



Operator Assisted Drive Test Report

Yamunanagar-Kurukshetra-Kaithal-Hisar Highway

14th Nov 2024

By

TRAI Regional office Jaipur

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

The Operator Assisted Drive Test has been carried out by Regional Office, Jaipur with the help of Service Providers in Yamunanagar-Kurukshetra-Kaithal-Hisar Highway from 9:00 AM to 8:00 PM during 14th Nov 2024. The drive test covered drive route of 220 Kms SSA on 14th Nov. Approximately 110 calls were made for each of the four networks: three 2G networks, one 3G networks and three LTE networks covering four TSPs.

Overview

Voice Summary

Data Summary

Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test on 14th Nov 2024 covering Yamunanagar-Hissar Highway. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G, 3G and 4G). 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: Calls were made for 180 sec duration with a wait time of 15 sec between calls in all technologies. The drive test covered a drive route of approximately 220 KMs. Approximately 110 calls were made on 2G and on 4G.

Data Tests:

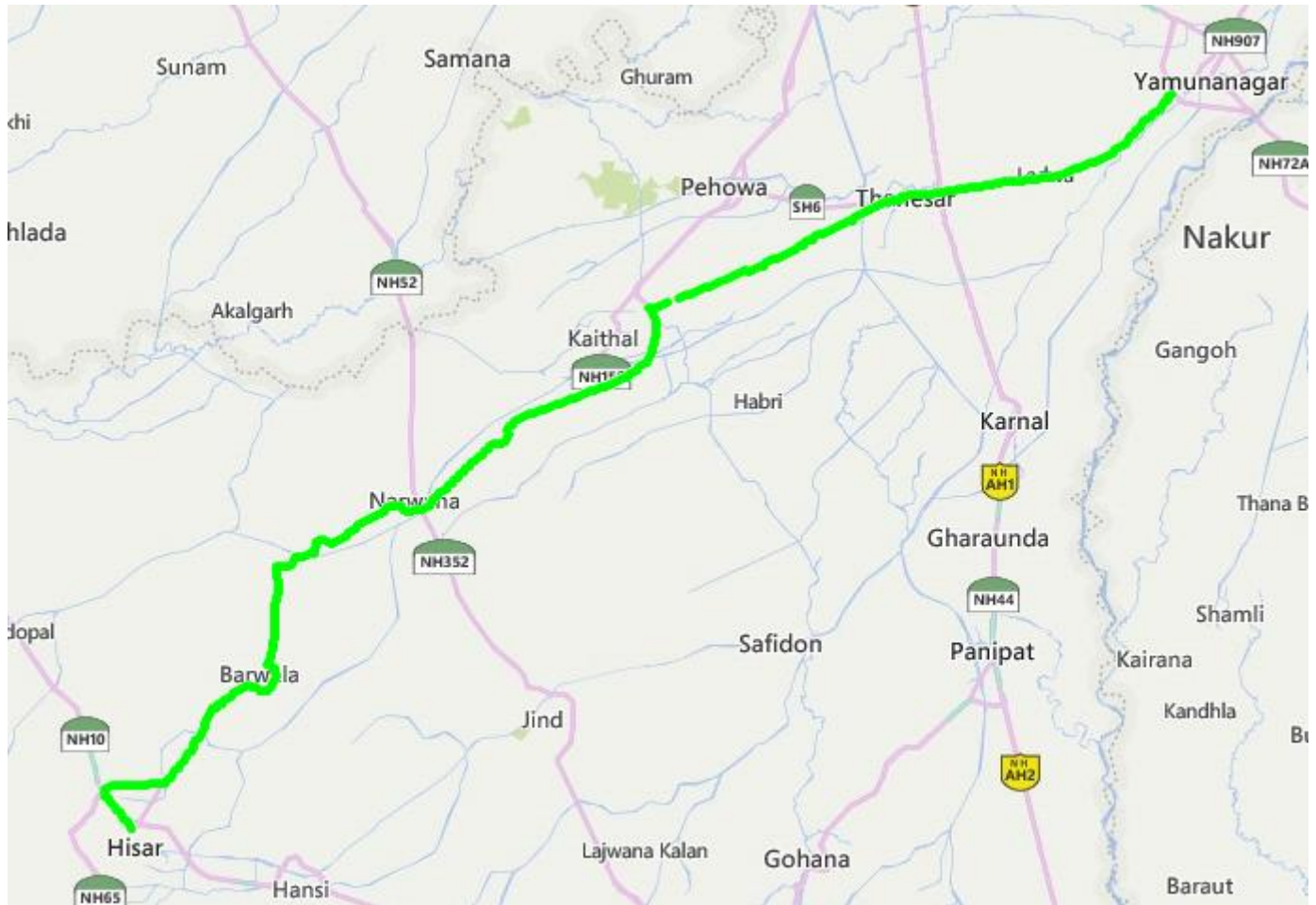
Dynamic data test was conducted for kms for download throughput in all technologies.
2G – measurement – UE Locked in 2G file size- 500KB

