

BOX2.78

A solution for flexible bicycle transportation

Rautkoski

Mustikainen

Heikkinen



The Problem

how to move everyday needs with bicycle in easy and flexible way

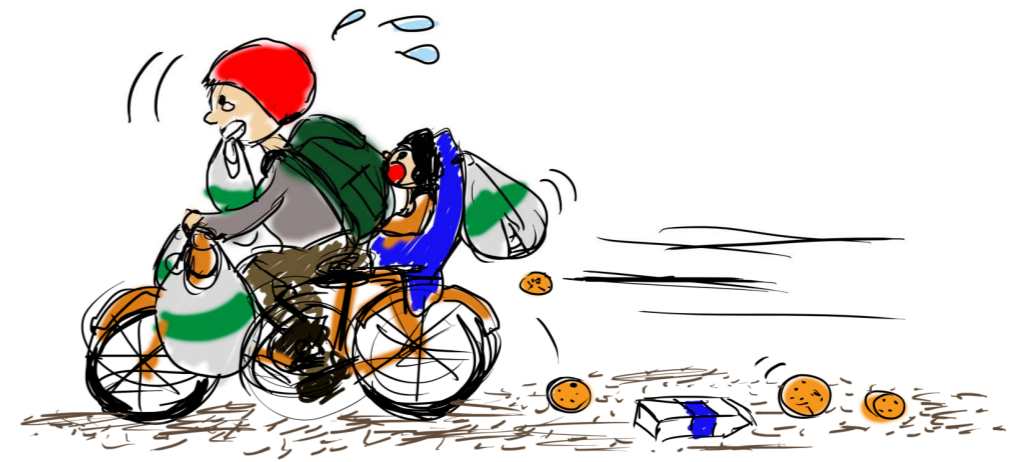
Background

We checked what previous groups has done.

In year 2011 they made survey what people moves with bike and how they do it. They also studied what what kind of products there is already. The biggest problem is how to move everyday products and children by bike.



Ongelma: Tavaroiden ja lasten kuljettaminen pyörällä



In year 2012 there was two design made: Buggy and The Trigo. First one was concentrated moving things in light and easy way. Another one concentrated how to move children by bike easy and safe way.

Final product



8.10.2012

Hänninen, Järvinen, Raudaskoski ja Venäläinen

15



The Trigo

Simply, take it further...



Ville Hela-Aro
Jarno Lindberg
Rochale Yates



Our Target

We want to focus on how to move everyday products like shopping bags, small household items, hobby items etc. in easy and simple way by bike. We would like that the product can be modified for many uses and can be attached on average bicycle. We would also like that the product can be used by average family or/and community.

The Outcome

We would like to make a working prototype from our final plan. Also we will make a 3D-model.



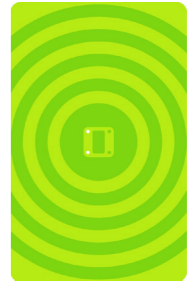
Preliminary Timetable

week	
35	Start / Brief plan
36	Sketching / Excursion / Testmodel / Test drive
37	Materials / Workshop / Frame prototype making
38	Materials / Workshop / Prototype making / Sketching
39	Model making
40	3D-model /
41	Test use - results / Photoshoot /Presentation
42	Finishing presentation

If everything goes well we will have working prototype and good 3D-model in the end of the course.

USERS





The product is fixable
on average bicycle

The product is designed for city
so it doesn't look like
camping equipment

Match with the
bicycle look

QUALITIES

Achievable
price

The attachmet is
easy and quick to use

Narrow and light construction



The Weber Monoporter

“Designed for cycling tours in the nature especially for cycling travel.”

One wheel, joins into the hub axle from both side

Quick assembly

Folding

Price 430€

Max weight: 22kg

Trailers weight: 5,75kg

Overall length: about 150cm



Extrawheel

“Is very practical set for both short trips and long journeys”

The luggage is on the both side of the wheel in bike packers

Quick assembly to the hub axle from both side

Price: 360€

Max weight: 35kg

Trailers weight: 4,75kg

Overall length: about 70cm



The Heavy Duty Trailer

“A large trailer or trailer frame designed to haul your heavier supplies. Shopping for the family, camping supplies, business supplies, gardening stuff”

Two wheels, joins into the hub axle from one side

Price 260€

Max weight: 68kg

Trailers weight: 8kg

Overall length: about 152cm

Frist week

We begun by sketching out our ideas and we came up with more ideas when we went through them together. Then we decided that it's better to try our ideas in real environment and in real size.

We made a trip to Rajasaari recycle center where we bought old bicycle parts. The next day we made our first test model.





week 36

LIKKUVAN ARJEN DESIGN

BOX2.78

FALL 2013

MUSTIKAINEN

RAUTKOSKI

HEIKKINEN

One wheel or two-wheel model?

We listed the good and bad features of both. Two-wheel trailer is more stabile, will stand up while loading, does not crash and it will take more weight. Things that support one wheel: it allows narrower and lighter construction, is less expensive and it will match better to the bicycles look. Futhermore it allows smoother movement.

We choose to use one wheel, because it is enough for our target group needs.





week 36

LIKKUVAN ARJEN DESIGN

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FALL 2013

MUSTIKAINEN

RAUTKOSKI

HEIKKINEN

Attachment

We tried different ways to joint the trailer to the bicycle and we noticed that two point joint is more stabile than one point joint what we had first tought about.

Another reason to attach the trailer to hub axle is that we wanted to leave the rack free for children safe seat.

