Cargo Carrier Project

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ME 009- Engineering Graphics and Design

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Multiple Access Cargo Carrier

Introduction

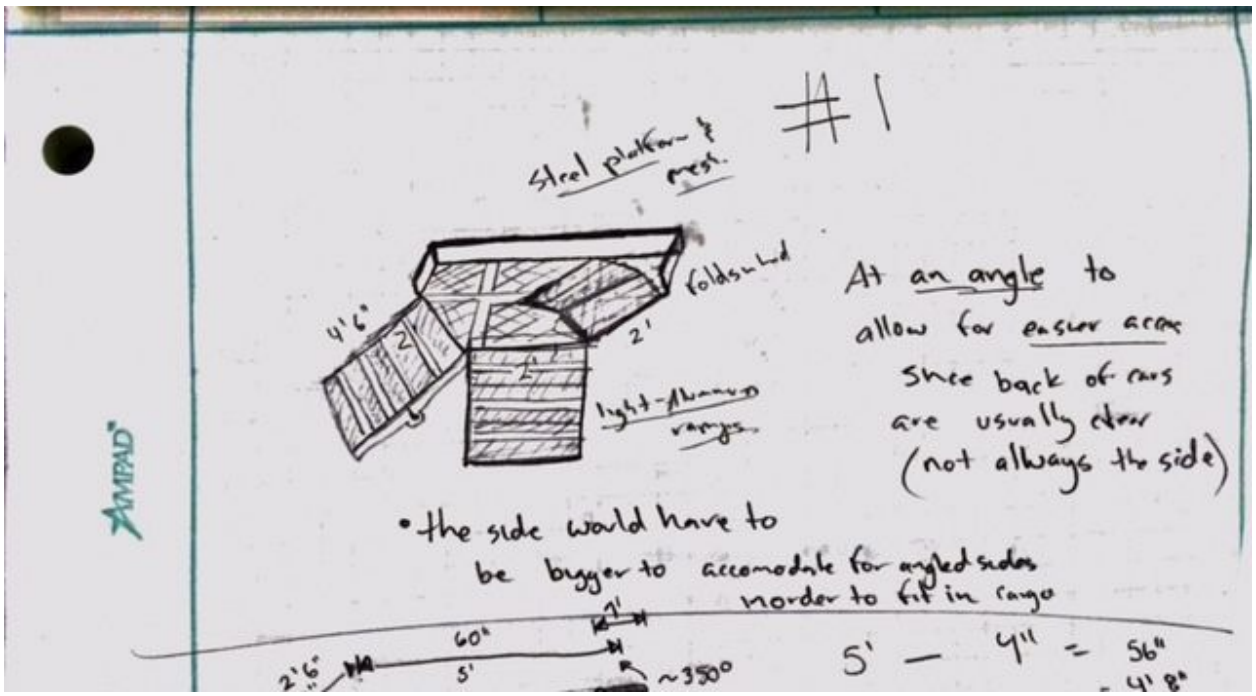
There has been determined that there is a need for alternative cargo carriers with loading ramps.Rear mounted cargo carriers are commonly used for wheelchairs and other mobility carts. These typically have side mounted ramps that fold down for loading and unloading. A common problem with these designs is that the necessary side access may not always be available in tight parking areas or garages. A design concept for a cargo carrier that provides ramps access from three sides is needed.

Problem Definition

-Cargo carrier with ramp access from 3 sides
-The cargo platform LxW of 60 x 30 inches.
-The ramp width shall be at least 24 inches.
-Overall height without cargo shall be less than 8 inches
-Overall height with cargo shall be less than 30”
-With the platform 18 inches above the ground, the ramp angle shall not exceed 20°.
    *This requires a ramp of length of 53” or longer
-The ramp will be deployed and stored manually by a single person.
    *Requires a simple and light design
-To be made of Aluminum, as to be light and strong.

