

# Perfecting Network Design with Ranplan Software Solutions

Design, optimise and automate in-building  
and urban outdoor wireless networks



# Achieve cost-effective seamless connectivity with **Powerful HetNet Designs**



Achieve  
**30%**  
CAPEX / OPEX  
savings



Design  
productivity  
enhanced by  
**50%**





## Perfecting Network Designs

We pioneer software solutions that perfect the design, optimisation and automation of in-building and urban outdoor wireless networks.

Our open platform simplifies network planning by allowing imports of geographical data, floorplans, mesh objects, and 3D building models from BIM authoring software. The intelligent automation and 3D ray-tracing simulations expedite the design process, expertly identifying potential issues and optimizing network performance for reliable connectivity.

Our software has proven to **enhance design productivity by 50%** and **reduce CAPEX/OPEX by 30%**. This supports the swift and cost-effective delivery of advanced wireless networks, providing an unmatched quality of service for end-users and businesses.

## Leading the way

We are on a mission to greatly improve the wireless communication between people and machines by developing software solutions that can perfect the way the world is wirelessly connected.

Ranplan Wireless is at the forefront of research and development in radio propagation, small cells and DAS networks, automatic RAN optimisation and the deployment of complex HetNets for cellular, private wireless, public safety, IoT and Wi-Fi communications.

Our experts harness the latest in computer science and Artificial Intelligence (AI) to elevate the quality and performance of our network engineering platforms supporting current and future wireless technologies and services.



Private Wireless



Public Safety



Cellular Networks



Enterprise Wi-Fi



Buildings



Cities



Industrial



Stadiums



Tunnels



Campuses



Ports

## Design your indoor and outdoor wireless networks in one platform

Ranplan Professional is the most powerful platform to simultaneously design in-building and urban outdoor wireless networks, calculating propagation interactions between the environments.

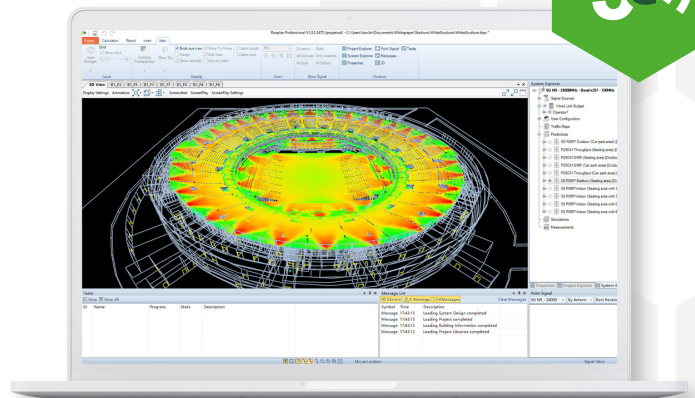
Efficiently generate your 3D environments by importing geographical data, floorplans, mesh objects, and 3D building models from BIM authoring software. Accurately replicate the real-world scenario by assigning building materials to the structures.

Optimise network performance and energy consumption with intelligent automation modules that automatically enhance network configurations.

Simulate network coverage, capacity, latency and reliability with Ranplan's true 3D ray-tracing propagation engine. This will allow you to evaluate and predict the end users' quality of service.

The results can be used to measure the return on investment, empowering you to make informed decisions on deploying cost-effective network solutions that meets coverage, capacity and other key performance indicators.

5G



### Complete HetNet design

Fully model and plan your indoor and urban outdoor networks.



### Rapid and cost-effective

Boost design productivity by **50%** and deliver up to **30% cost savings** in CAPEX / OPEX.



### Fast indoor 3D ray-tracing

Realistic 3D modelling capability and advanced propagation engine for design precision.

