

HUG BIKE

COMPACT | SAFE | FUN – FAMILY MOBILITY

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to hug [engl.]

Etymology: Appears late in 16th century: origin unknown

- to clasp or hold closely, especially in the arms, as in affection
- to embrace or cling together closely

ABSTRACT

The HUG-Bike is a cargo-tricycle suited for the needs of families in the urban environment. Through efficient design of frame and box, plenty transport capacity is created by maintaining compact outer dimensions. Thereby the bike is finally closing the gap between heavy, bulky cargo bikes and fast e-bikes. Thanks to innovative carving steering, big wheels and suspension, children and babies can be transported safely and comfortable. In addition the HUG-Bike is an essential companion for your shopping trips or leisure activities. Ultimately the bike underlines your activities with pleasure and style!

SIGNIFICANCE

Although the trend of digitalisation, and the beginning of the digital age in 2002, physical real mobility stays to be an important need for human mankind, and an important part of our daily life. Without the possibility for fast, reliable and sustainable mobility modern cities fail to work.

But exactly those cities are becoming more and more populated. The urbanisation means that more and more people are moving into the cities. It is estimated that since 2008, more people are living in urban areas than in rural ones. This trend combined with the overall strong increase in population means that new big cities will grow to so called megacities – inhabitants counting 20 millions and beyond. The automobile alone will not be enough to cope with this big demand for mobility.

A good modal split between different kinds of transportation to combine and an increase for cycling and other active mobility types are necessary. The EU and other government organizations already realized this and started campaigns to encourage more people to use the bicycle instead of the car. Besides the economical and Ecological need for an increase in bicycle mobility, there is also a social and health related movement behind that is pushing the bicycle forward. People have the wish of being more and better connected with their city and their environment. And the health boom is showing that people are becoming more aware of their body and seeking possibilities to stay in shape. The bicycle can be the perfect tool to bring all these needs together, and at the same time reward their user with fun and relaxation during the ride!



<http://en.wikipedia.org/wiki/Urbanization>
<http://en.wikipedia.org/wiki/Megacity>

MOTIVATION

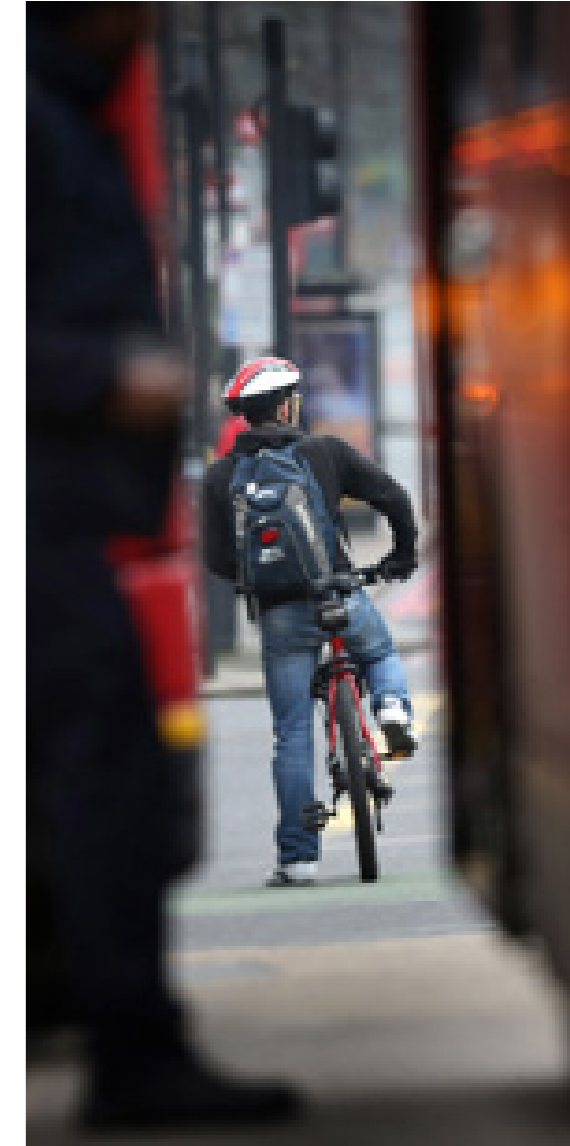
I have a big personal relationship to the cycling culture. Like most people I started cycling at a young age. I still can remember the moment when I first lifted my feet from the ground to balance and pedal my first meters on a bicycle. This very first moment was when my passion for cycling and bicycles began to grow. I was caught and not set free from this excitement since today. Soon I realised what the bicycle was capable of doing and that I was able to travel long distances in short time with a minimum amount of muscle power. In other words cycling enabled me a crucial thing: freedom!

