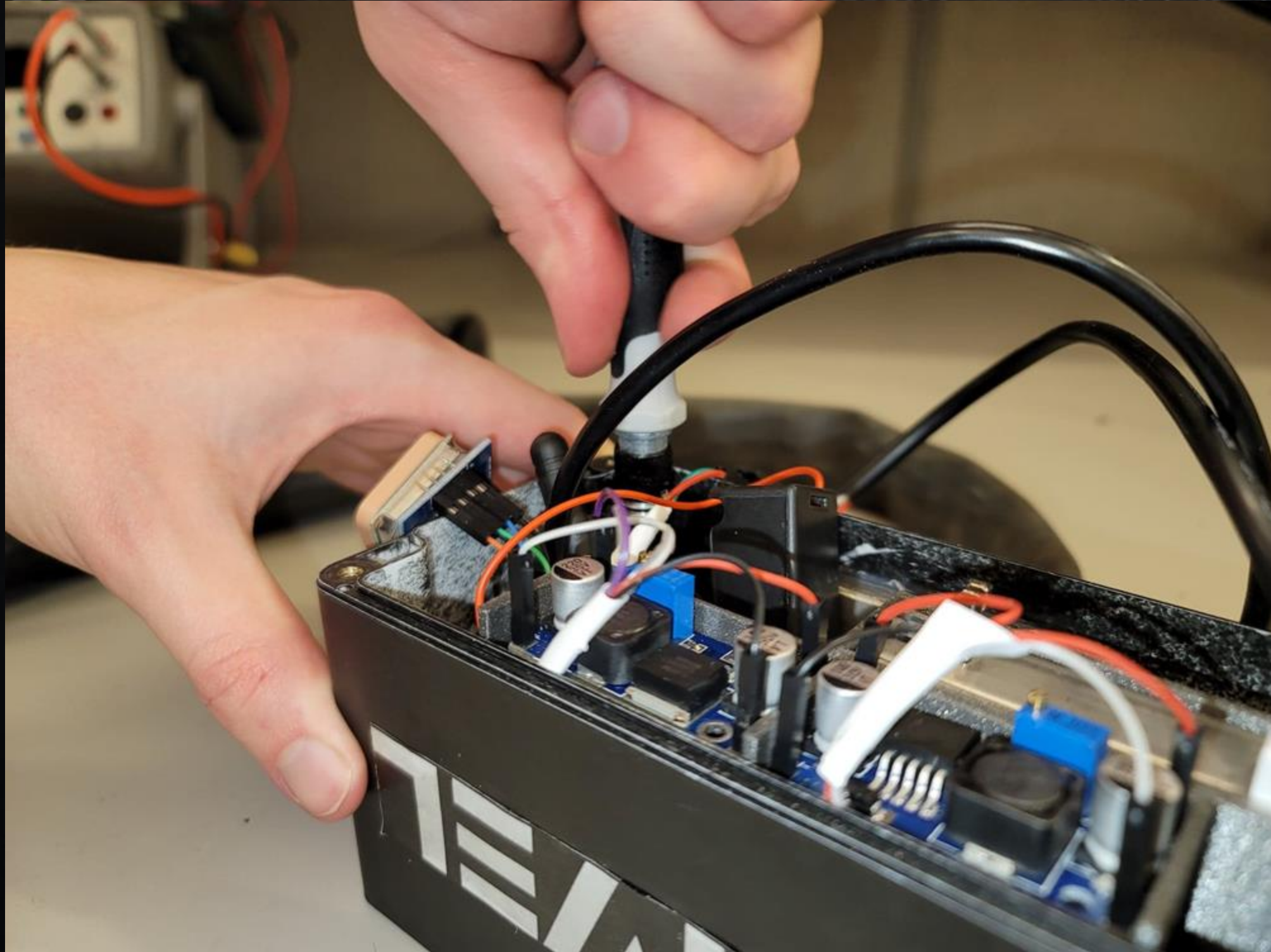
Mounting rack with lock and all electronics mounted.