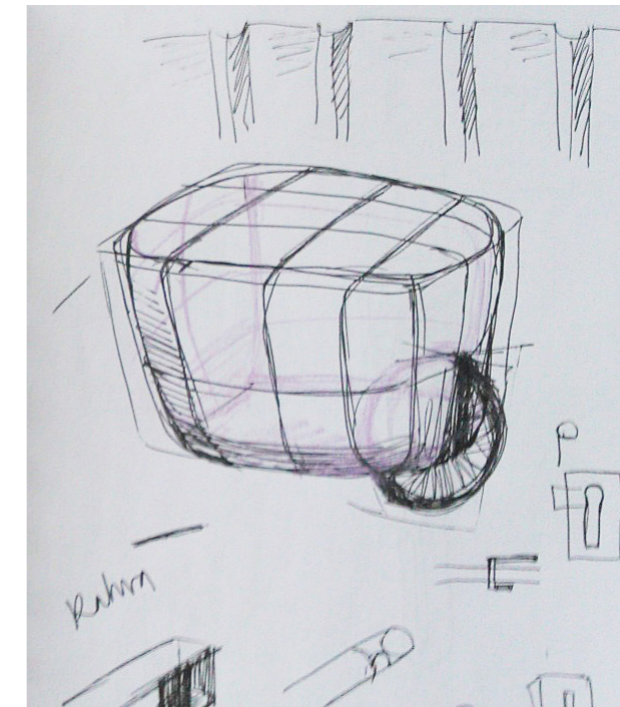


Use

At the beginning we discussed that should the trailer be modified to different use. After conversation and many sleepless nights the conclusion was that it's better to concentrate the main thing, which is moving shopping bags and hobby items as good as possible.

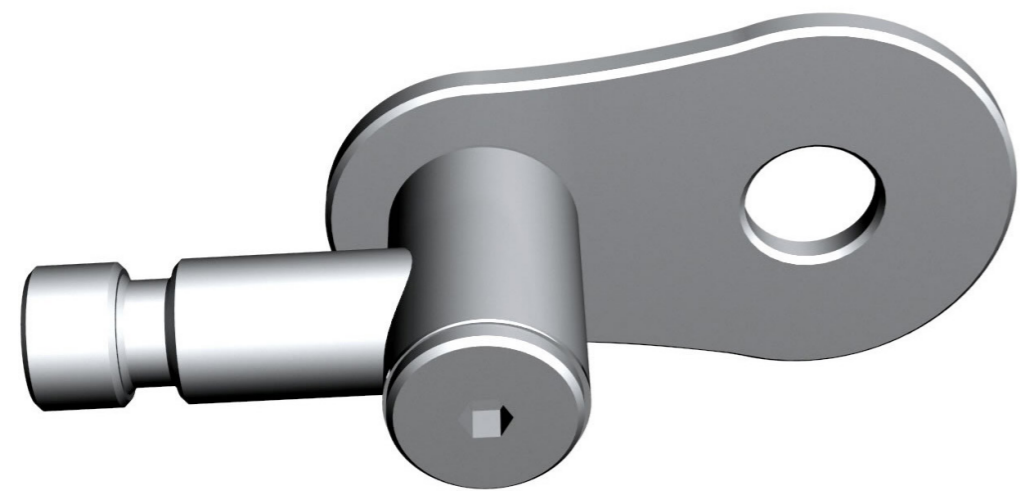


Changes

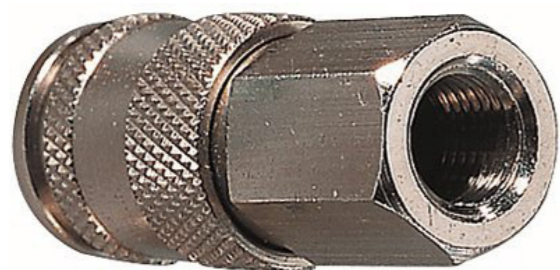


- plastic box, which forms a fender over the wheel
- more stable when weight is mainly on top of the wheel and the frame will be shorter

