



QoS/QoE Challenges and Solutions for Regulators

Jordan Connectivity and Performance Status / Visualization tools

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AGENDA



Jordan National/ Int. Connectivity Status and Traffic Growth



Connectivity within poor terrain



Performance and Connectivity Visualization



Processing and Analyzing High number of Complaints

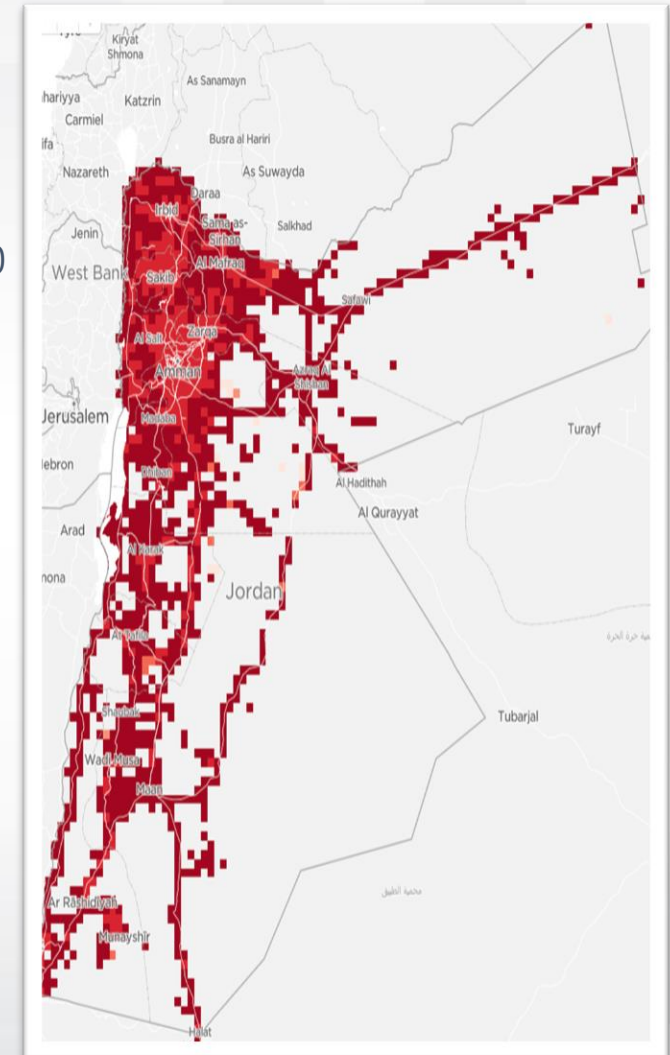
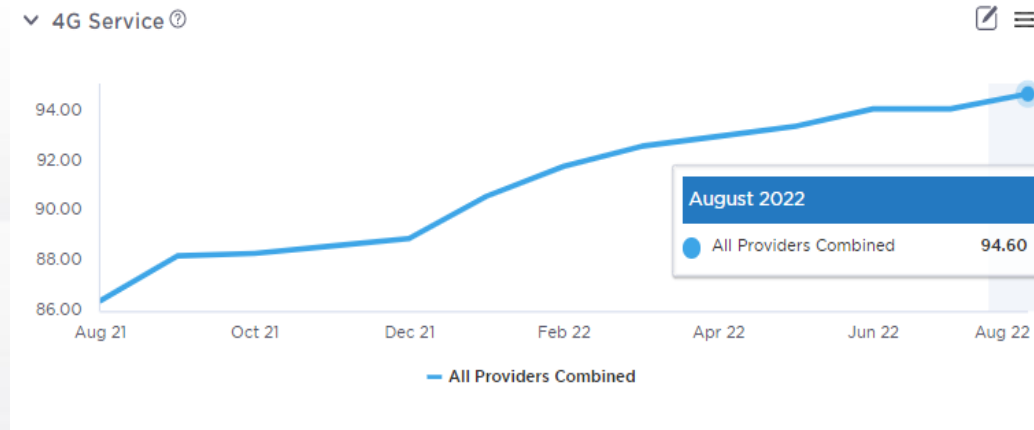


Crowdsourcing regulatory use cases

National Connectivity

Jordan Mobile Infrastructure Rollout Status

- Daily Traffic, TDD > 2000TB, FDD > 5500TB
- Pop. Coverage LTE ~ 94%, 3G ~ 100%, MPR 65.6%
- GSMA Mobile Connectivity 3G, 4G Indicator score 100
- ~ 70% of BTS for 2 Operators are Fiber connected
- TRC Imposed 300 BTS to bridge Digital Divide in Low Populated Areas –LPA during past years.
- 5G Commercial Launch Early 2024, 50% pop. coverage before 8/2026

