



TELECOM REGULATORY AUTHORITY OF INDIA

Independent Drive Test Report

UP West LSA

May 2025

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1. Introduction

TRAI Act, 1997 mandates the Authority to ensure the services delivered through various telecommunications networks meet required quality standards prescribed, to protect the interest of the consumers of telecommunication services. TRAI is also responsible for conducting the periodical audit of such services provided by the service providers so as to protect the interest of the consumers of telecommunications service.

Accordingly, TRAI has engaged M/s RedMango Analytics Pvt. Ltd. to undertake assessment of Quality of Service of mobile service through Independent Drive Test (IDT).

In IDT, the performance of all service providers providing service in a Licensed Service Area (LSA) through various technologies (like 2G/ 3G/ 4G/ 5G) for voice and data are measured by conducting drive test. The drive test routes are finalised based on various objective criteria like reported network performance, consumer complaints etc. Methodology adopted for conducting IDT is elaborated in **APPENDIX-I**.

2. Executive Summary (LSA)

2.1 Drive test details

This report covers the findings of the IDT undertaken in UP West License Service Area (LSA) during the month of May-2025 under the supervision of TRAI Regional Office (RO) Bhopal. Details of route / area covered during the IDT is as given below:

Sl. No	Drive test route	Type of route	Distance covered (KMs)	From date	To date
1	Moradabad	City	278.3	05-May-2025	07-May-2025
2	Moradabad	Inter Operator Calling	7.2	08-May-2025	08-May-2025
3	Moradabad	Hotspot	09 Locations	07-May-2025	08-May-2025
4	Dehradun to Badrinath	Highway	325.0	21-May-2025	22-May-2025

Table-1: Drive test summary

2.2 Drive test routes

The map provides overview of drive test routes indicating city drive, inter-operator call test, hotspots and Highway as per the legends shown on the map.

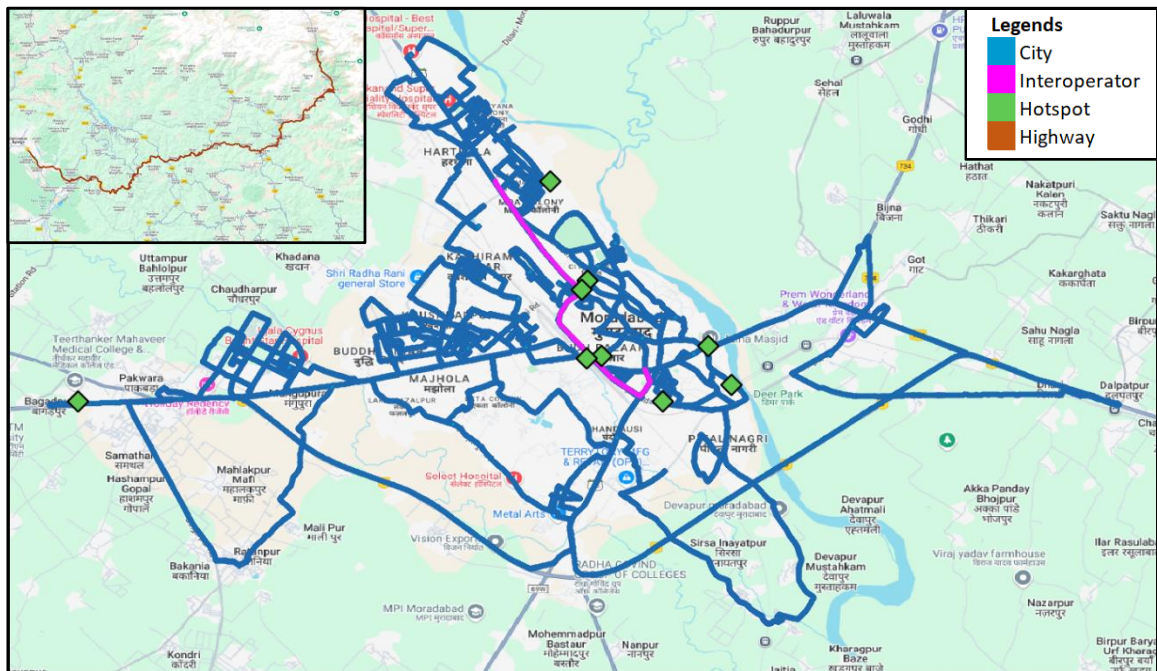


Figure-1: Drive test routes

2.3 Summary of areas covered

a) City-Nearby Dalpatpur, Sirsa Inyatpur, Pital Nagri, Chandausi, Ratanpur, Pakwara, Mangupura, Buddhi Vihar, Khushhalpur, Kashiram Nagar, MDA Colony, Harthala, Ashiyana Colony, Civil Line, Budh Bazaar and Ekta Colony etc.

b) Hotspot-

1. Civil Line Hospital
2. Hindu College Moradabad
3. Jama Masjid
4. Katghar Railway Station
5. Moradabad Railway Station
6. Pili Kothi Chauraha
7. Pital Nagri Bus Depot
8. TMU Hospital
9. Wave Mall

c) Highway

Dehradun to Badrinath Highway passing through Rishikesh, Shivpuri, Devprayag, Dhari, Rudra Prayag, Gauchar, Karna Prayag, Nanda Prayag, Pipalkoti and Joshimath etc.

2.4 Telecom service providers detected frequency bands

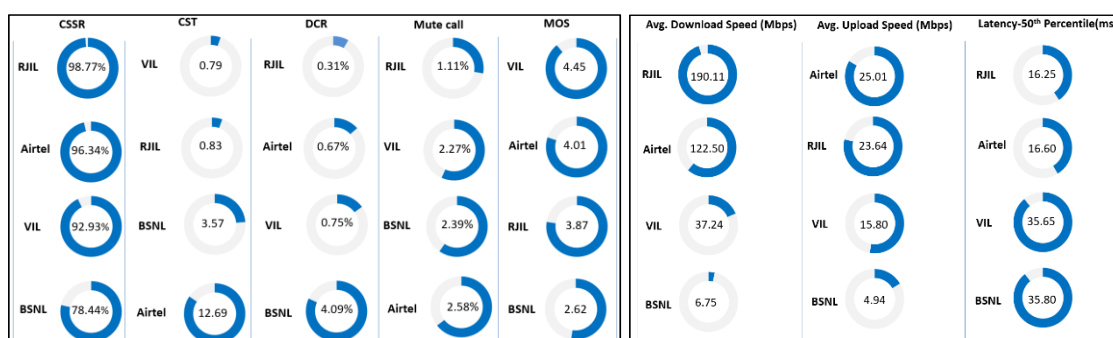
Technologies covered during the IDT and frequency bands in use are summarised in table below:

S.no.	Name of TSP	Technology	Frequency Bands (In MHz)
1	Bharti Airtel Ltd.	2G	1800
2	Bharti Airtel Ltd.	4G	850,1800,2100,2300
3	Bharti Airtel Ltd.	5G	3500
4	BSNL	2G	900
5	BSNL	3G	2100
6	BSNL	4G	700,2100
7	Reliance JIO Infocomm Ltd.	4G	850,1800,2300
8	Reliance JIO Infocomm Ltd.	5G	700,3500
9	Vodafone Idea Ltd.	2G	900
10	Vodafone Idea Ltd.	4G	900,1800,2100,2500

Table-2: Telecom service provider (TSP) covered in IDT

2.5 Performance against key QoS parameters

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milliseconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion Score.



Summary-Voice services

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have 96.34%, 78.44%, 98.77% and 92.93% call setup success rate respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL & VIL have call setup time of 12.69, 3.57, 0.83 and 0.79 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate 0.67%, 4.09%, 0.31% and 0.75% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate 2.58%, 2.39%, 1.11% and 2.27% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 4.01, 2.62, 3.87 and 4.45 respectively.

Summary-Data services

Data Download performance (Overall):

Average download speed of Airtel (5G/4G/2G) is 122.50 Mbps, BSNL (4G/3G/2G) is 6.75 Mbps, RJIL (5G/4G) is 190.11 Mbps and VIL (4G/2G) is 37.24 Mbps.

Data Upload performance (Overall):

Average upload speed of Airtel (5G/4G/2G) is 25.01 Mbps, BSNL (4G/3G/2G) is 4.94 Mbps, RJIL (5G/4G) is 23.64 Mbps and VIL (4G/2G) is 15.80 Mbps.

Data performance - Hotspots (in Mbps):

Airtel- 4G D/L: 20.48	4G U/L: 13.89
5G D/L: 274.99	5G U/L: 46.51
BSNL- 4G D/L: 10.06	4G U/L: 4.81
RJIL- 4G D/L: 24.95	4G U/L: 13.46
5G D/L: 240.16	5G U/L: 36.99
VIL- 4G D/L: 33.43	4G U/L: 16.42

Note- "D/L" Download speed, "U/L" Upload speed

QoS Performance Analysis- UP West LSA

3. QoS performance analysis-LSA level

3.1 Overview

This section provides summary of overall QoS performance of the telecom service provider's network in the LSA by aggregating the results of drive tests conducted in the LSA during the month of May-2025 covering city drive, hotspots and highway (Refer Table 1)

3.2 Voice performance

(a) Voice Call Performance in 3G/2G network mode only: 3G/2G network mode testing has been done to reflect experience for respective users as they have only 3G/2G compatible handsets.

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	858	1036	864
Call Setup Success Rate %	90.91	88.80	92.48
Drop Call Rate %	1.03	3.15	1.13
Call Setup Time-Average (Second)	8.42	4.01	4.59
Handover Success Rate %	98.87	99.80	97.53

Table-3: Summary of voice call performance in 3G/2G network mode only.

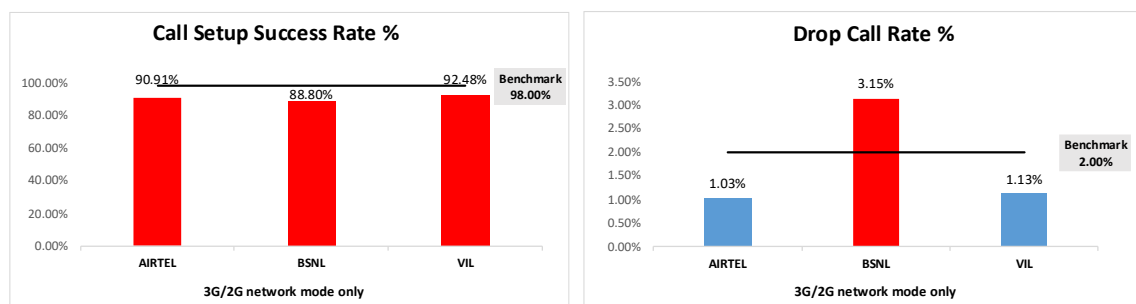


Figure-2: Call setup success rate and drop call rate performance.

Number of unique cell Id's covered in Voice test- Technology wise			
Technology	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
3G	NA	134	NA
2G	773	229	556

Table-4: Technology wise number of network cell Id's latched during drive test.

Note-

- RJIL does not have 3G/2G network.
- NA- Service provider doesn't provide services in respective technology.

(b) Voice Call Performance in auto network selection mode (5G/4G/3G/2G)

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempts	928	1215	975	1004
Call Setup Success Rate %	96.34	78.44	98.77	92.93
Drop Call Rate %	0.67	4.09	0.31	0.75
Call Setup Time-Average (Second)	12.69	3.57	0.83	0.79
Handover Success Rate %	99.85	99.65	99.87	99.97

Table-5: Summary of voice call performance in network auto-selection mode.

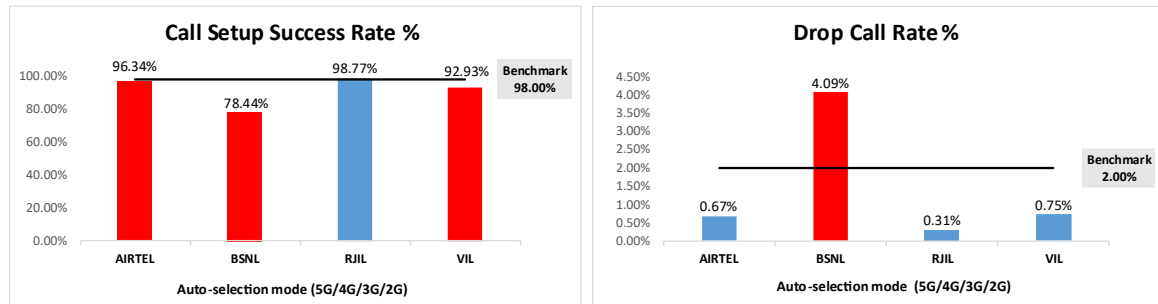


Figure-3: Performance for call setup success rate and drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	736	837	809	793
Number of silence call for >4 Sec	19	20	9	18
Silence Call Rate %	2.58	2.39	1.11	2.27
Number of silence instances for >4 Sec	25	21	17	20
Number of silence instances for >3 Sec	41	32	34	27
Number of silence instances for >2 sec	70	53	65	71
RTP Jitter (4G & 5G) in ms	3.73	14.76	8.09	14.17
Packet loss Rate Downlink %	0.76	6.74	0.55	0.85
Packet loss Rate Uplink %	0.68	7.87	0.59	0.85

Table-6: Summary of silence instances & packet loss rate for mobile to mobile calls.

Number of unique cell Id's covered in Voice test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
5G	0	NA	623	NA
4G	1367	414	1993	1137
3G	NA	99	NA	NA
2G	11	184	NA	64

Table-7: Technology wise number of network cell Id's latched during drive test.

Note-

- NA- Service provider doesn't provide services in respective technology.
- 0- No cell Id's were found in respective technology.

(c) Mean Opinion Score (MOS) performance for speech quality:

Mean opinion score indicates quality of speech observed during the drive test across different technologies. This parameter has been calculated for mobile-to-mobile calls made within same operator network in auto mode (5G/4G/3G/2G). As per ITU-T Recommendation P.863.1, MOS values means: 5-Excellent, 4-Good, 3-Fair, 2-Poor, 1-Bad.

Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
Total Number of MOS Samples for calls table-6	5265	4432	5720	5477
Speech Quality (Average MOS)	4.01	2.62	3.87	4.45
Number of samples with MOS ≥ 4 to < 5 (Excellent)	4498	842	4034	4707
Number of samples with MOS ≥ 3 to < 4 (Good)	629	795	1307	602
Number of samples with MOS ≥ 2 to < 3 (Fair)	60	1214	219	106
Number of samples with MOS ≥ 1 to < 2 (Poor)	78	1581	160	62
%age of samples with MOS ≥ 4 to < 5 (Excellent)	85.43%	19.00%	70.52%	85.94%
%age of samples with MOS ≥ 3 to < 4 (Good)	11.95%	17.94%	22.85%	10.99%
%age of samples with MOS ≥ 2 to < 3 (Fair)	1.14%	27.39%	3.83%	1.94%
%age of samples with MOS ≥ 1 to < 2 (Poor)	1.48%	35.67%	2.80%	1.13%

Table-8: Summary of speech quality (MOS) samples.

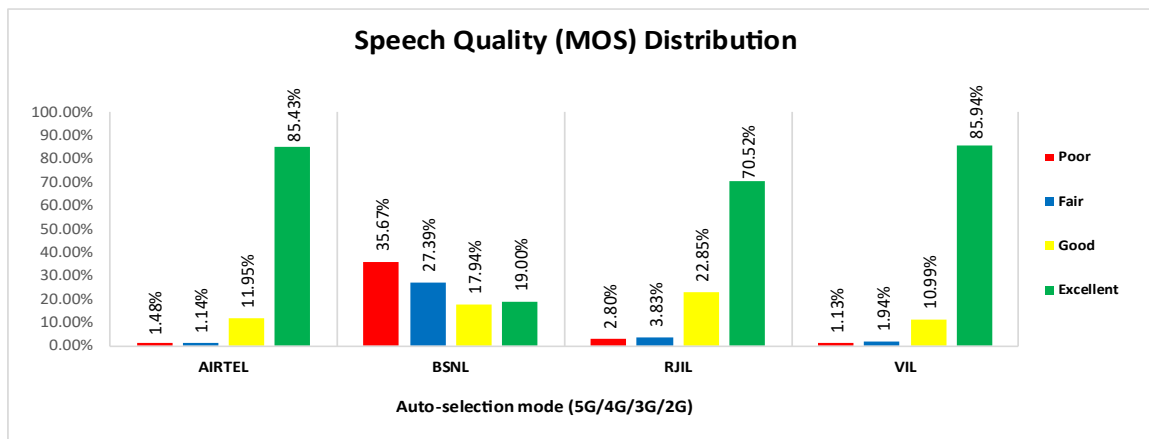


Figure- 4: Distribution of samples in MOS range.

(d) Inter-service provider voice call performance: To check the performance of inter-service provider call setup success rate, total 19 to 26 inter operator calls were attempted. The Call setup success rate and call setup time observation are as below.

Call Setup Success Rate %				
From Service Provider	To Service Provider			
	AIRTEL	BSNL	RJIL	VIL
AIRTEL	NA	100.00	100.00	100.00
BSNL	90.00	NA	90.48	95.45
RJIL	100.00	70.00	NA	100.00
VIL	85.00	100.00	100.00	NA

Table-9: Call setup success rate across service providers

Note-

- NA- Only inter-operator calls were measured during test.

Call setup time average (seconds)				
From Service Provider	To Service Provider			
	AIRTEL	BSNL	RJIL	VIL
AIRTEL	NA	19.21	17.59	17.46
BSNL	3.51	NA	3.45	3.28
RJIL	2.28	3.86	NA	1.68
VIL	3.17	3.39	2.97	NA

Table-10: Call setup time across service providers

Note-

- NA- Only inter-operator calls were measured during test.

3.3 Data performance

(a) Data Parameters (Auto-selection mode- 5G/4G/3G/2G)

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	122.50	6.75	190.11	37.24
	80th Percentile	221.36	12.48	329.86	58.63
	20th Percentile	15.22	0.46	16.31	14.36
Upload Throughput (Mbits/s)	Average	25.01	4.94	23.64	15.80
	80th Percentile	41.61	8.90	46.39	26.44
	20th Percentile	3.42	1.39	2.42	5.24
Latency (ms)	50th Percentile	16.60	35.80	16.25	35.65

Table-11: Summary of data performance in network auto-selection mode.

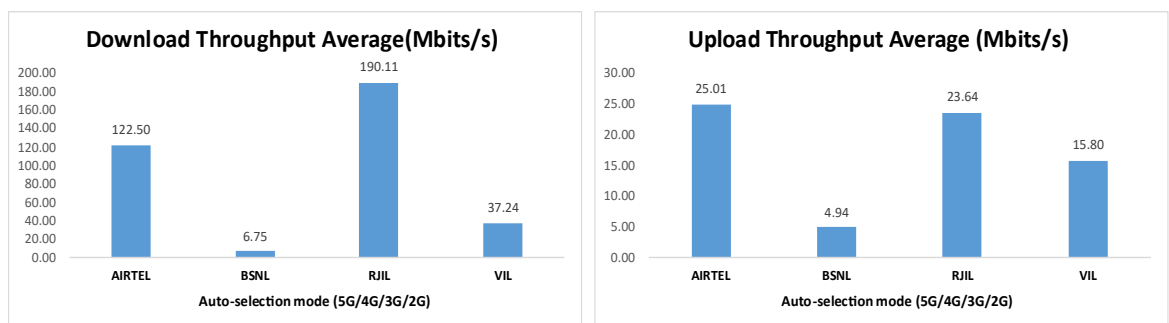


Figure- 5: Download and Upload throughput

Number of unique cell Id's covered in Data test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
5G	0	NA	815	NA
4G	1503	405	712	1073
3G	NA	127	NA	NA
2G	26	46	NA	54

Table-12: Technology wise number of network cell Id's latched during drive test.

Note-

- NA- Service provider doesn't provide services in respective technology.
- 0- No cell Id's were found in respective technology.

Detailed QoS Performance Analysis

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	616	737	629
Call Setup Success Rate %	98.86	92.13	98.89
Drop Call Rate %	0.66	2.36	0.00
Call Setup Time-Average (Second)	6.44	3.59	4.50
Handover Success Rate %	98.94	99.78	97.01

Table-13: Summary of voice call performance in 3G/2G network mode only.