week 38

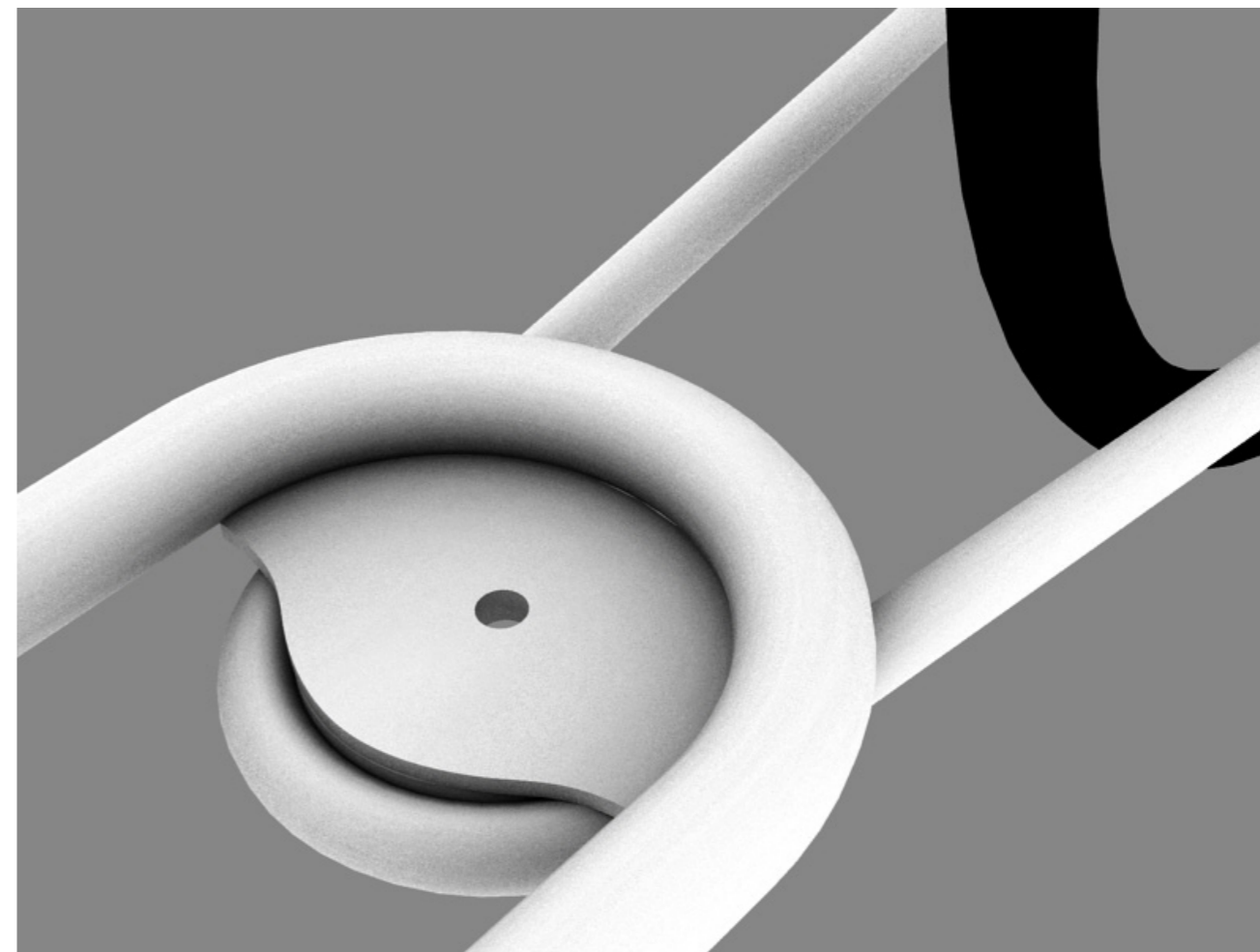


Sketch of the part which become attached to bicycle hub axle.



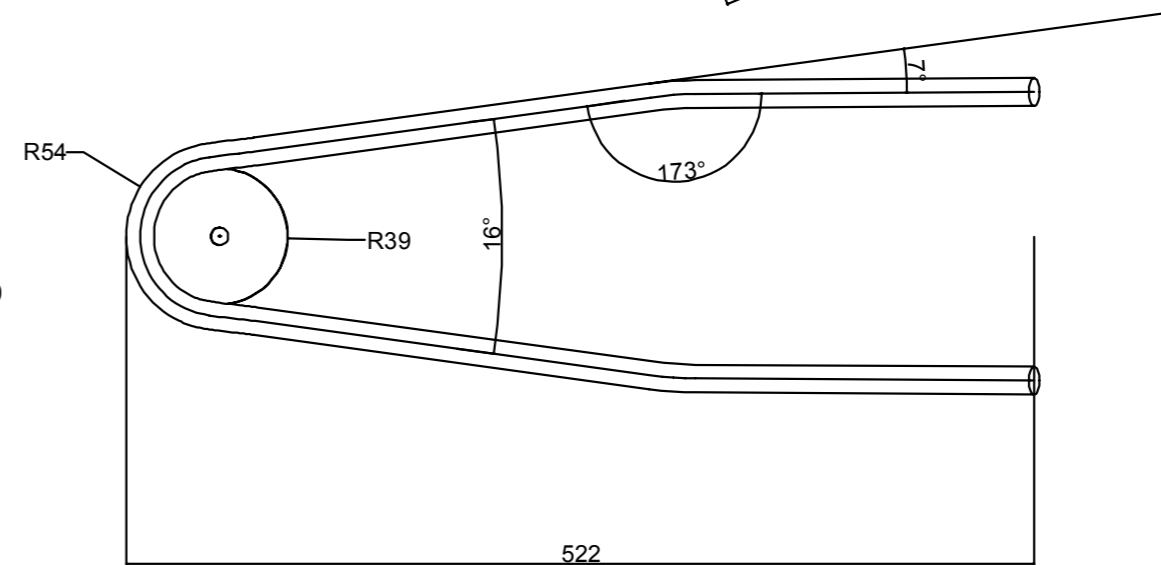
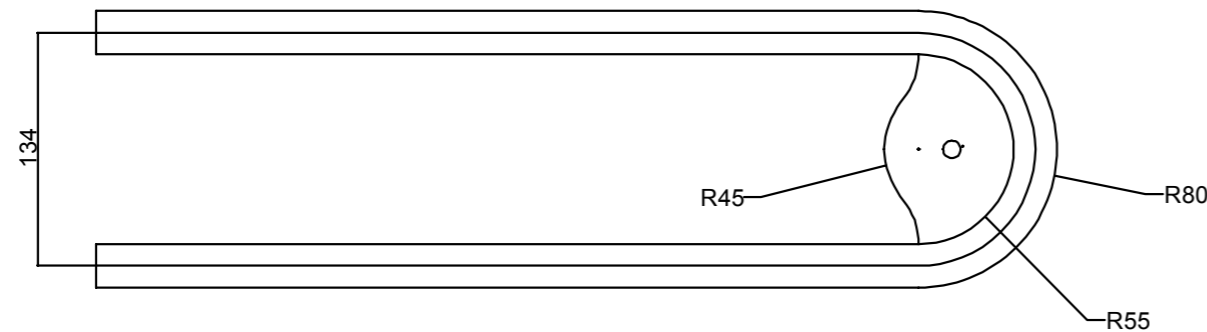
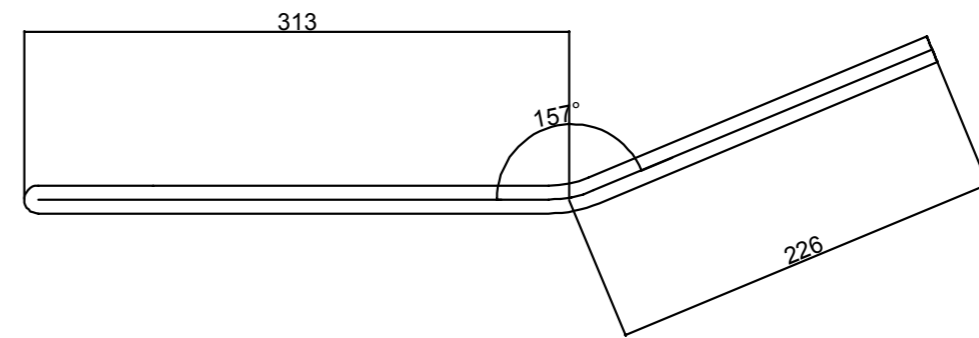
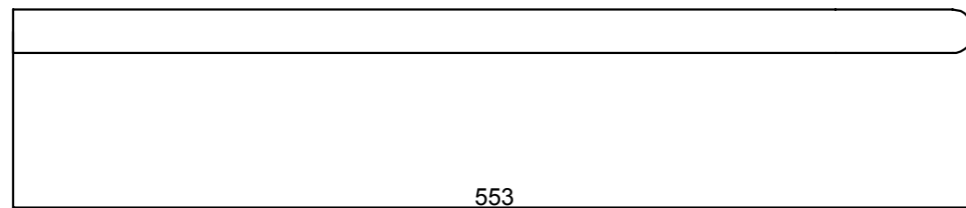
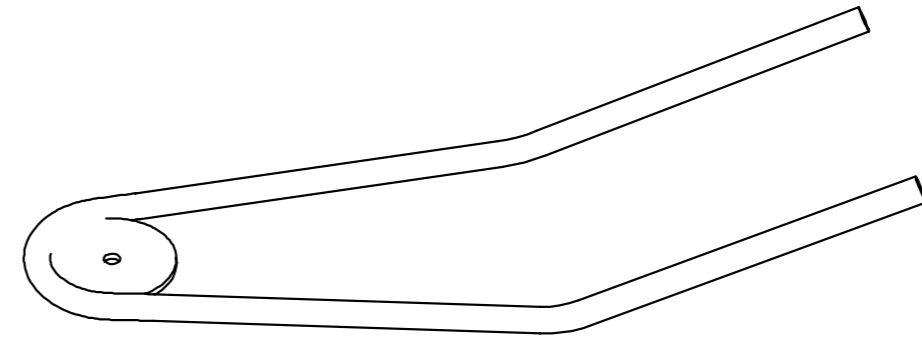
Bayonet catch. This part allows quick catch and release.

