



# UMD LOOP

## University of Maryland's Competitive Hyperloop Team



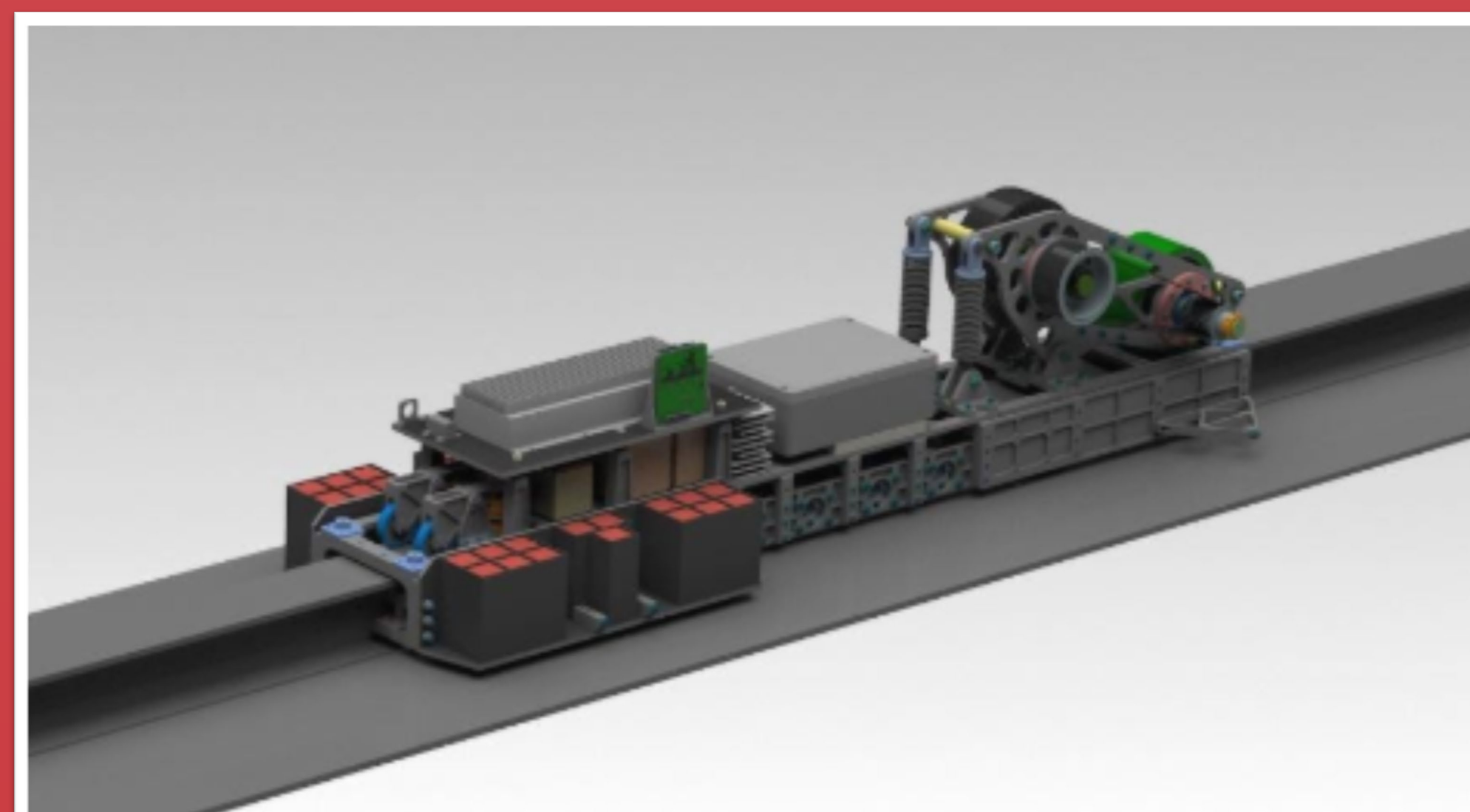