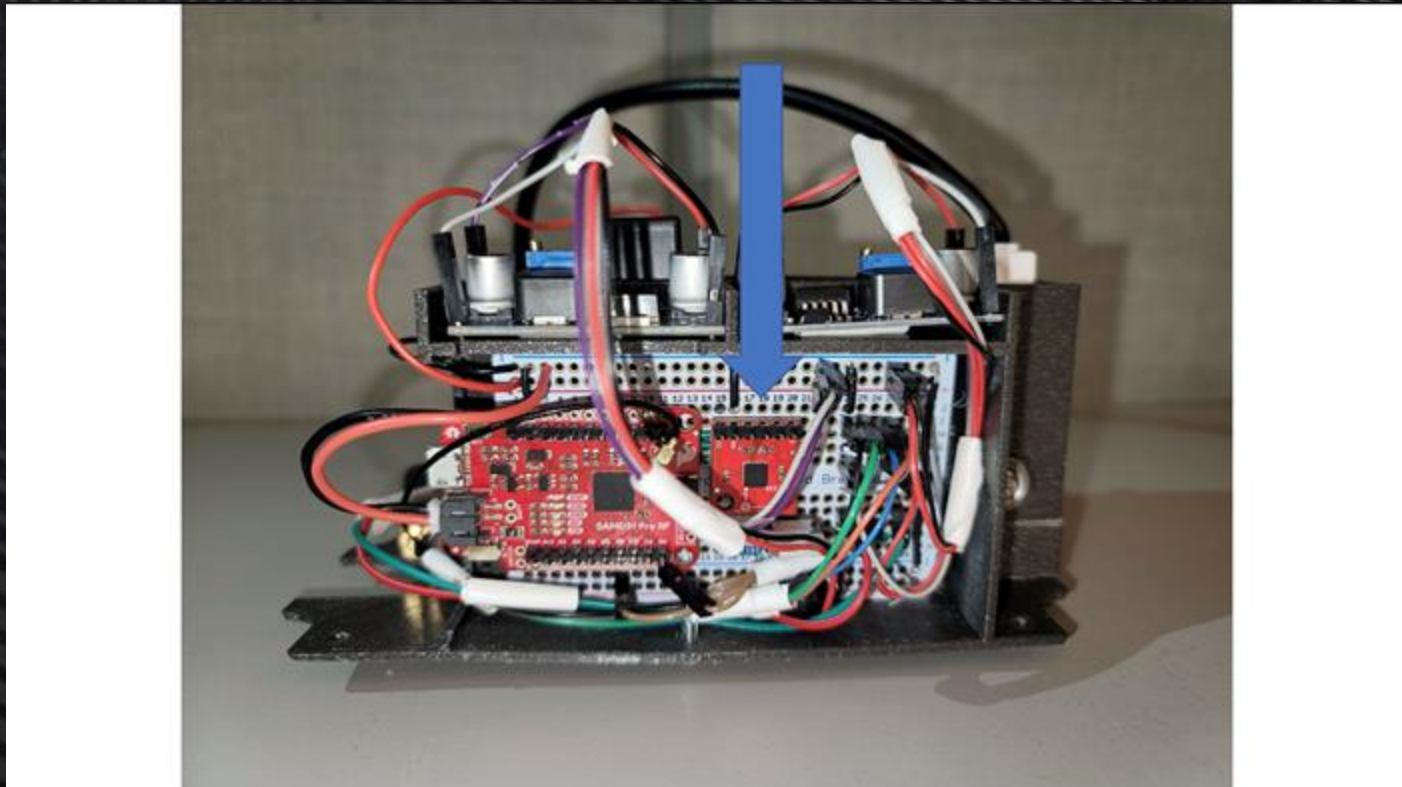
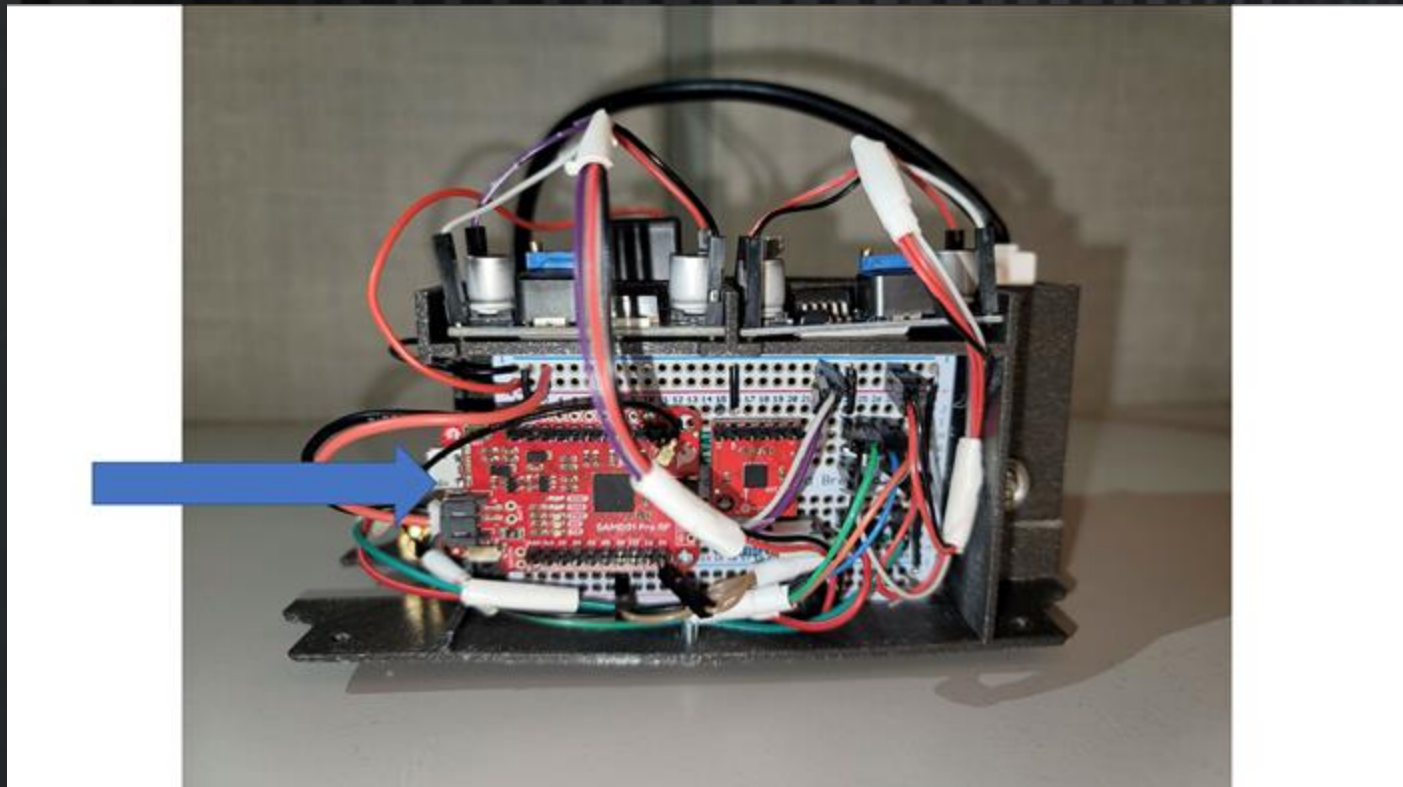