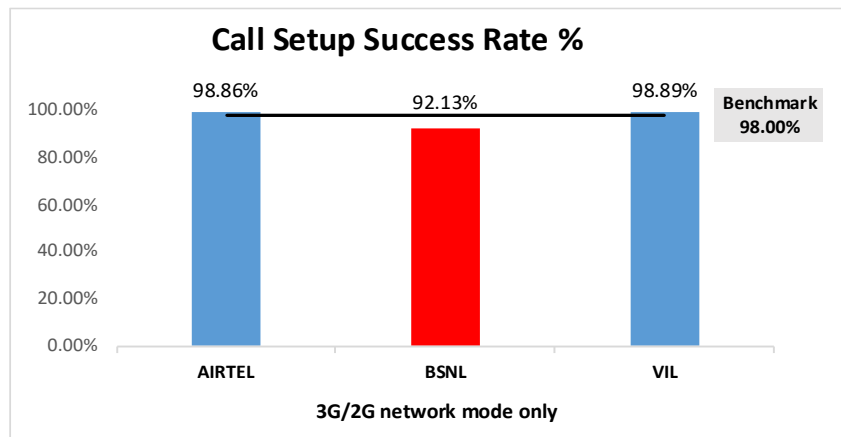


Figure-7: Performance for call setup success rate.

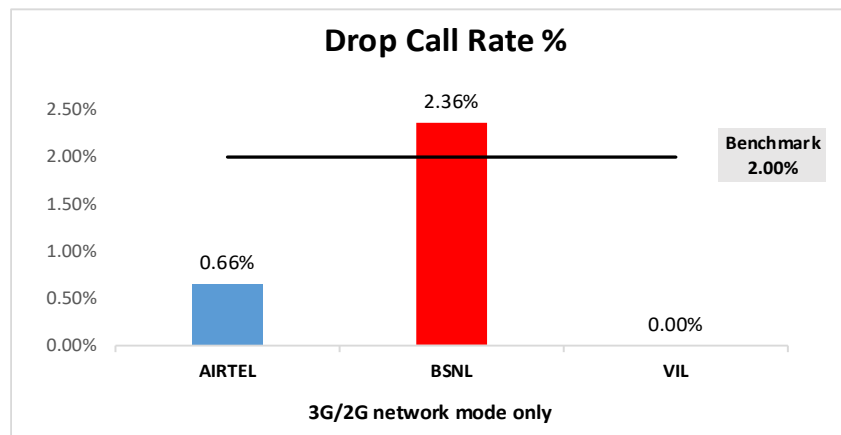


Figure-8: Performance for drop call rate.

(b) Network Technology: This section represent time spent on various network technologies.

Technology	Service Provider		
	AIRTEL	BSNL	VIL
3G	NA	72.05%	NA
2G	99.98%	27.67%	99.96%
Limited Service	0.02%	0.28%	0.04%

Table-14: Time spent on technology during drive test 3G/2G network mode.

Note-

- NA- Service provider doesn't provide services in respective technology.

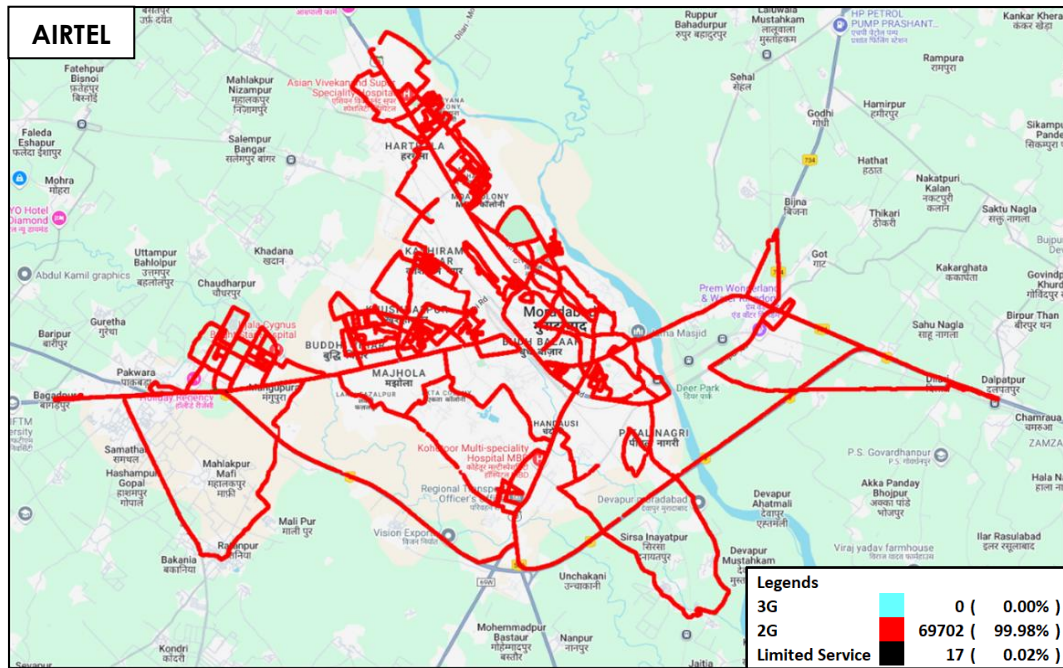


Figure-9: Serving technology plots 3G/2G network mode – AIRTEL

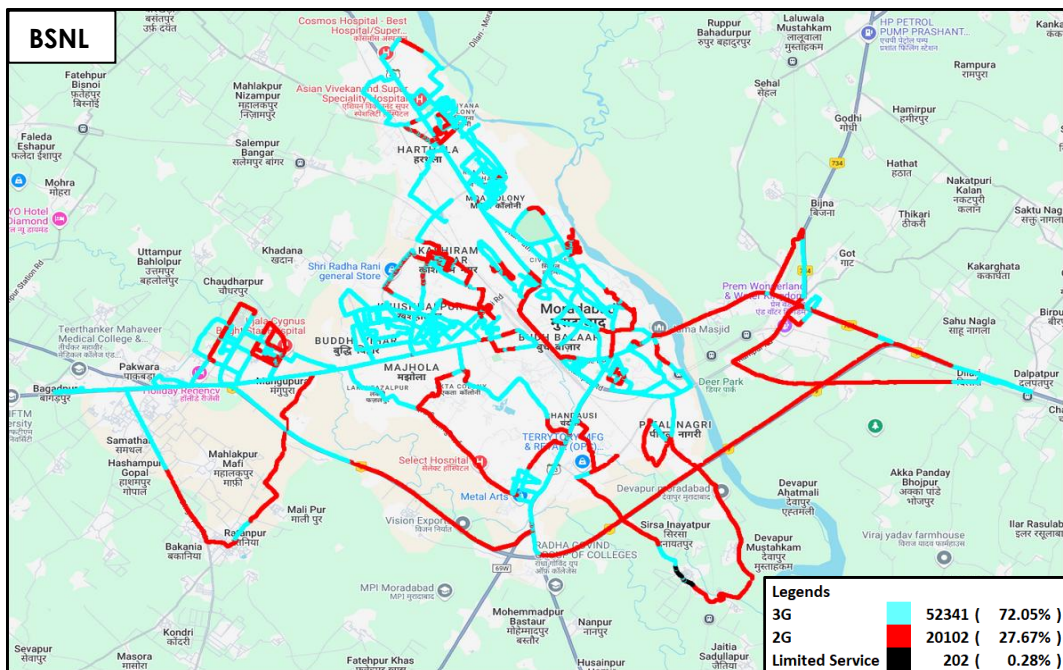


Figure-10: Serving technology plots 3G/2G network mode –BSNL.

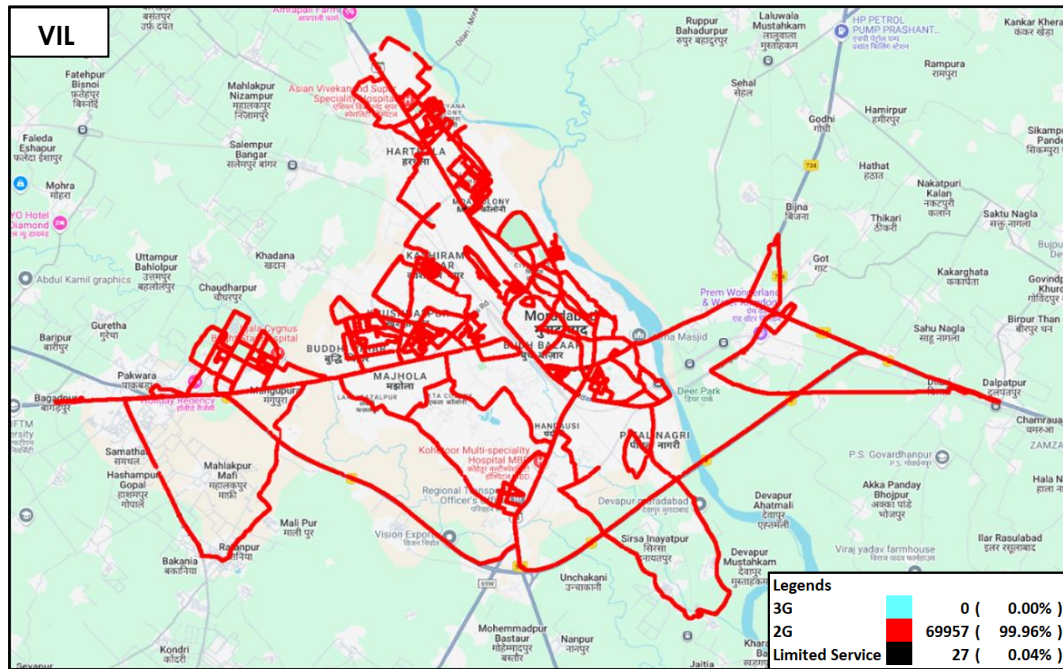


Figure-11: Serving technology plots 3G/2G network mode –VIL.

(c) Network Signal Strength Distribution: The following chart represents signal strength distribution for 3G/2G network mode only. (Refer figure- 41, 42 & 43 for map view)

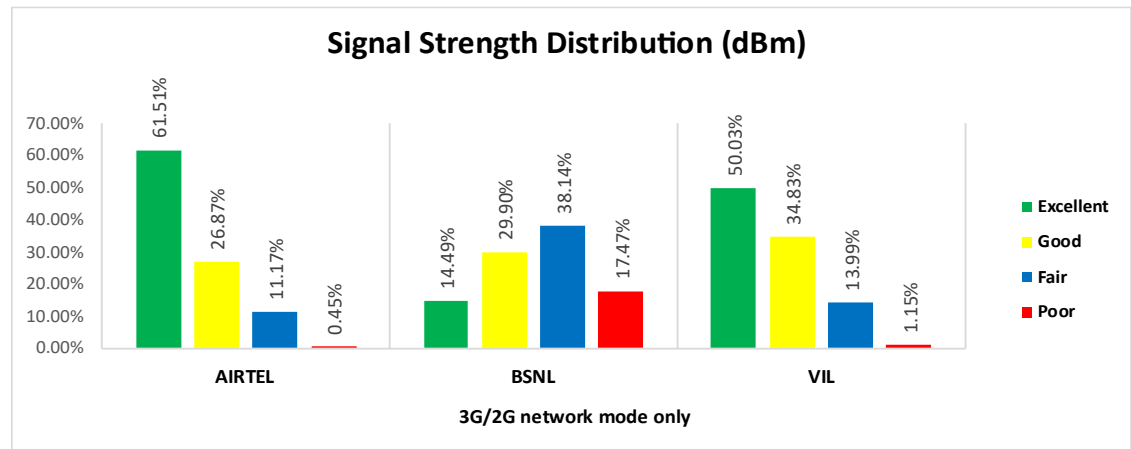


Figure-12: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 62% of samples falling in the excellent signal strength category.
- BSNL has 14% of samples falling in the excellent signal strength category.
- VIL has 50% of samples falling in the excellent signal strength category.

(d) Voice Call Performance in auto network selection mode (5G/4G/3G/2G)

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempts	621	798	669	664
Call Setup Success Rate %	100.00	81.70	100.00	100.00
Drop Call Rate %	0.00	2.30	0.15	0.15
Call Setup Time Average (Second)	10.82	3.06	0.76	0.61
Handover Success Rate %	99.91	99.51	99.97	99.96

Table-15: Summary of voice call performance in network auto-selection mode.

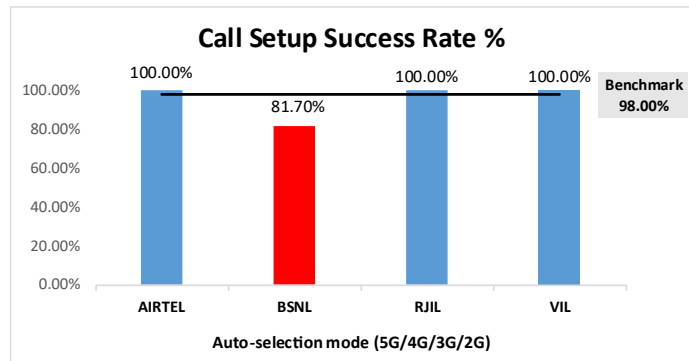


Figure-13: Performance for call setup success rate.

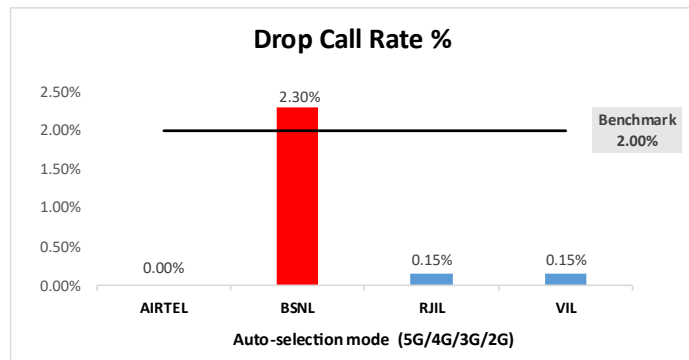


Figure-14: Performance for drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	582	627	638	641
Number of silence call for >4 Sec	0	11	0	0
Silence Call Rate %	0.00	1.75	0.00	0.00
Number of silence instances for >4 Sec	0	11	0	0
Number of silence instances for >3 Sec	7	20	1	2
Number of silence instances for >2 sec	13	34	9	20
RTP Jitter (4G & 5G) in ms	3.12	14.72	7.31	15.32
Packet loss Rate Downlink %	0.27	5.74	0.19	0.50
Packet loss Rate Uplink %	0.19	4.95	0.20	0.44

Table-16: Summary of silence instances & packet loss rate for mobile to mobile call.

(e) Mean Opinion Score (MOS) performance for speech quality:

Mean opinion score indicate quality of speech observed during the drive test across different technologies. This parameter has been calculated for mobile to mobile calls made within same operator network in auto mode (5G/4G/3G/2G). As per ITU-T Recommendation P.863.1, MOS value means: 5-Excellent, 4-Good, 3-Fair, 2-Poor, 1-Bad.

Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
Total Number of MOS Samples for calls in table-16	3462	2882	3728	3750
Speech Quality (Average MOS)	4.05	3.04	3.93	4.46
Number of samples with MOS ≥ 4 to < 5 (Excellent)	3066	823	2714	3242
Number of samples with MOS ≥ 3 to < 4 (Good)	358	728	847	422
Number of samples with MOS ≥ 2 to < 3 (Fair)	21	721	129	72
Number of samples with MOS ≥ 1 to < 2 (Poor)	17	610	38	14
%age of samples with MOS ≥ 4 to < 5 (Excellent)	88.56%	28.56%	72.80%	86.45%
%age of samples with MOS ≥ 3 to < 4 (Good)	10.34%	25.26%	22.72%	11.25%
%age of samples with MOS ≥ 2 to < 3 (Fair)	0.61%	25.02%	3.46%	1.92%
%age of samples with MOS ≥ 1 to < 2 (Poor)	0.49%	21.17%	1.02%	0.37%

Table-17: Summary of speech quality (MOS) samples.

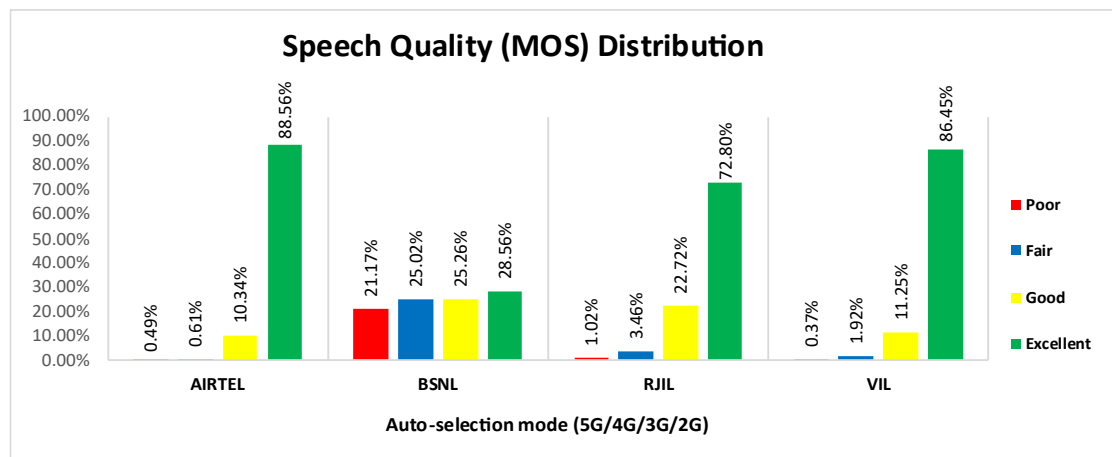


Figure-15: Distribution of samples in MOS range.

(f) Network Technology: This section represents time spent on various network technologies.

Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	3.36%	NA	19.76%	NA
4G	96.64%	75.90%	80.24%	100.00%
3G	NA	12.52%	NA	NA
2G	0.00%	10.48%	NA	0.00%
Limited Service	0.00%	1.09%	0.00%	0.00%

Table-18: Time spent on technology during drive test.

Note-

- NA- Service provider doesn't provide services in respective technology.

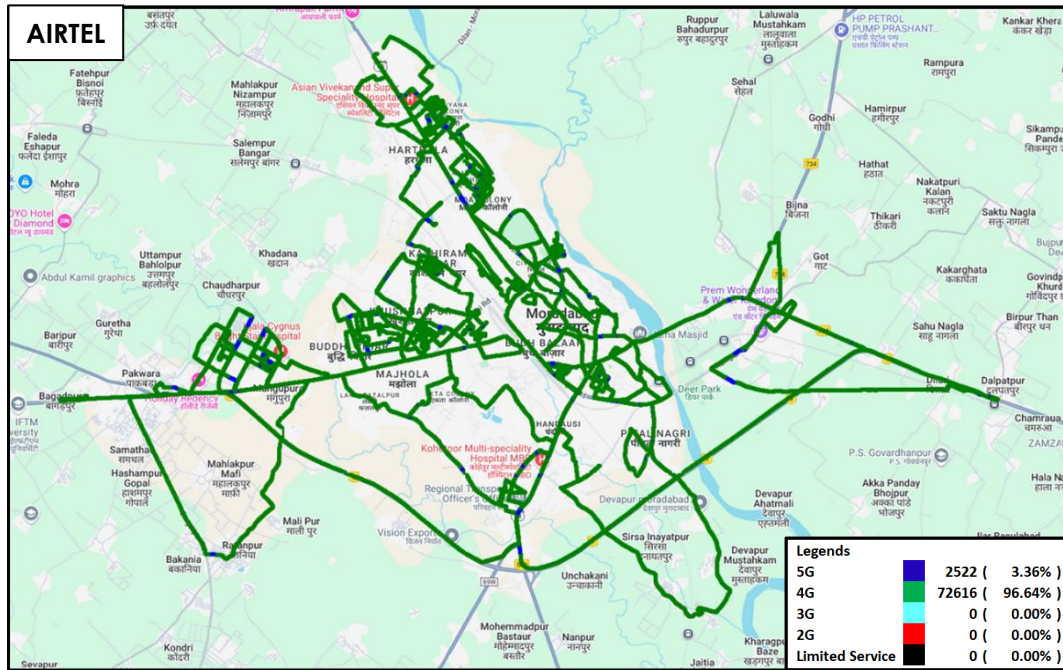


Figure-16: Serving technology plots in auto-selection mode (5G/4G/3G/2G) -AIRTEL.

