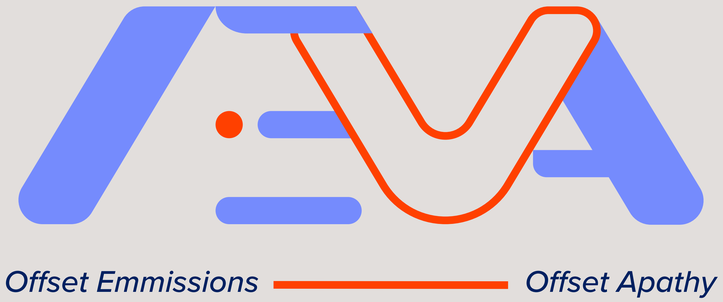
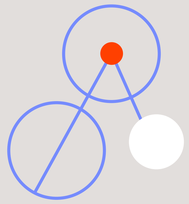

Offset Emmissions
Offset Apathy

The aim of AEVA is to bring an intermediate transport solution that ties into a greater network of vast support systems for the immediate surrounding community and ecosystem. It's also designed to engage and develop social change in regards to climate change. An important transition point for humanity and its cities is to not only have a technological and environmental impact but a change of mindset and societal behaviours to increase the likelihood of stopping and reversing the damages of climate change and its surrounding problems. All of this, using the sustainable development goals and universal design principles as it's guide.

In short, the project's aim is to **OFFSET APATHY** as much as it **OFFSETS EMISSIONS**.



Let’s begin with the first pillar of AEVA.

Personal and Public Mobility

Specifically targetting SDG’s

12 5 17 7 10

Car commuting (travelling to work) remains the dominant form of travel for 75.4% of the Melbourne population (ABS, 2017). In the CBD of Melbourne, public transport commuting is much higher, taking 30% of the share, however only 3-4 suburbs out and the number dwindles to from 10-5% (Microburbs, 2022). It doesn't help that an overwhelming majority of commuter cars are single drivers only (i.e No passengers).

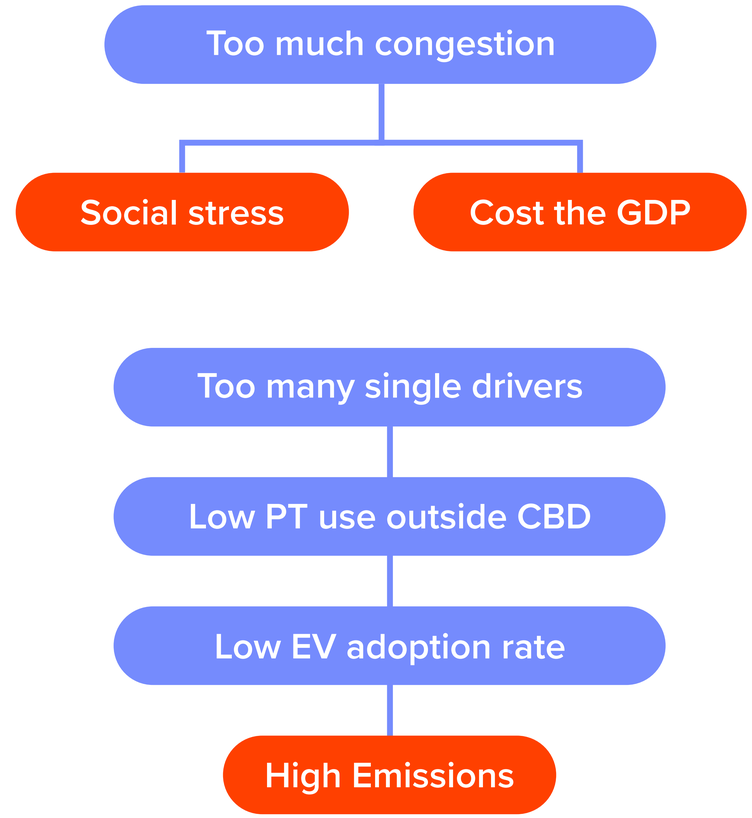
In Australia 2021, only 1.57% of the light vehicle market were electric vehicles, which is due to it being a relatively new and expensive technology but with Melbourne taxing such vehicles use by the kilometre, (Vic Roads, 2022) they're adoption has certainly been hindered.

The problem is pretty simple. There are too many cars on the road, too many of those being single drivers and our electric vehicle adoption rate is one of the lowest in the world. This doesn't just point to excessive environmentally hazardous emissions but congestion, which causes people to be late to work and can end up costing Melbourne $4.6 billion a year, projected to grow to $10 billion by 2030. (City of Melbourne, 2022). It's both an environmental and a social problem.

Some car commuters will change over to new public transport lines when they are close and convenient but many will never change.

So in a rush to fix this problem, conversion is necessity.

