



Ilja Oikarinen / 2017
pod-car concept 2030



Covestro
Pod auto -konsepti 2030
Lahden ammattikorkeakoulu
Muotoiluinstituutti
Muotoilun Koulutusohjelma
Ajoneuvomuotoilu
Opinnäytetyö AMK
Kevät 2017
Ilja Oikarinen

Covestro
Pod-car concept 2030
Lahti University of Applied Sciences
Institute of Design
Design programme
Vehicle design
Graduation project
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Ilja Oikarinen

abstract

My graduation project is a concept which is located to near future, 2030. It addresses a solution for mega cities and problems that they have, such as high renting and living costs caused by overpopulation. The Pod hotel concept uses already existing solutions like smart living and space solutions and Capsule hotels seen in Japan, combined with an autonomous vehicle.

The graduation project has been done within the cooperation of Covestro. Covestro is a german company, which produces and develops plastic solutions for every field of living. My task was to develop a car interior and find a way to merchandise their materials in a clever way so that it would arouse interest among OEM:s. For this, I chose a concept which has a relevant argument behind the concept.



Keywords:

pod-car concept
car interior
future
sleeping concept



Avainsanat:

kapseli-auto konsepti
auton sisusta
tulevaisuus
nukkumiskonsepti

tiivistelmä

Opinnäytetyöni on tulevaisuuteen sijoittuva konsepti, joka käsittelee jo nyt megakaupungeissa esiintyviä ongelmia, kuten suuria asumis- sekä elinkustannuksia. Opinnäytetyökonseptini esittää ratkaisun näihin ongelmiin käyttämällä hyväksi jo olemassa olevia ratkaisuja sovellettuna ajoneuvoteollisuuteen. Nämä ratkaisut liittyvät järkevään tilankäyttöön sekä Japanissa nähtyyn Kapseli-hotelli-konseptiin.

Opinnäytetyöni on tehty saksalaiselle yritykselle nimeltä Covestro. Covestro on Bayerin tytäryhtiö ja se keskittyy muovimateriaalien kehittämiseen sekä valmistamiseen. Tehtäväni oli löytää tapa markkinoida heidän materiaaleja sekä teknistä osaamistaan muovimateriaalien saralla. Jotta konsepti markkinoisi heidän materiaalejaan mahdollisimman hyvin, valitsin tulevaisuuden kannalta relevantin aiheen joka herättäisi heidän yhteistyökumppaneidensa ja muun ajoneuvoteollisuuden kiinnostuksen.

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introduction

As the purpose of my project is to find a way to merchandise Covestro's materials and technical solutions in the most clever way as possible, I've chosen a concept which would pursue towards future trends and cover an intriguing idea.

This gives a reliable and a valid argument for the for the materials and possible technological solutions which will be implemented.

Chapter 1

covestro



covestro

covestro

brief Introduction

1.1

Covestro is one of the world's leaders in manufacturing polymers. Products made by Covestro can be found almost in every field of living. Key words being innovation and sustainability. Over 15 thousand employees and sales of 12 billion, Covestro is present around the globe. Covestro is driven by the focus on innovation and sustainability. This is shown by having a spotlight on current megatrends, such as climate change, resource depletion, population growth and urbanization. These trends are served by being associated with industries like automotive-, construction-, electrical and engineering-, wood processing and furniture fields. Leisure time with sports is also included with the products of plastic.

Covestro is leading three different segments, polyurethanes, polycarbonates and adhesive specialties (Coatings).

In its largest segment, Polyurethane, Covestro is the leader in the development, production, and marketing with polyols and isocyanates. Found especially in mattresses and automobile seats. With Polycarbonate, Covestro leads in development and produc-

tion, most commonly used with electronic devices such as laptops, smartphones, medical devices and automotive parts. Polycarbonates are marketed through by the form of granules, semi-finished parts or blends with other plastics. As what it comes to coatings, Covestro is the biggest supplier of the premium segment. These are used in protection, and they protect for example car surfaces, furniture and floors. Coatings and adhesives are dealt with the situations when product needs to have "the final touch."

Covestro is still owned mostly by Bayer group with 64% of stock shares, while Bayer itself is concentrating on drugs and seeds.

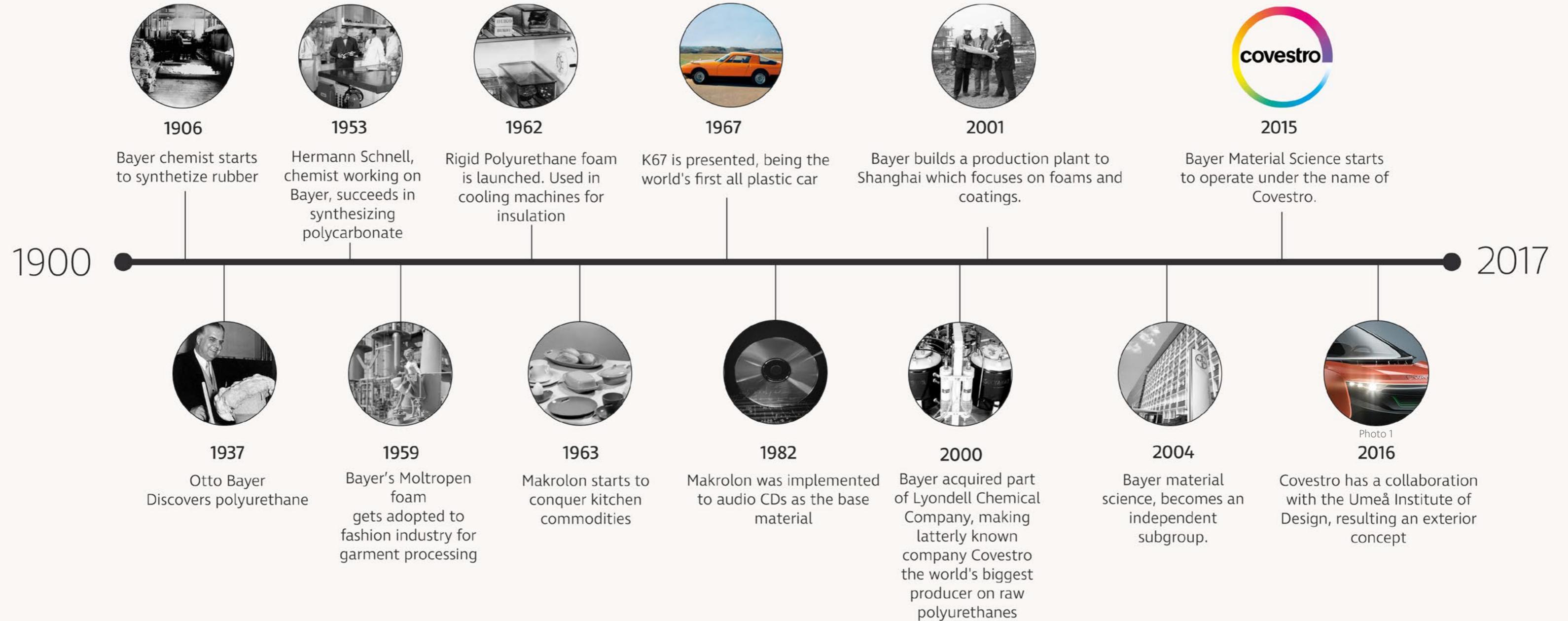
History

Under the name Covestro, history reaches only back to 2015, but the roots reach much deeper than what meets the eye. Covestro's technology and material science go deep down to the year 1906.

Since then Covestro has produced and invented new materials which are used in every field of living. For example, Moltropen, used in garment processing, or rigid foam from polyurethane, which was used in insulation for cooling machines. In 1963, Makrolon started to conquer kitchen commodities and this same polycarbonate is continued to develop until this day, having multiple implementations in the industry. For example, it is still the base material of traditional CD's. Later on, Makrolon came as an international option for replacing glass headlamps in car manufacturing business. Being easy to shape and the lightweight structure were irresistible perks. This named trend began in U.S.A and Japan, continuing to Europe on the 90's. Century changed, and Bayer kept growing by building production plants in Shanghai. In the turn of the century, it also became the biggest producer on raw polyurethanes.

An Independent subgroup formed from Bayer in 2004, it was called Bayer material science, latterly known as **Covestro**.

history timeline



why Covestro wants a concept car?

1.2

Producing and designing a concept car represents company's intentions and ambitions to pursue upcoming form language and overall thoughts. As Covestro provides materials and solutions in a plastic field for car manufacturers, it's a perfect way to promote their knowledge by making a concept car by themselves. That way they can truly show what possibilities is there, and what more appealing it is, more materials which they produce will be sold.

Identifying the need, what does Covestro need exactly + how to meet the need?

The car itself needs to be evocative and follow upcoming design forms by using ways of forms which promote plastics as the best possible way. The car which would make one think: "I want this" " brilliant idea." Better the concept, more likely car manufactures want to implement materials in question. The car needs to be clever and have smart solutions and a strong concept. So that there is something really to rely on.

Creating a brand for a vehicle which doesn't have it yet?

Headline being rather provocative, it still hits the target and passes the problem. Usually, when you should design a vehicle, you're doing it for some big company, and most likely, you're even working for them. As an example company X has decades of form history and -identity where you can lean on. This is a big perk when you have to come with a new model; user segment is profiled, customers know the company and everything is set. Customers are buying the brand's vehicle because they want to be profiled according to it. In another way, it can also be a burden. You don't have fresh plate to start with, you have to obey the things which are already there, and in fact, it just tells you to what to do. In the end, it doesn't matter how you turn it around; it's still harder to create a brand from dust. Luckily, Covestro is an innovative company, which can be taken as an advantage when thinking about the concept.

Lately, there has come new competitors for the traditional ones, which base on almost nothing. For example, Tesla, a rather new car manufacturer has hit it the market incredibly well. Last year in 2016, there emerged few intriguing concepts by companies, which are called Faraday Future (founded 2014) and Lucid Motors (founded 2007). Conjunctive factor in all of these companies is electricity and smart solutions. I believe that the newer the brand more it has to depend on form language and strong concept, that being said, it should also symbolize the thoughts and agenda behind the reason when making the car. Symbolize the function

and for what it's being used. Something should be found still in any case where you can rely on. If one thinks about popular and well-doing brands, it's not anymore even about the product itself or just how it looks. You could think about it more in a way that it's a lifestyle. This one big package, where you buy the product, in this case, a car for example, not because it's a car (every car goes forward) but more because it represents a certain way of living and the people want to identify to that. As a conclusion, this comes even more crucial part of a brand which isn't involved in automotive field design vise.

Brand analysis & lifestyle, conclusion.

In my opinion, Covestro has a solid foundation to develop a certain image and lifestyle for design perspective, it already exists in other fields being innovative & sustainable as the most obvious. As the solutions which Covestro produces are top of the notch, the design language and ideas should also reflect the feeling of something new and exciting. I see that the vehicle could be pointed for a user segment which is categorized with ecological and self-conscious people, who wouldn't buy the car just because of how it looks, but more because what it represents. Electric motor solution as the power source. Combustion engines don't have a good foothold when looking straightly to the future. It's irrelevant for Covestro at least, to consider a technology for their vehicle which should represent new ways of thinking.

introduction to the materials which covestro produces

1.3

I will briefly introduce you to the materials which Covestro produces.

Polycarbonate

Polycarbonates are part of thermoplastic polymers which contain carbonate groups in their structure. The overall definition of this material is that it is easily workable, though, firm and it can also be made to be transparent or translucent. These properties have made Polycarbonate widely used polymer throughout every field of living. It also has different trademarked names, such as Hammerglass or Lexan, Makrolon being Covestro's.

Biggest industry for polycarbonates is electronic components, due to its heat resistance and electric insulation properties. Significant need for polycarbonates is also in the construction field in the means of sound walls and dome lights. As Makrolon was the first type of polycarbonate used in CD's, it also still has a demand for data consumption purposes. Automotive fields take advantage of

polycarbonate also. Due to the easy injection molding properties, it can be used in headlamps and other surfaces resulting clean and smooth finish.

Makrolon

As told earlier, Makrolon is trademarked name for Polycarbonate By Covestro and Bayer.

It's said to be extremely robust and lightweight, with transparent properties. Being easily moldable, it suits well to many different instances. Impact resistance and excellent temperature durabilities. Listed on their website, Makrolon has glass-level transparency with optical quality, High dimensional accuracy and stability, good electrical properties, and grades which are available for injection molding, extrusion and blow molding. Makrolon can be used in safety goggles, ophthalmic lenses, and water bottles. Also, other consumer products such as covers for electronics, furniture, suitcases, hot tubs and even bicycles can be made from Makrolon.

Polyurethane products and accessories are also produced by Covestro, I've listed few different categories which covestro is involved into.

Films

Example fields of uses are the automotive and medical field. In the automotive field, films are mostly used in speedometers, and the idea is that the film is implemented to the mold when it's injected. A Certain type of light management films are used when one's ambitions are reflecting or diffusing light to different surfaces.

Coatings

Applied on top of named material, they will grant certain features for material underneath. These can be high glossy surface, scratch prevention or deadening sounds and noise. Something that I found interesting was a coating which prevents noise and coating which heals scratches by itself.

product portfolio

K1967
1.4

As told in Brief History, a division of Bayer, called BayerMaterialScience developed the world's all plastic car within the cooperation of BMW Group, which was a result from developing the technology and testing. Only parts which were metal were gear box, motor, and wheels. Designed by Hans Gugelot, it's said to be a sports car, at least how the chassis was done, hitting 170 km/h in Nurburgring.

Shells were made from glass-reinforced exposure resin, then put together, creating a hollow body, filled with polyurethane based foam. In fact that foam was made from liquid plastic, based on polyurethane. At that time a plastic car was considered to be an alternative choice for regular cars, arousing hype in its unveiling exhibition at the industrial fair in Hannover. Using composite materials in chassis as an example wasn't common. Even in racing; the first composite structure was seen in 1981 McLaren MP4/1. Ford used carbon fiber reinforced panels in LeMan Ford GT40.

BMW and Bayer had plans for 5000 cars, but early 70's oil crisis affected to the plans creating a conclusion that those plans were not considered again.

Photo 1: <http://www.914world.com>

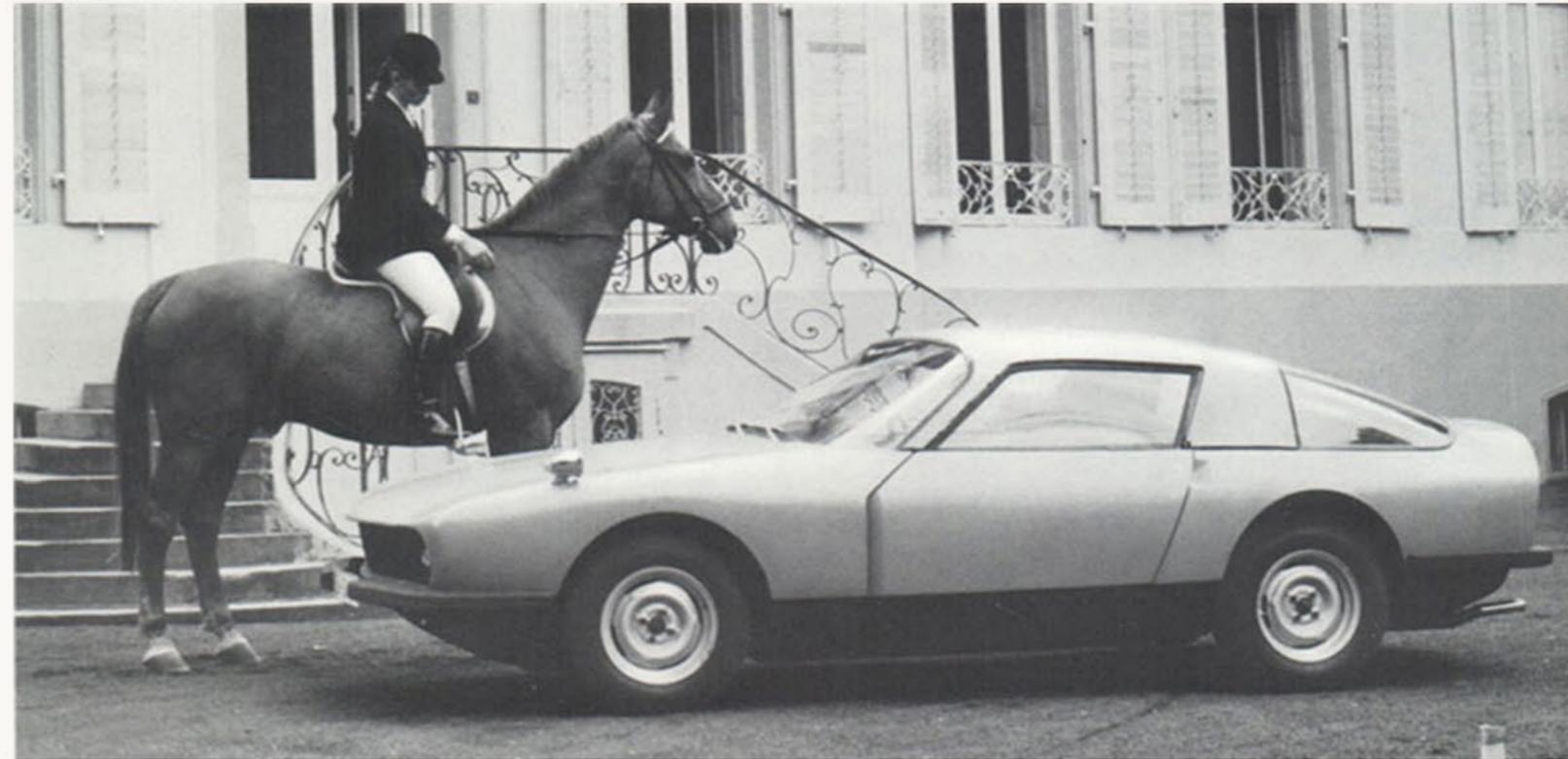


Photo 2: <http://flussigmagazine.com>



Photo 3: <http://www.markanto.de>



Photo 4: <http://www.flussigmagazine.com>

product portfolio

K2016

Key design sentences would be "Seamless design," adjective which Covestro wants to apply for their design language. The car has a rather homogeneous surfaces, but they do serve a function, such as aerodynamics and drag properties.

Done in collaboration with Umeå University, it is read as the second concept car purely named after Covestro / Bayer. Main Purpose of "Magic: Revealed" was to research the boundaries of existing limits when considering aesthetics and materials. To ideate functionality and design which would please the future drivers. As here also, the main point was to search solutions for transparent and translucent grades of polycarbonate called Makrolon. Finding implementations in a day- and night time lighting applications. Key point was to understand the possibilities of polycarbonate, and what it has to offer. As what it comes to the material point of view, they have succeeded to showcase their capabilities, but there isn't any idea behind the concept itself.



Photo 1: <http://www.products.covestro.com>



Photo 2: <http://www.ptonline.com>



Photo 3: <http://www.britishplastics.co.uk>

Chapter 2

the idea

when

2.1

By now, there are technologies which make autonomous vehicles possible, Tesla being one good example. Otherwise, half and fully autonomous vehicles are missing the consumer market.

Furthermore speaking, overall vehicles are completely focused to traditional interior design, meaning that they are designed with four seats and possibility for a steering wheel. Although there are concepts, which have explored what could be done when activity is not related to driving.

As autonomous vehicles start to spread, they will resemble more and more homes due the that they will also become a place of some activity, instead of driving.

By 2030, I strongly believe that autonomous vehicle exist on everyday basis, making it relevant to pursue towards a concept where the focus is in the activity inside the vehicle, and what purpose could it serve.

Photo 1: <https://teknosafari.com>



Photo 2: <https://www.motorafondo.net>



Photo 3: <https://3dprintingindustry.com>

2.2

context

I am focusing to an idea which is relevant in the future and addresses a solution.

As it is known, the trend in housing market has been quite a while already that people are focusing more in smarter and cheaper living solutions. It seems that wisely organized and divided space is more precious than huge waste of m². This by all means points to the direction of smaller apartments. In Japan, density of people is ridiculously high, and they have a smart solution for temporary sleeping. Capsule hotels. First one already built in 1978.

Many news have came up in social media and tabloids from people who are avoiding high rents in mega cities with interesting solutions. I personally got inspired from "home-vans" and earlier mentioned capsule hotels. Basically speaking, people have built in some terms a home inside a van, which usually contains at least

a place to sleep. This is an important factor in my context, but also for the future trends. Take example London, Tokyo, or New York. These are areas of work concentration, but due the immense amount of people, rents are skyrocketing with overall living costs, making it crucial point to save money from the biggest living expense.

As an example, in **Silicon Valley** people are suffering from lack of apartments and really high prices, even though people are earning rather a lot of money. Even that they can't find good houses or most of their income goes straight to living costs and rent. These people earn six figure salaries, but still they can pay up to 1,400\$ from a closet, which is serving them as a "private room". What it comes to secretaries and people who don't earn that much money, they have to live a long way from work, commuting time being even three hours.

Photo 1: <http://abduzeedo.com>



Photo 2: <http://trendland.com>

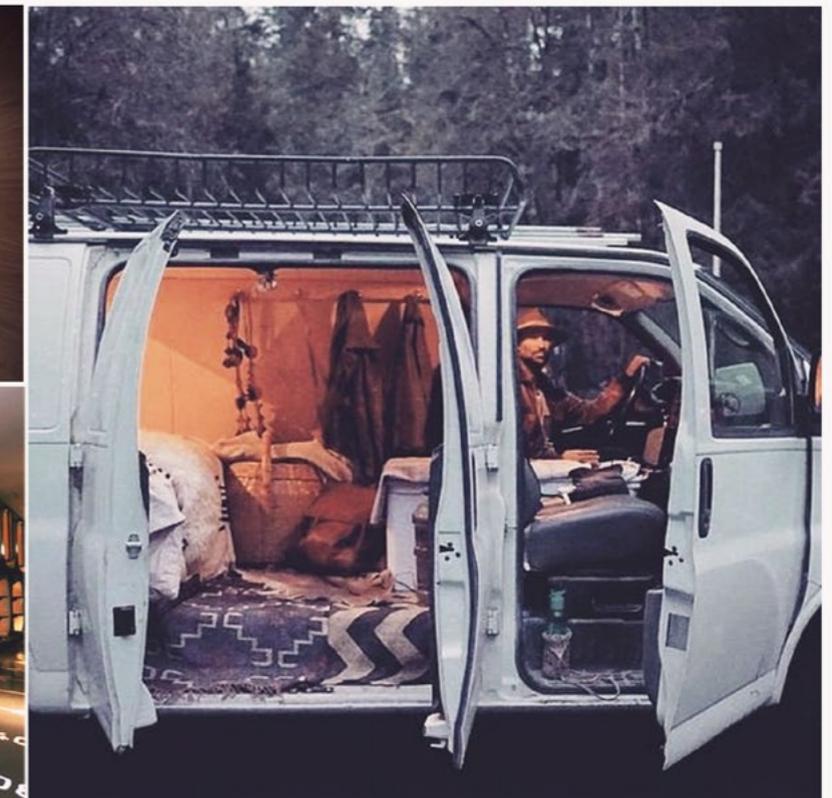


Photo 3: <https://www.instagram.com> User: bohobuys

Autonomous vehicle for rest & sleeping

the idea

2.3

"Pod Hotel"

Autonomous vehicle for rest and sleeping.

