Redefining the tent trailer -
Designing a new Holtkamper camping equipment concept.

HOLTKAMPER®

TU Delft

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Designing a new Holtkamper camping equipment concept.

Master Thesis Integrated Product Design
Faculty of Industrial Design Engineering
Delft University of technology

In collaboration with Holtkamper Vouwwagens BV.

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It should be noted that part of the result of this project is partly due to the support and energy provided by the people around me during this project.

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Figure 0. Simulating a design studio at IDE

Preface

Abstract

This report presents the graduation project which was conducted for the MSc Integrated Product Design at the Delft technical university of Technology. The project was performed in collaboration with Holtkamper. The Project means to design an innovative camping equipment concept, that responds to the changing camping landscape, integrates user and owner experience, while building on the strong heritage of Holtkamper brand.

The camping equipment landscape currently experiences limited innovation, while the demand grows for experience-driven and nature oriented travel. At the same time it is seen that the campers (kampeerders) are shifting towards reconnecting with nature and escaping the fast-paced digital world. This creates a growing imbalance between the current products, and evolving user needs. This project aims to build on this imbalance.

To address this challenge, a multi layered research was conducted, consisting of context analysis, user/owner research, and a future vision generation which used the Vision in Product (ViP) design method. The outcomes present identified tensions within the camping and travel landscape; user tensions and desires related to functionality, product handling, spontaneous travel, and usability. Design drivers were synthesised from the research to guide the consecutive design process.

Through ideation, concepting, and development activities, the Holtkamper Glider concept was created. It introduces a new approach to tent trailer travel and camping, by enabling new, spontaneous and nature oriented use cases. The key to this is embedded in the compact and modular architecture. Core features include a single motion set up, reduced weather and rain dependence through integrated drying and ventilation. And lastly an adaptable modular layout that allows adapts to the user and use case.

The concept demonstrates how camping equipment can evolve towards more flexible, experience-driven, and future-relevant solutions. While not intended as a production-ready design, the Glider concept provides actionable directions and inspiration for future Holtkamper products and the broader camping equipment landscape.

Abbreviations

EV – Electric Vehicle

HK – Holtkamper

PHEV – Plug-in Hybrid Electric Vehicle

TT – (folding) Tent trailer

U/O – User/Owner

ViP – Vision in Product

Table of Contents

- **Introduction** **2**
  - Background & Motivation 3
  - Aim & Scope 3
  - Research & Design approach 4
  - Project structure. 4
- **Research** **5**
  - Framework & Objectives 5
  - Context analysis 6
  - User/Owner Research 8
  - Future Vision Development 11
  - Research Synthesis 17
- **Design Process & Methodology** **18**
  - Design Drivers 18
  - Target Group & Persona 19
  - Ultimate Camping Vision & Desired Experience 20
  - Ideation & Targeted Solutions 21
  - Concepting 23
  - Concept evaluation 28
  - Concept Development & Prototyping. 30
  - Use case & scenarios 30
  - Construction & kinematics 31
  - Kitchen integration 32
  - Layout & Packaging 33
  - Aesthetics & Form 34
  - Reflection 35
- **Final Design Presentation** **36**
  - Open Camp Experience 37
  - Presenting Glider 38
  - Functionality - Exterior 40
  - Functionality - Modularity 41
  - Functionality - Interior 43
  - Use & Scenario 45
  - Product Positioning 47
- **Design Evaluation** **48**
- **Conclusion** **49**
- **Discussion** **51**
- **References** **54**
- **Appendices** **55**

Introduction

This design report represents the main deliverable of the master thesis of Bastiaan Dollé for the MSc Integrated Product Design (IPD) in the faculty of Industrial Design Engineering (IDE) at the Delft University of Technology. This report presents the research and design process and the results of the Graduation project in collaboration with Holtkamper, with its aim to arrive at the NEW CAMPING EQUIPMENT Concept designed for future camping experiences.

Holtkamper is a leading Dutch brand developing and selling camper trailers in the Netherlands. The camper trailer has been a popular type of camping equipment since the 1930's. With its essence being a compact trailer that unfolds to become a large spacious tent, within the camping equipment market segment, the camper trailer or 'vouwwagen' in Dutch confidently sits in between the traditional caravan and the tent (see figure 1).

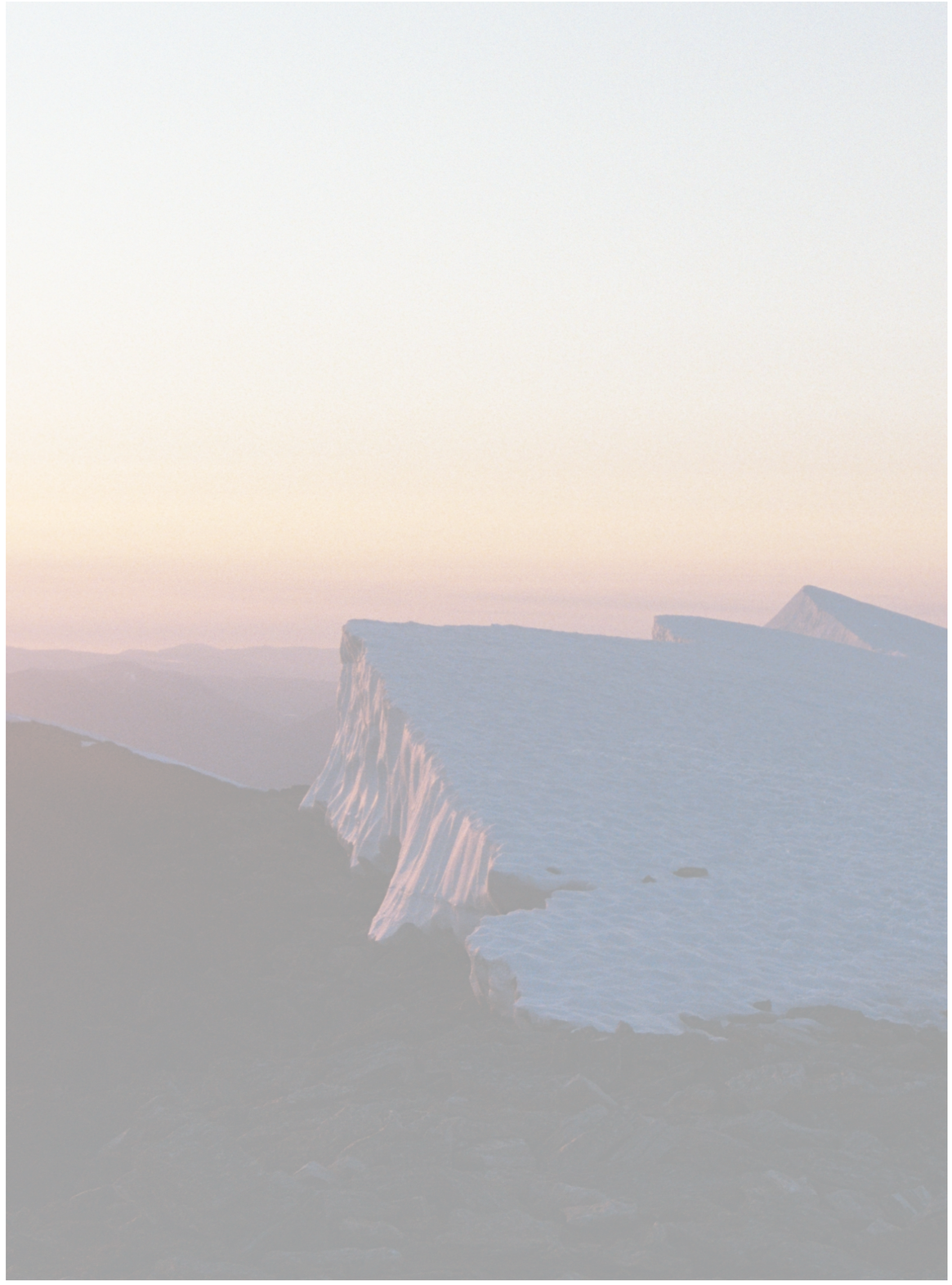
Typically containing an elevated slatted base bed, full kitchen, an indoor and outdoor living area, the camper trailer provides an alternative for the campers who love regular tenting but seek a bit more comfort, room and practicality.

Within the market segment, Holtkamper is often referred to as being the Rolls Royce of camper trailers, pointing to their premium positioning within the market. Holtkamper's gained a lot of traction with their first camper trailer: the 'Holtkamper Flyer', which are still on the road today.

The year 2028 will mark the 100th year of Holtkamper. To commemorate this milestone, they aim to launch a new product designed for future-proof camping experiences. To gain inspiration and get the development started for this new product, the owner of the company, Floris Holtkamp, stepped to the Faculty of Industrial Design Engineering to set up a collaboration, marking the start of this graduation project.



Figure 1. Holtkamper camping trailers.



Analogue picture by author.

Background & Motivation

Looking at the camping equipment market over time, there has only been very little innovation. Over the past decades, there have been updates in the form of small evolutions, but the essence of camping and the equipment has not veered far from the 1950s. While the camping equipment has not changed much, it is felt that the motivation for people to go camping has significantly changed over the years. (McKinsey & Company, 2024))

In the early days camping recreation used to be a budget friendly way to spend family holidays together.
In today's world, a large drive can be seen as connecting with nature, escaping the grip of the digital world and daily stresses (VMS | Insight, 2025). Considering the contemporary technological developments, and the way automation, the internet and artificial intelligence have found their way into our daily lives it is suspected that the way people go camping, and their motivation for it will shift even further.



Figure 2. Me and my passions: automotive; camping and engineering.

In March 2025, Holtkamper has undergone a change in ownership. During the long ownership of the original founder, the company had built a strong name, brand, and heritage. Especially with, the aforementioned revolutionary Flyer model, the company became a widely recognized brand. During this time, all innovations and product evolution were orchestrated from within the company, by the original owner. While this did create a strong product, it means on the other hand that desires, feedback and values of tent trailer owners and users were implemented to a lower extent.

Considering the role that camping plays and how it is likely to evolve in the future, there is a great opportunity to define the future of camping with the next generation of Holtkamper camping equipment. Integrating user experiences and feedback into the product.

On a personal level, the core of this project resonates with me strongly, providing a design challenge with technical and human nature. Considering I have always had a large passion for traveling, exploring, nature and road trips, combined with my intrigue for Automotive, vehicles and mobility in general, this opportunity felt like the optimal project to conclude my MSc in Design Engineering with (see Figure 2).

Aim & Scope

The aim of this project is to design a new camping equipment concept for Holtkamper to inspire future models, including the desired model to commemorate the 100-year anniversary of the company. The goal being to develop and integrate a triad of factors into a strong, innovative product concept.

- **The future of camping.**
- **User and owner experiences/ feedback.**
- **The strong Holtkamper heritage.**

Considering the limited amount of innovation within the market segment, it is desired to develop a relevant concept through a future design vision. Approaching drivers, motivation and reasoning behind camping in the upcoming 10-15 years. Meaning to understand upcoming personas, their reasoning, habits, values and the equipment accompanying them.
The underlying goal for the vision is to lead the design of a camping equipment concept with future relevance.

The previous limited involvement of users and owners of the product provides Holtkamper with an opportunity to start integrating their user's values, wishes, and feedback into the product. This is aimed to be done through extensive user research.

Additionally it was mentioned that the brand has developed a strong name and heritage over the years. The new concept should emphasize this heritage.

While with this project the aim exists to generate a concept that approaches a high feasibility level, the final design is not meant to be a production ready concept, containing exact materialization and dimensions.
It is still desired to keep material properties, production techniques and available technologies into account. This without limiting the design freedom in the early stages of the design.

Design Challenge

Meaning to integrate the afore mentioned factors into a strong concept the following design brief was synthesized:

"Design an innovative camping equipment (folding tent-trailer) concept for Holtkamper, redefining the future of camping, integrating modern user experiences/ values and building on the strong brand heritage, in order to Initiate the development of future Holtkamper products."

Research & Design Approach

In order for the concept to have a meaningful impact on future Holtkamper camping experiences, the design choices in this project will be informed by layers of research. To then follow an iterative development process, gathering new insights through designing itself. All while keeping a close tie to the initial research.

To create a reliable foundation of knowledge informing the design process, the project will commence with research, consisting of three core aspects.

A general context analysis will serve as a base, aiming to get a thorough understanding of the camping (equipment) landscape and the company. Literature review, interviews with key market players, and a brand analysis will serve as a base for the **context analysis**.

Building on the overarching perspective, an important aspect of the project will entail the implementation of user/owner experiences and values.

Meaning to address potential dissonances between users and their current products. A **user/owner study** will be conducted to identify improvement opportunities, unseen issues with the product, desires and more. The study will be conducted through a survey among the active owner and customer base from Holtkamper. Quantitative and qualitative data is meant to help understand the current owners, how they use the product, and the corresponding tensions.

The last significant aspect of the initial knowledge generation addresses the creation of a **future vision for camping**. The Vision In Product design method (Hekkert & Van Dijk, 2010) will be used as a guide to create a future vision, informing the design. In general, the VIP method will guide the design of a future product by deconstructing the current product to the context level and generating a future vision to construct a future product in that context.

The steps include deconstructing the current products, followed by the generation of a future world context and vision statement, which initiates the design process of the future product. The application of VIP will be discussed in more detail in the research section of this report.

Analysis and synthesis of the layers of research is aspired to generate design drivers, inspiring the subsequent ideation phase. Targeting the identified problems and opportunities, several ideation methods will be used to generate a broad selection of ideas, features, and solutions.

Keeping close reference to the identified user values and future vision/mission, the design solutions will be **integrated** into a selection of **concepts**.

As a concept has been chosen after evaluation, it will be subjected to an **development sprint**, including the prototyping and technical testing of certain features.

Ultimately, the design activities, features, and outcomes will be compiled in the **final design**. Showcasing the overall design, layout, use/context and the technical aspects. The project will be concluded by an **evaluation** and corresponding **recommendations** for future development.

Figure 3 showcases the multi-diamond model (Van Boeijen et al., 2020), indicating multiple cycles of diverging and converging to arrive at a final design solution. The multi-diamond model framework encourages the designer to diverge and think of solutions broadly in an open manner. While ensuring well-grounded decision making and evaluation throughout the converging phases.

Project Structure Overview

For providing a better understanding of the approach the following visual, displaying the structure of this project has been created.

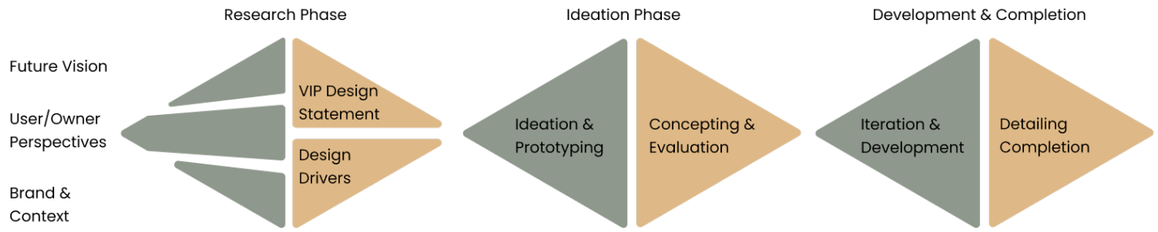


Figure 3. Project structure.

In the context of this project, the first out of the three diamonds signifies the **Research phase**, including the forming of the future vision statement definition and the design drivers.

The second diamond structure represents both the **Ideation phase**, where generating a broad selection of design ideas, features, and solutions is encouraged, and the **Concepting phase**, where the ideas, solutions and features will be combined into meaningful and well-grounded concepts.

The final diamond describes the iteration, developing, and testing in combination with the development of the final design of the camping equipment concept. This is described in the **Concept Development** and **Final Design** section of this report.

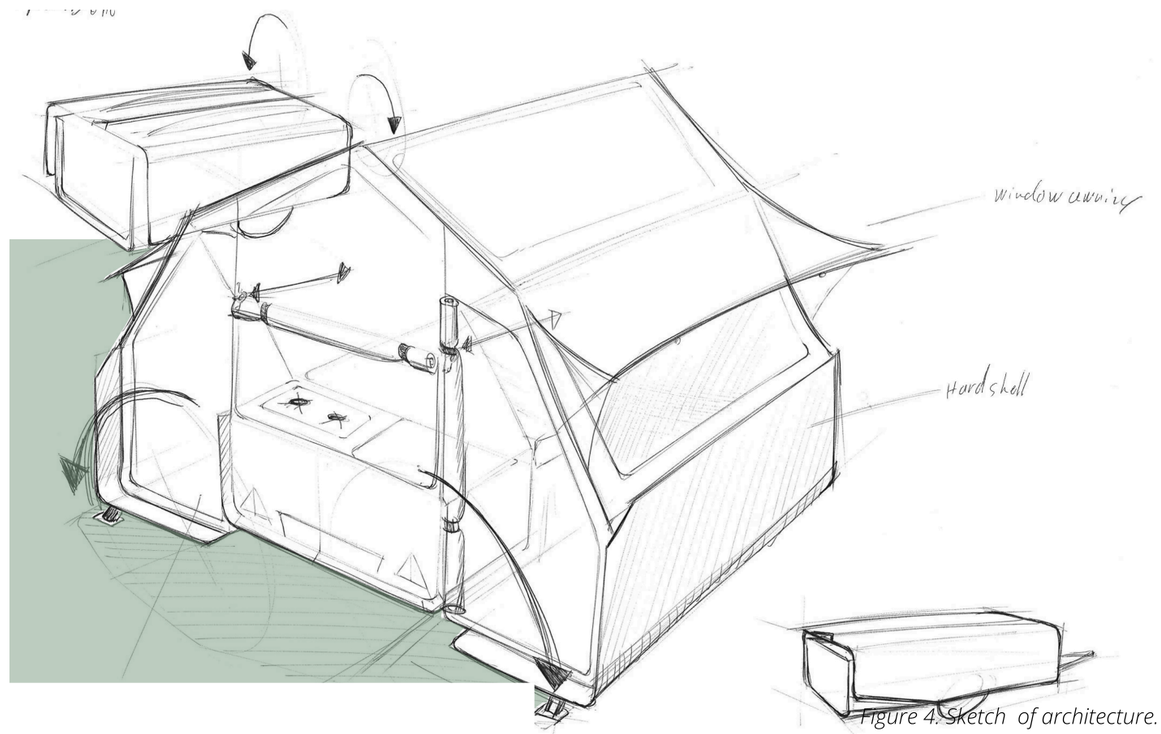


Figure 4. Sketch of architecture.

Research

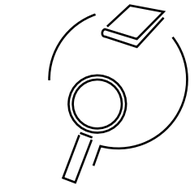
Research Phase

Research Framework & Objectives

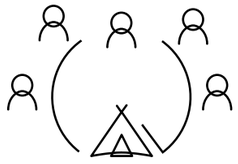
This segment of the report presents the initial knowledge generation, and corresponding methods, informing the ideation and design process.
This project surrounds a multi-faceted design challenge, meaning to incorporate a future vision, user values and experiences, and the brand heritage.

While these tracks complement each other and are connected in ways, this approach houses multiple knowledge gaps. It was therefore deemed logical to conduct separate studies. In the following sections of this chapter, three research tracks will be presented alongside each other as:

In the section *research synthesis* of this chapter the outcomes of the three studies are brought together and evaluated critically to identify overlaps and contradictions. The findings will be translated into opportunities, design drivers, requirements and topics for follow up research.



Context Analysis
Aiming to understand the current camping landscape and Holtkamper's position in it.



User/Owner Research
Aiming to uncover the tensions between current owners and their tent trailers to identify innovation opportunities and design drivers.



Future Vision Development
Defining what the future of travel and camping could look like, and how Holtkamper can play an active role in this future.



Analogue picture by author.

Context Analysis

The purpose of this context analysis is to create an understanding of Holtkamper's position in the current camping landscape. The goal being to identify opportunities for Holtkamper to innovate and resolve tensions in the current camping industry.

The scope of this analysis covers a wider range than just camping and its equipment. It is deemed necessary to understand current patterns and effects around travel, recreation, and tourism. To go even broader, the current socio-economic status, impact of climate and digital and technological "nature" of the world are considered relevant to the context.

In order to attain understanding of this context, multiple methods are used. Addressing the broader scope, a literature review is conducted. A selection of research papers, reports and articles has been generated using, among others, the following themes:

"outdoor recreation user behaviour"

"camper motivation study"

"camping tourism Europe"

"outdoor participation motivations"

In addition to the selection of articles, a multitude of interviews with experts and Key Market Players were conducted. To gain overview of travel habits of tourists in and around the Netherlands an online interview was held with a Marketing Strategist at NBTC (Nationaal Bureau Toerisme & Congressen).

To discover potential insights on travel developments through the camping and RV accessories market a interview was held with CEO of OCS Recreaties.

Company Context

As a company Holtkamper has been part of the Dutch camping landscape since 1928. Starting off as a business, designing, building and selling tents from Ter Apel.
A real breakthrough for the company was initiated by the launch of the Holtkamper Flyer. Its revolutionary nature stands as an example for the ethos of the brand, to solve challenges through engineering. Holtkamper introduced more, patented, innovative features that contributed to the company's current position and image like the Membrane, insulating and cooling, double layer tent system. The Windforce system, using pressurized air to unfold and fold the tent automatically.

The Pole-less awning and storm resistance of the current models are more examples of Holtkamper innovations. Over the decades, the company has released several iconic models including the Flyer, Spacer, Astro, Cocoon, and Amazon, of which many examples are still being enjoyed and in use today. More recent additions include the Kyte, Aero, and Nano, which feature the signature "kite-like" awning design and carbon fiber masts. The latest addition to the portfolio is the new holtkamper Astro, representing the modular, entry-level model.

Within the segment of camping equipment, Holtkamper has a confident position. Firstly, the tent trailer segment fills the opening between the traditional caravan and the tent, catering to campers who seek more of an outdoor camping experience, but would enjoy more practicality and comfort that a tent would provide. Comparing Holtkamper with competitors, it becomes clear that it fills the premium segment. Both in terms of high-end quality and price point Holtkamper belongs to the premium more luxurious end of the spectrum. The matrix in figure 5 shows the tent trailer market positioning in more detail. Additionally, a spread can be noticed in terms traditionality.



Figure 5. Market position of Holtkamper.



Figure 6: Picture curtesy of Holtkamper.

Key Findings

Considering the larger camping and recreation landscape, a selection of contextual tensions was identified, based on literature review and interviews with Key market experts. In full detail these findings are shared in Appendix A.
In the section below an overview of the key findings is presented, along with their implications.

Growth and Demand vs Structural Stagnation
After the COVID-19 pandemic, the camping and travel sector has experienced a strong growth and increasing demand, especially in the experience-oriented travel and motorized travel. This, while a large share of the camping equipment landscape is characterized by aging products and limited innovation. (McKinsey & Company, 2024) (VMS | Insight, 2025). For Holtkamper, and an upcoming new product, this could present opportunities to innovate in favor of this adapting market.

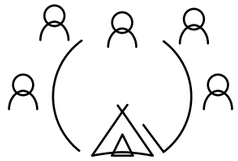
Comfort and Luxury vs Simplicity and Outdoor Values
Camping is increasingly positioned as a high-comfort, experience-driven activity through glamping and neo-comfort solutions. On the other hand, the association with it being a “back-to-basics" lifestyle, closely connected to nature , remains (Hanafiah et al., 2025; Gröoschel et al., 2025). Creating a tension between comfort-oriented and minimalist/outdoor based values. For Holtkamper, the positioning within this field is highly interesting.

Freedom and Autonomy vs Spatial and Systemic Constraints
While it is noticed that campers desire flexibility, autonomy and personal freedom, these values conflict with the constraints of the market more and more. Regulations and the reduction in campsite variety and availability combat this feeling of perceived freedom. (VMS | Insight, 2025).

Digital Convenience and Visibility vs Disconnection and Escape
Technological developments have enabled spontaneous travel planning through continuous connectivity and social visibility, reshaping expectations of convenience. At the same time, camping and recreation is increasingly used as a way to disconnect and mental escape the grip from “the online”. Signifying a contradiction between technological integration(in travel) and the desire to “log off”, disconnect and detox (Versloot, et al., 2025); (VMS | Insight, 2025); (Peeters et al., 2023).

Sustainable Values vs Enabled Choices
Sustainability is widely seen as an important value within camping and travel related decision making. Still, purchasing behavior remains strongly driven by the actual cost of equipment and trips, and additionall constraints in infrastructure and regulations. Shining a light on expressed sustainable intentions and the extent to which actions are taken to support these. (Versloot, et al., 2025); (VMS | Insight, 2025); (Peeters et al., 2023).

Changing Mobility and Climate vs Accessibility and Inclusivity
Camping (mobility) is being reshaped through intentional regulations regarding emissions and environmental impact, as well as climate change-driven effects influencing travel patterns and accessibility. While encouraging adaptation to less impactful means of travel, regardless of their nature, they simultaneously reduce the inclusivity by expected rise in travel cost. ((Matei, et al, 2023); (Gössling & Scott, 2025); (VMS | Insight, 2025); (Interview B–OCS recreatie, December, 2025).



User/Owner Research

Purpose

The User/Owner study in this project aims to understand ownership experiences, values, and tensions between users and their current tent trailers.

Simultaneously, it seeks to identify improvement opportunities and unmet desires within the product and its associated experience. These findings will be translated into design drivers, requirements, and features for the concept.

Additionally, the study provides value for Holtkamper by offering insight into its customer base and product use. Given that Holtkamper owners are generally highly engaged, active within communities, and strongly connected to the brand, involving them in the development process is expected to contribute to both insight generation and customer appreciation.

Setup & Methodology

To obtain understanding of user and owner aspects such as product use, habits, demographics, and vacation preferences, a structured survey was conducted.

The survey consisted of:

- **Closed questions,** providing a quantifiable dataset on usage and user characteristics.
- **Open questions,** capturing experiences, values, tensions, and desires.

Closed questions required respondents to select one or more predefined options. Examples include:

- "Which model tent trailer do you have/ have you had?"
- "How many people do you usually travel with?"
- "How long do you usually stay at one location?"

Open questions were used to gather qualitative insights into:

- Positive experiences
- Inconveniences and improvement opportunities
- Desired or currently missing functionalities



Figure 7. User survey (in Dutch) for Holkamper users to share their Holtkamper experience.

The full set of questions can be found in appendix B.

The survey was conducted using Typeform and distributed in Dutch via the Holtkamper newsletter, targeting 'active' customers (recent buyers, interested users, or subscribers).
To maintain focus and manageability of the dataset, only tent trailer owners were included.

Descriptive questions were structured using ranges (e.g. age brackets) to ensure anonymity and mitigate ethical risks. Approval from the Human research ethics committee was requested, and received. Appendix C presents the Informed consent statement preceding the study.

The open-ended responses were processed through thematic analysis, supported by a rough quantification to identify recurring themes and their relative prominence. A complete overview of the thematic analysis and its quantification is provided in the appendix D 1.



Figure 8. Advertisement to participate in user research.

Limitations

The study was intentionally scoped to tent trailer owners, limiting the complexity of the dataset and feedback, while supporting clarity and focus in analysis.

Due to privacy considerations, demographic data was collected in ranges rather than exact values, restricting the level of detail in segmentation.

The share of qualitative input was very large, while valuable in richness, required thematic processing and limited the depth of analysis within this phase. Cross-analysis of the data, considering aspects like age group, travel size and model(year) is not within the scope of this project and remains for future research, due to the data set size and available time for the project.

Results & Initial findings

Just after being sent out the number of respondents grew quickly, simultaneously an understanding of the owner base emerged.
This page presents an overview of the results and findings. Showing the data and patterns, the derived insights, and the corresponding implications.

A more detailed overview of the findings can be found in Appendix D 2

630+	Submissions	**80%**	Equipped with kitchen
94.9%	Holtkamper owners	**60%**	Uses bicycle carrier
50–70	Years dominant age group	**SUV /Station**	Most common towing vehicles
50%	Travels with 2 people		Vehicle share notably **larger than**
3–4	Weeks camping, mostly single location	**(P)HEV /EV**	**Diesel**

Data & Patterns

- 14.8% owned tent trailers for more than 20 years
- Camping behavior is typically stationary, with longer stays at a single location

Positive aspects
- Ease and speed of setup (absence of complex pole structures)
- Kitchen accessibility, especially the fridge during travel
- Sleeping comfort and bed layout
- Storm resistance, robustness, and canvas quality

Pain points & defects
- Sleeping cabin perceived as too light → desire for darker materials
- Lack of integrated electrical outlets and lighting
- Zippers experienced as too tight and difficult to operate
- Canvas-related issues: discoloration, mold, drying difficulties
- Frequent need for user-created solutions for electricity

Physical effort & handling
- Setup and packing often require two people
- Trailer weight and handling difficult, especially on slopes
- Physically demanding actions:
- High or hard-to-reach elements reduce perceived control

Use limitations & desires
- Desire to tour more and visit multiple destinations
- Interest in short, spontaneous trips (also outside summer)
- Current limitations:
  - Risk of wet packing → mold development
  - No simplified or “quick setup” mode

Customer sentiment
- Overall constructive and loyal attitude towards the brand
- However:
  - ~25% expresses strong criticism on price vs value
  - Frustration with service, wait times, and handling
  - Perception of declining material quality and “Holtkamper DNA”

Insights

- Camping behavior is primarily stationary, not touring-oriented.
- The product is appreciated for comfort, reliability, and ease, yet these same aspects are also sources of friction.
- Physical effort and lack of control during setup reduce perceived usability, especially for an aging user group.
- Users actively compensate for missing functionality, particularly in electrical systems.
- There is a clear mismatch between premium positioning and perceived product execution.
- Desired use (touring, spontaneity) is currently constrained by practical limitations such as drying and setup complexity.

Implications

- Preserve and strengthen core qualities such as comfort, kitchen accessibility, and robustness.
- Reduce physical effort through improved ergonomics, support systems, and more controlled setup processes.
- Integrate electrical infrastructure (lighting, charging) as a standard rather than a user-added solution.
- Address material performance and durability, especially in canvas and frequently used components.
- Enable new use cases by:
  - Reducing risk of mold (drying solutions).
  - Introducing a simplified or “touring” setup mode.
- Align product execution with premium expectations in both quality and service experience.

Key Tension

Premium, comfort-oriented product.
Physically demanding use and lack of integrated systems.

Core Insight

Holtkamper tent trailers are valued for their comfort, robustness, and ease of use, yet in practice users experience friction in usability, effort, and integration of modern functionalities.

Opportunities

- **Reduce physical effort and increase control during setup.**
- **Enable spontaneous and touring-based use through drying and quick-setup solutions.**
- **Integrate electrical and lighting systems as standard features.**
- **Reinforce perceived quality to match premium positioning.**

Identified tensions, needs, and values

Considering that the dominant age group of HK owners is within 50 – 70, and that from direct feedback could be concluded that a multitude of actions is to heavy or physically demanding, **designing a future concept, the required force, accessibility of grip points should be taken into account, making shure it can be operated by the target audience.**

80 percent of current tent trailers are currently fitted with a kitchen. The kitchen is mentioned consistently as an indispensable aspect for HK owners, and for model owners in which a kitchen is not fitted; an integrated example is often mentioned as a desire. **For a future concept considering the Implementation of a practical kitchen should be significant.**

It is expressed strongly that the perceived material and build quality of the most recent models does not meet the high expectations that are created through the pricing. It is noted that this might push current owners not to buy another HK. **Considerable effort should be placed in material selection, and R&D of parts frequently used during set up (reliability).** To ensure that the product reflects the high price.

Additionally, owners note that the brand heritage and HK DNA are fading away in the new models, mostly related to the material quality, (decreased) durability and design.
A future Holtkamper concept should "live and breathe" the Holtkamper brand heritage as it is known and loved. Or redefine it completely.

Within Holtkamper owners there is a significant drive to use their tent trailers for larger tours and spontaneous trips. The risk of developing mold through inconvenient weather and not being able to dry their canvas properly prevents them from doing so. **During the development of a future HK concept, reducing the chances of mold development, potentially through drying solutions, could enable a larger set of use cases for the product and allow higher satisfaction and freedom.**

With tech being an inseparable part of our lives, owners note the lack of charging amenities, along with a desire for better integrated lighting solutions, also in the kitchen (currently owners' DIY solutions).
A future HK concept should provide sufficient electrical amenities for devices, and support the user through convenient lighting, which enhances the camping experience.

On the contrary, a significant desire is expressed for resurrection of the simplicity, durability and ease of use of the "classic" HK models. "Leaving out all the gadgets"
In developing a new Holtkamper concept, significant consideration should be put into creating a bare bone, minimalist, robust and durable HK concept.



Figure 9. Example question in user survey.

Reflection

While it was seen that HK owners are very engaged and passionate about the brand, the number of submissions turned out to be significantly higher than expected. This resulted in the thematic analysis requiring a significant amount of time. As the expected number of participants was much lower, the survey was set up to acquire more qualitative data from the users with open questions. While providing a large data set with high level data, the sheer size has prevented the deeper analysis between for instance: specific models and certain feedback themes or specific use types and desires/ wishes.

It is also notable that the aspects of tent trailers that are mentioned as a strong selling points, and reasons for purchase, like canvas quality, kitchen accessibility and setup/packing time. Are also mentioned heavily as areas for improvement. At this point it is unclear whether people who named aspects as USP also mentioned the same aspects as improvement areas, or if the named USP's are form inform improvement areas for people who do not have them.

Additionally, it was interesting to see that a significant share of influential feedback was expressed during the last question, requesting to provide a last remarque.



Future Vision Development

Within the conducted research, the future vision informs the design process by shining light on the world where the product will be making an impact. More importantly, it will help define the roles that it could play. The goal for this study is to define what the future of travel and camping could look like and where Holtkamper can contribute to it. For the creation of this future vision, the Vision In Product (VIP) design method will be used (Hekkert & Van Dijk, 2010). While the current domain and projected implementation of new HK products is not that far away the ViP method can be a powerful tool to analyze product context developments, trends and changes, and most importantly a great way to create a projection of the future context. Serving as a guide in the creation of product (concept) with relevance in the near future.

ViP works by deconstructing the current product, through the (current)interaction, up to the current context; the bridge is then crossed to the future context. Through the generation of a future world vision, the position, role and desired goal of the product slowly emerge. To be captured in the future Vision.

As the historic models have been very influential in the creation of the brand, and it is desired to revive the spirit of the original Flyer model, it was decided to follow the deconstruction phase twice. Both for the current product, the Holtkamper Aero, as well as the historical product, the Holtkamper Flyer.

This section presents the steps that were taken to arrive at the future vision and vision statement.

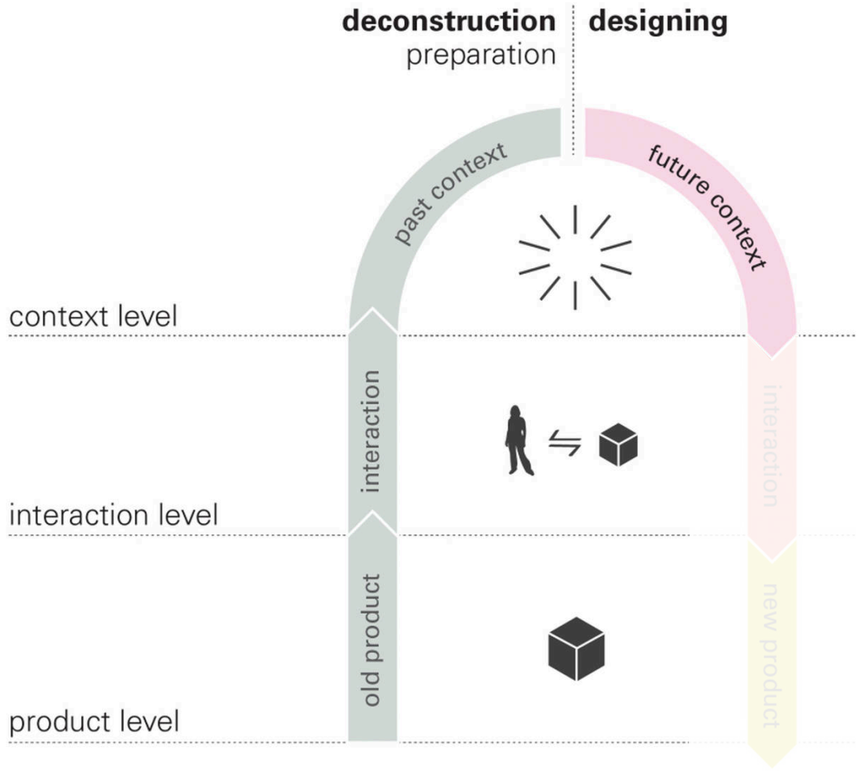


Figure 10. Visual structure of Vision in Product (ViP) method.



Analogue picture by author.

Application of ViP steps

Product

Initially the current and historical products were analysed at a product level.
Taking the construction, materials, and features into consideration.

Current:

Exterior





Holtkamper Aero 2025



Additional tent



Interior







Tent-frame construction





Figure 11. Current model: Holtkamper Aero 2025.

Single mast awning & layout
The luxury kitchen provides a fridge and cooking amenities. The interior living area creates a spacious interior. In this case, the model is decked out as a showroom model including accessories and furniture.

Tent frame construction.
High performance materials are used such as carbon fiber in the poles to increase stiffness and reduce weight. Contributing to the premium feel.

The construction is built around the aluminum core, referred to as the cage.

