

Operator Assisted Drive Test Report

on National Highways-19

(Dankuni Toll Plaza to Asansol)

Aug. 2021

(RO, Kolkata)

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

The Operator Assisted Drive Test has been carried out by Regional Office, Kolkata with the help of Service Providers on National Highways-19 (Dankuni Toll Plaza to Asansol) from 9:00 AM to 7:00 PM on 11th Aug. 2021. The drive test covered drive route of 220 KMs & 1 hotspot over a period of 1 day. Approximately 80+ calls were made for each of the 8 networks: three 2G networks, two 3G network and three LTE network covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

National Highway 19 (NH 19) is a national highway in India. It was previously referred to as Delhi–Kolkata Road and is **one of the busiest national highways in India**. Almost all of the 1,269.7 km (789.0 mi) stretch of NH 19 has been selected as a part of the Golden Quadrilateral by the National Highways Development Project.

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.

Date: Download Throughputs and Data File Success Rate.

Video Call: Video secession 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, two 3G (Lock Mode) networks, Three LTE (Lock Mode) networks covering 4 unique TSPs were tested.

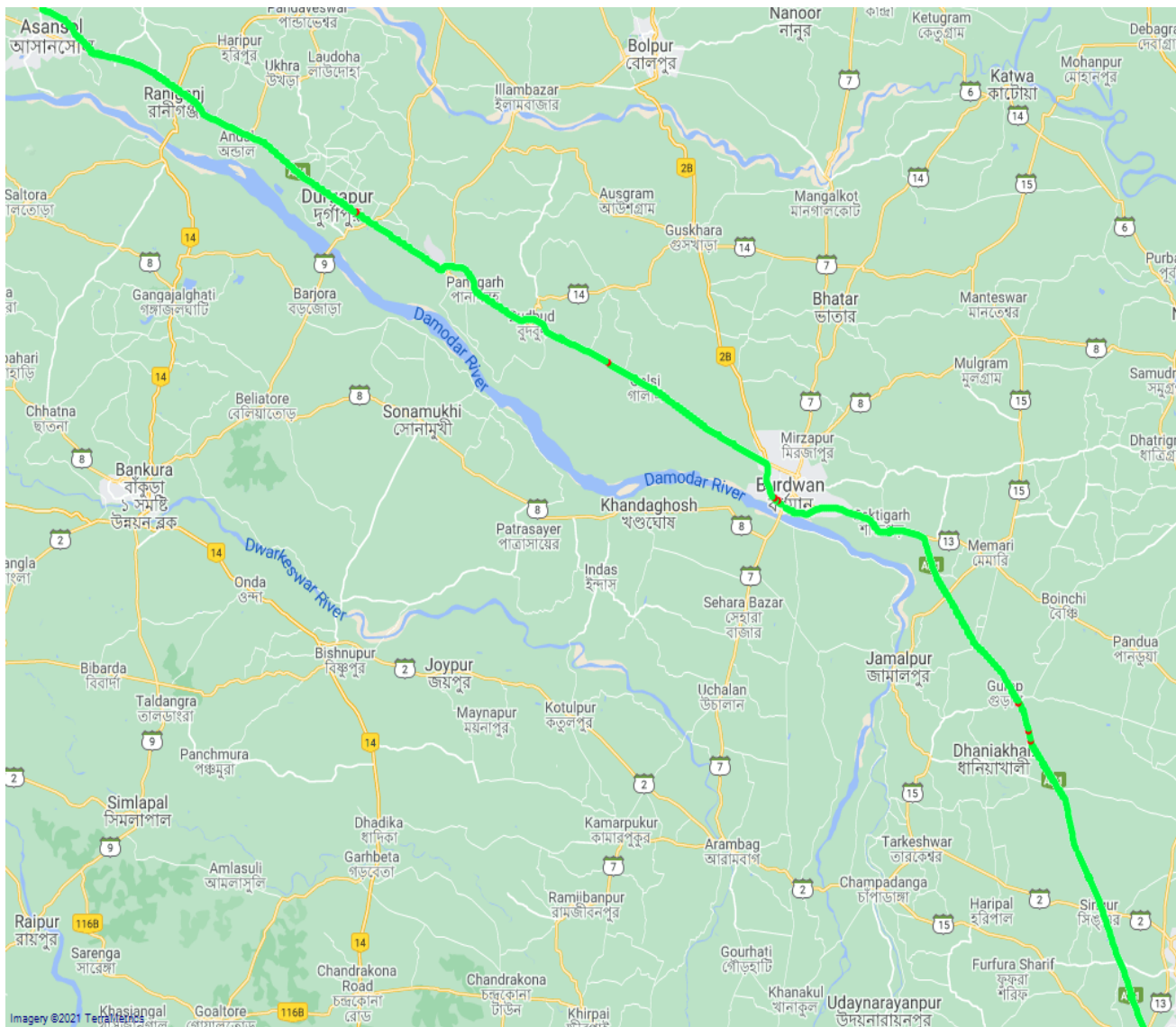
Data Tests: Dynamic Data Service Testing was performed along same route in all technologies. 500KB File for 2G, 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, Two 3G (Lock Mode) networks, 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.

Service	Specifications
Download	2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in, www.flipkart.com and PayTm
Latency	32 Bytes on www.google.com

Overview

Voice & Dynamic Data Test Drive Route



Data Service Test- Static Locations

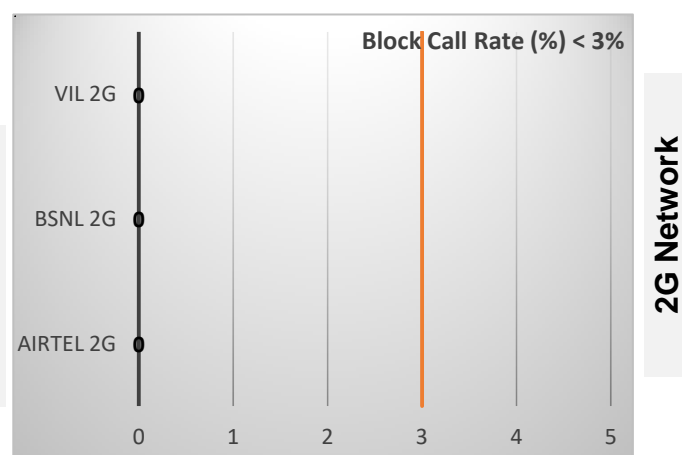
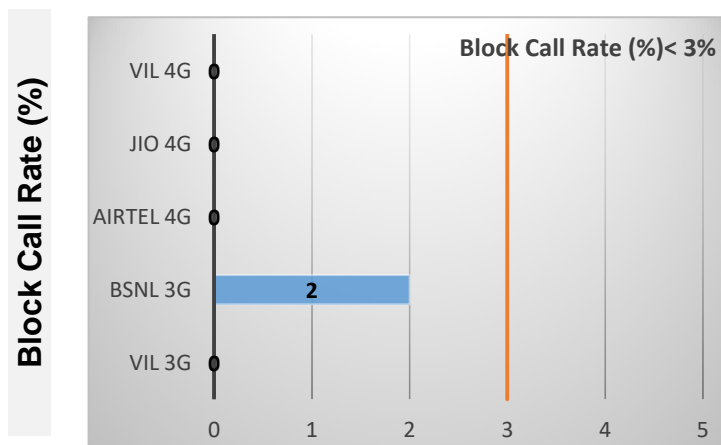
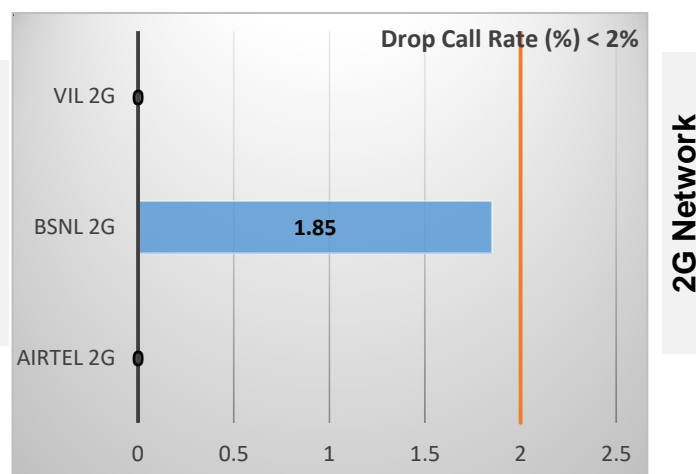
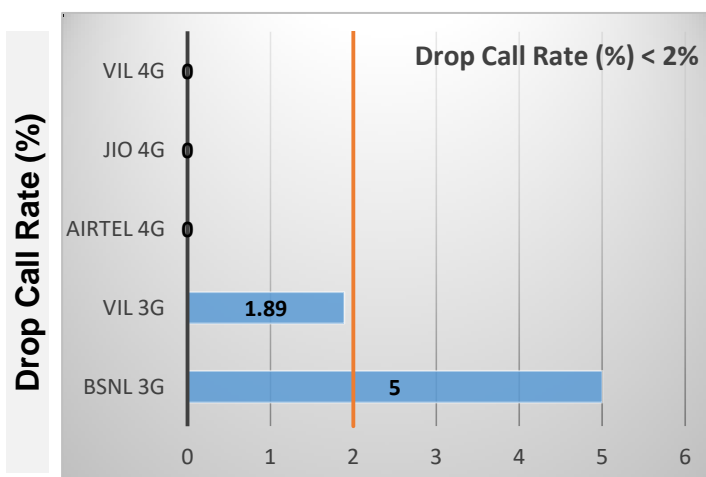
Static Locations

