Project Name – Underseat Luggage Holder for Wheelchair User

Overview
The intended customer is a spinal cord injured woman who travels using a wheelchair. She can propel her wheelchair but does not have anywhere to store her personal belongings and crutches when she gets to the airport. Because of the items she might be carrying onboard, our client does not want these items to be loose of her lab.

Objectives
- Secure storage of carryon luggage and crutches with no interference with the wheelchair's mobility
- Enable patient to navigate the TSA process
- Portability when wheelchair is folded

Approach
- The team visited sponsor to gather customer needs
- Concept generation was preform for each of the luggage carrier and crutch holder then concept selection was done using AHP method
- For the crutch holder and existing concept of a broom holder was used
- The team communicated with the client frequently to gather feedback on their progress.
- CAD models were created
- Two prototypes were constructed before the final prototype
- Two tests were preform on the luggage carrier and FEA on the crutch holder
- Final prototype met most of customer needs

Outcomes
- Luggage carrier is made of waterproof and tear resistance fabric
- Luggage Carrier can be attached in less than a minute and can be detached in less than 15 seconds
- A carrying strap was added on the bottom to allow user to use it as a personal bag going into the plane
- Crutch holder is attached to an aluminum platform and screwed to the back to wheelchair
- Crutches can be easily accessed to attach and detach when setting on the wheelchair