From this point on I was cycling whenever I had a chance to do so. And until today riding a bicycle always brings a big smile in my face. No matter which bicycle and no matter which circumstances and weather, it is always fun, it is simple and the moment I place my feet on the pedals and start to cycle, I can switch off my mind and focus on the ride.

But the bicycle is a versatile piece of art and although I enjoy riding my mountainbike, it is the urban utility bicycle that I use regularly in the city to drive to my university, to make my shopping or to any other occasion when a simple and convenient transportation is needed.

Therefore I decided to dedicate my final master thesis project to improve the way cycling in the city can help people in their urban environment and give a little bit back to the object that means so much to me: the bicycle.

MOODBOARDURBAN INFRASTRUCTURE



CARGO BIKES FOR FAMILIES

Since cargo bikes are an easy way to transport goods fast and convenient in the city, it soon got adopted by families who are using the bike to transport their groceries or other shopping goods home, or to carry their kids and toddlers along.

Even though the cargo bike was used commercial wise, it was soon adapted for private use too. Especially families used it to transport their kids. It is estimated that in Amsterdam 90% of the freight cycles sold are primarily used to carry children!

„In the U.S., „Cargo Bikes“ are becoming quite popular with families, especially in pedal-friendly communities. Families are using the bikes to do everything they do with cars, taking the kids to school, hauling groceries or running errands, without the hassle of finding parking spaces. Some do it to help the environment or to exercise, while others say it is an easier, more fun way to get around!“
[excerpt of the wikipedia article]

Countries like Denmark or the Netherlands seem to be the countries where cargo bikes are used private more than in other countries, I had a closer look at those. A plane ticket was too expensive so I decided to buy the book „Cargo Bike Nation“ by Mikael Colville-Andersen via Copenhageneze instead. The book gives good insight into the daily street life in Copenhagen, and was a big help to observe the vary applications of cargo bikes .



<http://www.blurb.com/b/4227651-cargo-bike-nation>

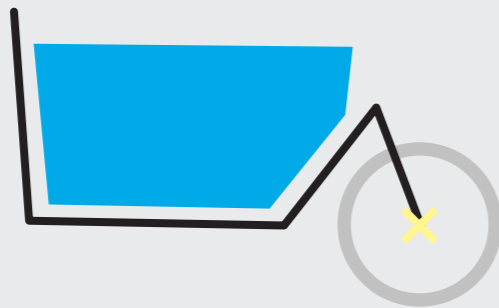
PROBLEMS WITH TILTING CARGO BIKES

All current tilting cargo bikes are using the same tilting ackermann-steering mechanism. This connects the both front wheels directly, **resulting in limitation of the cargo capacity.**

Therefore the cargo box is either way placed:

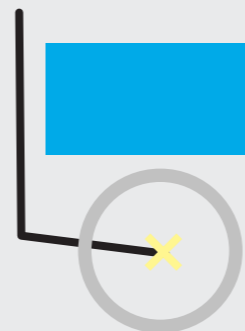
- in between
- on top or
- top and front

Cargo box placed in between wheelbase



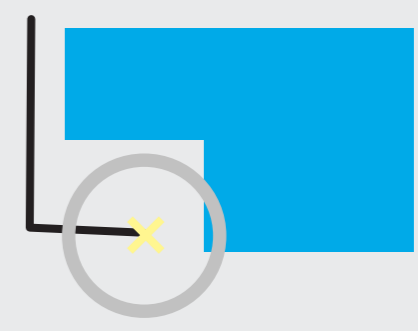
- + cargo placed secure in wheelbase
- the whole bicycle is very long