Historic:

Exterior









Holtkamper Flyer Expedition 1980

Interior







Box shaped trailer



Figure 12. Historic model: Holtkamper Flyer Expedition 1980.

Materials & construction
The constriction of the flyer consists of a aluminum trailer chassis with a wooden construction on top housing the tent, bed slide out and seating area. The main material used is wood.
The shown Flyer was in for maintenance, providing a thorough look at the way it was built up.

The tentpoles length of all beams could be adjusted in the case of canvas contraction through weather.
Completely opened up the flyer has a large footprint. With additional bunkbeds and tent attachments, it could sleep a sizable family. Featuring a seating area in the interior.

Interaction (emotional)

At the time of the research phase, the winter weather meant that there were not many (tent trailer) campers to be found on camping's. This meant observing Flyer and Aero owners with their product was difficult.

Therefore, expressions of Flyer and Aero owners were used to create a map of attributed emotional interactions and connections to the product.

Current:

With the Aero the largest share of the expressions signified a fluent use and connection to the product. Often the product is expressed to serve as an enabler of discovery and freedom.

On the other hand, feelings of fear to breakthe product imply a less carefree experience. It is also seen that the price of the product influences the experience and way it is perceived.



Figure 13. Product interaction of current Holtkamper model.

Historic:

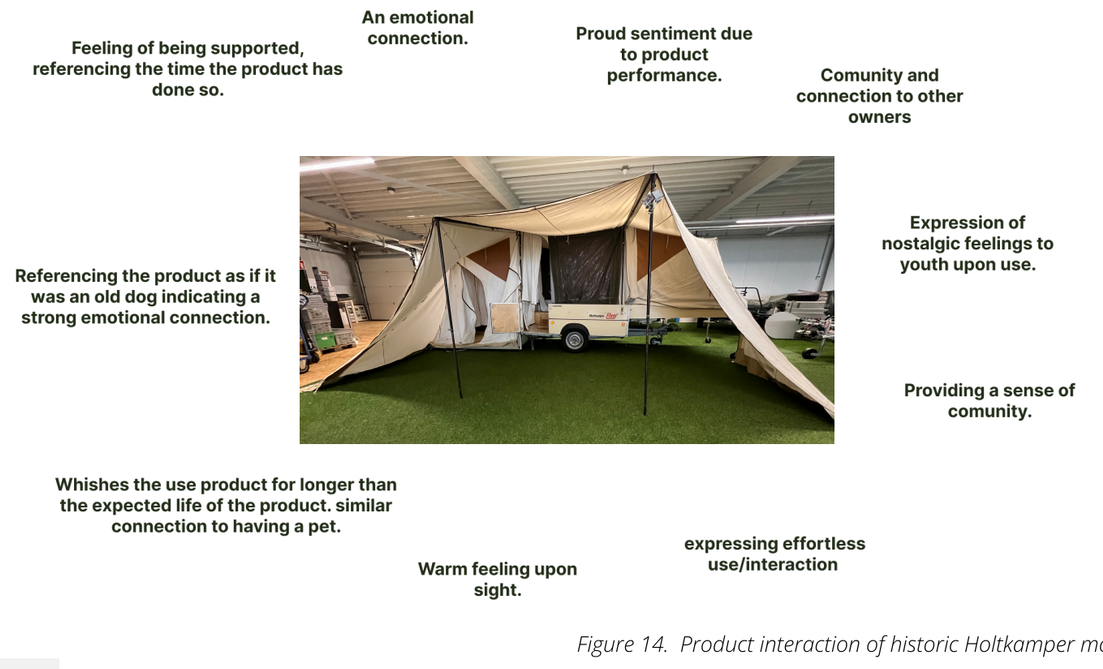


Figure 14. Product interaction of historic Holtkamper model.

It can be noted that the attributed expressi ons and associations regarding the Flyer are mostly warm and fluent with nostalgic tones. The tent trailer is sometimes addressed similarly to a pet, signifying an emotional connection. Additi onally, feelings of support are described.

Context

Before transitioning into the future context, the current and historical context are analysed, creating a picture of the relevant developments during the creation of the current and historical model.

This supports the understanding of how the context influenced the design at the time. This understanding is useful when analysing the future context and its design implications later.

A larger overview of the ViP deconstruction steps are presented in appendix D 1, -2 & -3.



Figure 16. Context of hisotric Holtkamper model.



Figure 15. Context of current Holtkamper model.

Future context creation

Following the deconstruction of the current and historical product, their interaction and context, the transition can be made to the future context creation, to grasp what could be a possible future. The construction of a future world will serve as a design frame to guide the following design process. Positioned as an inspirational tool, it facilitates design exploration, rather than setting hard boundaries.

The domain of the future context is defined as within **Mobile Camping equipment in 2035-2040.**

Where:
"We aim to make a contribution within the field of: Mobile Camping equipment. (RV's, Camper-trailers, Vehicle-camping attachments) within a future timeframe of 10-15 years."

The realm of Mobile Camping equipment creates a domain where a wide variety of fields intertwine, like mobility, nature, economic components, and meteorological aspects. Within this domain, the emphasis lies on the European camping contexts, where regulatory frameworks, infrastructure density, and environmental conditions significantly influence camping behavior.

Within the domain, a selection of context factors was made to capture the influential developments shaping the context of mobile camping equipment and the behavior of the users around it. These factors represent, among others, structural, societal, technological, and environmental forces that are expected to impact how camping is practiced, experienced, and enabled within the defined timeframe.

By isolating and projecting these context factors, a coherent future context can be constructed that provides insight into potential shifts in user behavior, constraints and regulations, and experiential expectations.

97 context factors were selected of the types: development, trend, state, and principle.

The selected context factors were subsequently clustered to identify recurring themes and underlying patterns. In total, **97 context factors** were grouped into **15 clusters**, each representing a distinct future aspect influencing the domain.

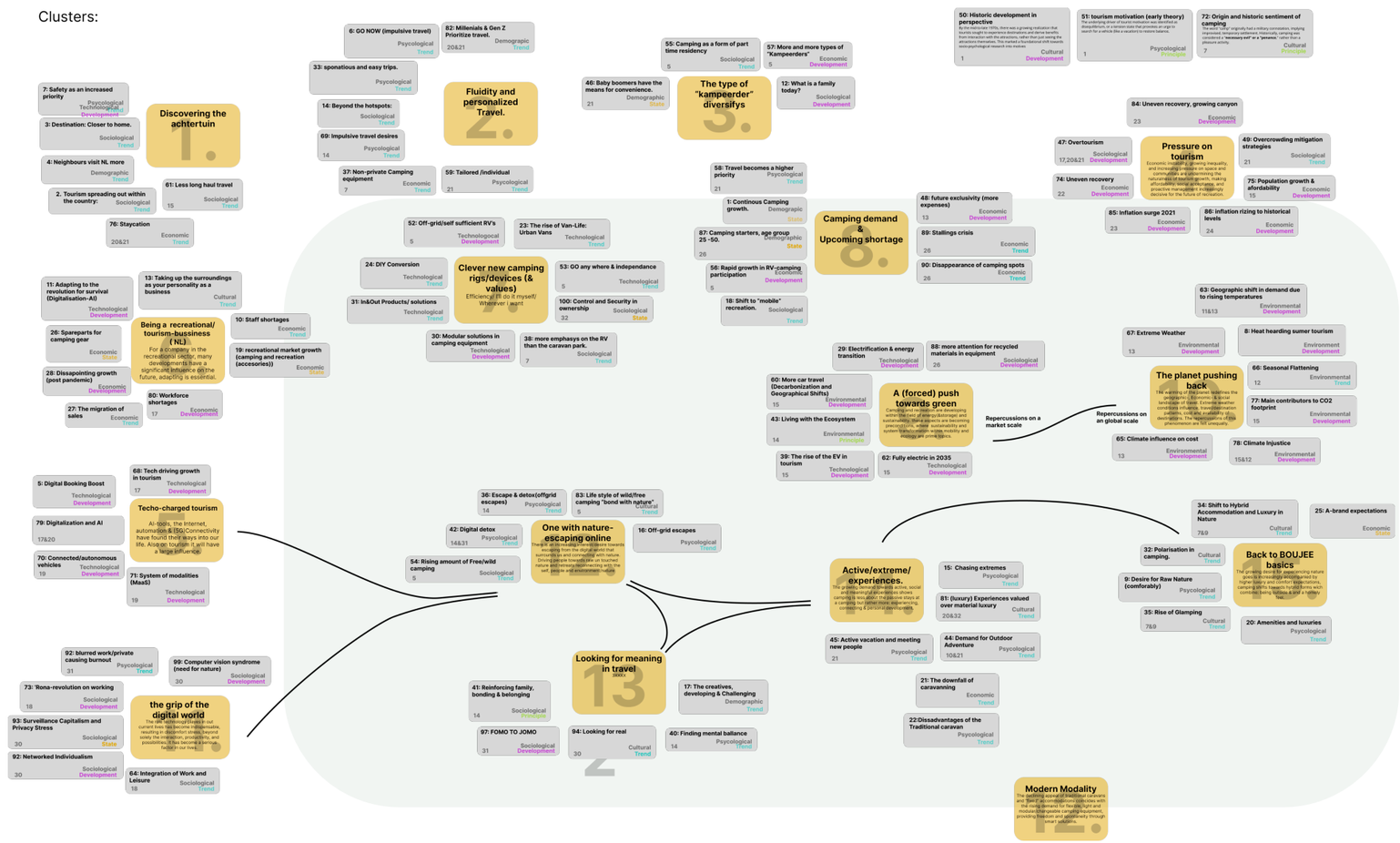


Figure 17. Fifteen clusters created by combining factors which are gathered using the ViP method.

The clusters, shown in figure 17 above were synthesized. They have been assigned a number, serving as a visual identifier to enable the reader to easily visually reference/track clusters through the process. There is no ordinal valuation or rating associated with the given number. Of which a complete overview can be found in Appendix E.

In in interpreting the clusters and the correlation between them. Some first conceptions about the future camping landscape become clear.

It is interesting to see the **role technology & the internet plays** in relation travel and camping. Both, speeding up and enabling travel, as well as playing a large part in the increased need for nature recreation, through overstimulation.

Furthermore, travel flavours and **styles keep diversifying**, showing the desire voor personal and tailored experiences.

additionally a number of forces can be seen that apply increasingly m**ore pressure on camping** and travel.

Future World Vision & Design Mission Statement

Following the clustering of the selected context factors, the fifteen clusters were interpreted as signals of diverging future movements within the domain. To define how these movements shape a future world as a whole, a matrix was created, positioning the clusters on the two axes, as seen in Figure 18.

Interpreting the movement that emerges from this world vision shows a selection of factors.

It is foreseen that the way people camp will diversify strongly, in terms of travel party and activities, moving away from (just) the traditional family. People want increasingly more individual/ tailored experiences. Regarding the level of luxury, a polarisation will be felt. Both a rise in luxury camping travel as well as minimalist experience travel is foreseen, the remaining common denominator is the attraction to nature.

In daily life, as well as the travel environment, digital systems play an increasingly predominant role. Allowing for automation and convenience, while also causing an increase in tech related stresses, anxiety and burnout. It appears as if the "digital ability" will have overtaken the brain's capacity to host it. Additionally the line between both private life and travel in relation to works is blurring.

Within the realm of camping travel and recreation, the importance of disconnecting from this digital environment is realized within a share of campers and acted upon, driving people to nature, extreme experiences keeping the technological burden at a minimum.

On the contrary, it is seen that in the near future the factors essential for recreation in nature like camping's, parks mobility, (on a larger scale even) the climate and global economic factors, will be applying pressure on nature recreation and exploration.

As the importance seems to increase, the freedom to do so seems to fade.

To position this project within this future world vision, the following Design Mission Statement was developed.

With the upcoming Holtkamper concept/camping equipment:

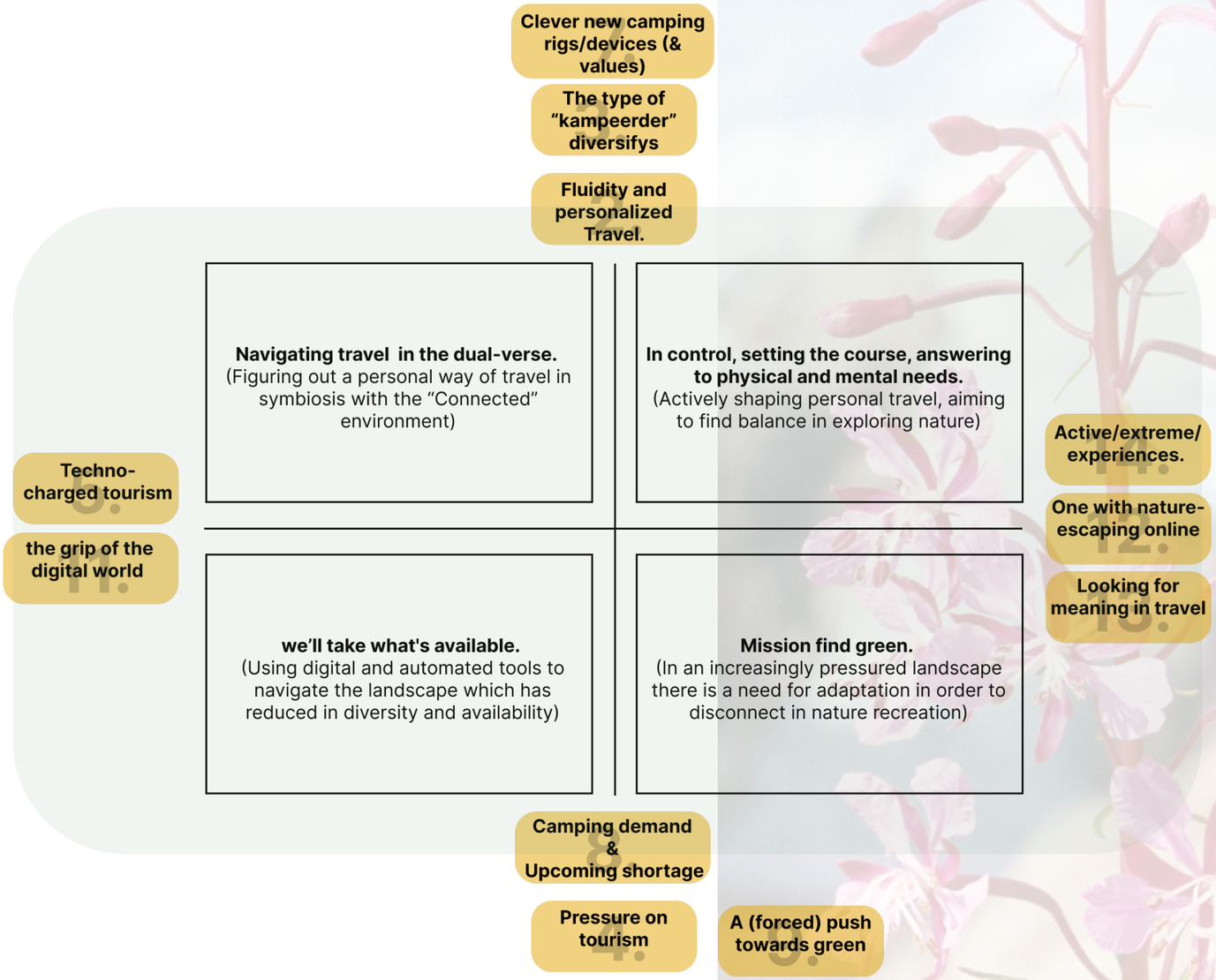


Figure 18. Future World Vision.

"I want people to **regain balance** in a *fast-changing digital world* by enabling them to **actively shape their own journey** and **experience the freedom of exploring nature**"

Research Synthesis

In concluding the main knowledge generation phase a significant amount of valuable insights were generated. Where the different studies each served their own respective purpose, similarly, it can be noted that the outcomes will be valuable in different aspects of the concept generation and development phase. This section will present an overview of the found insights, and additionally, how the generated knowledge will inform the subsequent design phase.

Context analysis

The context analysis revealed the current landscape in which the upcoming Holtkamper concept will be placed.

Characterized by a large post pandemic growth yet turbulent market. While there is growth and increasing demand, the innovation within the segment is limited and current camping equipment is ageing.

Noticeable is the increasing polarisation between demand for either luxury or more minimalist/extreme, often nature cantered, experiences. Insinuating the potential need to target either one of the directions or create a adaptable or hybrid solution.

Additionally, it is seen that digital tools have revolutionized the planning of trips. Facilitating more spontaneous travel being able to book accommodations and flights on the spot. Changing travel behaviour over time.

Lastly the context analysis pointed out transition towards more sustainable travel, both induced by local factors, e.g. regulations, as well as global environmental factors. This, resulting in a transition to lower impact mobility, recreation, and travel. While on the other hand, also driving costs higher.

User research

As noted earlier, the user research provided a surprizing amount of responses and input. The largest share of findings was related to specific practical aspects of Holtkamper ownership, regarding: specific product and feature desires, frustrations and usability issues.

Examples include the desire for integration of electrical (charging) amenities and lighting. Better kitchen accessibility and storage and functionality. The study also emphasized the average age of the target group being between 60 and 80 years old, and related responses regarding the required force, occasionally being to high or items, and handles being difficult to reach.

These user insights, which present incredibly valuable feedback for Holtkamper, in this project, will prove to be most valuable during a later stage of the project, during concept development, in concept embodiment and design/ selection of features.

In addition to specific product desires and frustration, the survey also presented a selection of reoccurring/structural implications and customer desires that hold significant “new” use cases and adress significant product improvement opportunities. Due to their perceived value these following aspects will be taken up into the core of the project.

The most significant aspect that structurally came forward related to the drying of tent canvas after rain. Having to pack a wet tent trailer or the fear thereof, is said to be a significant issue. Owners would rather leave a day early than risk packing their trailer wet, and having to let it dry later. Related to this issue is a desire for short spontaneous weekend trips and longer (multi-destination) tours, but a fear to do so because of the fear of wet packing. Resolving this fear could lead to new extended use cases for Holtkamper.

Future Vision generation

The Future Vision study based on the ViP method, highlighted the upcoming pressures on the recreational travel and camping. Additionally, the importance of nature recreation and the connection to nature where emphasized in combination to the expected increase of the negative effects of the fast-paced, digital world. To conclude, the importance of experiencing nature is growing, while the freedom to do so is fading.

To position the upcoming Holtkamper concept in this future, the Mission statement was created as a starting point, informing the desired future camping experience, further inspiring the ideation of solution and concept architecture.

Figure 19 highlight how the insights from the different studies will inform the following design process.

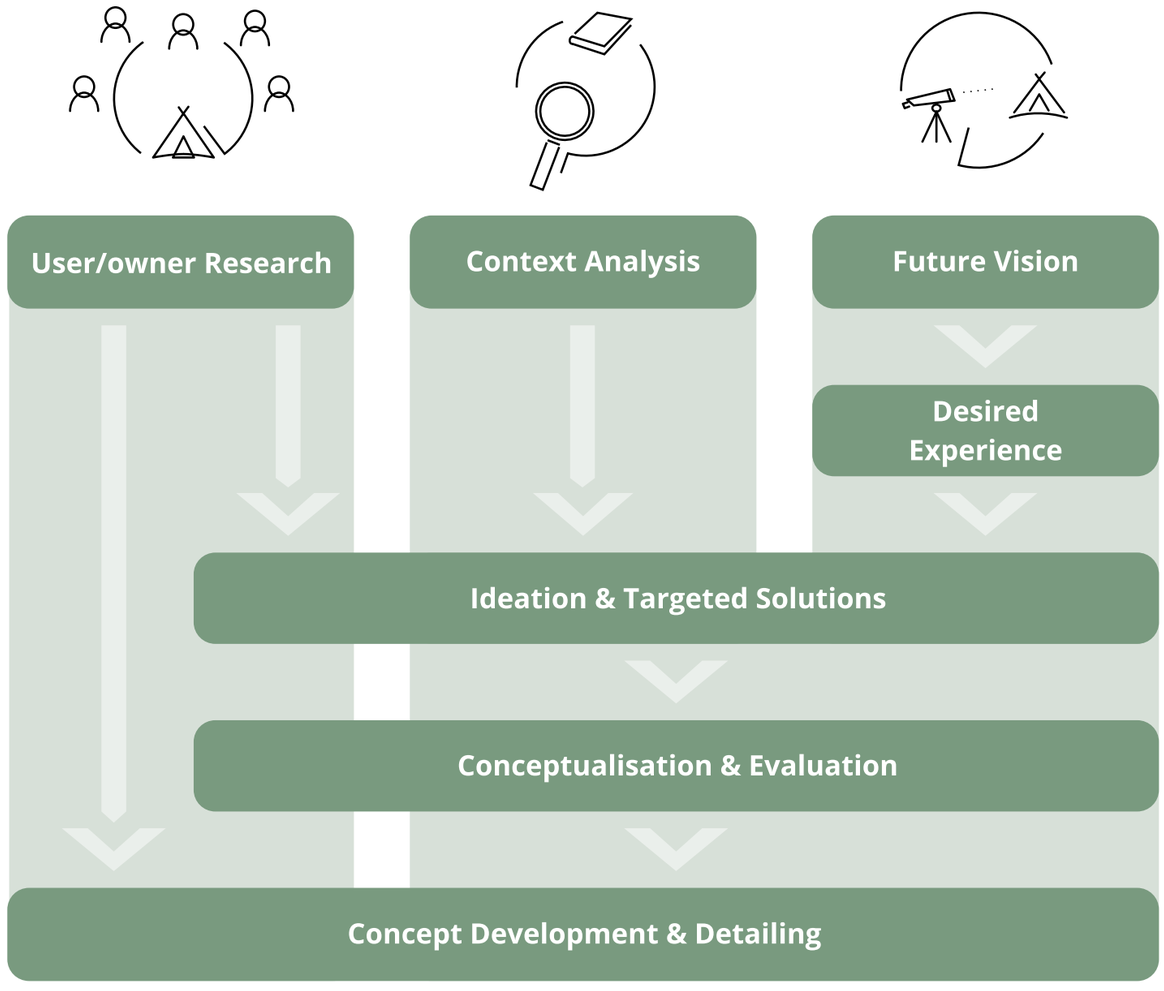


Figure 19. Overview of Research Synthesis.

Design Process

Design Process & Methodology

This chapter presents the translation from the preceding knowledge generation into the design of a camping equipment concept. It explains what design methods were used, and how their results informed the process. It shows the ideation, the evaluation of solutions, up to arriving at meaningful concepts. Following this, concept evaluation, development and design activities regarding the final concept, are presented.

Research Outcome to Design Drivers

Within the knowledge generation phase, many valuable aspirations and goals where identified, including the afore menioned Design Mission Statement. While incorporating the theoretical goal for the concept, a direct actionable path does not directly emerge from it.

Aiming to arrive at an accessible approach to address the project goal, the statement and research outcome were translated into design drivers. These were concretized even further to solution directions, which could be explored through targeted ideation activities. Additionally informing the design of the concept architecture and layout.

The visual 20 on the side means to convey this translation from a theoretical goal to tangible solution directions.
In addition, the framework will inform the decision making, evaluation and, ideation activities.

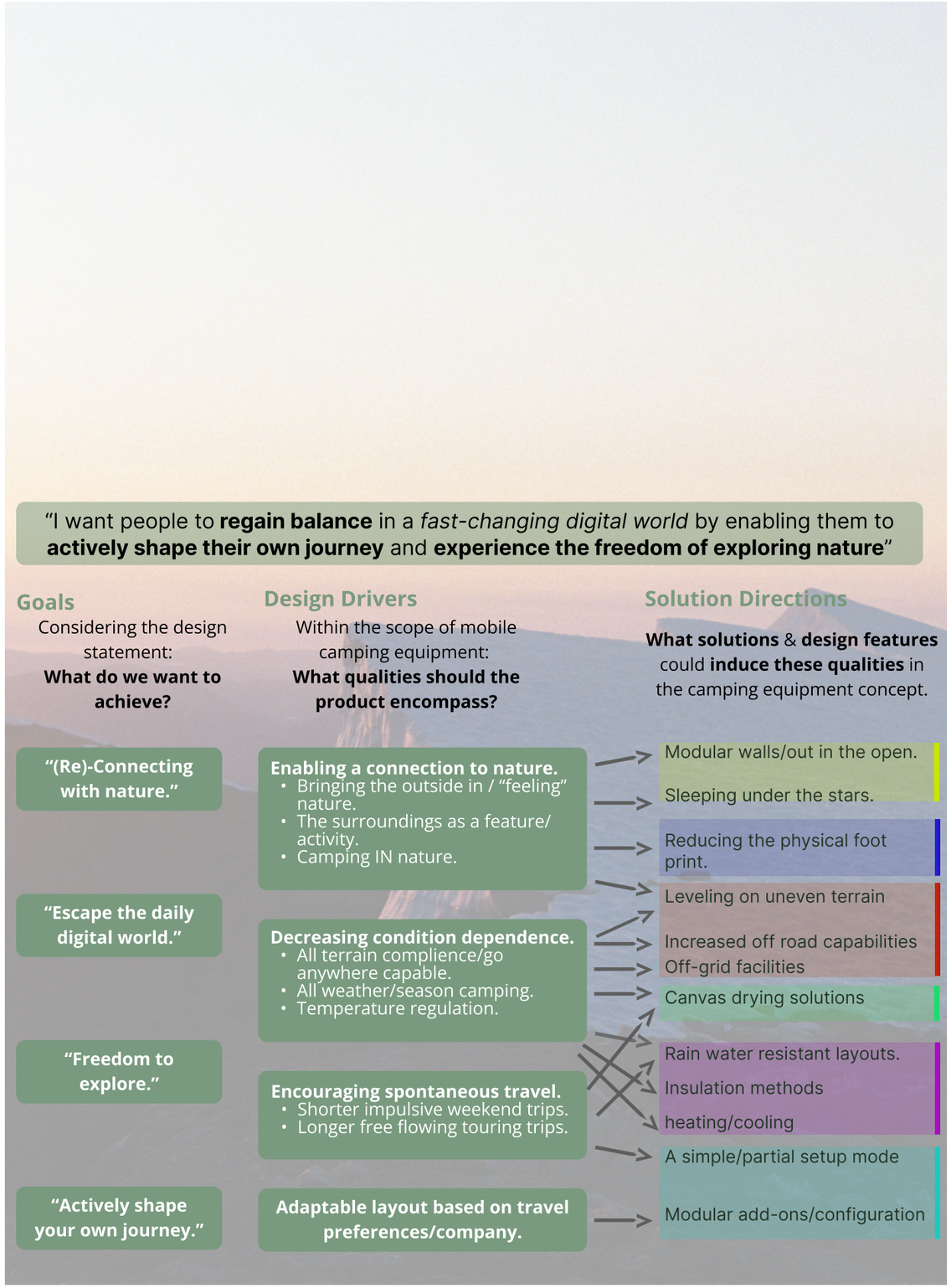


Figure 20. Visual of the translation from theoretical goals to tangible solution directions.

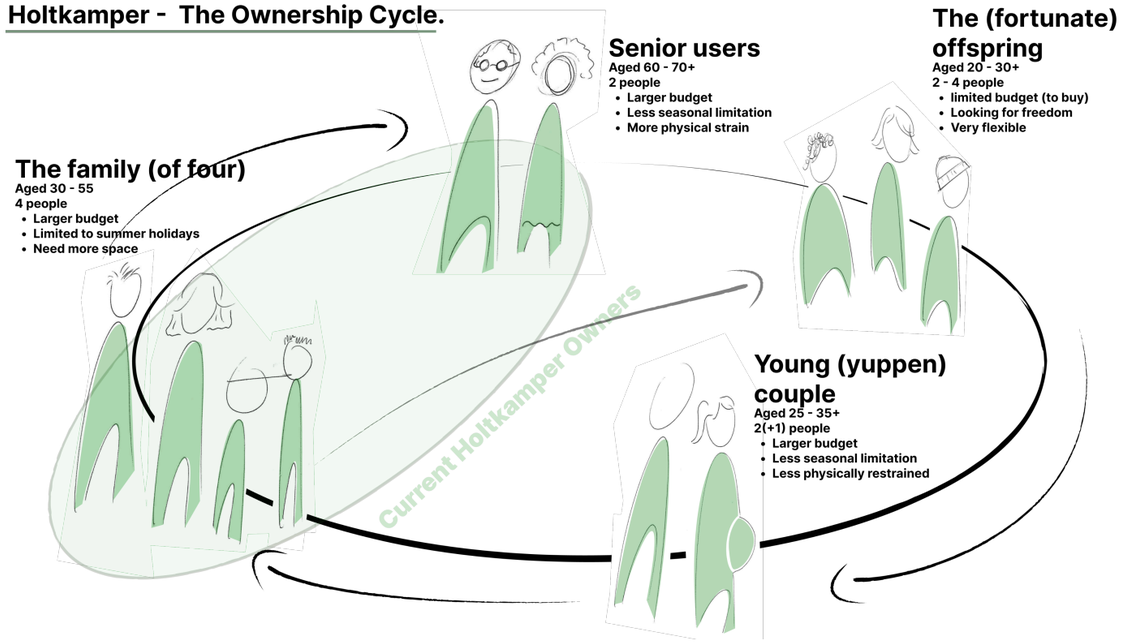


Figure 21. The Holtkamper ownership cycle.

Target user group & persona

From the U&O research it became clear that the most dominant age groups are the 50-60 & the 60-70. Together with the amount of travellers the study revealed that the most predominant user groups currently are senior couples and families with younger children. Considering the pricing and the premium market positioning this is perceived as logical.

In comparing the user experience and interaction of Holtkamper tent trailers (both VIP and U/O res.), it becomes clear that owners with older Holtkamper models show a strong emotional connection to their equipment, often facilitated by the nostalgic feelings fostered through previous Holtkamper memories and experiences from their own youth. It is seen that the strong brand image comes partially from the high product quality but also from the nostalgic association and past experiences. Similarly, it is seen that these “historic” models were often handed down from parents to the next generation(s).

Taking these insights, it was realised that the family/generational connection, and nostalgic emotions are strongly beneficial for the Holtkamper brand as well as the ownership experience.

In this belief the “HK ownership cycle” strategy was conceived. To strengthen the connection to the brand, ideally a sold Holtkamper model would be passed down from generation to generation, (re)integrating the brand into family holiday experiences. This ambition assumes a long lifespan and durability, which Holtkamper is already associated with.

In addition to the current identified customer groups, the HK ownership cycle also indicates the age group of “the younger yuppen) couple” which is currently underrepresented in the sales graphs, yet valuable to this desired cycle.

Lastly the visual identifies the potential of a tent trailer user group which does generally not have the means to buy a trailer them selves, but does occasionally borrow one from (grand) parents, in this case called “ the fortunate offspring”.
The user study does showed a significant selection of customers who take their children into account (as occasional users) when buying a tent trailer.

The concept will not be targeted specifically at this group, but it is interesting to keep in the back of the mind when designing.

Aiming to (re)introduce the HK ownership cycle strategy, the concept will be targeted at the **Young (urban Professional) Couples.**
To properly apply the ambitions, user habits, needs and goals into the concept a persona of this target group was created.

The persona provides an insight regarding required and valued concept qualities, as well as their lifestyle, personal struggles, and valued brands and products.



Figure 22. Persona of Young (Urban Professional) Couple Boris & Isabeau.

Ultimate Camping Vision & Desired Experience

To initiate the design process and aim the concept at the target group, it was desired to synthesise an Ultimate Camping Vision, incorporating the desired concept experience in use.
The VIP design mission statement would be taken as a starting point.

Meaning to add depth to this desired experience vision, input was gathered from “Kampeerders” within the target user group.

Informal semi structured interviews were conducted with a selection of young adults regularly taking part in camping, inquiring about their “Ultimate” camping experience.

Initially, practical aspects were mentioned often, such as smart magnetic lighting solutions, and battery pack electrical systems. But after requesting contributors to look beyond products and solutions but more towards what they would like to experience and feel, more insightful responses were shared.
People often emphasized wanting to be **IN** nature, being able to relax and sleep in between the trees and plants. Referencing being in contact with the surroundings requiring an open setup.
Quotes which stood out were:

“Camping out in the open, on the forest floor”

“I would want to feel the grass between my toes right as I get up”

“Imagine sleeping out under the stars, not just a panoramic roof but actually sleeping in the open”

“I would want to set up anywhere I desired, even over a river!”

“To connect with nature, I would not want to be isolated from it but be immersed in it”

Occasionally comments were shared about being in nature while being as little intrusive as possible, in terms of physical and figurative footprint.

“I would want to camp while not harming or crushing plants (or grass)”

An initial hand drawn sketch was made to synthesize the mission and insights in to an experience impression (figure 23). To reinforce this impression, Gemini’s AI immage generator Nano Banana was used to enhance the drawing and create a more realistic experience visual, shown below in figure 24.

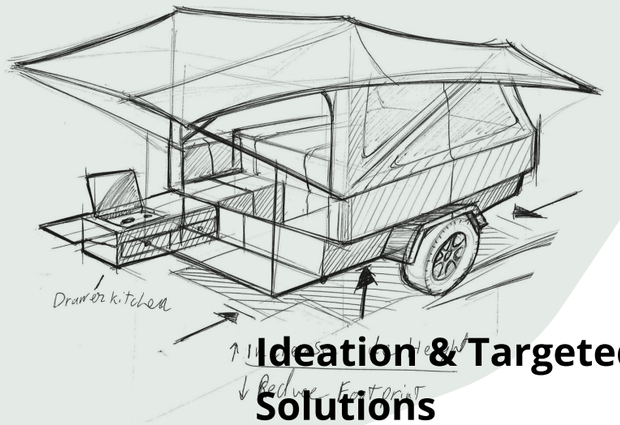
In the presented desired/ultimate camping experience visual it can be noted that current and past camping equipment types were kept out of reference as much as possible, aiming to solely grasp the camping experience.
A larger experience sketch, and iterations of the enhanced image are shared in Appendix F.



Figure 23. Desired experience sketch.



Figure 24. AI enhanced Desired experience visual.



Ideation & Targeted Solutions

In the ideation phase an initial translation from the research insights towards a concept is made.

Ideas are generated based on the Identified user tensions, desires and, needs from the user/owner research. The design mission statement and lastly, the desired/ultimate camping experience vision. Fostering the goal to diverge and create a broad selection of solutions and ideas, multiple methods approaches were explored. Focussing on both on individual identified problems as well as stages of the camping journey as well as the system as a whole. After the concretisation a ‘relatively’ abstract mission statement to more tangible solution directions, highly anticipated, ideation could be structured and performed more easily.

Free ideation, targeting solution directions and standalone/implementable features, were explored along with new ways to approach tent trailer architectures. Explorative design drawing was used to visualize ideas and mechanisms. Within the healthy selection of ideas generated, promising folding mechanisms and equipment architectures were evaluated with a fast low fidelity prototype, aiming to get a feel for the movement and kinematic feasibility.

Lego technic components proved to be a great way to test and simulate certain mechanism, as can be seen in figure 25 on the next page

The generated selection of ideas, features, architectures and mechanisms will serve as the base for the following concepting phase where they will be integrated into a set of meaningful concepts. In appendix G, larger versions of the sketches are shared.

