

Operator Assisted Drive Test Report

Saitual, Khawzawl & Champhai Districts

Mizoram

November, 2024

(RO, Kolkata)

Key Performance Indicators (KPIs):

The following TSPs could not meet the KPIs benchmark as stated below—

AIRTEL- Rx Quality in 2G & 4G (SINR) network.

BSNL-Drop Call Rate in 2G network, Block Call Rate in 2G, Call Setup Success Rate in 2G network, Hand Over Success Rate in 2G, Rx Quality in 2G network.

RJIO-Rx Quality in 4G (SINR) network.

VIL- Rx Quality in 2G network.

VIL and BSNL did not participate in the 3G/4G drive test because VIL has no 4G coverage, and BSNL has no 3G/4G coverage along the two-days OADT routes.

The Operator Assisted Drive Test has been carried out by Regional Office, Kolkata with the help of Service Providers in Saitual, Khawzawl and Champhai Districts and surrounding areas in Mizoram including National Highway 6 on 28th November and 29th November 2024 from 08:30 AM to 07:30 PM. The drive test covered drive route of 201 KMs (approx) over a period of two days. Approximately 172+ calls were made for each of the 5 networks: **three** 2G networks, and **two** 4G networks covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

Saitual district is one of the eleven districts of Mizoram state in India. Saitual district was recently created in 3rd June, 2019. The district is named after its headquarters Saitual.

Khawzawl district is one of the eleven districts of Mizoram state in India. Khawzawl district was recently created in 3rd June, 2019.

Champhai district is one of the eleven districts of Mizoram state in India. The district is bounded on the north by Churachandpur district of Manipur state, on the west by Saitual and Serchhip districts, and on the south and east by Myanmar.

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, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

Data: Download Throughputs and Upload Throughputs.

Voice Tests: Calls were made for 120 secs duration with wait time of 15 secs between call in 2G/ 3G on auto mode and 4G/ 5G on auto mode. Three 2G networks, Two 4G networks covering 4 unique TSPs were tested.

Data Tests: Dynamic Data Service Testing was performed along same route in 3G/4G/ 5G on auto mode. 250 MB file were downloaded and 125 MB file were uploaded from FTTP server in TSP's own server. Static Data Service Testing was also performed in 3G/ 4G / 5G on auto mode covering 4 unique TSPs were tested.

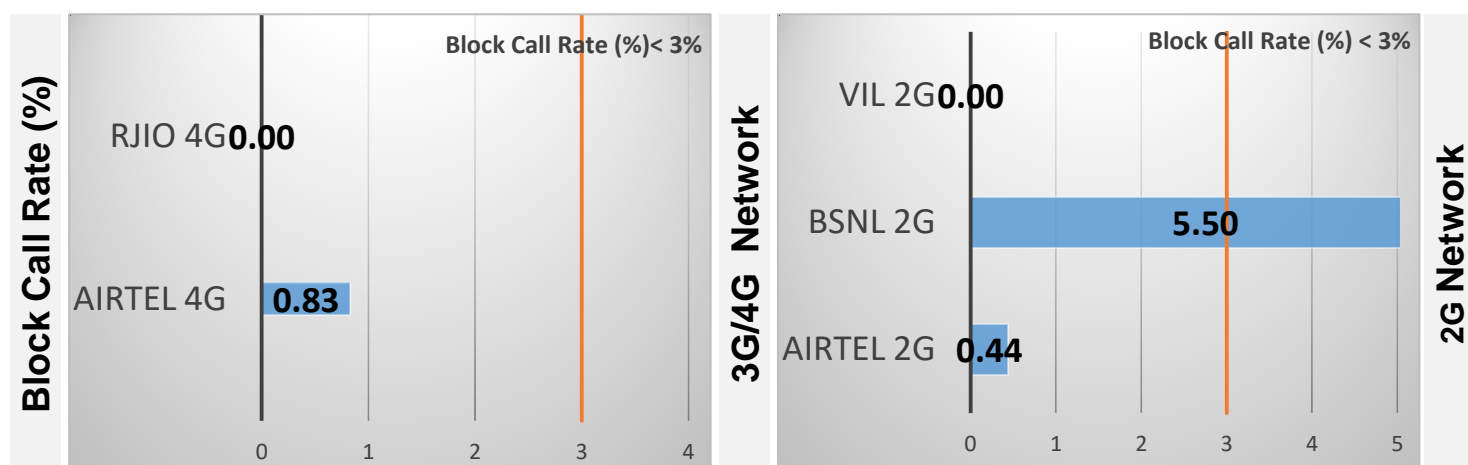
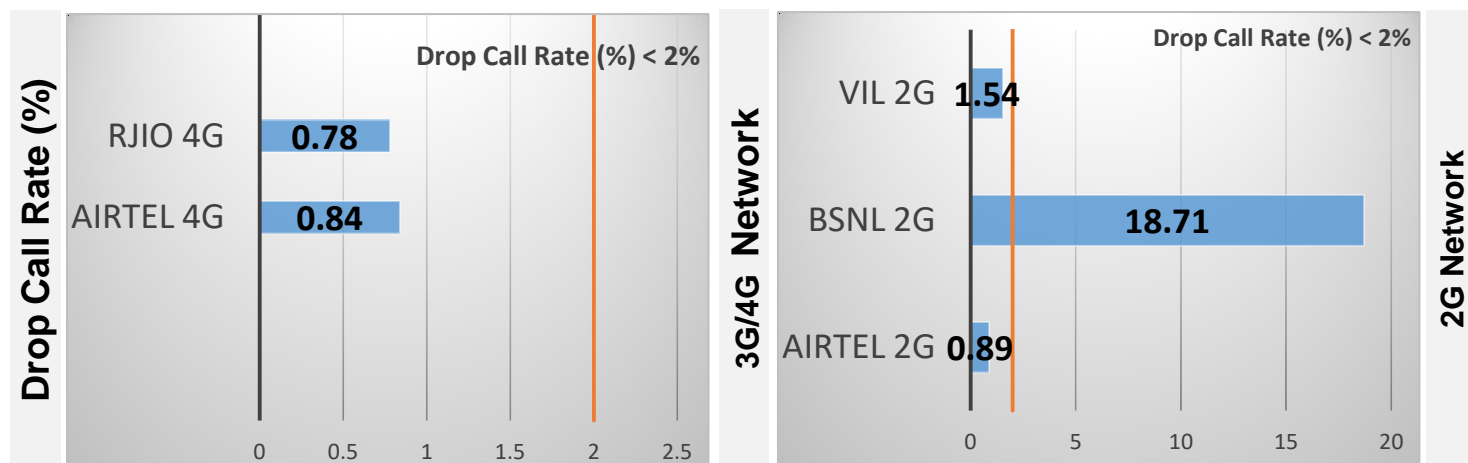
Service	Static Data Service Testing- Specifications
Download	250 MB in 3G/ 4G / 5G on auto mode
Upload	125 MB in 3G/ 4G / 5G on auto mode
Web Browsing	3 links of e/m commerce website www.amazon.in, www.flipkart.com and PayTm
Video Steaming	100 Sec Video & 125 sec Timeout
Latency	512 Bytes packet-- 1000 count on TSP own server using Ping.

Technology/ TSP	AIRTEL	BSNL	RJIO	VODAFONE-IDEA
2G	YES	YES	NO	YES
3G	NO	NO	NO	NO
4G	YES	NO	YES	NO
TOOL USED	TEMS	NIMO	X-CAL	TEMS

Voice Calls

Key Observations

QoS compliance of the TSPs for Voice across technologies 2G/3G/4G-VoLTE:



KPIs	2G			4G-VoLTE	
	AIRTEL	BSNL	VIL	AIRTEL	RJIO
Drop Call Rate %	0.89	18.71	1.54	0.84	0.78
Block Call Rate %	0.44	5.50	0.00	0.83	0.00

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%) except BSNL (2G) network.
- b) All TSPs have met the 3% QOS benchmark of Block Call Rate (BCR%) except BSNL (2G) network.

Coverage

a) Percentage of coverage samples for 2G ≥ -85 dBm.

TSPs	2G		
	AIRTEL	BSNL	VIL
Coverage %	63.50	53.71	92.59

b) Percentage of coverage samples for 3G ≥ -90 dBm & 4G ≥ -110 dBm.

