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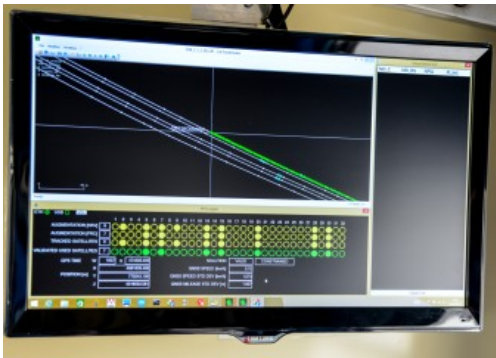


**INNOVATIONS  
AND TRENDS**

## GNSS and virtual balises for rail



Track & signalling site



Testing and demo of the EU GNSS-based train positioning solution

Satellite-based positioning is a game changer for ERTMS innovation, with the potential to reduce infrastructure-related costs and increase the efficiency of railway signalling systems. Augmented GNSS - including Europe's Global Navigation Satellite Systems Galileo and EGNOS and complemented by other sensors - can satisfy the stringent rail safety and integrity level requirements. Based on the results of the latest EU R&D projects, in the near future, train positioning – currently based on physical balises – can be complemented by virtual balises, relying on precise GNSS-based positioning and maintaining the operational safety of the ETCS. Galileo and EGNOS deliver integrity, improve availability and enhance accuracy, providing the innovation backbone for safety-critical positioning.

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Subject to further change