Idea is that the person owns or rents this vehicle, and it can be used for spending nights in the city when the user has long days and needs to sleep somewhere. Being an extension of home, it can be used solely for sleeping in a minimalist capsule hotel-like surrounding. The advantage of this vehicle is quite big. Apartment without any costs to permanent land rent or big building maintenances saves a lot of money. And the durability, one could rent the vehicle for a longer period of time, or just for a few nights, depending from the need. Considering that you would only sleep in the vehicle, there isn't a lot of things included inside the vehicle.

I want the idea to be taken as provocative suggestion, so there is no shower or toilet. Same way than in Capsule hotels.

Photo 1: <http://www.mesenvies.fr>



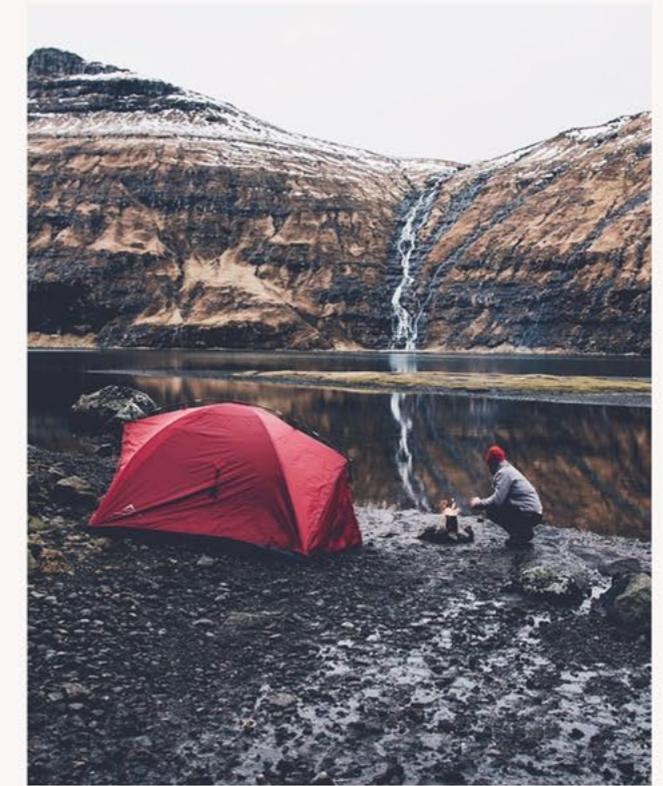
alternative purpose

Photo 2: <https://www.instagram.com/> User: lennart



temporary delight

Photo 3: <http://gentlemensmuse.tumblr.com>



extension of home

2.4

where

The concept will be placed in cities classified as a metropolitan areas, such as London, New York, or Tokyo. Metropolitan area consist at least 10 million in population.

I chose these cities as an example because the main idea is shown best in these areas which have problems with unavailability of apartments and high renting and living costs among with over-regulated pricing markets.



Photo 1: <http://theeverygirl.com>



Photo 2: [tumblr.com](https://www.tumblr.com/)



Photo 3: [pinterest.com](https://www.pinterest.com/)

user

2.5

Meet Frank.

He is 32 y/o Tech Worker in a big company.

He's a minimalist and an anti consumer. Basically speaking, he wants to own as little as possible, keeping focus on the things which are important, and while the trend in the western world and is to posses as much as possible, he thinks that world needs people who do not follow this economical path of over consumption. By being a minimalist, he appreciates things which are high quality and useful. For these reasons, he is using pod hotel concept. He can sleep there, relax, hang out, and use it for transportation.

Frank works in a big tech company located in the centre of Silicon Valley. The company is having a lot of customers and commissions, meaning that Frank has to put in a lot of hours requiring flexibility and white nights. He has an apartment completely outside of the valley where he goes to spend his weekends, but during weeks he has decided to use pod hotel concept for a place to sleep and to save money while in the past he had used his old apartment only to sleep, costing him a lot of money.

photo 2: <http://cdn.trendir.com>



photo 1: <https://fi.pinterest.com>



photo 3: <https://fi.pinterest.com>

2.6

(カプセルホテル kapuseru hoteru) capsule hotel 101

Capsule hotel is one form of an accomodation. It is mostly spread and known in Japan, although there are other variants and hotels around the globe. Referred as Capsule hotel or as Pod hotel, the name comes straightly from the size, as it is a rather small "capsule" like room, usual dimensions being 2m x 1m x 1,25m.

As what it comes to accesories and things what pod it-self has, there is usually Wifi, tv, and managing console. (these i'd like to include myself also)

Bathrooms and showers are available in the building itself. Prices are usually varie from 16€ to 31€.

The first one was opened in Osaka, 1979. In Europe, the first one was in Belgium, 2014. In India, Urbanpod launched in march, 2017.



photo 1: <https://s-media-cache-ak0.pinimg.com>



photo 2: <https://ninehours.co.jp/en/narita/>



photo 3 : <https://i.kinja-img.com>

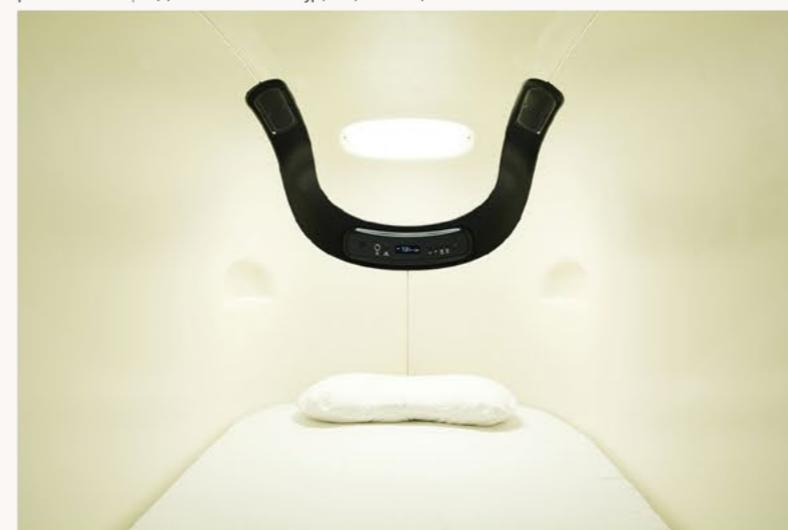


photo 4 : <https://ninehours.co.jp>



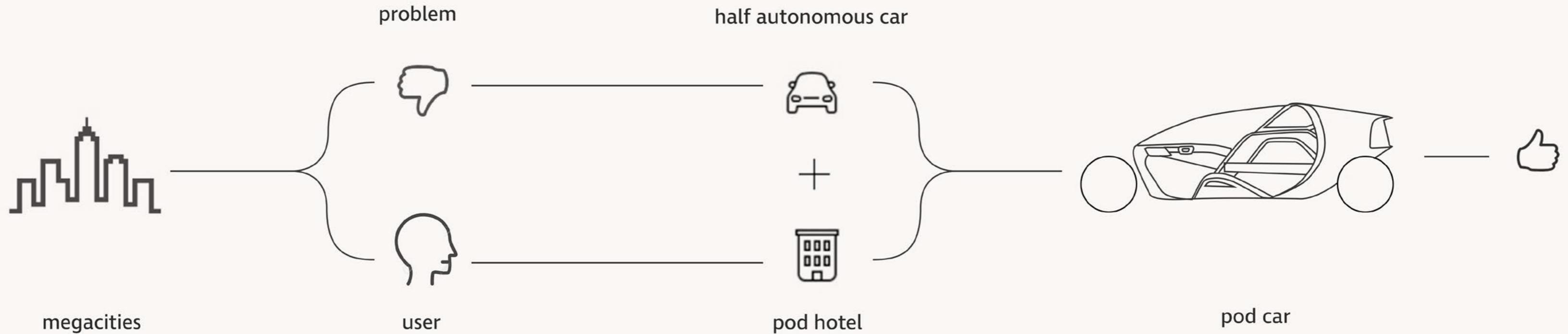
photo 5: <https://s-media-cache-ak0.pinimg.com>

concept summarum

- high density of population & unavailability of housing
- living far away from working place creates a problem of long commuting times

electric and charges by induction, charging points are placed around the city by 2030

can be used as a place to relax even if using the vehicle just to travel



Placed in a cities like New York, Tokyo and London.

- long working days suffers from high renting and living costs
- need of temporary place to sleep or even weekly place to stay the night in the city

Small & smart space usage + cheap prices

- user dodges expensive renting costs in the city by sleeping in the car during weekdays
- this way user can live outside of the city centre, in an area which is a lot cheaper



Chapter 3

design process

benchmark 1

3.1

Even though there are many different and various interior concepts, I have gathered here the ones which I personally got inspired.

Mercedes Maybach 6. Released 2016.

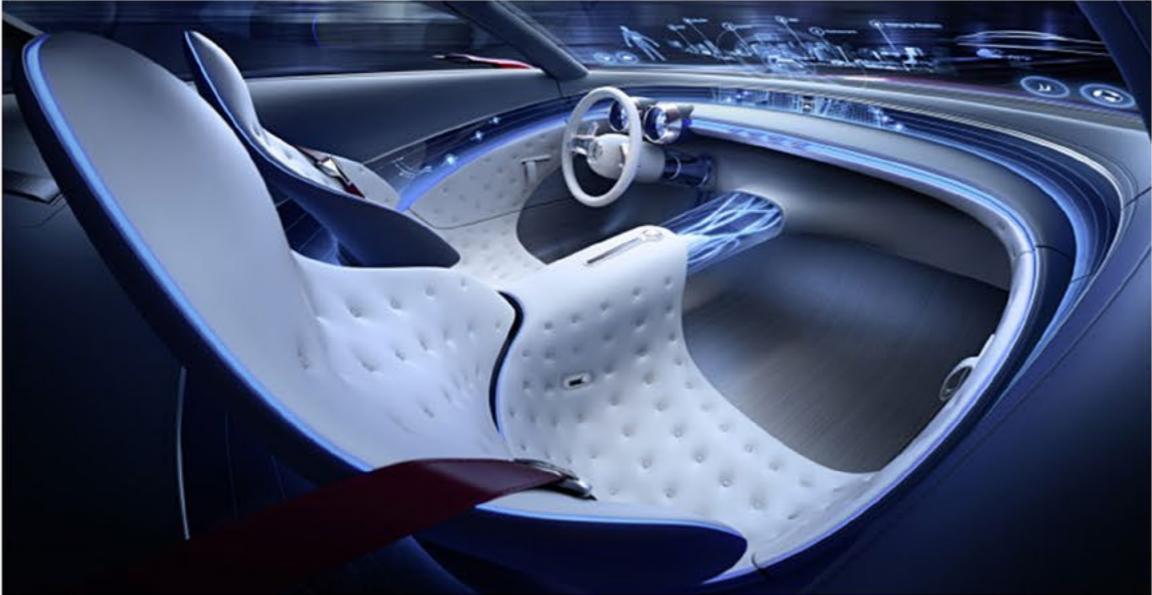


Photo 1: <http://o.aolcdn.com/dims-shared/dims3/GLOB/crop/2499x1406+0+0/resize/800x450!/format/jpg/quality/85/http://o.aolcdn.com/hss/storage/midas/f910234201bce8310a8e9fab79b3cf9/204221169/MercedesMaybach6Interior.jpg>

Photo 2: <http://www.nio.io/visioncar>



Photo 3: <http://www.nio.io/visioncar>



Nio Eve. Released in the beginning of 2017.

Photo 4: <http://www.designboom.com>



Photo 5: <http://www.carbodydesign.com>



BMW vision next 100. Released in 2016.

3.2

benchmark 2

Here I have gathered two different concepts and ideas which are linked to my concept. First one is a sleeping capsule which is designed solely with the idea of sleeping when being inside of a car, the possibilities to interact while being in the car are quite small. Second one is capsule-like car concept which is designed more like with this pod-likeness features.

Photo 1: <http://www.tuvie.com> Designer: John Bukasa



Photo 3: <http://www.tuvie.com> Designer: John Bukasa

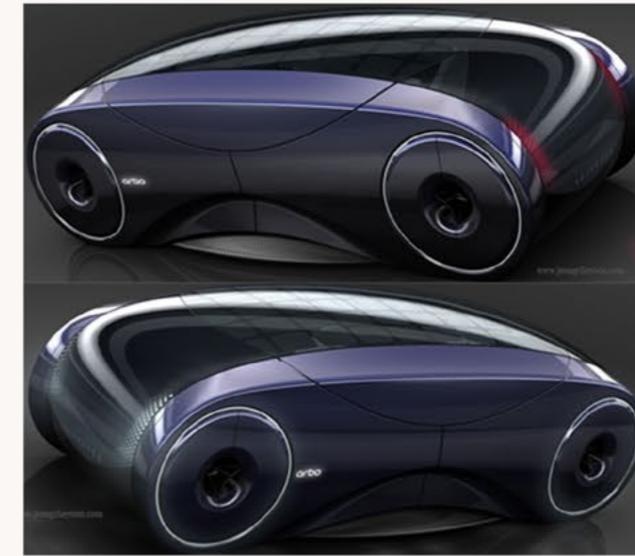


Photo 2: <http://www.tuvie.com> Designer: John Bukasa



Photo 4: <http://www.tuvie.com> Designer: Jeongche Yoon

moodboard

3.3

I started the design process by gathering ideas and thoughts in my head. To figure out basic ideas by pictures. Simple structures and forms, with architectural inspiration.

sculptural elements
simple & clean



Photo 1: <https://fi.pinterest.com/>



Photo 2: <https://www.quora.com/>



Photo 3: <https://www.smow.com>

color & trim
clean & simple



Photo 6: <http://tdctokyo.org>

play of surfaces
intriguing material choices



Photo 4: <https://lemanooosh.com/>

soft & comfortable
details in textiles



Photo 8: <https://fi.pinterest.com>

multifunctional
simple but useful



Photo 9: <http://www.swisstool.co.uk>

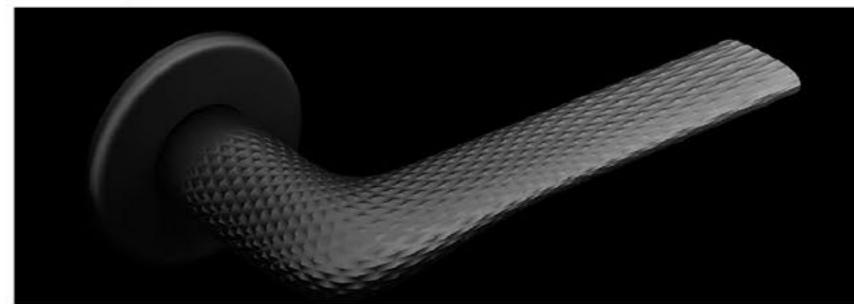


Photo 5: <https://lemanooosh.com/>

3.4

technical implementations

After getting familiar with the possibilities and things which Covestro produces, I gathered a collage which consists the options which I would possibly use in the car.

As the car needs to be a private and quiet, considering that one is sleeping there, I want to have sound proof interior, and what it comes to injection molding, it would be a great detail in the walls when sound insulation is part of the decoration. Electrochromatic glass coating would be good way to make the car private and still have big and roomy glass surfaces for a contrast to the capsule likeness. Covestro is producing a material which is called co2 foam. It is made from 80% crude oil and 20% co2. The result is a foam which can be used in mattresses. As the purpose of my project is to implement Covestros materials, co2 foam is the perfect put in the bed inside the capsule car. Covestro also produces different films and coatings from polycarbonate, which can be used on top of different materials and screens, providing invisibility or resemblance of another material.

