THANK YOU!

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Last but not least, a great thanks to the two most important women in my life, who suffered the most during this journey and stuck with me through thick and thin with all their energy. Danke Mysza und danke Mama!
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What if the future of transportation was more diverse, more exciting and more responsible? What if Volvo became a true mobility provider with a broader product palette? What if the airship would finally get its great renaissance and what would it look like if Volvo developed it? With these questions in mind, I started my thesis and eventually designed an airship for Volvo. The word Volvo is derived from Latin and means “I roll” which inspired me to pick the name “Volem” which is equally derived from Latin and means “I fly”.

The focus of the degree work is transport in tourism and the final concept is a holistic service design for continental round-trips provided by Volvo. It is not just an airship but rather an entirely new way of traveling suited to the needs of future tourism. A journey of this future should be environmentally responsible, experientially enriching, educational and exciting. The key to this future is “Volvo Volem”. “Volvo Volem” has a comfortable main deck, an extraordinary lounge and an observation balcony which provides an unforgettable experience with its views.

During the design process, I conducted some research in the field of tourism and in LTA (lighter-than-air) technologies. I used traditional design tools like sketching and 3D-modelling to refine my ideas. To get an impression of the interior I got the opportunity to test the geometry in virtual reality, which turned out to be a very helpful technology with increasingly indispensable characteristics in the design field.

“THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT”

ABRAHAM LINCOLN
THESIS INTRODUCTION // 
VOLEM // AIR TRAVEL BY VOLVO

Like many others I see myself as a transportation designer, not just as a car designer, therefore I have a very strong interest in any means of transport. The car always has a special position in my point of view. It’s not about four wheels or childhood memories, the biggest difference for me is the effort invested in the emotional aspect of the product. In no other product design field you get the same amount of time and budget for finding the perfect shape and style.

Nowadays we are facing a lot of problems, especially regarding climate change, environmental pollution and irresponsible waste of our resources. That makes the longing for a “better product” grow. Knowing that changing the world is an ambitious plan and most likely a pretty complex matter, I would like to illustrate at least a vision of a more friendly and responsible future for transportation.

Some historical documentaries let my interest in lighter-than-air technology grow and with the visit of the Zeppelin Museum in Ludwigshafen, Germany, I finally became fond of the idea to focus on an airship for my thesis.

During my first year I worked on a project which targeted the transportation part of tourism and since then I’ve always had a special connection to that field. With the support of my girlfriend who is studying tourism management that connection reached the top. So it was evident for me to combine these fields of interest for my thesis.

It should also be mentioned that my focus during this project will be on the interior although I am aiming for a quite holistic result.

Since we had a project in cooperation with Volvo cars I got to know the brand even better and later on I had the opportunity to gain deeper insight through an internship. During these six months I became familiar with their work philosophy and the designers. I really enjoyed the time and realized that my project was a good match for the brand.

Volvo is known for safety, innovation, their care for people’s needs and last but not least for excellent design. All these aspects play an important role in my thesis work as well.

After the well-known accident in Lakehurst 1937, which still influences peoples opinion about airships, Volvo could establish a new, trustworthy image for them and finally conquer the skies with excellent design as well. Even if it is hard to imagine that Volvo is developing airships from scratch in the future, for me it seems not too far-fetched that a cooperation between different manufacturers could happen. The process of designing an airship could lead to fresh ideas regardless, especially if it comes to autonomous traveling. Some new ways of thinking might be applicable to the future car interior since it is facing great changes in the near close future.

"I HAVE NOT TOLD HALF OF WHAT I SAW."
MARCO POLO
This makes “lighter-than-air-travelling” very interesting:
Since the physical principle makes it possible to float in the sky without needing energy, you just spend energy in “pushing in a direction”. This could be very efficient and a lot less harmful to the environment compared to other kinds of flying.

Point to point transport with simple infrastructure is another strong aspect that could enable travelling without annoying commuting time from airport to destination. With just minor investments airships could more or less dock everywhere you want.

Airships are able to hover in the same position for hours without significant energy use, so they could provide perfect conditions for an outstanding and maneuverable viewing platform.

Since tourism is growing at a phenomenal rate it might be one of the most attractive fields for a mobility provider in the future. Especially because tourism and transport are inextricably linked.

Sources: Inrate 2013. Data from World Travel & Tourism Council 2013 / World tourism organization (UNWTO) 2013 / UN 2013
Transport in tourism has a tremendous problem in being sustainable. Environmental awareness of people is growing but it won’t hold the majority back from travelling.

I never imagined I would one day quote the pope but he said something very relevant.

Pope Francis said: “The planes pollute the atmosphere, but with a fraction of the sum of the ticket price trees are planted to compensate for the damage inflicted. If this logic were extended, one day it would come to a point where armaments companies set up hospitals for those children who fell victim to their bombs. This is hypocrisy.”