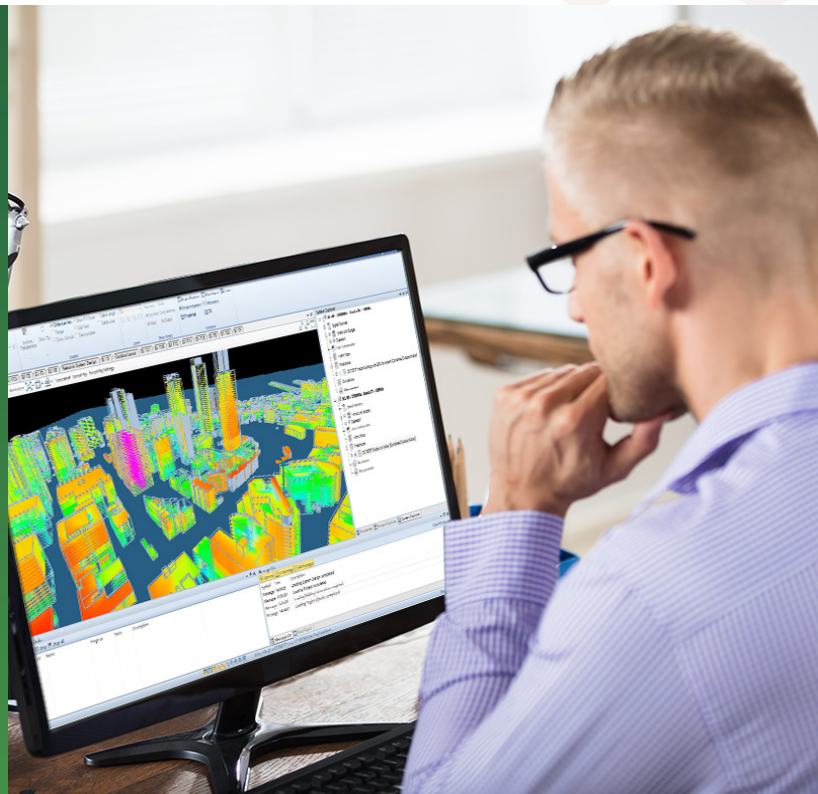
## Maximise network performance with Ranplan's optimisation modules

Create optimal network topology by optimising the route of cables and selection of components.

Optimise channel allocation and transmission power, reducing inter and intra network interference and signal leakage.

Automatically fine tune antenna location, quantity, transmission power and type.

Define network system measurements such as signal strength, coverage and leakage to analyse system performance and optimise the network design.





## Ranplan In-Building

### Predict and optimise indoor coverage and capacity

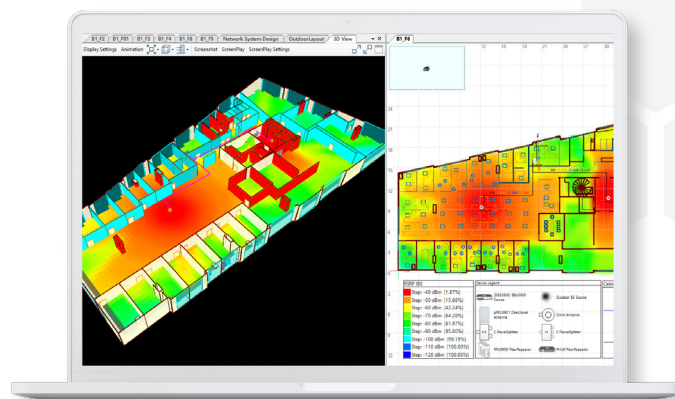
Ranplan In-Building is a comprehensive and high-performance planning tool offering a swift and cost-effective solution for the design and optimisation of indoor wireless networks across a diverse range of applications.

Accelerate your design time by importing 3D building models from Building Information Modelling (BIM) IFC files or CAD floorplans.

Predict and evaluate wireless coverage inside complex indoor environments using Ranplan's true 3D ray-tracing propagation engine.

Intelligent optimisation tools ensure planned networks work across multiple technologies to meet wireless service KPIs.

The automated reporting editor provides users with a convenient and fast way of producing a variety of reports at the simple click of a button.



#### Indoor design solutions

Perfect for large, complex in-building projects such as DAS, small cells and Wi-Fi networks.



#### Multi-technology support

Supports multiple technologies such as 5G NR, 4G (LTE), 3G, IoT, Wi-Fi, TETRA, DMR and P25.

