



प्रभावी विनियमन – सुगम संचार
Effective Regulation – Ease of Communication

Operator Assisted Drive Test Report Parasia-City and nearby Area

12/06/2025

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 for Parasia City and surrounding areas from 9:00 AM to 8:00 PM from 10/06/2025 to 12/06/2025. The drive test covered drive route of around 35 KMs.

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

Key Performance Indicators:

KPI	Benchmark	Observations
Drop call rate %	$\leq 2\%$	All TSP have met the benchmark
CSSR %	$\geq 98\%$	All TSP have met the benchmark
Mobility HOSR %	$\geq 95\%$	All TSP have met the benchmark
Good RX Quality %	$\geq 95\%$	All TSP have met the benchmark except Airtel in VoLTE

Overview

Regional Office, TRAI Haridwar-Rishikesh 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 **90-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

Static Data: Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay, and Latency

- i. Download- 3G - 20 MB, 4G - 40MB, 5G -200 MB
- ii. Upload - 3G - 5 MB, 4G - 10MB, 5G – 100 MB
- iii. Web browsing - 3 links of e-commerce websites <https://www.amazon.in>, <https://www.flipkart.com>, <https://paytm.com>.
- iv. Video Streaming – 130 sec clip
- v. Latency – 32 Bytes on www.google.com.

Overview

Voice & Dynamic Data Test Drive Route



List of important area covered during the drive test

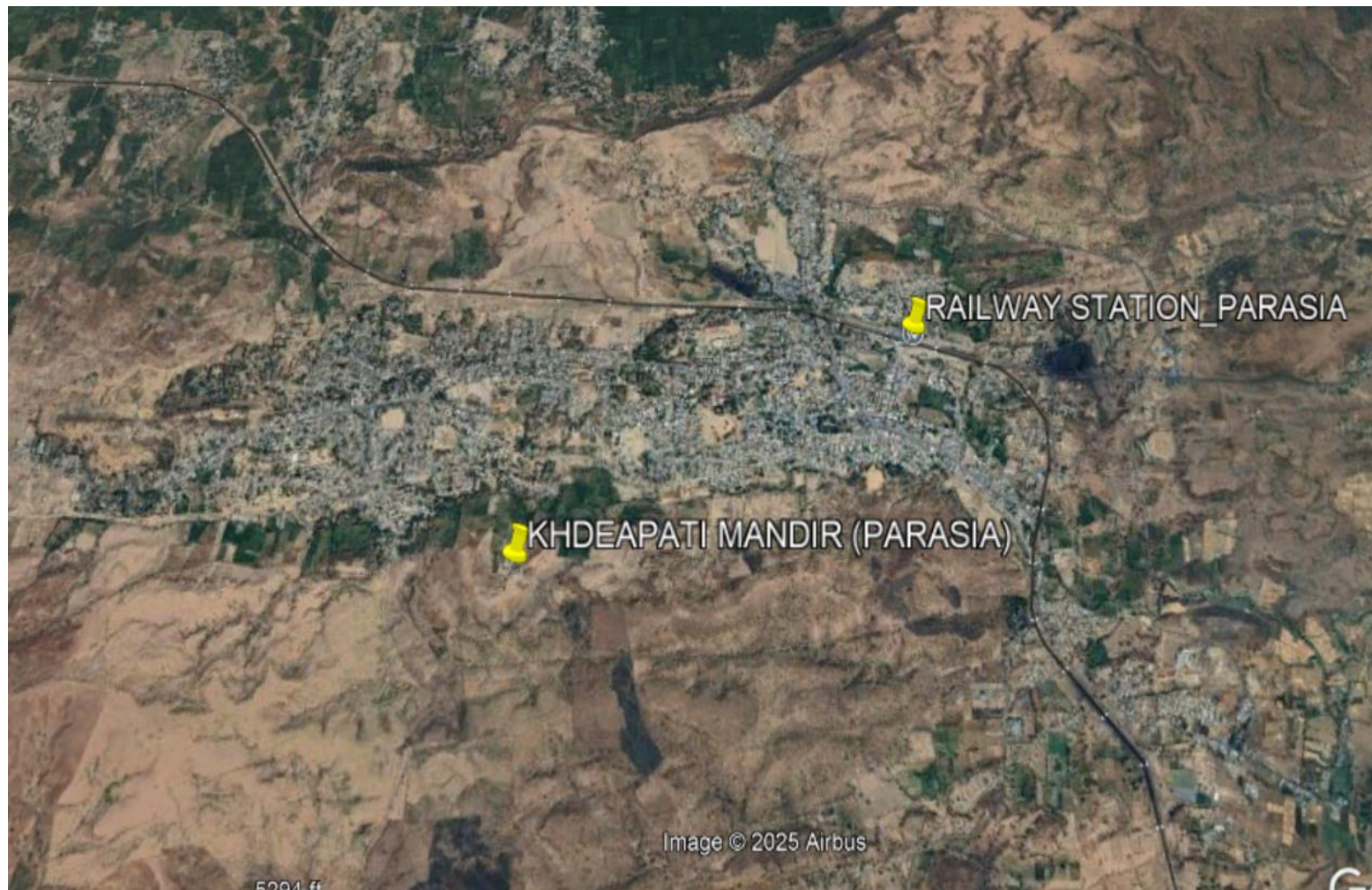
Station Road, Mangli bazar, Chandameta, Rescue Colony, EDC Colony,

Magazine line, Chandametta Butariya, Banda mohalla, GM office WCL,

Government Polytechnic College, Khirsadoh

Overview

Data Service Test- Static Locations



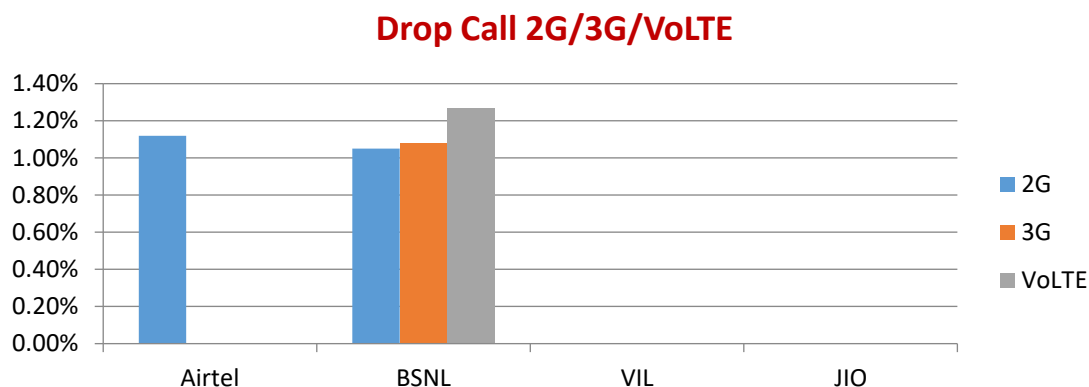
Hotspot Locations
1. Parasia Khedapati Temple
2. Parasia Railway Station

Voice Calls

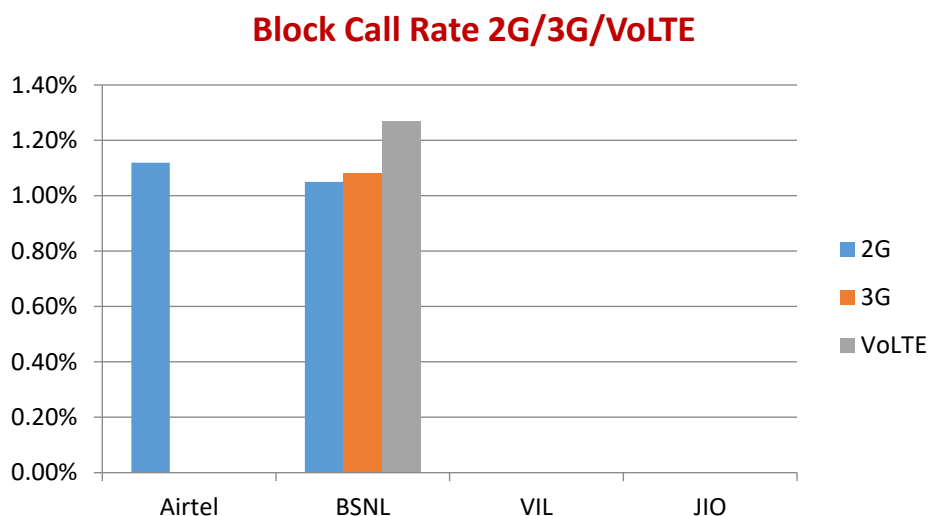
Key Observations

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

Drop Call Rate (%)