(Sueddeutsche Zeitung 17/02/04)

Comprehensive research shows that besides some efficiency tweaks there is no big change in sight. CO2 emissions from plane travel will grow which makes me ask why there are no bigger investments into alternatives.

(Wikipedia: Environmental impact of aviation, 17/12/13)

The middle class, especially in Asia, is growing and the desire for some premium experiences and products will not decrease which is another unfortunate fact when it comes to emissions in air travel. In the future there will be a growing demand in air travel and also a bigger demand in premium class travel which is estimated to doubled emissions. (IATA: Carbon Offset Program 3.6)

Planes are not the only problem, large cruise ships, for example, also have a terrifying impact on air pollution and climate change. This is pretty well illustrated in the graphic below.

The demand for premium experiences and products will grow with the growing middle class and the necessity of sustainability is undeniable. There is obviously a big need for a product which enables an exceptional experience with the smallest possible ecological footprint.

Once the airship is an established sustainable platform for mobility, one could raise the question “how can the actual use of this vehicle improve current mobility systems and create user experiences that are sustainable as well?”.
TOURISM IS THE BUSINESS OF PROVIDING SERVICES SUCH AS TRANSPORT, PLACES TO STAY, OR ENTERTAINMENT FOR PEOPLE WHO ARE ON HOLIDAY.

(CAMBRIDGE DICTIONARY DICTIONARY: TOURISM 18/01/05)

BRIEF HISTORY OF TOURISM

2,000 years ago wealthy citizens of ancient Rome decided to spend their summers away from their city and went to the coast and countryside.

An early version of the tourism industry developed through people catering these travelers and ended with the turbulent economic, social and political situation in Europe which made frequent, safe travel impossible.

Between the 5th and the 15th century, tourism again appeared in the form of pilgrimages, which explains the wording holiday which comes from “holy day”.

Hundreds of years later tourism evolved into something else for those who could afford it. People began to visit the spa and seaside towns of 18th century Europe to benefit from the spring waters and fresh air and others, mostly English, took educational holidays to study paintings, sculptures and architecture and to visit historical places.

Leisure tourism started when industrialization in Europe raised a wealthy middle class with a decent amount of spare time. Entrepreneurs started to build tourist hotels, took care of the traveler’s transport and thus international industry was born. The industry was successful from the early 19th century but still small because it was very expensive.

In the 1960s more people had disposable incomes and the same time reasonably-priced commercial aircraft were able to carry passengers everywhere in the world. Mass tourism was born. (english-magazine.org: A Brief History of Tourism, 18/01/09)

TRENDS IN TOURISM

In the last decade two noticeable trends in tourist motivation emerged:

The first trend is that people choose holidays based on beauty and health more.

The second is a shift to an intellectually active holiday. People want to use their time for learning new skills, visiting museums, art galleries, and places of cultural importance.

Spanish tour operator agencies have ascertained that especially tourists with a high-income desire ecotourism and adventure tourism.

Customers are looking for an unforgettable experience and ecotourism is gaining importance.

Tourists no longer choose purely relaxing and sedentary holidays, they require increasingly more unique and sensational experiences.

The desire to relax, rest and stay inactive is now replaced by discovering new places, to learn, meet people, to live new experiences. (Cactus Tourism Journal: Current trends in tourist motivation, Elena-Cristina Mahika, 2/2011)
WHAT MOTIVATES PEOPLE TO TRAVEL?

A touristic product has several important characteristics which differentiate it from other products and services:

- It contains both tangible elements and intangible elements
- Tourists buy an experience and not clearly defined products
- There are three phases in the tourist experience
  - anticipation phase
  - consumption phase
  - remembrance phase
- Tourists are strong drivers themselves in the process of tourism which means that attitudes, emotions and expectations affect tourist experience and the ensuing evaluation
- Experiences in tourism are strongly influenced by external factors like weather, possible conflicts, terror and wars, diseases, etc.

(Cactus Tourism Journal: Current trends in tourist motivation, Elena-Cristina Mahika, 2/2011)

According to specialists, motivations are:

- Psychological (relaxation, sun tan, exercise and health, sex)
- Emotional (nostalgia, romance, adventure, escape, fantasy, spiritual needs)
- Personal (visits to relatives and friends, new friends)
- Personal development (raising the level of knowledge, learning a new skill)
- Status (fashion, exclusivity, getting a good offer)
- Culture (sightseeing, experience of other cultures)

(Cactus Tourism Journal: Current trends in tourist motivation, Elena-Cristina Mahika, 2/2011)
“TOURISM AND TRANSPORTATION ARE INEXTRICABLY LINKED. AS WORLD TOURISM INCREASES, ADDITIONAL DEMANDS WILL BE PLACED ON THE TRANSPORTATION SECTORS.”

TOURISM MANAGEMENT PHILOSOPHIES, PRINCIPLES AND PRACTICES (J GADE, RANKATHI)

People like to travel and most of them who can afford it do it as often as they can. Even if the growing tourism industry has a lot of economic and also sociocultural benefits it has a downside from which our planet has to suffer and therefore we will. The environmental impact of tourism has multiple facets, this section deals mainly with the impact of transportation.