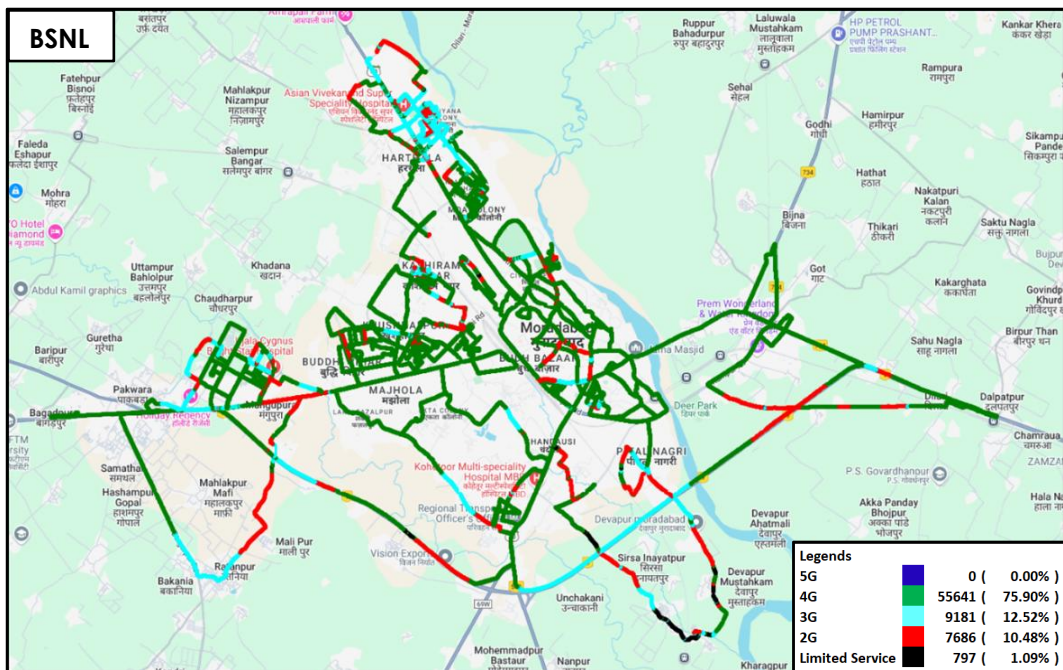


Figure-17: Serving technology plots in auto-selection mode (5G/4G/3G/2G) -BSNL.

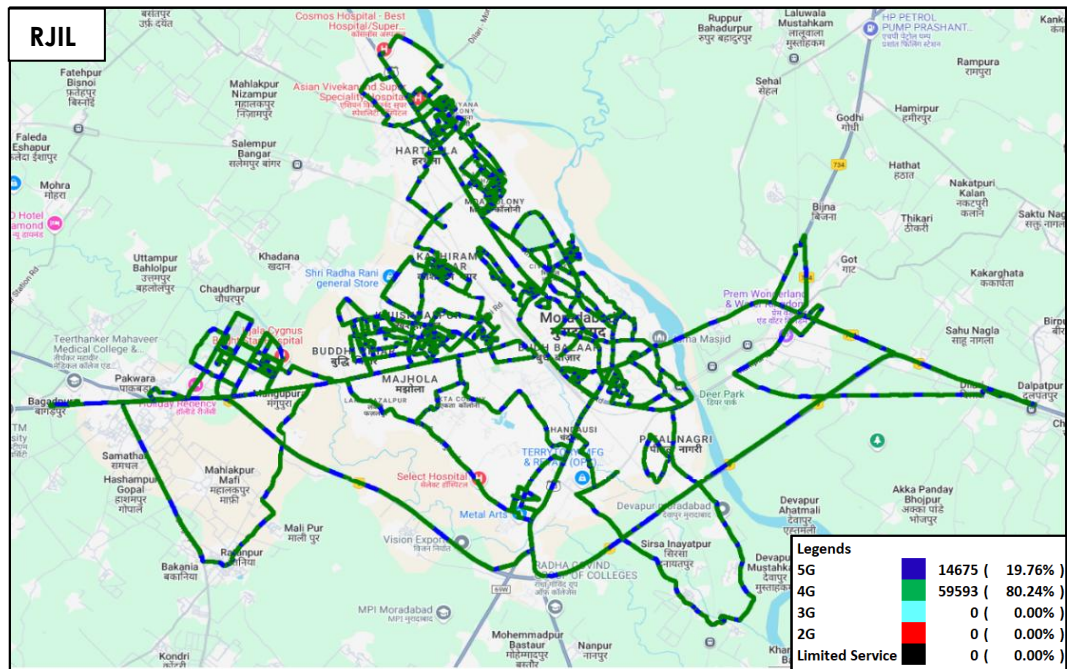


Figure-18: Serving technology plots in auto-selection mode (5G/4G/3G/2G)- RJIL.

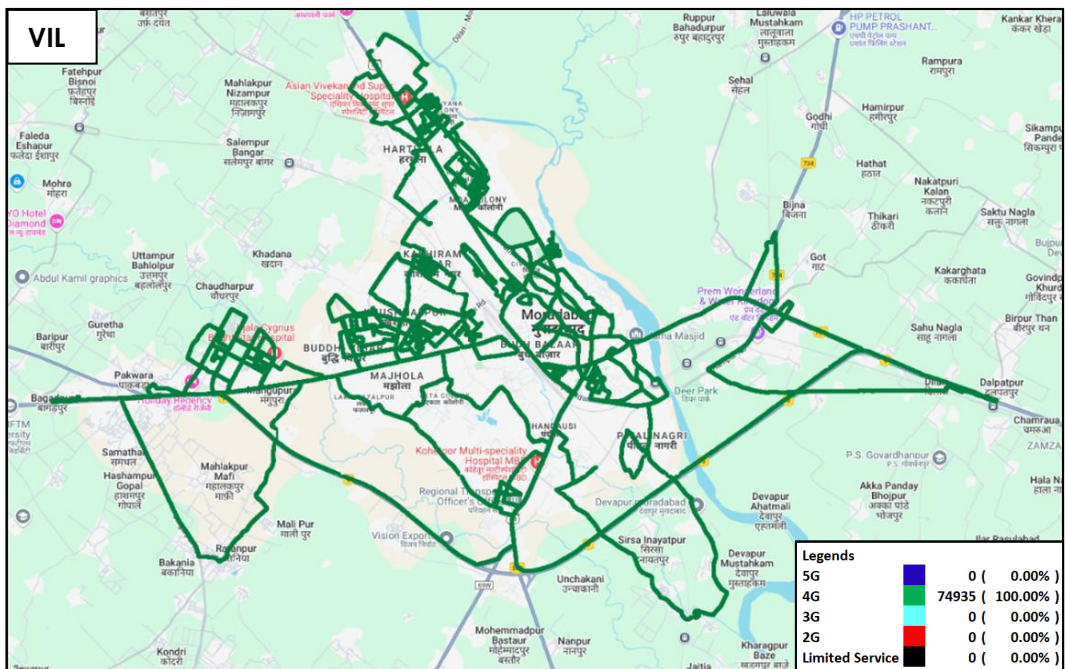


Figure-19: Serving technology plots in auto-selection mode (5G/4G/3G/2G) – VIL

(g) Network Signal Strength Distribution: The following chart provide signal strength distribution for auto-selection mode (5G/4G/3G/2G). (Refer figure-44, 45, 46 & 47 for map view)

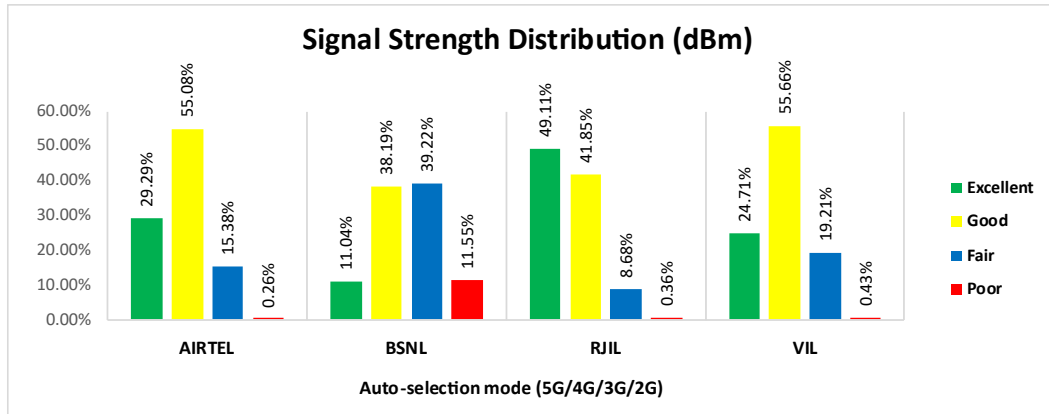


Figure-20: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

Observations:

- Airtel has 29% of samples falling in the excellent signal strength category.
- BSNL has 11% of samples falling in the excellent signal strength category.
- RJIL has 49% of samples falling in the excellent signal strength category.
- VIL has 25% of samples falling in the excellent signal strength category.

4.2.4 Data performance

(a) Data Parameters (Auto-selection mode- 5G/4G/3G/2G)

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	139.05	8.62	233.60	41.32
	80th Percentile	244.46	15.27	371.07	65.44
	20th Percentile	20.22	1.38	67.93	17.15
Upload Throughput (Mbits/s)	Average	27.53	5.35	28.79	17.52
	80th Percentile	44.23	9.66	51.15	28.08
	20th Percentile	5.65	1.50	6.40	7.25
Latency (ms)	50th Percentile	15.55	33.90	14.85	37.65

Table-19: Summary of Data performance in network auto-selection mode.

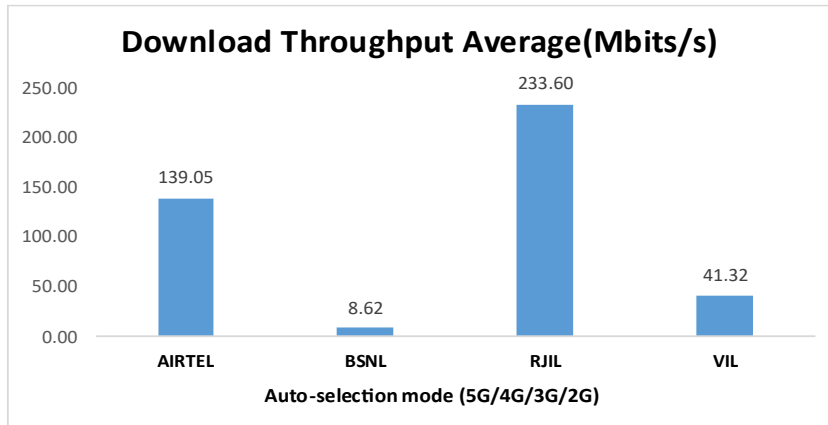


Figure- 21: Download throughput

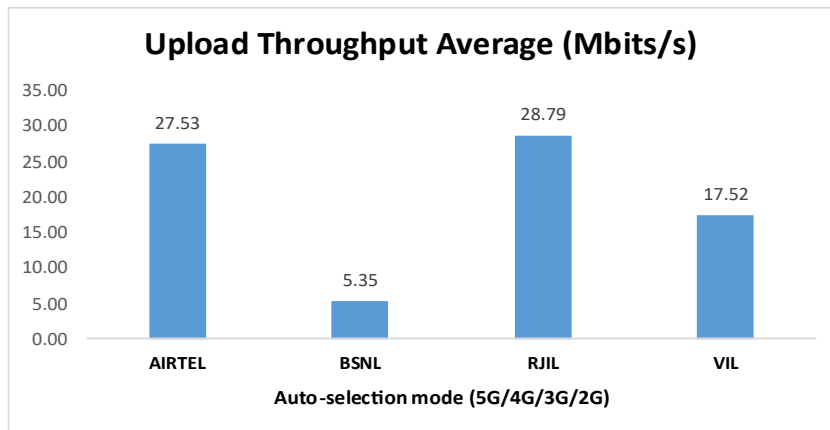


Figure- 22: Upload throughput

4.3 Hotspots

Hotspot testing have been done on 07th May 2025 and 08th May 2025. Nine locations have been tested in Moradabad.

4.3.1 Locations

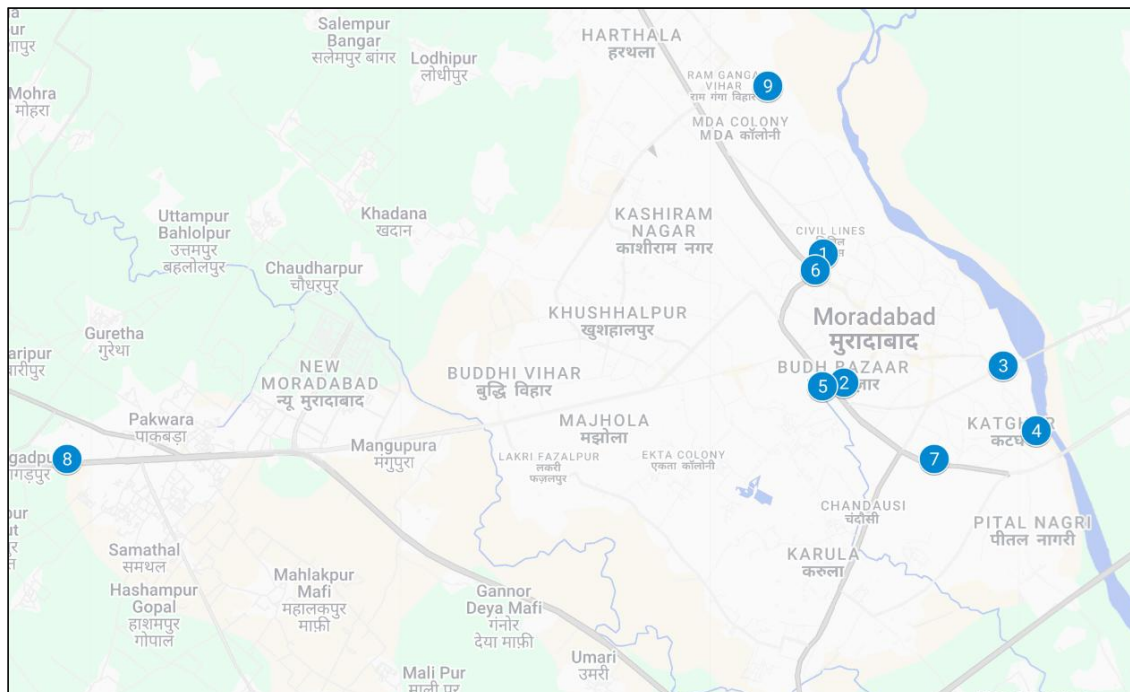


Figure- 23: Hotspot locations

4.3.2 Hotspot covered

1. Civil Line Hospital
2. Hindu College Moradabad
3. Jama Masjid
4. Katghar Railway Station
5. Moradabad Railway Station
6. Pili Kothi Chauraha
7. Pital Nagri Bus Depot
8. TMU Hospital
9. Wave Mall

4.3.3 Voice performance

Overall Voice Performance				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	90	90	90	90
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.63	2.62	0.65	0.59

Table-20: Overall summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Civil Line Hospital				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.61	3.90	0.60	0.52

Table-21: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Hindu College Moradabad				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.58	2.10	0.61	0.62

Table-22: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Jama Masjid				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.61	2.06	0.63	0.62

Table-23: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Katghar Railway Station				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.52	2.39	0.65	0.55

Table-24: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Moradabad Railway Station				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.62	2.10	0.73	0.59

Table-25: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Pili Kothi Chauraha				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.57	2.13	0.64	0.60

Table-26: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Pital Nagri Bus Depot				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.99	4.34	0.79	0.68

Table-27: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

TMU Hospital				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.61	2.52	0.59	0.61

Table-28: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Wave Mall				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	16.56	2.07	0.59	0.56

Table-29: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

4.3.4 Data performance (Auto-selection mode 5G/4G/3G/2G)

Overall Data Performance				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	160.13	11.80	254.45	37.06
Download Throughput 80th Percentile (Mbit/s)	279.11	15.64	410.78	54.97
Download Throughput 20th Percentile (Mbit/s)	26.80	6.80	96.24	19.19
Download Session Setup Success Rate %	100.00	86.67	100.00	100.00
Upload Throughput Average (Mbits/s)	41.04	4.98	40.35	14.32
Upload Throughput 80th Percentile (Mbit/s)	59.72	7.05	65.80	27.08
Upload Throughput 20th Percentile (Mbit/s)	18.00	1.86	7.58	4.45
Upload Session Setup Success Rate %	100.00	88.89	100.00	100.00
Web Browsing Delay (Second)	1.60	1.92	1.81	3.95
Youtube Initial Buffer Delay (Second)	0.95	1.48	1.16	2.65
Latency (ms) - 50th Percentile	16.10	34.90	14.65	31.30
Jitter (ms)	14.71	8.08	71.66	2.95
Packet Loss Rate%	0.74	2.27	2.18	0.09
Packet Loss Rate- 90th percentile	1.54	4.40	5.24	0.22

Table-30: Overall Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Civil Line Hospital				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	273.78	-	175.13	46.90
Download Session Setup Success Rate %	100.00	0.00	100.00	100.00
Upload Throughput Average (Mbits/s)	39.77	-	6.01	28.87
Upload Session Setup Success Rate %	100.00	0.00	100.00	100.00
Web Browsing Delay (Second)	2.52	-	1.41	3.54
Youtube Initial Buffer Delay (Second)	2.51	-	2.86	2.70
Latency (ms) - 50th Percentile	15.40	-	13.13	34.05
Jitter (ms)	3.39	-	6.80	4.47
Packet Loss Rate%	0.30	100.00	0.00	0.30

Table-31: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note--"All data tests were failed.

Hindu College Moradabad				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	61.19	7.90	375.43	46.15
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	28.49	1.90	37.04	19.90
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.47	1.51	1.33	3.97
Youtube Initial Buffer Delay (Second)	0.83	1.80	0.65	2.69
Latency (ms) - 50th Percentile	13.55	31.35	16.60	39.60
Jitter (ms)	11.16	6.29	3.92	3.31
Packet Loss Rate%	0.30	1.00	0.00	0.10

Table-32: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Jama Masjid				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	27.75	13.35	218.10	23.02
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	20.13	3.92	21.48	3.52
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.53	1.65	1.46	3.82
Youtube Initial Buffer Delay (Second)	0.78	1.92	1.82	3.88
Latency (ms) - 50th Percentile	25.05	40.20	12.15	27.45
Jitter (ms)	2.46	7.33	2.31	2.14
Packet Loss Rate%	0.00	0.50	0.00	0.10

Table-33: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G)

Katghar Railway Station				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	172.84	15.32	17.05	17.38
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	24.03	2.74	2.44	9.85
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.38	1.75	5.75	3.24
Youtube Initial Buffer Delay (Second)	0.58	1.48	3.43	1.90
Latency (ms) - 50th Percentile	18.50	39.40	25.75	32.35
Jitter (ms)	4.98	6.45	623.94	3.24
Packet Loss Rate%	0.00	1.40	17.40	0.00

Table-34: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Moradabad Railway Station				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	56.08	1.59	87.48	45.27
Download Session Setup Success Rate%	100.00	80.00	100.00	100.00
Upload Throughput Average (Mbits/s)	19.25	2.06	61.15	9.39
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.51	7.18	1.58	4.04
Youtube Initial Buffer Delay (Second)	0.83	-	0.89	2.78
Latency (ms)- 50th Percentile	11.70	32.70	25.10	31.45
Jitter (ms)	6.19	8.74	18.89	2.34
Packet Loss Rate%	0.20	3.00	2.20	0.00

Table-35: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-"-" Youtube tests were failed.

