



# INDEPENDENT DRIVE TEST REPORT

*For*

# Hyderabad to Tirupati Railway

2019

MAY

SOUTH ZONE

**Key Performance Indicators: All TSPs have met the Drop Call Rate (DCR) benchmark of 2% except Airtel 2G, BSNL 2G, BSNL 3G & Airtel VoLTE. All TSPs have met the Call Setup Success Rate (CSSR) of 95%.**

The Independent Drive Test has been carried out by M/s PhiMetrics Technologies Pvt. Ltd. on behalf of TRAI in Hyderabad to Tirupati Railway Route from 08:00 PM to 08:00 AM; 1<sup>st</sup> May 2019 to 2<sup>nd</sup> May 2019. The drive test covered a drive route of 633 KMs over a period of two day. Approximately 375 calls were made for each of the 9 networks: four 2G networks, three 3G networks and two LTE network covering 5 unique TSPs.

Overview

Voice Summary

# Overview

## Overview:

Telecom Regulatory Authority of India has been entrusted with the task of laying down the standards of quality of service to be provided by the service providers and ensuring its enforcement; and also TRAI is responsible for conducting the periodical audit of such services provided by the service providers so as to protect the interest of the consumers of telecommunications service

TRAI is regularly monitoring the performance of Telecom Service Providers (TSP) against the benchmarks for the various Quality of Service (QoS) parameters laid down by the Authority. TSPs submit Performance Monitoring Reports to TRAI every quarter. TRAI also undertakes audit and assessment of Quality of Service through independent agencies to verify the Quality of Service claimed. The Audit agencies conduct sample 'Drive tests' across various cities in the country as part of audit and assessment of the TSPs' performance.

In view of complaints on call drops and other network quality issues, on behalf of TRAI, an Independent Drive Test (IDT) was conducted by PhiMetrics Technologies Pvt. Ltd. on 1st May 2019 to 2nd May 2019 covering various locations in Hyderabad to Tirupati Railway Route. The performance of Airtel, BSNL, Tata, Jio and Vodafone Idea Limited (VIL(Idea)) were monitored across various technologies (2G, 3G, and 4G). The drive test route was defined on the basis of several factors that include - areas from where call drop complaints are commonly received; areas of heavy usage; areas where previous Drive tests showed network issues; etc.

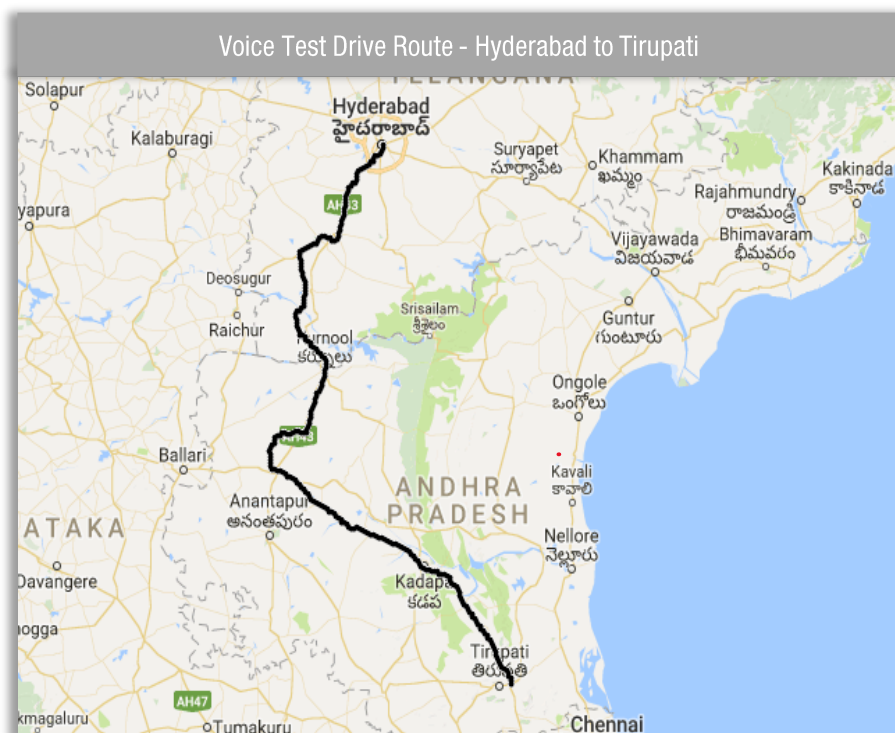
The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services in terms of Voice: Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

### Drive Test Details For Hyderabad to Tirupati Railway Route:

Independent Drive test was conducted for a period of two day on 1st May 2019 to 2nd May 2019 in Hyderabad to Tirupati Railway Route from 08:00 PM to 08:00 AM. Calls were made for 90 sec duration with wait time of 10 sec between calls in all technologies.

**Voice Tests:** The drive test covered a drive route of approximately 633 KMs over a period of two day on 1st May 2019 to 2nd May 2019. Approximately 375 calls were made for each of the 9 networks: four 2G (Lock Mode) networks, three 3G (Dual mode) networks and two VoLTE network covering 5 unique TSPs.

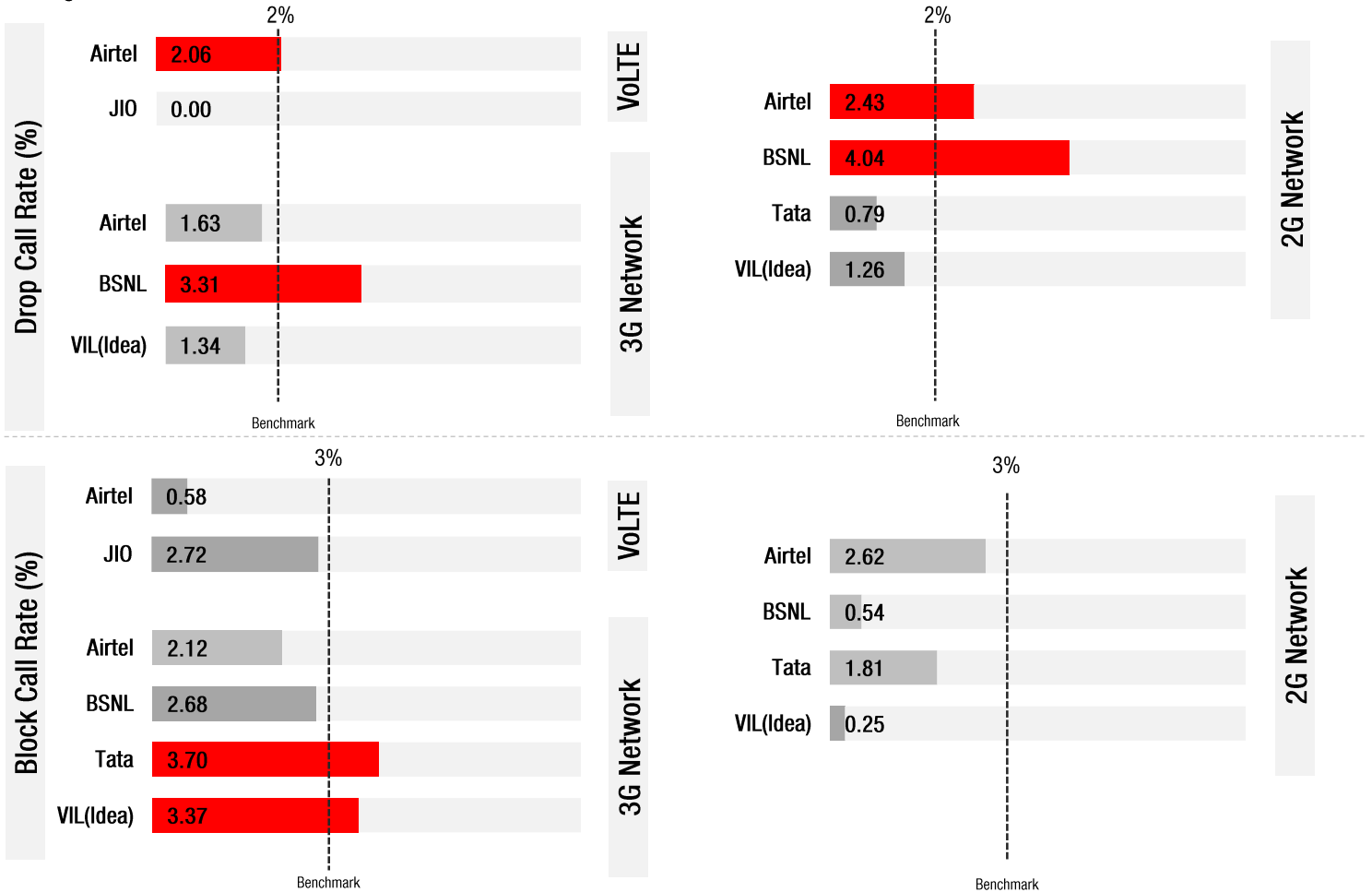
\* In case of multiple call failure in similar geo location in given period of 60secs has been counted as one call failure



