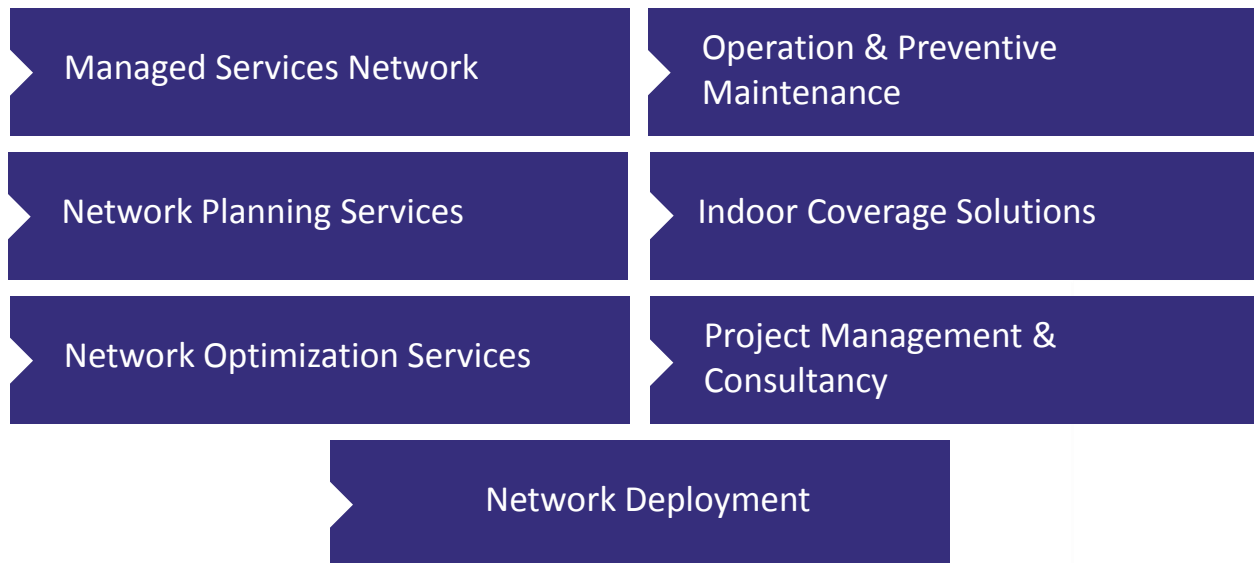


# TNI SYSTEMS IBS PRESENTATION



# INTRODUCTION

- TNI is a reliable partner providing innovative professional Telecom and Information Technology services to the Middle East & African Regions.
- We offer customized wireless voice and data turnkey services and solutions that range from consultancy to complete outsourcing, including planning, design, optimization and operation management.



# TNI Systems, IBS Solution Qualifications

## ☐ **Educated and Experienced Human Resources**

- Fully Qualified and Trained Engineers with In-Building RF Design, Testing and Optimization
- Each with minimum (3) Yrs RF Planning Design and Minimum (3) Yrs In-Building Design experience for multi-operator & multi-technology systems
- All experienced in GSM, GSM-R, UMTS and CDMA technologies.

