

Operator Assisted Drive Test Report

Gopalganj, Bihar

March 2022

(RO, Kolkata)

Key Performance Indicators (KPIs):

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

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

BSNL-Drop Call Rate (2G & 3G), Block Call Rate (2G), Call Setup Success Rate (2G & 3G), Handover Success Rate (2G), Rx Quality (Ec/Io) in 3G .

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

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

The Operator Assisted Drive Test has been carried out by Regional Office, Kolkata with the help of Service Providers in Gopalganj Lok Sabha Area, Bihar on 30th March'2022 from 8:30 AM to 8:00 PM. The drive test covered drive route of 200 KMs over a period of 1 day. Approximately 150+ calls were made for each of the 7 networks: three 2G networks, one 3G network and three 4G network covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

Gopalganj Lok Sabha Constituency is one of the 40 Lok Sabha constituencies in Bihar state in eastern India. Presently, Gopalganj Lok Sabha constituency comprises six Vidhan Sabha (legislative assembly). There are 14 Blocks in Gopalganj District , Bihar.

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, Handover Success Rate and Block Call Rate.

Data: Download Throughputs and Data File Success Rate.

Video Call: Video Call disconnection and poor Video quality.

Voice Tests: Calls were made for 180 secs duration with wait time of 10 sec between call in all technologies. Three 2G (Lock Mode) networks, One 3G (Lock Mode) networks, Three LTE (Lock Mode) networks covering 4 unique TSPs were tested.

Data Tests: Dynamic Data Service Testing was performed along same route in 3G & 4G technologies. 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, One 3G (Lock Mode) network, Three LTE (Lock Mode) networks covering 4 unique TSPs were tested.

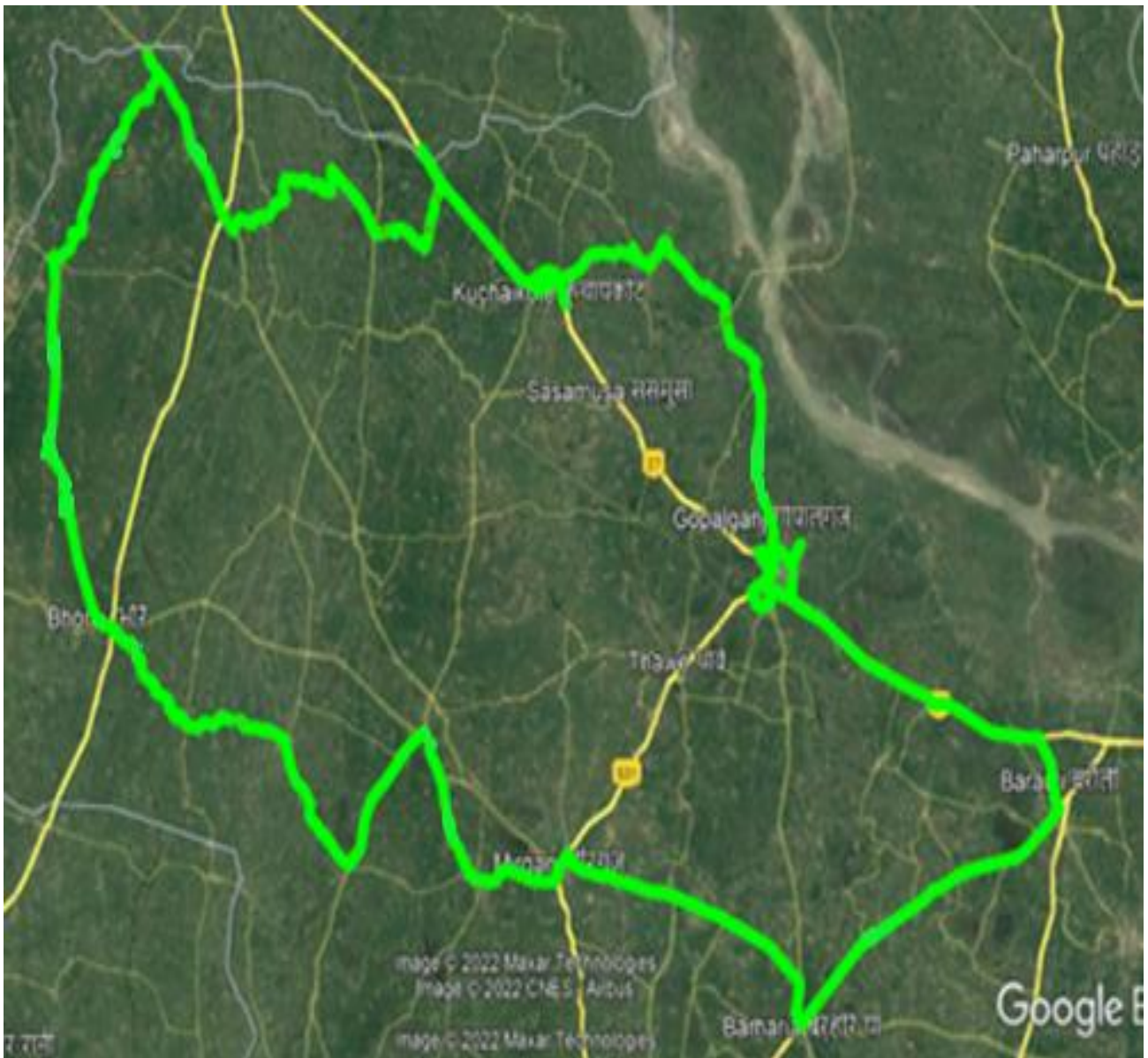
Video Call Tests: A Google meeting link was created for this OADT. All TSPs joined the Google meet link through their Handset and this online meeting was continued throughout the Drive Test. This online meeting was monitored by Advisor and other officials of RO Kolkata.

TRAI Myspeed App: Data download, Data Upload, Signal strength, Packet loss and Latency were measured through this App in the different locations on the drive test route.

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

Overview

Voice & Dynamic Data Test Drive Route



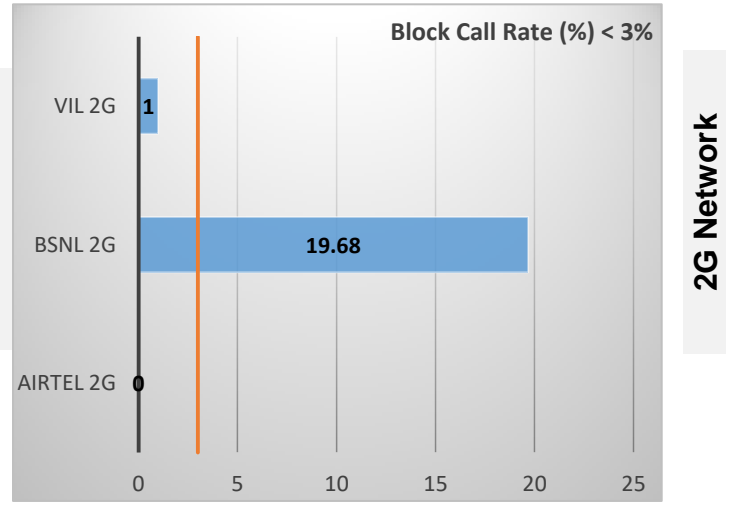
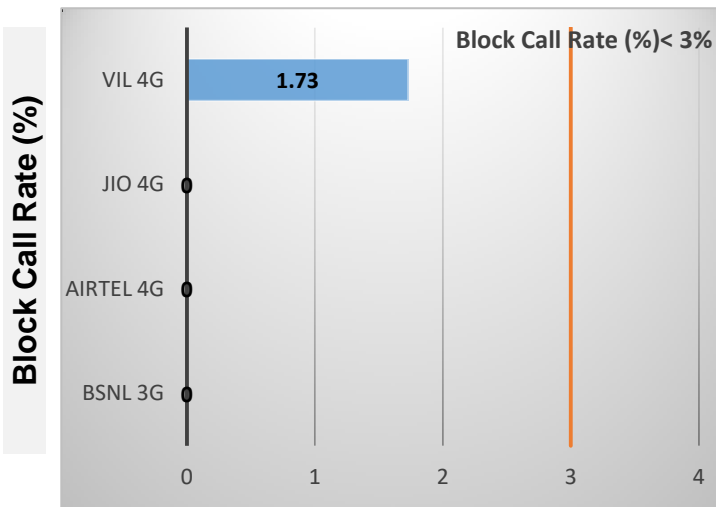
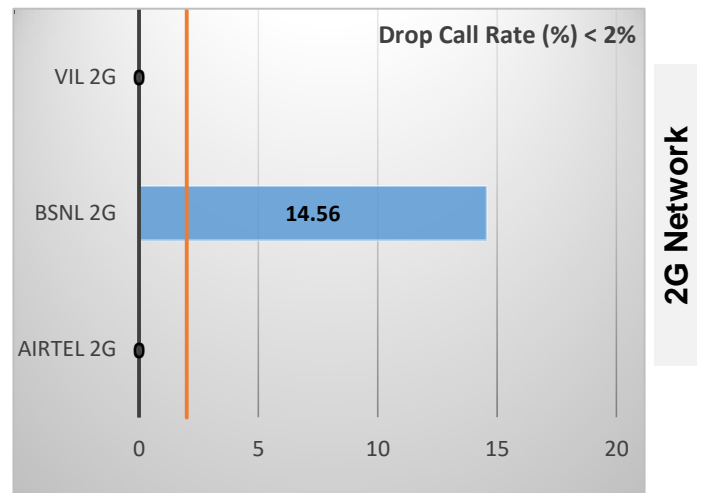
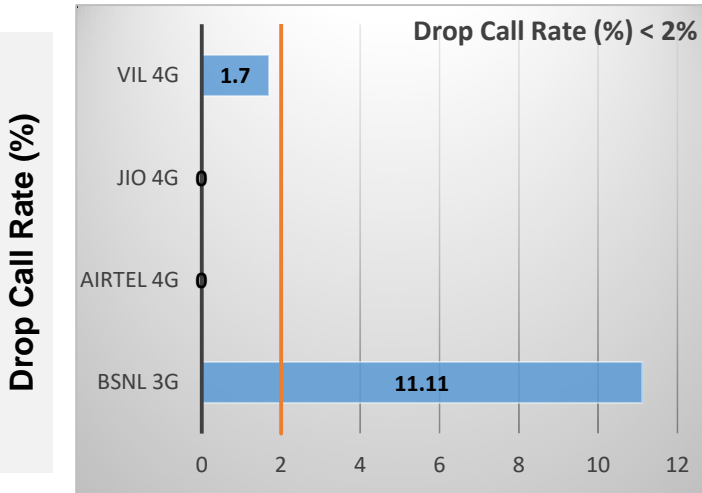
DRIVE ROUTES OF GOPALGANJ

Gopalganj to Baruli, Baruli- to Hathua via Barharia, Hathua to Bhoirey, Bhoirey to Kuchaikote via Katiya- Panchdewri- Rajapur, Kuchaikote to Gopalganj and Gopalganj Town.

