Project Description

Project Background:
Every year, RIT’s Baja SAE club designs a water-land vehicle to compete in competitions around the world. The goal of this project is to help the Mini-Baja team create the optimal water propulsion system for powering their vehicle during the water portions of the competition. The first portion of the project will be to design and build a testing device to measure the force of the propulsion system. This will aid in the second part of the project, which will focus on designing and testing a successful system that can be implemented on the Mini-Baja vehicle.

Problem Statement:
The primary objective of this project is to provide the Mini-Baja team with a recommendation for the best water propulsion option available within their constraints. The team will also provide documentation supporting this recommendation and testing results.

Objectives/Scope:
1. Design and build a testing device to examine multiple concepts.
2. Determine a method for retrieving and analyzing data from tests.
3. Propose and test multiple possible propulsion options and pick the best solution.

Deliverables:
- Functional testing device that Baja team feels comfortable using in the future.
- Repeatable testing process that Baja team understands and can implement in the future.
- Recommendation for top water propulsion solution to implement on vehicle.

Expected Project Benefits:
- Improved Baja vehicle performance in water competitions
- Proof of concept to provide Baja judges in the form of analysis data.
- Positive relationship with Baja club on which to build future MSD projects.

Core Team Members:
- Erika Soltis – Project Manager
- Greg Wall – Lead Engineer
- Henriette Bullmer
- Blaine Byers
- Eric Hodgkinson
- Stephanie Malinowski
- Ticiano Torres-Peralta

Strategy & Approach

Assumptions & Constraints:
1. A feasible solution can be found or built.
2. Testing materials (tires, etc) will be made available by Baja when needed.
3. The proposed budget of $1500 must be justified before it will be provided.
4. Solution must be usable by Baja in the future.
5. The team must gain an understanding of the complicated, interrelated elements of water propulsion.

Issues & Risks:
- New project area and customer.
- The customer does not have a clear idea of what they want.
- New area of study for many team members.
  - Many interrelated aspects contribute to propulsion of vehicle in water.
  - Team must determine appropriate elements of propulsion to test and optimize.
- Heavy course loads of all team members leave little time to meet and work together.
- Material and equipment needed for building and testing may not be available when necessary.
  - Lead time
  - Availability (if shared)