BURDWAN (23.26783/87.82407)

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	VIL	Airtel	RJIO	VIL
Drop Call Rate %	0	1.85	0	5	1.89	0	0	0
Block Call Rate %	0	0	0	2	0	0	0	0

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

Voice Calls

Key Observations

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	99.07	82.64	95.16

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

TSPs	3G		VoLTE		
	BSNL	VIL	Airtel	JIO	VIL
Coverage %	69.07	84.00	98.94	99	99

Data Services Dynamic

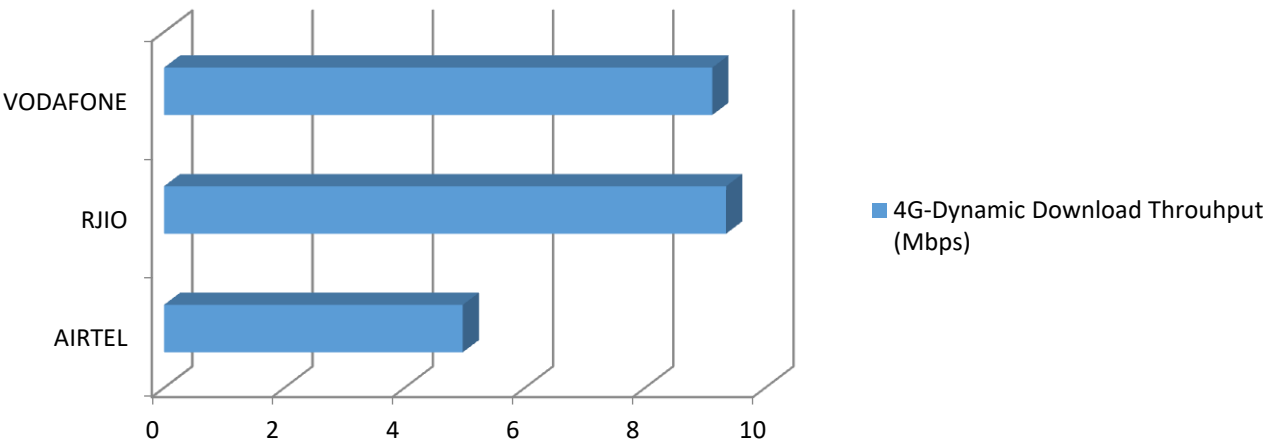
Key Observations

Dynamic Data was tested for 220 Kms. Download Throughput was tested.

Data Download Performance (Mbps) - Dynamic

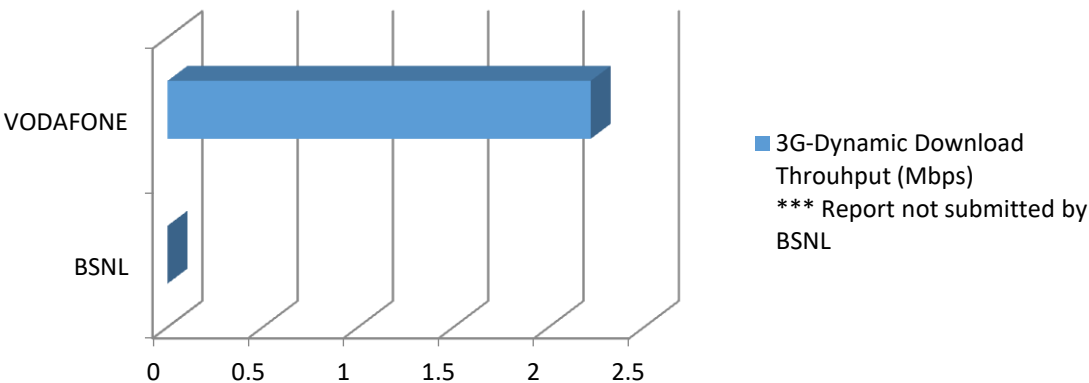
4G/3G/ Network:

4G-Dynamic Download Throuhput (Mbps)



3G-Dynamic Download Throuhput (Mbps)

*** Report not submitted by BSNL



Summary

NH Level Summary-Voice

Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	80	56	83
Blocked Call Rate (%)	0	0	0
CSSR% (Accessibility)	100	96.43	100
Drop Call Rate (%)	0	1.85	0
Mobility HOSR (%)	100	94.91	100
Rx Quality (%)	99.2	94.95	93.97

Voice Call	3G/4G				
	BSNL 3G	VIL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	108	53	78	102	84
Blocked Call Rate (%)	2	0	0	0	0
CSSR% (Accessibility)	98	100	100	100	100
Drop Call Rate (%)	5	1.89	0	0	0
Mobility HOSR (%)	100	100	100	99	100
Rx Quality (%)	78.47	97.49	98.22	89	89

BURDWAN	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	125.2	153	205.53
Upload Throughput (kbps)	63.3	79	77.7
Web Browsing Delay (sec)	1.2	155	1.31
Latency (msec)	230	221	183

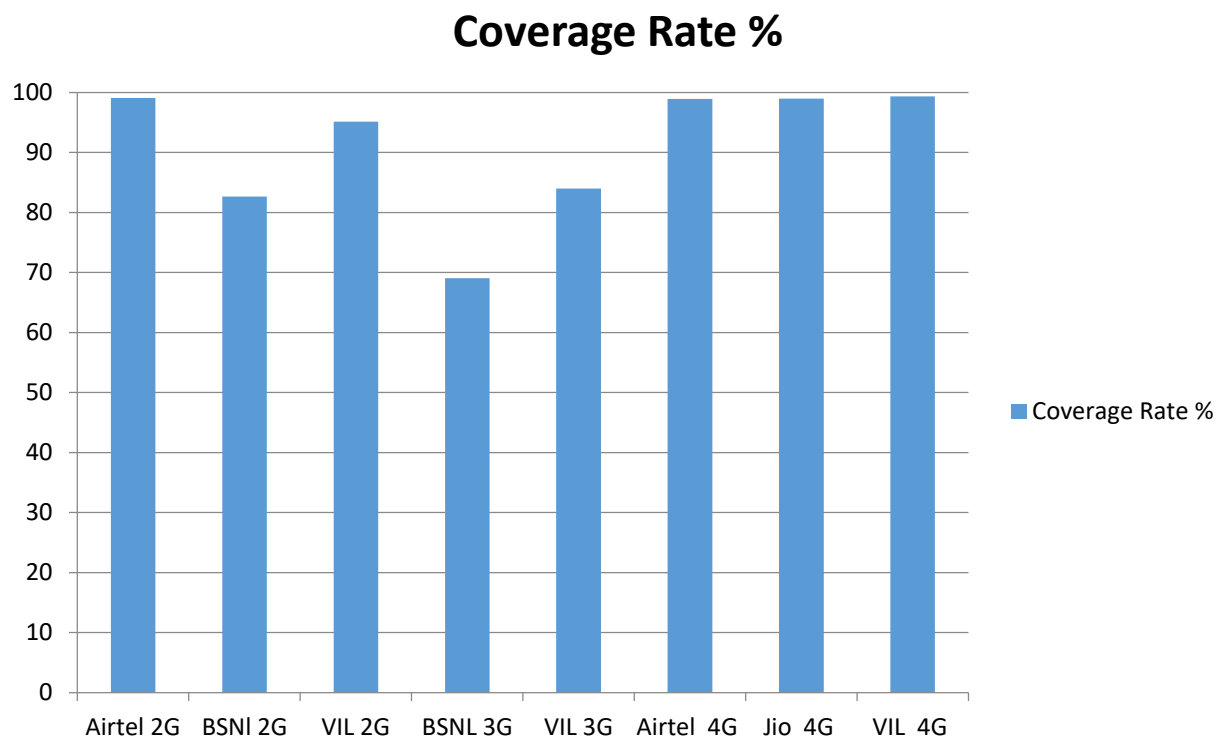
BURDWAN	3G	
	BSNL	VIL
Download Throughput (Mbps)	1.59	3.76
Upload Throughput (Mbps)	1.12	3.09
Video Streaming Delay (sec)	25	0.65
Web Browsing Delay (sec)	40	0.43
Latency (msec)	91	77