Key Problems



THIS IS MANTA

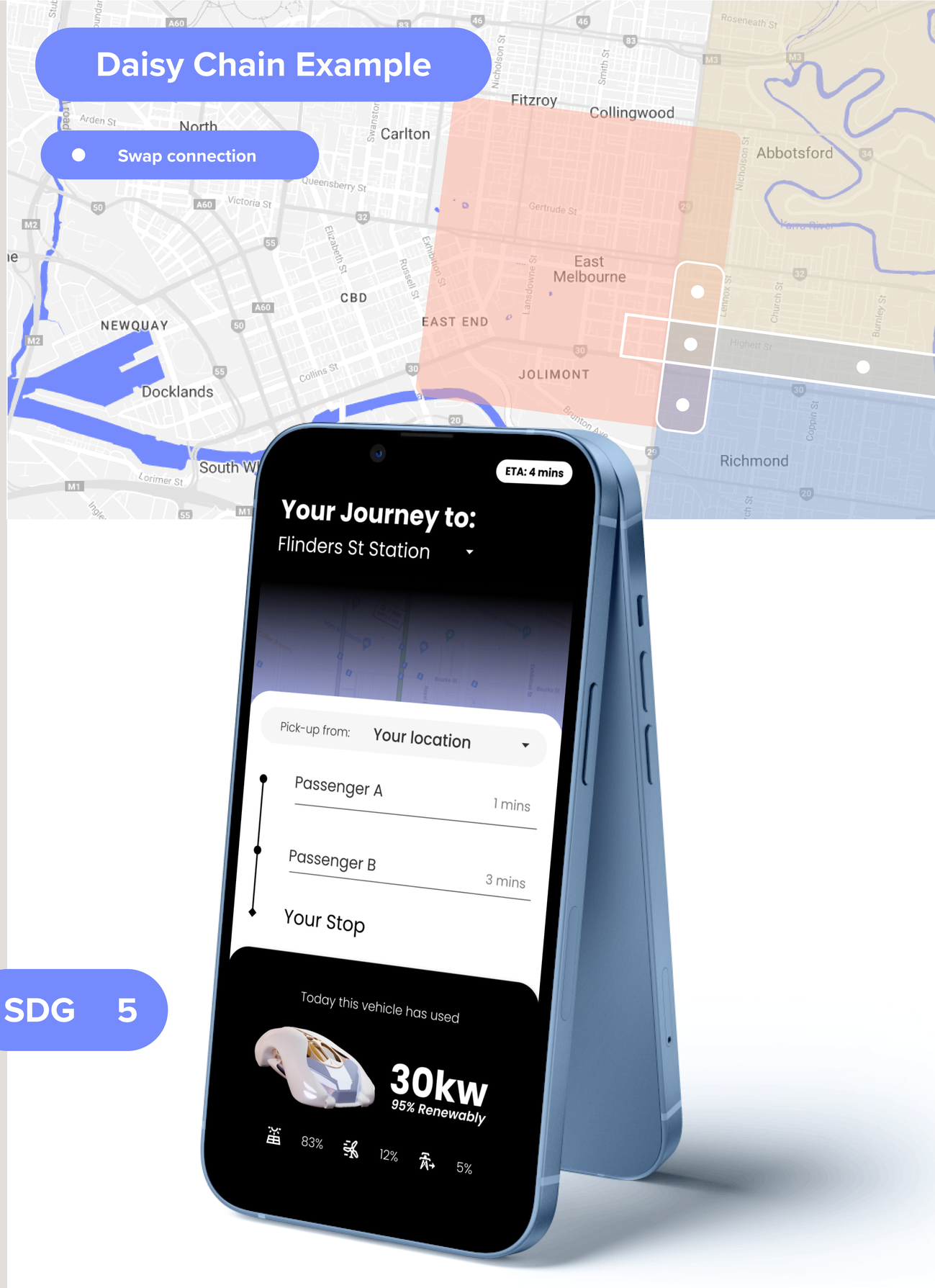
An Autonomous Shared Electric Vehicle

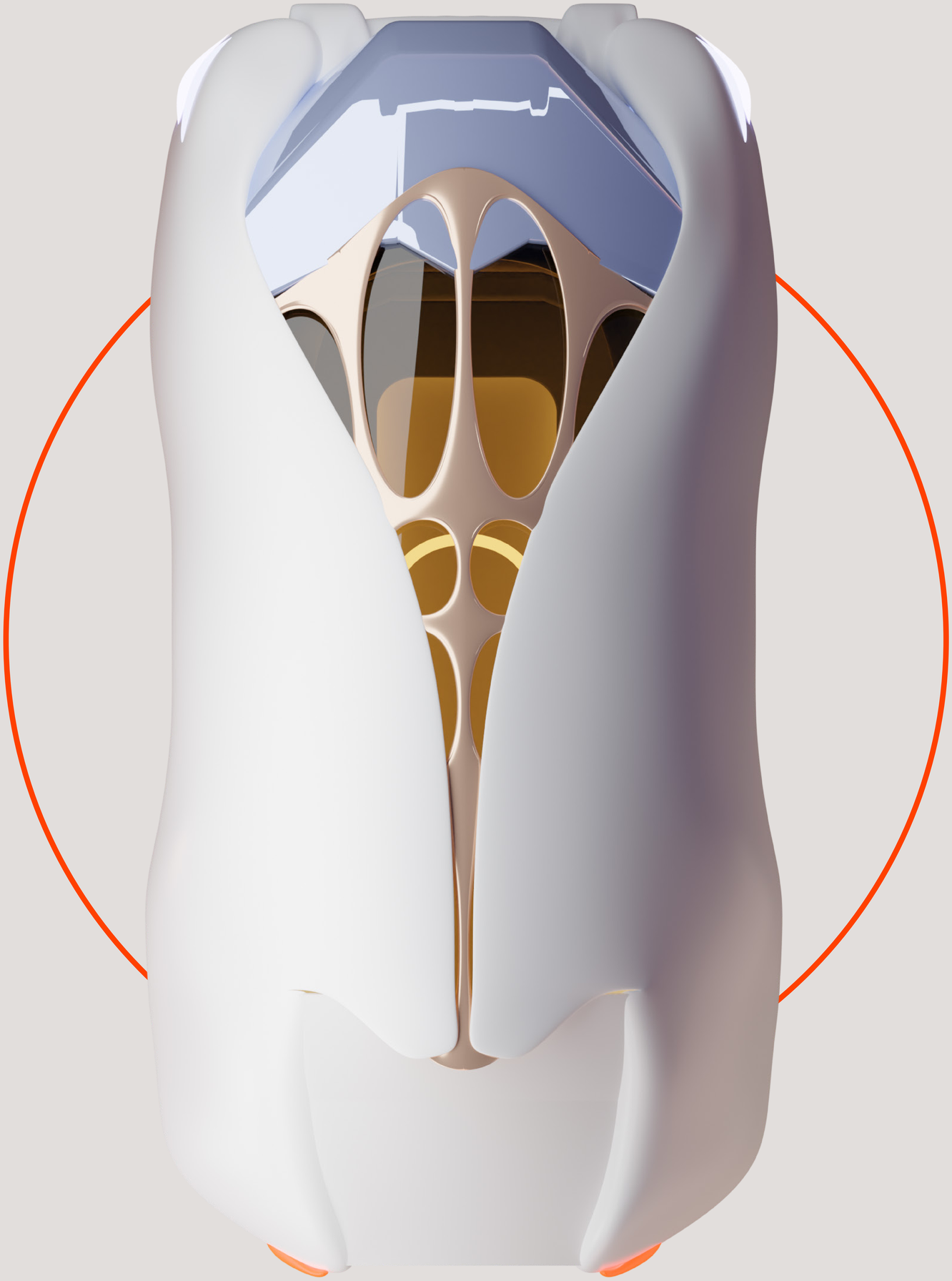
Its job is to fill in critical key points, using optimised grids built around demand to alleviate the load of commuters and general mobility. With the access being built into a revamped public transport application (pictured right), users can “hail” the car. This could also be implemented automatically in applications like Google Maps, where a faster route is suggested. Using machine learning, it could divert more commuters towards AEVA’s that take more direct paths. The users can be greeted with information on their ride, where the energy come froms and how much their ride uses, further encouraging mindfulness and awareness regarding sustainable energy.