# Voice Calls

## Key Observations

QoS compliance of the TSPs in Hyderabad to Tirupati Railway for Voice across technologies 2G/3G/4G-VoLTE is given below:



KPI	2G Networks			
	Airtel	BSNL	Tata	Vodafone Idea Ltd Idea
SDCCH Congestion(<=1%)	2.10%	0.27%	1.55%	0.00%
TCH Congestion (<=2%)	0.52%	0.27%	0.26%	0.25%
KPI	3G Networks			Vodafone Idea Ltd Idea
	Airtel	BSNL		
CSFB Failure %	0.52%	NA		0.26%
SDCCH Congestion%	0.27%	0.80%		0.52%
RRC Congestion%	1.06%	1.61%		2.33%
SDCCH & RRC Congestion(<=1%)	1.33%	2.41%		2.85%
TCH Congestion %	0.00%	0.27%		0.00%
RAB Congestion %	0.27%	0.00%		0.26%
TCH & RAB Congestion (<=2%)	0.27%	0.27%		0.26%

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%) except Airtel 2G, BSNL 2G, BSNL 3G & Airtel VoLTE.  
 b) Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's except Idea 3G.

\*NA = Not Applicable Not meeting Benchmark

# Voice Calls

## Key Observations

### Coverage

a) Percentage of coverage samples for 2G  $\geq$  -85 dBm .

TSPs	2G			
	Airtel	BSNL	Tata	VIL(Idea)
Coverage%	62.72%	66.51%	68.47%	76.75%

b) Percentage of coverage samples for 2G  $\geq$  -85 dBm, 3G  $\geq$  -90 dBm & LTE  $\geq$  -110 dBm.

TSPs	3G			VoLTE	
	Airtel	BSNL	VIL(Idea)	Airtel	Jio
Coverage %	55.20%	66.36%	68.59%	80.50%	94.74%

c) Percentage of time spent on 3G network:

TSPs	3G		
	Airtel	BSNL	VIL(Idea)
Time Spent on 3G%	51.54%	18.94%	47.43%

d) Percentage of RLT  $\geq$ 48:

TSPs	2G			
	Airtel	BSNL	Tata	VIL(Idea)
%RLT $\geq$ 48	0.00%	0.49%	0.00%	0.00%

e) Average CST Second

TSPs	2G			
	Airtel	BSNL	Tata	VIL(Idea)
Second	2.85	2.47	2.85	2.61

TSPs	3G				VOLTE	
	Airtel	BSNL	Tata	VIL(Idea)	Airtel	Jio
Second	4.27	2.75	3.5	3.16	4.68	0.46

# Summary

## City Level Summary

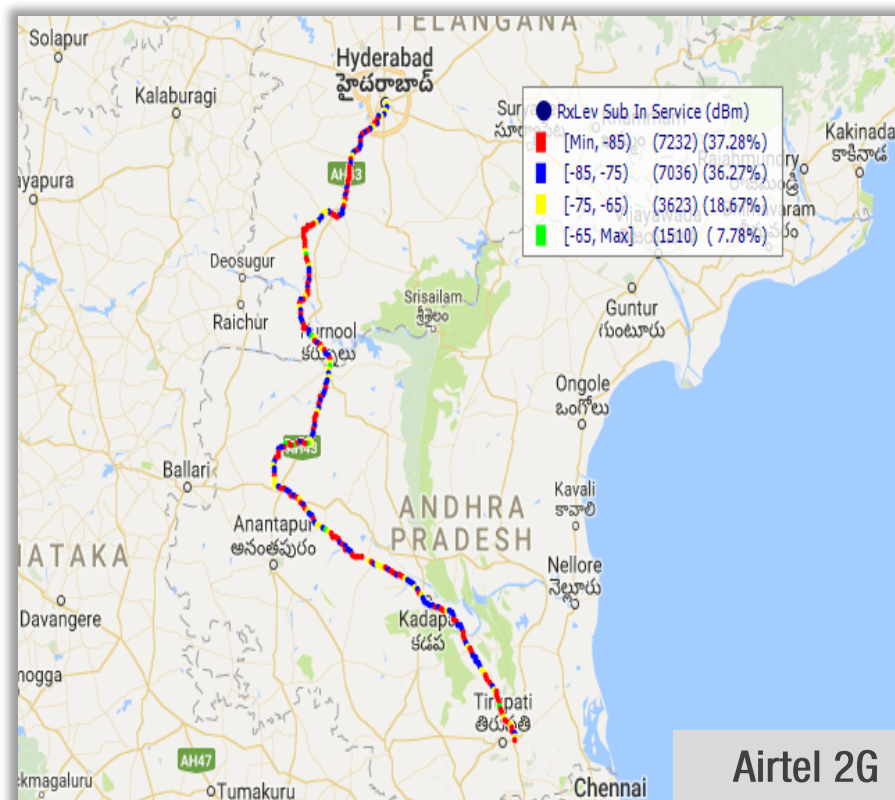
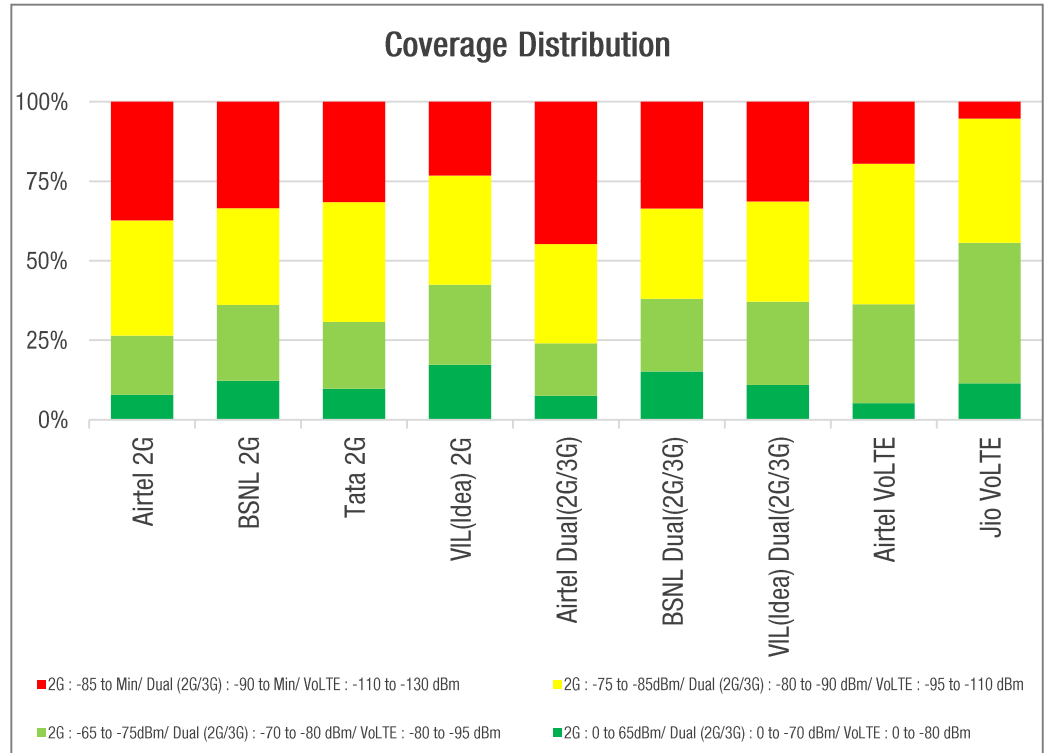
Voice Call	2G			
	Airtel	BSNL	Tata	VIL(Idea)
Call Attempt	381	373	387	397
Blocked Call Rate (%)	2.62%	0.54%	1.81%	0.25%
CSSR% (Accessibility)	97.38%	99.46%	98.19%	99.75%
Drop Call Rate (%)	2.43%	4.04%	0.79%	1.26%
Mobility HOSR (%)	94.45%	94.73%	98.00%	97.65%
Rx Quality (%)	92.04%	94.87%	95.12%	94.42%