Air travel has the biggest environmental footprint in tourism transport, especially regarding greenhouse gases per passenger kilometer, as the bar chart on the left shows. Worldwide planes cause between 1.5 and 2% of the total CO2 emissions. These numbers do not look too bad at first glance but if you consider that most flights are taken in developed countries, these percentages are skewed. It should also be highlighted that running an airport causes emissions as well, which has not been taken into consideration in the figures.

(Aviation Q&A: the impact of flying on the environment; Duncan Clark; 28. December 2017; www.theguardian.com)

twitter.com/euenvironment/status; 28.December 2017
TOURISM AND TRANSPORT

MEGATRENDS

Mega trends show what changes the world today and make the future a bit more predictable. Specialists have many different terms and perceptions but there are substantial correlations. In the following paragraphs I would like to cluster and summarize the ones affecting tourism and transport the most.

SILVER SOCIETY

Statistics show that the population worldwide is getting older. In 2013 just twelve percent of the global population was older than 60. This is estimated to rise to 21 percent by 2050, with two thirds of this number being women. (oecd: Megatrends affecting science, technology and innovation, 8/01/05)

Through advances in science and medicine people get older but also healthier and therefore more active. Health certainly affects people’s behaviors, therefore it is expectable that there will be more active travellers, especially in more developed countries (Horwathhtt: Tourism-Mega-Trends, 18/01/05)

People are more healthy and more active but for sure not 25 years old backpackers again, so how could an adventurous experience for well educated, active and wealthy senior travellers look like?

CONNECTIVITY AND SMART FUTURE

Everything is connected, the internet changed most of the things surrounding us and it will continue to do so. A few examples are new kinds of societies, different worklife and new kinds of economy. The connectivity started the next industrial revolution and will not stop changing our lives. Soon augmented reality and e-commerce will melt together and let digital and reality blur into each other even more. The smart of today will get a boost to a new level through advanced robotics and artificial intelligence.

How will a service for generation Y & Z look like when digital life is taken for granted and sharing experiences is more important than ever?
URBANIZATION

In 2050 nearly 70 percent of the world population will live in urban areas. In 2030 we will have 41 instead of 28 megacities. Urban mining (process of reclaiming raw materials from spent products, buildings and waste) and urban farming (practice of cultivating, processing, and distributing food in a city) will get more important. Inside the city, transport will be mainly electric and in many cities vehicles like bicycles will gain in importance. (welt.de: wissenschaft, Im-Jahr-2030-soll-es-weltweit-41-Megastaedte-geben, 18/01/05), (zukunftsinstitut: mega trend glossar, 8/01/05), (wikipedia: Urban agriculture, 8/01/05), (sintef: urban-mining, 8/01/05)

POST-CARBON ECONOMY

Climate change is forcing society to find alternatives to fossil fuels and change their lifestyles. That makes renewables to the fastest growing energy source. Parallel to that energy storage will get better and its cost will fall which will accelerate the shift to a post-carbon economy. (zukunftsinstitut: mega trend glossar, 8/01/05), (ey.com: The upside of disruption, Megatrends shaping 2016 and beyond, 8/01/05)

GLOBALIZATION

Economy gets progressively global and people’s lives get more international. But like with most big movements there is a countermovement. People are buying more and more local products because they promise regional distinctions and individuality. (zukunftsinstitut: mega trend glossar, 8/01/05) People’s awareness of the impact of their consumption is growing and that will also reinforce environmental sustainability in all business areas on a global level. (ey.com: The upside of disruption, Megatrends shaping 2016 and beyond, 8/01/05)
To better evaluate the position of the product on the market, it can be helpful to get a rough overview of the various types of transport which exist within the tourism sector. However in this context the focus is not on the means of transport to and from a holiday destination but rather on those that are used by tourists during their journey and are closely interwoven with the actual service. The experiences shown above represent examples where the service is even inseparable from the transportation.
LIGHTER THAN AIR TECHNOLOGY //
AEROSTATS AND AERODYNES

The human flight can be divided into two fields, lighter than air and heavier than air, even if combinations of both principles are possible. During the late 18th-century mankind started to conquer the skies with lighter than air and heavier than air flying machines more or less simultaneously. Today the commercial airplane plays one of the most important roles in modern, global transport. Back in the 1930s, the world of transport looked different. Rigged airships dominated air travel because they were the first aircrafts which could transport passengers and cargo over great distances. (Wikipedia: Aviation, 18/01/07)

The principle of lighter than air transport started with the hot air balloon, where the air inside the balloon gets heated and is therefore less dense than the air surrounding it. The force pulling the balloon upwards is called buoyancy. This floating in the air is working in the same way as ships float in water. For floating in the air gases are needed which are lighter than air, or less dense. (helium, hydrogen or hot air) (Wikipedia: Buoyancy, 18/01/07)

For better navigation and higher speed, the shape of the balloon changed into the typical cigar shape and got equipped with engines which added thrust in horizontal direction and the airship was born. The most successful airships were the well-known Zeppelins. The advantages of the airships compared with airplanes back in the 1930s were the wide range and loading capacity. Airplanes were faster, got bigger, gained in range and finally ousted the airships for a long time. (Wikipedia: Aircraft, 18/01/07)

Today, we are facing a big climate crisis and heading towards the end of fossil fuels. Lighter-than-air flight can again gain in importance, since airships score big-time in energy efficiency and soon mankind will not be able to afford air travel like today anymore.