Calling an Manta creates a demand point, to which the cars in the key area path to and then take to the user’s required destination or in cases for longer trips, daisy chaining can be implemented as seen in the map on the right. (i.e the car takes them to the furthest extent of its designated area and then another ones fills in the rest).

Manta can be optimised to run more at peak times, to take breaks and fill demand in areas where more are needed, unlike buses and trains, which don’t intersect. A key thing for trips after dark should be female only cars, especially in areas that are statistically more dangerous. Not only would it be a safer, more private trip home but would alleviate problems like harassment and stalkers. In the same vein, they should run more frequently on Friday and Saturday night, when drinkers are going home. This would reduce the likelihood of drunk driving, car incidents and even just tired drivers.

SDG 5

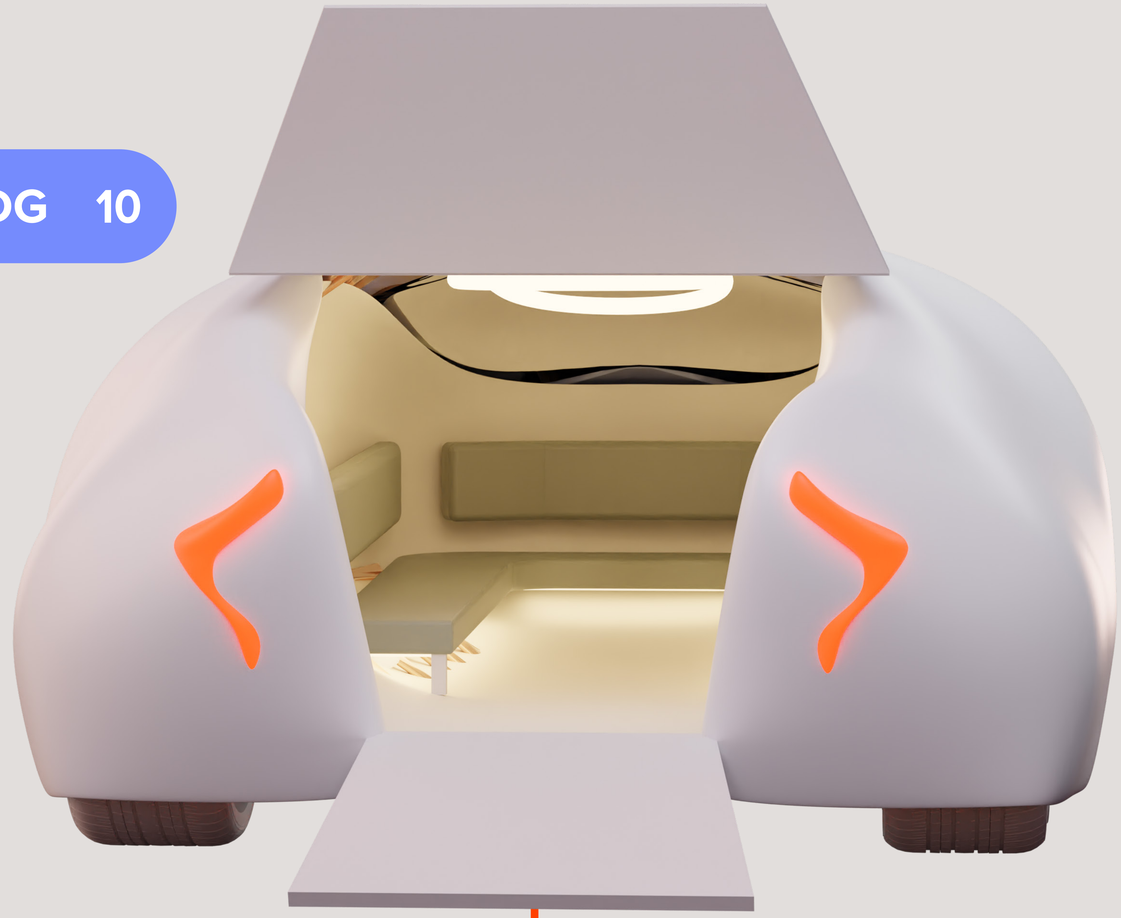


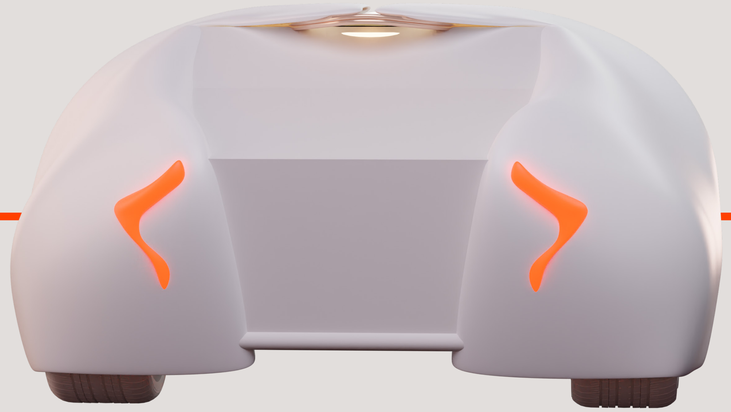


