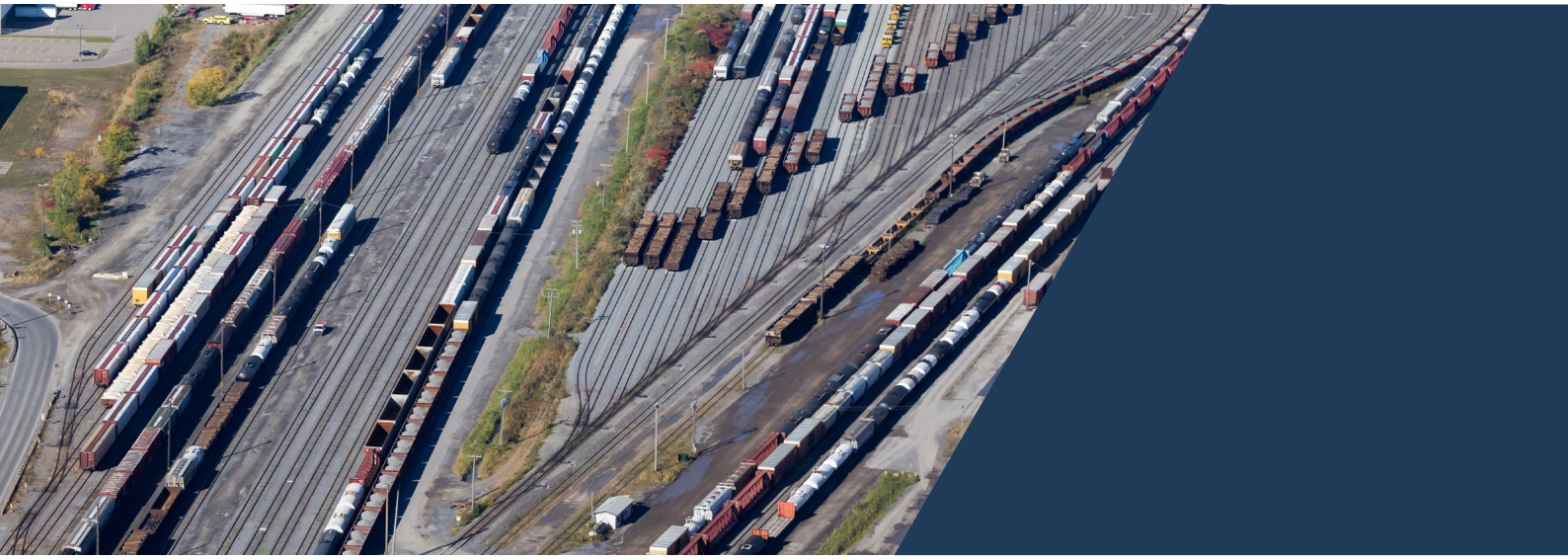
FRAUSCHER



Case Study

Frauscher Track Vacancy System FTVS

Product Test | Class 1 Yard Application

Development of the FTVS: from concept to a trial installation

The Frauscher Track Vacancy System FTVS has been designed as a cost effective axle counting solution for use in various non-vital applications. During the initial development phase of this system, a number of pre-production units were released to be tested in the real-world environment to examine their overall performance and gather any feedback from users. The primary intention was to measure the level of availability and reliability provided by FTVS in typical yard environments - subsequently, several trials were set up in the United States. Other key measurements of the trial included ease of installation and maintenance, as well as the ability to seamlessly integrate the system into existing yard infrastructure.

Common track circuit issues in yard environments

Rail yards typically have a large number of switches, and the installation of track circuits to control these switches requires many joints and bonds which presents the operator with additional system complexity and greater costs. Furthermore, track circuits frequently experience performance issues due to adverse environmental and rail conditions, including rain, dirt, extreme temperatures and changing ballast resistance. However, axle counting systems from Frauscher, including the FTVS, are not impacted by such adverse factors, making this test setting an ideal location to assess the performance of the FTVS and showcase its benefits over track circuits.