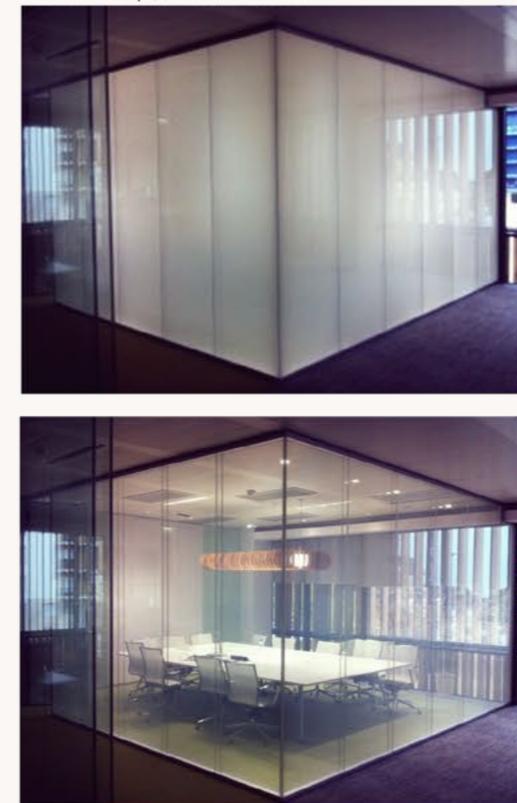
Photo 1: <http://www.archello.com>



injection molded panels
with lighting option

soundproof & beautiful
interior

Photo 2: <http://desiakhbar.com>



electrochromic glass /
coating

privacy & full exposure

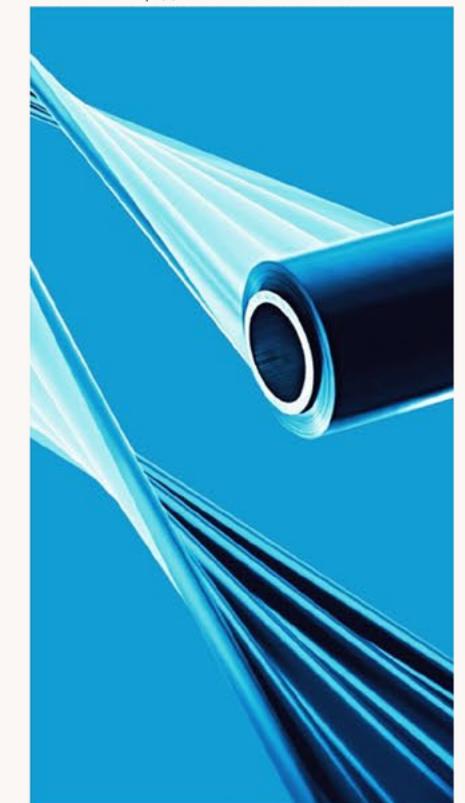
Photo 3: <http://www.plasticsnews.com>



CO2-foam

stuffing inside the mattress

Photo 4: <http://www.covestro.com>



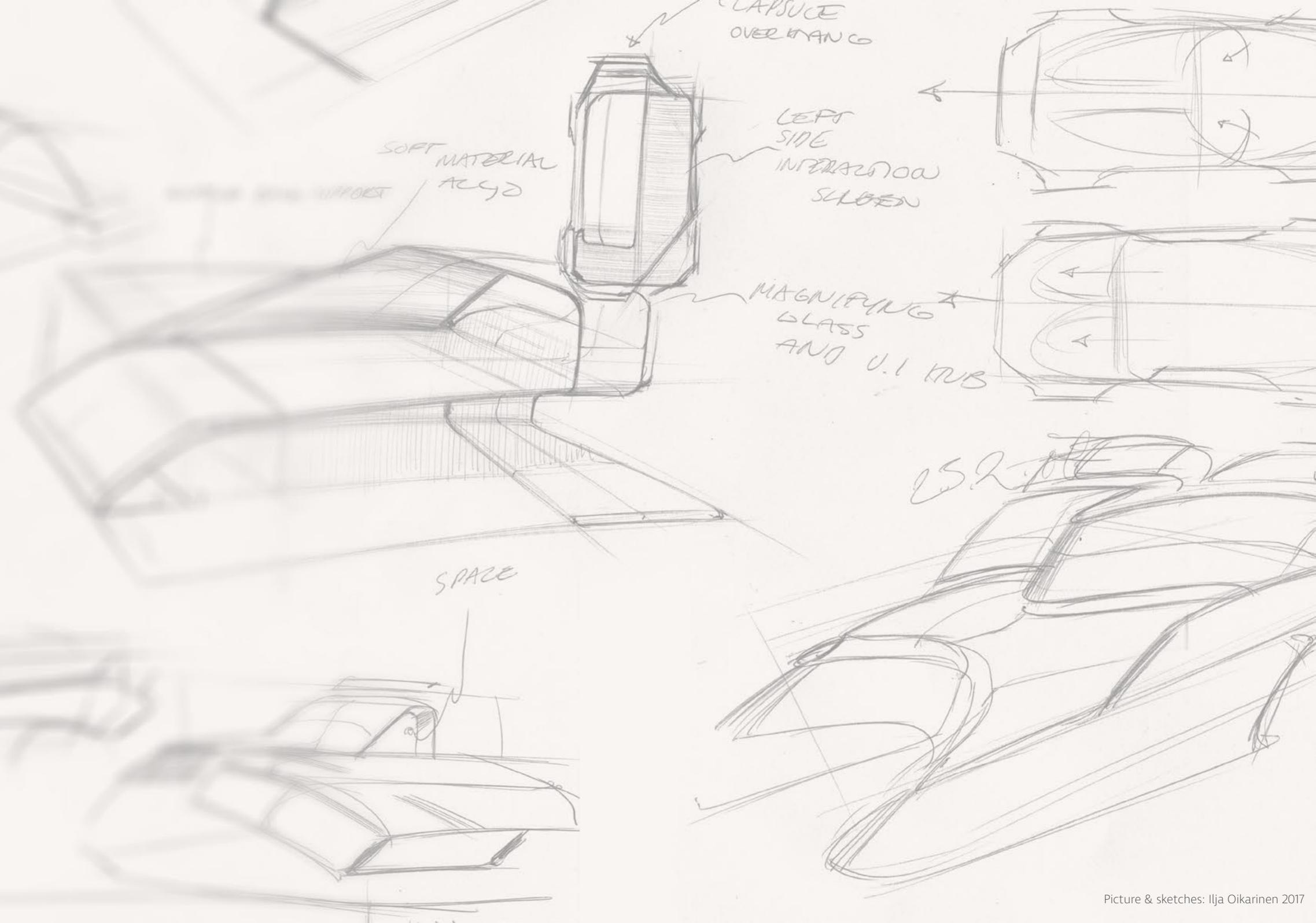
polycarbonate films

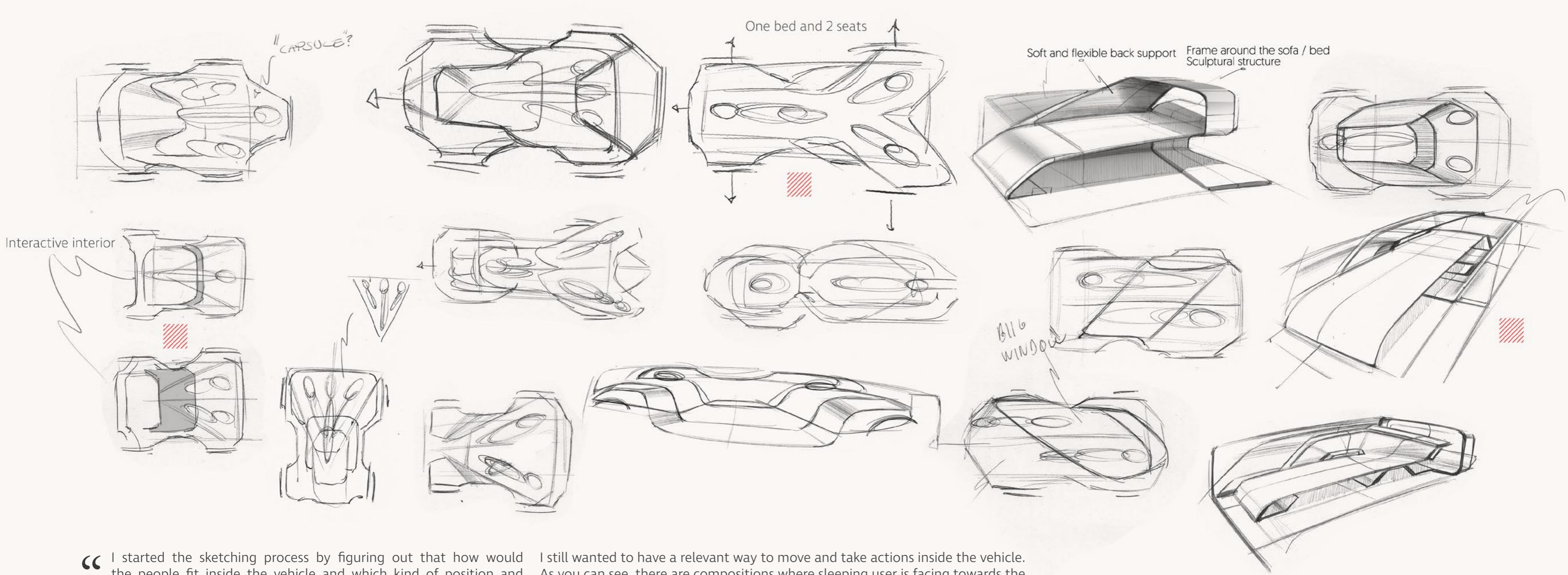
seamless screens &
intriguing coatings

3.5

first sketches

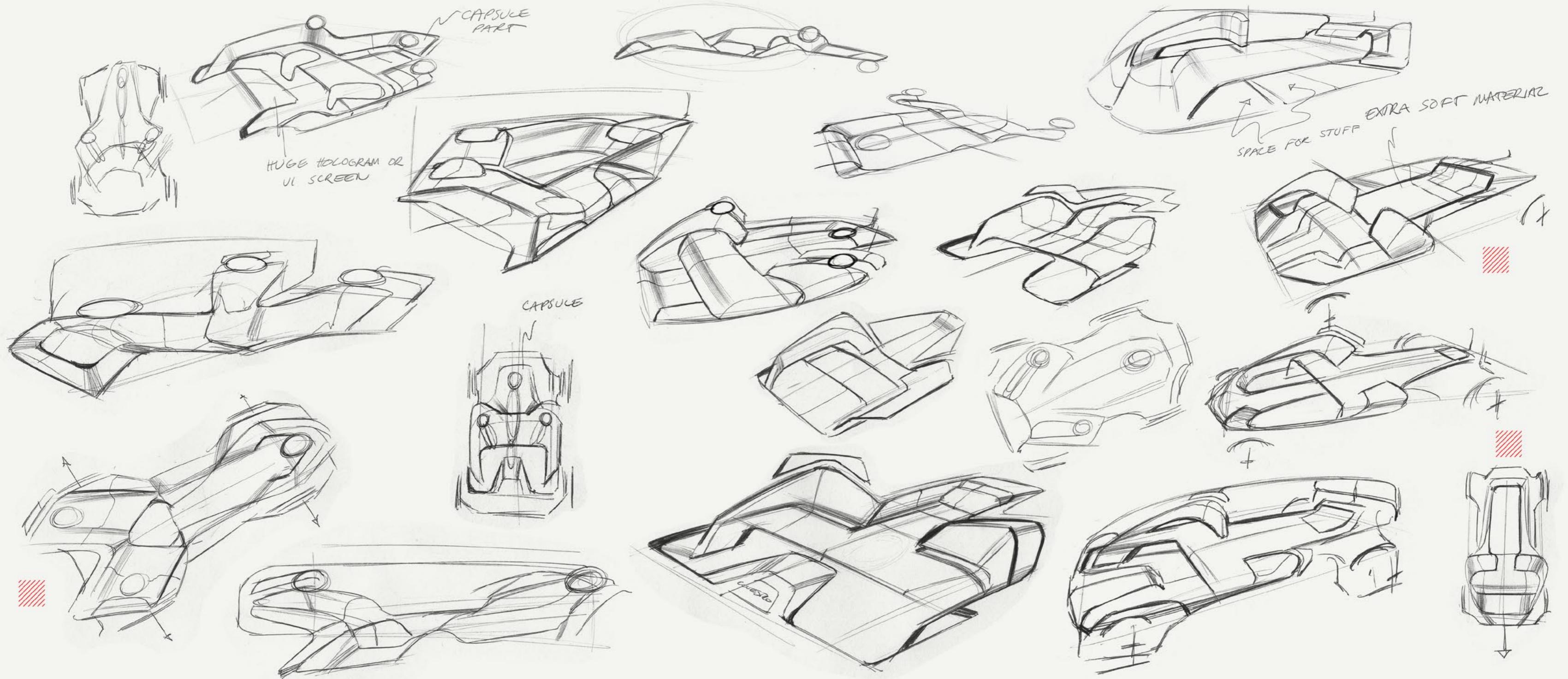
Here starts my sketch phase, which includes doodles and proposal variations. I have collected them in a chronological order, as how they were presented to Covestro. As it will be explained alongside with the phases, the process includes proposals and stages between the sketches, which I gathered to show the main ideas of each step.



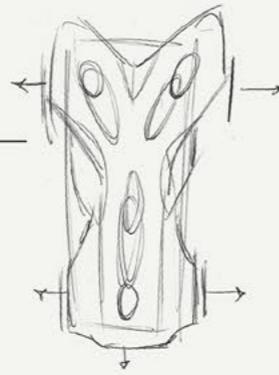


“ I started the sketching process by figuring out that how would the people fit inside the vehicle and which kind of position and composition would the interior have. At this stage I still had thoughts about multiple people being able to sit and be inside. Quite quickly it became more and more clear that the main focus would be put to the bed, and sitting function could be an alternative option.

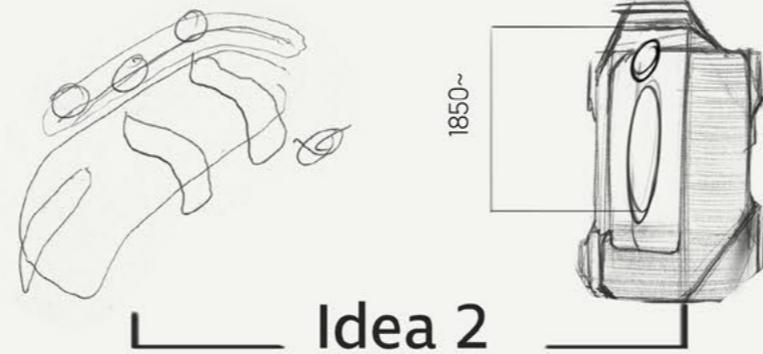
I still wanted to have a relevant way to move and take actions inside the vehicle. As you can see, there are compositions where sleeping user is facing towards the back or towards the front. I decided that the most relevant option would be that every one is facing forward.



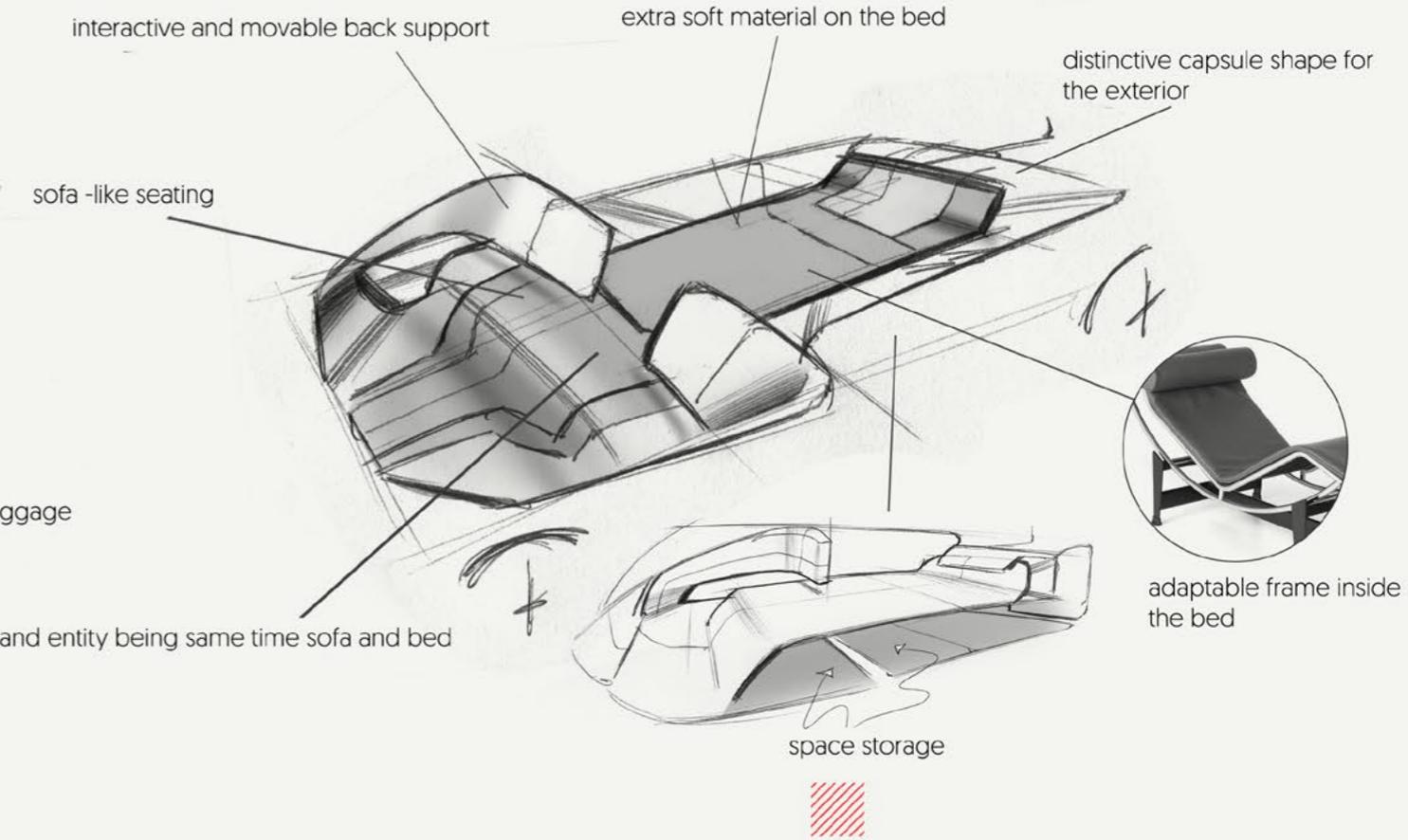
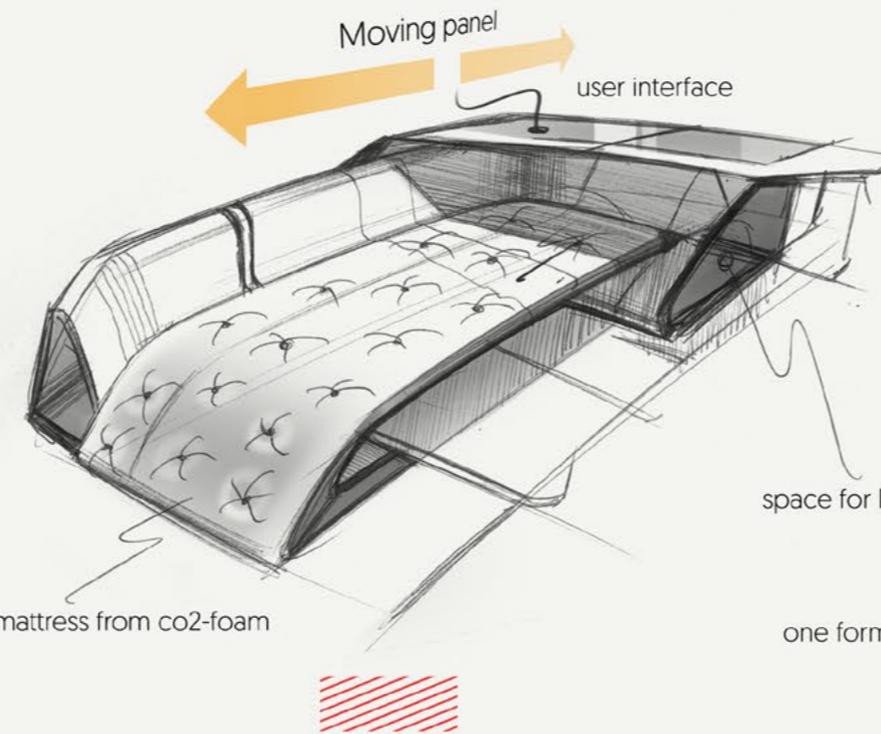
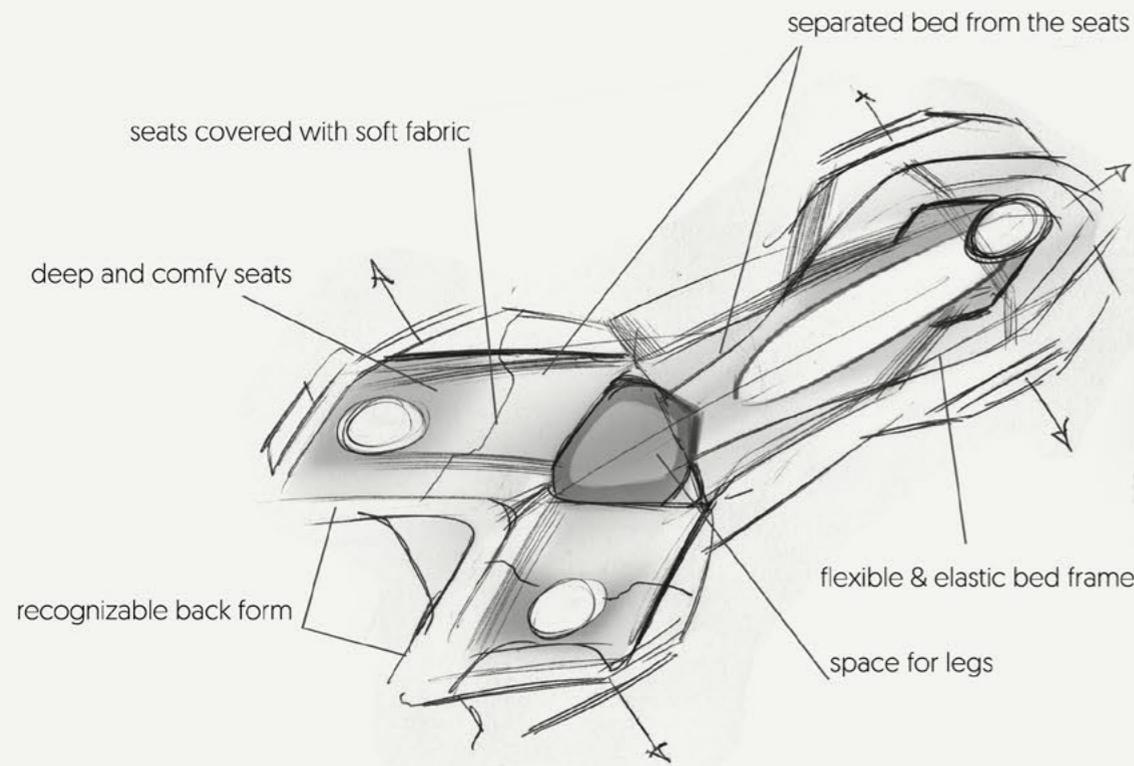
Idea 1 separated & stable



Idea 2 multipurpose & simple

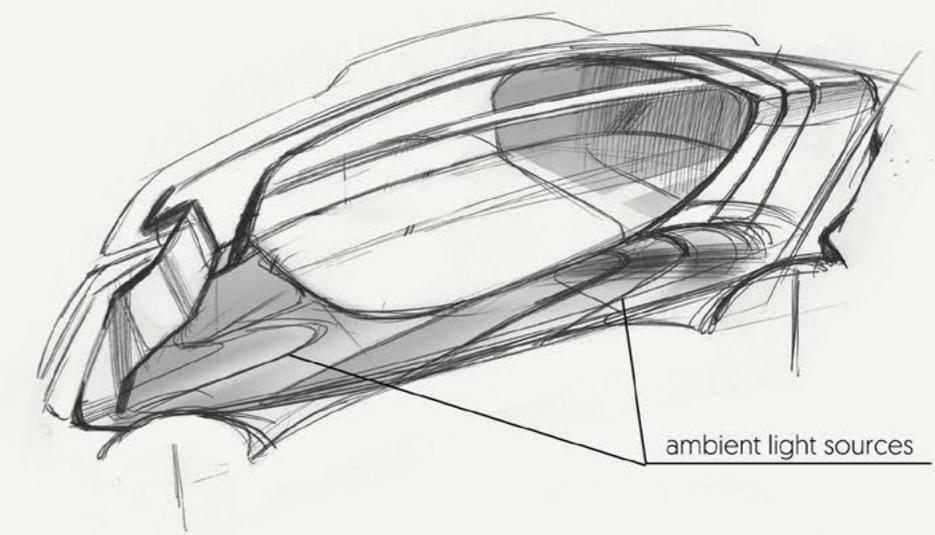
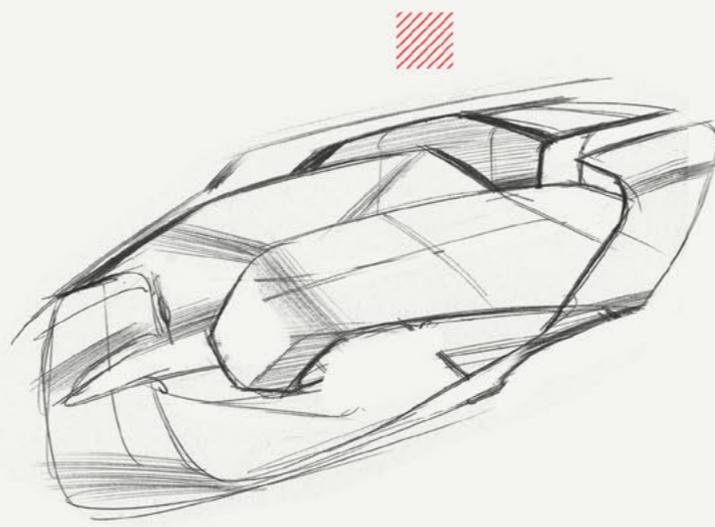
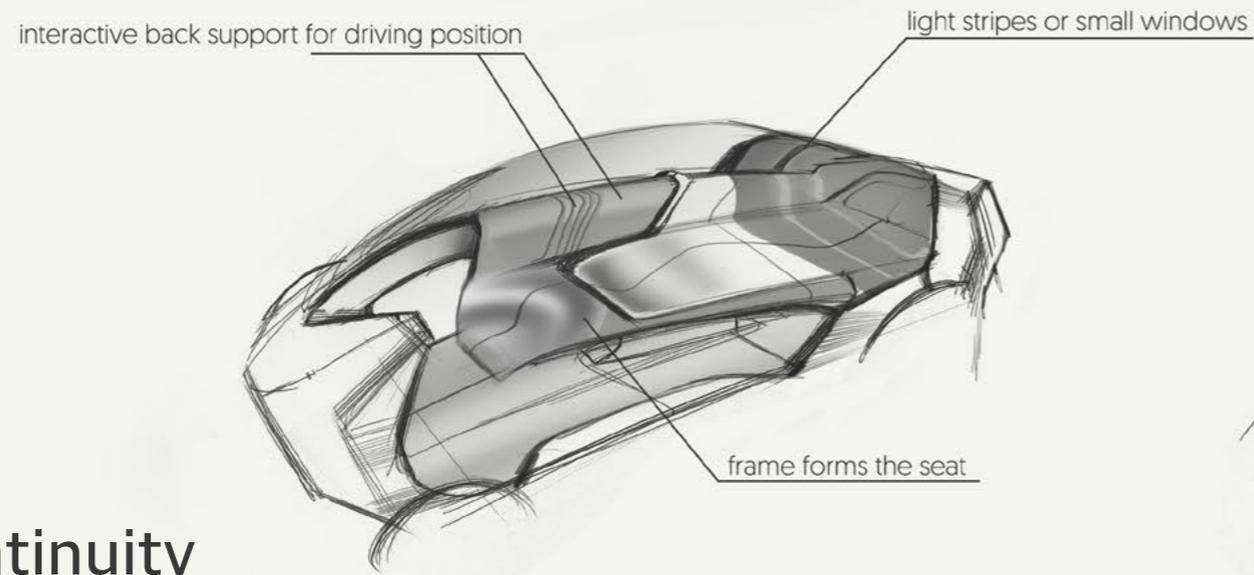


Idea 3 combined & interactive



“ After the initial sketching part, I collected the main ideas and made a short presentation for Covestro, to point out the thoughts that I had. There were total of 3 different proposals, which all were heading to different directions.

