"Let's say at some point in the not so distant future, you're barreling down the highway in your self-driving car, and you find yourself boxed in on all sides by other cars. Suddenly, a large, heavy object falls off the truck in front of you. Your car can't stop in time to avoid the collision, so it needs to make a decision: go straight and hit the object, swerve left into an SUV, or swerve right into a motorcycle. Should it prioritize your safety by hitting the motorcycle, minimize danger to others by not swerving, even if it means hitting the large object and sacrificing your life, or take the middle ground by hitting the SUV, which has a high passenger safety rating? So what should the self-driving car do?"

1. What information is important here?
    a. What factors *could the car consider*?
    b. What factors *should not be used in making the decision*?

One of the factors that the car should consider is the distance between the car and the object that falls off the truck since this determines the force of the impact that the car will have if it hits the box. Other factors that should be considered are : the SUVs and motorcycle's safety rating, the weight of the SUV and motorcycle, the size, material, and speed of the object, the speed that automobiles are moving at, your own chance of survival, other's chances of survival, whether the biker is wearing protective gear, damage that could be done to cars or motorcycles around the area of the crash, whether the other automobiles are autonomous, and how many people are in the SUV and your own car. One factor that should not be used in decision making is the size and weight of the truck, since the truck is so large that differences in truck size will only minimally change the outcome.

2. List the potential harms and benefits and map them into values.
3. What are the potential value conflicts here?

Self-driving car, collision protocol

Stakeholders	**Harms**	**Benefits**	**Values**	**Value tensions**
Driver (direct)	Potential injury or death to other people on the road, legal troubles that fall on either the driver or the car	Keep the driver safe, the driver trusts the car will keep them safe	Trust, Ownership and Property, Universal Usability, Autonomy, Accountability	Prioritizing trust and ownership above human welfare. No informed consent of other drivers or

	company			passengers. No Autonomy of the driver in the car.
SUV (direct)	Potential injury or death to SUV and SUV's passengers, the driver cannot trust the car to keep them safe	Other drivers will not be harmed, road conditions are kept safe, traffic can continue normally	Human welfare, Informed Consent	Prioritizing human welfare above trust and ownership. No informed consent of SUV driver or passengers.
Motorcycle (direct)	Potential great risk of injury or death to motorcyclist, the driver cannot trust the car to keep them safe	Other drivers will not be harmed, road conditions are kept safe, traffic can continue normally, hitting motorcycle will affect traffic less than hitting SUV, motorcyclist may have less passengers	Human welfare, Freedom from Bias, Calmness, Informed consent	Prioritizing human welfare above trust and ownership. No informed consent of motorcyclist.

4. How will you address these value conflicts? What decision should the car's algorithm make and why?

To address the conflict between human welfare and trust between the driver and company, I will provide an evaluation system that minimizes harm but weighs the drivers well-being on a higher level with all other people weighted equally, but on a lower level. In my opinion, the driver is the most important person in this situation barring all other factors due to them being a customer of a self-driving car and the fact that trust is an important factor to sell self-driving cars. However, if a collision with the SUV or motorcycle is sure to cause a great amount of death, the car should collide with the falling

object or other vehicle. If the car collides with the other vehicle, there should be a minimal amount of damage done. If the car collides with the object, the car must make sure the impact is not fatal. In all situations, the car should avoid fatal collisions except in cases that would cause a great amount of death. This is necessary to maintain trust between the driver (customer) and the company making the cars in a reasonable fashion while weighing human welfare, albeit unfairly skewed towards the driver and passengers of the self-driving car.