Block Call Rate (%)



KPIs	2G			3G	VoLTE			
	Airtel	BSNL	VIL	BSNL	Airtel	BSNL	RJIL	VIL
Drop Call Rate %	0	1.05	0	1.08	0	1.59	0	0
Block Call Rate %	1.12	1.05	0	1.08	0	1.27	0	0

a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%)

Voice Calls

Key Observations

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	77.48	98.27	90.74

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

TSPs	3G
	BSNL
Coverage %	99.58

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

TSPs	VoLTE			
	Airtel	BSNL	JIO	VIL
Coverage %	99.86	97.12	99.69	96.34

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

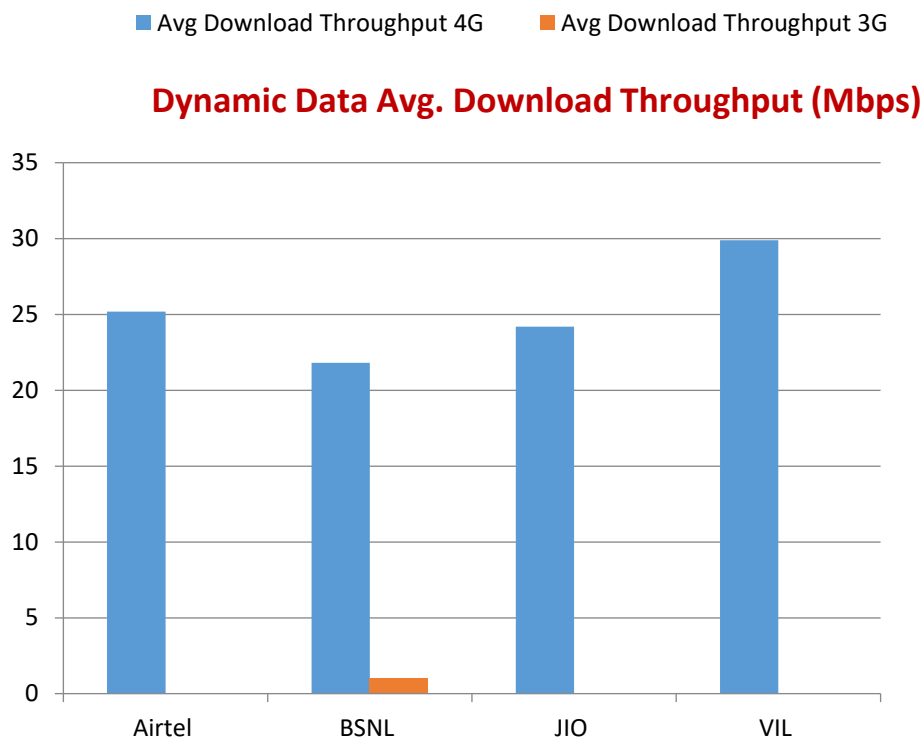
TSPs	3G	VoLTE			
	BSNL	Airtel	BSNL	VIL	JIO
Time Spent on 3G/4G %	2.4	100	96.98	98.8	100%

Data Services Dynamic

Key Observations

Dynamic Data -Download Throughput was tested.

Data Download Performance – Dynamic 3G/4G/ 5G Network



TSP	Airtel	BSNL	JIO	VIL
Average Download throughput- 3G In Mbps	-	1	-	-
Average Download throughput-LTE in Mbps	25.19	21.8	24.2	29.89

Summary

City Level Summary- Voice

TSP (For 2G)	Airtel	BSNL	VIL
Call attempts	89	96	84
Block call rate %	1.12	1.05	0
CSSR %	98.88	98.98	100
Drop call rate %	0	1.05	0
Mobility HOSR %	100	96.77	96.77
RX Quality %	97.71	98.97	98.26
Average CST Sec	3.2	0.62	2.32

TSP (For 3G)	BSNL
Call attempts	94
Block call rate %	1.08
CSSR %	98.94
Drop call rate %	1.08
Mobility HOSR %	96
RX Quality %	98.08
Average CST (Sec)	0.52

TSP (For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	94	92	88	93
Block call rate %	0	1.27	-	0
CSSR %	100	98.09	100	100
Drop call rate %	0	1.59	0	0.
Mobility HOSR %	100	96.36	100	100
RX Quality %	94.2	98	99.84	98.86
Average CST(Sec)	1.15	1.64	0.83	0.70

Summary

City Level Summary- Data Services -Static

TSP (For 3G)	BSNL
Download throughput in Mbps	3.9
Upload Throughput in Mbps	2.25
Video streaming delay in sec	1.5
Web browsing delay in second	0.515
Latency in (msec)	77

TSP (For LTE)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	39.23	26.375	32.54	29.89
Upload Throughput in Mbps	12.96	7.99	4.43	19.56
Video streaming delay in sec	1.0	1.46	0.48	1.89
Web browsing delay in second	1.48	0.326	0.95	6.80
Latency in (msec)	87.5	70	39	83.4

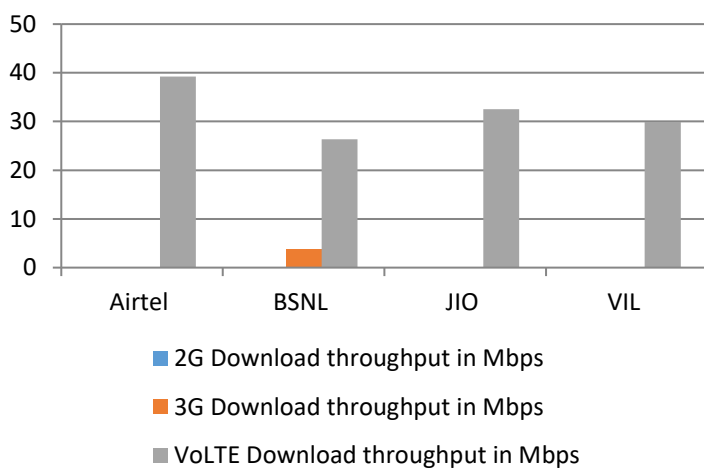
Data Services Static

Key Observations

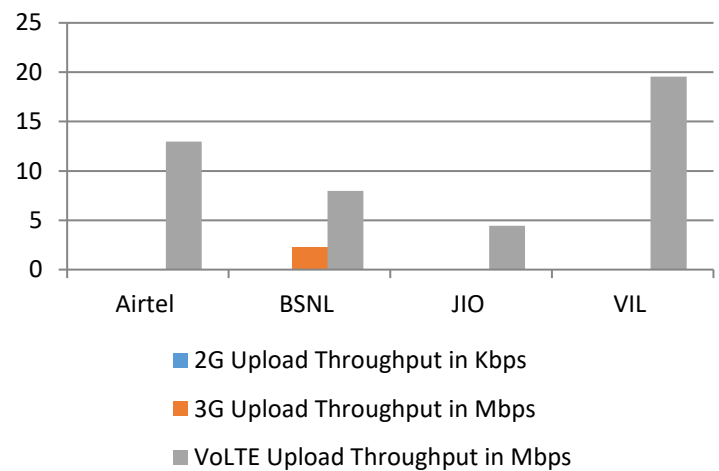
Data was tested at 6 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, PayTm)

