भादूविप्रा
TRAI

TELECOM REGULATORY AUTHORITY OF INDIA

Independent Drive Test Report

Madhya Pradesh LSA

July 2025

Contents

1. Introduction

TRAI Act, 1997 mandates the Authority to ensure the services delivered through various telecommunications networks meet the 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 interests of the consumers of telecommunications services.

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 Madhya Pradesh License Service Area (LSA) during the month of July-2025 under the supervision of TRAI Regional Office (RO) Bhopal. Details of route / area covered during the IDT are as given below:

S. No	Drive test route	Type of route	Distance covered (KMs)	From date	To date
1	Shahdol & Korba	City	371.8	07-July-2025	10-July-2025
2	Shahdol & Korba	Inter Operator Calling	21.0	08-July-2025	10-July-2025
3	Shahdol & Korba	Hotspot	10 Locations	07-July-2025	11-July-2025
4	Shahdol & Korba	Walk test	8.2	08-July-2025	10-July-2025
5	Shahdol to Korba	Highway	153.6	08-July-2025	08-July-2025
6	Korba to Rajnandgaon	Railway	268.9	11-July-2025	11-July-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, walk tests, highway and railway as per the legends shown on the map.

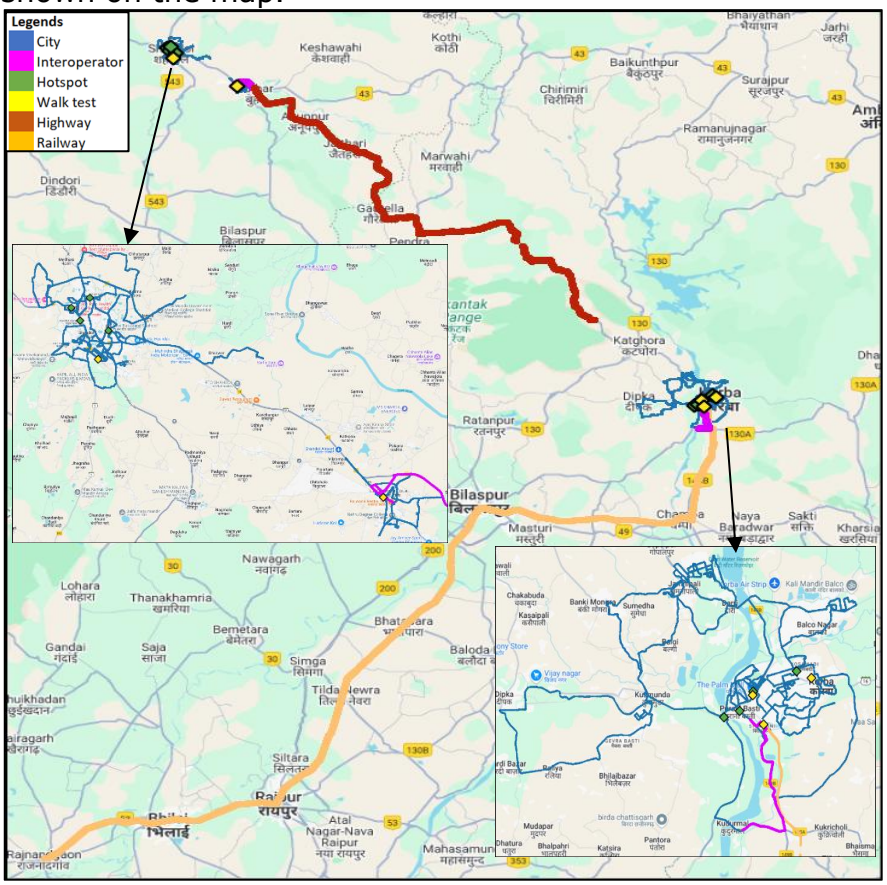


Figure-1: Drive test routes

2.3 Summary of areas covered

a) City-Shahdol city- Mendhaki, Sohagpur, Gortara, Jamuna, Kotma, Vikrampur, Lakheran Tola & Saabo etc.
Korba city- Jamnipali, Banki Mongra, Balgi, Dipka, Hardi Bazar, Kusmunda, Kudurmal, Purani Basti, Korba, Balco Nagar & Darri etc.

