

## Public Summery - Bachelor Assignment IDE

# Designing a Personal Human-Powered Road Vehicle for Every-day-use

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**Subject:** Developing a basic concept for a human powered road vehicle that is suitable for daily use by evaluating the design of existing vehicles.

**Background Information:** This assignment was conducted for the company Flevobike Technology who produce special cycles including recumbent bikes and trikes.<sup>1</sup> They also help develop vehicle concepts for other companies, while their main objective is to develop human powered vehicles to provide sustainable vehicle alternatives for commuting and other trips.<sup>2</sup>

Flevobike gave this assignment as an early stage of the development of a possible future in-house vehicle concept with this main objective in mind.

**Assignment Objective:** The objective of the assignment was to explore and evaluate the design possibilities that would best satisfy the given requirements and get a better picture of how the vehicle could look like.

The main research question was: “How can a human powered road vehicle be designed so that it is suitable for every-day-use?”

**Approach:** Through design-oriented research, first the use-case scenarios and requirements were further defined. Then, an analysis of existing vehicle

concepts was conducted with the aim to explore all the design possibilities to find out the advantages and disadvantages of different design solutions. Also, the more technical vehicle components and functions were evaluated to find the most suitable solutions. Based on all the findings from the analysis phase, vehicle packaging (component set-up) concepts were created and further developed to one final vehicle packaging concept. This was then finalized in more detail and based on the final shape of the component set-up an overall outer design was created. The overall set-up of the assignment was based on Applied Research.

**Results & limitations:** The main result was the final vehicle packaging sketches showing the component set-up for different use-options that were developed for the concept together with the extensive overall evaluation of all the design possibilities and explanations on why certain ones were chosen over others. In addition to the more technical packaging sketches, also a first impression of the possible outer design of the body was developed. Both the concept packaging and the outer design sketches give a good idea on how the vehicle could be set-up and look like. However, the results do not go into exact details and only include volumes of the main components and rough measurements. This means that the concept was not yet in the final phase and should only be seen as a concept suggestion. But it does provide a good basis for further development.

**Conclusions & Recommendations:** Coming back to the assignment's objective and more specifically the research question, one can say that it was definitely full-filled and answered through the extensive evaluating of the design options and the resulting concept design that managed to satisfy the requirements for every-day-use. To further complete the assignment's objective and in a broader scope, to bring the vehicle concept closer to commercialization, there would still be quite a few steps to go. The first of which would be a more accurate, in-depth packaging design and research into the aesthetics and visual perception.

**References:**

1. *Flevobike Technology*. [www.flevobike.nl/](http://www.flevobike.nl/). Accessed December 9, 2019.
2. A. Vrieling, *Flevobike, oral communication*,. 2019.

