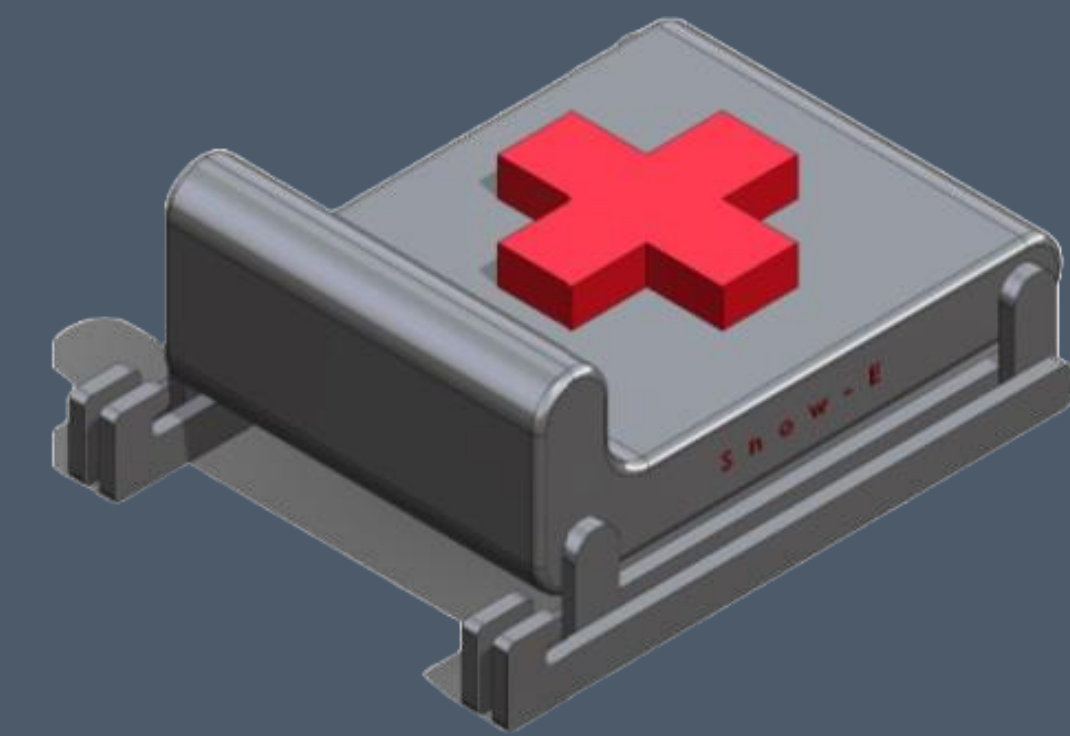




# Snow Emergency - SnowE

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## INTRODUCTION

**Purpose:** Create a first responder OHRV Trailer

**Details:** A few search and rescue groups in northern NH needed our help to redesign a new trailer as they were experiencing limitations of response time which jeopardized the safety of patient

## DESIGN CRITERIA

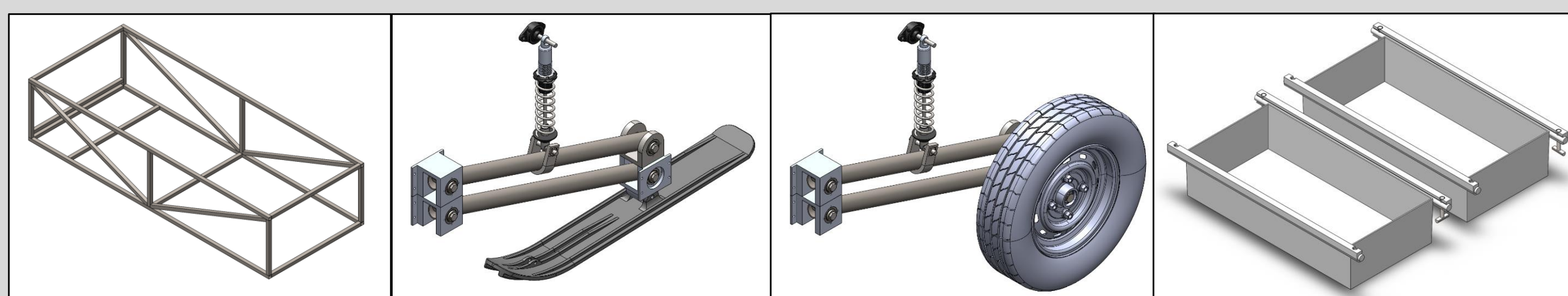
- Allows for storage of all the items requested
- Advocates for patient and responder seating inside a heated area
- Switches between skis and wheels
- Decreases response time by quick attachment points for all locations