b) Hotspot

1. District and Session Court Shahdol
2. District Court Korba
3. Indira Gandhi District Hospital Korba
4. Kushabhai Thakrey, District Hospital Shahdol
5. Mata Sarwamangla Temple Korba
6. New Bus Stand Shahdol
7. New Bus Stand T.P Nagar Korba
8. Old Bus Stand Korba
9. Palm Mall Korba
10. The Virateshwar Temple Shahdol

c) Walk Test

1. Burhar Railway Station
2. Indira Gandhi District Hospital Korba
3. Palm Mall Korba
4. Korba Railway Station
5. Shahdol Railway Station

d) Highway
Shahdol to Korba

e) Railway
Korba to Rajnandgaon

2.4 Telecom service providers detected frequency bands

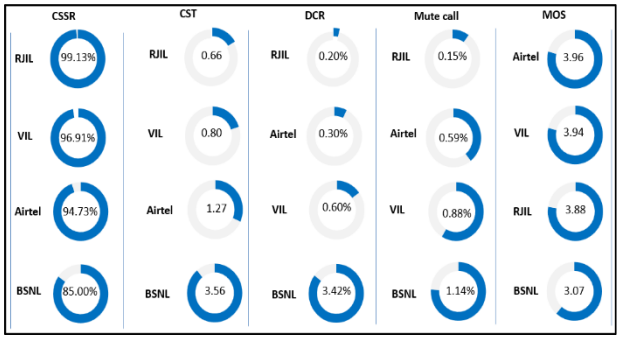
Technologies covered during the IDT and frequency bands in use are summarised in table below:

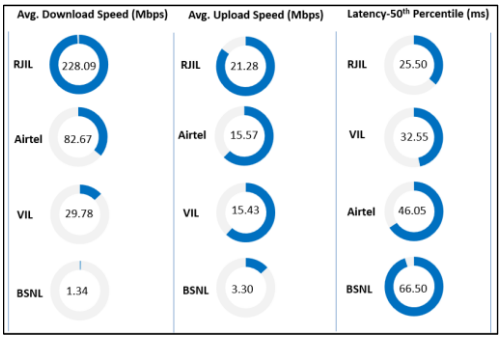
S.no.	Name of TSP	Technology	Frequency Bands (In MHz)
1	Bharti Airtel Ltd.	2G	1800
2	Bharti Airtel Ltd.	4G	850,1800,2100,2300
3	Bharti Airtel Ltd.	5G	3500
4	BSNL	2G	900
5	BSNL	3G	2100
6	BSNL	4G	700, 2100
7	Reliance JIO Infocomm Ltd.	4G	850,1800,2300
8	Reliance JIO Infocomm Ltd.	5G	700,3500
9	Vodafone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

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 seconds), **DCR**: Drop Call Rate (in %) & **MOS**: Mean Opinion Score.





Summary-Voice services

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have 94.73%, 85.00%, 99.13% and 96.91% 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 1.27, 3.56, 0.66 and 0.80 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate 0.30%, 3.42%, 0.20% and 0.60% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate 0.59%, 1.14%, 0.15% and 0.88% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 3.96, 3.07, 3.88 and 3.94 respectively.

Summary-Data services

Data Download performance (Overall): Average download speed of Airtel (5G/4G/2G) is 82.67 Mbps, BSNL (4G/3G/2G) is 1.34 Mbps, RJIL (5G/4G) is 228.09 Mbps and VIL (4G/2G) is 29.78 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G/2G) is 15.57 Mbps, BSNL (4G/3G/2G) is 3.30 Mbps, RJIL (5G/4G) is 21.28 Mbps and VIL (4G/2G) is 15.43Mbps.