3G/4G/ 5G Network

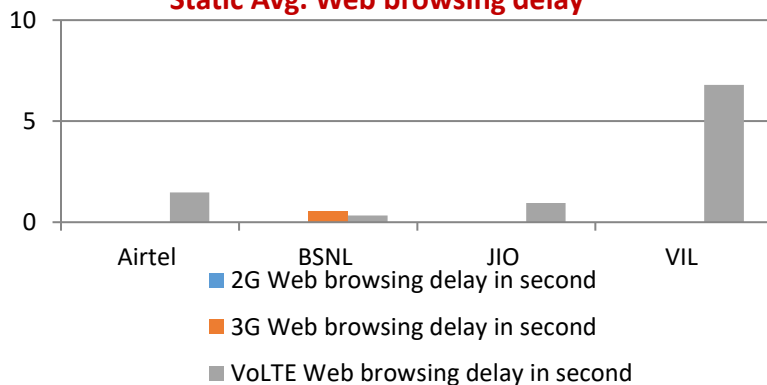
Static Avg. Data download throughput



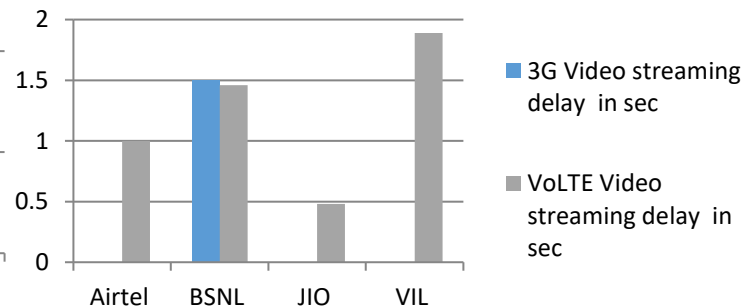
Static Avg. Data Upload Throughput



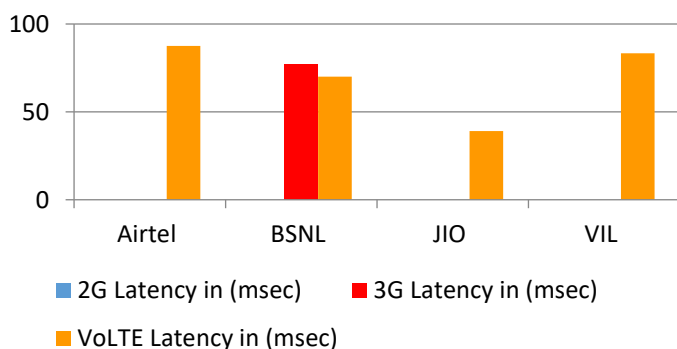
Static Avg. Web browsing delay



Static Avg. Video Streaming Delay



Static Avg. Latency



1. 1. Hotspot Location- Parasia Khedapati Temple

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	3.7	NA	NA
Upload Throughput in Mbps	NA	2.6	NA	NA
Video streaming delay in sec	NA	1.8	NA	NA
Web browsing delay in second	NA	0.511	NA	NA
Latency in (msec)	NA	76	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	30.14	22.18	26.35	36.78
Upload Throughput in Mbps	15.12	9.25	2.59	11.45
Video streaming delay in sec	0.97	1.3	0.59	0.64
Web browsing delay in second	1.21	0.436	1.019	5.2
Latency in (msec)	84	65	36	77

2. Hotspot Location- Railway Station Parasia

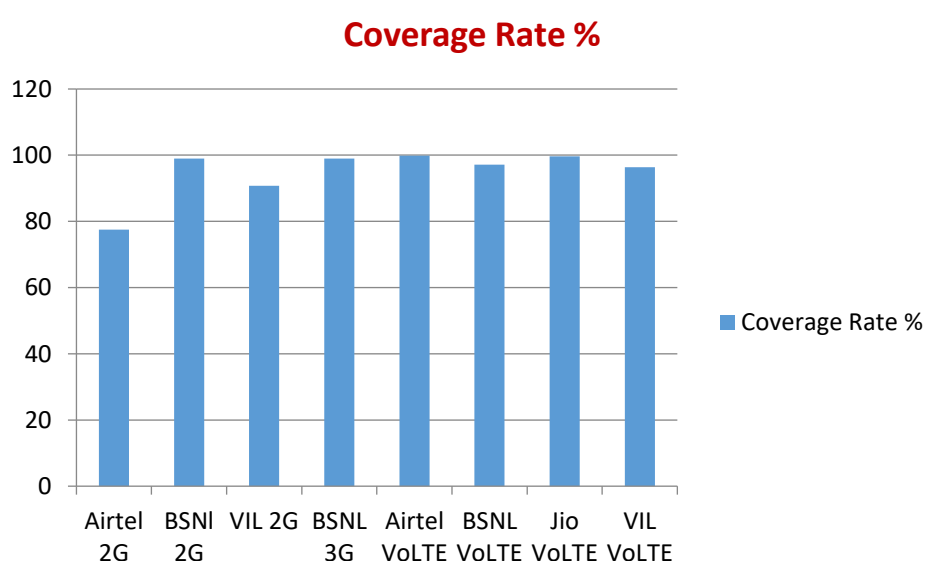
	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	4.1	NA	NA
Upload Throughput in Mbps	NA	1.9	NA	NA
Video streaming delay in sec	NA	1.8	NA	NA
Web browsing delay in second	NA	0.52	NA	NA
Latency in (msec)	NA	78	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	48.33	30.57	38.73	29.47
Upload Throughput in Mbps	10.81	6.73	6.26	9.33
Video streaming delay in sec	1.03	1.3	0.37	2.15
Web browsing delay in second	1.75	0.362	0.89	7.1
Latency in (msec)	91	68	43	81

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 \geq -85 dBm, RSCP is \geq -90 dBm & RSRP \geq -110dBm. The details are as follows.

TSP	Coverage Rate %
Airtel 2G	77.48
BSNI 2G	98.27
VIL 2G	90.74
BSNL 3G	99.58
Airtel VoLTE	99.86
BSNL VoLTE	97.12
Jio VoLTE	99.69
VIL VoLTE	96.34