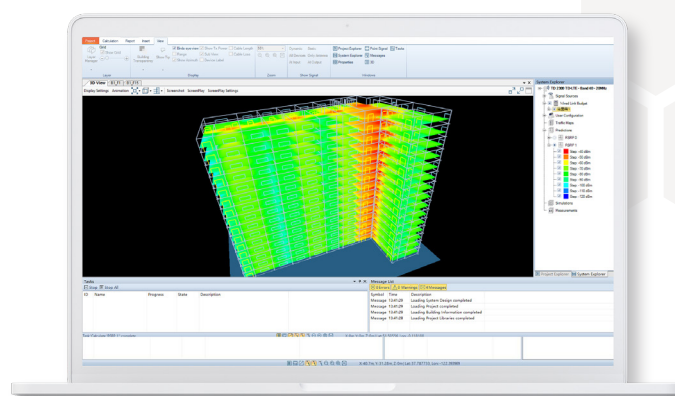
## Ranplan In-Building Lite

### Accelerate and validate in-building network delivery

Ranplan In-Building Lite simplifies the process of designing in-building public safety wireless networks with the Intelligent Topology Optimisation (ITO) module that automatically optimises the physical topology of the in-building network.

The Lite version of Ranplan's 3D ray-tracing propagation engine validates indoor coverage designs before physical deployment, to ensure reliable signal strength will be delivered in an emergency. Precise planning mitigates the need for subsequent upgrades, contributing to both time and cost savings.

The powerful and automatic reporting feature provides real-time project information and reports with just a simple click, ensuring projects stay on course and align with the customers' requirements.



#### Cost-effective designs

An agile tool for designing small to medium enterprise projects requiring ubiquitous coverage.