“The ONLY WAY TO MAKE A PLANE CONSUME FUEL MORE EFFICIENTLY IS TO PUT IT ON THE GROUND AND STOP IT. PLANES HAVE BEEN FANTASTICALLY OPTIMIZED, AND THERE IS NO PROSPECT OF SIGNIFICANT IMPROVEMENTS IN PLANE EFFICIENCY. A 10% IMPROVEMENT? YES, POSSIBLE. A DOUBLING OF EFFICIENCY? I’D EAT MY COMPLIMENTARY SOCKS.”

This quotation was made by David MacKay a physicist at Cambridge University and author of the book ‘Sustainable Energy - Without the Hot Air’, he is chief scientific adviser to the UK Department of Energy and Climate Change. (Empiricalzea: can we build a more efficient airplane not really says physics, 18/01/07)
Airships require a big volume for the buoyant gas. It is impossible to compete with the speed of a plane since the drag is way higher and therefore the efficiency advantage will suffer from higher speed. But it is worth trying to challenge the borders of hybrid airships to see what is possible. A new lightweight construction and optimized dynamics are just two fields of potential.
There are a lot of different aircrafts which get to fly through gas which is lighter than air. First of all you differentiate between powered airships and unpowedered balloons. In the following I will focus on the powered ones. There were two peaks in the successes of the airship, not surprisingly around the first and the second world war. Like many other technological achievements, airships were developed for - and used in - military activities. Since these days the principle and therefore the shapes didn’t change too much.

The graphic below shows 4 different types. The first type is the simplest, the blimp (1). Simple because it is basically an aerodynamic balloon with an attached gondola. Blimps do not have any kind of construction elements supporting the flexible shell, so all involved forces have to be absorbed by the shell itself. Which limits the performance quite a lot, it means in effect that it can carry less weight and it is slower than following examples but it can be inflatable and relatively cheap.

A “keel-airship” (2) still does not have any construction inside the main volume but it gets stiffness through its keel shaped gondola which is attached along the bottom side and helps to balance the involved forces. Through adding construction elements the airship is able to carry more weight and go faster, but also gets heavier and therefore it needs to grow bigger to contain more of the buoyant gas. The semi-rigid (3) airship is a successful middle course, it has an inner skeleton which absorbs forces and carries the needed power units. The last example is the rigid airship (4), compared to the other examples its shape is not a result of the overpressure anymore but from the construction itself. This type makes sense in particular for very big airships. Most popular rigid airships were Zeppelins “Hindenburg” and “Graf Zeppelin” which were basically flying hotels, carrying facilities for more than 70 people.

Dr. Bernd Sträter
Aktueller Stand der Leichter-als-Luft-Technologie
http://www.aviation.tu-darmstadt.de
Hybrid airships are worth mentioning because they combine the advantages of aerostatic lift and aerodynamic lift. This type of aircraft is filled with buoyant gas and is additionally equipped with wings or rotary wings. An example of a working prototype is Airlander 10, shown in the picture underneath.
Lighter than air technology requires a gas which is lighter than air, as the name suggests. The lightest existing gases are hydrogen and helium, both are used as lifting gases. For bigger airships helium was prioritized since the well known accident in Lakehurst 1937, when the famous Hindenburg caught fire.

In 2040 this accident will be more than 100 years old and technology today is already far enough to handle hydrogen with a very low risk. This makes airship experts like Prof. Dr.-Ing. Uwe Apel consider hydrogen as the better alternative to helium again. Hydrogen is not only cheaper than helium, it could also be generated through 100% renewable energies.

Besides being the lifting gas, hydrogen again can produce the electricity to run the engines which are needed for the thrust through a fuel cell. The graphic number 18 on the right shows a possible fuel cell aerostate system which was generated by Universität Siegen.

There are different ways to generate hydrogen, all of the ways require energy. Since mankind has to reduce CO2 emissions to slow down the climate change, only renewable energy sources should be considered. The most common process of generating hydrogen out of renewable energies is called electrolysis where water gets split up into hydrogen and oxygen.