Cargo box placed on top



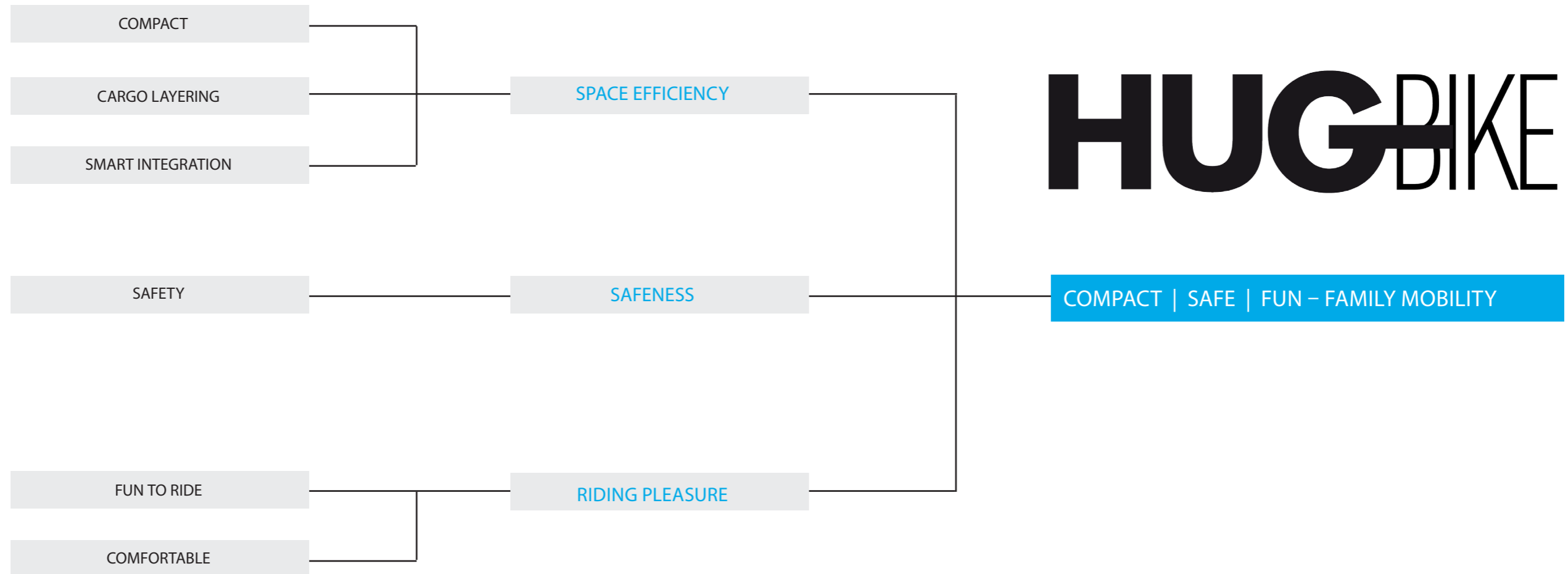
- + short and slim bicycle
- very limited cargo capacity

cargo box placed on top and front



- + more capacity as placement only on top
- balance point is very far up front
- needs additional kickstand to not tilt over