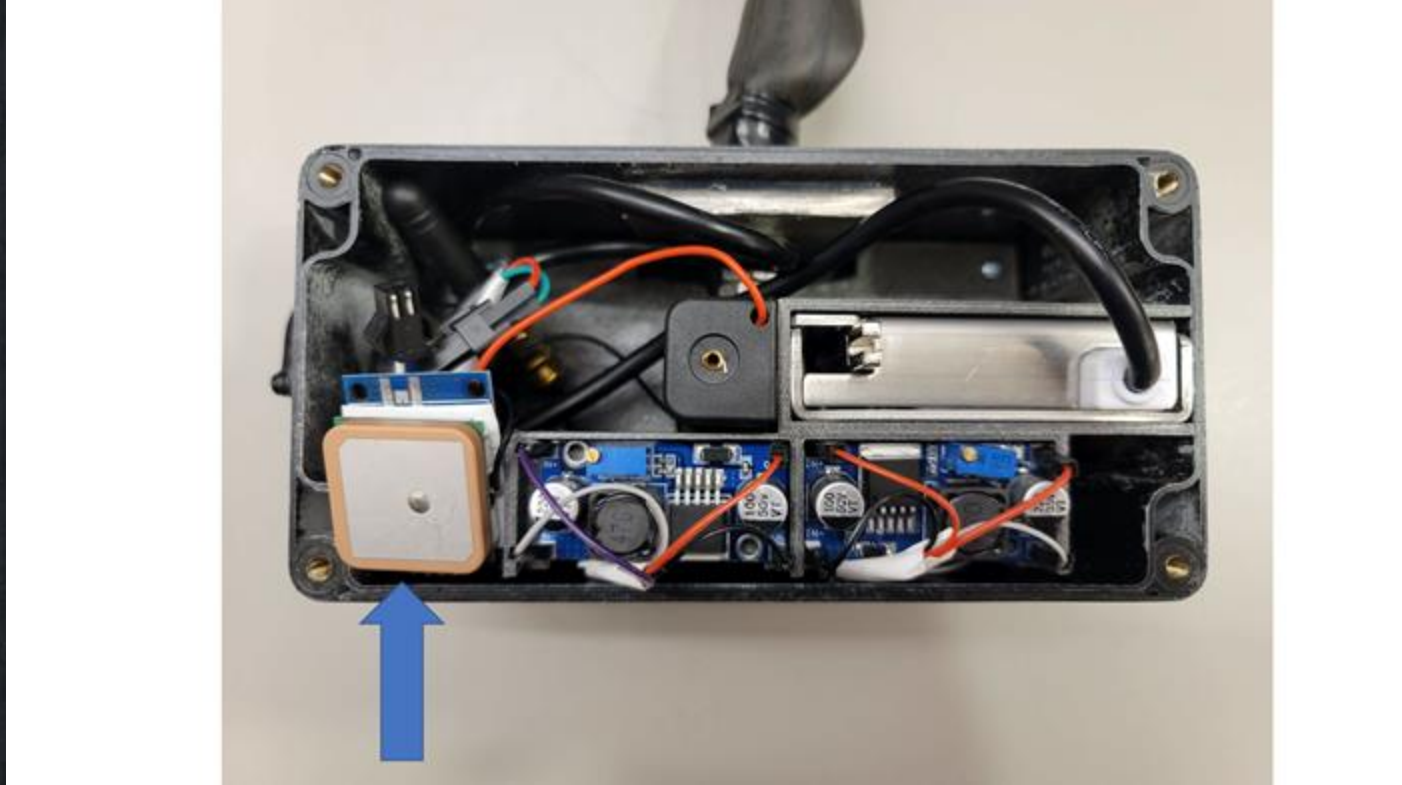
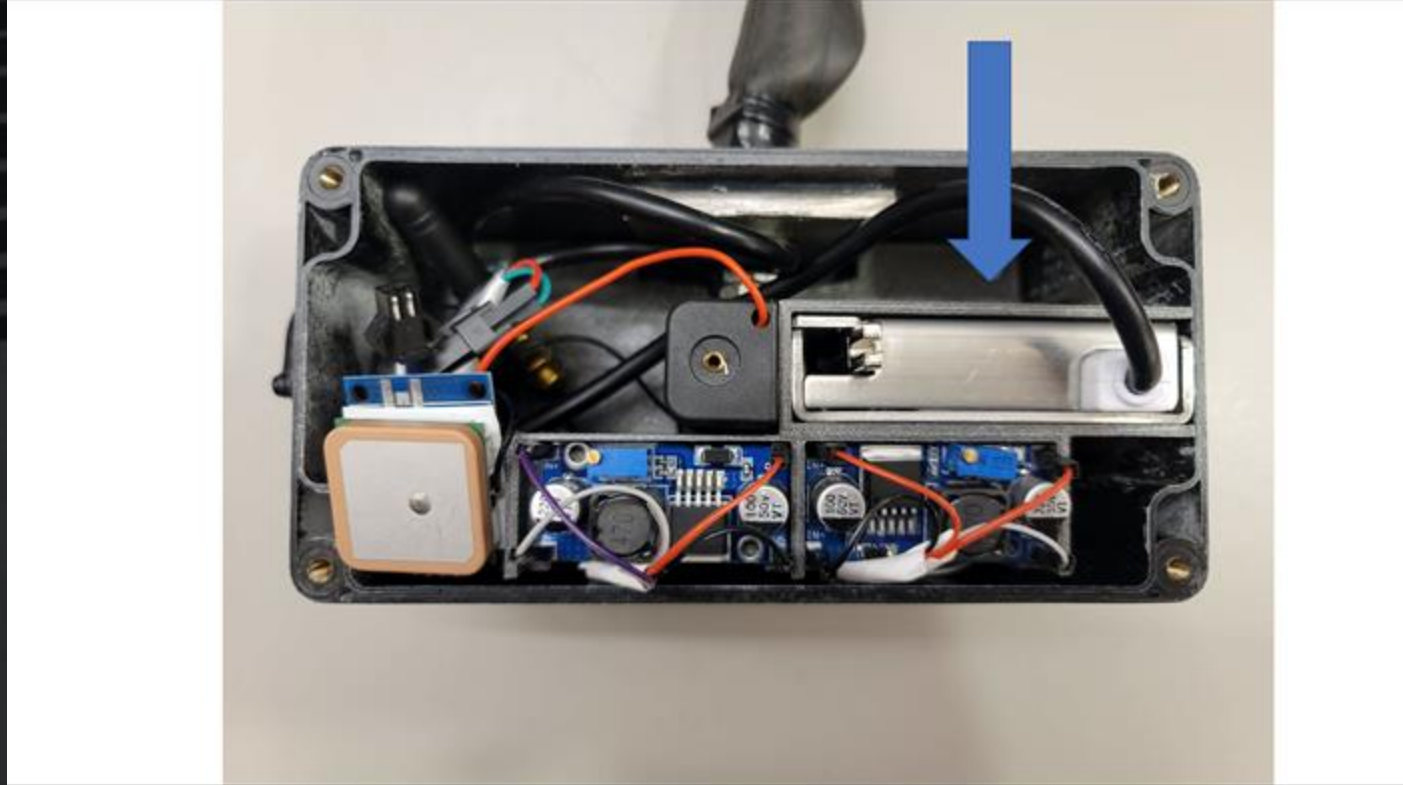


