

5G Reality Check: Verifying Commitments & Assuring Quality

Mikołaj Skipietrow

m.skipietrow@syspab.eu

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Systemics is part of Apave. a group specializing in risk management, as well as in **testing, inspection and certification**.

We work with National Regulatory Authorities, Mobile Network Operators & Telecom Equipment Vendors to help them identify and resolve network issues.





"Ensuring that consumers enjoy a good quality of network service is a priority for both telecoms operators and policymakers."

Source: GSMA, Jan 2025 "Towards better mobile quality of service in Asia Pacific"

The 5G Promise



Unprecedented potential:

- latency •
- speed ٠
- reliability •
- massive connectivity (IoT) •
- slicing and critical communication •

Parameter	LTE (Advanced)	5G NSA	5G SA
Latency (E2E)	~30-50 ms	~20-40 ms	<10 ms (target 1ms)
Throughput (Peak DL)	~100s Mbps (up to 1 Gbps)	~1-2 Gbps	~10 Gbps (theoretical 20Gbps)
Reliability	>99%	>99%	99.999%
Capacity / Connections	~10,000 devices/km²	>10,000 devices/km²	1,000,000 devices/km²



Reality





The promise comes with challenges:

- new bands (Low/C-band/mmWave)
- interferences (satellites, TV, army)
- complexity (DSS/NSA/SA/Slicing)
- device density and variety
- LTE anchoring affecting 5G NSA
- subscribers' confusion

Inconsistent quality can dilute the 5G promise

Traditional Approach



What NRAs do:

- coverage obligations
- speed targets
- deployment timelines



The risks:

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- theoretical models deviating from real user experience
- network KPIs may not fully reflect QoE (diverse use cases)
- operators not having full visibility or focusing solely on business KPIs
- lack of verification may lead to missed opportunities
- no objective comparison between operators



Positive Regulatory Stimulation

Moving beyond basic coverage obligations:

- specify key performance indicators (KPIs) relevant to 5G services
- recognize the growing importance of uplink (VHCN)
- understand actual network behavior vs. models
- identify true gaps and real opportunities for enhancement
- enable evidence-based dialogue with operators
- consider incentives for early 5G and high-quality
- require MNOs to provide clear, non-misleading information about their 5G service
- measure and publish the results

"You Can't Improve What You Don't Measure"

Peter Drucker

Real Life Examples (1)



Missed Opportunity

- Discovered cases when technology is possible (5G, multiple CA) but not used due to wrong configuration (e.g. 4G anchor for 5G NSA)
- Achieved result: higher 5G utilization and more efficent use of available bandwidth without heavy investments

5G Missed oportuni

- Based on Capacity DL tests done by the UE and scanner coverage tests where 5G usage was possible are marked on the map.
- The scanner results are binned to 25x25m bins to calculate the average acceptable threshold >-100dBm
- There has the most missed oportunity tests, mainly with n78, and has the least 5G missed opportunity.



Real Life Examples (2)



Lack of visibility

- Dialogue started by NRA based on BM showed an information gap of one of the MNOs concerning his network quality (also compared to the others)
- Benchmarking measurement helped in starting a constructive discussion and quality improvement





Wrong use of frequencies

- Discovered cases where MNOs used wrong frequencies, e.g. :
 - different from planned
 - licensed to other MNOs
 - temporary, pilot bands used in a commercial network





MNO comparison

Measurement comparing effenctiveness of how MNOs utilize the licensed frequencies and how it translates to user experience
SG Best Band RSRP Histogram



Real Life Examples (4)



NRA's long-term project:

2017

- **7 consecutive years** of the benchmarking project conducted by RATEL, Serbia
- Public reporting portal: http://benchmark.ratel.rs/en

2019

2020

 Achieved result: significant improvement in the quality of services provided by MNOs

2018







Reporting portal is live in Ratel and NTRA projects

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- Interactive map portal was created to let anyone interested obtain information about mobile network results. The portal can be publicly accessible to end users or available only internally for high-level evaluation of mobile networks. The design was prepared to ensure fast and user-friendly navigation.
- Interactive map portal provides results based on the following criteria:
 - Comprehensive measurement results for measured mobile operators
 - Measured results of geographical area of interest (entire country, city, etc.)
 - Measurements results of relevant technology (2G/3G/4G/5G)
 - The measurement results to the appropriate service
 - Ranking of mobile operators according to service results in particular location









Call for Action



Regulation as an Enabler, Not Just an Enforcer

- Measurement: Consistent, independent, showing the real-world performance
- **Transparency:** Sharing benchmarked insights to spark healthy competition

Recognition: Acknowledging demonstrable quality leadership

• Guidance:

Using data to highlight areas for smart investment & innovation that benefit users





Thank you!



Systemics-PAB Sp. z o.o. 46B Wolodyjowskiego St. 02-724 Warsaw, POLAND

www.systemics.com.pl