Dr. Ullrich Meyer published some interesting ideas related to an airship running on hydrogen which promises high safety through surrounding the hydrogen with a layer of helium. The helium forms a contamination zone which prevents the hydrogen of getting in contact with oxygen even in the case of a leak. (Ullrich Meyer: Luftschiff, 17/01/06)
For getting an idea about possible size, speed and capacity I listed four examples of airships. Two of them are established and two more conceptual but very realistic.

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<th>Orientation and Inspiration</th>
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**Zeppelin LZ 129**  
(Historical Example)  
- Max. Speed: 135 KM/H  
- Passengers: 72  
- Range: 16,000 KM  
- Length: 246.7 M  
(Wikipedia: LZ 129, 18/01/07)

**Zeppelin NT**  
(Established Today)  
- Max. Speed: 125 KM/H  
- Passengers: 12-14  
- Range: 1450 KM  
- Length: 75.00 M  
(Wikipedia: Zeppelin NT 18/01/07)

**Cargolifter CL160**  
(Concept)  
- Max. Speed: 125 KM/H  
- Passengers: 10-12 (160 Tons)  
- Range: 10,000 KM  
- Length: 260 M  
(Wikipedia: Cargolifter CL160, 18/01/07)

**Airlander 10**  
(Prototype)  
- Max. Speed: 148 KM/H  
- Passengers: 10-12 (10 Tons)  
- Range: 5 Days  
- Length: 92 M  
(Wikipedia: Hybrid Air Vehicles HAV 304/Airlander 10 18/01/07)
These two illustrations show some interesting technical solutions for propelling and steering. These methods allowed me to get around traditional propellers or turbines and were better to integrate into my design later on. The fan-wing could be very energy efficient and is not as loud compared to traditional plane turbines.

[soar-project.eu: the-open-fan-wing-design, 18/04/29]
LIGHTER THAN AIR TECHNOLOGY
PROS, CONTS AND FUTURE POTENTIAL

**PROS**

- OUTSTANDING VIEW & EXPERIENCE
- DOWN TO ZERO EMISSION
- MUCH FASTER THAN RAIL OR SHIP
- HIGHLY FLEXIBLE
- NO NEED FOR BIG AIRPORTS
- GREAT POINT-TO-POINT CONNECTIONS
- LITTLE OR NO NOISE POLLUTION
- COMFORTABLE JOURNEY (LESS NOISE AND VIBRATION)
- EXCELLENT HOVERING CAPABILITIES

**CONS**

- MUCH SLOWER THAN PLANE
- HIGH COSTS FOR DEVELOPMENT
- BIG VOLUME VS. UTILIZABLE VOLUME
- SUBJECT TO WEATHER CONDITIONS
FUTURE POTENTIALS

Lighter-than-air technology is more than a nostalgic idea of transport, it has a lot of potential to get a valuable and exciting high-tech product in the near future again.

Germany is for obvious historical reasons one of the countries with outstanding knowledge in lighter-than-air technology but for sure there is still a big need for research and development.

Just two years before the financial crisis 2007 the German government commissioned a committee of specialists to work out a detailed technological impact assessment regarding lighter-than-air technology. It contains a large overview of the technology and also its future economic potential. The document shows that tourism is one of the most important and well-established application areas of lighter-than-air technology. The specialists see opportunities in the sightseeing market especially in big cities (New York; Paris, Rome, Berlin) but also scenic areas like the Grand Canyon, Iguazu falls, pyramids or African animal reserves. Besides sightseeing tourism offers two other attractive fields, one is cruise holidays and the second city tourism. Cruise holidays bring some nearly insuperable challenges, the airship would have to compete with all advantages of a cruise ship and that seems impossible. Especially because of their inequality in their carrying capacity.

But there is a great chance to actually combine cruise and city tourism. The tourist would travel several days or even weeks from city to city and could enjoy the benefits of the flight and the ground facilities.
Volvo Cars claims to be one of the sustainability pioneers in its branch. The brand is a founding member of the UN Global Compact which supports companies to do more responsible business regarding human rights, labor, environment, and anti-corruption. Furthermore, the Compact helps to get closer to broader goals like UN Sustainable Development Goals. Furthermore, they plan a big shift towards electric mobility and therefore contribute to a better air quality in cities.

Volvo has a programme for sustainability commitments called Omタンケ which means “caring” and “consideration”, but also “to think again”. The brand sees itself as a human-centric car company which asserts to protect the customers interests. These “interests” contain re-thinking sustainability and reach beyond operations and their cars into society. (group.volvocars.com: sustainability, 18/02/03)

OMTANKE [SWEDISH, NOUN]
ATTENTION; CARE; CONSIDERATION; FORETHOUGHT
(en.bab.la: dictionary/swedish-english/omtanke, 18/02/03)
PRINCIPLES OF THE UN GLOBAL COMPACT

Human Rights
Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and

Principle 2: make sure that they are not complicit in human rights abuses.