Placing mounting rack into delegator box :



Placing mounting rack into delegator box :

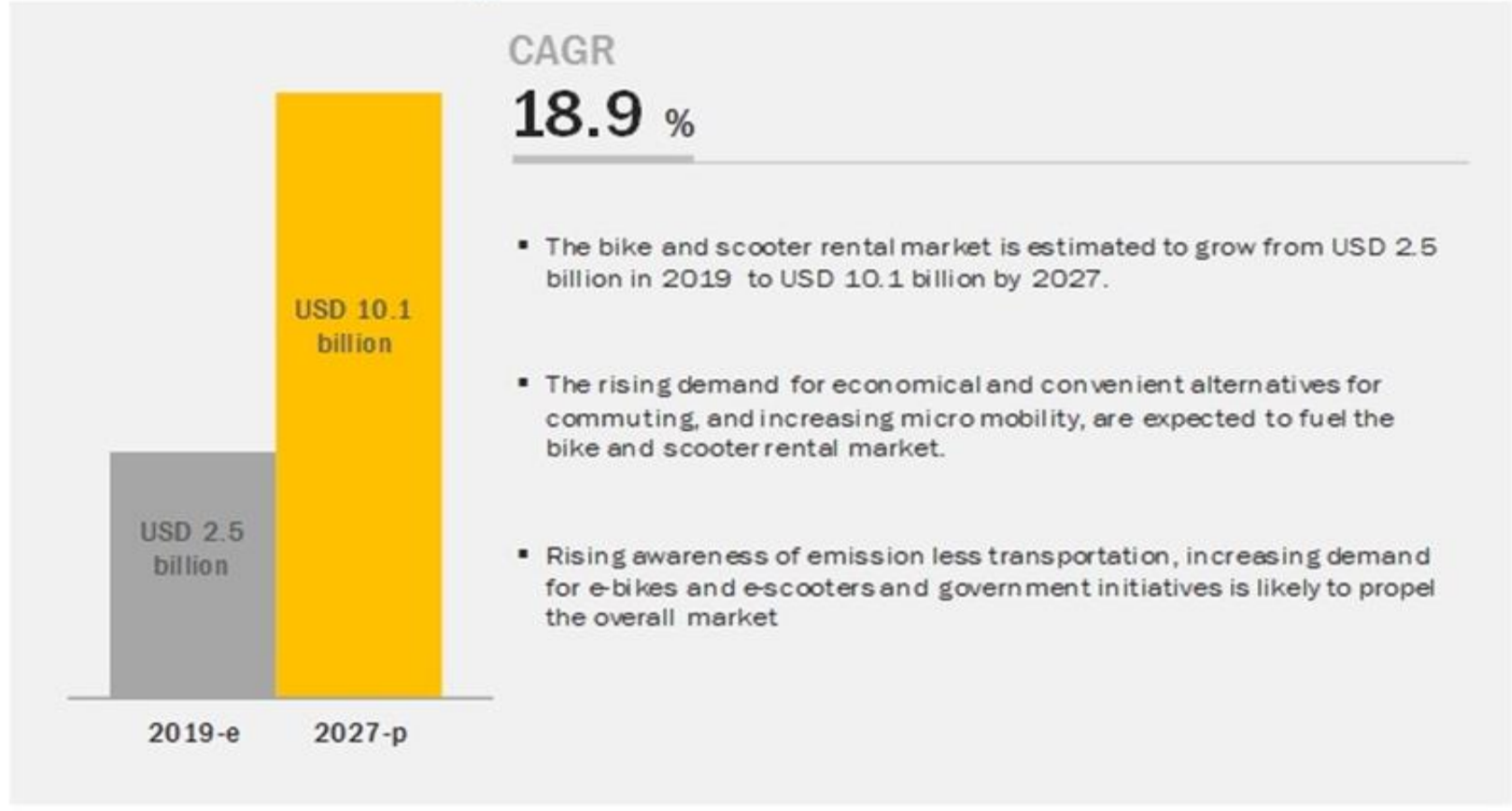




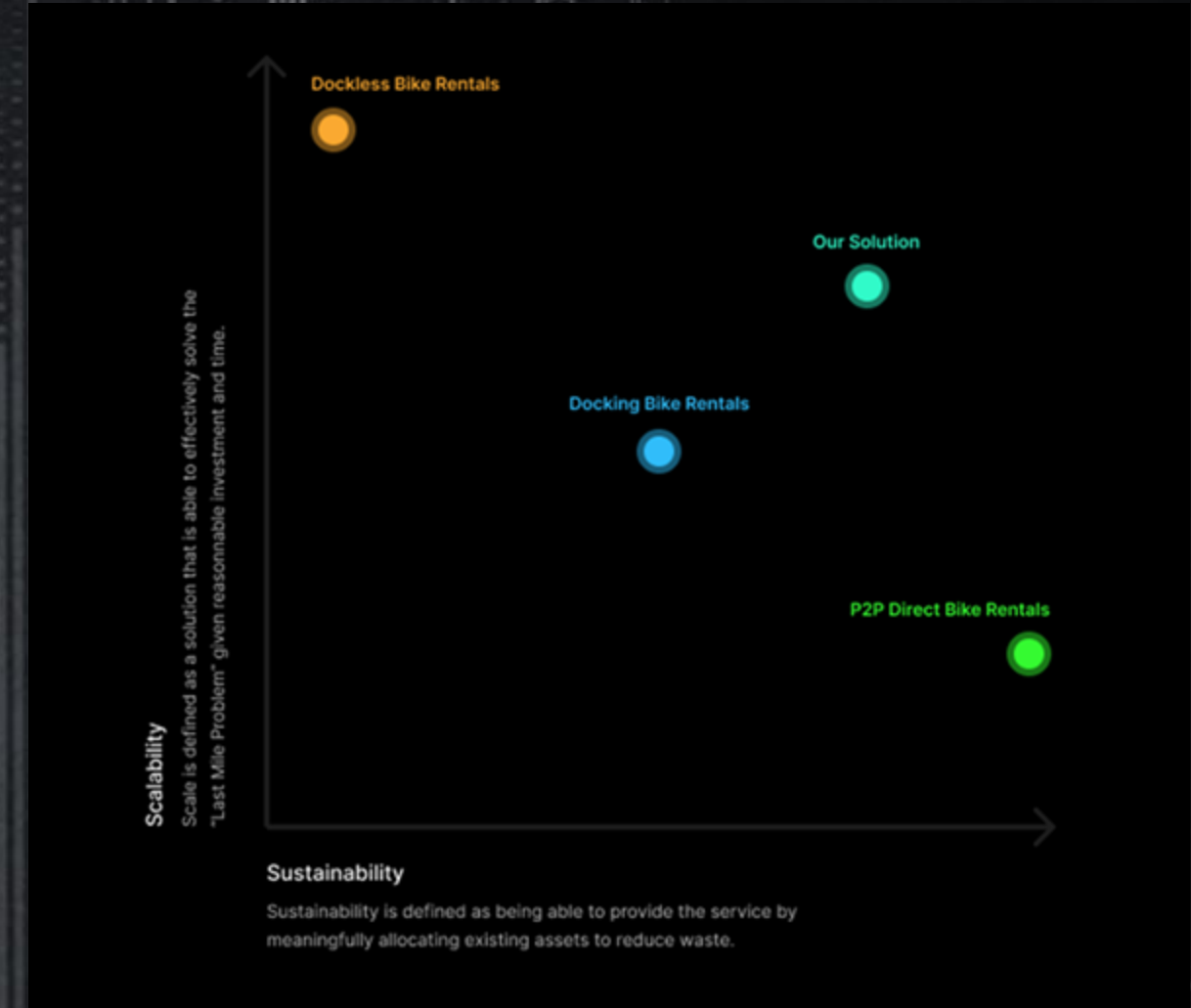


Demo Video

Attractive Opportunities in the Bike and Scooter Rental Market



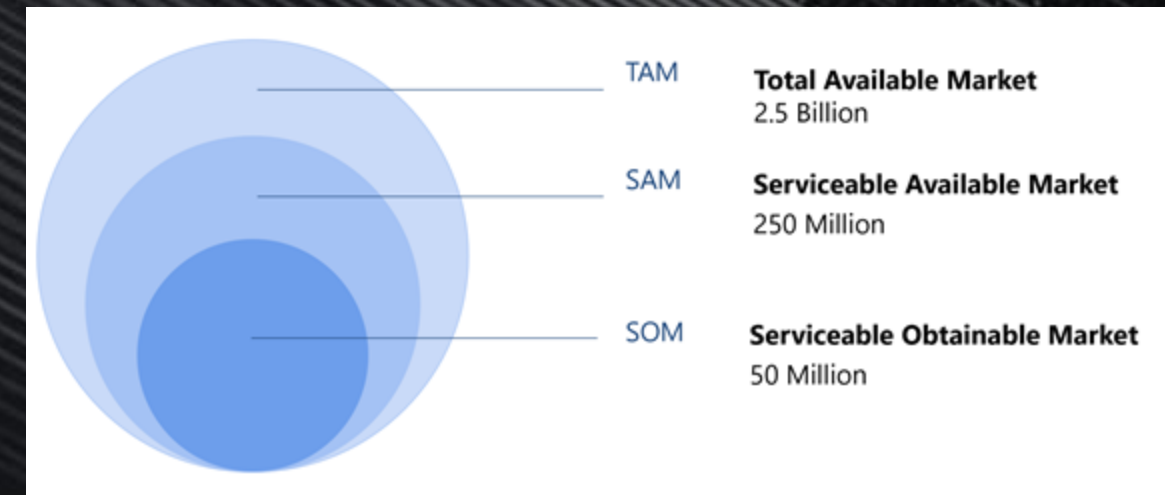
[3]



BIKE AND SCOOTER RENTAL MARKET, BY REGION (USD BILLION)



[3]



The Market

Market Analysis – The Changing World Order

Rising oil and energy prices and high upfront costs for
EVs

Bottlenecked urban infrastructure

Net zero emission coalition

Inflation and decreasing real wages



[4]



[5]



[6]

Indirect Competitors

Offer docking station bike rentals or require a scheduled meetup for pickup

Direct Competitors

Offer dockless bike rentals with contactless pickup



[7]



[8]

Contactless Bike Sharing

The SWIVEL app makes for an easy to use bike sharing experience with hassle-free bike pickups and dropoffs.

Lightweight Delegator

The delegator is both lightweight and compact to ensure it doesn't compromise the biking experience

Scalable and Sustainable business model

SWIVEL's business model is scalable and sustainable

Access to a wide range of bikes

Bike users are given a wide range of bikes to choose from and are not limited to heavy designs as seen with competitors.