BURDWAN	VoLTE		
	Airtel	JIO	VIL
Download Throughput (Mbps)	32.33	28.02	7.57
Upload Throughput (Mbps)	7.21	6.58	25.9
Video Streaming Delay (sec)	0.83	3.4	0.32
Web Browsing Delay (sec)	0.52	5.6	0.25
Latency (msec)	45.5	46.13	56

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	99.07
BSNI 2G	82.64
VIL 2G	95.16
BSNL 3G	69.07
VIL 3G	84.00
Airtel 4G	98.94
Jio 4G	98.76
VIL 4G	99.35

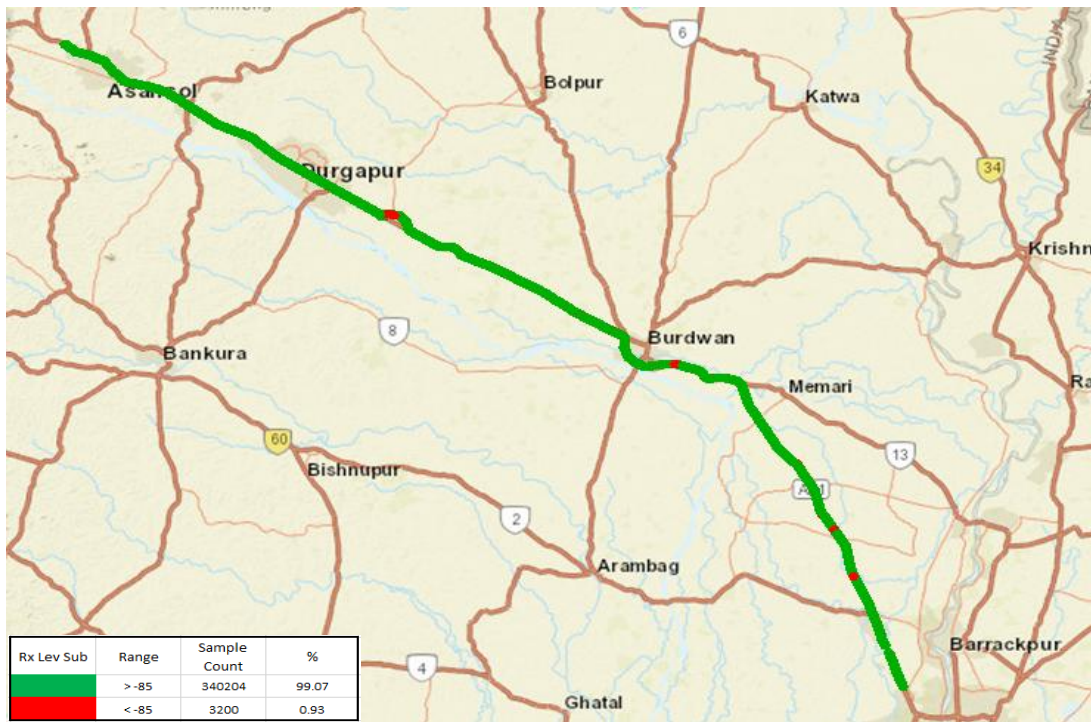


I. Coverage Details

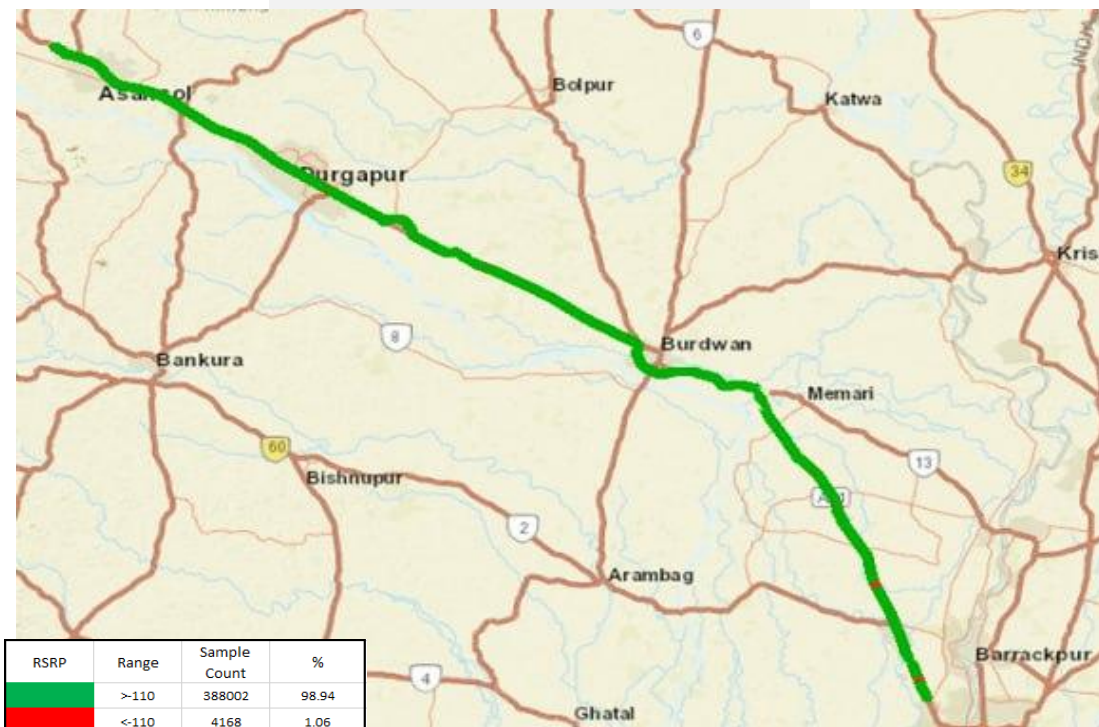
AIRTEL

Technology	Coverage Rate %
2G	99.07
VoLTE	98.94

2G



VoLTE

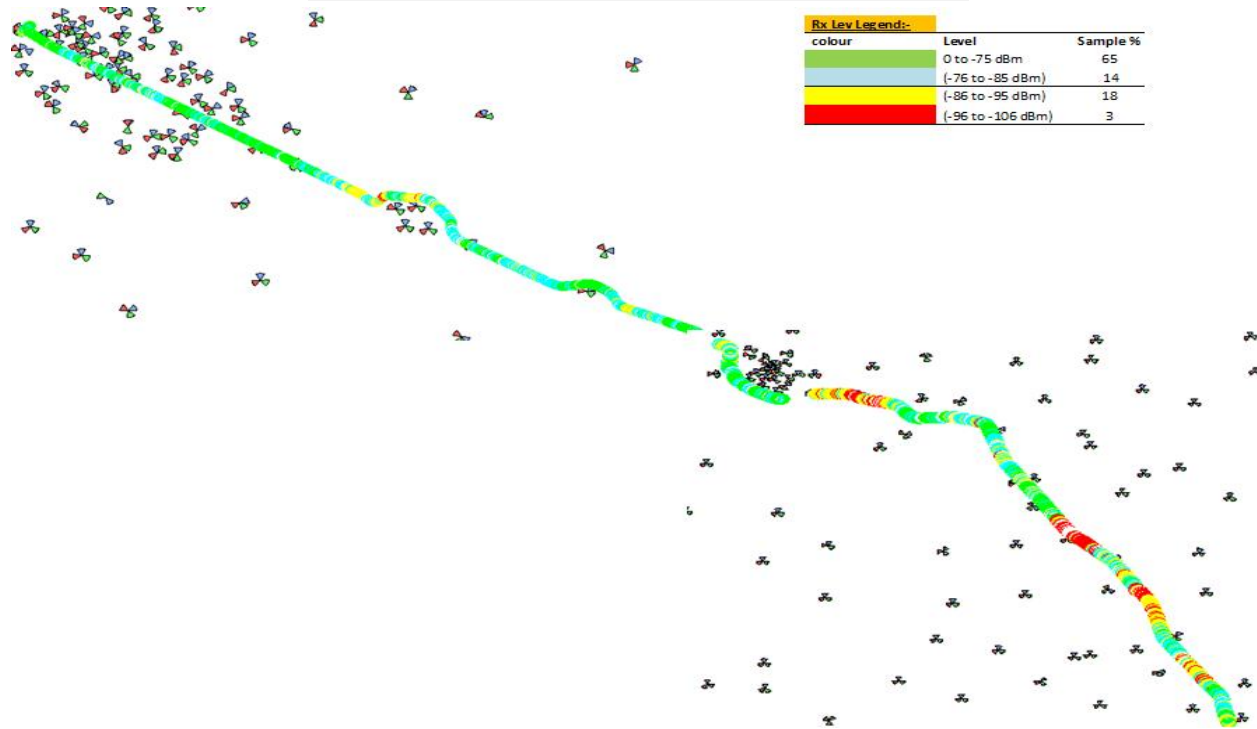


I. Coverage Details

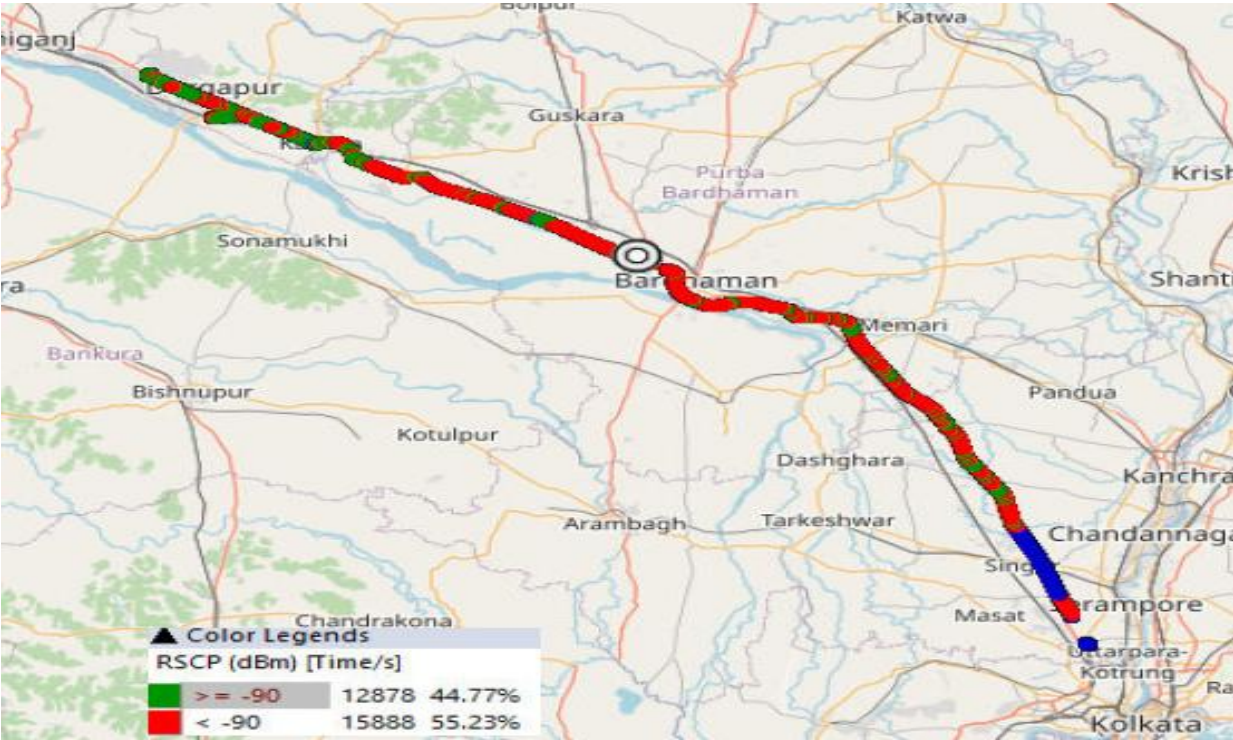