3G – measurement – UE in 3G File Size- 20MB

4G – measurement – UE in LTE /5G File Size- 40MB

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

Voice & Dynamic Data Test Drive Route

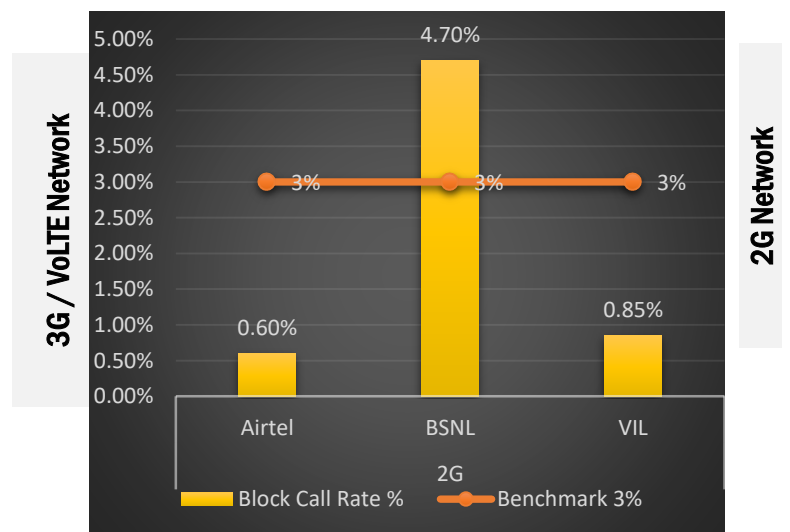
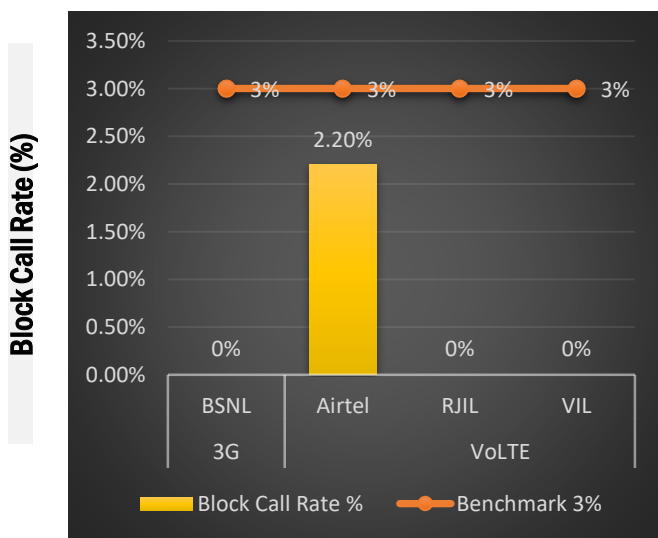
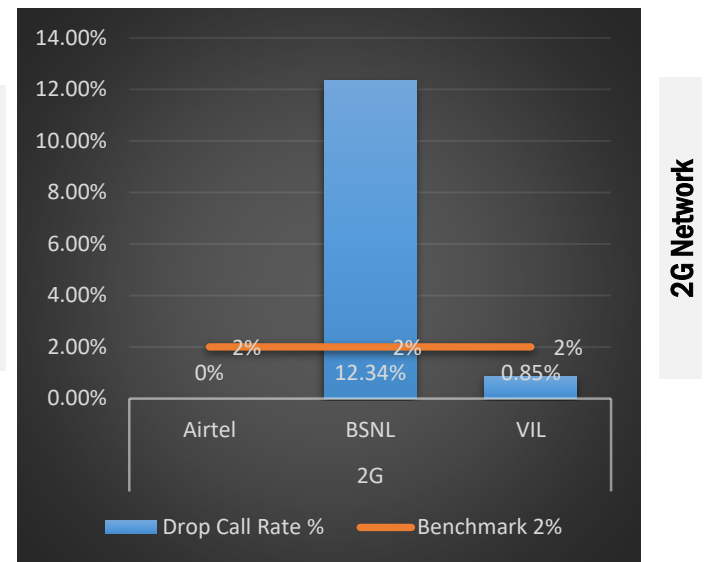
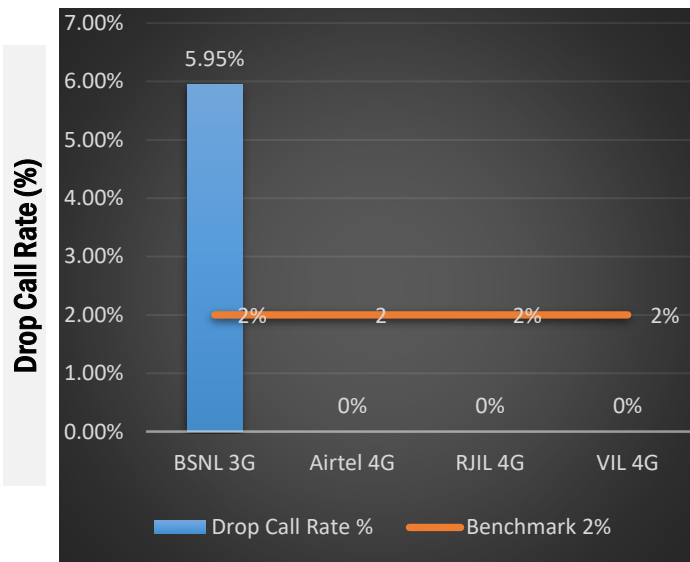


DAY-4, 14.11.24	Dynamic Drive	Yamunanagar-Kurukshetra-Kaithal-Narwana-Hissar Highway
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Voice Calls

Key Observations

QoS compliance of the TSPs on **Yamunanagar to Hisar Highway** for Voice across technologies 2G/3G/4G-VoLTE:



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0%	12.34%	0.85%	5.95%	0%	0%	0%
Block Call Rate %	0.60%	4.70%	0.85%	0%	2.20%	0%	0%

- All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%).
- 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 ≥ -85 dBm.