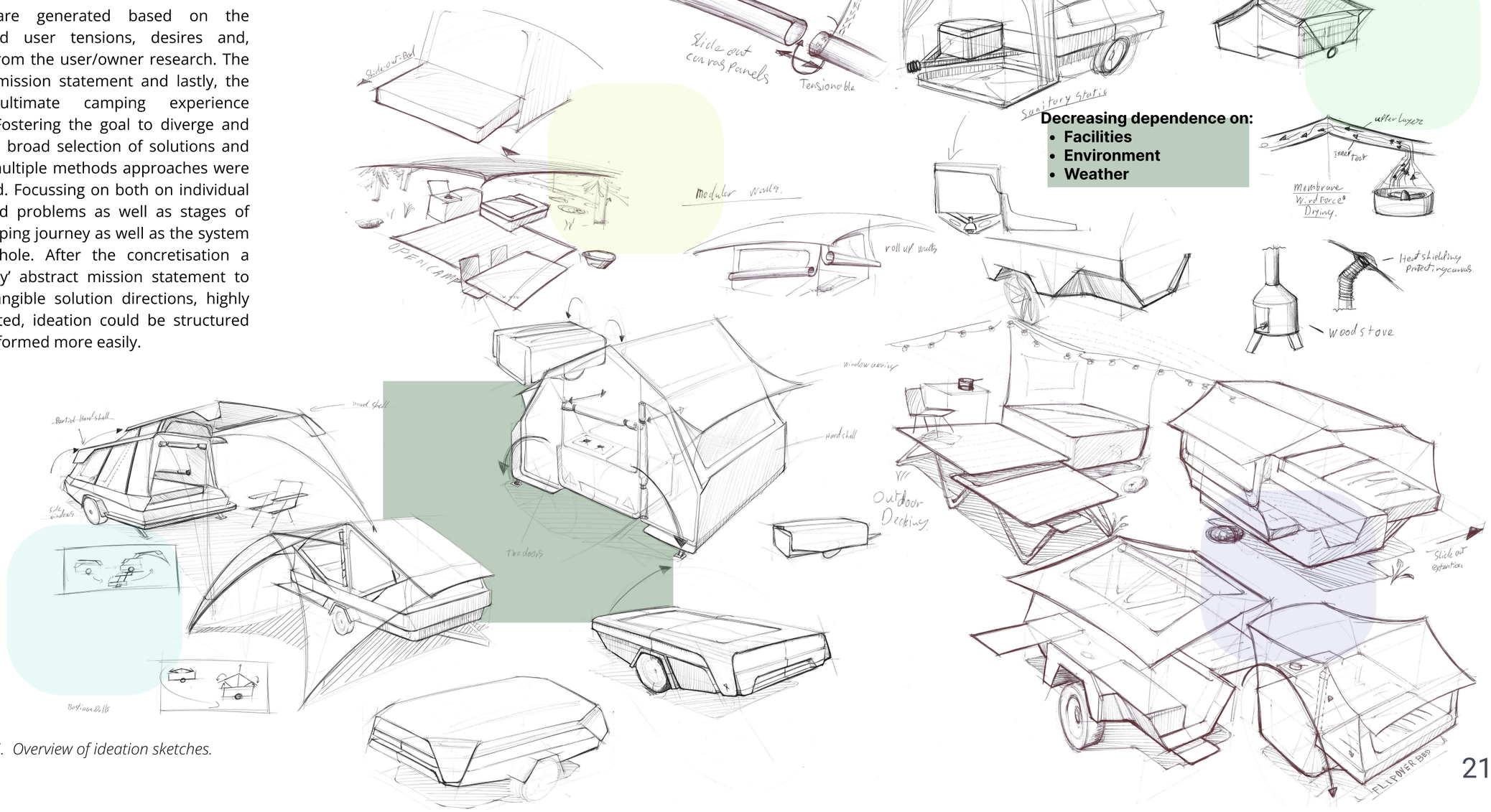
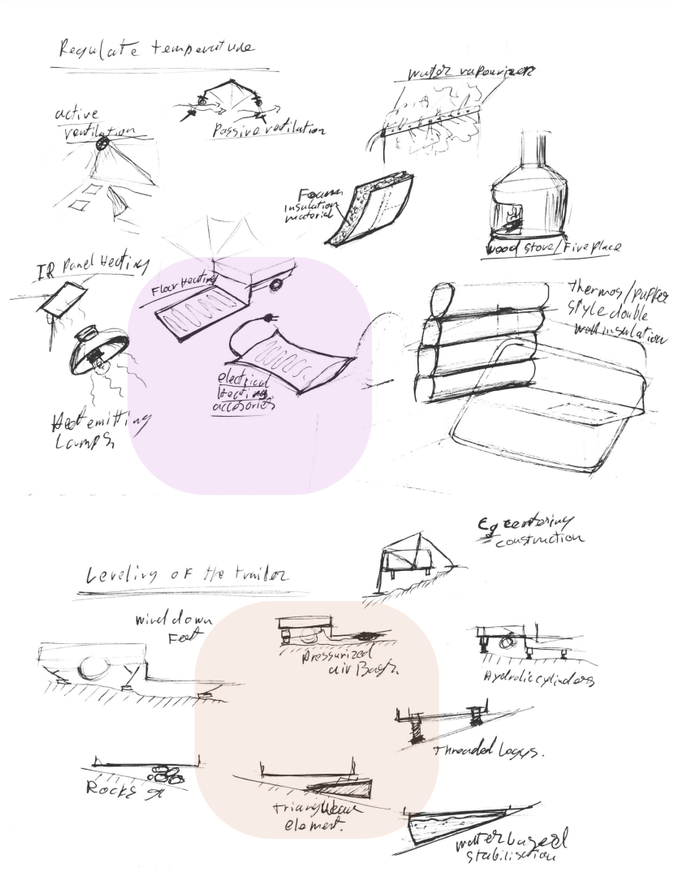
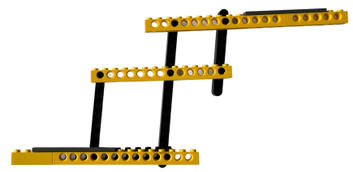
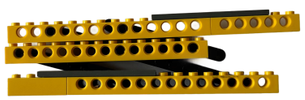
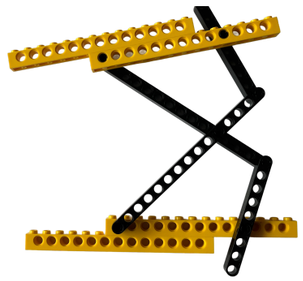


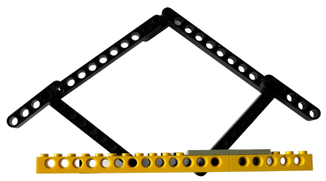
Figure 25. Overview of ideation sketches.

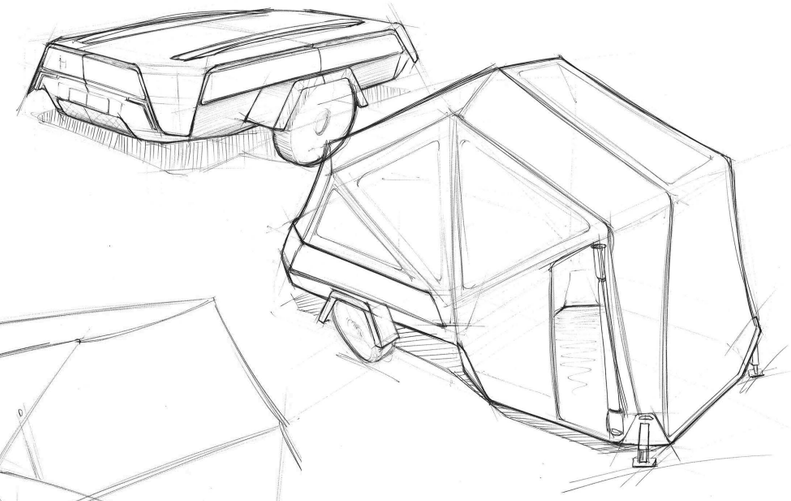


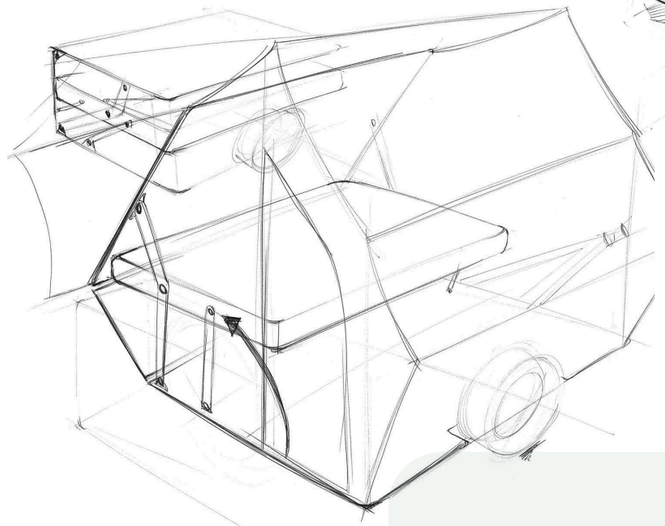


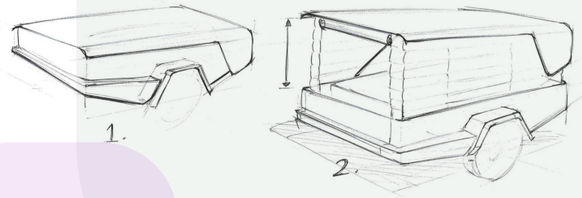


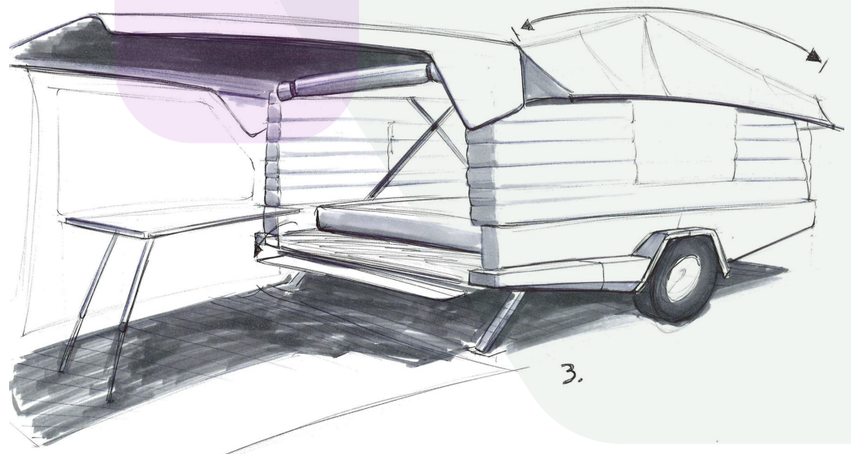












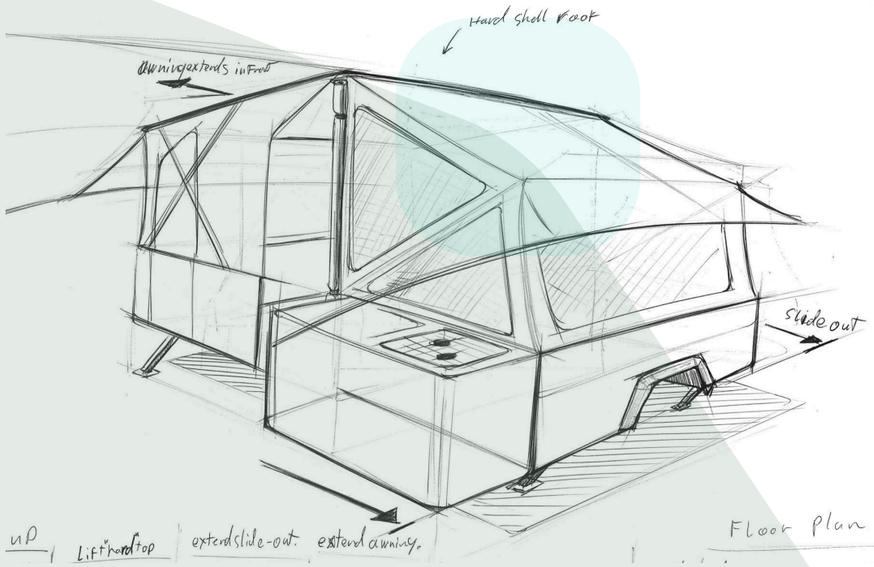


Figure 26. Overview of layout and targeted solution sketches/lo-fi construction prototypes.

Concepting

In the next section, four concepts are presented, each boasting a unique focus/ emphasis, meaning to contribute to the design mission statement with a specific strategy.

After diverging in ideation creating a broad selection of solutions features and architectures, during the concepting stage the process converges again, integrating ideas from the product layers into coherent complete camping equipment design propositions.

In reviewing ideas and features from the ideation activities, overarching themes were discovered in the shape of different approaches to the design statement. These themes would serve as a concept design strategy, focussing on different priorities in the Design mission and design drivers.

Four of the strategies were chosen to serve as the identity of the concepts, being developed further through key feature configuration, layout/architecture exploration and travel/use characteristics.

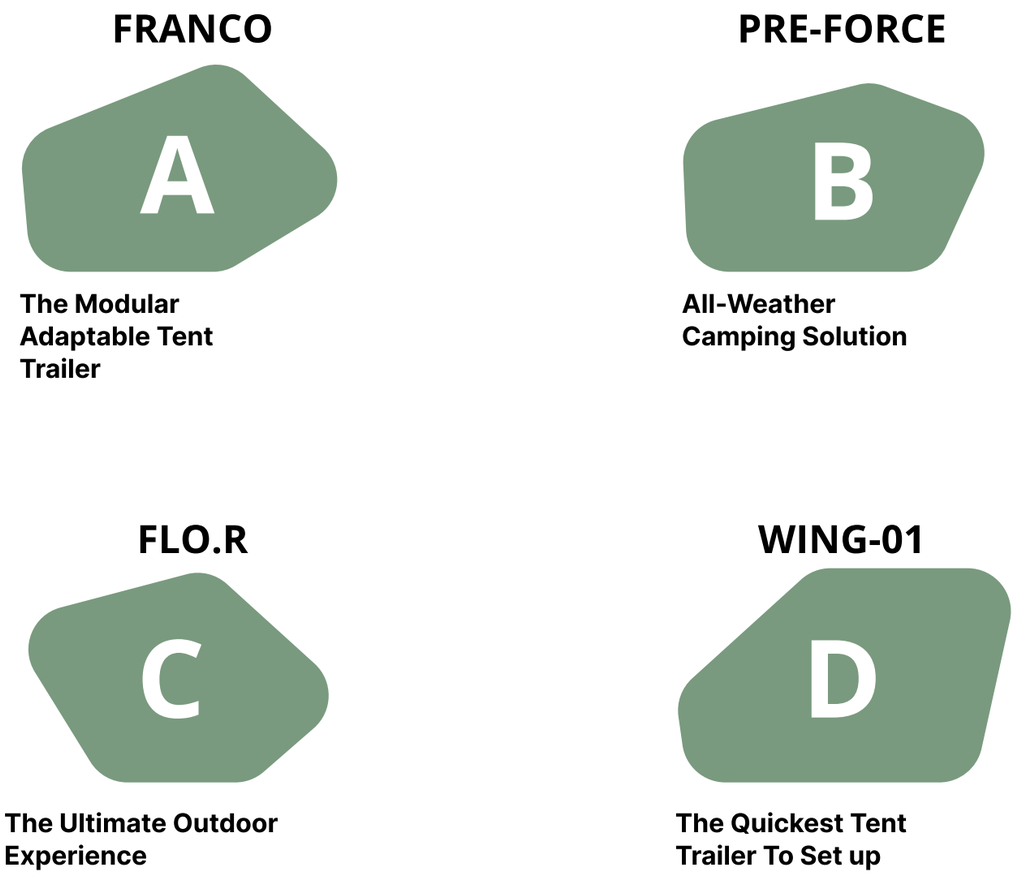
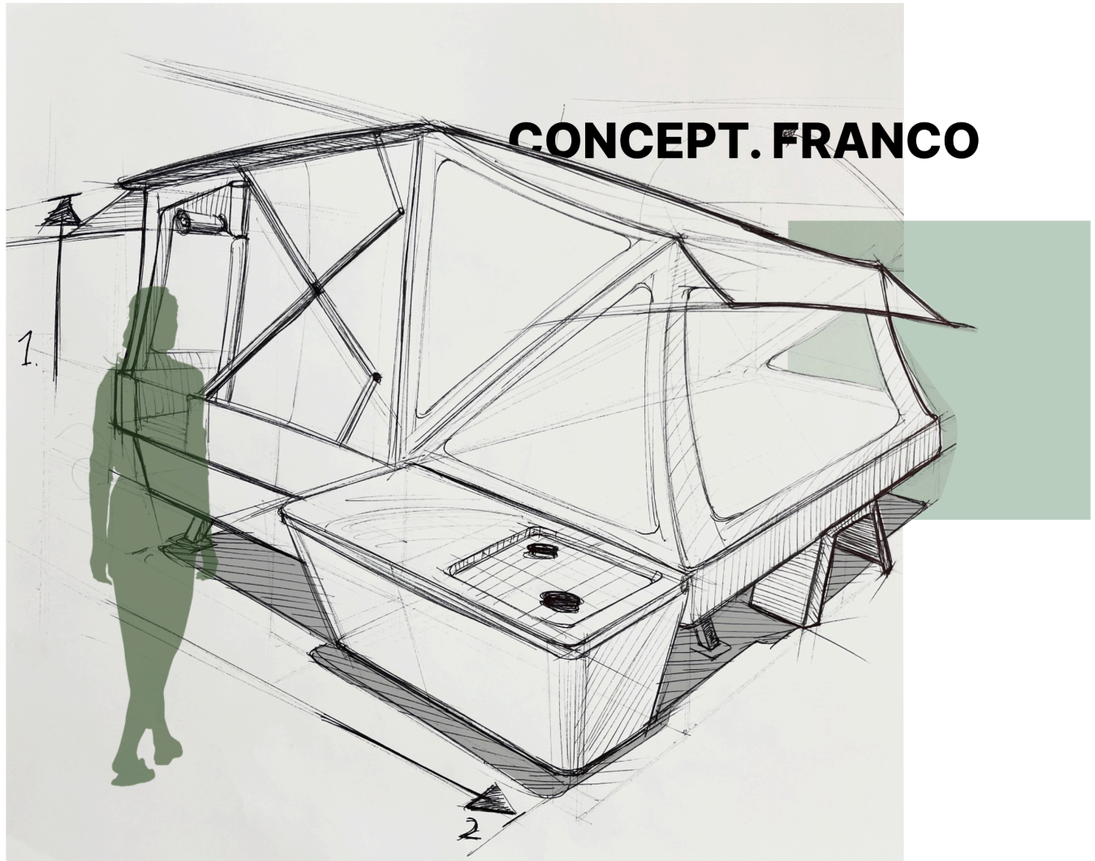
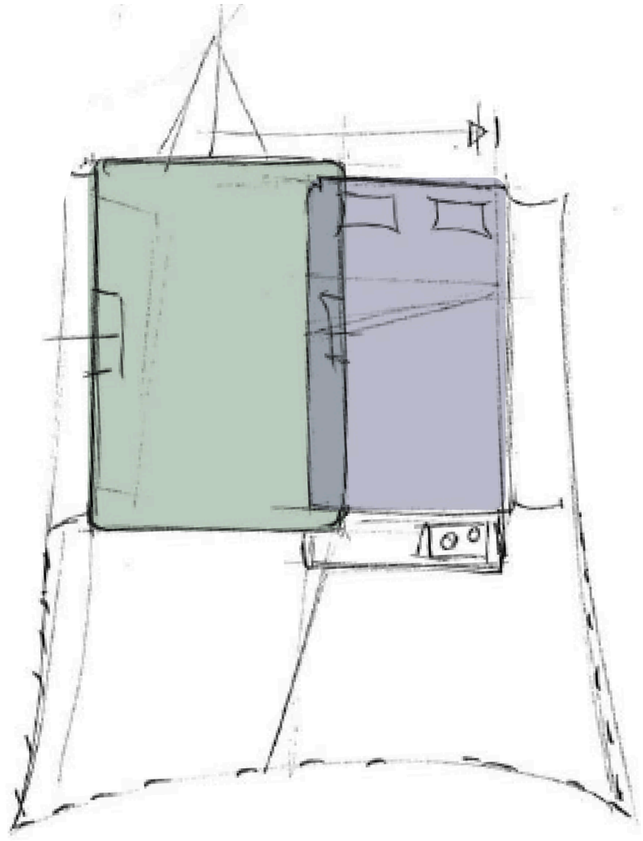


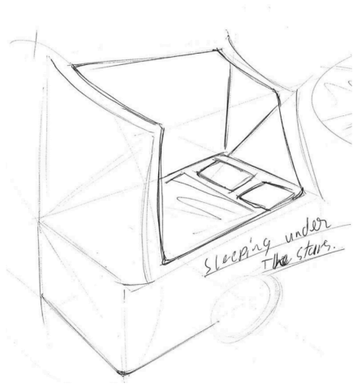
Figure 27. Visual of concept identifyers.





A

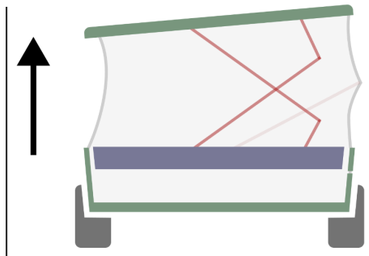
The Modular Adaptable Tent Trailer



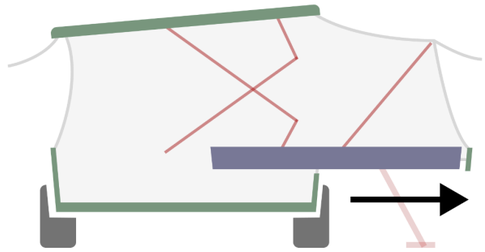
Set up



Closed trailer



1. Raise hard shell roof
(Single Night set up)



2. Slide out bed extention

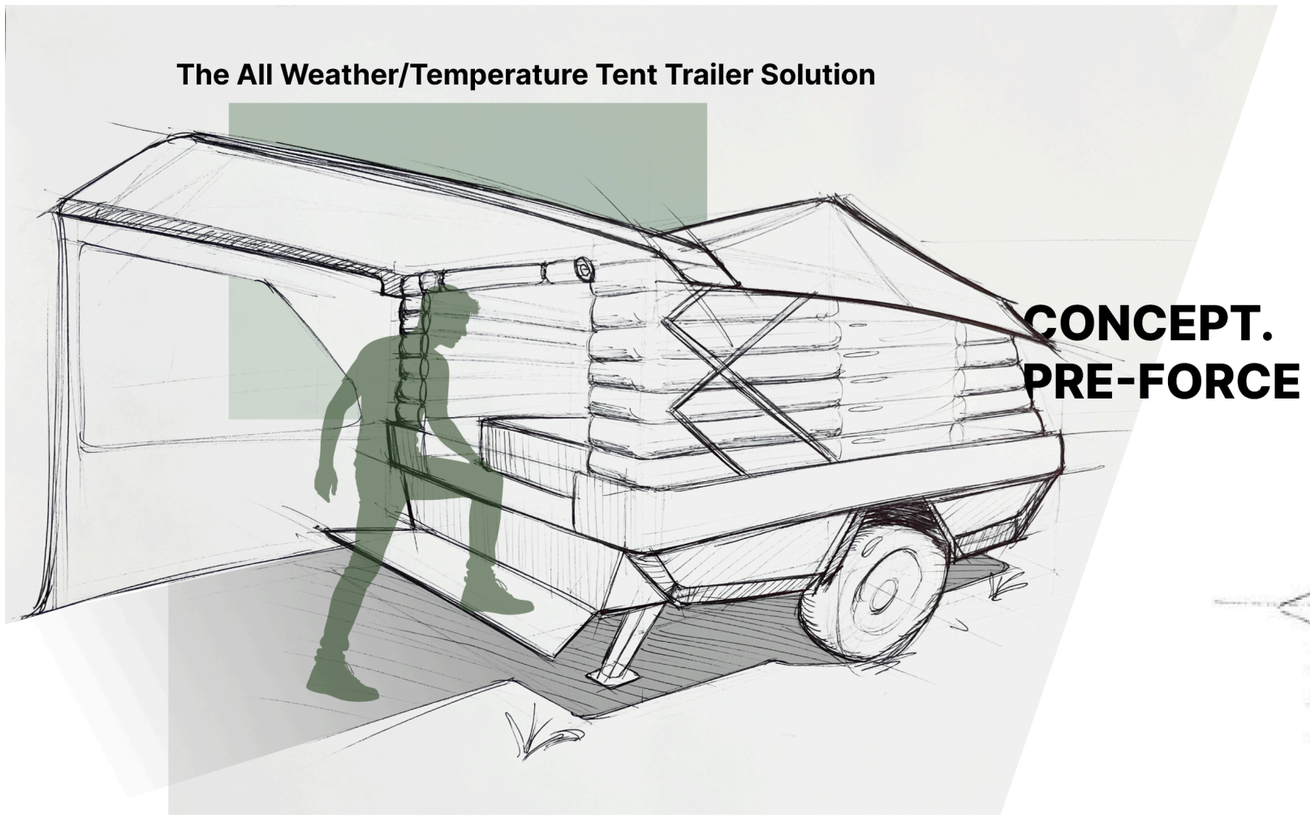
Figure 28. Concept Franco presentation overview.

Concept FRANCO

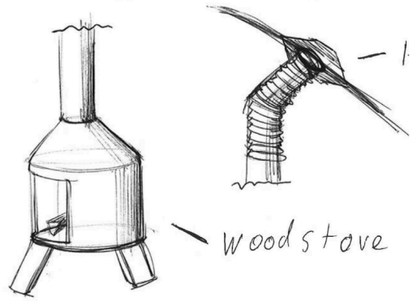
FRANCO represents a versatile concept, enabling spontaneous camping trips. It's flexibility comes from the fact that the trailer can be used in different set up levels. It could be set up fully, hosting a 2 person bed, indoor living area, a modular awning extention, and an outdoor kitchen.

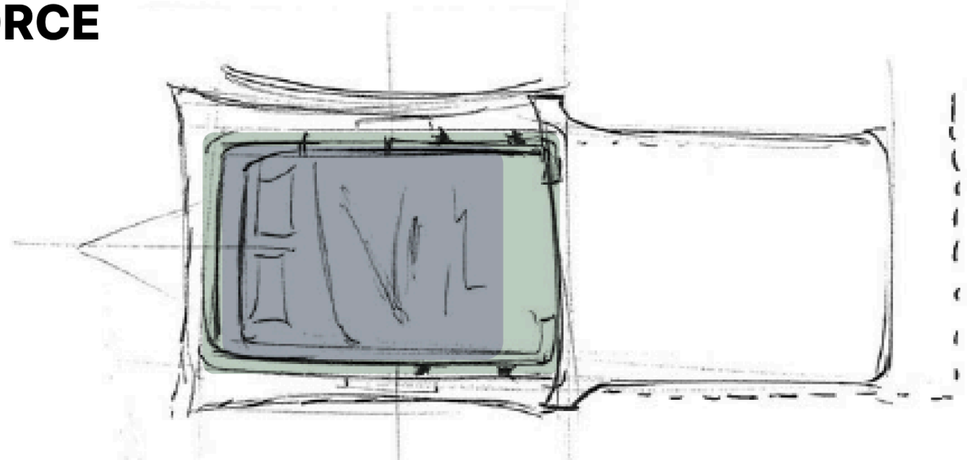
For shorter stays, or troublesome weather, It could also be used in single night mode, where only the hard shell roof is lifted. Creating a compact and easy to handle place to sleep, less sensitive to rain and weather.
Possibilities to be fitted with solar and battery technology enable off-grid stays.

- **Touring compatible.**
  Partial hard shell roof.
  Twin motion set up.
  Single Night Setup.
  Optional awning extension.
- **Off the ground trailer.**
  Levelling on uneven terrain.
  Optional Off-grid amenities,
  Solar/batery.
- **Star-vertible.**
  Option to sleep under the night sky,
  Outdoor sleeping experience.



CONCEPT. PRE-FORCE





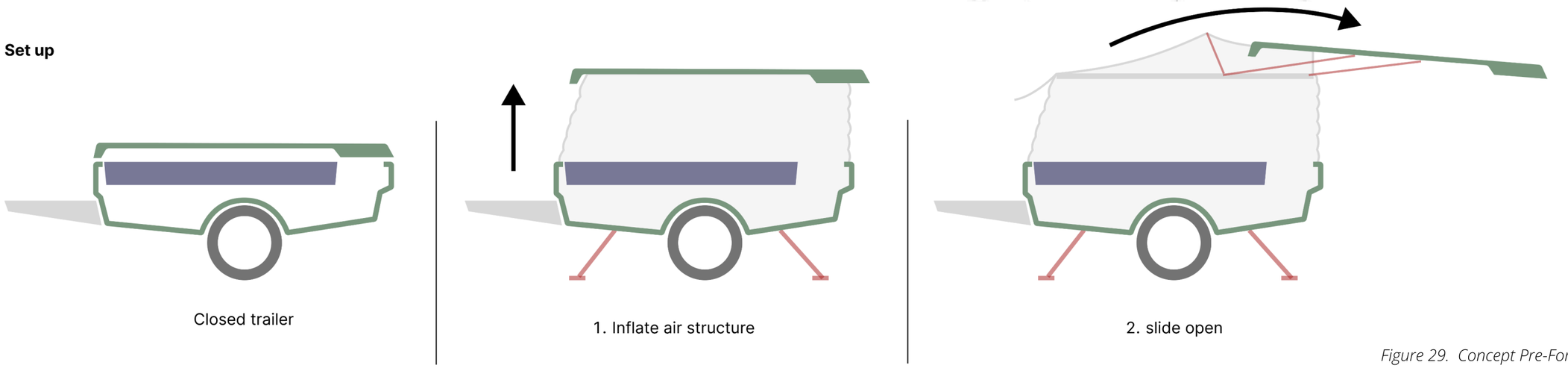


Figure 29. Concept Pre-Force presentation overview.

Concept PRE-FORCE

PRE-FORCE presents an all weather & all temperature camping equipment concept. Enabling adventurers to go on camping trips where ever they want in what ever conditions they want, the compact trailer concepts is equipped with a pressurized double wall insulation system.
Its hard shell roof protects against rain, hail, and snow "showers". With extendable walls and preperation for a wood stove a cozy setting is easily created.

- **Ultra low conditon dependency.**
  Hard shell roof.
  Double wall air filled insulation.
  Modular awning/wall extentions.
- **Winter camping.**
  Preperation for a wood stove & chimney.
- **Pressure assisted set up.**
  Air pressure roof lift with single night stay configuration

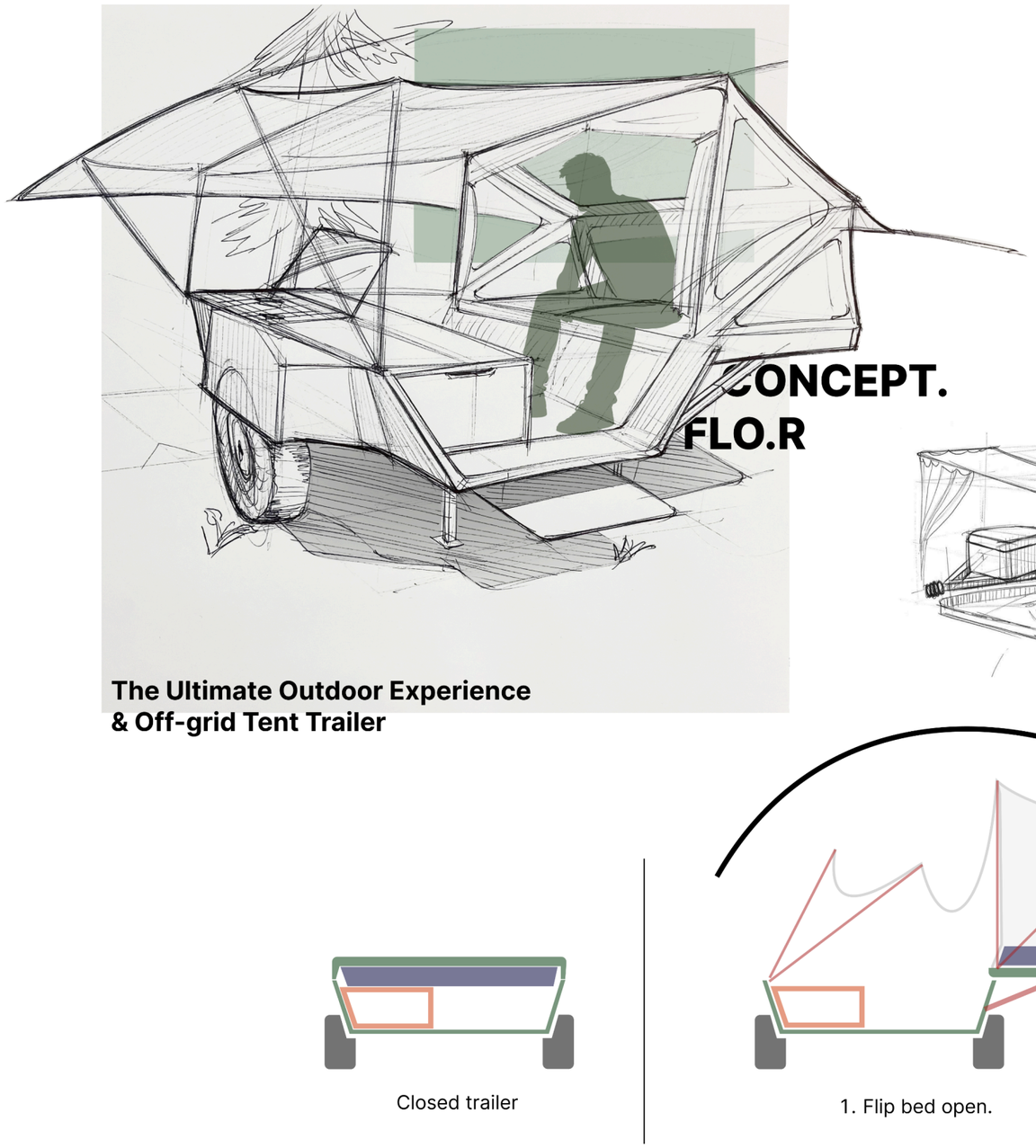


Figure 30. Concept FLO.R presentation overview.

Concept FLOR

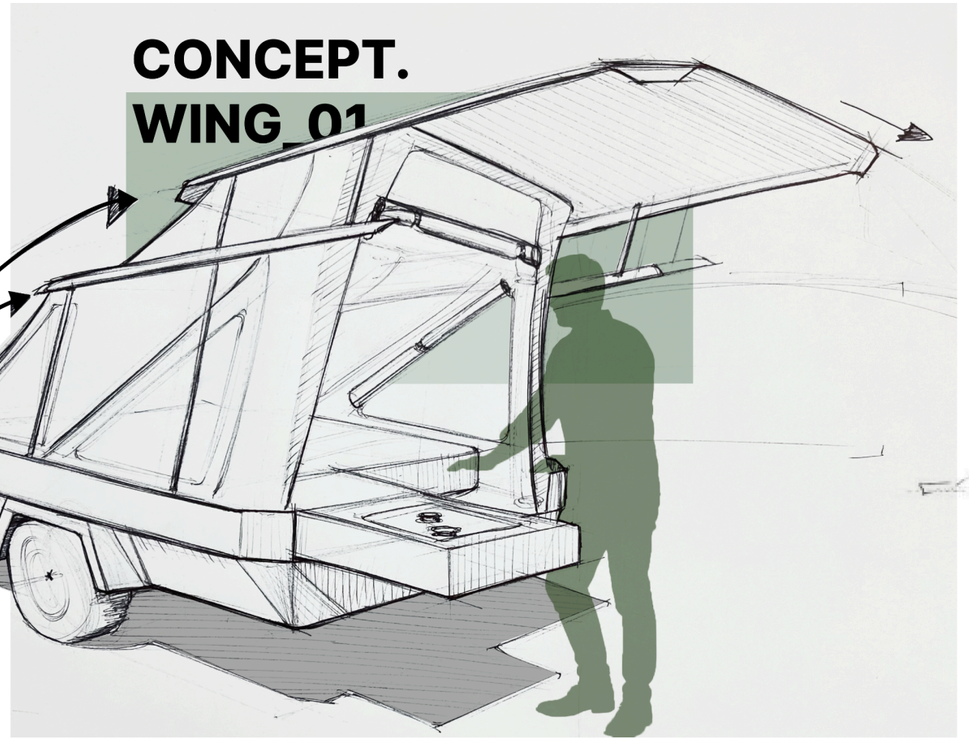
The FLOR concepts is aimed at creating the ultimate outdoor camping experience. It's architecture is aimed at creating an open Camping environment, complete with outdoor kitchen and seating area. Being open by default fosters a connection between the user and their surroundings. If desired the open "walls" can be closed.

The trailer creates a roomy usable space with a minimal foot print. in combination with the elevated ride height, it allows more versatile range of camping spots, in nature.
The concept could be extended to sleep more people or facilitate, for example, a shower.

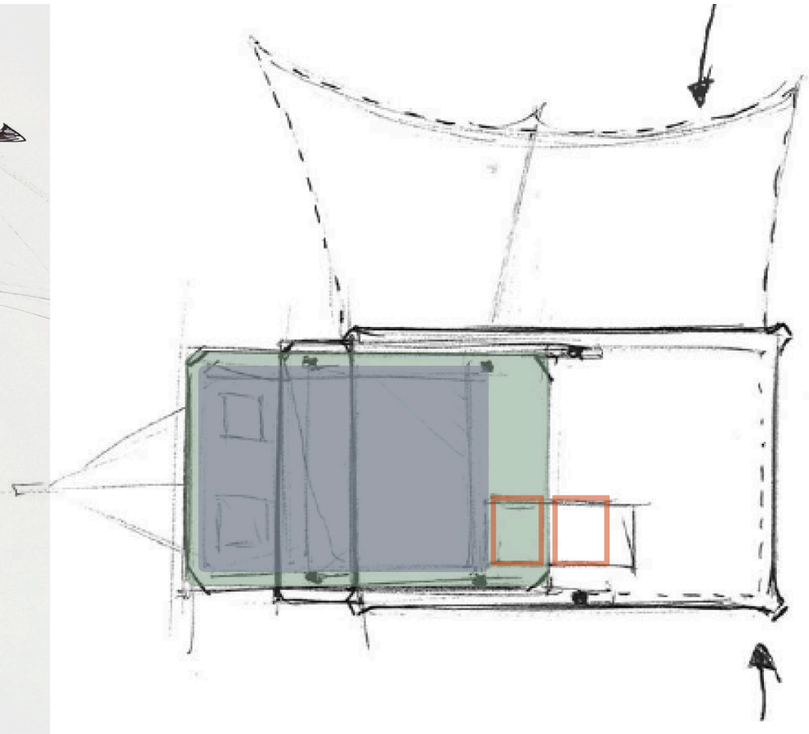
- **Open Nature Based Camping Experience.**
  Open design with modular in fillable wall inserts
  Raised off the floor.
  Open kitchen/workspace.
  Rain water collection.