Yes, the shiny polish look is a tad fancy for something that parallels public transport but with this problem, aesthetics do matter. It needs to look, feel and behave like a car in order for those who refuse to take a bus or train to adopt them. It needs to be the middle ground and it needs to exude safety and comfortability. It’s job is to make what is usually public, feel personable.

The car opens at the rear and the door acts as a ramp, allowing accessibility to people with prams, wheelchairs or mobility problems. People’s updates and destination information will remain on their phones to increase privacy.(It also means less screens and computers onboard to go wrong, increasing battery efficiency). The cars capacity should be around 4-6 to maximise efficiency and specificity. Prioritising direct passenger pick-up to drop-off is a key part of adoption.

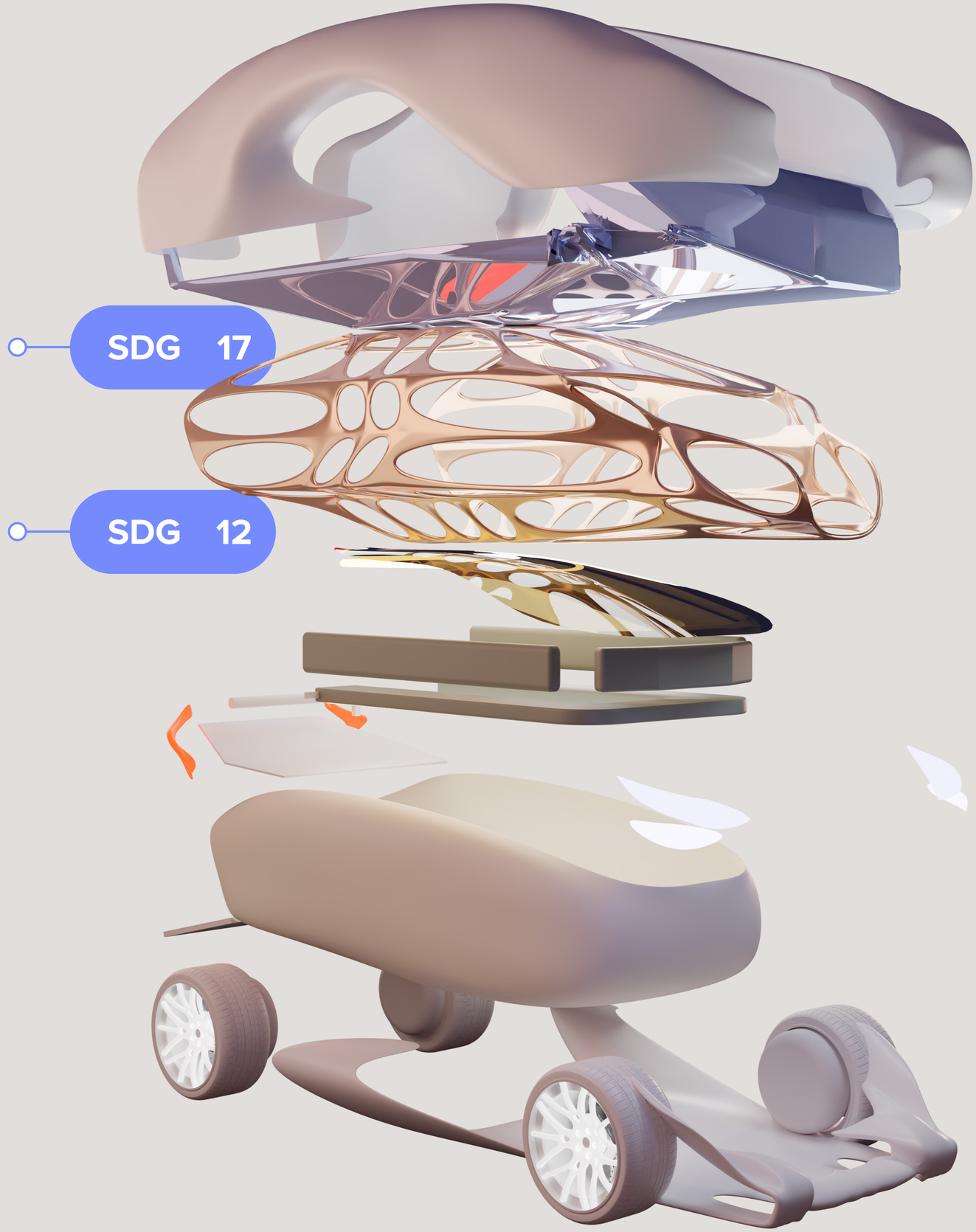
SDG 10





The development of these cars would have to be by trusted companies who are committed to building sustainably along side the other goals of this project. I'll cover more of this in the overall project scheme and partnership system.