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	93.60%	56.21%	74.24%

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

TSPs	3G
	BSNL
Coverage %	74.36%

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	97.80%	97.66%	91.99%

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	26.65%	100%	100%	100%

Data Services Dynamic

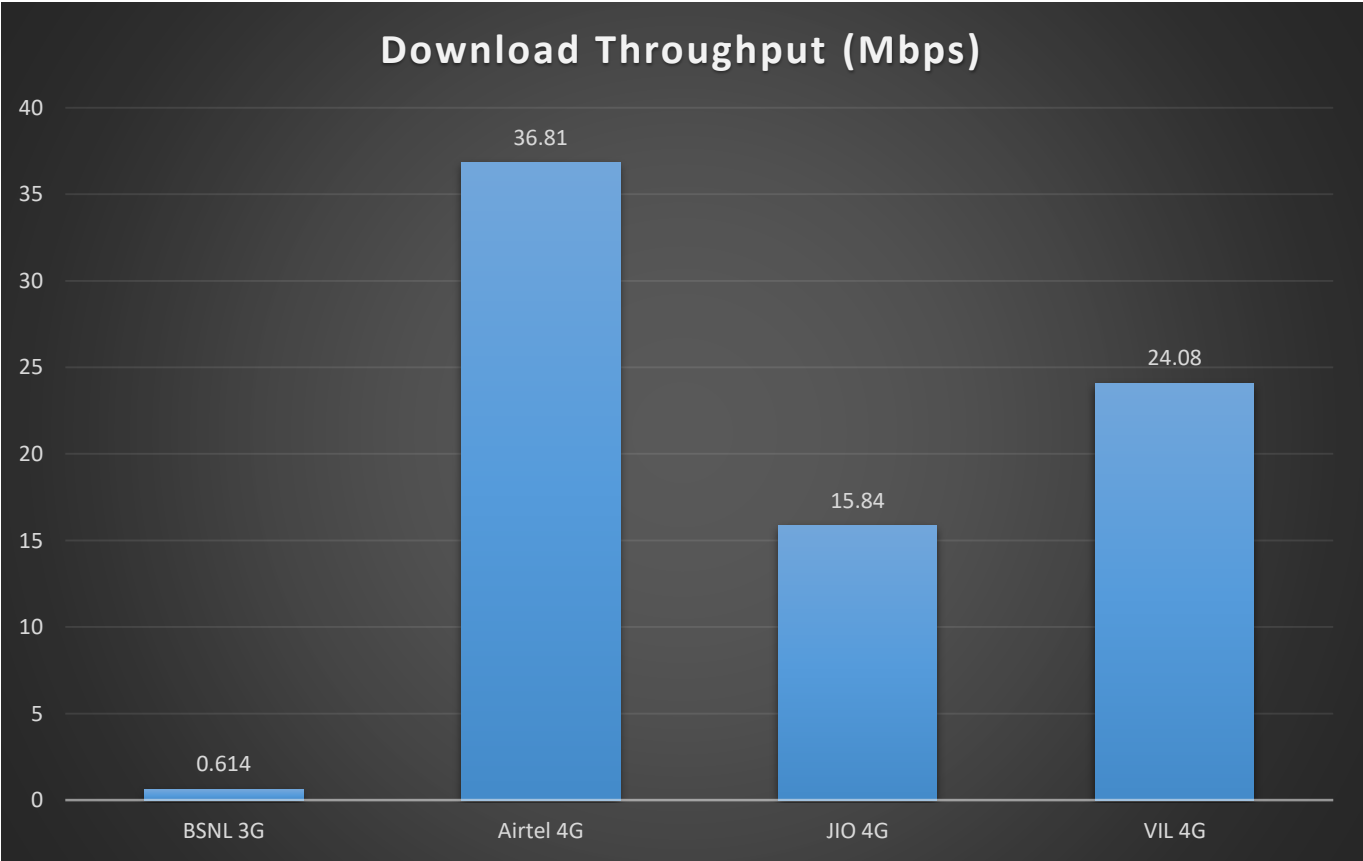
Key Observations

Dynamic Data was tested for whole voice route. Download Throughput was tested.

Data Download Performance (kbps) - Dynamic

3G/4G/ Network:

Data Services Dynamic	3G/VoLTE			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (Mbps)	0.614	36.81	15.84	24.08



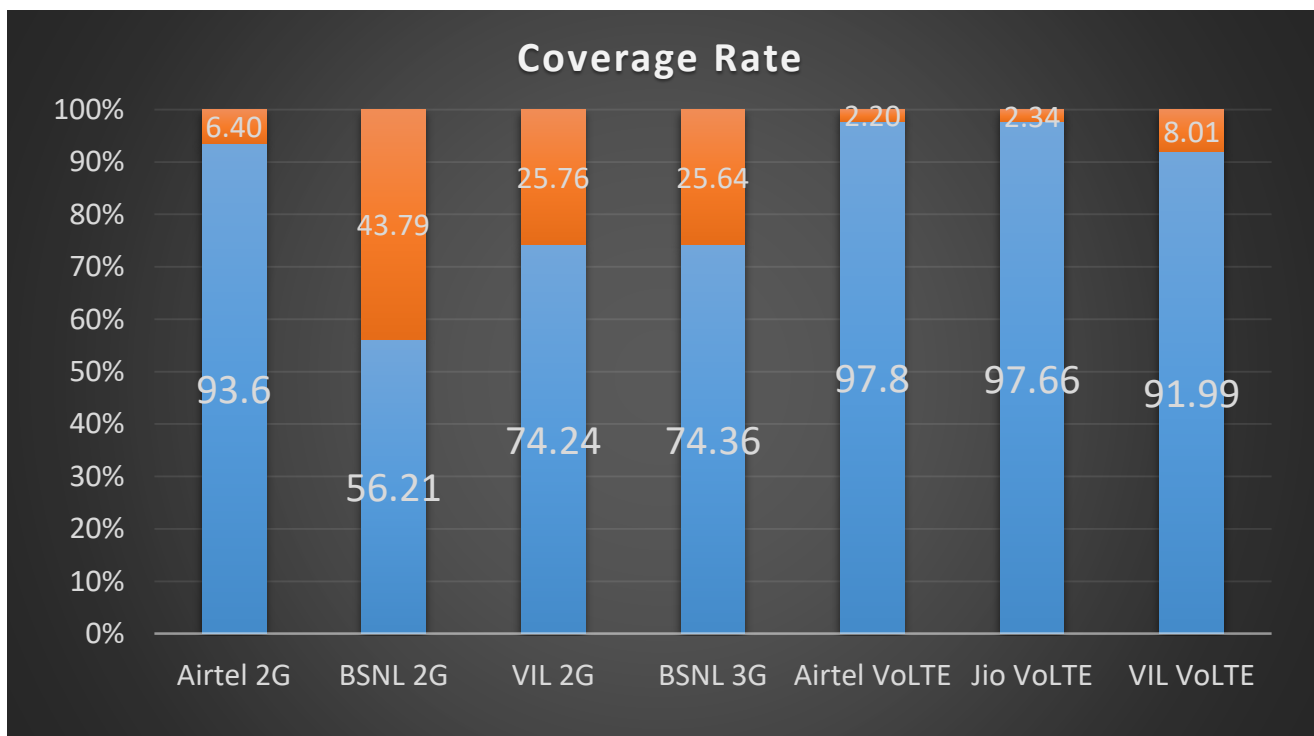
Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	99	85	118
Blocked Call Rate (%)	0.60%	4.7%	0.85%
CSSR% (Accessibility)	99.40%	95.3%	99.15%
Drop Call Rate (%)	0%	12.34%	0.85%
Mobility HOSR (%)	100%	96%	90.39%
Rx Quality (%)	95.61%	94.02%	97.22%
Average CST Sec	3.03	3.722	4.65

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	84	101	99	110
Blocked Call Rate (%)	0%	2.20%	0%	0%
CSSR% (Accessibility)	100%	97.80%	100%	100%
Drop Call Rate (%)	5.95%	0%	0%	0%
Mobility HOSR (%)	100%	100%	99.49%	100%
Rx Quality (%)	67.19%	95.52%	91.44%	68.93%
Average CST Sec	3.978	1.16	0.44	1.68

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.