Pili Kothi Chauraha				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	158.42	9.01	178.47	40.96
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	27.71	8.48	16.56	4.26
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.00	1.56	1.36	4.28
Youtube Initial Buffer Delay (Second)	1.17	1.14	0.79	1.76
Latency (ms)- 50th Percentile	13.50	35.40	14.05	27.75
Jitter (ms)	11.64	16.31	3.65	2.52
Packet Loss Rate%	0.80	6.50	0.00	0.00

Table-36: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Pital Nagri Bus Depot				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	421.84	10.44	395.37	18.74
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	106.22	3.07	64.75	3.55
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.39	2.08	1.34	5.36
Youtube Initial Buffer Delay (Second)	0.56	1.60	0.61	2.89
Latency (ms)- 50th Percentile	14.25	-	14.35	28.70
Jitter (ms)	73.01	-	2.95	2.08
Packet Loss Rate%	4.50	100.00	0.00	0.20

Table-37: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-"-" Latency test was failed.

TMU Hospital				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	140.89	27.52	194.89	68.54
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	55.24	14.16	62.99	40.31
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.16	1.35	1.25	3.66
Youtube Initial Buffer Delay (Second)	0.62	1.17	0.63	3.59
Latency (ms)- 50th Percentile	19.00	30.18	14.75	33.58
Jitter (ms)	13.96	4.53	3.99	3.09
Packet Loss Rate%	0.40	1.60	0.00	0.00

Table-38: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Wave Mall				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	128.39	7.24	648.11	26.55
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	48.51	3.52	90.77	9.23
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.47	1.56	1.30	3.66
Youtube Initial Buffer Delay (Second)	0.65	1.24	0.54	1.65
Latency (ms)- 50th Percentile	16.75	34.75	11.60	31.55
Jitter (ms)	5.56	7.35	6.41	3.34
Packet Loss Rate%	0.20	1.90	0.00	0.10

Table-39: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

4.3.5 Data performance (5G Only & 4G Only Download & Upload Speed)

Overall Data Performance					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	274.99	-	240.16	-
	Upload Throughput Average (Mbits/s)	46.51	-	36.99	-
4G	Download Throughput Average (Mbits/s)	20.48	10.06	24.95	33.43
	Upload Throughput Average (Mbits/s)	13.89	4.81	13.46	16.42

Table-40: Overall Summary of 5G only & 4G only data download & upload speed.

Note- "-"Respective technology was not observed during the test.

Civil Line Hospital					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	430.37	-	118.54	-
	Upload Throughput Average (Mbits/s)	43.43	-	6.15	-
4G	Download Throughput Average (Mbits/s)	11.61	-	25.30	42.43
	Upload Throughput Average (Mbits/s)	11.67	-	24.07	25.84

Table-41: Overall Summary of 5G only & 4G only data download & upload speed.

Note- "-"Respective technology was not observed during the test.

Hindu College Moradabad					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	168.16	-	316.55	-
	Upload Throughput Average (Mbits/s)	35.99	-	42.19	-
4G	Download Throughput Average (Mbits/s)	25.80	3.86	46.60	23.28
	Upload Throughput Average (Mbits/s)	10.55	2.38	13.28	9.32

Table-42: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

Jama Masjid					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	214.83	-
	Upload Throughput Average (Mbits/s)	-	-	26.49	-
4G	Download Throughput Average (Mbits/s)	28.94	9.88	13.06	13.44
	Upload Throughput Average (Mbits/s)	18.77	3.21	5.67	5.62

Table-43: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

Katghar Railway Station					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	156.45	-	20.64	-
	Upload Throughput Average (Mbits/s)	12.77	-	3.39	-
4G	Download Throughput Average (Mbits/s)	4.85	9.60	2.27	24.99
	Upload Throughput Average (Mbits/s)	7.46	2.51	0.84	21.21

Table-44: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

Moradabad Railway Station					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	142.93	-
	Upload Throughput Average (Mbits/s)	-	-	72.11	-
4G	Download Throughput Average (Mbits/s)	15.38	7.44	65.60	39.60
	Upload Throughput Average (Mbits/s)	8.95	3.04	23.82	12.10

Table-45: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

Pili Kothi Chauraha					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	276.22	-	219.80	-
	Upload Throughput Average (Mbits/s)	29.36	-	21.94	-
4G	Download Throughput Average (Mbits/s)	17.18	7.10	13.94	48.09
	Upload Throughput Average (Mbits/s)	15.89	4.79	2.33	4.87

Table-46: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

Pital Nagri Bus Depot					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	441.80	-	494.43	-
	Upload Throughput Average (Mbits/s)	114.35	-	67.78	-
4G	Download Throughput Average (Mbits/s)	35.02	7.02	17.72	19.90
	Upload Throughput Average (Mbits/s)	29.20	3.19	13.93	18.62

Table-47: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

TMU Hospital					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	203.89	-
	Upload Throughput Average (Mbits/s)	-	-	59.53	-
4G	Download Throughput Average (Mbits/s)	14.63	26.38	16.64	64.37
	Upload Throughput Average (Mbits/s)	8.95	14.99	13.72	40.61

Table-48: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

Wave Mall					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	188.68	-	429.81	-
	Upload Throughput Average (Mbits/s)	56.73	-	33.35	-
4G	Download Throughput Average (Mbits/s)	30.96	7.35	23.40	24.75
	Upload Throughput Average (Mbits/s)	13.60	3.39	23.51	9.58

Table-49: Overall Summary of 5G only & 4G only data download & upload speed.

Note- “-”Respective technology was not observed during the test.

4.3 Highway

Drive test has been conducted on 21th May 2025 and 22nd May 2025 covering one Highway route. (Refer Table-1)

4.3.1 Drive test route

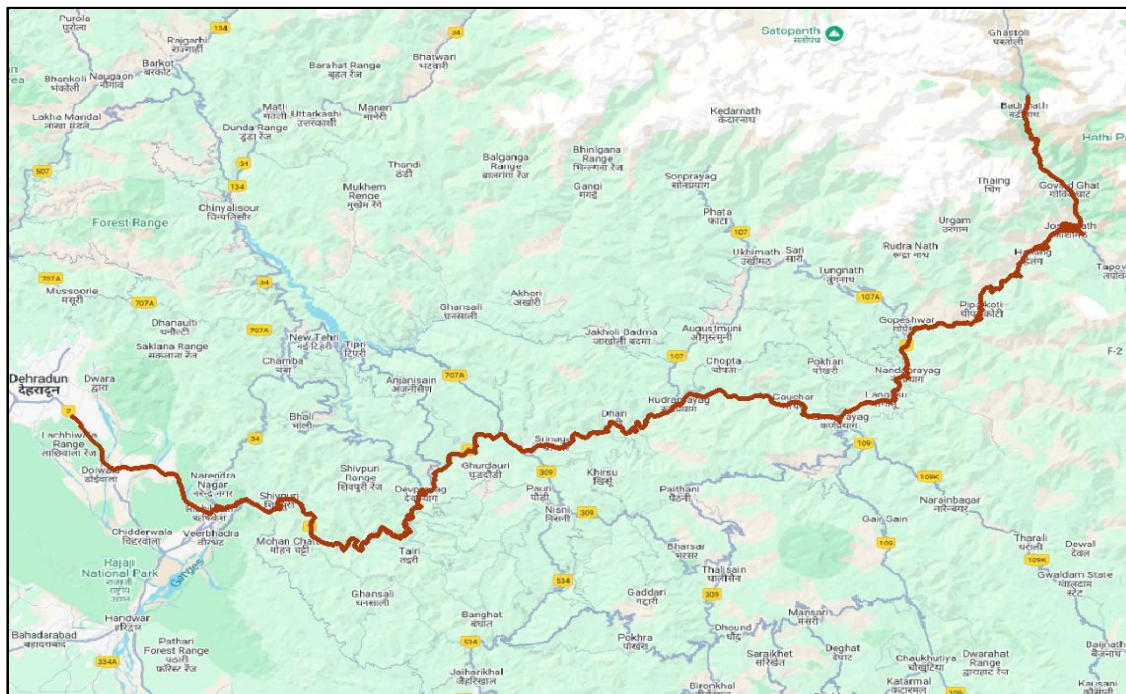


Figure-24: Drive test route Highway.

4.3.2 Routes Covered

Dehradun to Badrinath Highway passing through Rishikesh, Shivpuri, Devprayag, Dhari, Rudra Prayag, Gauchar, Karna Prayag, Nanda Prayag, Pipalkoti, Joshimath etc.

4.3.3 Voice Performance

(a) Voice Call Performance in 3G/2G network mode only: 3G/2G network mode testing has been done to reflect the experience for respective users as they have only 3G/2G compatible handsets.

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	242	299	235
Call Setup Success Rate %	70.66	80.60	75.32
Drop Call Rate %	2.34	5.39	5.08
Call Setup Time-Average (Second)	15.59	5.21	4.92
Handover Success Rate %	98.63	100.00	99.47

Table-50: Summary of voice call performance in 3G/2G network mode only.

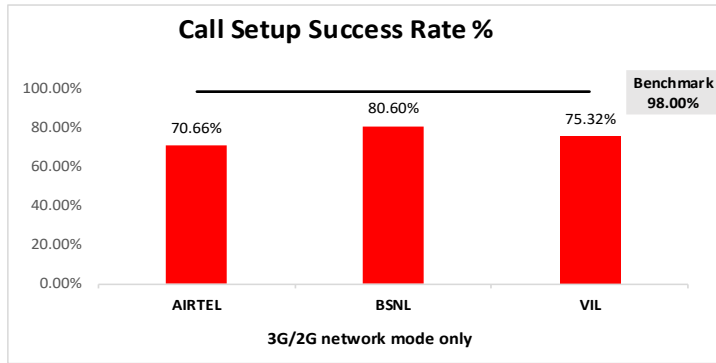


Figure-25: Performance for call setup success rate.

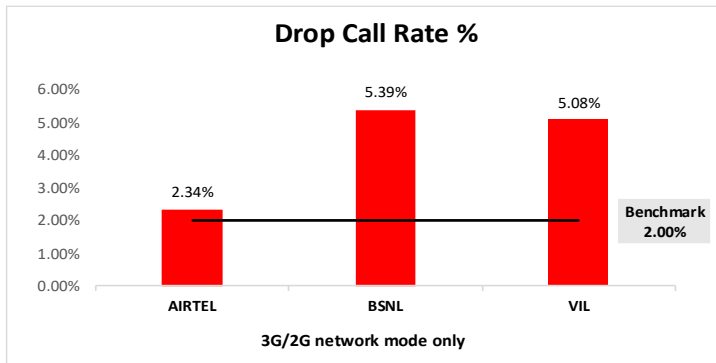


Figure-26: Performance for drop call rate.

(b) Network Technology: This section represent time spent on various network technologies.

Technology	Service Provider		
	AIRTEL	BSNL	VIL
3G	NA	32.87%	NA
2G	98.39%	65.72%	96.23%
Limited Service	1.61%	1.41%	3.77%

Table-51: Time spent on technology during drive test 3G/2G network mode only.

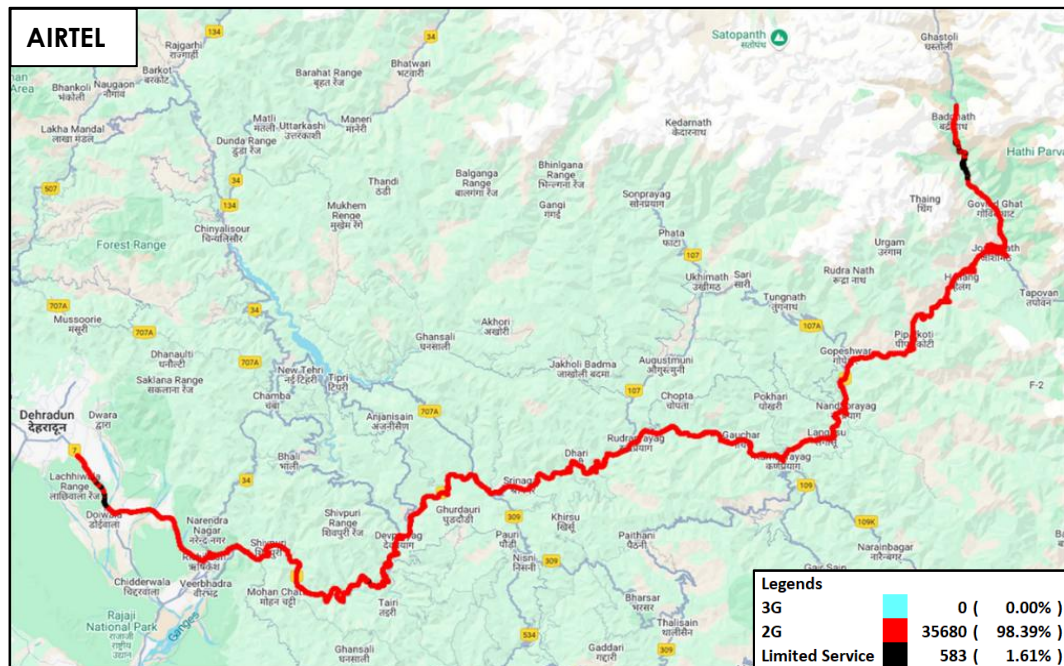


Figure-27: Serving technology plots 3G/2G network mode – AIRTEL.

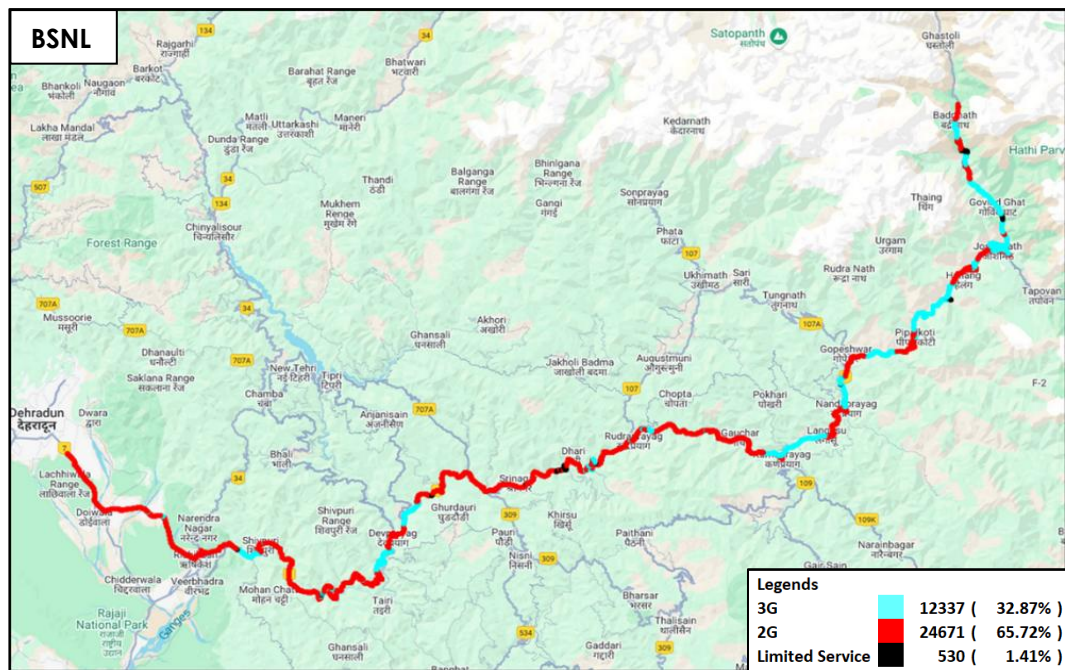


Figure-28: Serving technology plots 3G/2G network mode – BSNL.

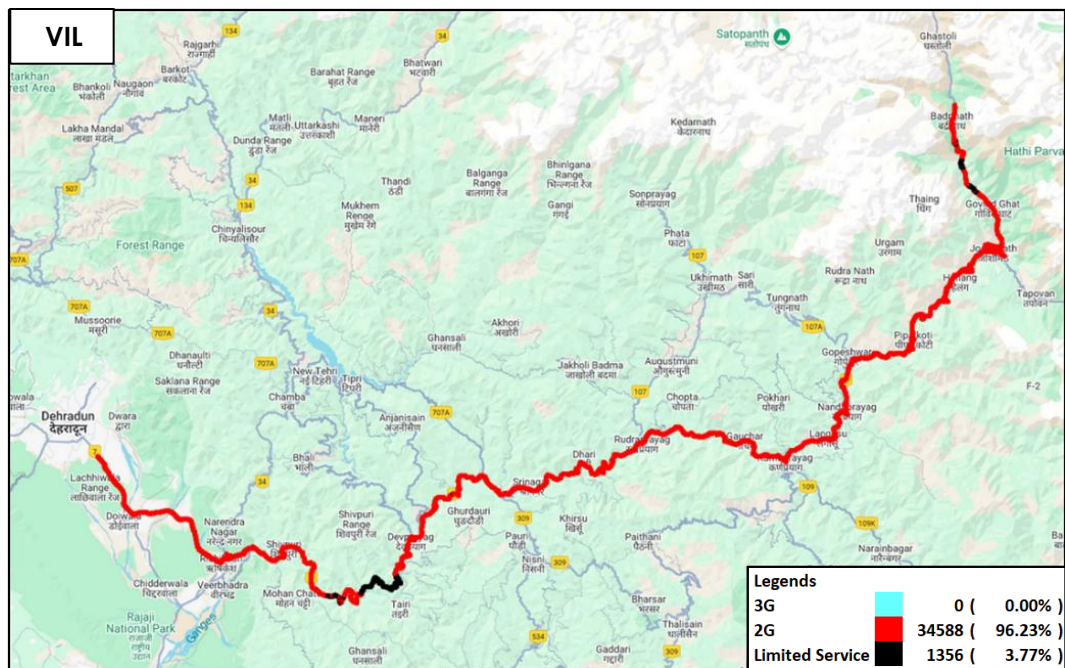


Figure 29: Serving technology plots 3G/2G network mode –VIL.

(c) Network Signal Strength Distribution: The following chart represents signal strength distribution for 3G/2G network mode only. (Refer figure-48, 49 & 50 for map view)

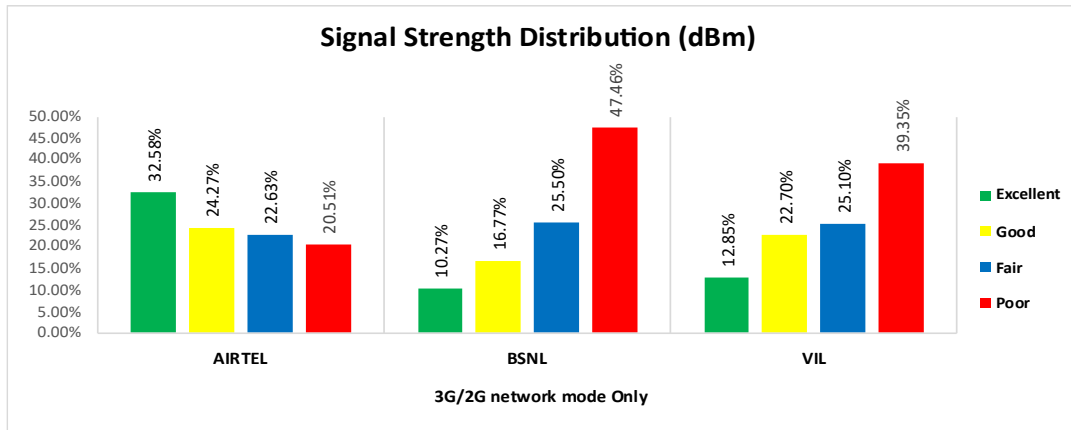


Figure-30: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 33% of samples falling in the excellent signal strength category.
- BSNL has 10% of samples falling in the excellent signal strength category.
- VIL has 13% of samples falling in the excellent signal strength category.

(d) Voice Call Performance in auto network selection mode (5G/4G/3G/2G)

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempts	217	327	216	250
Call Setup Success Rate %	84.33	64.53	94.44	71.60
Drop Call Rate %	3.28	11.37	0.98	3.35
Call Setup Time Average (Second)	17.08	5.50	1.12	1.57
Handover Success Rate %	99.73	100.00	99.66	100.00

Table-52: Summary of voice call performance in network auto-selection mode.

