# P.I. WORKS

## PERFORMANCE IMPROVEMENT

## C-SON comes to rescue MNOs at jam-packed venues

Centralized SON (Self-Organizing Networks) for management of Radio Access Networks (RAN) is a very effective solution for improving subscriber experience at venues, which host special mass events such as sports games, concerts, ceremonies, parades, or other unplanned gatherings involving a high density of mobile subscribers.

Mobile subscribers generally suffer from the quality of service due to heavy congestion at these special events. They get very slow response accessing internet from their mobile devices, and sometimes they can't even connect to internet. Mobile Network Operators (MNOs), who are keen on subscriber experience have been utilizing C-SON for managing their network for these special events. C-SON provides automated improvements to both the performance and throughput of mobile networks.

Traditional ways of managing the MNOs' networks for special events typically require both network engineering headcount and additional infrastructure investment.

P.I. Works uSON$^{TM}$ product portfolio provides a fully-automated centralized SON functionality as a single, integrated solution combining advanced network optimization techniques with real-time network status monitoring.

This paper describes an actual field deployment and the results achieved from utilization of P.I. Works uSON$^{TM}$ solutions.

P.I. Works customer-centric uSON$^{TM}$ portfolio includes a vendor-agnostic Special Event Handling (SEH) solution, which implements fully-automated real-time (in tens of seconds reaction time*) optimization along with pre- and post-event optimizations. The solution delivers real-time carrier load observation and optimization actions for all of the MNO's network (parts of which may be provided by different infrastructure vendors) without any adverse effect on vendor management systems. The results show observable service quality improvements, at a minimum, by doubling the infrastructure capacity at the venue locations.

## Special Event Handling Solutions

|  | Without uSON | With Real-Time uSON |
|---|---|---|
| Description | Reactive Load and Congestion Monitoring<br>• Based on Reports and Alarms<br>• Depends on Engineer Experience | Real-time network load monitoring and optimization<br>• 30 seconds polling interval<br>• Proactive traffic management |
| Network Investment | High | Low |
| Engineering Effort | High | Low |
| User Experience | Bad (disturbed) | Best |

*\* Reaction time depends on the performance network infrastructure and elements*

## Case Study: Special Event Handling with P.I. Works Centralized SON

The following case study is from a deployment of uSON at a series of events in a European soccer stadium consisting of ~53,000 fans in attendance.

A baseline case was established at the venue prior to utilizing P.I. Works uSON™ (referred as 'Without uSON' in the charts below).  At the next event, the customer used uSON SEH solution for a sold-out crowd at the same venue (referred as 'Real-Time uSON' in the charts below).
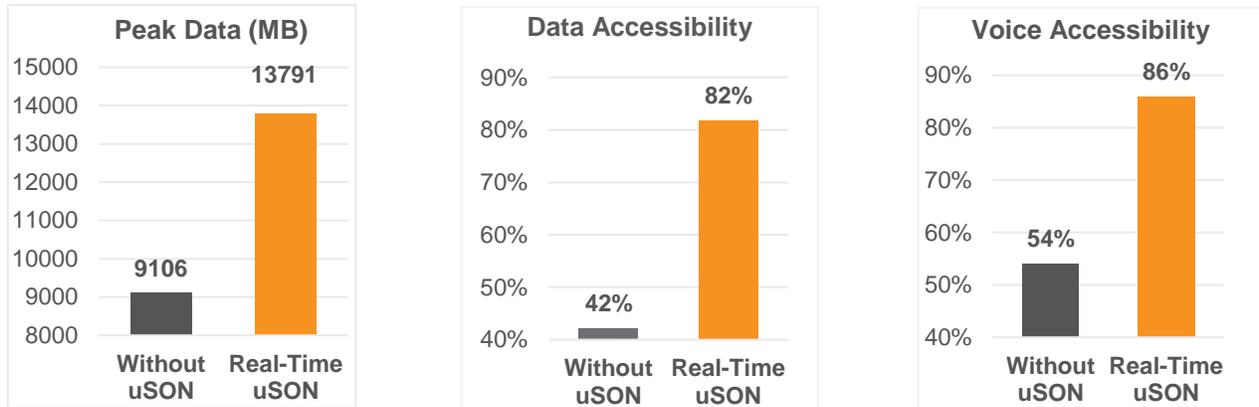


During the event, all radio resources are checked and proper optimization actions are taken proactively before it affects subscriber experience. Simultaneously, load balancing actions are taken for optimum load distribution between carriers by applying dynamic offsets to prevent congestion. uSON™ dynamically manages more than 30 radio parameters per interface in fully-automated mode.