Manta is not like public electric scooters that just sit on the road or sidewalk all day. They will need maintenance and charging hubs. As it turns out the discharge and charge of ion batteries can run quite hot, anywhere between 30-50*C. Which if were left to outside stations would be wasted energy expelled as heat. Utilising smart building design, we can create heat efficient spaces that uilitise the discharge and charge of these batteries. However creating buildings just for this purpose is wasted real estate and infrastructure that ultimately doesn't build back into the community. That's why I want these designated as multi-purpose hubs. They'll house the cars and house energy in lithium batteries.



Now, unto the final segment of AEVA

Infrastructure and Social Change

Specifically targetting SDG's

1 2 3 4 8

9 10 11 12 13

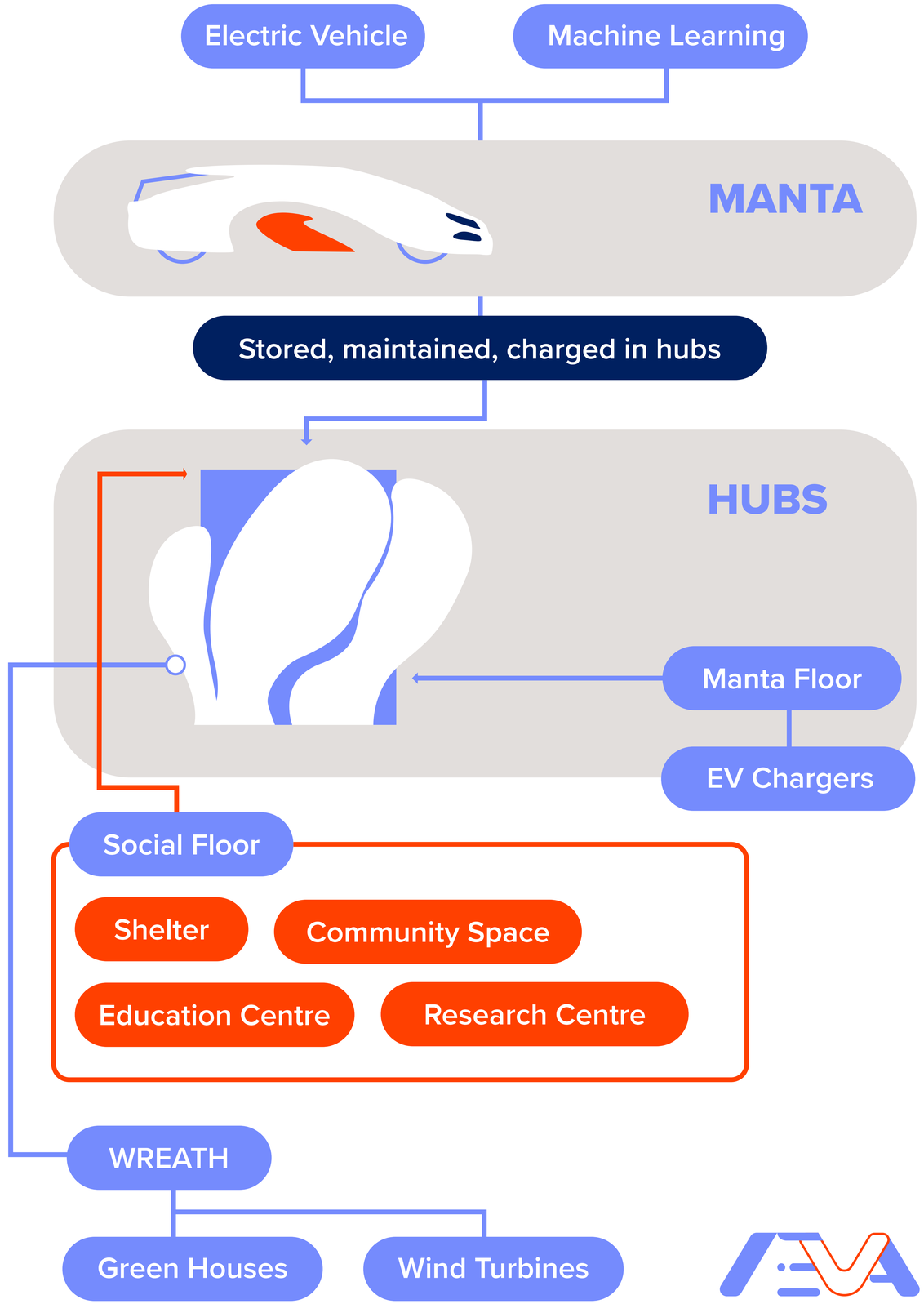
Introducing the human connection

Inventing and pushing the boundary for new technology isn't the only way we can increase our sustainability. What I hope to show and create here is a connection between people boarding these vehicles as they onboard new attitudes and mindsets towards their lives, their consumption, climate action, social change, the whole nine yards. It's humans that connect all these problems, so it's a human focus that I want to bring back into the picture. The purpose of these hubs is to create that connection. Bringing in social efforts, education centres and homeless shelters under one identity that then links into the greater plan of sustainability, technology and research. It's a hope to take something simple like your commute to work or wherever you need to go and tie it into a greater network. With people who are apathetic towards the environment or disassociate from it being their responsibility perhaps they can see a singular part of the system where it connects directly into helping people and can have their attitudes changed. It's a system of technology and infrastructure but by no means should it be treated as technological solutionism.

The real solution is the human connection. We cannot achieve anything meaningful by 2030 or 2050 or beyond without real quantifiable human change.

Be it at an individual or corporate level.

SDG's 1-4 & 10



“Oyster Mushrooms”
Photo by Green Deane
Fig 1.0

SDG 9

I acknowledge the Traditional Owners of the land on which I will discuss. I pay my respects to their Elders, past and present.

