Operator Assisted Drive Test Report

Raipur – Maharastra Border Highway
Date 16 /05 /2024
By
TRAI Regional Office Bhopal

The Operator Assisted Drive Test has been carried out by Regional Office, Bhopal with the help of Telecom Service Providers from Raipur(Chhattisgarh) to (Baghnadi) Maharashtra Border Highway from 10:00 AM to 8:00 PM 16/05/24. The drive test covered drive route of around 135 KMs.

TSP	Network tested
Airtel	2G & VoLTE
BSNL	2G & 3G
JIO	VoLTE
VIL	2G & VoLTE

Key Performance Indicators:

KPI	Benchmark	Observations
Block call rate %	≤3%	All TSPS achieved the benchmark
Drop call rate %	≤2%	All TSPS achieved the benchmark
CSSR %	≥95 %	All TSPS achieved the benchmark
Mobility HOSR %	≥95%	All TSPS achieved the benchmark
Good RX Quality %	≥95%	All achieved except Airtel, JIO & VIL in VoLTE

Overview

Regional Office, TRAI Bhopal conducted Operator Assisted Drive Test. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G, 3G, 4G & 5G). The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services.

Voice: Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

Data: Download Throughputs

Drive Test Details :
Voice Tests:
i.   2G – measurement – UE Locked in 2G
ii. 3G – measurement – UE in Dual mode (2G and 3G)
iii. 4G – measurement – UE in Free mode

Calls were made for the **180-sec** duration with a wait time of **10 sec** between calls in all technologies.
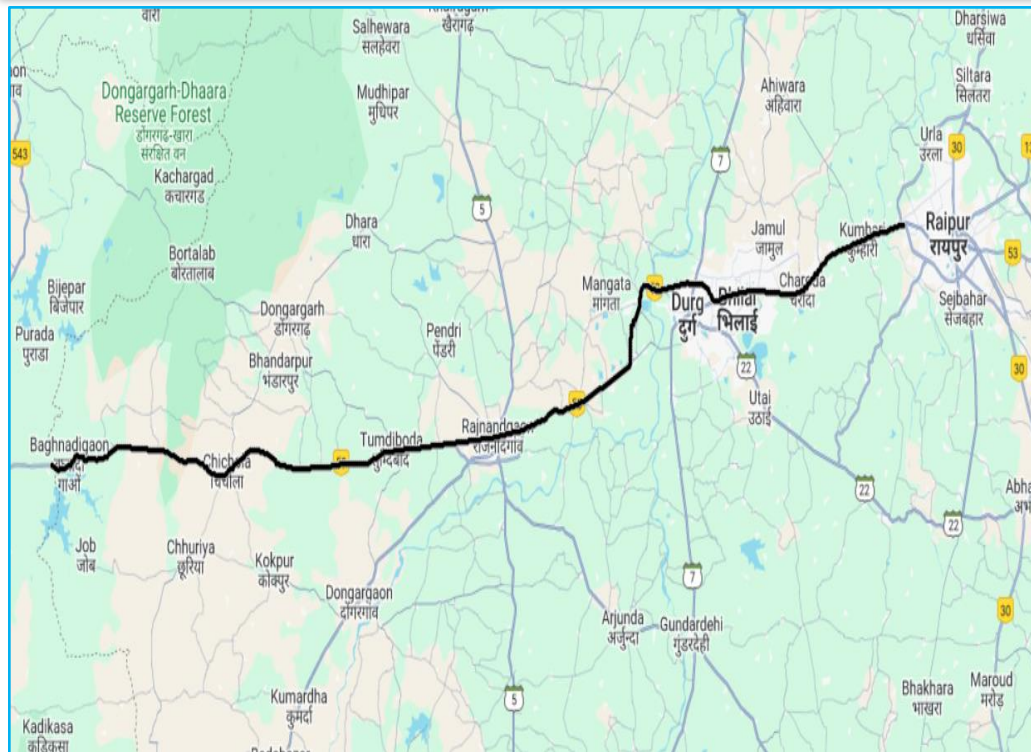
Data Tests:
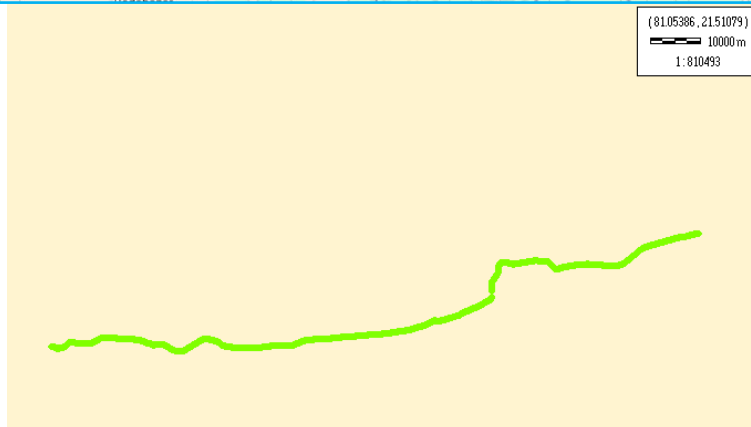**Dynamic data –** repeat data file download (to check throughput on the entire route)

i.   3G – measurement – UE in 3G   File Size- 20MB
ii. 4G – measurement – UE in LTE File Size- 40MB
iii. 5G – measurement – UE in 5G File Size- 200MB
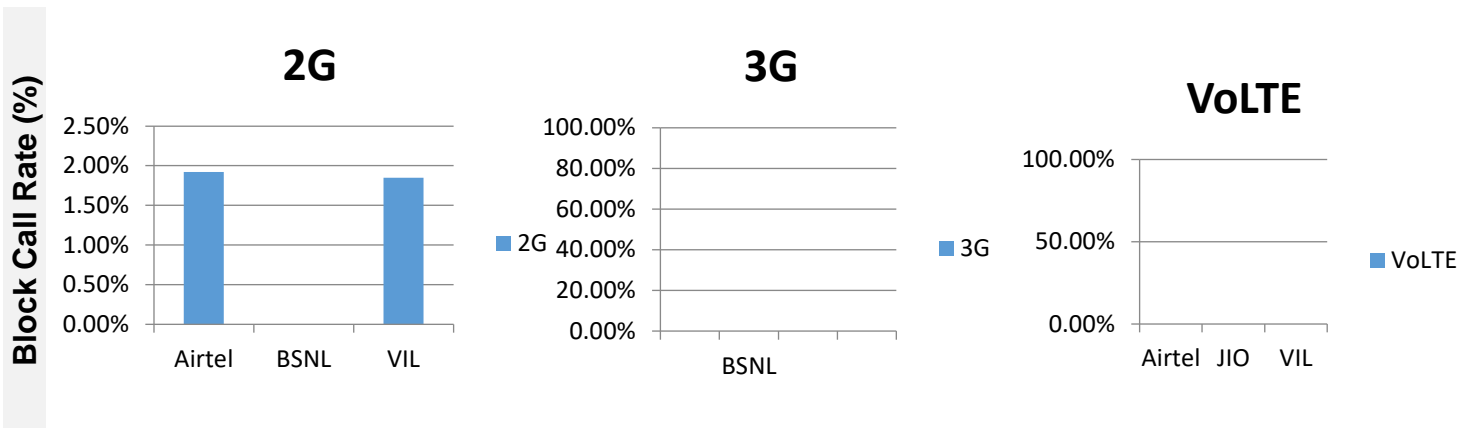
Overview

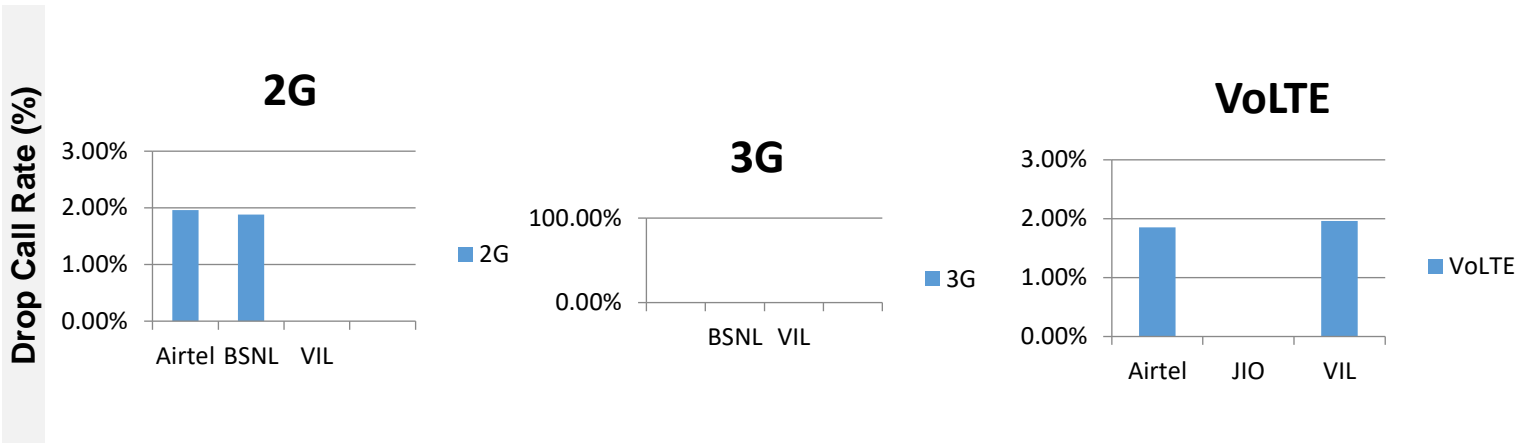## Voice & Dynamic Data Test Drive Route

List of important area covered during the drive test
Tatibandh, Kumhari,
Power House, Supela,
Durg Bypass, Nehru Nagar Chowk
Anjora, Somni,
Thakur Tola, Rajnandgaon,
Tendunala,Tumdibod
Chinchola, Baghnadi

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Voice Calls

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

KPIs	2G			3G		VoLTE		
	Airtel	**BSNL**	**VIL**	**BSNL**	**VIL**	**Airtel**	**RJIL**	**VIL**
Drop Call Rate %	1.96%	1.88%	0%	0	NA	1.85%	0	1.96%
Block Call Rate %	1.92%	0	1.85%	0	NA	0	0	0

a) **All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%)**
b) **Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's.**

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Voice Calls

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	67.76	82.24	64.43%

b) Percentage of coverage samples for 3G ≥ -90 dBm

TSPs	3G
	BSNL
Coverage %	65.60

b) Percentage of coverage samples for LTE ≥ -110 dBm.

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	96.69	98.28%	89.82%

c) Percentage of time spent on 3G/4G network

TSPs	3G		VoLTE		
	BSNL	VIL	Airtel	JIO	VIL
Time Spent on 3G/4G %	50.75	NA	100	100%	NA

Data Services Dynamic

Dynamic Data -Download Throughput was tested.