Concept Design

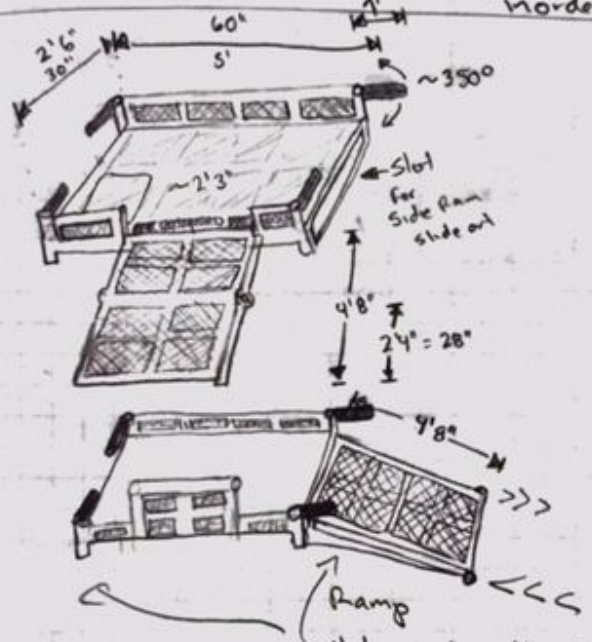
#1



#2

#2

• the side would have to be bigger to accomodate for angled sides in order to fit in range



5' − 4" = 56"
= 4' 8"
18.7° ~ 19°

Front 4'8"
2'4"

Side
56" ~ 19°
4' 8"

Slides underneath main platform to come out of either side.

- Very cool design
- too complicated so prob very expensive.
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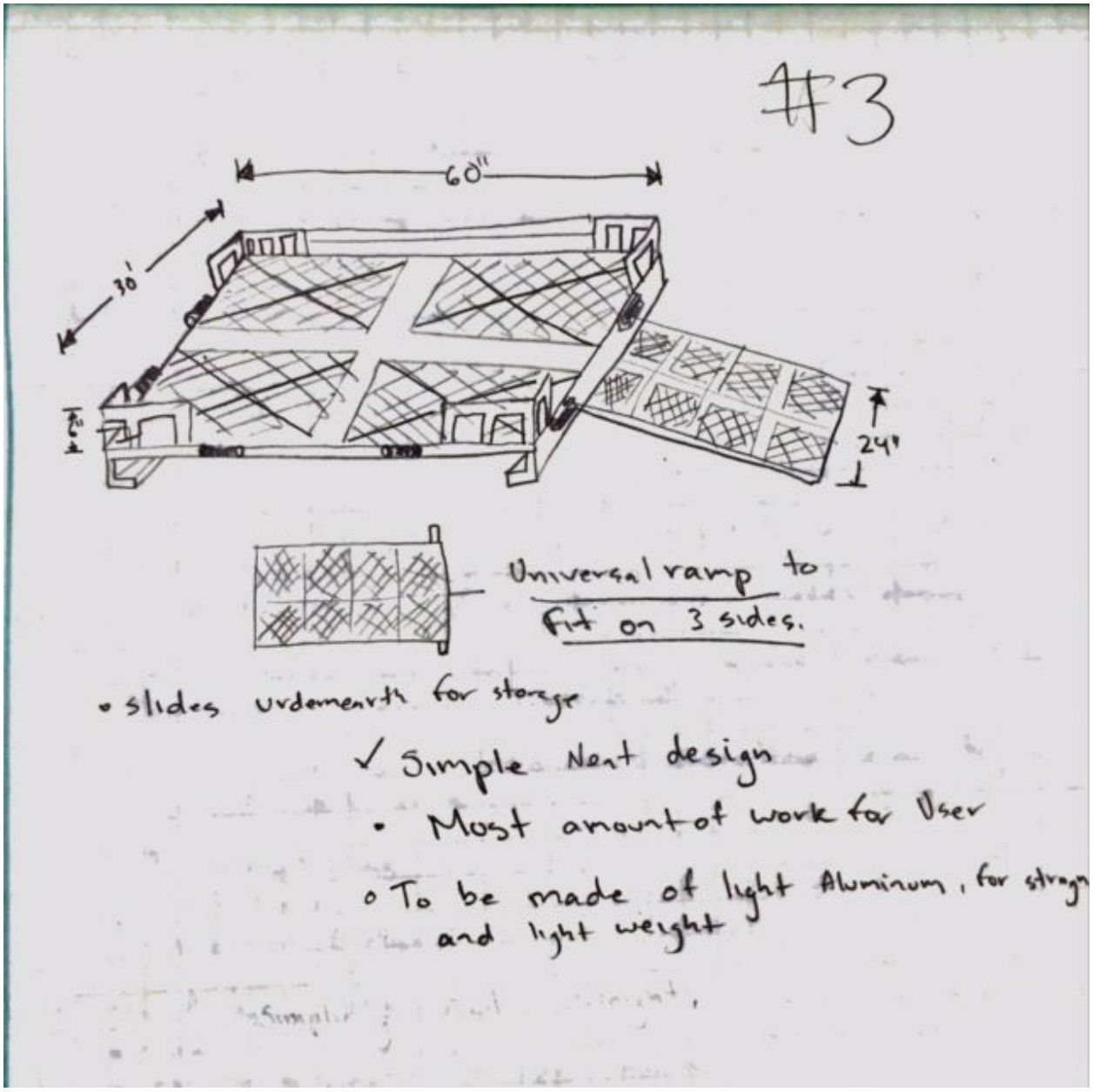
#3