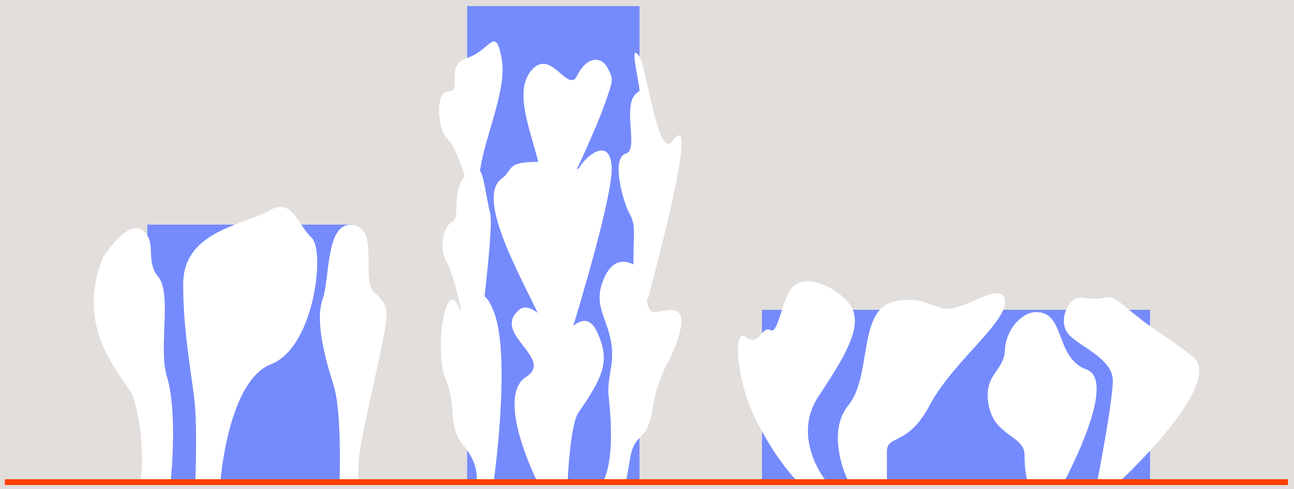
Melbourne is a city known for its arts and culture and that should apply to the architecture of these hubs. So in my design process I set out to make a design language for this infrastructure. There are a few key factors that need to be considered. Recognisability, multi-purpose functionality, stackability, sustainability and adaptability(must be able to retro-fit onto existing buildings).

I explored a few iterations of big large scale buildings. It’s easy to be drawn to the beautiful and utopian views of giant plants and vines draping from tall skyscrapers. However this often ends up being less sustainable than the green view it portrays and old buildings cannot reasonably support these amounts of plants. It ultimately would be detrimental and lead to a net loss.

Instead of looking at the current existing designs, I looked to nature and found the Oyster Mushrooms (pictured top left). Not only do they stack, they adapt and have these wonderful and intricate forms. This is what I chose to replicate.

This is Wreath.

Integrated Wind Turbines
Inspired by Flower Turbines’ Tulip Design



SDG 7

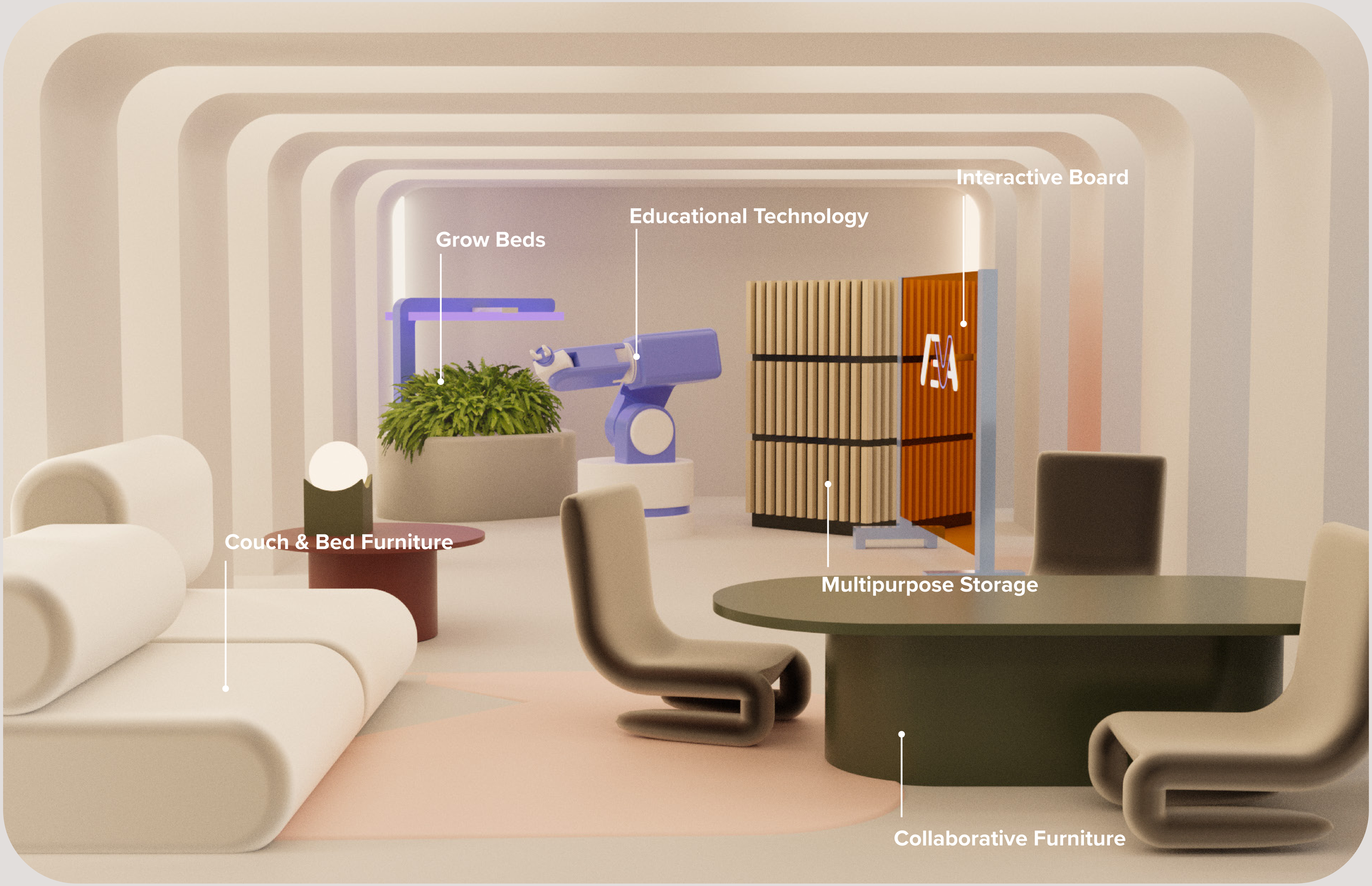
With Wreaths and their hollow nature we can house plants safely and protect them from wind while maintaining sunlight through the semi transparent surface. Not only this but because they become separate pockets we can grow a variety of foods (with humidity and temperature control) locally that couldn’t be produced in Melbourne as well as useful plants that could be turned into natural cleaning agents for the cars. Integrating a wind turbine into the mix adds a lot of seamless benefits, not only making use of wind generated by cars on the roads but the Wreaths' smooth and curved design, guides the wind into vertical mills, improving efficiency.