Data performance - Hotspots (in Mbps):

Airtel- 4G D/L: 40.42 4G U/L: 7.24
5G D/L: 252.48 5G U/L: 37.58
BSNL- 4G D/L: 1.63 4G U/L: 5.09
RJIL- 4G D/L: 41.82 4G U/L: 13.17
5G D/L: 375.42 5G U/L: 26.84
VIL- 4G D/L: 28.11 4G U/L: 14.19

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

QoS Performance Analysis- Madhya Pradesh 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 July-2025 covering city drive, hotspots, walk tests, highway & railway (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	729	755	719
Call Setup Success Rate %	92.87	88.34	95.55
Drop Call Rate %	0.30	3.00	0.73
Call Setup Time-Average (Second)	4.43	4.36	2.91
Handover Success Rate %	98.88	99.68	97.48

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

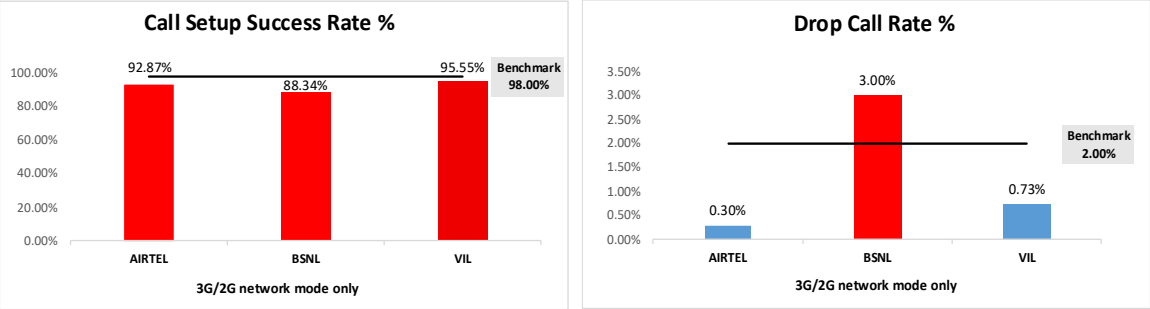


Figure-2: Call setup success rate and drop call rate performance.

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	60	NA
2G	437	190	345

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	1043	1100	1032	1037
Call Setup Success Rate %	94.73	85.00	99.13	96.91
Drop Call Rate %	0.30	3.42	0.20	0.60
Call Setup Time-Average (Second)	1.27	3.56	0.66	0.80
Handover Success Rate %	99.88	99.59	99.89	99.88

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

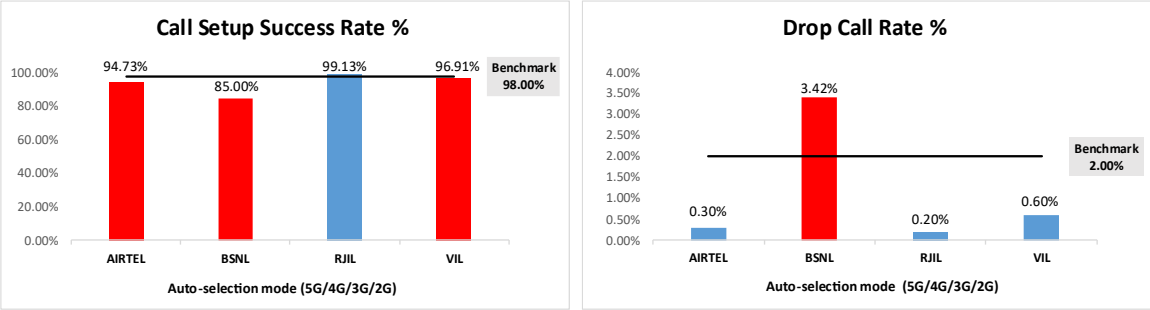


Figure-3: Performance for call setup success rate and drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	678	701	677	678
Number of silence call for >4 Sec	4	8	1	6
Silence Call Rate %	0.59	1.14	0.15	0.88
Number of silence instances for >4 Sec	5	10	2	7
Number of silence instances for >3 Sec	11	19	4	17
Number of silence instances for >2 sec	31	43	32	35
RTP Jitter (4G & 5G) in ms	5.31	10.37	8.10	18.40
Packet loss Rate Downlink %	0.90	3.86	0.25	0.84
Packet loss Rate Uplink %	0.74	1.94	0.48	0.77

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	627	NA
4G	1436	516	2570	1090
3G	NA	70	NA	NA
2G	10	216	NA	72