BSNL

Technology	Coverage Rate %
2G	82.64
3G	69.07

2G



3G



I. Coverage Details

JIO

Technology	Coverage Rate %
VoLTE	98.76

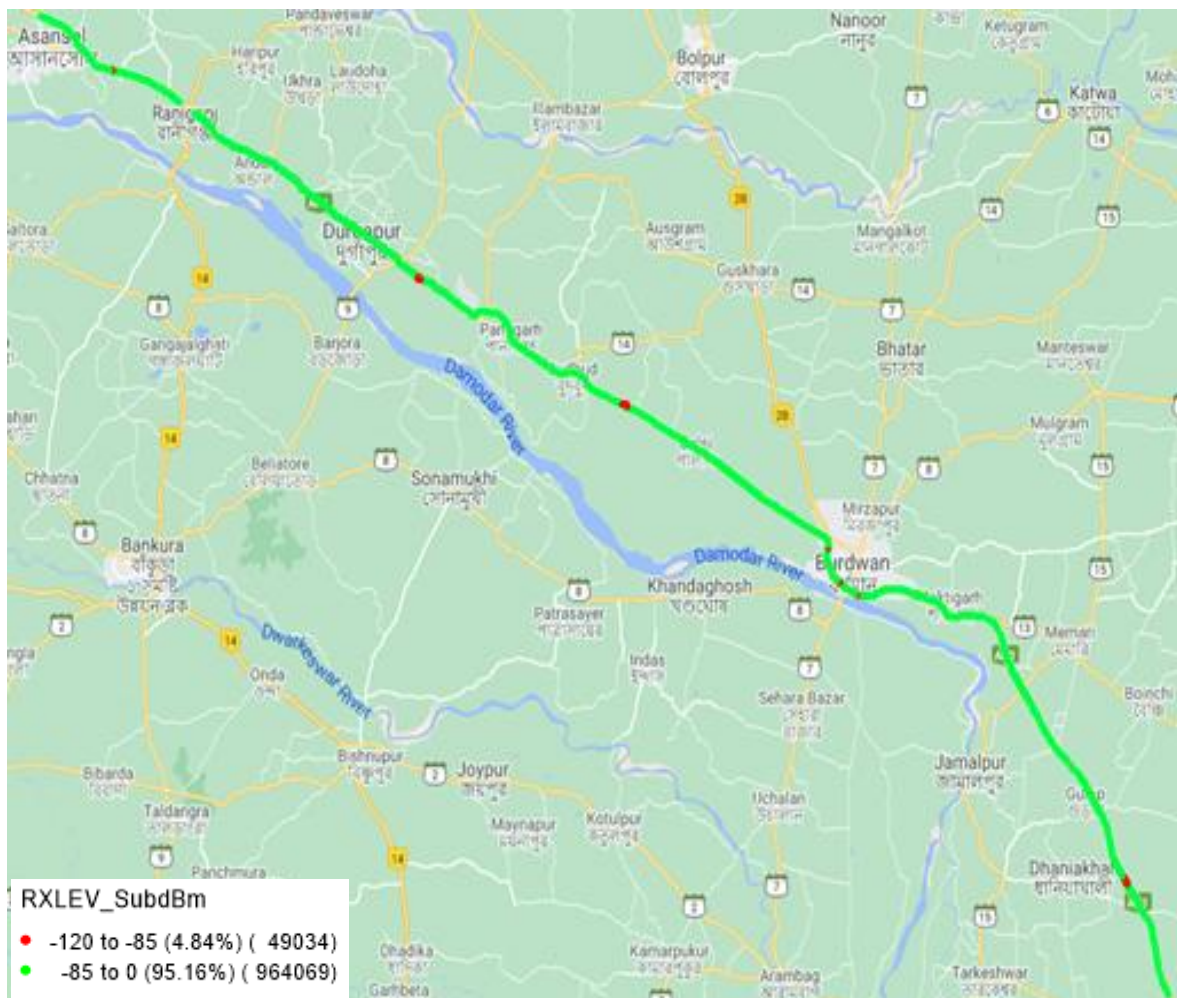


I. Coverage Details

VIL

Technology	Coverage Rate %
2G	95.16

2G

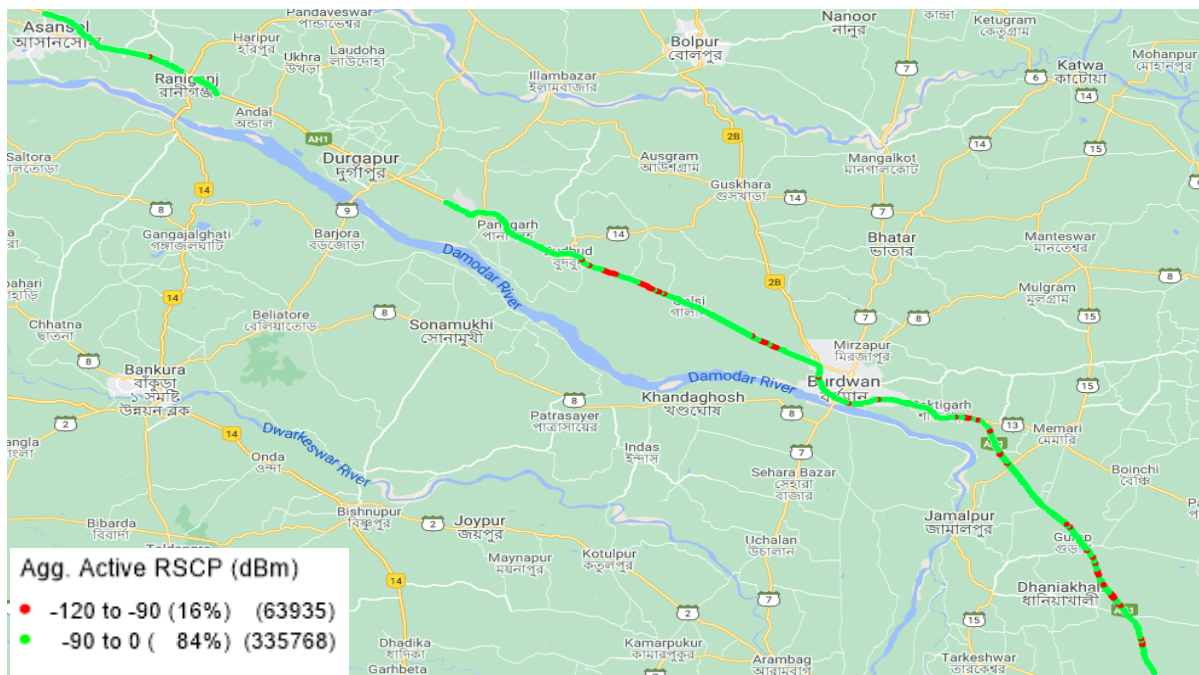


I. Coverage Details

VIL

Technology	Coverage Rate %
3G	84.00
4G	99.35

3G



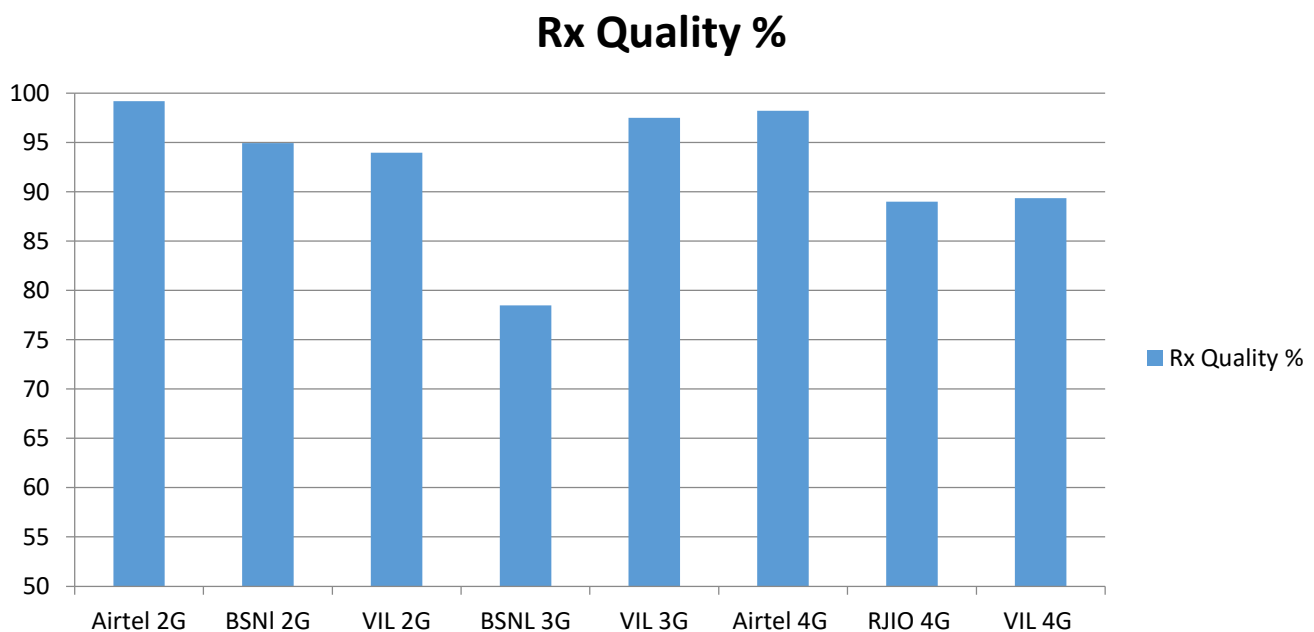
4G



II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -14 dBm for 3G TSP sand 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	99.2
BSNI 2G	94.95
VIL 2G	93.97
BSNL 3G	78.47
VIL 3G	97.49
Airtel 4G	98.22
RJIO 4G	89.35
VIL 4G	89.65