## MECHANICAL DESIGN

**Frame:** 11 gauge 1x1 tube stock and 14 gauge sheet metal welded together.

**Suspension:** Parallel trailing swing arm suspension with interchangeable pivot points on the bottom for ski and wheel attachments.

**Storage:** Secure clamps on sides for light poles and underbelly containers with easy on off capabilities.



## INTEGRATED SYSTEMS

### Machinery:

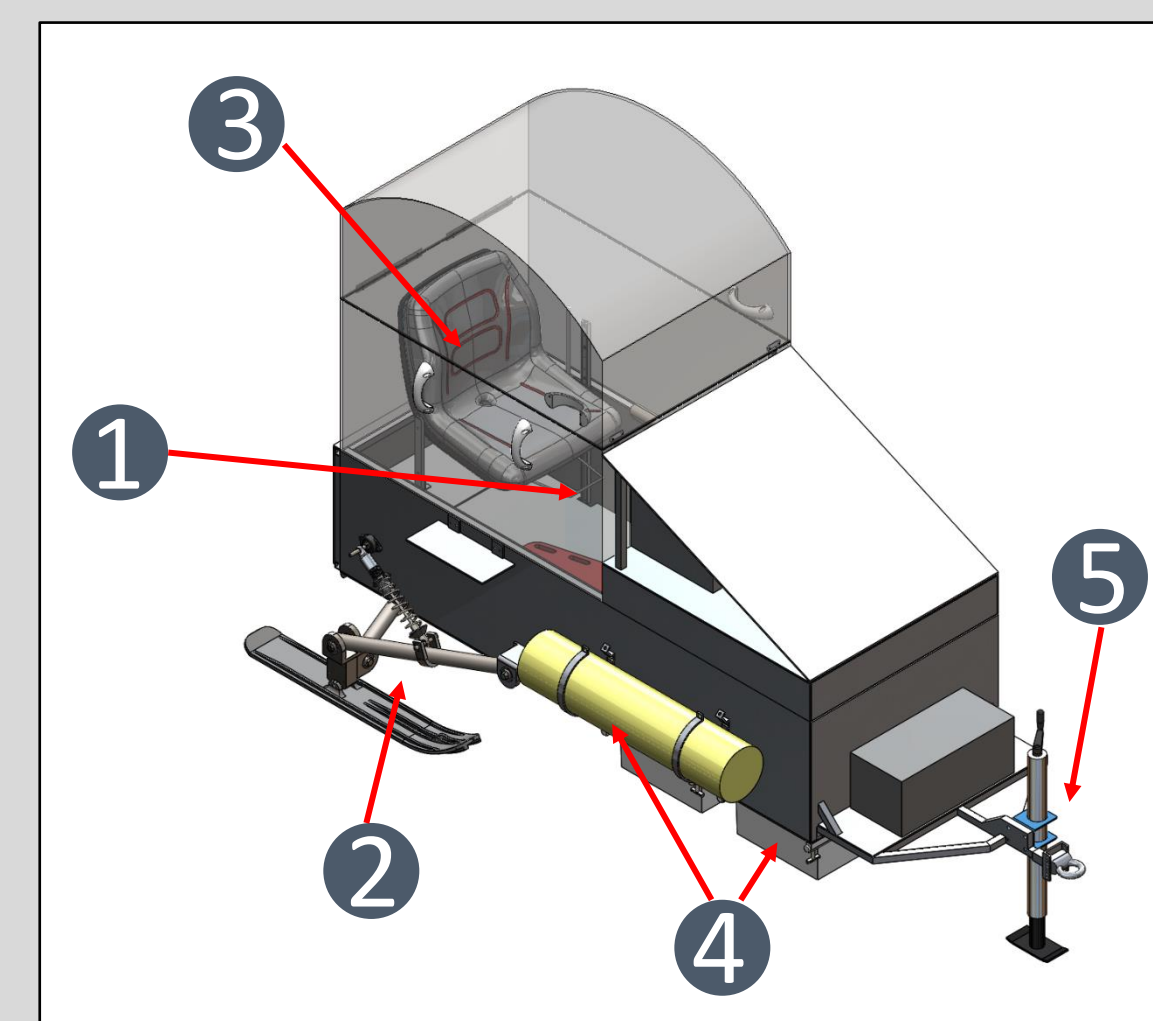