TSPs	4G	
	AIRTEL	RJIO
Coverage	82.87	77.27

Summary

City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	226	164	65
Blocked Call Rate (%)	0.44	5.50	0
CSSR% (Accessibility)	99.56	94.51	100
Drop Call Rate (%)	0.89	18.71	1.54
Mobility HOSR (%)	98.33	85.70	100
Rx Quality (%)	94.56	94.00	91.65

Voice Call	3G/4G	
	AIRTEL 4G	RJIO 4G
Call Attempt	240	127
Blocked Call Rate (%)	0.83	0
CSSR% (Accessibility)	99.17	100
Drop Call Rate (%)	0.84	0.78
Mobility HOSR (%)	99.80	98.94
Rx Quality (%)	92.51	94.80

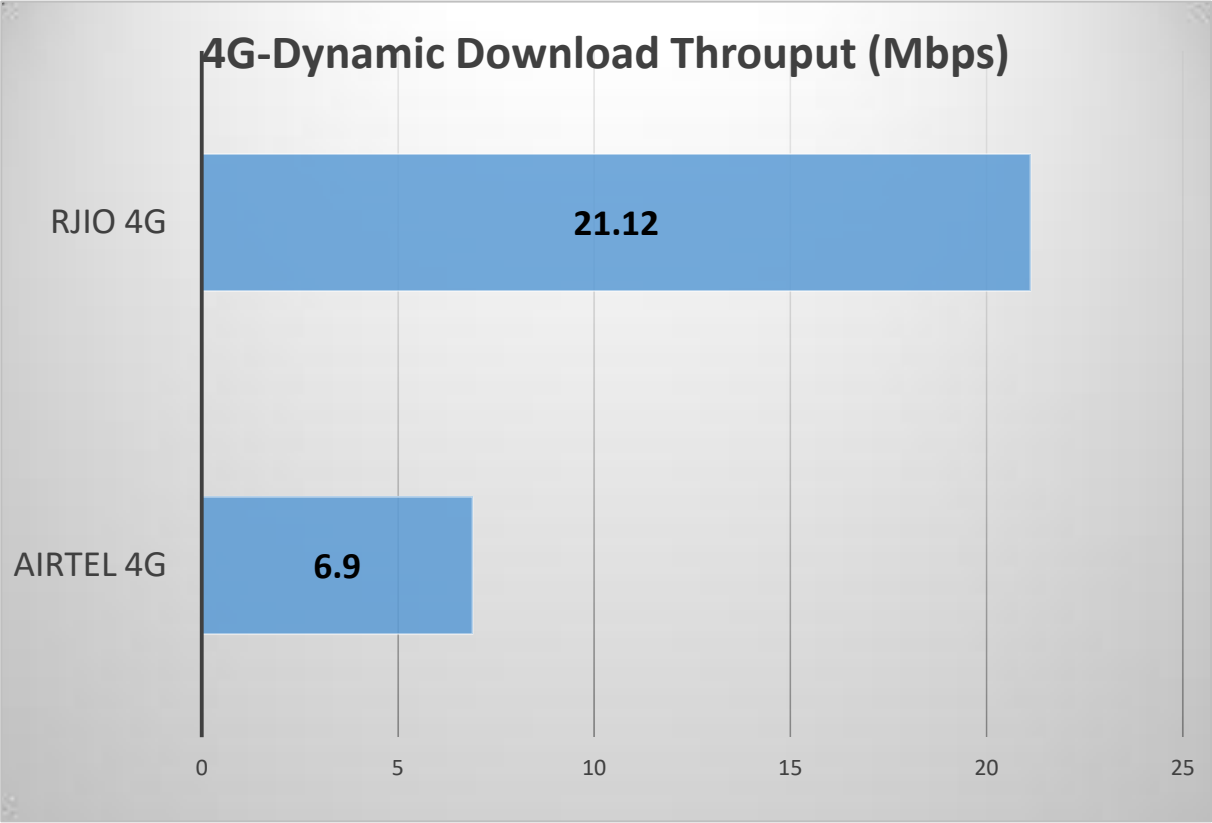
Summary-Data Services Dynamic

Key Observations

Dynamic Data was tested for 201 Kms. Download Throughput was tested.

Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

4G Network:



Summary-Data Services Static

City Level Summary-

Average Data Services Static	4G/ 5G	
	AIRTEL	RJIO
Download throughput in Mbps	146.10	109.49
Upload Throughput in Mbps	39.36	10.01
Video streaming delay (secs)	1.16	0.00
Web Browsing Delay (secs)	1.25	0.06
Latency (msec)	66.01	20.00

Summary-Data Services Static

Location Level Summary-

Location:-Pushpak Gurudwara, Aizwal	4G/5G	
	AIRTEL	RJIO
Download throughput in Mbps	134.15	207.16
Upload Throughput in Mbps	33.69	12.89
Video streaming delay (secs)	1.10	0
Web Browsing Delay (secs)	1.20	0.006
Latency (msec)	66.27	***

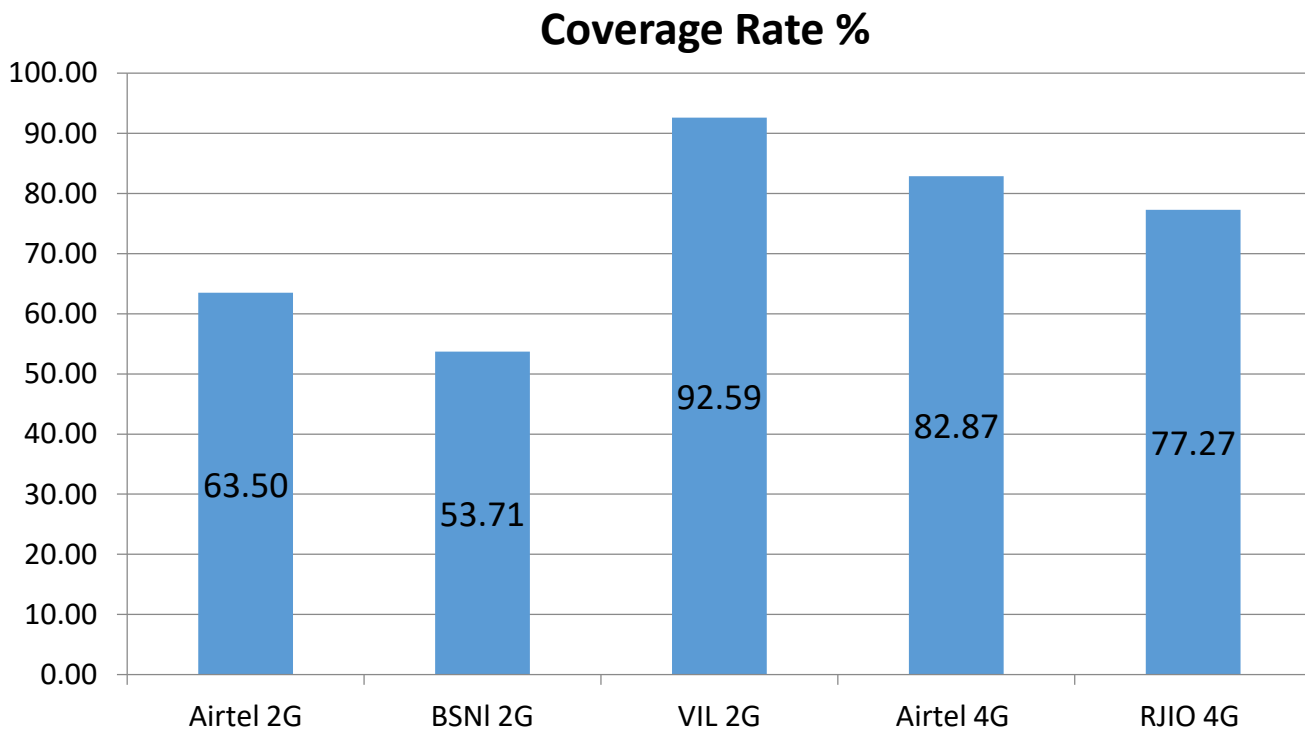
Location:- Champai District Hospital	4G/5G	
	AIRTEL	RJIO
Download throughput in (mbps)	158.05	11.83
Upload Throughput in (mbps)	45.03	7.14
Video streaming delay (secs)	1.22	0
Web Browsing Delay (secs)	1.30	0.006
Latency (msec)	65.75	20.00