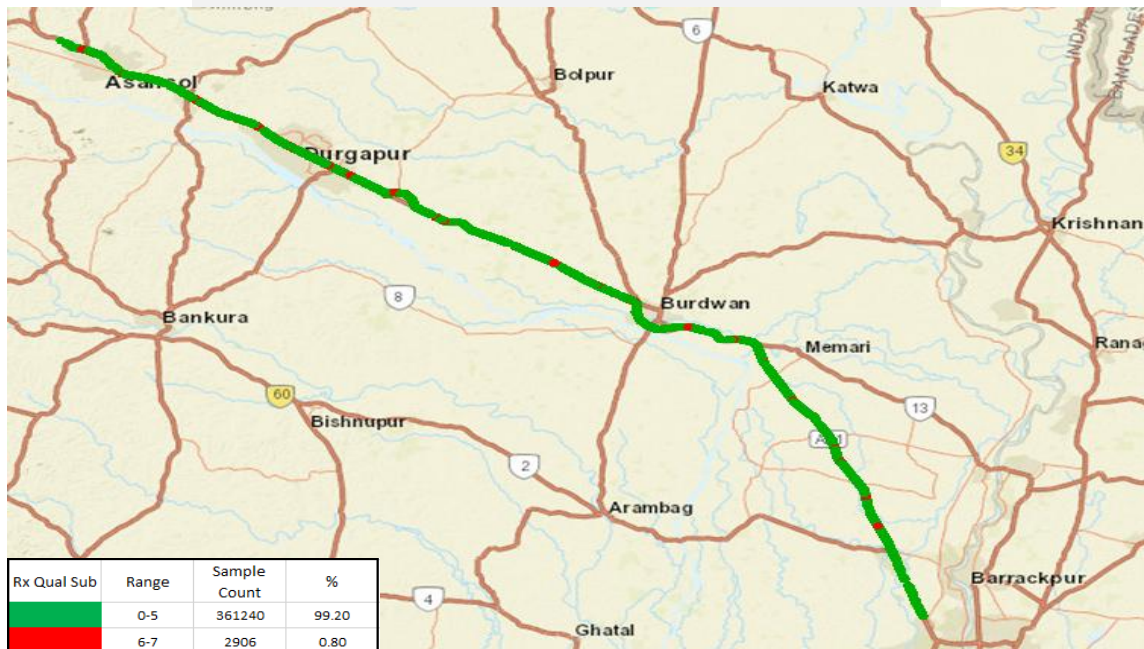


II. Quality Details

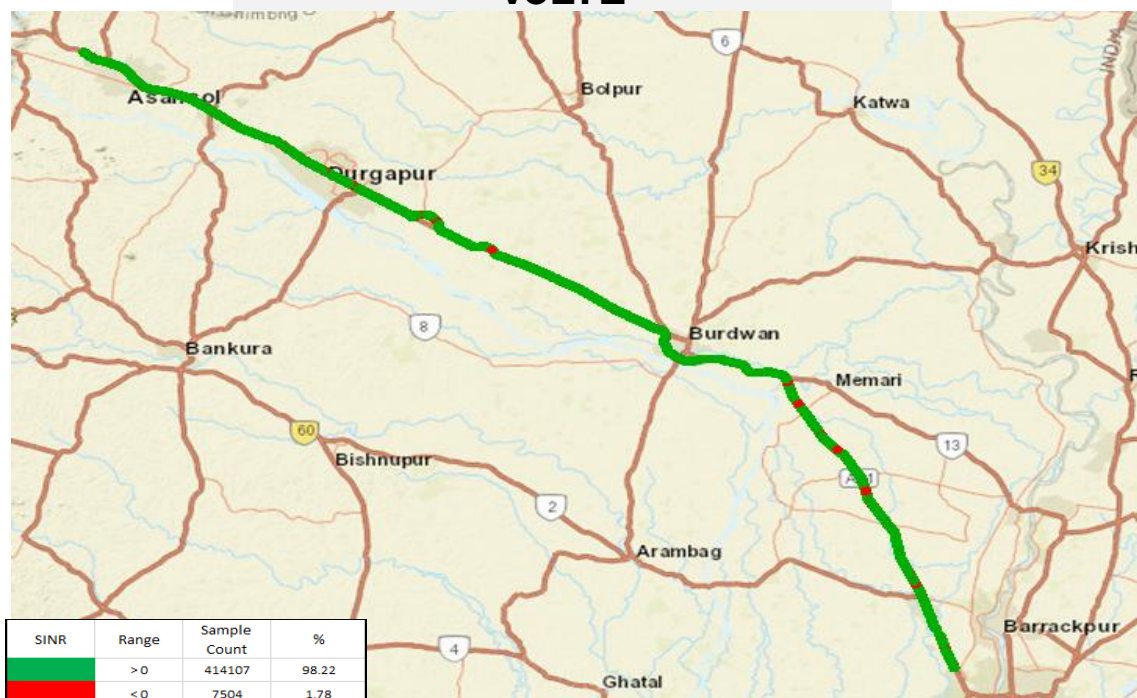
Airtel

Technology	Rx Quality %
2G	99.20
VoLTE	98.22

2G



VoLTE

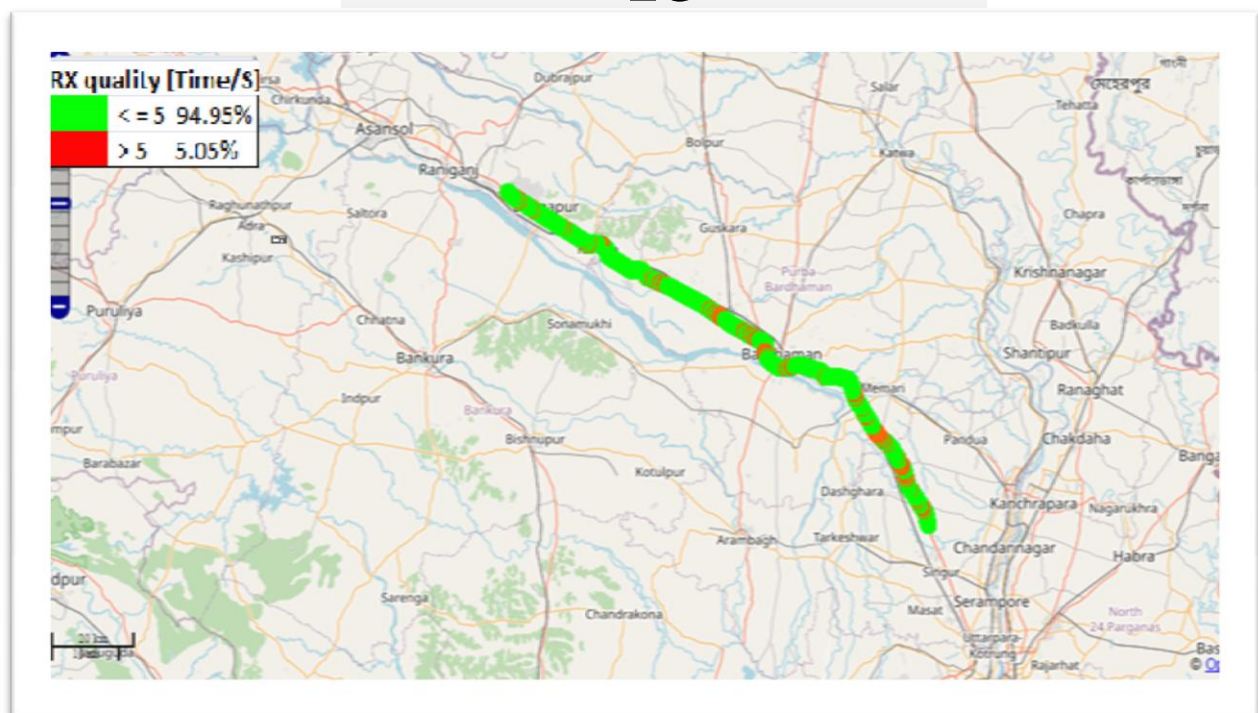


II. Quality Details

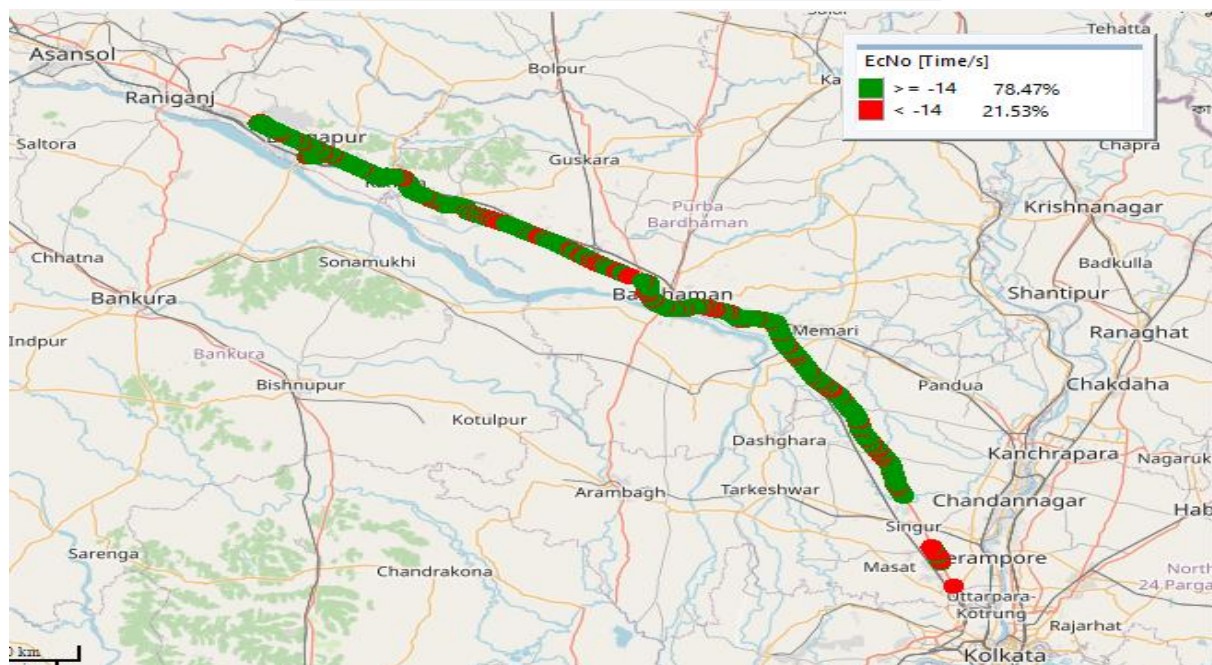
BSNL

Technology	Rx Quality %
2G	94.95
3G	78.47

2G



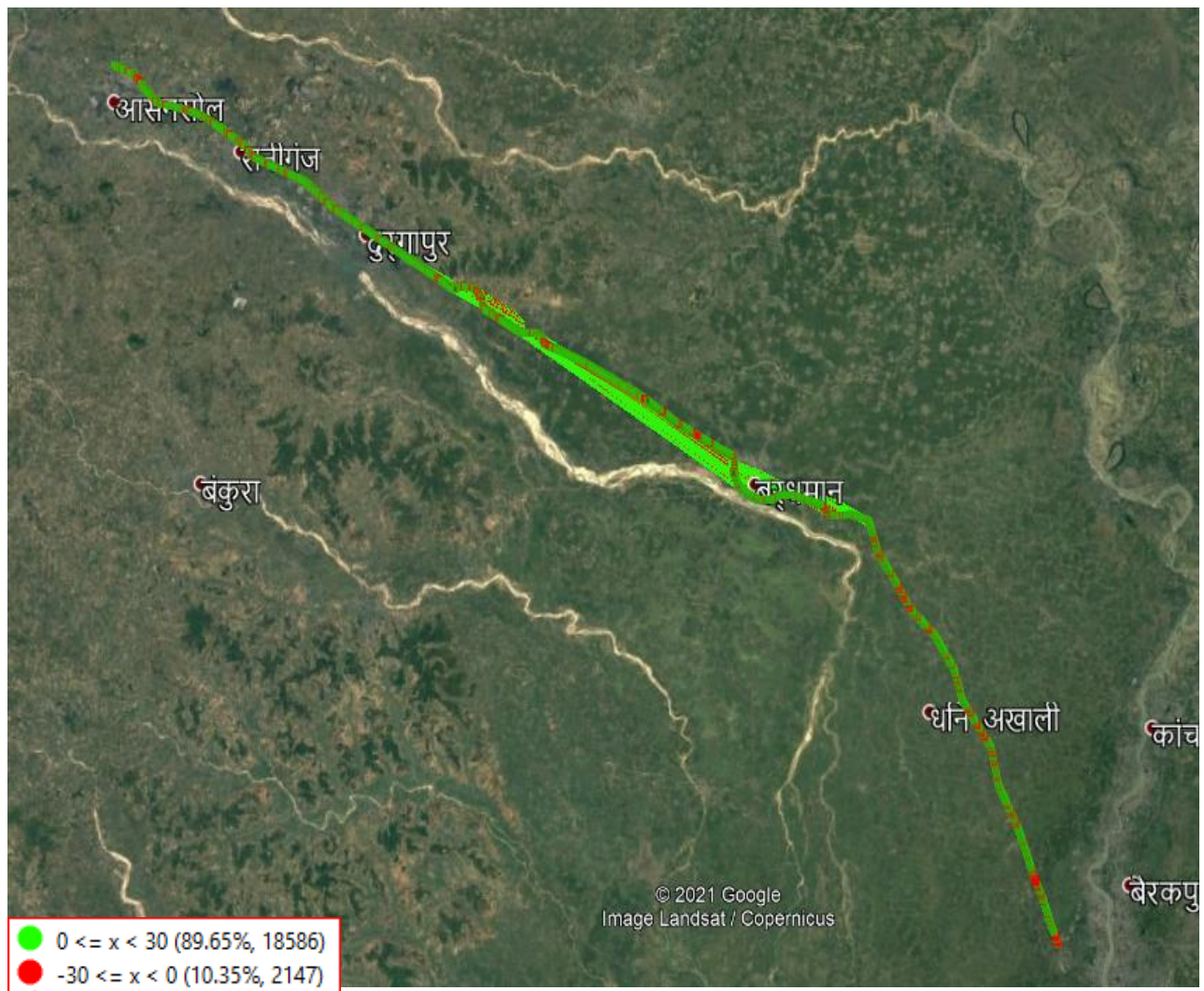
3G



II. Quality Details

JIO

Technology	Rx Quality %
VoLTE	89.65



II. Quality Details

VIL

Technology	Rx Quality %
2G	93.97

2G

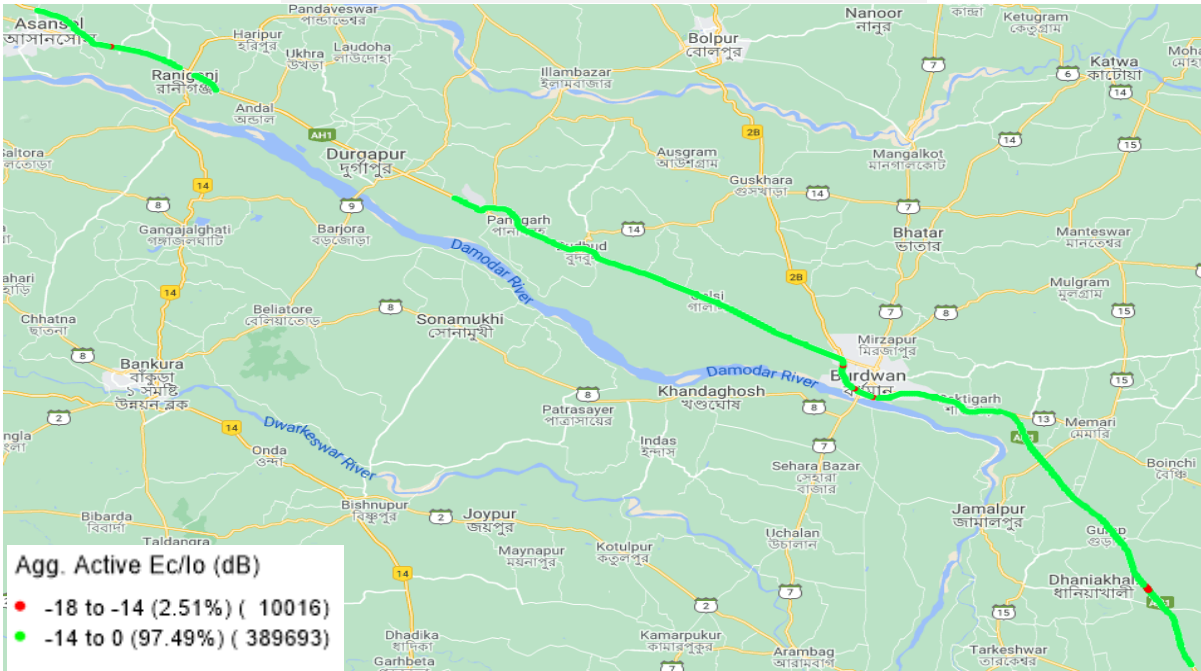


II. Quality Details

VIL

Technology	Rx Quality %
3G	97.49
4G	89.35

3G



4G

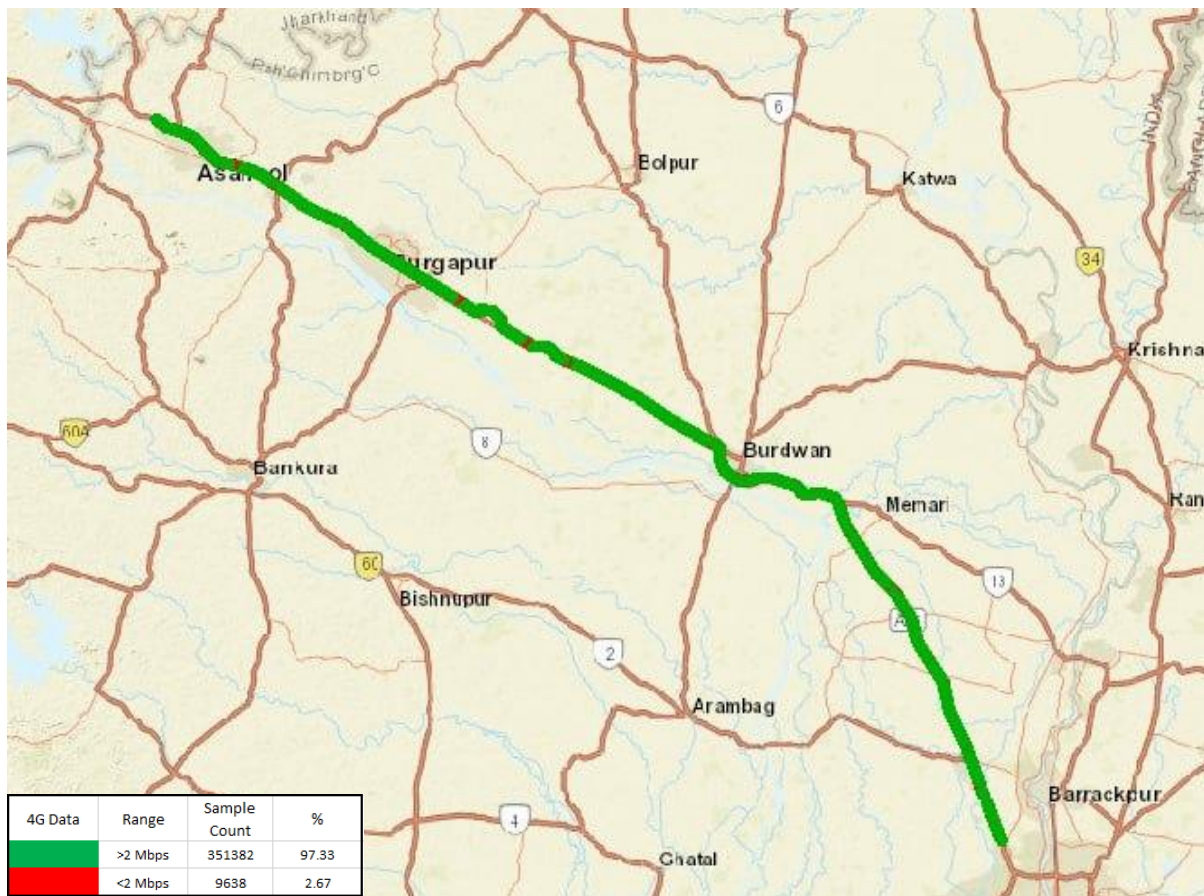


IV. Dynamic Data Test- 4G DL Details

Airtel

Data Statistics - Dynamic Complete 220 Kms

Data KPIs - Overall	4G
Download Throughput (Mbps)	4.97



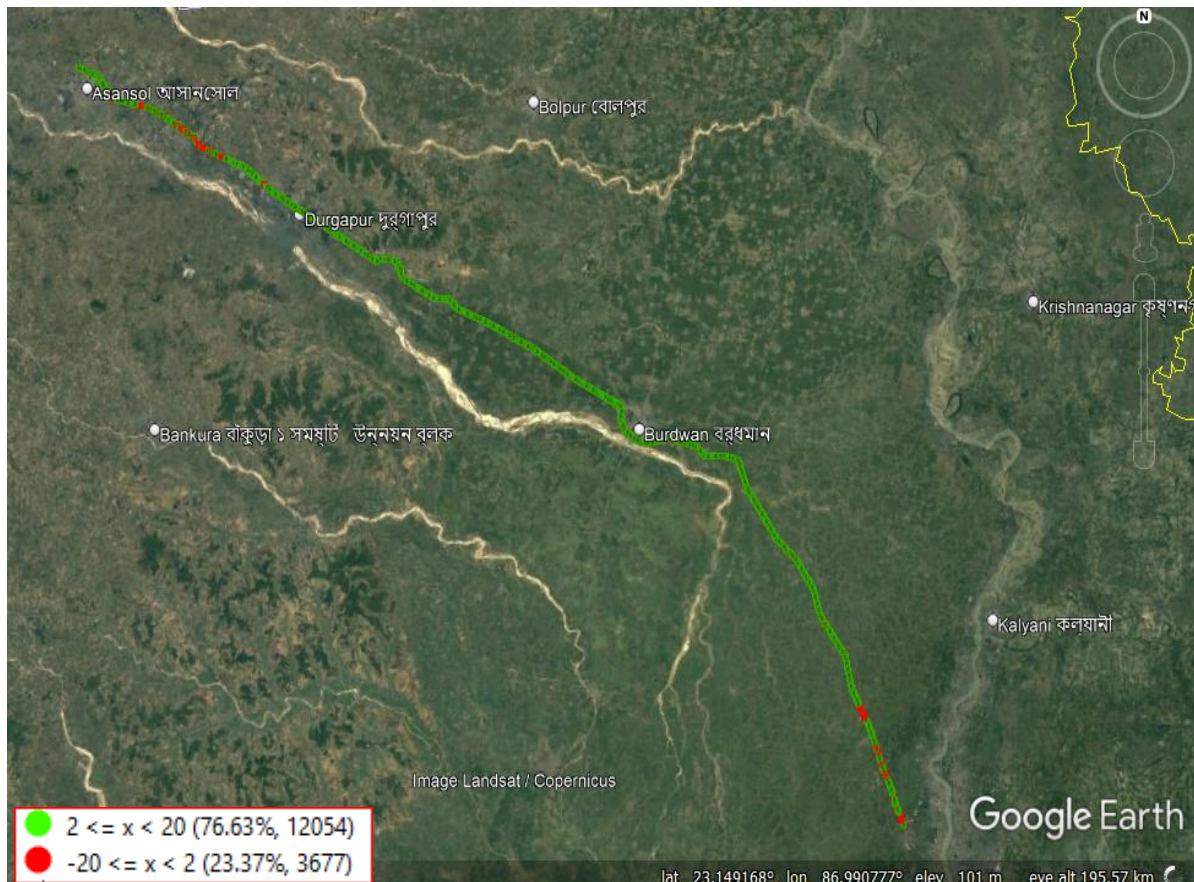
TSPS	AIRTEL
AVG. SPEED Mbps	4.97
NO. OF SAMPLES =< 2 MBPS	3985
NO. OF SAMPLES > 2 MBPS	357035
FILE DOWNLOAD SUCCESS RATE%	100

IV. Dynamic Data Test- 4G DL Details

Jio