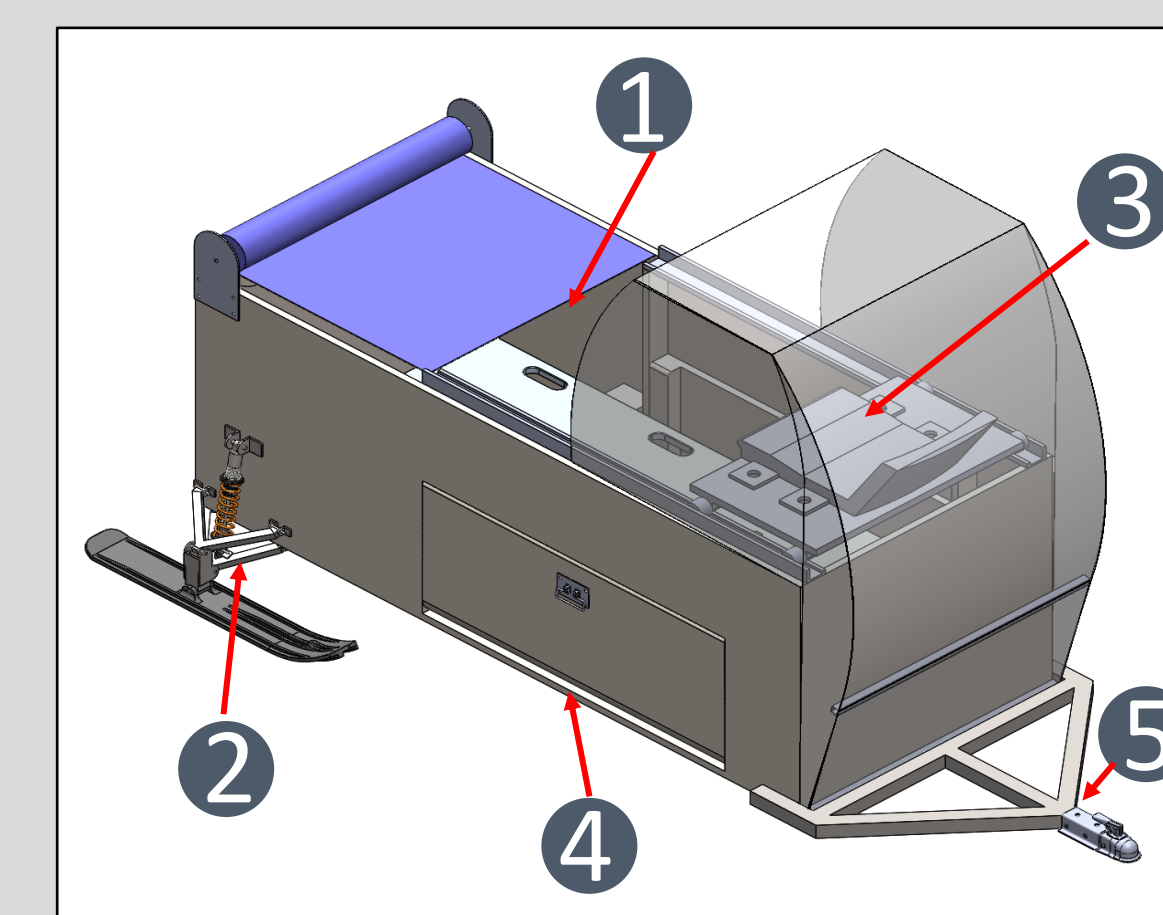
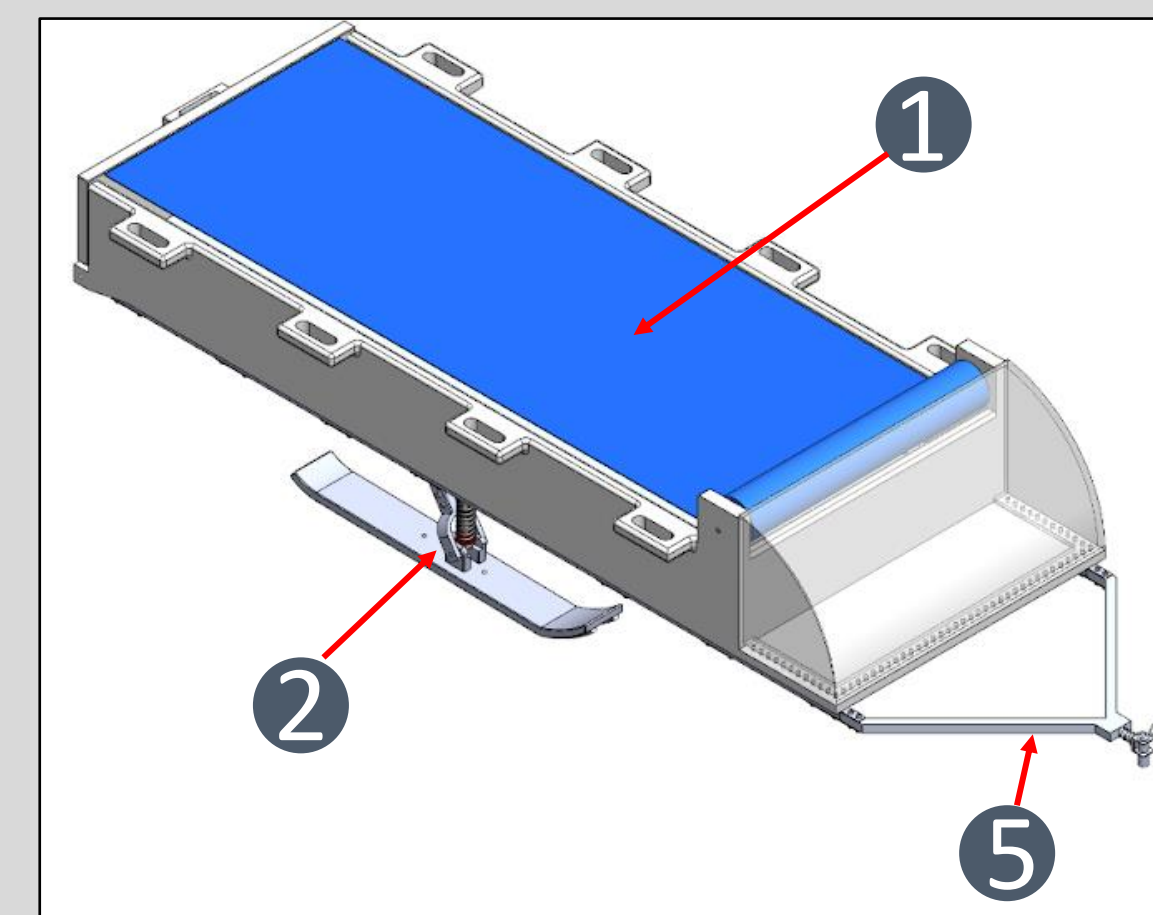
Maxiem Waterjet, Horizontal Band Saw, Tig Welder, Hydraulic Sheet Metal Press, Basic Machine Shop Tools

