



QoS/QoE Strategies Monitoring in Senegal



**Autorité de Régulation des
Télécommunications et des Postes**

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Ensemble, comblons le gap numérique



Agenda

- *QoS/QoE Strategies and Vision 2017/2020*
- *QoS/QoE legal framework*
- *QoS/QoE planned campaigns*
- *QoS/QoE management during major events*
- *QoS/QoE complaints management*
- *QoS/QoE data resulting from operators management*
- *Incidents which impact on the QoS/QoE management*
- *HR management*
- *The fallouts of the various QoS strategies applied*



Introduction

- Network Performance and QoS/QoE improvement are key pillars of Senegalese government in the telecommunication sector;
- This vision is developed since many years ago but it is really boosted by the current General manager. Senegal is having a prominent position in this area in West Africa;
- ARTP is rolling out and supporting well established strategies and regulation rules to improve network performance and QoS/QoE.



• **Social**

*Consumers protection against poor QoS delivered by operators;
Managing efficiently conflicting relations between consumers and operators.*

• **Politics**

Pursuing the PUMA project imposes more and more coverage in the border zones;

• **Economics**

Reduce the economic losses caused by the problems bound to the QoS aspects

• **Cultural**

The mobile phone became has become a " virtual indicator social ranking (the more the terminal is expensive, the more we are sensible to belong to a high social category)

The mobile penetration rate



• **Technology**

- Monitoring devices types in the national market;
- QoS monitoring 4G and LTE networks;
- Get interest in IOT 5G, and Smart Cities QoS monitoring;
- Technologies convenience will be a reality

• **Legal framework**

- *To update regularly the legal framework in QOS/QoE monitoring ;*
- *To Handle Technological and statutory scanning missions;*

• **Ecology**

- *Being rigorous on the choice of the sites location*

• **Demographic**

- *Reducing poor demographic coverage in some areas*



Démographic

- Reducing poor demographic coverage in some areas
-

Social

- Consumers protection against poor QoS delivered by operators
- Managing efficiently conflicting relations between operators and consumers

Politics

- Pursuing the PUMA project that imposes more and more coverage in the border zones

Ecology

- Being rigorous on the sites locations

DCQ

Economic

- Reduce the economic losses caused by problems bound to QoS aspects

Legal framework

- To update regularly the legal framework in QoS/QoE monitoring
- To handle technological and statutory scanning missions

Technology

- Monitoring devices types in the national market
- QoS monitoring 4G and LTE networks
- Get interest in 5G, IOT and smart cities QoS monitoring
- Creating technology convergence as an opportunity

Cultural

- The mobile phone has become a virtual indicator social ranking
- The mobile penetration rate



QoS/QoE legal framework

- **QoS/QoE aspects are regulated by:**
 - 1. Article 104 of the law N 2011-01 of February 24th, 2011 of the Senegalese Telecommunication Code ;**
 - 2. Decision n° 004 / 201 / ARTP / COL on June 24th, 2013;**
 - 3. Draft agreement between ARTP and the operators, in november, 2017.**



QoS/QoE planned campaigns

Each year, we are performing:

1. One coverage national campaign:

This campaign is covering all the 45 departments and main roads and highways. We are measuring Indoor, Incar and Outdoor coverage with a special focus on Indoor coverage. It is done once a year.

2. One QoS/QoE national campaign:

In this operation, we are driving also the 45 departments we are most focusing in the populated zones.

3. One national campaign on mobile data:

This campaign is just targeting the 14 regional capitals.

