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INTERIOR DESIGN FOR A PERSONAL SEMI AUTONOMOUS VEHICLE - 2025

Design project II

By Deepak Peddoju (156390001)
Guided by Dr. Sugandh Malhotra

INTERIOR DESIGN FOR A PERSONAL SEMI-AUTONOMOUS VEHICLE - 2025

Design Project - II

Guide: Prof. Sugandh Malhotra

Submitted By
Deepak Peddoju - 156390001

Mobility & Vehicle Design,
IDC School of Design, IIT Bombay

DECLARATION

I declare that this written report represents my own idea in my own words, and where others, ideas or words have been included, I have mentioned the original source. I also declare that I have adhered to all principles of academic honesty and integrity and have not falsified, misinterpreted or fabricated any idea, data, facts or source in my submission. I understood that any violation of the above will be cause for disciplinary action by the institute and can also penal action from the source from which proper permission has not been taken, or improperly cited.

Name	:	Deepak Peddoju
Roll Number	:	156390001
Date	:	
Place	:	IDC School of Design, IIT Bombay, Mumbai
Sign	:	

APPROVAL SHEET

This Mobility and Vehicle Design project report entitled “Interior Design for a Personal Semi-Autonomous Vehicle 2025”, by Deepak Peddoju is approved in partial fulfilment of the requirement for Master of Degree in Mobility and Vehicle Design.

Project Guide :

Chair Person :

Internal Examiner :

External Examiner :

ACKNOWLEDGEMENT

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals I would like to extend my sincere thanks to all of them.

I am highly indebted to Dr. Sugandh Malhotra for his guidance and constant supervisions as well as for providing necessary information regarding the project & also for his support in completing the project. I also thank Prof. Nishant Sharma for his inputs on the project.

I would like to express my gratitude to the members of IDC IITB for their kind co-operation and encouragement which help me completion of this project.

Last but not the least, my thanks and appreciations also go to my batchmates in developing the project and people who have willingly helped me out with their abilities.

Deepak Peddoju

Date :

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INTRODUCTION

1. INTRODUCTION

Earlier in 1950's people were dreaming about the future of flying and self-driving cars that make transportation fast and safe. Fast forward to 2016, no sight of flying cars instead roads are jammed with vehicles emitting harmful gases that are threatening to humans. Technology advancements over the years have reshaped our dreams about the future. Flying cars may take a couple more decades but the future looks promising as we are very close to seeing cars which can drive on their own. Technology advancements have proved that machines can be better than humans in certain areas. Which makes us believe that future of transport is going to be safer with autonomous technology as it helps solve traffic problems, eliminate human errors and also unlocks new possibilities.

1. AVE Mizar - flying car (1971)

With autonomous vehicles on road, possibilities seem to be endless. People can indulge in other activities if they are not incharge of the car anymore. Truly enjoying travel doesn't seem to be a dream anymore. All these possibilities change the way cars are going to be treated. This situation throws us a question, how do we treat cars if they are not meant to be driven or partially driven? Automotive industries are very confident about autonomous technology and have already started working towards it.

2. Driverless car of the future (advertisement-1950's)

1.1. Scope of the project

With autonomous technology on road, we have an exciting chance to design the future of automobile. With no driving involved, interior space of an autonomous vehicle can be reimagined to suit futuristic lifestyle that enables new interactions. Interpreting interior space of an autonomous car that hits the road in the coming decade is challenging.

2

PRE-RESEARCH

2. PRE-RESEARCH

Before arriving at concepts, research was done to gain knowledge and understand autonomous technology, advancements in technology, current and the future state of automobile, changing environmental factors, changes in human behaviours and other involving factors. Doing so let me understand trends in the industry which are further used while developing concepts.

- **RESEARCH**
  - Technological advancements
  - Environmental changes
  - Changing human behaviour
  - Auto Industry
  - Future of Automobile
  - Understanding Autonomy

2.1. LIFE IN 2025

2.1.1.Technology

Technology today is advancing at a higher pace than ever before. Advancements in various fields like Engineering, Medical and others project a bright future for humans.

Powerful computers

For the last decade, we were speaking about computers that are fast and easily portable. But we have already reached a point where computers are smaller than our wallets. In the coming decades computers are expected to reach a level where they can crack problems in milli seconds which would take the fastest conventional computer today years.

People, Internet and Connectivity

As computers get cheaper, number of devices connected to the internet is also going to grow drastically. It is expected that by 2025, we would see 100billion connected devices with 8billion people on the globe. Which

includes autonomous vehicles, wearables, drones, homes and new devices that don't even exist today. All these devices are going to communicate with each other with hyper fast internet connection.

Augmented and Virtual Reality

With such connectivity and ability of communication, even cars are going to take new shape. Soon we would experience virtually borderless life. Technologies like augmented reality and virtual reality are going to present our very own world in a new dimension.

Machine Learning

Machine learning could enable robots to teach an other robot which is beyond communication. Other industries would take advantage of this and make communication better. With machine learning, cars can communicate well and identify other cars easily.

Nano technology could help build stronger structures with flexibility. Health care would also change making diagnosis and monitoring way easier and accessible than ever.

2.1.2. Humans

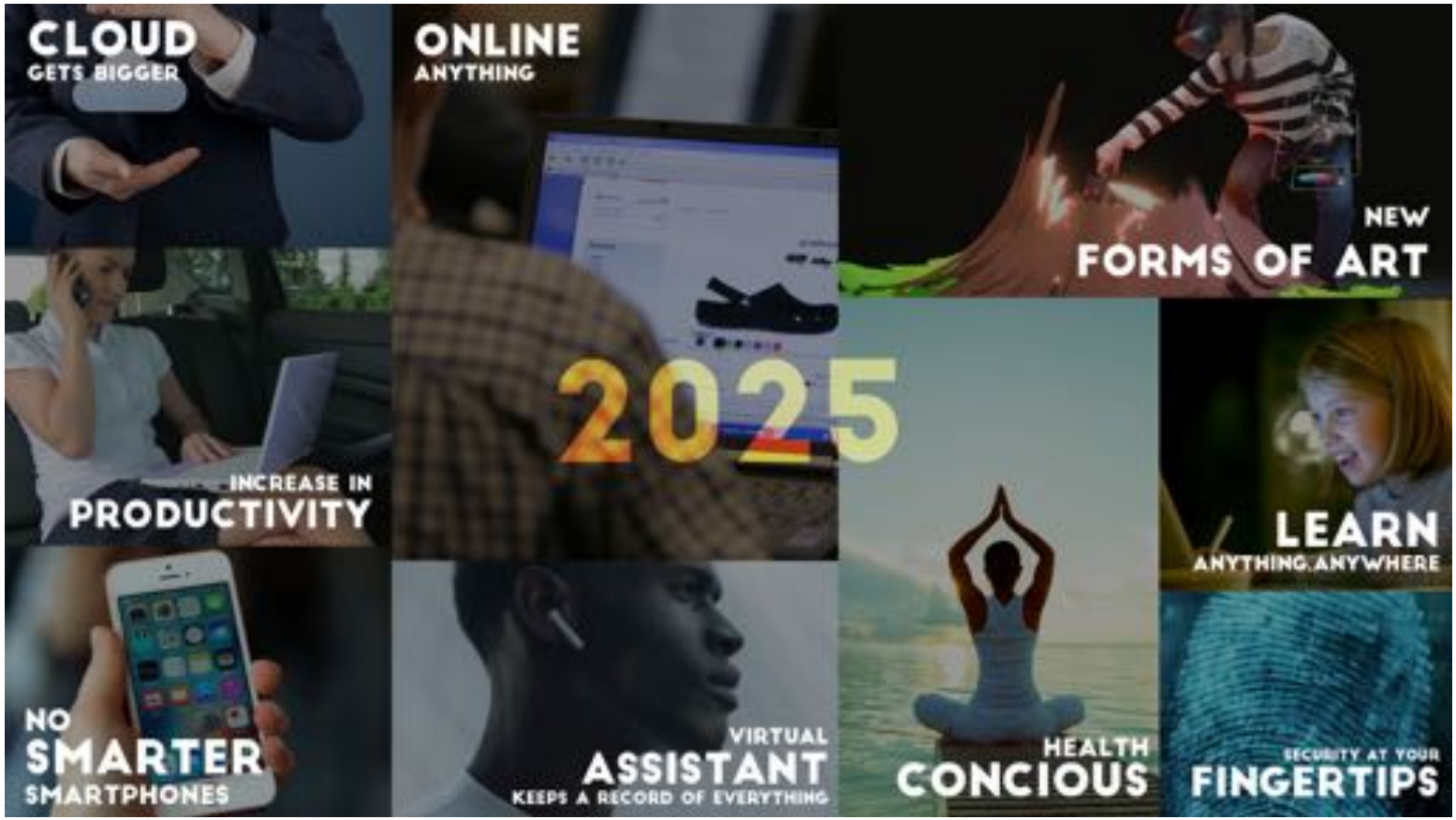
Technology is to make humans more smarter and efficient. With all the accessibility, humans are going to experience life like never before.

Virtual Assistant's

A normal day in 2025 would start with a tap on surface that tell us how to start our day. From playing music based on our mood, showing us the best track to run to reminding us to slow down or sip water, we are going to have our own virtual personal assistant.

Health Conscious

Humans are going to be health conscious as they get monitored in real time. Real time health monitoring will help people diagnose everything from blood pressure to deathly cancers. This help humans stay health and



Productivity

We may not have workspaces kilometres away from homes. The way we work is going to change, increasing productivity. With autonomous technology we can start working the moment we get into the car. Talk to people as you would in a board meeting. Update work as you would in a office.

Anything, Anywhere

New forms of art with technologies like AR and VR will be explored in the coming decades increasing creativity. We will be able to learn anything from anywhere which makes the upcoming generations smart.

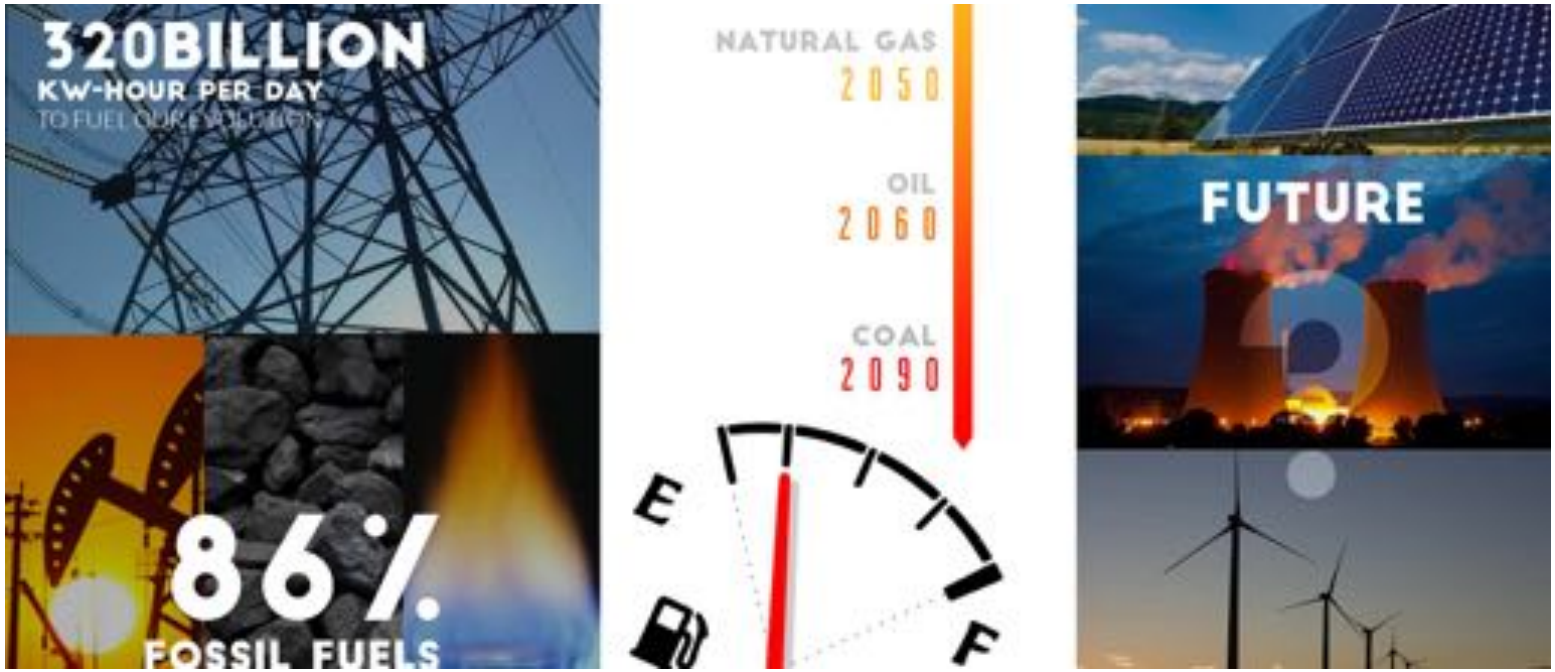
Security

Our body is going to be the primary key to unlock things around you as security becomes more personal. Our body acts as a personal key for everything. However, technology is going to be a part of life as humans evolve.

2.1.3. Environment & Energy

Depleting Fossil Fuels

Humans in their never ending struggle to improve standards of living, has invariably depended on colossal amounts of electric power to fuel our evolution. As of today according to National geographic, it is estimated that we use 320billion KW-Hour of energy per day. Most of this enormous requirement is addressed by burning



fossil fuels. To be precise, 86% of the energy is generated by burning fossil fuels. With this pace, we are going to

run out of fossil fuels known to man by 2090. Reports say that we are going to reach the bottom levels of natural gas by 2050, oil by 2060 and coal by 2090. This combined with global warming is alarming to humans.

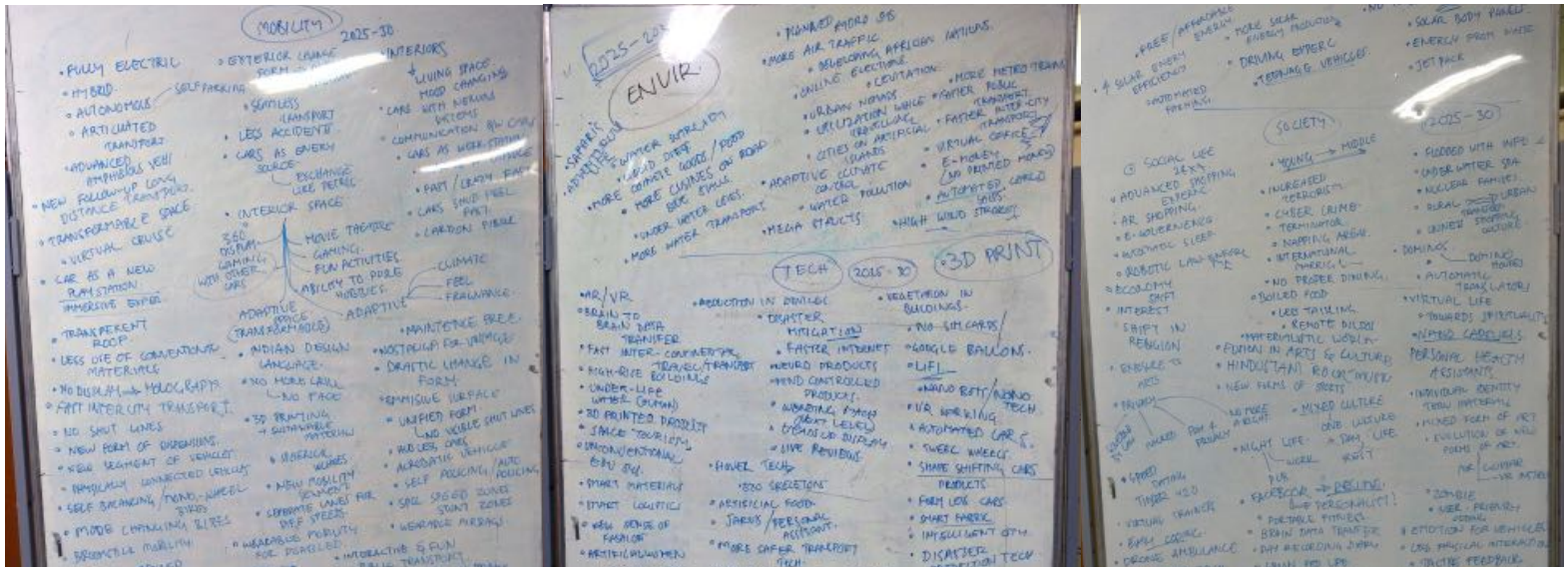
Future of Energy

As situation needs to be addressed, people have started looking at other sources decades ago. But, it is in the recent years development towards green energy has grown. Solar panels have become cheaper over the years with a 40% drop in price in just 6 months. This is expected to continue making solar energy affordable to everyone. Elon Musk, CEO of Tesla have recently introduced solar roof's in association with Solar city that look beautiful and work efficiently. And promise to be cheaper than conventional roof panels. Big companies are moving towards solar energy promoting green energy usage.

With availability of affordable and reliable solutions to use green energy, we would see a major shift in energy source. Automobile industry, which is a major emitter of CO_2 emission is now in a race to produce efficient electric vehicles.

2.1.4. Brain Storming

After pre-research on environment, humans, and technology, a brain storming session was conducted within a group of 12 people to understand what they think about the future.