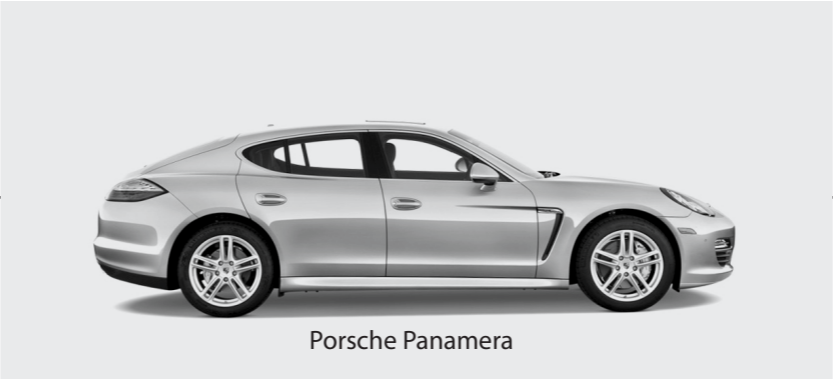
SOLVING THE PUZZLE



ANALOGY PREMIUM CARS



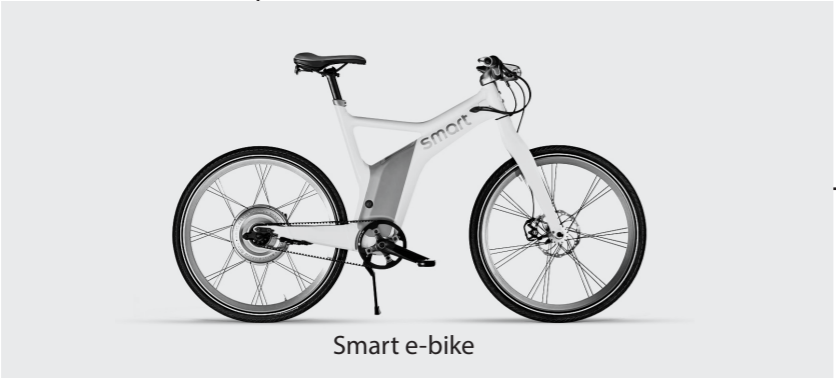
Porsche 911



Porsche Panamera



Porsche Cayenne



Smart e-bike



Urban Arrow Family

Fast e-bike commuter

PRO: + fast
+ agile
+ compact

