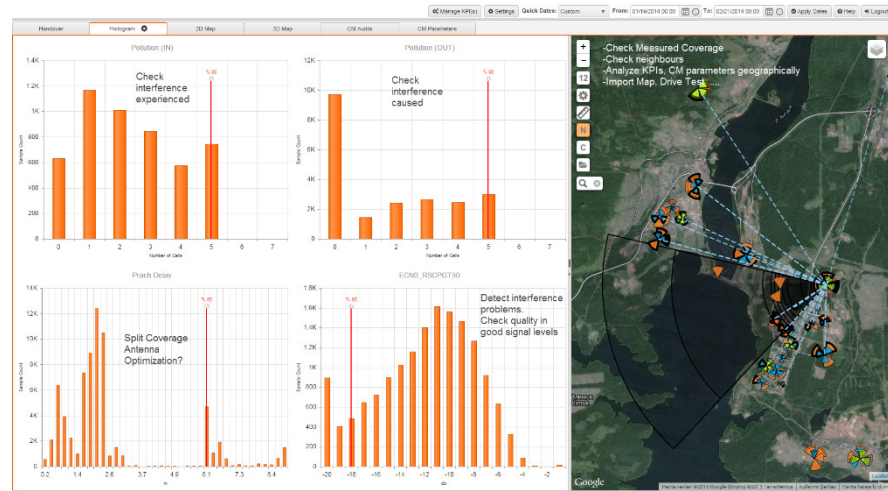


P.I. Works provides centralized mobile network performance and capacity management solutions.

P.I. Works solutions assure lower costs for managing the network. They allow the existing network to be used more efficiently, minimizing capital costs for capacity expansion.

P.I. Works helps to improve the mobile subscriber experience.

**uSON Inspection** is an advanced, easy to use tool for in-depth examination of the radio network with root-cause analysis functions and open-loop optimization letting you see the network in the way you want.



### Benefits

- ▶ Short lead time to improvements
- ▶ Faster integration time
- ▶ Reduce engineering cost
- ▶ Fewer drive tests, tune your network with driveless tuning
- ▶ Better quality of service for the subscriber resulting in less churn

**Rich map visualizations.** 3D Map option provides engineers geographical analysis capability enhanced with measured coverage distance (TA or PRACH) visualizations. Built-in technology packages for GSM, UMTS, CDMA, WIMAX, LTE, TD-LTE and LTE- Advanced provides multi-technology optimization capability.

**Geolocation.** Analyze call traces (GPEH, IOS, CHR, CTR/ UETR, Megamon etc.) for in-depth analysis of RF conditions with geolocation capability, tune new cells and minimize drive-test requirements.

**Find root causes quickly.** KPI trend analysis on map and histograms give you real information about your customers' quality perception. Additionally neighbour analysis with per neighbour performance statistics by correlating configuration management, planning data, drive test and trace data will highlight any problems in the RF environment and cell to cell settings.

**Configuration Management Analysis.** Reduces OpEx with cross-technology and cross-vendor configuration parameters analysis with history. Troubleshoots all setting related problems in the network.

### Case Study using uSON Inspection at a Tier 1 North American Operator

#### Project Profile

- ▶ Duration: 2 Months
- ▶ Size: 1253 eNodeB
- ▶ Technology: LTE
- ▶ Vendor: Ericsson
- ▶ Resource: 2 LTE engineers using P.I.ANO

#### Challenge

- ▶ New operational problems with LTE commercial launch
- ▶ Low UL/DL throughput
- ▶ Unresolved IRAT strategy for LTE, 3G and 2G

KPI Classification	Baseline KPIs	Final KPIs	Improvement
Accessibility	98.02%	99.31%	1.32%
ERAB Drop	1.01%	0.72%	28.81%
RACH Success Rate	29%	38%	31.03%
DL Throughput	13,513	16,229	20.1%
UL Throughput	7,382	8,325	12.77%
Time on LTE %	85.67%	90.76%	5.94%

#### Approach

- ▶ P.I. Works tools integrated for LTE
- ▶ CTR/UETR trace analysis
- ▶ RACH root sequence planning
- ▶ Detailed RF shaping and parameter turning
- ▶ Detection and resolution of low UL/DL throughput problems

**OTHER PRODUCTS**

**uSON PM** is an umbrella performance management solution for Mobile Network Operators. Besides Radio, Core and Transmission network support custom sources like IN, VAS, Fixed Network Equipment, CEM and many others are also supported with advanced performance reporting, GIS interfaces and alarm management features.

**uSON** is an automated optimization tool for radio access networks. This solution yields best subscriber experience, increased data throughput, minimizing OpEx and improving utilization of network equipment leading to CapEx reductions.

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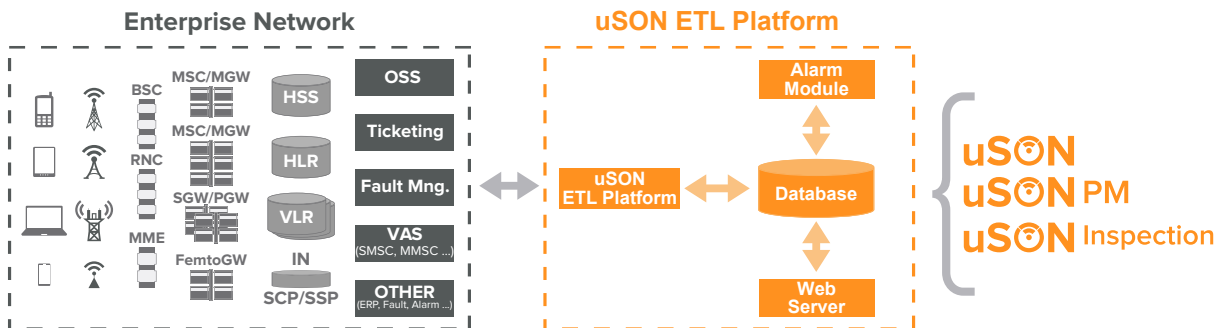
**KEY FEATURES**

- ▶ Driveless network tuning support
- ▶ Supports GSM, UMTS, CDMA, WiMAX, LTE, TD-LTE and LTE-Advanced
- ▶ Supports multi-vendor equipment: Ericsson, Huawei, Nortel, NSN, Alcatel-Lucent and Samsung, ZTE.
- ▶ Fast integration time. Start using it in ~2 weeks.
- ▶ Rich Map visualizations capabilities, 2D and 3D map support including Google Earth, Drive Test file support, thematic mapping on CM, PM, Trace and planning data.
- ▶ Configuration Management Analysis (CMA) across vendors and technologies.
- ▶ Detailed root cause analysis.
- ▶ Utilizes near real-time network data: mobile measurements, traces, PM, and CM data.
- ▶ Network issues detected before it affects customer experience.



**UNIFIED SOLUTION FOR ALL YOUR NETWORK NEEDS**

There are 3 components to P.I.Works tools architecture: uSON ETL Platform, DB server, and the web server. uSON ETL Platform collects data from all sources of statistics (RAN, Core, VAS, etc.), parses the data format (data parsing), processes them and loads to the database. P.I. Works tools use this database for all operations on network data.



- Performance Monitoring+**   **Open-loop Optimization+**   **Closed-loop Optimization+**
- Radio Network Planning+**   **Alarm Management+**   **Troubleshooting+**
- Call-Trace Analysis+**   **Fault Management+**