

## **Sponsoring Company: Atwood Fencing**

### **Team Members**

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**Application Name:** An Impact Detection and Monitoring IoT Sensor for Roadway Safety Devices

### **Problem Statement:**

There are thousands of guardrails on roads all over the nation. The terminal end section of a guardrail is often damaged due to vehicle collisions. When a vehicle collides with these guardrails, the Department of Transportation (DOT) sometimes does not find out for several weeks after the incident. Departments of Transportation or similar agencies who own, operate, and maintain these assets have to send a driver to check for damage on said guardrails. The process is time-consuming, error-prone, and results in taking several weeks to be made aware that the rails were damaged. The delayed time to discover damage also causes delays in repairs due to unawareness of such collisions. This leaves drivers in that area's lives at risk as the damaged guardrails increase the chances of vehicles falling off bridges.

### **Proposed Solution:**

- Develop an inexpensive device to detect collisions with the guardrail and alert the appropriate parties when a collision occurs.
- With these alerts, those involved in maintenance know immediately when a guardrail is damaged. This allows for a faster turnaround for repairs and a higher chance to identify the at-fault parties and recover the costs of repairs and replacement from their insurance with near real-time notification.

### **Benefits:**

- This solution is more efficient than sending an employee to check for damage due to its increased time of alert allowing for repairs to begin sooner.
- By using our sensor, the department of transportation is spending less on inspections as the inspection driver no longer has to work as many hours checking all of the guardrails himself, and the DOT does not need to pay for as much gas for his vehicle.
- There is also significant error reduction using this method. The inspection driver can drive by a guardrail without noticing that it has been damaged. This sensor not only alerts when it is damaged but also by allowing the DOT to remotely check the status of these sensors, having one offline can still be a sign that something might have happened at that location.