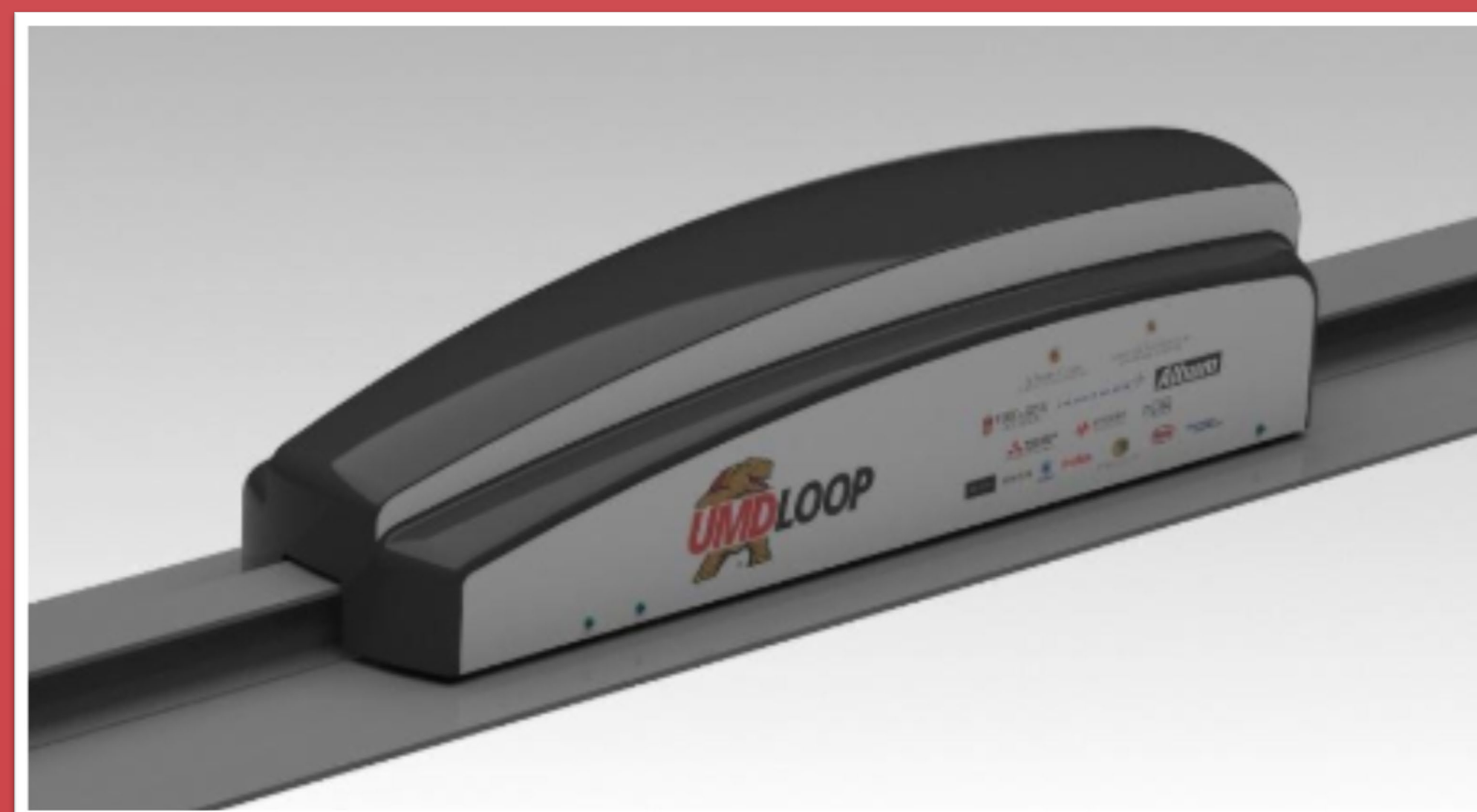
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Science, Discovery, & the Universe  
Aerospace Engineering