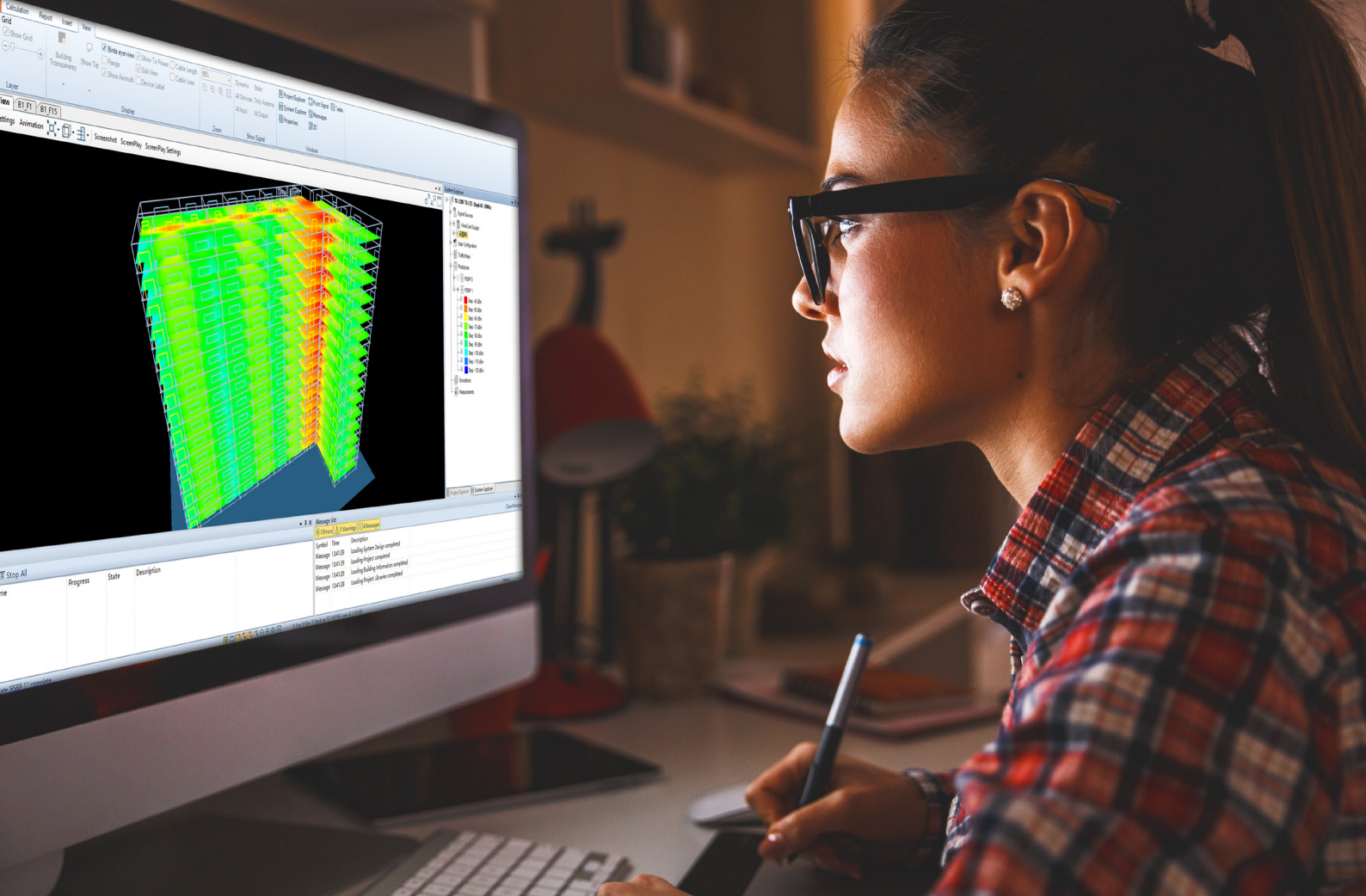


#### Public safety networks

Ideal for rapidly designing indoor public safety networks that meet wireless coverage and capacity KPIs.







# Ranplan Certification Program

Advance your wireless network design skills



## Real World Examples

Directly apply the knowledge and experience you gain to a live working scenario.



## Certify your Skills

Accelerate your career with Ranplan credentials in complex HetNet design.



## Designed by Experts

Courses created by experts who have extensive experience designing wireless networks.



## Dedicated Support Team

Our teams are on hand if you have any require assistance during the course.





## Ranplan Tablet

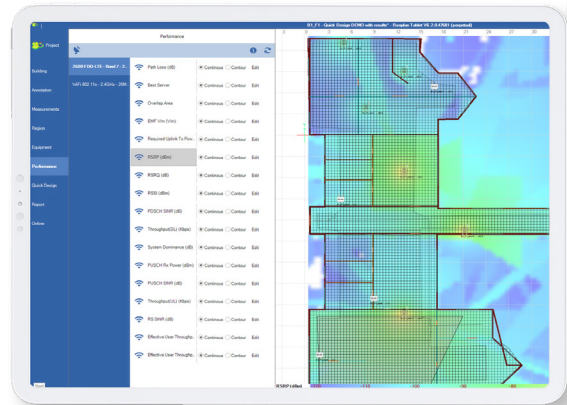
### Simplify and speed up onsite wireless network design

Ranplan Tablet is the ideal onsite survey tool for the easy and quick capturing of building information to begin planning a wireless network.

The enhanced and intuitive interface and Intelligent Design Module helps users with limited RF planning or optimisation knowledge to rapidly plan preliminary indoor network designs.

With capacity and coverage heatmaps users can visualise predicted network performance in 3D based on defined KPIs.

Generated reports facilitate simple verification and validation of proposed system designs. These reports seamlessly integrate into the project bidding process, enabling the swift production of quotes and timelines.



#### Automate onsite design

Quickly and easily capture site information to begin the in-building network design.



#### Seamlessly interoperates

All Ranplan planning tools and Collaboration Hub interoperate with Ranplan Tablet.

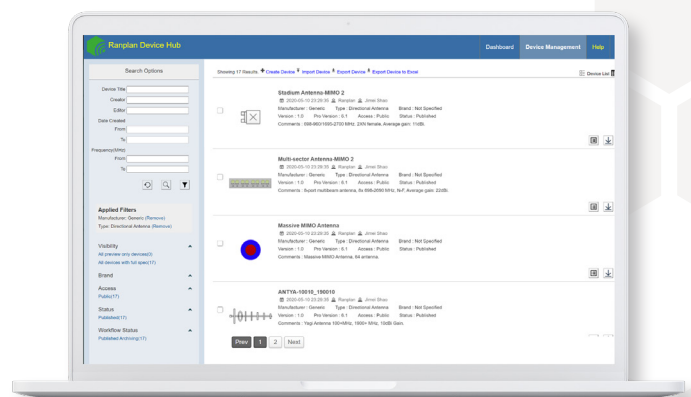
## Ranplan Device Hub

### Comprehensive database of vendor approved components

The Ranplan Device Hub contains over 12,000 devices from over 175 equipment vendors. As an independent and neutral partner, Ranplan can provide the most up-to-date device information and fair representation in network designs.

The centralised database offers a secure environment to facilitate collaborative device modelling and interactive 2D/3D device evaluation before being imported into network designs.

The use of vendor approved or independently approved devices directly in the network design increases the accuracy of the radio propagation predictions and simulations in the project, especially for Massive MIMO antennas, multi-beam antenna modelling and multi-core fibre cables.