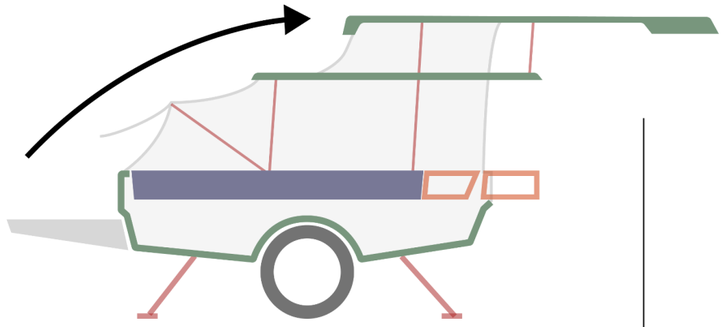
- **Off the ground trailer.**
  Minimal footprint
  Levelling on uneven terrain
  Go anywhere ground clearance.

- **Modular extendibility.**
  Optional tent & awning extensions.



Closed trailer





1. lift Single wing structure.

Figure 31. Concept Wing_01 presentation overview.

Concept WING-01

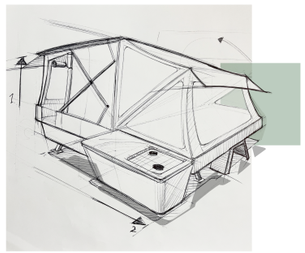
WING-01 represent the fastest to set up camping equipment concept, providing a place to sleep and canopy within one single motion. While compact at the first glance the trailer can be outfitted with awning and wall extensions to become a complete tent trailer package.

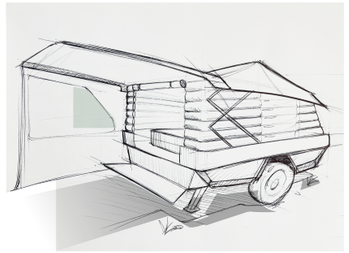
Its weather in dependability comes from its hard shell roof, leaving less canvas exposed. in addition, in additions the Wind force drying feature uses air to dry the rest of the fabric.

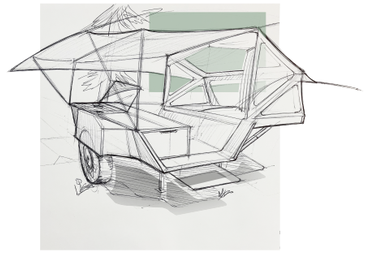
- **Off the ground trailer.**
  Minimal footprint when set up. (easy to position on site/easy to access at home.
  Easy to level on uneven terrain.

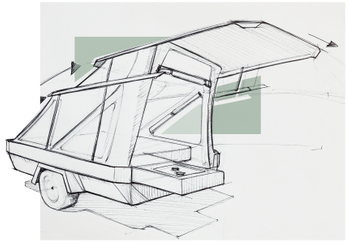
- **Suited for spontaneous travel.**
  Single motion set up
  Optional (single mast) awning extension.
  Open-outdoor configuration with modular wall extensions
  With ventilation and canvas drying through Windforce.

- **Star-vertible**
  Option to sleep under the night sky,









Concept evaluation

While each concept follows a unique approach/strategy, a common goal and mission remain. To further differentiate the concepts, they will be evaluated against criteria, to converge to a single camping equipment concept. This is presented in the following section.

This section presents the concept evaluation, signifying convergence, defining the further direction of the project. The used evaluation method and its outcome are discussed.

From the start, it was aspired to design a camping equipment concept that would not only anticipate the future of camping, but also suit the client company, Holtkamper. For this reason the ambitions, culture and philosophy of the client company were considered closely. As the concept choice presents an important project milestone, incorporating stakeholder values was perceived as highly important.

In order to choose a single concept to develop further, an evaluation method was synthesised.

Balancing the views and values of the designer and Holtkamper. A weighted criteria framework was created, consisting of a broad set of criteria. Incorporating: design goals, desired experience, basic requirements and use characteristics. These, ranging from the facilitated nature connection and weather independence, to storage and accessibility.
The full set of criteria is presented in the visual XX below.

The four concepts, presented in the preceding section, will receive a numerical score on all 17 criteria between 1 and 5, attributed by the designer.

This score is multiplied by a criteria weight, signifying the importance of requirement/ goal to the project. Considering the likelihood of there being a variance between the designer and the client perspective, the attributed criteria weights should be balancing the two.

Holtkamper is represented by two people in this evaluation, the company owner, and the manager operations. It was decided their opinion regarding the criteria weights would contribute to 25% of the total weight.

And the designer thus contributing to the remaining 50% of the criteria weight. Coming up to a 50/50 division. This subdivision is characterized by the formula presented below.

(Weight client 1 * 0.25) + (Weight client 2 * 0.25) + Weight designer * 0.5) = final attributed weight.

A more detailed overview of the attributed criteria weights and scores can be found in appendix H & -I respectively.

EVALUATION CRITERIA

The should incorporate/address/focuss on: _____	Final criteria Weight
Decreasing condition dependency.	
1. All terrain compliance/go anywhere capabilities.	• 1
2. All weather / all season camping (rain/storm and water management).	• 2.5
3. (active/passive)Temperature regulation. (Heatwave/winter camping)	• 1.75
4. Off grid facilities/compatibility.	• 1.25
Accessible set up & handling.	
5. Set up speed & ease (set up complexity).	• 3
6. Pre/post trip Handling.	• 2.5
7. Storage space & Accessibility.	• 2
Enabling nature connection.	
8. Bringing nature in/the surroundings as a feature.	• 2
9. Camping IN nature (camping on uneven terrain/footprint in nature)	• 2.25
Adaptable layout & enabling extensions.	
10. Extendable layout. (facilitating add-ons Modular base).	• 2.25
11. Adaptable to different Travel styles & use cases.	• 2.5
Tent trailer requirements.	
12. Bed access & Sleeping comfort.	• 2
13. Kitchen access & functionality.	• 2.5
14. “Indoor” standing area.	• 1.5
15. Holtkamper-ness	• 2
16. Product novelty within the segment.	• 2.25
17. Mechanical/production complexity	• 1.75

Figure 32. Evaluation criteria & wheights.

WEIGHTED CRITERIA CONCEPT EVALUATION

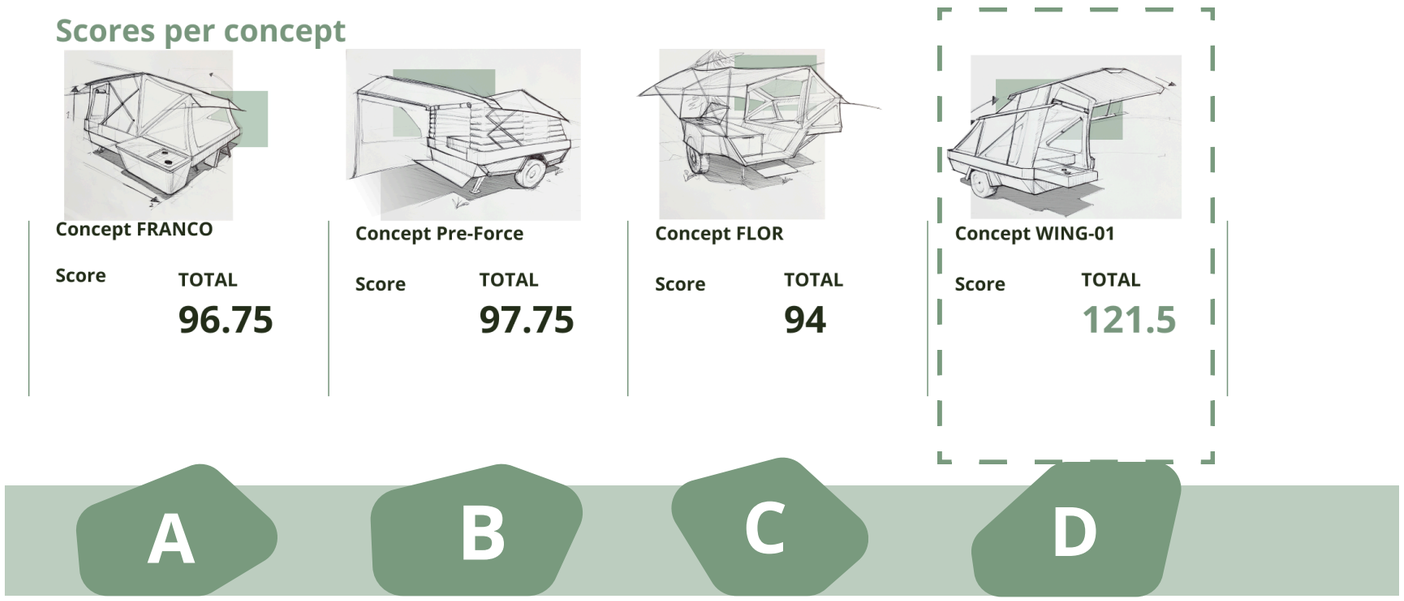


Figure 33. Overview of the four concepts with respective evaluation scores.

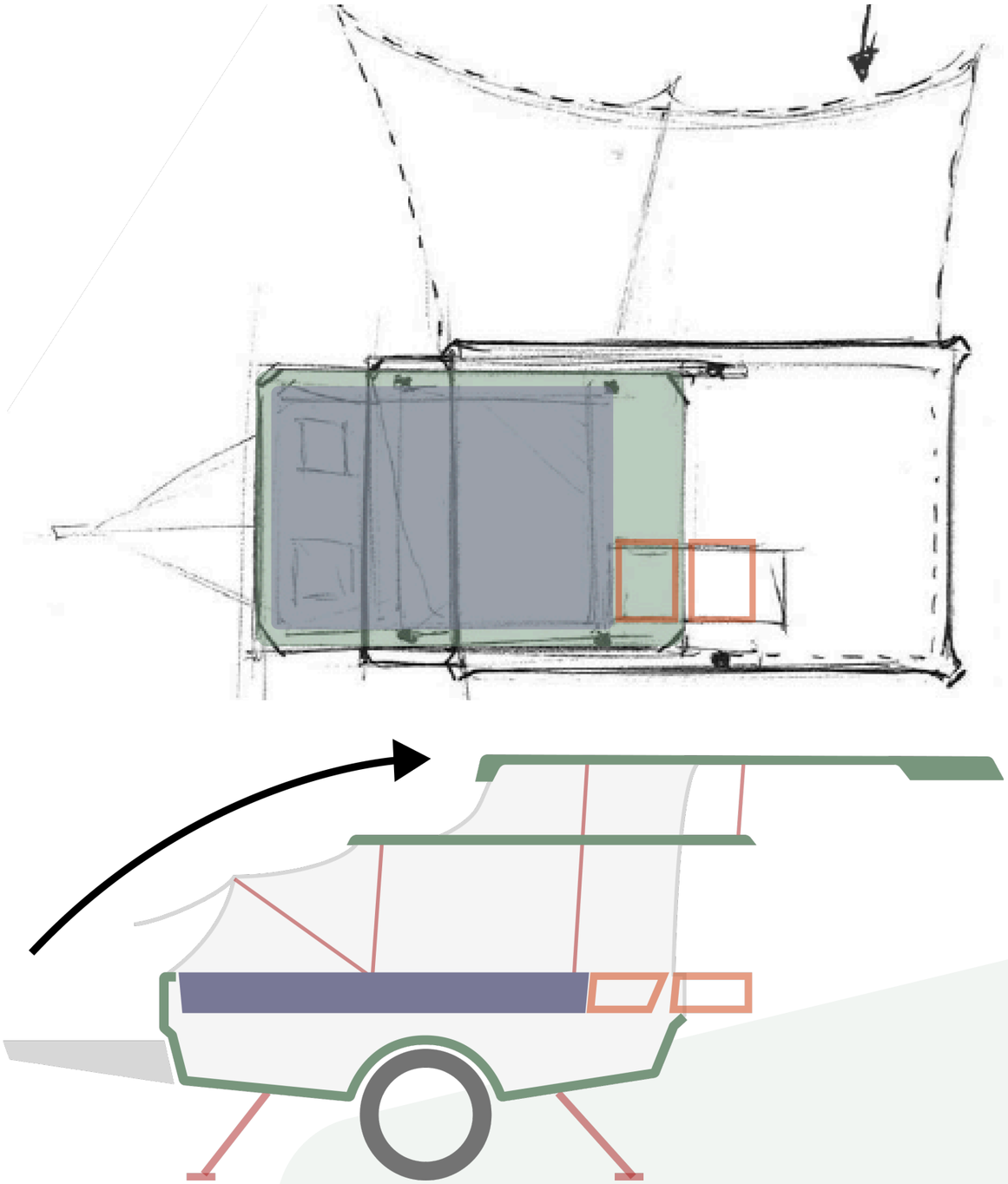


Figure 34. Wing_01 concept architecture.

In multiplying the received score and attributed weight, a final criterium valuation is generated.

Adding up the final valuations per concept revealed the total concept score. Pointing roughly towards the concepts to move forward with. In addition to the overall score of all concepts, it also shows the strengths and weaker aspects of a concept on its own, indicating potential opportunities.

It should be noted that a concept decision should not be based on just the numerical outcomes of a method such as this, as there lies more nuance within the concepts such as improvement opportunities and qualities beyond the criteria.

Reviewing the overall scores of the concepts, it was interesting to find that the final values came very close together, apart from *concept Wing-01*, which came out significantly higher.

In addition to concept Wing-01's high overall score, it showed exeptionally high ratings within the categories of Accesible set up and handling. Signifying a contribution to the enabling/ encouragement of spontaneous travel.
Considering its score, the high contribution to the design mission statement and, the advantages regarding ease of use and handling, it was decided to continue this design project by developing Concept Wing-01 further.

To develop concept Wing-01 to become a complete and coherent camping equipment concept, aspects like layout, constuction and kinematics were explored in more detail, meaning to ensure a feasible concept.
Similarly, feature integration, use and, experiences were worked out in more detail through scenario's. In addition kitchen integration, form and, more were explored on a deeper level, presented in the next section.



Concept development & prototyping

Within this project it is aspired to deliver a camping equipment concept inspired by the future, yet holding a high level of realism and implementability. Therefore the aspiration exists to develop a concept that “approaches” a production level of realism. This implies that the concept could in theory be produced, while leaving the precise material specifications and force analysis to a potential, future development stage.

The following sections present the activities and steps taken to further develop Wing-01 concept into an elaborate and coherent concept for Holtkamper. Consisting of the following focus areas:

- **Use cases/scenario's.**
- **Construction and kinematics.**
- **Layout and packaging**
- **Kitchen integration**
- **Aesthetics and form.**

Use cases/scenario's & features

Adaptable and spontaneous travel represents a significant aspect of the identified desired use (looking back at the user research). Additionally it is also incorporated in the VIP design mission statement.

To reflect this into the concept, two different product scenarios were created, highlighting Wing-01's features in spontaneous travel use cases.
Imagining the concept in **A longer camping tour in Scandinavia**, and emulating the important aspects and features that would facilitate and enhance the free journey and nature exploration when camping.

Figure 35. Bastiaan behind the sewing machine.

The scenario describes a longer road trip tour in Sweden and Norway. The trip is semi structured, allowing room for spontaneity and deviations, consisting of overnight stops at camping's and in nature its self combining single nights and longer stays at a single location.

In addition to the desire to go on longer tours with multiple locations and nature-based camping, another new potential use case was recognised in the U/O research, being the spontaneous weekend trip.

Meaning to discover/highlight the required/related functionalities and features in this use case, **A spontaneous weekend at a nature camping in the NL's scenario was created.**

The scenario describes a weekend trip to a camping closer to home. In the desire for some time away our persona spontaneously decides to meet up with friends at a camping in Drenthe to do some cycling and enjoy nature together. As there is a chance at rain, they decide to bring proper clothing.

The full scenario’s are shared in the final design presentation section.
“Simulating” the concept in these two settings pointed out new insights regarding the use, architecture and features. Among other aspects, it was realised that with the new concept:

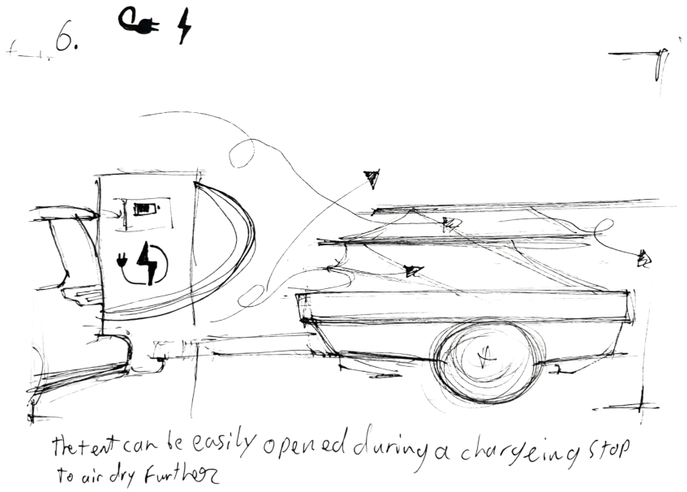


Figure 36. Scenario sketch of concept Wing_01.

- ***That a front storage access would be desirable, as Pack-N-Go is not implementable.***
- ***The small foot print does significantly aid handling. Allowing for airdrying at short (charging)stops.***
- ***The “pre-mounting” of wall or tent extensions is desirable, allowing easy adaptation to conditions.***
- ***Kitchen and interior flexibility would significantly improve interior space value (indoor-outdoor living). In addition to on the road cooking.***
- ***To further enable spontaneity of travel, sideways storage, and roll-over brackets are desirable. Allowing storage at home.***
- ***A fold-down rear hatch is desirable, to place shoes away from the (wet) floor, additionally to be used as a step when camping on uneven terrain.***

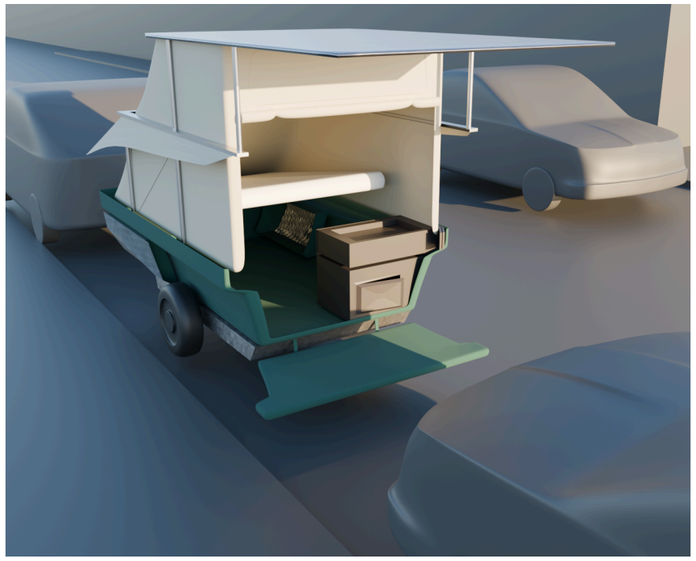


Figure 37. 3D model of Wing_01 being packed on a street.



Figure 38. Solid Works assembly of frame construction.

Construction & kinematics

In the realm of tent trailers concept Wing-01 introduces a new folding mechanism principle aiming to leverage several advantages.
Beyond a quick mechanical mock up from technical Lego, the folding mechanism would need to be developed further.

To move gradually from rough iterative sketches towards defined architecture a kinematics diagram was developed, as seen in figure 39, to then be translated to a SolidWorks assembly to be tested on functionality. Presented in appendix J in more detail.

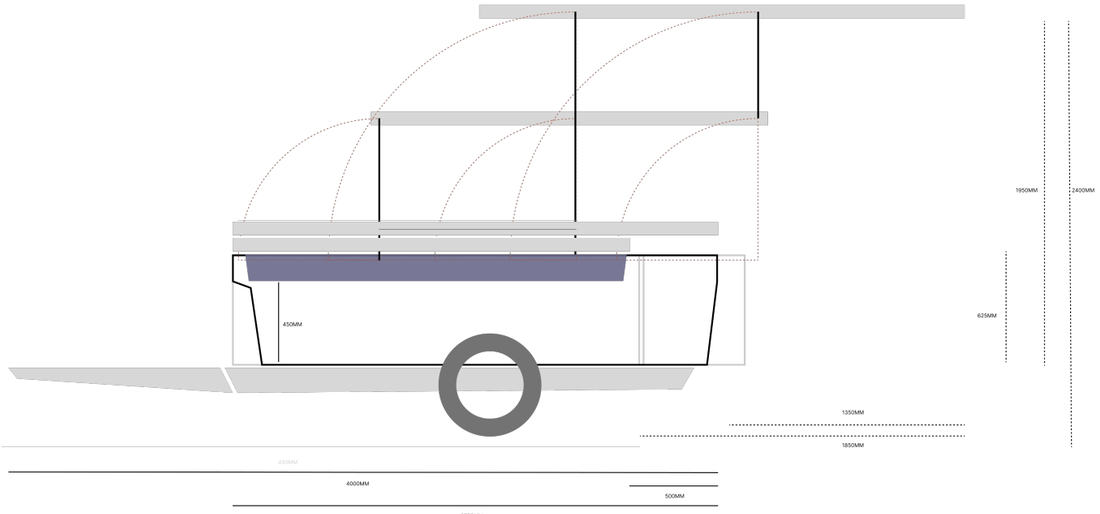


Figure 39. Kinematic diagram of the concept, showing open and closed construction.

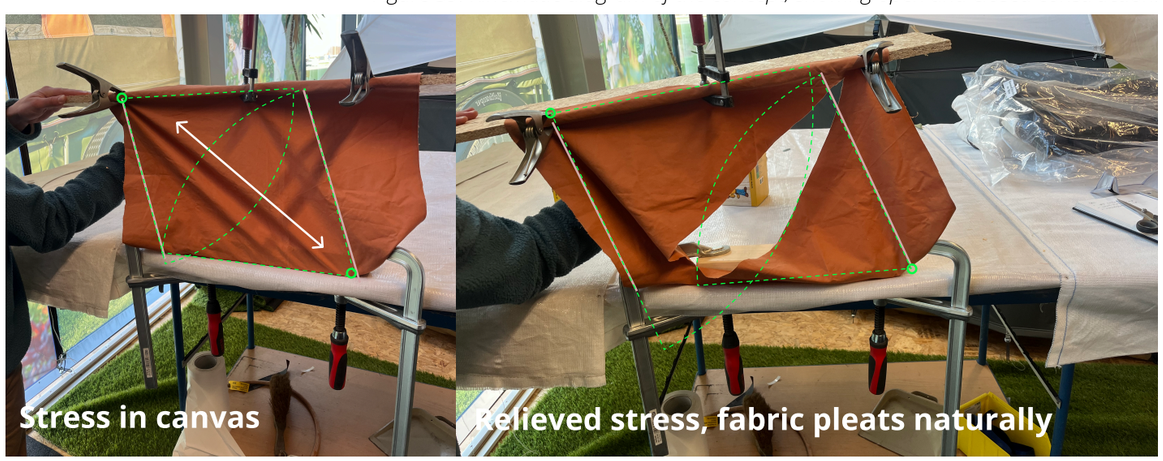


Figure 40. Visual of canvas stress & -mitigation.

In the design of the layout and structure it was realized that the folding structure of wing-01 would bring about additional complexities, shear-like forces would likely be induced on the canvas during opening and closing of the frame.

In current tent trailers it is common to have a single pivot point, e.g. rotation axis, allowing the canvas to neatly pleat perpendicular to said axis, wen being folded.

With the wing-01 folding mechanism a 2nd point of rotation is introduced, creating a parallelogram linkage structure. Indicated in green in figure 41. This would obstruct the tent fabric in the side walls of the tent trailer from folding neatly, as a load of stress would be exerted on the canvas.
This, not being able to stretch, would break the fabric. Following this realisation, a solution was discovered by adding a diagonal zipper to the side walls of the tent trailer. By disconnecting the segments of fabric they are allowed to pleat (again), perpendicular to their respective axis of rotation. This principle is shown in the picture XX, resembling a section of sidewall fabric. Highlighting the stresses and lack thereof in two fabric samples.

An additional benefit of the diagonal zipper would be that, upon closing it would effectively lock the tent trailer into its “open” position as the side walls are not able to be folded up anymore. Even though the additional two zippers (left and right side) would add an extra step to the set up and break down process this is perceived as “negligible” as the set up is still considerably less intensive compared to traditional tent trailers.

In developing the construction and kinematics it was desired to stay close to the current Holtkamper engineering, meaning to take their development experience as a starting point, and deliver a feasible concept.

Starting out with rough dimensions, at times, it took quite some iterations and variations to get to a workable part assembly with usable interior space and canopy overhang. The final Sollidworks assembly effectively presents the motion and construction of the concept providing a good base to build on.

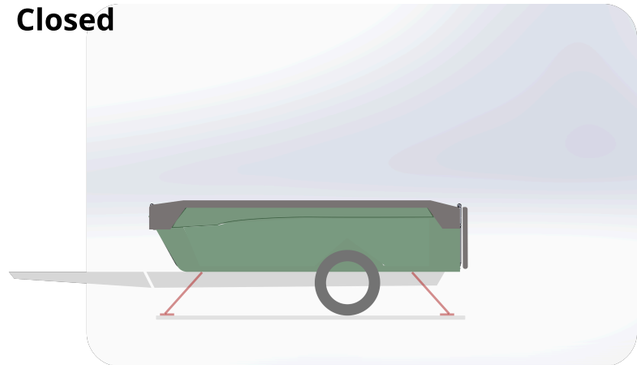


Figure 41. Visual of the concept opening, shown in increments.

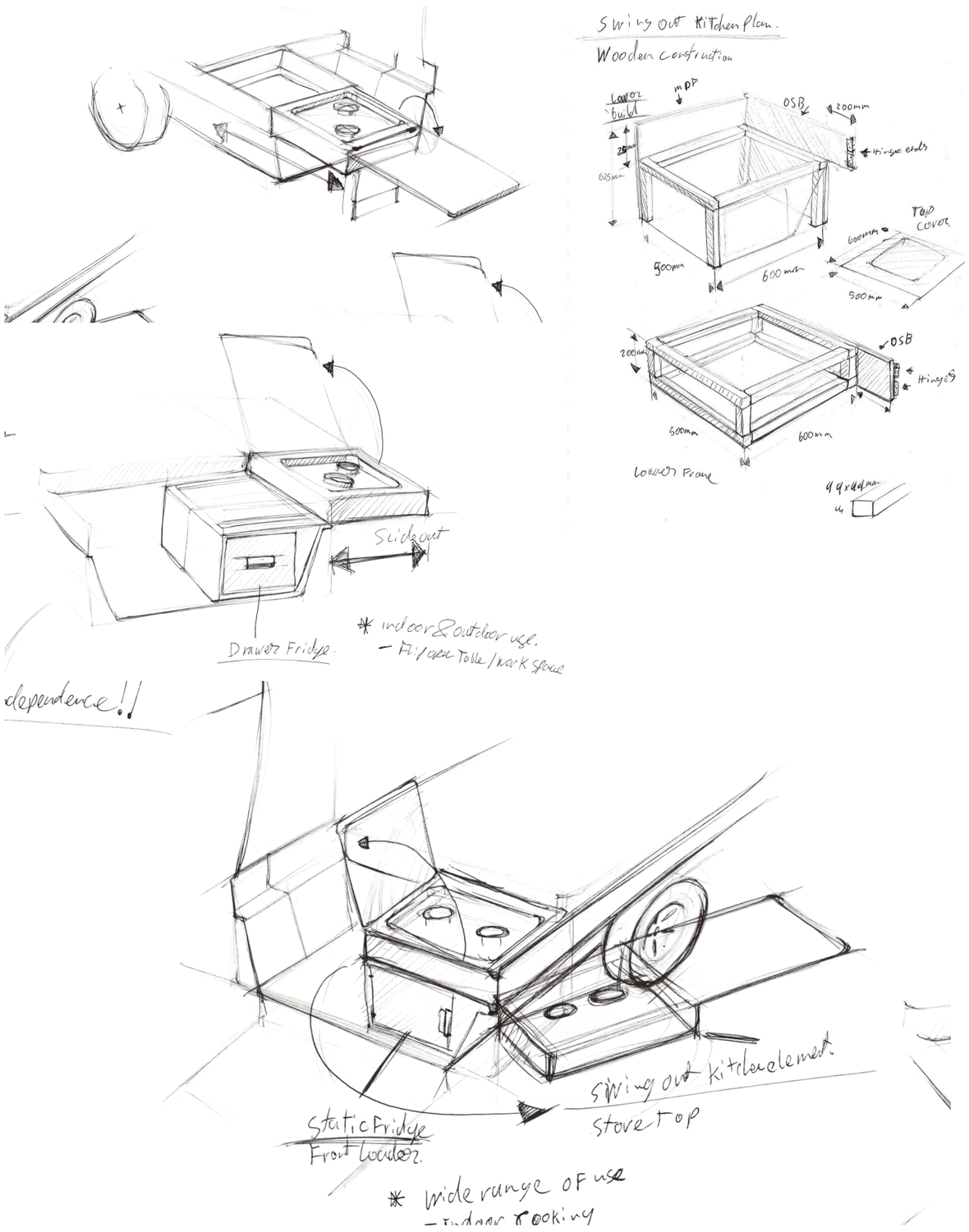


Figure 42. Overview of kitchen integration sketches.

Kitchen integration

The initial concept shows a slide-out kitchen providing flexibility and a more spacious cooking experience.
Looking back at the User/Owner research, the functionality and accessibility of the kitchen came forward as a considerable aspect of significance.
Being referenced as one of the most common frustrations as well as recognised opportunities/desires.

To conclude, it was clear that the kitchen integration in the tent trailer would need to be done with care and significant consideration. Meaning to diverge, a selection of
moveable kitchen architectures were considered, designed and evaluated side by side.
Evaluating the iterations, it was realised that the option to cook indoor would significantly decrease the weather dependability.

The 270-swingout architecture was chosen as it was assessed to be the most adaptable and therefore in line with the design mission.

In addition, it was perceived to be most compatible with the structural layout (the cage) of the tent trailer. Avoiding the need to alter the cage structural members, and maintaining fridge accessibility in the different configurations.

RV kitchen appliances could be integrated into the kitchen structure to ease production. Gas stoves and fridge units are sold by brands such as Dometic, shown below in figure 43. (dometic, n.d)



Figure 43. Dometic stove top and front loader fridge.

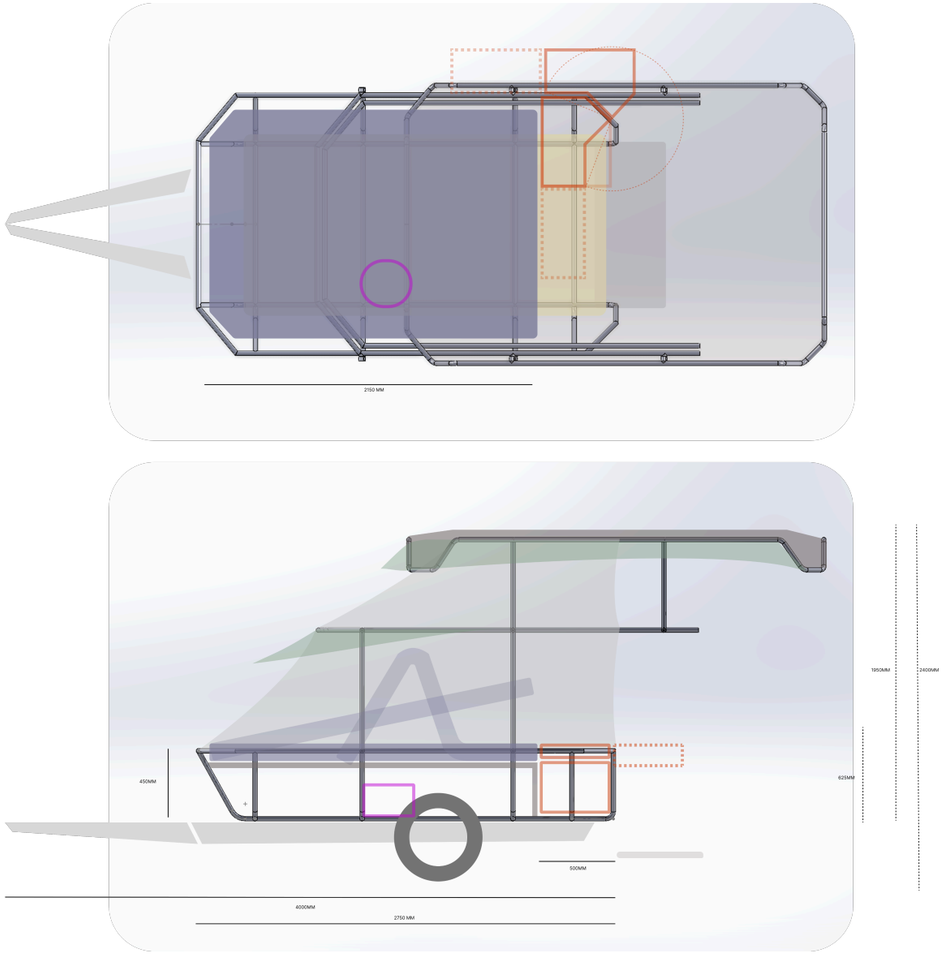


Figure 44. schematic visual of packaging & construction of the concept.



Figure 45. Wing_01 concept with attachments.



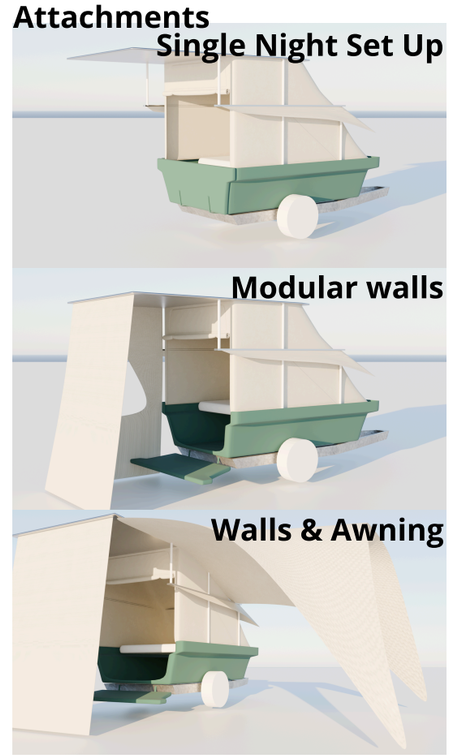
Figure 46. Overview of bed functionality.

Layout & packaging

Having outlined the use of the concepts, the construction and kinematic structure an idea of the rough packaging of the full tent trailer started to emerge. To expand this, a packaging layout was developed showcasing placement and dimensions of core elements. The placement of the bed, kitchen and wind force drying motor could be defined.

To create a more comprehensive overview of this packaging and proportions of the concept a preliminary 3D model was created in blender, shown in figure 46 and 46 above. Additionally it is presented in more detail in appendix M The aim for this model is to showcase the positioning of the main components without diving into form and aesthetics, which will be shared in the next section.

The this preliminary model was usefull to play around with different extension accessories like modular walls and awnings.



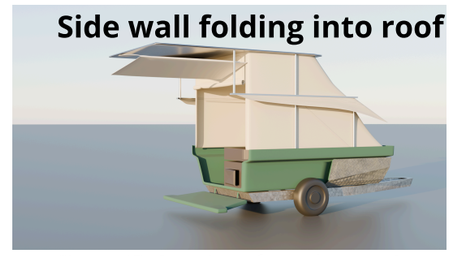


Figure 47. Overview of attachments & use.



Figure 48. Render of the concept in context, on a street.

Aesthetics & form

While most Holtkamper products have always held a form follows function philosophy, the U/O research pointed out that customers feel that the Holtkamper herritage/feeling/appearance, which has always been highly valued, is fading in the newer models.

This, combined with the personal ambition to create a visually coherent concept underline the decision to develop the concept in terms of aesthetics, form and materials was well.

In this project, the form and aesthetics of the concept were developed, meaning to create a tent trailer concept coming across as a dependable, rugged, but most importantly Holtkamper tent trailer.

To initiate ideation in terms of styling a selection of principles was drawn up.
The U/O research identified a tension between the brands identity and ownership experiences.

To address this, the new concept is aimed to have a **purposeful** and **honest** appearance ,through a **clear** and **functional** aesthetic. This is meant to be embodied by using durable and functional materials.
In aspiring to translate the design mission into form, the concept should have a **rugged, go anywhere** expression. Radiating **dependability** and inviting the user to go **“off the beaten track”**.

Through visual exploration, the afore mentioned design principles were sought in other products, materials shapes and designs. A selection of material which inspired the styling of the concept is shown in figure 49.