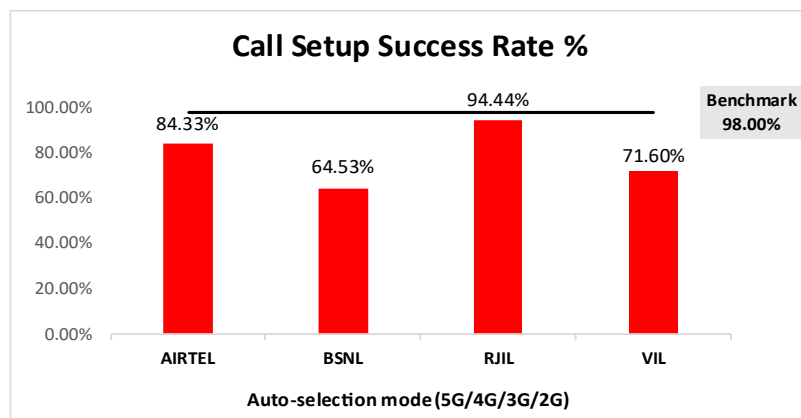


Figure-31: Performance for call setup success rate.

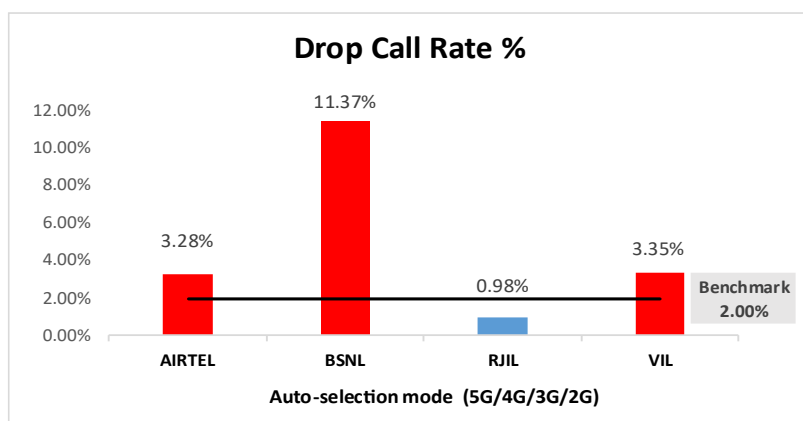


Figure-32: Performance for drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	154	210	171	152
Number of silence call for >4 Sec	19	9	9	18
Silence Call Rate %	12.34	4.29	5.26	11.84
Number of silence instances for >4 Sec	25	10	17	20
Number of silence instances for >3 Sec	34	12	33	25
Number of silence instances for >2 sec	57	19	56	51
RTP Jitter (4G & 5G) in ms	5.26	8.84	9.65	11.39
Packet loss Rate Downlink %	2.66	25.3	2.13	2.60
Packet loss Rate Uplink %	2.21	21.17	1.84	2.25

Table-53: Summary of silence instances & packet loss rate for mobile to mobile call.

(e) Mean Opinion Score (MOS) performance for speech quality:

Mean opinion score indicate quality of speech observed during the drive test across different technologies. This parameter has been calculated for mobile to mobile calls made within same operator network in auto mode (5G/4G/3G/2G). As per ITU-T Recommendation P.863.1, MOS values means: 5-Excellent, 4-Good, 3-Fair, 2-Poor, 1-Bad.

Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
Total Number of MOS Samples for calls in table-39	1803	1550	1992	1727
Speech Quality (Average MOS)	3.92	1.84	3.77	4.41
Number of samples with MOS >=4 to <5 (Excellent)	1432	19	1320	1465
Number of samples with MOS >=3 to <4 (Good)	271	67	460	180
Number of samples with MOS >=2 to <3 (Fair)	39	493	90	34
Number of samples with MOS >=1 to <2 (Poor)	61	971	122	48
%age of samples with MOS >=4 to <5 (Excellent)	79.42%	1.23%	66.27%	84.83%
%age of samples with MOS >=3 to <4 (Good)	15.03%	4.32%	23.09%	10.42%
%age of samples with MOS >=2 to <3 (Fair)	2.16%	31.81%	4.52%	1.97%
%age of samples with MOS >=1 to <2 (Poor)	3.38%	62.65%	6.12%	2.78%

Table-54: Summary of speech quality (MOS) samples.

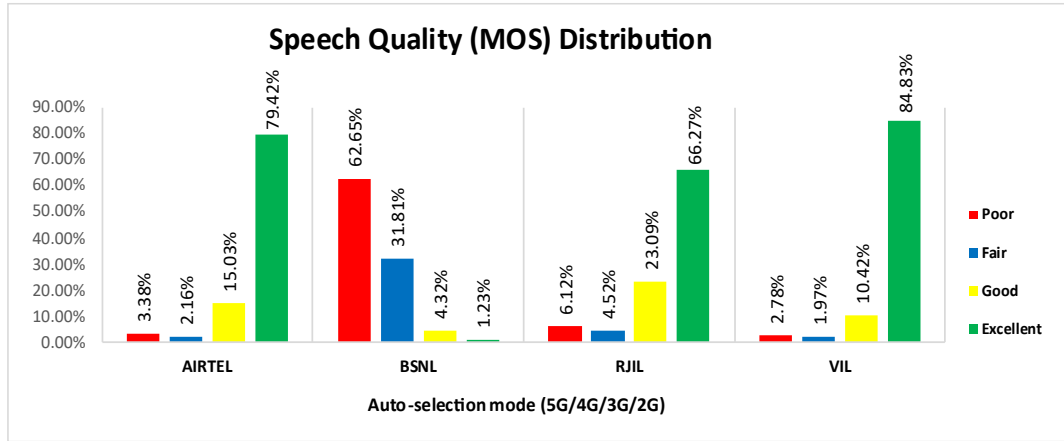


Figure-33: Distribution of samples in MOS range.

(f) Network Technology: This section represents time spent on various network technologies.

Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	0.86%	NA	6.32%	NA
4G	94.55%	31.08%	93.12%	74.42%
3G	NA	19.80%	NA	NA
2G	1.66%	45.80%	NA	18.75%
Limited Service	2.93%	3.32%	0.57%	6.83%

Table-55: Time spent on technology during drive test.

Note-

- NA- Service provider doesn't provide services in respective technology.

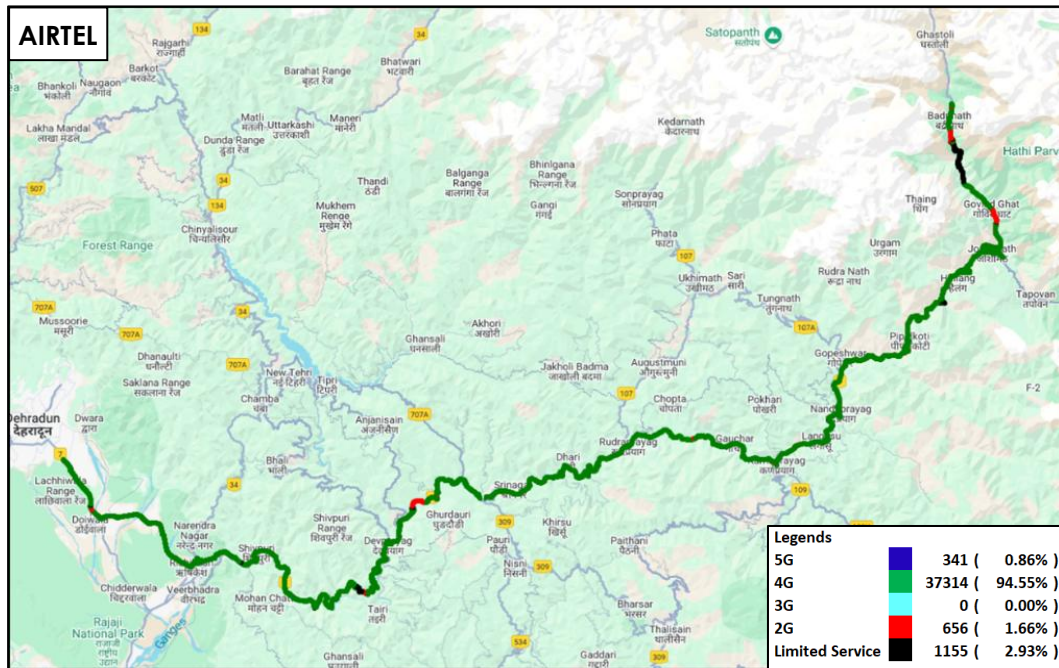


Figure-34: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-AIRTEL.

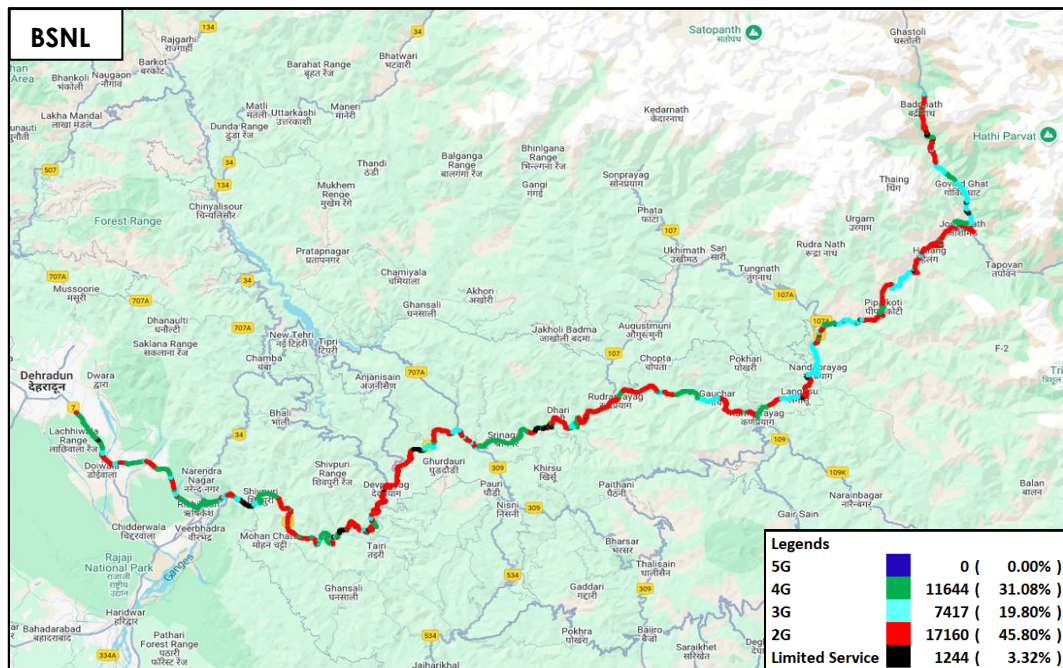


Figure-35: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-BSNL.

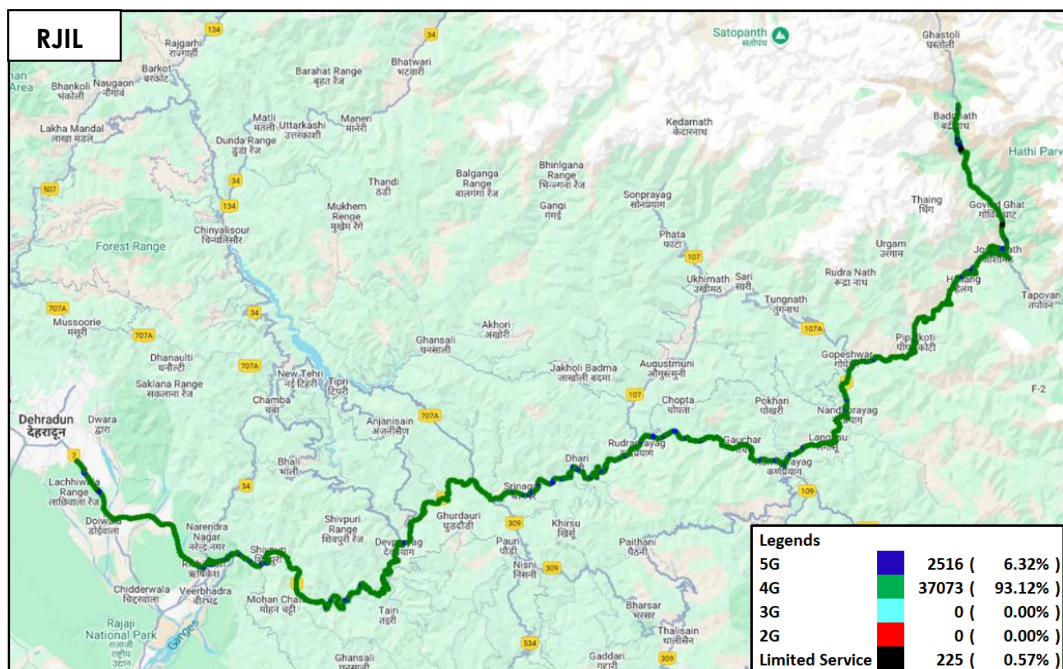


Figure-36: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-RJIL.

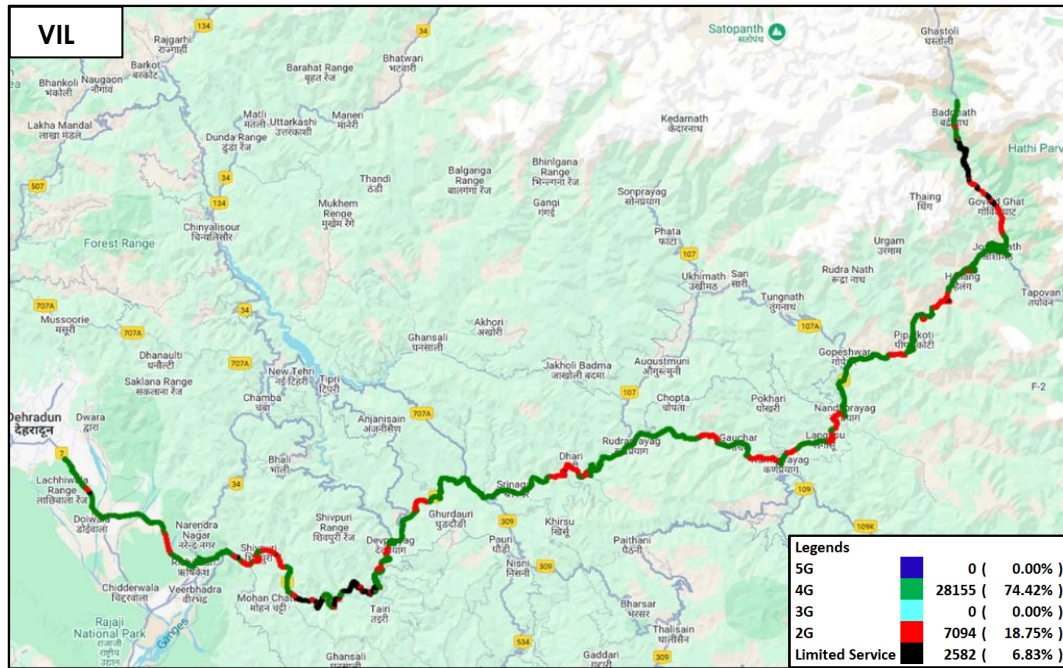


Figure-37: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-VIL.

(g) Network Signal Strength Distribution: The following chart provide signal strength distribution for auto-selection mode (5G/4G/3G/2G). (Refer figure-51, 52, 53 & 54 for map view)

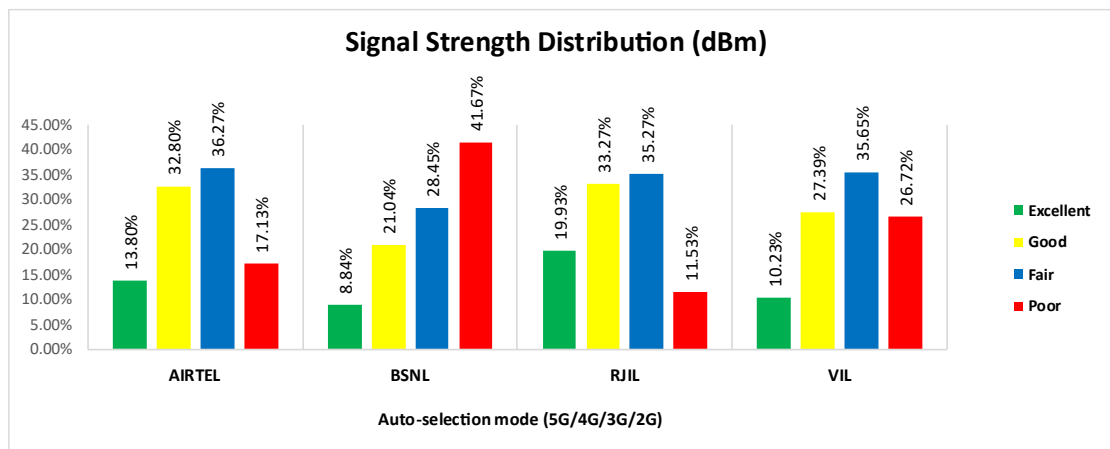


Figure-38: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

Observations:

- Airtel has 14% of samples falling in the excellent signal strength category.
- BSNL has 9% of samples falling in the excellent signal strength category.
- RJIL has 20% of samples falling in the excellent signal strength category.
- VIL has 10% of samples falling in the excellent signal strength category.

4.3.4 Data Performance

(a) Data Parameters (Auto-selection mode- 5G/4G/3G/2G)

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	80.31	1.46	94.09	24.85
	80th Percentile	148.17	1.89	160.68	37.51
	20th Percentile	6.79	0.05	3.41	8.04
Upload Throughput (Mbits/s)	Average	17.12	3.90	10.97	10.94
	80th Percentile	30.98	5.71	20.96	17.87
	20th Percentile	1.65	1.13	0.91	2.03
Latency (ms)	50th Percentile	21.90	50.50	25.70	35.50

Table-56: Summary of Data performance in network auto-selection mode.

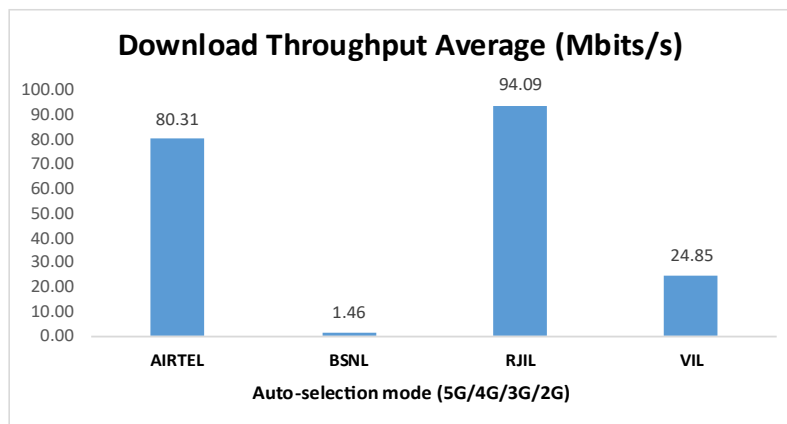


Figure-39: Download throughput.

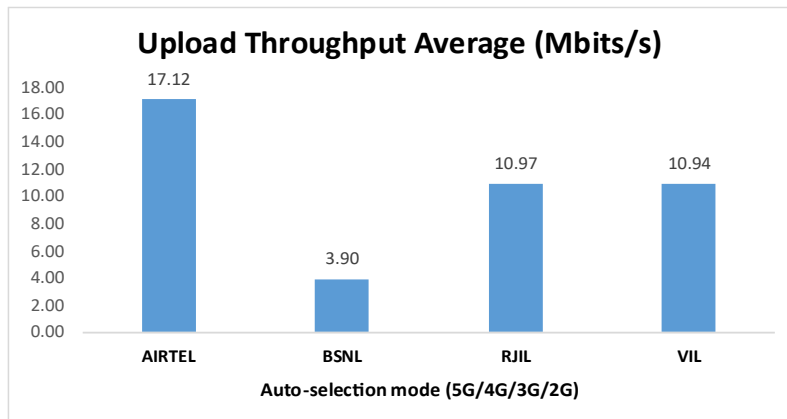


Figure-40: Upload throughput.