*** Latency Report is not submitted by RJIO

I. Coverage Details

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

TSP	Coverage Rate %
AIRTEL 2G	63.50
BSNL 2G	53.71
VIL 2G	92.59
AIRTEL 4G	82.87
RJIO 4G	77.27



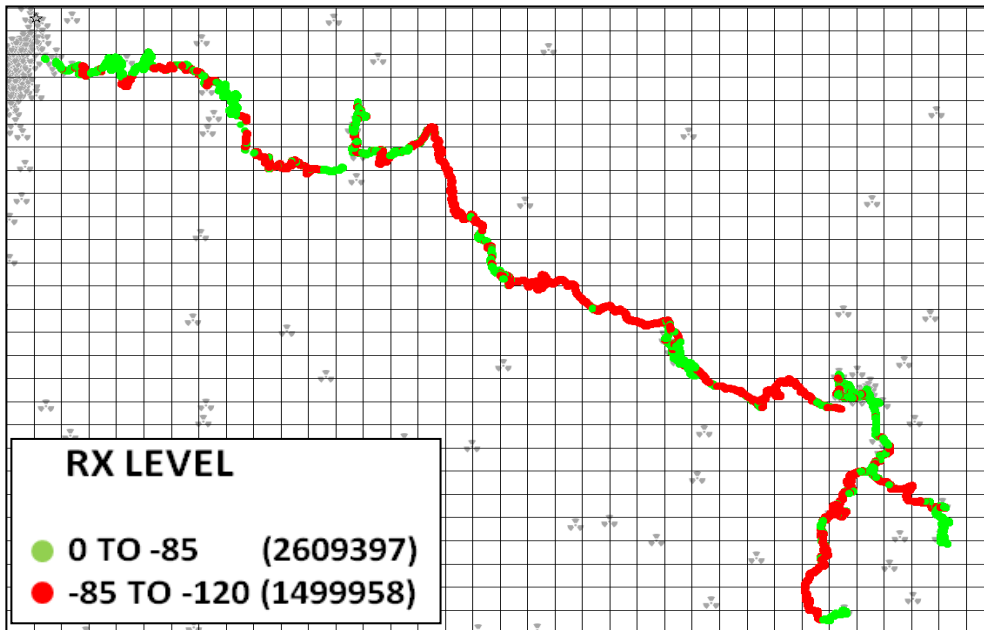
Note- Coverage is the percentage of samples having signal strength more than the threshold value (2G ≥ -85 dbm, 3G ≥ -90 dbm and 4G ≥ -110 dbm). However, these samples are only for the portion of the OADT routes where TSPs have coverage i.e 'no coverage' routes have been excluded.

I. Coverage Details

AIRTEL

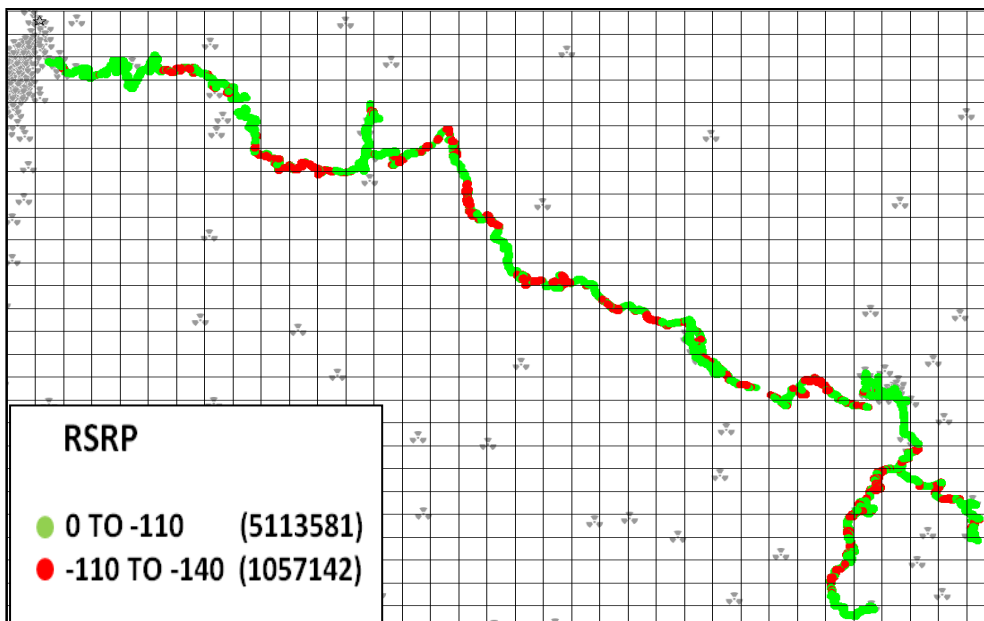
Technology	Coverage Rate %
2G	63.50
4G	82.87

2G



Overall Rx Level	Sample %
[Max >=-75]	23.61
[-75 >=-85)	39.89
[-85 >=-95)	19.44
[-95 >=Min)	17.06
Total	100

4G



Overall RSRP	Sample %
[Max >=-80]	9.08
[-80 >=-90)	14.44
[-90 >=-110)	59.35
[-110 >=Min)	17.13
Total	100

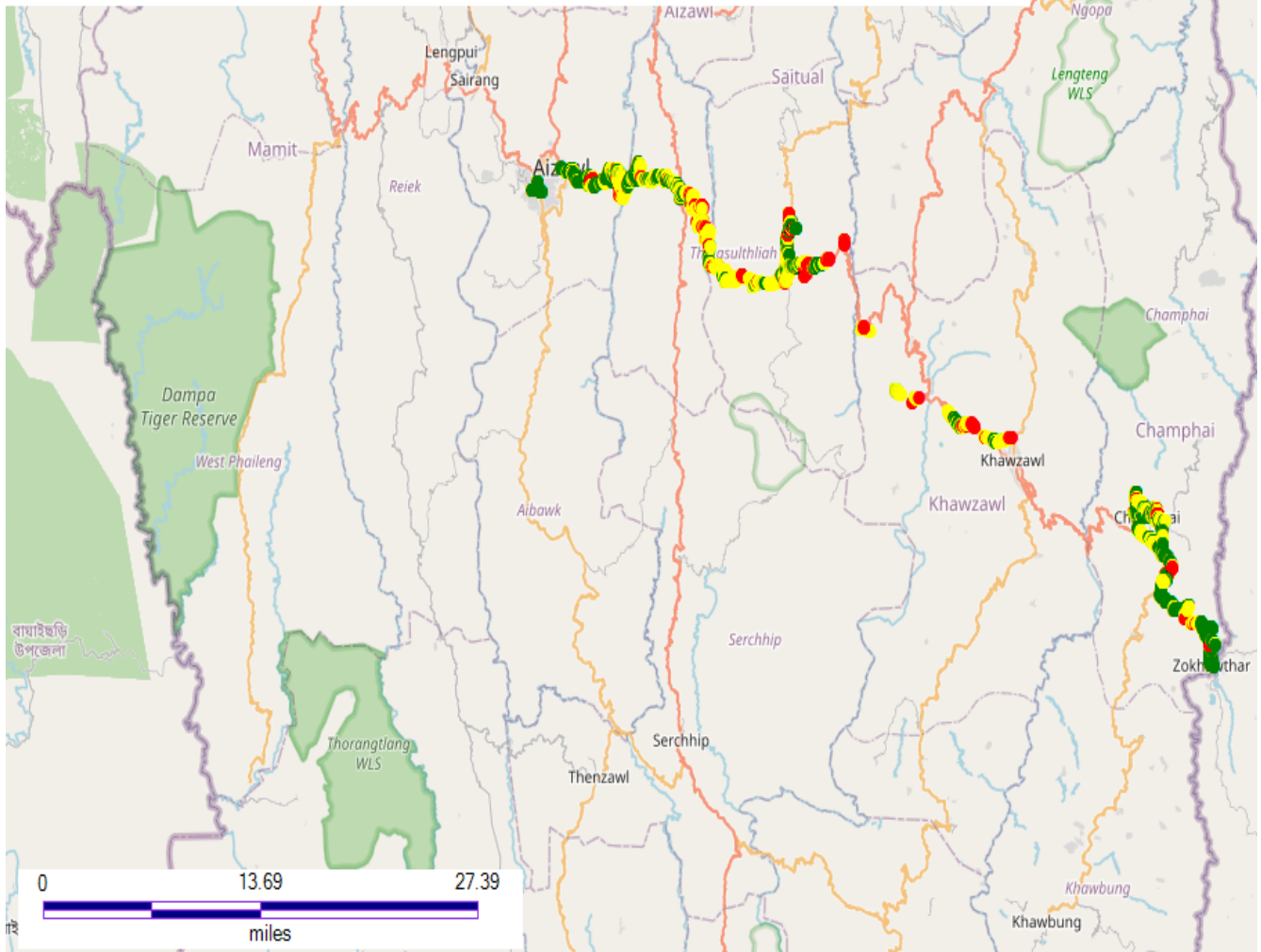
I. Coverage Details

BSNL

Technology	Coverage Rate %
2G	53.71

Device - 1 Phone Sony/F8331 QUALCOMM (1) + Handy + 404774240011558 - RxLev Sub (dBm)