Voice Call	3G			VoLTE	
	Airtel	BSNL	VIL(Idea)	Airtel	Jio
Call Attempt	377	373	386	342	367
Blocked Call Rate (%)	2.12%	2.68%	3.37%	0.58%	2.72%
CSSR% (Accessibility)	97.88%	97.32%	96.63%	99.42%	97.28%
Drop Call Rate (%)	1.63%	3.31%	1.34%	2.06%	0.00%
Mobility HOSR (%)	99.57%	95.28%	99.60%	99.76%	99.30%
Rx Quality (%)	91.11%	94.57%	90.62%	87.12%	85.26%

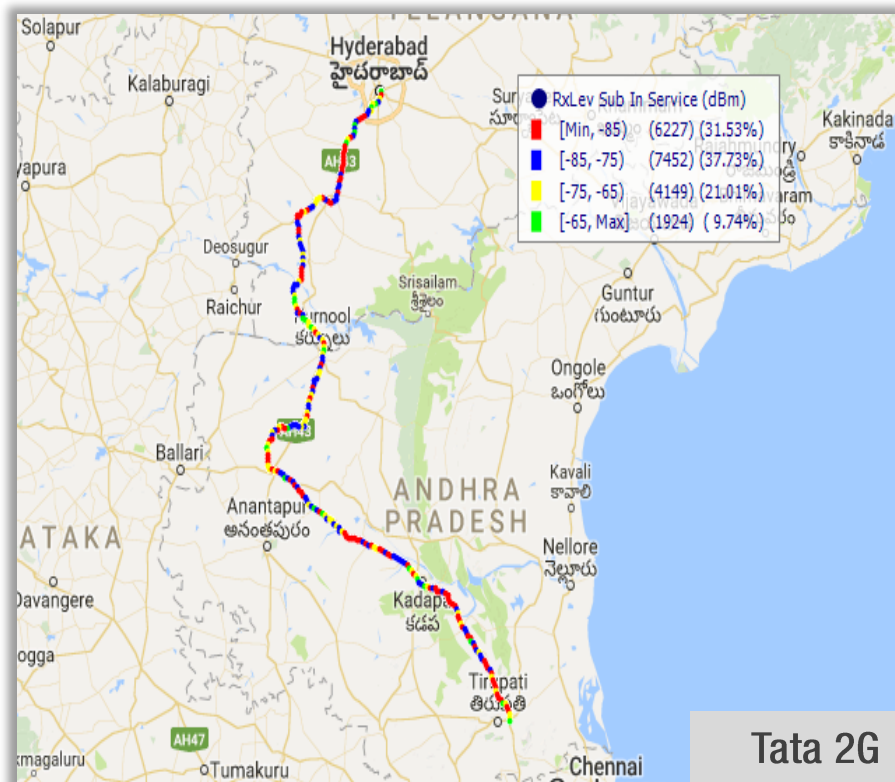
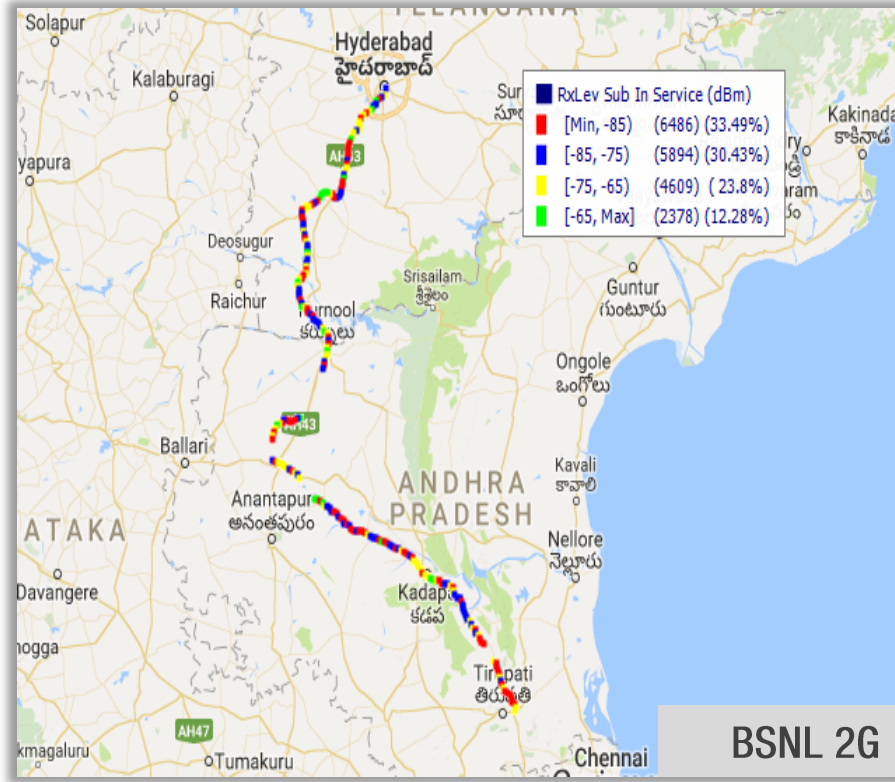
# I. Coverage Details

RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call/data session. The Coverage rate of an TSP is calculated on the basis of % of samples in which the Rx level  $\geq -85$  dBm, RSCP is  $\geq -90$  dBm & RSRP  $\geq -110$  dBm. The details are as follows.

TSP	Coverage Rate
Airtel 2G	62.72%
BSNL 2G	66.51%
Tata 2G	68.47%
VIL(Idea) 2G	76.75%
Airtel Dual(2G/3G)	55.20%
BSNL Dual(2G/3G)	66.36%
VIL(Idea) Dual(2G/3G)	68.59%
Airtel VoLTE	80.50%
Jio VoLTE	94.74%