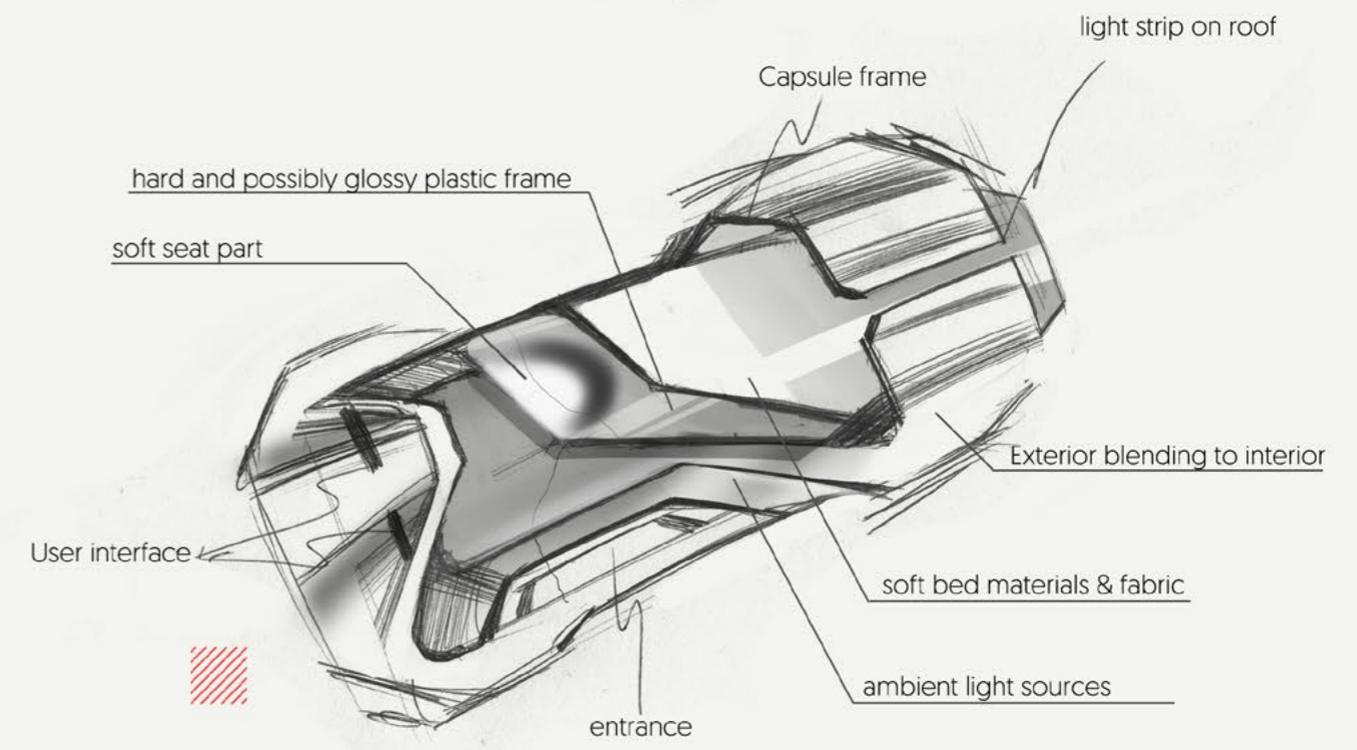
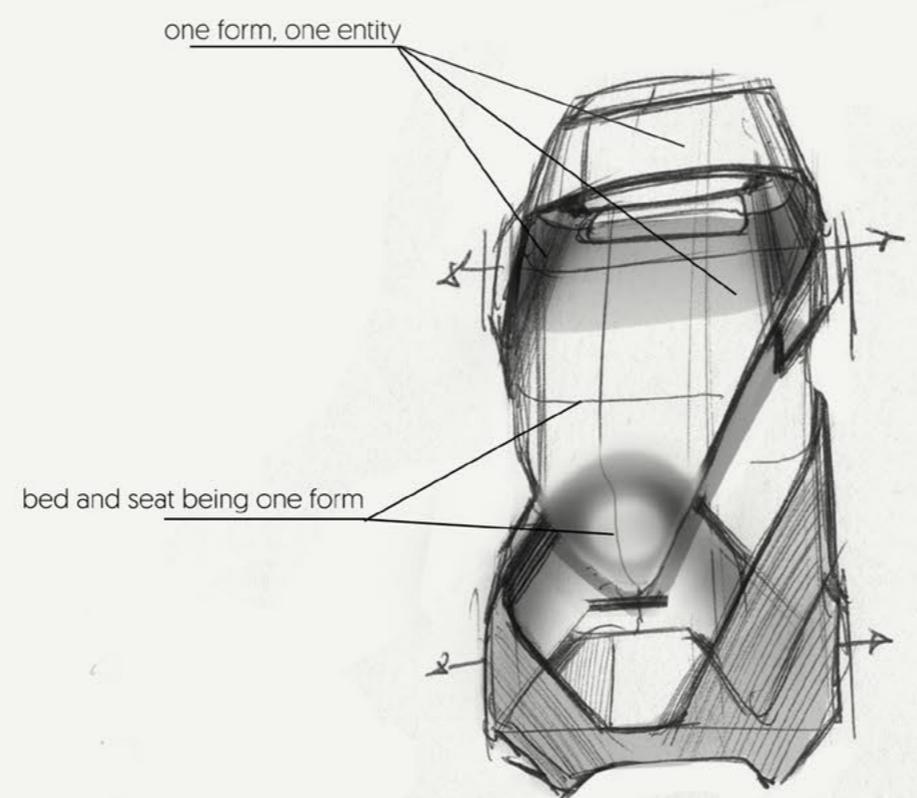
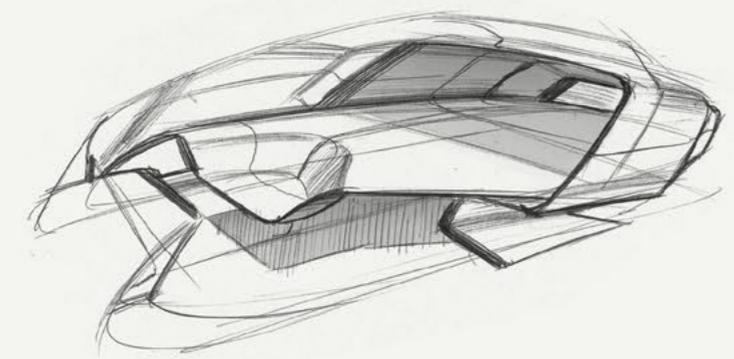
Even though the mattress sketch (2) is rather ugly and doesn't represent car interior much, it describes well what I wanted to have inside the car. **Multifunctional and simple interior.**

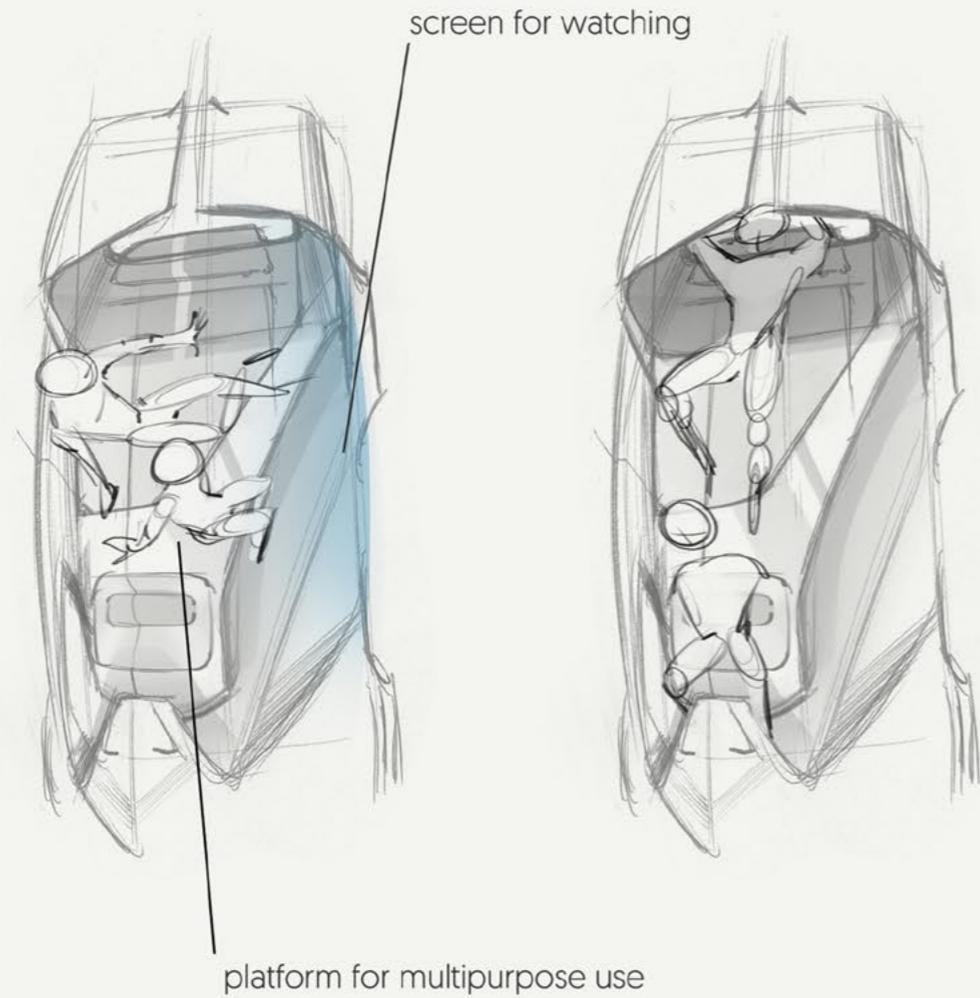


idea continuity

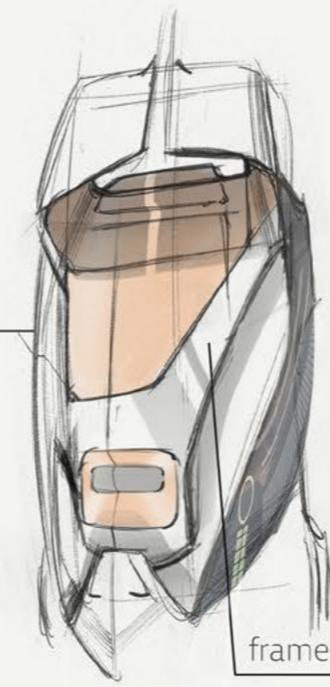
3.6

Covestro preferred the idea 3, but personally I was keen to continue also the direction 2, which was the most space convenient, having most opportunities when it came to functionality and space saving. In the end I took reference from both suggestions.

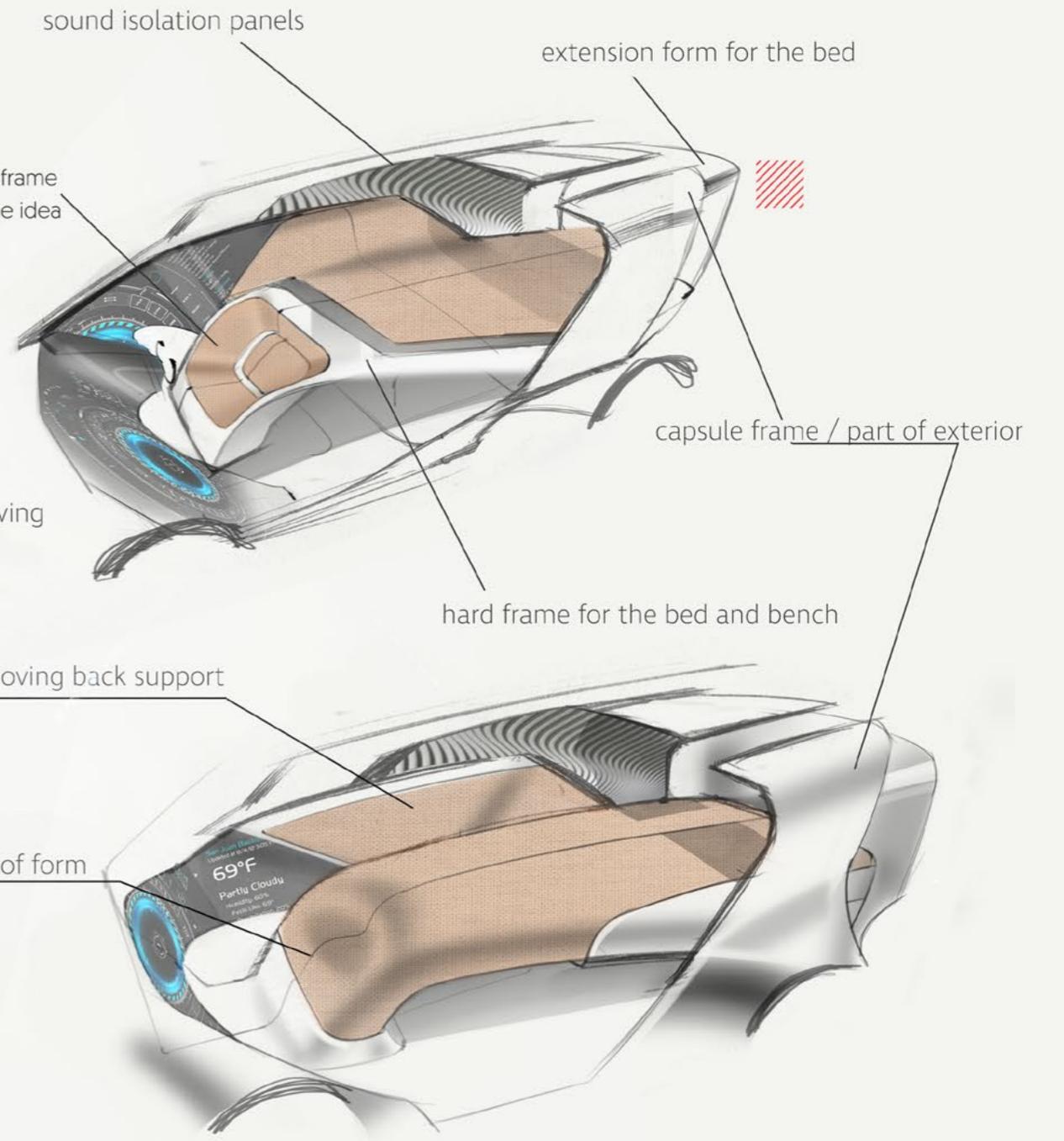
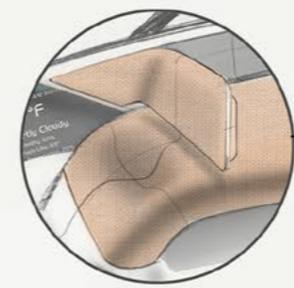




proposal 1



proposal 2



“ I visualised few scenarios and detailed sketches that how the interior would work and look. It helped myself also to paint the image in my head that what would the interior need inside.

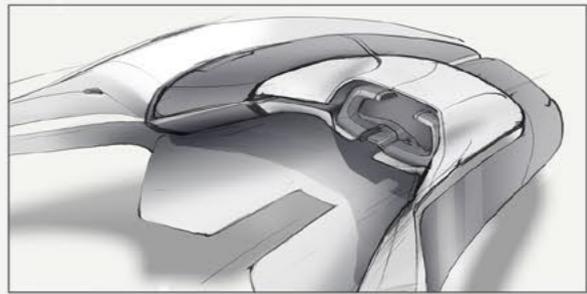
I wanted to bring the Japan Pod-hotel feeling inside with the frame seen in the sketches. This would be the connecting factor of the interior and exterior.

3.7

idea exploring

After Covestros request, I started to ideate more how the control panel and dashboard would be. I found it troubling, since it was hard to understand depth and perspectives when drawing interiors. Ideas which are in your head, don't show on paper. Slowly it started to go forward.

light panel where insetted screen



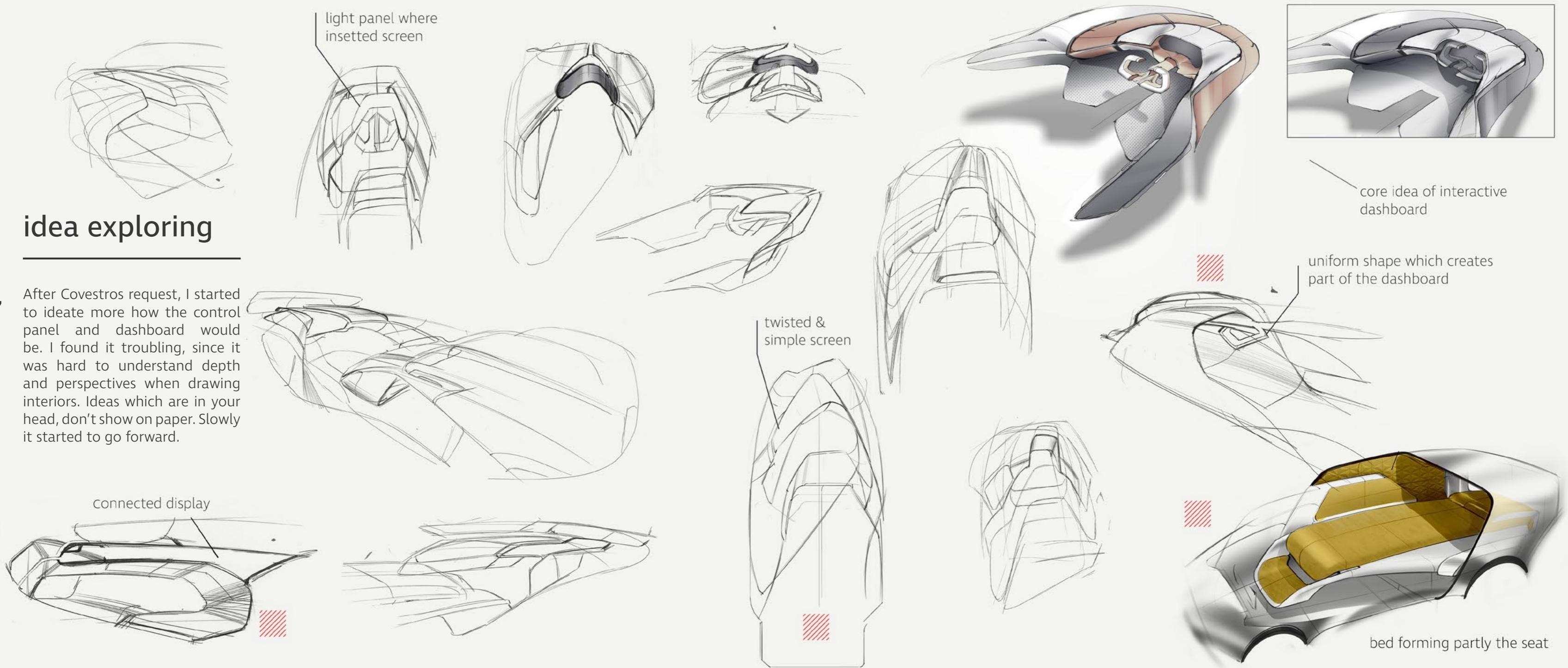
core idea of interactive dashboard

uniform shape which creates part of the dashboard

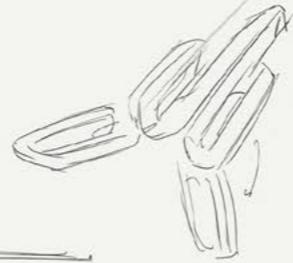
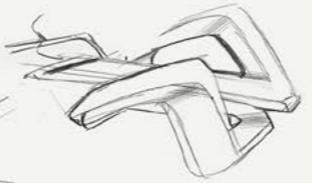
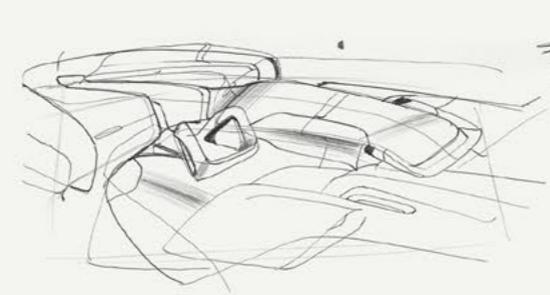
twisted & simple screen

connected display

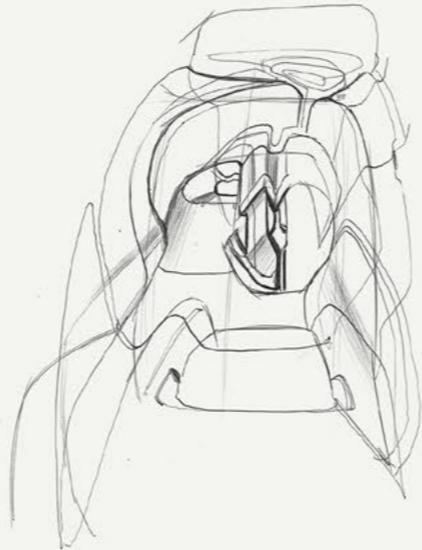
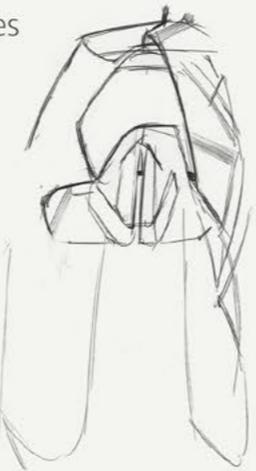
bed forming partly the seat



flowing shapes



U.I panel forming from the sides



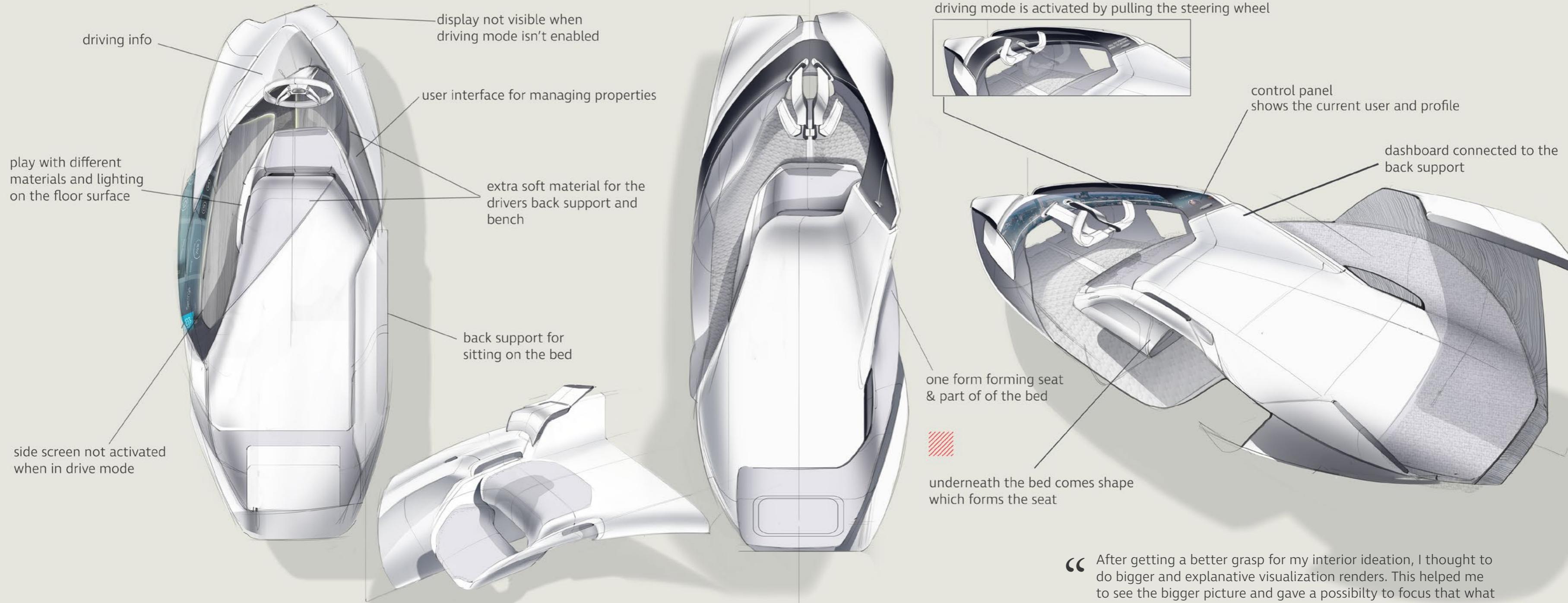
steering wheel pulled out to activate the driving mode