Full Control for Bike Owners

Bike owners are given full control over where their bike with geofencing and security monitoring features available on the app

The
SWIVEL
Advantage



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Target Market

Commuters

looking for a convenient way to commute to school or work

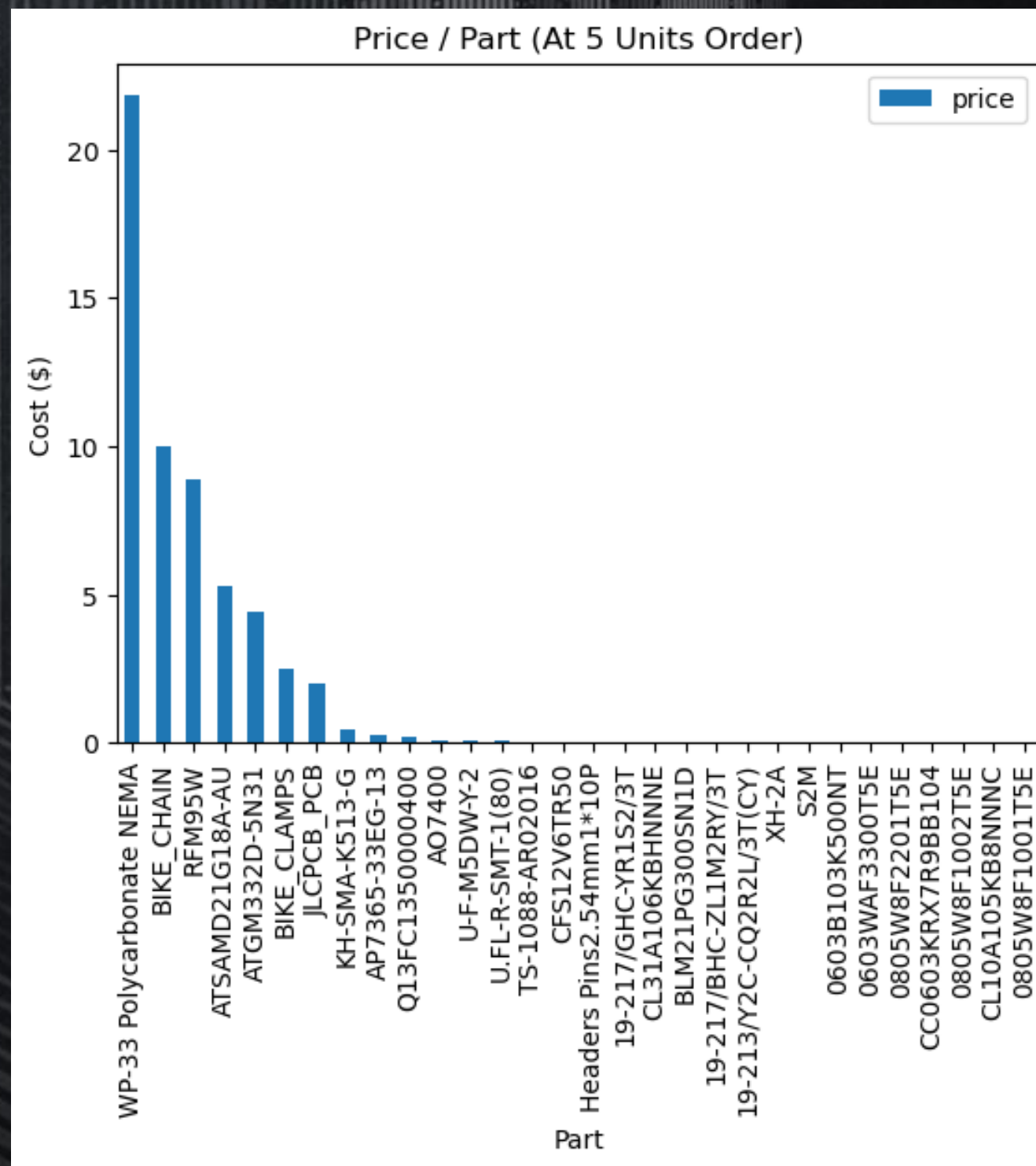
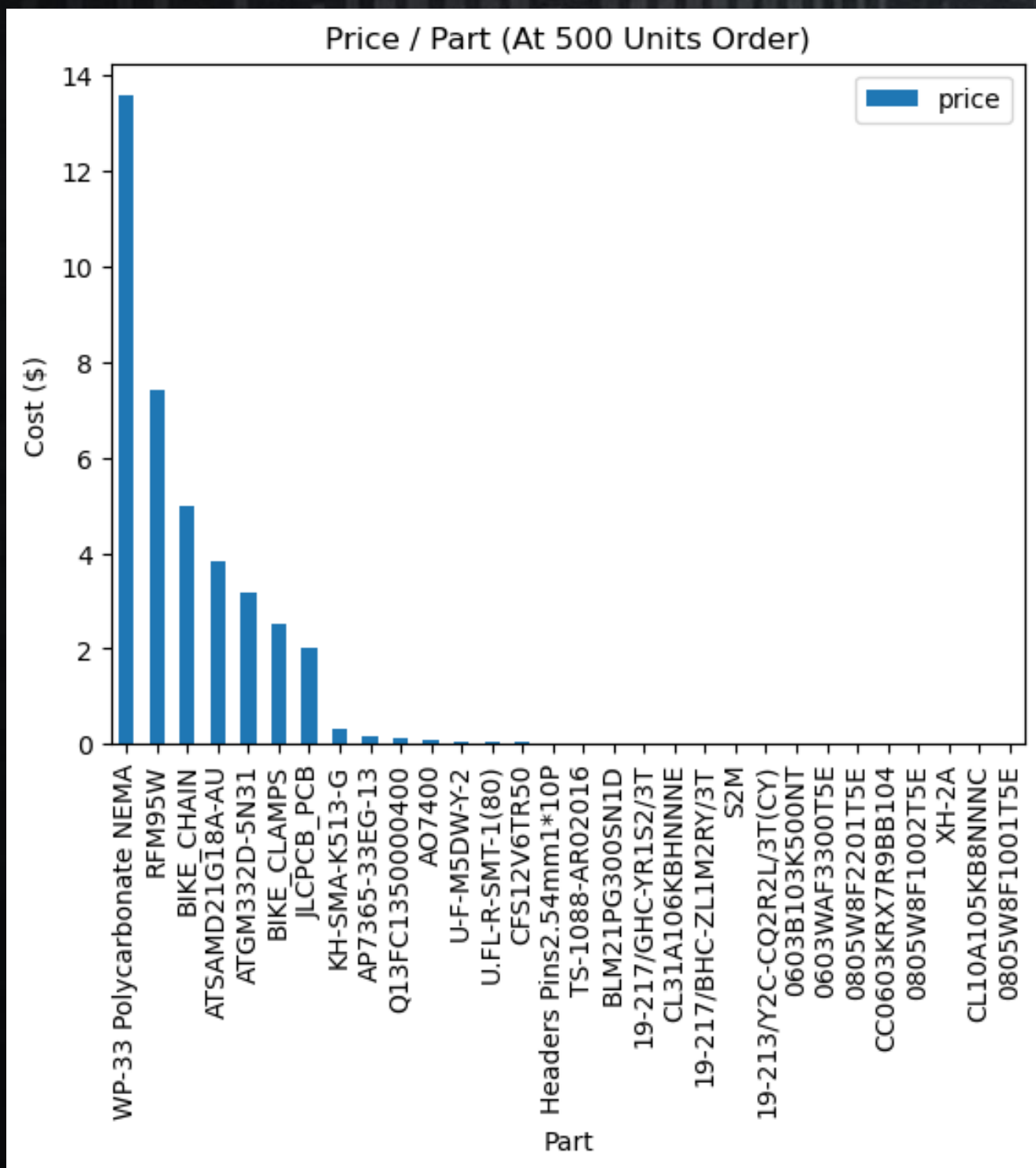
Casual bike renter