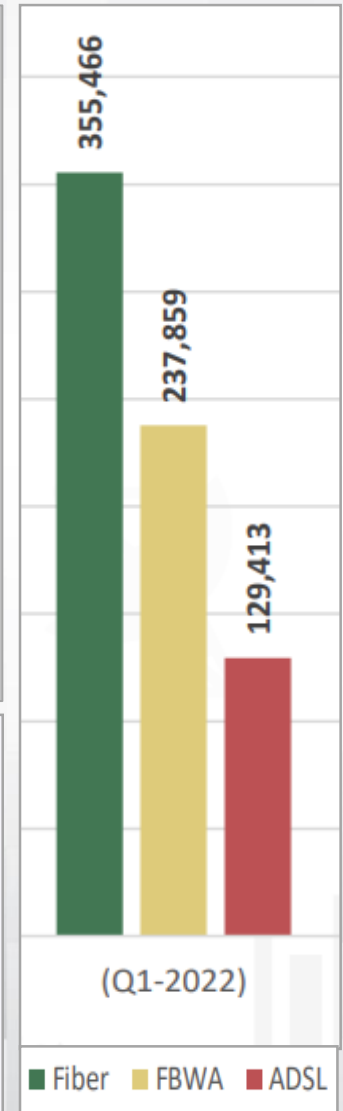
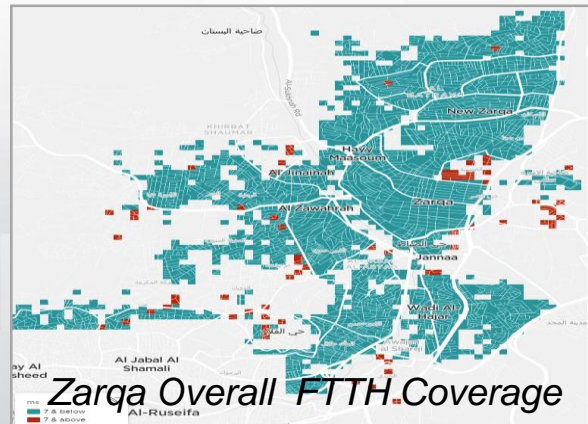
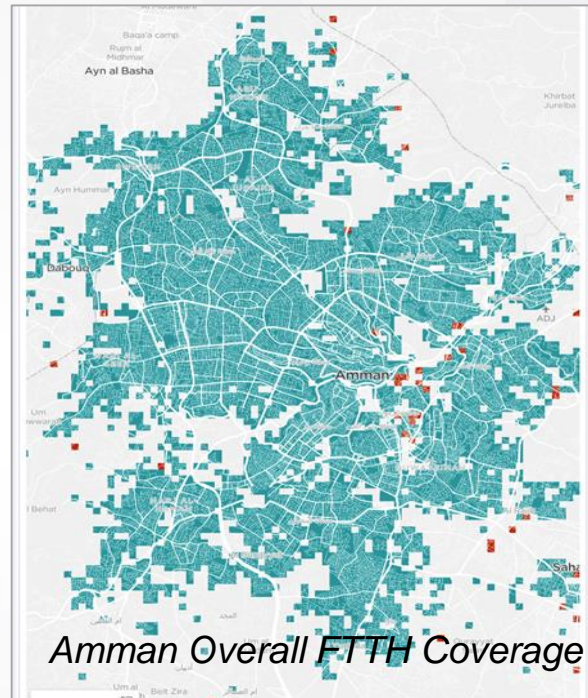
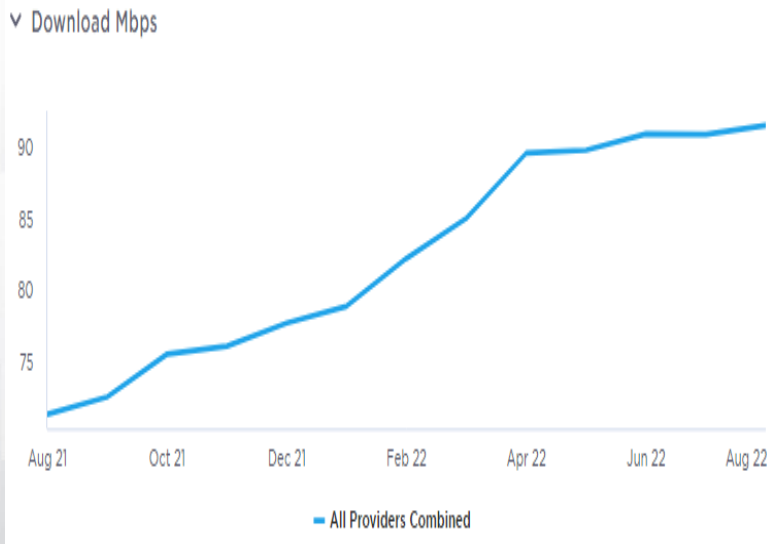