Data Download Performance – Dynamic 3G/4G Network

■ Avg Download Throughput 4G   ■ Avg Download Throughput 3G

Dynamic Data Avg. Download Throughput (Mbps)
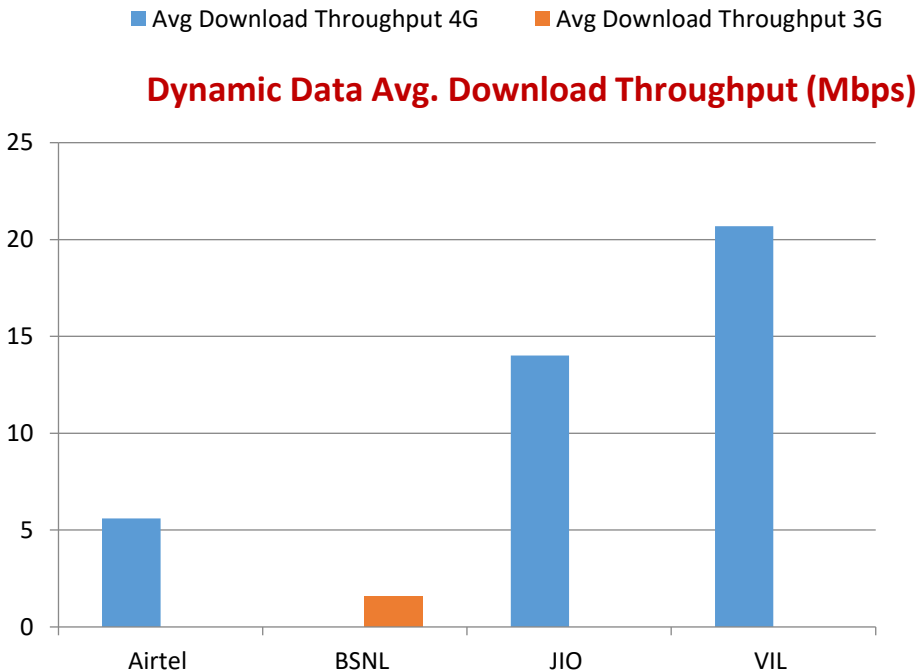
TSP	Airtel	BSNL	JIO	VIL
Average Download throughput- 3G In Mbps	NA	1.57	NA	NA
Average Download throughput-LTE in Mbps	5.6	NA	14.02	20.70

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Summary

TSP (For 2G)	Airtel	BSNL	VIL
Call attempts	51	53	54
Block call rate %	1.92	0	1.85%
CSSR %	98.08	100	98.15%
Drop call rate %	1.96	1.88	0%
Mobility HOSR %	97.14	98.98	95.31%
RX Quality %	96.15	96.04	96.05%
Average CST Sec	3.04	4.28	3.2 sec

TSP (For 3G)	BSNL
Call attempts	46
Block call rate %	0
CSSR %	97.82
Drop call rate %	0
Mobility HOSR %	100
RX Quality %	97.67
Average CST (Sec)	4.19

| TSP (For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	54	NA	69	51
Block call rate %	0	NA	0	0%
CSSR %	100	NA	100%	100%
Drop call rate %	1.85	NA	0	1.96%
Mobility HOSR %	99.66	NA	100%	100%
RX Quality %	83.45	NA	90.02	92.04%
Average CST(Sec)	1.33	NA	0.70	0.8 sec

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 ≥ -110dBm. The details are as follows.
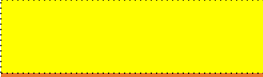
TSP	Coverage Rate %
Airtel 2G	67.76
BSNl 2G	82.24
VIL 2G	64.43
BSNL 3G	65.60
Airtel VoLTE	96.69
Jio VoLTE	100
VIL VoLTE	89.82

Coverage Rate %
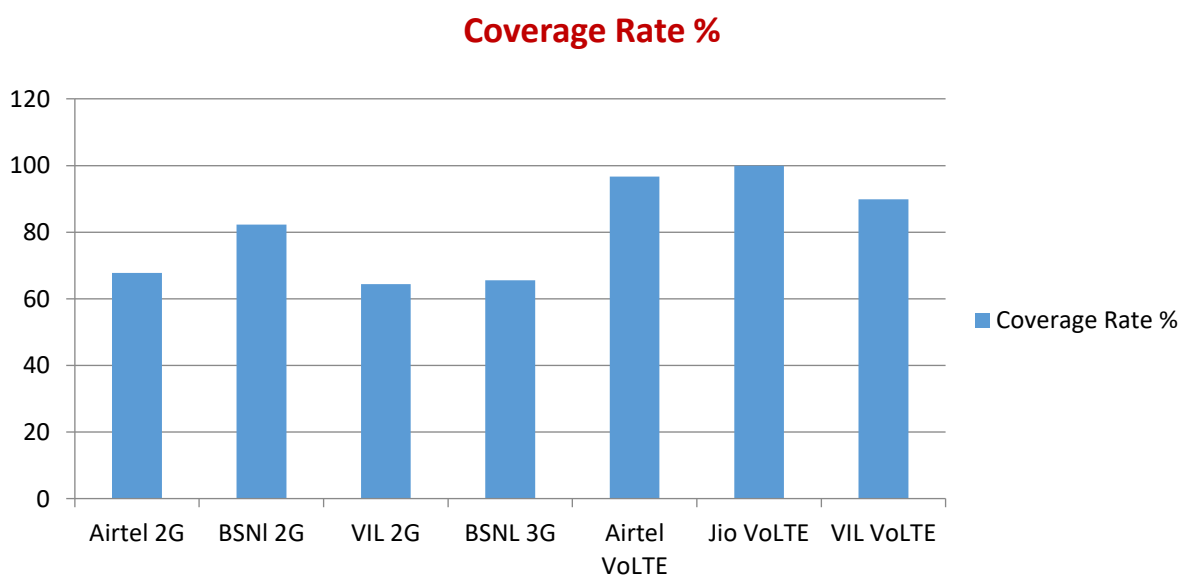
TSP-Airtel 2G

Technology	Coverage %
2G	67.76
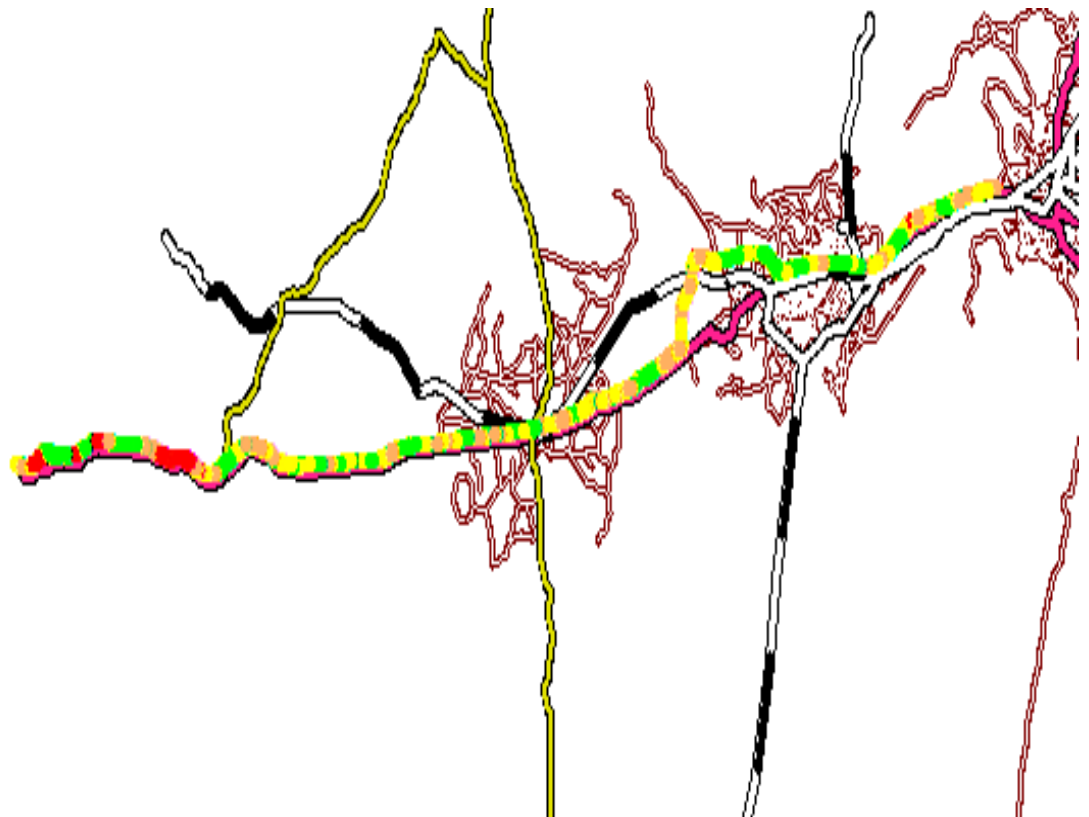
2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	385031	27.91	
[-75, >=-85)	549758	39.85	
[-85, >=-95)	401300	29.09	
[-95, >=Min)	43438	3.15	
Total			

TSP- BSNL 2G

Technology	Coverage %
2G	82.24
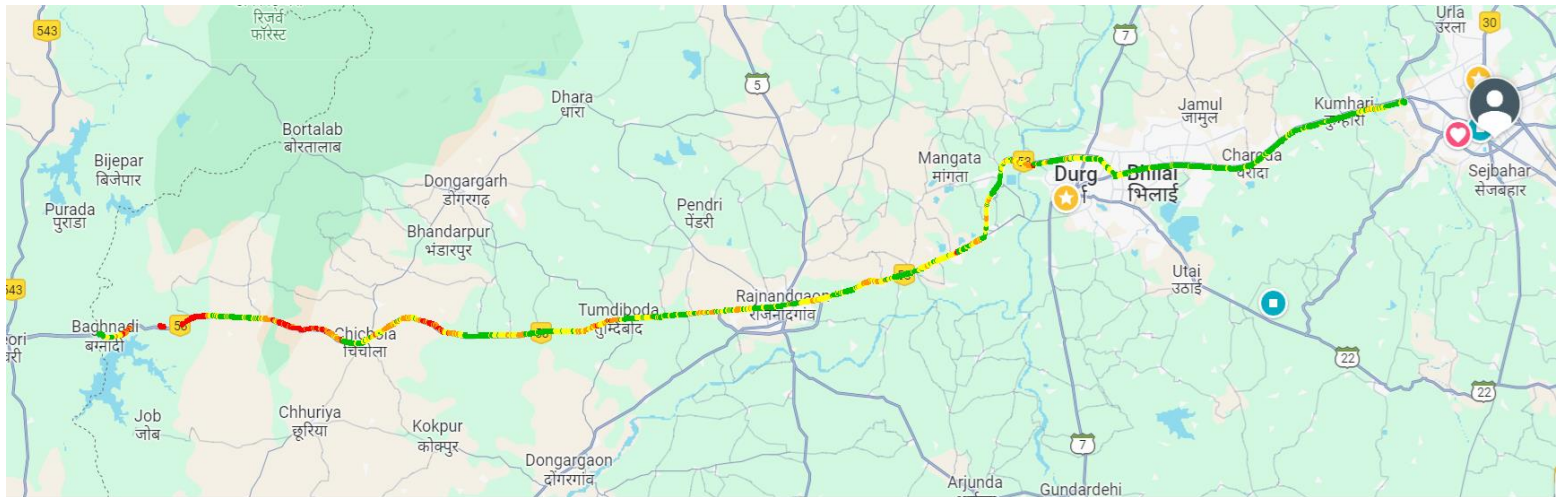
2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	5244	56.62	
[-75, >=-85)	2372	25.62	
[-85, >=-95)	1113	12.02	
[-95, >=Min)	532	5.73	
Total	9261	100	

