

Sponsor: Tenneco Inc.

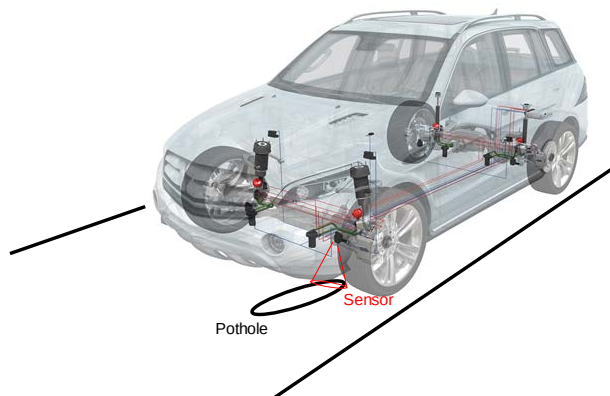
ECE 480- Road Condition Reporting System

This project focuses on expanding a vehicle system which recognizes potholes or other road hazards and utilize that data to enhance the driving experience. As autonomous vehicles become commonplace, road conditions will no longer be an active part of a driver's attention. Rather, a driver may be focusing on a work task, communicating through video, or be other activity. The vehicle will need to recognize road hazards independently and communicate this information to entities interested in the data (Department of Transportation, other vehicles, social media, or apps).

Tenneco is a world-wide manufacturer of automotive components that include shocks and struts for vehicles. As vehicles become more automated, the ride control and predictive nature of their decision making will also become automated by taking advantage of various detection and vision systems. These systems will enable Tenneco to have more data for controlling the ride performance of vehicles. However, there are more opportunities to utilize road condition data (e.g. pot holes) than simply changing the performance of a shock.

This project will focus on how the end-user (e.g. driver of a vehicle) could utilize road condition data through the use of a phone app integrated with the vehicle. Examples of app functionality could include:

- Inclusion of Social Media to road conditions (e.g. automatic tweets "Watch out for Main St, large pothole in front of Barney's Pub" or integration to Google Maps / Waze)
- Alert systems for other vehicles with the integrated road condition monitoring apps to help them avoid road hazards or potholes
- Algorithm for reporting potholes to a state's Department of Transportation for repair (Michigan's pot hole reporter: https://www.michigan.gov/mdot/0,4616,7-151-9615_30883_30885-69798--,00.html)



The design team will deliver their project to a small team of research engineers at Tenneco. The team will need to know how to design applications for use with a phone and how to integrate those apps with outside systems. The road condition data generated from a vehicle will be fictitious (GPS location, signals from road condition sensors, vehicle speed, etc.), unless the group would also like to design an aftermarket component to gather road condition data. However, this option is not necessary for the scope of this project. The student will be expected to brainstorm various ideas for utilizing road condition data and how to integrate that data into a phone app.

Contact: Bradley Fingland, BFingland@Tenneco.com (517) 522-5525