



Company Information

Company Name	Ideas for Good	Date Submitted	10/28/2022
Project Title	<i>Adan Transport Design (IDEAS_Trans)</i>	Planned Starting Semester	Spring 2023

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	1
Computer	1	Systems	

Company and Project Overview:

Brian Johanson created the project idea, *Adan Transport*, which is inspired by a 16-year-old wheelchair bound boy named Adan, whose mother and father have difficulties traversing him around places in his everyday life. After meeting their family at a local farm and discussing the daily difficulties Adan and his family face moving him around his favorite places, Brian decided he wanted to create a motorized platform Adan could be secured to that would enormously help him and numerous others in his situation.

Project Requirements:

The project objective is to create a platform to attach/secure multiple different types of wheelchairs for transport across challenging terrain. The platform is desired to be approximately 3'x 5' to accommodate different standards of wheelchairs and provide a greater and more stable base. The platform is should be sturdy enough to transport a wheelchair and occupant (total load of 500 lbs) over rough terrain and provide a minimum of 4" ground clearance. These dimensions may be changed depending on the design and engineering requirements identified by the students. *Adan Transport* will be motorized and controlled by an external remote-controlled device used by a guardian or escort. *Adan Transport* will include: all-wheel powered drive with braking capacities; front steering; and should be able to traverse a front/back incline/decline of 25° and a left/right incline of 15°. The optimal design should accommodate a maximum walking



speed of 2.5 to 5 mph. It must be able to maneuver over 500 pounds, as well as have a minimum of 2 hours of battery life.

Expected Deliverables/Results:

- What is *Adan Transport*: *Adan Transport* converts difficult-to-access spaces into accessible areas, offering wheelchair-bound individuals greater mobility and less physical exertion. *Adan Transport* enables special needs individuals to maintain the comfort and familiarity of their personal wheelchairs by providing a secure platform for wheelchair attachment. Ultimately, *Adan Transport* allows individuals to experience greater freedom while assisting caretakers and family members at many venues where wheelchair mobility may be difficult or limited.
- Why?: A motorized platform *Adan* could be secured to would enormously help him and numerous others in his situation. *Adan Transport* allows greater independence to families and/or caretakers in challenging settings where a great deal of physical energy is normally required to move the wheelchair user. *Adan Transport* alleviates the need for physical exertion while providing a safe and secure way of transportation. As an example, a family visiting a zoo, sporting arena, hotel, school, office, etc., could be provided with access to *Adan Transport*, allowing the caretaker to move the wheelchair-bound individual with relative ease using a remote control. In addition, difficult-to-traverse terrains which are normally not accessible to wheelchairs can be rendered accessible with the use of *Adan Transport*. *Adan Transport* will give independence and relief to both wheelchair users and families.
- Basic Details of *Adan Transport*: *Adan Transport* will have four individually powered wheels/tires with lower air pressure to absorb terrain irregularities and provide comfortable transportation as well as negative static camber. There will be an attachment on the platform which will secure the wheelchair user to the *Adan Transport*. There will also be a remote-control device that will be operated by the designated caregiver to transport the user around more easily. The long-range goal is to offer different models of *Adan Transport*, including models that are fully autonomous, but it is not a requirement for this prototype.
- Functionality: The optimal design should accommodate a maximum walking speed of 2.5 to 5 mph. There will be an emergency off switch/button. The platform will not be remotely driven or operated by the user, but by an external person such as a caretaker, family member, or escort. The remote control would most likely be one-handed with a thumb for steering movement and the index finger for throttle (similar to a Nintendo Wii Nunchuck Controller)



Disposition of Deliverables at the End of the Project:

Deliverables needed:

1. CAD drawings of all iterations and final design
2. Any output of mechanical simulations
3. Electrical schematics
4. Part list for all components
5. Build instructions
6. Test data
7. Final report with observations and recommendations for design improvements
8. Final physical prototype

List here any specific skills, requirements, specific courses, or knowledge needed or suggested (If none please state none):

- N/A