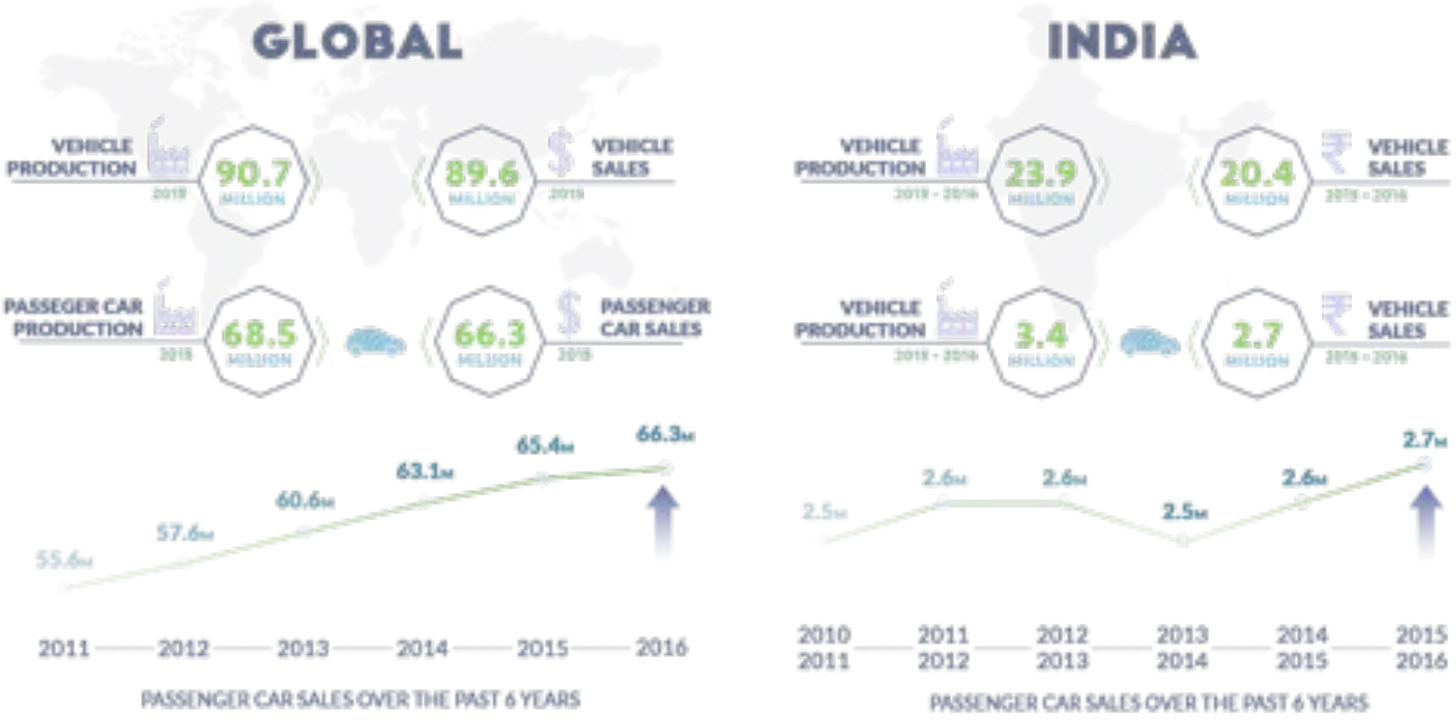



MOBILITY
Interior space
Form changing seats
Playful Interiors
360 display
Extension of a living room
Transformable
More than a car
Relax
Entertainment
Work
Meetings
Virtual Conferences
Eat
and more..
gaming with other cars
Movie theatre
Materials
Nano materials
Improved carbon fibre
Unconventional materials
Tangible technology
Smart fabric
3D printed parts
Virtual reality
Move slow, but feel fast
Virtual surroundings
No displays-holographics
Advancements
Connected to the world
Communication with other cars
Awareness on surroundings
LIDAR
SONAR
Continuous tracking
Driver/Passenger monitoring
Technology
High level of automation
Compact batteries
Hub less motors
Advanced surface treatment
Shape shifting
Heads up displays
Roads
Special zones
Speed zones
slow zones
Energy producers
Modes of transport
Capsules/pods
Hyperloop
Shared vehicles
Shared but private
Interactive & fun public transport
Self balancing bikes
Autonomous/ Driverless
Shared
public transport
Shared taxi
Rented
Rented for days on demand
Monthly/Yearly subscriptions
Owned
Owned Personal vehicles
Owned utility vehicles
Safety
Wearable airbags
Others
Automated farming
No IC Engines
Jetpacks
Human powered vehicles
Organic forms
Maintenance free
Amphibious Vehicles
Mood changing interiors
Drones
Mobility for all(Disabled)
Safer transport
Everybody in comfort
Transformable mobility
Transparent roof
Seamless transport
No more grill face
Communication
Car to car communication
Car to place communication
Self policing


HUMANS
WORK
Work anywhere, anytime
Data is protected and accessible everywhere
Automated
Start/Stop from home
Review from anywhere
Virtual meetings
VR
AR
Use of Holo Lens
Advanced interaction with virtual world
FOOD
Vertical Farming
Aeroponics
Aquaponics
Hydroponics
Quality
Home grown
Healthy/Nutritious
Grounded refrigeration
Organic/Natural
Kitchen garden
Delivered to home
Selective time
Smart Kitchen
SOCIAL LIFE
Health/Fitness
Monitors
Smart health monitors
Fitness trackers
Data constantly shared with doctors
Alerts
Timely alerts
Caution warnings
Symptom analyst
Virtual
VR
Augmented reality
Always connected
Personal photographer
Memories auto captured
auto stored
SHOPPING
Cardless payments
Online Purchases
Automatic refills
Efficient Delivery
Use of drones
Automatic package drop systems
Autonomous delivery vehicles
SHELTER
Energy
Multiple Sources
Grid - Complimentary
Green Energy
Electric
Solar
Panels
Transparent solar windows
Wind
Floating wind turbines
Geo thermal
Excess energy sharing
Excess energy Sold/exchanged
Charge your car here!
Every house/building can be a charging point
Space
Vertical Space & Smaller foot print
Transformable
Transformable furniture
Space on purpose
Smart Furniture
One servers two
Smart Cleaning aids
Dishwasher
Floor cleaner
Washing machines
Interactive surfaces
Walls
Ceiling
Glass - windows & mirrors
Smart
Connected devices
Interactive appliances, furniture and more
Efficient power saving
Intelligent house
Behavioural changes
Adapts according to the weather changes
Auto ON/OFF devices

2.2. Auto Industry 2016 - Towards Electrification

Despite of global warming, increasing traffic and other issues, people have not stopped purchasing vehicles. Looking at the current statistics, passenger car sales have grown up from 65.4 million to 66.3 million worldwide. And in India, Even though the sales have seen a downward graph in the past, it picked up in the recent years. This shows the current trend of people's interest in passenger cars. People in India and other populated countries are interested in compact cars as the roads are tightly packed.

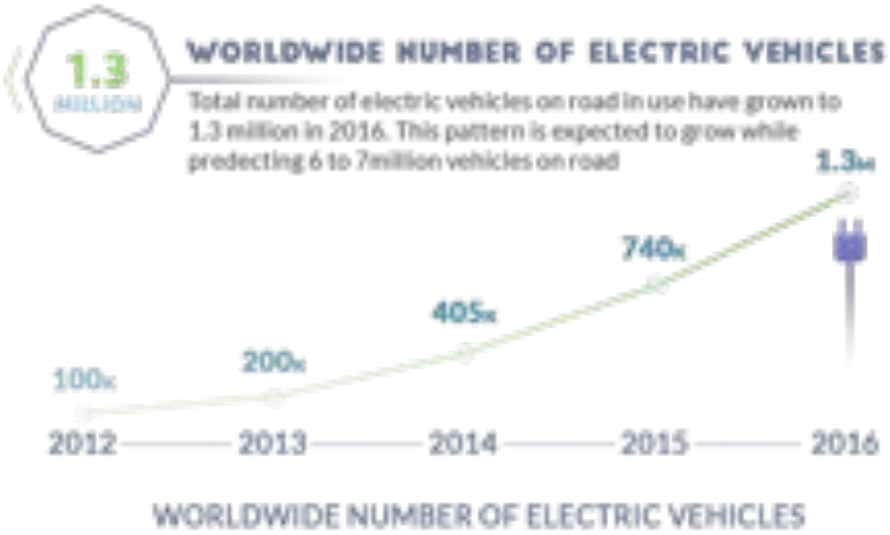


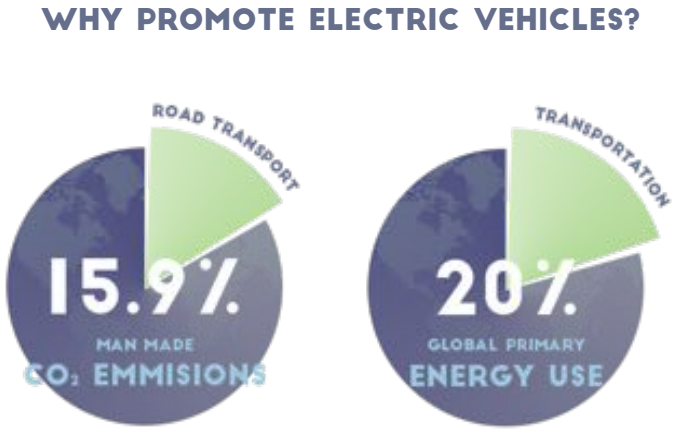
As CO_2 emissions reach alarming levels, globally auto industries are undergoing a major change. A change to electrify all the vehicles in the coming years to fight global warming and make the roads safe. Few countries are ready to ban the use of petrol and diesel cars to avoid emissions. Electric vehicles have already found their

way onto the roads in the last 10 years. But it is in recent years the demand has been growing.

As of now, there are 1.3million electric vehicles on road compared to 0.7million last year. This pattern is expected to grow. It is expected to reach 6 to7million. As government's realise the threats of global warming, various countries have started promoting electric vehicles with various incentives in an effort to reduce emissions. Indian government provides subsidies upto ₹150,000 on hybrid and electric vehicles. It aims to have 7million electric vehicles on the road by 2020.

Tesla launched Model S and demonstrated that electric vehicles have immense potential and can also be efficient, reliable and good looking as well. Even though Industries are working on electric cars since ages, tesla have made an impact bringing a major trend shift. People's interest and views on owning an electric vehicle have changed. Tesla's Autopilot feature have showed what could be the future to common public by enabling it on their vehicles.





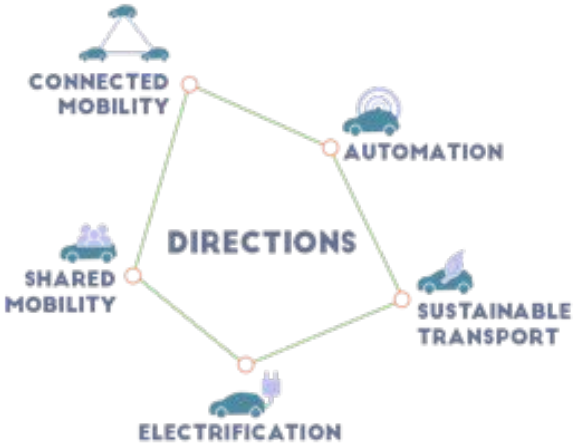
Making electric cars reality is not a new born idea. Auto industries along with governments have been trying to make electric cars main stream since many years. It is not as easy as it sounds as the shift from conventional gasoline cars to electric cars demands many new things. Most importantly the infrastructure. Electric cars needs charging stations. Yes, we can charge our car at home every night but what if I need to go on a long trip? Even if you provide charging stations, we cannot charge the car the I refuel with gas. Electric cars store charge in conventional batteries which degrade with time. Along with these, cost, lower performance, shorter range per charge are the major problems that are keeping the buyer away from buying electric vehicles.

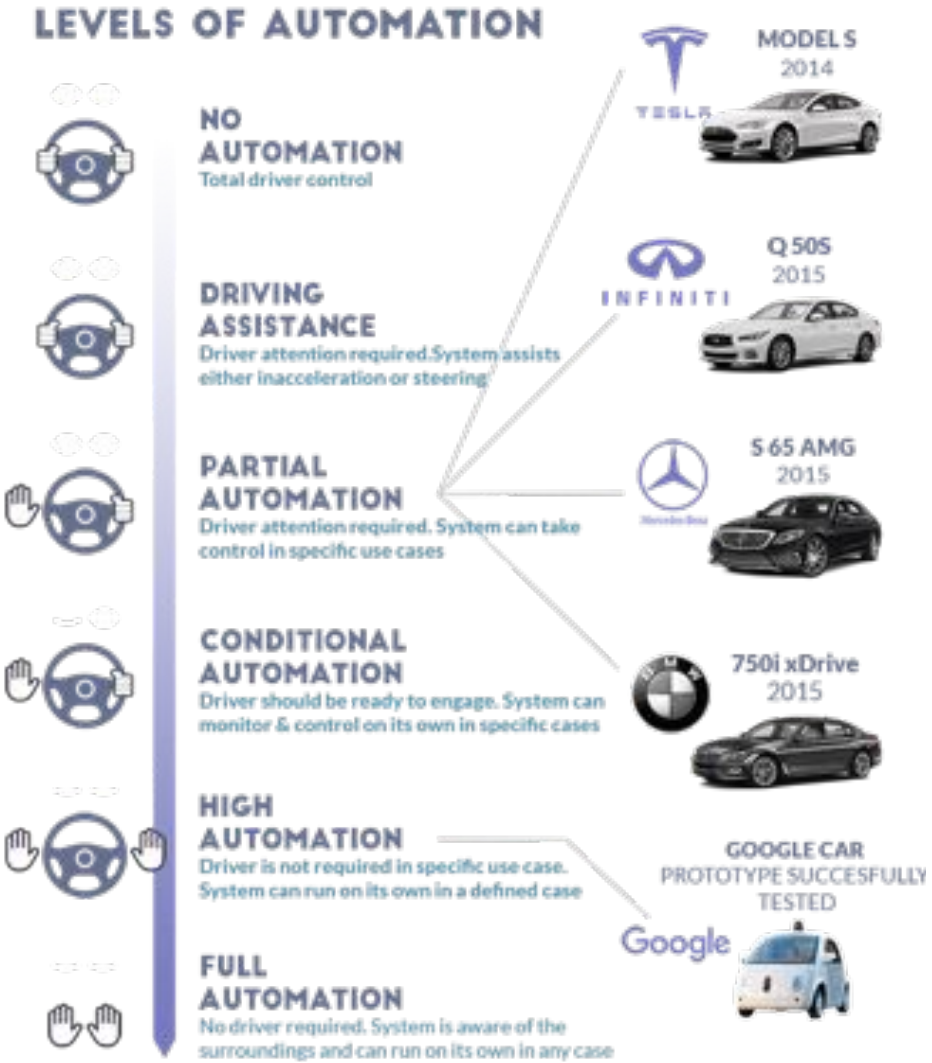
Unlike Tesla Motors which make PEV(Plugin Electric Vehicles), other Automotive manufacturers are trying to keep the transition smooth by launching PHEV(Plugin Hybrid Electric vehicles) into the market. These vehicles have both electric and gasoline engines to balance both the sides. The following are the top(left to right) selling PEV's & PHEV's in the market.

AVAILABILITY OF AUTONOMOUS VEHICLES ACCORDING TO MANUFACTURER'S

2.3. Future of Automobile - Manufacturer's Vision

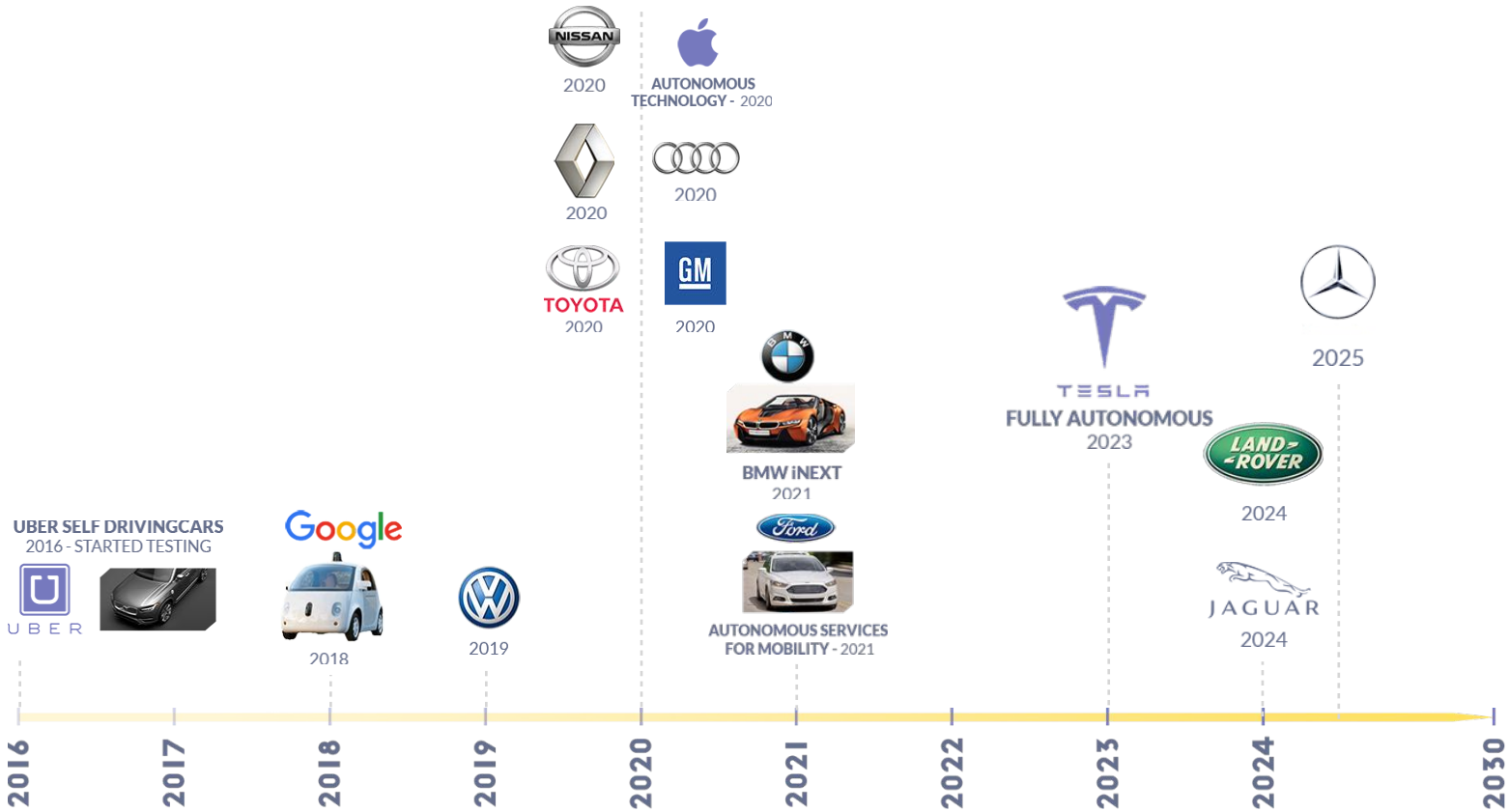
All the major manufacturer's have clearly set directions for their future generations of vehicles. They expect the future to be autonomous, electric, connected, shared and sustainable. We have already reached level 3 automation where cars can take control with drivers attention in specific cases. As of now, this feature is available in premium segments only. In 2014, Google has successfully attained level 5 automation with its prototype. That is one step away from full automation. As vehicles take shape into new form of computers, it may not be surprising to see they communicate with each other. In the recent years people in urban environments have started to prefer shared mobility inspite of owning cars. As cities grow, they become populated and hectic to drive. As manufacturer's understand that





users interest in buying cars has been changing, they plan to make cars that can be shared with anyone when not in use.As we reach level 5 automation we don't need a conventional steering wheel anymore. New and tech companies like Google are trying to build a car without a steering wheel. Whereas traditional manufacturers are trying not to disconnect the driver from the car even if it has the ability to drive on its own. Service providers like Uber and Ola are trying to take advantage of the technology to provide more safer and reliable services.

Most of the car manufacturer's believe autonomous technology with level 5 automation to hit the roads by 2030. Other companies like Intel, Google, Apple etc, also strongly believe that autonomous technology will be ready by 2030.



2.4. Autonomous Technology

By adding all these to a car, we are basically providing a virtual vision to understand its surroundings and tackle situations on its own. With true autonomy we can make the roads safer as machines get to precisely calculate, process and handle the situations with no distractions unlike humans.

2.4.1. Benefits

Safer Roads

As cars understand and sometimes predict what's coming their way, it is possible for them to quickly act responsibly. This will make the roads safer as severe accidents can be avoided. This could also eliminate the need of traffic signals

Reduced Emissions

Autonomous cars are expected to be powered by electricity. As electric cars don't emit any harmful gases into the atmosphere, emissions would be reduced.

Free Time

As cars monitor and control everything, we the passengers get more free time. You can walk out of the car at your destination as it would park on its own.

2.4.1. Current Problems

With all the benefits, there are few but serious problems why the technology is not ready for deployment yet. Today, even with all the advanced sensors onboard, cars are not capable of handling all the situations. This is why we need human attention while cars operate on their own.

Identifying Humans and Signs

Current technology is not good at identifying humans. It cannot understand the difference between humans and other objects when the vehicle is moving. Both pedestrian and passenger safety is at concern as technical errors on road could have fatal consequences. On the other hand, bad weather hinders its visibility making it hard to read road markings and signage. This is also a major concern as computers depend on this information for every move.

Law and Ethics

Law and ethics might conflict in dangerous situation where action requires an illegal move. Machine learning is not advanced enough to understand such critical situations

Affordability

On top of everything, autonomous technology is not affordable yet. Performing a move autonomously requires advanced technology which is very expensive as of now. Still, automotive manufacturer's aim to bring full autonomy on to the roads by 2030.

3

RESEARCH

3. RESEARCH

3.1.Automotive Trends - Futuristic Design

To understand OEM's take on futuristic design over the years, trend study was done by considering various concept vehicles that were released to public in the past 10 years.

3.1.1. Year 2006

It is observed that vehicles released in the year 2006 had boxy forms, pronounced wheel arches showing muscularity and rigidity in forms. They had large surface stretched with no creases on them. This may be due to the limitations in manufacturing and lack of technology to produce dynamic surfaces.

3.1.2.Year 2006

A year later, manufacturer's have showcased vehicles with smooth and dynamic surfaces. Strong wheel arches and long flat surfaces are given some treatment with curves. Vehicles started to exhibit crispness with sharp creases. Surfaces started to blend in smoothly.

Manufacturer's exhibited curvy forms, Mazda had exhibited unique surface treatment expressing fluidity and organic nature in the form which was interesting and grabbed attention.

3.1.3.Year 2008

Trend of blending surfaces smoothly have continued and manufacturer's exhibited the cars with aggressive surfaces. Surfaces expressed sportiness with dynamic lines. Smooth surfaces were treated with sharp and edgy lines.