Voice Calls

Key Observations

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



KPIs	2G			3G	VoLTE		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIO	VIL
Drop Call Rate %	0.00	14.56	0.00	11.11	0.00	0.00	1.70
Block Call Rate %	0.00	19.68	1.00	0.00	0.00	0.00	1.73

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

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	70.60	69.66	82.31

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

TSPs	3G	4G		
	BSNL	Airtel	JIO	VIL
Coverage %	36.93	93.63	98.48	91.74

Data Services Dynamic

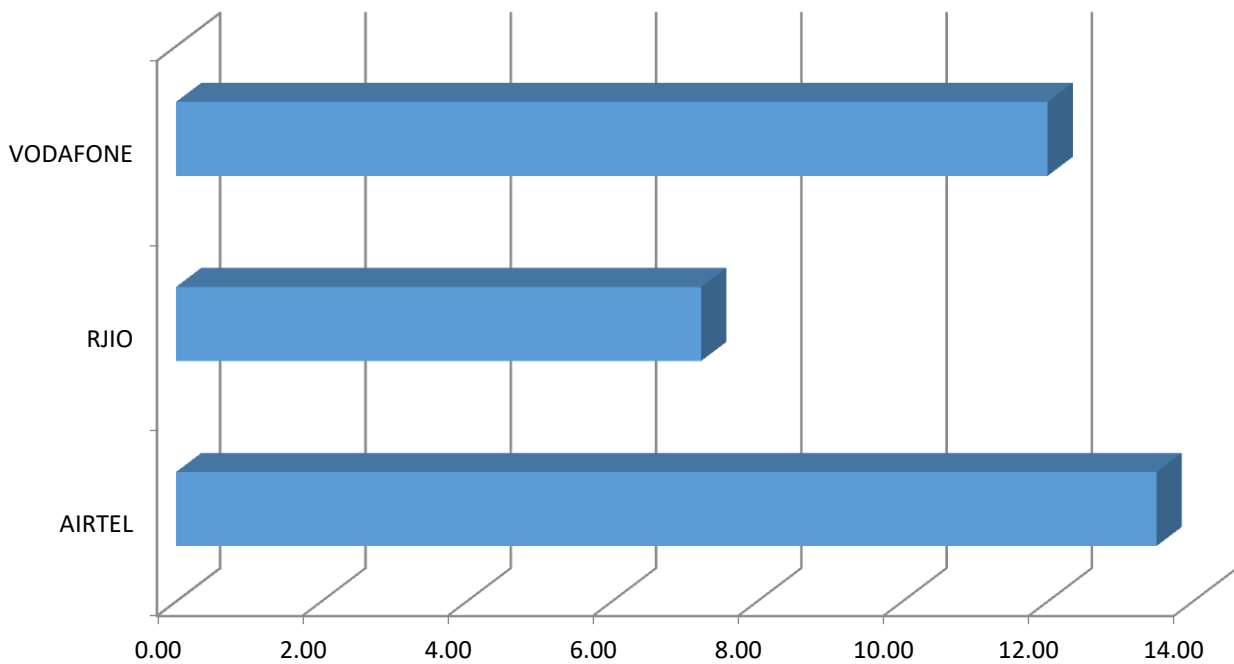
Key Observations

Dynamic Data was tested for 200 Kms. Download Throughput was tested.

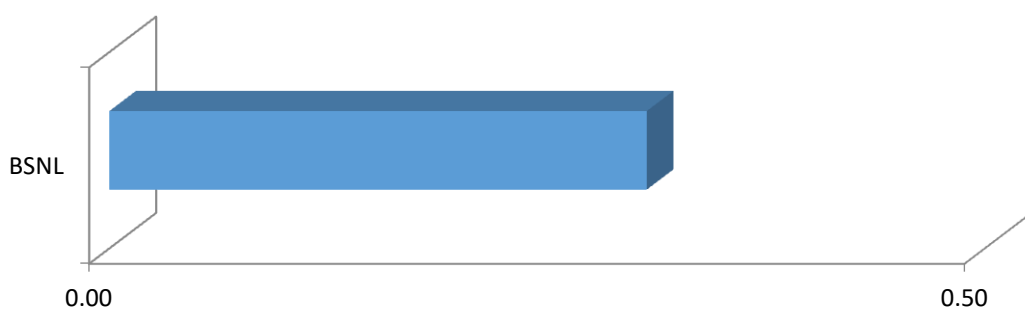
Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

4G/3G/ Network:

4G-Dynamic Download Average Throuhput (Mbps)



3G-Dynamic Download Average Throuhput (Mbps)



Summary

City Level Summary- Voice

Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	140	188	157
Blocked Call Rate (%)	0.00	19.68	1.00
CSSR% (Accessibility)	100	80.32	100
Drop Call Rate (%)	0.00	14.56	0.00
Mobility HOSR (%)	99	77.05	99.09
Rx Quality (%)	95.30	95.81	97.50

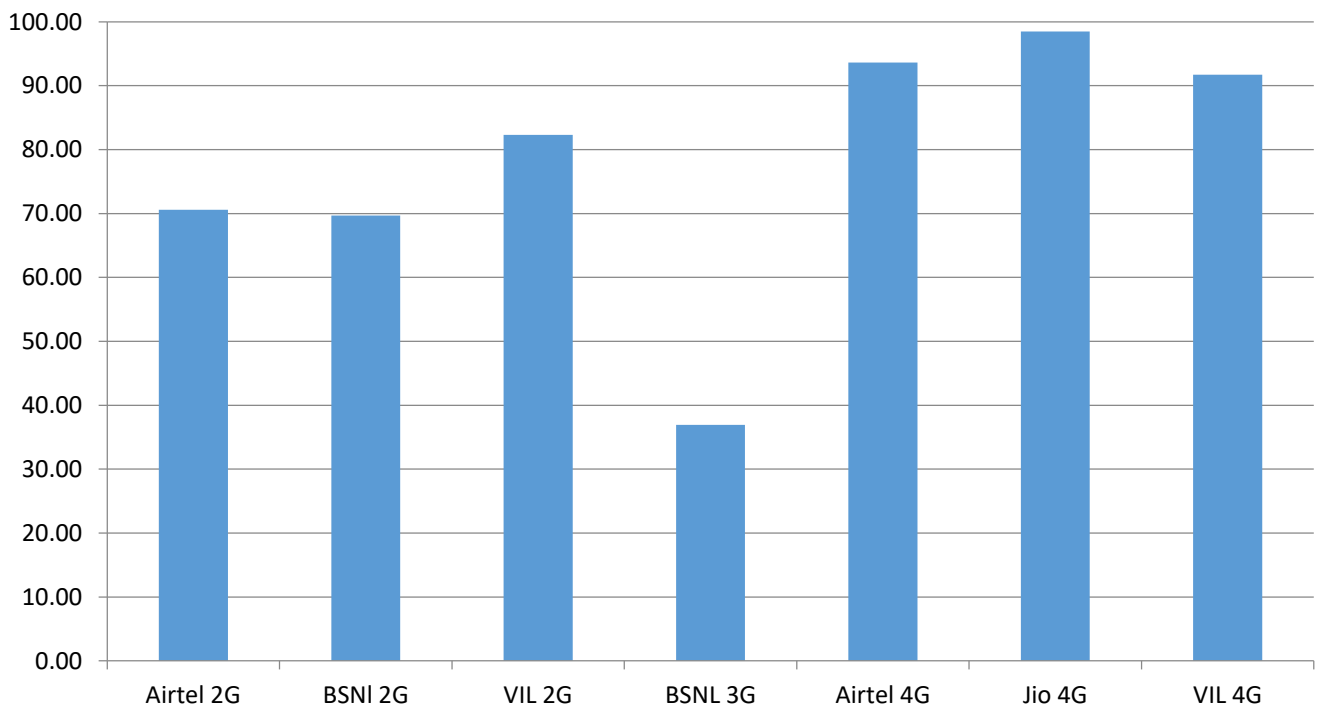
Voice Call	3G/4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Call Attempt	22	137	160	115
Blocked Call Rate (%)	0.00	0.00	0.00	1.73
CSSR% (Accessibility)	81.82	100	100	100
Drop Call Rate (%)	11.11	0.00	0.00	1.7
Mobility HOSR (%)	100	99.4	97.14	99.2
Rx Quality (%)	58.48	61.00	81.54	91.30

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	70.6
BSNL 2G	69.66
VIL 2G	82.31
BSNL 3G	36.93
Airtel 4G	93.63
Jio 4G	98.48
VIL 4G	91.74