### Sketches Representing the Final Result:

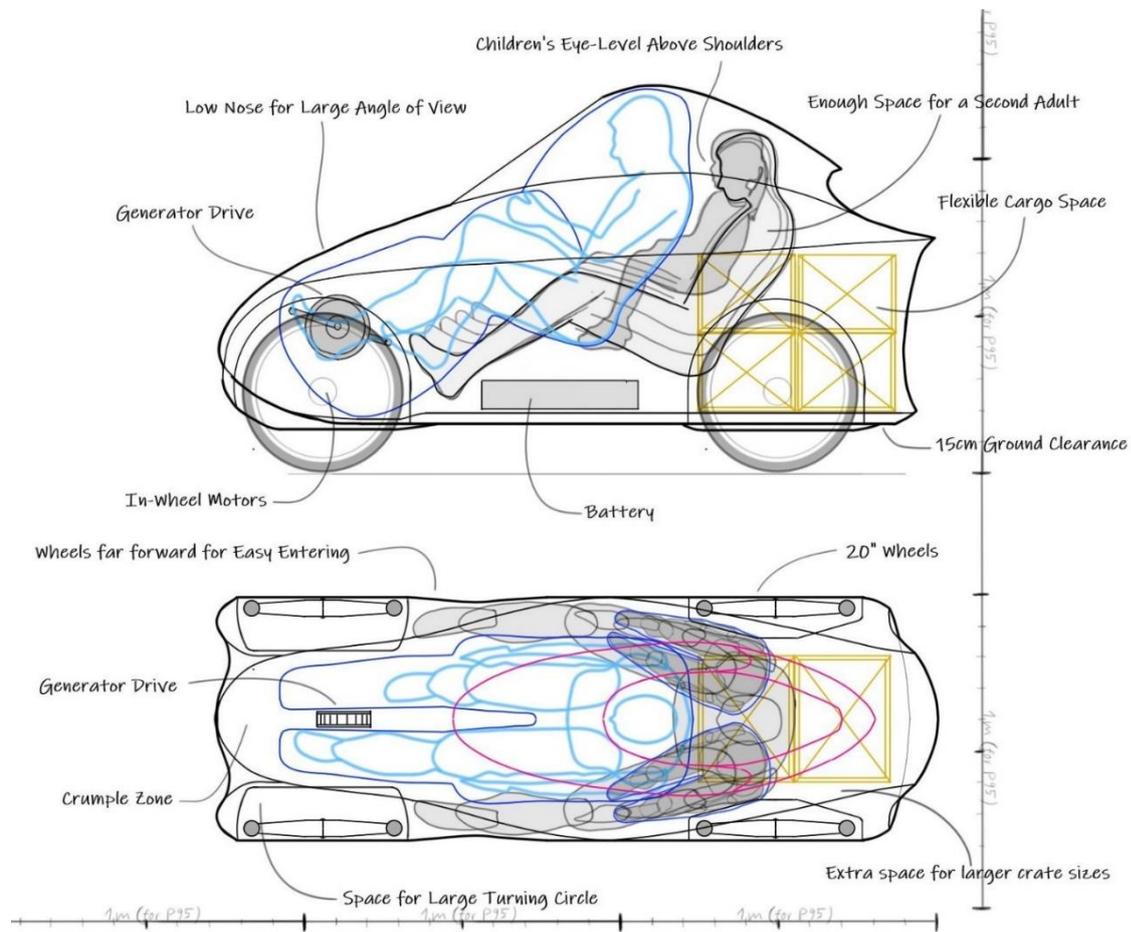


Figure 1: Final Packaging Design Sketch including all possible packing options and information.

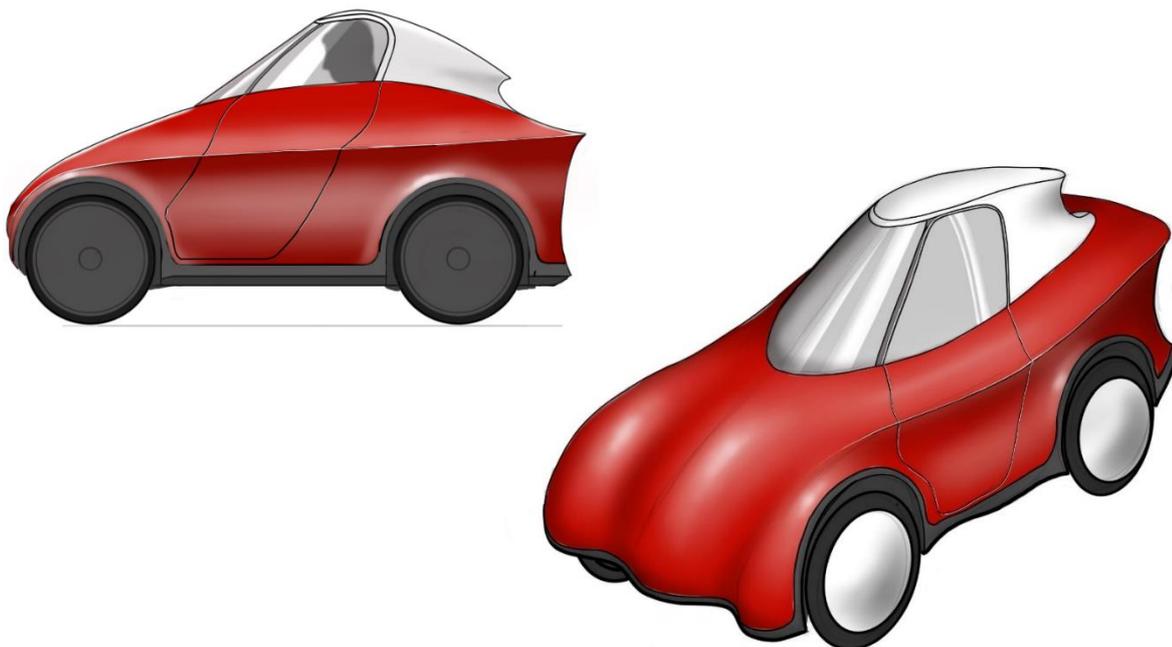


Figure 2: Sketch of first impression of the possible outer design of the vehicle.