- -85 to 0 (54%) (5858)
- -100 to -85 (40%) (4313)
- -120 to -100 (7%) (736)

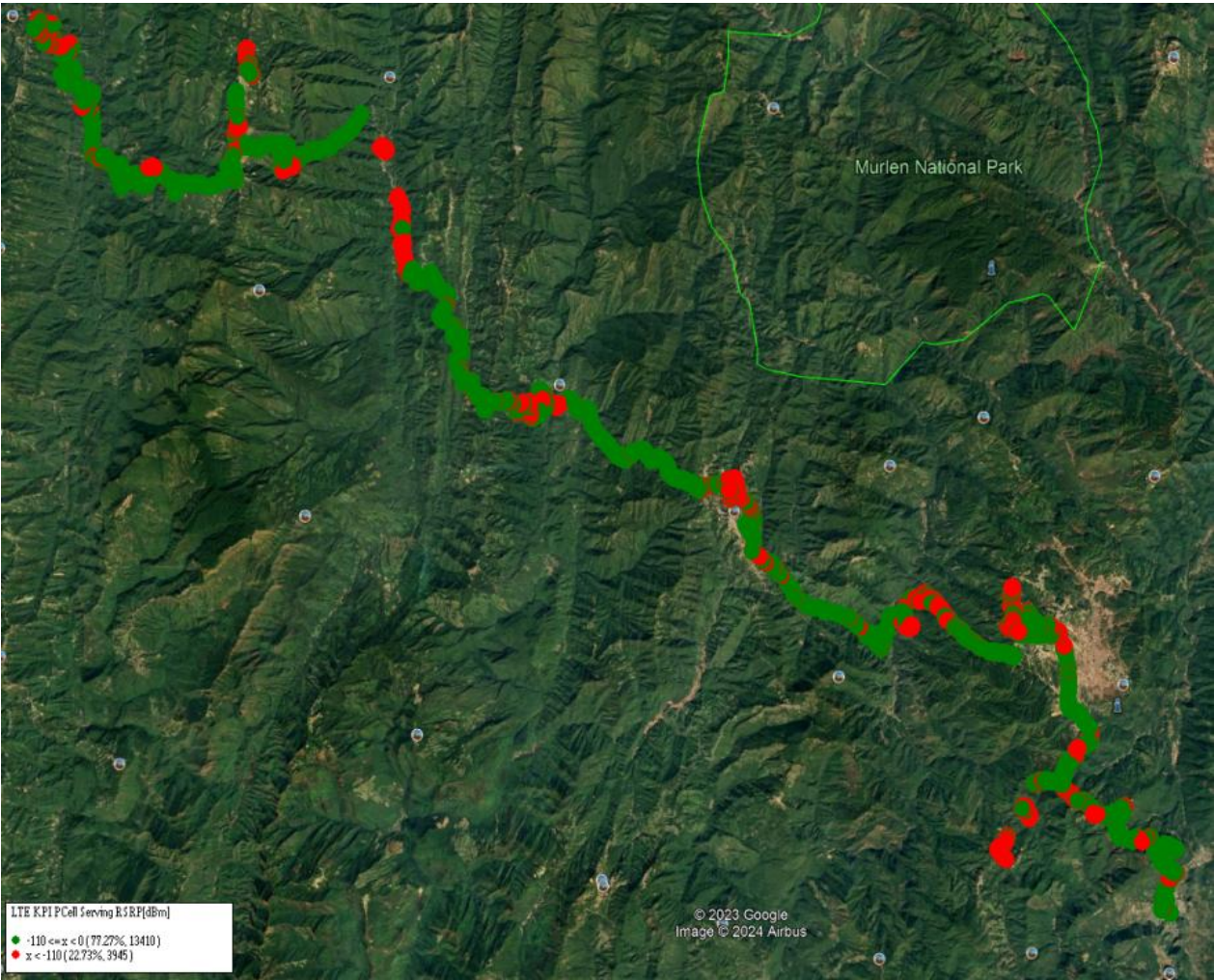


Overall RxLevel	Sample %
[Max >=-85]	54
[-85 >=-100)	40
[-100 >=Min)	6
Total	100

I. Coverage Details

RJIO

Technology	Coverage Rate %
4G	77.27
4G	



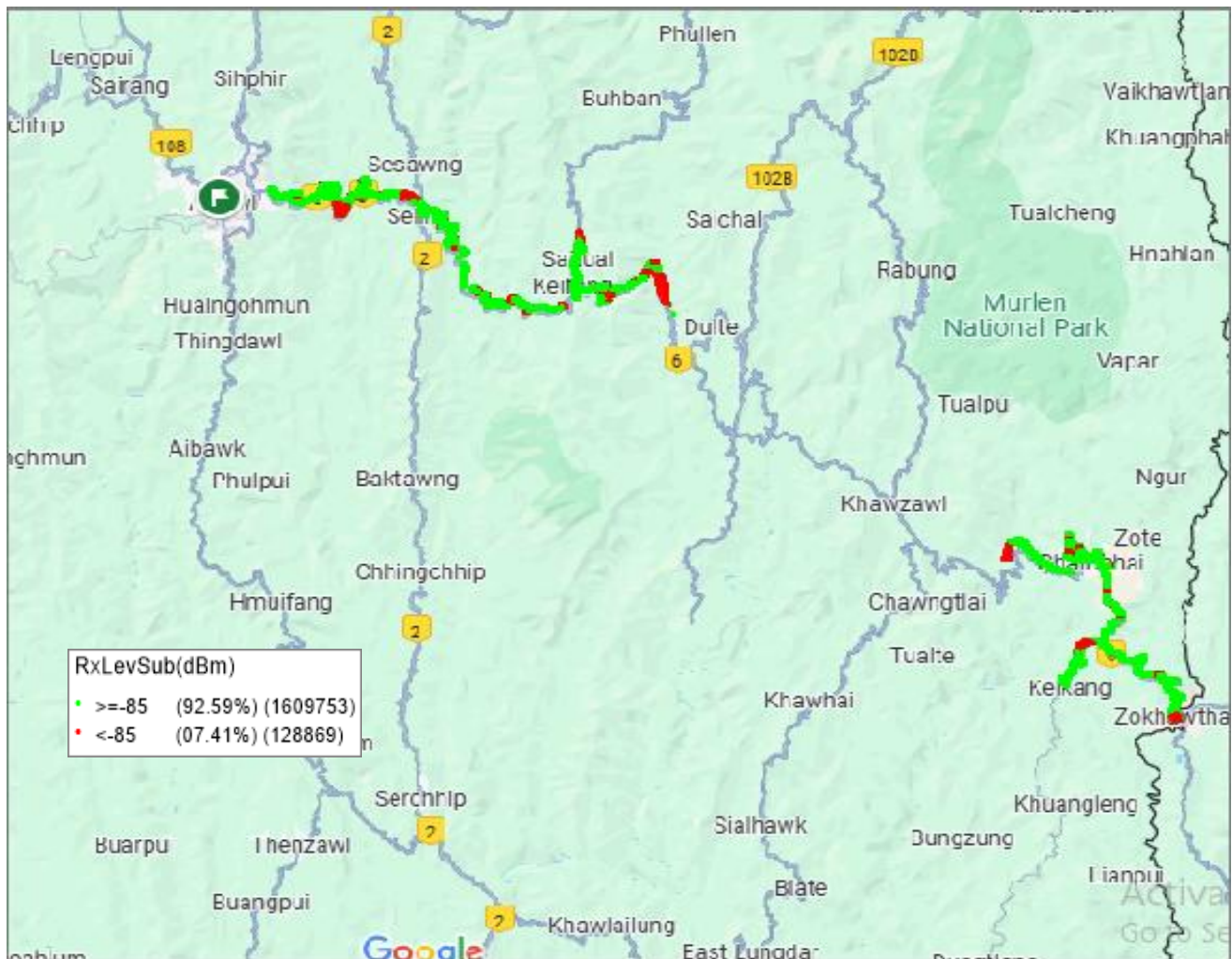
Overall RSRP	Sample %
[Max >=-80]	6.55
[-80 >=-90)	15.14
[-90>=-110)	55.57
[-110 >=Min)	22.74
Total	100