TSP-VIL 2G

Technology	Coverage %
2G	64.43%
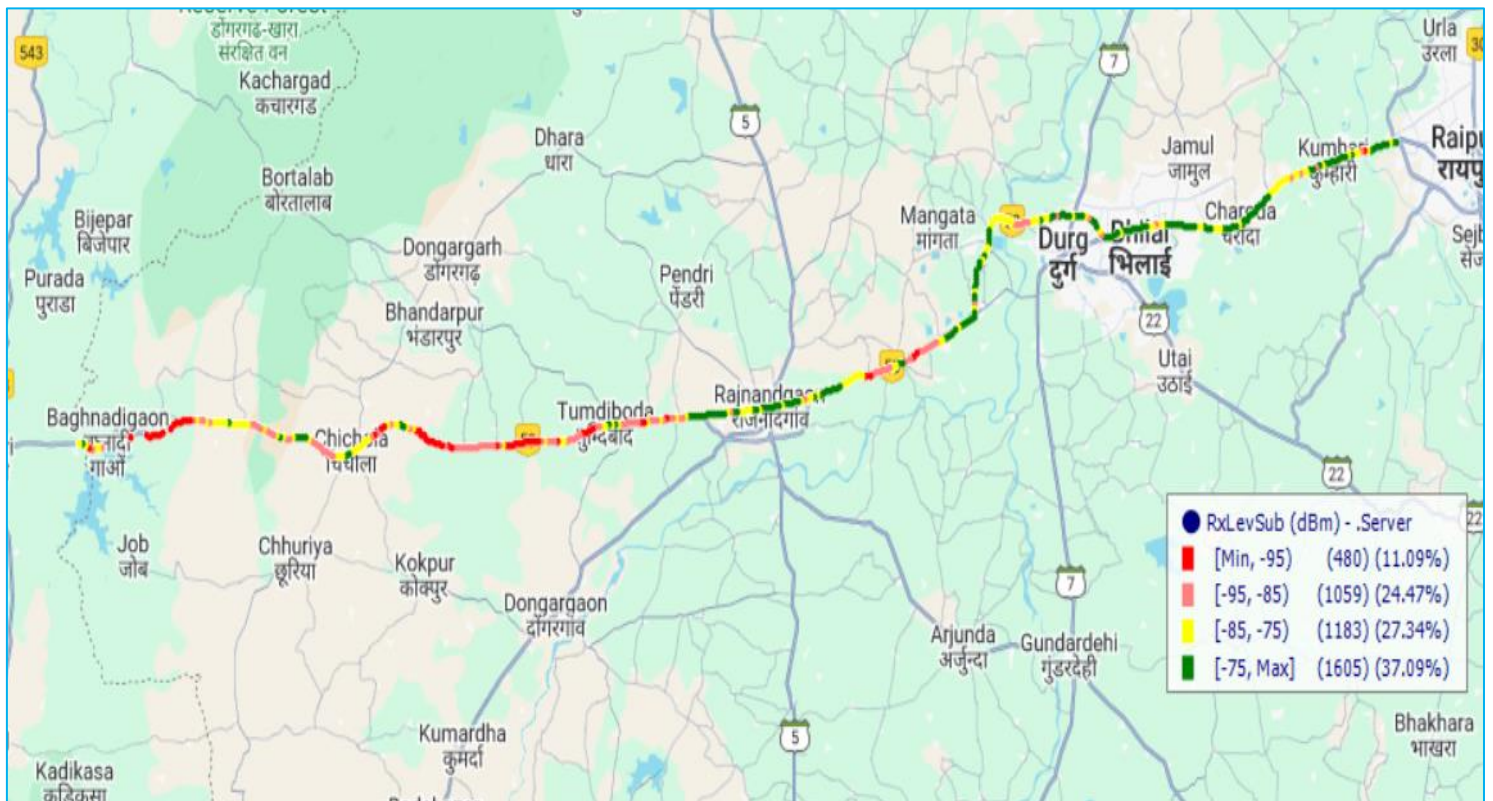
2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	1605	37.09%	
[-75, >=-85)	1183	27.34%	
[-85, >=-95)	1059	24.47%	
[-95, >=Min)	480	11.09%	
Total	4327	100%	

TSP- BSNL 3G

Technology	Coverage %
3G	65.60
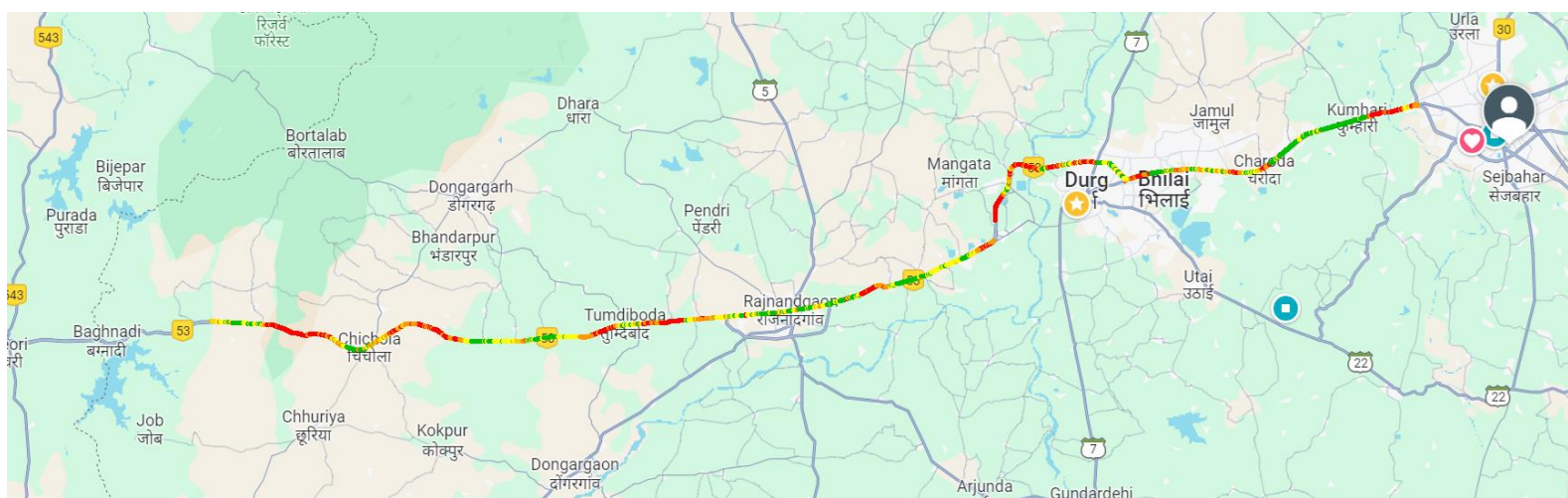
3G			
Overall RSCP	**# Samples**	**% PDF**	**Legends**
[Max, >=-70]	325	7.25	
[-70, >=-80)	1175	26.18	
[-80, >=-90)	1444	32.17	
[-90, >=Min)	1544	34.40	
Total	4488	**100**	

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TSP-Airtel VOLTE

Technology	Coverage %
VoLTE	96.69
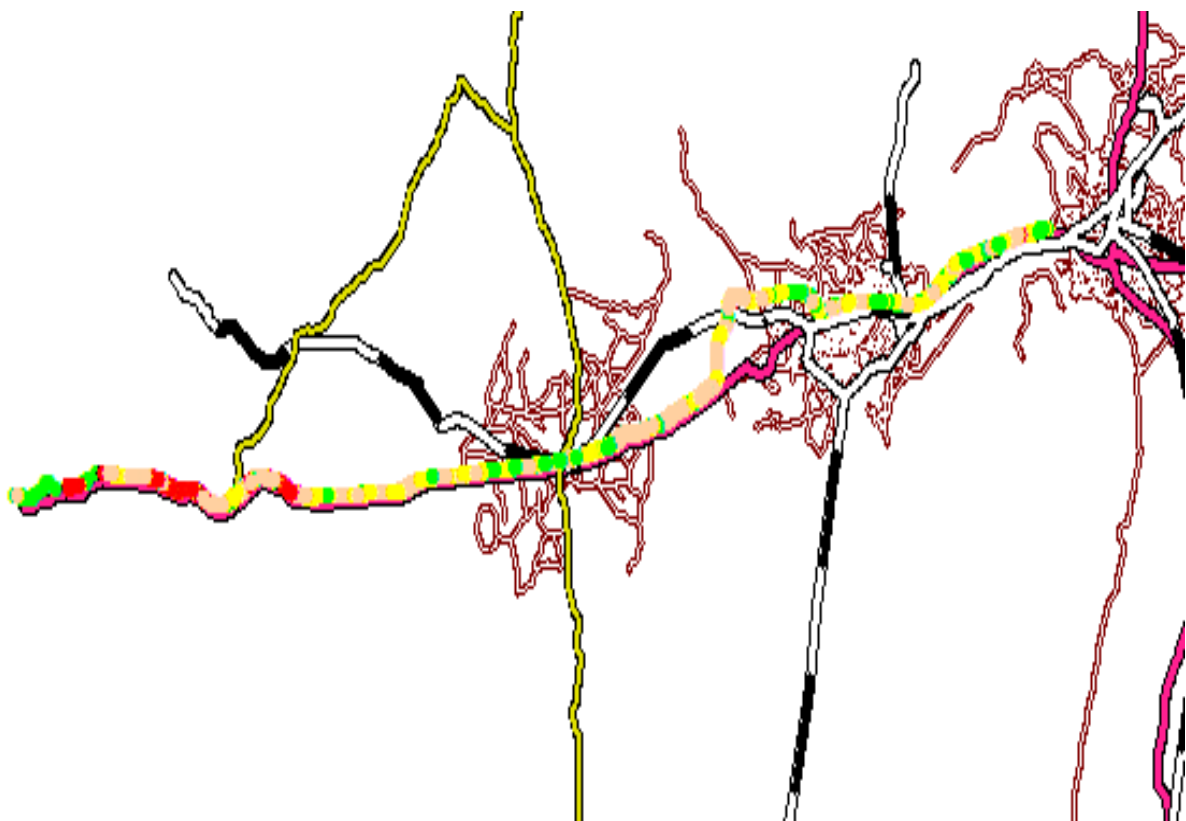
VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	423082	18.99	
[-80, >=-90)	754440	33.87	
[-90, >=-110)	976199	43.83	
[-110, >=Min)	73745	3.31	
Total			

