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The WILLIAM STATES LEE COLLEGE of ENGINEERING
Industrial Solutions Laboratory

Senior Design Project Description

Company Name	*Will Rice*	**Date Submitted**	*7/24/2020*
Project Title	*Small Track Rail Speeder* **(WRICE_RAIL)**	**Planned Starting Semester**	Fall 2020

Personnel

Discipline	Number	Discipline	Number
Mechanical	2	Electrical	2
Computer	1	Systems	
Other			

Company Overview:

This project is sponsored by an individual, Mr. Will Rice

Project Overview:

The United States has a long history of using rail lines for transporting people and goods prior to advances in interstate trucking. Rail infrastructure was extensive in many rural areas. In addition to industrial commercial transport rails, many cities implemented small rail and trolley systems to move people around. Many of these rail lines have since been abandoned as a result of more trucking, ocean shipping, and other methods of material transport. The car also assisted in the demise of many early, urban transit lines. All the rails still exist, since considerable cost would be needed to officially remove them. The question is, how can they be reused? Some of them are being repurposed as pathways for greenways, dubbed “Rails to Trails” projects. Recent innovation though has also created an option for them to be used for light, personal vehicle mobility.

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In Charlotte, we have an extensive, unused, set of rail tracks that run parallel to the Irwin Creek Greenway in uptown Charlotte. This greenway was built along the right-of-way used for an old trolley line, but many of the tracks remain in place, unused and unmaintained.

This project has the goal of creating a mechanized mode of transport ("Speeder") that is small and lightweight, to be used as a means of transport up and down the old, abandoned rail lines. The Speeder can be used for assisting people who want to get outside, whether they intend to do a full out and back trip or maybe just ferry one way while walking the rest of the greenway as a return trip.

Outside of Charlotte, there are additional opportunities for a vehicle that could use old, unmaintained tracks. Between Tryon North Carolina and adjacent Saluda, there are more than 10 miles of unused railway with beautiful scenery in the foothills of the Appalachian Mountains. This would be an excellent location for a "cross country" tour using a vehicle that can operate on rails.

This concept is not a new idea. In southeast Asia, it is not uncommon for people to rig together rail carts for use getting to and from the countryside. Sometimes the rails are still in use, necessitating the quick disassembly in the face of "heavier," competing traffic.

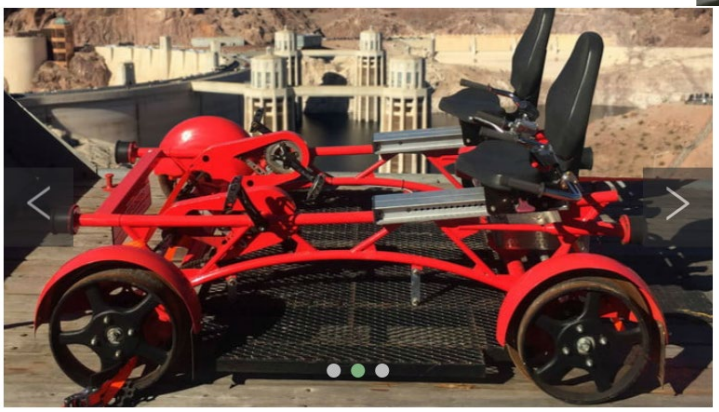
Project Goals/ Requirements:

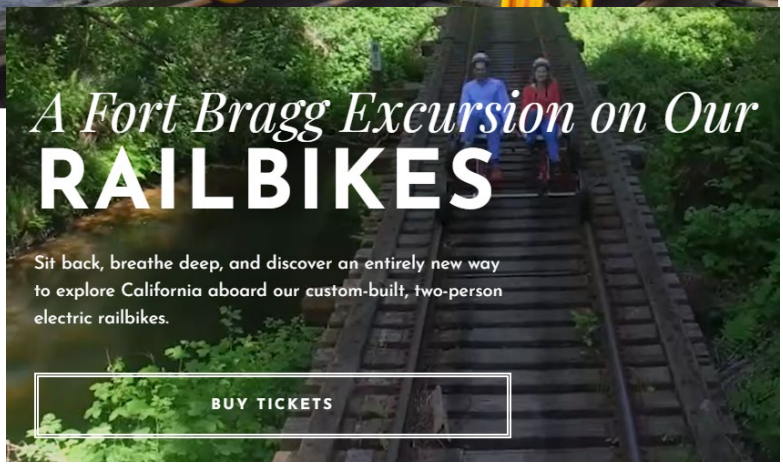
The intent of this project is create a cart that can utilize the Irwin Greenway tracks. Cart should be lightweight (<200 lbs) and able to be assembled without specialized tools. Base option should be utilizing a 10 hp Briggs

and Stratton lawnmower engine.

If time and funding is available, additional features could include alternative seating configurations, electric motor drive swap for the engine, "coupling" feature for groups, quick collapsing for portability, and added safety features.

Revolution Rail Co.





Reference Info for Brainstorming:

https://www.firstpost.com/world/watch-end-of-the-line-for-cambodias-homegrown-bamboo-train-3997127.html
https://www.singletracks.com/mtb-interviews/riding-on-rails-with-craig-durkin/
https://www.kirklandreporter.com/news/cross-kirkland-commute-man-constructs-rail-bike-to-incite-others-to-think-about-how-to-use-the-corridor/
http://rbp2009.blogspot.com/2009/11/richard-smart-bike.html
https://www.pinterest.com/brianetown/rail-kart-examples/
https://www.pinterest.com/bentleybeasley/my-rail-rider-design-concepts/
https://www.youtube.com/watch?v=_cktlY8JfvQ
https://www.youtube.com/watch?v=77dY8i5NqGM

Expected Budget: $1,000
Engine also provided
Seating for 2 also provided (optional)

Expected Deliverables/Results:

- Platform/ frame for Speeder (occupancy of 1)
- Method for mounting engine to frame
- Method for transmitting engine power to rails
- Method for keeping Speeder on rails
    - Rail spacing width varies
    - Rail depth above ground varies (sometimes there is no clearance, i.e. rail is flush with the ground)
    - Braking system

- Expanded Scope (at the discretion of budget, time, and team's choice)
    - Transmission to vary applied horsepower
    - Cosmetic/ aesthetic additions
    - Improved seating
    - Collapsible/ portability features
    - Increase occupancy
    - Safety features

Disposition of Deliverables at the End of the Project:

Work product to be handed over to the supporter post Expo

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

- Very interested in engineering students who would also be interested in possibly using this as a platform to get into entrepreneurism.