

Will Brown

*Supporting the Future: design and Creation of an Air-Evacuated Maglev Tunnel*

In a study done in 2008 in China, run by Dr. Deng Zigang, it was predicted that a maglev train running inside of an air-evacuated tunnel has the potential to reach speeds of up to 1800 mph. By reducing the air pressure inside the tunnel to near 0.0 pa it is possible to reduce the total drag on the train by 80% - 90%. The goal of this project was to create a support for the tunnel that ensures the tunnel will not collapse as the air is pumped out. The design was based on the classic building strut support but was modified to act as a circular support. A small-scale model of the support was constructed using 1/16" and 1/32" thick stainless steel wire. The first method of testing the designed support, the vacuum test, was successful. The small-scale support was able to withstand one atmosphere of pressure with very little deformation. The second method of testing, the band test, was flawed so no accurate data on the support was attained. The support is able to withstand full atmospheric pressure, however, the full capabilities of the model are unknown due to the flawed test method labeled the band test. The intended application for this design was to create a way to support a large scale air-evacuated tunnel to prevent collapse due to outside air pressure.