#### Access the latest devices

Incorporate the latest components from equipment vendors in your wireless network designs.



#### Interfaces seamlessly

Instant access to the Device Hub from all Ranplan design software, including Tablet.



# Discover the right software for you

	Feature	Professional	In-Building	In-Building Lite	Tablet
Indoor and Outdoor Modelling	Multiple indoor building modelling with network devices	✖	✖	✖	✖
	Import IFC 3D building models from BIM authoring software	✖	✖	✖	
	Import floor and wall plans	✖	✖	✖	Floor only
	Environment Zone Modelling	✖	✖	✖	✖
	Stair, tunnel and inclined plane modelling	✖	✖	✖	
	Walls (linear, inclined and curved), ground and roof drawing	✖	✖	✖	
	Curved and circular doors and windows	✖	✖	✖	
	Building objects with 3D Mesh	✖	✖	✖	
	Inclined plane and tunnel with Mesh type	✖	✖	✖	
	Assign building materials from material database	✖	✖	✖	✖
	Export building to Google Earth	✖	Indoor only	Indoor only	Indoor only
	Outdoor and foliage modelling with terrain, clutter, tile map	✖			
	Integrated GeoConverter	✖			
	Association for an Indoor Building with an Outdoor Building	✖			
	Point, trace and region vector data import support	✖			
Network System Design and Optimisation	Supporting 5G NR, 4G, 3G, 2G, TETRA, PMR, DMR, P25, IoT, Wi-Fi	✖	✖	✖	✖
	Indoor Small Cell, Passive DAS and Wi-Fi network design	✖	✖	✖	✖
	Indoor active DAS network design	✖	✖		
	Outdoor network design including Macro, Micro, Small cells, VRAN & outdoor DAS	✖			
	Multiple sources modelling (base stations, CU, DU, small cells and Wi-Fi APs)	✖	✖	✖	✖
	Support uplink and downlink MIMO modelling with 2x2, 4x4 and 8x8	✖	✖	✖	✖
	Massive MIMO and beamforming modelling	✖	✖	✖	✖
	Broadcast and service beam for advanced antenna array in 2D and 3D	✖	✖	✖	✖
	Cable modelling with coaxial, radiating and jumper	✖	✖	✖	✖
	Multi-strand optical fibre and corresponding components modelling	✖	✖		
	Antenna output power and contour display	✖	✖	✖	✖
	Smart layout and device grouping	✖	✖	✖	✖
	Virtual DAS functionality	✖	✖	✖	
	Connection validation and assistant for fast connection	✖	✖	✖	
	Source planning	✖	✖		
	Site, riser and cable tray modelling	✖	✖	✖	
	Cell merge and cell split	✖	✖	✖	
	Antenna coverage display based on arrow configuration	✖	✖	✖	
	Antenna isolation and near-far effect calculation	✖	✖		
	Redundant loop DAS design	✖	✖	✖	
	Intelligent optimisation modules	✖	✖	Topology only	Quick design
	Automatic Cell Optimizer (Multiple system and multiple objective optimization)	✖	✖		
	Automatic Power Sharing	✖	✖		
	Automatic Topology Optimizer	✖	✖		