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TSP-JIO VOLTE

Technology	Coverage %
VoLTE	100%
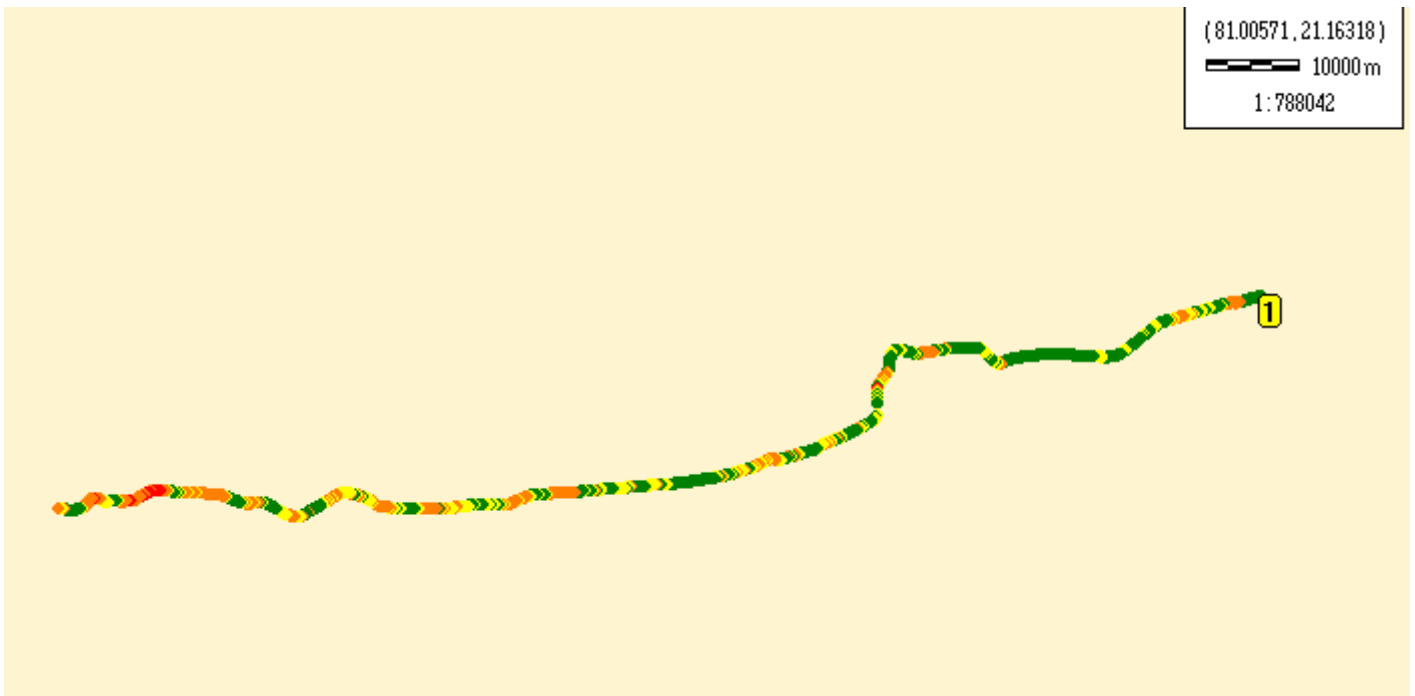
VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	4600	50.13	
[-80, >=-90)	2337	25.47	
[-90, >=-110)	2081	22.68	
[-110, >=Min)	158	1.72	
Total			

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TSP-VIL VOLTE

Technology	Coverage %
VoLTE	89.82%
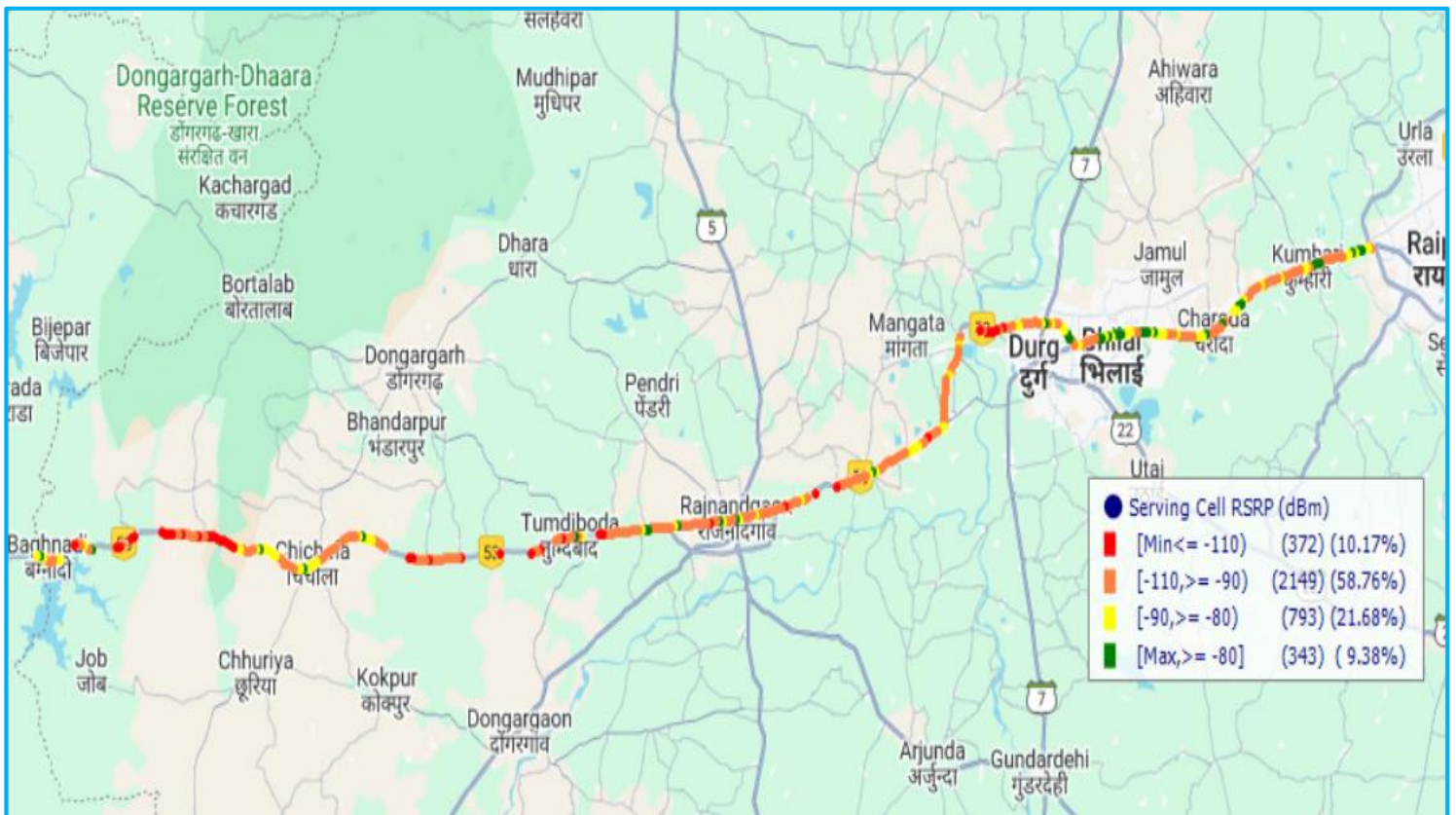
VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	343	9.38	🟩
[-80, >=-90)	793	21.68	🟨
[-90, >=-110)	2149	58.76	🟧
[-110, >=Min)	372	10.17	🟥
Total	3657	100%	

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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 ≥ 95%.

TSP	Rx Quality %
Airtel 2G	96.15
BSNl 2G	96.04
VIL 2G	96.05
BSNL 3G	97.67
Airtel VoLTE	83.45
Jio VoLTE	90.02
VIL VoLTE	92.04
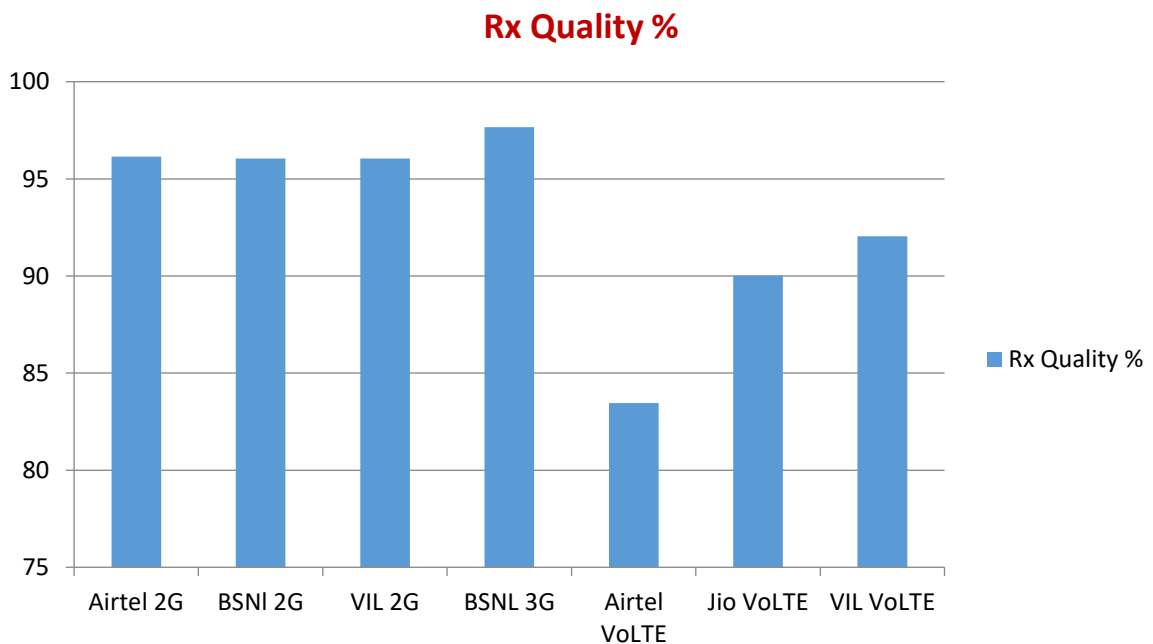
Rx Quality %

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 ≥ 95%.

TSP- Airtel 2G

Technology	Rx Quality %
2G	96.15

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1165992	84.52	
(2, <=3)	36478	2.64	
(3 , <=4)	48761	3.53	
(4 , <=6)	75236	5.45	
(6 , <=Max)	53060	3.85	
Total			

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 ≥ 95%.

TSP- BSNL 2G

Technology	Rx Quality %
2G	96.04
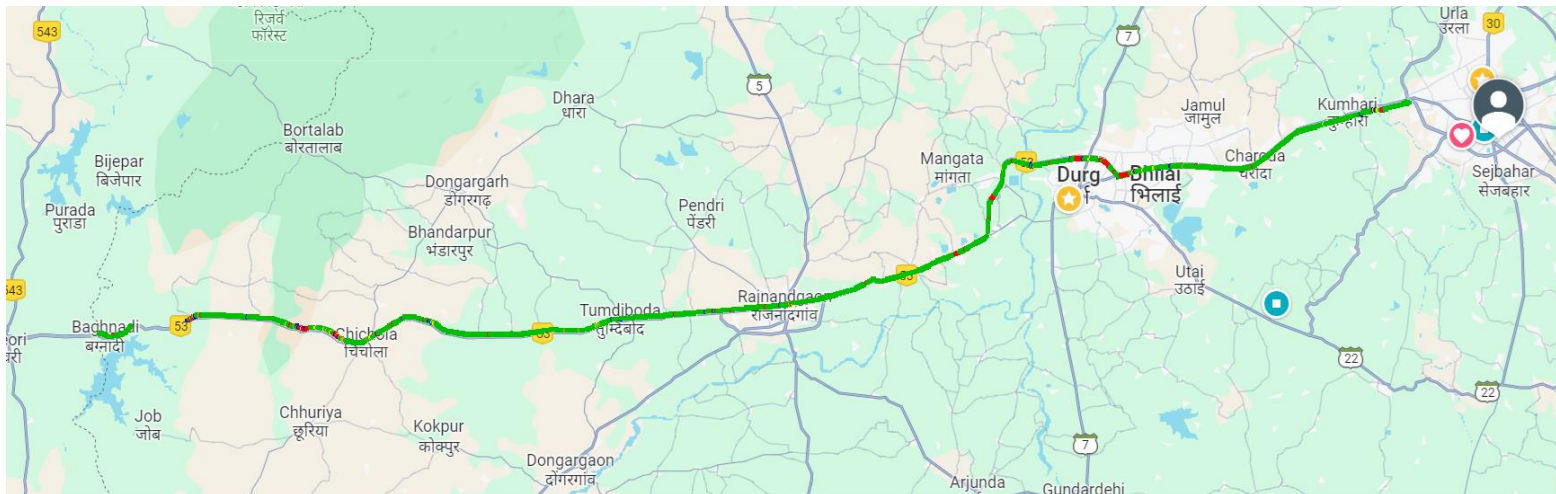
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	7885	91.29	
(2, <=3)	132	1.53	
(3 , <=4)	153	1.77	
(4 , <=5)	125	1.45	
(5 , <=Max)	342	3.96	
Total	8637	100	

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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 ≥ 95%.

