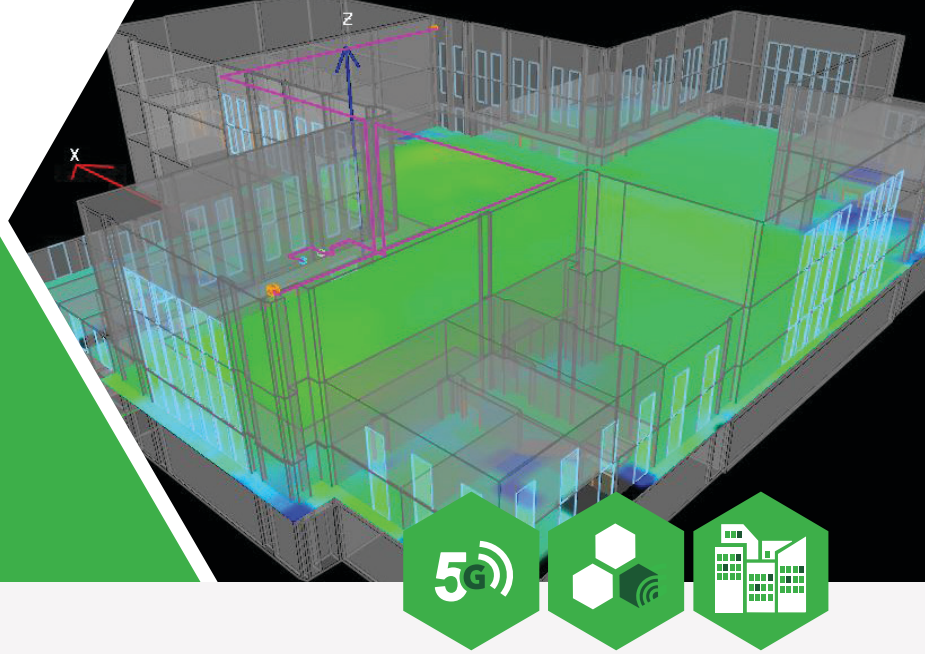
Ranplan WIRELESS



Case Study MEDIA BROADCAST

Designing standalone private 5G networks for media companies to comprehensively test 5G applications in a real environment.

Overview

Media Broadcast own a transmitter station in Nauen near Berlin - one of the oldest continually operating short-wave transmitters in the world – which they have modernized with innovative 5G technology.

They operate a 5G Standalone campus network that is available to companies - particularly media companies and event organisers - that are looking for the opportunity to comprehensively test 5G applications on protected frequencies in a real environment. There has been a focus on applications using the fully flexible 5G solution to make future TV production easier.

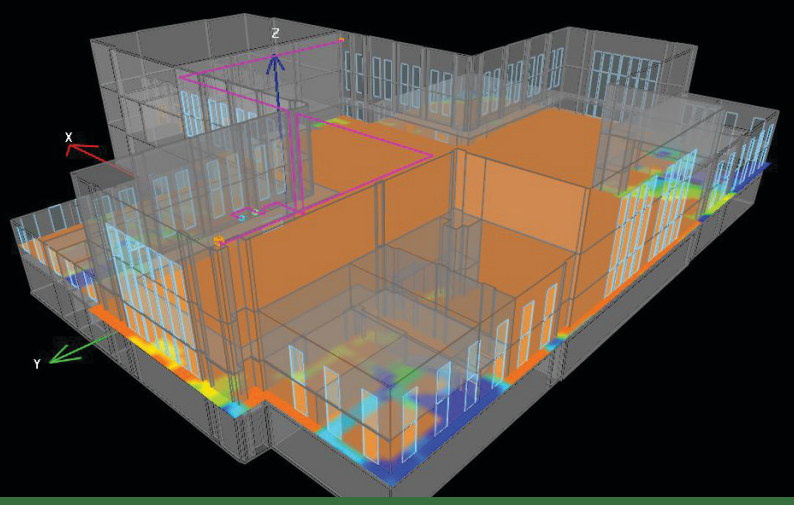
The purpose of these network designs is to provide the end users with a comprehensible impression of the planned 5G coverage across the Nauen site.

Challenge

Media Broadcast were seeking to evaluate and visualise how their 5G standalone mobile technology system would perform across their 10km² site for a variety of customer use cases.

Media Broadcast received a 10 year license from the Federal Network Agency to use 100 MHz bandwidth in the frequency spectrum 3.7 - 3.8 GHz for their Proof of Concept projects. 5G offers the significant data capacity needed for high-definition video productions. At the same time, the shorter signal range at higher frequencies and optimisation for line of sight must be taken into account when planning the network.

To deliver the required 5G wireless coverage across Nauen's large broadcasting hall and significant parts of the surrounding site amounting to approximately 1 km², Media Broadcast would need to plan and adjust their network to cater for the variety of use cases.