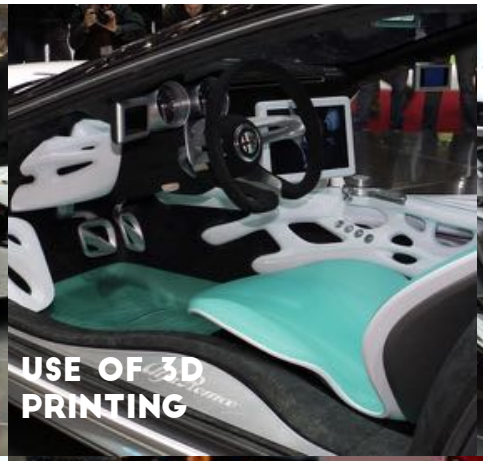
3.1.4.Year 2009

Character of the vehicles were shown by confident and sharp lines. Soft and smooth forms intersected with strong and dynamic lines giving the entire form a dynamic and aggressive nature. BMW showcased its i8

concept which had dynamic lines all over the car. Technology advancements have let them create an unique car with such dynamic and futuristic character

3.1.5. Year 2010

Advancements in technology like use of 3D printing technology have unlocked new possibilities that were not possible before. Automobile manufacturer's have showcased some very interesting design languages taking advantage of such technologies. This year have also seen some electric car concepts with new and smart forms.



Trends from previous years have continued to evolve and started to appear in production models slowly. As technology advanced in a greater pace, the gap between concepts hitting the road have been decreased gradually.

3.1.6. Year 2015

Growth in technology like ability to print body panels and other big parts in 3D allowed manufacturer's to play with the form further. Manufacturer's have started to show how they imagine the future with autonomous technology. Mercedes and Renault showcased autonomous concept vehicles with clean and simple surfaces. The prominent grille was reimagined to give the electric feel to the vehicle. Electric styling have started to show up with electric vehicles grabbing attention. Front facia have started to change as there is no more a need for huge grille for radiator. This especially leaves the front su

3.1.7. Year 2016

2016 is the year manufacturer's showed unique concepts. From surfaces that move along with the wheels giving the car sense of emotion and life to interiors surfaces that react according to the surroundings, it can be said that automotive design is taking full advantage of available technologies today. Surfaces are going clean and minimal while expressing the emotion. Interior spaces are also going minimal with less moving components.

Design language through the years have undergone a huge change and is about to change further drastically with electric and autonomous technologies. Over the years, the way of expressing chosen emotion or character has kept changing. For example, 10years ago sportiness of a vehicle was shown by using vibrant colours but now elements like dynamic surfaces treatment and aggressive stance are used to show the exact same character. After looking at the trends over the years, the direction is to keep the desired character while maintaining simplicity. To also express the cleanliness of electric energy via surface treatment.

3.2. Existing products - Interior Spaces

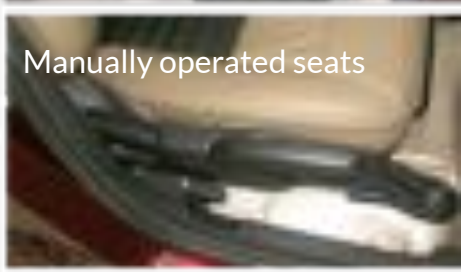
Study on interior spaces of existing vehicles was done to understand how OEM's provide features and manage space within various vehicle segments.

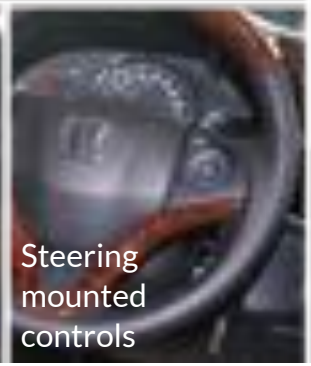
MAJOR ELEMENTS OF A CONVENTIONAL DASHBOARD

As we adopt autonomous technology where everything is controlled and monitored by the car itself, we may not need a big and conventional dashboard with many controls on it.

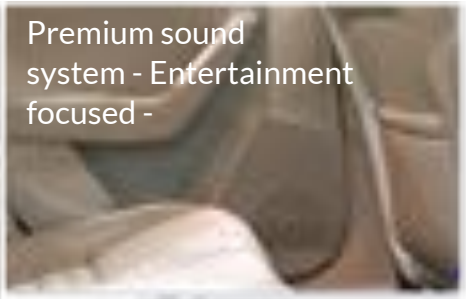
As future promises to offer numerous features in an autonomous vehicles, observational study on executive and premium sedans from various OEM's which offer most of the features as of today was done to get an idea on current situation. Honda city, Skoda Octavia, Skoda Superb and Toyota Altis were considered for the study as they were best appreciated in their class.

3.2.1. Honda City

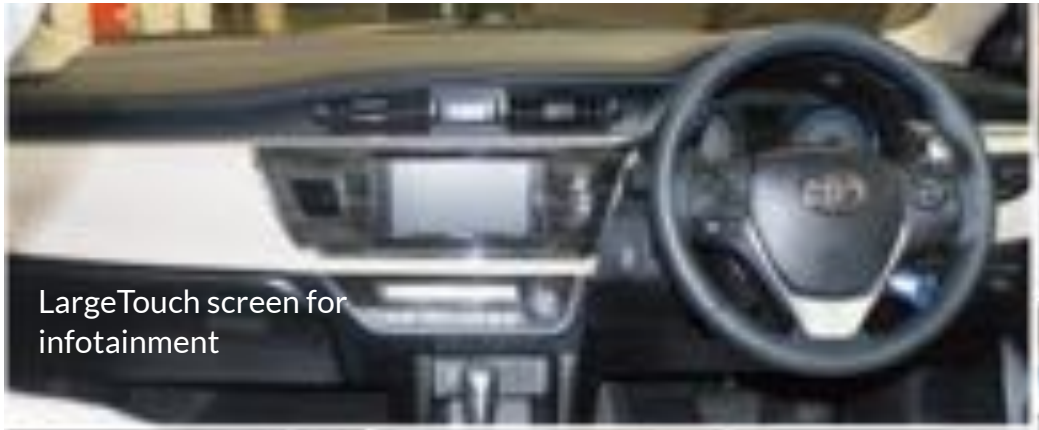




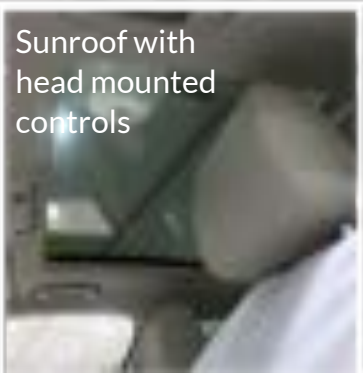
3.2.2. Skoda Octavia

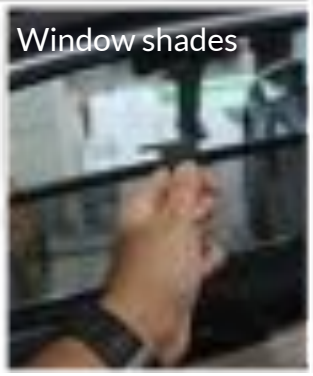


3.2.3. Toyota Altis



3.2.4. Skoda Superb





3.3. Other Observations of Indian Automobile

Observations to understand how people use the space provided to them was done. This is also to understand if users use the space for intended purposes.

3.3.1. Personalisation

It is observed that people in especially in India like to decorate their cars with idols of god showing religious touch or with Indian flags to show patriotism.

3.3.2. Customisation

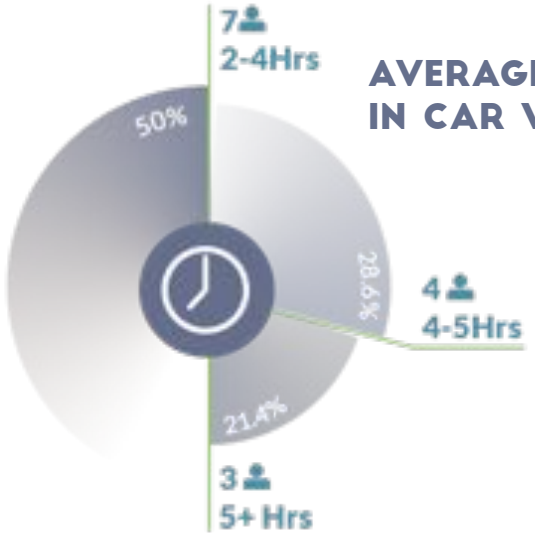
It is observed that users come up with ingenious ideas to compensate the lack of some much needed features. Lack of few specific features makes the user use the space for intended purposes. People prefer convenience over any intended purpose.

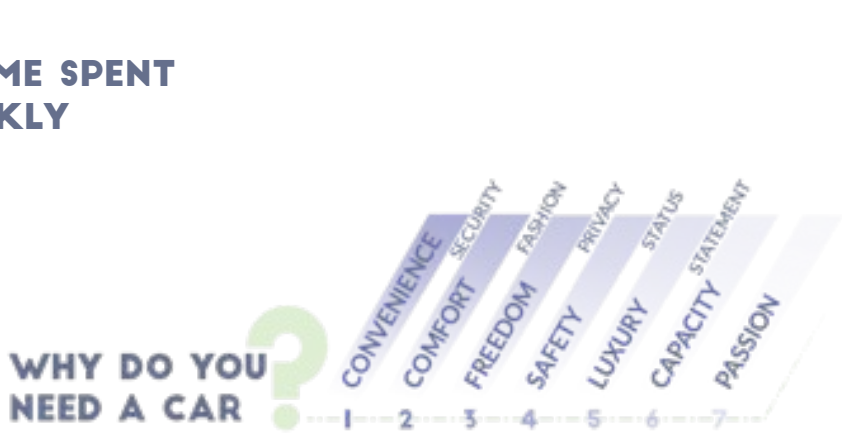
3.3.3. Other Observations

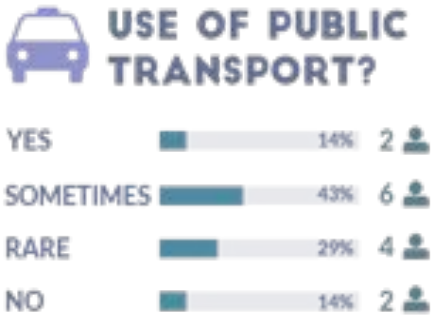
It is also observed that users have many other problems like highly reflective screens and areas that make cleaning hard. Users tend to choose black or dark interiors shade to make maintenance easy.

3.4. User Study

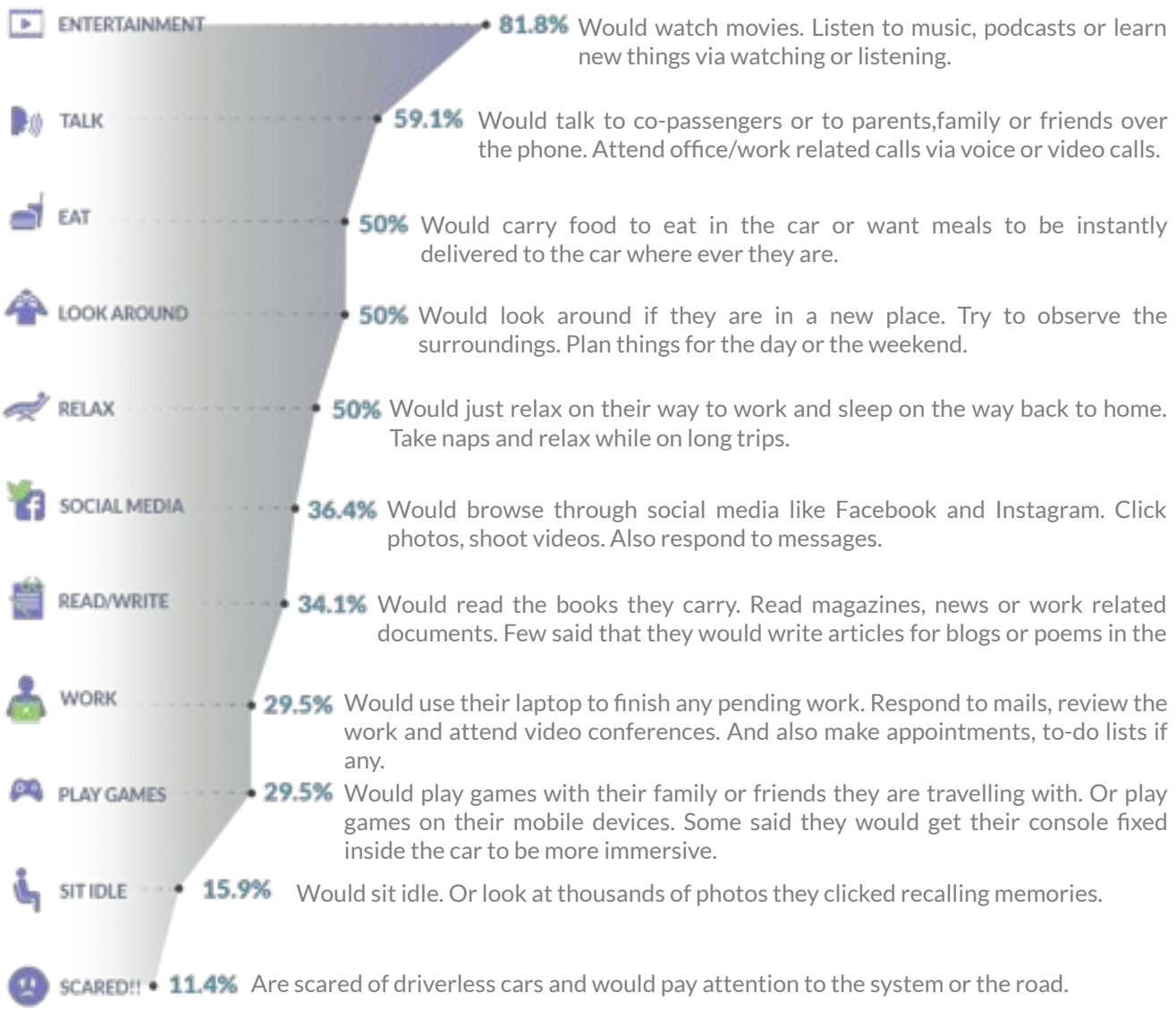
User study was done to understand the views and expectations of people on autonomous technology. People with sedans, especially executive sedans were picked expecting them to have special purpose in owning such a car. 14 such users aged between 30 and 60 were physically interviewed. And remaining 44 aged above 20 and owning cars were given a questionnaire via online.







People were questioned ”What would they do if their car would drive by itself? “. The purpose of this question is to get inputs from people on things they would do while the car drives itself.



Results show that people are not so scared of cars driving on their own. Instead they want to take advantage of the technology and use the time and space for other things. Looking at the big picture, they want new experience where they can do things that can't be done in a conventional car. Like working on the go, eat, relax or play games like they would at home.

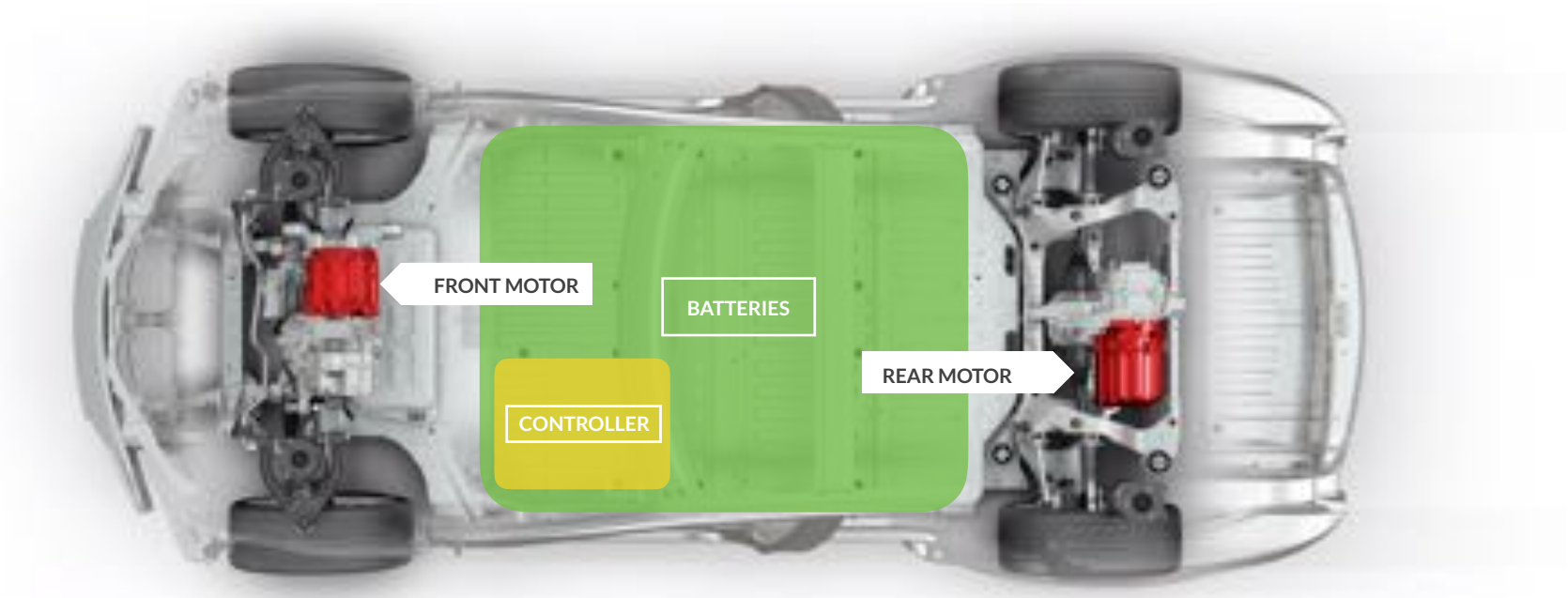
4

BENCHMARKING

4. BENCHMARKING

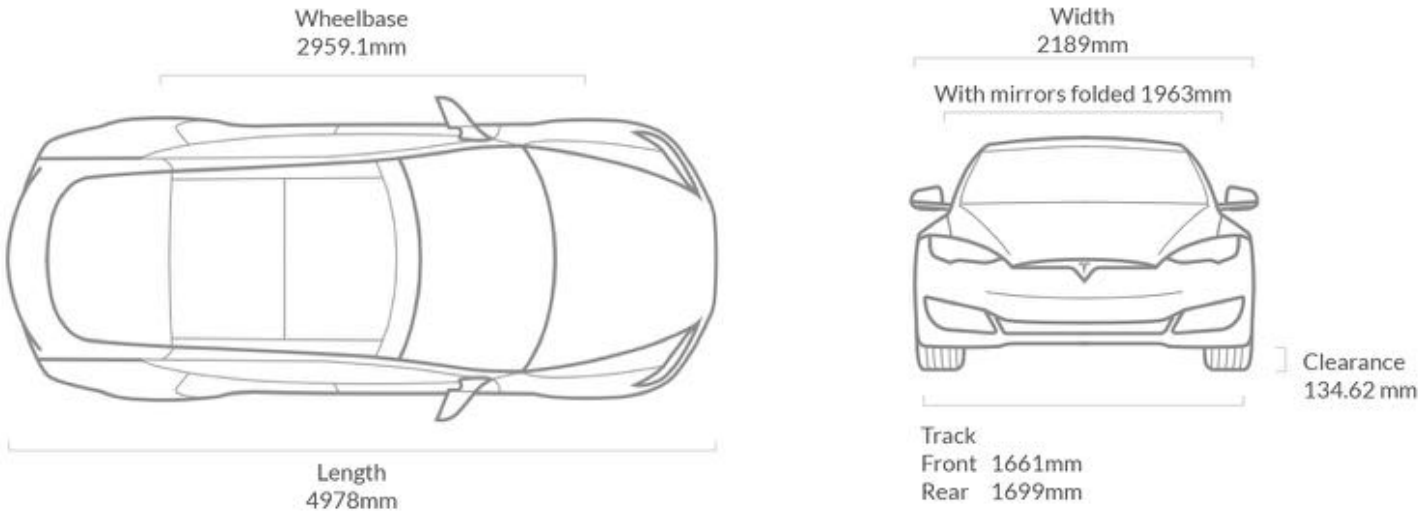
4.1. Vehicle Packaging

Unlike conventional gasoline vehicles, electric vehicles have very few components. As it is powered by electricity, charge is stored in Lithium ion batteries which are placed across the floor of the vehicle. Based on the requirements, one or two motors can be used to power the vehicle. A controller regulates the power output to the motors and other systems. As of today, along with these components, power steering system, airbags and other essential mechanisms and sensors occupy some space in the car. This advantage leaves the car with lot of usable space.