I. Coverage Details

VIL

Technology	Coverage Rate %
2G	92.59

2G

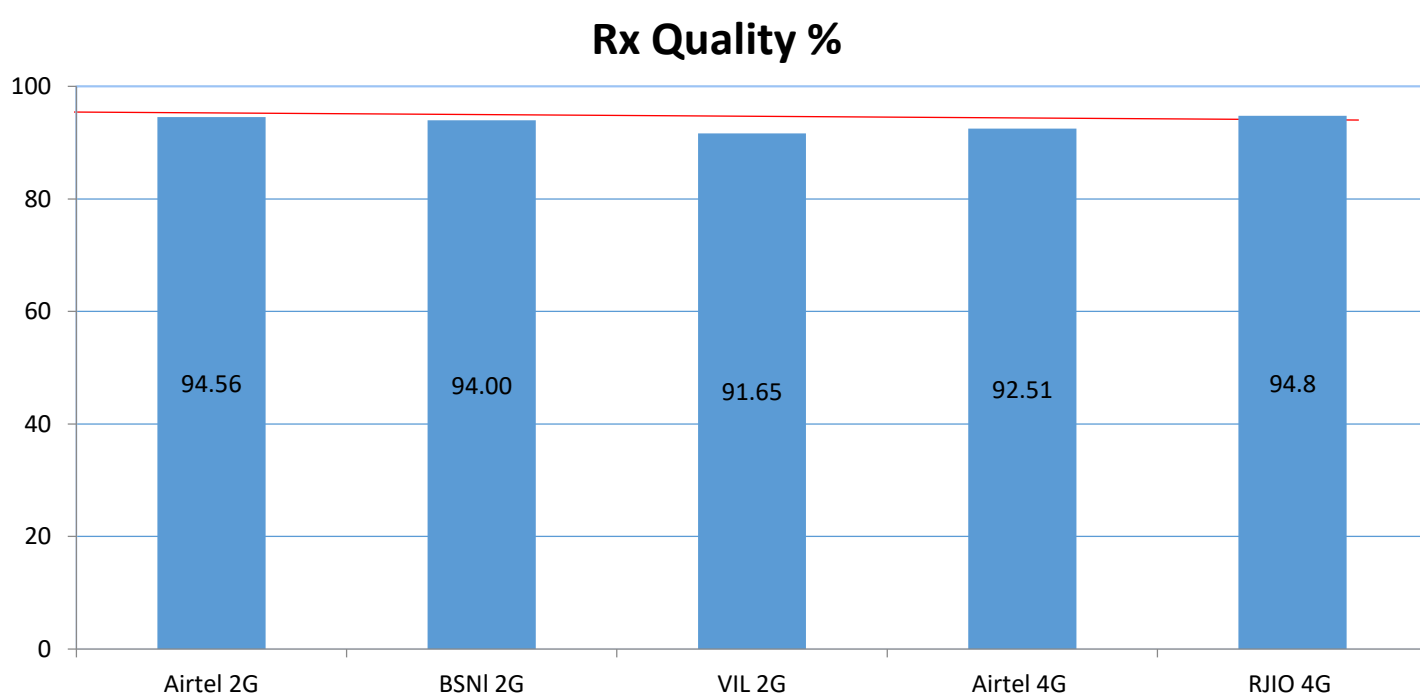


Overall RxLevel	Sample %
[Max >=-75]	52.79
[-75 >=-85)	39.80
[-85 >=-95)	5.25
[-95 =Min)	2.16
Total	100

II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Quality ≤ 5 for GSM, $E_c/N_o \geq -14$ dBm for 3G 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	94.56
BSNL 2G	94.00
VIL 2G	91.65
AIRTEL 4G	92.51
RJIO 4G	94.80

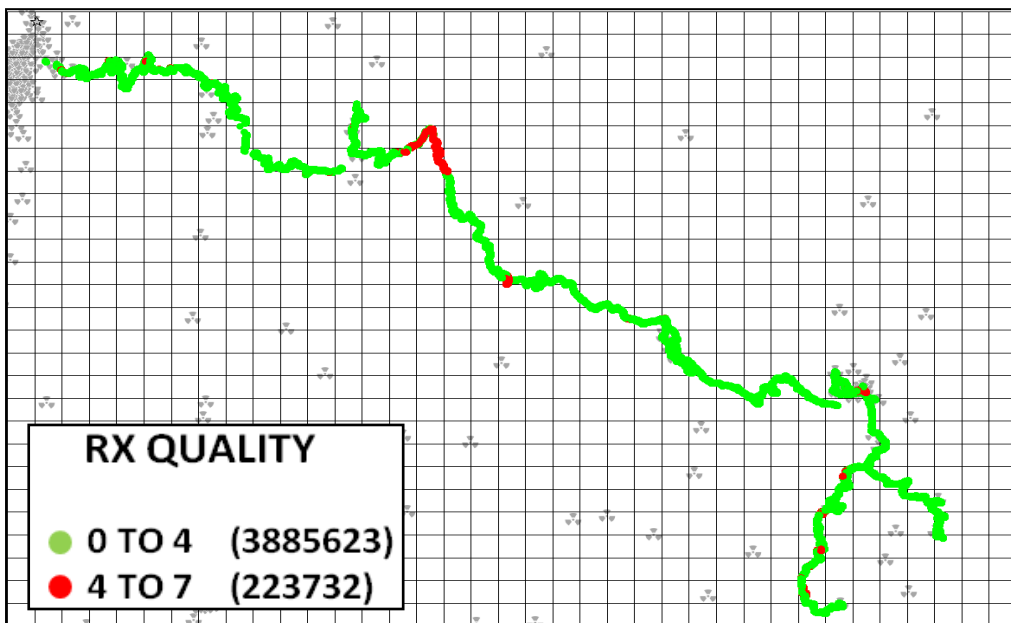


II. Quality Details

AIRTEL

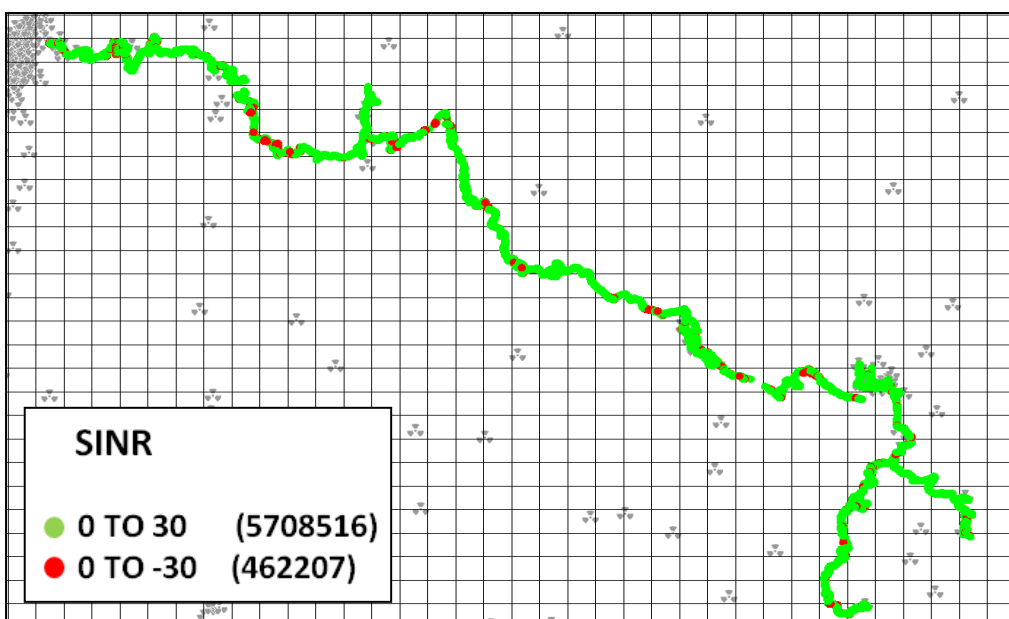
Technology	Rx Quality %
2G	94.56
4G	92.51