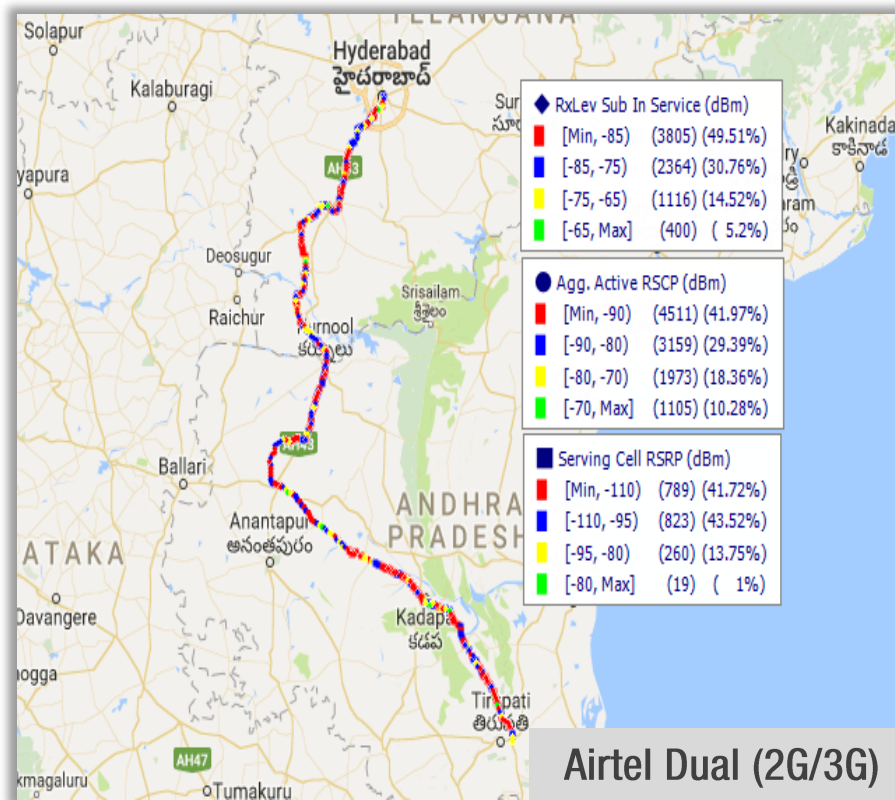
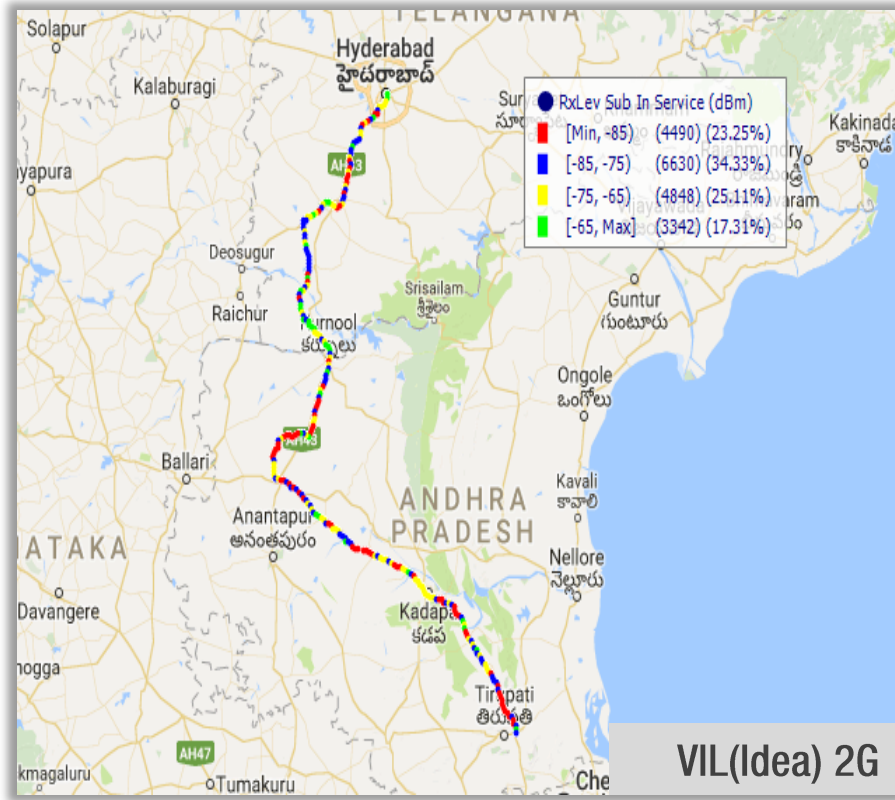


# I. Coverage Details (contd.)



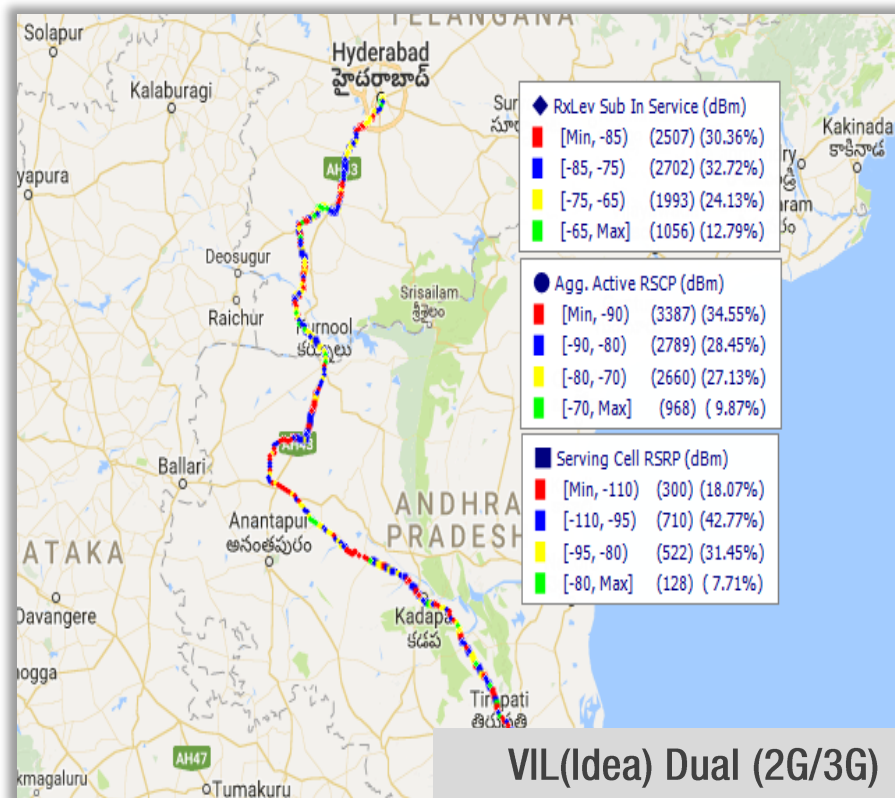
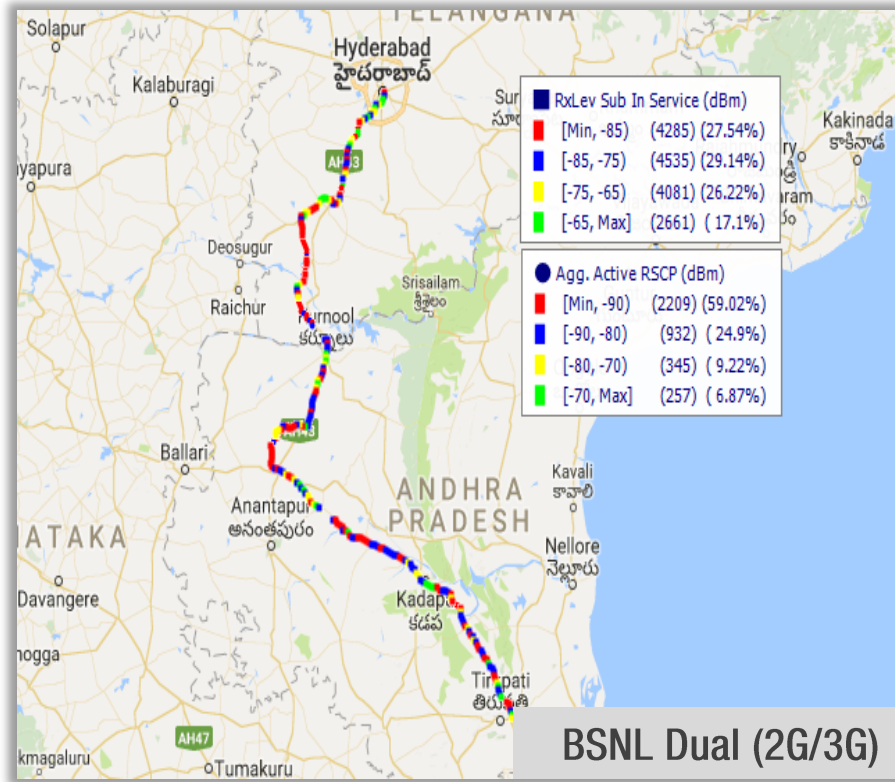