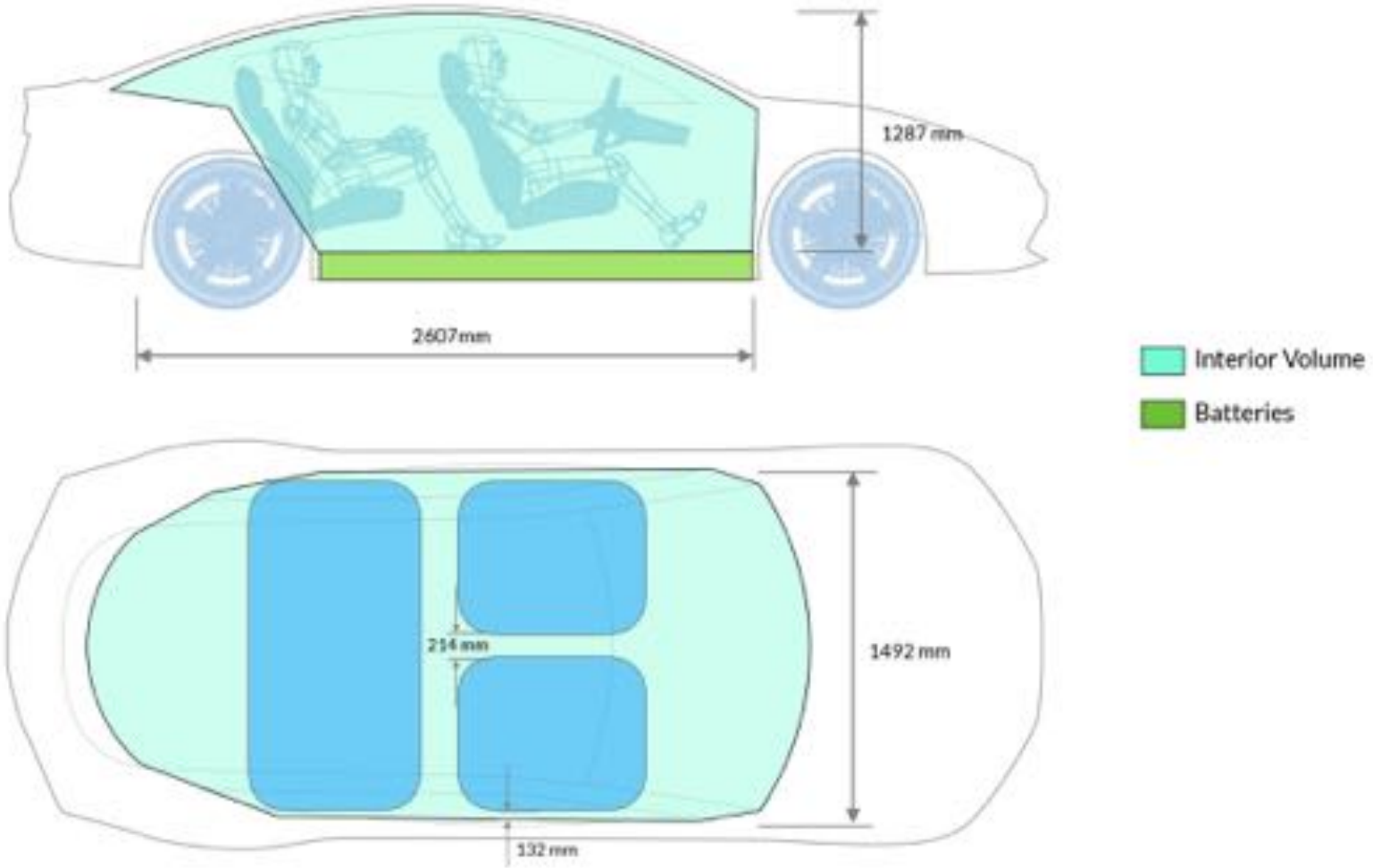
3. *Ref: Tesla Model S*
https://www.tesla.com/models

Tesla Model S was picked for benchmarking as it is currently the best electric vehicle with semi-autonomous mode available to public in the market. It can accommodate minimum of 4 people and is provided with 2 child seats at the back and the trunk is also empty adding it to the boot space unlike unconventional cars. All these make the car almost 5 meters long.



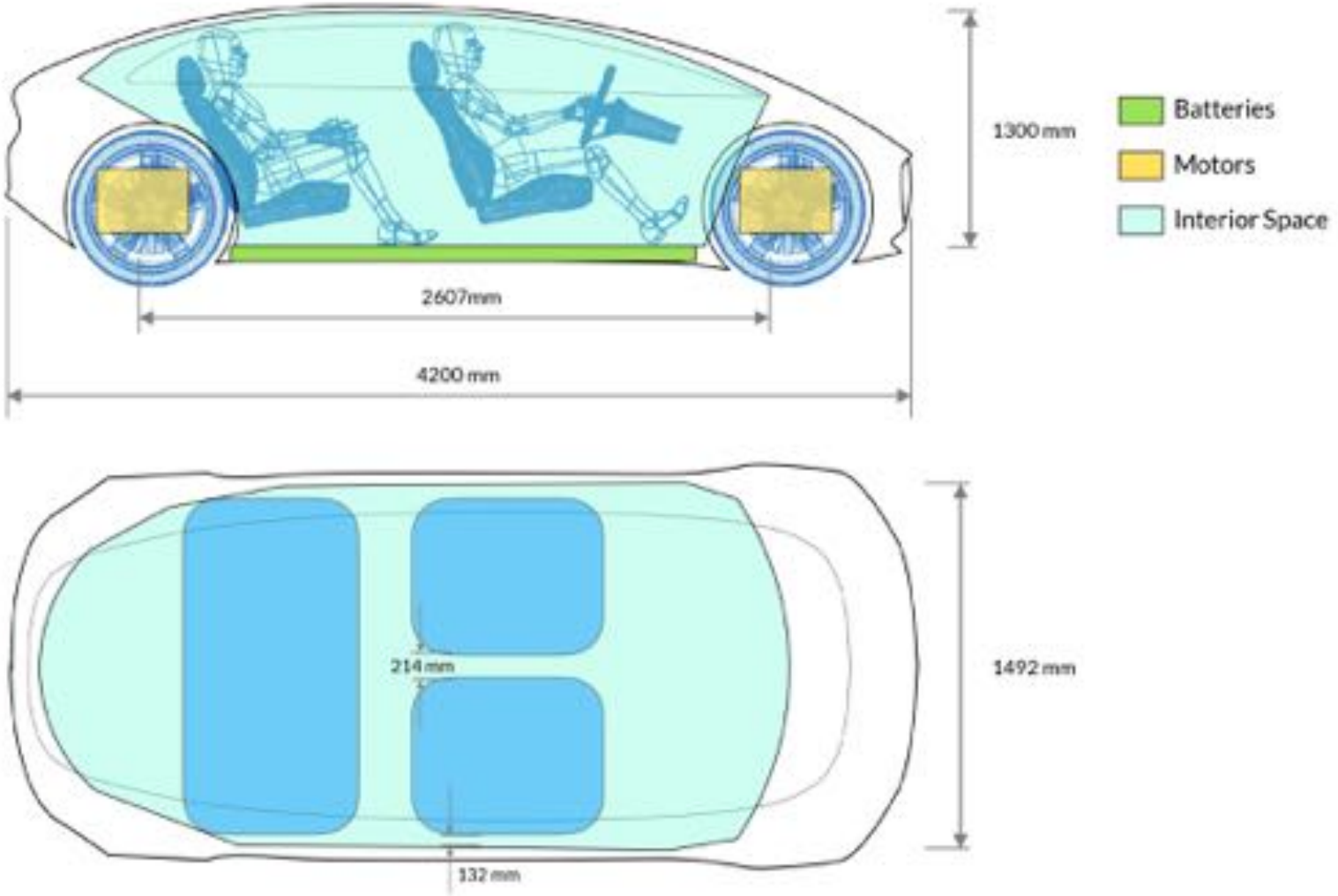
TESLA MODEL S DIMENSIONS

TESLA MODEL S PACKAGING



TESLA MODEL S INTERIOR VOLUME DIMENSIONS

As cars get electric in the future, we might see cars using new packaging advantage and shrink in size while maintaining interior space. We might see cars as small as 4 meters in length with interiors as spacious as Tesla's Model S. With this reason, Tesla's Models S interior space is benchmarked and considered to further work on concepts. The following images show what could be the car of the future with the same interior space.



5

DESIGN BRIEF

5. DESIGN BRIEF

To conceptualise the Interior space of a personal semi-autonomous vehicle for the year 2025.

Specifications

- The concept should give the driver and the passengers the ability to relax, work, eat and be entertained in autonomous mode
- Interiors should take the advantage of both autonomous technology and electric drivetrain

Aesthetic Intent

- Interiors should look futuristic
- Should be welcoming

Package

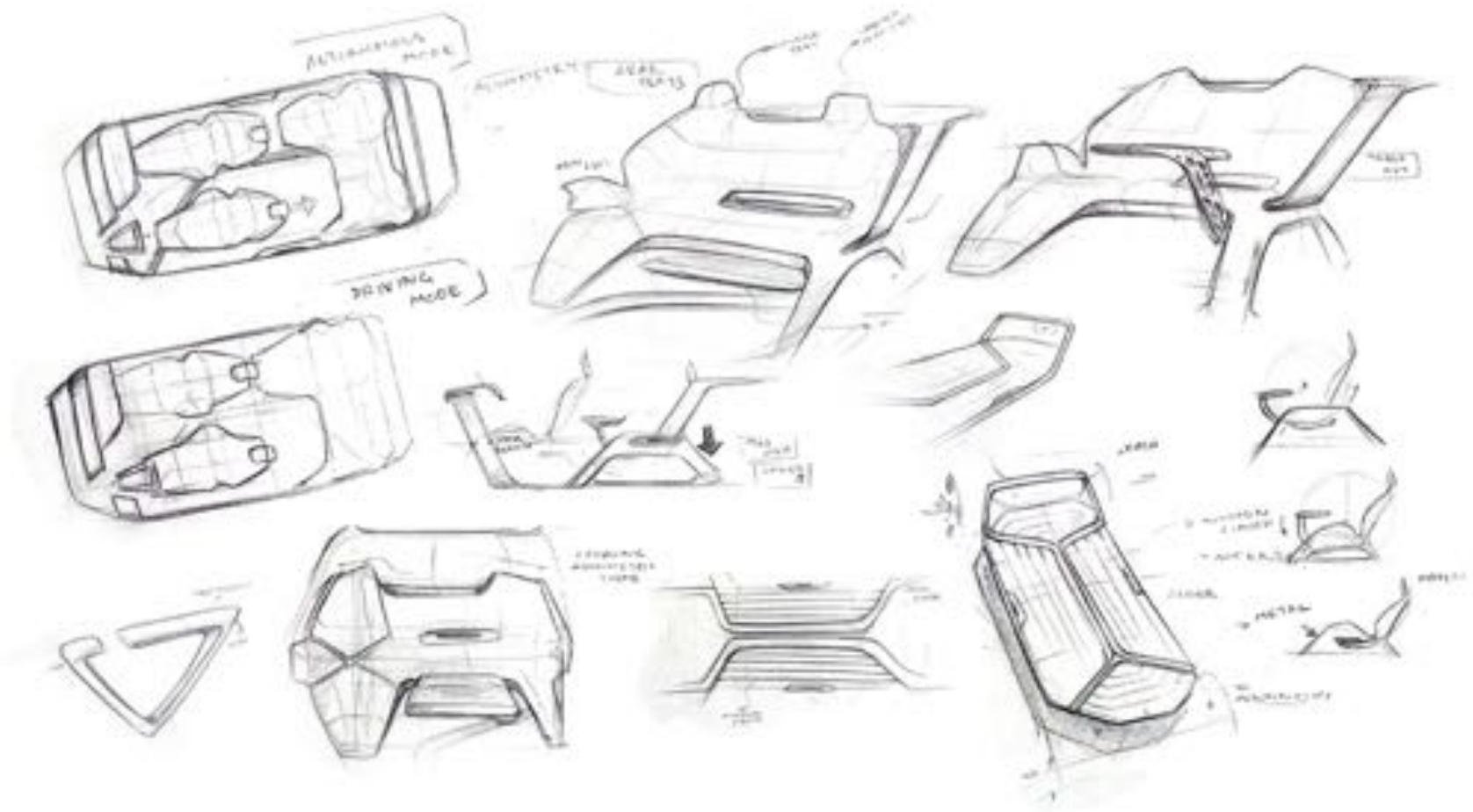
- Should accommodate minimum of 4 passengers