Part 2

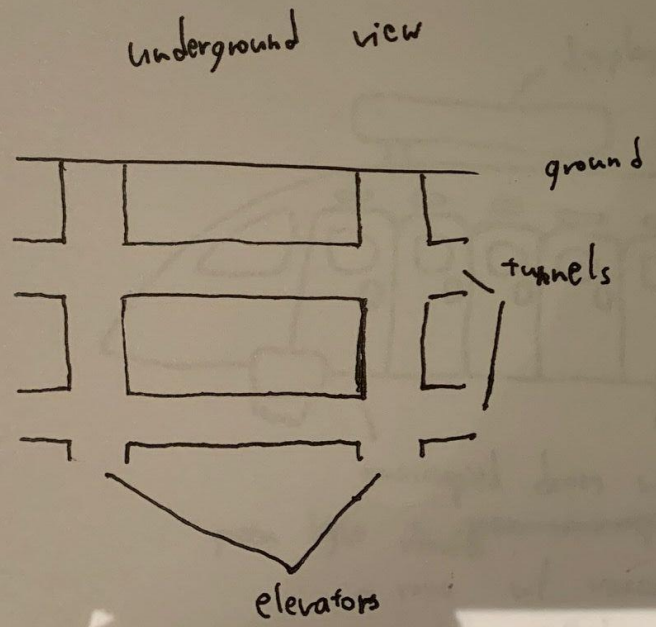
2.1

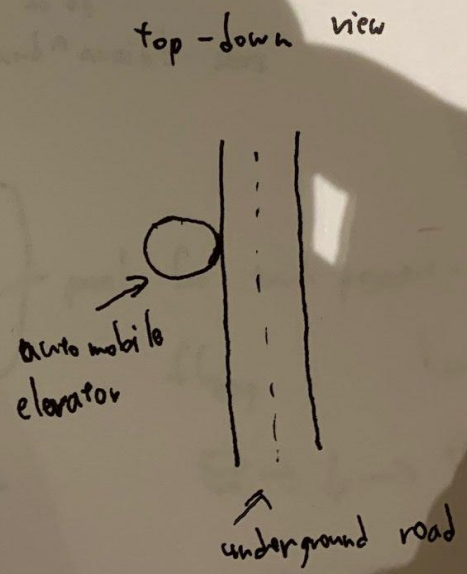
Multi-Level Underground Highways / Roads

Audience : Everyone

Purpose : General Travel

Benefits : Less Traffic - less chance for accidents and faster travel



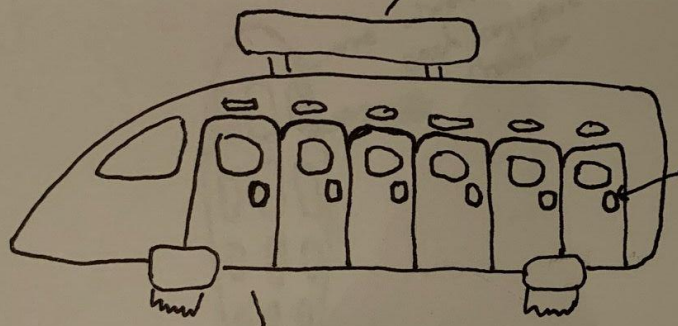


High Speed Flying Bus

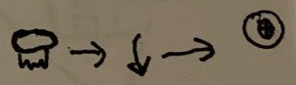
Audience - People of Lower Socio economic Status, disabled and old people

Purpose - commute to work, school, going to grocery store / running errands

Benefits - cheap, quick

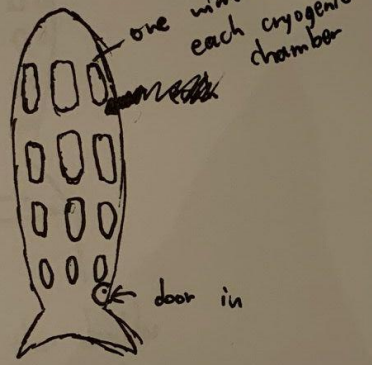


flying landing

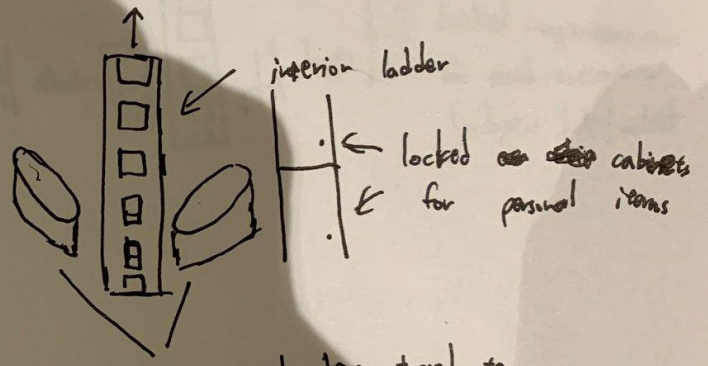


blasters turn 90 degrees, turning into tires for landing

One way pod to Mars



ladders in interior



Cryogenic chambers - travel to Mars will be several months and cryogenic chamber relieves worries of biological needs