Coverage Rate %

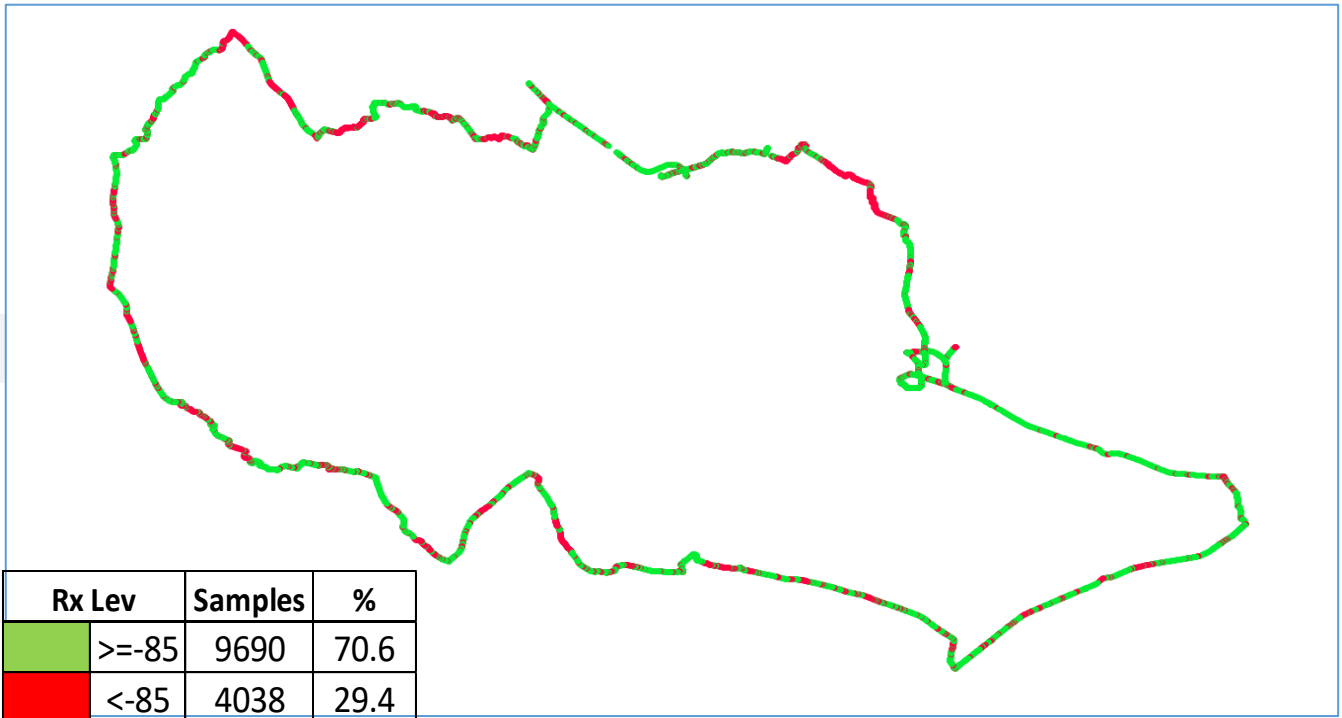


I. Coverage Details

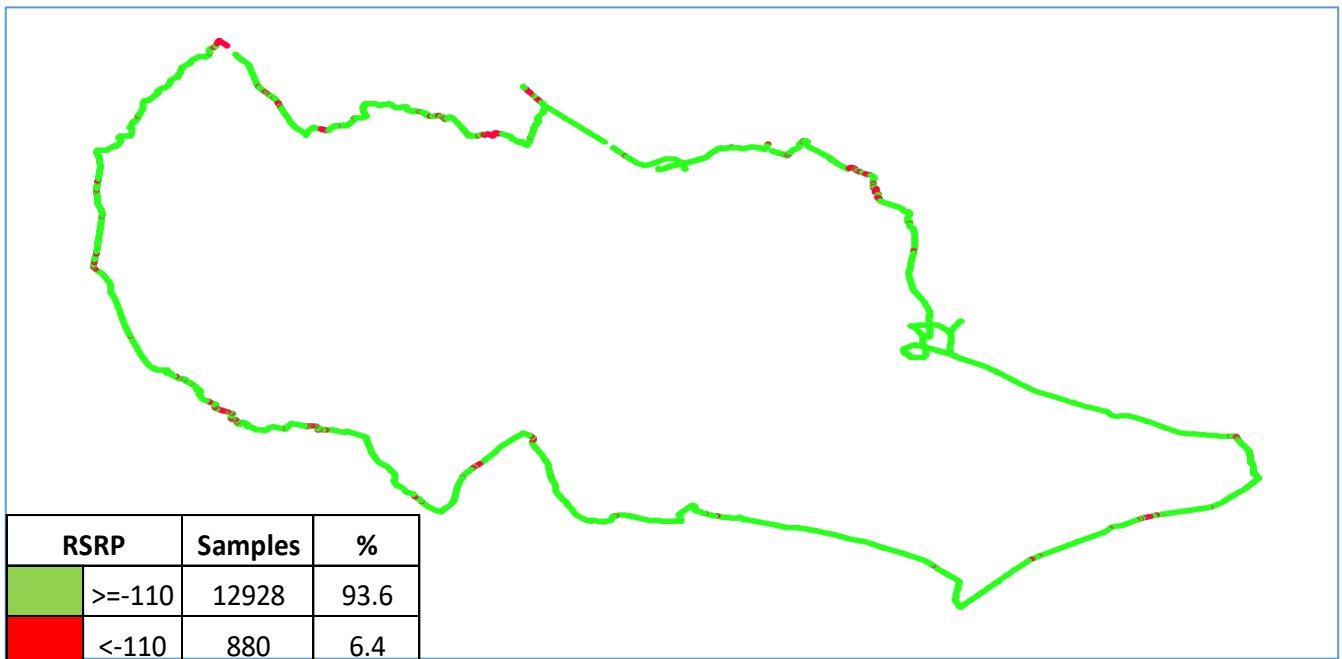
AIRTEL

Technology	Coverage Rate %
2G	70.60
4G	93.63

2G



4G

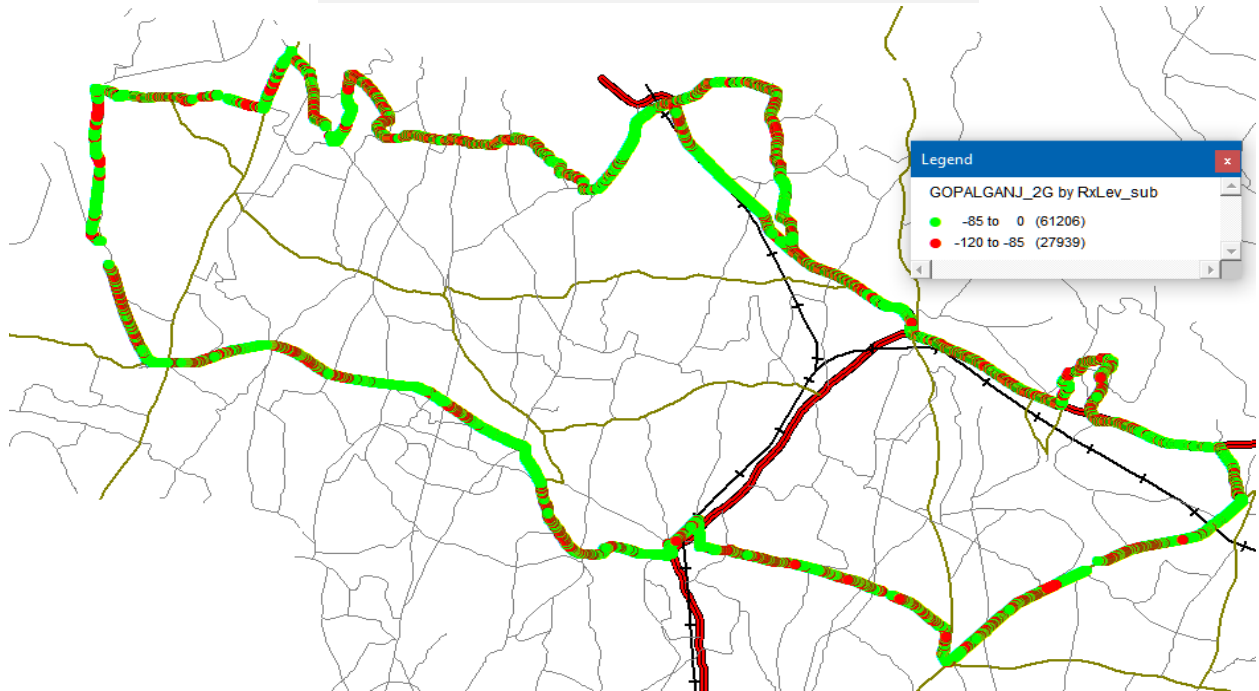


I. Coverage Details

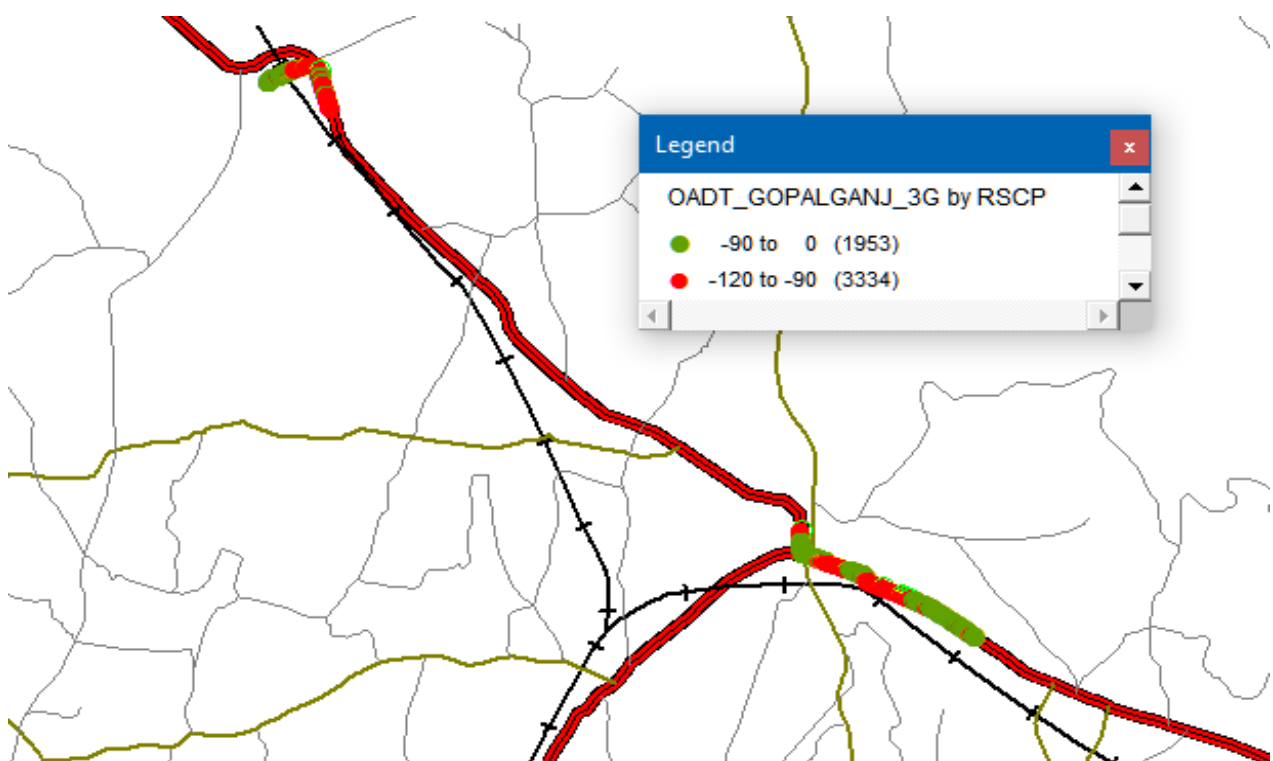
BSNL

Technology	Coverage Rate %
2G	69.66
3G	36.93

2G



3G



I. Coverage Details

JIO

Technology	Coverage Rate %