Labour
Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;

Principle 4: the elimination of all forms of forced and compulsory labour;

Principle 5: the effective abolition of child labour; and


Environment
Principle 7: Businesses should support a precautionary approach to environmental challenges;

Principle 8: undertake initiatives to promote greater environmental responsibility; and

Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Anti-Corruption
Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

(unglobalcompact.org: what-is-gc/mission/principles, 18/02/03)
WHAT IS VOLVO DESIGN?

“The next four years for any interior designer will probably be the most exciting time since we converted from coaches to cars.”

ROBIN PAGE, SENIOR VICE PRESIDENT, DESIGN
(cardesignnews.com/articles/car-design-review-yearbook/robin-page-volvo, 18/02/03)

“We understand that your car becomes part of your life and that it reflects who you are. And, of course, we come from Sweden, a place where people are valued as individuals.”

EBBA MARIA THUNBERG, VICE PRESIDENT, COLOUR AND MATERIAL
(volvocars.com/intl/cars/new-models/xc60/stories/personalisation, 18/02/03)

“Good Scandinavian design is beauty that wants to be discovered, that you want to know more about”

MAXIMILIAN MISSONI, VICE PRESIDENT, EXTERIOR DESIGN
(volvocars.com/intl/cars/new-models/xc60/stories/scandinavian-design, 18/02/03)
“When it comes to design my number one goal is elegance, how can I create the most beautiful result with a minimal amount of effort? Simplistic, effective and beautiful...”

TISHA JOHNSON, VICE PRESIDENT, INTERIOR DESIGN
(mashable.com/volvos-senior-director/video, 18/02/03)
GOALS AND WISHES
MY PERSONAL EXPECTATIONS

GOALS

1. Create a holistic image of a new, more responsible way of traveling in tourism for 2040

2. Design an attractive, innovative and user-centered interior to a detail level

3. Think through and illustrate the whole service and experience

4. Come up with a believable and appealing exterior to a decent level of detail

5. Make the whole thing fit Volvo as well as possible and ensure a benefit for the brand

WISHES

1. Go through the thesis journey in a healthy and balanced way (no night shifts, not more than 10 hours a day and have some kind of distraction on weekends)

2. Have interdisciplinary dialogues to get inspired and to inspire

3. Enjoy the work and be always open minded

My personal expectations are: strengthen existing skills, gain more knowledge in different design fields and do nothing less than the best job I have done so far.
AIR TRAVEL BY VOLVO //
DISTANCES AND APPLICATIONS

WHAT IS POSSIBLE, WHAT MAKES SENSE?

The max. speed which is expected to be between 100 and 200 km/h makes me exclude intercontinental trips. Trips like London - New York are possible but they take too much time. The point to point distance is 5575 km, and with an average speed of 150 km/h, the journey would take more than 37 h. The airship would need facilities like a hotel or would need to stop four times on ships or flying platforms which provides these facilities.

Volvo Volem would not replace the plane when it comes to far distances (above 1500 km). But it could take over a lot of round trip flights like the images show. The continental journey would be a lot more comfortable and exciting and the footprint of a globetrotter could be way smaller than it is today. Furthermore, Volvo Volem could be a lot more than A to B transport. Through possible low and slow speed flights it is a perfect observation deck. There is no need for big infrastructural changes, so it’s easy to imagine that Volvo Volem could stop close to any kind of tourist highlights.

example trip (Europe): all of the distances are under 700 km so theoretically no flight takes longer than 5 hours. (average speed 150 km/h)

https://www.daflogic.com/projects-google-maps-distance-calculator.htm
example trip (Asia): all of the distances are under 1200 km so theoretically no flight takes longer than 8 hours (average speed 150 km/h)

https://www.daftlogic.com/projects-google-maps-distance-calculator.htm

up to 10 hours travel time is comfortable without private rooms

up to 1200 km non stop trips are comfortable to make
AIR TRAVEL BY VOLVO

THE SERVICE

HOLISTIC SERVICE EXPERIENCE:

- round trips (continental)
  - fly from destination to destination to see and get to know interesting places
  - point-to-point service e.g. directly to city center
  - see beautiful places from new perspectives
  - enjoy nature with a small ecological footprint

NEVER LANDING STORY

- the airship could stay in the air for weeks without touching the ground
- no infrastructure or airport needed

LANDING TOWER/BRAND EXPERIENCE CENTER

- tower where airship docks to get people on board
- refill water, helium, and hydrogen
- travellers get picked up by Volvo shuttles or get a Volvo to drive
- tower can act as a showroom for Volvo products

WHAT HAPPENS INSIDE?

- comfortable/private seating
- experience areas
- social areas
- balconies (augmented reality)
- extreme sports and thrill area ‘Volvo/Polestar’
INTERIOR BRIEFING // OPPORTUNITIES AND BOUNDARIES

UP TO 10-HOUR FLIGHTS
(very slow observation flights & fast travel speed)

- comfort
- privacy
- infotainment
  - movie etc.
  - interactive information about e.g. destinations
  - new kinds of interaction (holograms, transparent screens etc.)
- social areas (lounge areas to mingle and exchange experiences)
- observation areas (glass balcony)
- lavatories (enough for 30 people)
- catering
- luggage (how much and where? in the same ship?)
- no hard accelerations or breaks (ease in and ease out)
- no belts
- standing/walking is possible

HOW DO PEOPLE GET IN AND OUT?

