MARITIME AND RAIL
Radar Planning and Wireless Communication

Full-coverage surveillance, positioning, and communication are the means of securing safety and tracking for sea vessels and trains. Make sure that there are no blind spots in your coastal waters resulting from interference or lack of coverage on railway lines. Altair® Feko®, Altair® WRAP™, and Altair® WinProp™ provide all the required planning capabilities.

Intuitive Workflows, Comprehensive Results, Actionable Insights
Full coverage for radio communication, navigation systems, and coastal surveillance radars is essential to ensure safety in busy coastal waters. WRAP is a comprehensive system, ideally suited for maritime applications.

SAFETY AT SEA DEMANDS HIGH-QUALITY RADIO COMMUNICATIONS AND NAVIGATION.

Manage both with optimized planning tools to achieve system requirements.

Finding ideal locations for radars and coastal radio stations to achieve optimal coverage of territorial waters and economic zones is a simple task with WRAP. Use detailed geographical data and advanced radio wave propagation models to ensure high accuracy and quickly identify blind spots that may need complementary coverage.
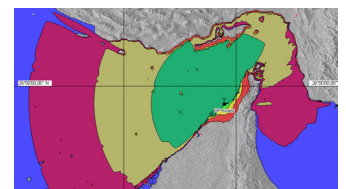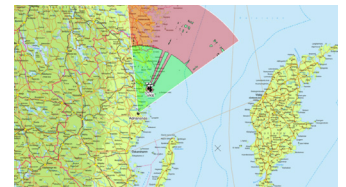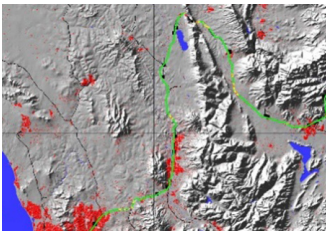

TOP: Obstruction manager map for fixed radar station
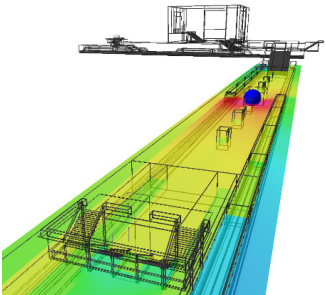**BOTTOM:** Coast station ground wave coverage
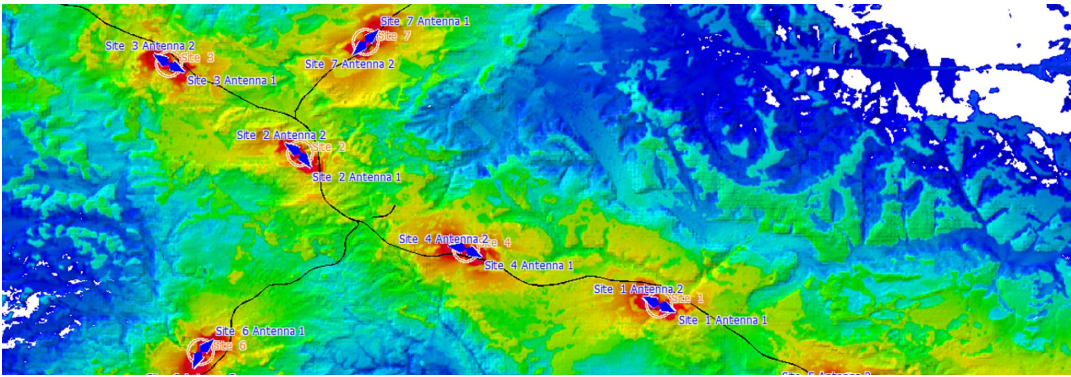
Radio coverage along railway tracks

Dual station LTE-R coverage of part of a railway network

Underground station coverage

For railway communication networks, WRAP offers integrated tools that let users plan for coverage, interference, redundancy – even in the event of base station failures – and account for traffic properties as well as microwave point-to-point/multipoint links for backbone network planning. Capabilities such as the wireless network cost and coverage optimizer automatically places base stations at optimal locations and reveals optimum antenna heights. WRAP also provides frequency assignment and analysis tools that ensure minimum interference and maximum communication reliability.

ACCURATE ANALYSIS AND PLANNING KEEP YOUR RAILWAY COMMUNICATION ON TRACK

Train/metro operators face rising traffic volumes while guaranteeing passenger safety and real-time multimedia accessibility. Feko's antenna design and placement capabilities along with WinProp's short- to medium-range wireless network planning and implementation tools collaborate to simulate antennas and leaky feeder cables in 3D environments. Simulations encompassing WiFi, LTE-R, and FRMCS across various railway settings including stations, tunnels, and on board ensure optimal networks and antenna designs.

COST AND COVERAGE OPTIMIZER

Site and station locations

Propagation models and calculation parameters

Optimization criteria

Experience streamlined planning and efficient spectrum utilization for site/station locations.

Optimize for best coverage with required redundancy along the railway tracks for a fixed cost or the lowest cost for a defined percentage of track coverage. And with the frequency assignment and interference analysis tools, WRAP achieves minimum interference and maximum communication reliability for cost-effective networks with less workforce planning.

Learn more at **altair.com/wrap-applications**