Coverage Details

TSP-Airtel

Technology	Coverage %
2G	77.48

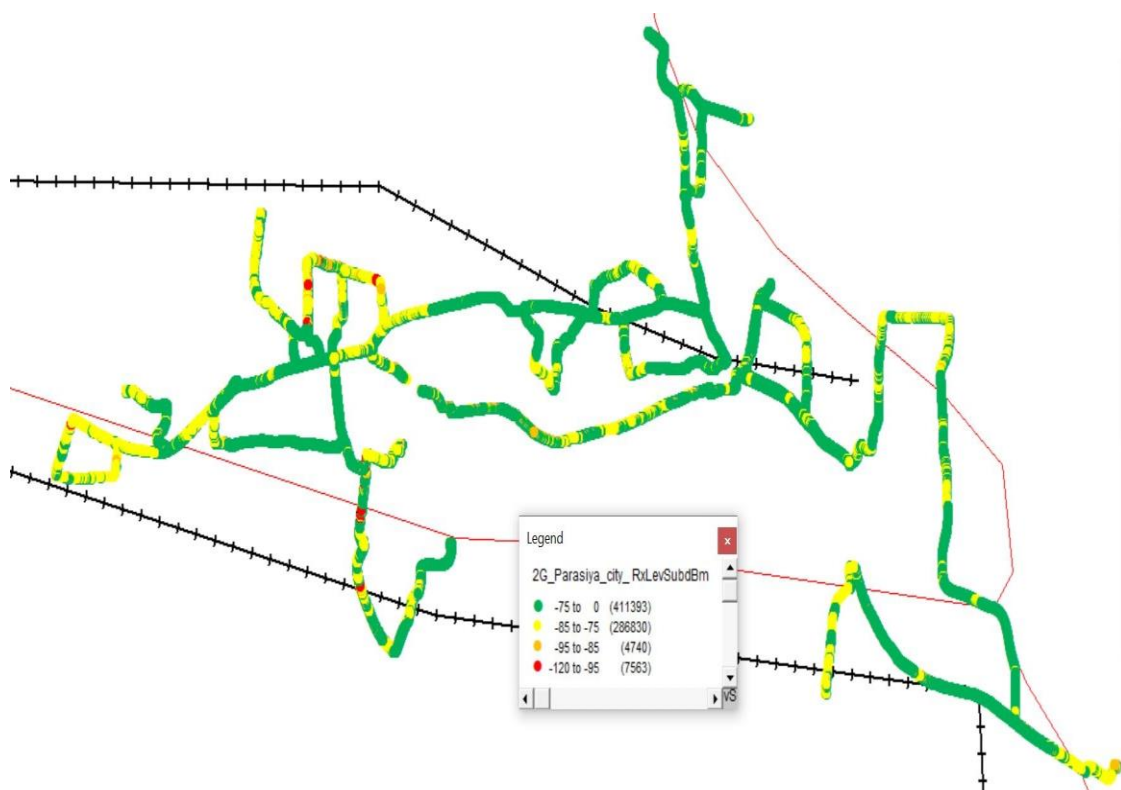


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	13394	55.8	
[-75, >=-85)	5204	21.68	
[-85, >=-95)	3843	16.01	
[-95, >=Min)	1563	6.51	
Total			

Coverage Details

TSP-BSNL

Technology	Coverage %
2G	98.27



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	411393	57.90	
[-75, >=-85)	286830	40.37	
[-85, >=-95)	4740	0.67	
[-95, >=Min)	7563	1.06	
Total		100	

Coverage Details

TSP-VI

Technology	Coverage %
2G	90.74



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	3511	65.16	
[-75, >=-85)	1378	25.58	
[-85, >=-95)	427	7.92	
[-95, >=Min)	72	1.34	
Total	5388	100	

Coverage Details

TSP- BSNL

Technology99	Coverage %
3G	99.58

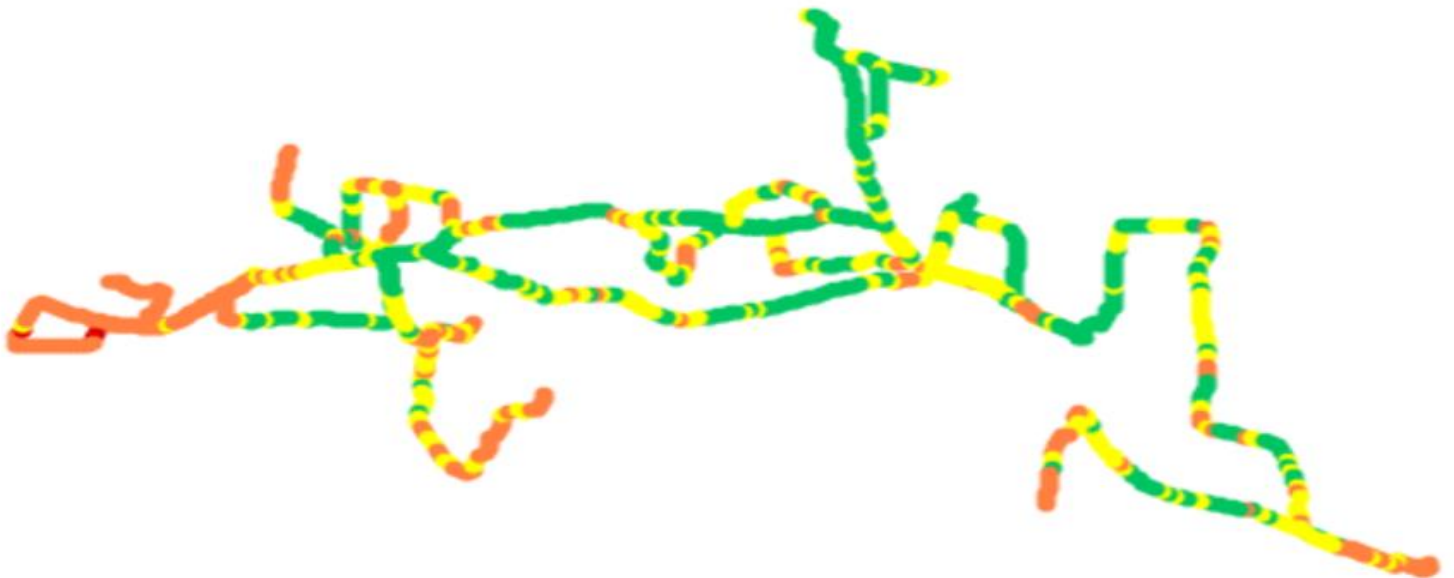


3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	48369	17.85	
[-70, >=-80)	64299	23.73	
[-80, >=-90)	157137	58.00	
[-90, >=Min)	1100	0.42	
Total	270905	100	

Coverage Details

TSP-Airtel.

Technology	Coverage %
VoLTE	99.86

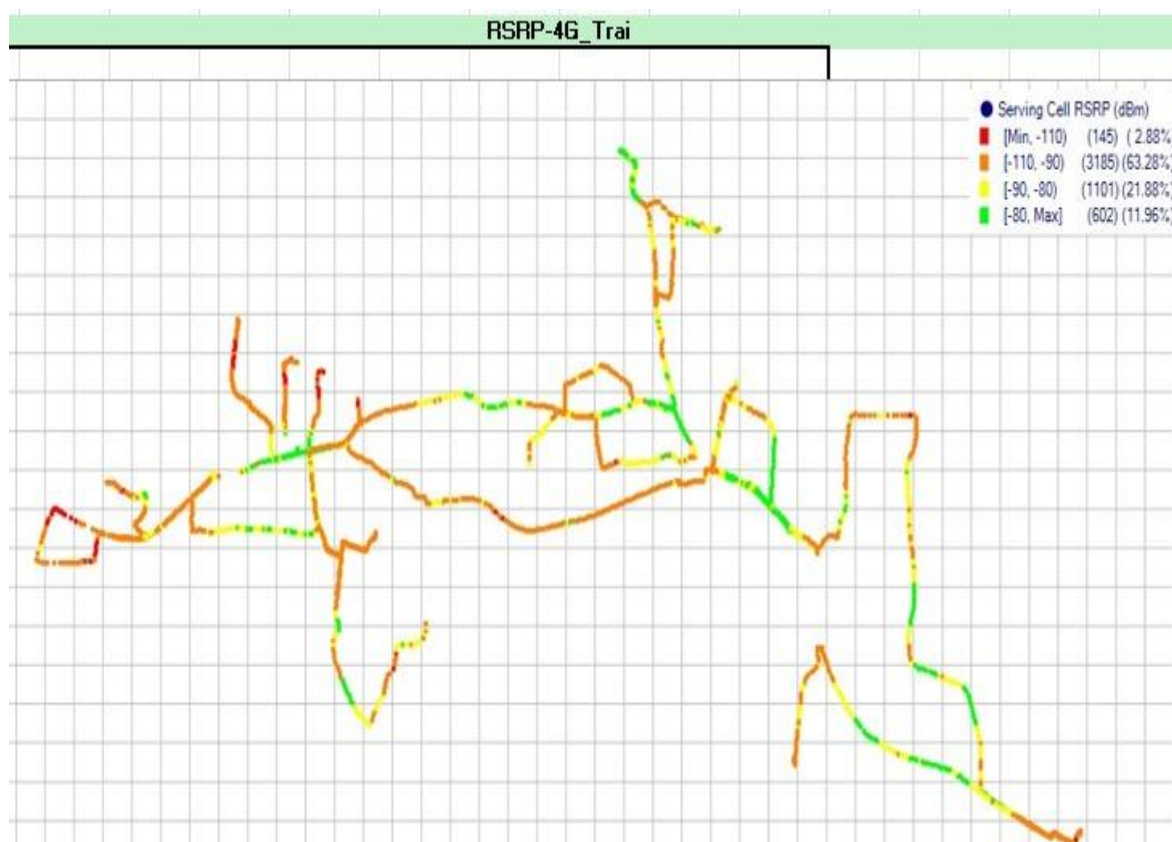


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	20661	37.62	Green
[-80, >=-90)	20567	37.45	Yellow
[-90, >=-110)	13613	24.79	Orange
[-110, >=Min)	78	0.14	Red
Total			

Coverage Details

TSP-BSNL.