Attachments



Sketch how the forks join together

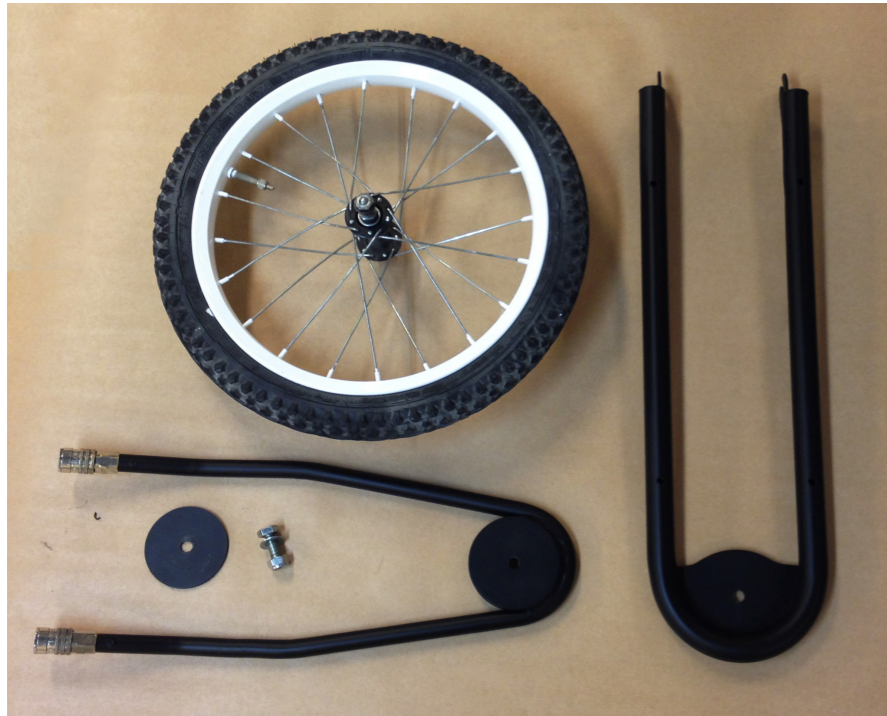
FRAME blueprints





TEST FRAME





FRAME

Consist from two forks, which are made from steel or aluminium pipe. The forks are attach to each other in the middle. The joint where the trailer turns is in between of them. This is how we were able to keep the frame short and lightweighted.

ATTACHMENTS

There is two parts that will be attached to bicycles hub axle. You can have many of these small parts which can be attached to different bicycles at the same time. The trailer joins into these two parts easy and quick way.