CON: - no cargo capacity
- not versatile

compact hybrid

PRO: + fast
+ agile
+ compact
+ medium cargo capacity
+ versatile

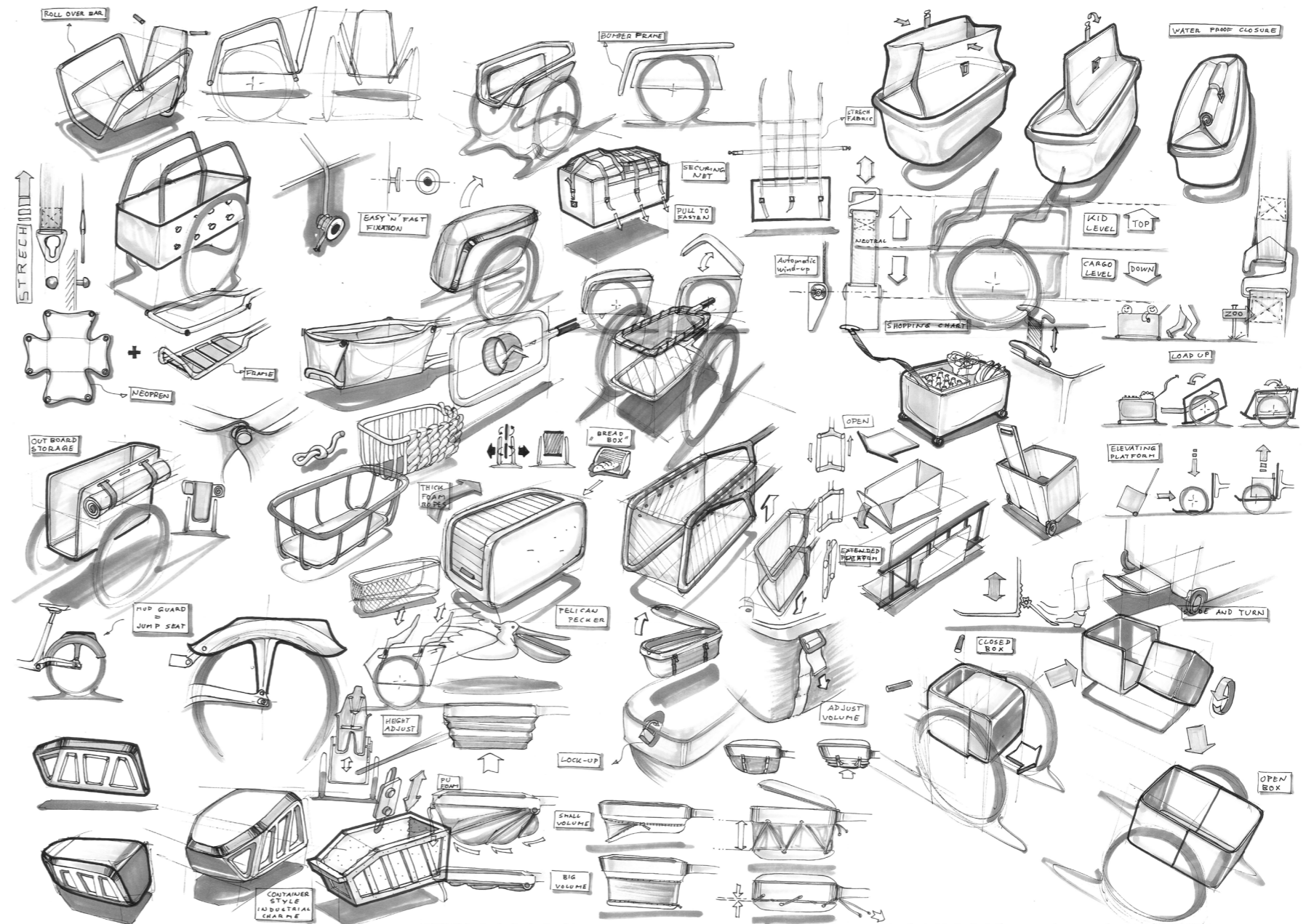
Big/long cargo bicycle

PRO: + strong
+ big cargo capacity

CON: - not agile
- not compact
- heavy



FUNCTIONAL IDEATION