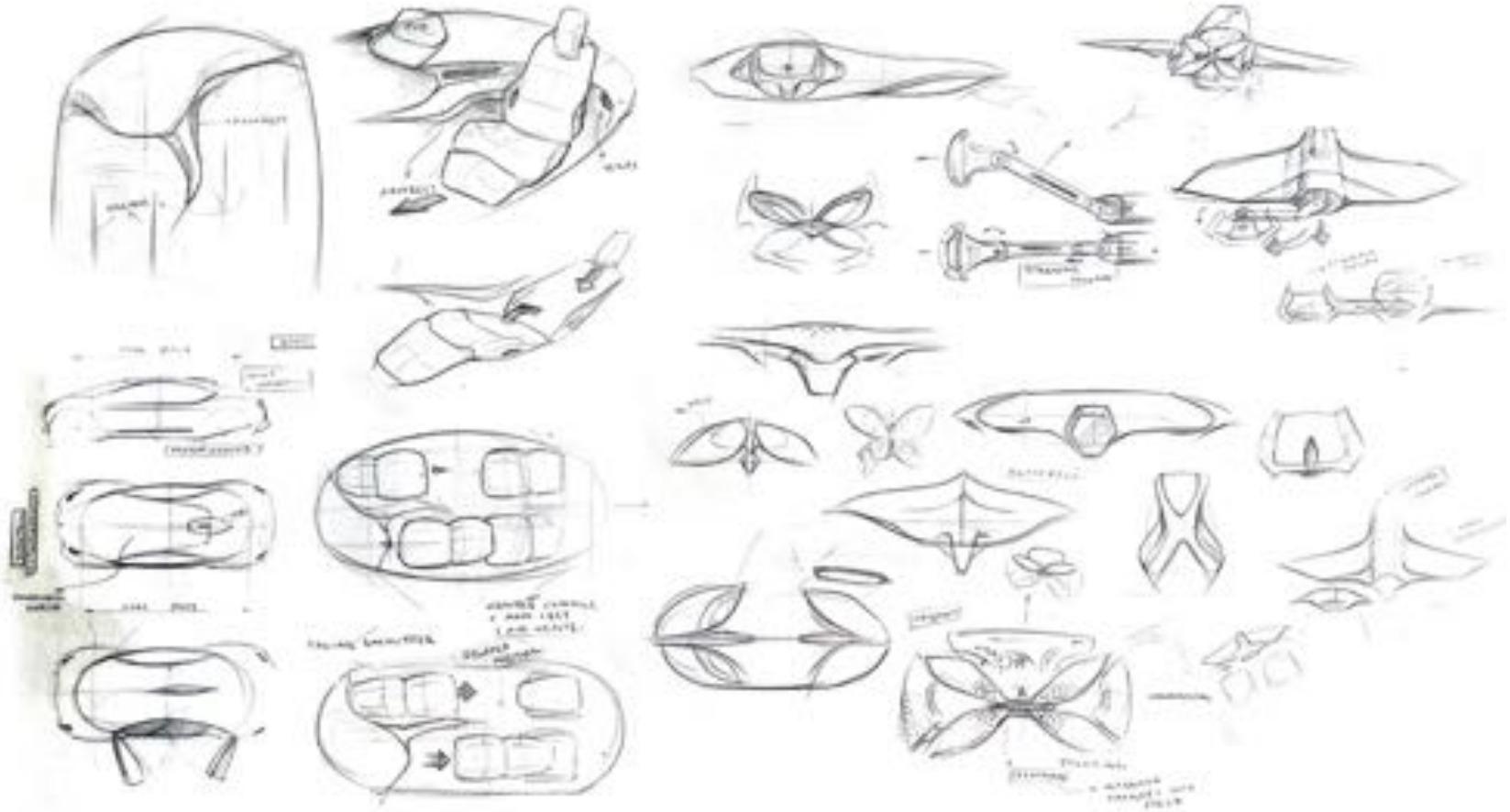
6

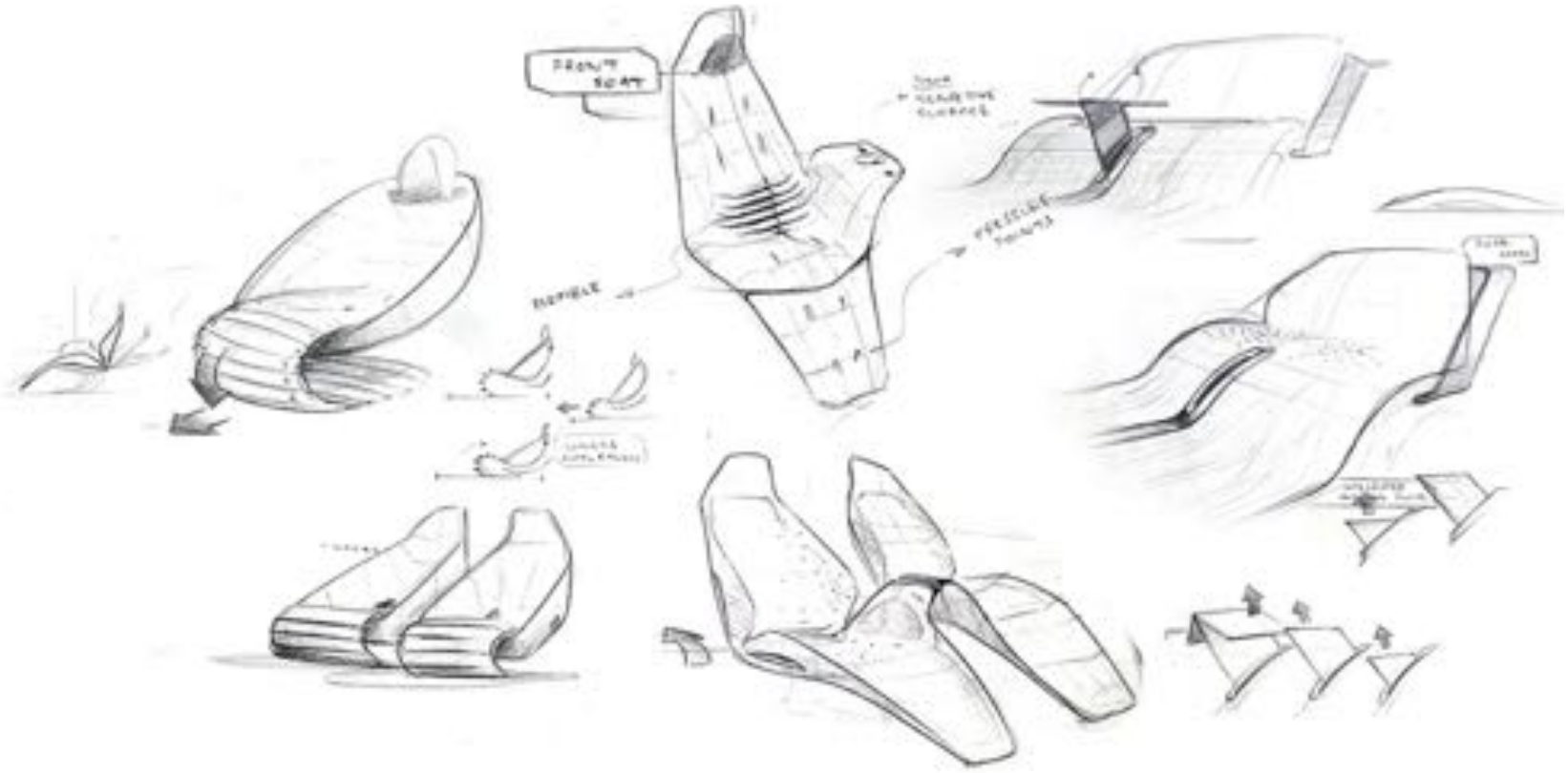
PRE-IDEATION

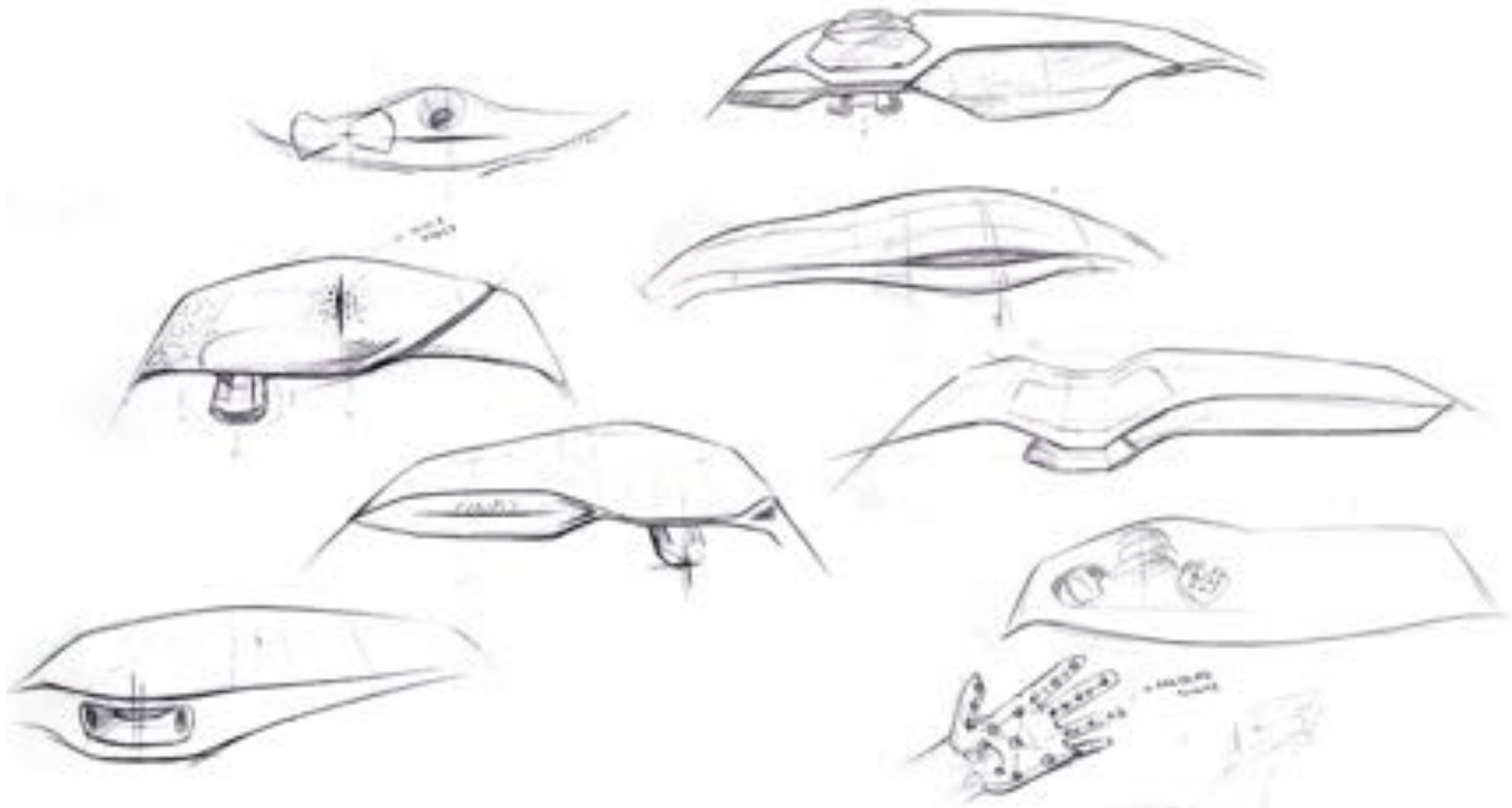
6. PRE - IDEATION

Pre-ideation was done to get some ideas out after understanding the design brief.









7

USER PROFILES AND SCENARIOS

7. USER PROFILES AND SCENARIOS

Before proceeding to concepts , user profiles and scenarios for different possible cases were imagined to work on. These are basically imagined based on the data obtained from user research.

7.1. User Profile I: Techie

Here the user is a 26 year old engineer, who is outgoing, unorthodox, gadget lover and is alway connected to the world. He likes to own stuff. Lives in a megacity where roads are filled with traffic and rush hours noisy and are painful to deal with. He spends his weekdays working in the office and likes to party in the weekend.

His needs are to enjoy the trip, stay connected without out touching his personal devices, relax while returning home or when required.

7.2. User Profile II: Entrepreneur

Here the user is a 30 year old modern day ambitious woman entrepreneur who is creative and social. Living in a city, she manages her business which includes carrying stuff to clients and other creative work in weekdays. In weekends she likes to relax and spend time with friends.

Her needs include space to work on the go like a moving office. She likes to stay connected and get updated to manage her business well. Eat food on the go saving time.

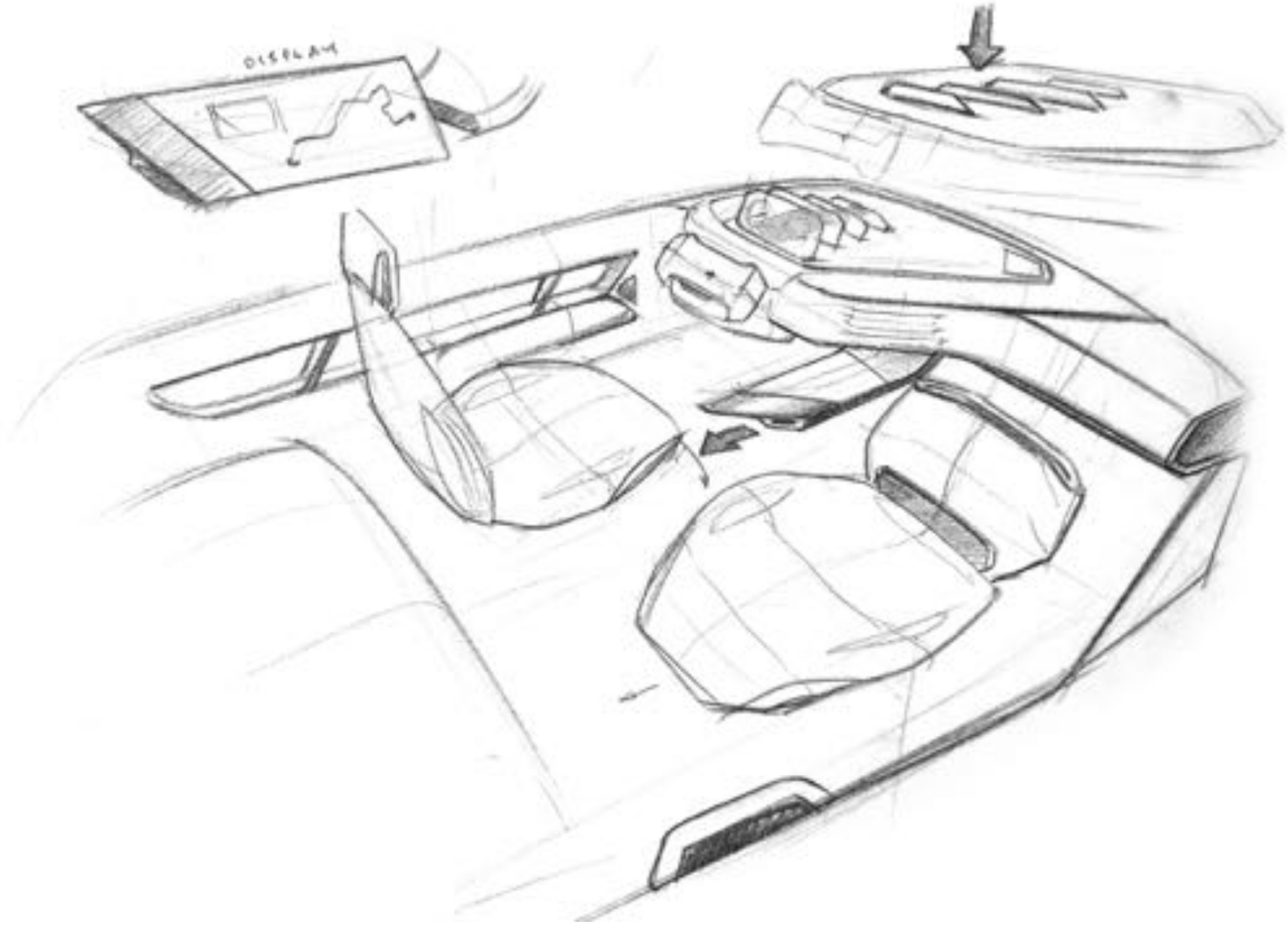
7.3.User Profile III: Developer

A 24 year quick learning, young and curious developer. His work does not demand his presence and has no specific routine to follow like others. He does the job at different times of the day and is always on the move. As a young earning developer he likes to play games, fly drones and tries to experience thrill doing things.

His needs are to have a playful space that looks futuristic and gives him new age experience. Like everyone else he needs to be connected and be able to work on the go.