looking to rent a bike for casual stroll on the beach or park

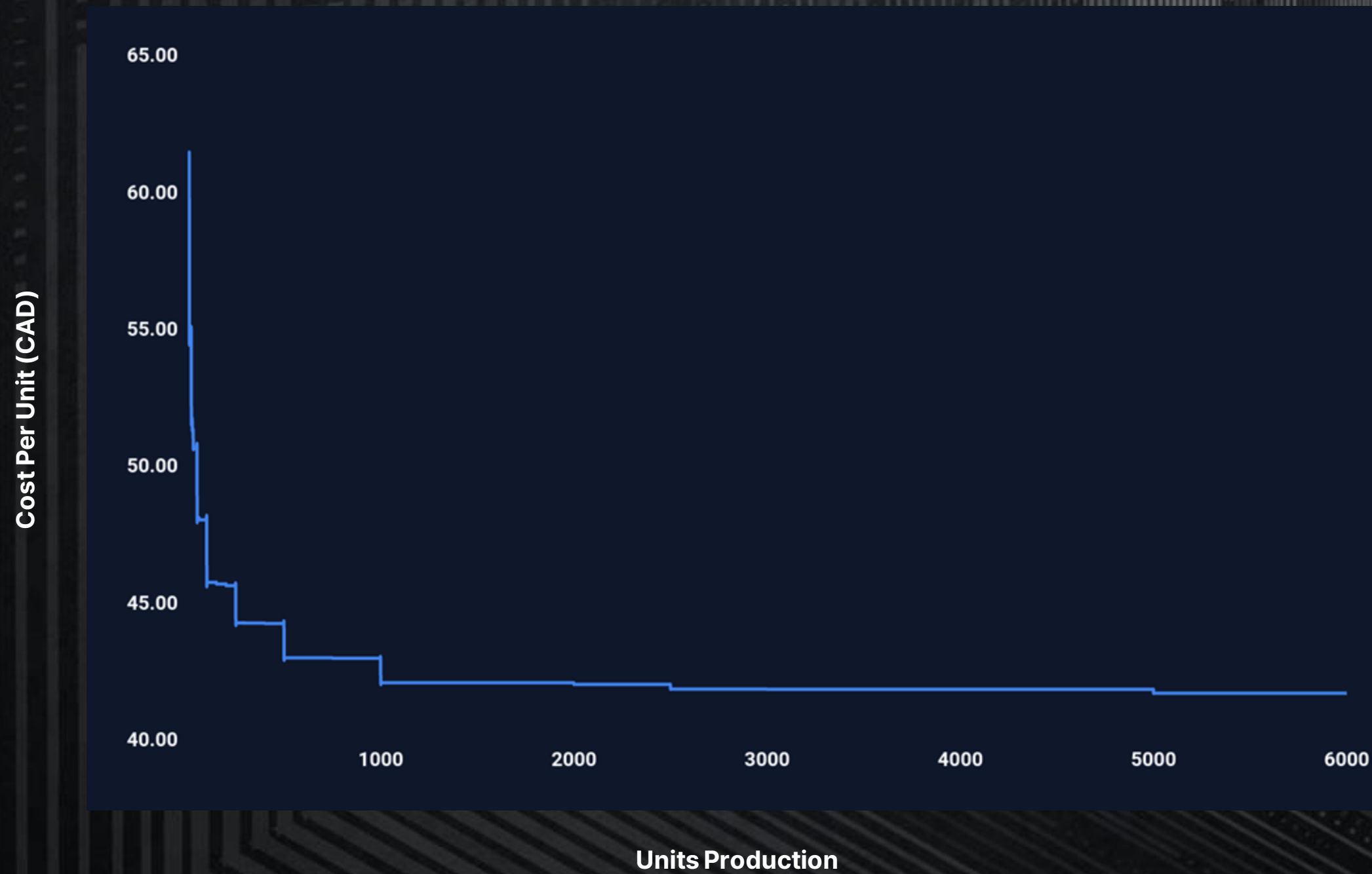
The Entrepreneur

looking to create passive income through the SWIVEL bike sharing network

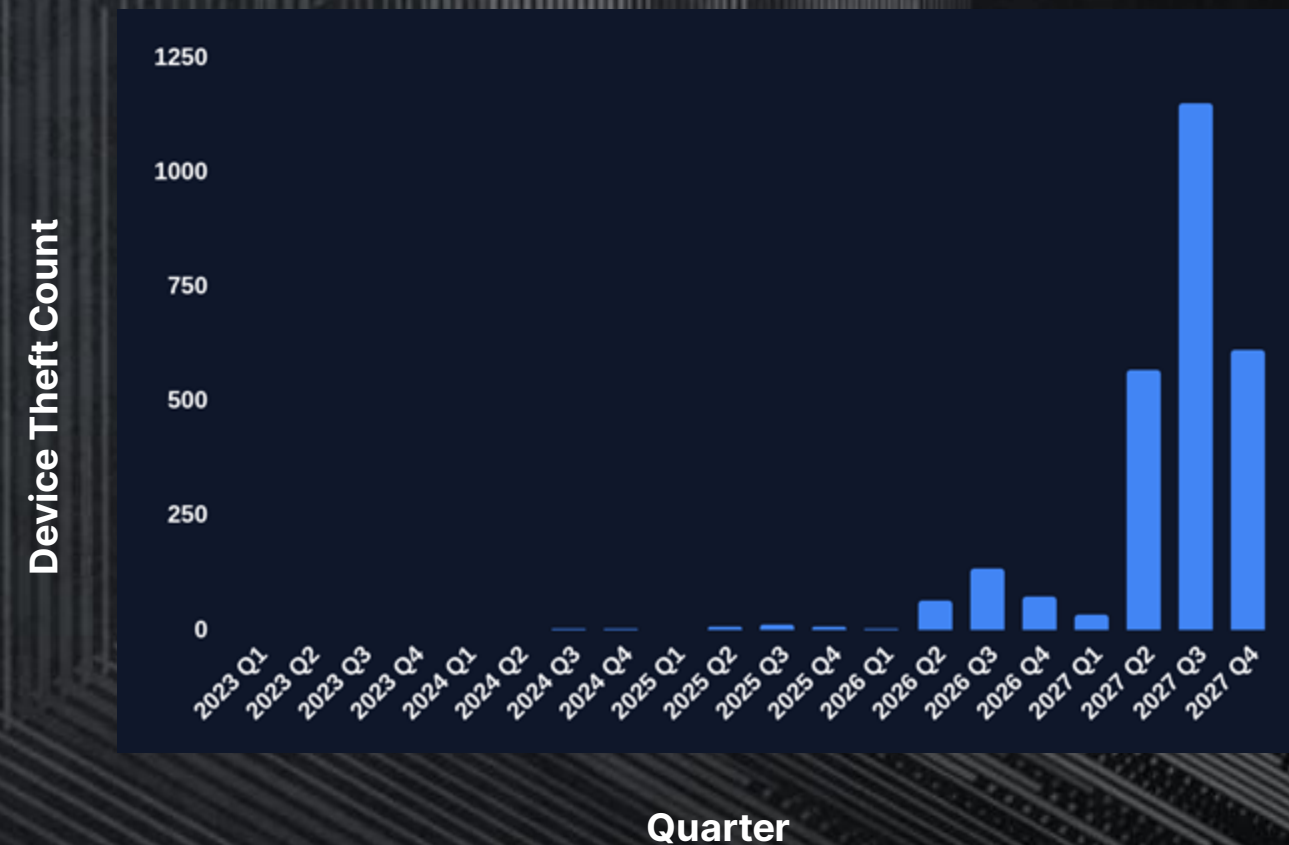
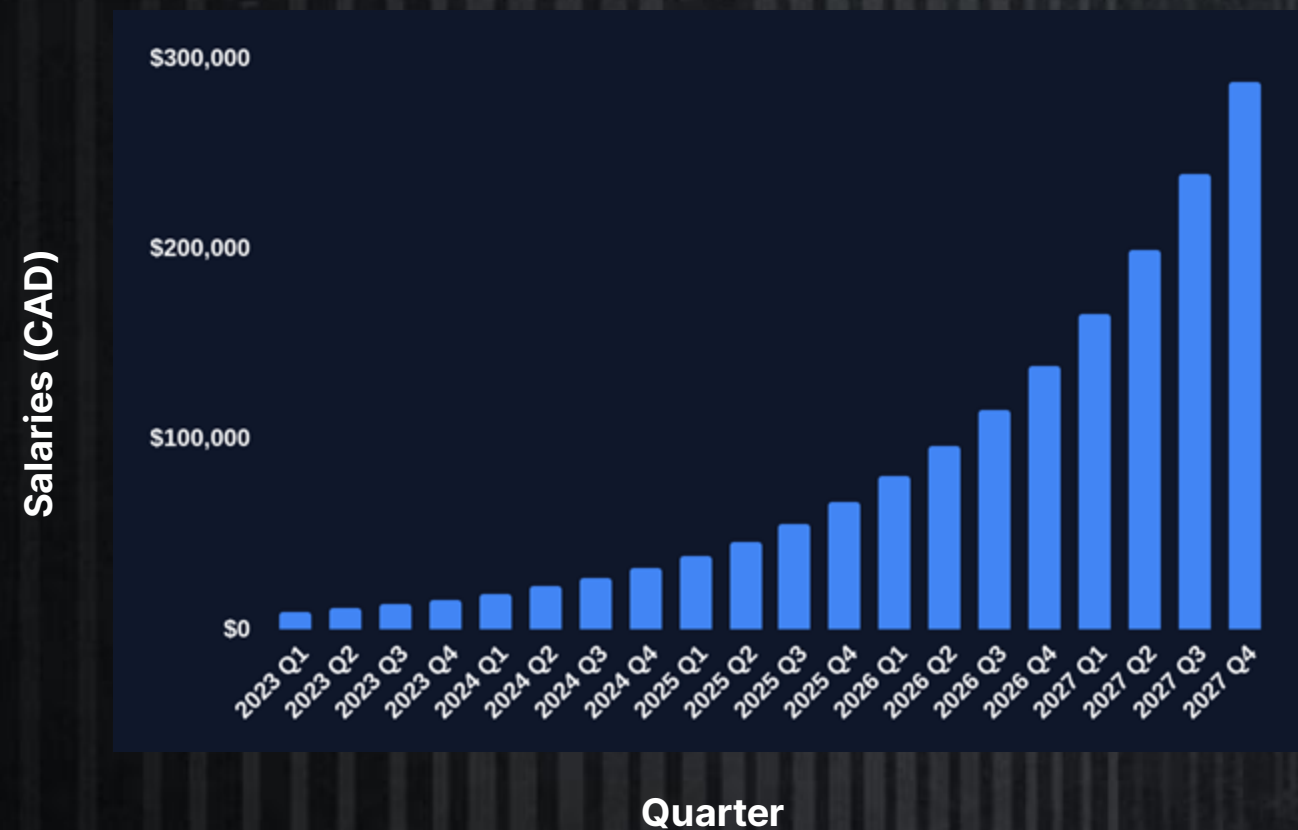
Cost at scale