Mobile General Service

National Connectivity

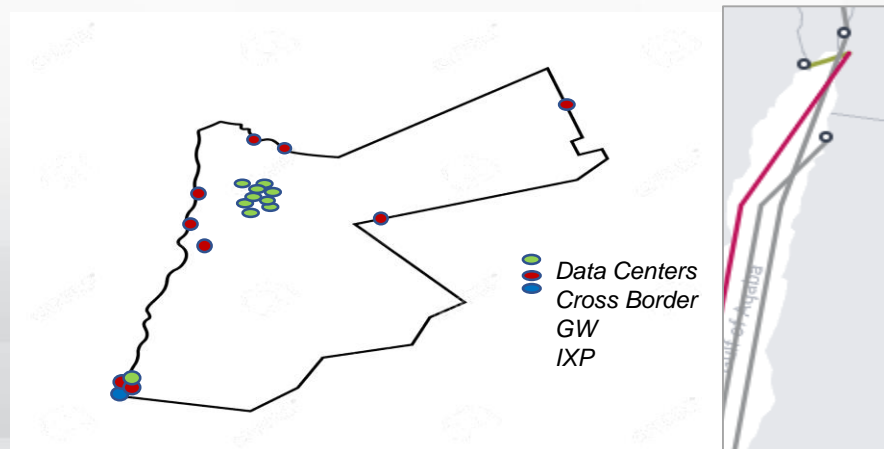
Jordan Fixed Infrastructure Rollout Status

- Country Median Fixed BB DL grew to 70Mbps and Amman FTTx Median BB grew to 91Mbps, Aug 2022
- FTTx accessibility over Power Grid 1.4M HH by H1 2024, 415K User Q3 22
- FBWA Rev. share exemptions in return of LPA coverage ~ 240K User
- NBN connecting 2423 governmental sites (4570 Km)

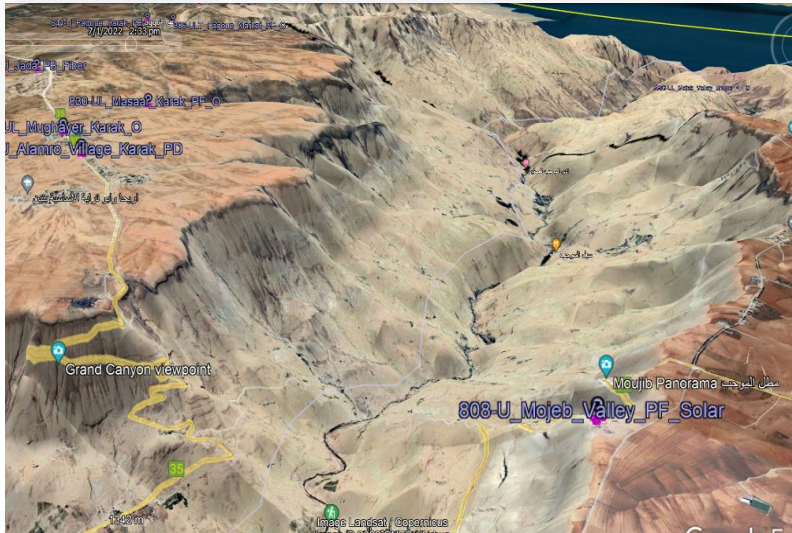


International Connectivity and Traffic Growth

- Beside international border gateways, only 3 Submarine Cables: FLAG (FEA), Raman (New Landing Cable by 2024), Aqaba-Taba.
- Exponential Growth of daily traffic (18x in 2022 compared to 2020)
- The importance of caching servers for service providers and content origination considering below traffic growth.