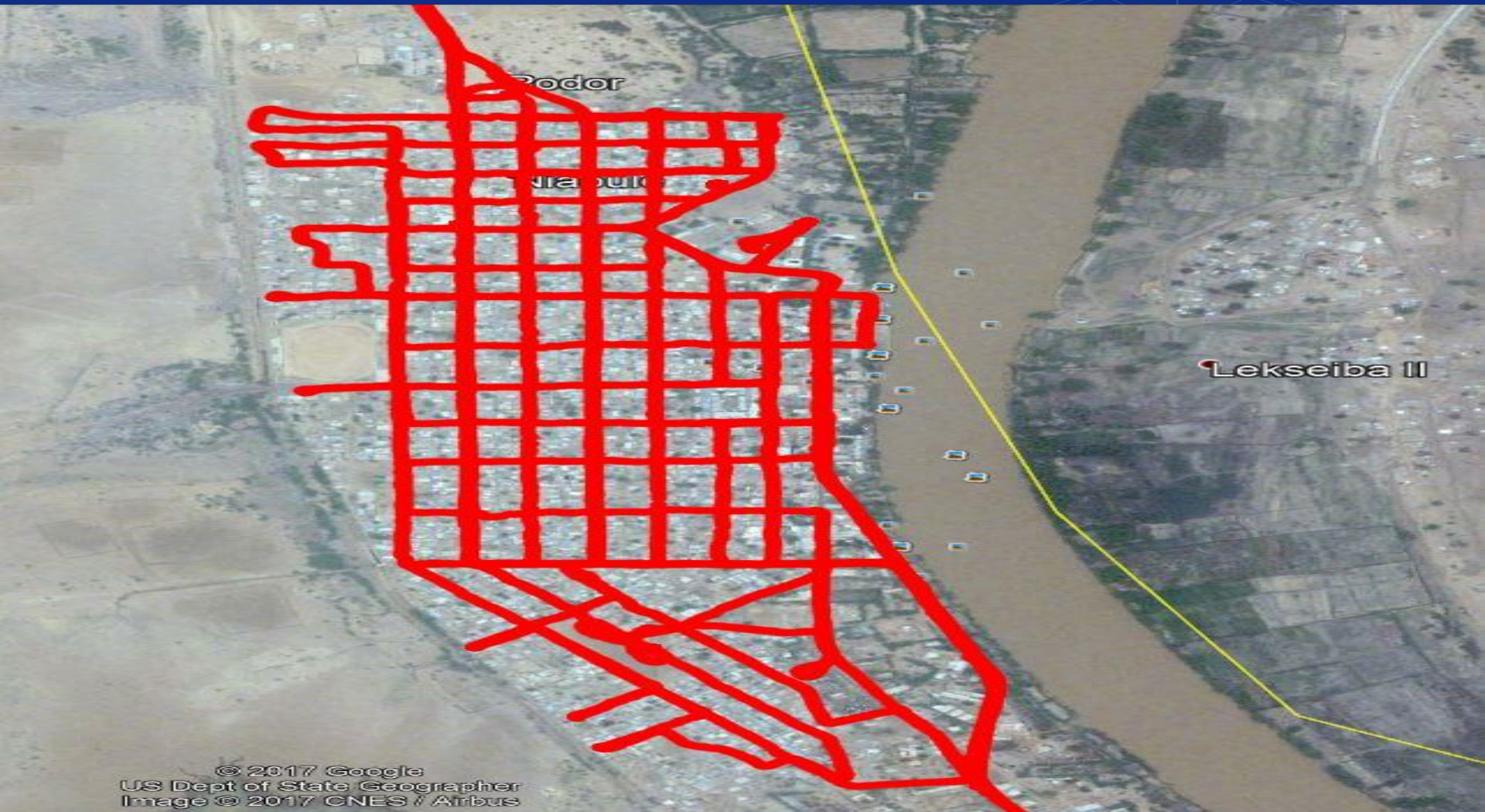
4. One Regional ADSL campaign:

This campaign is covering just the four departments of Dakar.