2G



Overall Rx Quality	Sample %
(Min <=2)	66.37
(2 <=3)	15.36
(3 <=4)	12.82
(4 <=5)	3.00
(5 <=Max)	2.45
Total	100

4G



Overall SINR	Sample %
(Min <=0)	7.49
(0 <=5)	17.33
(5 <=10)	26.80
(10 <=15)	24.21
(15 <=Max)	24.16
Total	100

II. Quality Details

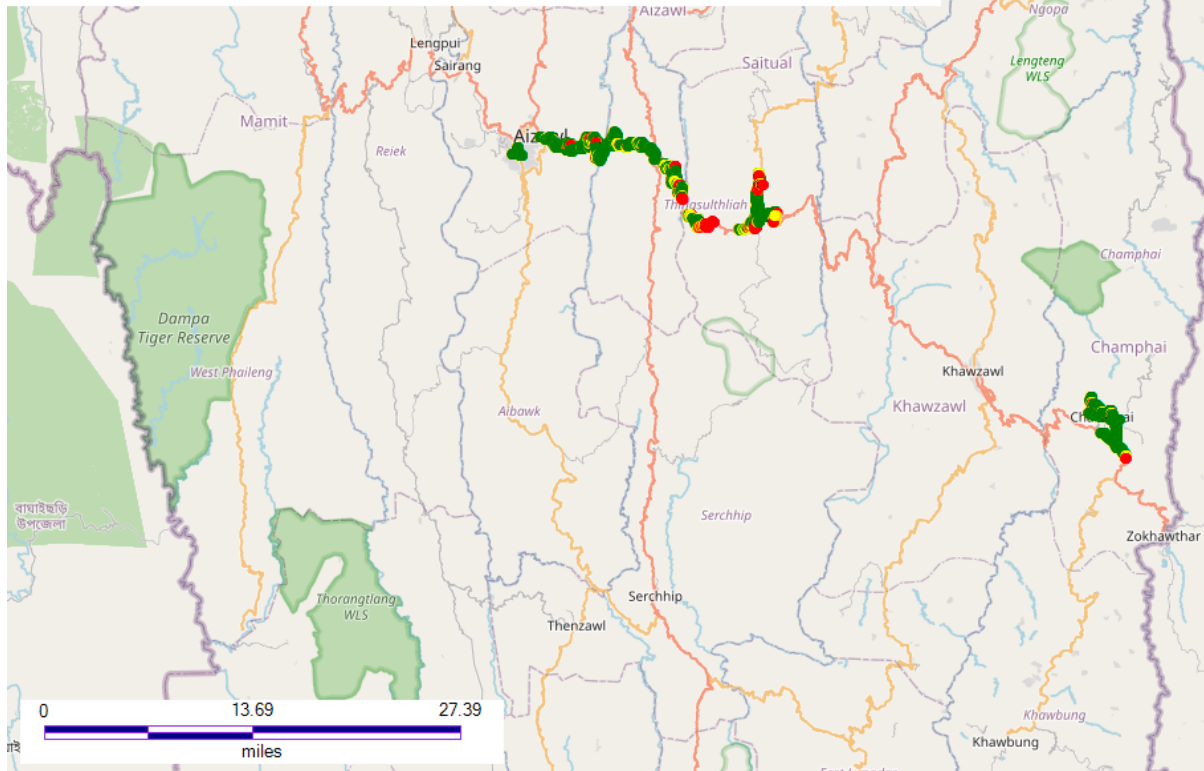
BSNL

Technology	Rx Quality %
2G	94.00

2G

Device - 1 Phone Sony/F8331 QUALCOMM (1) + Handy + 404774240011558 - RxQual Sub

- 5 to 7 (6%) (410)
- 2 to 5 (10%) (714)
- 0 to 2 (84%) (5895)