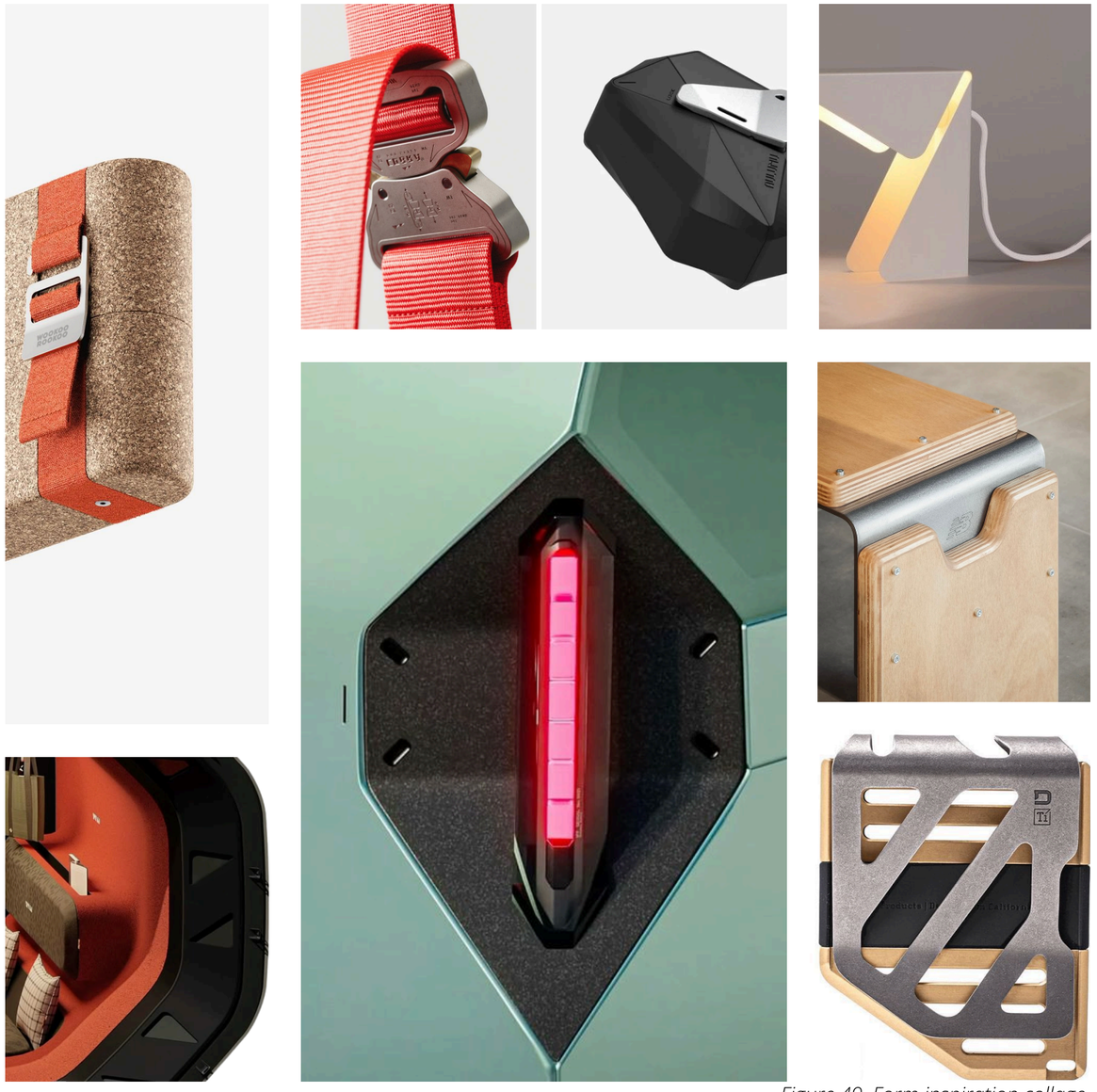


Figure 49. Form inspiration collage.

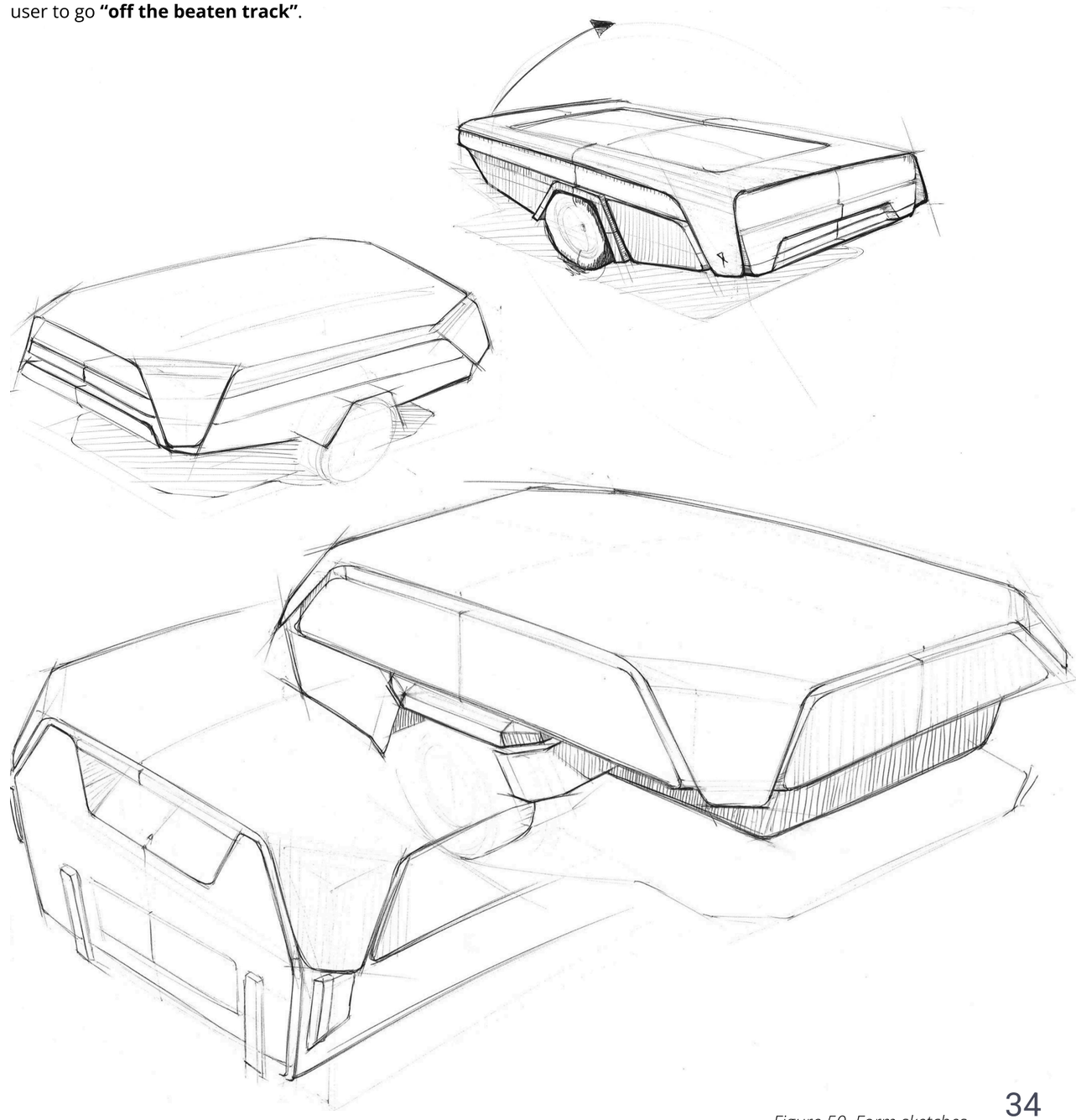


Figure 50. Form sketches

Form sketches were made to explore the mentioned goal, creating a tent trailer Along side this ideation, an appearance and impression visual was created. Meant to convey the expression the model should induce, shown in figure 52.

Ideation of individual concept aspects, like the rear hatch and wheel cover area where taken into Blender (3D modelling) to get a better visual insight on detailing, proportions and interplay of materials. as can be seen in figure 51.

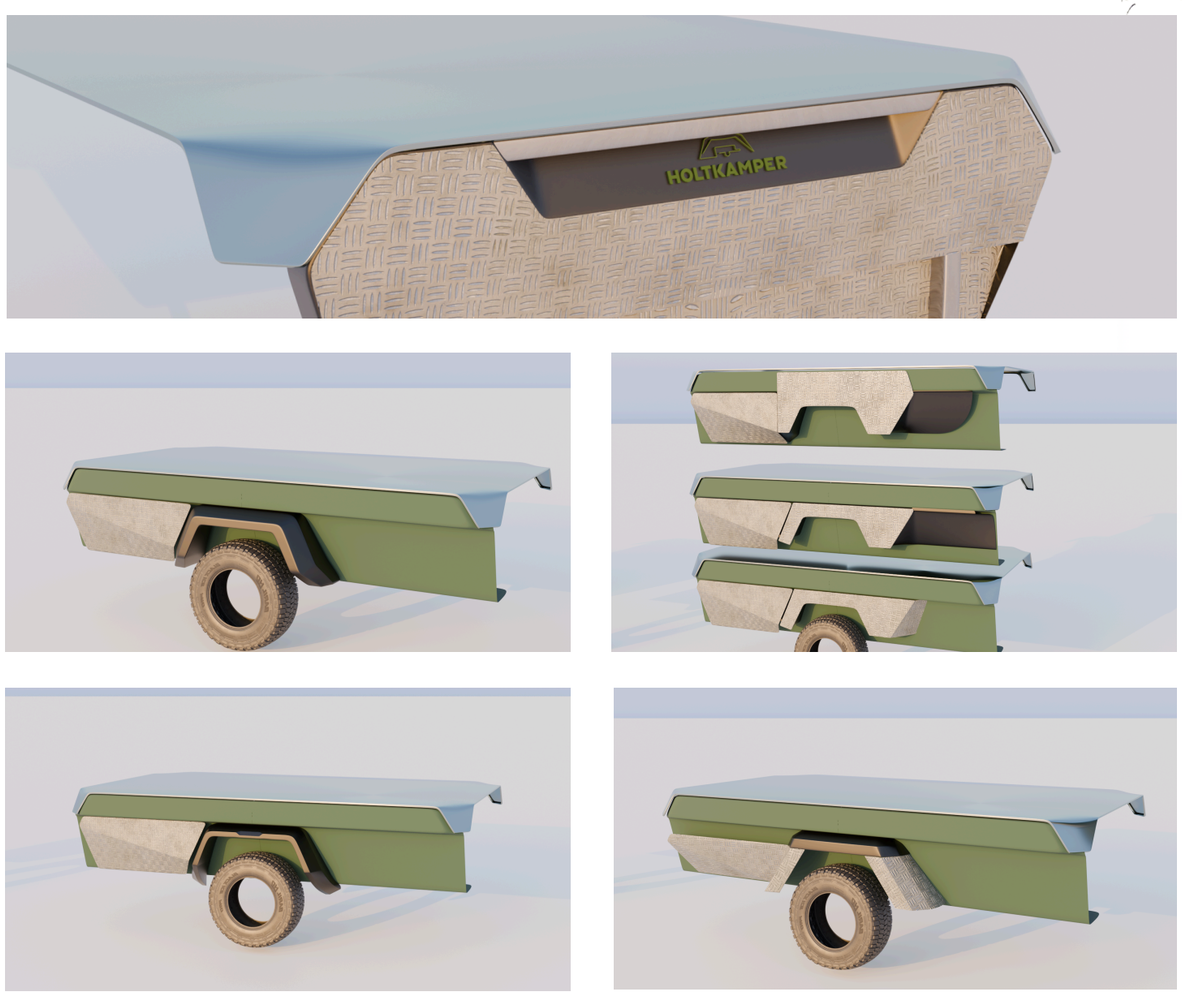


Figure 51. Explorative form modelling in Blender.

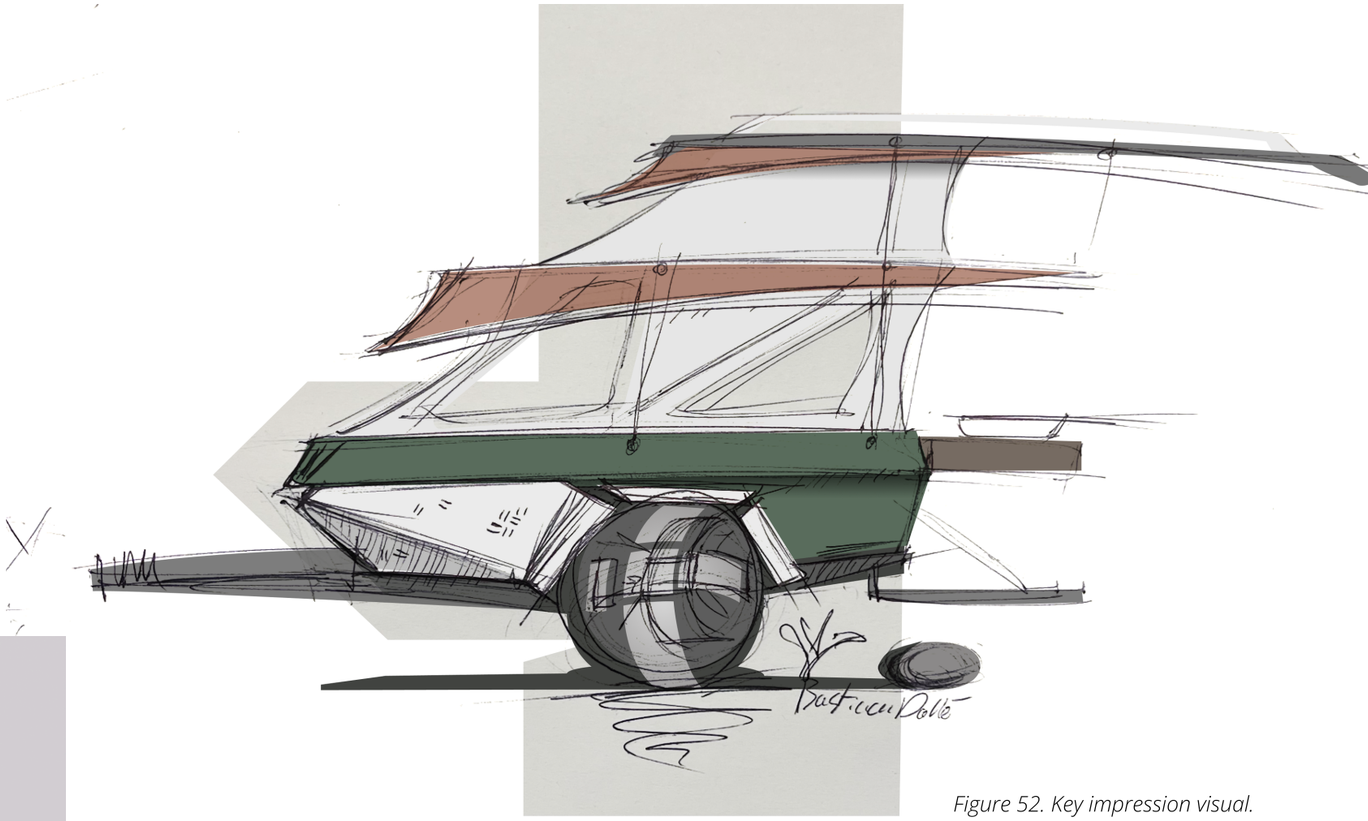


Figure 52. Key impression visual.

Concluding the design process

Looking back at the concept development stage, significant advancements were made. The concept gained shape and features and layout came together.

The close collaboration with Holtkamper was very beneficial to the project. It meant that technical questions could be resolved quickly, much inspiration could be found and materials and tools could be used to test and create prototypes. All significantly boosting the concept development.

A single downside of this close collaboration with HK could be that, being constantly surrounded by tent trailers meant that at some times, it was difficult to look beyond tent trailers.
In retrospect it is realised that at times it was difficult to think of innovative solutions, outside of tent trailer camping scenario's and products.

The development of the Concept resulted in a coherent concept with a clear mission targeting the identified tensions and design goals.

In the next section, the final design presentation, the full concept is presented showcasing features and use.

Design

Final Design Presentation

This section transitions from process and development to the outcome of this project.
It presents the final concept design, serving as a response to the identified user desires and needs, simultaneously adapting to upcoming implications brought forward by the future vision.

The concept has been designed to be an integrated and coherent system, where experience, function and construction are interrelated, serving the overarching mission of the concept.

The concept design is intended to serve as inspiration, guiding the development of upcoming models and exploration of future camping equipment. It does therefore not provide a production ready solution.

The following sections present the final concept by showcasing:

- The ***desired experience*** it means to represent and enable.
- The **features & functionality,** that give the concept its strength.
- The concept in the **use cases** it enables.
- And lastly the positioning.



Open Camp Experience

Considering the increasing importance of nature recreation, the recognised desire for tailored exploration and nature Connection.

The new Holtkamper Concept enables an open camping experience. In nature, while in harmony with your surroundings, beyond the prepared camping grounds. To be able to go off the beaten track, following your own compass.

- **Camping with nature**
- **In contact with your surroundings**
- **Wherever you desire.**
- **Enabling your nature exploration, adapting to your styles.**

*Figure 53. Overview of desired camping experience renders.**

*The visuals shown on this page are an render of a blender model in an environment, supported by a background which was generated by GPT-4o.



*Figure 54: Render Glider in context.**

The Glider architecture is built for optimal set up ease, providing both a place to sleep and canopy in a single motion. It enables an easy single overnight stay.

While Glider promotes an open camping experience, harmonious with your surroundings, it can easily be extended to provide more shelter from the elements.
Along with additional side walls, an extendable awning and extra tent can be fitted to increase comfort and sleeping capacity.

**The visuals shown on this page contain a render of a blender model in an environment, supported by a background which was generated by GPT-4o.*

Presenting: Holtkamper

GLIDER

A Holtkamper tent trailer allowing you to shape your own journey.

- **Go wherever**
- **No matter the conditions**
- **Enabling *Your* nature exploration**

Aimed at spontaneous travel, the Holtkamper glider facilitates longer tours as well as impulsive weekend trips, adapting to the conditions and travel parties thrown at it.

It caters to a spacious range of camping needs through a compact and modular architecture.

By decreasing the trailer footprint when unfolded, the trailer is easily placed, even at a rougher forest floors, unlevel river banks. and tight clearings.

*Figure 55. Render of glider concept in context, closed trailer.**



HOLTKAMPER GLIDER

*Figure 56. render of Glider concept in Context.**

**The visuals shown on this page contain a render of a blender model in an environment, supported by a background which was generated by GPT-4o.*

Functionality - Exterior

To overcome current issues with wet packing and mould-development in canvas, the Glider tent layout is designed to reduce canvas-water-saturation during rain. The hard shell roof, and window awnings shield the canvas from most of the rain without impeding the Holtkamper camping experience.

Hard shell roof
- Wall extention preparations.
- Protection against harsh weather.
- Roof rack, accesory mounting.

Window awnings.
- Reduce canvas water saturation during rain.
- Cover ventilation areas during rainy conditions.

Open view windows.
- Large window surfaces improve the open/outdoor camping experience.

Drawbar accessory mount
- Option to mount a bicycle rack or other accessories.



Front storage access
- Improving storage accessibility of the Glider both of open and closed trailer.

Increased Ride height & tires
- Lifting the trailer off the ground to provide all terrain mobility and leveling on coarse locations.

Rear Hatch
- Providing access to trailer, (step up)
- To store your shoes.
- kitchen/fridge access on the go.





Figure 57. Overview of exterior features of the Glider concept, sideview render.

Functionality - Modularity



Figure 58. Glider fitted with attachments(extra tent, left-, right- & rear sidewall & awning extention).



Figure 59. Glider concept shown without extensions.

The ambition to create a tent trailer that can be set up anywhere, has resulted in a compact layout and footprint.
Simultaneously, the desire for equipment which adapts to changing conditions, was identified.

Meaning to integrate an open nature experience, a compact foot print, and adaptability, a modular tent trailer architecture was born.
Consisting of a main trailer with pre-mounted modular attachments.

Setting up Glider, it starts out as a compact tent trailer with a sleeping area, kitchen and canopy, providing the essentials for a single night stay.



Figure 60. Glider shown with extensions in context.

Functionality - Modularity

While seeming bare boned, Glider could already be fitted with attachments hidden out of sight.

The modular walls can be lowered from their folded position up against the hard shell roof.

Similarly, the side awning rotates out from under the shell to form a single pole awning, providing additional cover from the elements.

To add sleeping capacity, an extra tent can be mounted.



Figure 61. Top-view of glider showcasing optional extentions.



Figure 62Glider with mounted (left) sidewall.



Figure 63. Render of sidewall being folded into roof structure

Functionality - Interior



Figure 64. Render of Glider interior (bed in sleeping mode).



Figure 65. Render of bed in storage access mode.



Figure 66. Render of bed in bench set-up.

The compact, yet versatile nature of the Glider is carried through to its interior. Glider increases the value of its compact interior space by enabling a multitude of use cases.

The bed can be transformed to create a seating area. Additionally, it could be lifted to access trailer storage.

To add to the concept's convenience and comfort, the interior is fitted with lighting elements and electrical outlets. The lights and 5V USC-C outlets integrated in the Gliders design are powered by an on board 12Volt battery system. It charges when the trailer is attached to the towing vehicle.

Functionality - Interior

Similar to the bed configuration, the kitchen can be used in a multitude of ways.
It's assembly consists of the fixed lower construction, fitted with a front access fridge, which could still be accessed through the rear hatch when the trailer is closed.

The kitchen top houses a two burner stove. Made to swing out 270°, the architecture enables both indoor and outdoor cooking, further catering to an adaptable experience.

When stored the stove top is covered by a wooden section, which can be flipped over to provide a larger working area.

The kitchen is also fitted with power outlets to supply appliances and a lighting module to facilitate cooking in the dark.



Figure 67. Render of kitchen top lid open.



Figure 68. Render of kitchen top lid Closed.

SCENARIO

TOURING SCANDINAVIA

Preparing for departure.
Packing the trailer is convenient, even on a street, as its footprint does not increase when opened.

Single open motion & lift up bed help with storage access.

1.



A stop on the road.
With front storage access, items can be accessed on the go.

The rear hath means the kitchen and fridge can be used without opening the trailer.

2.



Overnight stop
Single night set up provides a place to sleep quickly. Preparing the essentials in a single motion.

3.



The use of the Glider concept is demonstrated in this scenario through a longer (wild) camping tour in Scandinavia. This context is chosen deliberately as a core focus of the concept lies on the spontaneity in travel.

A longer tour with a multitude of spontaneous destinations, including wild camping, is a context which was previously unsuitable for tent trailers. The Glider concept promotes new use cases such as this one.

Standing out in Touring concept is the **single night set up** mode, providing both a place to sleep and a canopy in a single motion.

Camping in the wild.
The increased ground clearance and levelling allows the user to find their ideal spot any where in nature. Connecting them through the open experience.

4.



Rain? No problem.
The User can attach or remove the modular attachments and place them in their storage position. The rain resistant layout means the chances of wet-packing are decreased significantly

5.



6.



Air dry on the go.
If the canvas does get wet, the Glider can be opened easily during a charging stop. Getting rid of the final moisture.

Figure 69. Scenario: Touring Scandinavia. The scenario steps show an AI-enhanced version of a blender render, generated using GPT-4o.

SCENARIO

SPONTANEOUS WEEKEND NATURE CAMPING IN THE NL'S



1.



2.



3.

Besides traveling without planned destinations, the Glider also promotes spontaneous travel by enabling impulsive (weekend) trips. It does so by simplifying the ease of set up, pre and post trip handling, compared to current tent trailers. Its most significant quality, however, lies in its weather dependence.

In the "Spontaneous weekend nature camping in the NL's" scenario, depicted here, such a scenario is explained.

It describes a spontaneous weekend getaway to a nature camping in Drenthe, meeting up with a couple of friends, while going cycling and enjoying nature.

Side ways storage.
Storing the trailer on its side, at home allows for less trips to the storage facility, and more trips with the Glider.

Packing the trailer.
Glider takes it all, mountain bikes and tent extensions are already mounted.

Arriving on the site.
Positioning the trailer on the camping spot.

Providing shelter.
Beyond the open camping experience, Glider can adapt to provide cover for the whole group.



4.



5.

Adapting to the conditions.
The ability to use the kitchen both in and outdoors increases the weather independent nature of the Glider concept.

Figure 70. Scenario: Spontaneous weekend Nature camping in the Netherlands. The scenario steps show an AI-enhanced version of a blender render, generated using GPT-4o.

Product positioning.

Comparing the Holtkamper Glider concept to the current models within the Holtkamper showroom, it might at first come across as an entry level tent trailer due to its compact size. Upon deeper investigation, it becomes clear that this compact trailer hides a whole lot of functionalities. In addition to its functionalities, the Glider features pre-mounted extensions that enhance indoor space, expand sleeping capacity and a create a covered area under the awning, rivaling that of its larger siblings.
Beyond the multi functional interior and extendable room, Glider generates most value by enabling new use cases, previously unseen within the realm of tent trailers.

Considering competition, and the current Holtkamper Model portfolio, the Glider concept should be seen as a capable and versatile trailer, with a high level of convenience features and facilities. It is therefore considered appropriate to position Glider within the upper range of the Holtkamper line up.
As the Glider holds a different approach to the Kyte and Aero, it is not expected to cannibalize within the brand portfolio.
In its compactness and bed layout, Glider shares more similarities with the Holtkamper Nano. It should, however, clearly be placed above this model as it comes with a kitchen and can be fitted with extensions, which builds on the idea of its increased functionality and use cases.

Glider is currently developed up to concept level. This means an exact purchase price is difficult to calculate. However, seeing as the construction, materials, and potential productions methods have been thought out, an approximation of pricing can be made.

Comparing the Glider Concept to The outgoing models, its cage construction is similar to the Nano, extended by 500 mm to allow for the kitchen and compact interior space. Considering the elimination of HK's pack and go feature, the cage construction could be significantly lighter. This avoids the need for several heavy stainless steel construction elements, currently seen in most models.

As the tent pack is considerably more compact and simple compared to the outgoing models, this would cost less in materials and production.

The development and production of the compact kitchen would add to the cost. Its simple layout with compact stove, eliminated sink, reduce cost and complexity. On the other hand, the front access style fridge is generally a more expensive procurement part (Interview B–OCS recreatie, December, 2025.) The kitchen would contribute to the price.
Additionally the Wind Force system, with drying and ventilation capabilities would add both value and cost, as well as the integrated light fixtures and outlets.

In the figure 71, the Positioning of the Glider within the Holtkamper portfolio is presented.

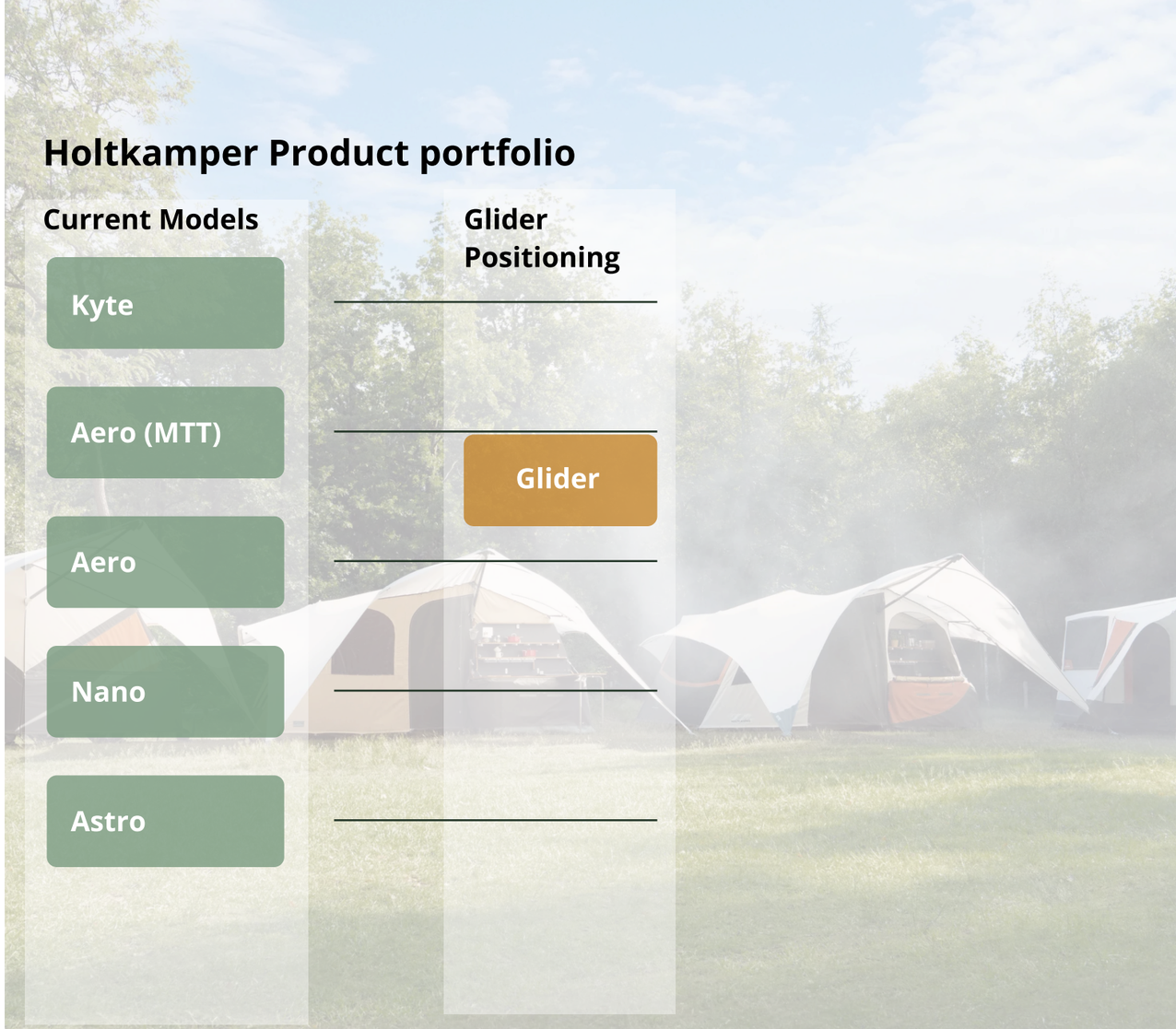


Figure 71. Glider positioning

Picture curtesy of Holtkamper

Evaluation

Design Evaluation

This section evaluates on the design outcome against the identified design drivers and project mission. Assessing the extent to which the concept responds to the identified research insights.

Out of the knowledge generation activities performed in this project, a large collection of design drivers and insights were gathered. Each of the studies contributed to a different areas of design drivers, such as more detail/feature oriented, or more focused on the meaning and use of the product.

This broad selection of takeaways, insights, and design drivers can be structured in a selection of core Design Goals.

- ***Enabling a nature connection.***
- ***Decreasing condition dependence.***
- ***Encouraging spontaneous travel.***
- ***A layout adaptable to the user.***
- ***Reduce setup complexity and strain.***
- ***Strengthen the Holtkamper Heritage.***

Throughout the project it was aimed to keep a close alignment to the mission and the goals. Within the design process, evaluation was continuously integrated to validate decisions based on these goals, identify the most promising solution and test on the effectiveness.

Criteria Based selection

In choosing a single concept to develop further, the four concepts were evaluated based on a set of criteria. Both the designer and client company Holtkamper contributed to the weight of the criteria. Separately, the designer scored the concepts on each criteria. Based on this outcome, the concept with the highest potential was chosen to continue with.

Technical Evaluation

During the development phase, one feature was perceived as particularly promising due to its contribution to multiple Core design goals. The Wind Force Drying system would reduce condition dependence (such as poor weather conditions), encourage spontaneous travel and reduce handling complexity/ ease of use. It was highly desirable to validate the effectiveness of this feature.

As highlighted in the development chapter of this report, a prototype WFD installation was designed, build and tested to evaluate the performance of the system. Which proved to be highly effective in the tests.

Final Design Evaluation

To assess effectiveness of the Holtkamper Glider concept at addressing the design challenge, it was validated by reviewing its performance against the core design drivers. In the matrix, the core design drivers are presented along with their meaning, and the extent to which the Glider performs on this aspect. Lastly reflective comments are shared. This is seen shown in the figure 72 on the side.

Design Outcome Evaluation Matrix

Design Goal	Meaning	Performance	Reasoning.
• ***Enabling a nature connection.***	• Nature immersion. • Environment awareness & harmony • Connection to the surroundings	Significant **Expected** contributions, though dependant on user experience.	Significant interventions have been integrated to facilitate a nature connection with the user like: • IN nature camping. • Open experience layout User involvement and testing would confirm the expected true effectiveness.
• ***Decreasing condition dependence.***	• All terrain compliance (rough/uneven surface & smaller spaces). • All season camping/ camping in the rain.	Significant contributions.	In redesigning the tent trailer architecture, a large contribution was made toward reducing the chance of wet-packing through less exposed canvas surface and an active drying/ ventilation. The increased ride height and decreased footprint enable all terrain camping and placement in tight spots.
• ***Encouraging spontaneous travel.***	• Enabling impulsive trips. • Journeys without planned destinations.	Very strong contributions.	Decreased weather dependence is strongly related to the enabling of spontaneous trips. The facilitation of new usage types is an important aspect of Glider. Aspects like the created Single Night set up further enhance the touring capabilities. The sideways storage of the trailer (at home) reduces the boundary to go on a trip.
• ***A layout adaptable to the user.***	Camping equipment that adapts to changing travel: • Style • Activities • Party • Conditions.	Reasonable contributions	The modular layout means that the concept can be adapted to a high level, without overly large trade-offs in terms of complexity. The pre mounted attachments (tent, walls and awning) are relatively similar in functionality compared to current models. Ease of use and storage when not in use has been improved considerably.
• ***Reduce setup complexity and strain.***	• Reduce required set up steps. • Reduce required force to set up tent. • More accessible grip points.	Considerable contributions	The Single-Motion-Setup significantly improves set up ease and speed. Gas struts aid less mobile users, and a basic sleep set up can be created without the need for pegs. The total trailer weight will likely be less heavy. Some actions are still relatively high though.
• ***Strengthen the Holtkamper Heritage.***	• Improve perceived product/material quality, durability and design. • Care free use.	Significant contributions, though dependent on future development and perceived user experience.	The “cheap looking” plastic elements have been replaced for a more honest and durable design language, for which the HK brand was always praised. Several problematic zippers have been replaced by other fastener types. User testing would outline actual user experience and valuation.

Figure 72. Evaluation matrix.

Conclusion.

Conclusion

In this chapter the conclusion of the graduation project, *Redefining the tent trailer - Designing a new Holtkamper camping equipment concept*, **will be shared.**
The way the project, the design challenge and the outcome was approached, is emphasized in this conclusion section.

This project started out with the ambition to create an innovative camping equipment concept, by redefining future camping, integrating user experiences, values, and the Holtkamper Brand heritage.

The Holtkamper Glider concept answers the design challenge by presenting a whole new approach to tent trailer camping. It does so through enabling spontaneous, nature oriented travel, while integrating user experiences and future context developments. All while flaunting the essence of the Holtkamper brand.

The generation of the future vision showed that camping is subject to change in the upcoming years, driven by factors of environmental, global, economic and societal nature. Pressure is applied on nature recreation and camping. This is troubling as the connection to nature is perceived as increasingly important in the current, fast paced digital world.

The Glider concept improves the user nature connection by encouraging **spontaneous travel, facilitating exploration, no matter the conditions and adapting to your style.**

From the ground up Glider is designed to facilitate **YOUR** nature connection by allowing you to camp wherever the outdoors take you.

The increased ride height, reduced footprint and coarse terrain leveling capabilities allow you to set up camp **IN** nature.

With the open camping experience, Glider allows you to be in touch with your surroundings, camping **WITH** nature.

The new architecture encourages all-season camping trips, even when the forecast does not. Passive and active ventilation, combined with a rain-resistant tent layout, reduce weather dependency and ensure a comfortable, airy sleeping experience. The integrated Wind Force Drying system further reduces canvas drying time, lowering post-trip handling complexity.

Wet-packing stress and related mold-development issues proved to be among the most pressing challenges in current tent trailer ownership. The Glider concept aims to eliminate these challenges.

In combination with the “single motion set up” ease, this opens the realm of longer wild camping tours and spontaneous weekend trips, both identified as key use case opportunities through user feedback.

The modular nature of Glider allows users to adapt their travel style on the fly. Pre-mounted, yet hidden, extensions are available when needed or when circumstances change unexpectedly.

- ***Reducing condition dependency***
- ***Nature connection***
- ***Adapting to your travel style***
- ***Encouraging spontaneous travel***



Figure 73. Render of mounted bike rack.



Figure 74. Close-up render of lower trailer.

Engaging with current tent trailer owners and users led to valuable insights and the identification of tensions and unmet needs, many of which relate to required handling force and setup ease. Glider's single motion setup, assisted by gas struts, aims to reduce physical strain during setup and breakdown.

An important aspect of Holtkamper products is the brand's heritage. Owners indicated that perceived brand value could be improved. Through the application of robust and durable materials, combined with honest and practical design, the Glider concept aims to elevate the Holtkamper design language.

Placing Glider within the current landscape of camping equipment highlights its differentiation. While campers and tenting show movement toward nature exploration, the tent trailer segment remains relatively traditional.

Glider's focus on nature exploration and spontaneous travel unlocks new use cases for Holtkamper, encouraging users to look beyond conventional camping patterns. Its emphasis on open camping, enhancing connection and harmony with nature, positions it uniquely within the segment.

This direction aligns with the ambition to attract a new generation of tent trailer owners to Holtkamper.

While modularity and ultra-compact solutions are common within camping equipment, Glider approaches this differently. By starting from a compact base, it offers advantages when space or time is limited, while still providing the room, protection, and amenities of larger competitors when fully deployed. Its multifunctional interior further increases usability, enabling users to sleep, sit, and cook within the trailer.

Holtkamper currently holds a strong position within the traditional tent trailer segment. The Glider concept aims to inspire the company to explore new use cases and adopt a more pioneering stance within an evolving landscape. Through its dry camping approach, Wind Force Drying system, and reduced equipment footprint, it presents clear directions for future innovation.