### The Hyperloop

The Hyperloop is a project proposed by SpaceX as a method of fast travel between metropolitan hubs. The final product will have a 'pod' travelling at high speeds through a vacuum tube to prevent drag force. Specifics of how this goal is to be achieved are determined through competitions hosted by the company. Examples of changes from competition to competition may be the track length, method of travel (i.e. gliding on an I-beam vs. on wheels), and weight and dimension restrictions of the pod. No competition has yet been announced for 2020.



### Tasks

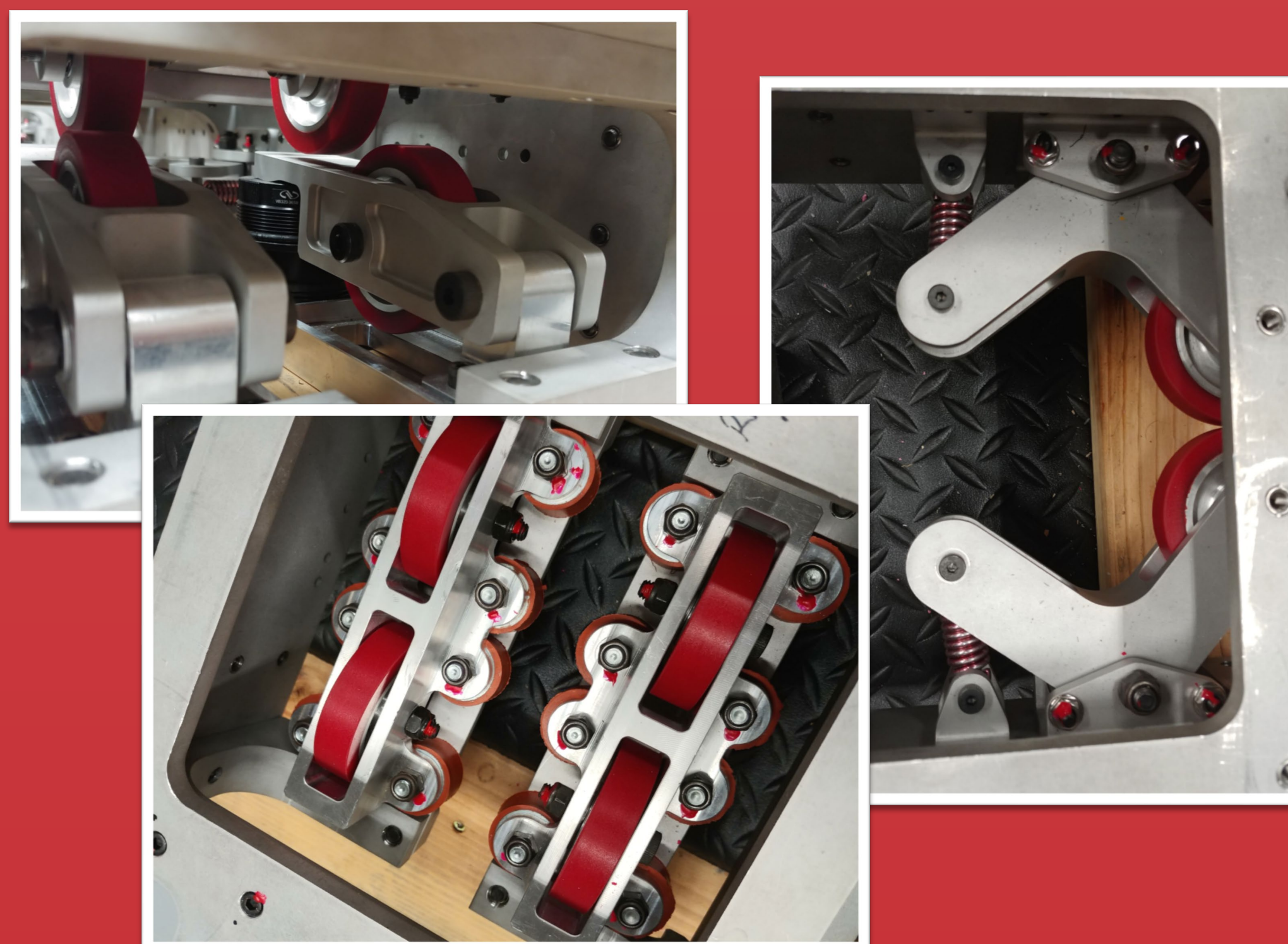
Some tasks I have personally worked on as a member of the dynamics sub-team:

- Contacting motor manufacturers to obtain data on motor curves and interpolating that data to be used in kinematic modeling
- Using MATLAB to develop a SISO state space model to determine suspension movement and force output to be used by chassis sub-team
- Moving forward, I will be working with a group of five other members on the NASA payload project.

### Goals

Since no competition has yet been announced, the team has been working to put ourselves in a position to hit the ground running. On the dynamics sub-team we've helped:

- Conduct a trade study on different motor/transmission combinations for future competitions
- Model the suspension's response to changes in track position (bumps and turns) and determine loads



Images: pod rendering (courtesy of UMD Loop), photos of suspension systems (photographer: Aidan Wallace)

### Future

UMD Loop hopes that after business resumes, a competition date will be announced soon. The team has put pod competition work on hold this semester and will continue work on research toward the Hyperloop and other engineering challenges. UMD Loop has given me invaluable experience working on a large-scale engineering project and important exposure to subsystems common in many aerospace vehicles.

A special thanks to my fellow students on UMD Loop, Dr. Noah Ryder, Dr. Alan Peel, and the rest of the SDU community!