## ☐ **Best in Class Tools for In-Building Design, Test and Optimization**

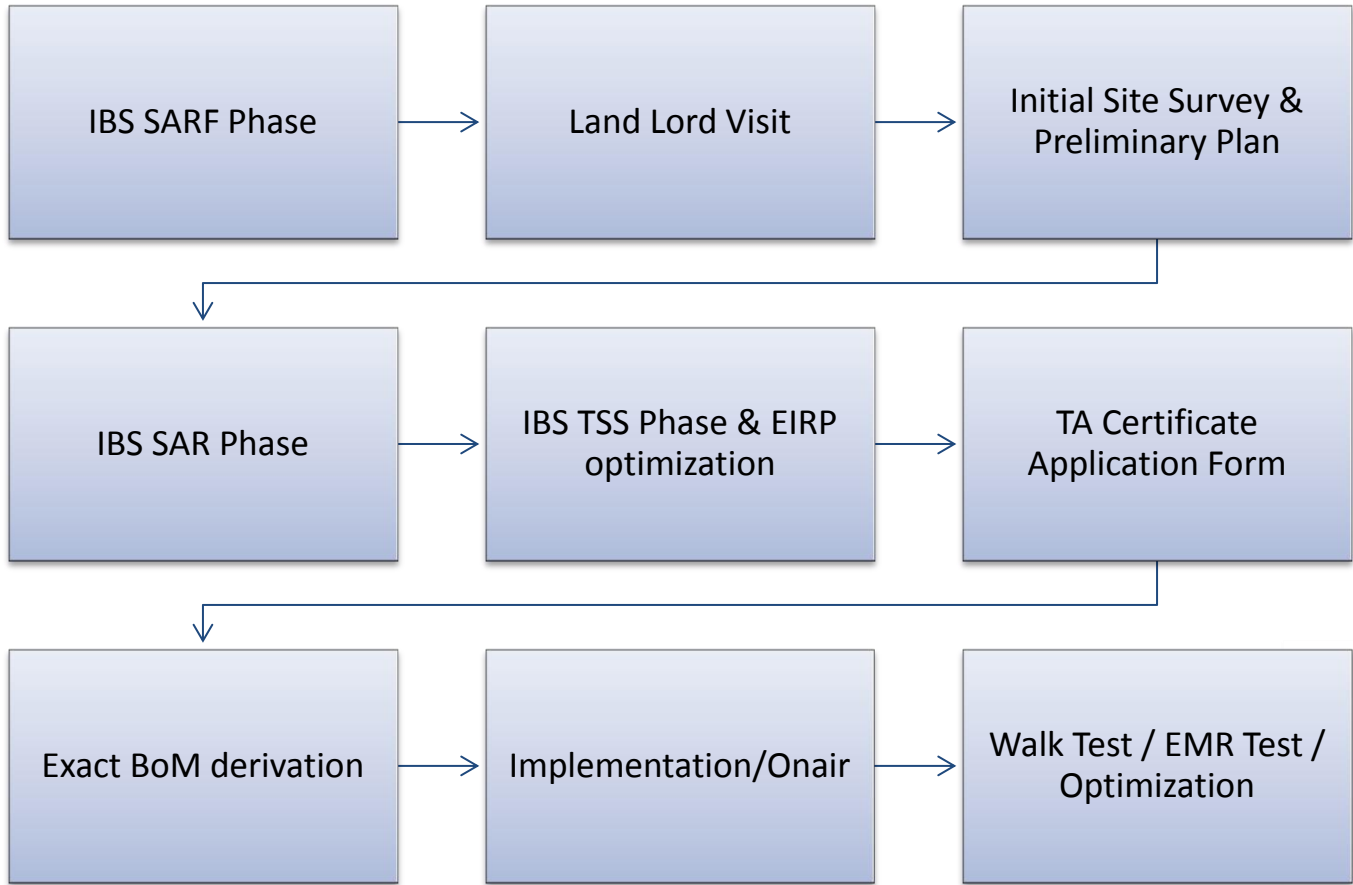
- [IBWave](#) RF-VU IBS with all modules (simulation, propagation & optimization)
- Minimum TEMS-9 or higher for walktests supporting 2G/3G
- TEMS Mapinfo for walktest reporting.
- ASCOM Qvoice for benchmarking.

## ☐ **Experience in more than 250 In-Building Engineering Solutions**

- Customers include Tier-1 Operators and Vendors “ Avea, Turkcell, Zain, MTN,
- Ericsson, NSN, Huawei and ZTE.
- Projects include High-Rise Buildings, Shopping Malls, Tunnels and Airports.



# IBS PLANNING PROCESS



# TNI Systems, IBS Engineering Services



## ❑ Planning & Engineering

- EIRP (power at each node/antenna level) planning, tuned according to the demands of customer
- Coverage and capacity planning with 2D or 3D simulations
- System capacity dimensioning
- Parameter planning

## ❑ Systems Design Alternatives

- System design with leaky feeders, splitters, tappers, etc...
- System design with antennas ( omni, panel, yagi, bi-polar, etc...)
- Passive and Active Repeaters & Fiber Optic Repeater Systems
- Conventional DAS solutions for single or multivendor/operator cases



Omni Antenna



Installation in car park area  
(Directional antenna)