8

CONCEPTS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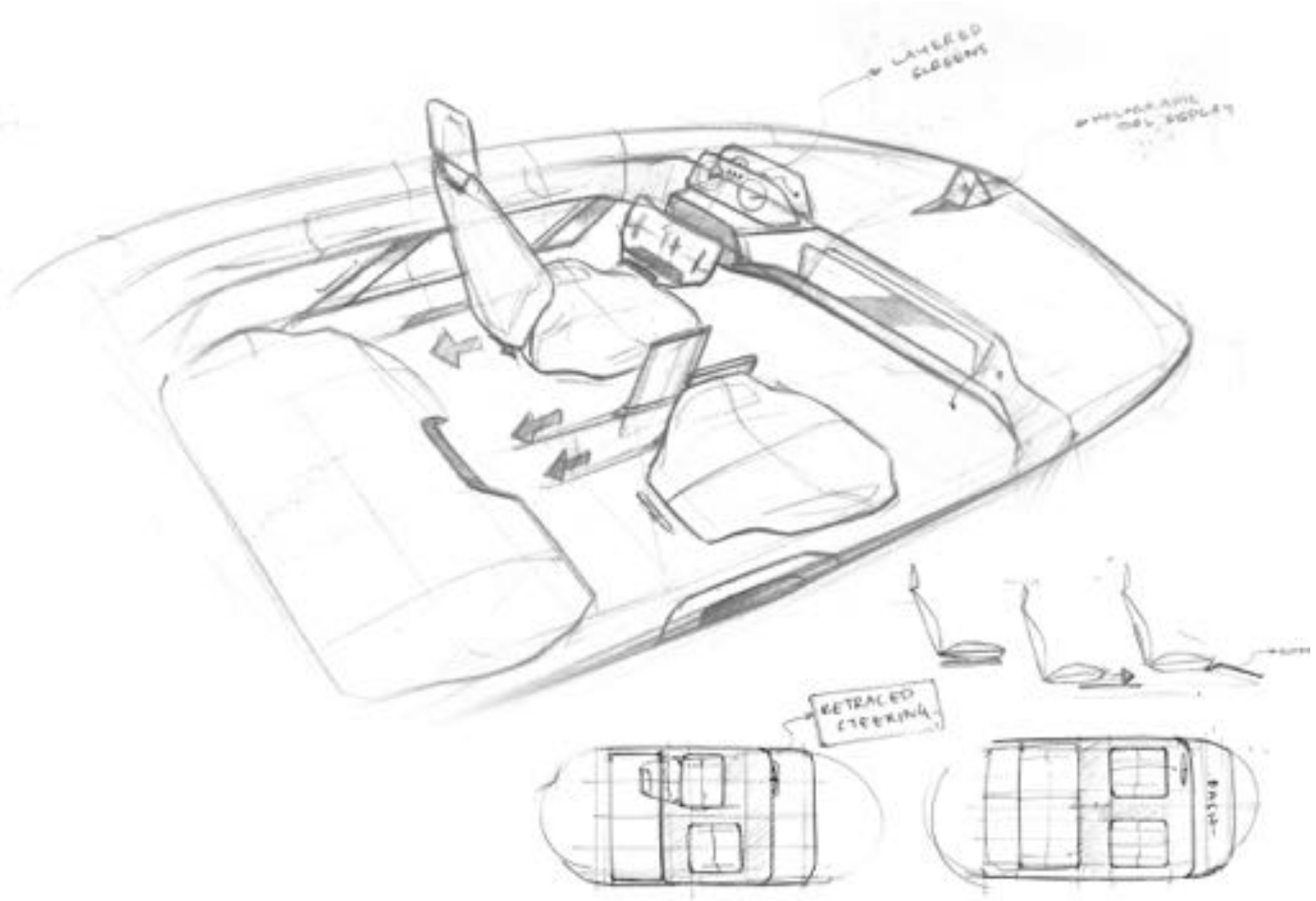
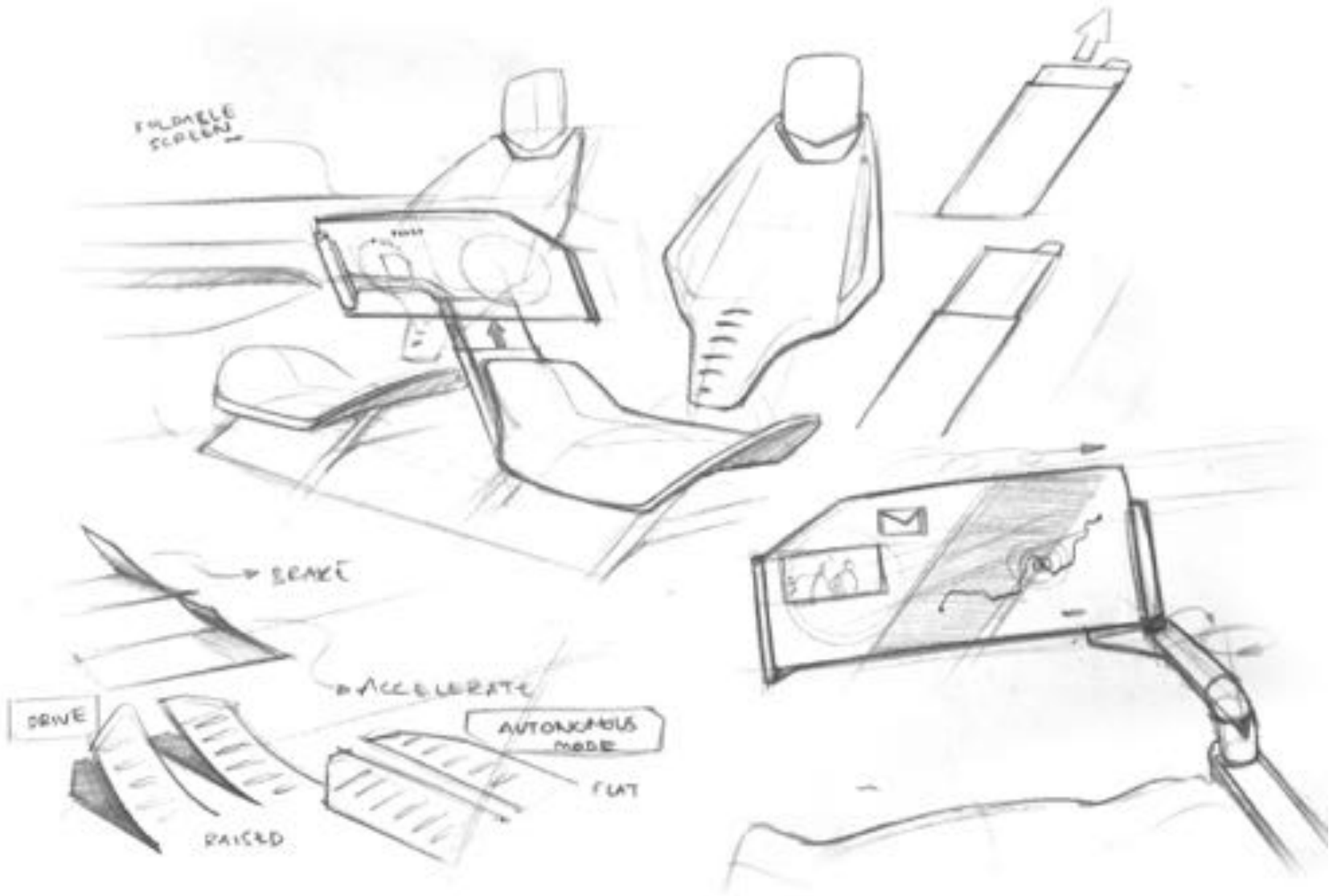
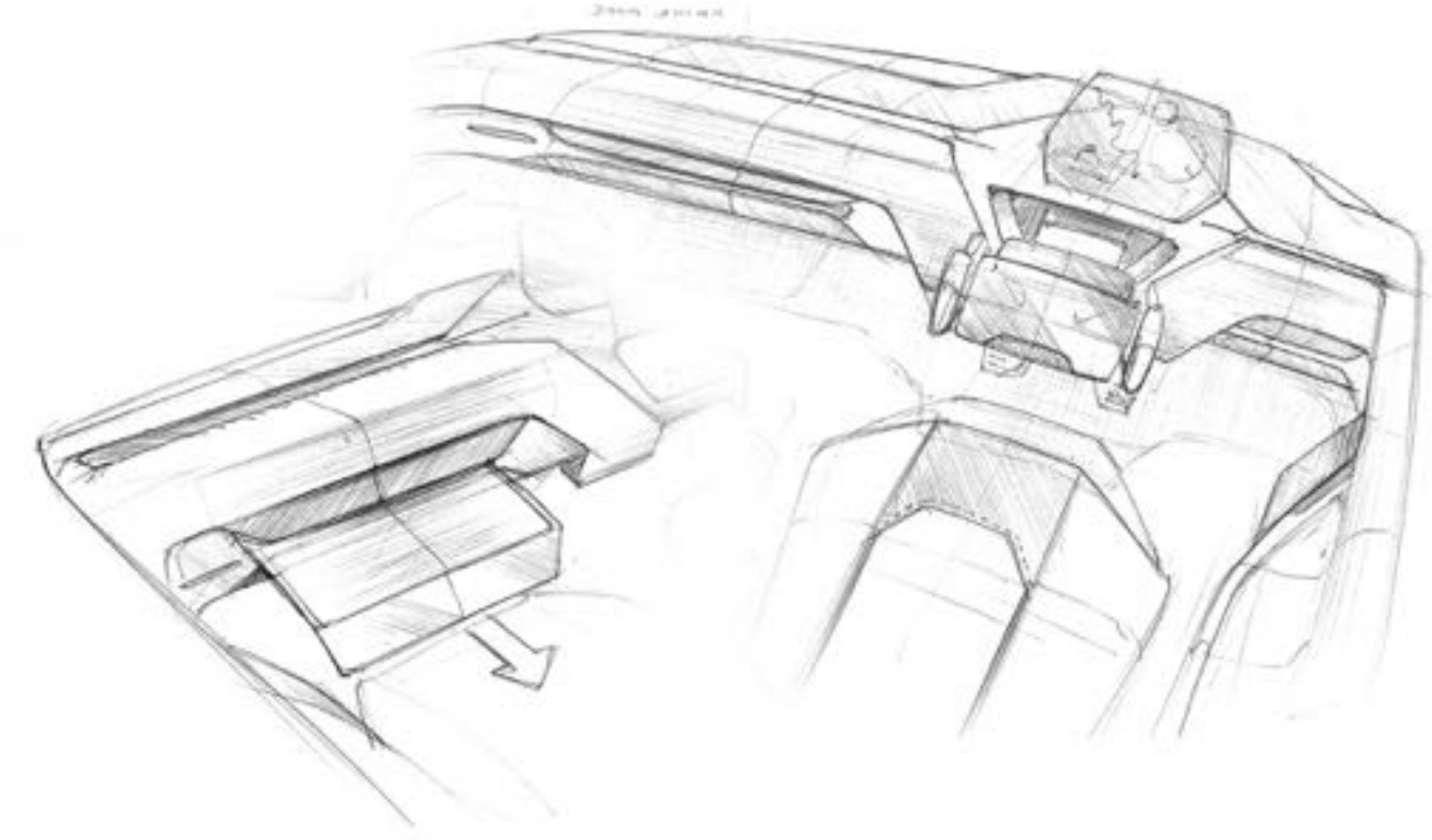
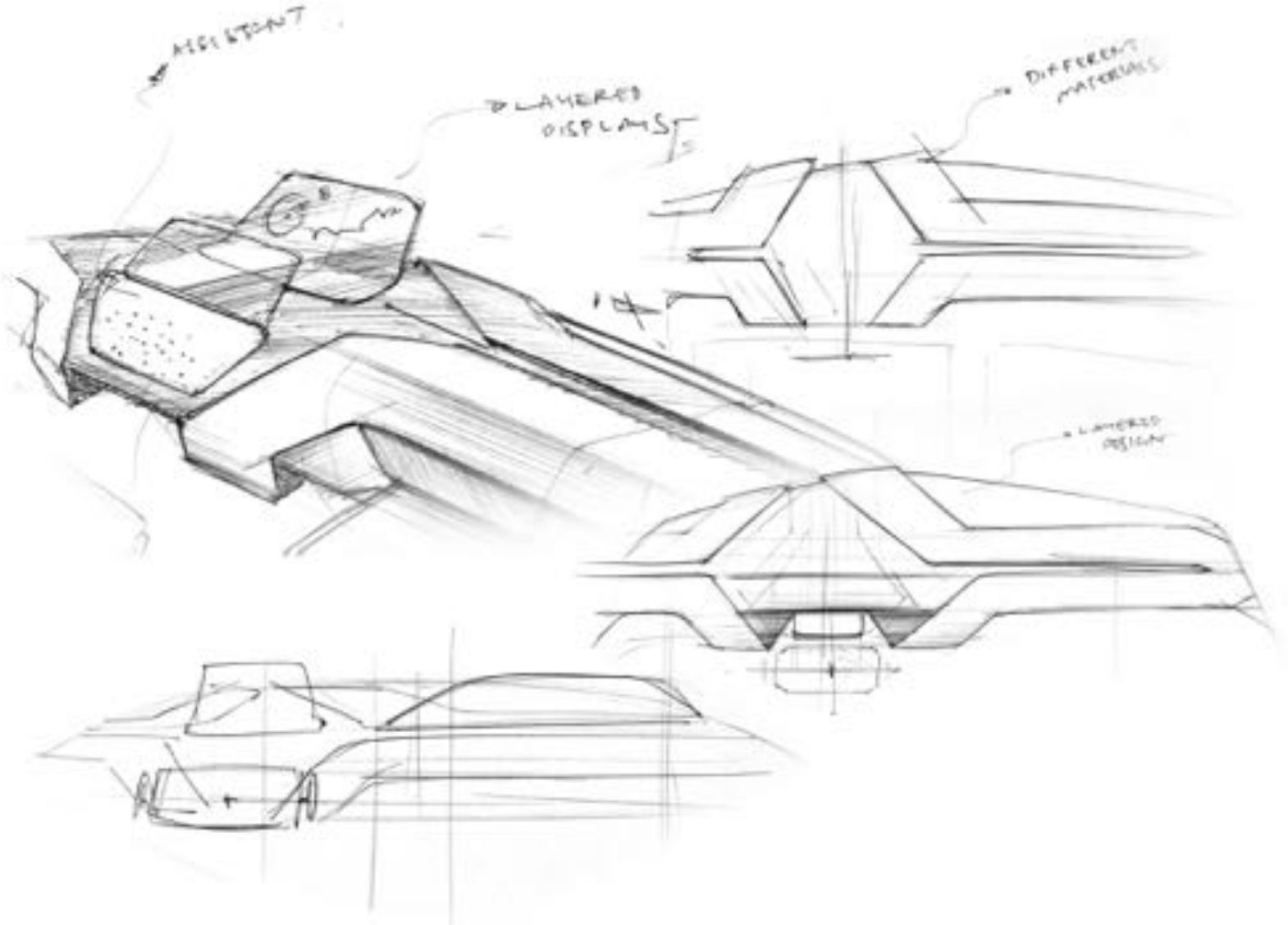
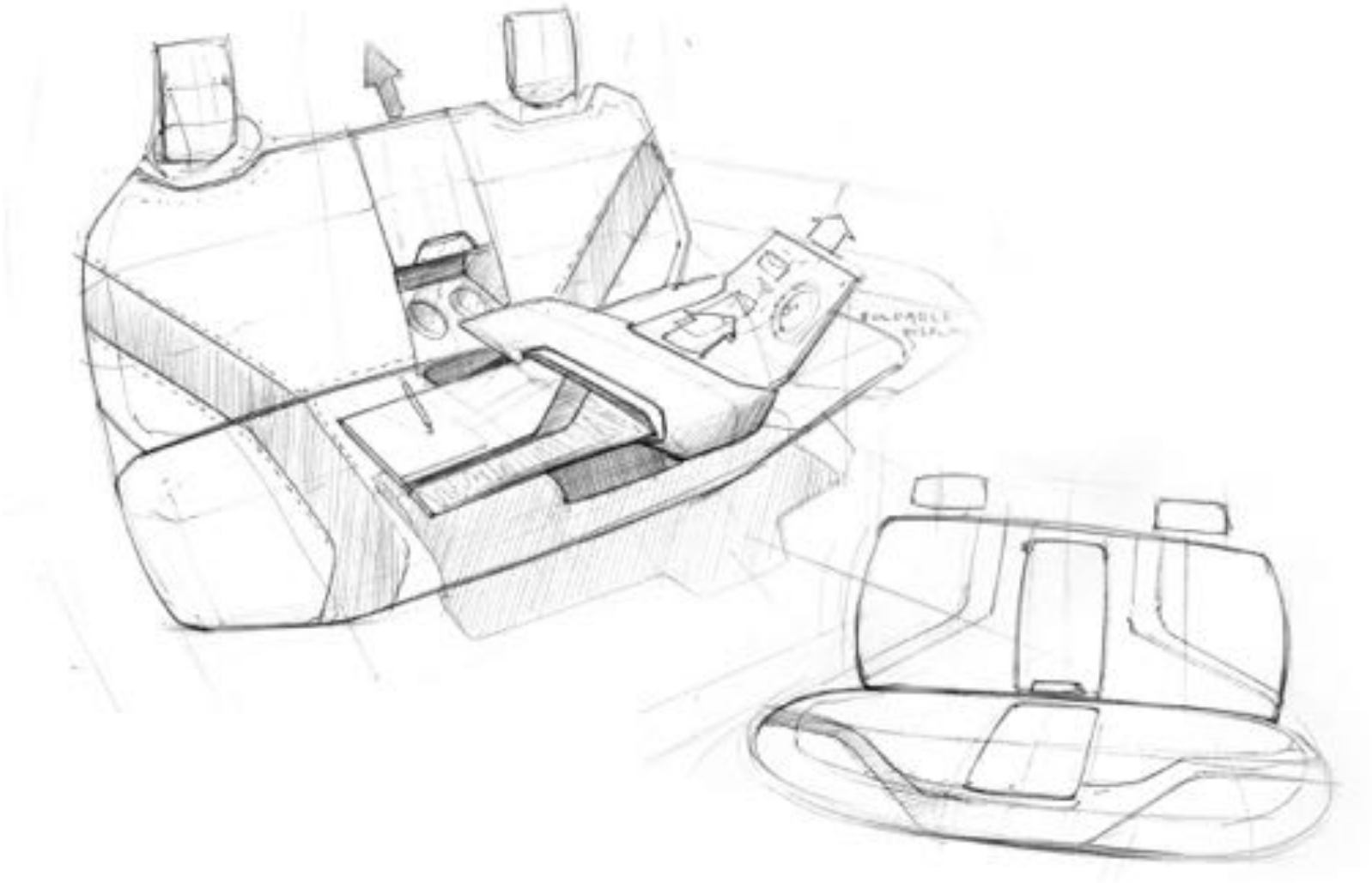
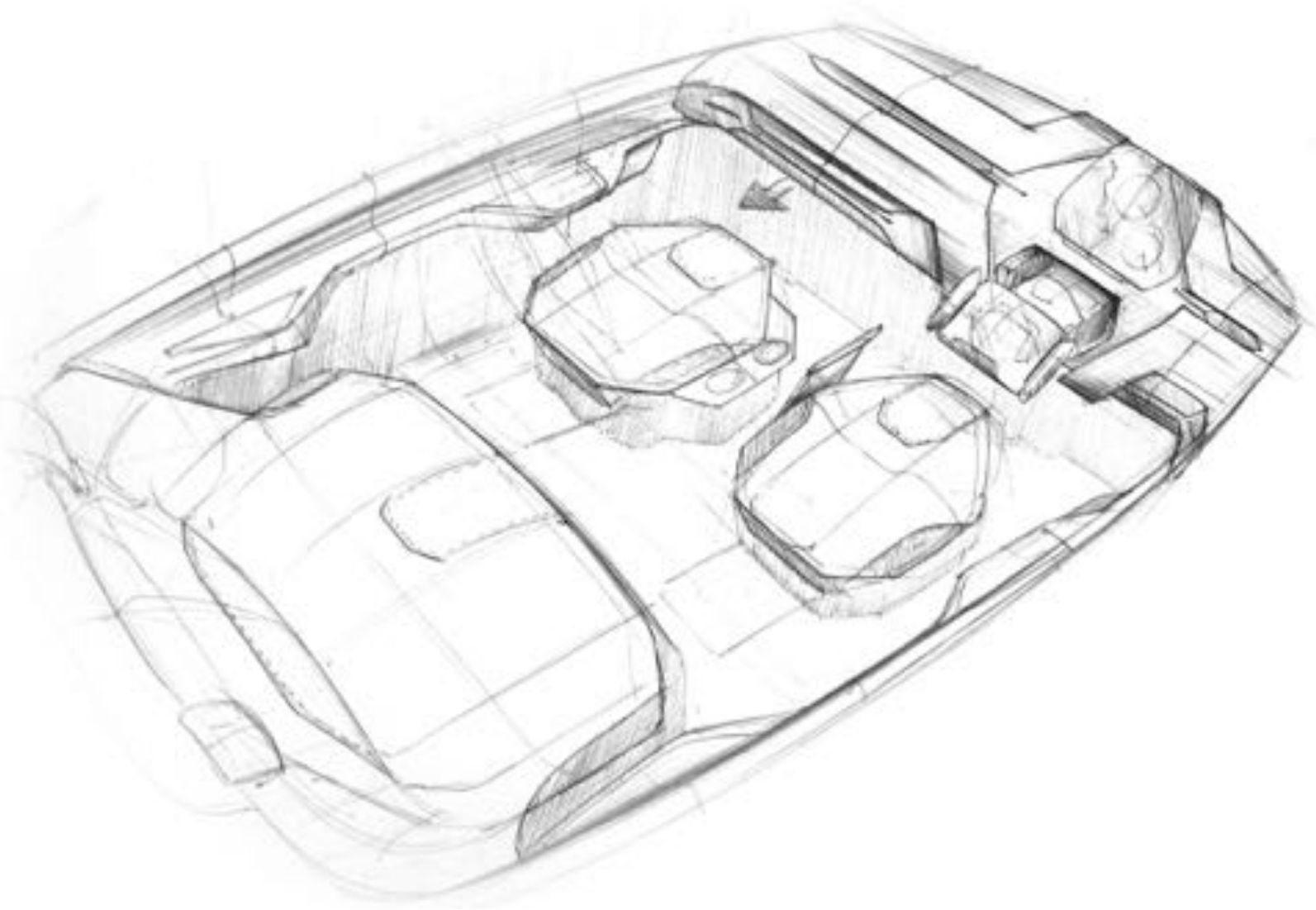