Audience - the ultra rich or potentially everyone by necessity (if global warming makes Earth unlivable)

Purpose - travel to Mars, potentially saving humanity

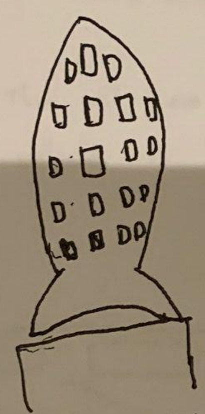
Benefits - ~~travel to~~ safe, secure travel to Mars

Rocket ~~transport~~ replacing planes

Purpose ~~Audience~~ - long-distance travel - esp overseas/between countries

~~Purp~~ Audience - travelers/general

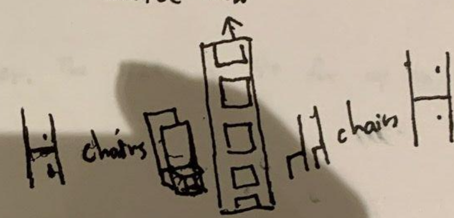
Benefits - faster than plane, locked compartments for security, faster landing



launch pad that doubles as landing pad

adjustable based on type of rocket
pad and launch

Inside view



locked compartments for each customer - handprint lock/unlock

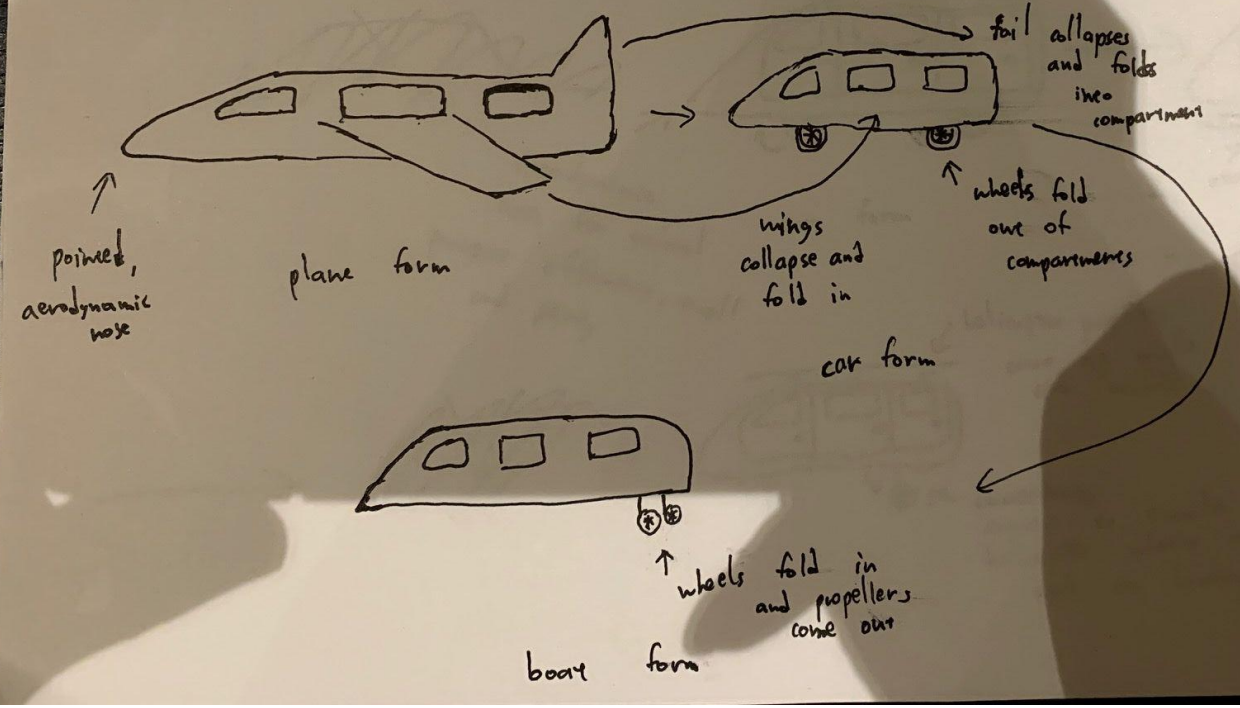
Ferry - Bus - Plane Hybrid

Audience - People who need to travel fast and far - who have higher socioeconomic means