- elevator enough for 10 people (three times up)

SEAT DESIGN

- light
- comfortable
- unexpected
- integrated
- avoid the sea of seats —> otherwise public transport feeling
- more furniture & less automotive
- single seat and lounge?
AIR TRAVEL BY VOLVO

STORYBOARD

The customer gets picked up at home or at the airport.

The elevator lifts up the customer directly into the ship so that no landing needed.

In areas with attractive scenery, the ship slows down from travel speed to observation speed to provide best conditions for enjoying the view.

Inside the ship, the customer can experience the comfortable, spacious and luxurious interior. Depending on the booking, the customer either sits on the main deck or in the exclusive lounge.

In the city center they arrive in front of the brand experience center and "volem elevator" where they get a warm welcome and all needed information for their booked round trip.
For getting a better idea how the service should look I illustrated a part of a possible use-case. In this example the customer lives and travels within Europe, so he never has to take a step into a traditional airplane and enjoys an incredible journey without stress and frustration.

The customers booked a 15 days round trip. The journey started close to their home town. From now on they will several stops in Europe. The traveller will stay several days at the destination to get to know the place and its culture.

After they had local food and a bunch of other unique experiences the trip continues with the airship to see the area out of new perspectives and to reach their next destinations.
The concept should support an efficient, sustainable, exciting and intense way of traveling. It should not be just a way of transport, but rather a new way of tourism. People could discover the world from new perspectives and enjoy the journey in a way which is comparable with sea cruises but in a more environmentally friendly way.
The airship could visually fade into its environment to avoid being too disturbing in the sky. The whole system might be driven by solar energy and new 3D printing technologies could lead to new possibilities to contain the gas or simply build the architecture of the airship.
EXTERIOR DEVELOPMENT
CLEAN AND SIMPLE DYNAMICS

For the exterior design, I aimed for something clean and simple. The goal was something “producty” but dynamic looking since I would describe Volvos current exterior design language in a similar way. Inspired by a balloon basket hanging in the air, I designed an exo-frame which is holding the passenger cabin underneath the carrying gas volume.

The overall shape is reminiscent of a whale which dives through the air. In my eyes, the whale was a good inspiration for something very big and yet dynamic. The forward-swept wing is inspired by the fighter jet Sukhoi Su-47 Berkut. The unexpectedness of the wings bestows a certain appeal upon the ship and is intended to arouse curiosity. The balloon is semitransparent so that it’s not blocking too much light and also appears as light as possible.
the whole interior is structured by one core element which contains the central processing unit which navigates the ship during its trips and also other technical components. Furthermore, the elevator is located inside and is thereby the entrance of the airship. The main stem has four roots, three of these roots contain a restroom, one is meant for the staff equipment. Two branches of that core stem reach out to the rear of the ship to hold the architecture together and also structure the interior layout.

Using the branches instead of solid walls helped to visually lighten up the whole construction. The monolithic approach of the main stem was a way to achieve a clean and organized impression. Unifying several elements to one helped the interior to appear a way calmer and less cluttered.
INTERIOR DESIGN//
EXPLORATION
I started sketching in many different directions. Some of the early proposals focus on entertainment and privacy during the trip, others more on social seating. Lightweight and comfort were other attributes I was aiming for.
INTERIOR DESIGN//
MAIN DECK SEATING
The final direction of the main deck seats is a very light looking hybrid of a deckchair and a lounger, which is supposed to be very comfortable and highly adjustable. I picked this direction since it was possible to unify several of them to reduce visual noise.

I decided to use big radiuses and soft lines to avoid a too “sporty” feeling and achieve a more “furniture like” impression. I tried to prevent unnecessary detail to have as little as possible repetition when several seats are standing next to each other.
The lounge is pretty much an extraordinary living room above the clouds. I picked a design which emphasizes the architecture and gives the biggest room impression. The plants should give a homey feeling and also could be combined with a humidifier and scents. Furthermore, I started thinking about a service drone which could be an additional communication item.