RETRACTED
STEERING

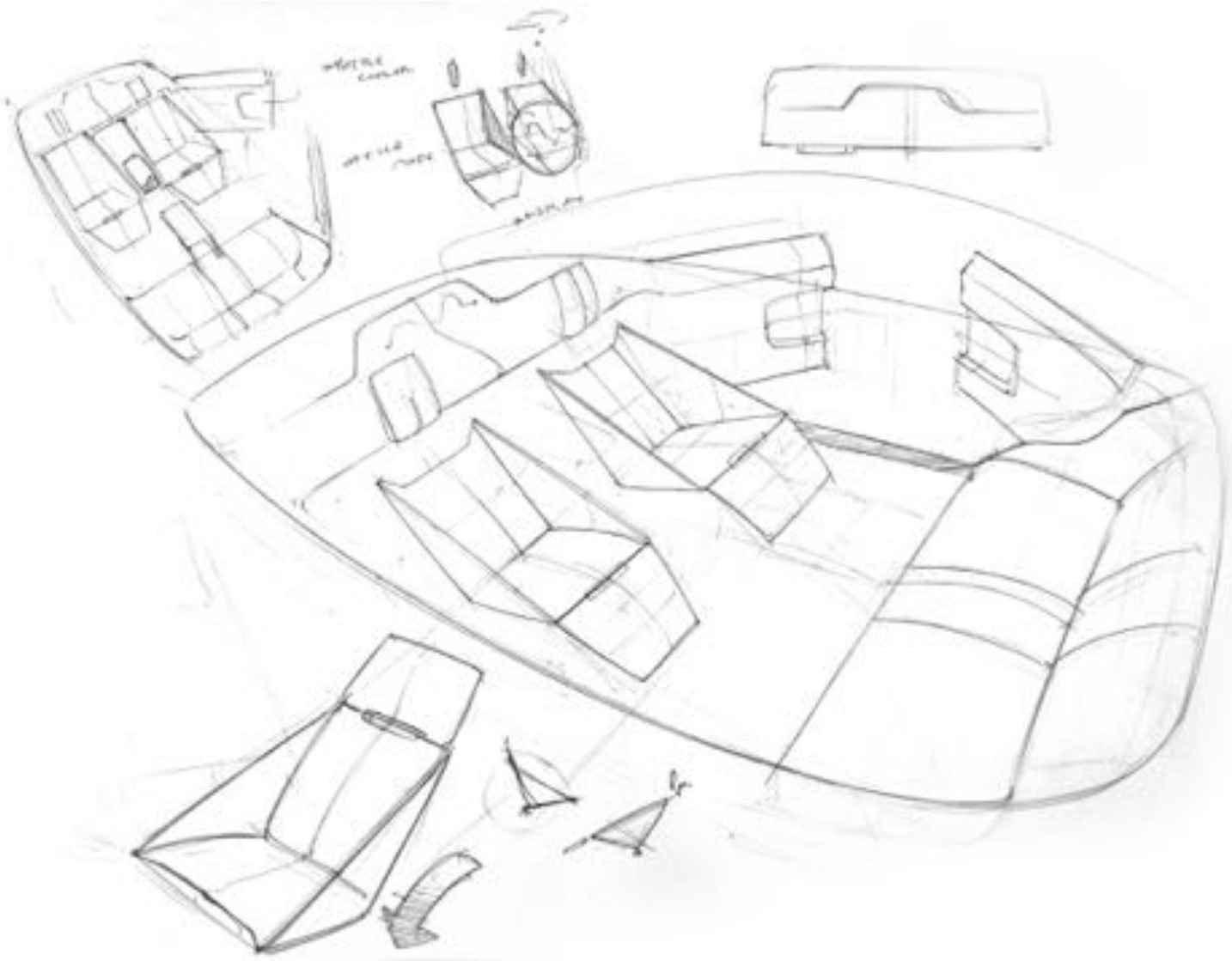

FOLDABLE SCREEN
BRAKE
ACCELERATE
DRIVE
AUTONOMOUS MODE
FLAT
RAISED

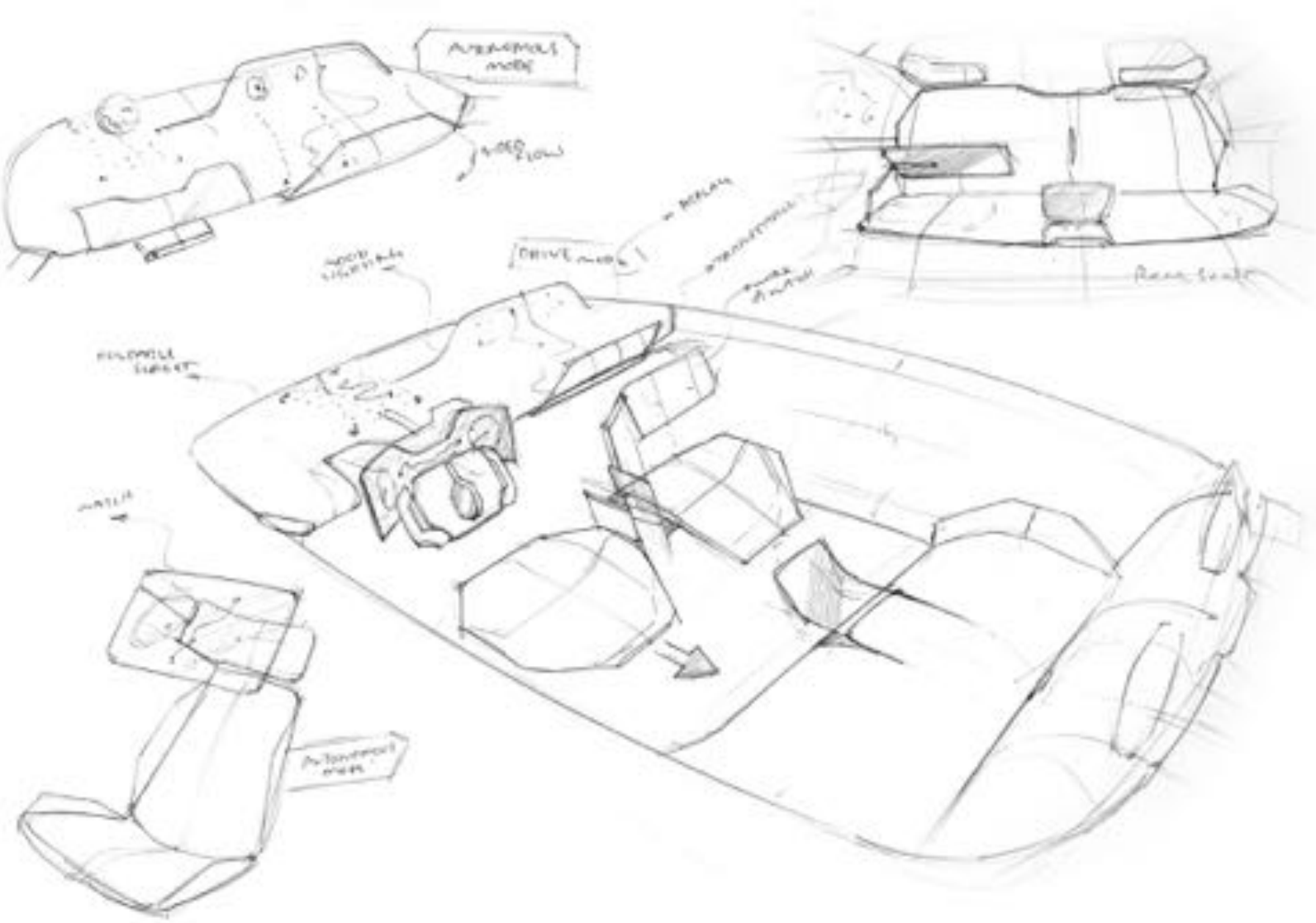


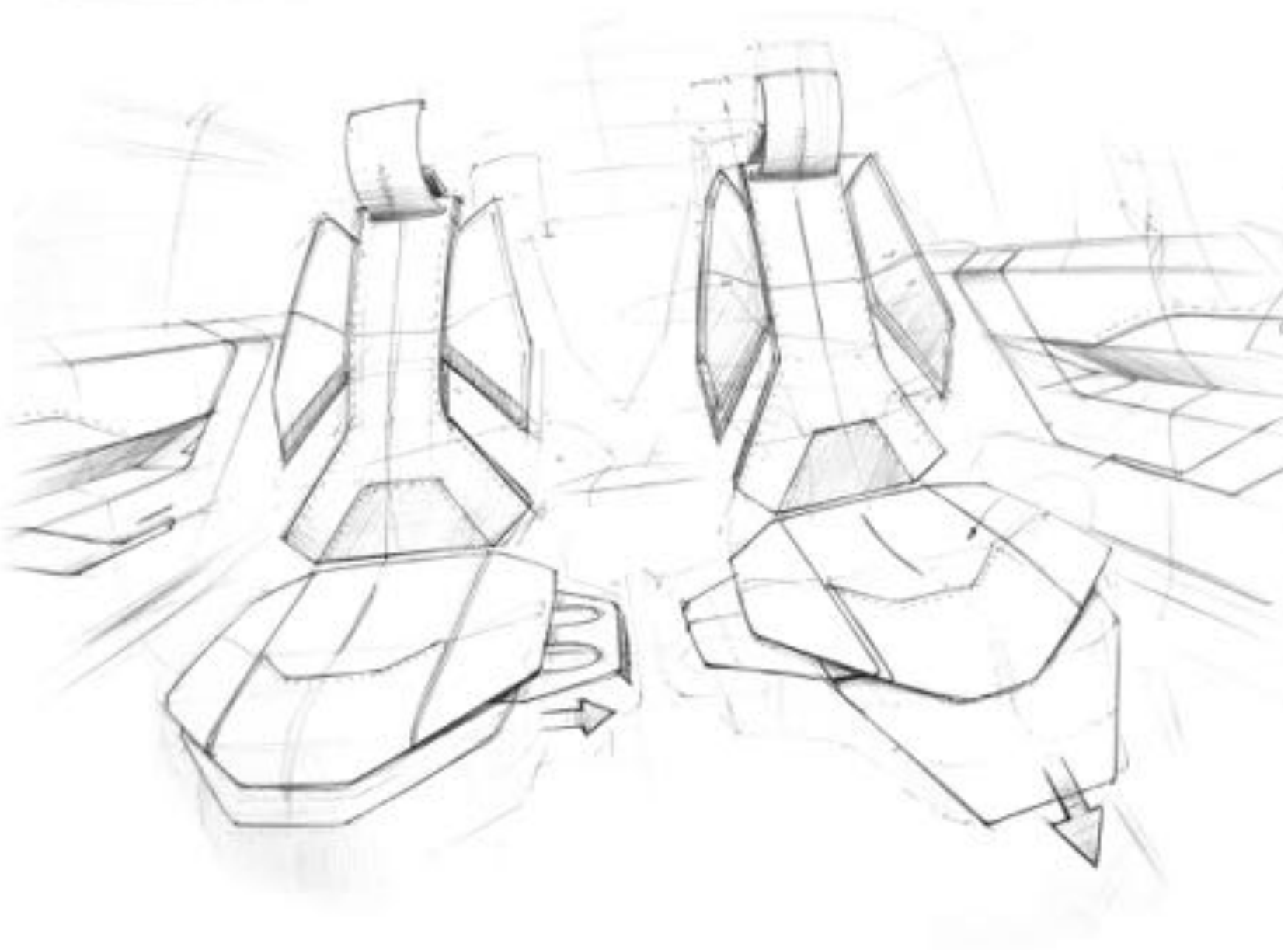

LAYERED
DIFFERENT
MATERIALS
LAYERED

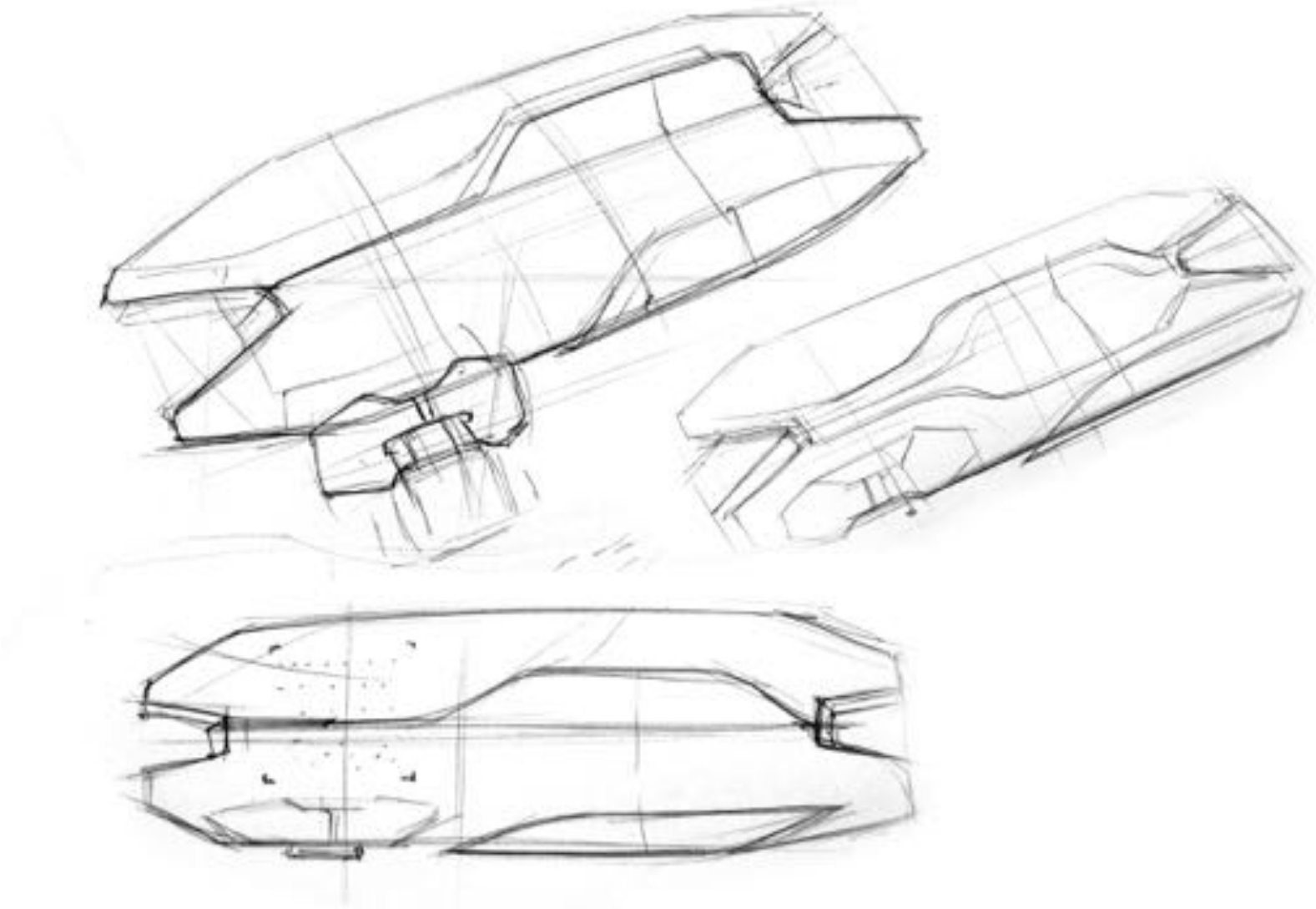


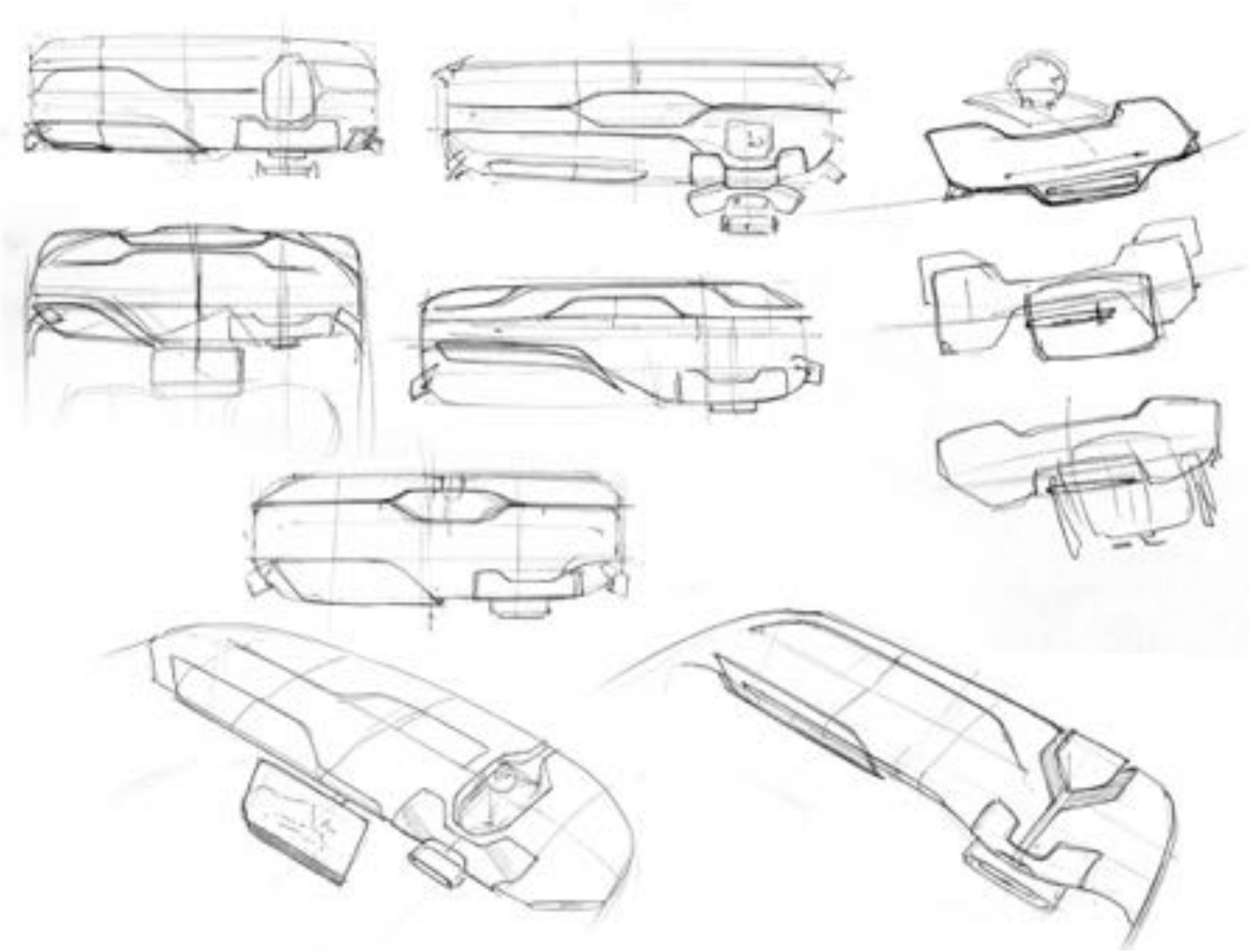


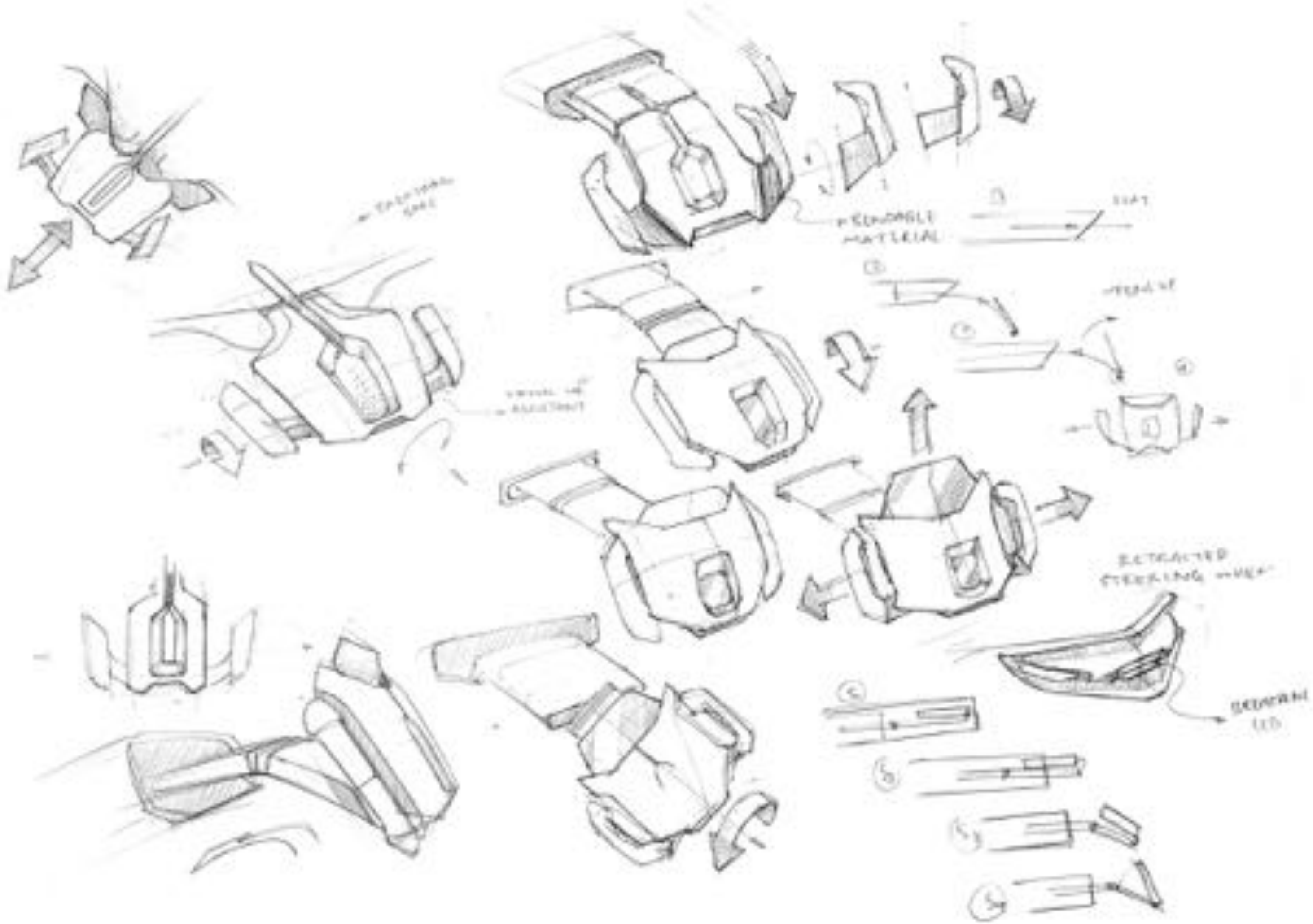


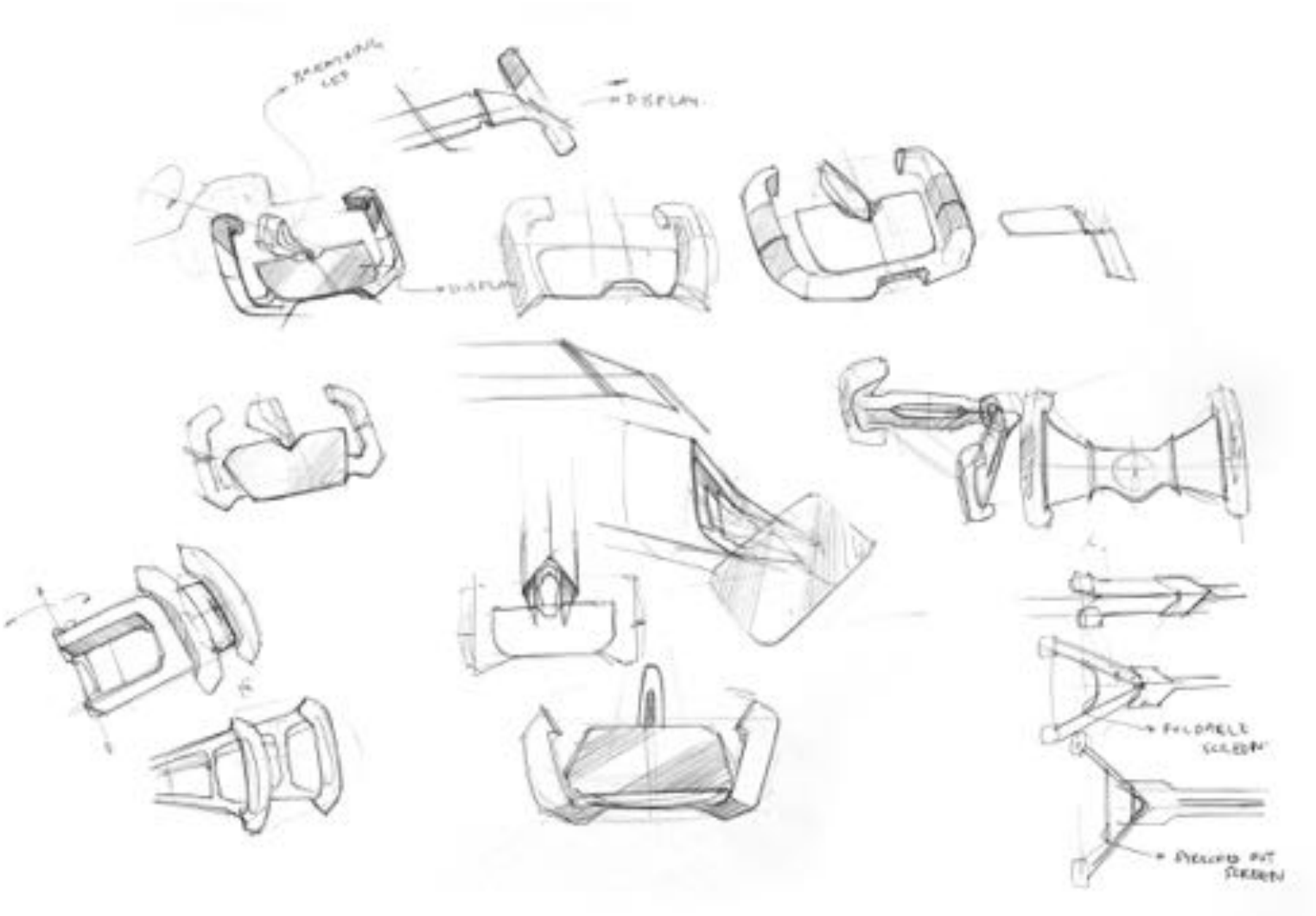