5. Voice & Data Key findings

5.1 Overall Voice

1. Call Setup Success Rate:

- a) Airtel, BSNL and VIL have 90.91%, 88.80% and 92.48% call setup success rate respectively in 3G/2G network mode. (refer table-3)
- b) Airtel, BSNL, RJIL and VIL have 96.34%, 78.44%, 98.77% and 92.93% call setup success rate respectively in auto-selection mode (5G/4G/3G/2G). (refer table-5)
- c) Airtel has 100% call setup success rate while calling on peer service provider's network, while remaining service providers have block call rate for inter-operator calls. (refer table-9)

2. Call Setup Time:

- a) Airtel, BSNL and VIL call setup time is 8.42, 4.01 & 4.59 seconds respectively in 3G/2G network mode. (refer table-3)
- b) Airtel, BSNL, RJIL & VIL call setup time is 12.69, 3.57, 0.83 & 0.79 seconds respectively in Auto-selection mode (5G/4G/3G/2G). (refer table-5)

3. Call Silence/Mute Rate:

In packet switched network (4G/5G) Airtel, BSNL, VIL and RJIL have 2.58%, 2.39%, 2.27 & 1.11% silence call rate respectively. Further BSNL has higher RTP packet loss rate in downlink (6.74%) compared to VIL (0.85%), Airtel (0.76%) and RJIL (0.55%). In uplink the RTP packet loss rate is higher for BSNL (7.87%) compared to VIL (0.85%), Airtel (0.68%) and RJIL (0.59%) (refer table-6)

4. Drop Call Rate:

- a) Airtel, BSNL and VIL drop call rate 1.03%, 3.15% and 1.13% respectively in 3G/2G network mode. (refer table-3)
- b) Airtel, BSNL, RJIL and VIL drop call rate 0.67%, 4.09%, 0.31% and 0.75% respectively in Auto-selection mode (5G/4G/3G/2G). (refer table-5)

5.2 Overall Data

1. Data download and upload performance (Overall i.e. LSA):

- a) Airtel, BSNL, RJIL and VIL average download speeds are 122.50 Mbps, 6.75 Mbps, 190.11 Mbps and 37.24 Mbps respectively. (refer table-11)
- b) Airtel, BSNL, RJIL and VIL average upload speeds are 25.01 Mbps, 4.94 Mbps, 23.64 Mbps and 15.80 Mbps respectively. (refer table-11)

2. Data download and upload performance (static i.e. while stationary):

- a) Airtel, BSNL, RJIL and VIL average download speeds are 160.13 Mbps, 11.80 Mbps, 254.45 Mbps and 37.06 Mbps respectively. (refer table-30)
- b) Airtel, BSNL, RJIL and VIL average upload speeds are 41.04 Mbps, 4.98 Mbps, 40.35 Mbps and 14.32 Mbps respectively. (refer table-30)

3. Data session setup success rate (static i.e. while stationary):

- a) Airtel, BSNL, RJIL and VIL have 100.00%, 86.67%, 100.00% and 100.00% download session setup success rate respectively. (refer table-30)
- b) Airtel, BSNL, RJIL and VIL have 100.00%, 88.89%, 100.00% and 100.00% upload session setup success rate. (refer table-30)

5.3 Operator wise Key Findings

1. Airtel:

Voice

- 90.91% call setup success rate and 1.03% drop call rate have been observed for 3G/2G network mode respectively for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-3)
- 96.34% call setup success rate and 0.67% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-5)
- 98.86% call setup success rate and 0.66% drop call rate have been observed for 3G/2G network mode for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-13)
- 100.00% call setup success rate and 0.00% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for overall hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 70.66% call setup success rate and 2.34% drop call rate have been observed for 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-50)
- 84.33% call setup success rate and 3.28% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-52)

Data

- Airtel has 122.50 Mbps average download speed & 25.01 Mbps average upload speed LSA. (refer table-11)
- Airtel has 139.05 Mbps average download speed & 27.53 Mbps average upload speed across measured routes for city drive. (refer table-19)
- Hindu College Moradabad, Jama Masjid and Moradabad Railway Station have less download speed (less than 100 Mbps) out of total 09 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table-32, 33 & 35)
- Moradabad Railway Station has less upload speed (less than 20 Mbps) out of total 09 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table-35)
- Airtel has 80.31 Mbps average download speed & 17.12 Mbps average upload speed across measured routes for highway drive. (refer table-56)

2. BSNL:

Voice

- 88.80% call setup success rate and 3.15% drop call rate have been observed for 3G/2G network mode respectively for LSA. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-3)

- 78.44% call setup success rate and 4.09% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for LSA. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-5)
- 92.13% call setup success rate and 2.36% drop call rate have been observed for 3G/2G network mode for city drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-13)
- 81.70% call setup success rate and 2.30% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for city drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for overall hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 80.60% call setup success rate and 5.39% drop call rate have been observed for 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-50)
- 64.53% call setup success rate and 11.37% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-52)

Data

- BSNL has 6.75 Mbps average download speed & 4.94 Mbps average upload speed for LSA. (refer table-11)
- BSNL has 8.62 Mbps average download speed & 5.35 Mbps average upload speed across measured routes for city drive. (refer table-19)
- Civil Line Hospital, Hindu College Moradabad, Moradabad Railway Station, Pili Kothi Chauraha and Wave Mall have less download speed (less than 10 Mbps) out of total 09 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table-31, 32, 35, 36 & 39)
- Civil Line Hospital and Hindu College Moradabad have less upload speed (less than 2 Mbps) out of total 9 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table-31 & 32)
- BSNL has 1.46 Mbps average download speed & 3.90 Mbps average upload speed across measured routes for highway drive. (refer table-56)

3. RJIL:

Voice

- 98.77% call setup success rate and 0.31% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) respectively for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-5)
- 100.00% call setup success rate and 0.15% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) respectively for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for overall hotspot

locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)

- 94.44% call setup success rate and 0.98% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% for call setup success. (refer table-52)

Data

- RJIL has 190.11 Mbps average download speed & 23.64 Mbps average upload speed for LSA. (refer table-11)
- RJIL has 233.60 Mbps average download speed & 28.79 Mbps average upload speed across measured routes in city drive. (refer table-19)
- Katghar Railway Station and Moradabad Railway Station have less download speed (less than 100 Mbps) out of total 09 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table-34 & 35)
- Civil Line Hospital, Katghar Railway Station and Pili Kothi Chauraha have less upload speed (less than 20 Mbps) out of total 09 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table-31, 34 & 36)
- RJIL has 94.09 Mbps average download speed & 10.97 Mbps average upload speed across measured routes for highway drive. (refer table-56)

4. VIL: Voice

- 92.48% call setup success rate and 1.13% drop call rate have been observed for 3G/2G network mode respectively for LSA. Performance is not meeting the benchmark of 98.00% for call setup success. (refer table-3)
- 92.93% call setup success rate and 0.75% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-5)
- 98.89% call setup success rate and 0.00% drop call rate have been observed for 3G/2G network mode for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-13)
- 100.00% call setup success rate and 0.15% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) respectively for overall hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 75.32% call setup success rate and 5.08% drop call rate have been observed for 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-50)
- 71.60% call setup success rate and 3.35% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-52)

Data

- VIL has 37.24 Mbps average download speed & 15.80 Mbps average upload speed for LSA. (refer table-11)
- VIL has 41.32 Mbps average download speed & 17.52 Mbps average upload speed across measured routes for city drive. (refer table-19)
- VIL has 24.85 Mbps average download speed & 10.94 Mbps average upload speed across measured routes for highway drive. (refer table-56)

6. Annexure

6.1 Route wise coverage map

6.1.1 City

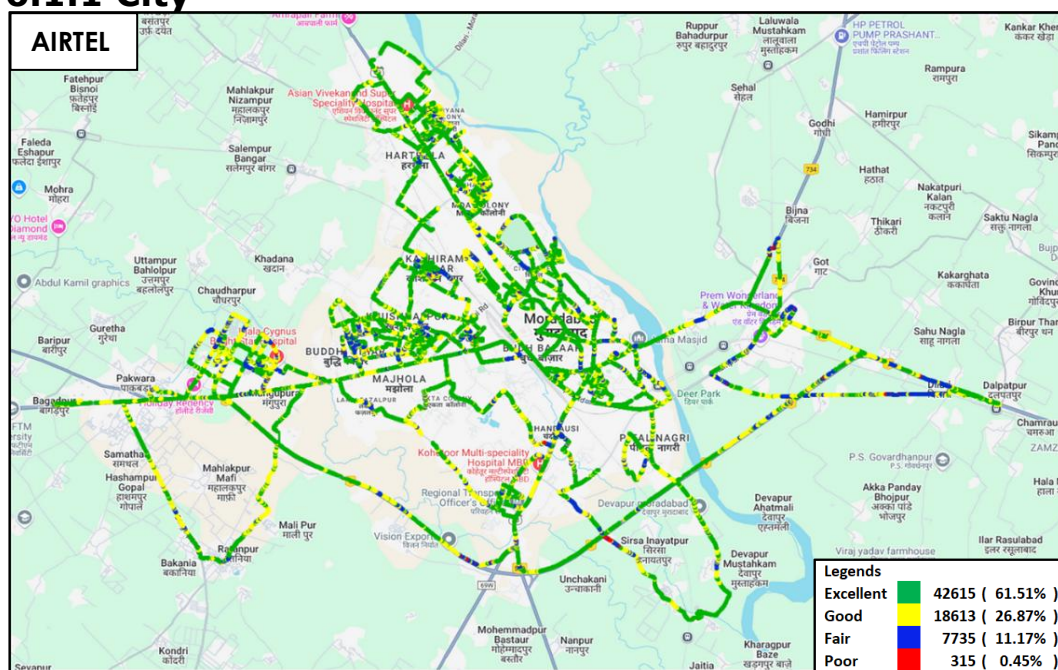


Figure-41: Signal strength 3G/2G network mode – AIRTEL.

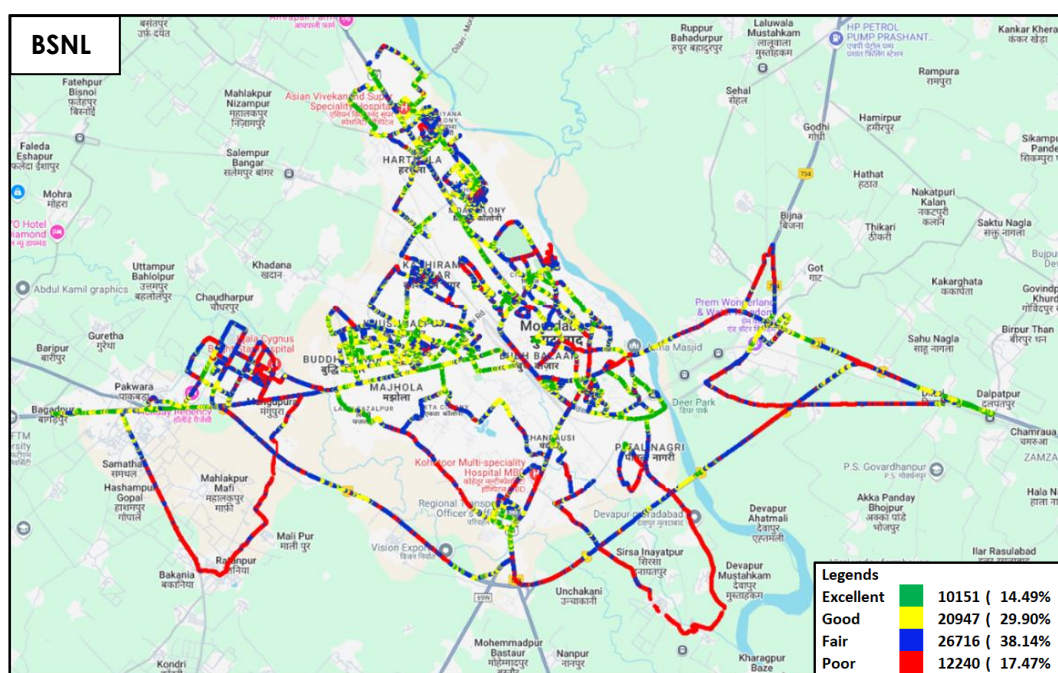


Figure-42: Signal strength 3G/2G network mode – BSNL.

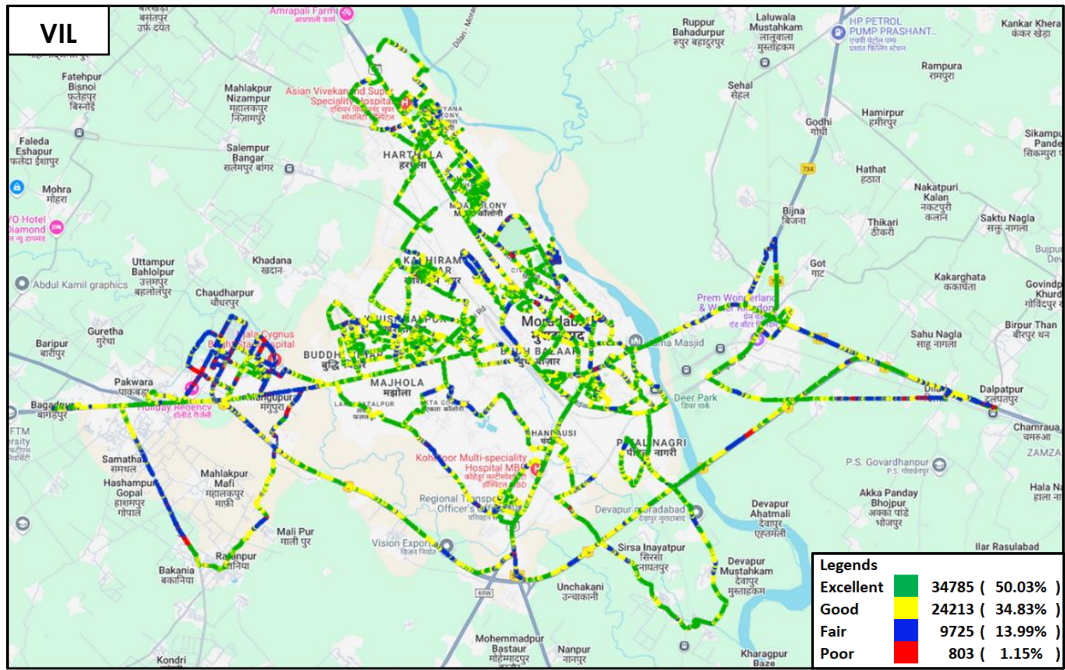


Figure-43: Signal strength 3G/2G network mode – VIL.

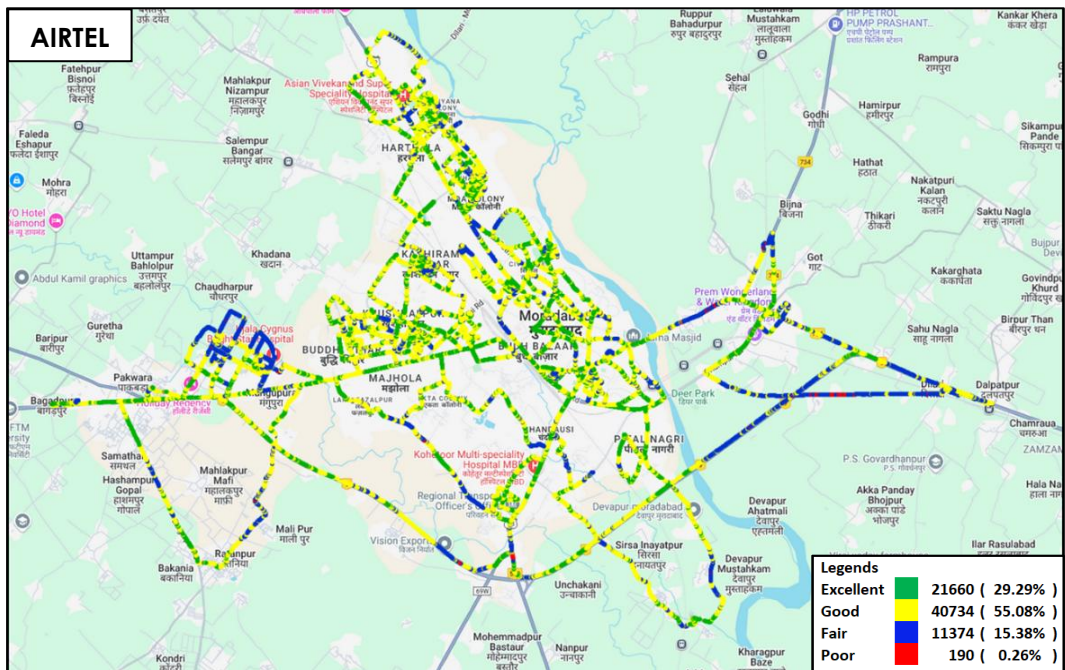


Figure-44: Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL.

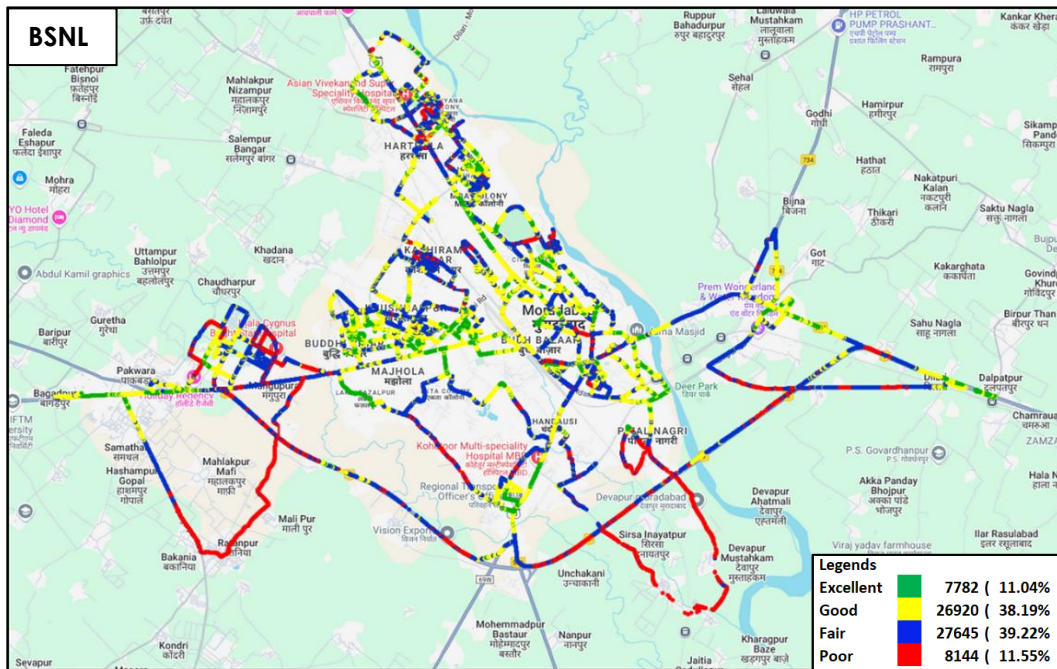


Figure-45: Signal strength auto-selection mode 5G/4G/3G/2G – BSNL.