# I. Coverage Details (contd.)

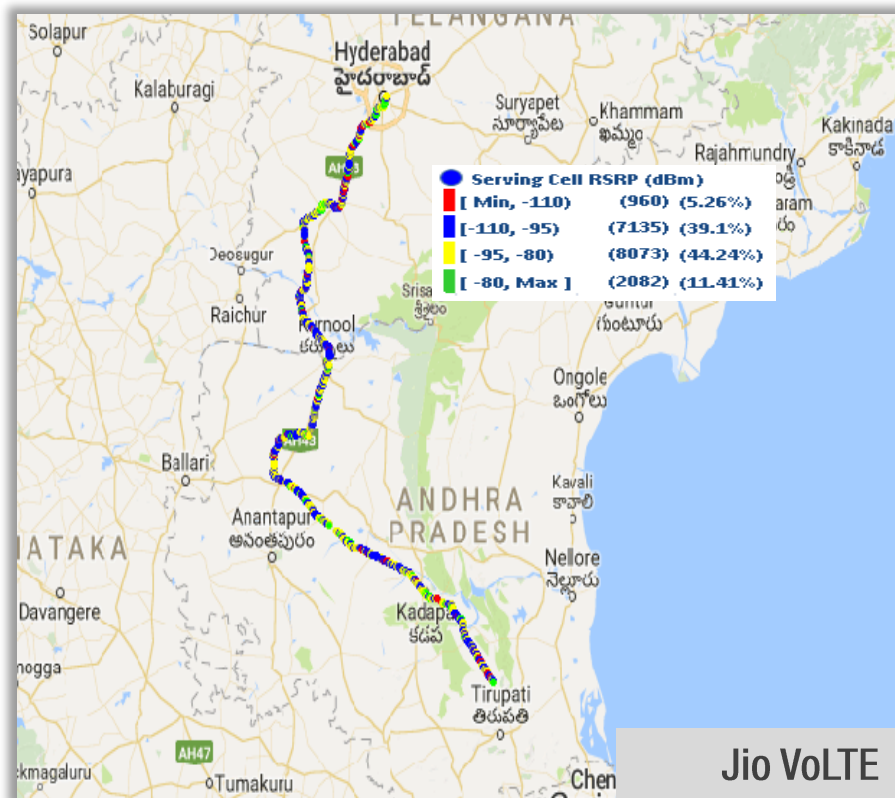
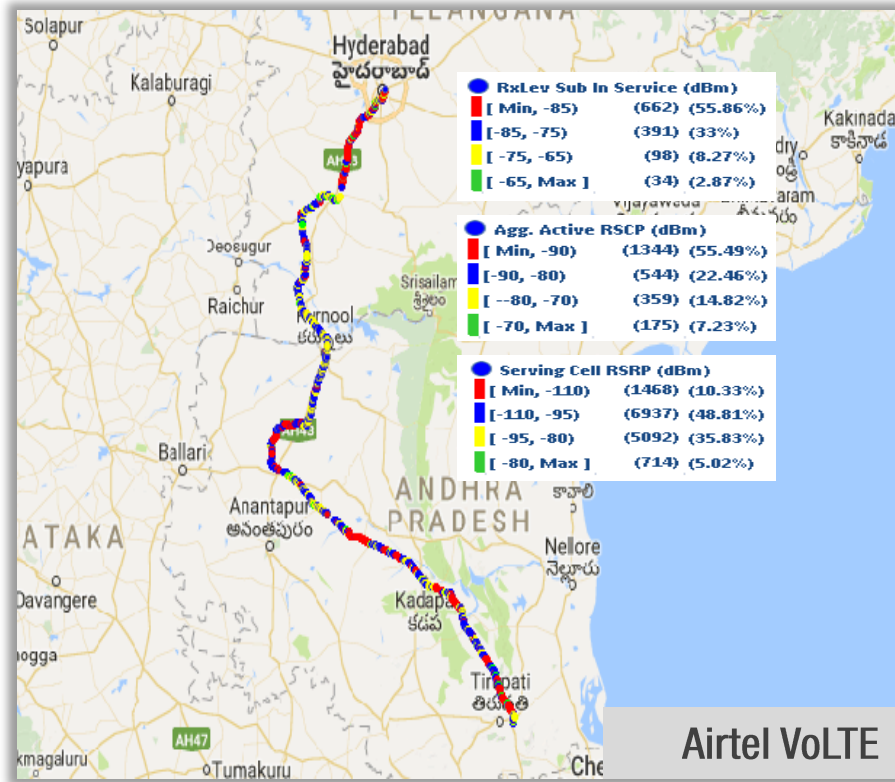




# I. Coverage Details (contd.)



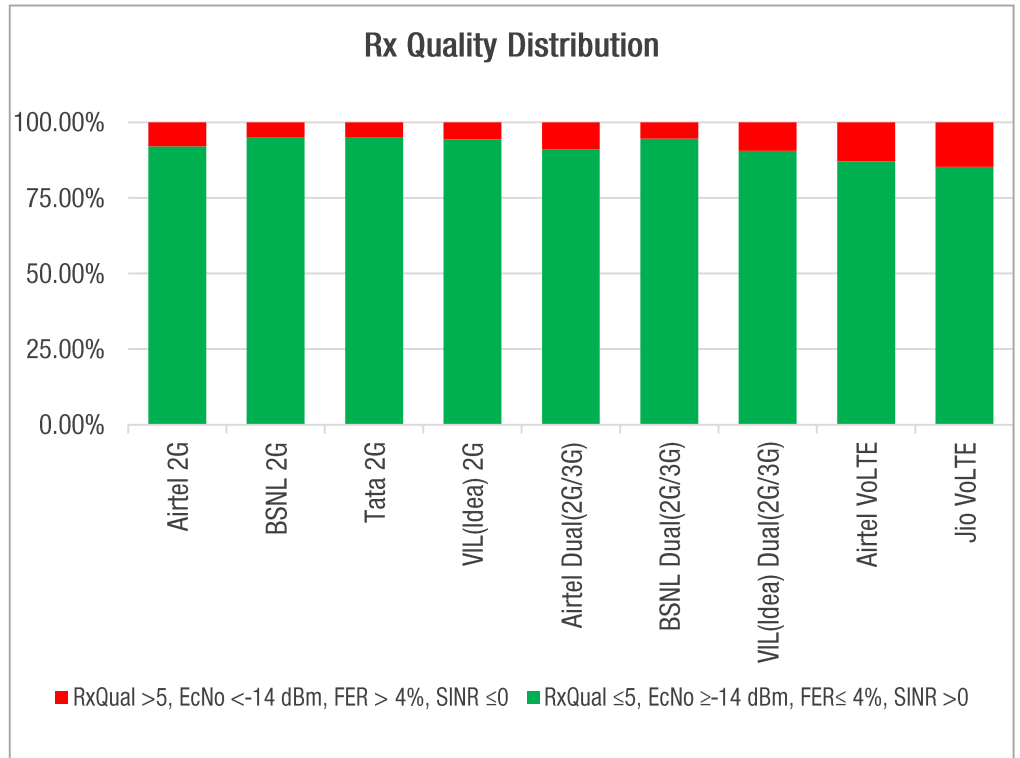
# I. Coverage Details (contd.)



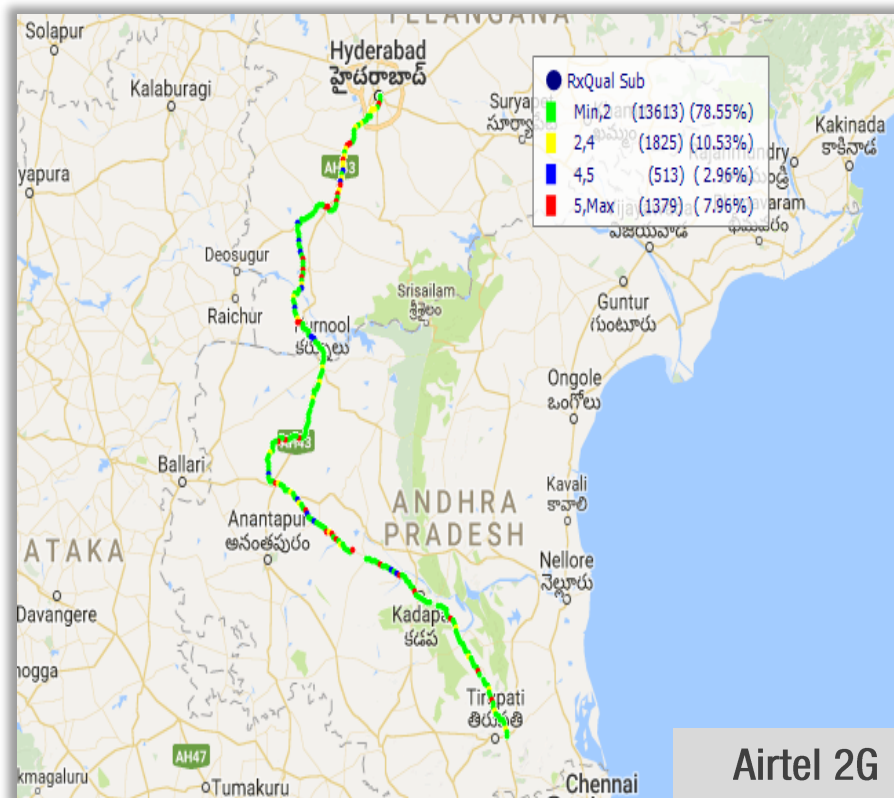
## II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual  $\leq 5$  for GSM TSPs, EcNo  $\geq -14$  dBm for 3G TSP and SINR  $> 0$  in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be  $\geq 95\%$ .