Purpose - long-distance travel, business trips

Benefits - Fast, versitile, convenient, a "one-stop stop

This will act as an expensive uber. The size is fit for up to 8 people and the vehicle is autonomous



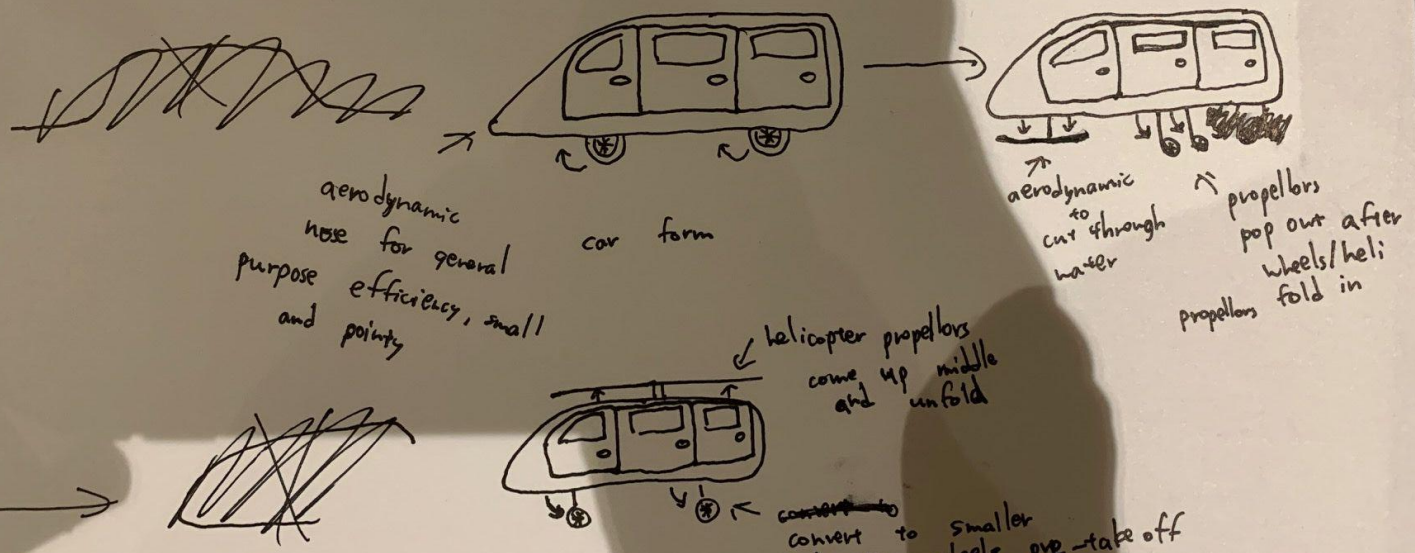
Ferry - Bus - Helicopter Hybrid

Audience - People who need to travel fast, - who have higher socioeconomic means
and/or conveniently

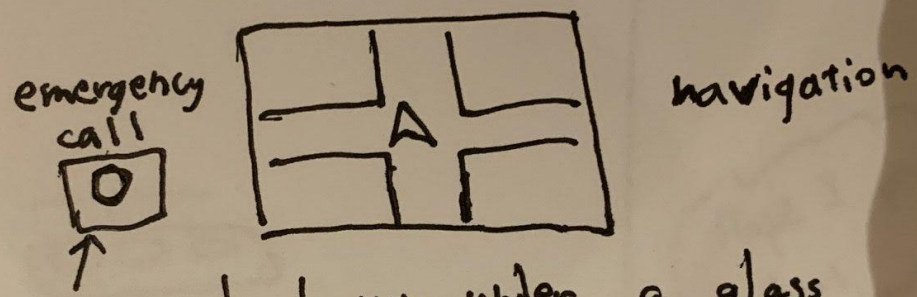
Purpose - ~~convient~~ convenient, fast, efficient travel method - potentially long distance