TSP-VIL 2G

Technology	Rx Quality %
2G	96.05
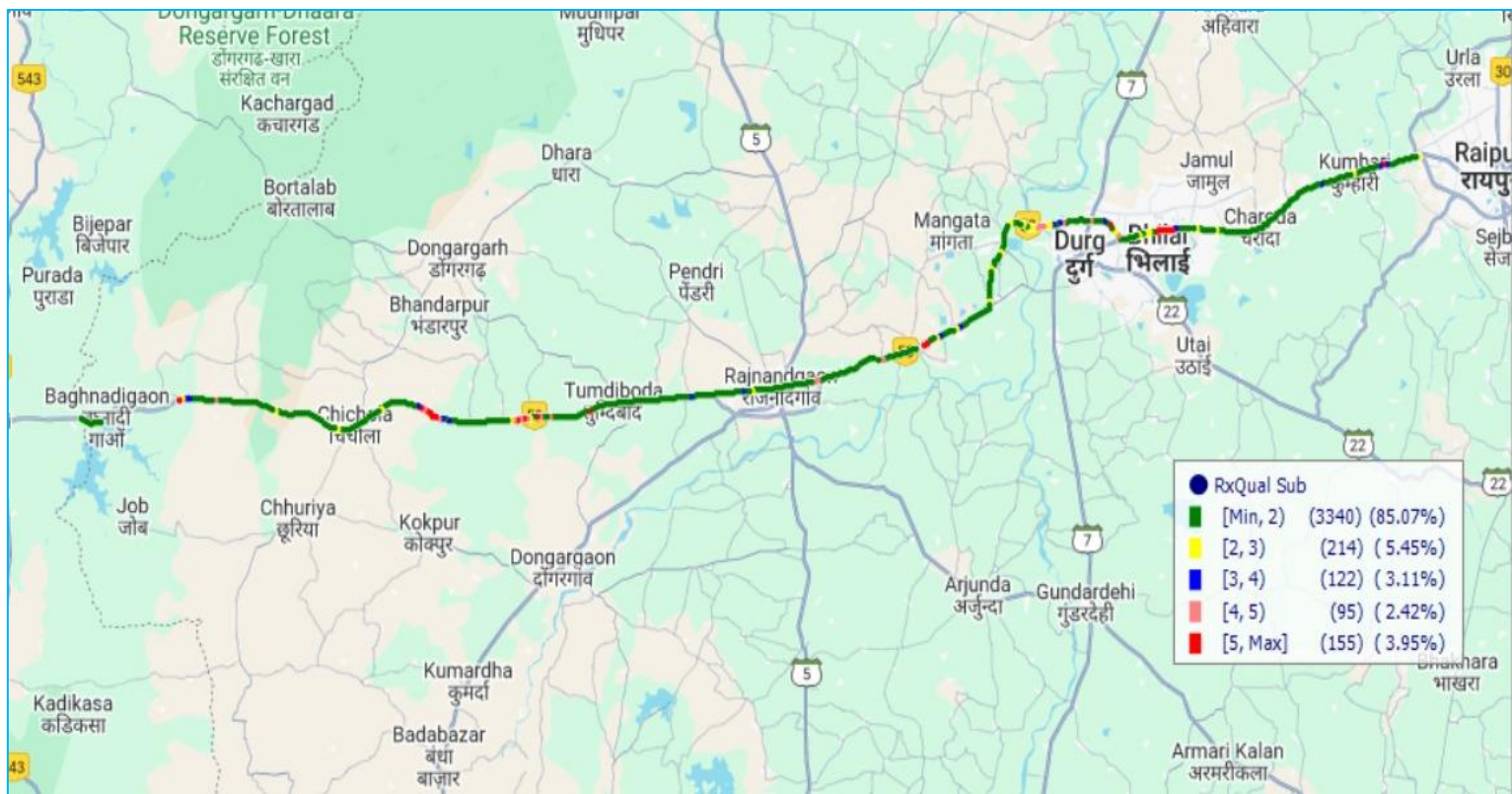
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	3108	85.07%	
(2, <=3)	232	5.45%	
(3 , <=4)	214	3.11%	
(4 , <=5)	122	2.42%	
(5 , <=Max)	250	3.95%	
Total	3926	100%	

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 ≥ 95%.

TSP-BSNL 3G

Technology	Rx Quality %
3G	97.67
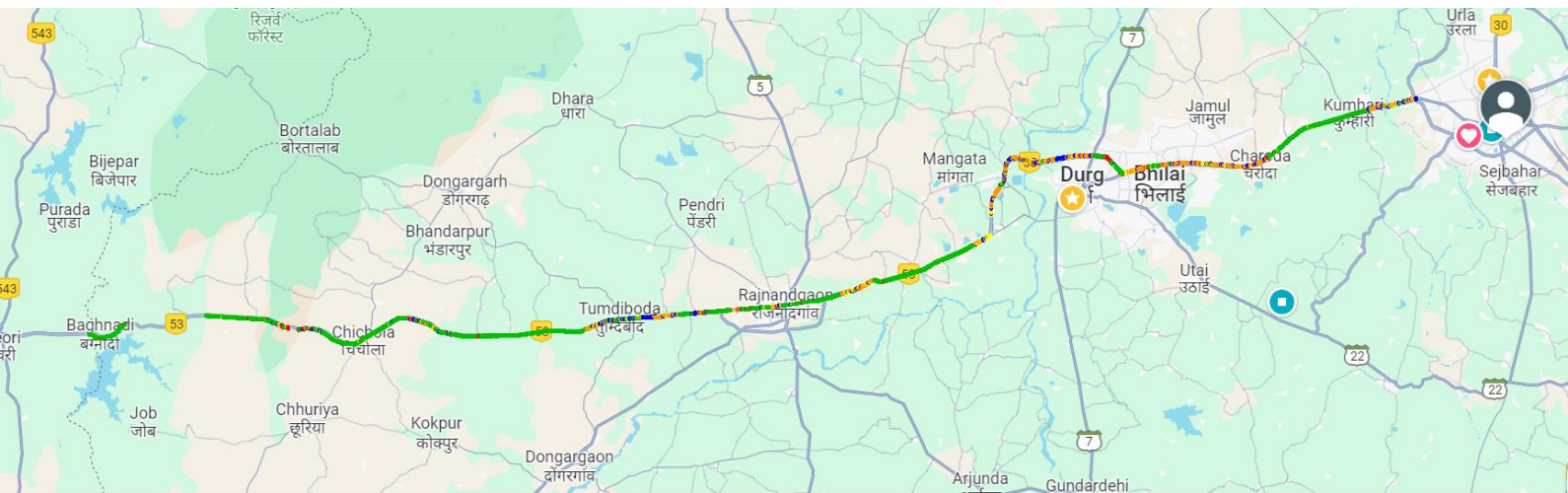
Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	527	11.74	
(-6, <=-9)	567	12.63	
(-9, <=-11)	1300	28.98	
(-11, <=-14)	1988	44.32	
(-14, <= Min)	105	2.33	
Total	4487	**100**	

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 ≥ 95%.

TSP-Airtel VOLTE

| Technology	Rx Quality %
VoLTE	83.45
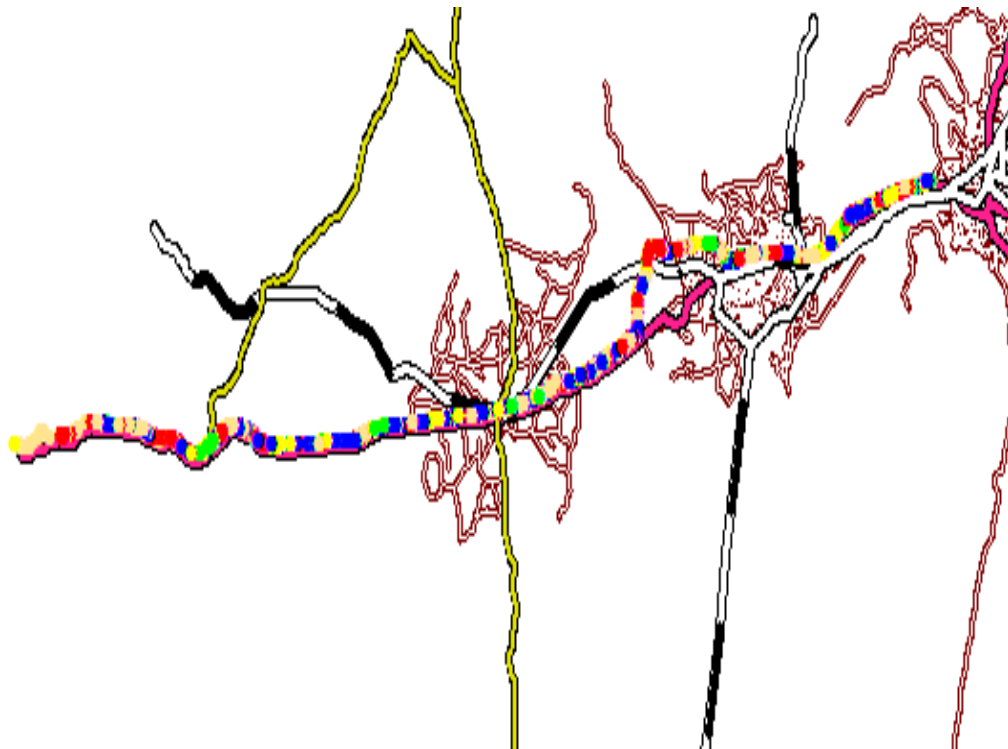
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	376126	16.55	
(0, <=5)	694076	31.29	
(5, <=10)	678685	30.59	
(10, <=15)	338483	15.26	
(15, <=Max)	140096	6.31	
Total			

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 ≥ 95%.