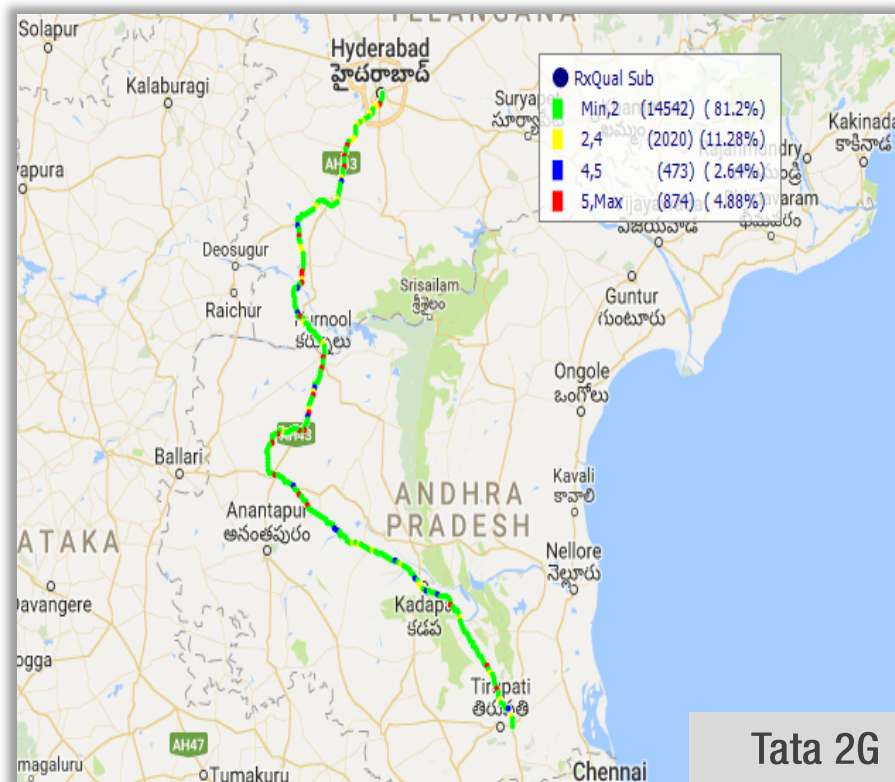
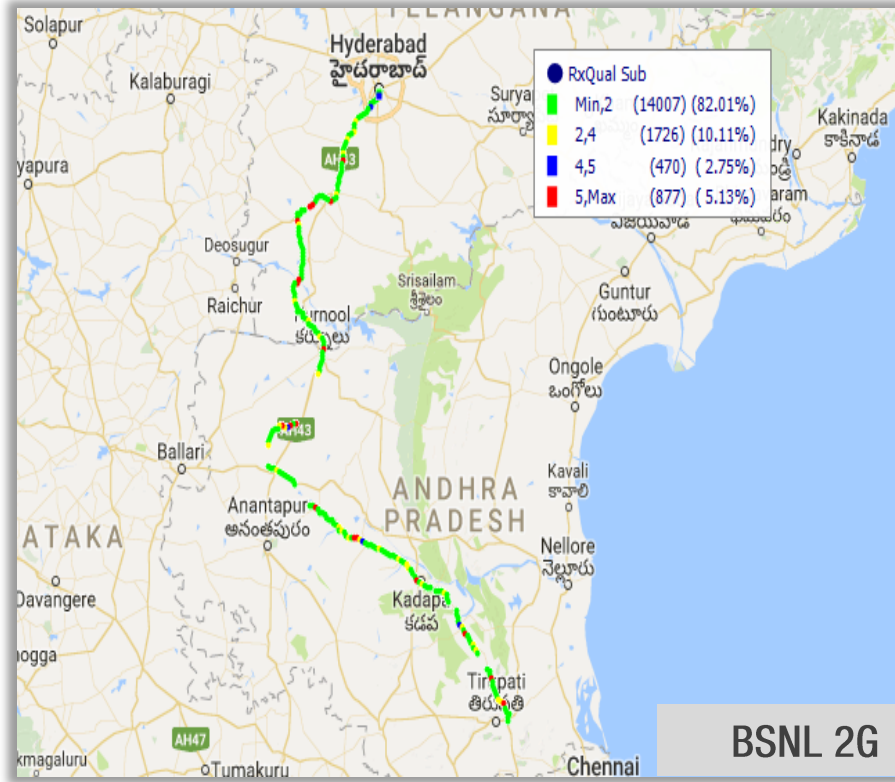
TSP	Rx Quality
Airtel 2G	92.04%
BSNL 2G	94.87%
Tata 2G	95.12%
VIL(Idea) 2G	94.42%
Airtel Dual(2G/3G)	91.11%
BSNL Dual(2G/3G)	94.57%
VIL(Idea) Dual(2G/3G)	90.62%
Airtel VoLTE	87.12%
Jio VoLTE	85.26%



— TSPs not meeting the Benchmark

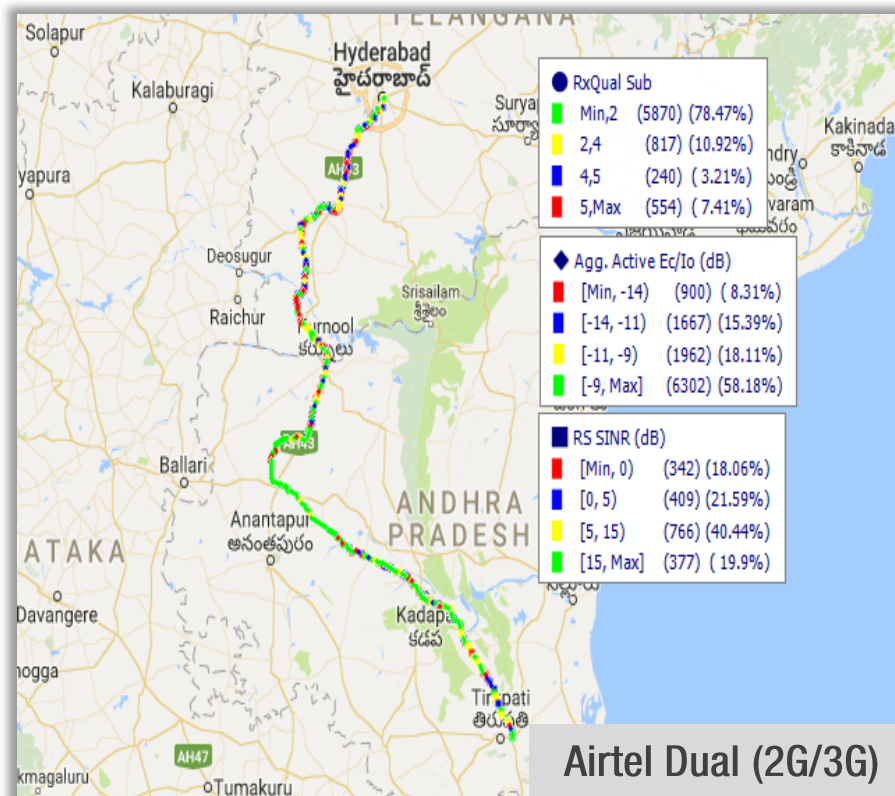
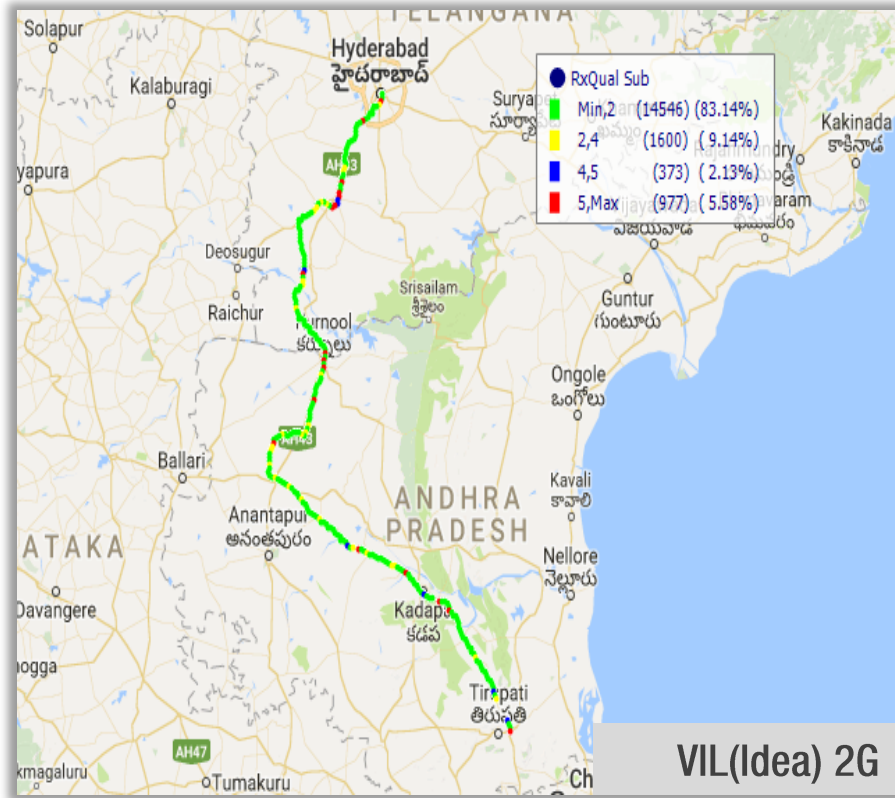