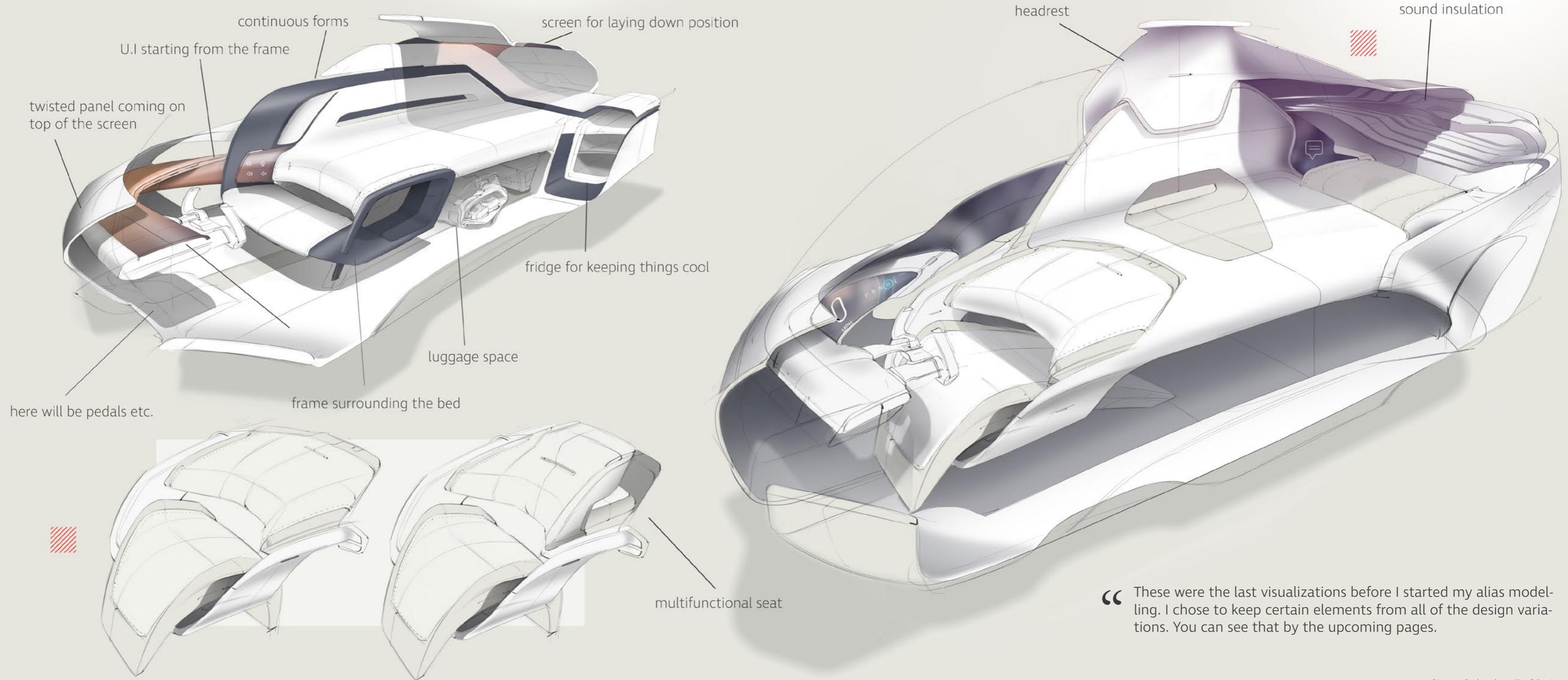
one shape continuing through the interior



dashboard's form follows bed's form



“ After getting a better grasp for my interior ideation, I thought to do bigger and explanative visualization renders. This helped me to see the bigger picture and gave a possibilty to focus that what there could really be, instead of searching hints by pen & paper.



“ These were the last visualizations before I started my alias modeling. I chose to keep certain elements from all of the design variations. You can see that by the upcoming pages.

3.8

alias

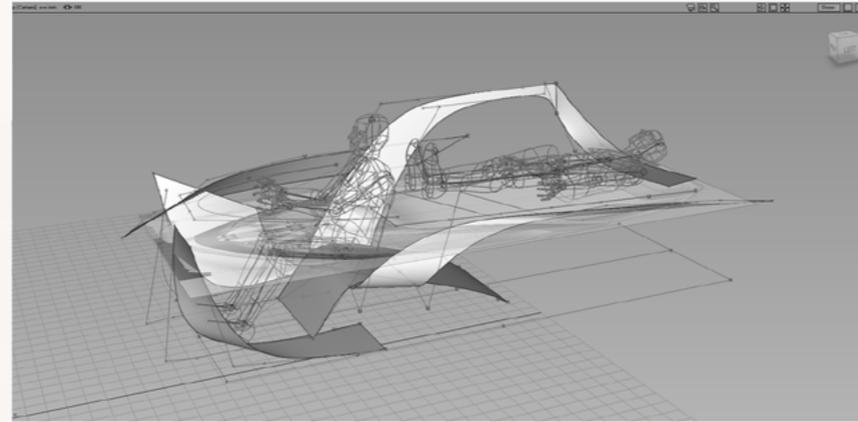
After going through different variations and themes, I started to feel that I needed some other way to ideate and discover the upcoming final theme, where I would combine different thoughts what I had. As it was rather hard for me to think only 2d since I haven't done interior before, it really helped me to see things differently in Alias.

Here you will see the process of my 3D model. It's quite slow to design in 3D, and since my level of the software is relevantly low, it was also a great opportunity to learn it as well.

This model will be taken forward for the Stance-show and it will be seen through VR-goggles.

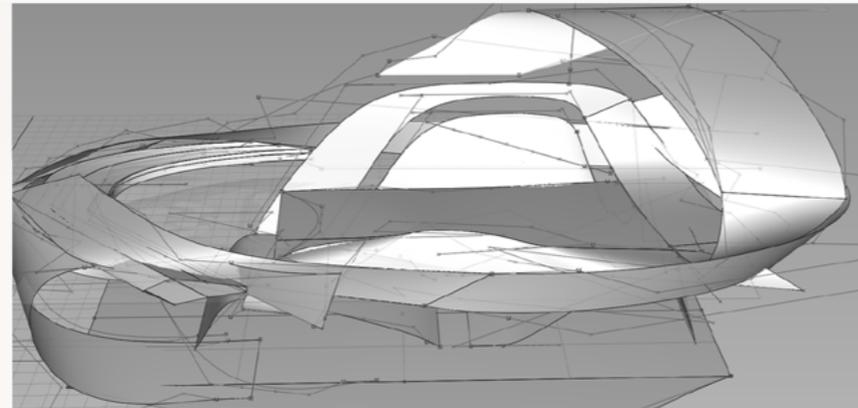
I started the modelling process by using one of my renders as a reference canvas. That way I got the basic lines and measurements that I wanted.

1



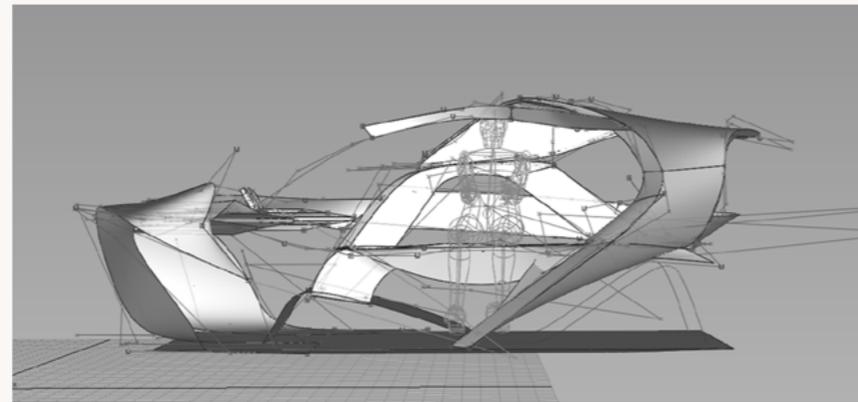
I varied basic volumes and elements; how they could work. Some things are easier to see 3-dimensionally. If something works on 3D, its going to work in 2D also, atleast what it comes to my personal opinion. It was hard to implement elements from a drawing to 3D, since you can "cheat" on certain things when purely doing a photoshop render.

3



Slowly it started to look like something. At this stage I had spent maybe few days on the model. It was quick to do things and this gave more motivation since I didn't get bored to the modeling. Here its almost at the point of adding thickness and duplicating surfaces.

5



2

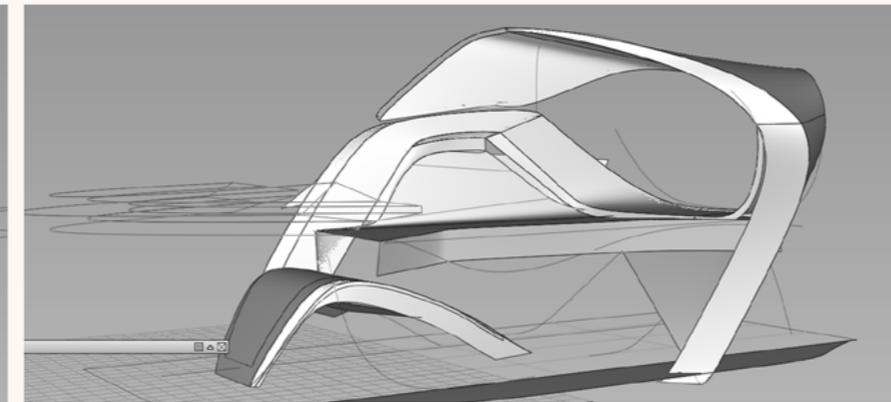
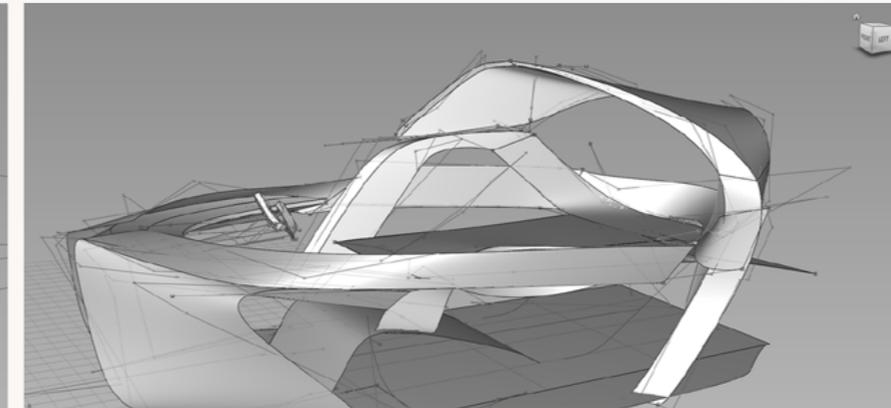
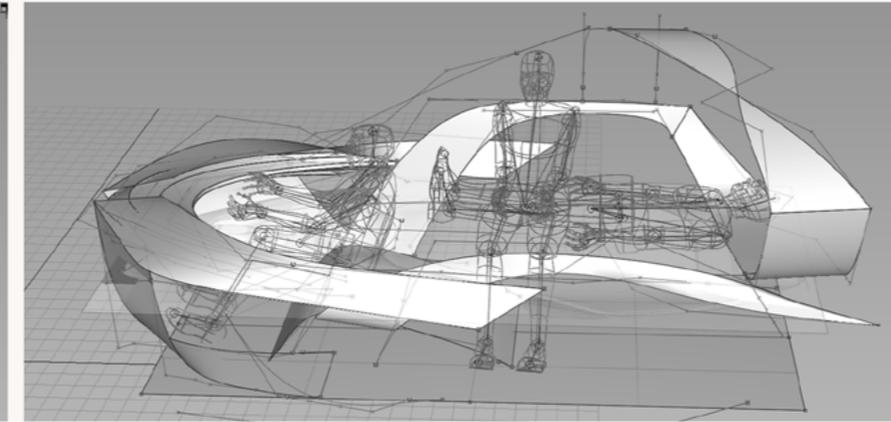
Almost immediately I put the mannequins inside to see the first glimpse of reality, so to say. Infact, Some things needed adjusting. For example, it was hard for me to realise the depth of the vehicle and how the guys would fit inside.

4

As you can see from 3 & 4, I varied the main sculptural elements. I wanted to have more continuous form with the curve, so I ended up with the 4th option.

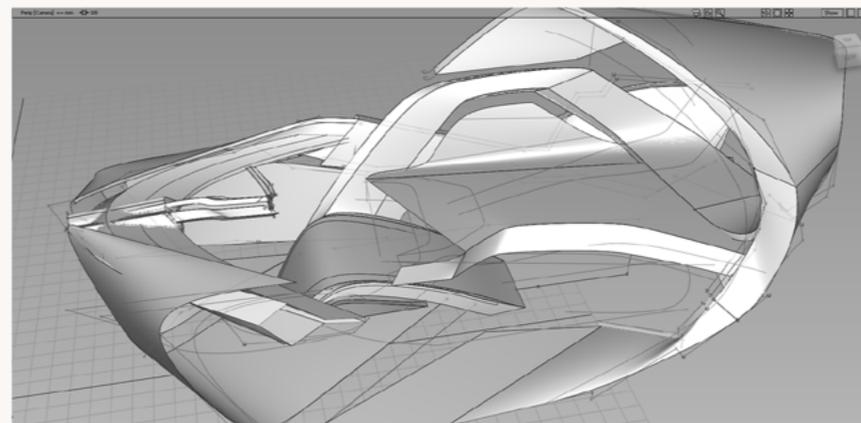
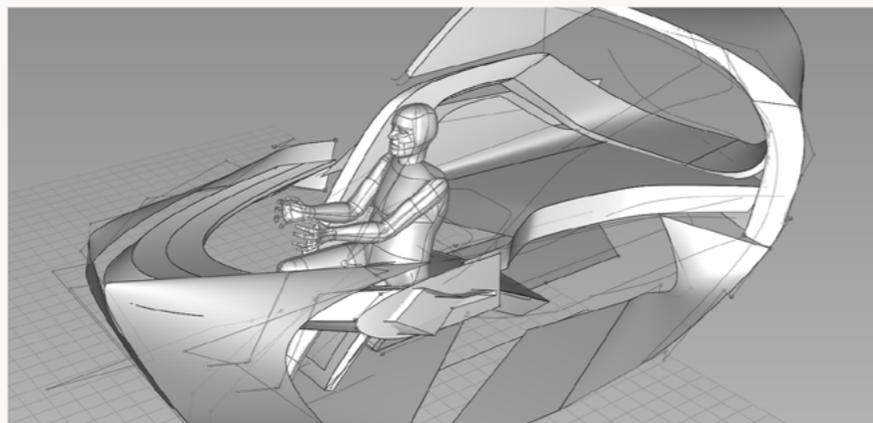
6

For now, I had already finished the first mockup of the bed / capsule part.



The basic structure is ready here, and I needed to start think about the dashboard. As I was combining different elements from the sketches that I made in the previous phase, it was a little bit of a struggle to combine everything design wise.

7

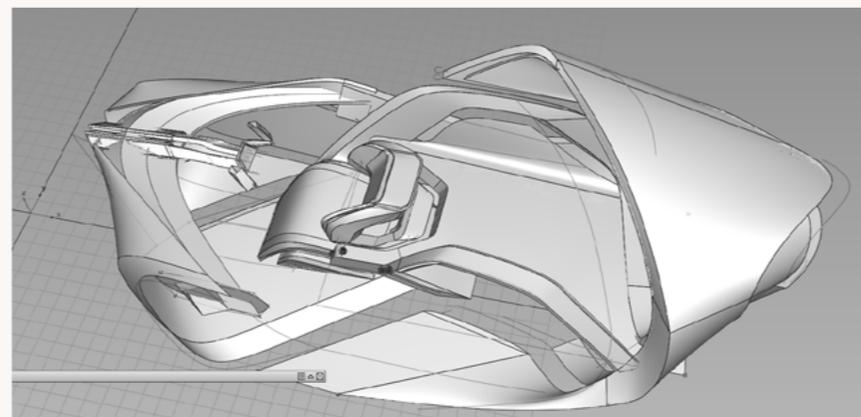
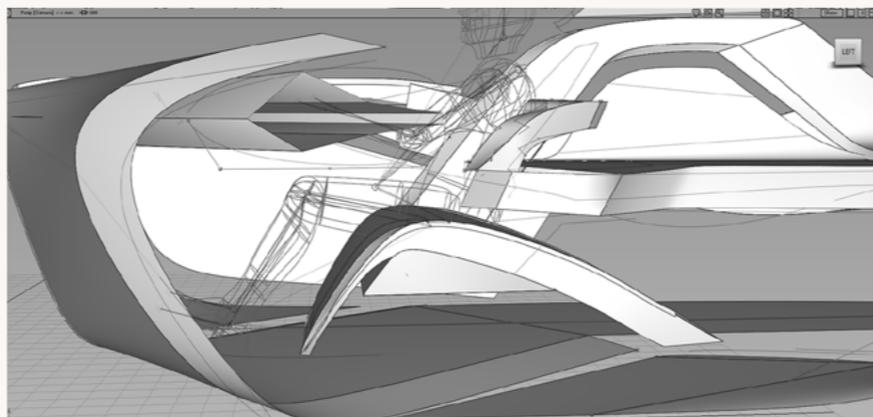


8

You can see that there is a mockup of the steering wheel and how it would connect to the dashboard. It seemed quite fragile and the form language was now different than in the rest of the vehicle, so it needed to be solved, which didn't happen for a while.

I was pushing forward the time to start modeling the bench and back support because I knew that it's going to cause me a headache. I used the one of the proposals as a reference for the bench.

9

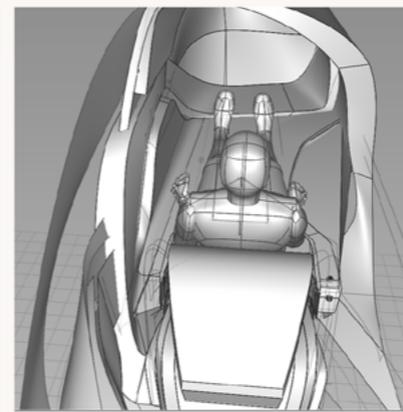
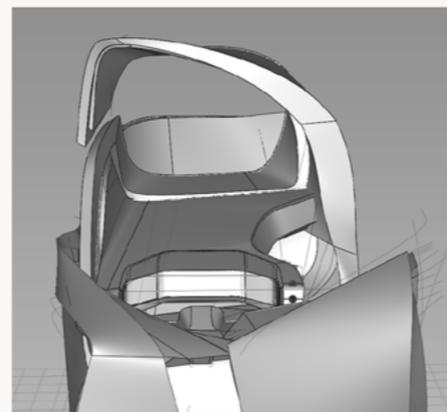
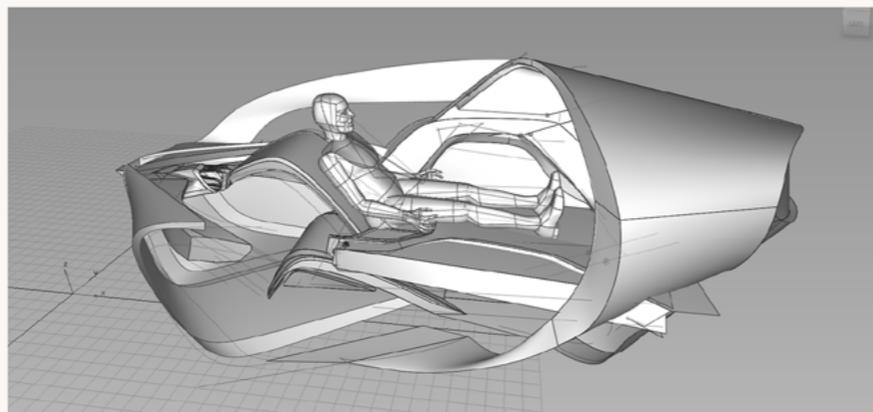


10

After some time, the bench was starting to look like one. There were lot of problems with the actual form since it theoretically has to work, and the problems needed to be solved. This meant that I needed to change / add some parts to the bench, but the overall design stayed quite the same.