With uSON™, including interference control actions, a total of 230 optimization actions were taken without human intervention based on a 30 second monitoring cycle. uSON™ SEH solution demonstrated superior subscriber experience improvements (50% better) with real-time proactive optimization actions. The customer observed noticeable traffic gains (1.5 times more data and 2 times more voice traffic) and 81% reduction of congested calls.
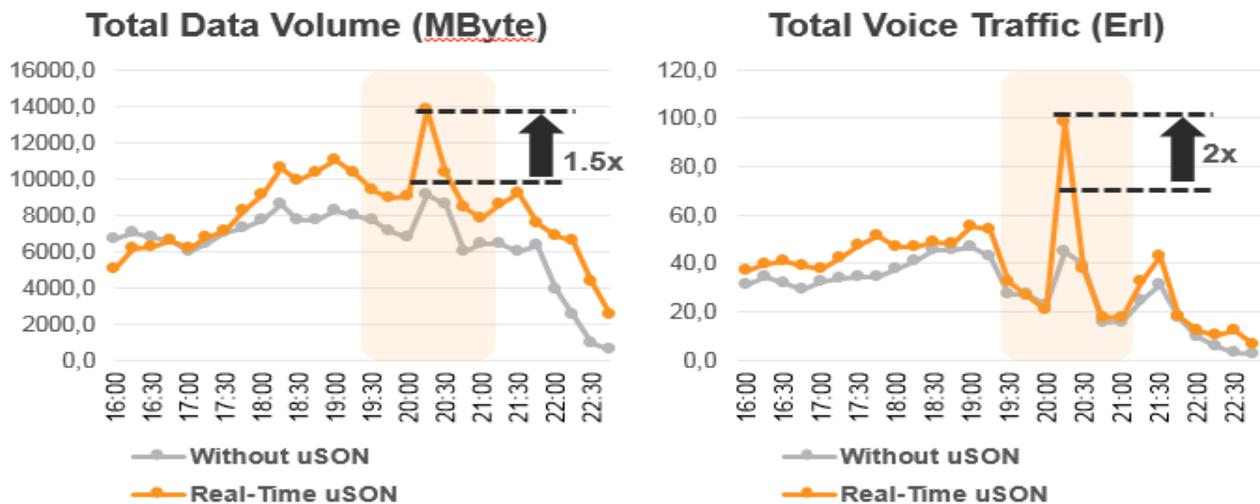
## Financial Benefits

Besides great improvements in subscriber experience described in the case study above, there are financial benefits for MNOs using uSON™ at special events. Utilizing uSON™ solution, MNOs are able to minimize the engineering effort for event monitoring. Also, uSON™ generated capacity and throughput gains eliminate the need for infrastructure expansions. The combined effect is a reduction in both operational expenses (OpEx) and capital expenses (CapEx). The expected improvements to OpEx labor expenditures result in approximately $700,000 in aggregate savings per year for the MNO in the case study.

uSON SEH reduction of CapEx
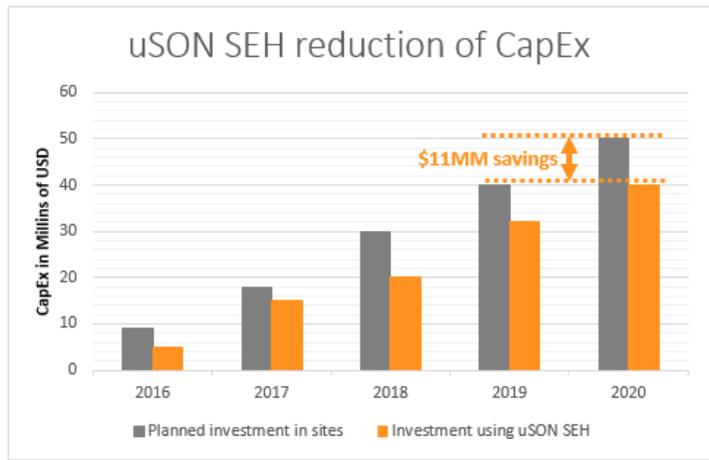
CapEx savings across all special events, based on 81% reduction in network congestion result in an annual deferral of $2.2M (assuming 30 venue locations, and the half of venue locations require capacity expansion). Today, where data demands on the network are growing exponentially, the uSON™ SEH solution offers great savings in terms of CapEx and help MNOs to contain expansion costs and get more from their CapEx investments.

## Conclusion

As described in the case study above, uSON is instrumental in managing subscriber experience at the special events. Additionally, mobile operators are benefitting financially using uSON due to both OpEx and CapEx reductions resulting from efficient management of network resources at special events.

## About P.I. Works

P.I. Works, as our name implies, "Performance Improvement Works" is a leading provider of next-generation Radio Access Network (RAN) management solutions. Our expertise which span over a decade combined with our commercially available product portfolio and services enable global Mobile Network Operators (MNOs) to improve their network quality, subscriber experience, and increase profitability.

P.I. Works has deployed its solutions for 38 MNOs in 27 countries and it's still counting.

P.I. Works state-of-the art product portfolio, unified Self Organizing Networks (uSON™), automates optimization and operational tasks of complex mobile networks 24/7 to increase quality, capacity and coverage.

For more information visit http://www.piworks.net/ or send e-mail to sales@piworks.net