## II. Quality Details (contd.)

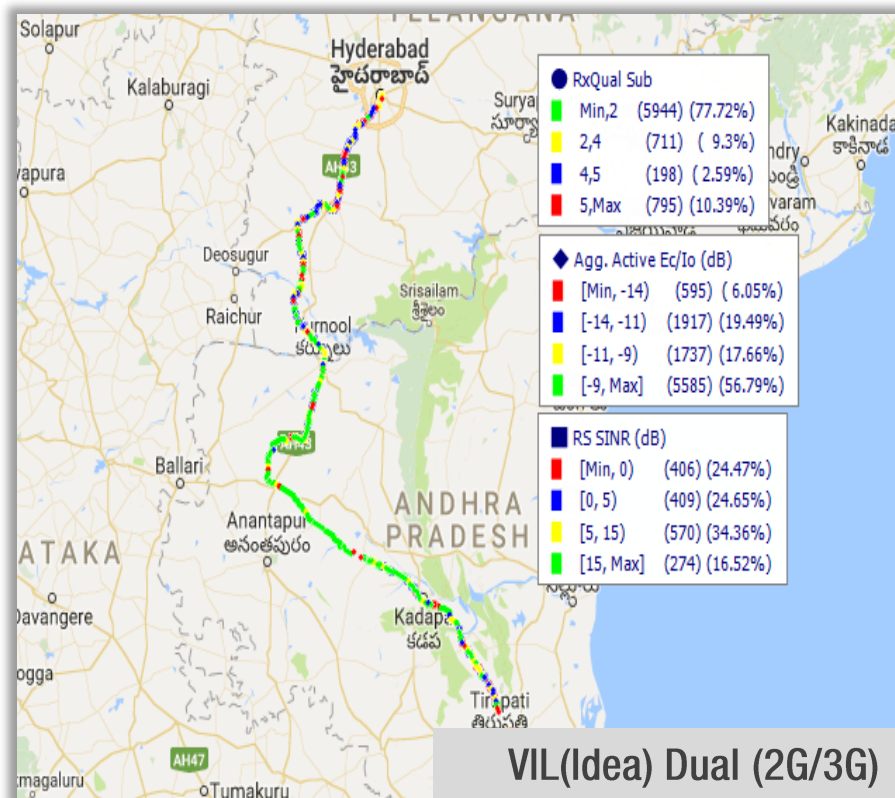
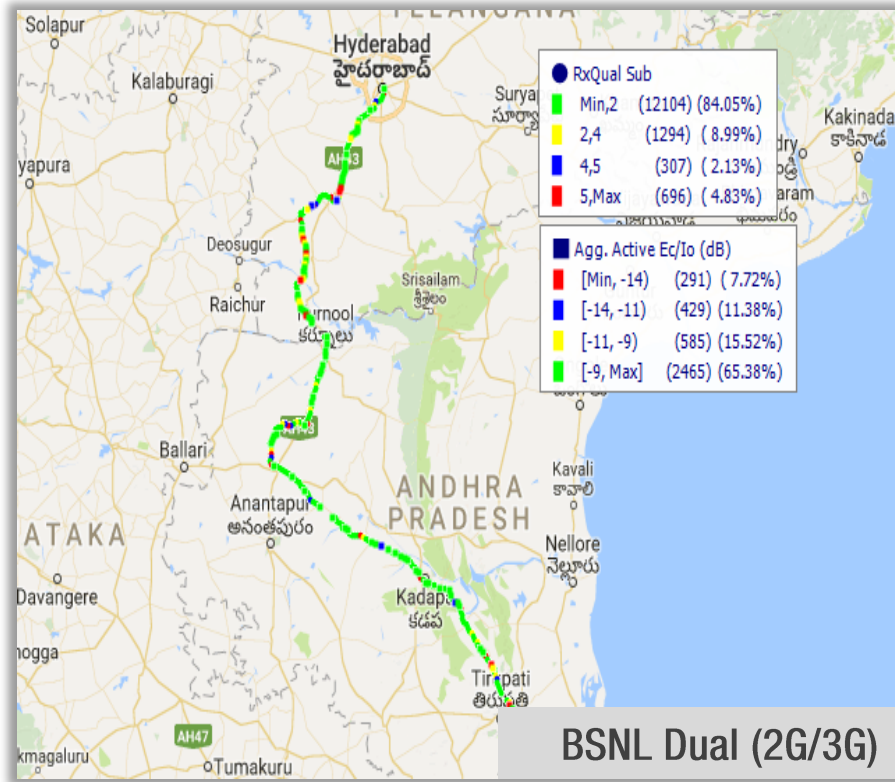