I was discussing about the purpose of the vehicle with my mentor Miika, and it came out that the vehicle was still too driver orientated. We thought that it's good idea to make it more centered towards the autonomous mode. We solved this by adding a function for the lower seat part. Now it had a possibility to be a divan-like seat also.

11

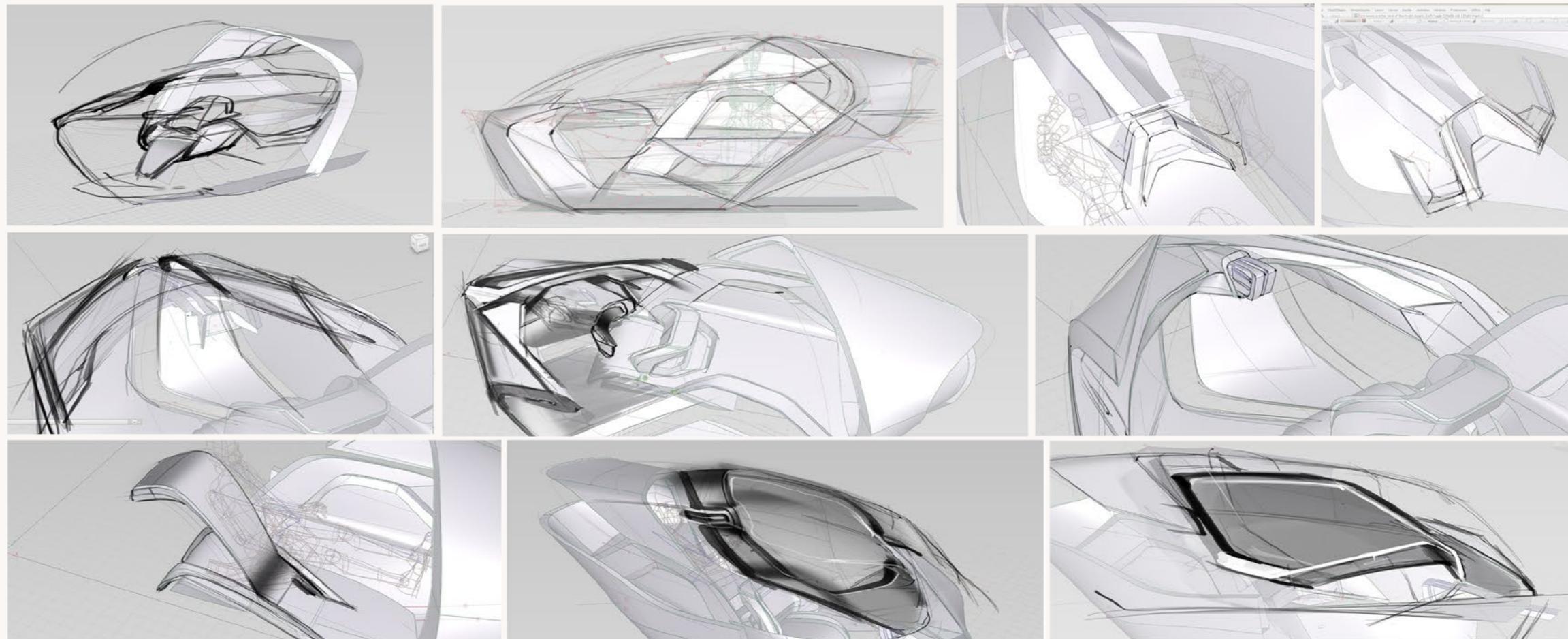


12

I got feedback that the model was too wide considering the context and pod hotel likeness. Somehow I had gotten blind for these kind of things and didn't see the bigger picture. Little bit of narrowing down the model and it was good. Luckily, these modifications are easily done.

alias sketching

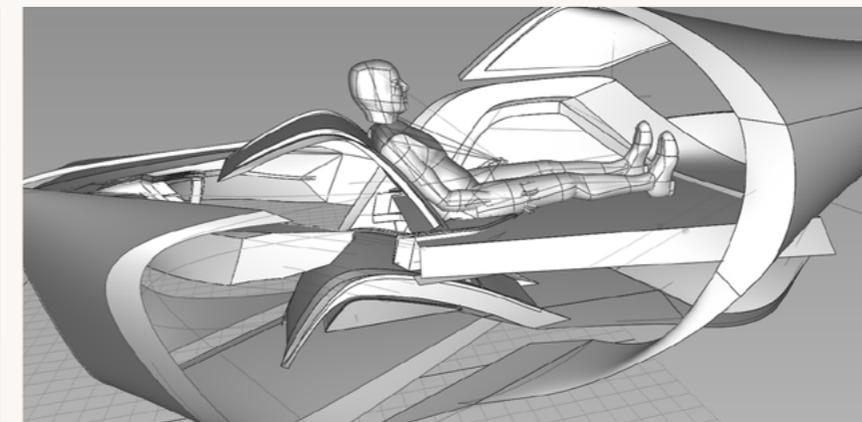
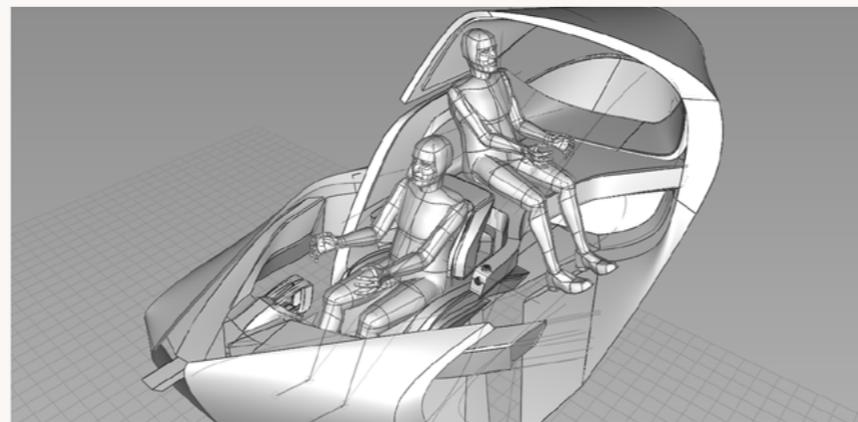
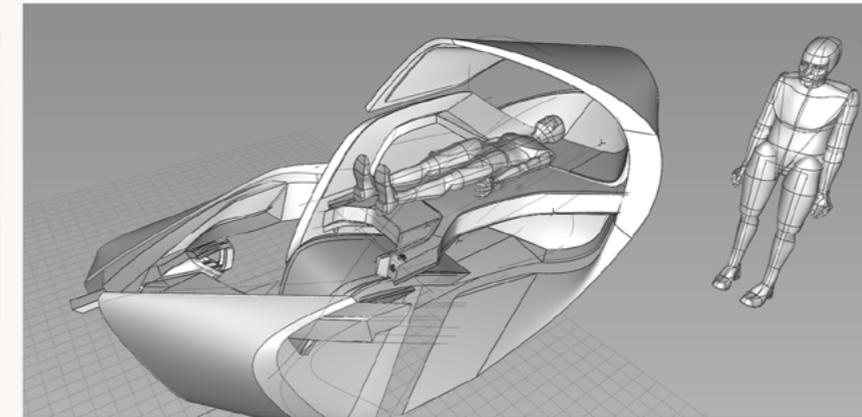
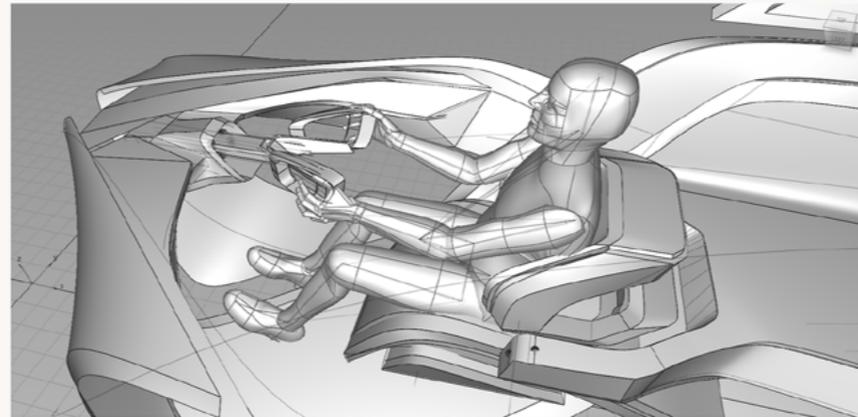
Here you can see how I used Alias as a tool for developing the design. If I had some tricky parts or knots which I couldn't solve by modeling or twisting the model, I took a screenshot and started to draw on top in photoshop.



alias summary

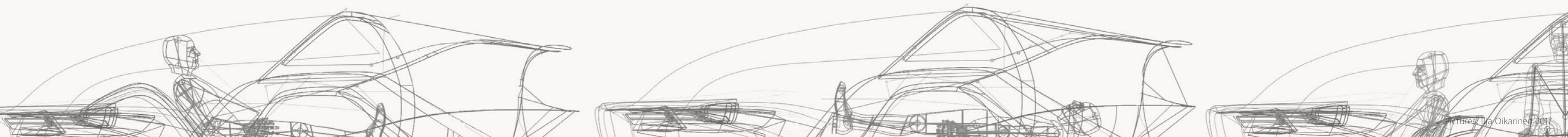
It took approximately two weeks+ to take the model to the stage where it is now. It was partly really slow because I was using the software as a tool to design, which, is always slow. At the stage where it is now, I can use it solely as an underlay and develop details and other little things.

I will continue with the model and my plans are to get it in a phase that it can be seen through VR-goggles.



Chapter 4

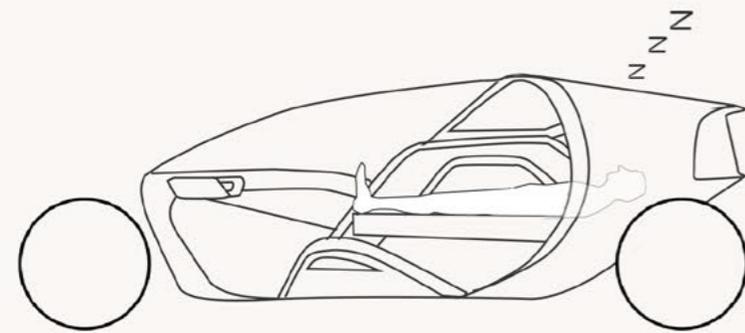
the concept



4.1

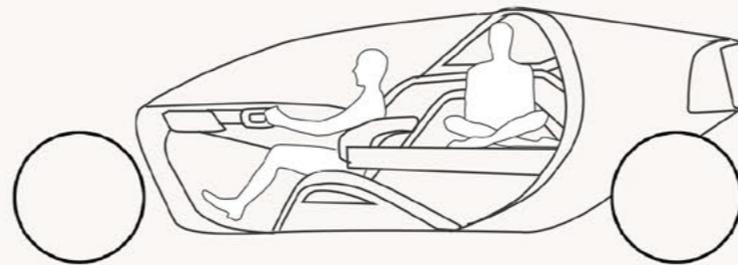
final concept

Here is my concept presented in its final form. This includes explanation pictures about the functions but also user scenarios and technical drawings.



sleep mode

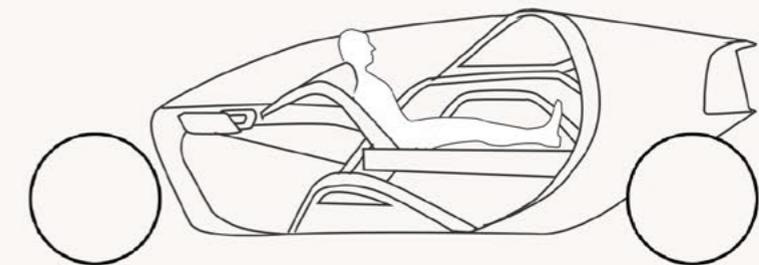
 vehicle can stay put or move while passanger sleeps



drive mode

 bench turns into a back support and the steering wheel is pulled out to activate the driving mode

 back support is formed from the end of the bed



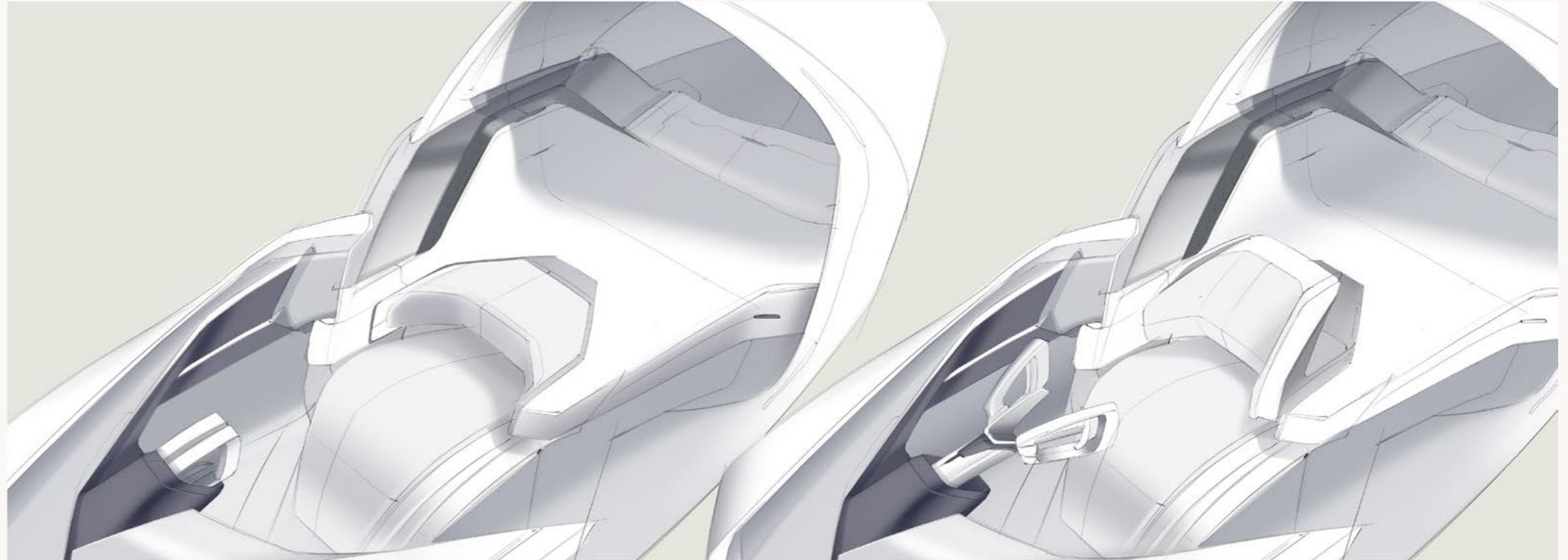
relax mode

 bench turns into a divan like -back support

 used when hanging out or while the car is driving itself

seat & steering wheel

As what it comes to the interior as whole, it is an interactive entity. The idea is that when you do something, it has consequence and a result. As an example, if you want to enable the driving mode, you need to pull out the steering wheel. By doing this, it activates the seat support resulting it to come up.



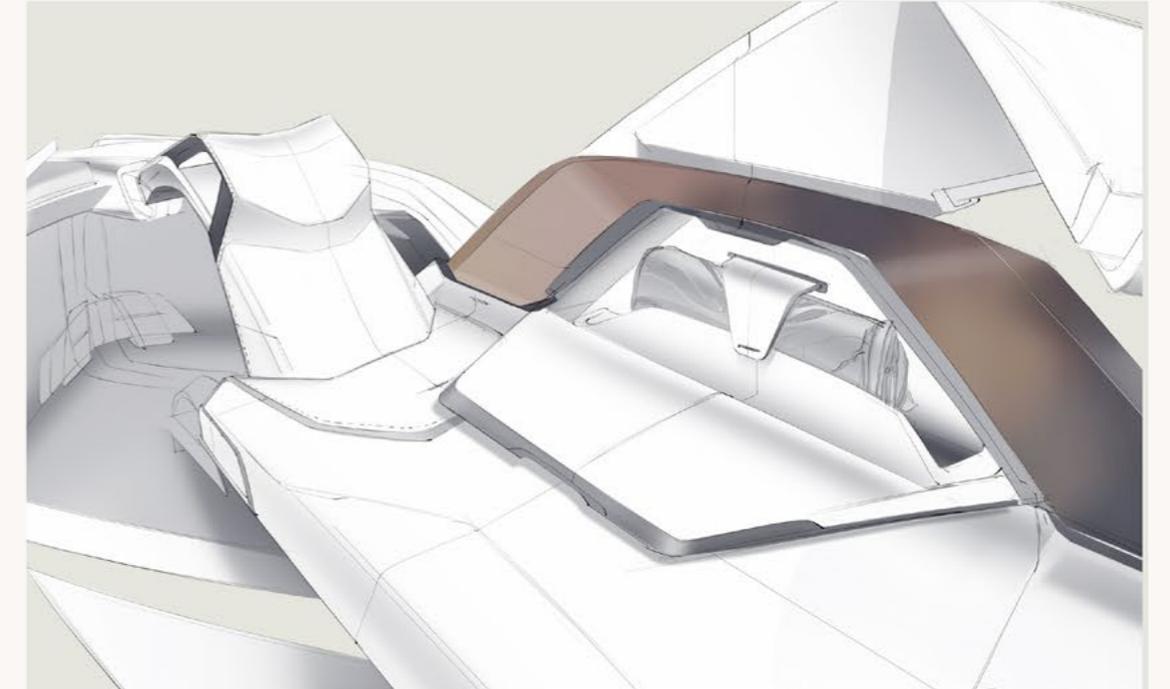
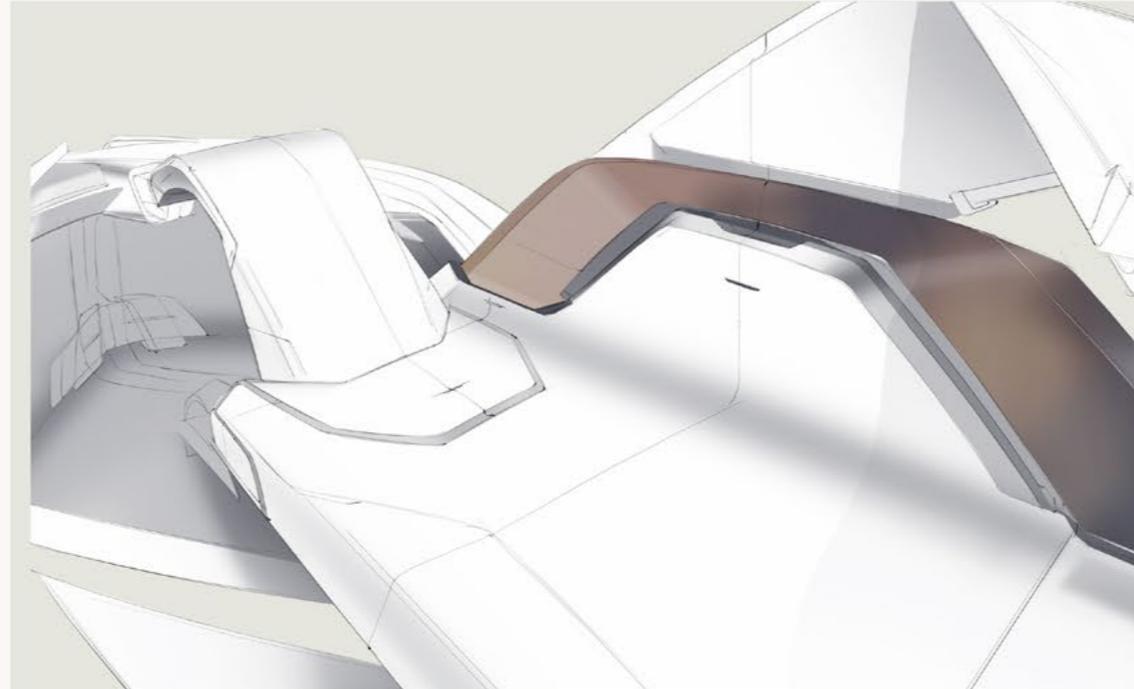
seat function

For the lower seat part, it has a mechanism inside which rises part of the seat up, forming a lounge seat support for the bed. When it has risen, it can also activate a soft headrest, if needed.