Discussion

Discussion

This section presents a reflective analysis/view of the performed project. Aiming to share strong aspects and limitations that influenced the flow and outcome. Ultimately concluding with recommendations for further research and advised development directions of the future glider concept.

Design outcome.

The concept resulting from this design project presents an innovative and coherent camping equipment concept. It provides a confident answer to the design challenge, targeting identified tensions through design interventions such as the WindForce Drying system, while proposing new and relevant directions for Holtkamper.

Due to the scope and timeframe of the project, not every design driver and identified tension could be responded to equally. This resulted in a selection of trade-offs within the concept.

A recurring point of user feedback was the desire for accessible, fixed kitchen storage space. In the effort to reduce the overall footprint while integrating a kitchen, this need could not be fully realised to the desired extent. This reflects a broader tension between compactness and interior usability. The precise ratio between compactness and interior usability desired could be further defined.

Another example is the introduction of the hard-shell roof. While it provides clear functional and structural advantages, it partially replaces the traditional canvas roof. The experience of sleeping under canvas, including the sensory aspects such as the sound of rain, is currently highly valued by tent trailer users.

This uncertainty directly points toward the importance of customer evaluation as a next step. While the concept addresses the design challenge, identified tensions, and project mission, validation with the user base is required to assess the desirability and acceptance of the proposed design directions.

Further development could focus on the integration of off-grid technologies, such as solar energy, energy storage, and water systems, strengthening the concept's autonomy and alignment with emerging camping practices. Additionally, the concept could be expanded through tailored accessories, such as integrated seating, tables, and storage solutions, further enhancing usability and coherence.

Research phase.

The knowledge generation preceding the design of the concept provided a solid foundation of insights around which the concept could be structured. A key strength of this phase was the user and owner survey. The high number of respondents enabled a substantial quantification of responses, allowing for well-supported conclusions. In addition, the qualitative nature of the data provided insight into user sentiment, adding depth to the findings.

A limitation of the dataset was the time required for processing and analysis. Due to the scale of the responses, cross-analysis between different respondent characteristics was not feasible within the project timeframe. As a result, relationships between factors such as age, usage patterns, and specific needs could not be explored in detail, reducing the specificity of some insights.

Another limitation originated from the formulation of survey questions. During analysis, it became apparent that certain questions were interpreted differently by respondents. Despite prior review and refinement in collaboration with Holtkamper, misinterpretations occurred. While this is partly inherent to qualitative survey methods (Suessbrick et al.,2005) further refinement through pilot testing could have improved clarity and consistency of responses.

Looking back at the VIP Future vision generation, it is felt that the outcome is plausible and coherent, but somewhat limited in depth. The resulting vision represents logical developments rather than unexpected or disruptive perspectives. This is expected to be related to the framing of the domain within a relatively near future, where developments remain closer to current conditions. While this reduces the speculative character of the vision, the VIP future vision and the preceding design mission provided a strong direction for the design of the concept.

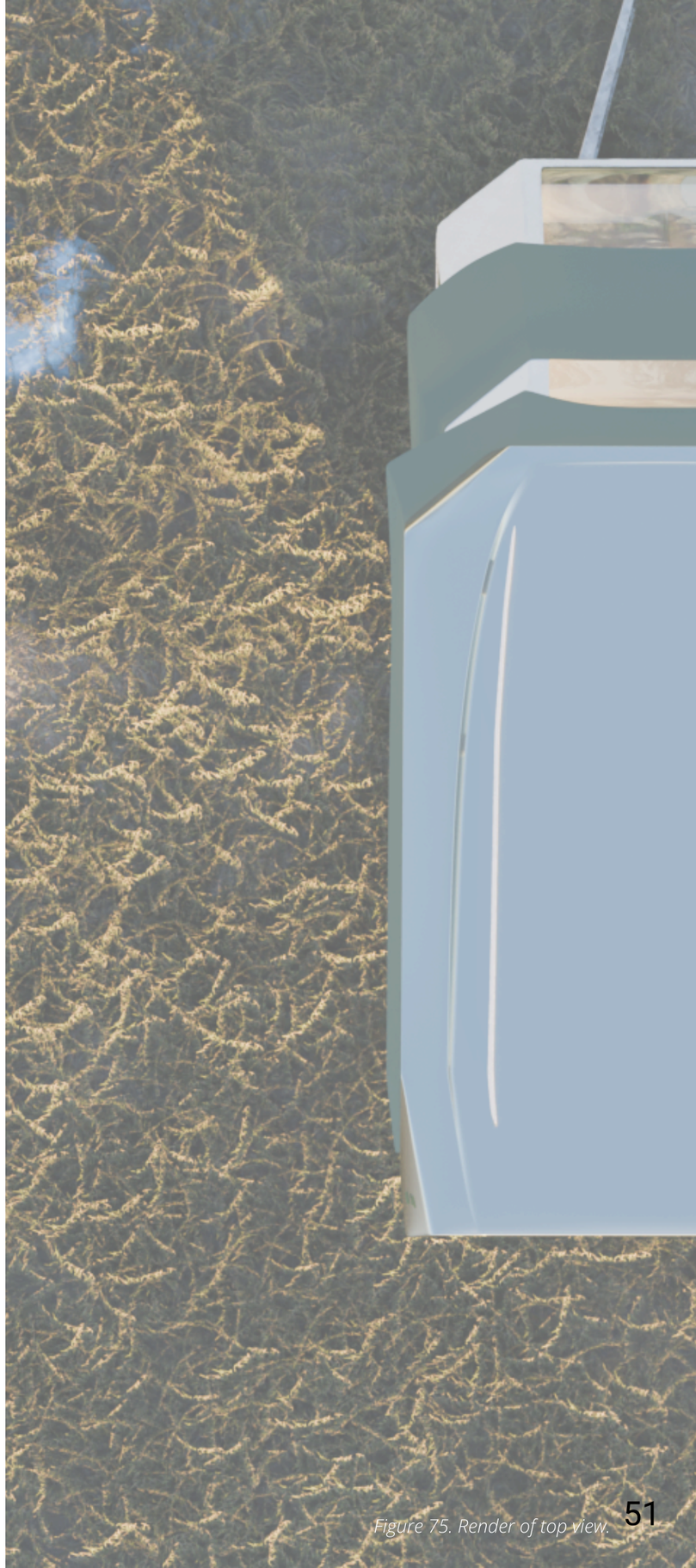


Figure 75. Render of top view.



Figure 76. Close up render of buckle clasp.

Design process.

Following the initial knowledge generation, the project progressed into ideation and targeted solution development. During this phase, the pace of the project increased significantly. The research phase provided a strong foundation for decision making, allowing design choices to be consistently grounded and argued. This enabled efficient progression throughout the ideation, evaluation, and development stages.

The combination of structured methods and iterative development resulted in a fluent design process. Throughout the development of the concept, multiple aspects were refined through testing and iteration cycles. Notably, the core construction and kinematics, as well as the WindForce Drying system, were explored and improved through prototyping. The development and testing of the WFD prototype in particular yielded strong results, supporting its role as one of the key design interventions within the concept.
The chosen design process structure proved to be supportive to the project, enabling a clear progression from research to concept development. At the same time, it should be noted that the initially planned activities and their allocated time shifted throughout the project. While such adjustments are inherent to design processes, they influenced both the depth and focus of the final outcome.

A recurring theme throughout the project was the ambition to develop a complete and coherent concept. In combination with the complexity of the design challenge, this made it difficult to fully realise every intended aspect within the available timeframe. As a result, prioritisation was required, focusing on the development of a strong overall concept with its key aspects, rather than developing a completely engineered concept.

If the project would be continued, it would be a logical next step to evaluate the core construction and folding mechanism through a large-scale prototype (1:2 or 1:1). Though the construction is perceived as promising, the mechanical performance and feasibility of the construction have not been validated at full scale, representing an uncertainty of the current outcome.

In addition to evaluation on a mechanical level, it would also be desired to integrate a secondary level of user involvement, as briefly mentioned before.

Validity of the outcome.

From the start of the project, the intention was to design an innovative camping equipment concept that could inspire future Holtkamper products, while remaining grounded in a realistic and near-future context. Rather than creating a highly speculative or conceptual “concept car” of camping, the aim was to develop a concept that balances innovation with feasibility and relevance to current production methods and user expectations.

This resulted in an approach that is progressive in its rethinking of camping practices and use cases, without veering far from the known engineering principles and manufacturing possibilities within Holtkamper’s context. As such, the concept introduces new ways of camping within the tent trailer segment, without fully departing from its existing engineering and brand.

The validity of the concept is primarily supported by its grounding in the research phase. The design is based on identified user needs, experienced tensions, and broader contextual developments, which increases its relevance. In addition, specific aspects of the concept, such as the Wind Force Drying system, have been explored through prototyping, providing a level of functional validation.

At the same time, several limitations affect the extent to which the concept can be considered fully validated. The absence of large-scale prototyping means that the structural performance, kinematics of the design have not been tested up to scale. Similarly, the lack of user evaluation limits the ability to assess user acceptance and interest.

As stressed originally in the scope of this project, the concept should be understood as a well-developed and grounded design proposal, rather than a fully validated product solution. While certain aspects have been explored and partially tested, further development and evaluation are required to underline its feasibility and desirability in practice.

Within this context, the choice to remain relatively close to existing engineering and production methods can be seen as a deliberate trade-off. While this may result in a concept that is less radical in form or functionality, it increases the likelihood of real-world applicability and implementation. The concept therefore offers realistic and actionable value for Holtkamper, particularly in terms of new use cases, feature development, and future product direction.

It is hoped that the resulting Holtkamper Glider concept showcases how camping might evolve in the near future, and in doing so, inspires brands within the camping equipment landscape to innovate.

Recommendations

U/O

In order to get more depth out of the responses/data. Cross comparison of respondent characteristics could be performed. While admittedly taking up significant time it would result in higher definition insights and model/age group/usage type specific input.

Beyond the data analysis, the gathered insights from U/O’s could be applied to the Glider concept in more detail in a potential future development phase. As concept detailing was beyond the scope of this project, Glider could not cater to all the identified user tensions. Aiming to resolve these in current en future products could potentially increase customer-product satisfaction significantly.

WFD

It is recognised that the Wind Force Drying system could be even more effective if combined with a heating element, further research could be conducted to determine the effect of introducing heat to the system. In addition to heating it would be advisable to explore the Wind Force Drying system at a full trailer scale, beyond simulated conditions, in combination with the modular Air-guide extensions.

Development

This concept has currently been worked out up to a conceptual level. Though forces such as wind and people (inside the trailer) have been recognised and kept in mind throughout the design process, no force calculations have yet been performed on the construction of the glider concept.
If serious intentions to produce the Glider or a derived model, are recognised, it is recommended to test the frame on a broad scale of loads.



Figure 77. Render of Glider in context.

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Figure 78 Render of Glider in context.

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Figure 78. Close up render of Glider leveling feet.

Appendices

Appendices

Contents

Appendices

- A: Context analysis Findings.
- B: User / Owner research - Survey questions.
- C: Human Research Ethics - Informed consent
- D: User / Owner research - Thematic analysis
- E: VIP - Deconstruction steps - Product.
- F: VIP - Future context clustering.
- G: Ultimate desired / Future -experience Visual.
- H: Ideation & Targeted solution sketches.
- I: Concept evaluation - Criteria weights.
- J: Concept evaluation - Valuation of concepts.
- K: Concept development - Kinematics diagram.
- L: Concept development - Prototyping WFD.



Figure 79. Closed glider in Context.

Appendix A: Context analysis Findings.

Contextual tensions within the camping landscape.

The current camping landscape is characterized by a strong post-pandemic recovery, accompanied by a noticeable shift toward versatile, high-comfort camping experiences that increasingly blur the boundary between traditional outdoor life and modern luxury (McKinsey & Company, 2024). While the overall Dutch holiday market is projected to grow by 5–8% over the coming five years, the camping sector specifically reveals a more nuanced picture. Motorized campers are rapidly increasing in popularity, whereas the traditional caravan market remains relatively stable but is defined by a significantly aging fleet (VMS | Insight, 2025). This creates a situation in which the sector appears economically healthy, yet structurally constrained by outdated equipment and limited innovation within established product categories.

Within the camping equipment market, a clear division can be observed. The rising popularity of campers, with new registrations increasing by 14% in 2024, contrasts sharply with the stagnation of the caravan segment, where the average vehicle age has reached nearly 22 years (VMS | Insight, 2025). This aging fleet sustains a strong secondary market focused on maintenance, repair, and second-hand sales, often taking place directly between consumers. At the same time, barriers to new ownership remain high, particularly due to the ongoing storage crisis. Limited storage availability, stricter fire regulations, and increasing insurance costs prevent a significant portion of potential buyers from entering the market (VMS | Insight, 2025).

Parallel to these developments, campsites themselves are undergoing a process of “verstening,” where traditional open camping plots are increasingly replaced by fixed accommodations such as chalets and glamping units. As a result, the availability of flexible camping spaces has decreased by approximately 18% over the past twelve years (VMS | Insight, 2025). Together, these developments point toward a camping landscape that is becoming more fixed, regulated, and less adaptable, despite growing demand. On the contrary other believes are expressed regarding a shift where there will be more emphasis on mobile equipment rather than apartments and fixed accommodations in parks. (Interview B–OCS recreatie, December, 2025)

From a consumer perspective, camping is increasingly positioned as an experience-driven activity rather than a purely functional form of travel. Particularly among younger generations, travel experiences are prioritized over material ownership, with individuals willing to compromise on other budgets to finance leisure and travel (Gröoschel et al., 2025). This shift can be noticed through multiple trends. On one hand, there is a growing demand for glamping and neo-comfort experiences, where users seek immersion in natural environments without relinquishing the comforts associated with home, such as high-quality sleeping facilities (Hanafiah et al., 2025). This trend, for Holtkamper, if acted upon correctly could mean a significant new market area. The desire for off-grid escapes and mental detachment from digital overstimulation is becoming increasingly visible, positioning camping as a form of retreat and psychological recovery (Versloot, et al., 2025); (Caldicott et al., 2022).

Simultaneously, the popularity of Van-Life culture and personalized camping solutions reflects a desire for autonomy, individuality, and self-expression. Influencer-driven hypes around renovated vintage vehicles and self-built campers combine nostalgia with a sense of freedom and personal control over the travel experience (Interview A–NBTC, December, 2025); (VMS | Insight, 2025). While sustainability is increasingly recognized as an important theme within the camping sector, particularly in relation to destination choice and environmental impact, purchasing decisions remain primarily influenced by purchase prize (Versloot, et al., 2025); (VMS | Insight, 2025). This creates a recurring tension between expressed values and actual consumer behavior, in which sustainability is acknowledged but not always acted upon.

Technological and infrastructural developments further influence the camping context. The ongoing electrification of the passenger car fleet is reshaping mobility patterns and directly influencing camping equipment preferences (Interview B–OCS recreatie, December, 2025). As electric vehicles become the primary mode of transportation for many households, demand shifts toward lighter and more aerodynamic solutions, such as tent trailers, to mitigate range limitations (VMS | Insight, 2025). Which for Holtkamper is a significant benefit. At the same time, full electrification of motorized campers remains constrained by battery weight, limited charging infrastructure, and practical usability concerns (Peeters et al., 2023). Another layer of complexion is being added by the digitalization, simultaneously enabling spontaneous, platform-driven travel planning through real-time booking systems and AI-supported services, while also provoking a growing counter-movement that promotes digital detox and signal-free environments as part of the camping experience (Daniel et al., 2022); (Interview A–NBTC, December, 2025).

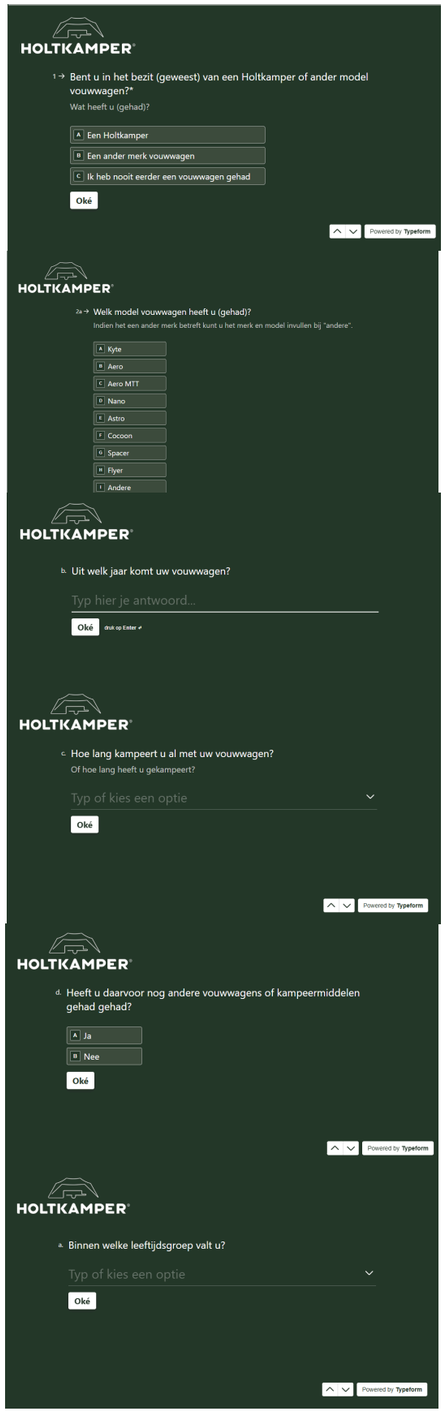
The rise of networked individualism further illustrates this duality, as "kampeerders” remain socially connected and motivated by the shareability and “Instagrammability” of their experiences, even when seeking escape and solitude (Ahluwalia & Balhara, 2024).

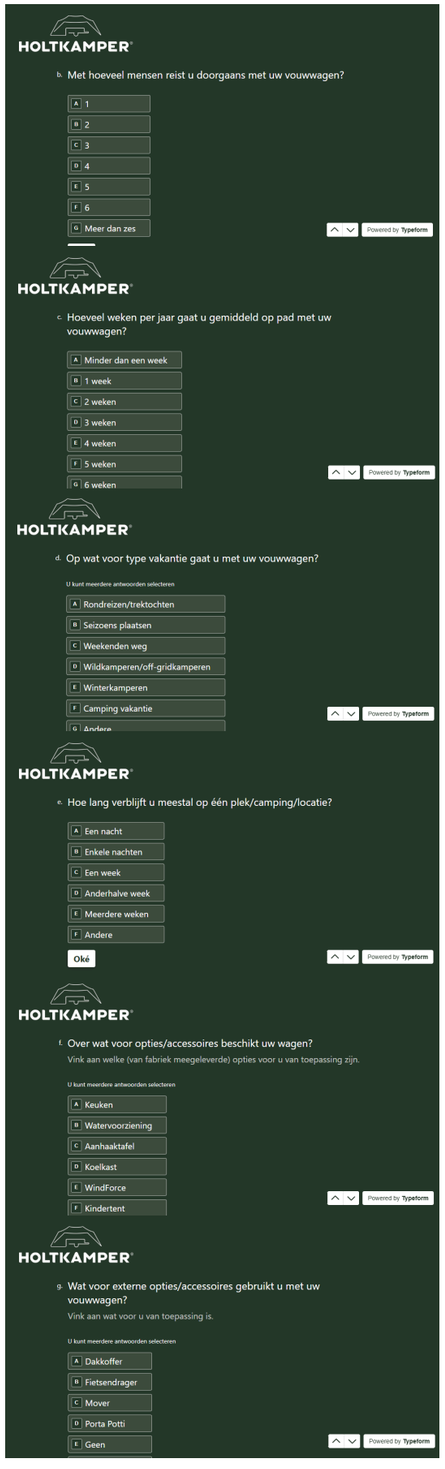
Finally, broader socio-economic and climatic pressures increasingly shape the boundaries of the camping landscape. Rising inflation has contributed to a significant increase in accommodation costs, with Dutch holiday prices rising by approximately 60% since 2015 (McKinsey & Company, 2024). Labor shortages within the hospitality sector continue to challenge campsite operators, particularly as travel seasons extend beyond traditional peak periods (Oecd, 2024). Demographically, Baby Boomers remain a dominant and influential group due to their spending power and temporal flexibility, which partially offsets seasonal demand fluctuations (McKinsey & Company, 2024). Climate change further alters travel behavior, with extreme heat and wildfires in Southern Europe driving demand toward Northern and Central regions and extending travel into shoulder seasons (Matei, et al, 2023); (Interview A–NBTC, December, 2025)

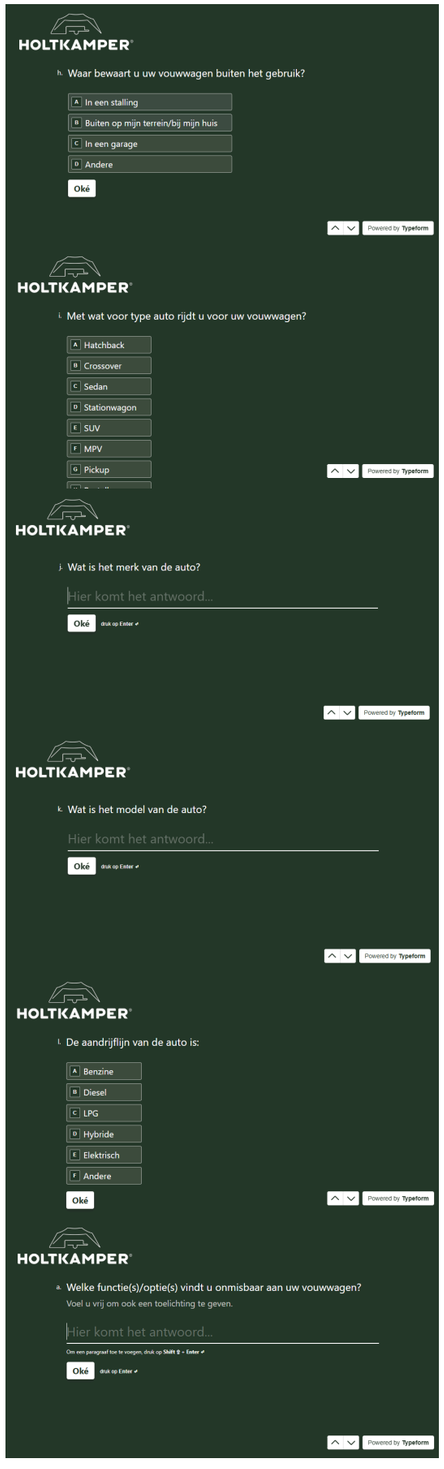
Regulatory developments, such as the introduction of zero-emission zones in Dutch city centers from 2025 onward, are expected to restrict access for a substantial share of the existing camper fleet, forcing users to confront trade-offs between mobility, investment, and accessibility (VMS | Insight, 2025). In the long term, these economic, environmental, and regulatory pressures raise questions about the inclusivity and accessibility of camping as a form of leisure (Gössling & Scott, 2025).

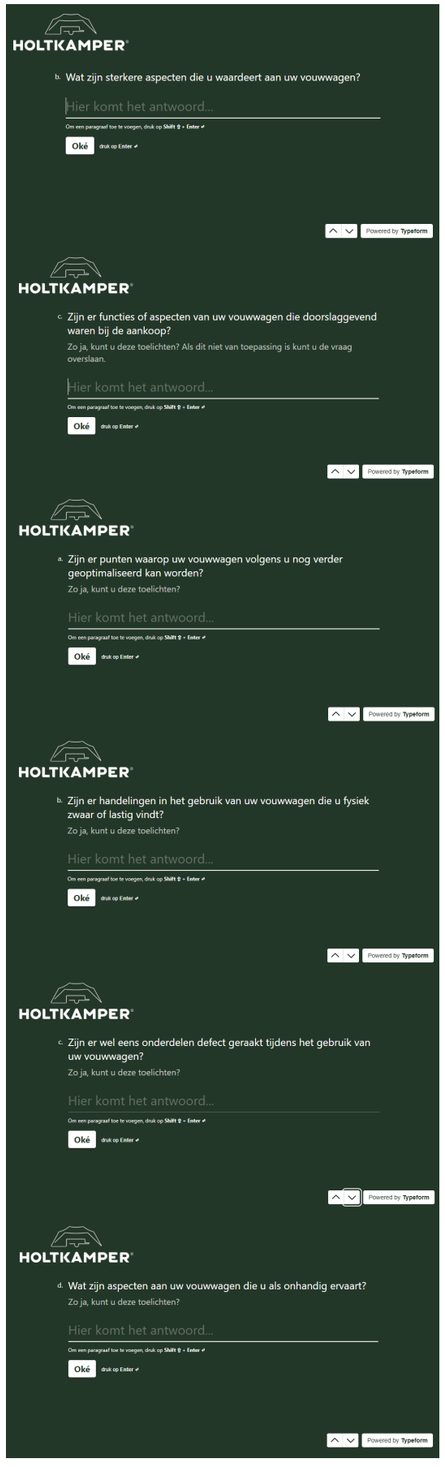
Appendix B: User / Owner research - Survey questions.

Survey questions

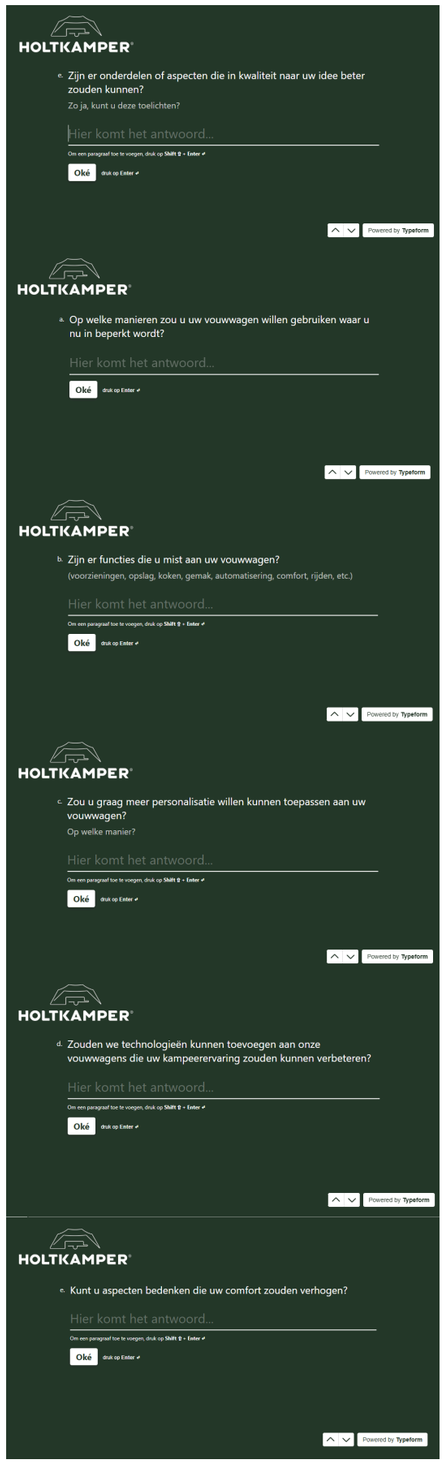


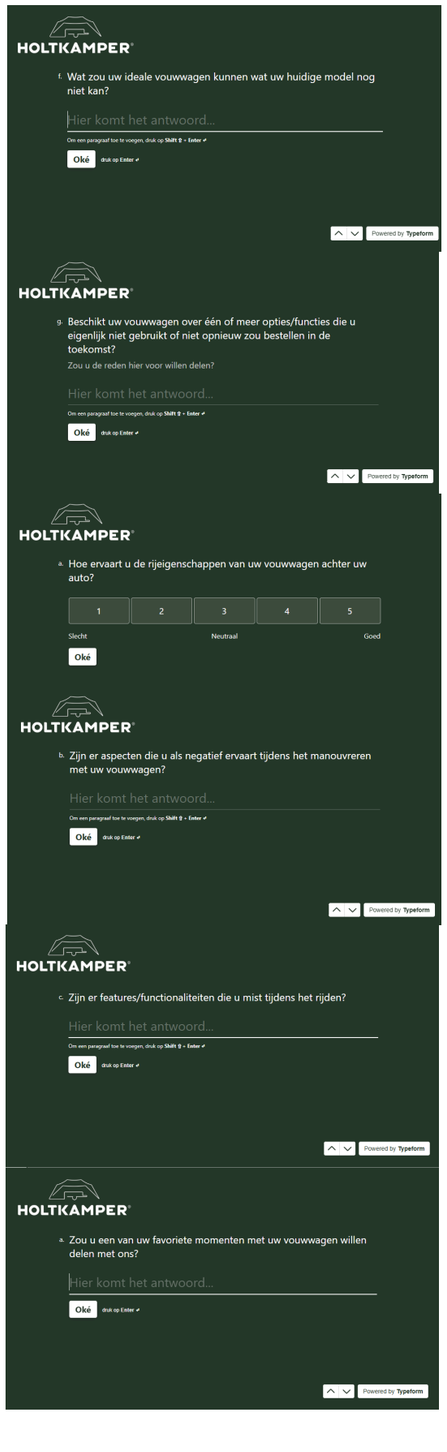


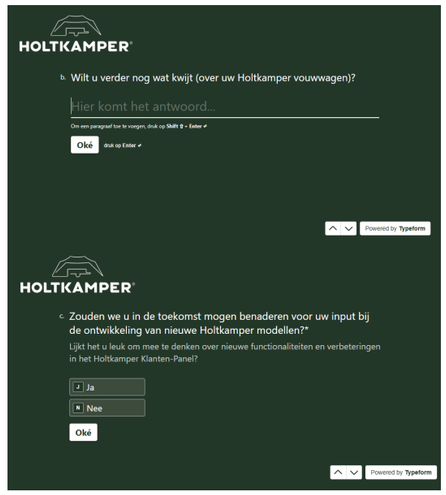




Appendix B: User / Owner research - Survey questions.







Appendix C: Human Research Ethics - Informed consent

Informed Consent Opening Statement

Holtkamper user research

Researcher:
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Informed Consent will be presented in Dutch as all participants are based in the Netherlands and dutch speaking. The Dutch version of the informed consent opening statement is presented below.

English

You are being invited to participate in a user research for Holtkamper. This study is being done by Bastiaan Dollé from the TU Delft & Hotlkamper BV.

The purpose of this research study is to identify improvement and innovation opportunities through the experiences, values and whishes' of users. It will take you approximately 10 minutes to complete. The data will be used for the design of new Holtkamper Concepts. We will be asking you to answer questions regarding the way you typically use your camping equipment and share your opinion regarding improvement opportunities and valued features. The findings of the study will be used and published in a TU Delft MSc thesis. The raw responses will be processed anonymously and will be deleted after the research, solely the analysis will be kept.

As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by conducting the research completely anonymous, no personal data or IP addresses will be collected.

Your participation in this study is entirely voluntary, and you can withdraw at any time. You are free to omit any questions.

In case of questions you can reach out to Bastiaan Dollé via the following email adress:
B.b.dolle@student.tudelft.nl

By sellecting "volgende" and continuing to the survey you agree to the this opening statement.

Dutch

U wordt uitgenodigd om deel te nemen aan een gebruikersonderzoek voor Holtkamper. Dit onderzoek wordt uitgevoerd door Bastiaan Dollé, student aan de TU Delft & Holtkamper BV.

Het doel van dit onderzoek is om verbeter- en innovatiemogelijkheden te identificeren aan de hand van de ervaringen, waarden en wensen van gebruikers. Het invullen van de vragenlijst duurt ongeveer 10 minuten.

De verzamelde data wordt gebruikt voor het ontwerpen van nieuwe Holtkamper-Producten. U zult vragen krijgen over de manier waarop u uw kampeeruitrusting doorgaans gebruikt en vragen om uw mening te geven over verbeterkansen en gewaardeerde eigenschappen. De resultaten van het onderzoek zullen worden gebruikt en gepubliceerd in een MSc-thesis aan de TU Delft. De losse antwoorden zullen anoniem worden verwerkt en na het onderzoek verwijderd, enkel de analyse wordt behouden.

Zoals bij elke onlineactiviteit is er altijd een risico op een datalek. We zullen er alles aan doen om uw antwoorden in dit onderzoek vertrouwelijk te houden. We minimaliseren de risico's door het onderzoek anoniem uit te voeren; er worden geen persoonsgegevens of IP-adressen verzameld.

Uw deelname aan dit onderzoek is volledig vrijwillig, en u kunt op elk moment stoppen. Het staat u vrij om vragen over te slaan.

Voor vragen kunt u contact opnemen met Bastiaan Dollé via het volgende e-mailadres:
B.b.dolle@student.tudelft.nl

Door "volgende" te selecteren en verder te gaan met de enquête gaat u akkoord met deze opening statement.

Appendix D 1: User / Owner research - Thematic analysis

4 A. Welke functie(s)/optie(s) vindt u onmisbaar aan uw vouwwagen?
4 B. Wat zijn sterkere aspecten die u waardeert aan uw vouwwagen?
4 C. Zijn er functies of aspecten van uw vouwwagen die doorslaggevend waren bij de aankoop?

Themes	Sentiment	Approx freq. (%)	Insights
• Speed & ease of setup		**29,5%**	Owners value Quick setup | the absence of loose poles is valued strongly | windforce | mast-based awning
• Kitchen Utility & acces		**19,7%**	Fixed kitchen is a selling point | The accesibility of fridge/kitchen named as important
• sleeping Comfort		**17,2%**	Good bed | with slatted frame | Length based layout is named as a pre
• Storage & pack & go		**11,7%**	Pack & go seen as USP | easy packing and departure
• quality & robust ness		**9,8%**	Robustness & storm resistance | Highquality canvas → premium status
• Towing & road handling		**6,8%**	Praised for stability behind the vehicle "forget it is there"
• Canvas & climate control		**5,2%**	The roof ventilation system is mentioned often for its working.
Mentioned satisfaction/Did not answer		**1,1%**	When asked about the positive aspects of their (holtkamper) around a third is related to the the ease of set up, absence of complex pole structures and general speed of (un)folding. The kitchen is praised as a selling point of the product, and its accessibility on the road, mainly the fridge. The bed (slatted base) layout and comfort are mentioned often as strong aspect of the trailers. Additionally the storm proof nature and robustness along with the canvas quality come up.

5 A. Zijn er punten waarop uw vouwwagen volgens u nog verder geoptimaliseerd kan worden?

Themes	Sentiment	Approx freq. (%)	Insights
• sleeping comfort (light & Bed)		**12,8%**	Sleeping area to light | Waking up due to to much light ingress | Desire for lenghtwise sleeping | Beds are off too poor quality
• Kitchen functionallity		**19,6%**	Toplids impractical → drawers | More workspace | Issues big pans | Access while traveling
• Electricity & lighting		**16,7%**	Demand power outpt. ports (usb-C & 230V) | Inbuilt lighting (kitchen & storage)
• Canvas, zipper quality & maintainance		**17,7%**	Issues with Mold & drying | Fast discolouration (colours) | (lightcolours) gets dirty easily | Cover zippers often heavy or too tight
• Set up & folding ease		**15,7%**	Wind force needing to much PWR on camp. | Still complex/could be faster easier | Set up still heavy | Strong desire for better instructions. (QR-codes, manuals, videos)
• Awnings, windows ventilation.		**11,8%**	Desire for removable awning | integrated Musquito nets | More/better windows
Mentioned satisfaction/Did not answer		**8,2%**	Users often have to create their own "MacGyvered" solutions for electricity. The sentiment is largely constructive criticism. Owners are generally loyal to the brand but feel the premium price point should include modern amenities like black-out sleeping areas, integrated USB/ LED systems, and more robust/easier-to-operate zippers. There is a clear "tension" between the desire for "glamping" luxury and the physical struggle of setting up and packing a heavy, complex trailer.

5 B .Zijn er handelingen in het gebruik van uw vouwwagen die u fysiek zwaar of lastig vindt?

Themes	Sentiment	Approx freq. (%)	Insights
• folding, unfolding & managing canvas		**27,8%**	Two person job| Canvas → heavy | Difficult to fold neatly |
• manoeuvring & positioning		**19,0%**	Heavy trailer difficult on slopes | Desire for mover →
• Poles, (awning) mast & tensioning		**17,7%**	Raising mast and tensioning sliding poles perceived heavy | Elements positioned high or out of reach
• Zippers & covers		**16,5%**	Cover zipper too tight | Hard to close (jamming, finger strength, "violence")
• Kitchen handling.		**7,6%**	Lifting/moving kitchen → Physical burden (older models)
• Pack & Go, bed access		**6,3%**	Managing the bed / Pack & Go (down)
• Ground sheet(grondzijl) & pegs		**5,1%**	Zipping in the ground sheet → very difficult
Mentioned satisfaction/Did not answer		**37,7%**	

Appendix D 1: User / Owner research - Thematic analysis

5 C. Zijn er wel eens onderdelen defect geraakt tijdens het gebruik van uw vouwwagen?

Themes	Sentiment	Approx freq. (%)	Insights
• Frame pole mechenical systems		**29,3%**	Broken carbon poles | Click systems failing | Gas springs (Pack & Go)
• Tent fabric canvas		**21,2%**	Pinch holes in fabric → canvas stuck between poles | Tears | Mold
• kitchen & appliences		**17,2%**	Fridge breaking | water and gas lines failing | Gas stove (igniters)
• Zippers & runners		**12,1%**	Main entrance zip | Cover | Pack and go | all breaking due to high tension
• Ground sheets & attachment points		**11,1%**	Loose peg loops (elastics) | Holes/punctures in ground sheet → poles or rocks
• Road safety & Chassis		**9,1%**	Noisy & worn brakes | Lighting and wiring issues | Nose wheel breaks on route
Mentioned satisfaction/Did not answer		**25,8%**	

6 A. Op welke manieren zou u uw vouwwagen willen gebruiken waar u nu in beperkt wordt?

Themes	Sentiment	Approx freq. (%)	Insights
• Weather dependencies & drying		**28,8%**	Fear of wet packing, Short, outside summer trips are avoided. No space to dry.
• Touring & setup speed		**23,8%**	Desire for a basic set up formation for single nighte → normal set up takes to long for touring
• Kitchen accesibility & storage		**16,3%**	Desire for better available kitchen | Better internal storage (drawers & acces)
• Off-grid &utilities		**11,3%**	Desire for offgrid camping | No battery electricals |
• Maneuverability (movers		**8,8%**	Difficult to move over uneven or soft terrain | Desire for mover
• Sleeping & comfort		**6,3%**	Transeverse bed is not ideal | Lack off darkness
• Bicycle & gear transport		**5,0%**	Weight limit creates issues for e bike owners
Mentioned satisfaction/Did not answer		**39,1%**	

6 B. Zijn er functies die u mist aan uw vouwwagen?
6 C. Zou u graag meer personalisatie willen kunnen toepassen aan uw vouwwagen?
6 D. Zouden we technologieën kunnen toevoegen aan onze vouwwagens die uw kampeerervaring zouden kunnen verbeteren?
6 E. Kunt u aspecten bedenken die uw comfort zouden verhogen?
6 F. Wat zou uw ideale vouwwagen kunnen wat uw huidige model nog niet kan?