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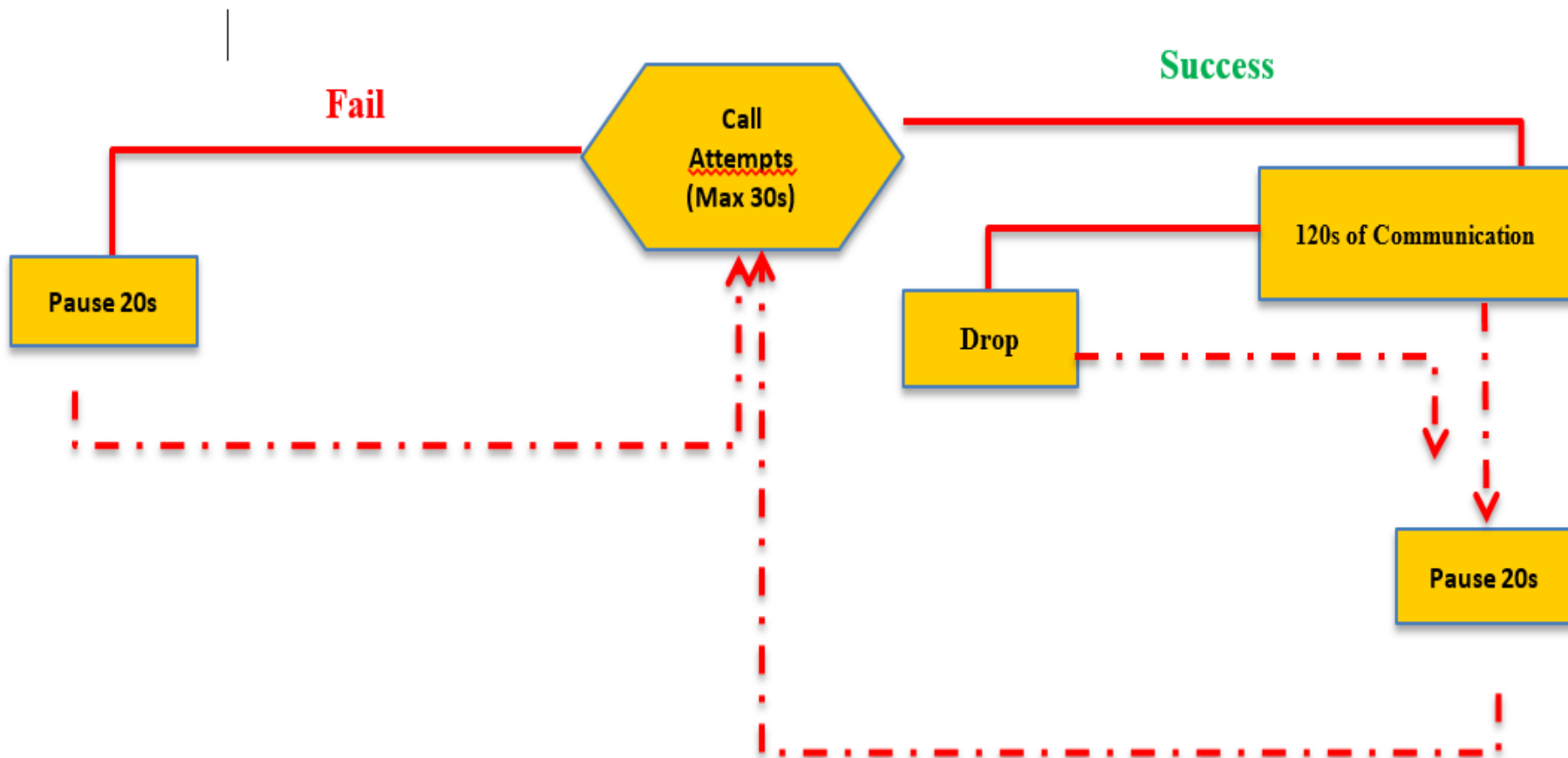
QoS/QoE planned campaigns for an example