Details of one of the trial installations

The proof of concept began in October of 2022 and was completed by March of 2023. As part of one of such trials, three Frauscher Wheel Sensors RSR110 were installed at a switch in the yard and connected to the FTVS. During the test period, the system was monitored regularly by Frauscher engineers and the collected data showed that an average of 30 vehicles and 3600 axles traversed the test track section on a daily basis. Throughout the duration of the trial, no miscounts, resets or equipment failures were recorded.
The general layout of the FTVS in this particular trial is depicted in Figure 1. The Wheel Sensors RSR110 were installed quickly and conveniently thanks to the patented Frauscher rail claw which eradicated the need for any drilling into the rail. The cables connect each sensor to its own junction box (JB), and a four-conductor signalling cable is used to connect to the wayside equipment. The wayside equipment is housed in a signal controller where it is installed on a DIN rail, requiring only a small spatial footprint of approximately 7x12x11 centimeters (as shown in image 1).

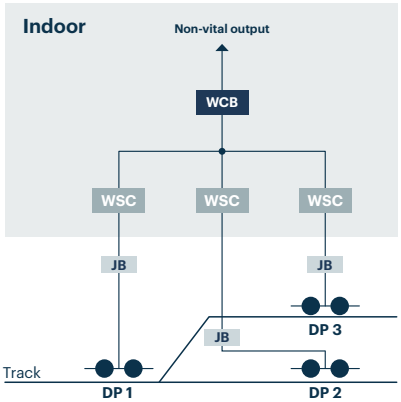


Figure 1: General layout of the FTVS system in this trial

This wayside equipment consists of one Frauscher Wheel Signal Converter WSC per wheel sensor, with each WSC being connected to the Frauscher Wheel Counting Board WCB.

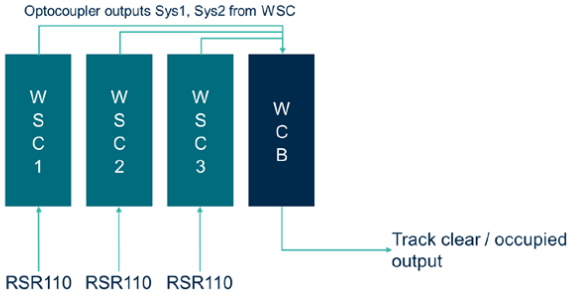


Figure 2: General layout of an FTVS system

The WSC converts the analogue output received from the RSR110 into digital pulses and the WCB then takes this information and provides clear and occupied status outputs for a specified track section.

If a wheel traverses any of the sensors from either direction, the track section goes into an occupied status and will remain occupied until the same number of axles is counted out and the count equals zero – only then will the track section return to “clear” status. Furthermore, the counting in and counting out of axles can occur simultaneously with different sensors.

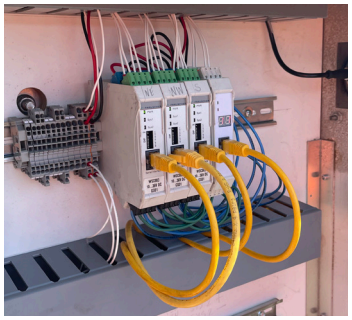


Image 1: Equipment at the site

Conclusion

The trial of the FTVS and the proof of concept was deemed as a success, mainly as the system ran without a single miscount, reset, or equipment failure for the duration of the trial. In addition, the test enabled the railroad operator to assess the ease of installation, integration, and maintenance of the FTVS, highlighting the clear benefits over track circuits. As a further testament to the successful implementation of FTVS and the system’s ease of use, once the trial was completed, the railroad operator decided to move the FTVS equipment from this yard and reinstall it in a different yard without assistance from Frauscher. The system is currently operational in the second yard, and the operator’s intention is to confirm and repeat the impressive results seen in the original location.