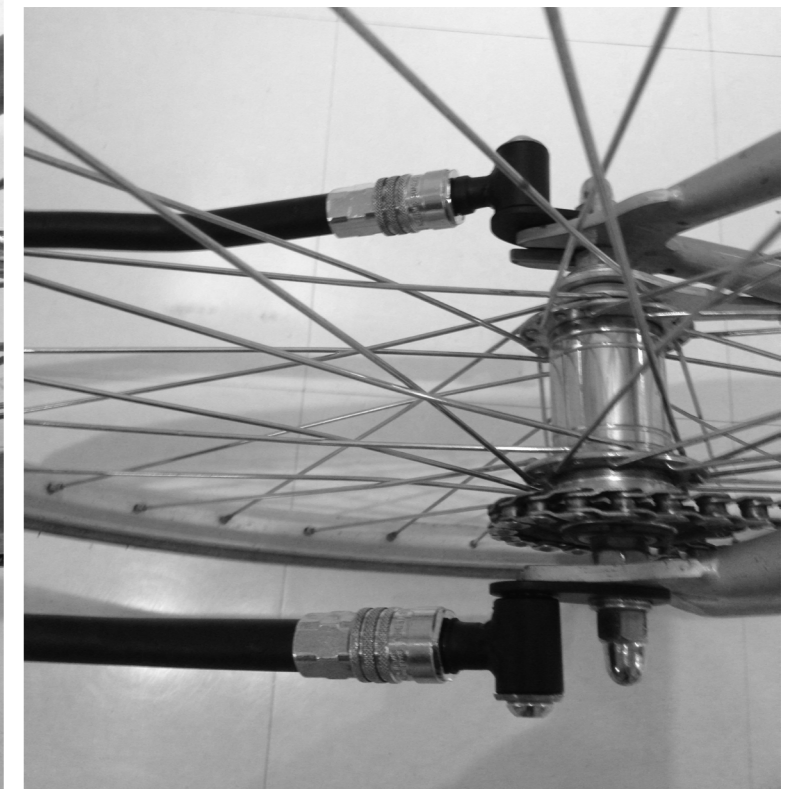
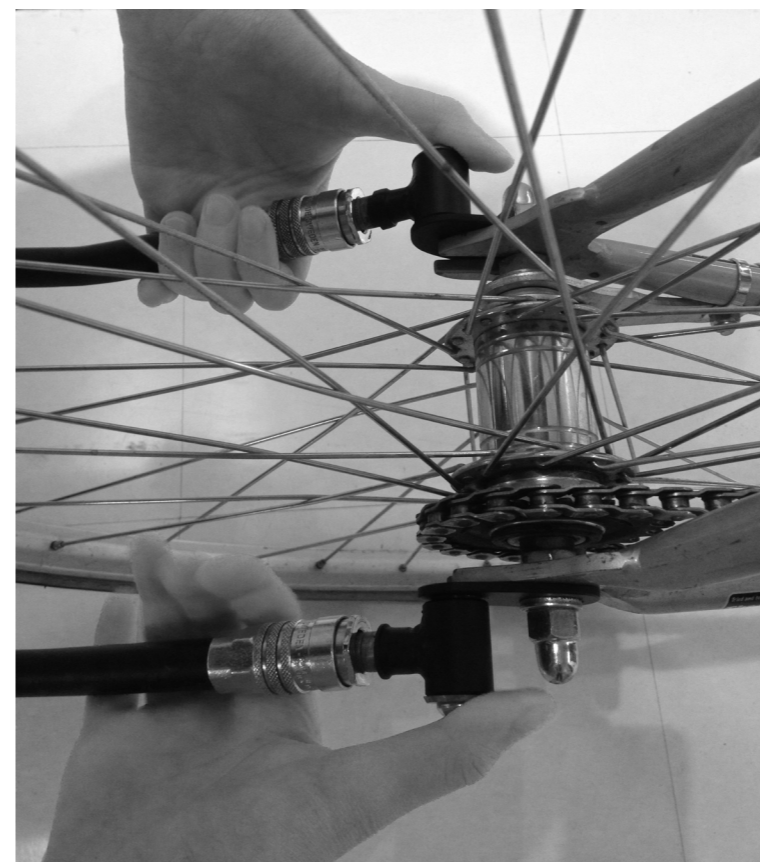
Reason to attach the trailer to hub axle is that the rack remains free for children safe seat and the trailer will be more stabile.



Axle hub part

Joint point of the trailer

this is how the attachment works

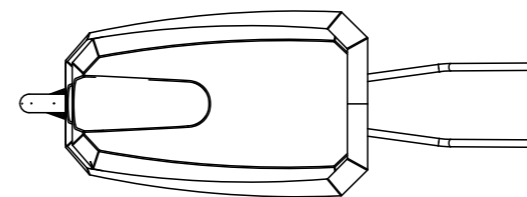
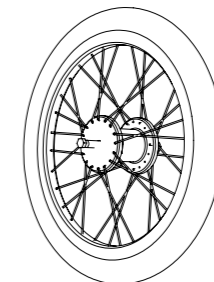
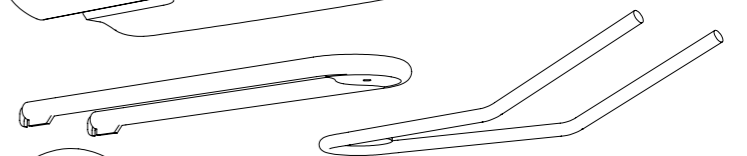
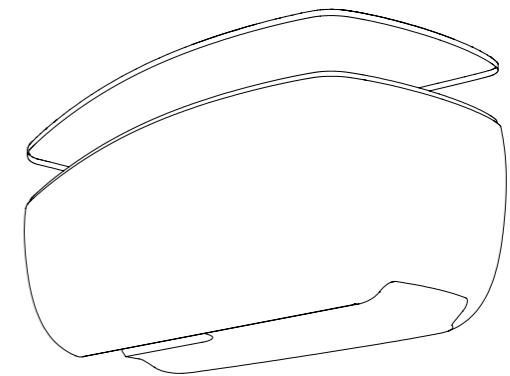
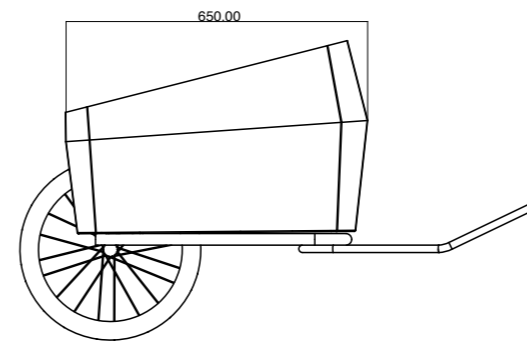
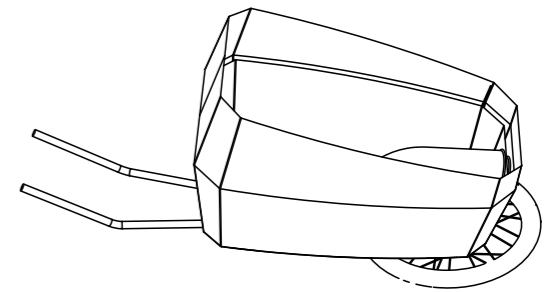
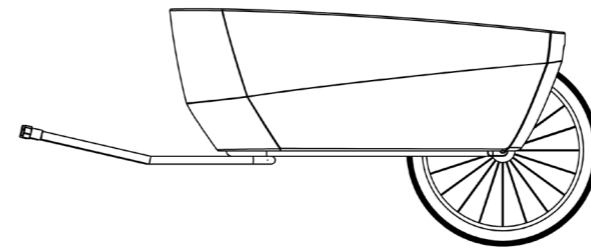
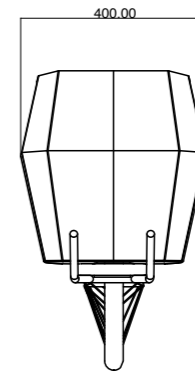
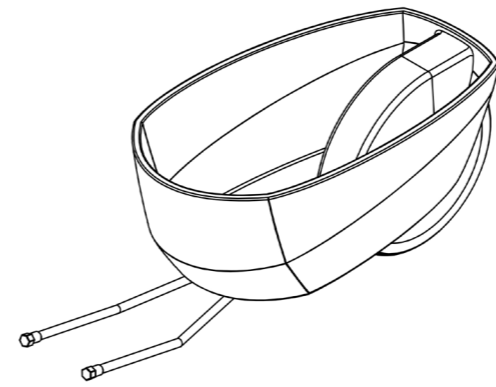