4G	98.48

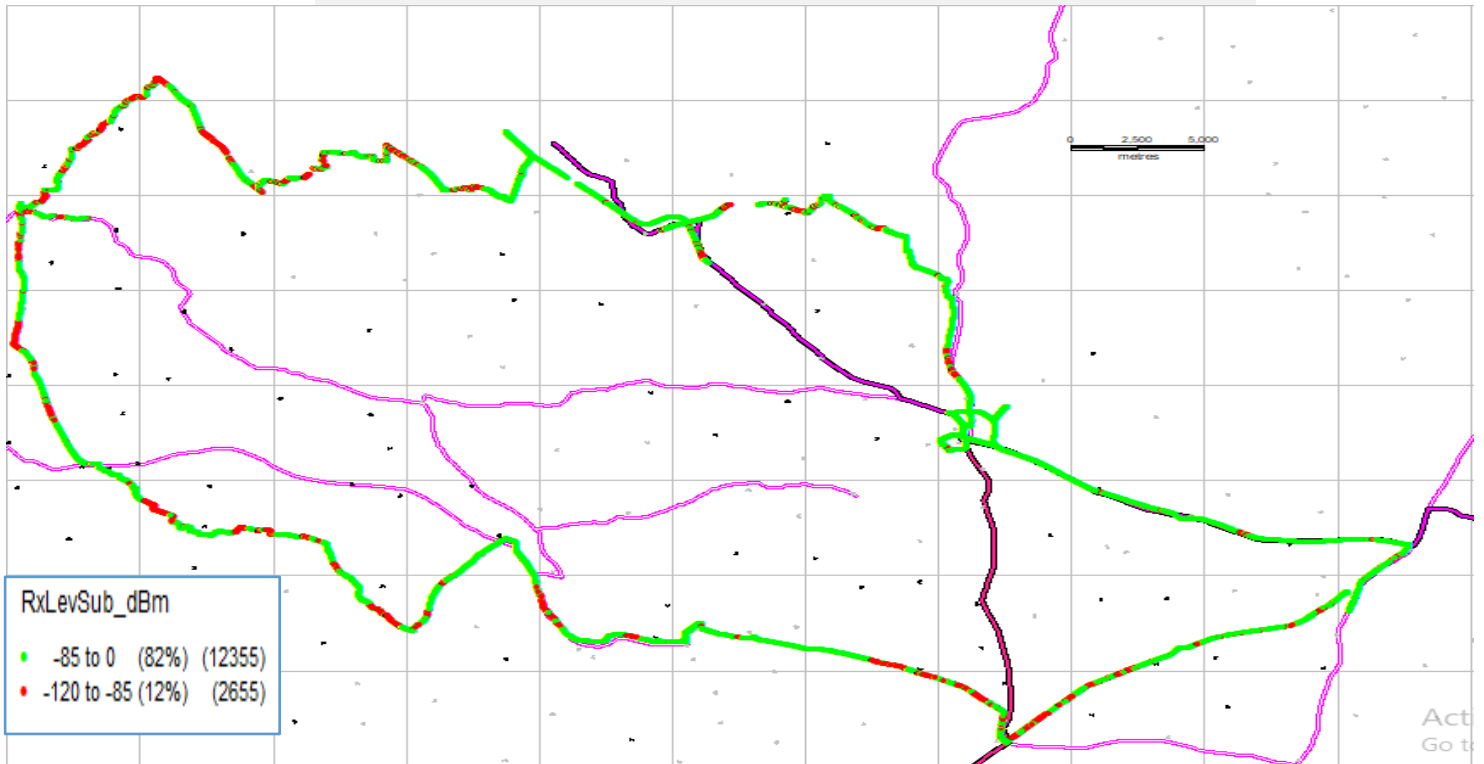


I. Coverage Details

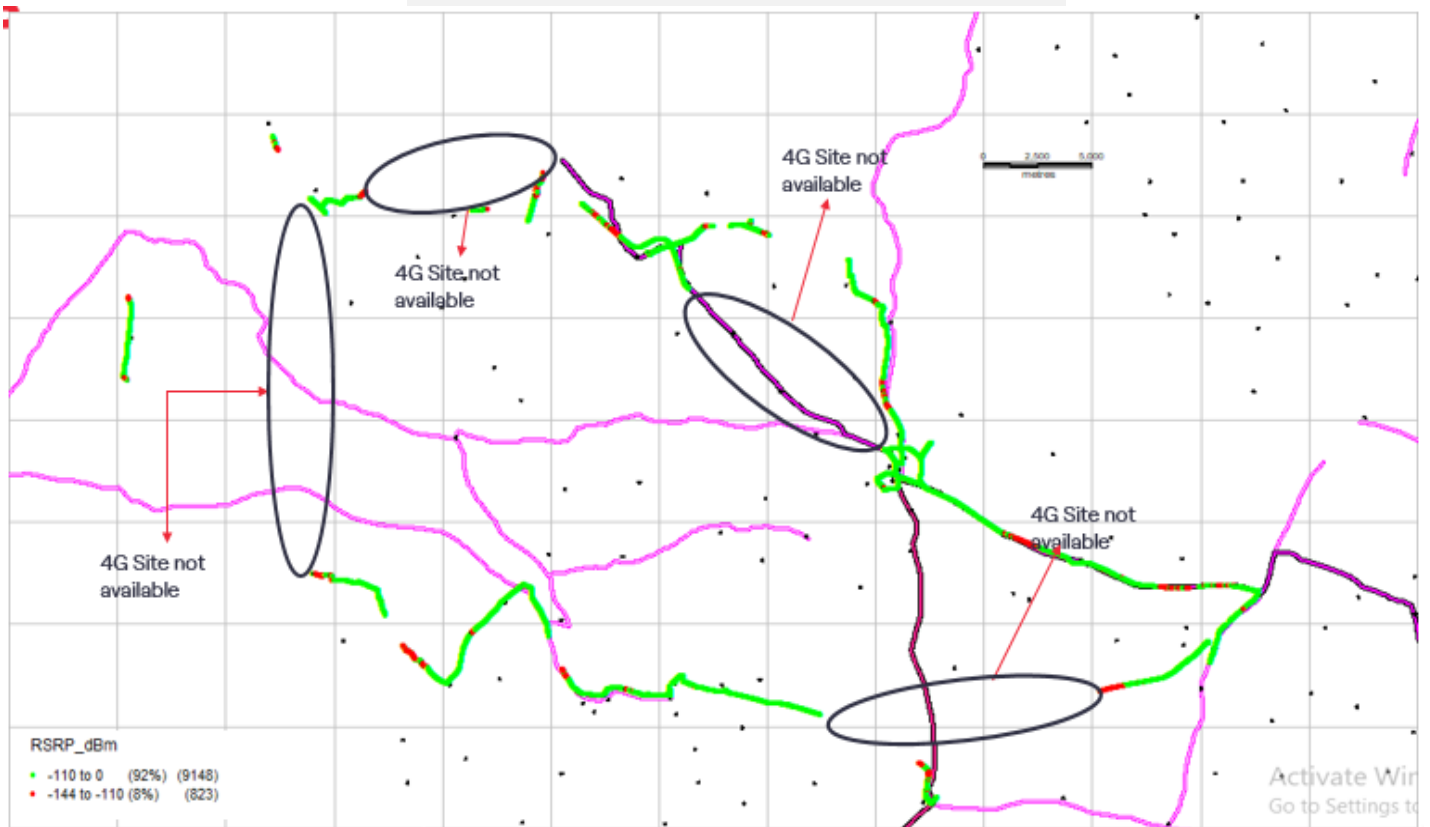
VIL

Technology	Coverage Rate %
2G	82.31
4G	91.74

2G



4G

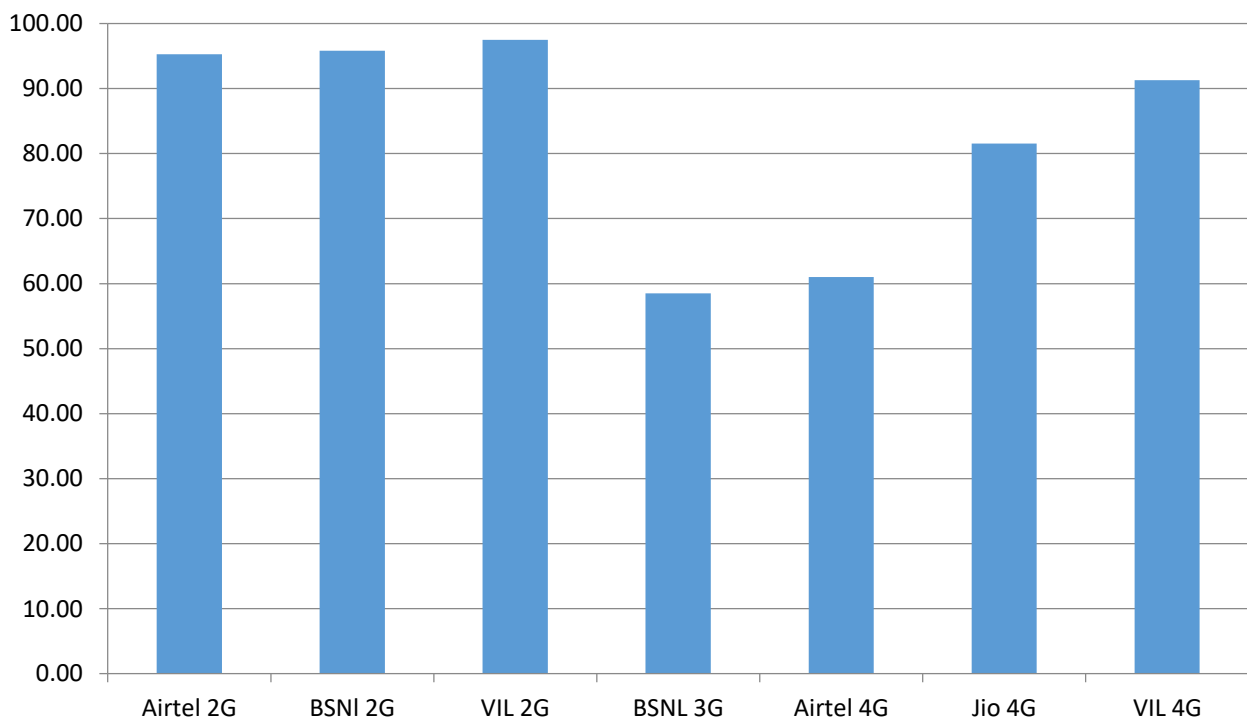


II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -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	95.3
BSNL 2G	95.81
VIL 2G	97.50
BSNL 3G	58.48
Airtel 4G	61.0
Jio 4G	81.64
VIL 4G	91.30