SDG 15

SDG 11

In the CBD, there is not a huge availability of space for new infrastructure. However there also is increased walkability, less demands for car trips yet it’s still a tight point for congestion. So while this would be a lower demand area for AEVA, it would still need hubs. Therefore retrofitting these facilities seems to be the most viable and environmental solution. Many buildings already have parking lots and spaces within their buildings they could dedicate. It would still need to require them to pledge efforts to the same social efforts that the other hubs offer. The majority of the real estate in the CBD is office space which by nightfall is nearly completely empty and yet we still have 1000’s of homeless on the street. It seems cruel when there is space, cafeterias and heating in all these offices that could house them at night.

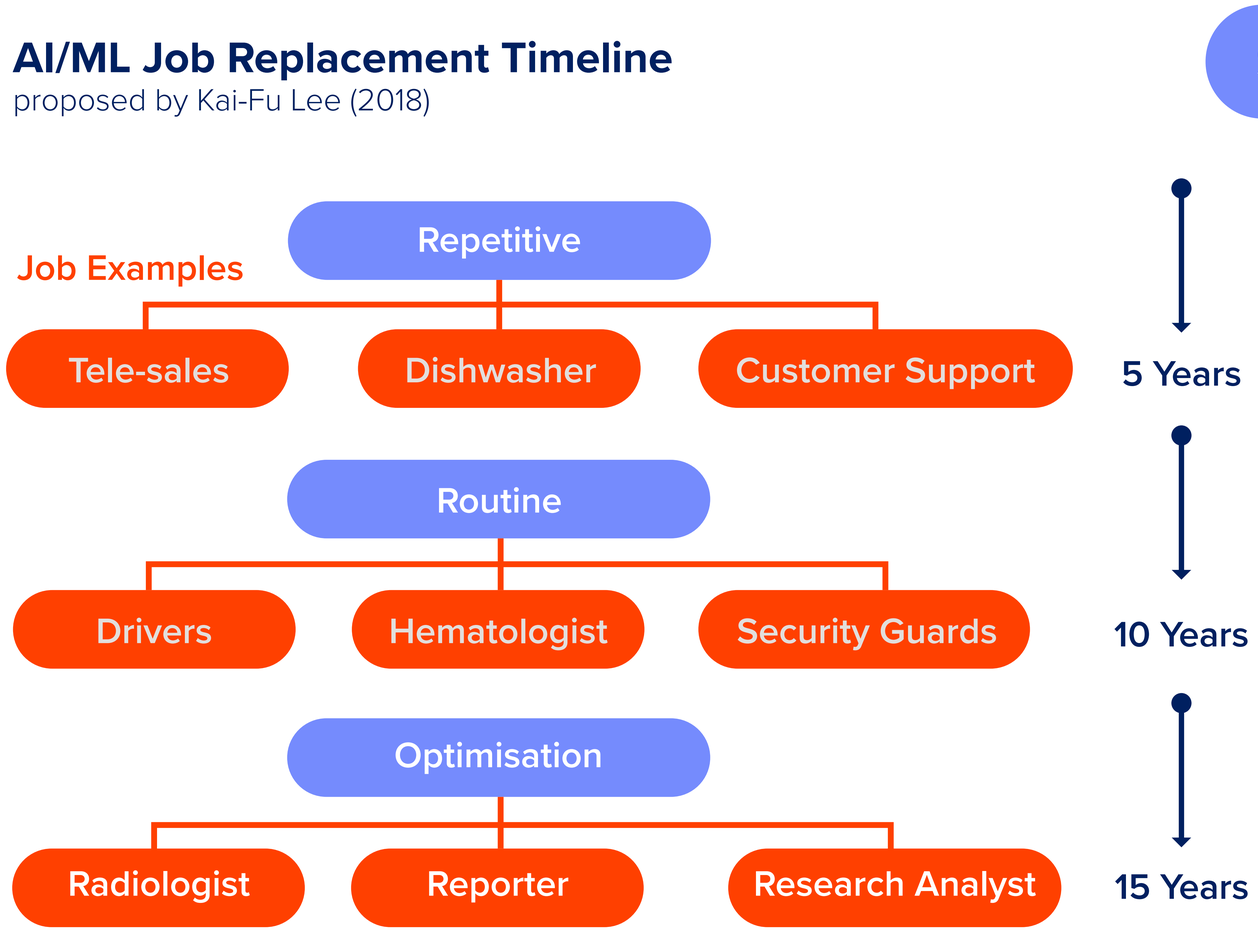
This is the right space for these businesses to offset emissions and their unrenewable uses and contribute to agreements beyond their own efforts. By doing this, they join into a greater partnership system, where they benefit from renewables and electric vehicles or other incentives.