Themes	Sentiment	Approx freq. (%)	Insights
• Integrated power & lighting		**23,2%**	Strong desire for more power solutions USB-C 230V | Better integrated & dimmable led lighting
• sleeping comfort & darkness		**19,7%**	Lack of blacked out sleeping cabins | Lots of issues are had with the mattrass not being right
• Offgrid & green tech		**13,4%**	Users want to go off-grid camping → including battery & solar options. | Mobile fridge use
• Automatic leveling & movers		**12,7%**	Manual leveling is an issue → desire for autoleveling features. | Integrated movers
• Weather & Drying solutions		**12,0%**	Fear of rain is a major limitation → better/faster drying of the canvas is a huge desire
• Kitchen acces & logic		**11,3%**	Better acces to the kitchen without unfolding the trailer is desires | Top loading is problematic.
• Bicycle & gear transport		**7,7%**	There is a wish to bring e-bikes → often issue due to weight limits
Mentioned satisfaction/Did not answer		**51,4%**	

The "Modern Utility" Package: Most users are currently retrofitting their trailers with IKEA LEDs and cable reels. Integrating a professional electrical plan with fixed points in the sleeping cabin and kitchen is the most requested functional upgrade.
2. Modular Sleeping Experience: While personalization of the exterior is less important to many, the interior sleeping environment is highly personal. Offering "Black-out" vs. "Light" cabins and "Firm" vs. "Soft" mattress modules would address major comfort tensions.
3. Physical Accessibility: As the owner demographic ages, the demand for automation (Windforce, Movers, Auto-leveling) increases. Reducing the physical force required for the "dead point" in folding and the tensioning of the mast is critical for product longevity.
4. Weather Resilience: Developing a "sprint mode" for packing up in the rain or a fabric that allows for temporary wet storage without immediate mold risk would solve the most cited "limitation" of the current product line.

8B

Themes	Sentiment	Approx freq. (%)	Insights
• Overall satisfaction & brand loyalty	Very positive	**34,4 %**	Most customers are happy with their product. "joy to travel with," a "top product," or the "Mercedes of folding trailers".
• Pricepoint & value for money	Highly critical	**23,2%**	A large tension is represented by the price being rediculously high. "trailer for the elite" "prices outpace improvements".
• Service, maintenance & logistics	Frustrated	**13,6%**	Long wait times for service → frustration | Service center → far away | service → bad publicity/arrogant
• Design DNA & model legacy	Nostalgic/critical	**12,0%**	Strong demand to bring back discontinued models → Flyer & Cocoon | new models lack HK. DNA → too much plasic little durability
• Material Durability & canvas	constructive	**9,6%**	Feeling canvas quality has gotten worse (new models) Gets very dirty easily
• Functional Specifics (beds & kitchens)	frustrated	**7,2%**	Mattress quality percieved poor | Desire for compressor fridges | Lack of kitchen acces while traveling.
Mentioned satisfaction/Did not answer		**31,7%**	

The Price Gap: There is a significant segment of loyal owners who feel "priced out" of a new purchase. They value the high resale value but find the €30k+ entry points for some models hard to justify compared to a caravan.
• The "Flyer/Cocoon" Desire: There is a massive "retro" demand. Owners want the simplicity and aesthetics of the older models but likely with modern conveniences (like Windforce or integrated power).
• Utility & Maintenance: As a designer, addressing the "Emmen Gap" through easier self-service designs or modular components that can be shipped (rather than requiring a trip to a service center) would solve a major customer pain point.
• Material Choice: The "White/Light" canvas is a brand signature, but owners are clearly struggling with its maintenance. Exploring dirt-repellent coatings or darker "limited edition" canvas options could meet a high user desire.

Appendix D 1: User / Owner research - Thematic analysis

Praised/Highs USP's **Approx. freq.** 1.1% DNA

- Speed/ease of setup 29.5%
- Kitchen utility/access 19.7%
- Sleeping comfort 17.2%

Desired use (but limited) **Approx. freq.** 39.1% DNA

- Weather/drying 28.8%
- Touring→basic setup 23.8%
- Kitchen storage/acess. 16.3%

Optimization **Approx. freq.** 8.2% DNA

- Kitchen functionality 19.6%
- Canvas/zipper 17.7%
- Electricity/lighting 16.7%
- Sleeping comfort 12.8%

Missed features **Approx. freq.** 51.4% DNA

- Integrated power/light 23.2%
- Sleeping comfort/dark 19.7%
- Off grid amenities/batt 13.4%

Additional: Wet canvas&drying/leveling/kitchen logic/E-bikes

Heavy/ physc.demanding **Approx. freq.** 37.7% DNA 27.8%

- (un)folding/canvas 19.0%
- Manoeuvring/moving

Additional: zippers/poles

Final comment **Approx. freq.** 31.7% DNA

- Satisfaction/loyalty 34.4%
- Pricepoint/value for m 23.3%
- Service/maintennance 13.6%
- DNA & legacy 12.0%

Additional: canvas qual./dirty/matress/fridge

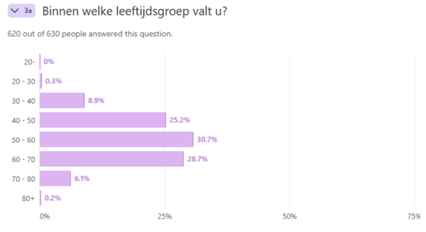
Appendix D-2: U/O Data & analysis.

Results & Initial findings

In the first hours after sending out the survey, the number of submissions came in considerably faster than expected. Ultimately receiving more than **630 submissions**. 94,9% of which (had)owned a Holtkamper tent trailer.

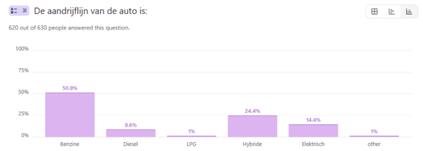
It was surprising to see the largest share of respondents had owned tent trailers for longer than 20 years, with 14,8%. 85,4 of the respondents did have other camping equipment before their latest tent trailer, for the remaining 14,6% this was their entry into camping equipment ownership.

It did not come as a surprise that the most common age group of (HK) tent trailer owners was between 50-60 years old (30,7%), followed by the age group of 60-70 (28,7%). This result is in line with the earlier finding that the campers wanting a more premium camping experience are generally older of age (boomer generation) (McKinsey & Company, 2024)



Similarly the typical use case of tent trailers seen within the responses was in line with the preceeding expectations. Halve of the U/O's travels with just two people, above that the remaining 50% is divided over parties of 3, 4, 5 and ocassianally six people. Throughout the year respondents generally take their tent trailers to go camping for 3 or 4 weeks, staying at a single location, park or camping for a couple nights up to multiple weeks.

Furthermore it was interesting to discover that 80% of trailer is fitted with a kitchen, and 60% is used in combination with a bicycle carrier. The car in front of the trailer was most often a SUV or station wagon, from Volvo or Volkswagen. It was interesting to discover that a larger segment of the vehicles was either electric drive or hybrid rather than diesel powered. Half of the towing vehicles are fully petrol powered.



When asked about the positive aspects of their tent-trailer around a third is related to the ease of set up, absence of complex pole structures and general speed of (un)folding.
The kitchen is praised as a selling point of the product, and its accessibility on the road, mainly the fridge. The bed (slatted base) layout and comfort are mentioned often as a strong aspect of the trailers.
Additionally the storm proof nature and robustness along with the canvas quality come up.

Within responses to questions regarding optimization opportunities, physically demanding actions, inconvenience and encountered defects, clear themes attributed by respondents can be recognized.

The sleeping cabin being too light, and the desire for darker material. The poor or lack of integration of electrical outlets and lighting solutions. The perceived poor quality of the (modern) canvas and discoloration. Additionally, the zippers being too tight, and therefore difficult to operate; Issues with molding canvas, and poor drying are mentioned fairly frequently.

Users often must create their own "MacGyvered" solutions for electricity.
The sentiment is largely constructive. Owners are generally loyal to the brand but feel the premium price point should include modern amenities like black-out sleeping areas, integrated USB/LED systems, and more robust/easier-to-operate zippers.

Setting up and packing the tent trailer is frequently named a two-person task. The overall weight of the trailer and the required physical power make handling difficult, particularly on slopes or uneven terrain, leading to a strong desire for supportive systems such as movers.

Several core setup actions are experienced as physically demanding, including raising the mast, tensioning sliding poles, and folding the canvas neatly. Elements positioned high or out of reach amplify the perception of heaviness and reduce perceived control during setup.
Fabric-related issues come about during both setup and re-packing. Pinch points between poles lead to trapped canvas and therefore tears and accelerated wear.

The second to last segment of the study regards the questions about the user's desires, values, and missed features. When prompted with the question: In what ways would owners like to use their tent trailer in which they are currently restricted. A couple of clear desires are communicated.

U/O's generally would really like to tour with their equipment, making longer trips, visiting more destinations and staying at sites for less long. Additionally it becomes apparent that owners would like to use their tent trailer to go on short, spontaneous weekend trips, also outside of summer. Both these travel desires are being hindered by common problems, like for instance the fear of wet packing and the development of mold in the canvas.

As with these short trips, the option to leave a day earlier or later is usually not applicable. Additionally, the models do not have a basic set up mode allowing user to erect a less elaborate set up for easier arrival and leaving.

Addressing the drying of the canvas and a possible touring set up could play into the desire of owners, effectively opening a whole new use case for the product.

Moreover, many elements communicated during earlier questions reappear in this section. Most users are currently retrofitting their trailers with aftermarket LEDs and cable reels. Integrating a professional electrical plan with fixed points in the sleeping cabin and kitchen is the most requested functional upgrade. The interior sleeping environment is highly personal. Offering "Black-out" vs. "Light" cabins. As the average owner ages rises, the demand for automation (Windforce, Movers, Auto-leveling) increases.

As mentioned, the concluding question provided an opportunity for the respondents to leave a final comment. Where it was expected that general comments would be shared regarding ownership or the survey its self, it was surprising to find a large selection of comments with a critical nature.

While more than a third of the comments represented a positive sentiment, and expressions of satisfaction, almost 25% addressed the price point and value for money of current Holtkamper products. This with a highly critical sentiment. Additionally frustration was communicated regarding long wait times for service appointments, and poor or arrogant service handling.
Lastly the disappearance of the Holtkamper DNA was mentioned strongly, focusing on the reduced durability, material quality and design, of newer models.

Appendix E 1: VIP - Deconstruction steps - Product.

Exterior





Holtkamper Aero 2025



Additional tent

Interior



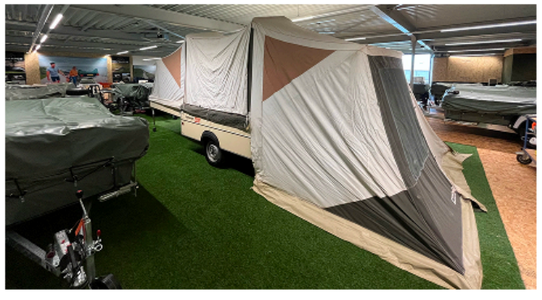




Appendix E 1: VIP - Deconstruction steps - Product.

Exterior









Holtkamper Flyer Expedition 1980

Interior









Appendix E 2: VIP - Deconstruction steps - Interaction.

The product enables discovery and feeling of freedom.

Expression of quality.

Fostering connection to the product and its experience.



Expresses proudness of its stance.

Souple handling of the product.

Expresions of missing the feeling of the product.

High price degrading the experience.

Experiences stress through pressure to handle the product properly.

Appendix E 3: VIP - Deconstruction steps - Interaction.

Feeling of being supported, referencing the time the product has done so.

An emotional connection.

Proud sentiment due to product performance.

Comunity and connection to other owners

Referencing the product as if it was an old dog indicating a strong emotional connection.



Expression of nostalgic feelings to youth upon use.

Providing a sense of comunity.

Whishes the use product for longer than the expected life of the product. similar connection to having a pet.

Warm feeling upon sight.

expressing effortless use/interaction

Appendix E 1: VIP – Deconstruction steps – Context.

Current context: Holtkamper Aero-2013

Coming from optimistic times the 2008 crisis initiated a shift towards financial insecurity.

- This "post-crunch" economy led to a reversal in consumer growth trends, It also fostered a shift toward thrift, frugality, and self-reliant behaviors

- Globalization - Coca-colonation

- Social Multiplier Effects: Behavioral changes, such as quitting smoking, were increasingly seen as socially contagious processes that followed networking paths, particularly among highly educated social circles
- The decade saw the growth of online social media and internet-based communication



Socio-Economic









- Rise of the "Green Consumer": The decade was marked by the emergence and sophistication of green consumption

Behaviour → products

- With the rise of digital technology the concept of ownership would slowly be redefined as physical ownership turned more towards “acces, submissions and services”

Technological Developments

- where previously technological advancements where marked by understandable/reliable engineering, technology becoming (black box) software driven played a big part in the developments that characterize this time.

- **The Wireless Revolution: A defining technological trend was the rapid transition from landline telephones to cellular phones. By late 2007, nearly 15.8% of households were wireless-only.**

Appendix E 1: VIP - Deconstruction steps - Context.

Historic context: Holtkamper Flyer-1981

Socio-Economic

Oil crises 1973 & 1979
- Energy = political
- Scarcity
- Using less fuel.

Growing **financial instability** after the post-war "bloom"
- Inflation
- Unemployment

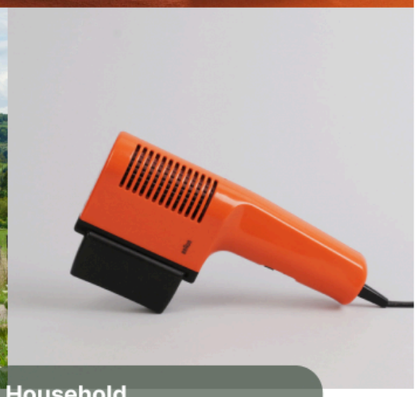
Work ethics & recreation.
- Fixed jobs and work shifts. (9-5)
- Little off-time.
- Vacation is highly regarded.











Household
- Fixed routines
- Clear (M-V) role devision
- comfort is functional

Ownership & Use
- Use products until the end.
- Products have **one** clear functionality

Analog world.
- Mechanical tech
- Understandable & simple
- Reliable and focused on durability
- Evolutionairy innovation

Technological Developments

Trust in "Tech" without dependency.

Self-reliance/problem solving
- Taking on maintainance.
- Problem solving.
- Basic technical skills.

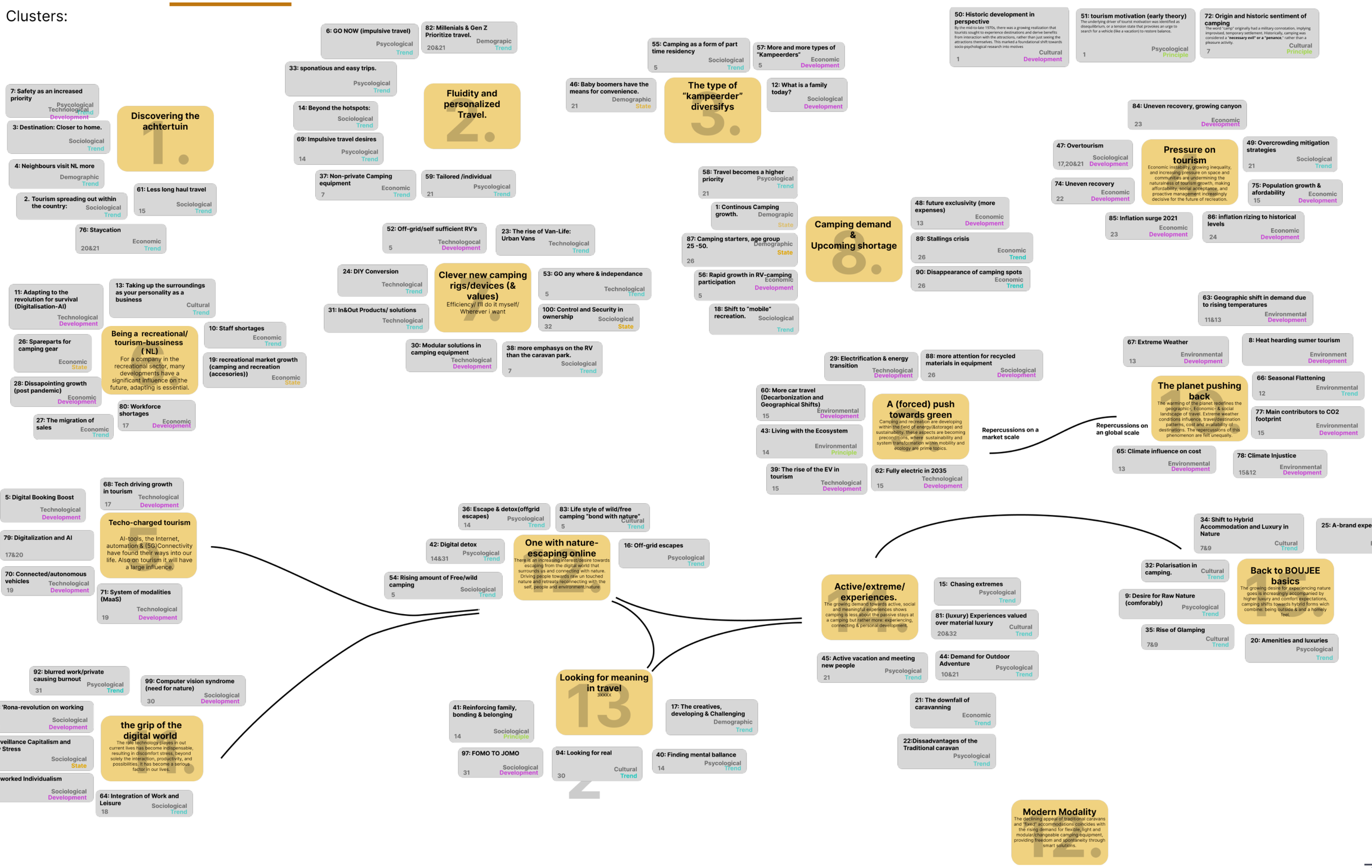
Time & Patience
- Normal for processes to take time
- Waiting (on progress) is accepted
- Little urge for optimalisation.

Behaviour → products

1970-1980

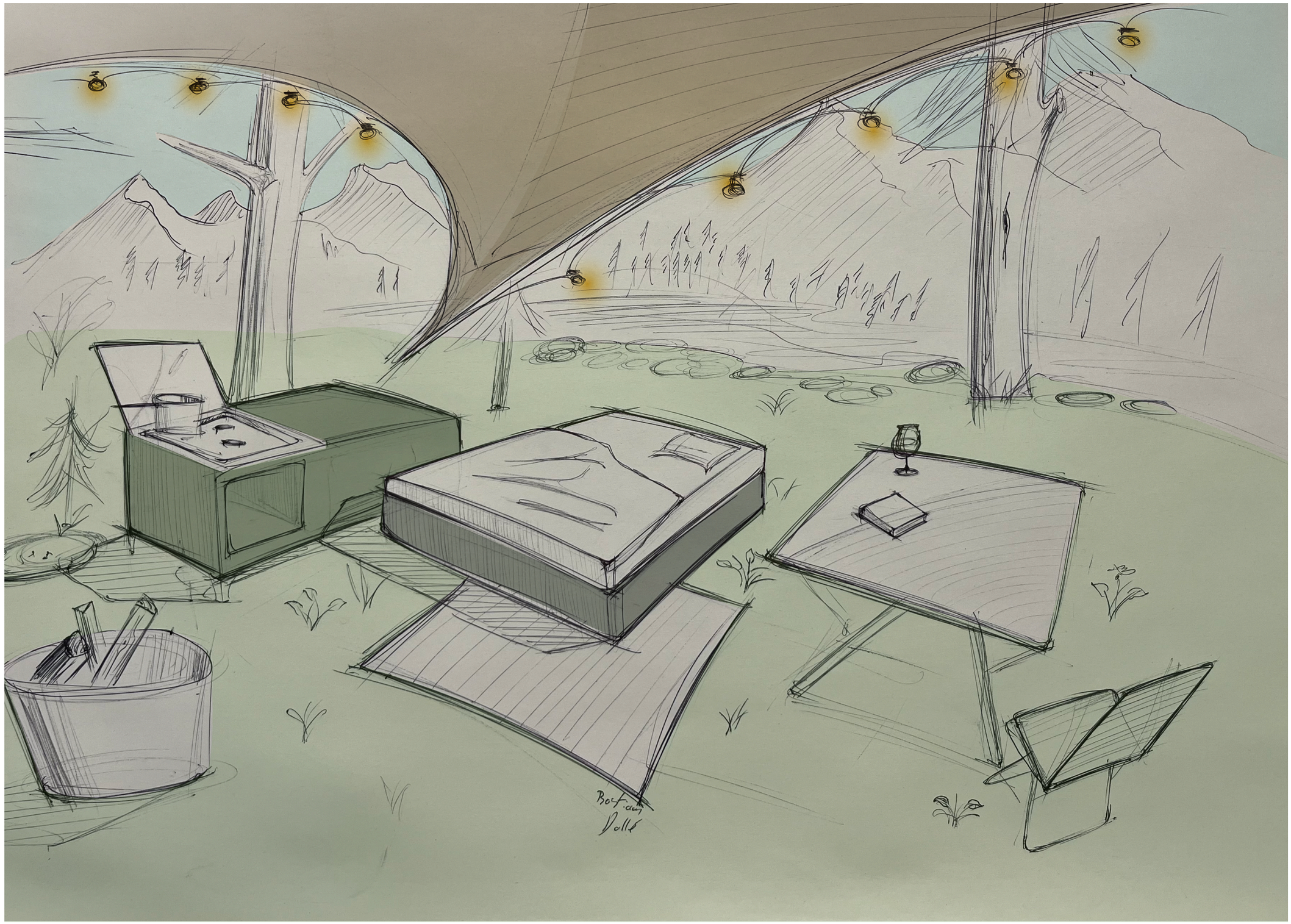
Appendix F: VIP - Future context clustering.

Clusters:



Appendix G: Ultimate desired / Future -experience Visual.

Hand sketch



Appendix G: Ultimate desired / Future -experience Visual.

AI enhanced Visual



Appendix G: Ultimate desired / Future -experience Visual.

AI generation

Google gemini: Nano banana



Appendix G: Ultimate desired / Future -experience Visual.

AI iterations

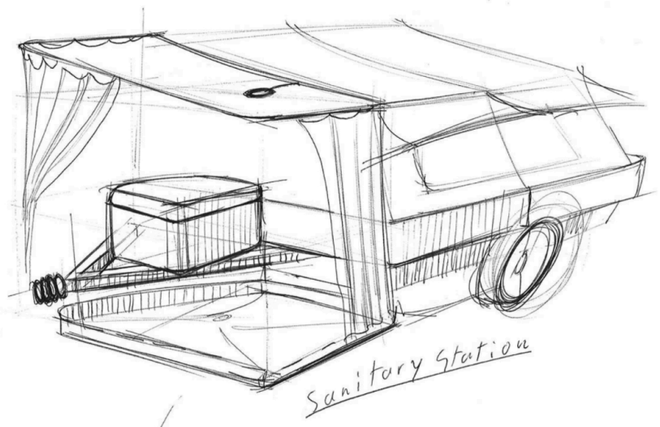
Chat GPT - (GPT-4o)



Vizcom



Appendix H: Ideation & Targeted solution sketches.

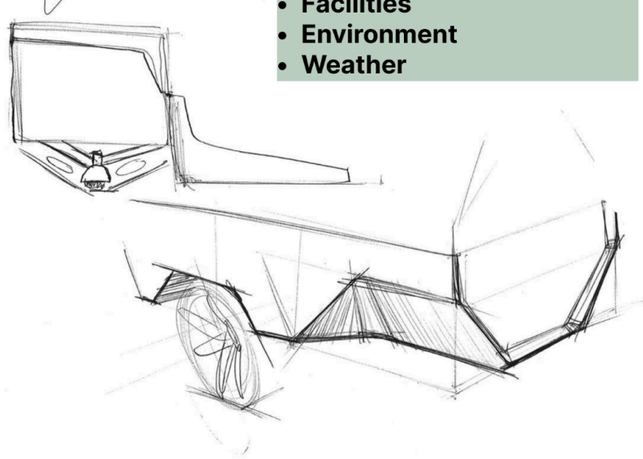


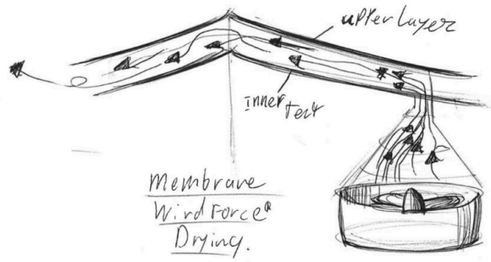


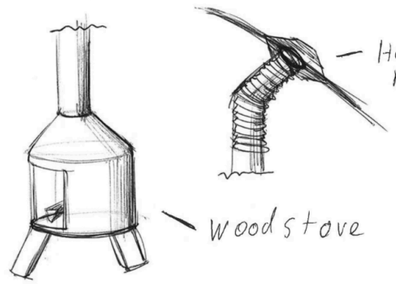


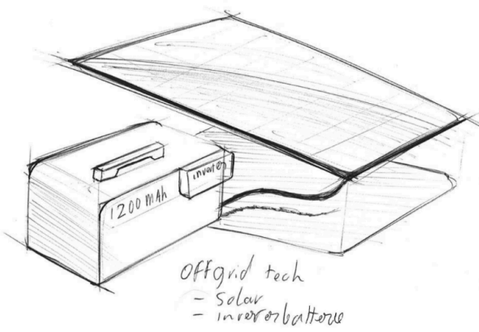
Exploring & connecting with nature.
Shaping your own journey.
Meaning in travel

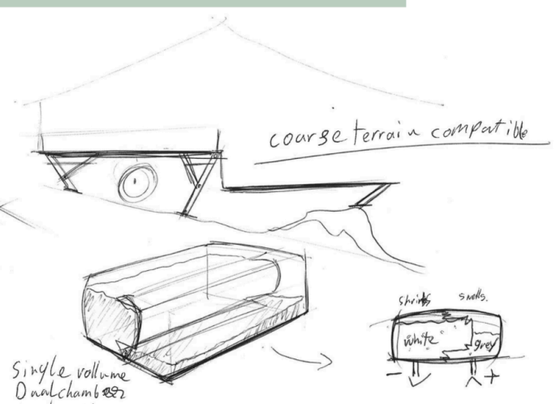
Decreasing dependence on:
- **Facilities**
- **Environment**
- **Weather**

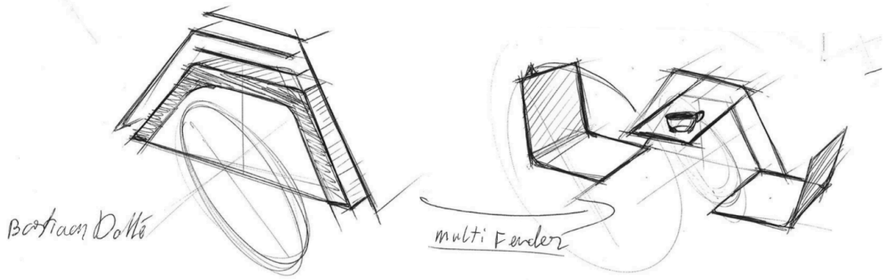


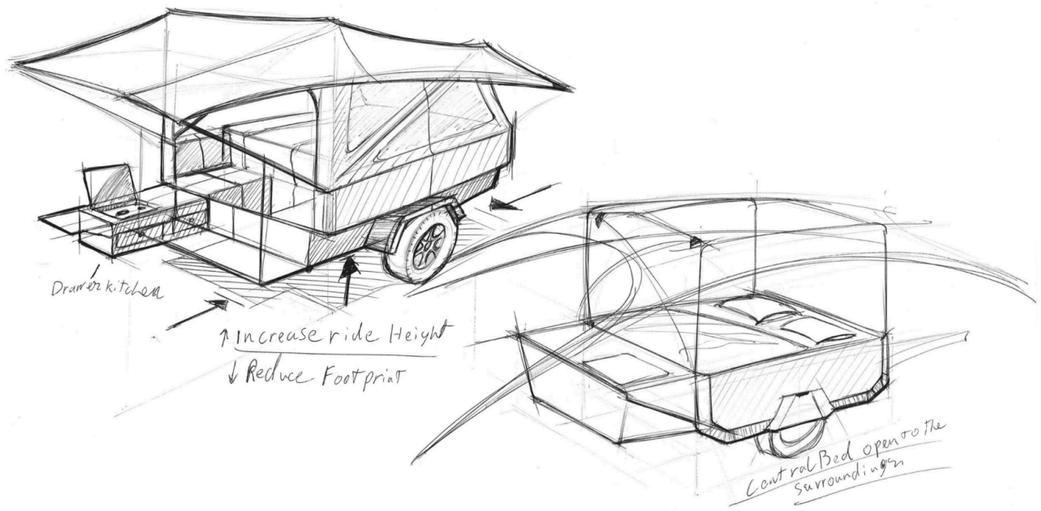






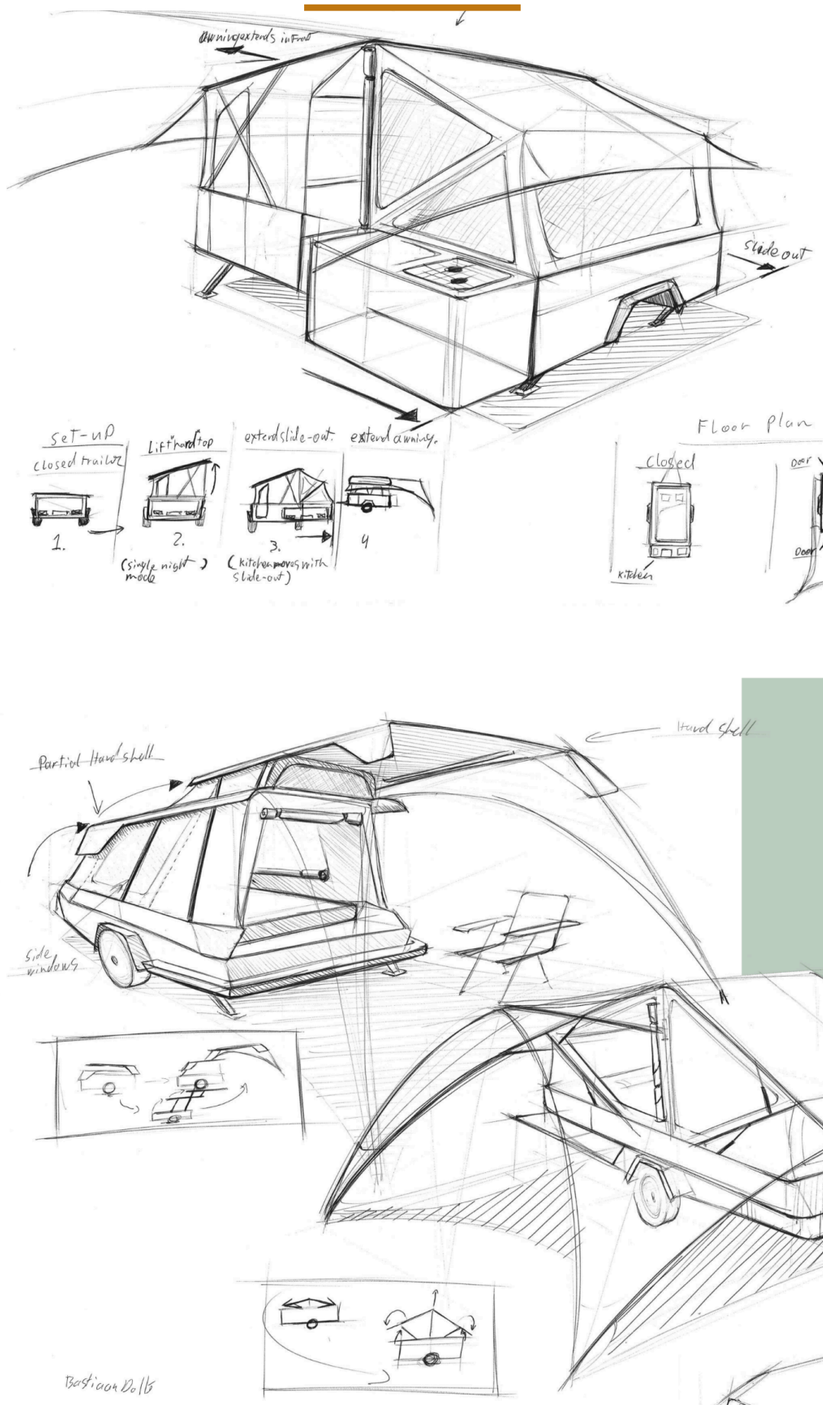


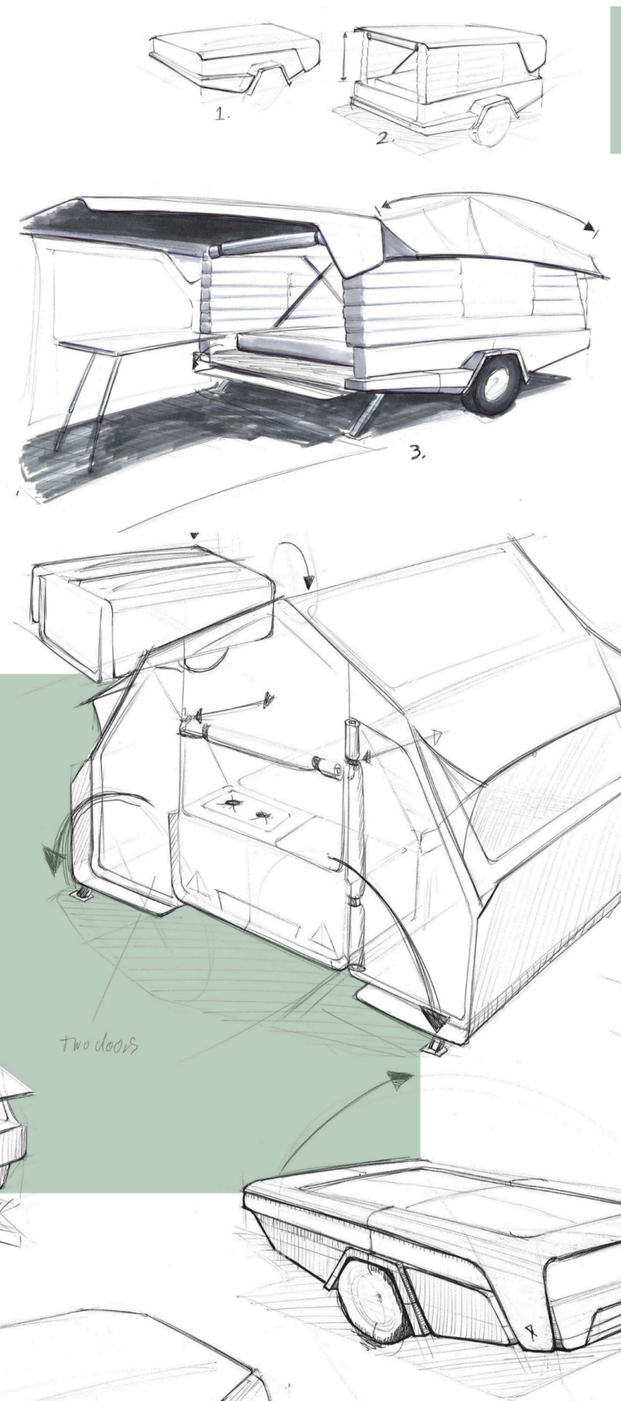


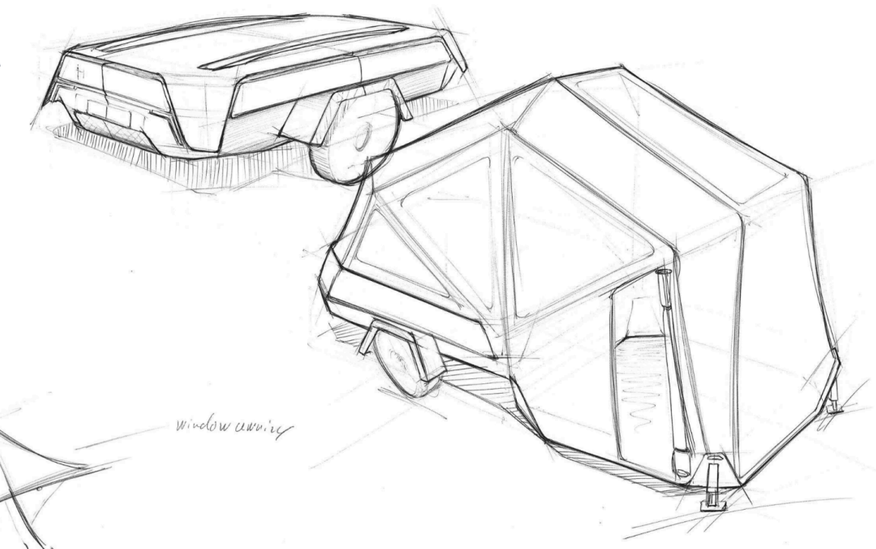


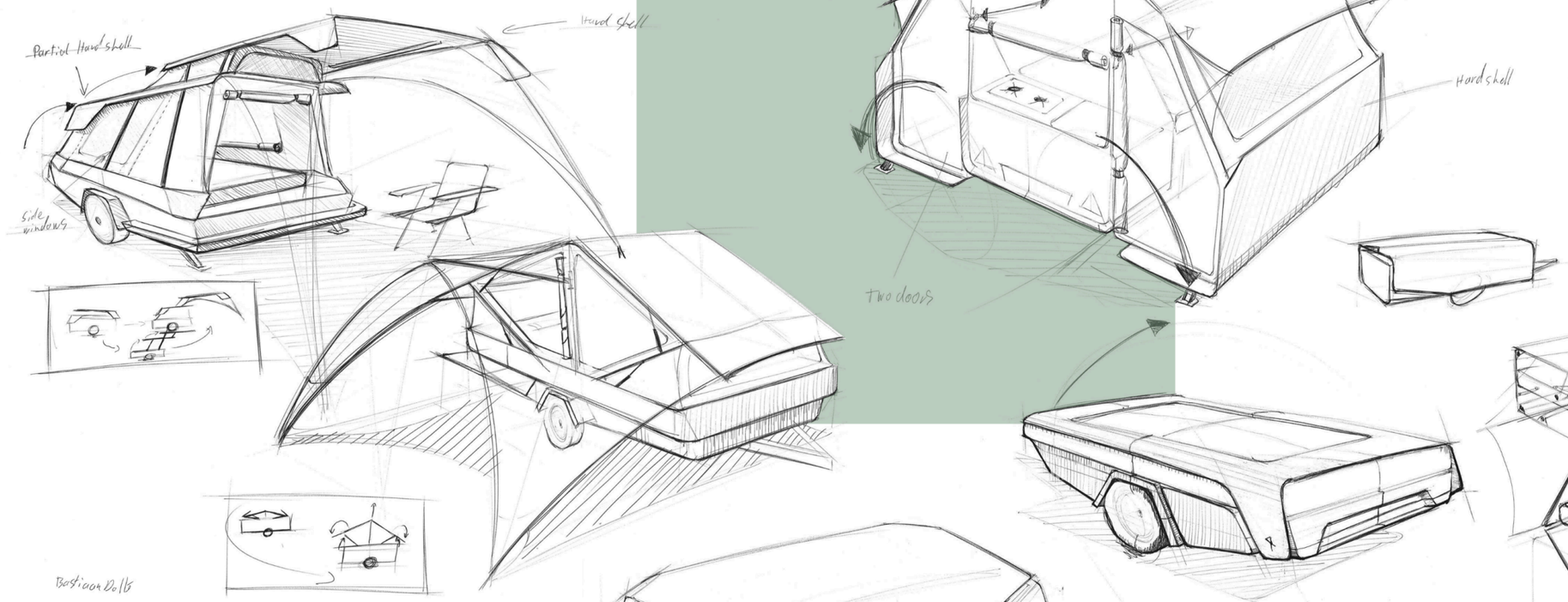
SOLUTION DIRECTIONS

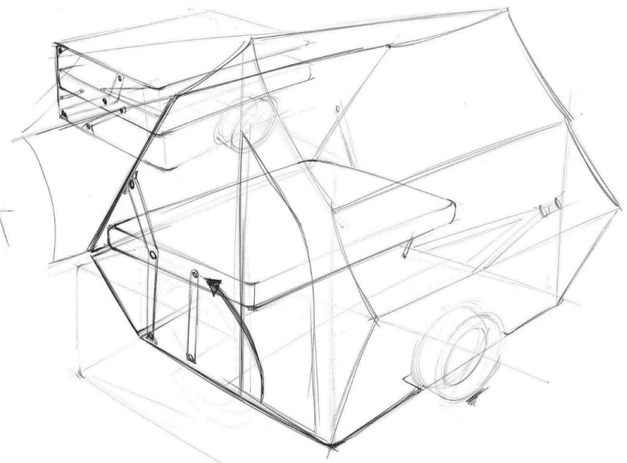
Appendix H: Ideation & Targeted solution sketches.