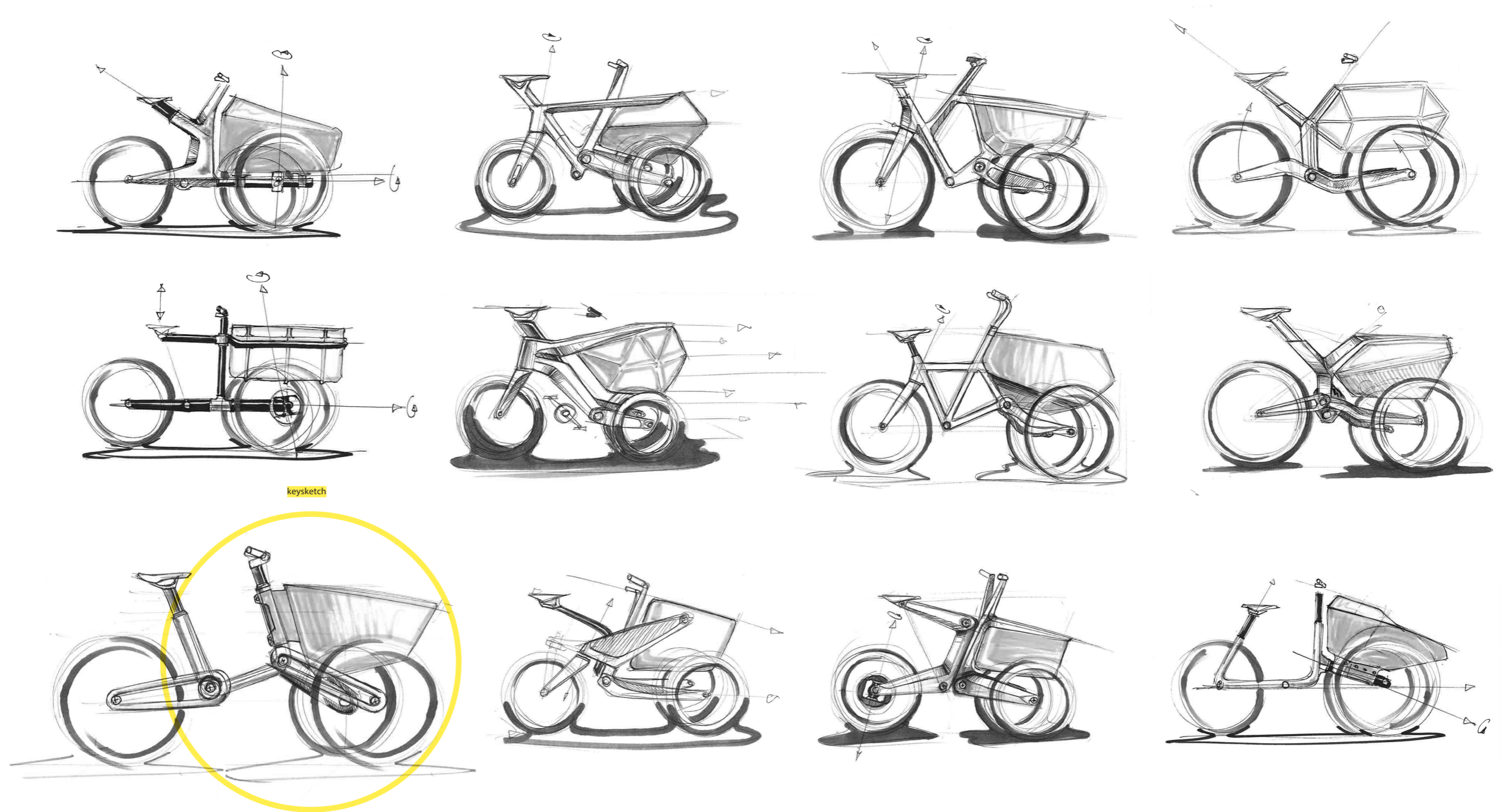
IDEATION STEERING



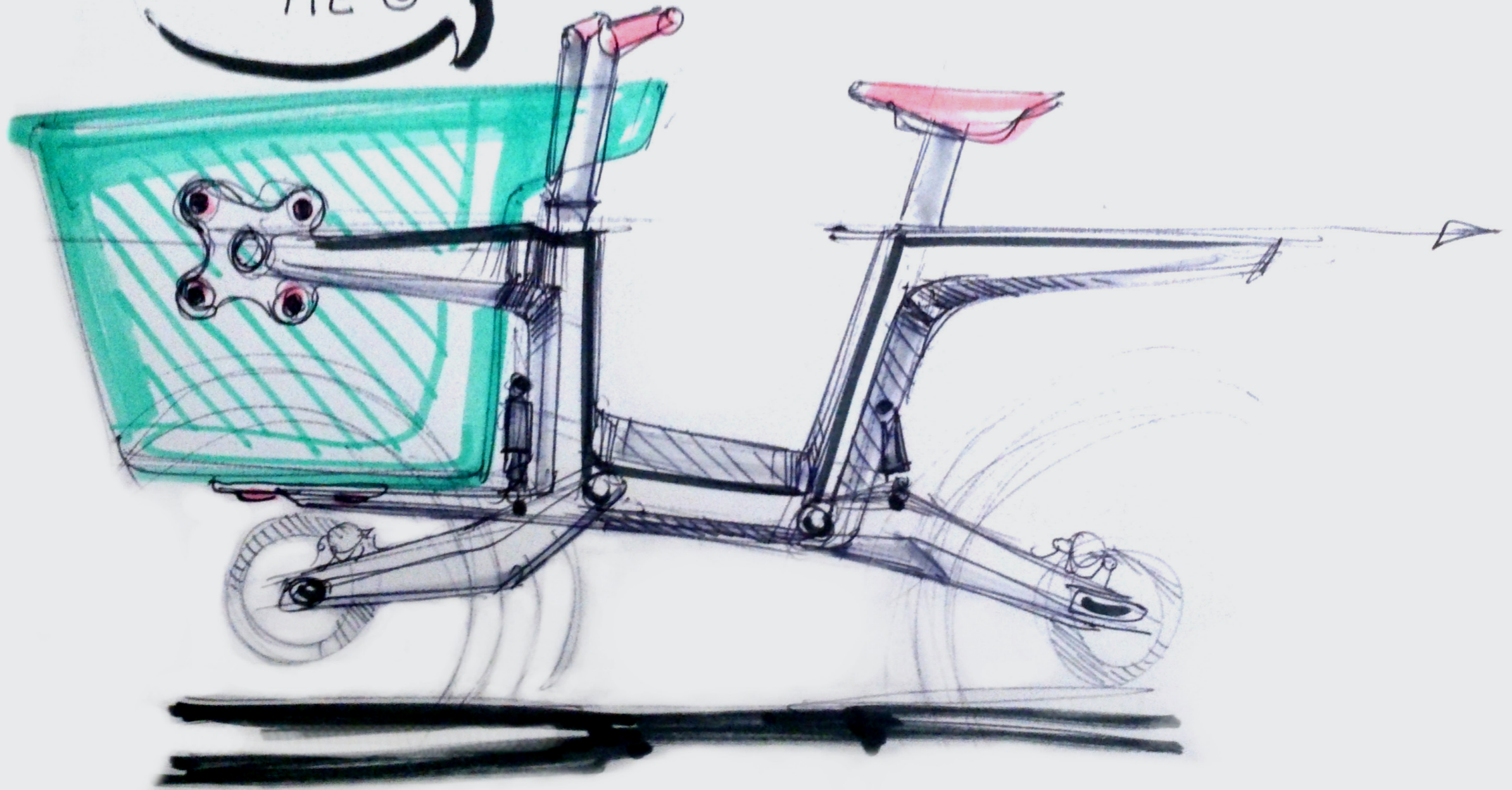
STEERING
IDEATION



IDEATION STEERING



HUG
ME ☺

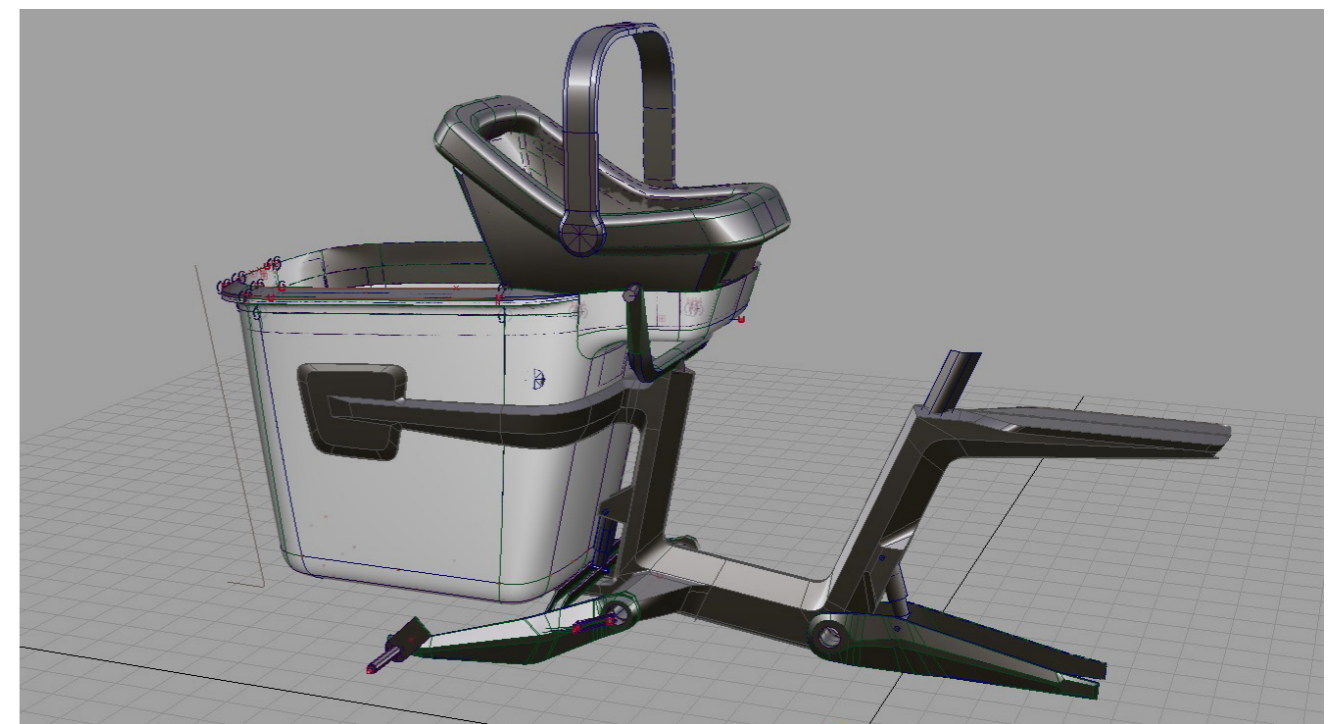
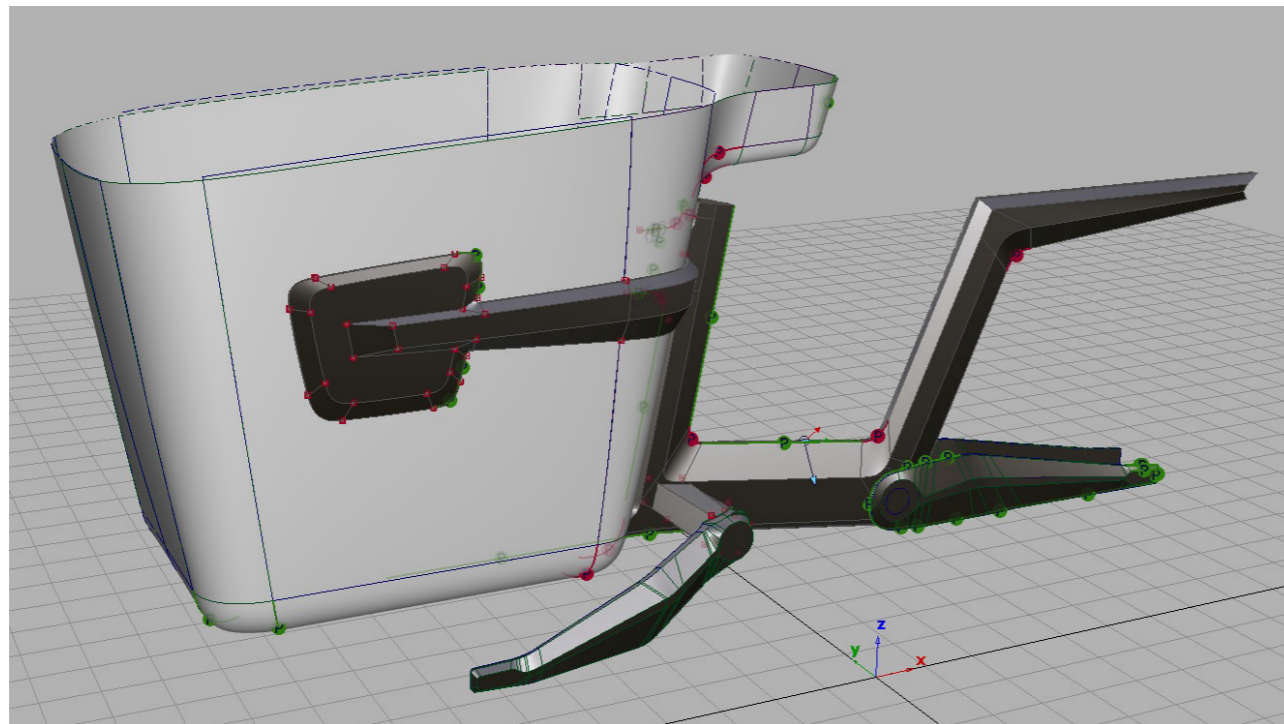
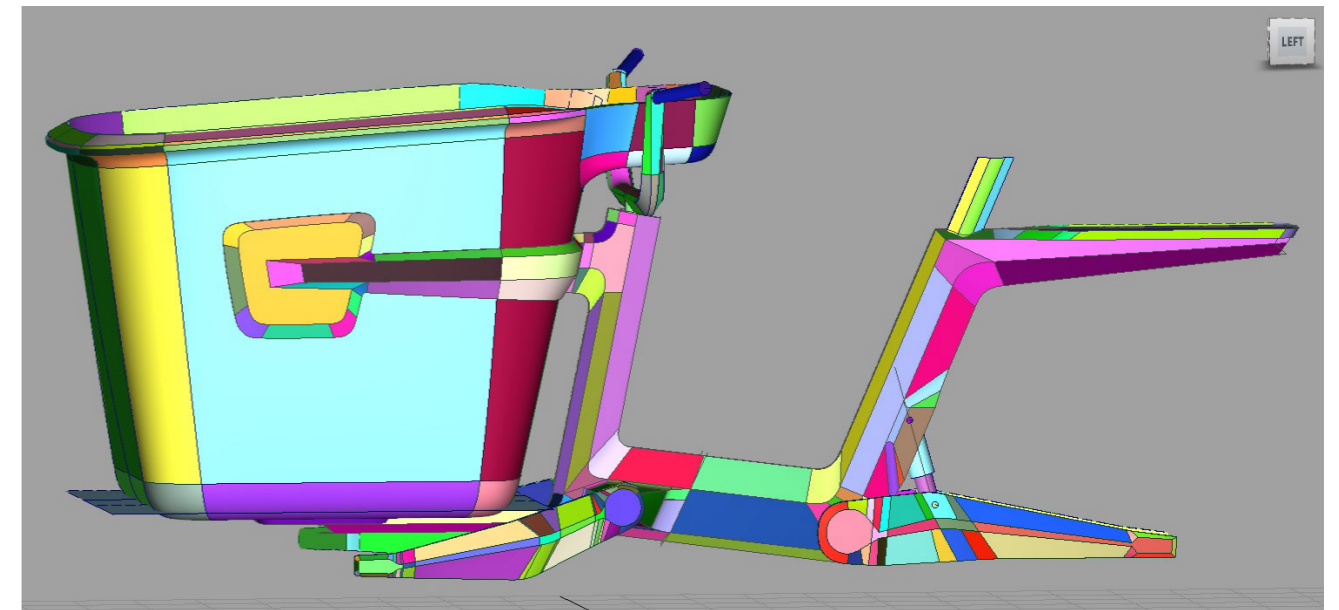


CAD DEVELOPMENT

In order to achieve best results I combined the advantage of two CAD Programs.

At first Alias Automotive for the Surface Modelling and later on Solid Works for the assembly and detailing

Here are some screenshots I did during modeling.



AUTODESK
ALIAS
Mock Up



AUTODESK
ALIAS
FINAL SURFACING



SOLIDWORKS

FINAL CAD ASSEMBLY AND DETAILING









GROCERIES



BABY + CHILD



BABY + CHILD + SHOPPING



FULLY LOADED



THREE CHILDREN



THREE CHILDREN + GROCERIES

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