THE BOX

After the metal workshop, we started to designing the box. We found it more difficult than we expected, First the box looked like coffin. After that it looked like bath tube rather than lean moving equipment which follows bicycle. The hardest part was to communicate at the same language about the boxes shape. We made mood board about the shape.

During the frame making we had sketched the box many times, but we haven't got any conclusion about the shape together. We liked the idea of plane box, but in design point of view it shouldn't be just a box.

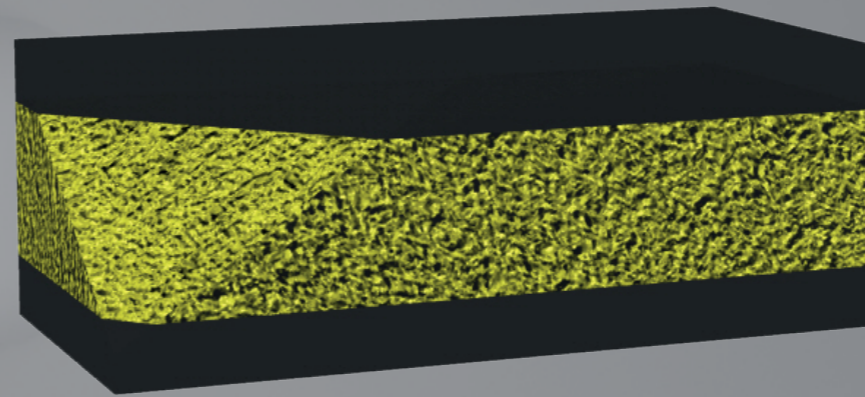
We keep in mind the manufactory point, which limited the shape a lot. The shape had to be open, so it can be taken out of the mold. We should have done more research about the manufactory things, so we have had more guide lines to design the shape.



Rotationally Molded box

High-density polyethylene (HDPE)

Polyurethane (PU)



The box is rotationally molded piece, which is filled with insulation.



First demonstrations of the box, dimensions and the possible shape.



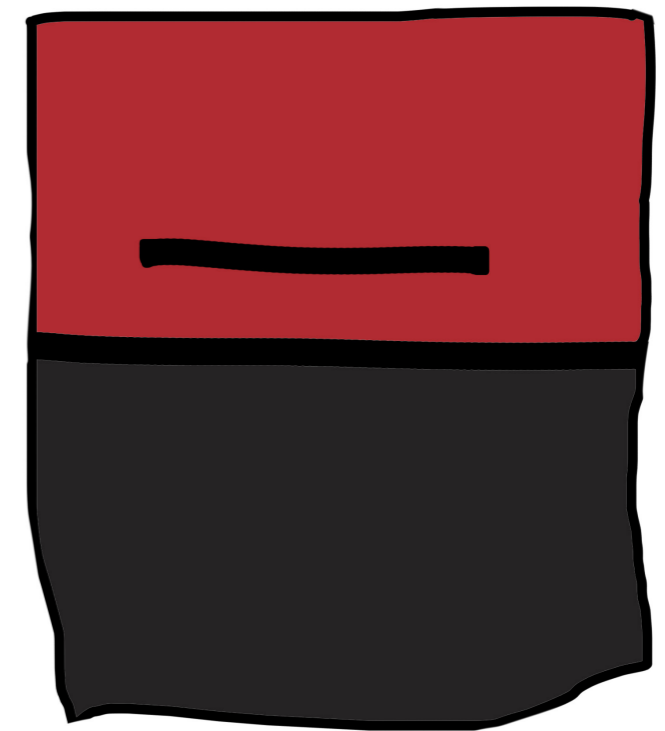
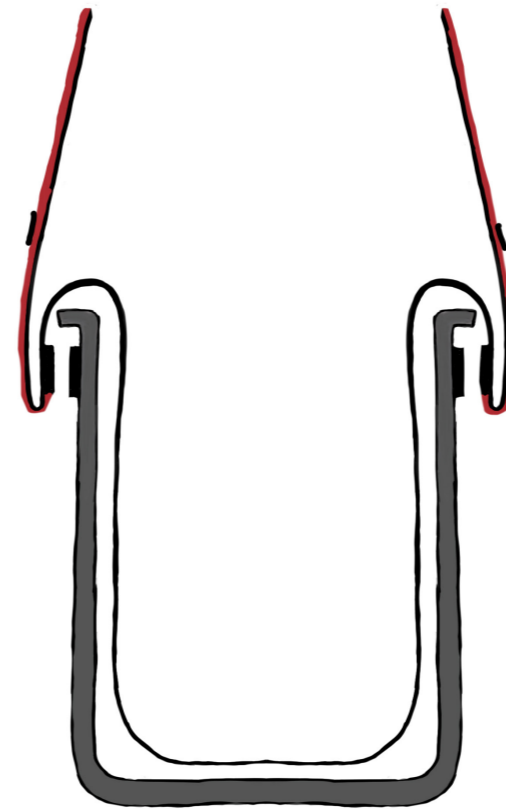
frame proto