TSP-JIO VOLTE

| Technology	Rx Quality %
VoLTE	90.02

(80.56172 , 21.36471)
10000 m
1 : 808156
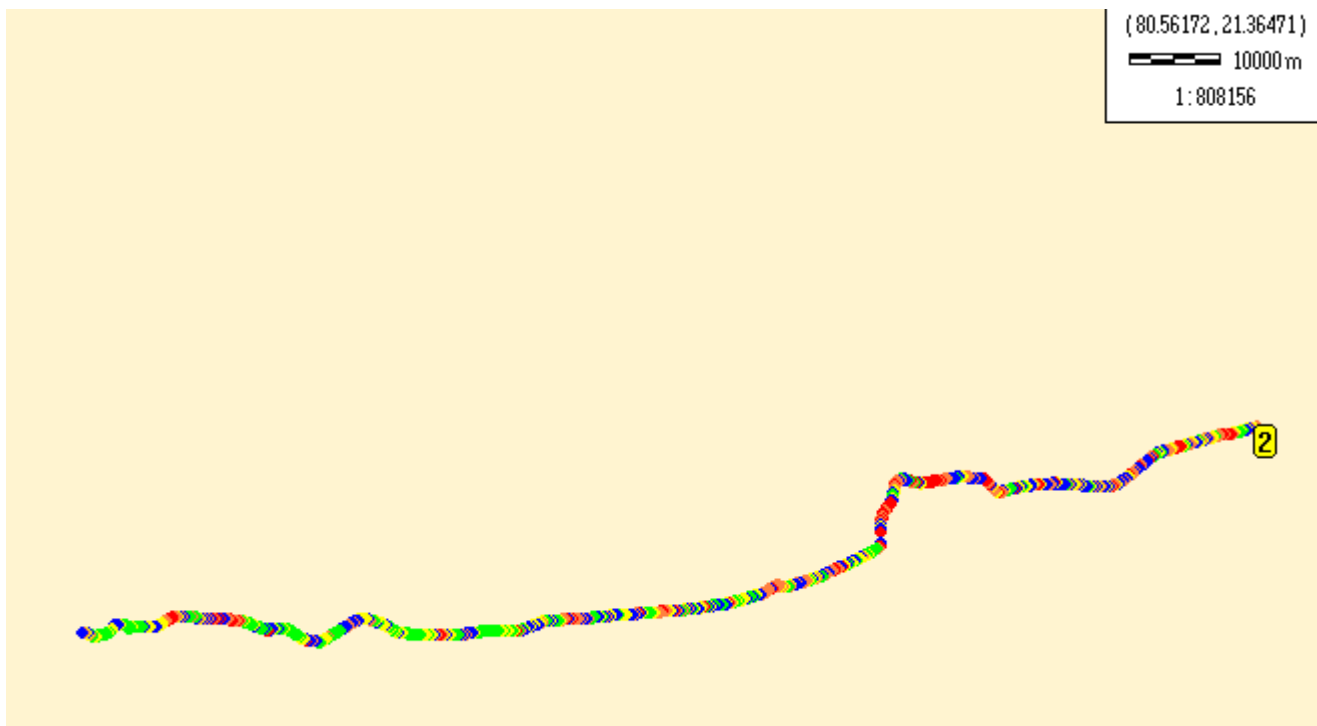
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	916	9.98%	
(0, <=5)	1929	21.02%	
(5, <=10)	2422	26.39%	
(10, <=15)	1951	21.26%	
(15, <=Max)	1958	21.34%	
Total	9176	100.00%	

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 ≥ 95%.
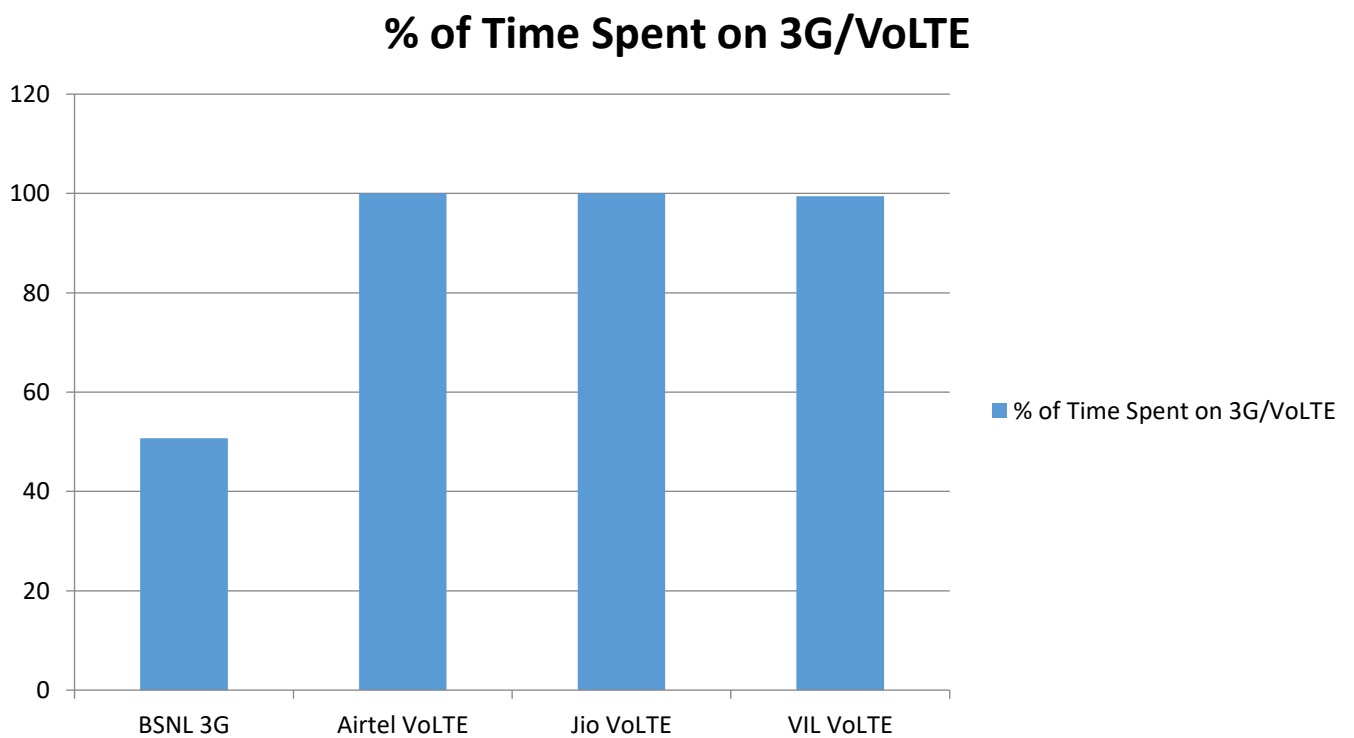
TSP-VIL VOLTE

Technology	Rx Quality %
VoLTE	92.04
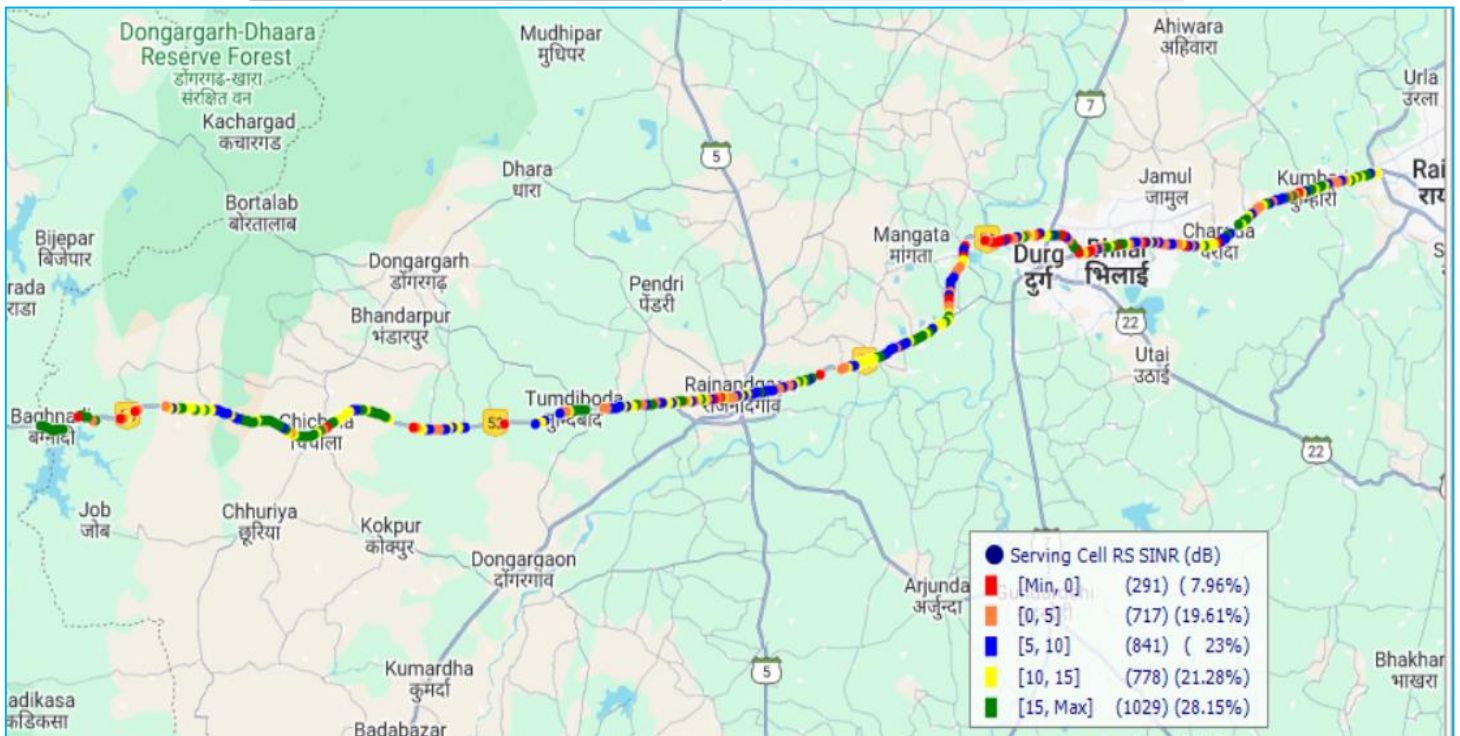
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	388	7.96%	
(0, <=5)	620	19.61%	
(5, <=10)	841	23%	
(10, <=15)	778	21.28%	
(15, <=Max)	1029	28.15%	
Total	3656	100%	

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	50.75
Airtel VoLTE	100
Jio VoLTE	100
VIL VoLTE	99.42