Technology	Coverage %
VoLTE	97.12



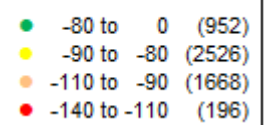
VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	602	11.96	
[-80, >=-90)	1101	21.88	
[-90, >=-110)	3185	63.28	
[-110, >=Min)	145	2.88	
Total	5033		

Coverage Details

TSP-VI

Technology	Coverage %
VoLTE	96.34

Volte RSRP plot



VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	952	17.83	
[-80, >=-90)	2526	47.29	
[-90, >=-110)	1668	31.22	
[-110, >=Min)	196	3.66	
Total	5342	100	

Coverage Details

TSP-JIO

Technology	Coverage %
VoLTE	99.69%

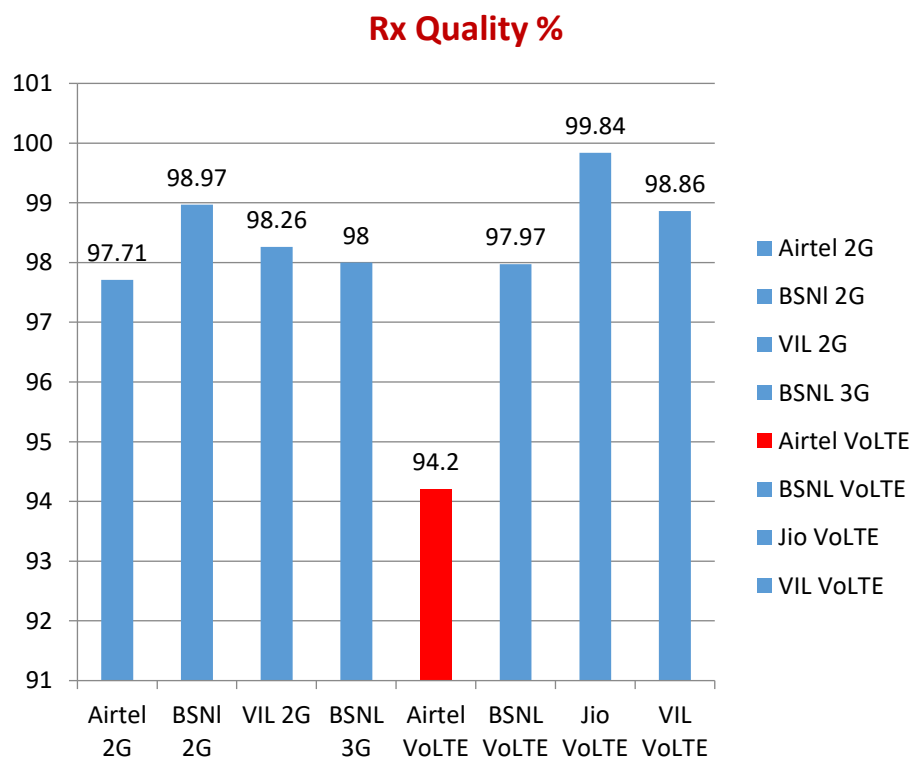


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	4782	50.37%	
[-80, >=-90)	3156	33.24%	
[-90, >=-110)	1527	16.08%	
[-110, >=Min)	29	0.31%	
Total	9494		

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	97.71
BSNI 2G	98.98
VIL 2G	98.26
BSNL 3G	98.08
Airtel VoLTE	94.2
BSNL VoLTE	97.97
Jio VoLTE	99.84
VIL VoLTE	98.86