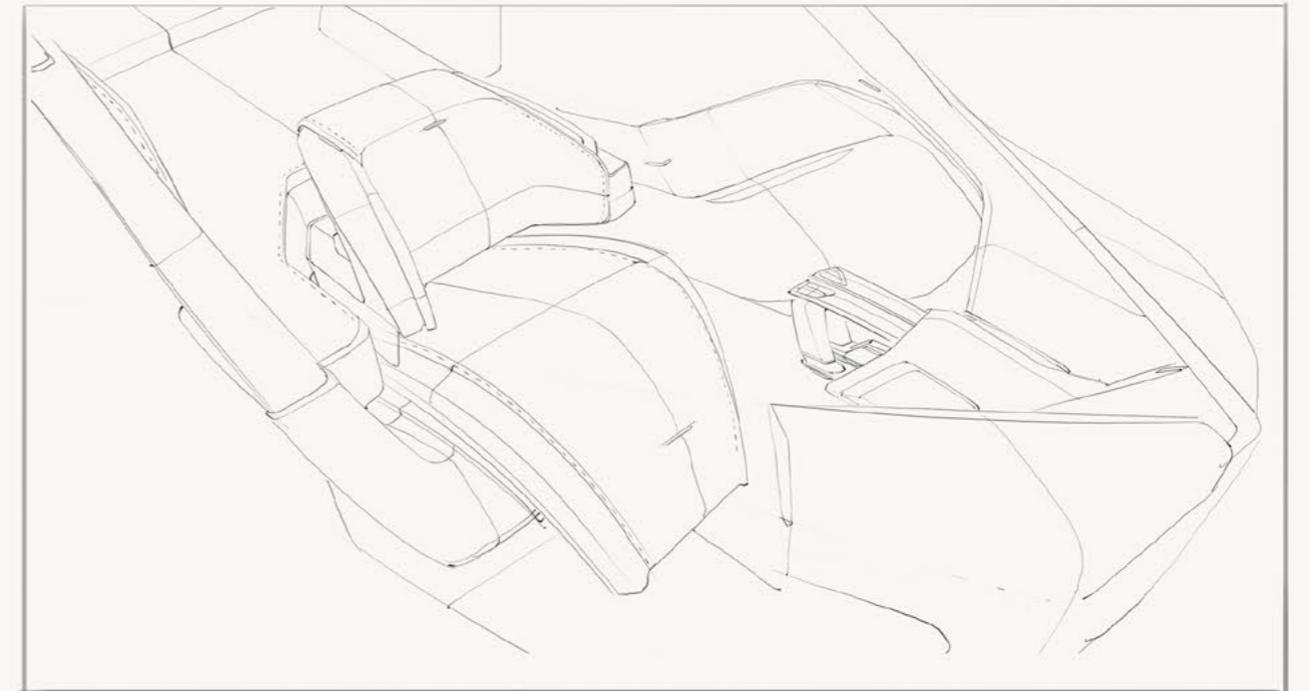
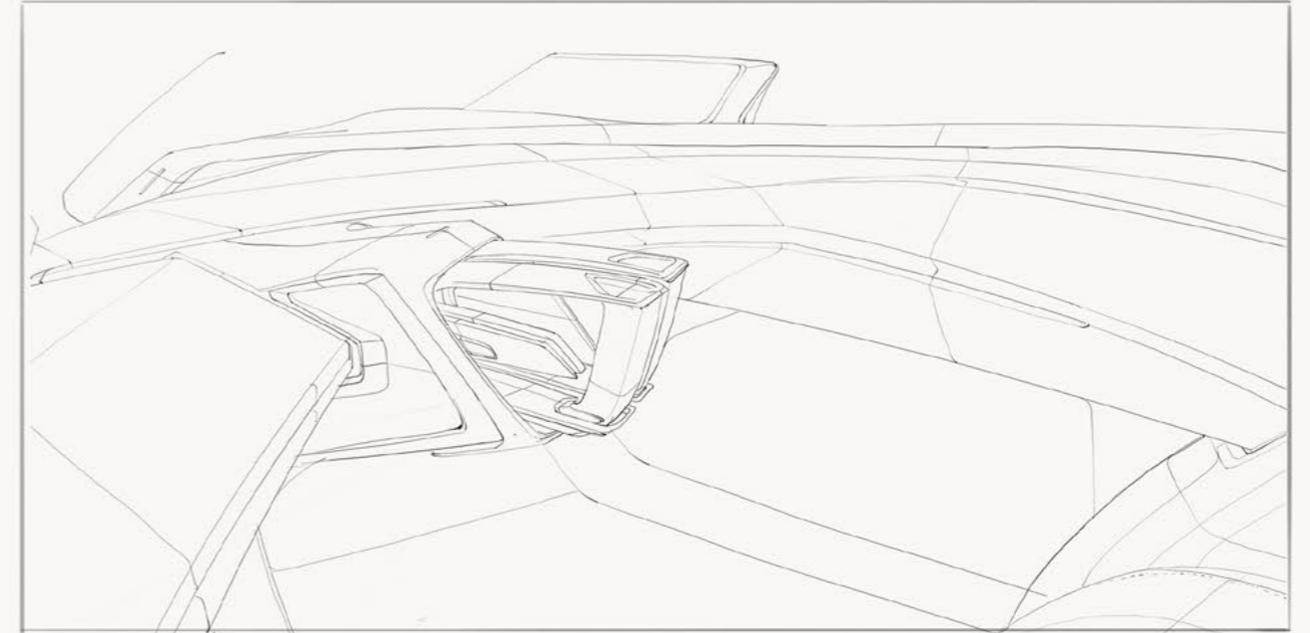
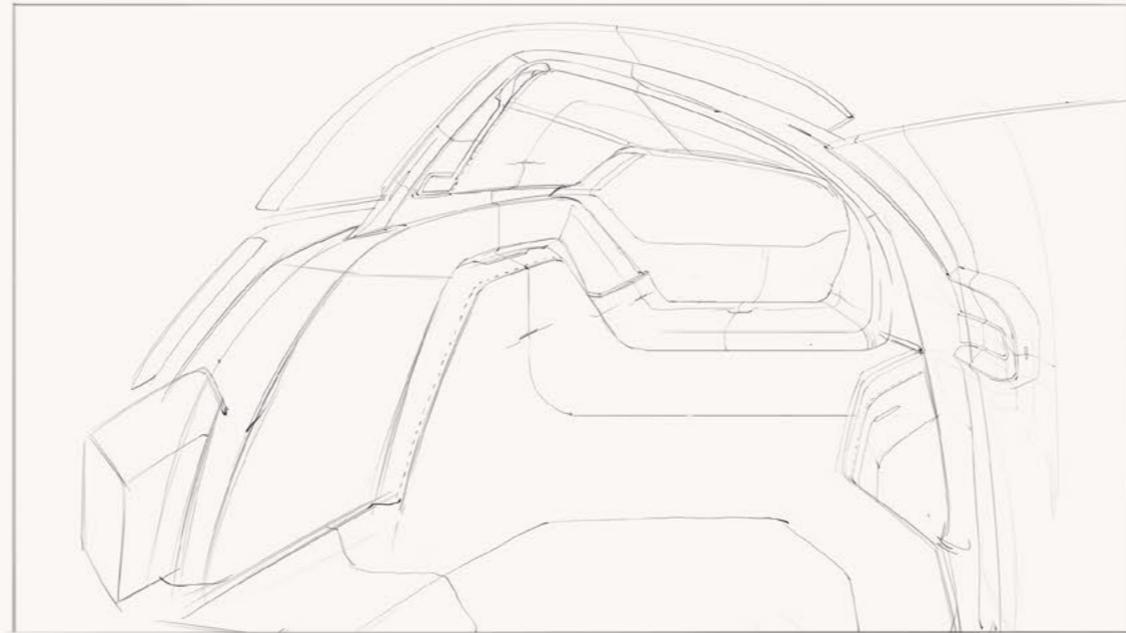
wall function

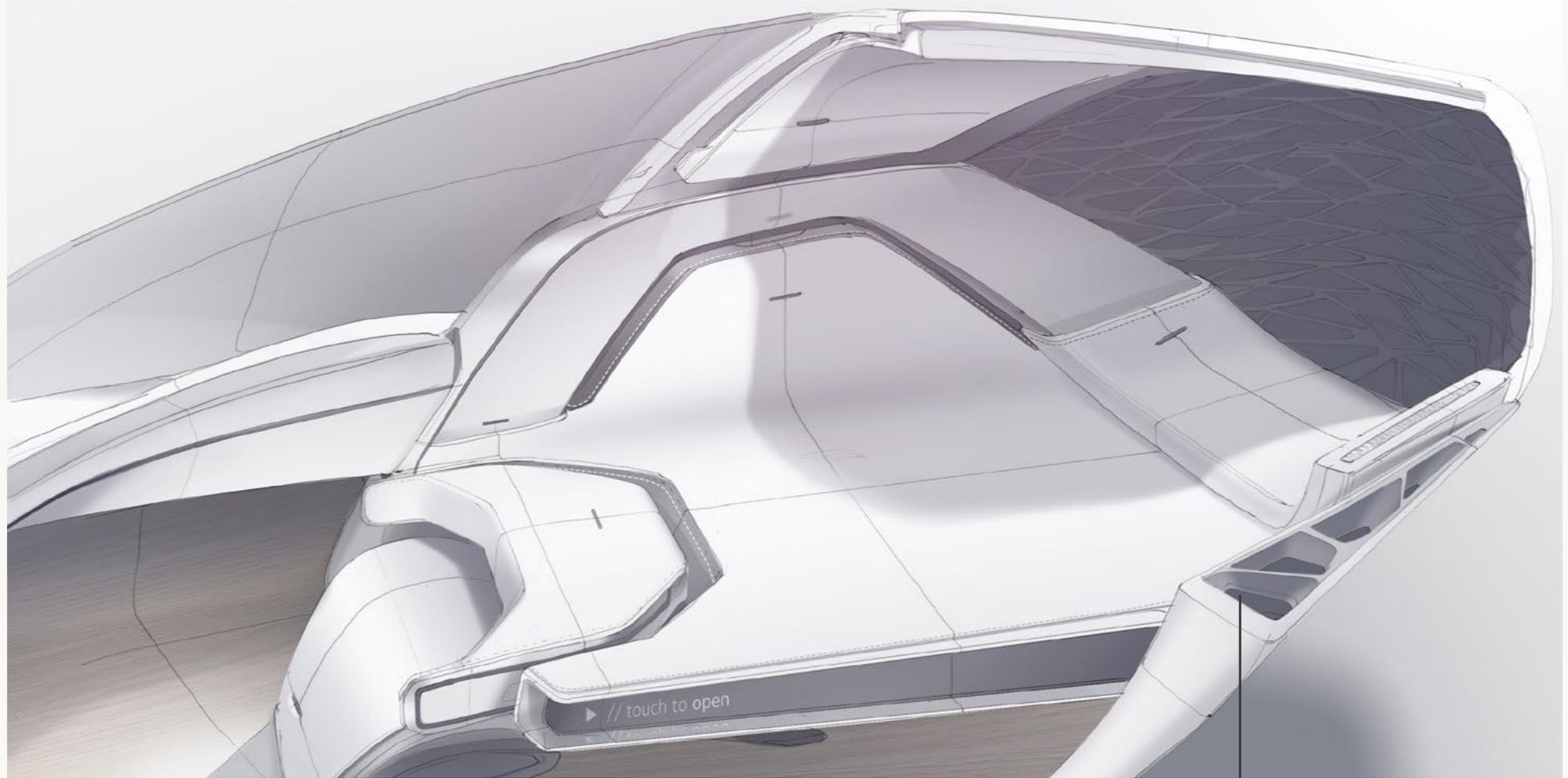
As being a minimalist interior, I don't want to put a lot of items inside, but the most important one is indeed a blanket, and it is hidden inside the wall.



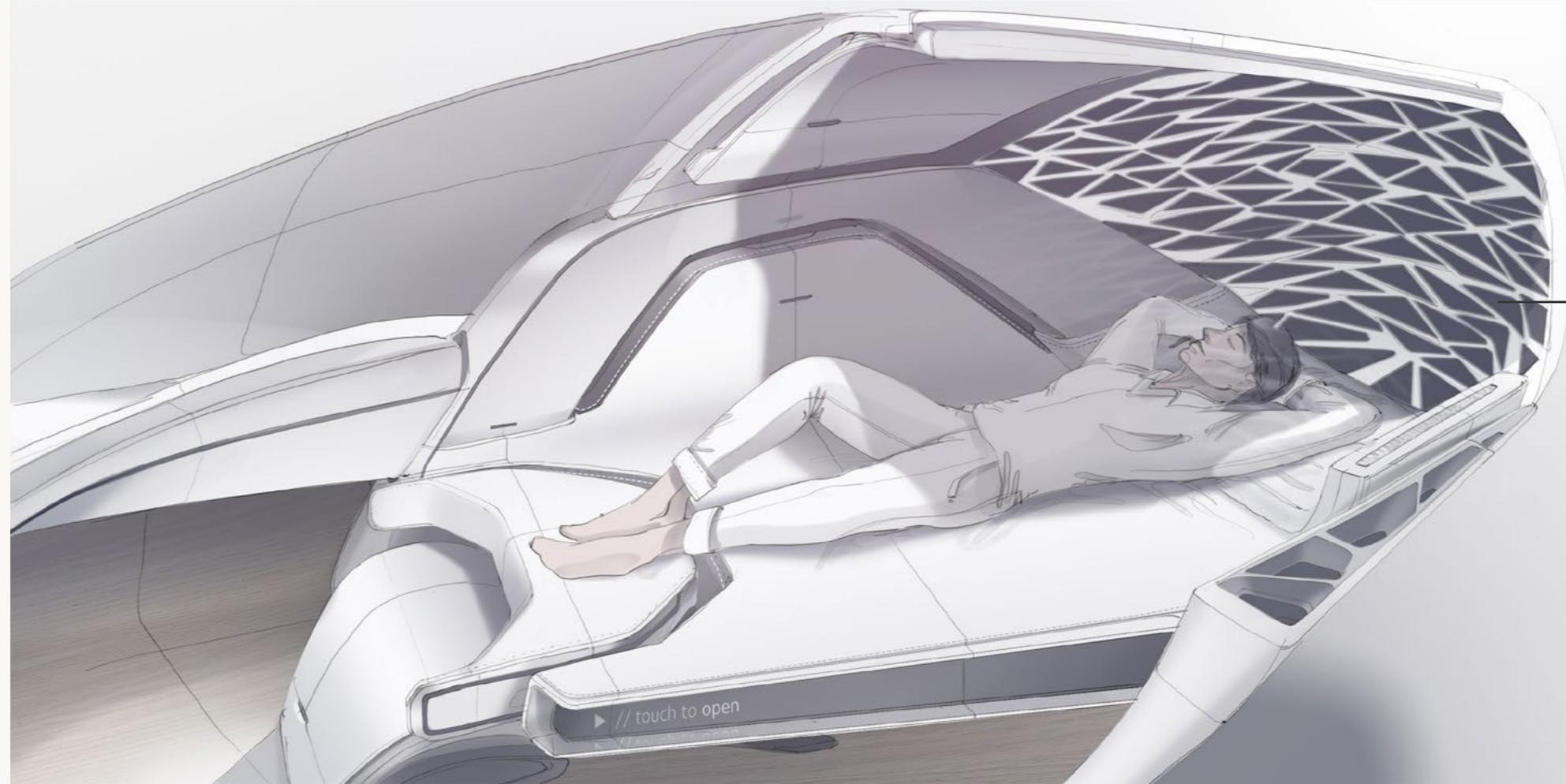
collected sketches

I have collected a few different sketches here, also to show the design.