#3
60"
30"
24"
Universal ramp to fit on 3 sides.
• slides underneath for storage
✓ Simple Neat design
• Most amount of work for User
• To be made of light Aluminum, for strength and light weight

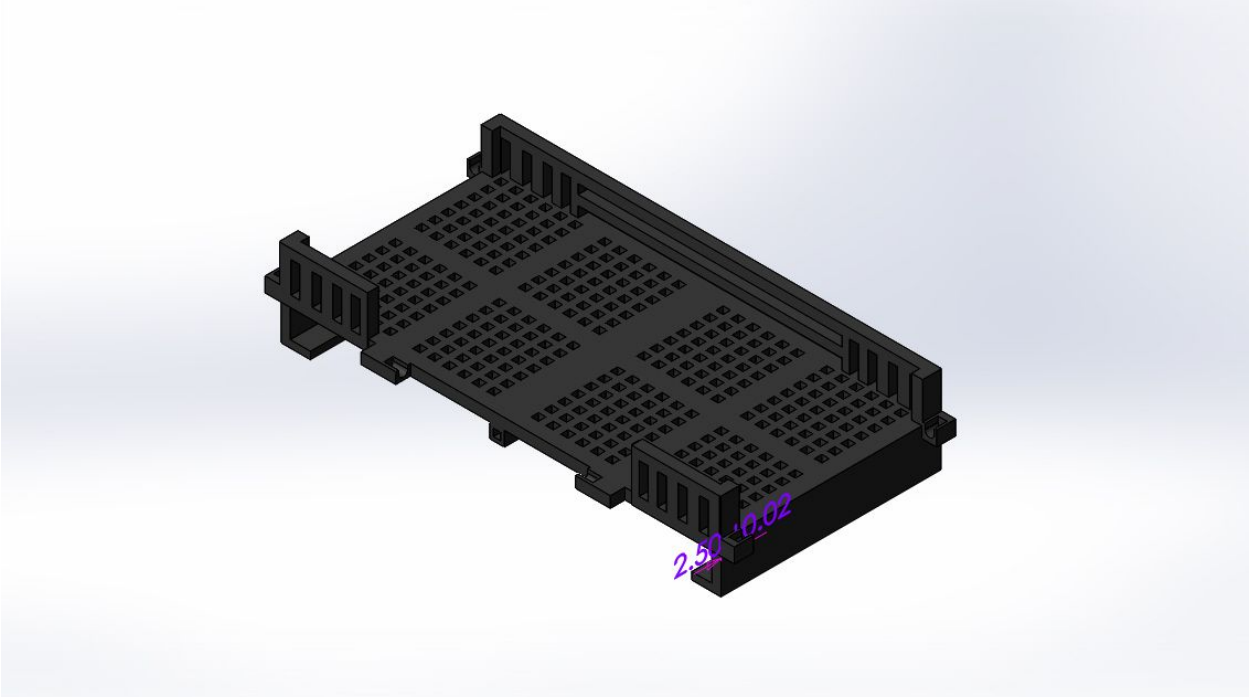
Sketch idea selection

Design Criteria	weight [1-10]	Sketch 1	Sketch 2	Sketch 3
Safe	8	5	6	9
Simple	8	6	4	7
Reliable	7	6	8	8
Aesthetically Pleasing	7	9	10	9
		26	28	33