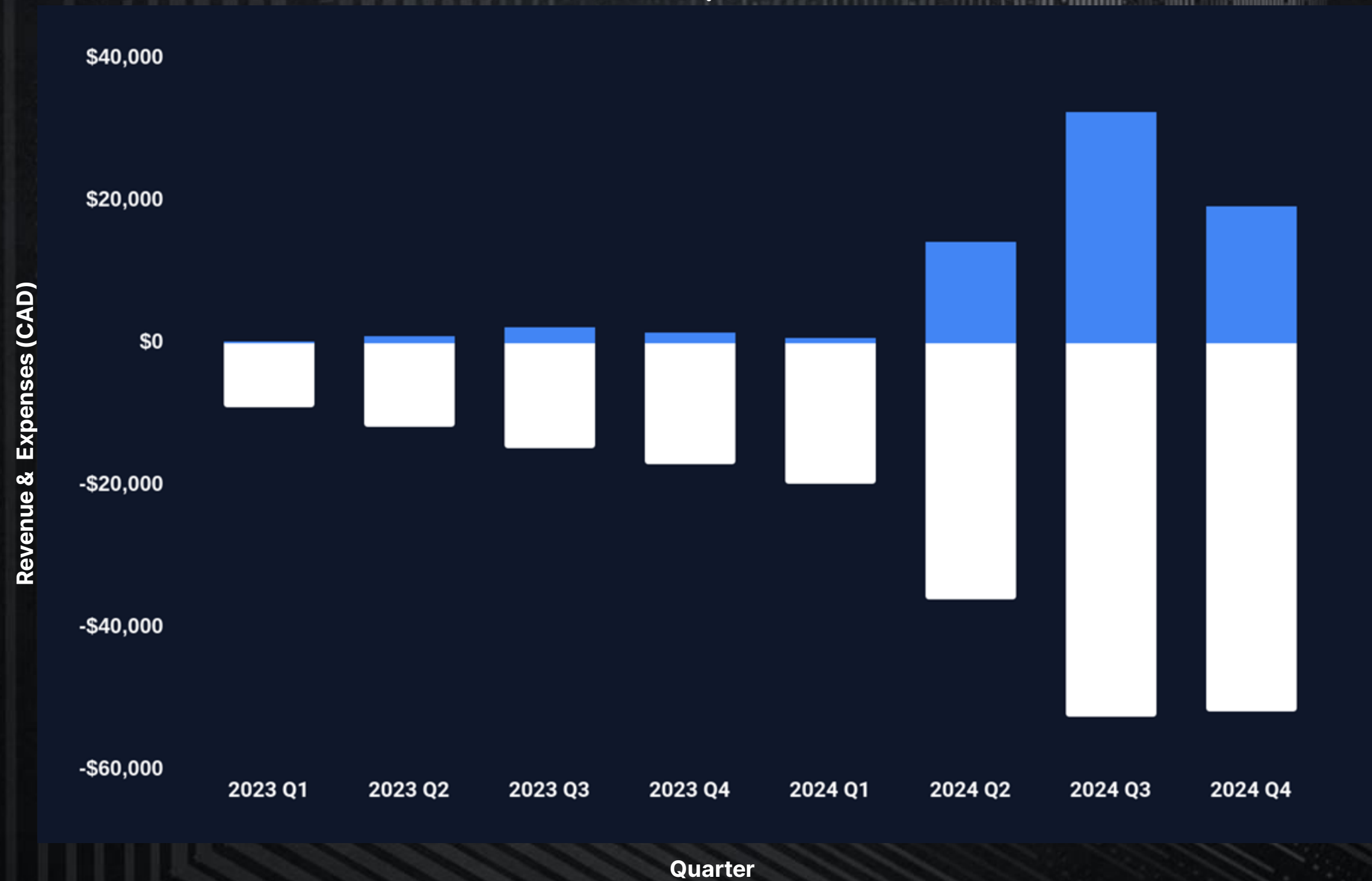
Manufacturing, Cost Per Unit



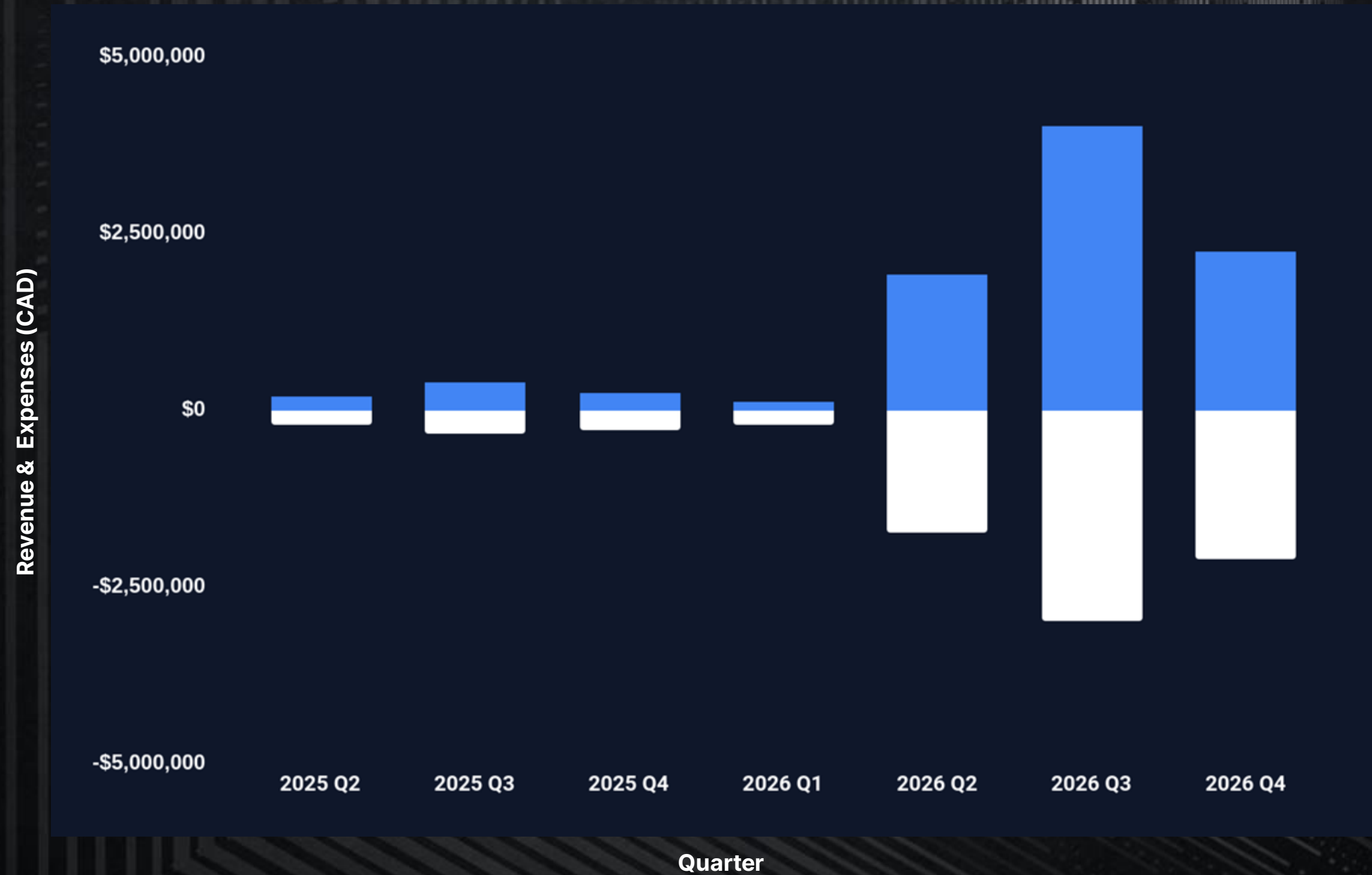
Additional Factors



Quarterly Cash Flow Estimates (Q1 2023 - Q4 2024)



Quarterly Cash Flow Estimates (Q1 2025 - Q4 2026)



	2023	2024	2025	2026
Bikes On Platform	90	689	8,198	81,803
Marketing Spend	3K	32K	375K	3.7M
Platform Revenue	4K	58K	712K	7.3M
Cash Flow	-79K	-93K	-77K	1.2M



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Financing

Angel Investors

Attempt to advertise product to investors and work towards them funding Swivel

Business Loan

Canada provides business loans to applicable businesses, we can attempt to get funding

CrowdFunding

Discount delegator and fees for users who help finance Swivel

Schedule

	Estimated	Actual-to-Date
Proof of Concept	August 15th	Fully Realized
Prototype	November 25th	Fully Realized
Product Ready	May 4th 2023	Planning only

Security Risks

Risk:

Theft of the delegator or bike.

Solution:

Incorporation of an accelerometer into the delegator to monitor for motion and the use of financial penalties as incentive for users to properly lock the device.

Device Risks

Risk:

Damage to the device due to natural elements or vandalism.

not being able to unlock the device when there is no signal or no power

Solution:

Waterproofing, heat proofing, and adequate structural designs to mitigate severity of damages.

Use bluetooth to manually connect to the phone and unlock and use the charging port to charge the device

Corporate Risks

Risk:

Liability concerns for the health and safety of the user and their property.

Fraudulent credit card disputes and chargebacks.

Solution:

Carefully crafted terms of use that must be accepted when users sign up for an account.

The use of Stripe as the payment provider. Stripe provides tools to handle instances like these while also ensuring proper legal bookkeeping for taxation and other purposes.

Plan B

Move to the electric scooter or electric bike market

Research and expand to new markets (Europe)

Cradle to Cradle



Swivel devices are reusable and can be sold to other consumers

Most of the delegator is made of recyclable metal