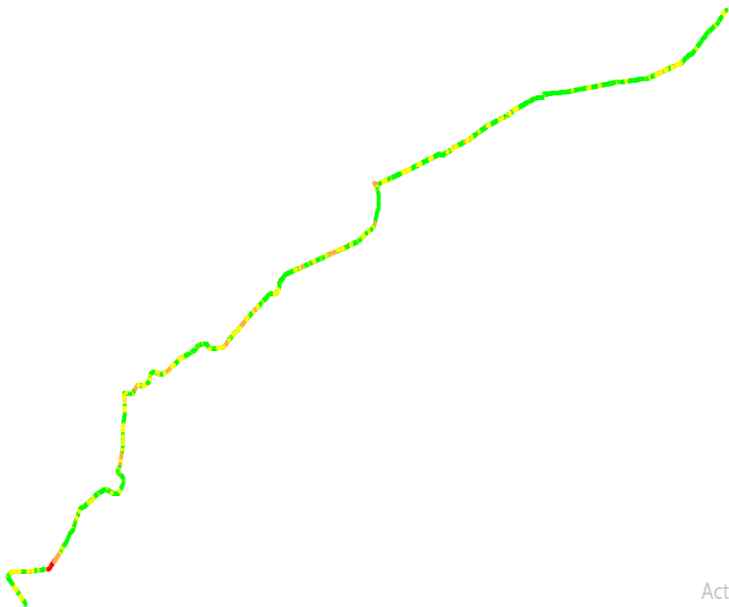
TSP	Coverage Rate %
Airtel 2G	93.6%
BSNL 2G	56.21%
VIL 2G	74.24%
BSNL 3G	74.36%
Airtel VoLTE	97.8%
Jio VoLTE	97.66%
VIL VoLTE	91.99%



TSP-AIRTEL

Technology	Coverage %
2G	93.6%
VoLTE	97.8%

2G



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2G			
Overall RxLevel	# Samples	% PDF	Legend s
[Max, >=-75]	852847	59.6%	
[-75, >=-85)	485977	34.0%	
[-85, >=-95)	82328	5.8%	
[-95, >=Min)	8807	0.6%	
Total	1429959	100%	

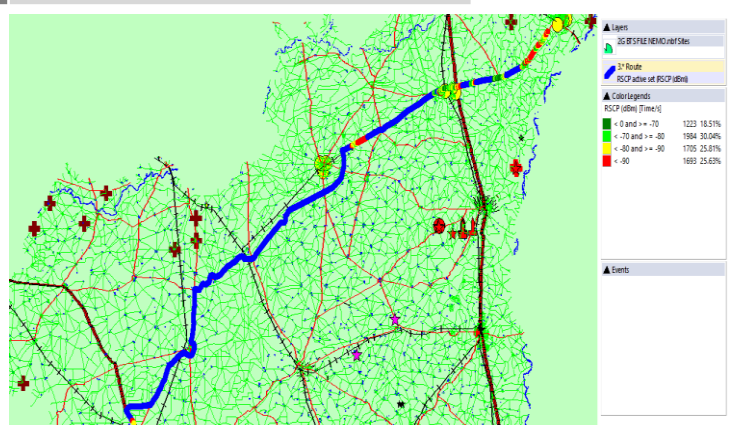
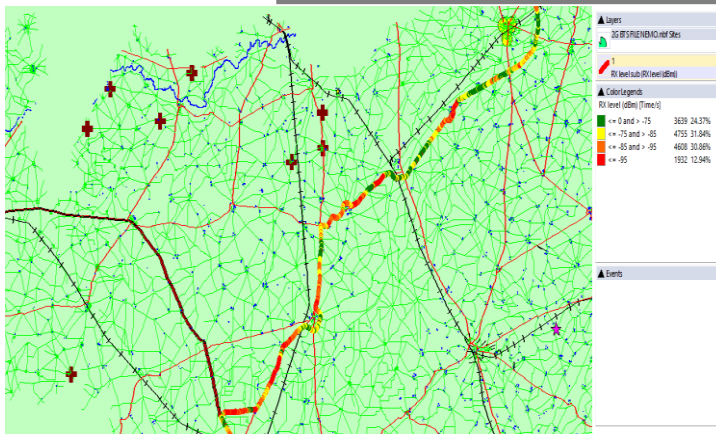
VoLTE



VoLTE			
Overall RSRP	# Samples	% PDF	Legend s
[Max, >=-80]	1006545	38.3%	
[-80, >=-90)	492175	18.7%	
[-90, >=-110)	1070900	40.8%	
[-110, >=Min)	57922	2.2%	
Total	2627542	100%	