Panel indoor antenna



Power splitters/tappers



Yagi antennas for tunnels



Sample 2G/3G Repeater



Feeder Types

# TNI Systems IBS Engineering Services

## ❑ Bill of Material Production and Implementation

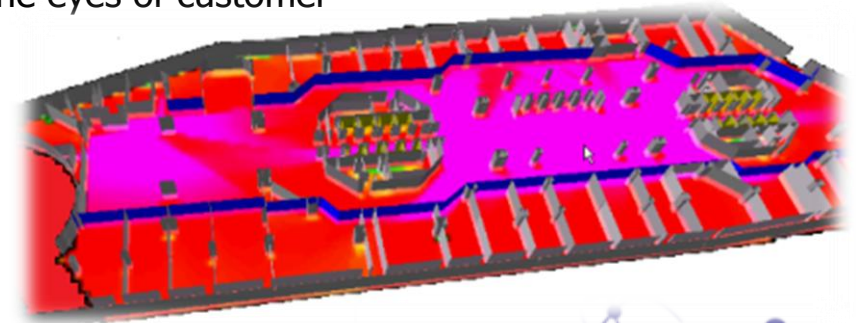
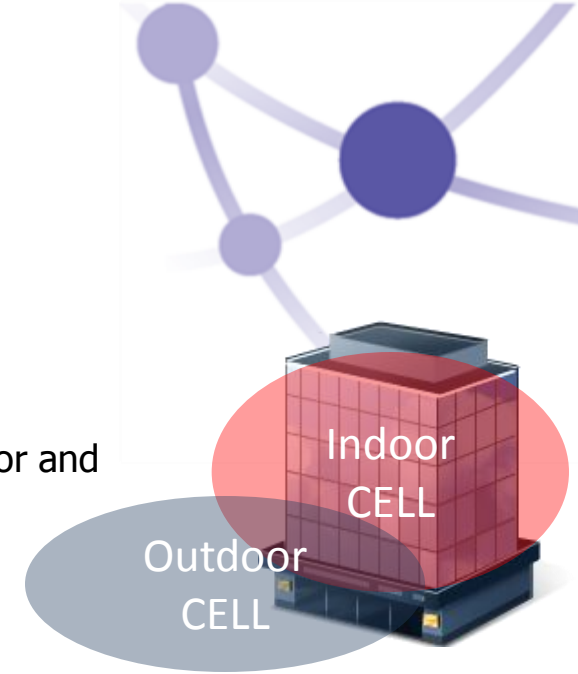
- Automated Bill of Material list from RF-Vu Planning tool modules
- Fast logistics due to predefined accurate BoM
- Implementation/Integration and Commissioning excellence on multi-vendor and multi-technology platforms
- Fast Pricing

## ❑ Walktest

- Measuring and reporting Coverage and Capacity
- Measuring and reporting Service Quality (Rxlev, RxQual, RSCP, UE Tx power, EcNo etc)
- Verifying results of planning and optimization for the eyes of customer

## ❑ Optimization

- Low interference towards outdoor environment
- Optimization of antenna locations for coverage
- Capacity optimization by power limitations
- Signal Quality optimization (Signal levels, Handover, optimization etc)
- Well managed handover scenarios towards outer layers from indoor solutions





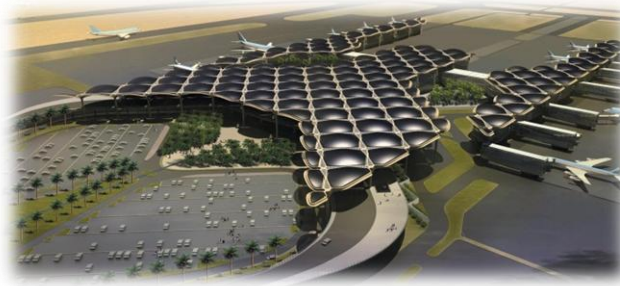
# TNI Systems – Some Active System IBS Projects



TAT Towers with RF Repeaters



Palladium Tower with RF Repeaters



Design of Queen Alia Airport – Jordan  
with F/O repeaters ( Umniah )



Design Al Hamra Tower ( Zain )

And **Two Hundred** more to count...

# References





# CONTACTS



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