## Discover the right software for you

	Feature	Professional	In-Building	In-Building Lite	Tablet
Propagation Modules	RF propagation pathloss modelling and calculations	3D calculations	3D calculations	2.5D calculations	2.5D calculations
	Body loss modelling	✖	✖	✖	
	Morphology propagation model	✖	✖	✖	✖
	Configurable transmission, reflection and diffraction calculation	✖	✖	✖	✖
	Atmosphere absorption	✖	✖	✖	✖
	Outdoor signal propagation with / without foliage	✖			
	Support 2D and 3D antenna pattern	✖	✖	✖	✖
	Calibration of path loss exponent and materials based on measurement data	✖	✖	✖	
	Consider indoor to outdoor and outdoor to indoor scenario	✖			
	Extended Hata model	✖	✖	✖	✖
	Outdoor terrain diffraction	✖			
Prediction Modules	5G NR KPI predictions (SS RSRP, PDSCH SINR, PDSCH throughput etc.)	✖	✖	✖	✖
	Carrier aggregation in 4G and 5G	✖	✖	✖	✖
	4G, 3G and other wireless network KPI predictions	✖	✖	✖	✖
	Wi-Fi KPI predictions	✖	✖	✖	✖
	Effective user throughput based on configurable traffic map	✖	✖	✖	✖
	System dominance prediction	✖	✖	✖	✖
	Nth Best Server, Overlapping areas and uplink predictions	✖	✖	✖	✖
	3D visualisation of building models, network system designs and signal heatmaps	✖	✖	✖	✖
	Point / trace / region calculation	✖	✖	✖	✖
	Prediction comparison	✖	✖	✖	✖
	Beamforming interference modelling	✖	✖	✖	✖
	Specific beams for massive MIMO antenna analysis	✖	✖	✖	
	Uplink transmission power for public safety	✖	✖	✖	✖
	5G NR SS-RS and CSI-RS power offset configuration	✖	✖	✖	✖
	Ultra-Reliability, Low Latency communication (URLLC) analysis	✖	✖	✖	
	Energy Consumption analysis	✖	✖	✖	
	Reconfigurable Intelligent Surface (RIS) modelling and predictions	✖	✖		
Simulation Modules	Configurable traffic map size and traffic type	✖			
	Simulations based on configurable traffic map	✖			
	5G, 4G and other wireless technologies KPIs simulation	✖			
	Configurable snapshots and TTIs simulation	✖			
	DL and UL user status simulation	✖			
	HetNet capacity analysis with hotspot zones	✖			
	Wi-Fi and LTE aggregation	✖			
Data	Measurement data modules	✖	✖	✖	✖
	Comprehensive reporting	✖	✖	✖	✖
	Over 12,000 components from 175+ vendors in device database	✖	✖	✖	✖



# Here's what our customers have to say about Ranplan

*"Providing reliable connectivity that meets our customer's needs in the Enterprise Industry with the most challenging environments requires partnering with the best-in-class and high-quality solutions vendors like Ranplan Professional which speeds up our planning processes for Private 4G/5G Networks. For business-critical Private Networks, Ranplan's accuracy has been a major advantage."*

Timo Mäkelä, Senior Radio Engineer,  
EDZCOM - a Cellnex company

*"Freshwave have been delighted by the relationship with Ranplan. They are a flexible, responsive team and our engineers love their user interface and enhanced functionality. They've helped us deliver expert designs for hundreds of customer sites."*

Tom Bennett, CTO, Freshwave

*"Ranplan Professional is used intensively by Media Broadcast. The fast and easy 3D building modelling is to be emphasised. The integrated material database defines the physical properties of the building substance. 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



*"Ranplan Professional will help us design our indoor networks in offices, shopping malls, underground rail systems, stadia and many other facilities and will enable us to keep pace with growing coverage needs and all the complexities that come with 5G and the Internet of Things."*

Dr. Robert Joyce, Group Head of  
Radio Access Technology, Ooredoo

*"Ranplan Professional provides our customers with an all-in-one independent network planning platform which is leading the way companies design and maintain their local 5G networks. The ability to precisely model the unique environments and optimise the network designs with the use of 3D RF simulations and productivity-enhancing automation tools has delivered and will continue to deliver substantial time and cost savings for our customers."*

Shun Miyamoto - Information &  
Communications Team, Marubun


*"Ranplan Professional's ability to accurately simulate the network as a whole rather than cell by cell helped us to optimise the overall performance."*

Amr Albanna, CEO,  
Omega Wireless

*"The only thing I like better than the speed at which I can complete designs with Ranplan is the support I receive with timely responses from courteous and knowledgeable people."*

Edward Ridley - Staff Systems  
Engineer, CommScope





Revolutionising the way  
wireless networks are planned  
in a smart connected world



## About Ranplan Wireless

Ranplan Wireless pioneer software solutions for the design, optimization and automation of in-building and urban outdoor wireless networks. Our open platform, intelligent automation and 3D ray-tracing simulations streamline the network planning process, expertly identifying potential issues and optimizing network performance for reliable connectivity. This results in an unparalleled quality of service, ensuring seamless and efficient wireless communication for end-users and businesses.

Ranplan Wireless is a subsidiary of Ranplan Group AB (Nasdaq First North: RPLAN) whose head office is in Stockholm, Sweden. The group operates out of offices in the UK, USA and China.

[www.ranplanwireless.com](http://www.ranplanwireless.com)  [sales@ranplanwireless.com](mailto:sales@ranplanwireless.com)