TSP- BSNL

Technology		Coverage %
2G		56.21%
2G	3G	74.36%
		3G

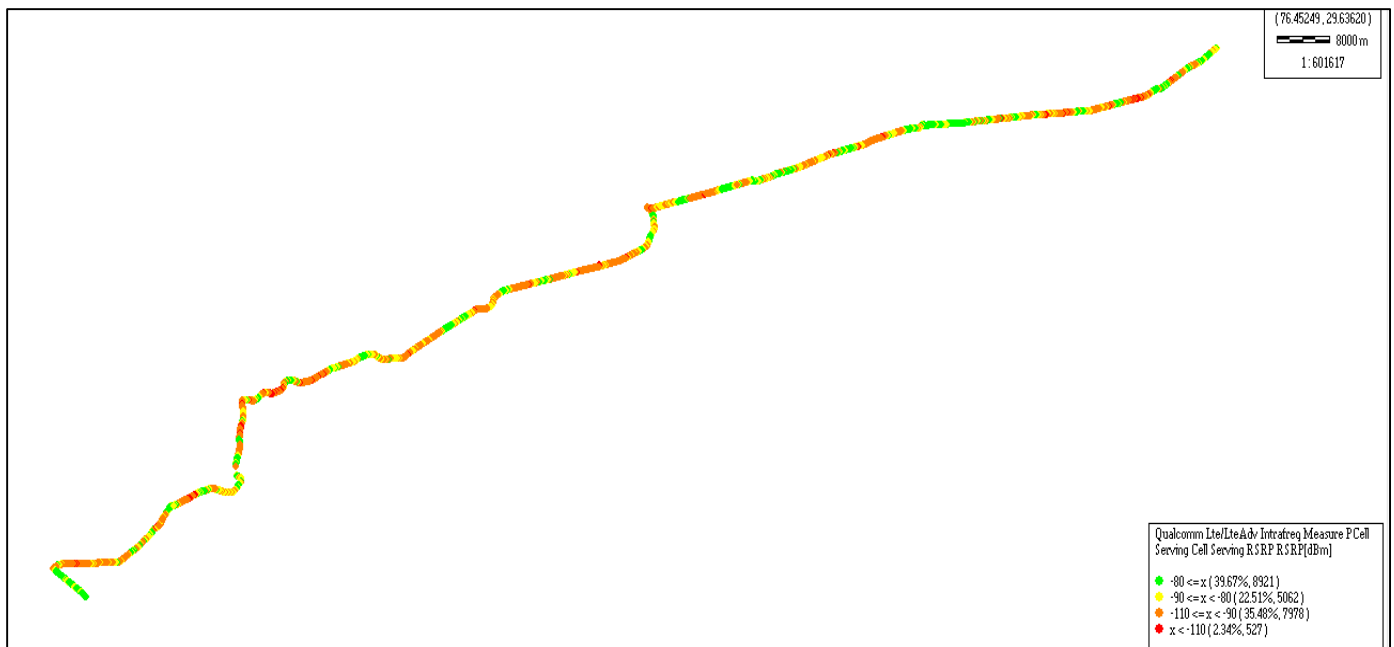


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	3639	24.36%	
[-75, >=-85)	4755	31.84%	
[-85, >=-95)	4608	30.86%	
[-95, >=Min)	1932	12.94%	
Total	14934	100%	

3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	1223	18.51%	
[-70, >=-80)	1984	30.04%	
[-80, >=-90)	1705	25.82%	
[-90, >=Min)	1693	25.63%	
Total	6605	100%	

JIO

Technology	Coverage %
VoLTE	97.66%

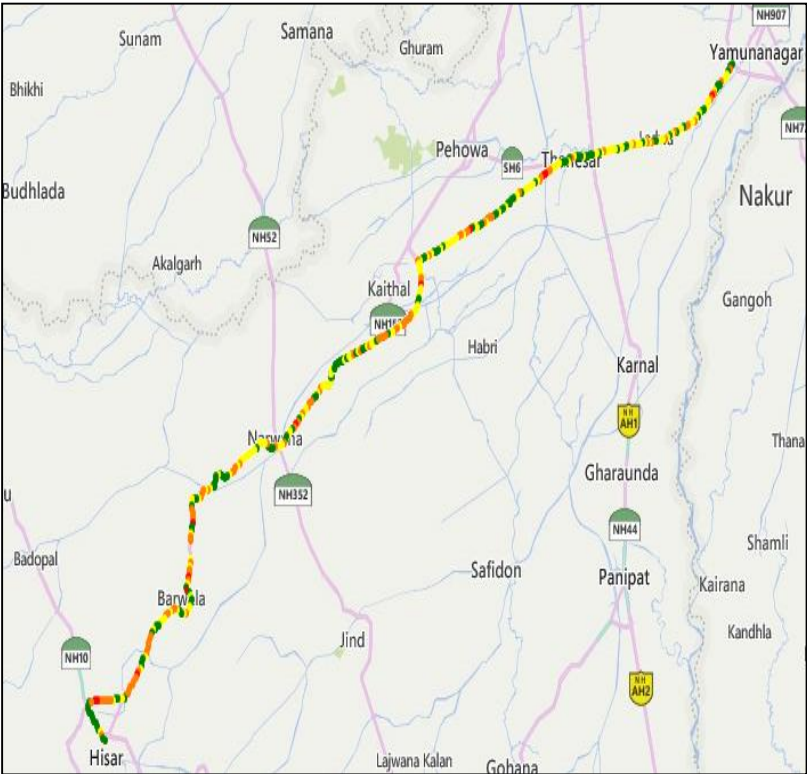


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	8921	39.67%	
[-80, >=-90)	5062	22.51%	
[-90, >=-110)	7978	35.48%	
[-110, >=Min)	527	2.34%	
Total	22488	100%	

VIL

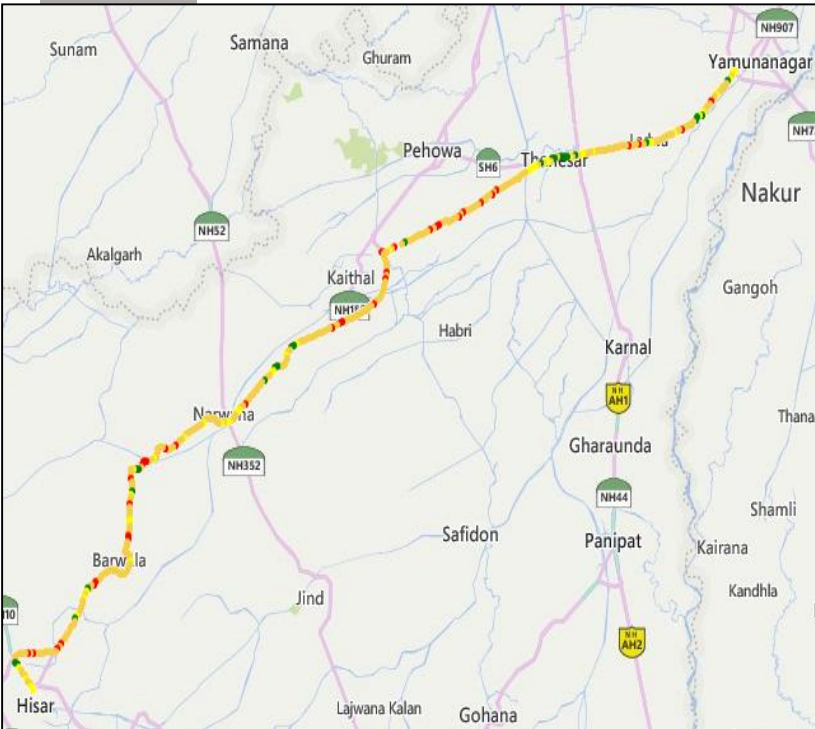
2G

Technology	Coverage Rate %
2G	74.24%
VoLTE	91.99%



2G			
Overall Rx Level	# Samples	% PDF	Legends
[Max, >=-75]	3859	35.36%	
[-75, >=-85)	4244	38.89%	
[-85, >=-95)	2439	22.35%	
[-95, >=Min)	372	3.4%	
Total	10914	100%	