To highlight the width and size of the lounge I used many vertical lines in the design. Connecting the headrest to one piece also enhanced the broadness. Since it is an airship interior and not a living room I decided to have a very “technical looking” lower part. Carbon fiber as a material choice combined with sharp edges and small radiuses give a lightweight and high-tech look.
RESULT

SIZE AND CAPACITY

| 250 | 240 | 230 | 220 | 210 | 200 | 190 | 180 | 170 | 160 | 150 | 140 | 130 | 120 | 110 |
72 passengers

15 passengers

30 - 35 passengers
FINAL EXTERIOR DESIGN
CLEAN AND SIMPLE DYNAMICS
FINAL EXTERIOR DESIGN
CLEAN AND SIMPLE DYNAMICS
OBSERVATION DECK
NEXT LEVEL BALCONY
One of the main features of the concept is the balcony. If the weather permits, the ship can slow down from cruise speed to observation speed and people can step out to enjoy the breathtaking view. Whoever feels a bit insecure with the glass floor could walk on the opaque path. The balcony is equipped with smart binoculars, which could take pictures and save some nice memories.
TOWER DESIGN

REPRESENTATIVE AND FUNCTIONAL

The tower is the place where people get through an elevator into the ship and start their trip. Volvo could also use this centrally located building to represent the brand through an experience center. The ship gets caught and held by strong electromagnets. The tip of the tower is rotatable so that the ship can adjust its direction with the wind in stormy weather conditions.
INTERIOR LAYOUT
OPEN BUT STRUCTURED
INTERIOR LAYOUT //
OPEN BUT STRUCTURED
FINAL DESIGN

MAIN DECK
The main deck is equipped with highly comfortable seats which can go into “zero gravity” position. Each of them has some privacy features to separate the passenger from their neighbors if they wish to. The backside works a bit like a flexible cocoon. The stretchable fabric gives subtle privacy in a simple and light way.
FINAL DESIGN

LOUNGE AREA
The lounge is a private area the customer could rent for the entire trip. It is meant for four to maximum six people and includes some exclusive services. Food would be served by Volvo’s professional flight attendants to fulfill every need of the guests. The breathtaking view combined with the spacious, opulent layout will make the journey a memorable and incomparable experience.
FINAL DESIGN
SERVICE DRONE
The service drone is primarily a device to serve drinks but also a communication tool. If customers have questions or requests, they could just talk to it. The service drone is a hybrid between a helium balloon and a drone. Instead of traditional propellers, the drone uses compressed air for uplift and steering supported by the buoyancy of the gas. That would make the drone more efficient and less noisy.
FINAL DESIGN

SOCIAL AREA
The social area is a spot to mingle with other people. Travellers can share their experiences and get to know each other. When lunch time and the food drone arrives from a trusted local restaurant, the meal is going to be served as a buffet on the table. People could stay there and enjoy or take their plate to the seating area.
CONCLUSION //
A SUMMARY OF A JOURNEY

After completing my thesis, I can say I learned several things. Trying new stuff despite a tight schedule often pays off. I also lost the fear of starting ambitious projects. I realized when I make decisions at the right time and prioritize everything in the right way, I can achieve more than expected. Another thing I am sure about now is that all feedback is good feedback if you manage to deal with it in a good way. Trying to understand the real reason why people react to something, reflecting and seeing it from another perspective is very valuable. Often you do not have to change a lot to get a better solution.

Being proactive during a degree project with a sponsor is something I learned quite quickly. Just because you have professional support does not mean you have a baby-sitter. They are also people who have work to do and everybody has busy schedules. Getting the feeling for who to ask at what time is crucial for a smooth run in any project. If you respect other people's priorities and don't take anything for granted, you are more likely to get great support and you will enjoy a nice working environment during your time at the company.

The research part of my thesis gave me an impression of how complex it is to place and develop a successful and trustworthy type of transportation on the market. The car has more than 100 years of steady development behind it, the same goes for the plane. Development in transportation sometimes feels too slow and unable to react to climate change and the evolving needs of people. But there is hope. Growing awareness about the critical circumstances might force politics to adapt too and support research and development more. But also technology is developing a lot, artificial intelligence could help us achieve goals exponentially faster and the future of transportation could become greener and richer in variety sooner than we might think.

During the actual design process, I learned that leaving cherished ideas behind at the right time often makes sense. Dropping a proposal if it obviously does not fit the goal can help you gain capacity for other things and stay focused. In conclusion, I can say that I achieved my goals for the thesis and more importantly also achieved things I didn’t plan to do. I aimed for a holistic impression of the service with a focus on the interior, out of my point of view it worked out well and I am happy with the outcome. Doing the thesis project in collaboration with a sponsor is something I can highly recommend and also sitting at their facilities during that period is beneficial. I was surrounded by competence and had marvelous support along the way.
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For the final presentation I’m aiming for a virtual reality experience of my model with animations. The physical output could be a simple but aesthetic model of the exterior which is set into a reduced context.
UID 18
MODEL EXHIBITION

1. 3D printed title & laser-cut text (sticker)
2. VR glasses container
3. Acrylic glass detail & logo
4. Acrylic glass detail & logo
5. Simple foam buildings & hills, matte dark grey paint
6. 3D printed, glossy white, acrylic glass
TIME PLAN

GOALS ALONG THE WAY

January
- Research
- Briefing
- Ideation
- Documentation
- Physical model
- Concept freeze
- Midreview

February
- May modeling

March
### BUDGET

#### CASH CHECK

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