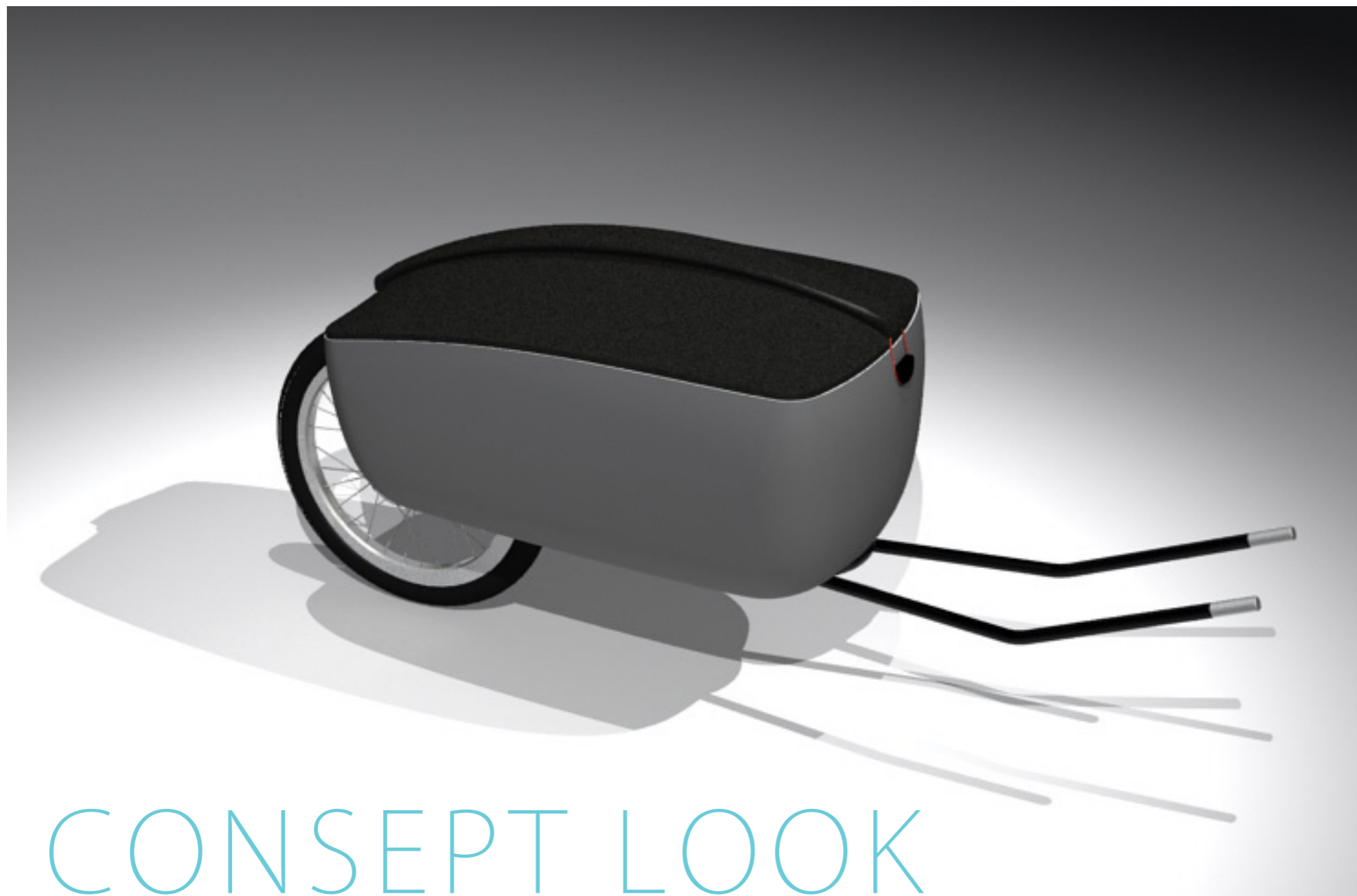
test
box

THE COVER

We wanted that there should be cover on the box incase of rain and to keep your things inside the box. This was also a hard part to all tree of us to design, because we had so many ideas and options and we were not quite sure what we wanted the cover to be. The questions were: where to put the cover when you don't need it? How to close it? Can or should it be part of somekind of bag, which you can take out of the box? Is it hard or soft? Is it lockable? If its lockable then where and how? Should the cover add something more to the box, like add more high to the sides, so you can move higher and bigger items?