This will serve as an expensive Uber w/ a dedicated app. rideshare

The size is fit for 8 people and the vehicle is autonomous



Interior Front View



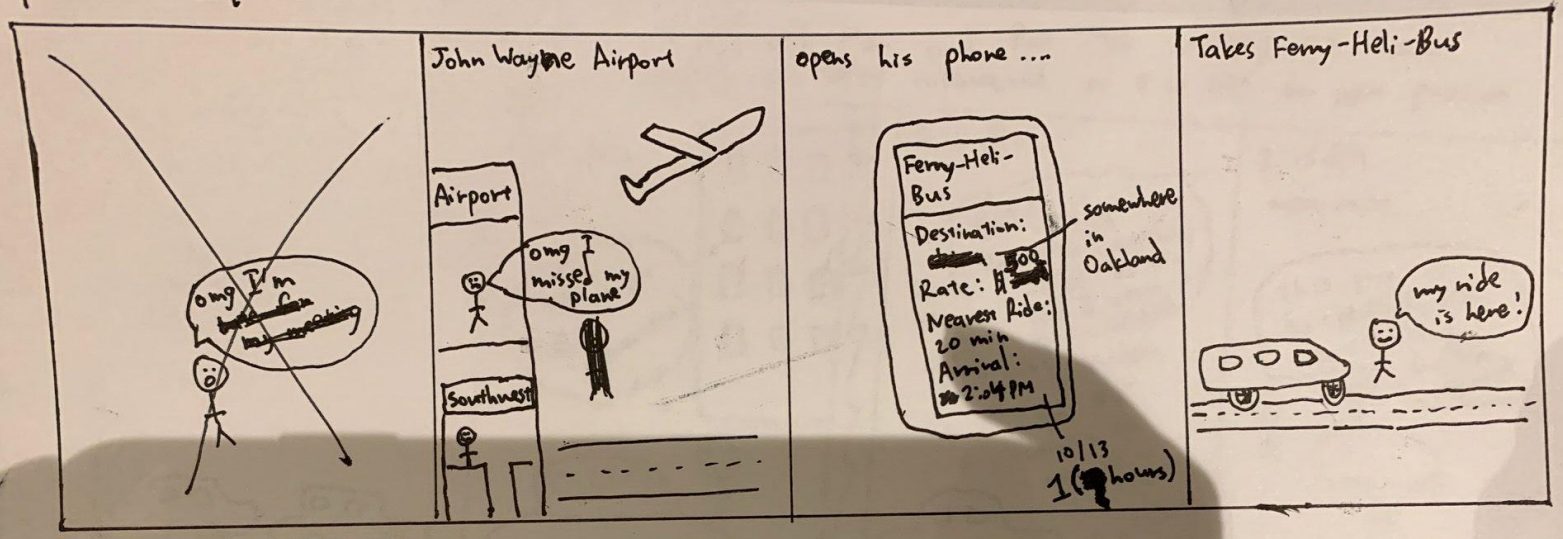
big red button under a glass case - easily broken