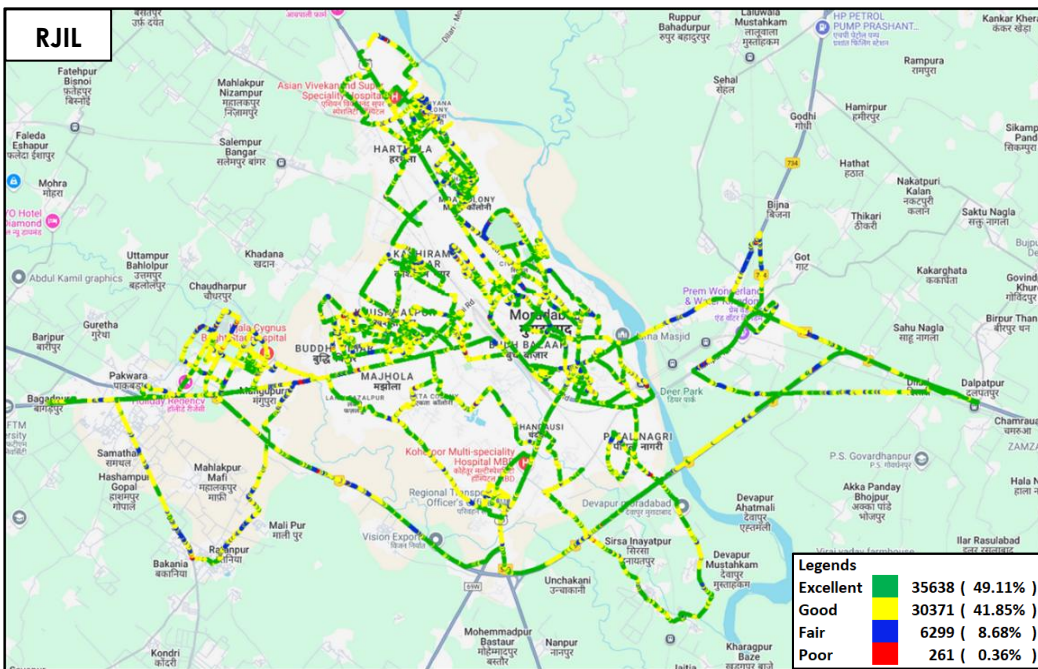


Figure-46: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

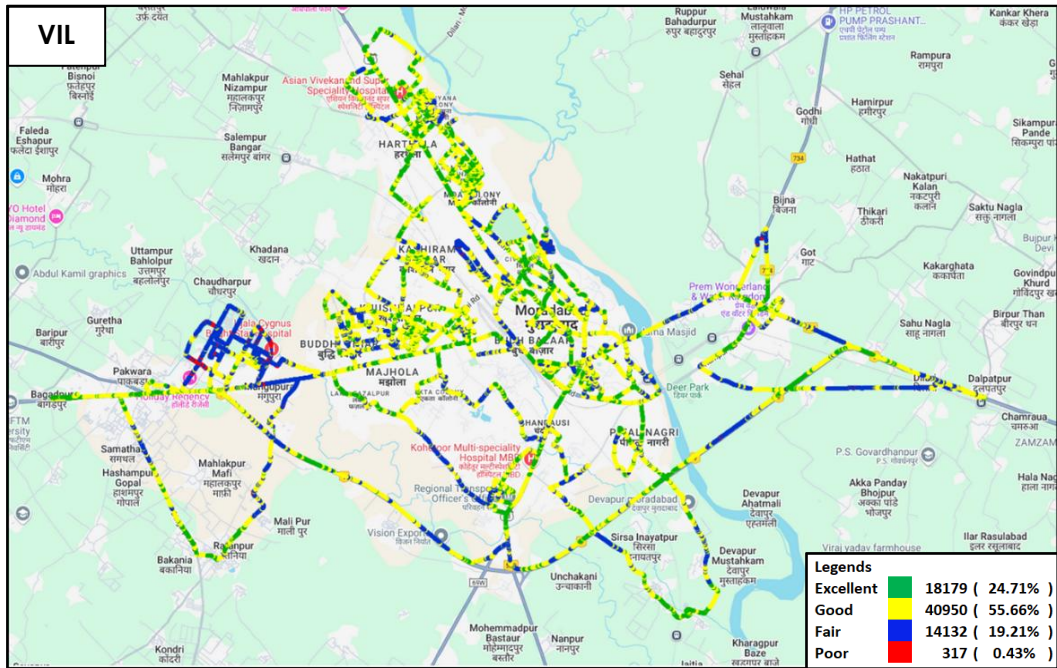


Figure-47: Signal strength auto-selection mode 5G/4G/3G/2G – VIL.

6.1.2 Highway Route

i) Dehradun to Badrinath

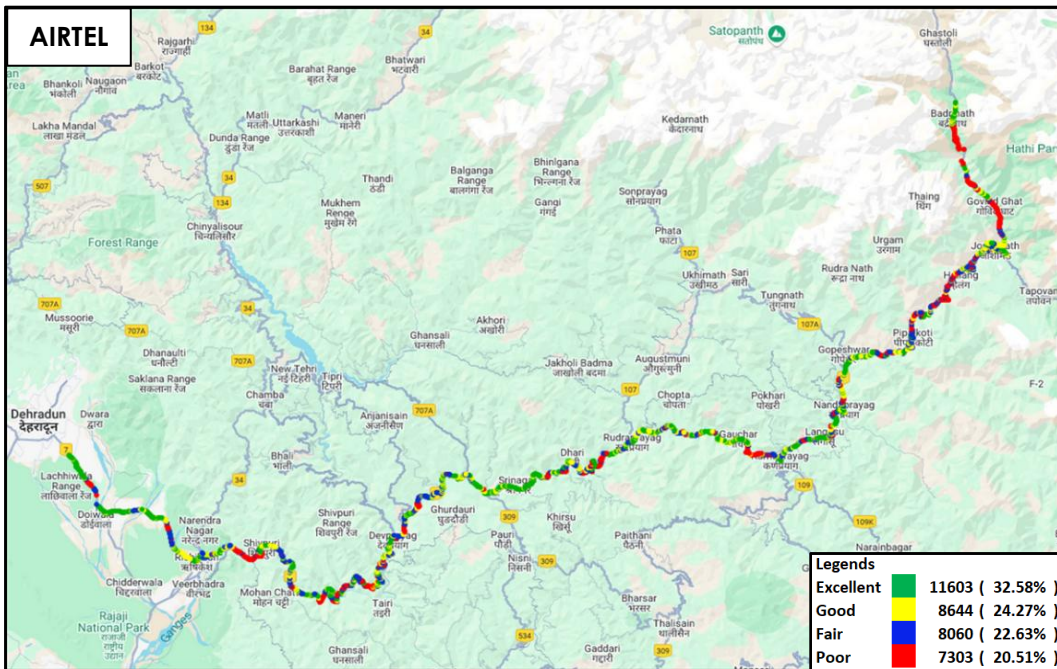


Figure-48: Signal strength 3G/2G network mode – AIRTEL

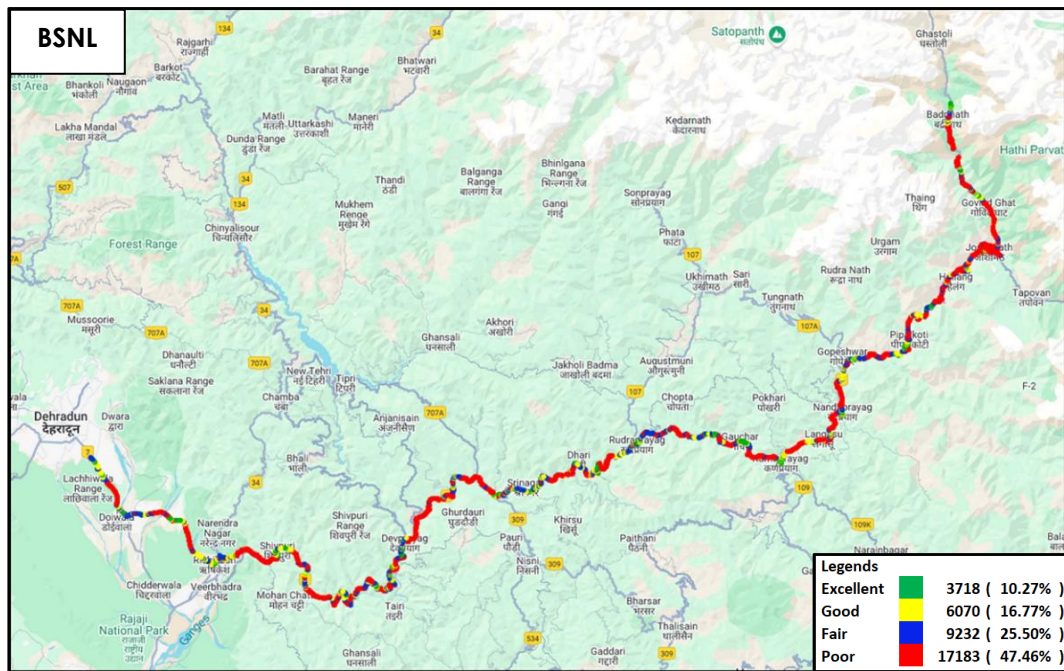


Figure-49: Signal strength 3G/2G network mode – BSNL

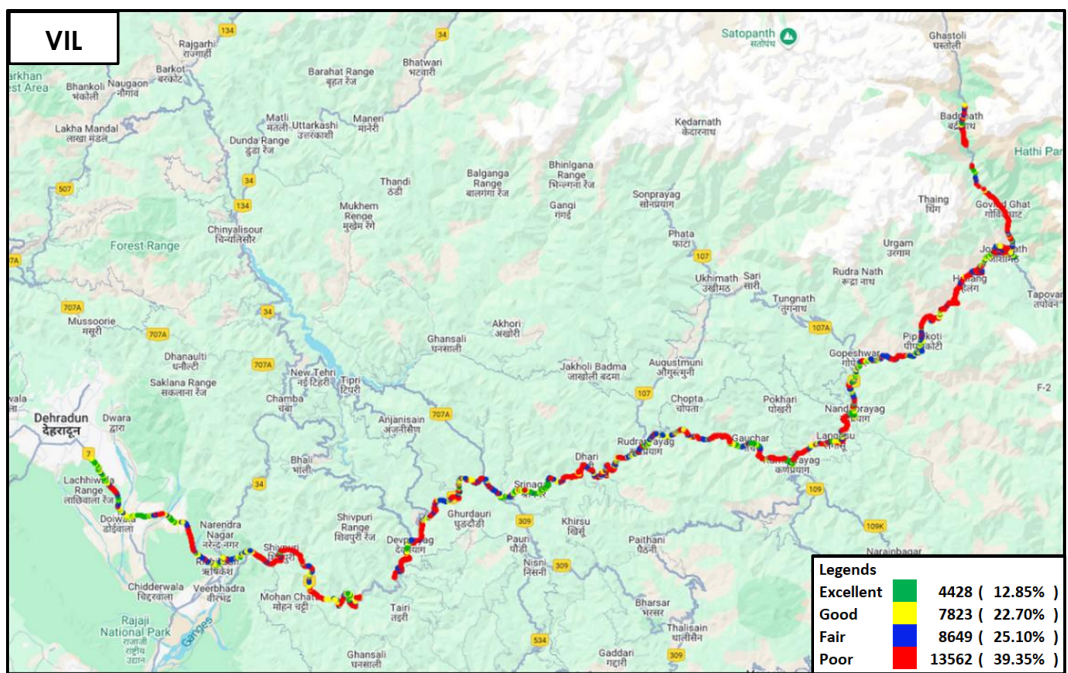


Figure-50: Signal strength 3G/2G network mode - VIL

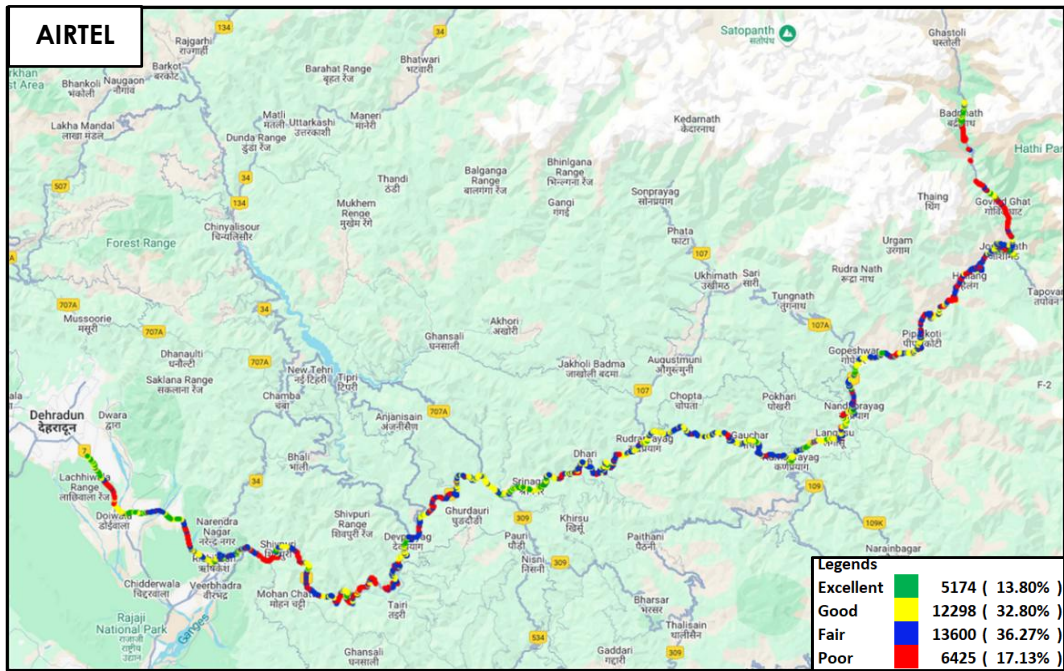


Figure-51: Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL

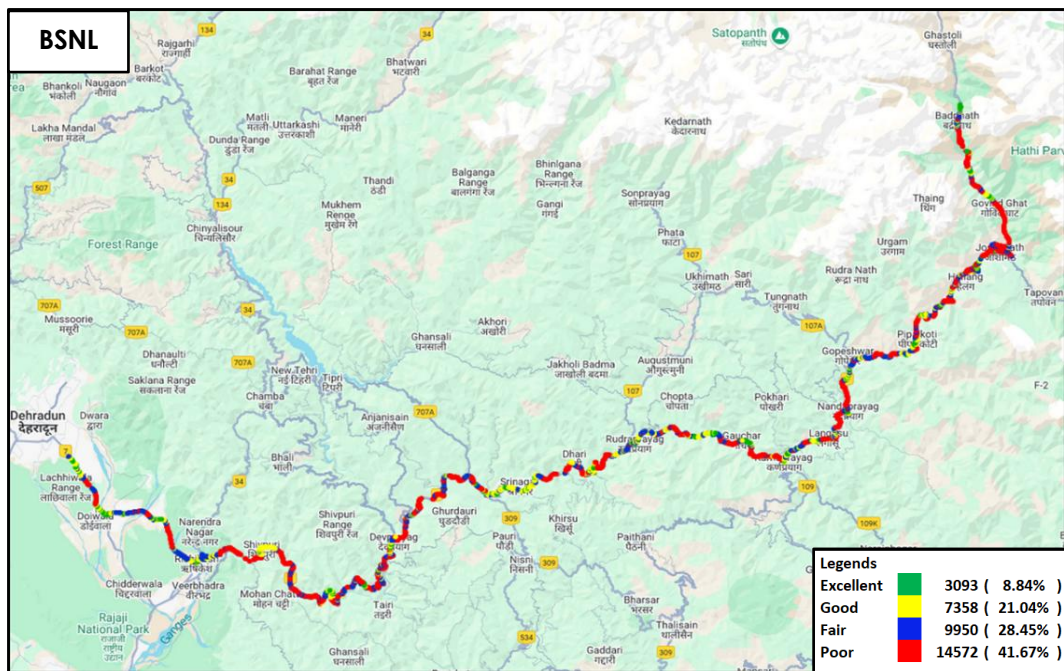


Figure-52: Signal strength auto-selection mode 5G/4G/3G/2G – BSNL

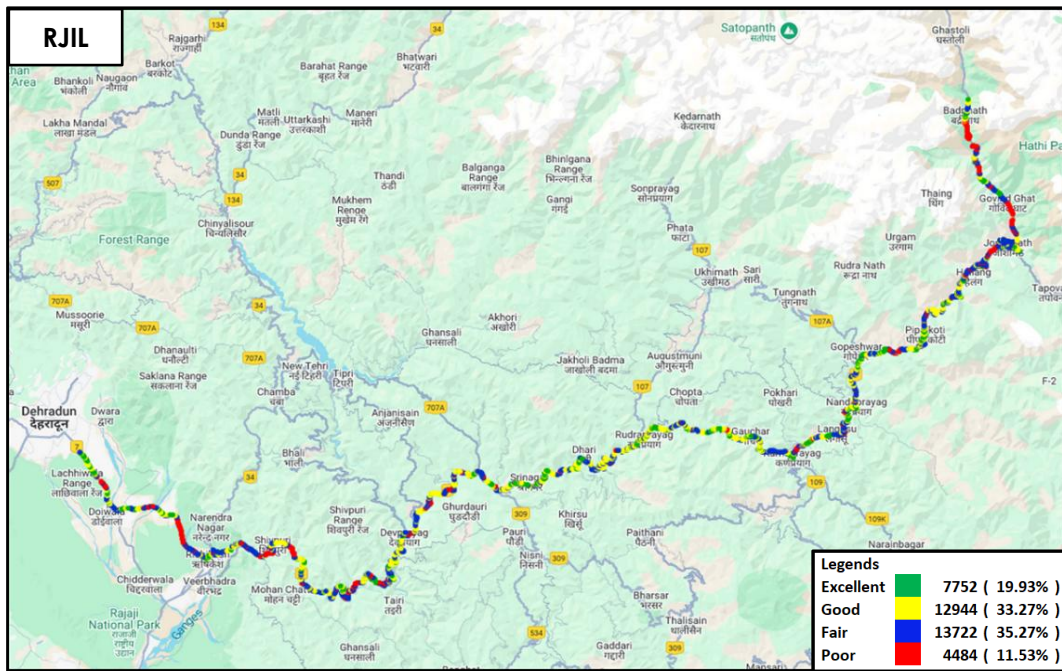


Figure-53: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL

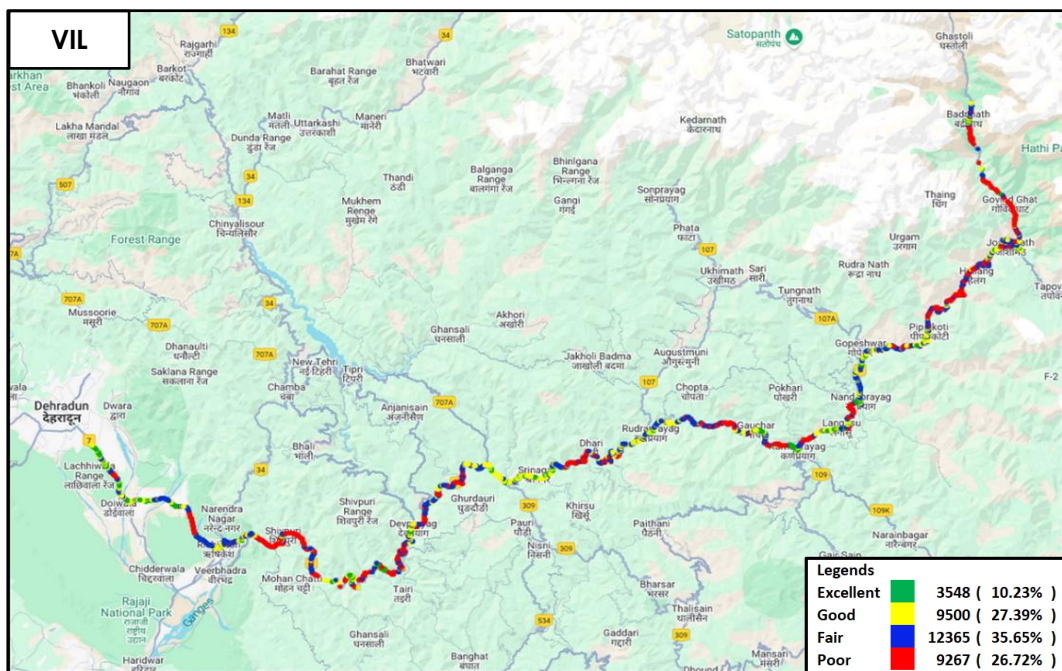


Figure-54: Signal strength auto-selection mode 5G/4G/3G/2G – VIL

7. Appendix

The details of the setup used for conducting the drive test and the network or performance parameters captured under different conditions may be seen at Appendix-I. The calculation method of each QoS parameter is given in Appendix-II of the report. The summary of key equipment used in technical setup is as under

- **Device-1:** OnePlus Nord CE3 for 3G/2G CAT-15 Smartphone.
- **Device-2:** Samsung Galaxy S23 for 5G/4G/3G/2G CAT-20 Smartphone
- **Drive test Software:** Azenqos Engineering capable Applications to capture actual user experience.