Propotision for cover



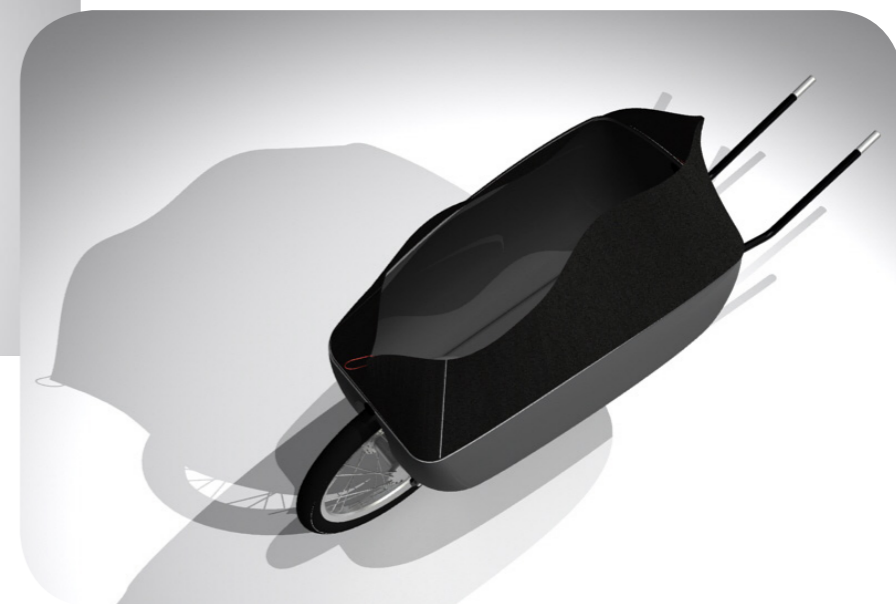
CONSEPT LOOK

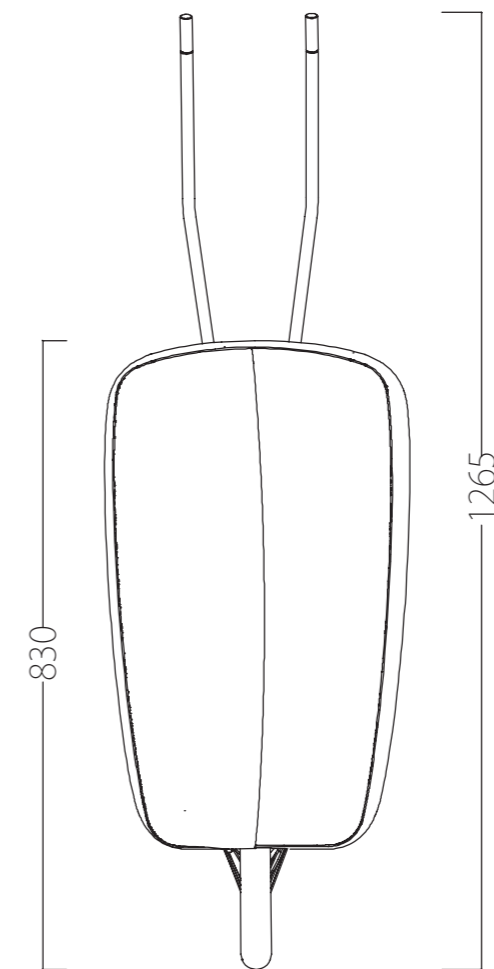
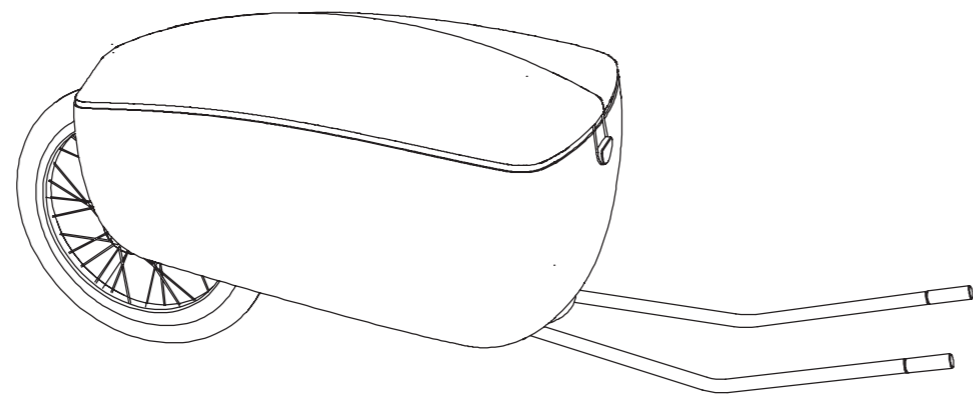
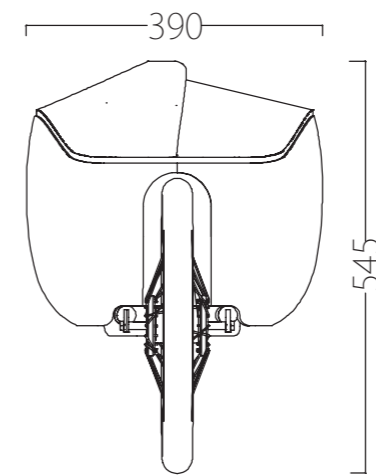
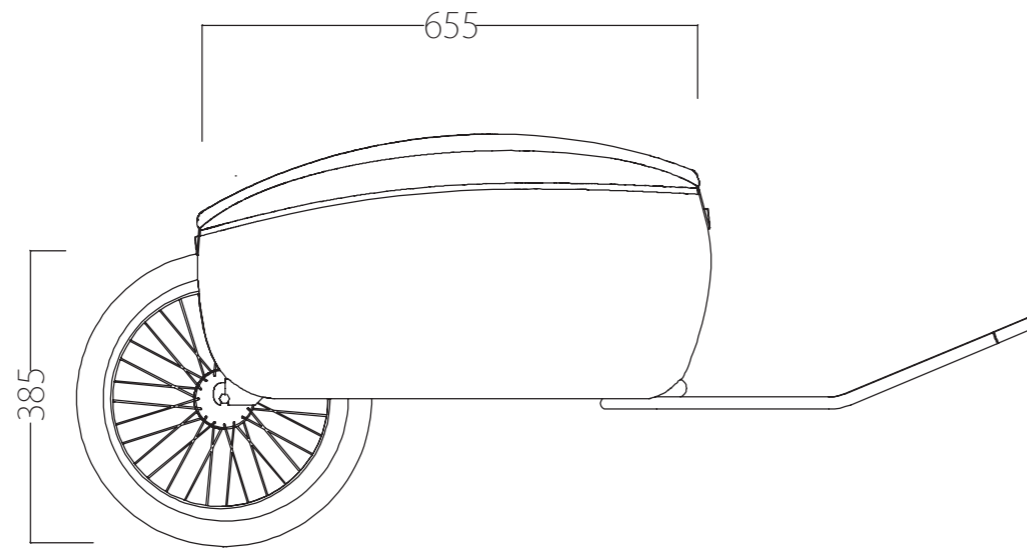
BOX2.78

“Designed for daily use, specially for grocery shopping, in city environment “

One wheel, joins into the hub axle from both side
Quick assembly
Narrow construction

Price: 80-150€
Max weight: ~25kg
Trailers weight: 6kg
Overall length: 80cm





1:10 DIMENSIONS



Conclusion

There is still a lot of questions about the cover. The concept is almost there, and we are satisfied with the test model. It was fun to actually make something real and test it and notice that it really works. It was also very educational to see how much tool can limit or affect the shape and final product. If there were more time we could have made the test model better and may have decided the final concept of the cover.

About the team work, we had great fun, we worked well together and everyone gave their own impact to the project. We may have made some decisions earlier and choose exact frames to this project. We kinda have them but then we lost them in the big ocean of opportunities.





Uudenmaan liitto
Nylands förbund

Leverage from
the EU
2007-2013