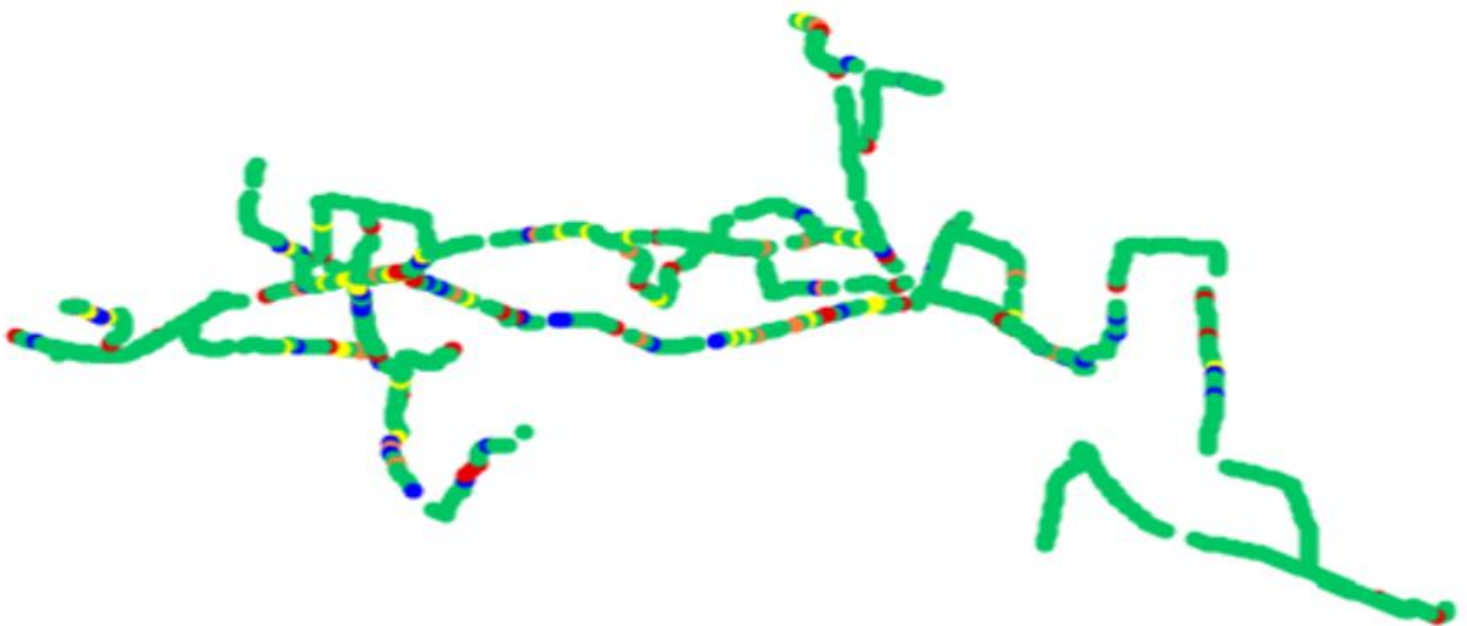


Quality Details

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-Airtel

Technology	Rx Quality %
2G	97.71



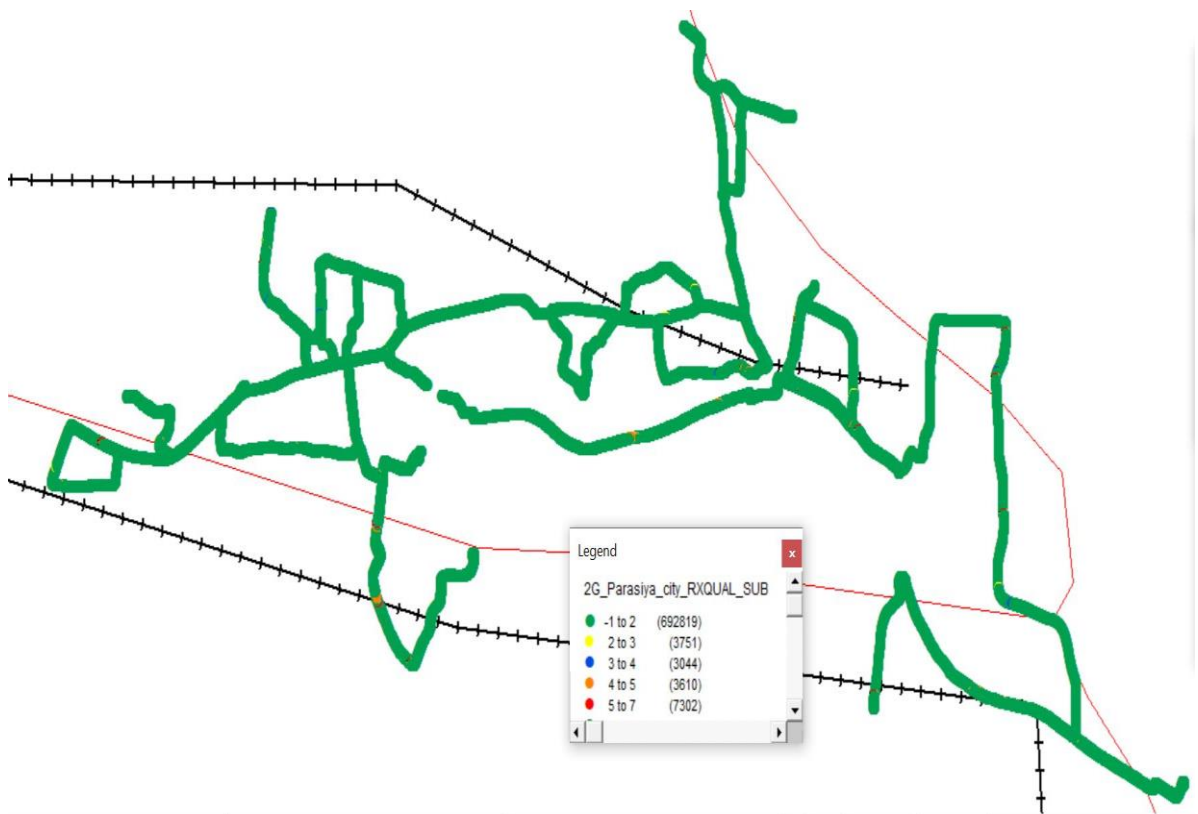
Overall Rx Quality	# Samples	% PDF	Legends
(Min, ≤ 2)	14353	86.66	
(2, ≤ 3)	767	4.63	
(3, ≤ 4)	647	3.91	
(4, ≤ 5)	416	2.51	
(5, $\leq \text{Max}$)	380	2.29	
Total			

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-BSNL

Technology	Rx Quality %
2G	98.98



Overall Rx Quality	# Samples	% PDF	Legends
(Min, ≤ 2)	692819	97.51	
(2, ≤ 3)	3751	0.53	
(3, ≤ 4)	3044	0.43	
(4, ≤ 5)	3610	0.51	
(5, $\leq \text{Max}$)	7302	1.02	
Total	710526	100	

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-VIL

Technology	Rx Quality %
2G	98.26



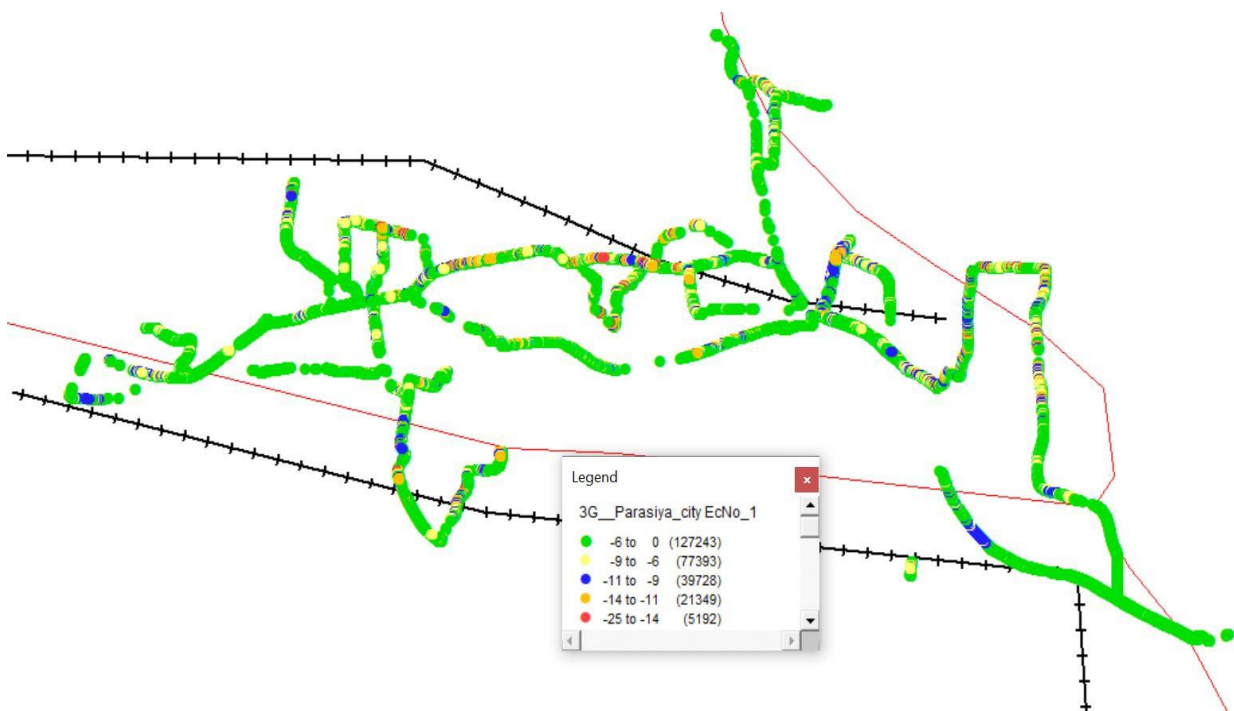
Overall Rx Quality	# Samples	% PDF	Legends
(Min, ≤ 2)	3299	84.69	
(2, ≤ 3)	206	5.29	
(3, ≤ 4)	182	4.68	
(4, ≤ 5)	140	3.59	
(5, $\leq \text{Max}$)	68	1.76	
Total	3895	100	