QoS/QoE planned campaigns: Scenario measurements of Voice Call Quality

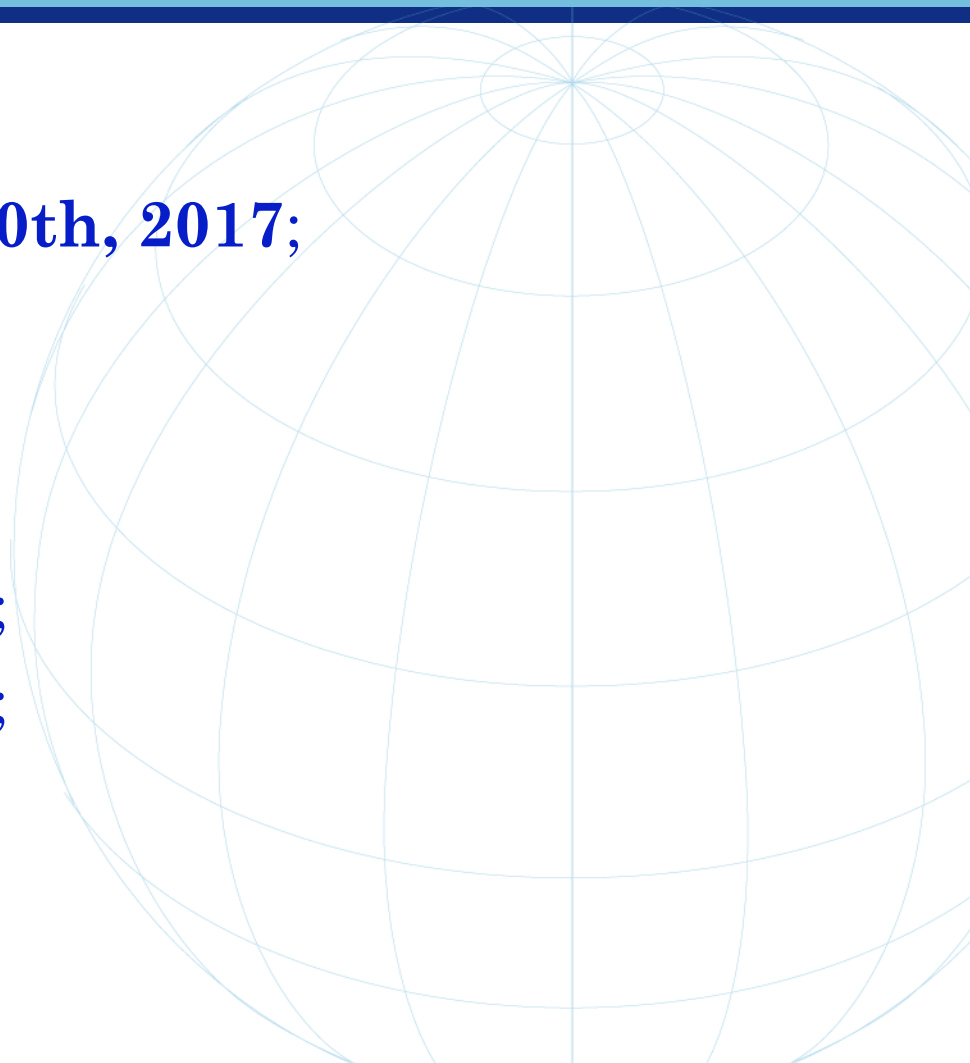
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QoS/QoE planned campaigns: Statistics

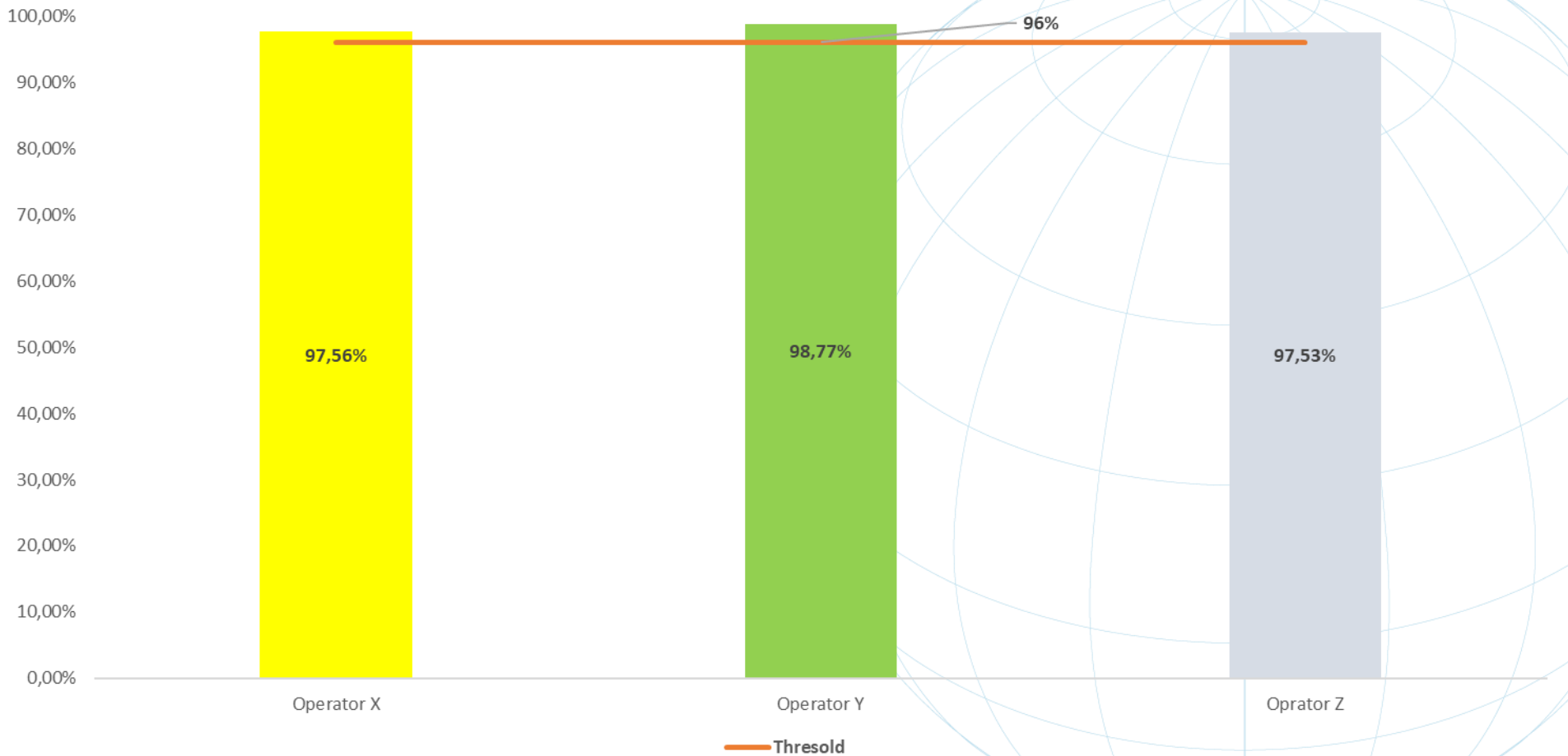
- Measures Period : **October 20th, 2017;**
- Browsed distance: **41,19 km;**
- Average speed: **07,36 kph;**
- Sampling:
 1. Operator X: **117 calls;**
 2. Operator Y: **117 calls;**
 3. Operator Z: **117 calls.**





