BART Tunnel Ventilation

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Project Description

BART has tunnel ventilation systems in place to assist in emergency fire situations. Our design will be a failsafe to ensure fans are running in supply or exhaust, as confirmed by central. The system must also monitor power output of fan to ensure proper fan operation is occurring.

Conclusions and Recommendations

To address BART’s emergency tunnel ventilation fan safety operation procedures Railwaze compiled a comprehensive system that confirms three main features: fan operation direction, wind speed through the ventilation duct, and power supplied to the fan system. The proposed solution incorporates a 2D Wind Sonic Ultrasonic Sensor, a Split Core Current Transducer, a Remote Terminal Unit, a wall mount, and the required cabling. The system proposed by Railwaze allows BART to ensure that each emergency fan is operating in the proper orientation during an emergency situation via data that reflects: whether the fan is operating in supply or demand, if debris or other materials are blocking a fan inlet and reducing maximum fan speed, and finally if a fan is being supplied the proper power required for operation.

While this system has components that are rated to last many years it may be advisable for BART to consider cheaper alternatives for the ultrasonic sensor. Railwaze has determined that having the added benefit of knowing the max and average wind speeds within each ventilation site is a valuable piece of data. If BART determines that the velocity of air within the ducts is not a required data point then it may be advisable to find an alternative solution, though not overly necessary.