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- BSNL

Technology	Rx Quality %
3G	98.08



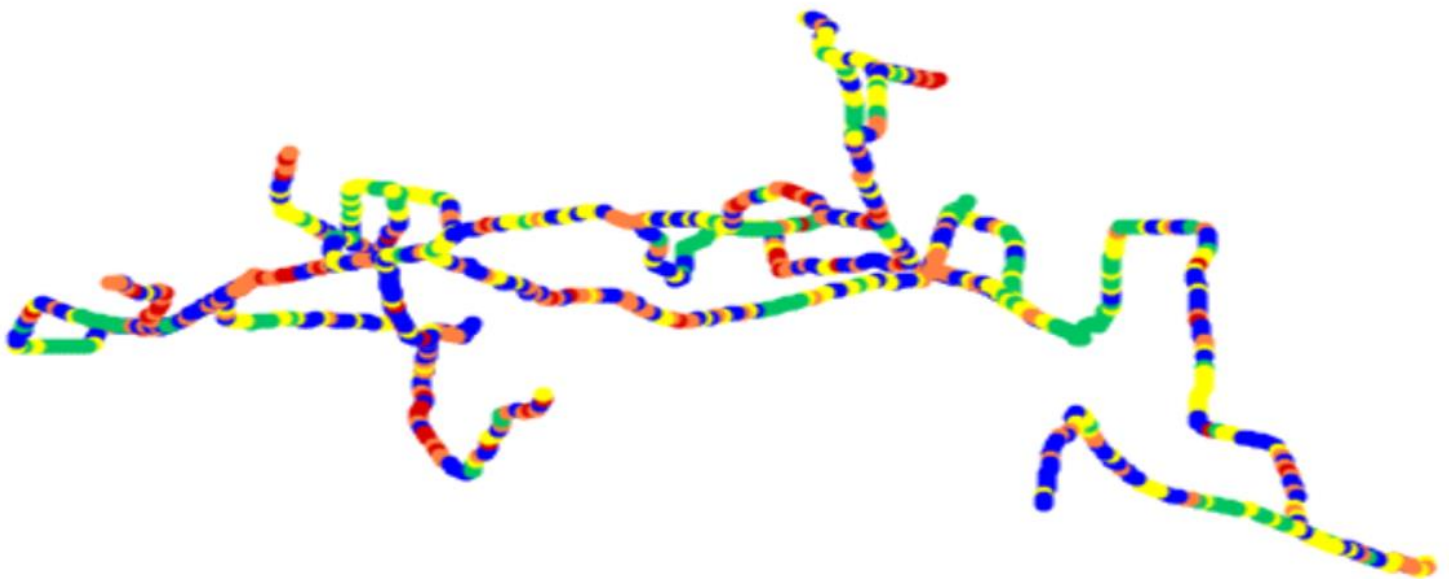
Overall Ec/No	# Samples	% PDF	Legends
(Max, ≤ -6)	127243	46.97	Green
(-6, ≤ -9)	77393	28.57	Yellow
(-9, ≤ -11)	39728	14.66	Blue
(-11, ≤ -14)	21349	7.88	Orange
(-14, \leq Min)	5192	1.92	Red
Total	270905	100	

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-Airtel.

Technology	Rx Quality %
VoLTE	94.2



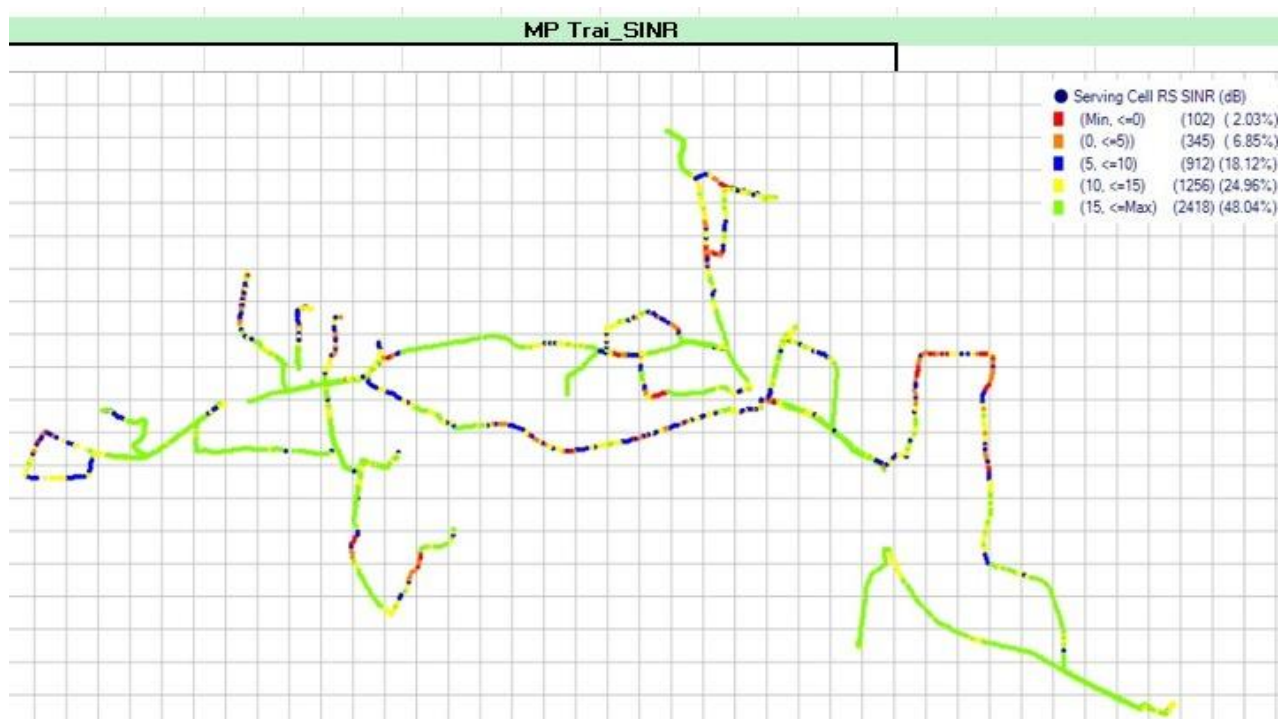
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	3189	5.80	
(0, ≤ 5)	14490	26.41	
(5, ≤ 10)	17332	31.59	
(10, ≤ 15)	11296	20.59	
(15, $\leq \text{Max}$)	8565	15.61	
Total			

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-BSNL

Technology	Rx Quality %
VoLTE	97.97

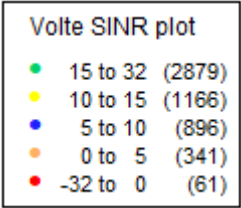


Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	102	2.03	
(0, ≤ 5)	345	6.85	
(5, ≤ 10)	912	18.12	
(10, ≤ 15)	1256	24.96	
(15, $\leq \text{Max}$)	2418	48.04	
Total	5033		

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-VI

Technology	Rx Quality %
VoLTE	98.86



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	61	1.14	
(0, <=5)	341	6.39	
(5, <=10)	896	16.76	
(10, <=15)	1166	21.82	
(15, <=Max)	2879	53.89	
Total	5343	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-RJIO

Technology	Rx Quality %
VoLTE	99.84



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	15	0.16%	
(0, <=5)	2282	24.04%	
(5, <=10)	2393	25.21%	
(10, <=15)	2395	25.23%	
(15, <=Max)	2409	25.37%	
Total	15	0.16%	

Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	2.4
Airtel VoLTE	100
BSNL VoLTE	96.98
Jio VoLTE	100
VIL VoLTE	98.8