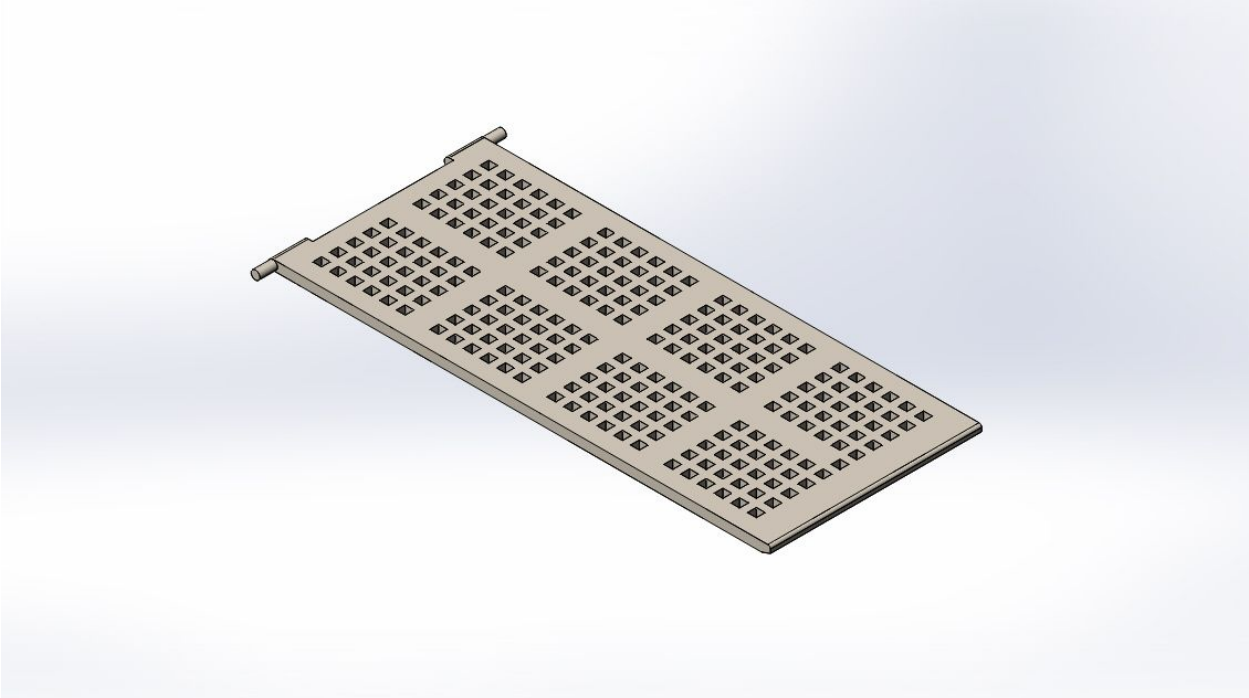
Sketch #3 was the one to be chosen for its simplistic design that would yield the best overall result while maintaining cost down.

Embodiment Design:

The Cargo Bed:

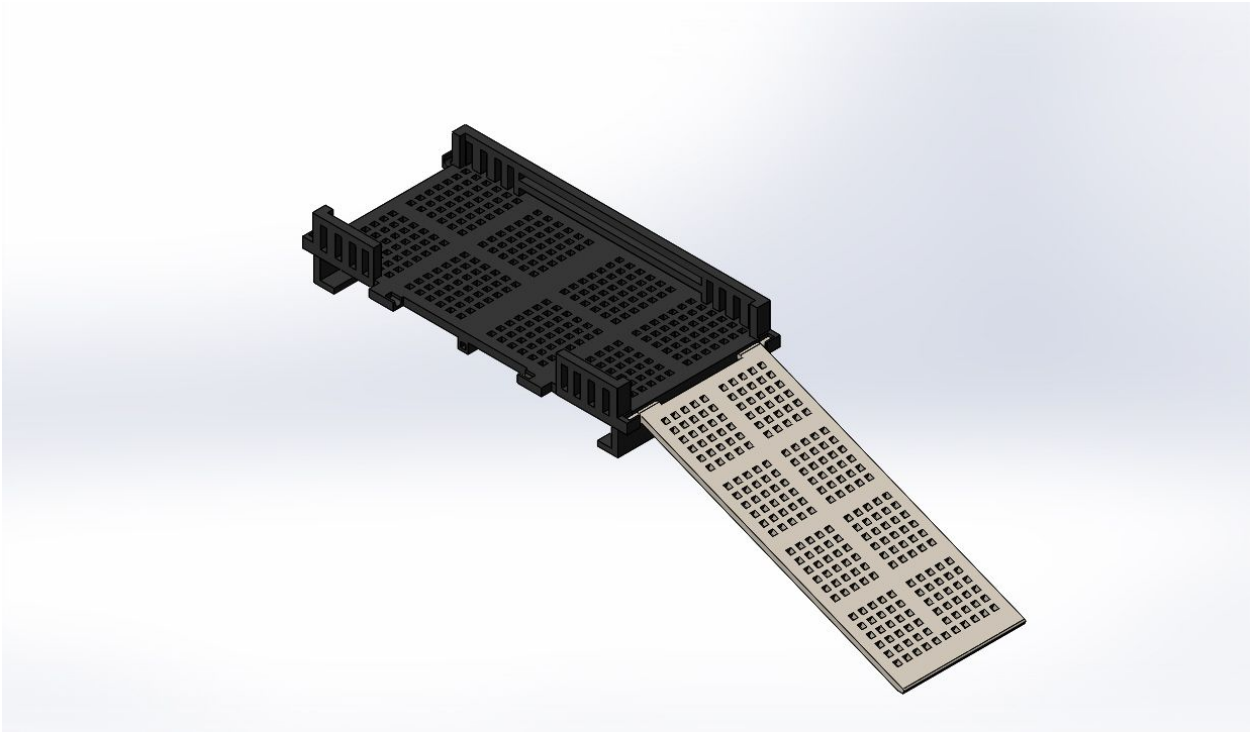


The Ramp:

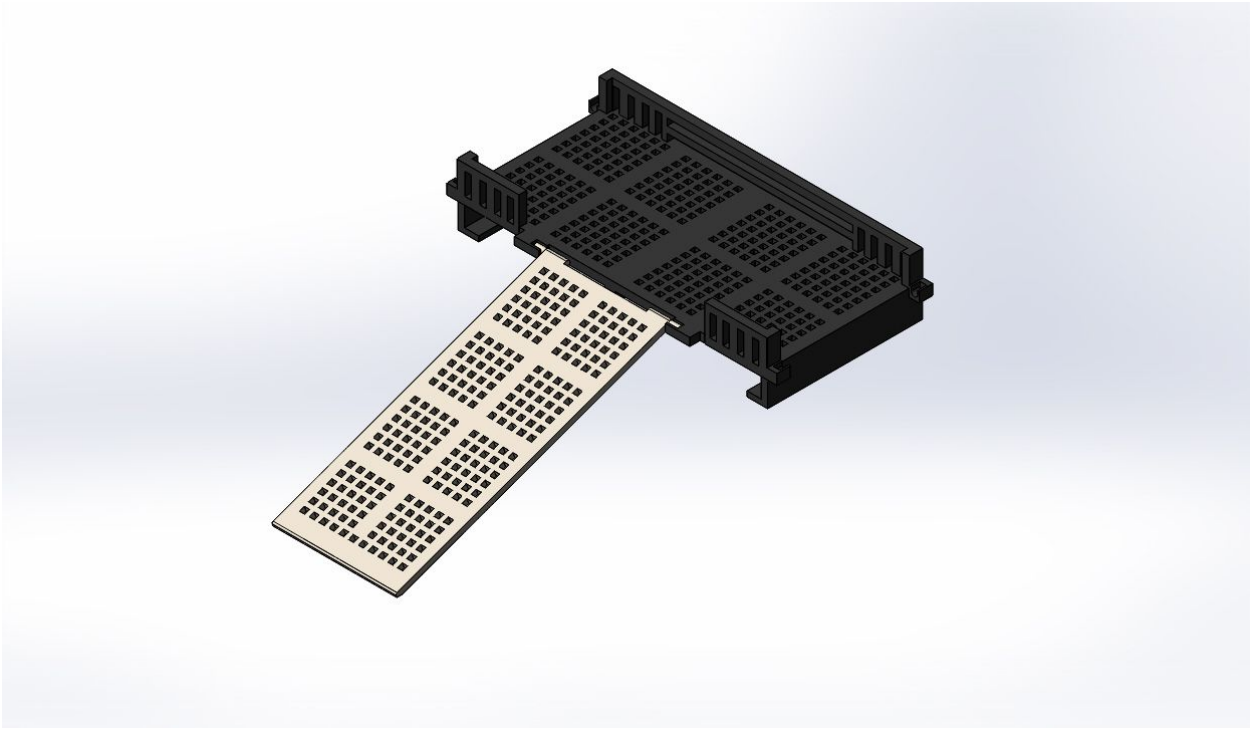


Description:

The cargo carrier is made of two parts; the cargo bed and loading ramp. The cargo bed was designed to be symmetric as to be appealing to the eye. With simplicity in mind, the bed has the same attachment mechanism on each side. This allows the ramp to be attached from all three sides of the cargo bed. Its has a simple and reliable attachment setup. When the ramp is not in use; it conveniently stores away right under the cargo bed.



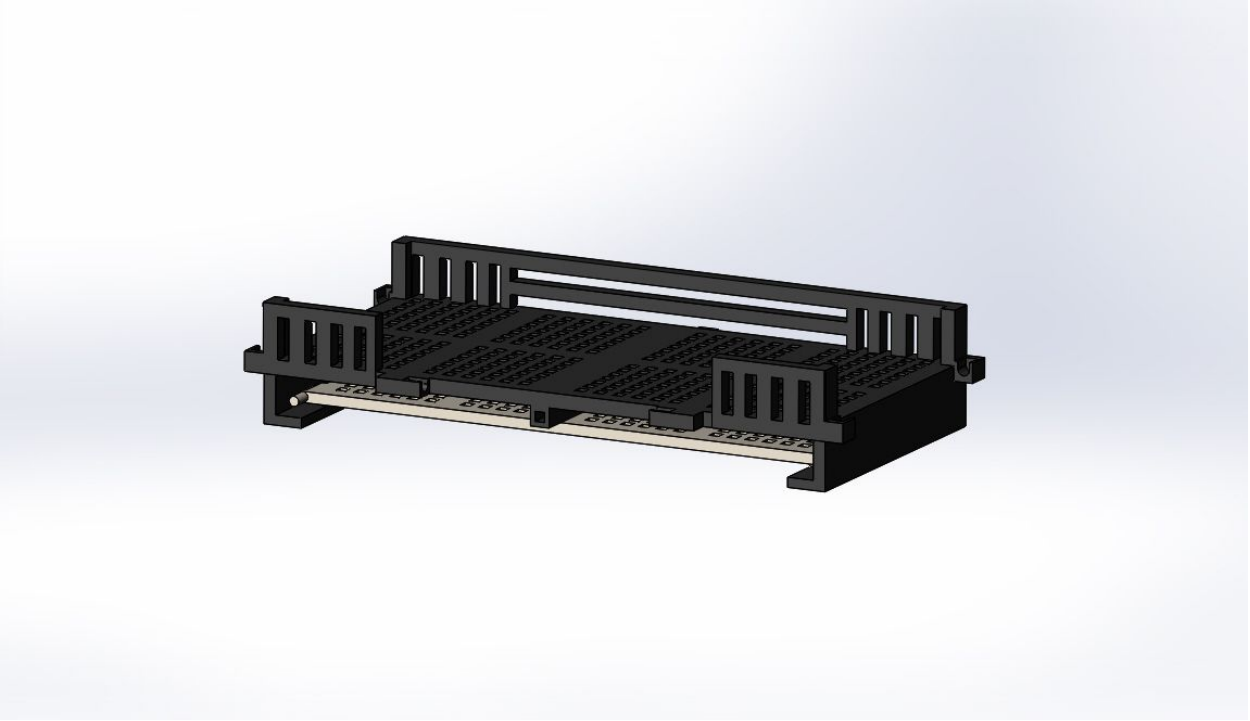
Here we see the assembly with the traditional side ramp



Here we see the ramp attached to the front on the cargo bed.

As we see, the front and side have wide path entrances to make it easier for wheelchairs and scooters to be loaded.

The stored configuration



Convenient and simple setup to get the job done every time.

Summary

In conclusion, the design chosens seems to be a good applicant to solve the multiple access dilemma. If given some more time and thought the design could be improved to reduce the overall weight and improve on bed design; this would add to the ease of use and reliability of product. The bed is too complicated, and would be better if broken down into a few pieces, that can be produced at a cost effective price.