VoLTE

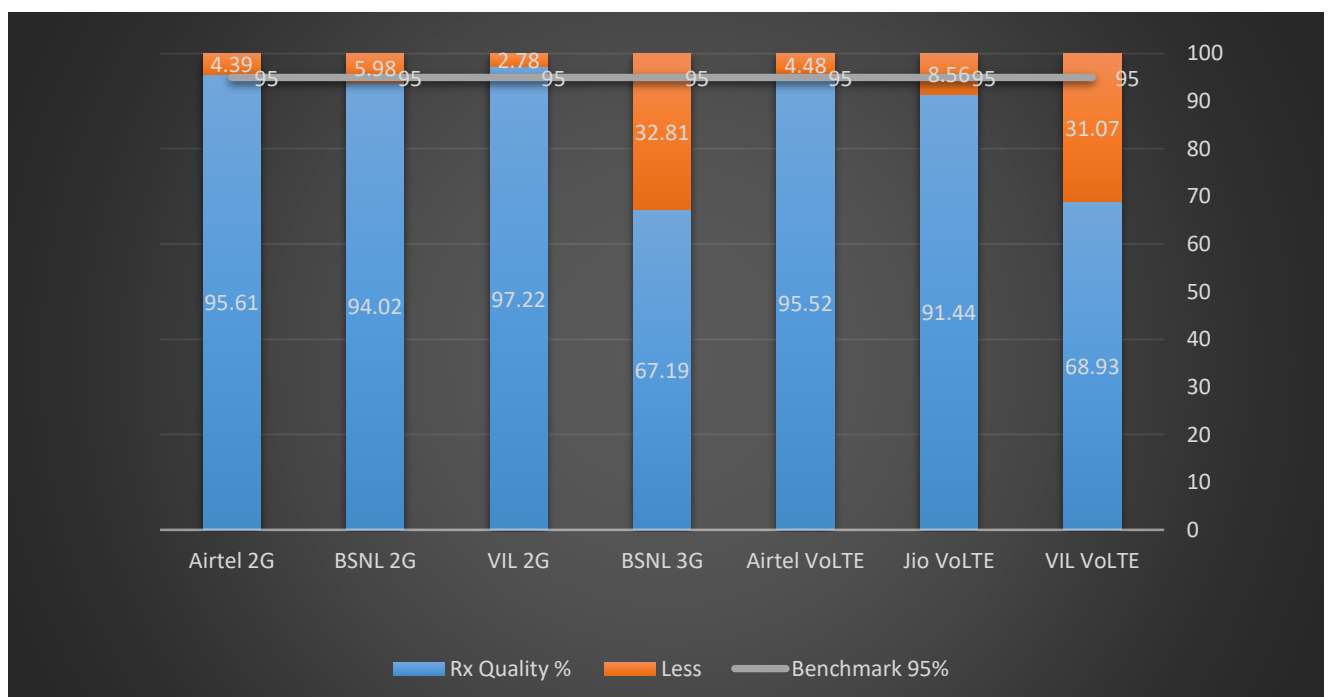


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	5315	23.03%	
[-80, >=-90)	4776	20.70%	
[-90, >=-110)	11139	48.27%	
[-110, >=Min)	1848	8.0%	
Total	23078	100%	

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 $\geq 95\%$.

<u>TSP</u>	Rx Quality %
Airtel 2G	95.61%
BSNL 2G	94.02%
VIL 2G	97.22%
BSNL 3G	67.19%
Airtel VoLTE	95.52%
Jio VoLTE	91.44%
VIL VoLTE	68.93%