% of Time Spent on 3G/VoLTE

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TSP-Airtel

Technology	% of Time Spent on
VoLTE	100

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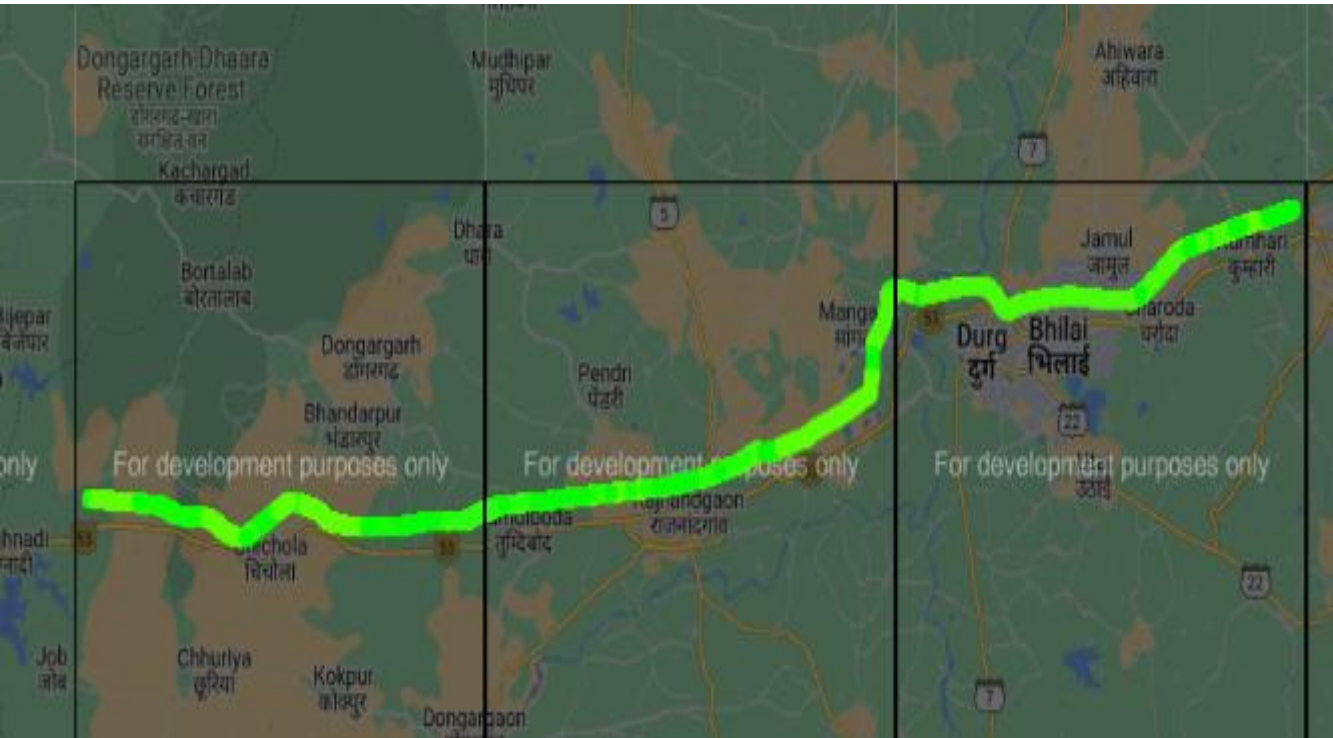
TSP- BSNL

Technology	% of Time Spent on
2G	49.25
3G	50.75
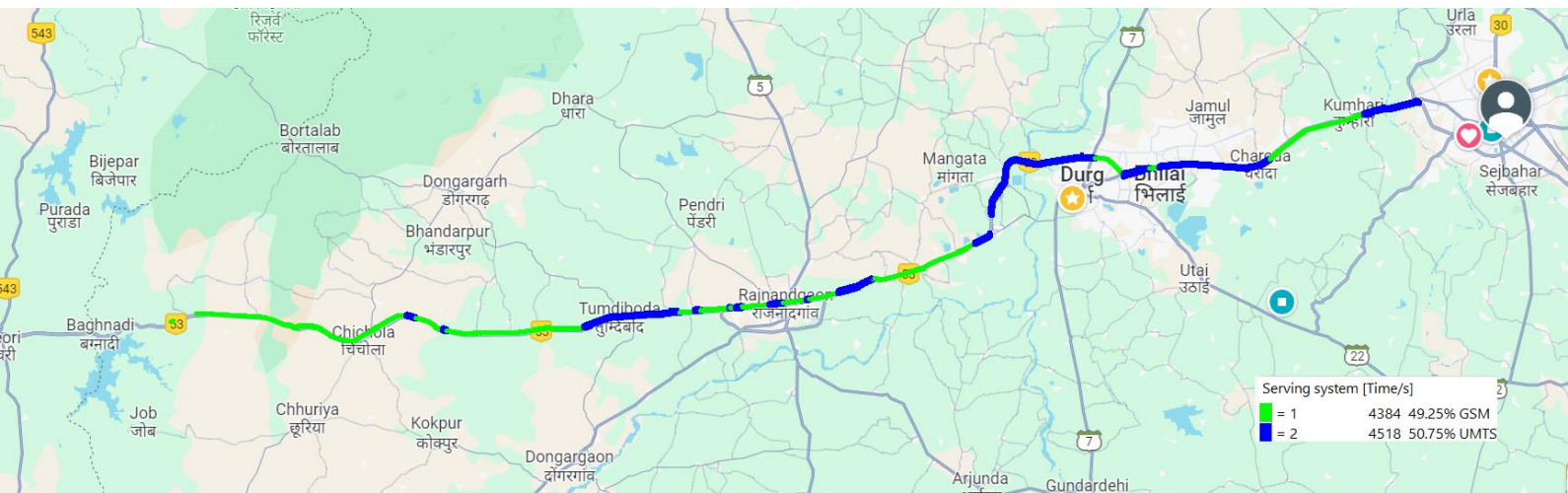
TSP-RJIO

Technology	% of Time Spent on
VoLTE	100

(81.05386 , 21.51079)
10000 m
1 : 810493
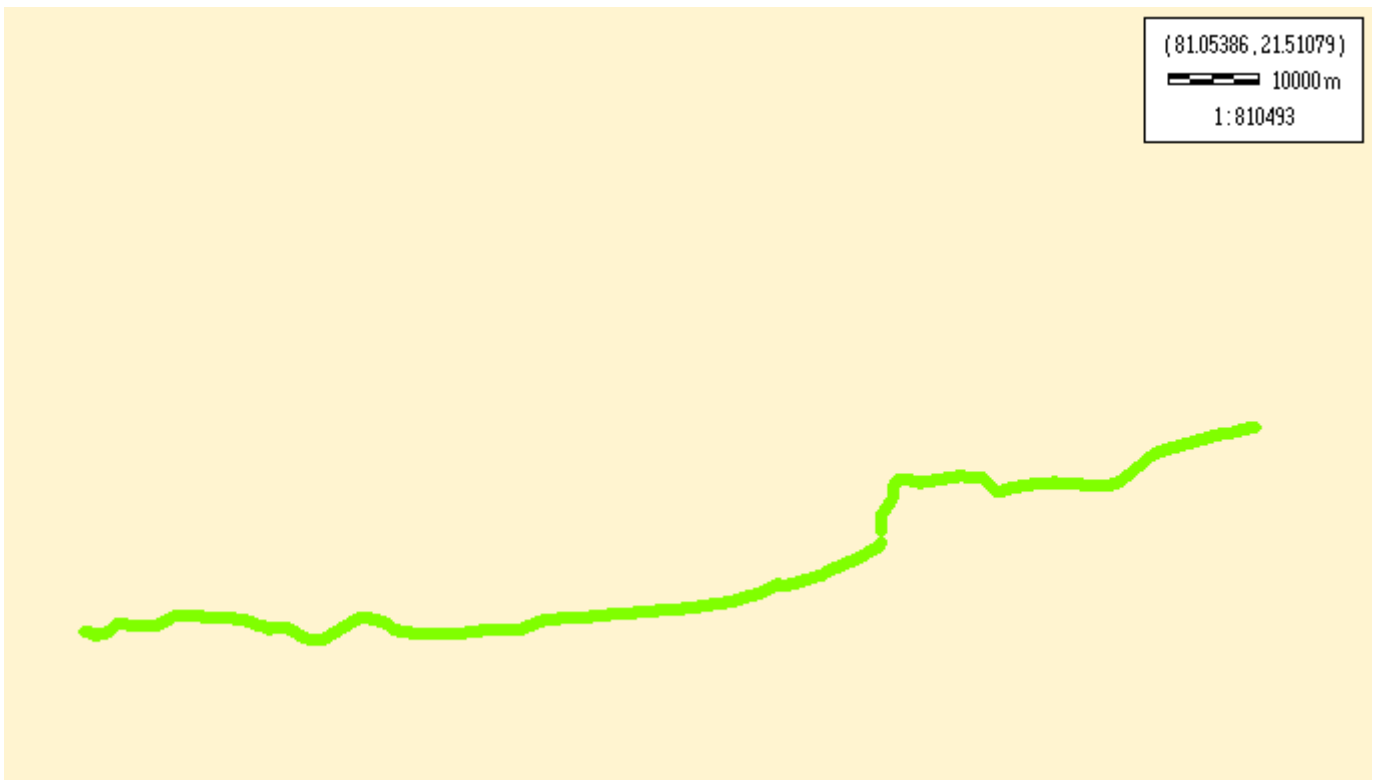
TSP-VIL

Technology	% of Time Spent on
VoLTE	99.42
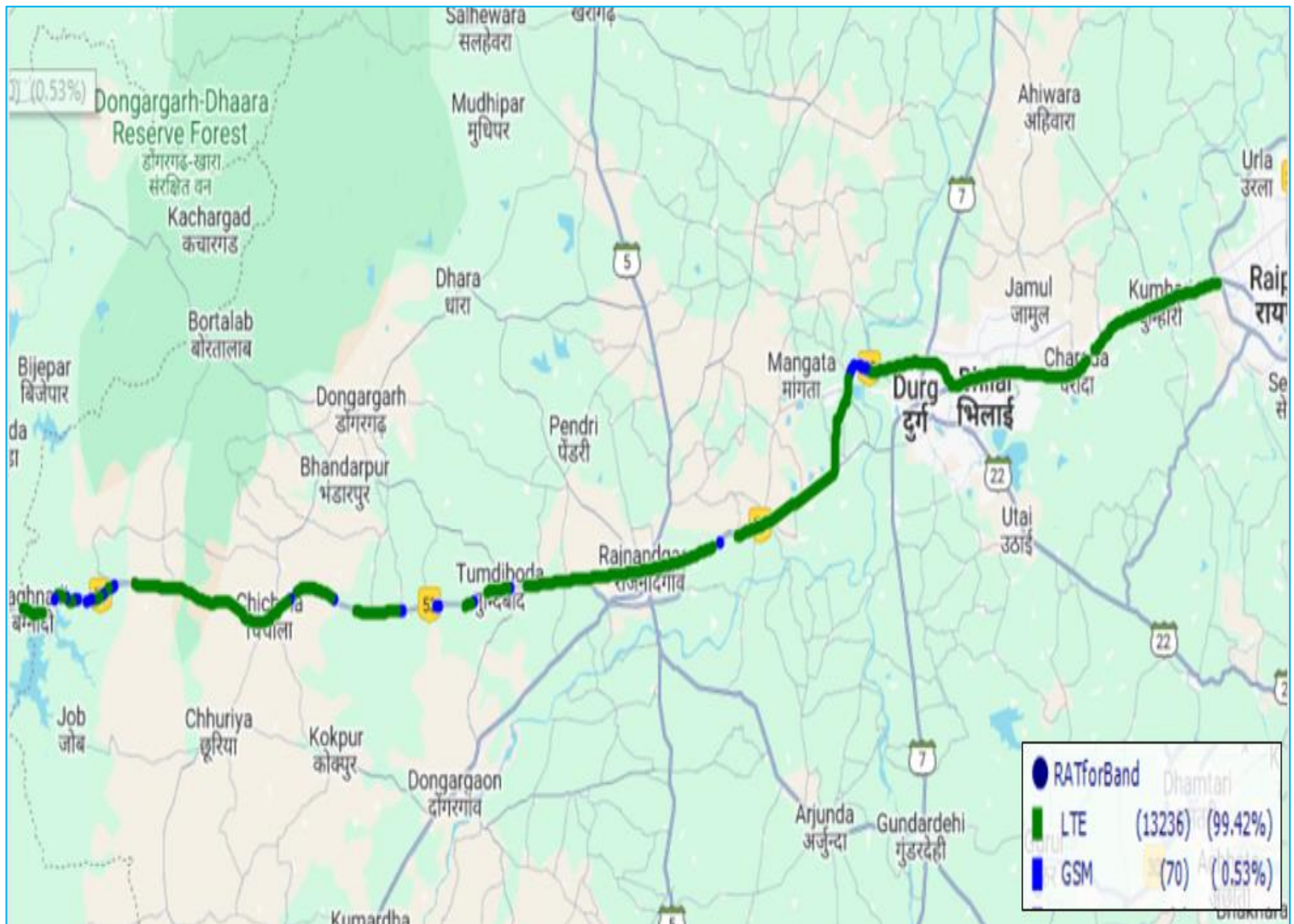
TSP-Airtel