QoS/QoE planned campaigns: Success rates results

Drive results





QoS/QoE planned campaigns: Dysfunctions points of operator Z

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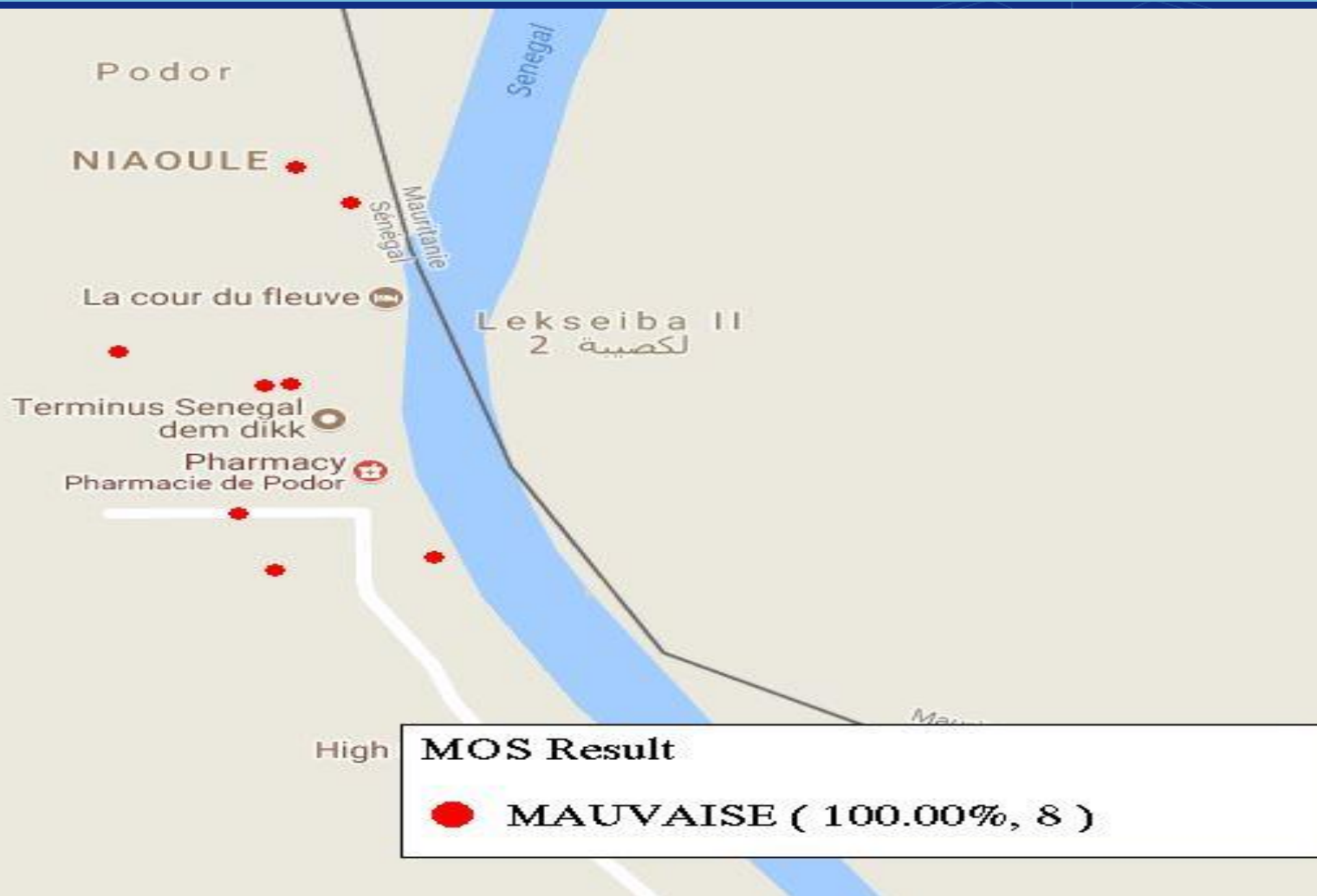