Rx Quality %

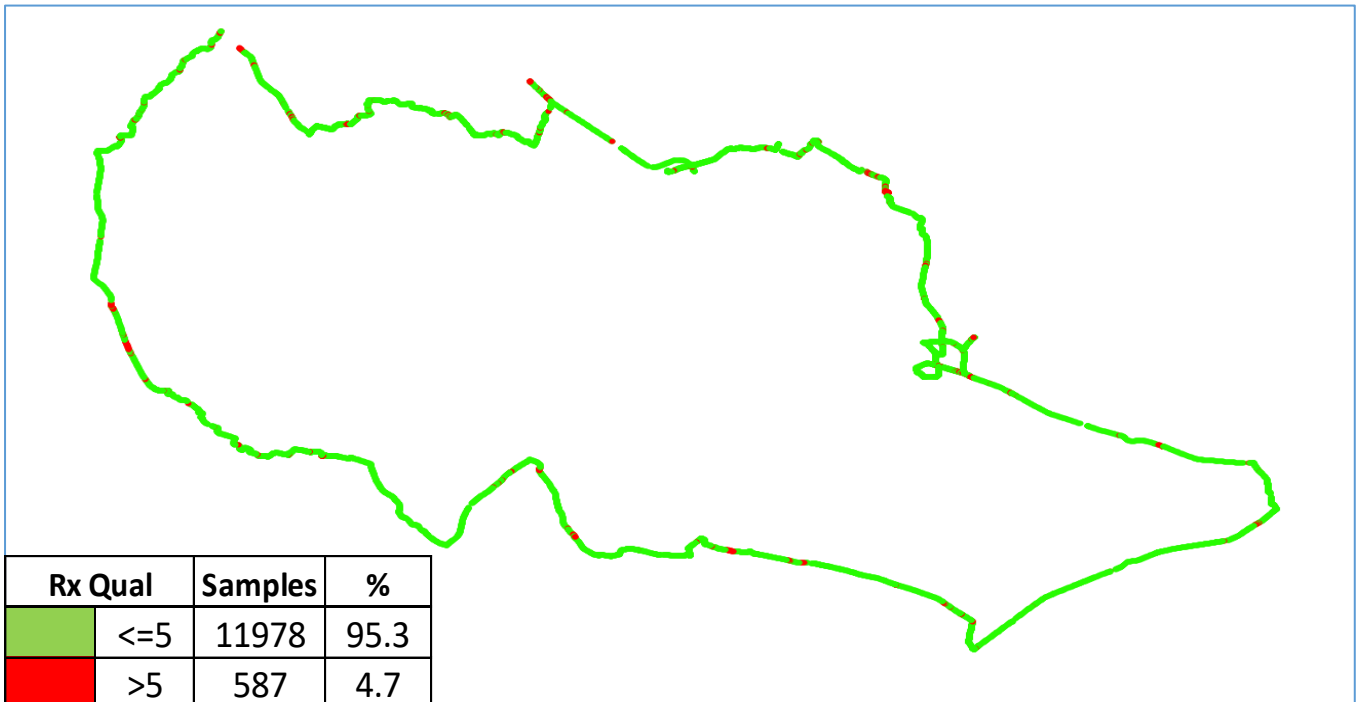


II. Quality Details

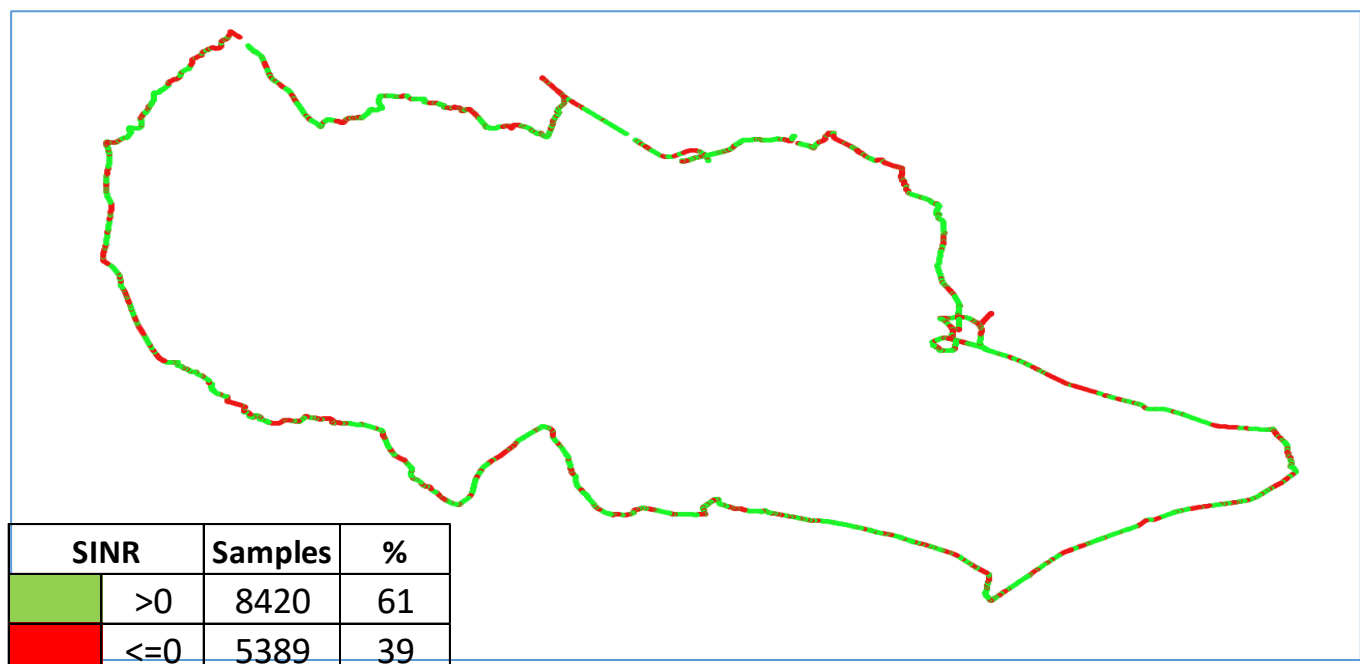
Airtel

Technology	Rx Quality %
2G	95.30
4G	61.00

2G



4G

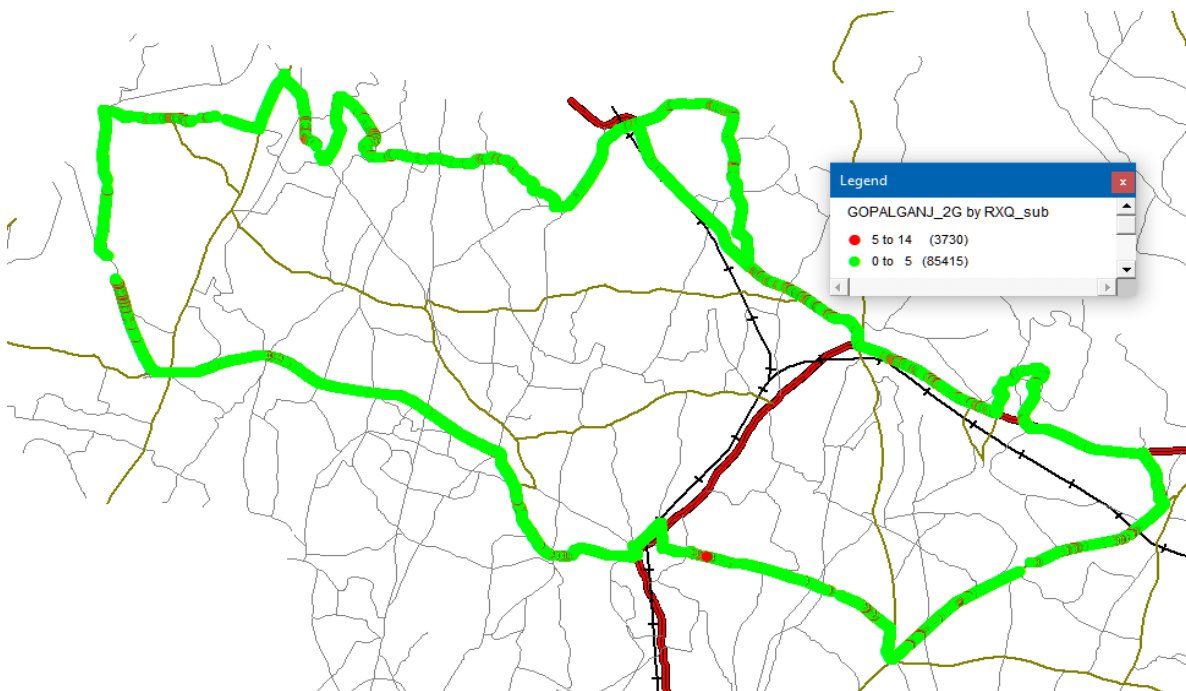


II. Quality Details

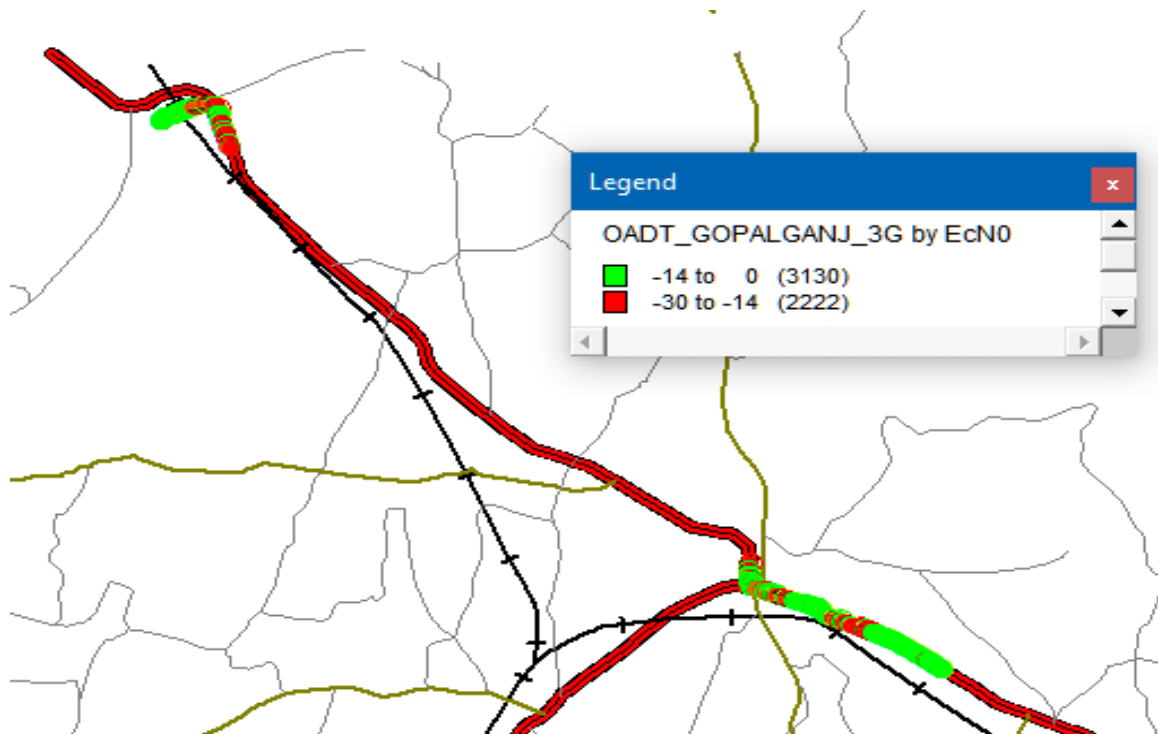
BSNL

Technology	Rx Quality %
2G	95.81
3G	58.48

2G



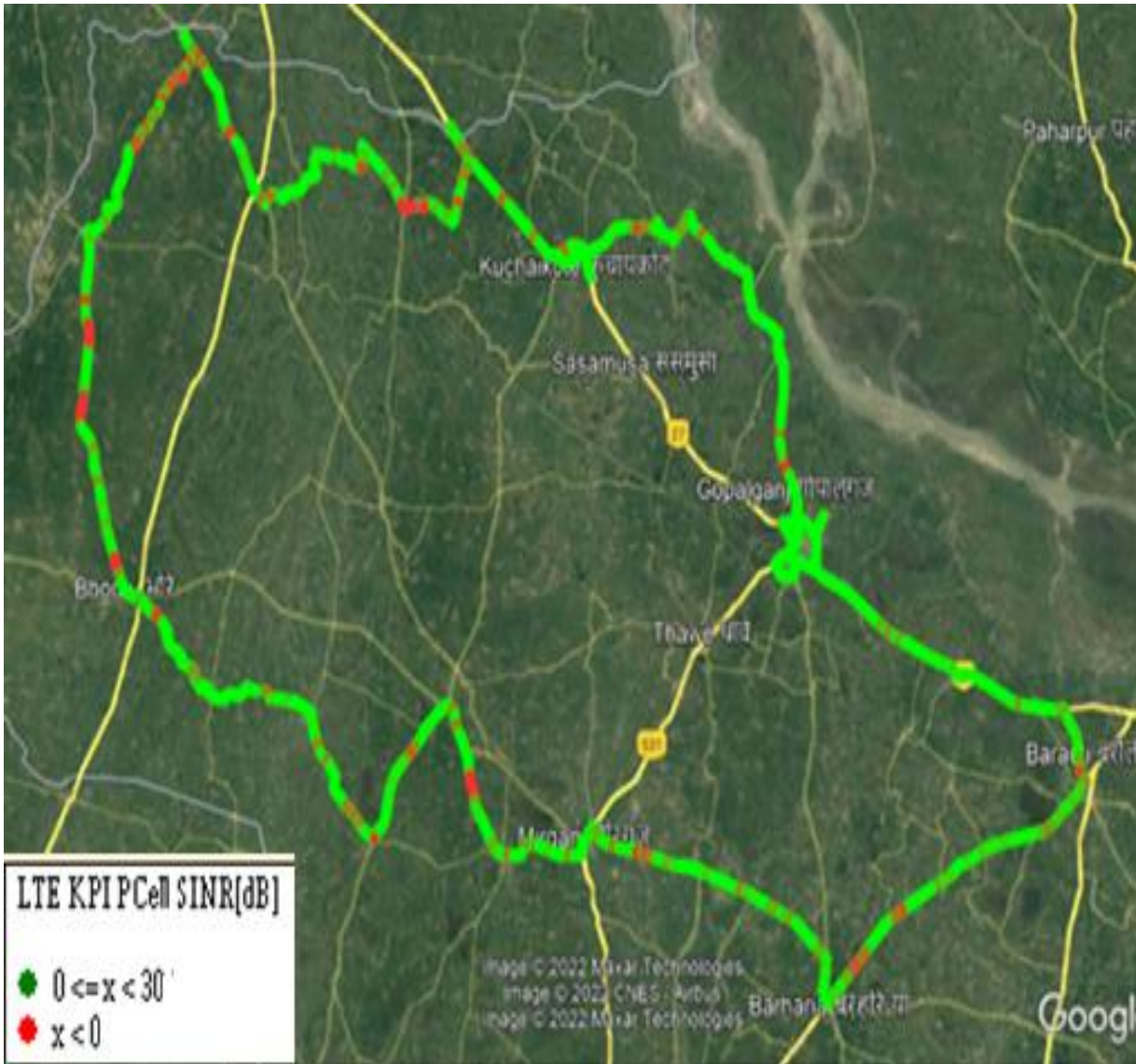
3G



II. Quality Details

