

# Implementing an Alert System for Trains at Level Crossings

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Train crossings are commonplace through US roads; they are a vital part of our transportation systems. Train crossings, however, introduce precarious conditions to our daily commutes. Two crossings can look radically different (IE, protected vs. unprotected crossings), causing confusion amongst drivers. Studies have shown that train crossings have larger accident rates than other road locations. Further, train crossings cause disruption to traffic flow, causing increased commute times. These delays are a public nuisance and can be deleterious when Emergency Response Vehicles are stopped behind the tracks during an emergency. In one particular instance, first responders even had to crawl underneath a stopped train to perform life-saving emergency procedures. These issues could be mitigated if commuters were aware that a train was set to cross their path. To make this possible, this project created a detection system for alerting nearby civilians of the train crossing the railroad. Using a CNY-70 infrared sensor, an HC-06 Bluetooth Module, and an Arduino Uno, a model system capable of detecting the speed, time, and location of the train was designed. Once the train is detected, the system sends an alert that warns users of the incoming train, providing them an opportunity to plan accordingly. The system developed in this project could decrease commute times, prevent traffic accidents at rail crossings, and save lives.