

# Design of a moving van with the StowBox experience

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On developing a connection between the Salland Storage StowBox and a chassis cabine.

Salland Storage, a personal storage company, wants to develop a box truck for usage with their Stowbox storage container.

The StowBox is “a storage container specially designed for furniture storage that is light and robust. It is easy to transport on our special trailer. . .” [1]. So, in essence the StowBox is a storage container designed for moving furniture and other personal belongings. This storage container can easily be loaded on and off a trailer and be stacked on other containers for storage. The advantage of this design is that the user only needs to load and unload the container once, eliminating half of the work. The StowBox is the container itself; the trailer chassis used to move the StowBox is called the StowMover. There is an old and new design for the StowBox, this thesis will focus on the new StowBox design.



Temporarily storing Furniture? A trailer and a safe and clean storage location are enough. Rent our StowBox online.



The only thing you need for driving with the StowBox is a B drivers' licence and towbar



Load the storage container at home. It fits 216 moving boxes. An extra van or trailer is not needed. Need any help? The **StowAssist** can help you out



Bring the loaded StowBox back. We will store it directly in our secured facility. No unloading needed. After this it as a 24/7 accessible self-storage box



In the meantime, you want to access your winter tires, garden equipment or summer dresses? You have 24/7 independent access to your StowBox.



When you don't need the Storage space anymore, you can retrieve the mobile storage container and unload it at your desired destination.

The scope of this project is to develop a box truck existing of the Stowbox, a chassis cabine and a locking mechanism between the two. For this project it is important that the truck can be

driven with a Dutch B driver's license and the principle and user experience of the StowBox correspond with the principle and user experience of the final product.

The new box truck is important for the company to offer customers a new way of transporting the Stowbox. Without the customer needing their own means of transportation, needing to drive with a trailer or needing an employee to drive the Stowbox to the customer. This makes the Stowbox more accessible for a larger customer base.

Based on some initial research and what the company wants the following research question was formulated:

"How can you create a boxtruck with the StowBox experience?"

## **Approach**

This thesis started with a research phase. Here was looked at the current connection method, StowBox experience, chassis cabins and market research. From this requirements were formulated and it was found some kind of loading aid needs to be developed next to the connection method between the StowBox and chassis cabine. This was done to make sure the StowBox experience stays consistent.

After the research phase the design approach started.

Firstly, a chassis cabine was selected based on requirements and company preferences.

Secondly, there were two options for loading the StowBox; the option to load the StowBox on the chassis cabine or to take the StowBox off of the chassis cabine. These two options were then compared. From this was concluded that both loading aids would be developed further. Lastly, The two loading aids and connection method were developed to different levels of detail. The result of this was a fully worked out design for a connection method between the StowBox and chassis cabine and folding-retracting stairs for getting in and out of the StowBox. To further verify the design of the stairs a prototype was made and some calculations were done for the forces needed to handle the stairs.

The other loading aid resulted in a concept for a method to take the StowBox off the chassis cabine at the customer's home (lifting method).

Then in the analysis phase a cost estimation of all the parts was done. This was mostly based on prices of parts found online and a cost quote given by a trailer building company. After this the requirements were evaluated to determine shortcomings of the final designs and concept. Based on all the gathered information a final comparison could be done between the two loading aids. This resulted in the final results where the company was advised if they were to invest in the connection method to use the stairs. The lifting method could then later be used to give the company and customers more options for handling and bringing around the StowBox.

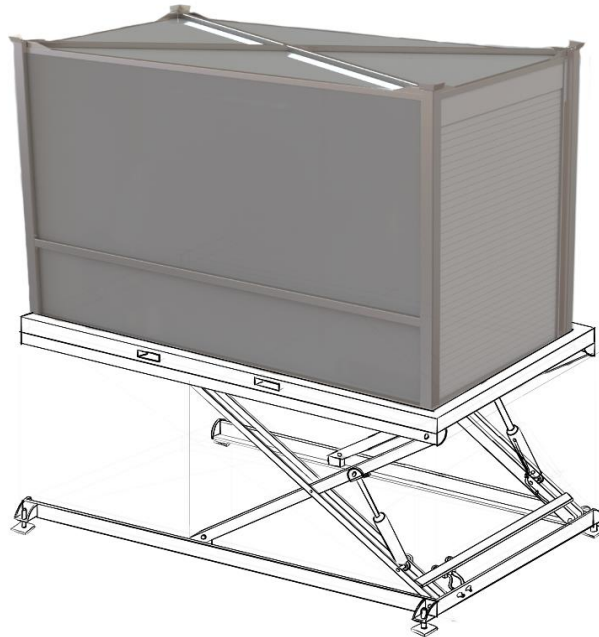
## **Results**

As a result of the development process 3 designs/concepts were created.

Firstly, the stairs. These stairs can be used as an easy way to get in and out of the StowBox while it is mounted on the Chassis cabine.



Secondly, the concept of taking off the StowBox at the customer's house. The concept uses a hydraulic actuated scissor lift mechanism to lift the StowBox.



Lastly, the subframe. This is the connection between the StowBox and the chassis cabine. The StowBox can be attached to this frame locking the chassis cabine and StowBox together.



## **Conclusion**

From this thesis can be concluded that it is possible to create a boxtruck with the StowBox experience. This can be done by using the subframe and stairs developed in this thesis. In addition to this the StowBox experience could be expanded by using the lifting method concept developed in this thesis.

## **Recommendations**

Possible improvements or new research direction are:

- Making it easier positioning the StowBox onto the subframe.
- Adding compatibility for the old StowBox to the subframe.
- Further development of the loading aid of taking off the StowBox if it's deemed profitable. And adding compatibility to the subframe for the older StowBox design.

## **References:**

1. StowBox, onze mobiele opslagcontainer; inladen, opslaan, uitladen. url: <https://www.sallandstorage.nl/stowbox/>.