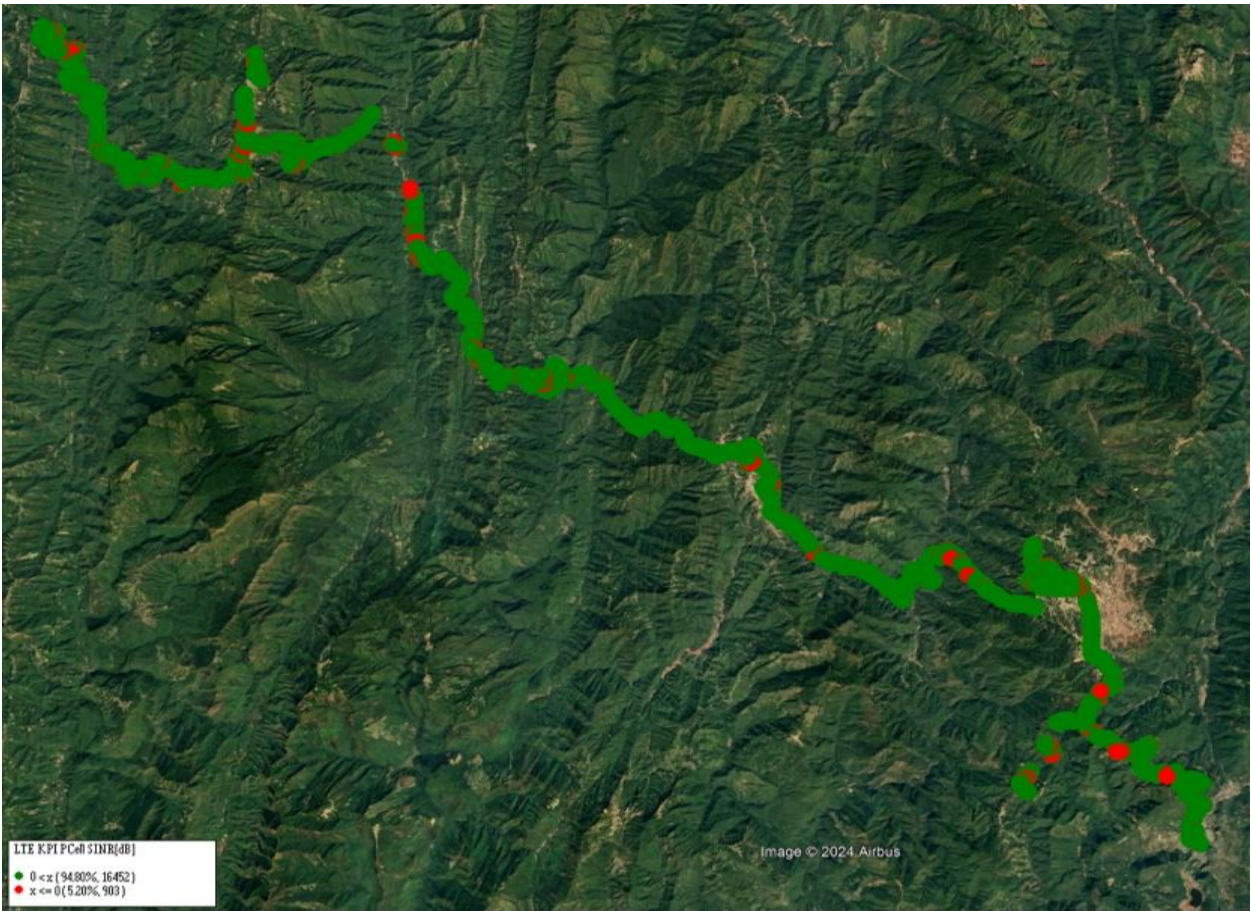


Overall Rx Quality	Sample %
(Min <=2)	84
(2 <=5)	10
(5 <=7)	6
Total	100

II. Quality Details

RJIO

Technology	Rx Quality %
4G	94.80
4G	



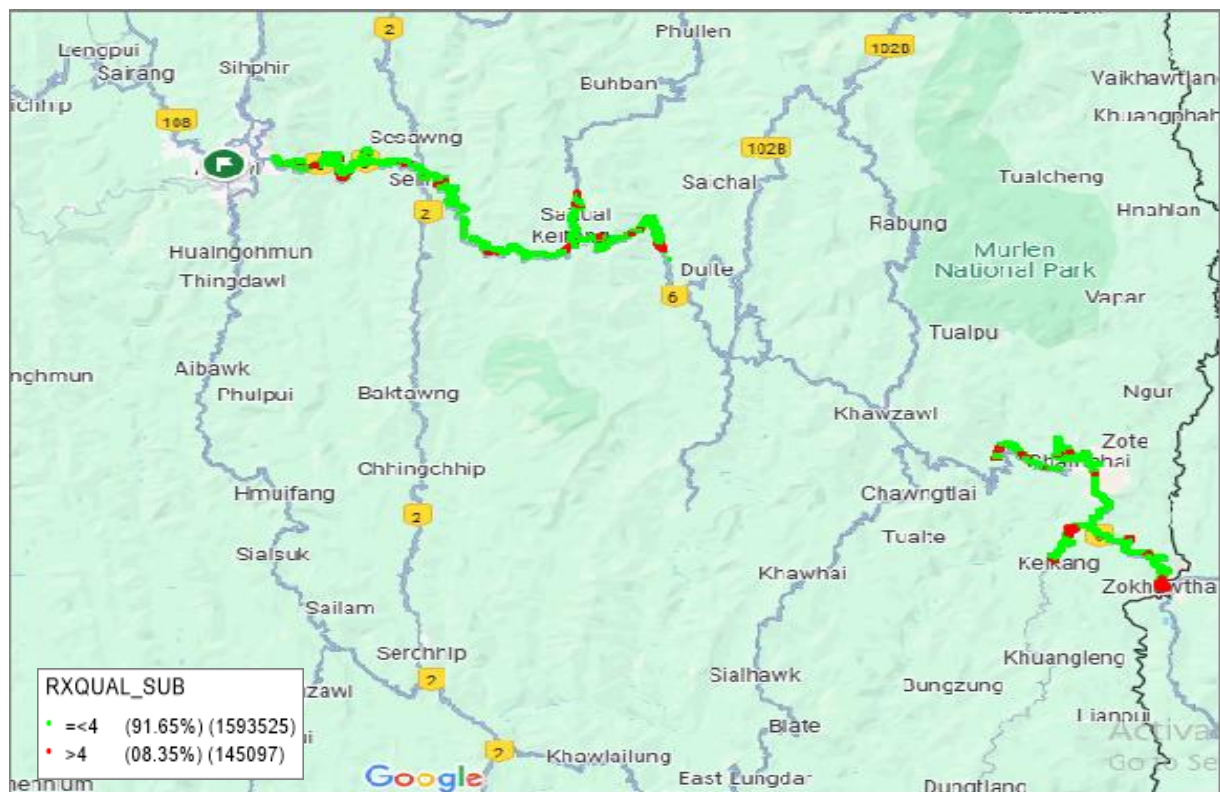
Overall SINR	Sample %
(Min <=0)	5.20
(0 <=5)	22.73
(5 <=10)	21.31
(10 <=15)	23.35
(15 <=Max)	27.41
Total	100

II. Quality Details

VIL

Technology	Rx Quality %
2G	91.65

2G



Overall Rx Quality	Sample %
(Min <=2)	44.61
(2 <=3)	30.47
(3 <=4)	16.57
(4 <=5)	5.04
(5 <=Max)	3.31
Total	100

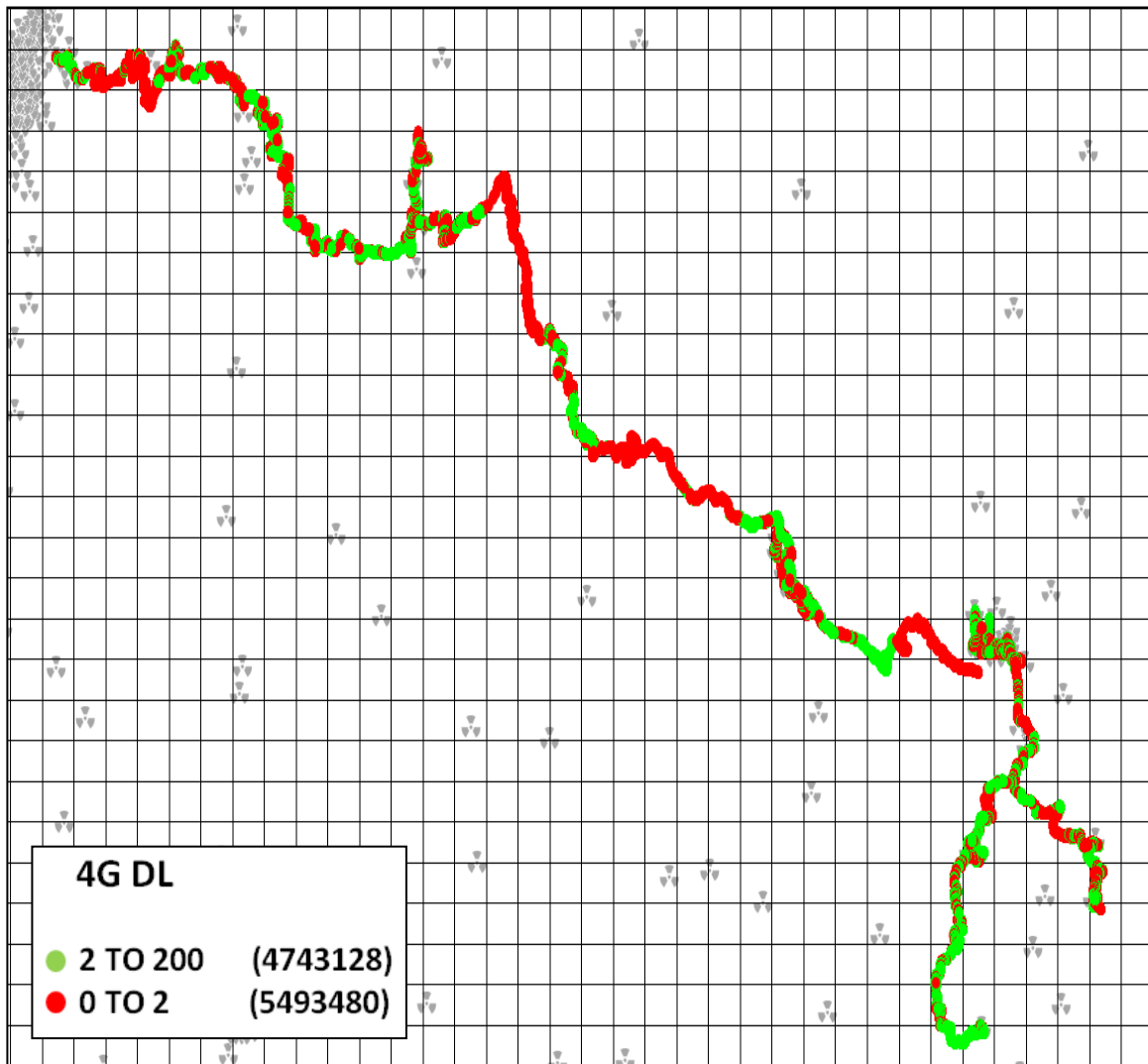
IV. Dynamic Data Test- 4G DL Details

AIRTEL

Dynamic Data Testing Complete 201 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	6.9

4G



AVG. DOWNLOAD SPEED (Mbps)	6.9
DL throughput	Sample %
0 to <2 Mbps	53.67
2 to <10 Mbps	9.34
10 to <=30 Mbps	33.35
>30 Mbps	3.65
Total	100%