Technology Details

TSP-Airtel

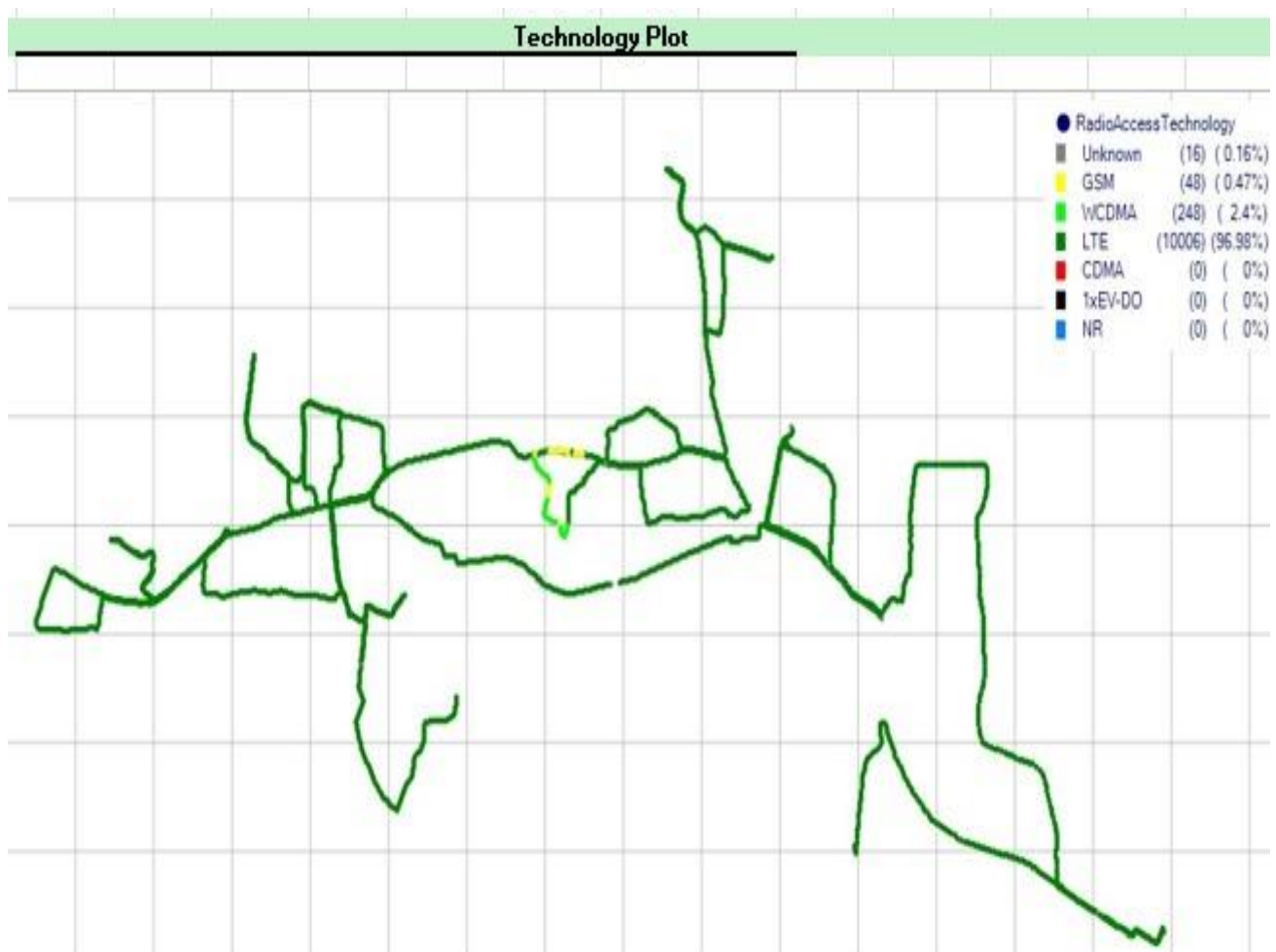
Technology	% of Time Spent on
VoLTE	100



Technology Details

TSP-BSNL.

Technology	% of Time Spent on
3G+ 2G	2.4 + 0.47
VoLTE	96.98



Technology Details

TSP-RJIO

Technology	% of Time Spent on
VoLTE	100%



Technology Details

TSP-VI

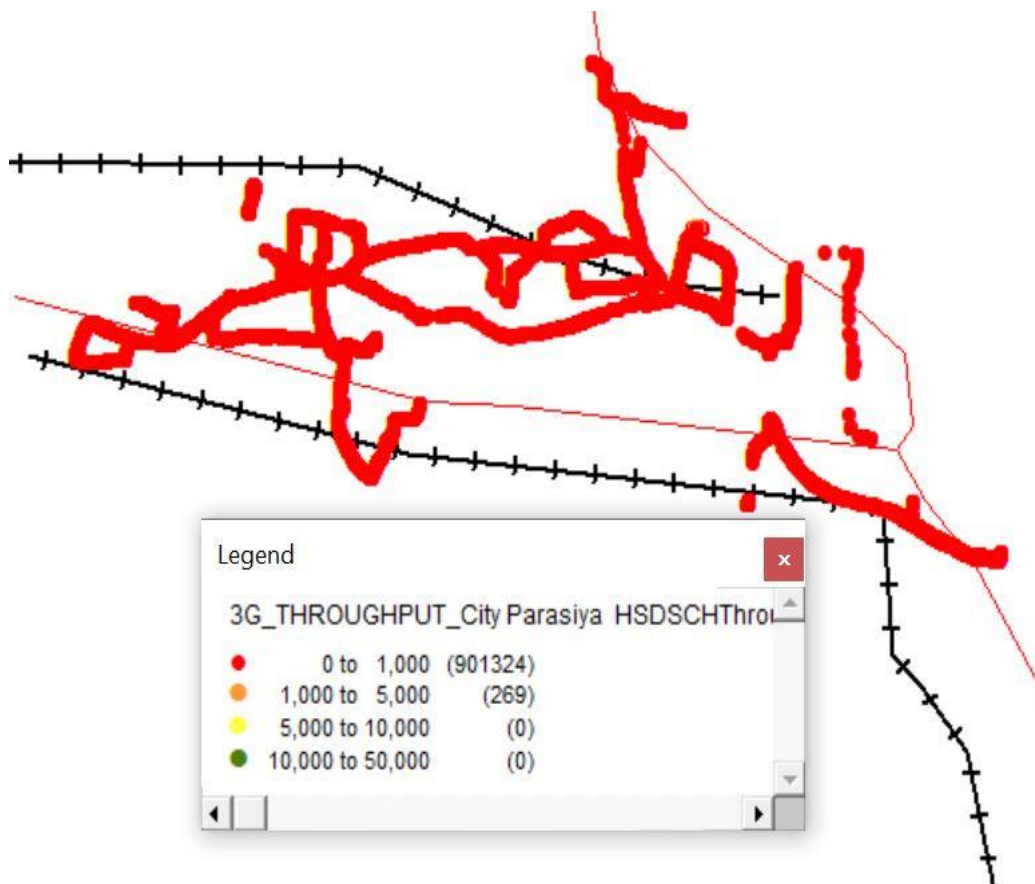
Technology	% of Time Spent on
VoLTE	98.8



TSP- BSNL

Data Statistics - Dynamic data testing

Data KPIs - Overall	3G
Download Throughput (Mbps)	1.0



DL throughput	No of Sample	%	Legends
< 1 Mbps	901324	99.9	
1-5 Mbps	269	0.1	
5-10 Mbps	0	0	
>10Mbps	0	0	

TSP-Airtel

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	25.19



DL throughput	No of Sample	%	Legends
< 2Mbps	1326	19.62	Red
2-5 Mbps	234	3.46	Orange
5-10 Mbps	469	6.94	Yellow
>10Mbps	4729	69.98	Green

TSP-BSNL

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	21.18



DL throughput	No of Sample	%	Legends
< 2Mbps	438	8.86	
2-5 Mbps	184	3.72	
5-10 Mbps	426	8.62	
>10Mbps	3895	78.8	

TSP-RJIO

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	24.2



DL throughput	No of Sample	%	Legends
< 2Mbps	692	7.42%	
2-5 Mbps	670	7.19%	
5-10 Mbps	993	10.65%	
>10Mbps	6969	74.74%	

Dynamic Data Test

TSP- VI

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	22.92



DL throughput	No of Sample	%	Legends
< 2Mbps	468	9.21	
2-5 Mbps	461	9.49	
5-10 Mbps	444	9.14	
>10Mbps	3508	72.16	

Data testing on hotspots using traимyspeed app

Hotspot		Airtel	BSNL	JIO	VIL
1. Parasia Khedapati Temple	3G download in Mbps	NA	4.93	NA	NA
	3G upload in Mbps	NA	1.5	NA	NA
	4G download in Mbps	21.29	5.12	50.45	29.57
	4G upload in Mbps	7.35	1.61	14.31	10.25
	5G download in Mbps	NA	NA	NA	NA
	5G upload in Mbps	NA	NA	NA	NA
2. Parasia railway Station	3G download in Mbps	NA	6.45	NA	NA
	3G upload in Mbps	NA	1.91	NA	NA
	4G download in Mbps	29.86	5.12	27.18	22.55
	4G upload in Mbps	11.56	1.61	5.94	8.64
	5G download in Mbps	NA	NA	NA	NA
	5G upload in Mbps	NA	NA	NA	NA