7.1 Appendix-I

7.1.1 Drive test setup

Voice Call		
Call details	Technology	Detail
Call Setup Timeout	• 3G/2G auto mode- switch Call • 5G/4G/3G/2G auto mode- switch Call • 5G/4G MOS Call	30 Sec
Call Duration		90/180 Sec
Wait/ Guard Time		15 Sec

Table-57: Voice test detail

Note-

- There is 15 sec wait time after locking and before starting first call in 3G/2G call.
- 10 calls to be made at each Hotspot location.
- Minimum 10 Calls to be made during the walk test. Call count will be increased based on walk test distance.
- Speech quality (MOS) has been measured only in city drive & highway by making Mobile to Mobile call.
- 180 Sec calls were made only in highway & railway route drive.

Data Test		
Test Type	Technology	Detail
HTTP/FTP Download	5G/4G/3G/2G Auto Mode	500 MB File- 30 Sec Timeout, (Multithread 3- TCP Connection at a time)
HTTP/FTP Upload		250 MB File- 30 Sec Timeout, (Multithread 3- TCP Connection at a time)
YouTube Streaming		20 Sec Video & 25 sec Timeout (Only at Hotspot)
Web Browsing		3 popular websites (www.google.co.in , www.irctc.co.in , www.sbi.co.in) 20 sec timeout (only at Hotspot)

Latency		25 count- Dynamic 1000 count- Hotspot Payload- 42 bytes in all drive
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Table-58: Data test detail

Note-

- 5 Data iteration to be done at each hotspot location.
- Minimum 5 iteration to be made during the walk test. Iteration count will be increased based on walk test distance.
- Ping test to be performed only once at hotspot location.
- Youtube & Web browsing test to be performed at static location only.
- All values are taken up to two decimal places with round off.
- Download and upload testing has been done on FTP server for Airtel, BSNL & RJIL.
(Airtel, BSNL & RJIL not provided HTTP server)
- VIL download and upload testing is done on HTTP Server.

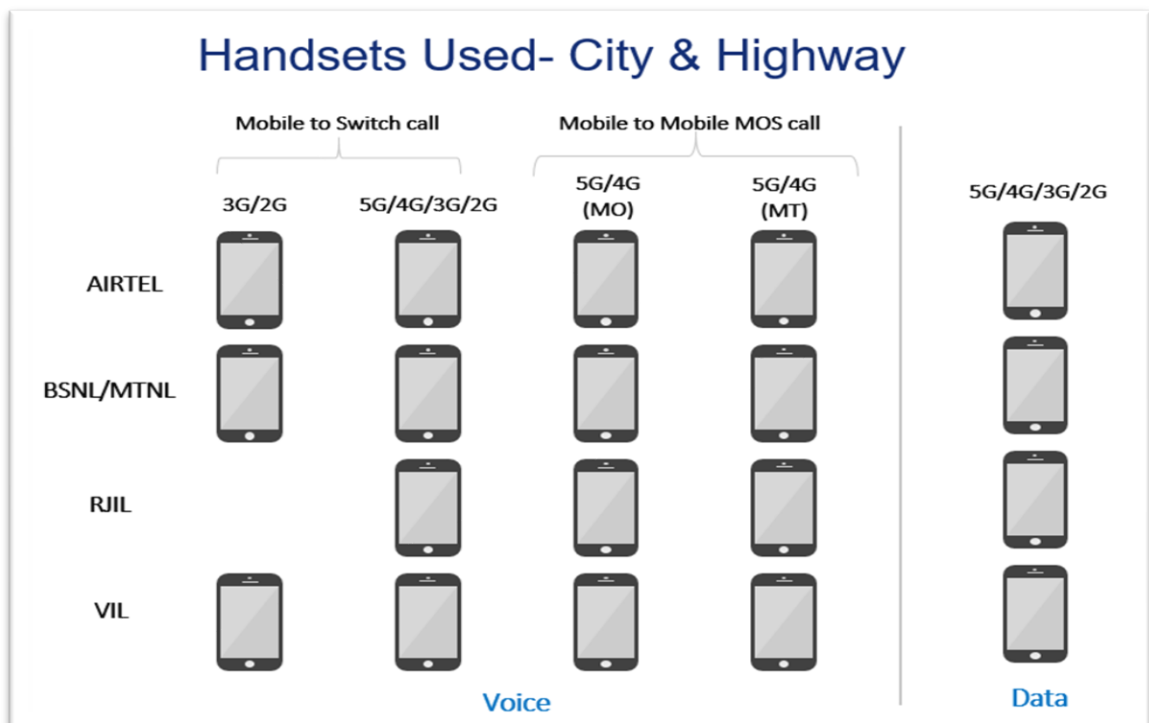


Figure-55: Number of handsets used in city & highway drive

MO: Mobile originating

MT: Mobile terminating

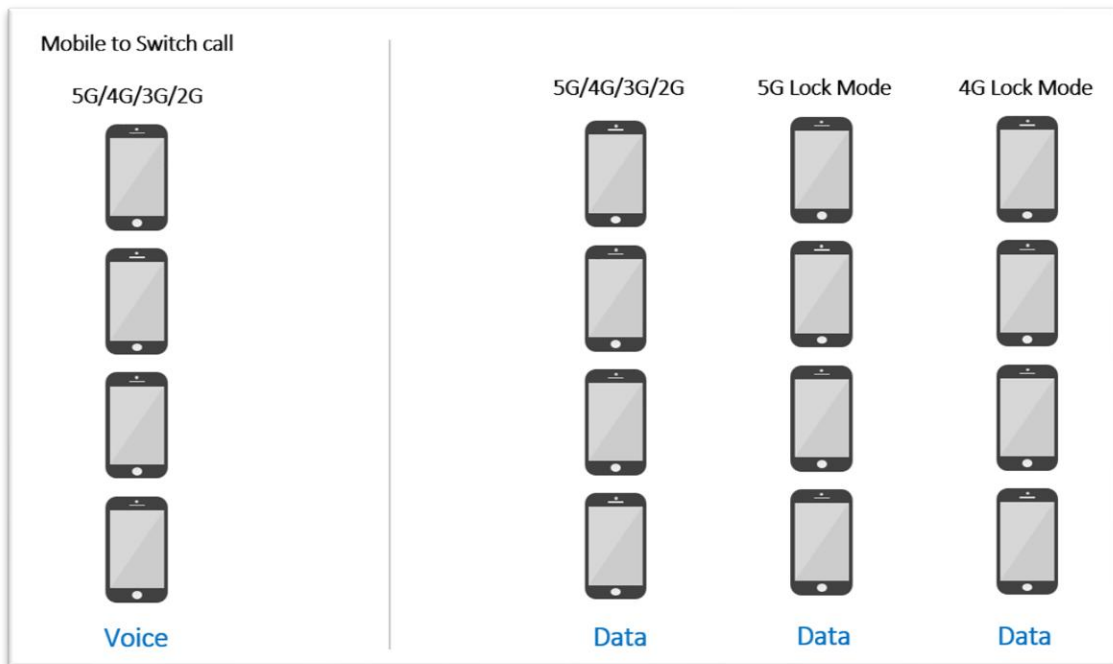


Figure-56: Number of handsets used in railway/metro/walktest/hotspot/coastal area

Note- 5G & 4G Lock mode testing has been performed at hotspot locations only.

7.1.2 Drive test Methodology

(a) Dynamic voice testing (on the move)

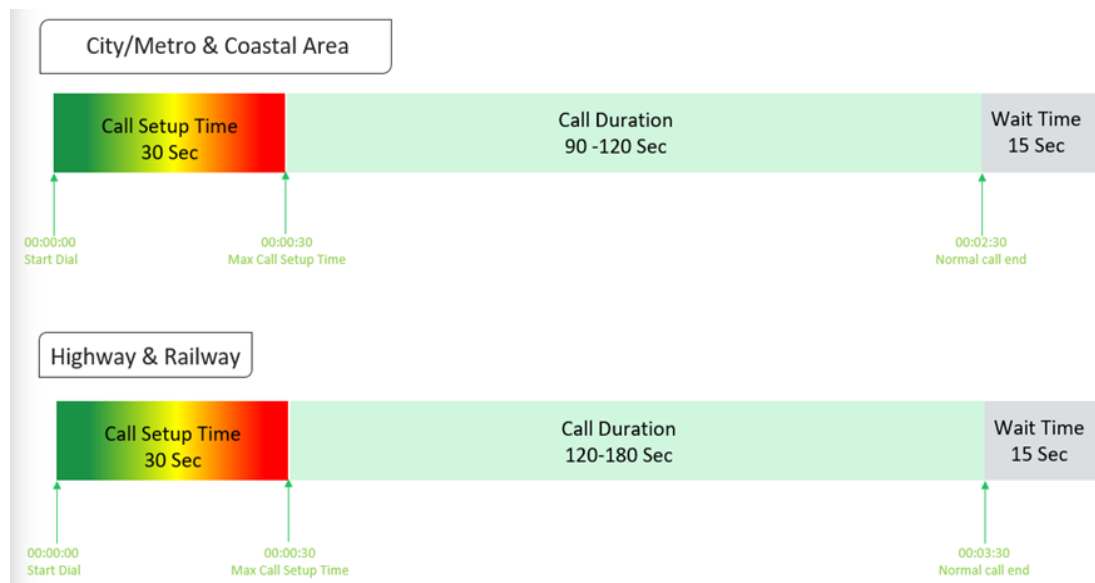


Figure-57: Voice test script for city/railway/metro/highway & coastal area

- 15 sec wait time is applied after locking Radio Access Technology (RAT) to 3G/2G and before starting first call in 3G/2G call.
- Speech quality (MOS) will be measured only City & Highway drive by making Mobile to Mobile calls.

(b) Hotspot voice testing



Figure-58: Voice test script for walktest/hotspot

- 10 calls to be made at each Hotspot location.
- Minimum 10 Calls to be made during the walk test. Call count will be increased based on walk test distance.

(c) Dynamic Data (internet) test

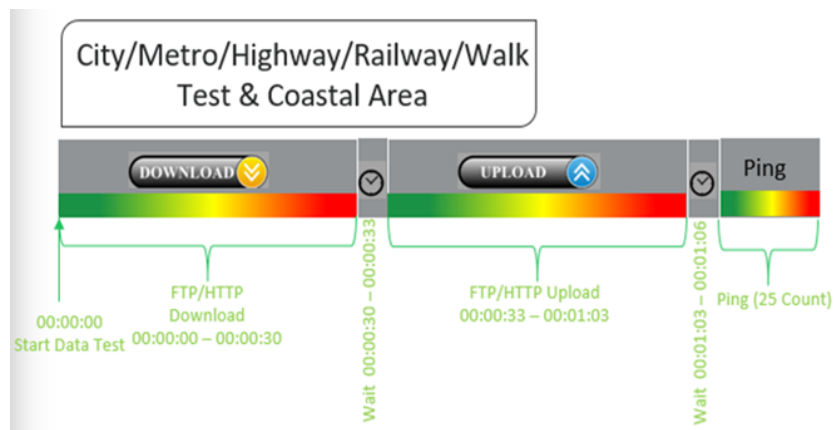


Figure-59: Data test script used in city/metro/railway/highway/walk test & coastal area

(d) Static Data(internet) testing

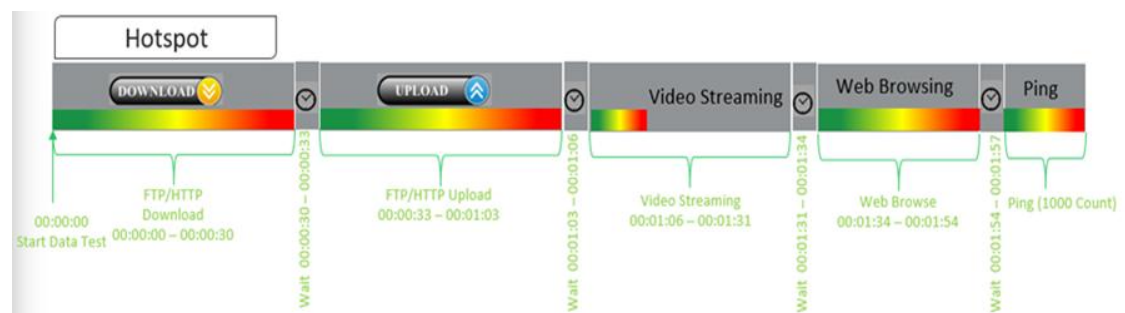


Figure-60: Data test script used at hotspot

- 5 Data iteration done at each hotspot location
- Min. 5 iteration made during the walk test.
- Web browsing duration mentioned above is for one web site only.
- Only 1 ping iteration (with 1000 Count) done at hotspot location.

7.2 Appendix-II

7.2.1 Network Performance Parameters for Voice calls

Parameter Name	Definition
Call Setup Success Rate	<p>(i) Call Setup Success Rate is defined as the ratio of Established Calls to Call Attempts. 'Established Calls' mean the following events have happened in call setup:</p> <ul style="list-style-type: none"> (a) Call attempt is made (b) The signaling channel is allocated (c) The call is routed to the outwards path of the terminating network (d) An alert signal is received by caller in the form of ring back tone, busy tone, or an announcement. <p>CSSR = (Total Call Established/ Total Call Attempt) *100</p> <p>As per QoS Regulation 2024 benchmark value is >=98%</p>
Drop Call Rate	<p>Call drop represents the service provider network's ability to maintain a call once it has been successfully established. This parameter shall include both incoming calls and outgoing calls which, once they have been established and have an assigned traffic channel/ bearer, are dropped, or interrupted before their normal completion by the user, the cause of the early termination being within the service provider's network</p> <p>Drop Call Rate = (Total Call Drop/Total Call Established) *100</p> <p>As per QoS Regulation 2024 benchmark value is <=2%</p>
Call Setup Time	<p>Time taken from call initiate to call alerting/ringing.</p> <p>Call Setup Time = T2- T1</p> <p>T2- Ringing (VoLTE/VoNR) & Alerting (for WCDMA & GSM), T1- Invite (VoLTE/VoNR) & CM Service Request (for WCDMA & GSM)</p>
Voice Quality (MOS)	<p>Voice quality in mobile networks is measured with algorithms based on ITU-T P.863 (POLQA). The grading for Voice quality has been given as:</p> <p>Excellent: MOS ≥ 4 and < 5 Good : MOS ≥ 3 and < 4 Fair : MOS ≥ 2 and < 3 Poor : MOS ≥ 1 and < 2</p>
Handover Success Rate	<p>Handover Success Rate = Count of successful handovers (All Technology Handover combined) / Total count of Handover Attempt (All Technology Handover combined) *100</p> <p>Handover type which are considered- 2G Inter & Intra cell, 3G Soft & IRAT, 4G Inter & Intra frequency & SRVCC, 5G Inter & Intra frequency & 5G to 4G handovers.</p>
Silence Call	<p>A call which has ≥ 4 sec continuous RTP gap is considered as a Silence Call.</p> <p>Silence call rate = (count of silence call / Total calls established) *100</p> <p>If a call observes multiple silence count ≥ 4 sec in a particular established call it has been taken as one silent event.</p>

Jitter	<p>The inter arrival jitter is the difference in the relative transit time for two packets. The relative transit time is the difference between a packet's Real-time Transport Protocol (RTP) timestamp and the receiver's clock at the time of arrival, measured in the same units. If S_i is the RTP timestamp from packet i, and R_i is the time of arrival in RTP timestamps units for packet i, then for two packets i and j the inter-arrival jitter D can be expressed as:</p> $D(i,j) = (R_j - R_i) - (S_j - S_i)$ <p>The interarrival jitter is calculated continuously as each data packet i is received from source $SSRC_n$, using this difference D for that packet and the previous packet $i-1$ in order of arrival (not necessarily in sequence), according to the formula</p> $J(i) = J(i-1) + (D(i-1,i) - J(i-1))/16 \text{ or } 8$																																		
Downlink Packet Drop Rate	<p>Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source_SSRC and sequence number) at call originating handset. This KPI is calculated from MOS call for packet call only (VoNR/VoLTE)</p>																																		
Uplink Packet Drop Rate	<p>Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source_SSRC and sequence number) at call terminating handset. This KPI is calculated from MOS call for packet call only (VoNR/VoLTE).</p>																																		
Signal Strength	<p>Signal strength is the signal power level received by the wireless user.</p> <table><tr><th rowspan="2">Parameter Name</th><th rowspan="2">Technology</th><th colspan="4">Signal Strength (dBm)</th></tr><tr><th>Excellent</th><th>Good</th><th>Fair</th><th>Poor</th></tr><tr><td>Rx Level</td><td>GSM</td><td>0 to ≥ -65</td><td><-65 to ≥ -75</td><td><-75 to ≥ -85</td><td><-85 to min</td></tr><tr><td>RSCP</td><td>WCDMA</td><td>0 to ≥ -70</td><td><-70 to ≥ -80</td><td><-80 to ≥ -90</td><td><-90 to min</td></tr><tr><td>RSRP</td><td>LTE</td><td>0 to ≥ -80</td><td><-80 to ≥ -95</td><td><-95 to ≥ -110</td><td><-110 to min</td></tr><tr><td>SS_RSRP</td><td>NR</td><td>0 to ≥ -80</td><td><-80 to ≥ -95</td><td><-95 to ≥ -110</td><td><-110 to min</td></tr></table>	Parameter Name	Technology	Signal Strength (dBm)				Excellent	Good	Fair	Poor	Rx Level	GSM	0 to ≥ -65	<-65 to ≥ -75	<-75 to ≥ -85	<-85 to min	RSCP	WCDMA	0 to ≥ -70	<-70 to ≥ -80	<-80 to ≥ -90	<-90 to min	RSRP	LTE	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min	SS_RSRP	NR	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min
Parameter Name	Technology			Signal Strength (dBm)																															
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SS_RSRP	NR	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min																														

Table-59: Network performance parameter and definition voice

7.2.2 Network Performance Parameters Data tests

Parameter Name	Definition
Download Speed (Mbps)	<p>The download speed is defined as the data transmission rate that is achieved for downloading a test file from a test server to a test device.</p> <p>Download Speed = Total bytes transferred during download / Total time for transfer</p> <ul style="list-style-type: none"> 80th percentile (upper range) & 20th percentile (lower range) value has been calculated for download throughput in dynamic drive and Hotspot combine data
Upload Speed (Mbps)	<p>The upload speed is the data transmission rate that is achieved for uploading a test file from a test device to a test server.</p> <p>Upload Speed = Total bytes transferred during upload / Total time for transfer.</p> <ul style="list-style-type: none"> 80th percentile (upper range) & 20th percentile (lower range) value has been calculated for upload throughput in dynamic drive and Hotspot combine data.

Download Session Setup Success Rate	(total download session established (successfully connected to server)/ total download session attempt) *100. This KPI has been calculated for Hotspot only.
Upload Session Setup Success Rate	(total upload session established (successfully connected to server)/ total upload session attempt)*100. This KPI need to report for Hotspot only.
Web Page Download Time	Web browsing test is used to measure performance in terms of opening a web/HTTP page. Time taken to open the web page successfully is considered as web browsing delay/web page download time.
Video Streaming Delay	The Video streaming delay is time taken from start of video transfer to First video frame displayed in player.
Latency	Latency is the time it takes for a small data set to be transmitted from a device to a server on the Internet and back to the same device again. The Latency is measured in milliseconds (ms). To calculate the one-way latency we just do half of the round-trip time. 50th percentile of one-way latency has been reported.
Jitter	Measure of variation in time in arrival of packets from a source to destination The consideration of packet delay jitter is considered by standard deviation of Inter Packet Delay Variation. If IPDV is used. By standard deviation is meant the average of standard deviation of IPDV on DL $IPDV(i) = D(i) - D(i-1)$ then Stdvs of IPDV is considered as jitter.
Packet Loss Rate	Number of packets lost out of total packet transferred during test. Packet loss rate = (Total packet lost / Total packet sent) *100 * Packet delay (using ping) >90 ms considered as packet loss and included in packet loss rate. * Packet loss rate is calculated based on ICMP *90th percentile for Packet loss rate has been reported in overall Hotspot performance summary.

Table-60: Network performance parameter and definition Data

Disclaimer: The observations presented above and, in the reports, represent the performance of the service providers on the area/route under test on the day/time of conducting the drive test and no inference whatsoever may be drawn regarding the quality of the telecom service by the service providers in the whole city/state/licensed service area.