### Software:

SolidWorks, IntelliMax, Matlab, Excel



## REVISIONS



1. Enclosure
2. Suspension
3. Attendant Seat
4. Storage
5. Hitch

### Revision 1 - Top Left

**Problems:** Need space for attendant and a spot to store rescue equipment

**Solution:** Added a sliding seat and storage under the trailer with a door and compartment

### Revision 2 - Top Right

**Problems:** Seat facing the wrong way and there is no enclosure for the heat to be trapped in

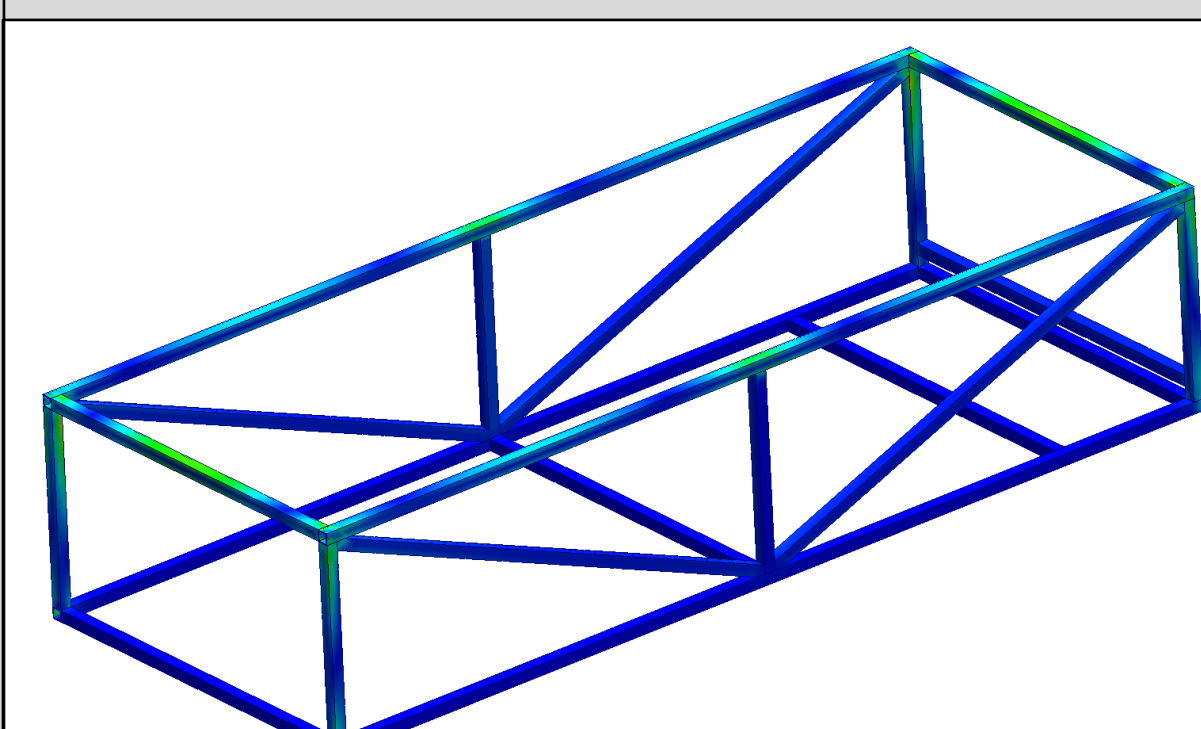
**Solution:** Seat for attendant flipped, storage underneath patient, fully enclosed the trailer with a soft top

### Revision 3 - Bottom Left

This is our current model and the one we have assembled for the rescue groups.

## ANALYSIS

We used the Finite Element Analysis tool in SolidWorks to test for weaknesses in our frame.



- Tested with 500 lbf
- Minimum deflection to ensure safety of patient
- Found critical points

## MANUFACTURING

- Trailer Manufacturing completed in 6 weeks.
- Manufactured through Advanced Automation and the Kingsbury Machine Shop



## SUMMARY

- The trailer was able to be tested in SolidWorks
- Assembled an approved model
- Our team colluded with multiple industry companies to overcome problems
- Ultimately leading to the use of multiple tools and software's that will further our experience

## ADDITIONAL WORK

- Organized Files in ASME Standard
- Worked alongside First Responders to gain valuable information
- Trained in welding and other industry techniques
- Successfully assembled the trailer and donated it to the northern rescue groups
- Over \$6,500 in parts and donations

## ACKNOWLEDGMENTS

Special thanks to Advanced Automation, TMS Diesel, HK Powersports and Central NH Trailers for their generous donations.

Thanks to Becky Bean and Michael Chappell and the rest of the Northern Fire and Rescue groups.

And to everyone else who supported us along the way.