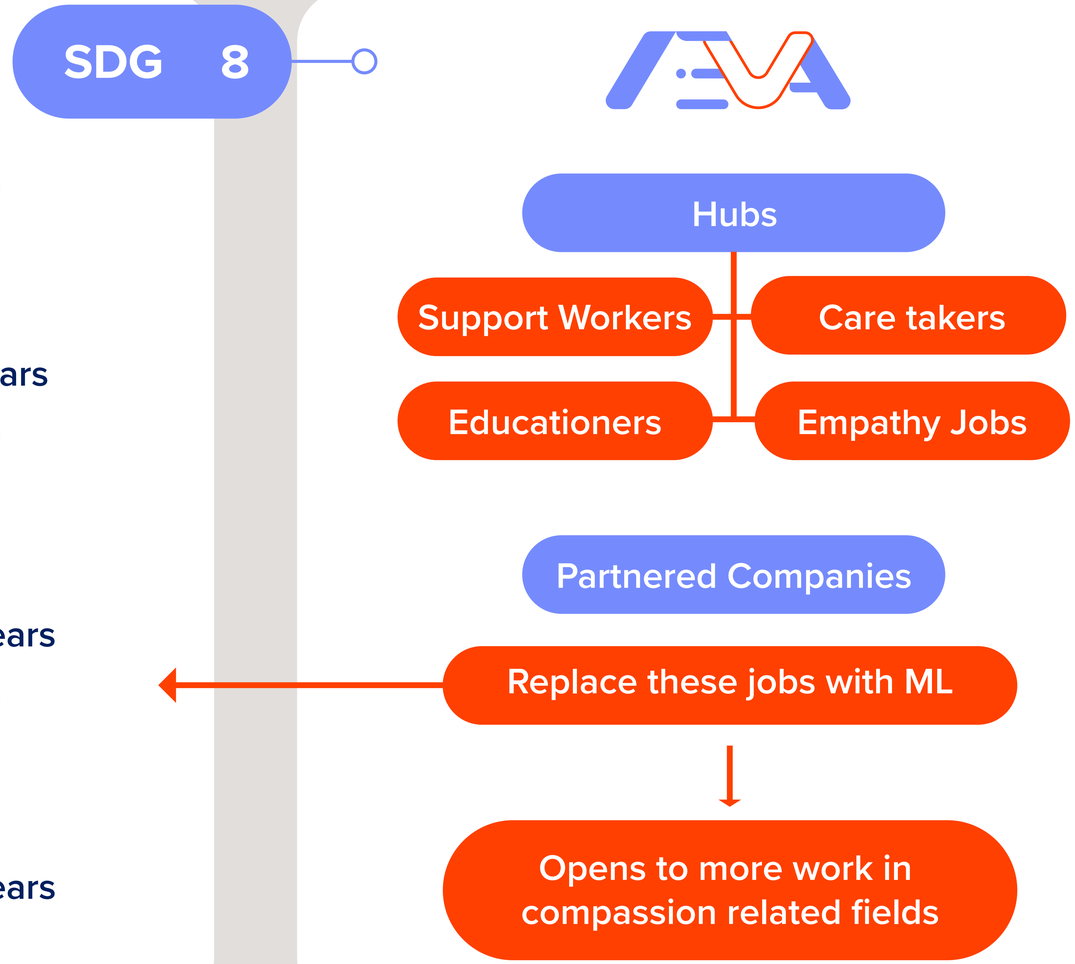


Objects you could find in the hubs

AI/ML Job Replacement Timeline

proposed by Kai-Fu Lee (2018)





Ultimately what the multi-purpose hubs offer is connected equity. Bringing back social spaces in a world that is vastly digital and automated. While repetitive, routine and eventually optimisation jobs will be replaced by machine learning(Kai-Fu Lee, 2018), the hubs will require empathetic and care-taking jobs that a machine simply cannot (nor should) replace, balancing the shift of automation. It's opportunity to create jobs that are meaningful and human. Jobs that have goals beyond a profit line for companies.

This is where a government lead company partnership system can employ work not just in these hubs but across all sectors, opening up to more compassion focused work. The hubs will be spaces to inspire the next generation, with a green sustainable focus but also one that aspires to set further technological goals without seeing them as the whole solution.

The technology exists to achieve these functions in one way or another. Tesla's autopilot beta is nearing completion and many companies will soon be able to replicate similar results. Renewables are improving every year and with more and more eyes on electric vehicles, better battery technology is always on the horizon. Small factor vertical wind turbines already exist as the Flower Turbines Tulip design, which is safer for birds and more space efficient. All that's really left is system wide implementation and adoption.

The real design of AEVA is to network behavioural change that pushes adoption rates. By seeing Manta and the impact it can have on human lives by the Hubs built around them, the inclination to adopt sustainable practices in personal and business forms should increase and ultimately push us into a place where we diminish unrenewable fuels and enhance the way we store energy. We cannot simply fix climate change just by stopping a few things. I acknowledge the rate of adoption and even creation of technology is advanced for 8 years but if we are to prevent a **1.5 degree warming by 2050**, our pace must be rapid. We must change, adapt and adopt not only on an individual level but on an entire systemic level. That's why AEVA is designed as an interconnected system. Not only for climate change but for social improvement as a whole.

We need a system change and individual change,
one cannot exist without the other.

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