JIO

Technology	Rx Quality %
VoLTE	81.54

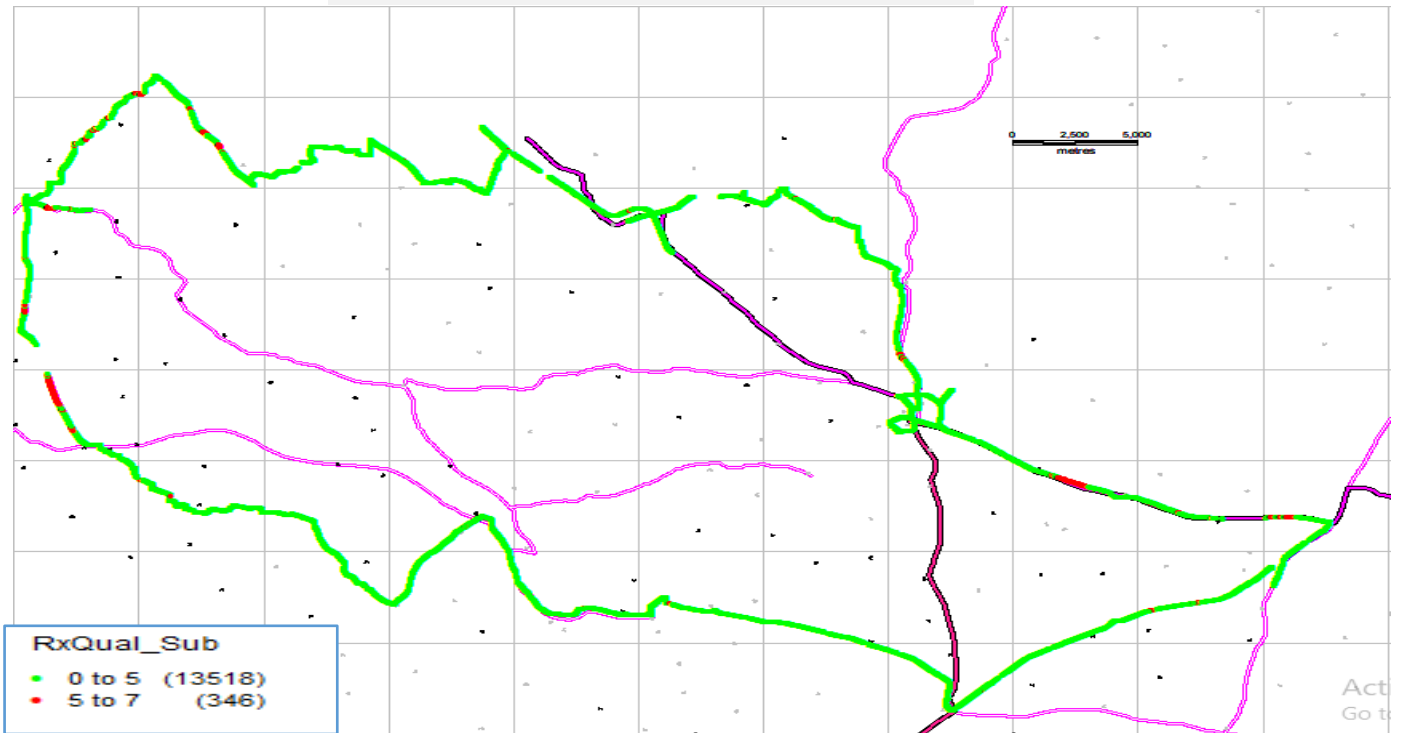


II. Quality Details

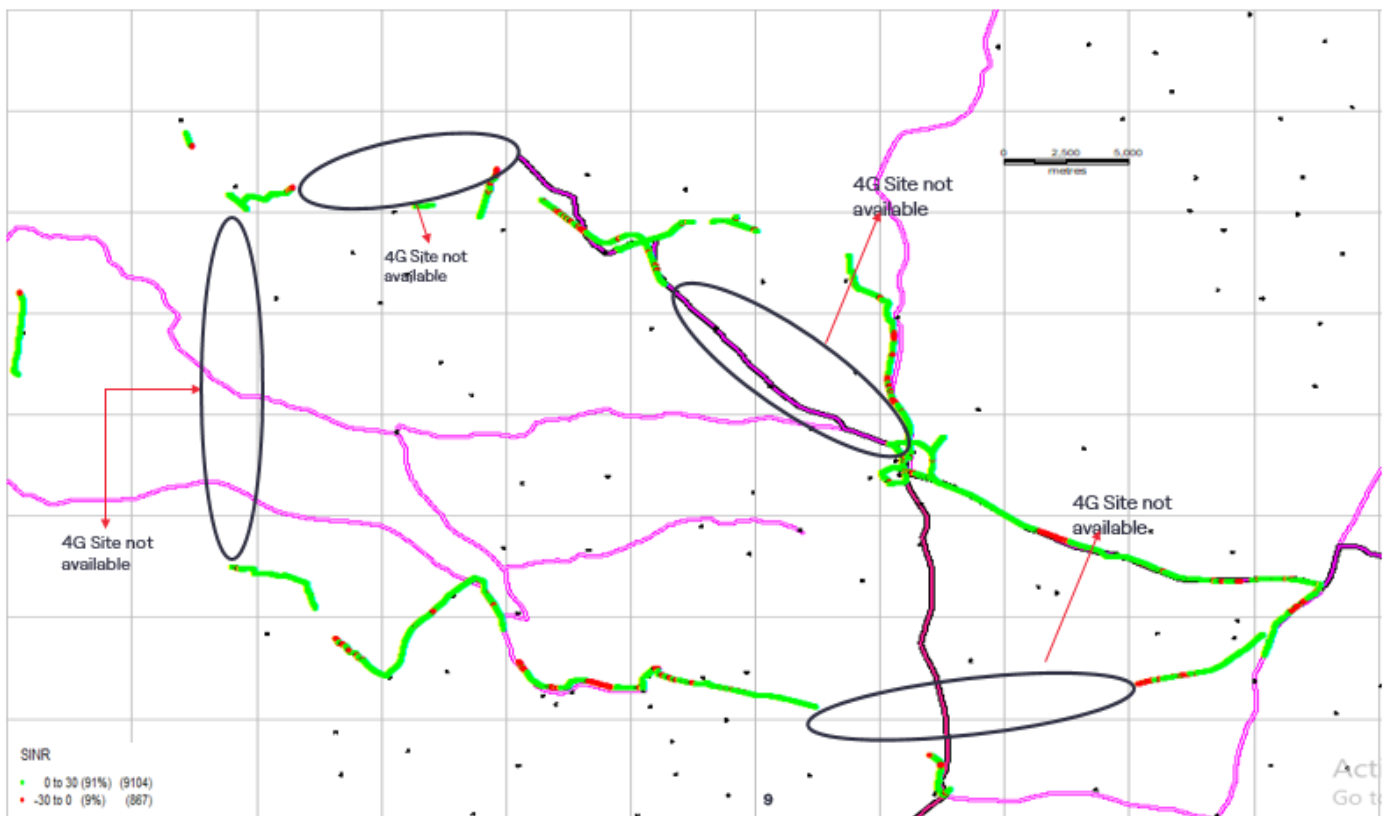
VIL

Technology	Rx Quality %
2G	97.50
4G	91.30

2G



4G

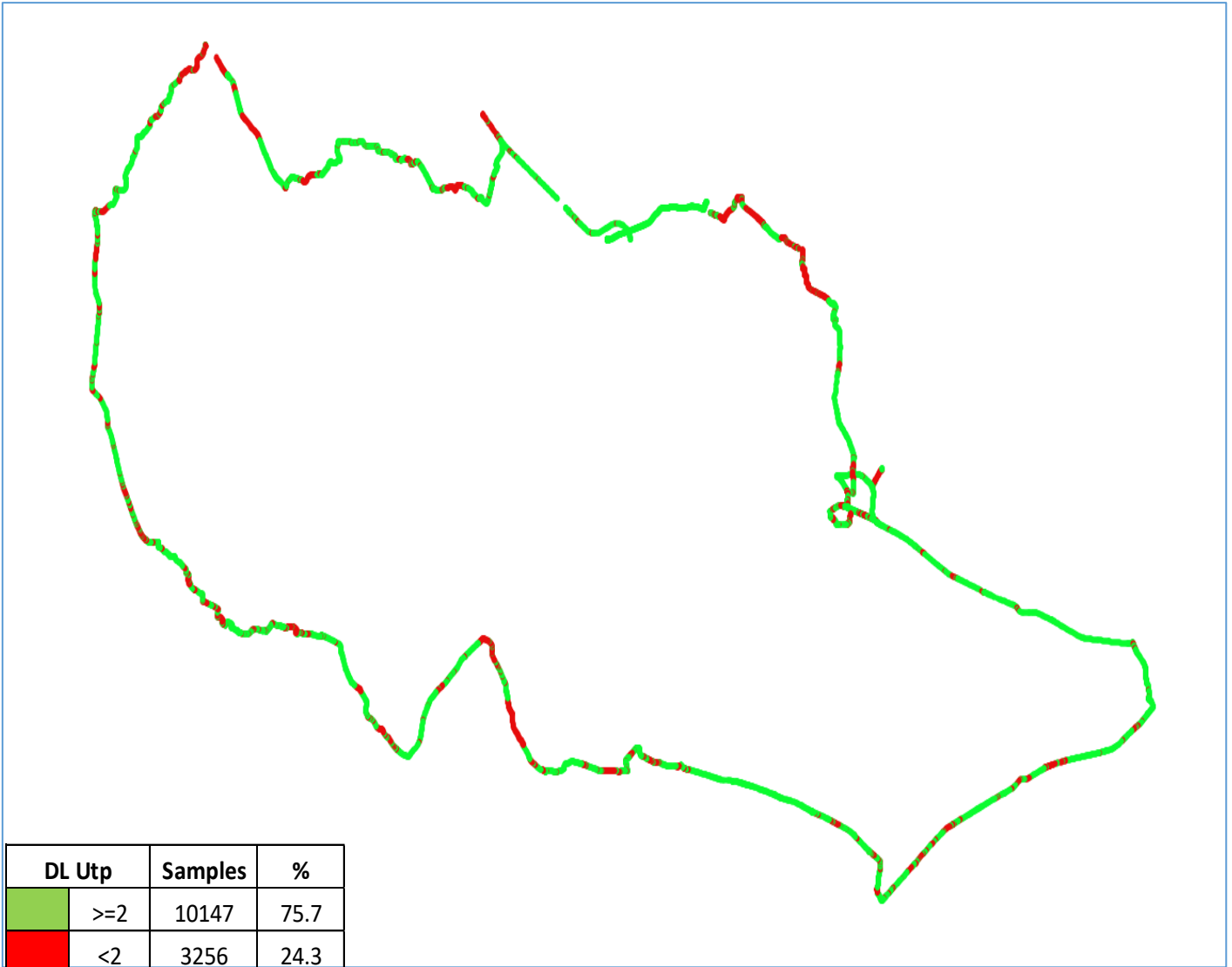


IV. Dynamic Data Test- 4G DL Details

Airtel

Data Statistics - Dynamic Complete 200 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	13.5