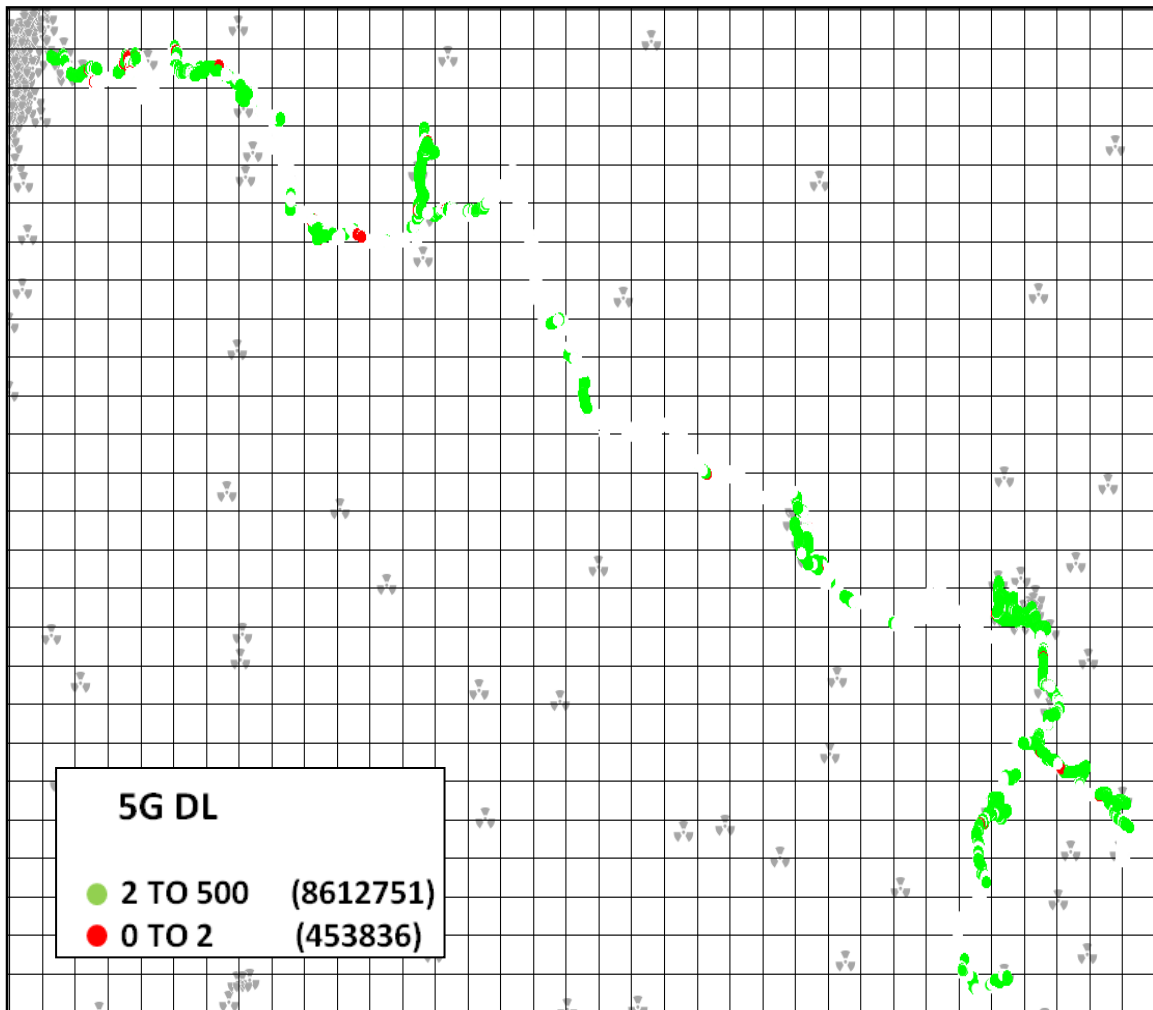
IV. Dynamic Data Test- 5G DL Details

AIRTEL

Dynamic Data Testing Complete 201 Kms

Data KPIs - Overall	5G
Average Download Throughput (Mbps)	46.80

5G



AVG. DOWNLOAD SPEED (Mbps)	46.80
DL throughput	Sample %
0 to <2 Mbps	5.01
2 to <10 Mbps	3.45
10 to <50 Mbps	6.47
> 50 Mbps	85.07
Total	100%

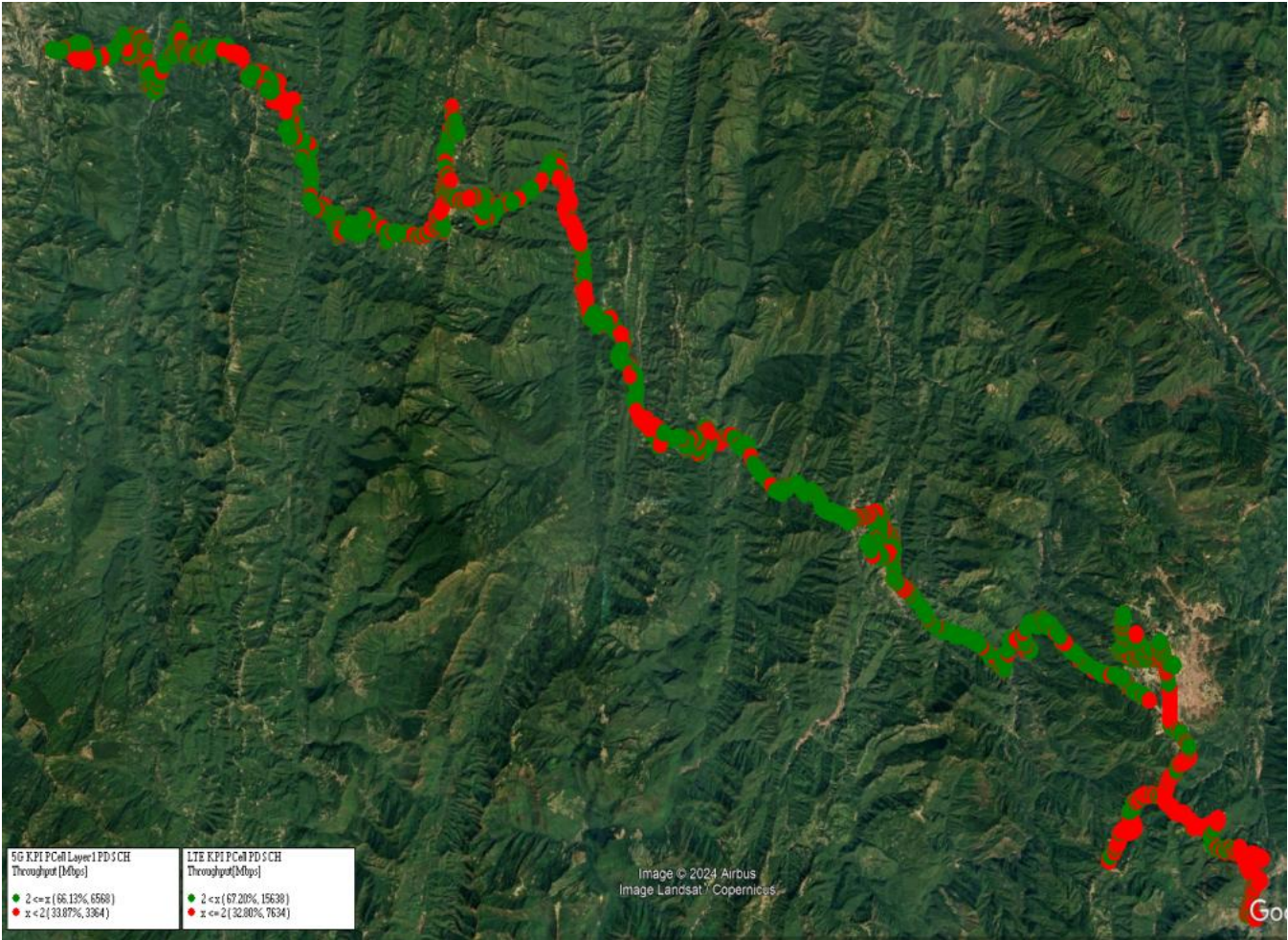
IV. Dynamic Data Test- 4G/5G DL Details

RJIO

Dynamic Data Testing Complete 201 Kms

Data KPIs - Overall	4G/5G
Average Download Throughput (Mbps) 4G	21.12
Average Download Throughput (Mbps) 5G	146.11

4G/5G



AVG. DOWNLOAD SPEED (Mbps) 4G	21.12
DL throughput	Sample %
0 to <2 Mbps	32.80
2 to <10 Mbps	18.47
10 to <=30 Mbps	33.40
>30 Mbps	15.33
Total	100%

AVG. DOWNLOAD SPEED (Mbps) 5G	146.11
DL throughput	Sample %
0 to <2 Mbps	33.87
2 to <10 Mbps	10.18
10 to <50 Mbps	14.39
> 50 Mbps	41.56
Total	100%