Data Statistics - Dynamic Complete 220 Kms

Data KPIs - Overall	4G
Download Throughput (Mbps)	9.35



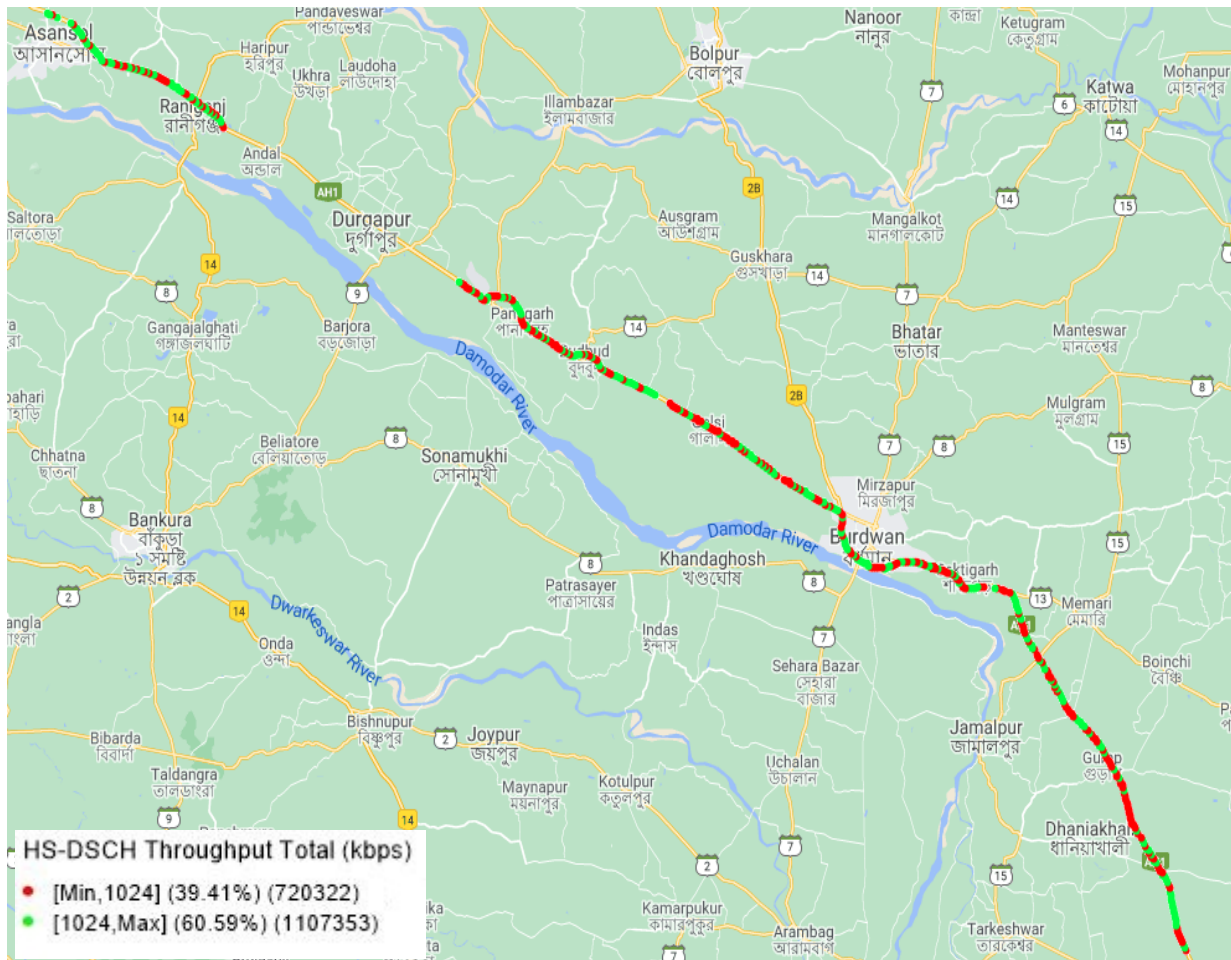
TSPS	JIO
AVG. SPEED Mbps	9.35
NO. OF SAMPLES <= 2 MBPS	3677
NO. OF SAMPLES > 2 MBPS	12054
FILE DOWNLOAD SUCCESS RATE%	100

IV. Dynamic Data Test- 3G/4G DL Details

VIL

Data Statistics - Dynamic Complete 210 Kms

Data KPIs - Overall	3G
Download Throughput (Mbps)	2.22



TSPS	VIL
AVG. SPEED Mbps	2.22
NO. OF SAMPLES <= 1 MBPS	720322
NO. OF SAMPLES > 1 MBPS	1107353
FILE DOWNLOAD SUCCESS RATE%	97.5

IV. Dynamic Data Test- 3G/4G DL Details

VIL

Data Statistics - Dynamic Complete 210 Kms

Data KPIs - Overall	4G
Download Throughput (Mbps)	9.12



TSPS	VIL
AVG. SPEED Mbps	9.12
NO. OF SAMPLES =< 2 MBPS	614207
NO. OF SAMPLES > 2 MBPS	1393004
FILE DOWNLOAD SUCCESS RATE%	99.14

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

AIRTEL

Average download data speed (4G network- Locked mode) is 4.97 Mbps throughout the drive test route.