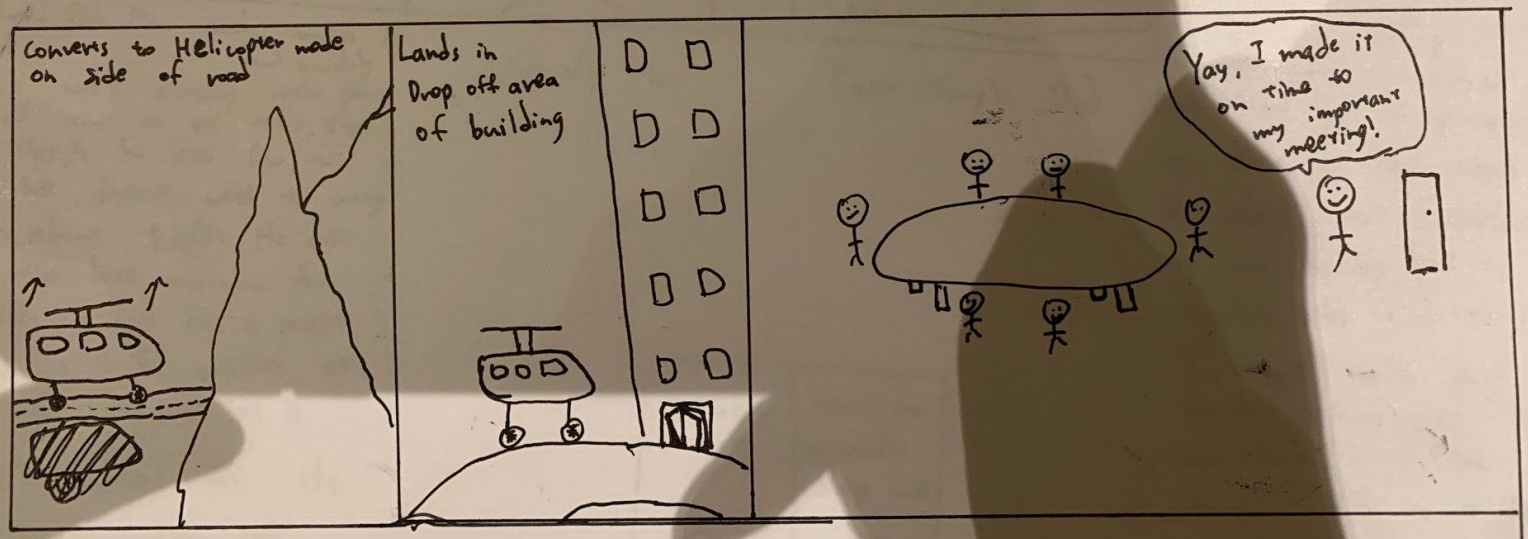
The main idea for future transportation I decided on was my ferry-bus-helicopter idea. This automobile would pair with an app which would act as an ultra-convenient rideshare option similar to Uber in terms of ride-hailing, variable rates, a map of available “drivers” (not really since the vehicles are autonomous), and wait times. Since we currently have the technology for commercial cars, boats, and even helicopters, it’s feasible that sometime in the future, we could discover how to combine these vehicles into one transportation vessel with retractable wheels, boat, and helicopter propellers. The power of this vehicle would be determined by its helicopter mode, as helicopters need the most power out of all vehicle modes to take flight and travel. It would also be complete with an advanced navigation system including all travel modes, which I believe will be possible in the near future due to the already existing modes of navigation for multiple modes of transportation - public transportation, bike, car, walking. This form of navigation could be expanded for boats and helicopters more generally.

The vehicle would be fast and efficient, saving the user the time of having to switch between different transportation options, and the struggle of having to schedule and make it on time to varying forms of public transportation or taxi. Ultimately, the vehicle market would be those who are busy and want to travel places as fast as possible, or want the ease and convenience of such a vehicle to save them the struggle of conventional travel.