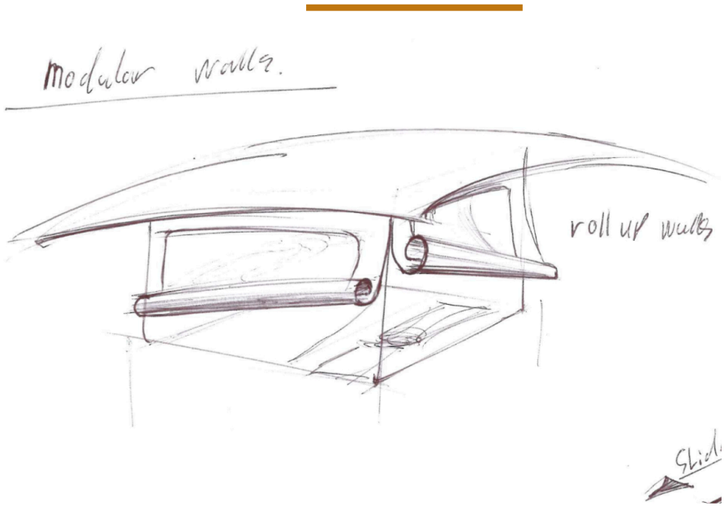


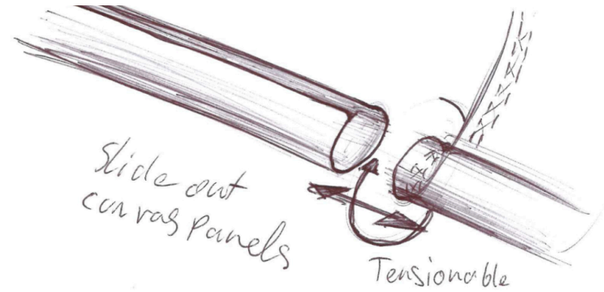


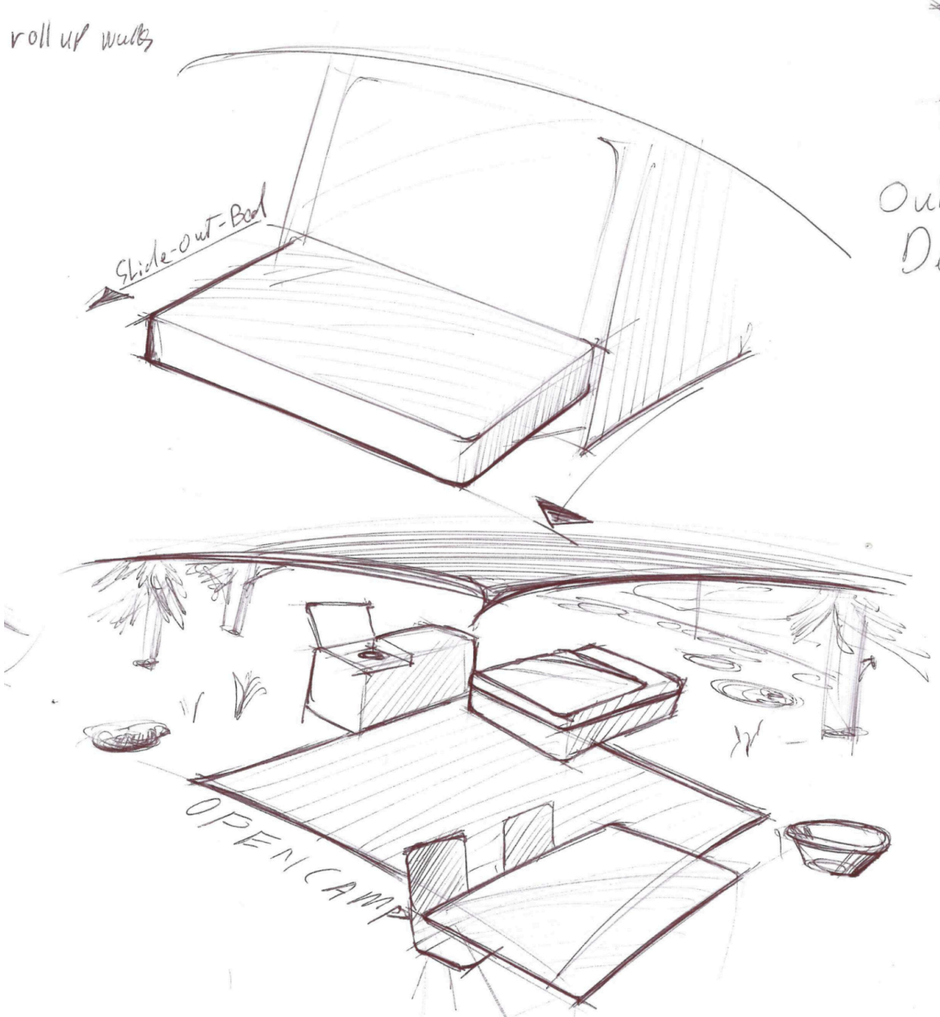


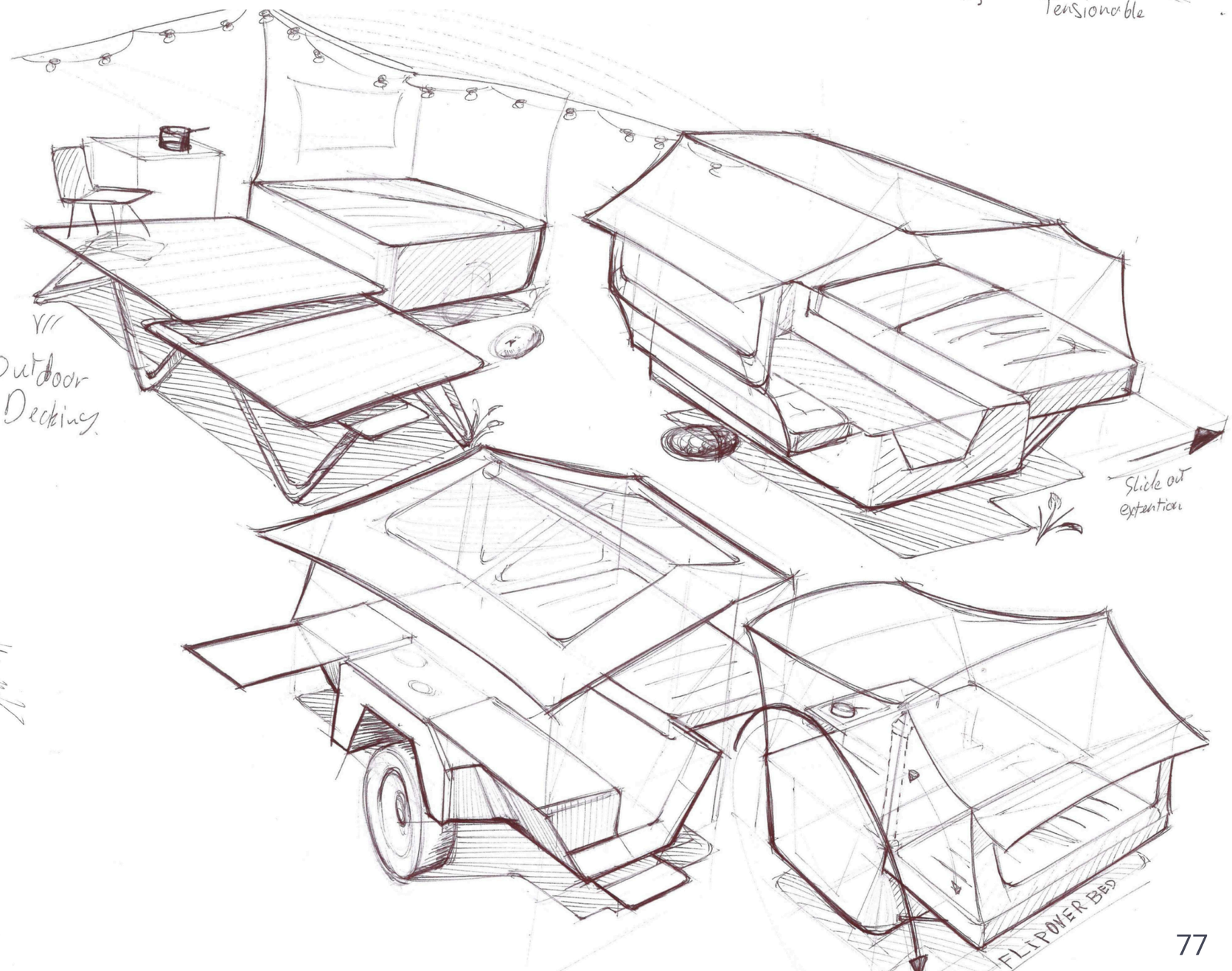


Appendix H: Ideation & Targeted solution sketches.

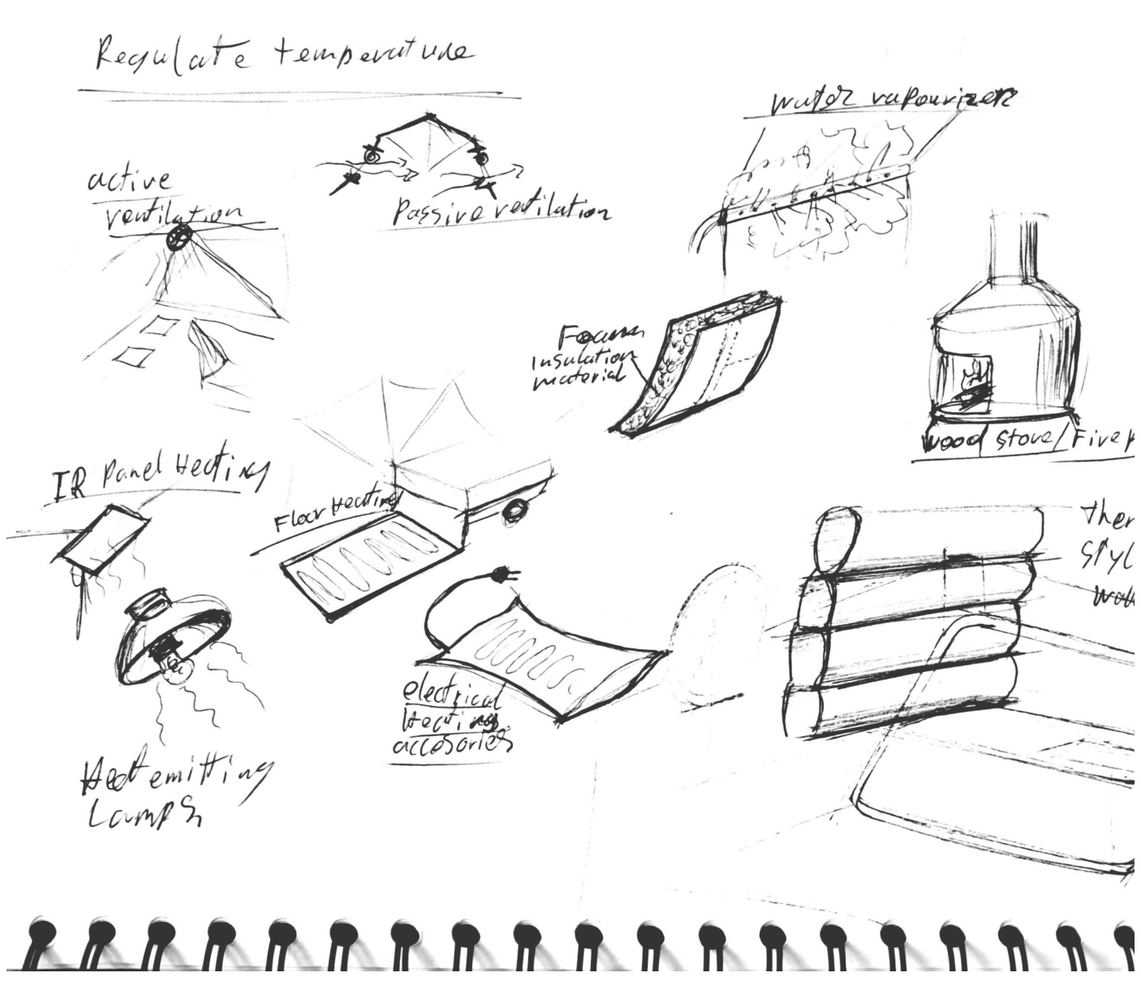


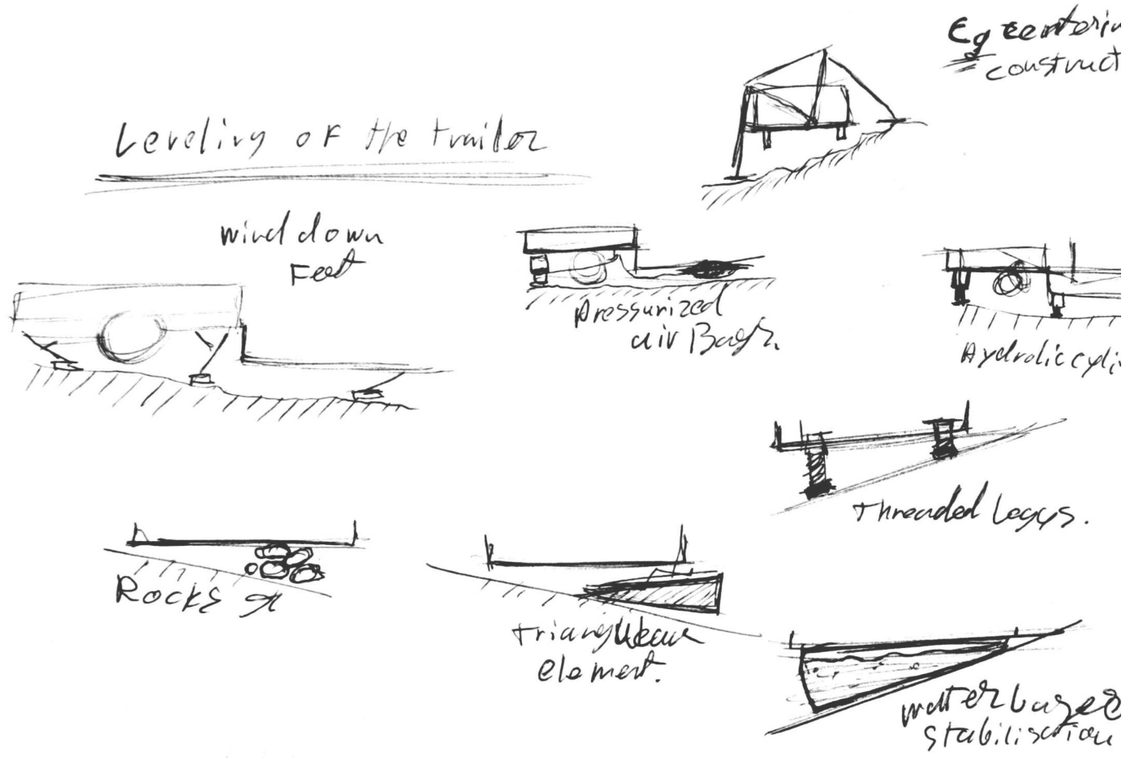






Appendix H: Ideation & Targeted solution sketches.





Appendix I: Concept evaluation - Criteria weights.

EVALUATION CRITERIA

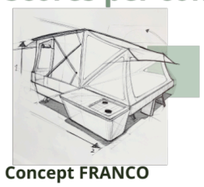
The should incorporate/address/focuss on: _____	Weight attributed by **Client**(50%).		Weight attributed by **Designer**(50%).	**Final criteria Weight**
Decreasing condition dependency.				
1. All terrain compliance/go anywhere capabilities.	• 1	• 1	• 1	• **1**
2. All weather / all season camping (rain/storm and water management).	• 3	• 3	• 2	• **2.5**
3. (active/passive)Temperature regulation. (Heatwave/winter camping)	• 1	• 2	• 2	• **1.75**
4. Off grid facilities/compatibility.	• 1	• 2	• 1	• **1.25**
Accessible set up & handling.				
5. Set up speed & ease (set up complexity).	• 3	• 3	• 3	• **3**
6. Pre/post trip Handling.	• 3	• 3	• 2	• **2.5**
7. Storage space & Accessibility.	• 3	• 3	• 1	• **2**
Enabling nature connection.				
8. Bringing nature in/the surroundings as a feature.	• 2	• 2	• 2	• **2**
9. Camping IN nature (camping on uneven terrain/footprint in nature)	• 1	• 2	• 3	• **2.25**
Adaptable layout & enabling extensions.				
10. Extendable layout. (facilitating add-ons Modular base).	• 2	• 3	• 2	• **2.25**
11. Adaptable to different Travel styles & use cases.	• 2	• 2	• 3	• **2.5**
Tent trailer requirements.				
12. Bed access & Sleeping comfort.	• 3	• 3	• 1	• **2**
13. Kitchen access & functionality.	• 3	• 3	• 2	• **2.5**
14. “Indoor” standing area.	• 2	• 2	• 1	• **1.5**
15. Holtkamper-ness	• 3	• 3	• 1	• **2**
16. Product novelty within the segment.	• 2	• 3	• 2	• **2.25**
17. Mechanical/production complexity	• 2	• 3	• 1	• **1.75**

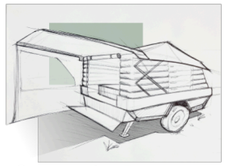
Weighted between 1-3

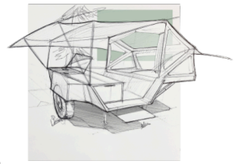
Appendix J: Concept evaluation - Valuation of concepts.

Criteria

Scores per concept









The should incorporate/address/focuss on: _____		Concept FRANCO		Concept Pre-Force		Concept FLOR		Concept WING-01	
Decreasing condition dependency.	**Weight**	**Score**	**Final Valuation**	**Score**	**Final Valuation**	**Score**	**Final Valuation**	**Score**	**Final Valuation**
1. All terrain compliance/go anywhere capabilities.	• 1	• 2	• 2	• 3	• 3	• 4	• 4	• 3	• 3
2. All weather / all season camping (rain/storm and water management).	• 2.5	• 4	• 10	• 5	• 12.5	• 1	• 2.5	• 3	• 7.5
3. (active/passive)Temperature regulation. (Heatwave/winter camping)	• 1.75	• 2	• 3.5	• 4	• 7	• 2	• 3.5	• 3	• 5.25
4. Off grid facilities/compatibility.	• 1.25	• 3	• 3.75	• 2	• 2.5	• 2	• 2.5	• 3	• 3.75
Accessible set up & handling.									
5. Set up speed & ease (set up complexity).	• 3	• 3	• 9	• 3	• 9	• 1	• 3	• 5	• 15
6. Pre/post trip Handling.	• 2.5	• 2	• 5	• 3	• 7.5	• 1	• 2.5	• 5	• 12.5
7. Storage space & Accessibility.	• 2	• 2	• 4	• 2	• 4	• 3	• 6	• 4	• 8
Enabling nature connection.									
8. Bringing nature in/the surroundings as a feature.	• 2	• 3	• 6	• 2	• 4	• 5	• 10	• 4	• 8
9. Camping IN nature (camping on uneven terrain/footprint in nature)	• 2.25	• 2	• 4.5	• 3	• 6.75	• 4	• 9	• 4	• 9
Adaptable layout & enabling extensions.									
10. Extendable layout. (facilitating add-ons Modular base).	• 2.25	• 3	• 6.75	• 3	• 6.75	• 4	• 9	• 3	• 6.75
11. Adaptable to different Travel styles & use cases.	• 2.5	• 3	• 7.5	• 3	• 7.5	• 2	• 5	• 4	• 10
Tent trailer requirements.									
12. Bed access & Sleeping comfort.	• 2	• 2	• 4	• 4	• 8	• 2	• 4	• 3	• 6
13. Kitchen access & functionality.	• 2.5	• 5	• 12.5	• 2	• 5	• 4	• 10	• 3	• 7.5
14. “Indoor” standing area.	• 1.5	• 4	• 6	• 1	• 1.5	• 3	• 4.5	• 1	• 1.5
15. Holtkamper-ness	• 2	• 3	• 6	• 1	• 2	• 3	• 6	• 2	• 4
16. Product novelty within the segment.	• 2.25	• 2	• 4.5	• 4	• 9	• 4	• 9	• 3	• 6.75
17. Mechanical/production complexity	• 1.75	• 1	• 1.75	• 1	• 1.75	• 2	• 3.5	• 4	• 7
		TOTAL		**TOTAL**		**TOTAL**		**TOTAL**	
		96.75		**97.75**		**94**		**121.5**	

Appendix K: Concept development - Kinematics diagram.

LAYOUT & STRUCTURE/CONSTRUCTION DESIGN

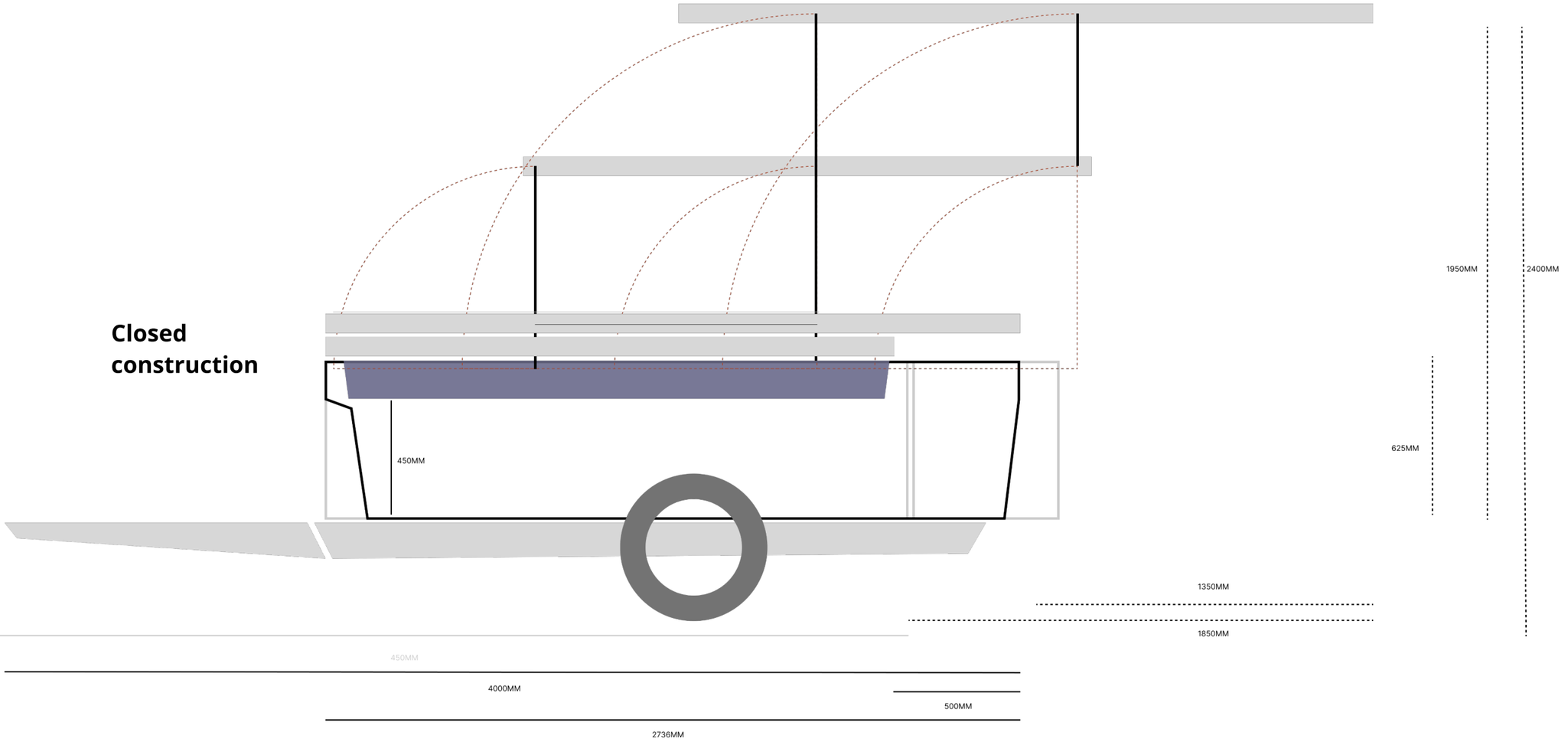
KINEMATICS

V1.3

SIDE VIEW OPEN

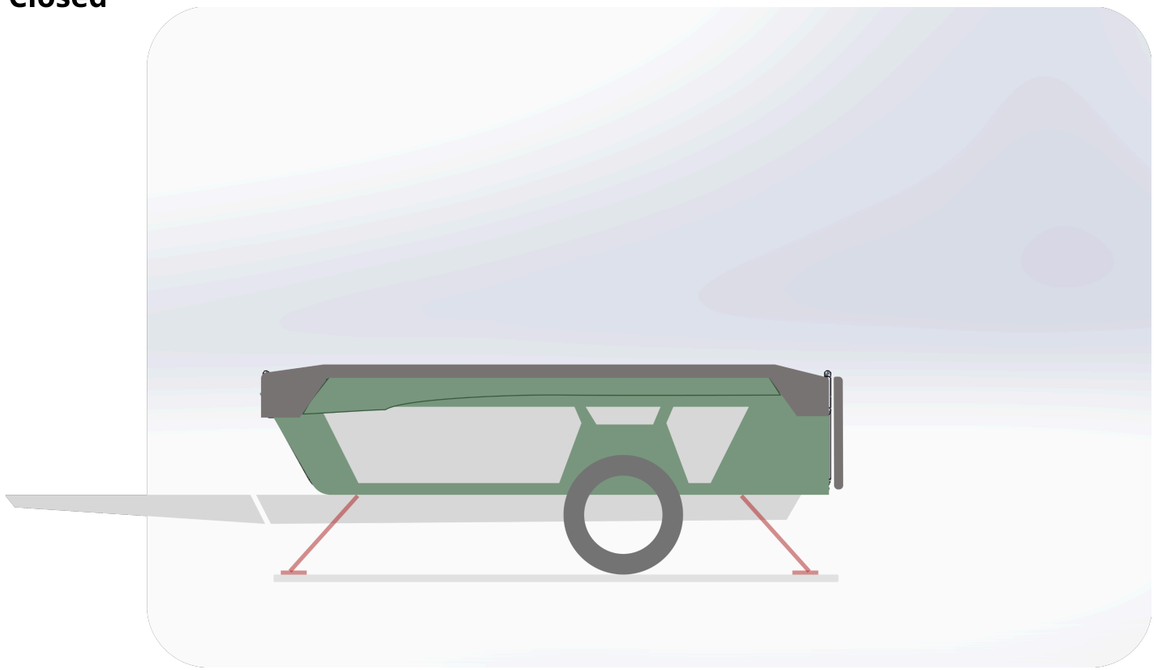
Opened construction

Closed construction

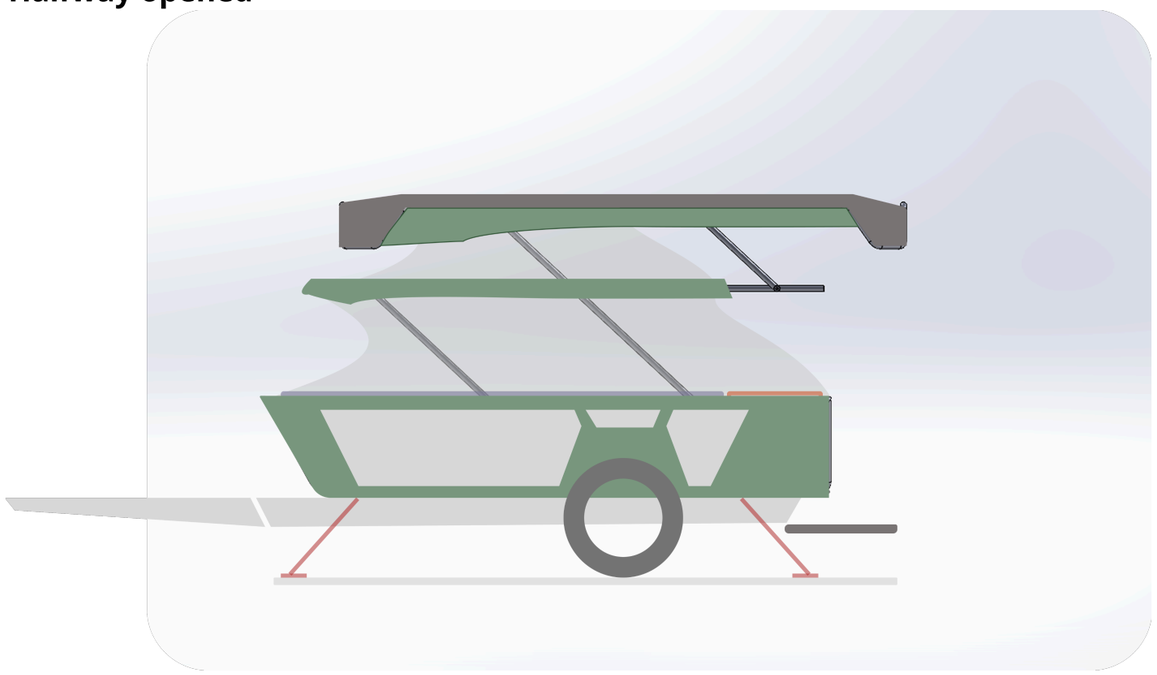


Appendix K: Concept development - Kinematics diagramme.

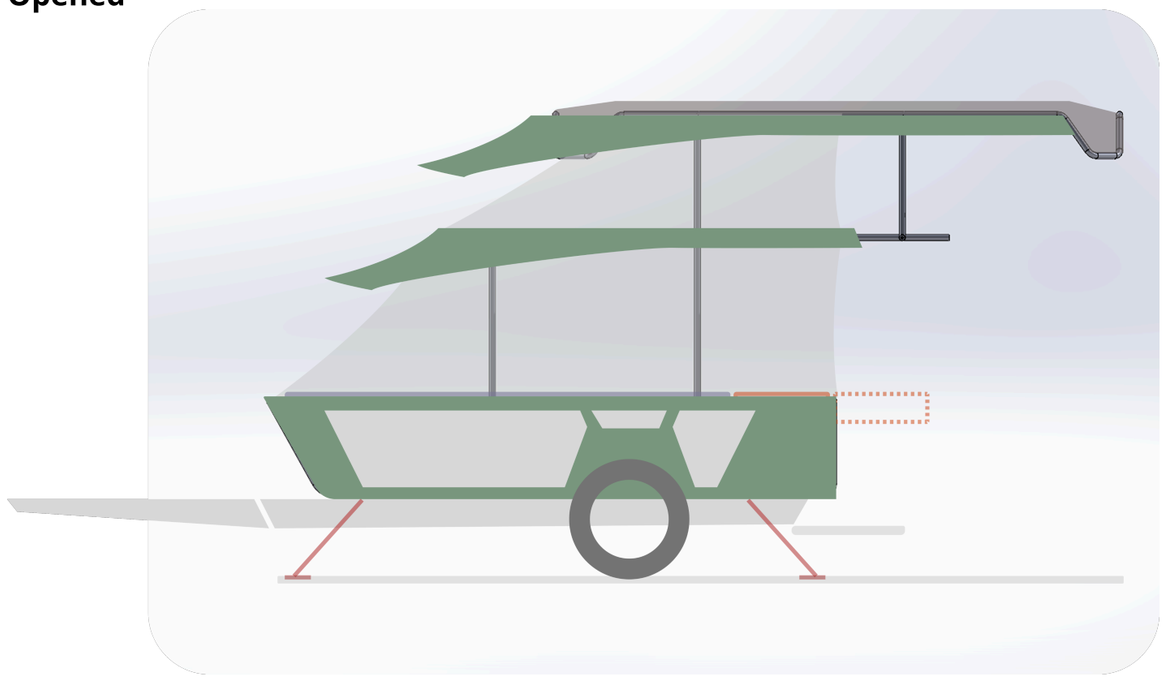
Closed



Halfway opened



Opened



Appendix K: Concept development - Kinematics diagramme.