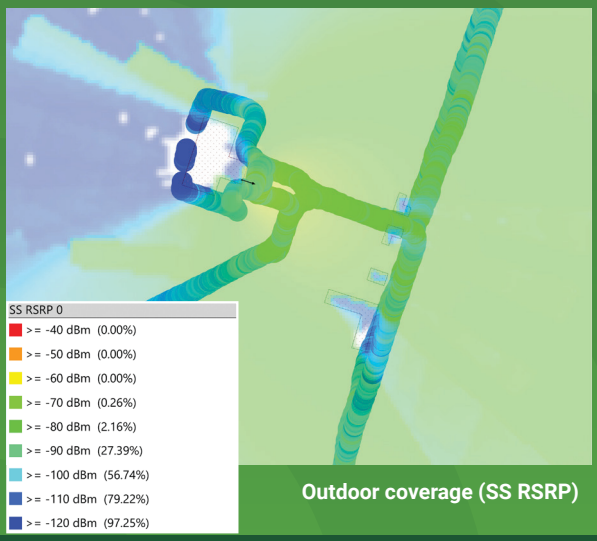


Solution

Ranplan Professional is being used by Media Broadcast to facilitated the familiarisation process of the private network for 5G applications. Using the intuitive modelling tools, the engineers were able to quickly create a 3D model of the Nauen campus, and then define the physical properties using the materials database within the Ranplan software.

The wireless network system was then planned using replicated devices and optimised with the Automatic Cell Optimizer, before wireless coverage and throughput predictions were calculated using Ranplan's built-in propagation engine.

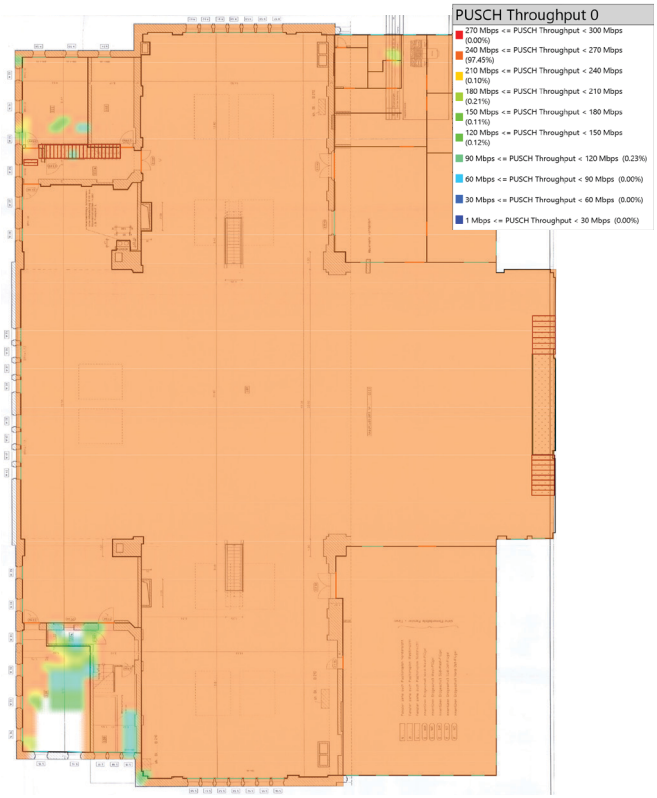
The TDD (Time Division Duplex) configuration within Ranplan was used to define the number of downlink (DL) and uplink (UL) slots within a frame of the 5G network. This allowed Media Broadcast to design and optimise the network to meet the requirements of the specific 5G use case.



Outdoor coverage (SS RSRP)

Results

The coverage heatmap calculations showed the 5G standalone system could achieve good coverage. This was confirmed by a 'walking test'.



2x2 MIMO Indoor uplink throughput (PUSCH) prediction

The throughput calculation resulted in values of 819 Mbps for the downlink (DL) and 242 Mbps for the uplink (UL). The measured values were 753 Mbps (DL) and 185 Mbps (UL). This provided good information for dimensioning, optimised operations (transmission power) and avoiding interference in future projects.

The ACO (Automatic Cell Optimizer) proved to be a very powerful tool for Media Broadcast. It can be challenging to use multiple cells on the same frequency because it can cause interference which significantly reduces the data rate. This can be managed by minimising interference through the adjustment of transmission power as well as the positioning, alignment and lowering of the antenna is not a trivial problem. Ranplan's ACO offered a convenient and time-saving method to solve the problem.

MEDIA BROADCAST

"Ranplan Professional is used intensively by Media Broadcast. The fast and easy 3D building modelling is to be emphasised as a picture is worth a thousand words. The presentation of the common KPIs gives our customers a comprehensible impression, e.g. the planned coverage."
- Paul Weiss, Media Broadcast

5G