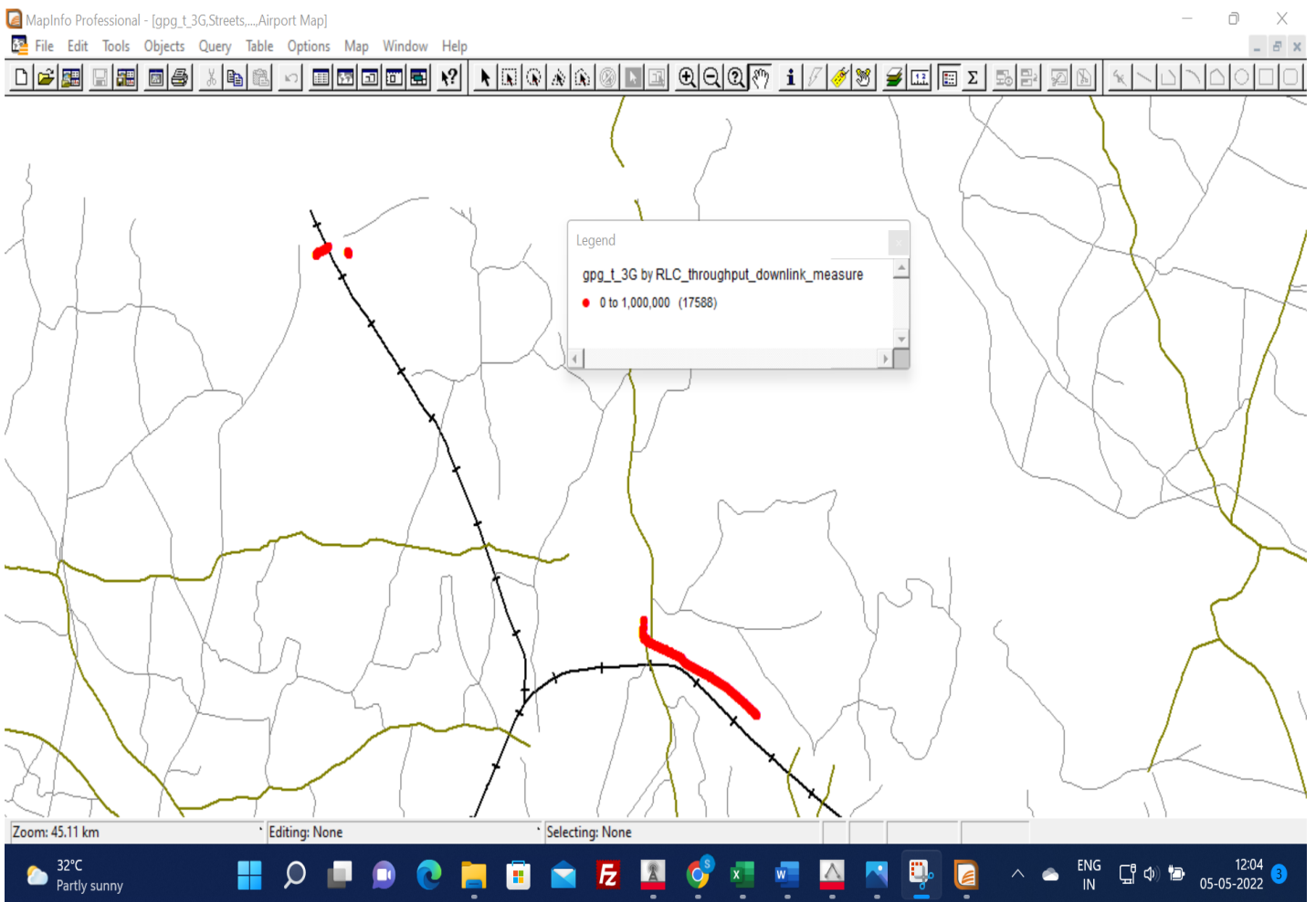
AVG. DOWNLOAD SPEED (Mbps)	13.5
% FILE TRANSFER COMPLETE	99.2
DL throughput	Sample %
0 to 1 Mbps	17.20
1 to 2 Mbps	7.10
2 to 5 Mbps	15.45
5 to 10 Mbps	17.45
>10 Mbps	42.80
Total	100%

IV. Dynamic Data Test- 3G DL Details

BSNL

Data Statistics - Dynamic Complete 200 Kms

Data KPIs - Overall	3G
Average Download Throughput (Kbps)	0.307



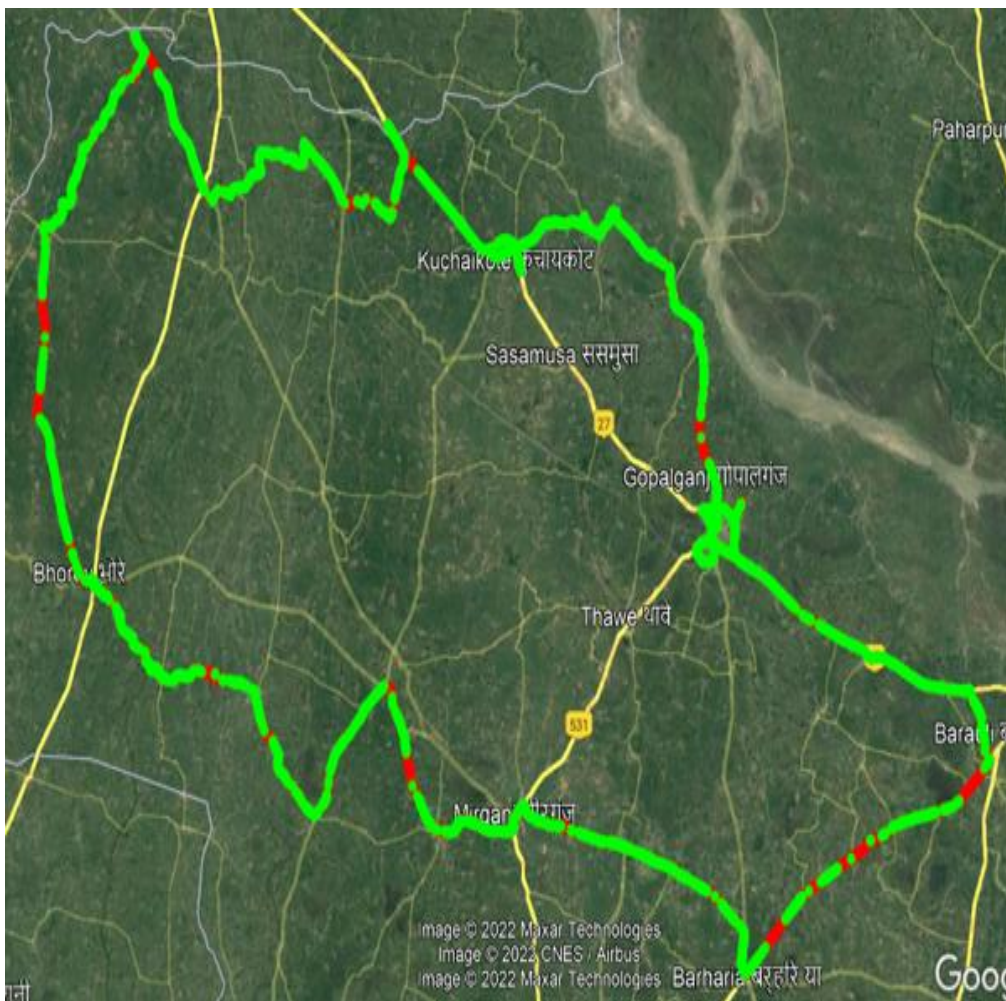
AVG. DOWNLOAD SPEED (Mbps)	0.307
% FILE TRANSFER COMPLETE	
DL throughput	Sample %
0 to 0.5 Mbps	57.25%
0.5 to 1 Mbps	23.91%
1 to 2 Mbps	18.12%
2 to 5 Mbps	0.72%
Total	100%

IV. Dynamic Data Test- 4G DL Details

Jio

Data Statistics - Dynamic Complete 200 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	7.23



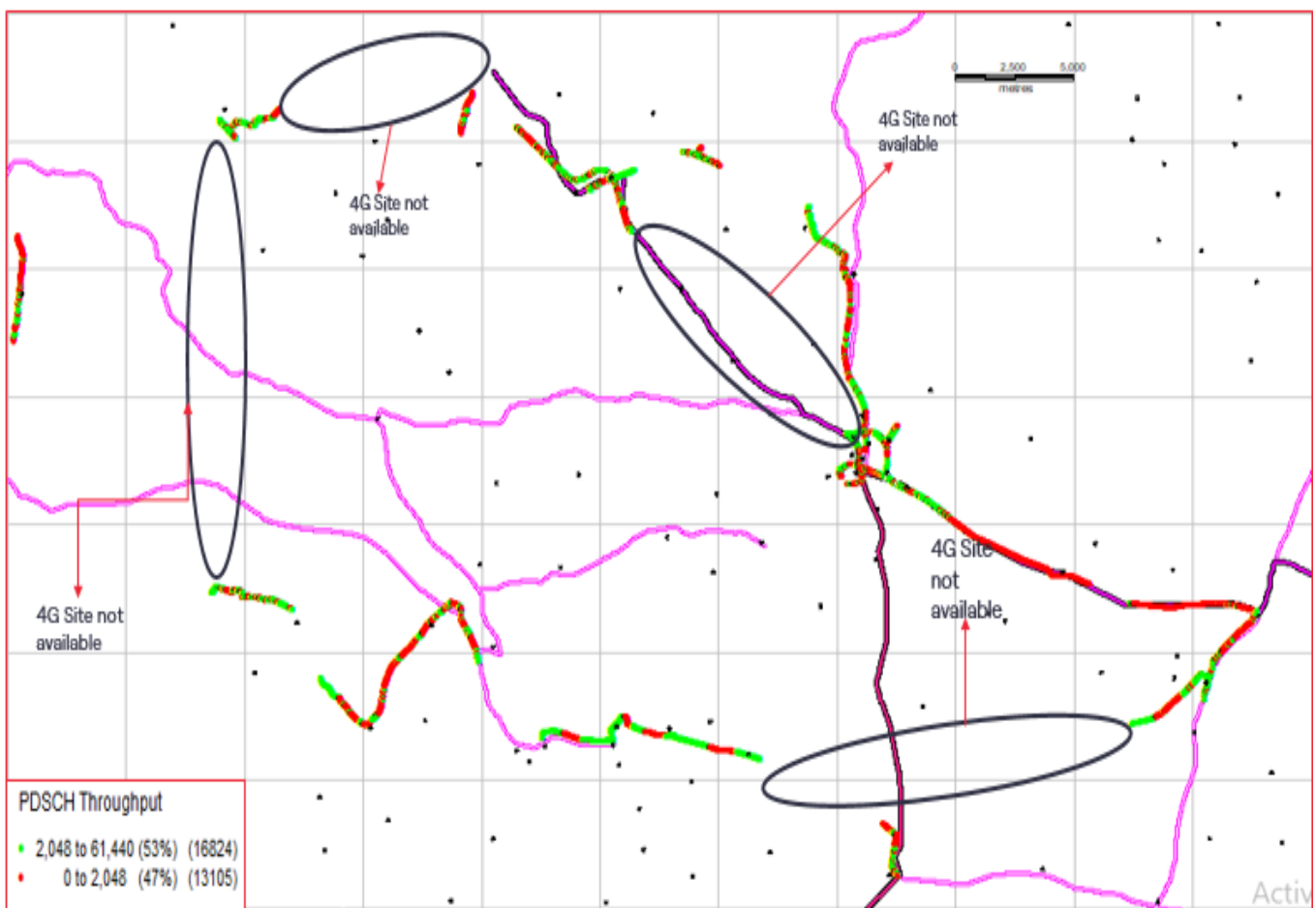
AVG. DOWNLOAD SPEED (Mbps)	7.23
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 1 Mbps	11
1 to 2 Mbps	8
2 to 5 Mbps	16
5 to 10 Mbps	14
>10 Mbps	13
Total	100%