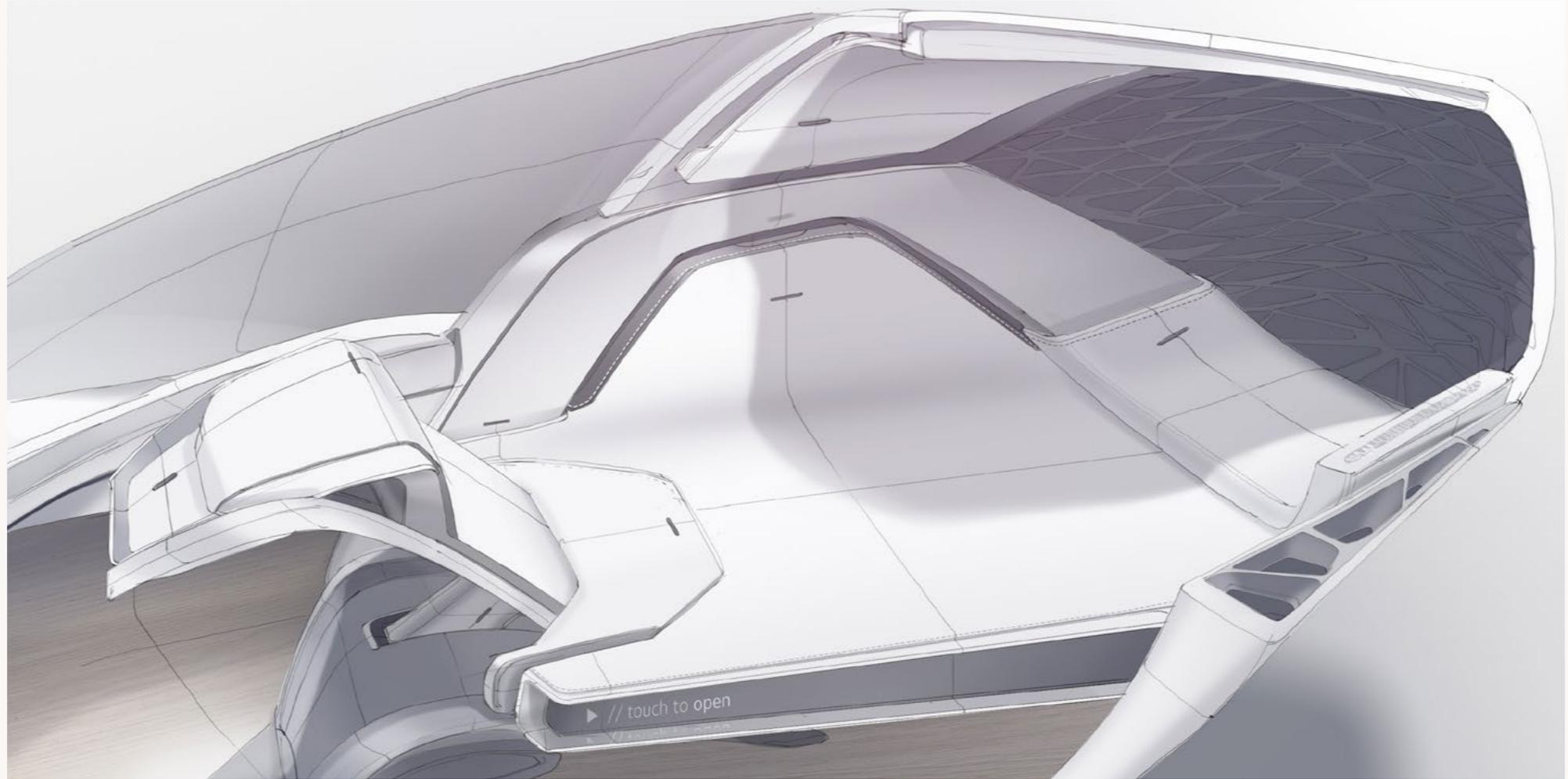


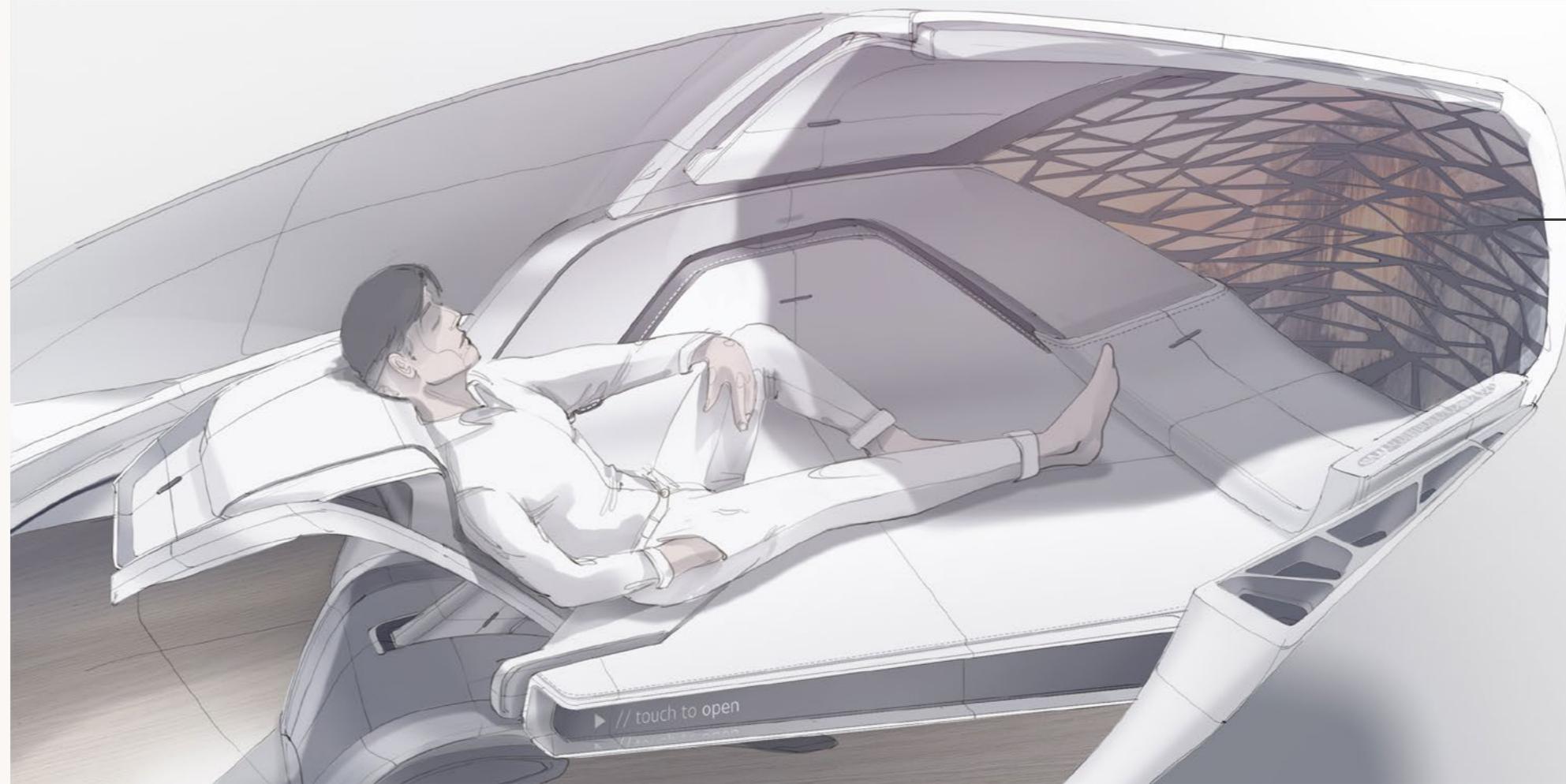


light structure inside the frame



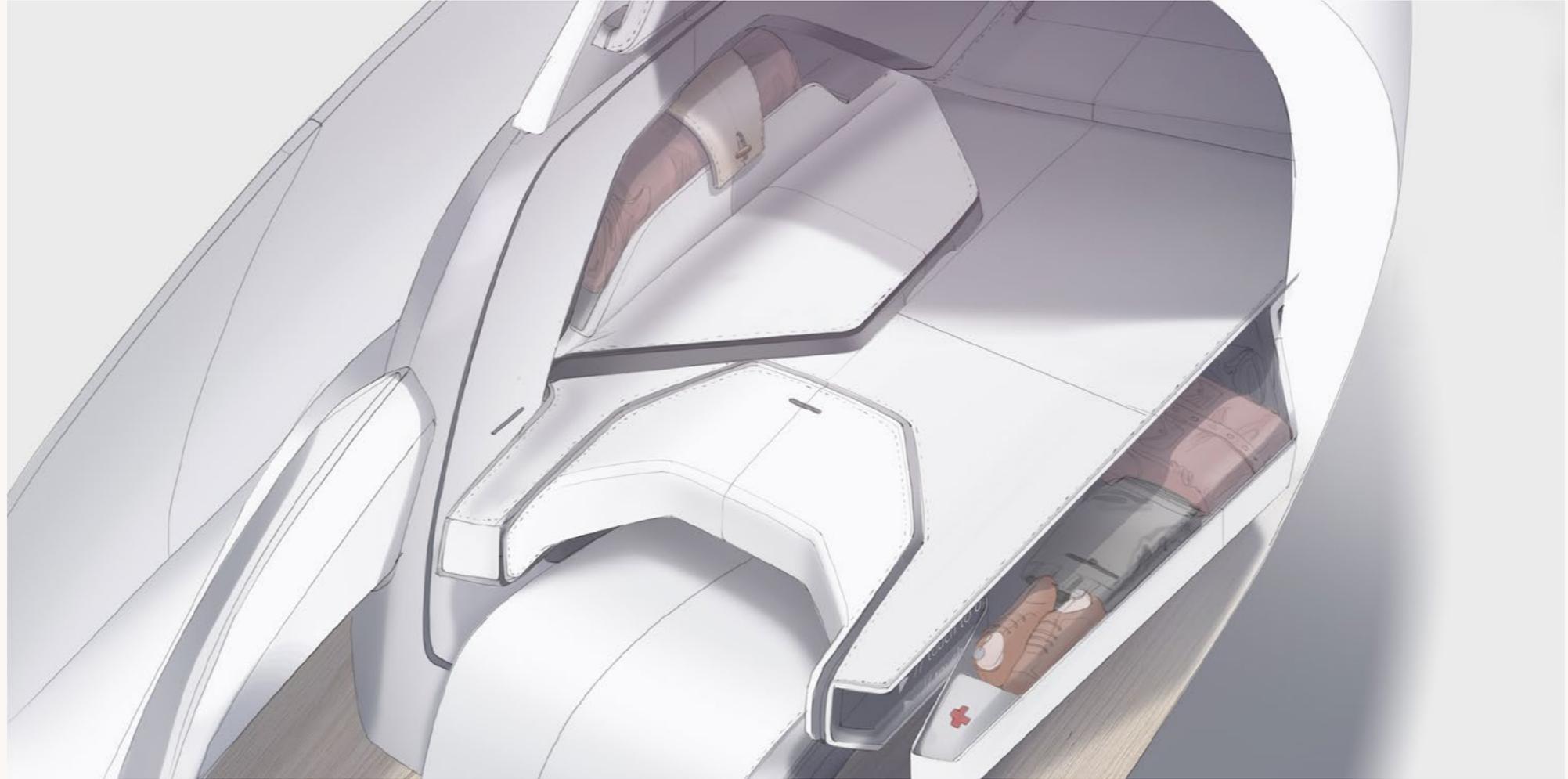
ambient light is on when
user is sleeping or relaxing



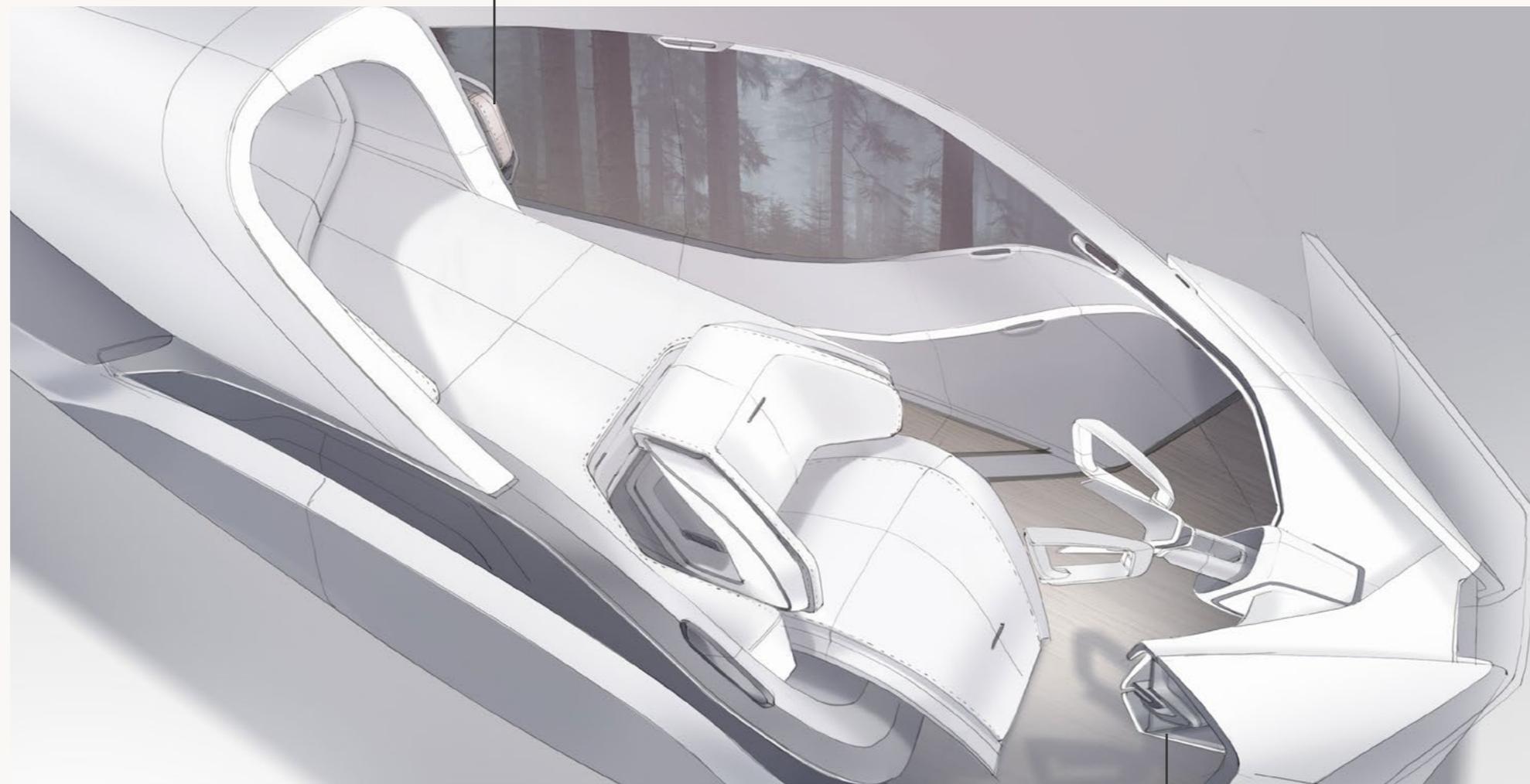


diamond shapes form a screen
to view

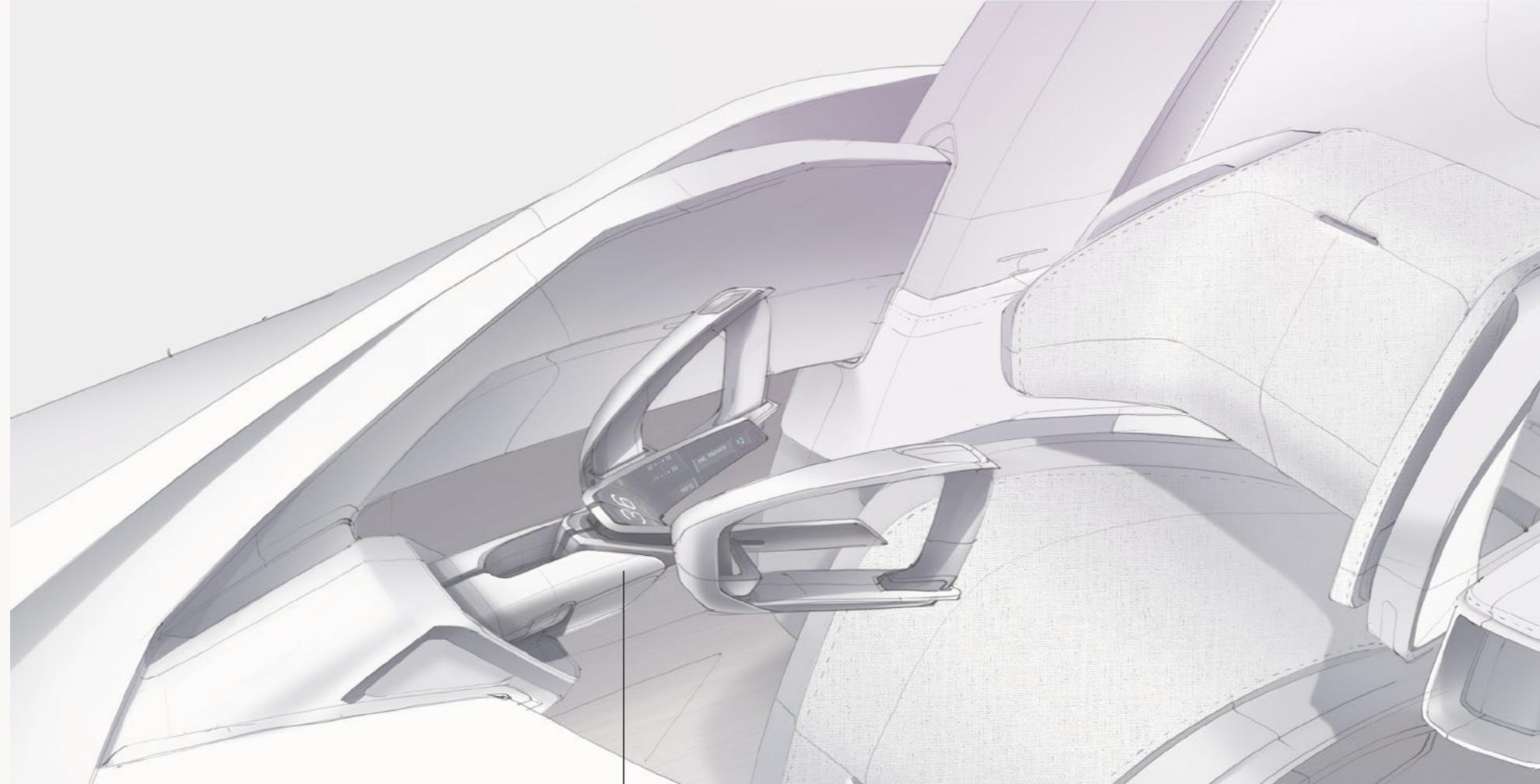




door handle

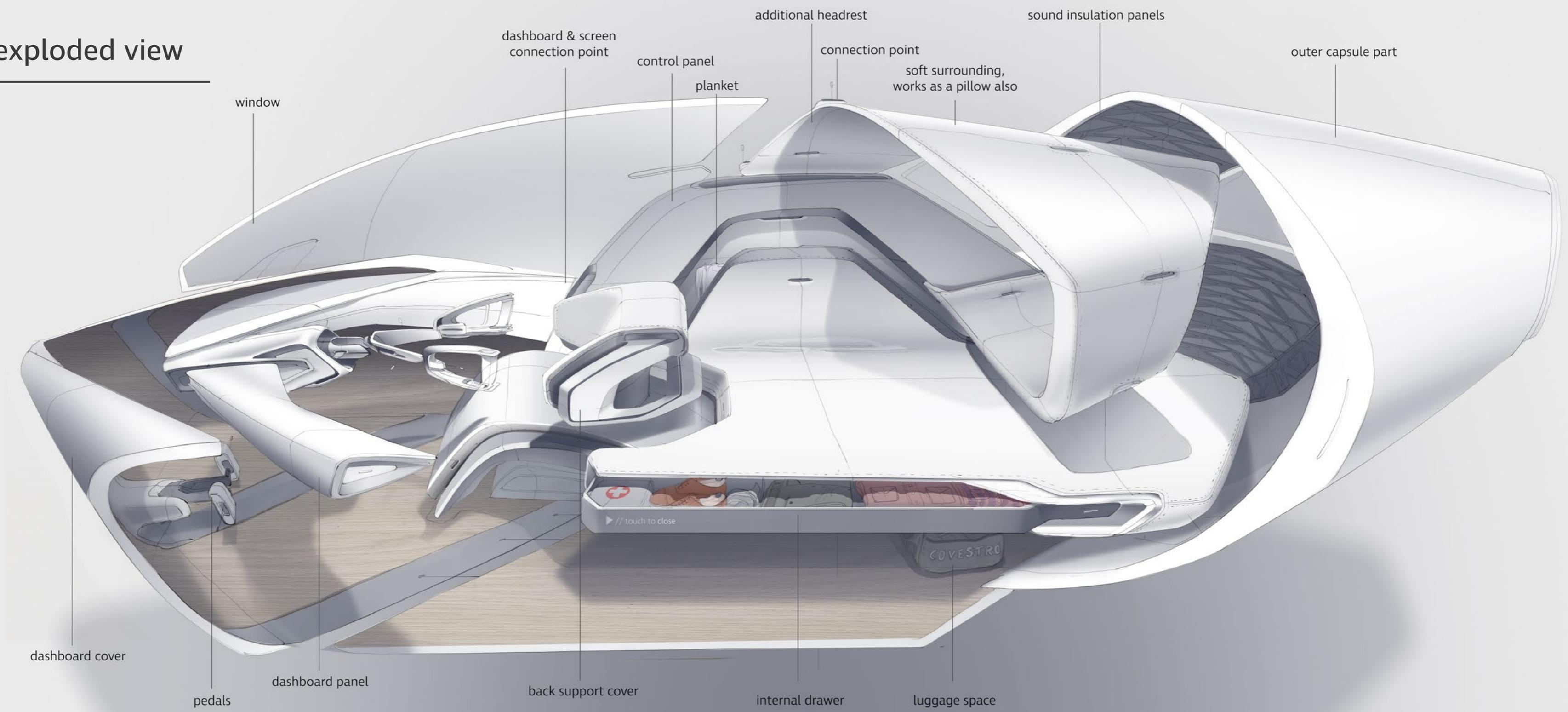


air vents



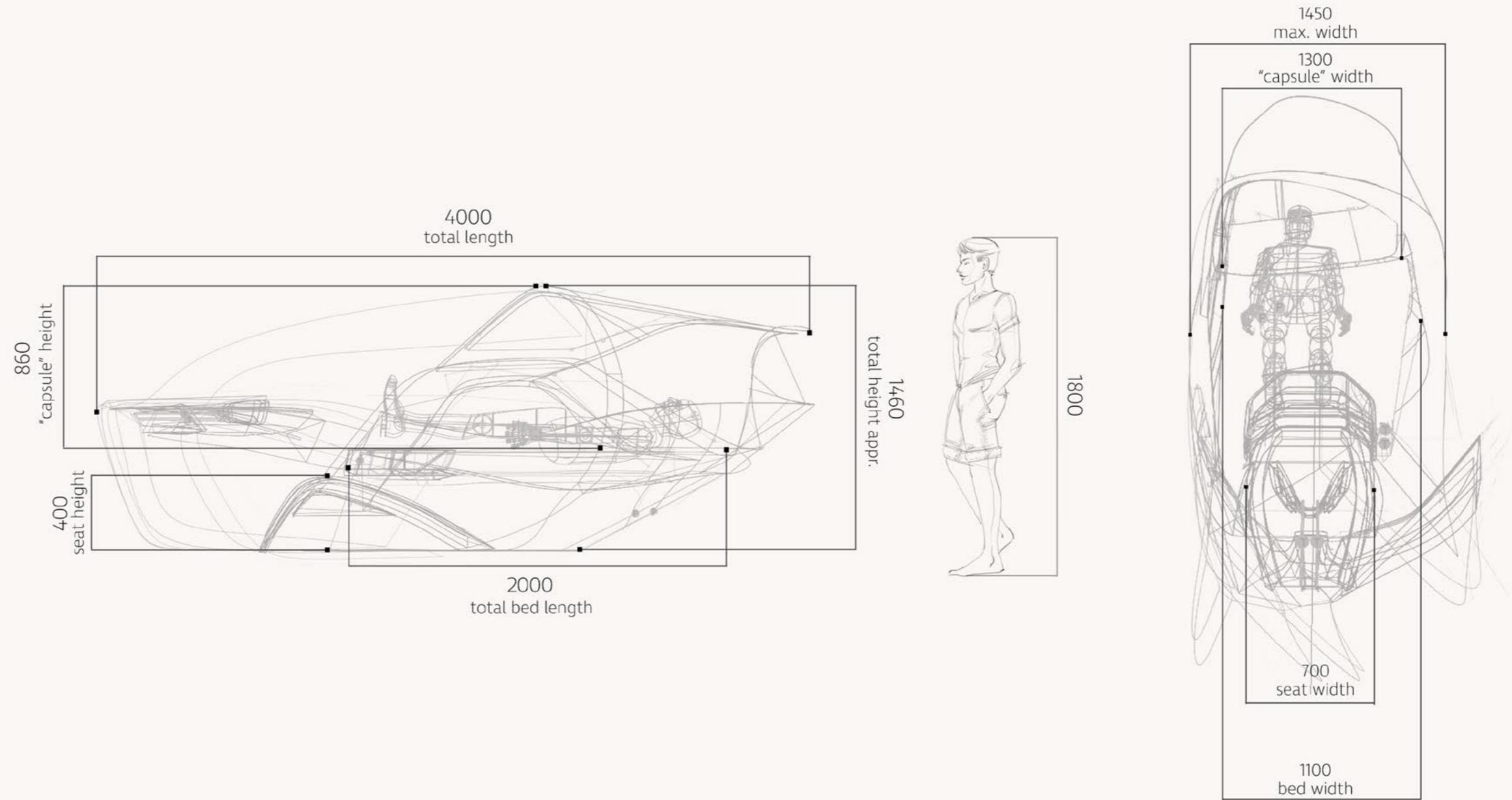
foldable steering wheel

exploded view



measurements

Here you can see the approximate measurements, which the interior has. Of course, the measurements would and will be different when the exterior is taken into consideration also.



Chapter 5

evaluation

process & methods

For me, this project has been maybe the most demanding and challenging yet to come. If I'd had to pick one possible project which would mean the most to me during my studies, I think it would be this one. It hasn't always been nice and frustration has been felt more than once. I've learned many new things and ways to do things. There is no exact way to do things, but many, and even then things can be varied and sometimes things don't work out the way you would like to. You just have to adapt and make the best of it. At the end of this semester, I will not be the best interior sketcher, but I'm going to be the best what I can be, for now. Even though the design process is approximately same than doing an exterior, the variable elements which were formed by my inexperience, gave me a whole bunch of knowledge. As the modeling stage began, I quickly learned perspective tricks and my eye got more used to looking and sketching interior also. The process isn't completely over yet, but I am confident and happy with this fantastic opportunity which I've had, being able to do this project and learn something new.

result

As said already, I think that this particular project has had a significant impact on myself as a designer. It made me insecure and weak when it came to the fact of not knowing something. It forced me to push myself forward, and by doing this, I started to believe myself. As often designers work is judged by the visualization and final product, the process inside is left away from the equation. This "invisible" part has developed in my set of skills a lot, which I am more than happy for. I can see better that how much I need time for certain stages and how to listen to my intuition when it comes to making decisions or feeling insecure.

acknowledgements

I want to thank these persons for helping me with this project. Without them, this concept wouldn't exist in this form by any means.

**Antti Vahtola & Mika Niskavaara,
Miika Heikkinen,
Daria Ivanova,
Lee Walton.**

Thank you.

sources

images

Pages: cover, back cover, info, abstract & table of content

Photo: < http://www.wallpapervortex.com/wallpaper-26898_cityscape.html#.WOyaQPnyhhE >. 11.4.2017

Page: Introduction

Photo: < http://www.signabc.com/images/home/2000_700_sh.jpg >. 17.4.2017

Chapter 1 / Covestro

Photo: < <http://www.rp-online.de/nrw/staedte/leverkusen/covestro-spitze-strotzt-vor-zuversicht-aid-1.5789238> >. 17.4.2017

Page: brief history

All photos except Photo 1: < <http://www.covestro.com/en/company/history> >. 11.4.2017

Photo 1: < http://www.seamlessdesign.covestro.com/-/media/covestro/landingpages/emobility/images/bild_1800x1200px_seamless_design.jpg?la=en&hash=00B324A14AEBF9C2070A77DF500E1D128D9501FA >. 11.4.2017

Page: Product portfolio k67

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Page: Product portfolio k2016

Photo 1 : < http://www.products.covestro.com/~/_/media/Product%20Center/EntryPage/Images/Newsletter%20Archives/Automotive/2016/11/website/stand_out_with_seamless_design_02.jpg >. 11.4.2017

Photo 2 : < http://www.ptonline.com/cdn/cms/Kblog_day1_Covestro_car.JPG >. 11.4.2017

Photo 3 : < <http://www.britishplastics.co.uk/downloads/3209/download/Covestro2.jpg?cb=f5eb51bc074af11524926c4094decac3> >. 11.4.2017

Page: when and why?

Photo 1: < <https://teknosafari.com/wp-content/uploads/2016/08/t.jpg> >. 11.4.2017

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spoken

I've had multiple conversations with **Lee Walton, Miika Heikkinen, Mika Niskavaara, Antti Vahtola** and with the people of **Covestro (Ulrich Grosser & Ciro Piermatteo)** during the spring semester. They have granted me a knowledge and information among varying topics. I can't specify the exact topic of these conversations, but they have had a great impact to my graduation project by influencing my subconsciousness and thinking.



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pod-car concept for 2030