2.2

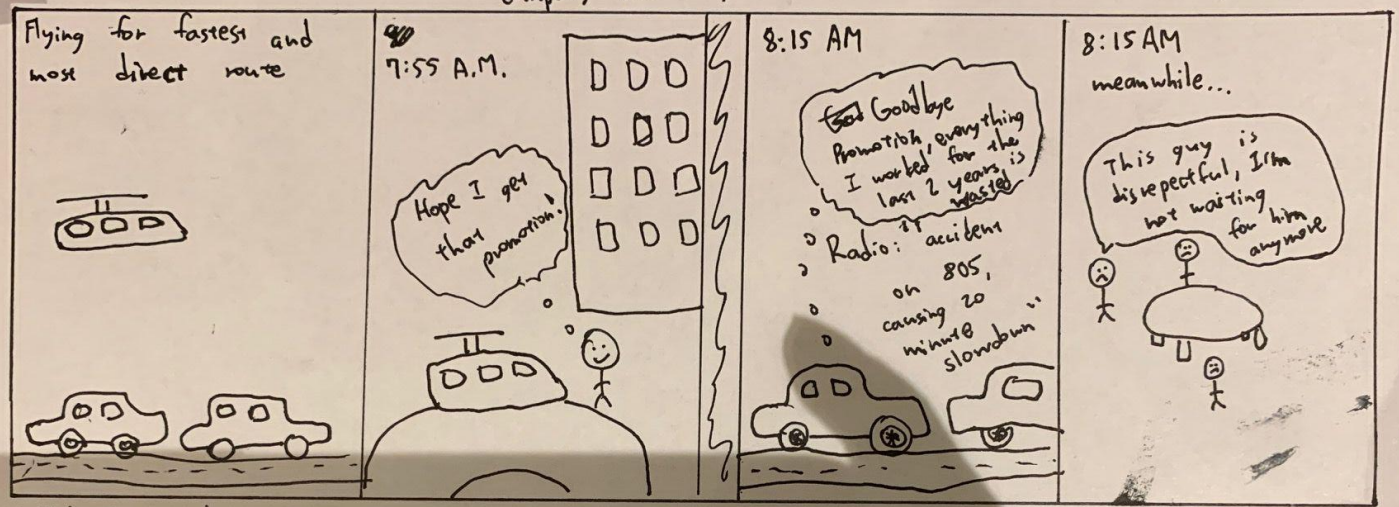
positive consequence





Negative Consequence

A well-off Man and Poor Man working at same company are being interviewed at 8:00 AM for same position

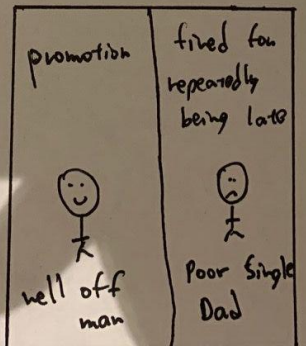


Well-off Man easily, and quickly makes it to work everyday with plenty of time to get ready, even though he lives far, as he doesn't need to worry about traffic. He does the bare minimum for his job and has a parent in a high position at the company. He is ill-qualified for the promotion job

Well-off Man

Poor Single Dad

Poor Man has to wake up kids, get them ready for school, make breakfast for his family, sit in traffic, take time to iron his suit and look nice. He has many great Ideas that have helped the company and is a hard worker, highly qualified for the promotion job.



2.3

Stakeholders	Harms	Benefits	Values	Value tensions
Company building and selling the vehicle	Faulty or cheap parts, cutting corners on vehicle design which can lead to potential injury or death	Money, potential trust of long-term customers, ability to expand market	Trust, accountability, Human Welfare, Autonomy, Ownership and Property	Company can take shortcuts on vehicle production for greater profits. Taking accountability for accidents may result in lowered trust and profits. Cars are sold or leased to Rideshare company, transferring ownership from production company.
Company developing the Rideshare App	The company building vehicle may take shortcuts on production - lower quality vehicles may result in more accidents or other malfunctions. This means less customers.	Money, potential trust of long-term customers, ability to expand market	Trust, accountability, Human Welfare, Autonomy, Privacy	Company needs your info to for rideshare App, such as location, name, credit card information and other info to ensure you don't cheat the system and that they get paid.
Passenger	Potential risk of injury or death	Fast, one-stop travel, no need to schedule and plan out public	Human welfare, Autonomy, Privacy	Giving up autonomy for ease of transportation

		transportation		of vehicle. This expensive mode of transportation creates inequality of access.

3. To address value conflicts, companies should be as transparent as possible in their designs with each other and with consumers. They should also be genuinely interested in making quality products that will create the smoothest and most positive experience for users. For example, the car manufacturer can explain on their website how their autonomous vehicles navigate and move. The Rideshare App company can explain how personal data is used by asking for each piece of data and clarifying how the app uses it in informational blurbs. The Rideshare company can also have an insurer for all the vehicles, protecting their claims on the vehicles and any accidents, for which the car manufacturer would have to take responsibility. This would encourage the car manufacturer to make vehicles as safe as possible, along with the profit incentive that comes along with trust of safe and efficient vehicles.