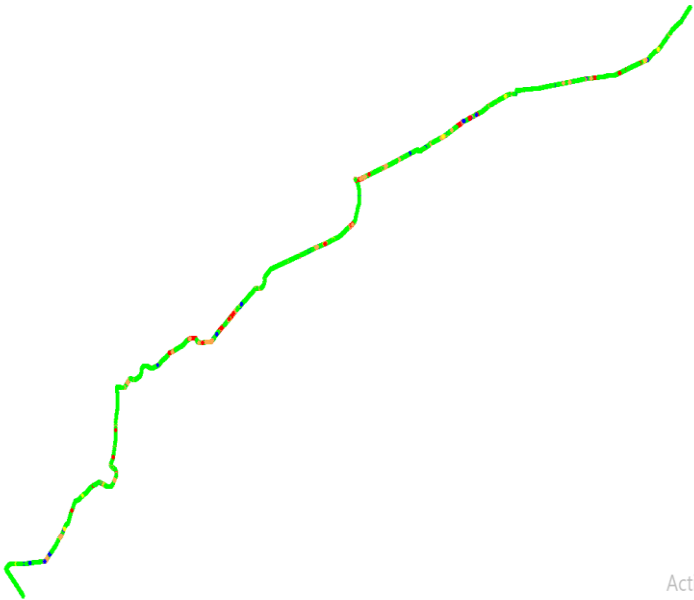


II. Quality Details

Airtel

Technology	Rx Quality %
2G	95.61%
VoLTE	95.52%

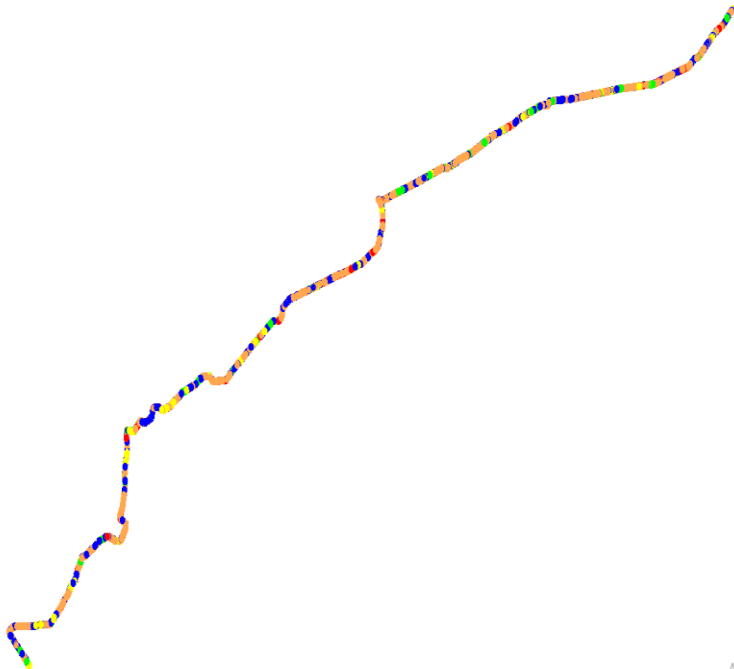
2G



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Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1185348	82.88%	
(2, <=3)	33469	2.34%	
(3 , <=4)	37656	2.63%	
(4 , <=5)	110908	7.76%	
(5 , <=Max)	62758	4.39%	
Total	1430139	100%	

VoLTE



Ac

Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	115272	4.48%	
(0, <=5)	936168	36.42%	
(5, <=10)	659482	25.65%	
(10, <=15)	533117	20.74%	
(15, <=Max)	326738	12.71%	
Total	2570777	100%	

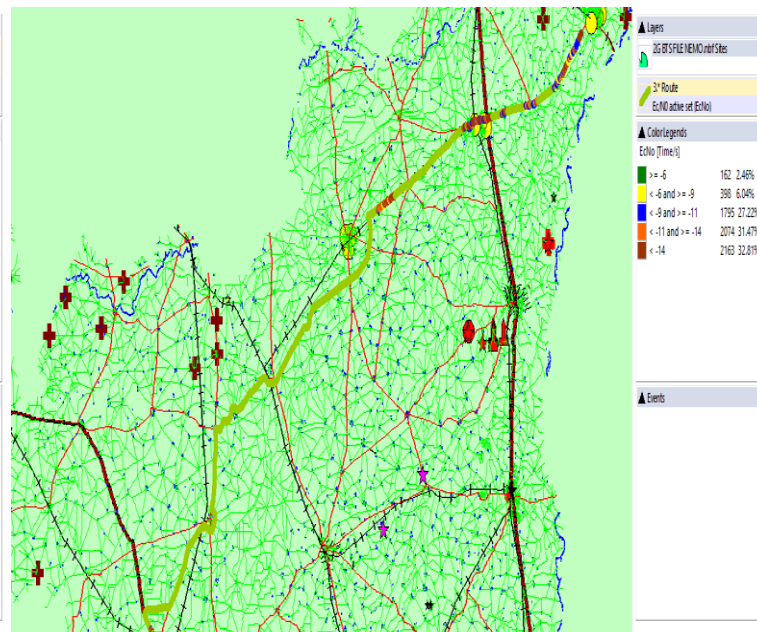
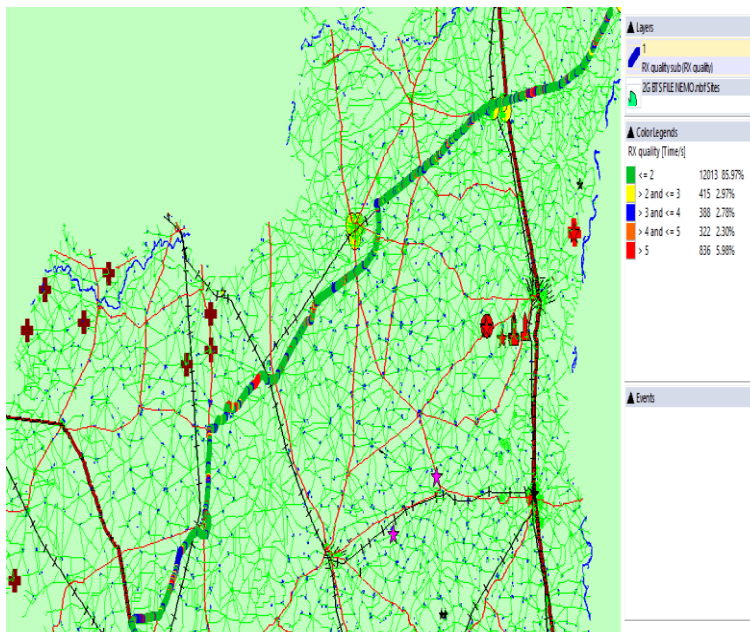
II. Quality Details

BSNL

2G

Technology	Rx Quality %
2G	94.02%
3G	67.19%

3G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	12013	85.97	
(2, <=3)	415	2.97	
(3, <=4)	388	2.78	
(4, <=5)	322	2.30	
(5, <=Max)	836	5.98	
Total	13974	100%	