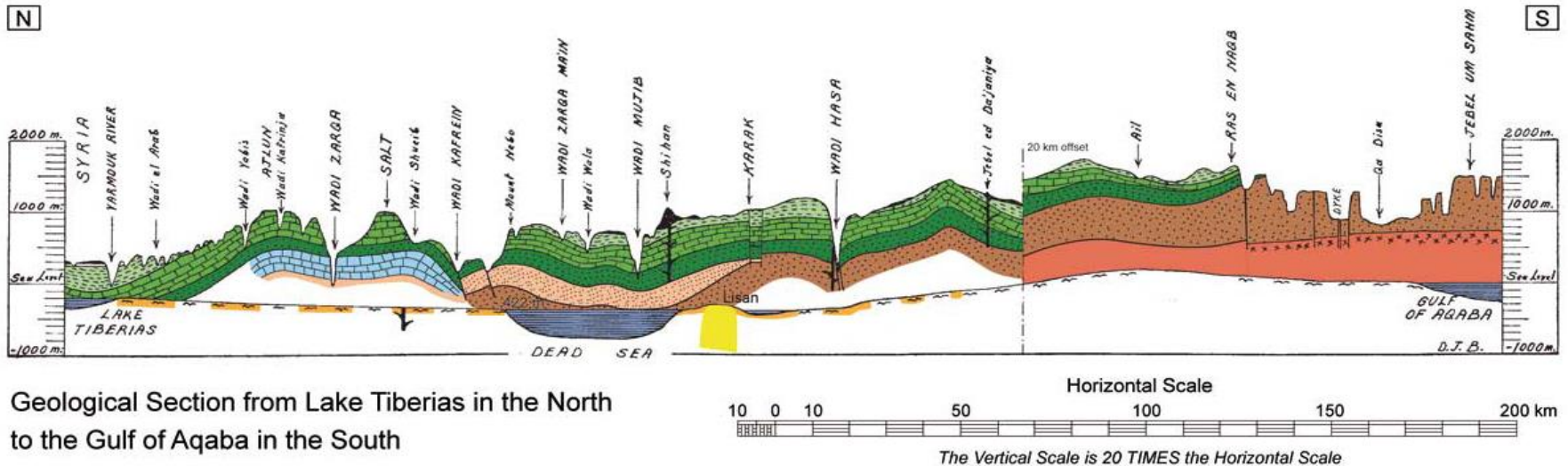


Coverage Challenge



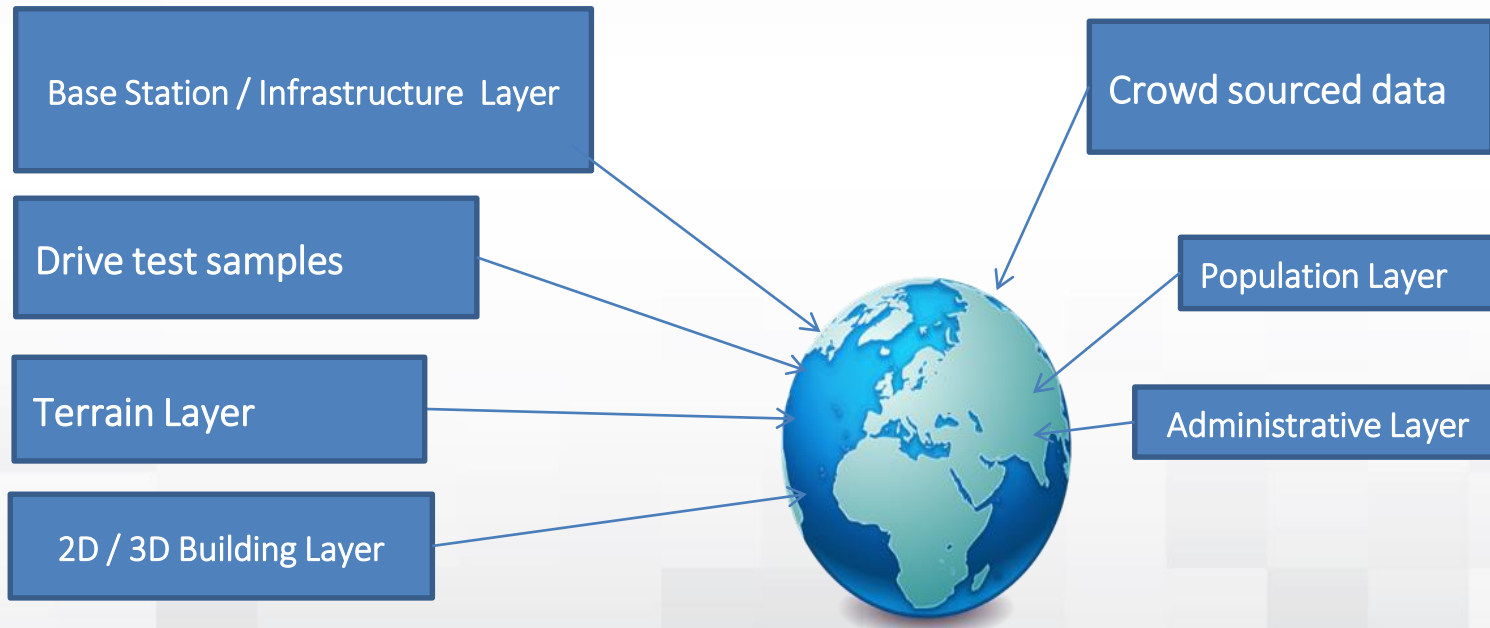
Jordan most populated regions are within the western and northern parts of the country where unique topography and elevation variations exist and stretching from (-410m to 1650m), hence challenges:

- LoS Backhauling,
- limiting BTS coverage and
- Increasing needed Inter-Site Distance



TRC Jordan uses collective Visual Data Representation

Visualizing multi-data layers during complaint analysis is critical for a confident remote conclusion such as the following:



Monitoring Networks Using Transformative Technologies

TRC deploys crowdsourcing technology to monitor daily traffic, assess operators performance and remotely overlook all coverage and quality issues.



Performance monitoring

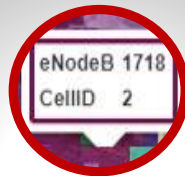


Handled coverage and quality complaints during lockdowns

TRC remotely evaluate operators commitments:



Site Optimization Validation



Base Stations Buildup Validation



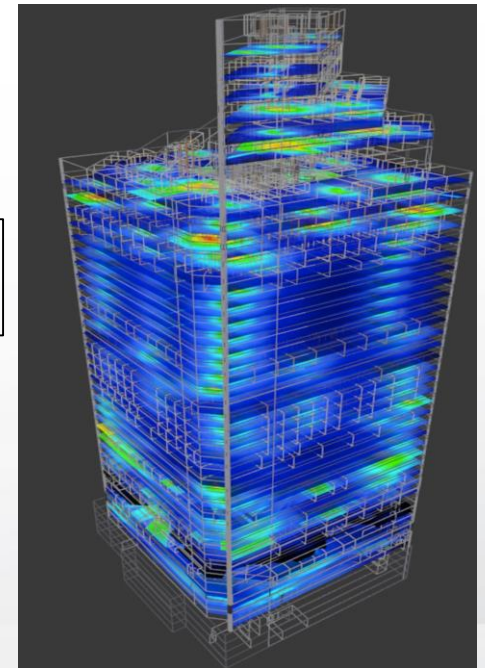
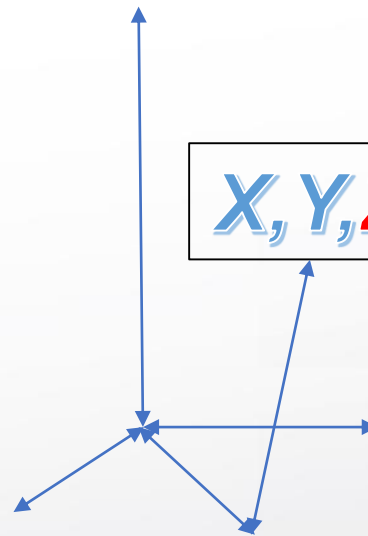
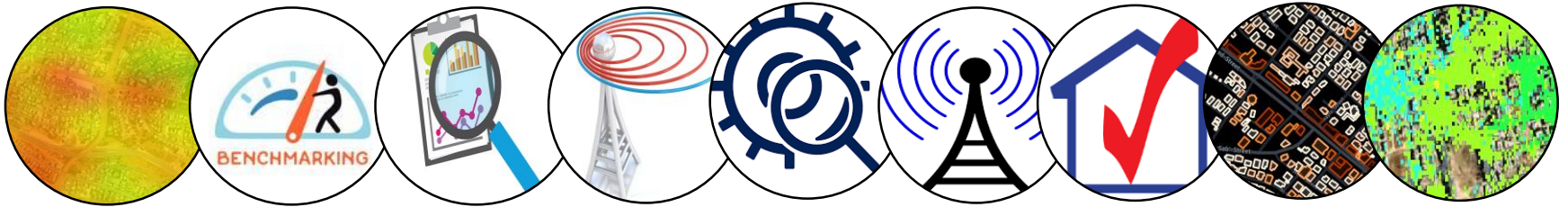
Technology Addition Validation (FDD, TDD)



Spectrum Commitment Validation



TRC crowdsourcing regulatory use cases:



THANK YOU