

# ICS designer

## Overview

ICS designer is the complete multi-technology radio planning tool provided by ATDI for Telecom operators, Broadcasters, Telecom equipment suppliers, system integrators, Engineering and consultants firms. The set of features available in the ATDI planning tools has been specifically developed to meet all the needs required by the RNP/RNO engineers, experts in charge of the radio studies. The set of features are grouped into five main groups of tasks:

- **Site planning & acquisition**
- **Radio network planning**
- **Transmission planning**
- **Optimization and KPIs enhancement**
- **Coexistence between different Systems/Equipment/Bands**

ICS designer is the **unique solution in the market supporting all the wireless technologies evolving from a few kHz until 450 GHz**, multiple frequency bands, channels and equipment configurations without any restriction and additional modules.

## More than one hundred wireless technologies supported in a single project

- **Radio cellular technologies**

GSM, PMR, Trunked Radio Systems (TETRA, TETRAPOL, APCO-25, MPT 1327), GSM-R, DCS, EVDO GPRS, Wi-Fi (802.11a/b/g/ac), WiMax (802.16 a/d/e), UMTS, HSPA, HSPA+, Advanced LTE (FDD, TDD), eMBMS, etc.

- **Microwave links**

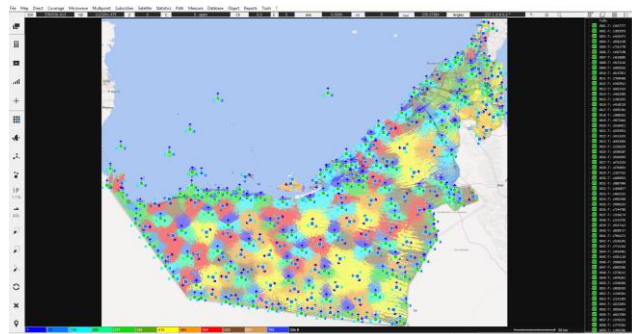
PDH, SDH, IP-radios, including all the latest categories of MW equipment's using MIMO systems and working in the unlicensed bands (e.g. 70-80 GHz bands)

- **Broadcast**

TV, FM, LF/MF, AM, DAB, DAB+, DVB, DVB-T2, ISDB-T, DMR, DVB-S, DVBS2 ...

- **P2MP**

M2M, D2D, SCADA, CDMA 450, MMDS, WiMAX, LMDS, LoRa™, Smart -Grid...



National TETRA coverage in E.A.U

- **Aeronautical systems and Radio Navigation Systems**

Radar systems, ILS (GP, markers, Loc), COM, MLAT, DME, TACAN, NDB, Markers, GBAS RX, MLS AZ, MLS, VHF Ground to Air systems

- **Satellite**

NGSO and GSO satellites, Constellations.

- **Heterogeneous networks**

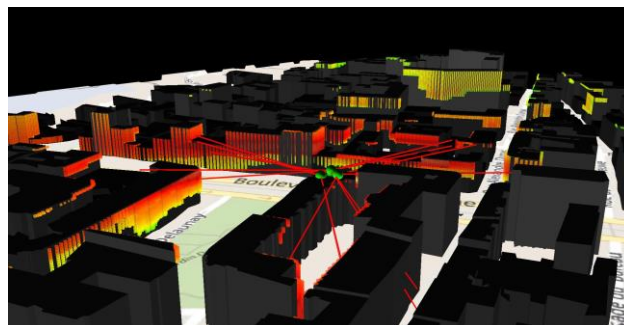
Modelling of Macro, micro, femto, indoor, small cells, repeaters

- **Subscribers and User Equipment**

Modelling of CPEs, UEs, Hand-Held portable unit, etc.

- **Latest technologies**

LTE Advanced/ Release 11 (including Carrier Aggregation, Joint Transmission, Femtocells, SON...), 5G technology (under development), Aerial and spatial broadband radio equipment (UAVs, aircrafts...),



3D network coverage

# The most complete and cost-effective radio planning and optimization tool

## More than 50 propagation models (including deterministic, ITU and empirical models)

Since the validation of the coverage and the network performance will determinate the optimization process/actions required. An accurate network design is essential to minimize the need of reconfiguration of deployed site, deployment of additional sites, change to equipment and to the network as a whole. With more than 50 propagation models, ICS designer allows to perform the most accurate coverage prediction even without calibration of the propagation

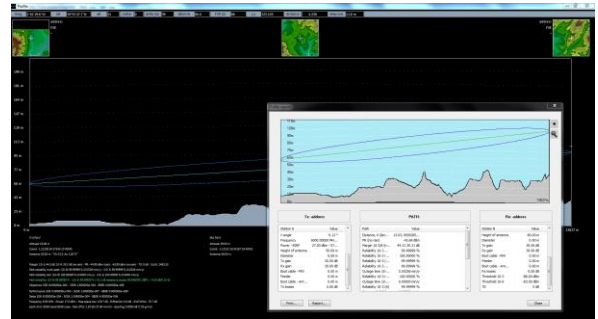
## Site planning & acquisition

Set of features dedicated to the planning and acquisition (not exhaustive):

- A facility to assess the load on existing networks and candidate locations (via .CSV file);
- A site database containing technical and administrative information (address, owner, cost, power connectivity, height, etc...);
- The ability to rank candidate sites according to backhaul availability, site costs or according to the different stages of the network rollout;
- Automatic site selection of the best candidates according to a predefined target coverage over a specified area, based on factors such as vectors and clutter;
- Automatic site searching according to a predefined target coverage.

## Network Planning and analysis

- Uplink and downlink coverage simulations
- Composite, best server (1<sup>st</sup>, 2<sup>nd</sup>, ...), overlapping, number of servers, etc.
- DL/UL Peak throughput map
- Capacity to plan indoor networks based on scanned 2D plans and vectors;
- Automatic Cell Planning – ACP;
- Automatic Code planning (BSIC);
- Automatic PCI planning (LTE);
- Automatic Prospective planning (for repeater deployment);
- Automatic Neighbor List generation;
- Automatic traffic dimensioning;
- Automatic Frequency Planning (AFP);
- Interference analysis with support of TRX type-Measures (correlation, automatic tuning, import
- Population analysis



Path profile

## Optimization and KPIs enhancement

Features include:

- Traffic analysis including calculation of KPIs, including blocking rates, QoS (2G and LTE);
- Network parameter optimization to increase coverage and capacity;
- Antenna parameter optimization (height, azimuth, tilt...);
- A dedicated ACP function for highways, roads and rail tracks (for TETRA/LTE) to support automatic site selection and azimuth optimization;
- Site optimization including priorities and objectives (coverage, overlapping, ...);
- Self-Optimization Network (SON) features for TETRA-LTE networks;
- PCI check/optimize;
- Inter-cell Interference Coordination (ICIC) considerations.



Indoor / Outdoor