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	5.6

Color	Range	Count	Per
🟥	(Min,2000)	(2366)	(22.78%)
🟨	(2000,6000)	(4775)	(45.98%)
🟨	(6000,10000)	(2390)	(23.01%)
🟩	(10000,Max)	(854)	(8.22%)

TSP- BSNL

Data Statistics - Dynamic data testing

Data KPIs - Overall	3G
Download Throughput (Mbps)	1.57
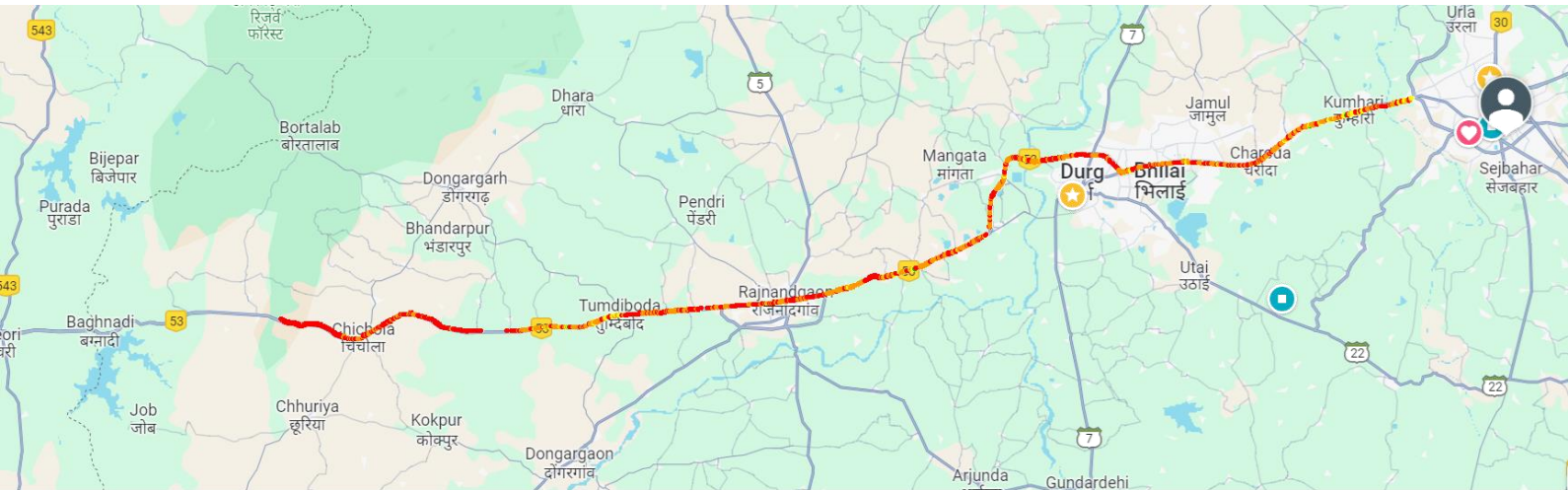
DL throughput	No of Sample	%	Legends
< 1 Mbps	3802	48.06	
1-5 Mbps	3436	43.44	
5-10 Mbps	600	7.59	
>10Mbps	72	0.91	

Dynamic Data Test Details

TSP-JIO

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	**14.02**
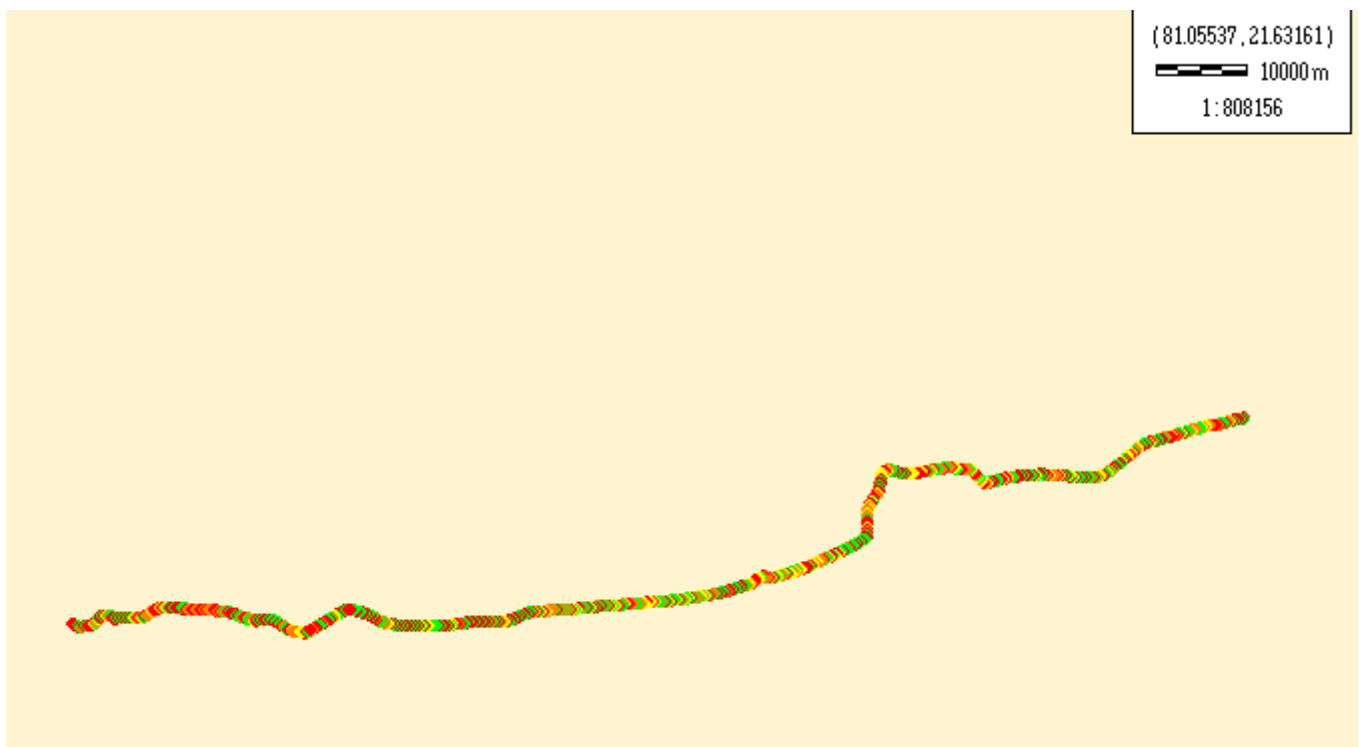
DL throughput	No of Sample	%	Legends
< 2Mbps	1150	14%	
2-5 Mbps	2190	26%	
5-10 Mbps	1953	23%	
>10Mbps	3103	37%	

TSP-VIL

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	**20.70**
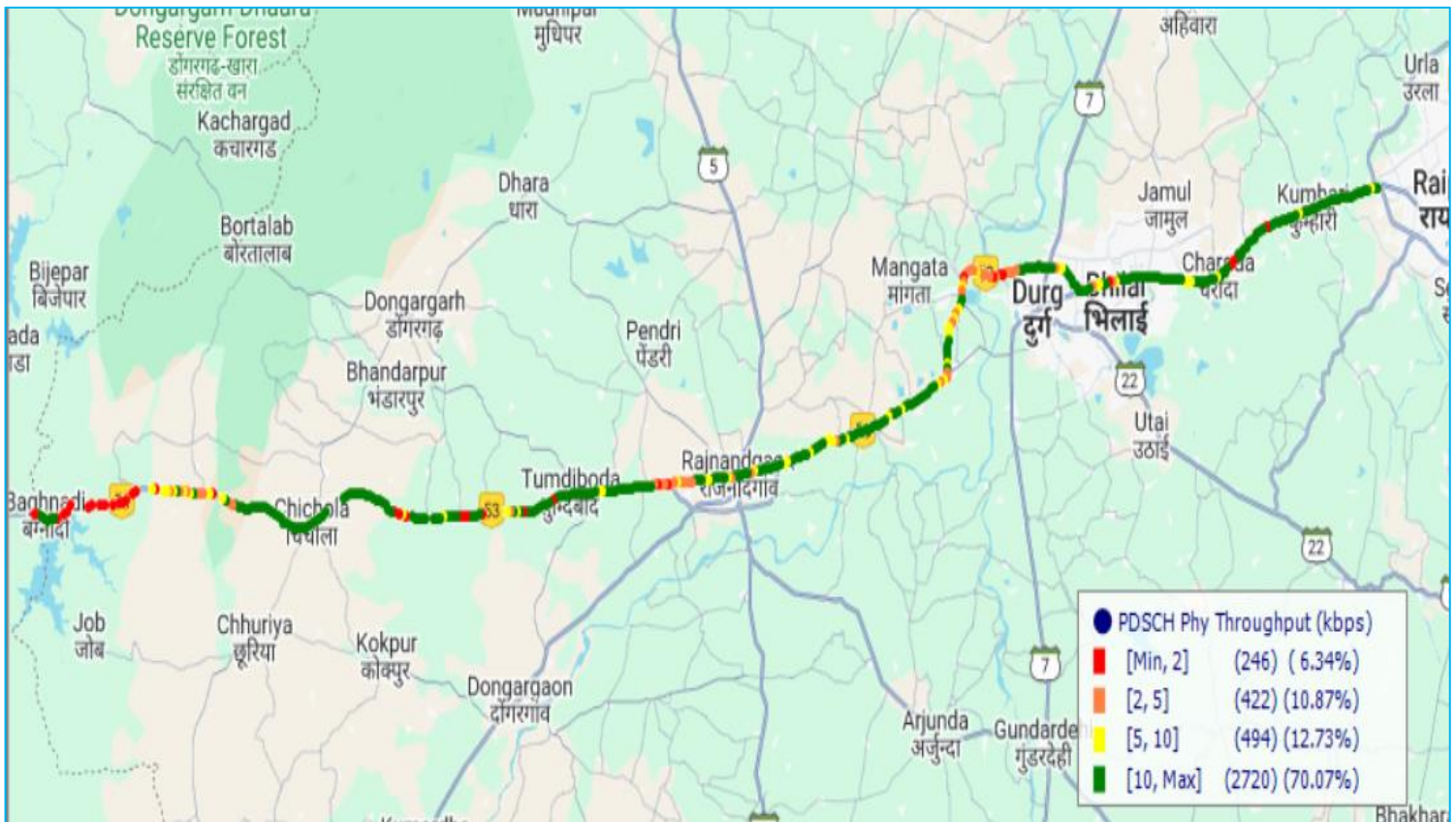
DL throughput	No of Sample	%	Legends
< 2Mbps	246	6.34%	
2-5 Mbps	422	10.87%	
5-10 Mbps	494	12.73%	
>10Mbps	2770	70.07%	