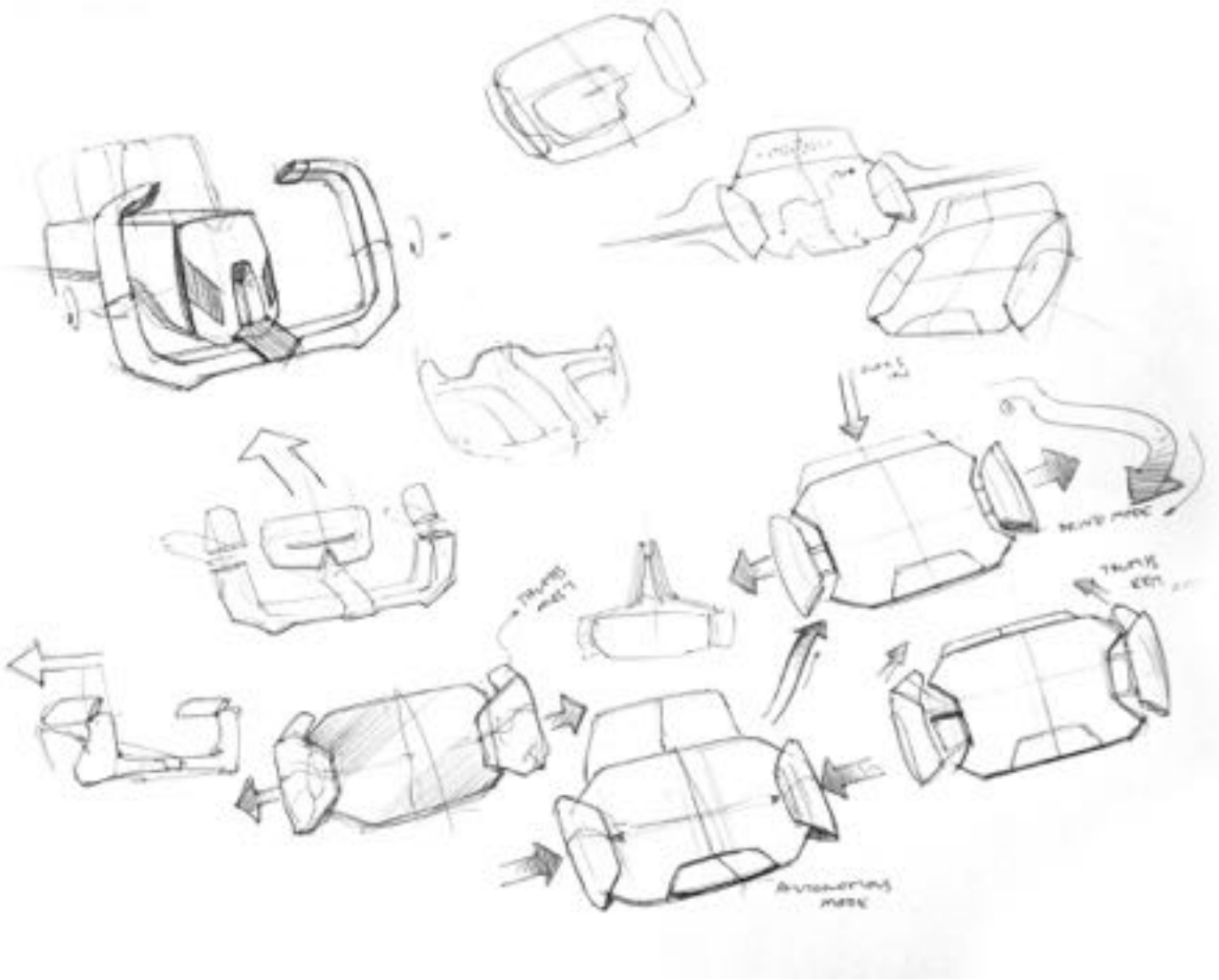


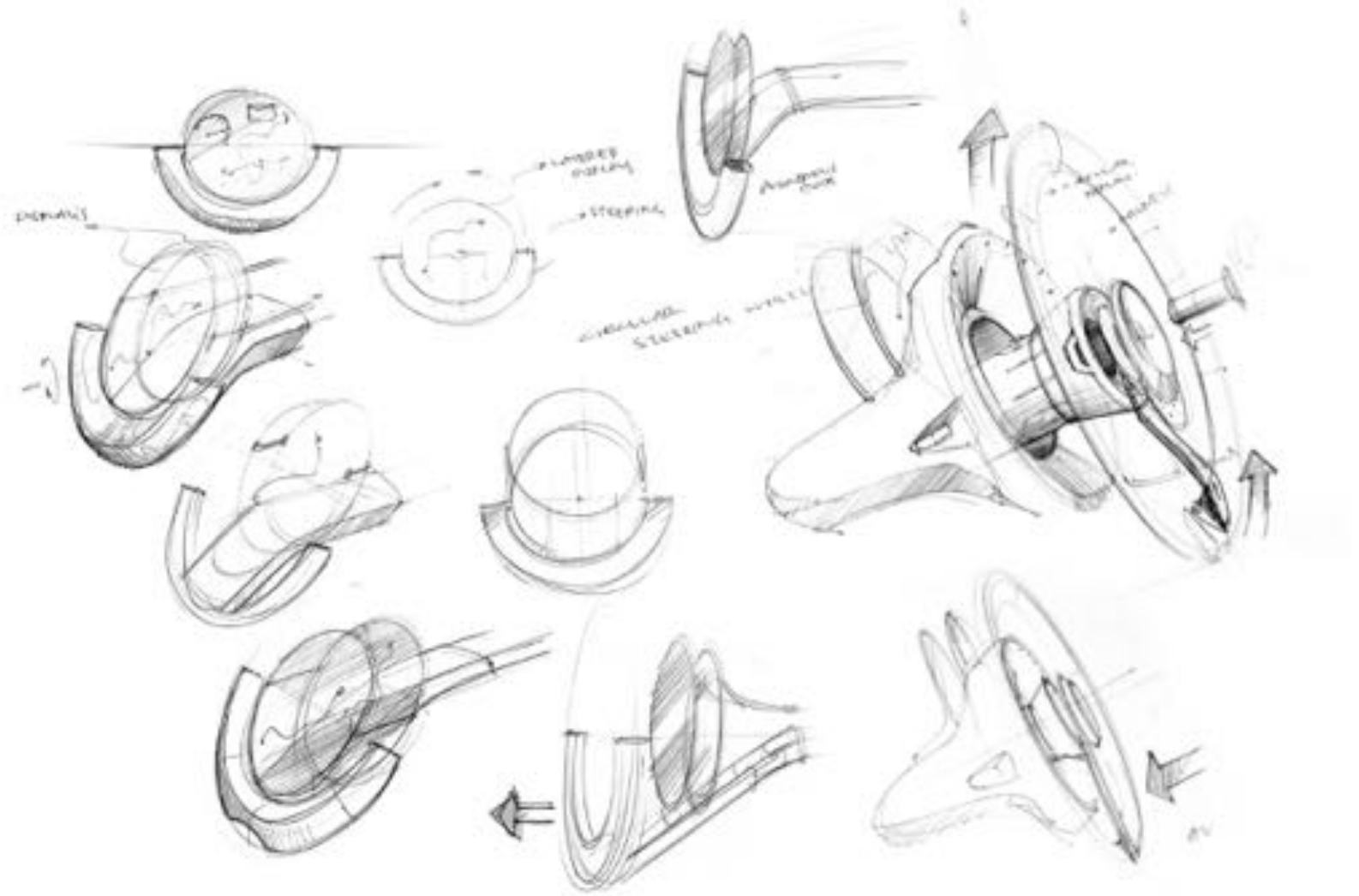


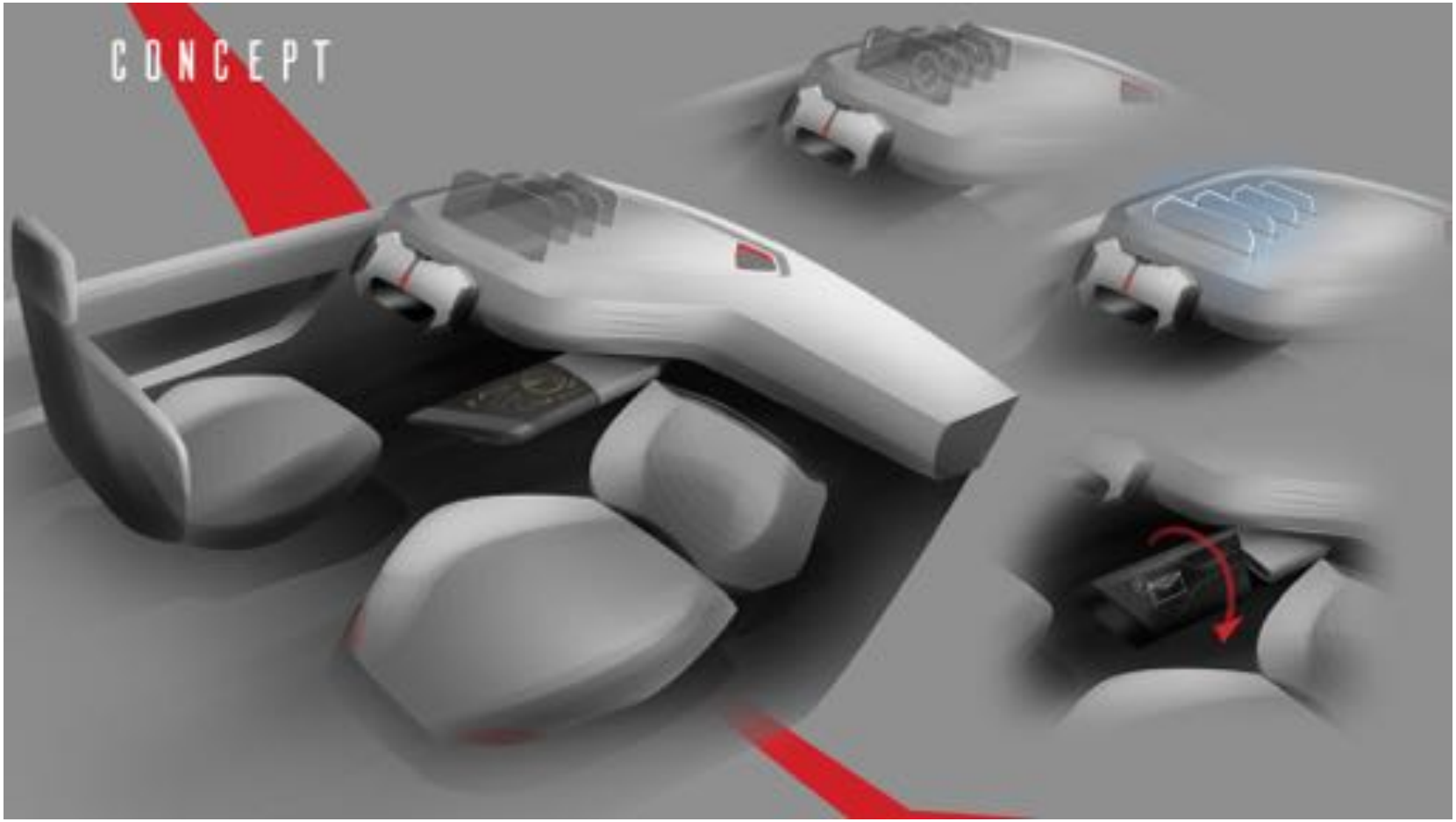


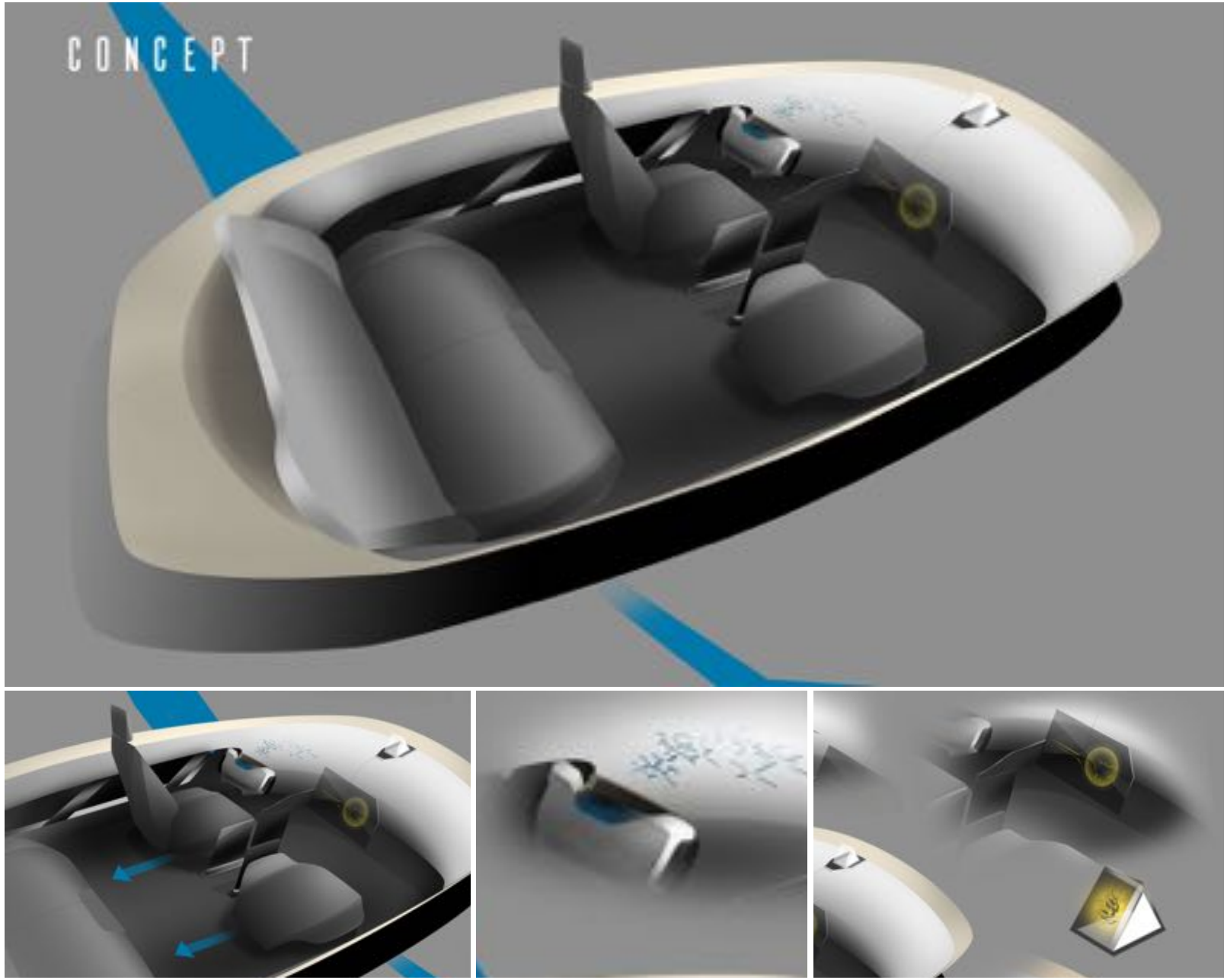

REMOVABLE
MATERIAL
RETRACTED
STEERING WHEEL








CONCEPT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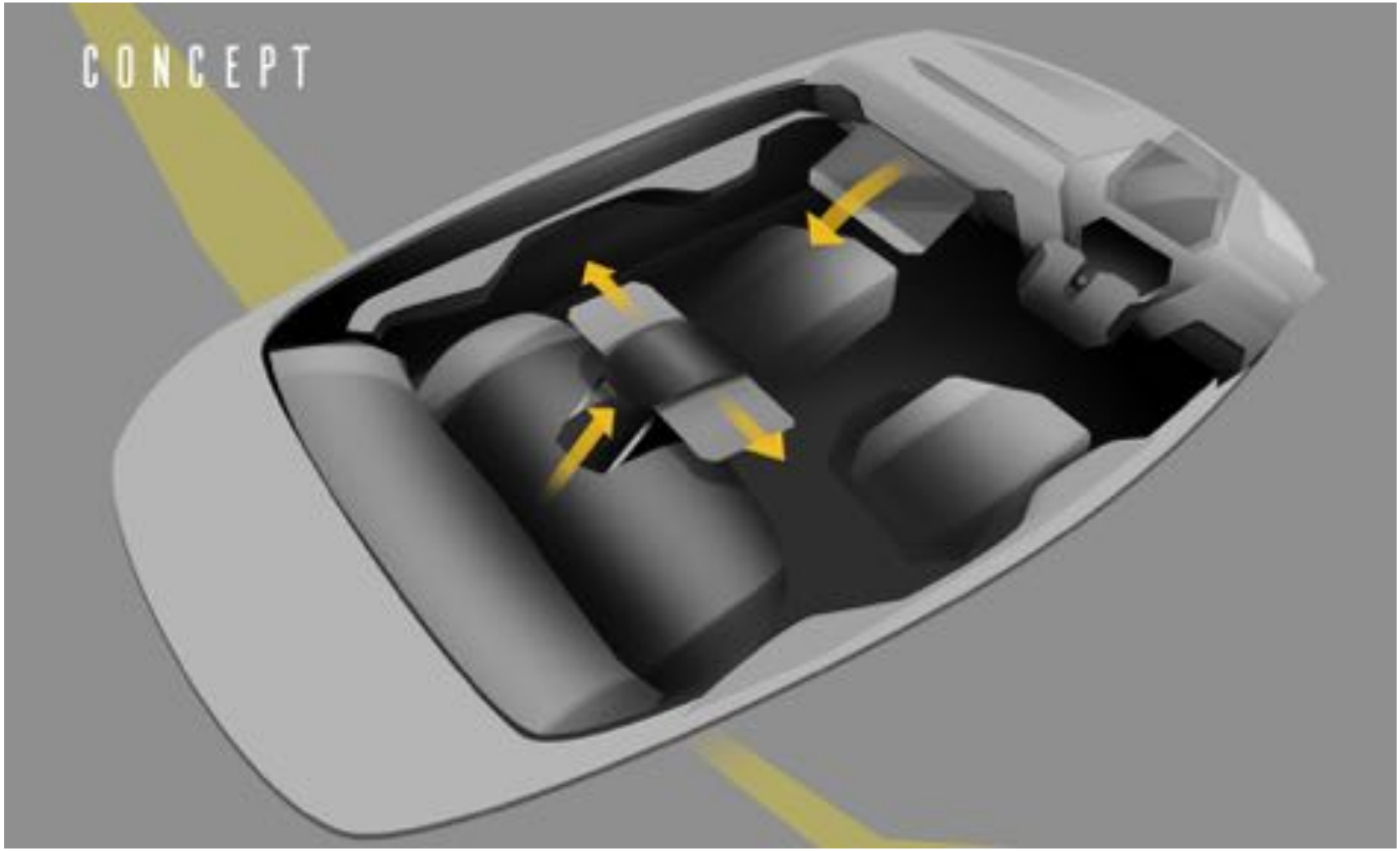
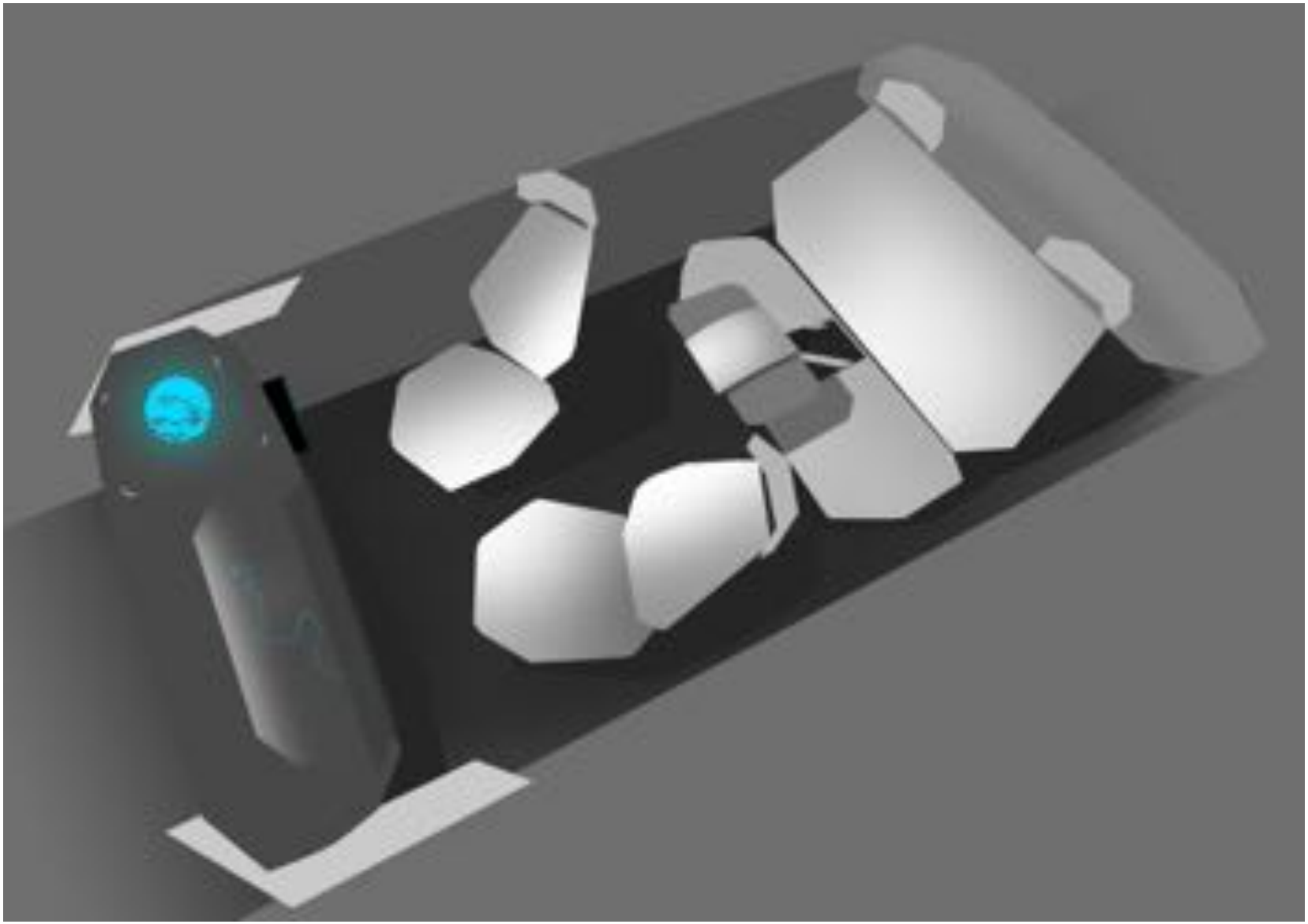

CONCEPT



9

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