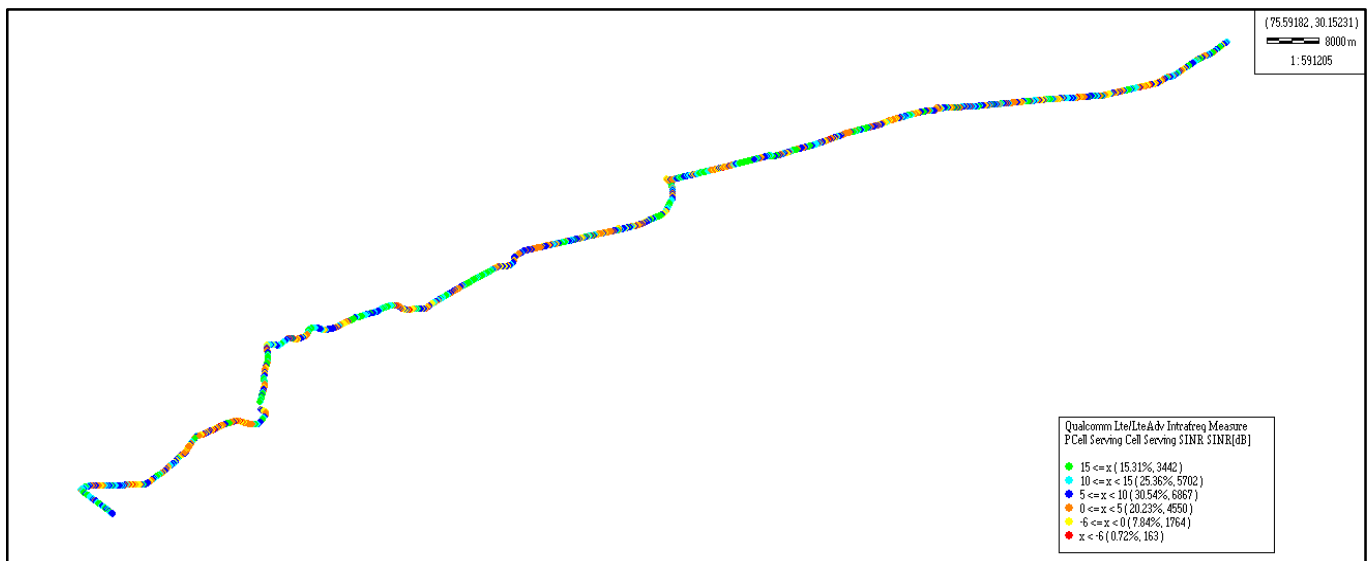
Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	162	2.46%	
(-6, <=-9)	398	6.04%	
(-9, <=-11)	1795	27.22%	
(-11, <=-14)	2074	31.47%	
(-14, <= Min)	2163	32.81%	
Total	6592	100%	

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 $\geq 95\%$.

JIO

Technology	Rx Quality %
VoLTE	91.44%



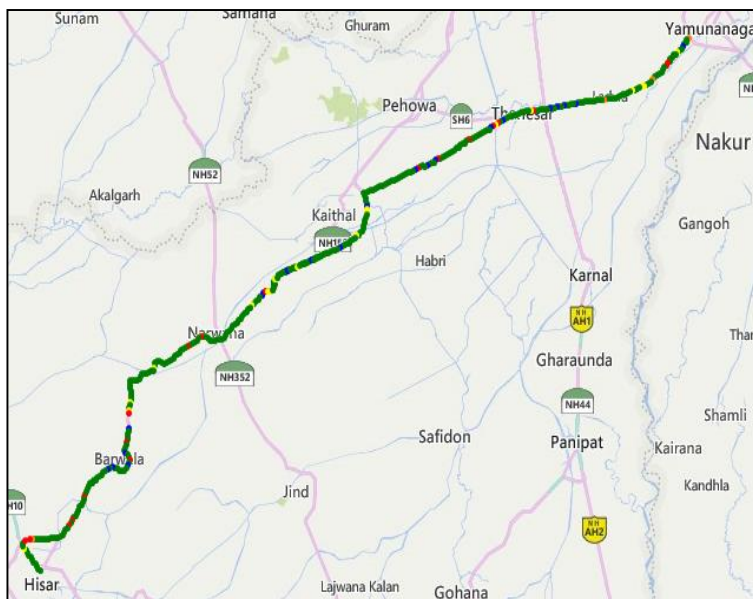
Overall SINR	# Samples	% PDF	Legends
(Min, ≥ -6)	163	0.72%	
(0 \leq -6)	1764	7.84%	
(0, ≤ 5)	4550	20.23%	
(5, ≤ 10)	6867	30.54%	
(10, ≤ 15)	5702	25.36%	
(15, \leq Max)	3442	15.31%	
Total	22488	100%	

II. Quality Details

VIL

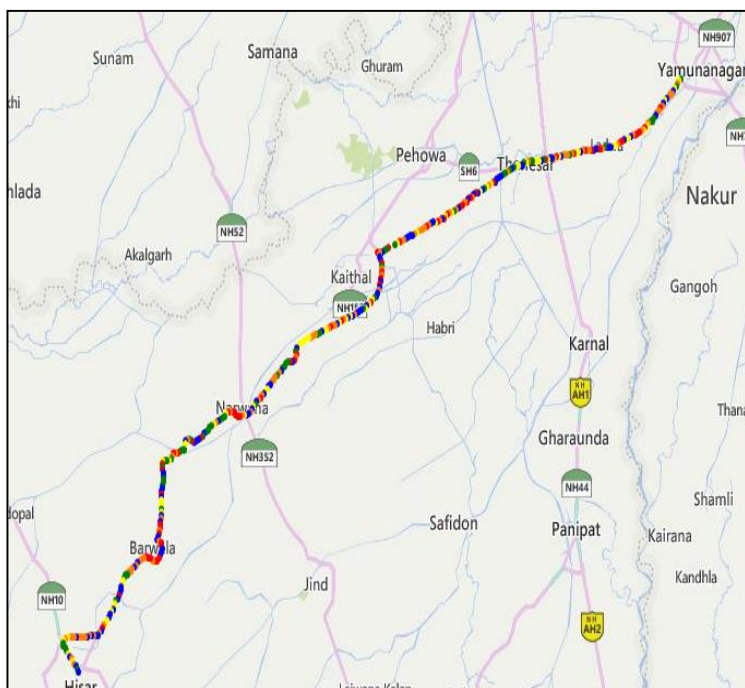
Technology	Rx Quality %
2G	97.22%
4G	68.93%

2G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	8822	87.82%	
(2, <=3)	390	3.88%	
(3, <=4)	382	3.80%	
(4, <=5)	173	1.72%	
(5, <=Max)	279	2.78%	
Total	10046	100%	

VolTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	7171	31.07%	
(0, <=5)	4815	20.86%	
(5, <=10)	4665	20.21%	
(10, <=15)	4220	18.29%	
(15, <=Max)	2206	9.57%	
Total	23077	100%	

III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	26.65%
Airtel VoLTE	100%
Jio VoLTE	100%
VIL VoLTE	100%