## II. Quality Details (contd.)

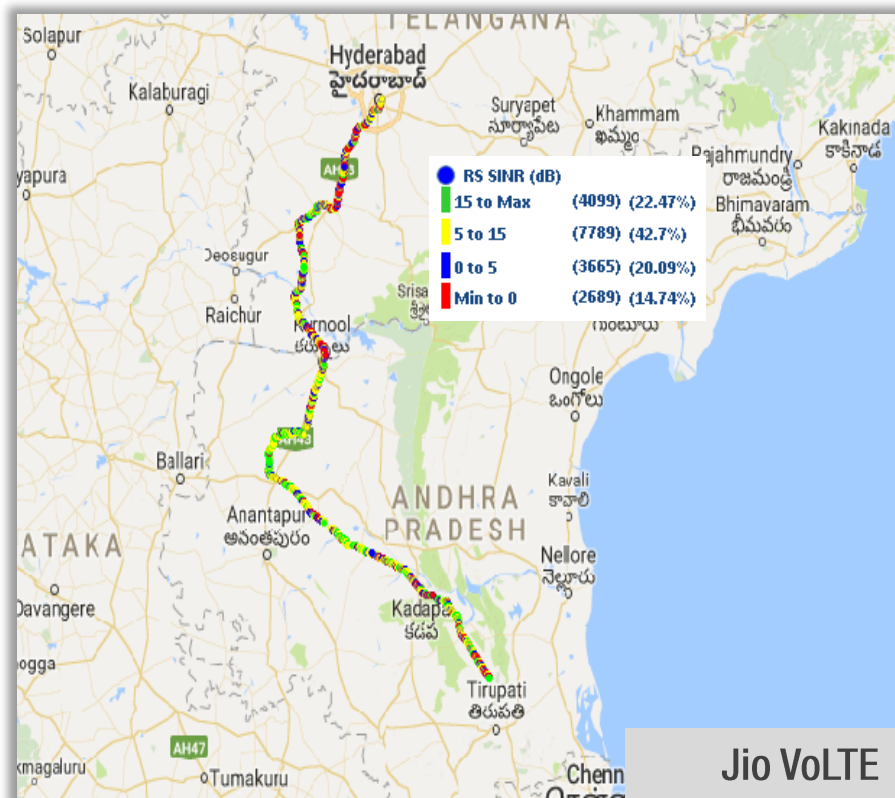
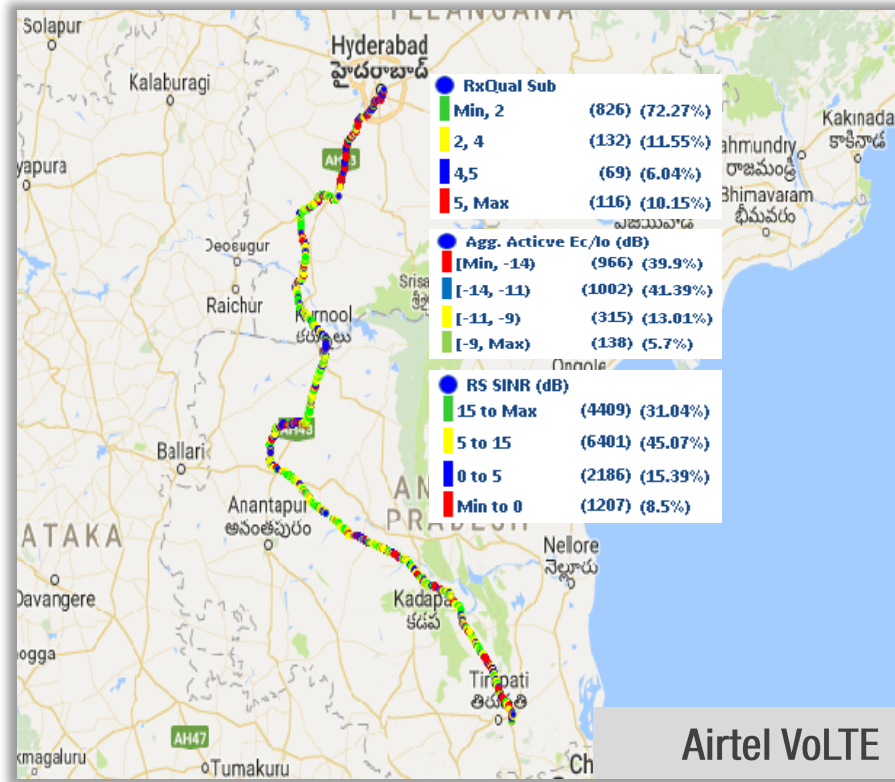


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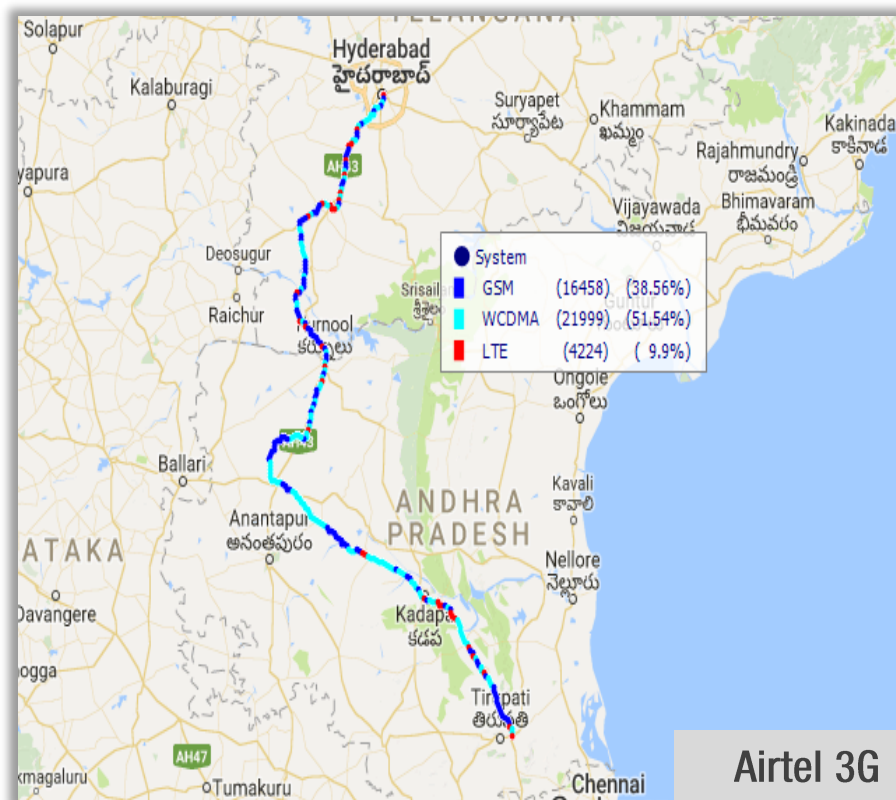
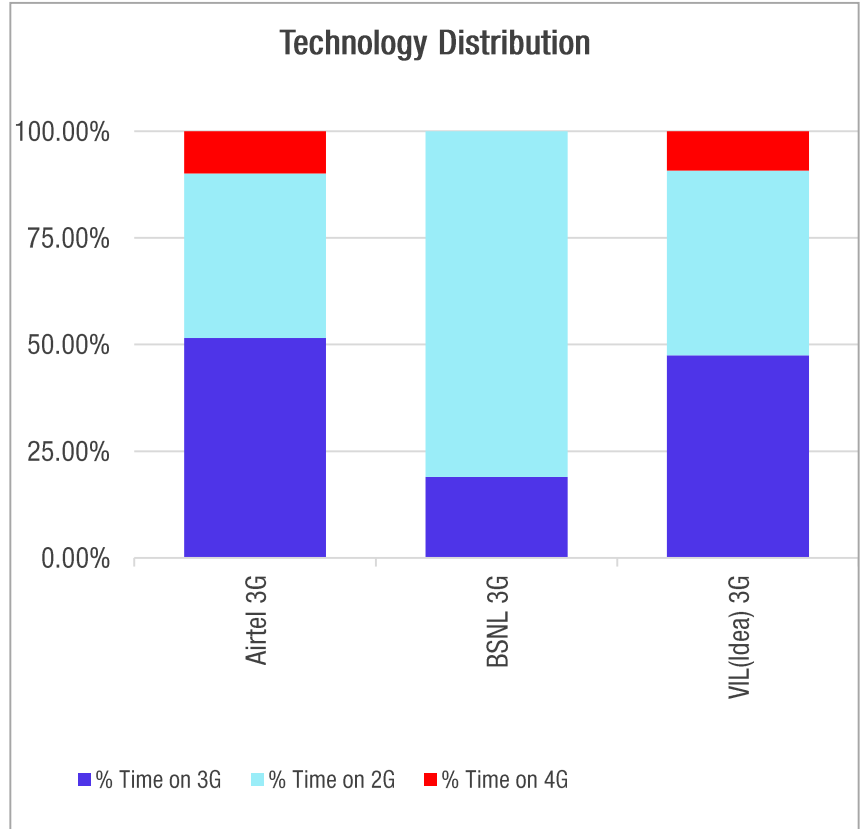


## II. Quality Details (contd.)



### III. Technology Details

TSP	% Time on 3G
Airtel 3G	51.54%
BSNL3G	18.94%
VIL(Idea) 3G	47.43%



### III. Technology Details(contd.)