IV. Dynamic Data Test- 4G DL Details

VIL

Data Statistics - Dynamic Complete 200 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	12.0



AVG. DOWNLOAD SPEED (Mbps)	12.0
% FILE TRANSFER COMPLETE	93.24
DL throughput	Sample %
0 to 1 Mbps	0%
1 to 2 Mbps	5.8%
2 to 5 Mbps	18.4%
5 to 10 Mbps	25.1%
>10 Mbps	50.7%
Total	100%

DATA SPEED TESTING REPORT THROUGH TRAI MY SPEED APP is given below as Table-1. . Only those Snap Shots measurements of TRAI Myspeed App where download speed in 4G network is less than 10 Mbps and in 3G network is less than 2 Mbps is furnished in Table-1.

DATA TESTING REPORT FROM TRAI MY SPPEED APP						
LOCATION	DATE	TIME	TSP	SIGNAL STRENGTH (-dbm)	DOWNLOAD SPEED(Mbps)	UPLOAD SPEED(Mbps)
POST OFFICE GOPALGANJ	30-03-2022	09:27AM	JIO	81	2.71	2.00
POST OFFICE GOPALGANJ	30-03-2022	9:20 AM	AIRTEL		3.13	6.21
SADAR SALARY HOSPITAL GOPALGANJ	30-03-2022	09:34AM	JIO	83	7.47	5.04
SADAR SALARY HOSPITAL GOPALGANJ	30-03-2022	09:35AM	AIRTEL	73	9.32	6.99
ELECTRICITY BOARD OFFICE GOPALGANJ	30-03-2022	09:41AM	JIO	95	2.78	1.54
POST OFFICE GOPALGANJ	30-03-2022	10:05AM	BSNL	113	0.00	0.00
BARAULI POLICE STATION	30-03-2022	10:27AM	JIO	87	5.50	13.87
BARAULI POLICE STATION	30-03-2022	10:55AM	AIRTEL	93	5.53	1.31
BADHARIA THANA	30-03-2022	11:02AM	JIO	94	1.48	0.73
BADHARIA THANA	30-03-2022	11:25AM	AIRTEL	90	9.84	1.69
MIRGANJ MARKET	30-03-2022	11:56AM	AIRTEL		9.62	8.15
HATHUA SAINIK SCHOOL	30-03-2022	12:03PM	VODAFONE	79	5.15	10.07
HATHUA SAINIK SCHOOL	30-03-2022	12:10PM	AIRTEL	93	8.17	2.75
MISHRI BATRAHAN	30-03-2022	02:22PM	BSNL	85	1.73	0.99
KATIYA MARKET	30-03-2022	02:34PM	JIO	93	9.16	2.42
BHORE	30-03-2022	02:35PM	BSNL	97	0.14	0.06
BHORE MARKET	30-03-2022	02:51PM	BSNL	63	0.60	0.11
BHAGIPATTI	30-03-2022	03:00PM	JIO	102	3.76	0.56
UP-BIHAR BORDER	30-03-2022	03:05PM	JIO	87	9.99	0.85
BAGIPATTI	30-03-2022	03:07PM	AIRTEL		3.75	9.20
PANCHDEORI MARKET	30-03-2022	03:19PM	JIO	96	3.10	1.59
KUCHAIKOT BLOCK OFFICE	30-03-2022	04:43PM	JIO	99	5.98	1.35
KOCHAIKOT	30-03-2022	05:19PM	BSNL	61	1.01	1.35
KOCHAIKOT	30-03-2022	05:20PM	BSNL	63	1.46	1.15
RAILWAY STATION	30-03-2022	07:26PM	AIRTEL		4.39	10.66

VI. Video Call Observations

•Observations of Regional Office, Kolkata on the Operator Assisted Drive Test and action to be taken by TSPs to improve the QoS-

Video Call Testing Report where Video Call disconnection and poor Video quality/ Video freeze were observed is provided below --

NO. OF LOCATIONS OBSERVED POOR VIDEO QUALITY & VIDEO FREEZE				
DAY/TSP	AIRTEL	BSNL	RJIO	VI
DAY -1 (30.03.2022)	4	0	8	1
NO. OF LOCATION VIDEO CALL DISCONNECTED				
DAY/TSP	AIRTEL	BSNL	RJIO	VI
DAY -1 (30.03.2022)	2	2	4	6

VIDEO CALL TESTING --3G & 4G NETWORKS—

AIRTEL- Video calls were disconnected two times and the Video picture quality was poor many times throughout the drive routes.

BSNL- Video calls were disconnected most of the time due to poor/ no 3G coverage throughout the drive routes. 3G coverage on most of the drive test routes are very poor or zero. For this reason, BSNL could not join through video calls most of the time

RJIO- - Video calls were disconnected four times and the Video picture quality was poor many times throughout the drive routes.

VI- Video calls were disconnected six times and the Video picture quality was poor one time throughout the drive routes. There are many routes where 4G coverage is very poor or nil.

VII. 3G/ 4G Coverage

•Observations of Regional Office, Kolkata on the Operator Assisted Drive Test and action to be taken by TSPs to improve the QoS-

There are fourteen Blocks in Gopalganj District in Bihar. Below Table shows the availability of Coverage 3G/4G of TSPs in the Blocks of Gopalganj District

Availability of Coverage 3G/4G in Blocks of Gopalganj District in Bihar							
Sl.no	Block	Lat	Long	VI(4G)	BSNL(3G)	RJIO(4G)	AIRTEL(4G)
1	Kuchaikote	26.5581	84.3302	Yes	Yes	Yes	Yes
2	Barauli	26.3926	84.5932	Yes	Yes	Yes	Yes
3	Hathua	26.3627	84.3039	Yes	Yes	Yes	Yes
4	Gopalganj	26.4831	84.4366	Yes	Yes	Yes	Yes
5	Baikunthpur	26.2745	84.7855	Yes	No	Yes	Yes
6	Maniha	26.4034	84.4985	Yes	No	Yes	Yes
7	Bhorey	26.4470	84.1070	No	Yes	Yes	Yes
8	Uchkagaon	26.4455	84.2867	Yes	No	Yes	Yes
9	Sidhwalia	26.3318	84.6671	Yes	Yes	Yes	Yes
10	Bijaipur	26.4616	83.9829	No	No	Yes	Yes
11	Katiya	26.5676	84.0870	No	No	Yes	Yes
12	Phulwaria	26.4969	84.2108	No	No	Yes	Yes
13	Thawe	26.4346	84.3949	Yes	Yes	Yes	Yes
14	Pach Deuri	26.5691	84.2183	Yes	No	Yes	Yes

THE ABOVE INFORMATION IS COLLECTED FROM TSPs

VI. Observations of RO, Kolkata

•Observations of Regional Office, Kolkata on the Operator Assisted Drive Test and action to be taken by TSPs to improve the QoS-

AIRTEL

SINR (61.0%) in 4G network does not meet the benchmark (95%).

Video Call got freezed and disconnected near Bihar-Uttarpradesh broder and Baharia. Video Call got freezed between Katiya to Kuchaikote, Gopalganj Post Office to Gopalganj Bettiah Road and near Kamala Rai College Road.

Airtel has been asked to take necessary action including software/ hardware optimization to improve the Rx Quality (SINR), Video calls disconnections, poor Video quality and poor coverage/ download throughputs on the drive test routes and at all important locations.

An action taken report is to be submitted by 20.06.2022.

BSNL

Drop Call Rate (2G-14.56 % & 3G-11.11%), Block Call Rate (2G-19.68%), Call Setup Success Rate (2G-80.32 % & 3G-81.82 %), Handover Success Rate (2G-77.05 %), Rx Quality (58.48 %)do not meet the benchmarks.

3G signal is extremely poor/ no signal most of the time through out the drive test route. For this reason, BSNL could not join through video calls most of the time. Most of 3G BTSs are situated in Gopalganj town. BSNL got connected through google meet where Node B was available on the drive test like at Bhore TE ,Kuchaikote TE and Misirbatra TE. So, new sites or tower sharing may improve the coverage on the above areas.

Out of 14 Blocks in Gopalganj, there are no 3G/ 4G coverage in 7 Blocks..

BSNL could not meet the above parameters benchmarks in 2G/ 3Gnetwork and BSNL has been asked to take necessary action including software/ hardware optimization and installing new sites to improve the above KPIs, Video calls disconnections, poor Video quality and poor coverage/ download throughputs on the drive test route and at all important locations.

An action taken report is to be submitted by 20.06.2022.

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VI. Observations of RO, Kolkata

•Observations of Regional Office, Kolkata on the Operator Assisted Drive Test and action to be taken by TSPs to improve the QoS-

RJIO

Rx Quality (SINR-81.54 %) in 4G network do not meet the benchmarks.

Video call was disconnected near Barharia, Nawadah , Lamichor and Kushaundi. Video Call got freezed between Barharia to Hathua, Kusaundhi to Kawe Lamichaur Road , Bhorey to Rajt Koreya, Katiya to Kuchaikote, and near Kamala Rai College Road & Rajapur.

RJIO has been asked to take necessary action including software/ hardware optimization and installing new sites to improve the above KPIs, Video calls disconnections, poor Video quality and poor coverage/ download throughputs on the drive test route and at all important locations.

An action taken report is to be submitted by 20.06.2022.

VIL

Rx Quality (SINR-91.30 %) in 4G network do not meet the benchmarks.

Video call was disconnected near Bishanpura Bazar Barharia, Surahia Mirgunj, Khapkat parrauna, Chakia, Natwa Mod and Sipaya dhala Bijaypur. Video Call got freezed near Kamala Rai College Road.

Out of 14 Blocks in Gopalganj, there are no 4G coverage in 4 Blocks..

VI could not meet the Rx Quality in 4G benchmark. VI has been asked to take necessary action including software/ hardware optimization and installing new sites to improve the Rx Quality in 4G, Video calls disconnections, poor Video quality and poor coverage/ download throughputs on the drive test routes.

An action taken report is to be submitted by 20.06.2022.