It is requested to check the reasons and efforts are made for further improvement of download data speed and submit a report by 20.12.2021.

BSNL

HOSR (94.91%) and Rx Quality (94.95%) in 2G network and Call Drop (5%) & Ec/No (78.47%) in 3G network do not meet the benchmarks.

It was observed that the Video call could not be initiated due to poor 3G coverage for half an hour from Dankuni towards Burdwan.

BSNL has been asked to take necessary action to improve the above KPIs and 3G coverage in the above route from Dankuni Toll Plaza. An action taken report is to be submitted by 20.12.2021.

Due to a technical issue in testing tool, 3G dynamic data was not submitted. BSNL has been asked to undertake the 3G dynamic data test and submit the report at the earliest.

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

SINR (89%) in 4G network do not meet the benchmark (95%).

RJIO has been asked to take necessary action including software/ hardware optimization to improve the above KPI and submit an action taken report by 20.12.2021.

VIL

SINR (89%) in 4G network and Rx Quality (93.97%) in 2G network do not meet the benchmarks (95%).

It was observed that the Video call was disconnected two times ([Location 1 \(23.171447, 88.028977\)](#) and [Location 2 \(23.607447, 87.160237\)](#)) throughout the drive test route due to poor 4G/ 3G coverage on that locations.

VIL has been asked to take necessary action to improve the above KPIs and 4G coverage in the above two locations. An action taken report is to be submitted by 20.12.202

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

AIRTEL- The Video call was running without disconnection of data session throughout the drive route and the Video picture quality was good throughout the drive route.

BSNL- The Video call was not initiated due to poor 3G network at the starting of Drive test near Dankuni Toll Plaza.

RJIO- The Video call was running without disconnection of data session throughout the drive route and the Video picture quality was good throughout the drive route.

VIL- The Video call was disconnected two times throughout the drive route.