Swivel will have a repair and recycle program, if a device cannot be fixed
Swivel will get the recyclable components and attempt to use the non-recyclable ones

SWIVEL

Adherence to Engineering Standards

Swivel has adhered to the engineering standards outlined by The Government of Canada, Canadian Standards Association (CSA), and the International Electrotechnical Commission (IEC). The health and safety of our users depends on our close attention to these standards and we delivered on our promises.



Self Reflection - What we learned

Mobile App development

Presentation skills

Circuits and electronics

Cloud and database systems

Market research skills

Self Reflection - What we can improve on

Time Management - Allow more time to build redundant systems

Spend more time prototyping without sacrificing necessary forethought

Run more tasks in parallel when possible, and leave enough time for integration. Do not assume two working pieces will work together.

Future Plans

As of current day there are no concrete plans to continue to develop the Swivel product line after ENSC 440

While the idea has many merits, the barrier to entry and company risk is high enough that we have reservations about continuing the business

The work done on the Swivel platform will be documented for the possibility of continuation in the future

References

- [1] <https://www.mobibikes.ca/en/map>
- [2] <https://thebestbikelock.com/parts-of-a-bike/>
- [3] <https://www.marketsandmarkets.com/Market-Reports/bike-scooter-rental-market-122654882.html>
- [4] <https://www.dreamstime.com/stock-image-beijing-heavy-traffic-jam-cars-image21372891>
- [5] <https://www.spinlister.com/>
- [6] <https://www.mobibikes.ca/en/news/how-guide-day-pass-users>
- [7] <https://www.thebedfordcitizen.org/2018/11/lime-bike-share-closing-for-the-season/>
- [8] <https://help.bird.co/hc/en-us/articles/360044628332-How-can-I-contact-Bird->
- [9] <https://ca.trustpilot.com/review/spinlister.com?stars=4>
- [10] <https://www.climateandcapitalmedia.com/no-mckinsey-it-will-not-cost-9-trillion-per-year-to-solve-climate-change/>
- [11] <https://mcdonough.com/cradle-to-cradle/>