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QoS/QoE planned campaigns Bad MOS

Points of operator Z





QoS/QoE planned campaigns

Information sharing

- After each campaign, we proceed with two types of returns: a plenary with all operators to share the results and give general recommendations and an other one in bilateral to give specific recommendations to every operator.
- For the noticed network dysfunctions , we proceed to formal demands



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QoS/QoE management during major events





QoS/QoE management during major events

- In Senegal, we have like 10 major events yearly where we have to deal with million of people in a place at one time.
- For this kind of event, we are proceeding like that:
- *Estimate the area QoS/QoE situation at least one month before the event takes place;*
- *Ask to the operators to provide us the plan to set up for the event;*
- *Doing another QoS/QoE assessment one week before the event;*
- *Having mobile technical teams to alert the operators of their negligence in time real during all of the event period;*
- *Implementing of a toll-free number;*
- *At the end of the event , we proceed with a return under plenary form with all operators to share the results and give general recommendations for improvement for the events to come*



QoS/QoE complaints management

- **Complaints are coming from many different channels:**
 - *Email, mails, calls, toll-free number.....*
 - *We forward in real time all complaints to the concerned operator and we summon them to handle the complaint in compliance with the SLA;*
 - *When the complaint becomes recurring we send a mobile team on the spot to ask about the situation,*
 - *We always try to have the information feedback concerning the situation in order to close the trouble ticket;*
 - *We are also monitoring closely the most impacted services or areas;*



QoS/QoE data resulting from operators management

- We are receiving monthly data from operators
- *Coverage cards by technology; QoS KPI results, CDRS....*
- *We are always comparing operators data to ours and do reconciliation when there are some significant gaps:*



Incidents which impact on the QoS/QoE management

- It is mandatory for operators to inform us in real time about all accidents on the Network;
- After the accident, they have to send us an incident report in which they have to highlight in details all impacts;
- They have also to provide a solution to avoid this accident to happen in the future.



HR management

- ARTP is taking QoS/QoE issues very seriously:
- *A direction is created just for Control and QoS/QoE and Network Coverage;*
- *An entire department is dedicated to QoS/QoE and coverage;*
- *Recruitment of talented people;*
- *Acquisition of new equipment;*
- *Ambitious training programs;*
- *Active Participation of Senegal at the African and world meetings;*
- *Senegal is hosting the next African Regional workshop on QoS/QoE in March 2018;*
- *Benchmarking around the world.*



The fallouts of the various QoS strategies applied

- These different strategies have many impacts on the Senegalese Telecommunication Landscape:
- *Build up and reinforce trust between Telco operators and Regulator;*
- *To have an accurate estimation of QoS/QoE situation nationwide;*
- *To be able to forecast the future targets in terms of QoS/QoE;*
- *To build up strong and reliable Telecommunication infrastructures that can support the upper layers.*

Thanks you



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