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	4193	3423	4330	4201
Speech Quality (Average MOS)	3.96	3.07	3.88	3.94
Number of samples with MOS >=4 to <5 (Excellent)	3406	811	2909	2721
Number of samples with MOS >=3 to <4 (Good)	608	1122	1157	1260
Number of samples with MOS >=2 to <3 (Fair)	81	1071	200	135
Number of samples with MOS >=1 to <2 (Poor)	98	419	64	85
%age of samples with MOS >=4 to <5 (Excellent)	81.23%	23.69%	67.18%	64.77%
%age of samples with MOS >=3 to <4 (Good)	14.50%	32.78%	26.72%	29.99%
%age of samples with MOS >=2 to <3 (Fair)	1.93%	31.29%	4.62%	3.21%
%age of samples with MOS >=1 to <2 (Poor)	2.34%	12.24%	1.48%	2.02%

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

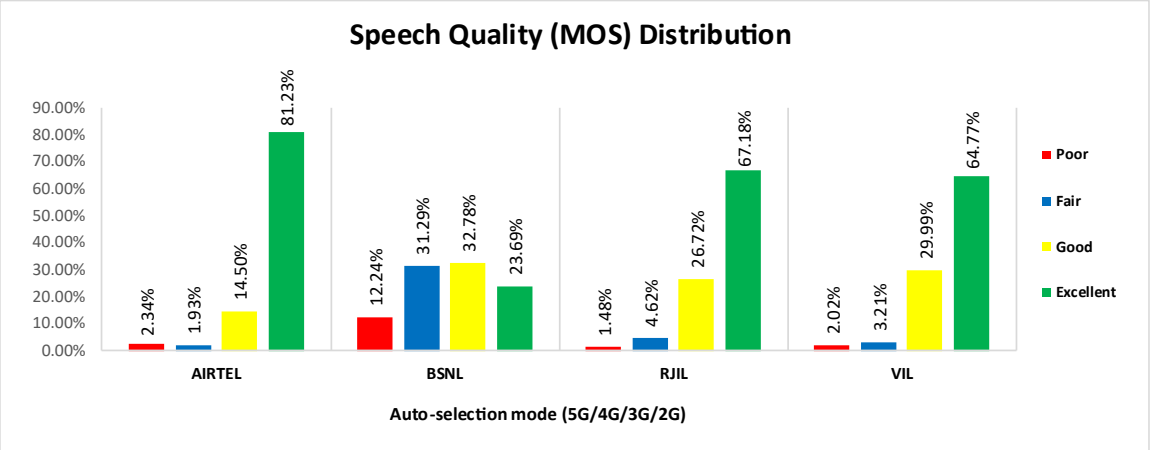


Figure- 4: Distribution of samples in MOS range.

(d) Inter-service provider voice call performance: To check the performance of inter-service providers call setup success rate, total 40 to 67 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	87.72	100.00	100.00
BSNL	96.49	NA	40.00	98.39
RJIL	98.51	84.31	NA	98.28
VIL	100.00	93.75	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	4.22	2.40	2.78
BSNL	3.80	NA	5.29	4.78
RJIL	2.17	4.22	NA	2.26
VIL	2.39	3.14	3.36	NA

Table-10: Call setup time across service providers

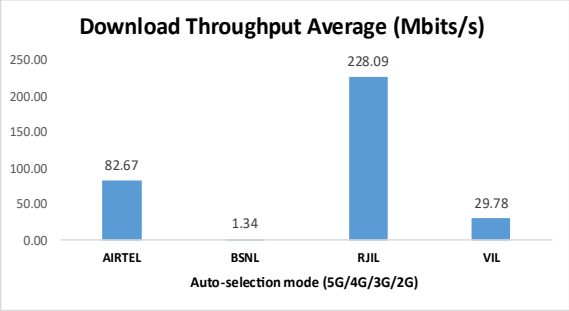
Note-
- NA- Only inter-operator calls were measured during test.

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	82.67	1.34	228.09	29.78
	80th Percentile	166.34	1.74	414.80	48.75
	20th Percentile	8.55	0.55	24.88	7.24
Upload Throughput (Mbits/s)	Average	15.57	3.30	21.28	15.43
	80th Percentile	23.35	4.39	37.56	28.36
	20th Percentile	3.50	1.81	3.74	3.31
Latency (ms)	50th Percentile	46.05	66.50	25.50	32.55

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



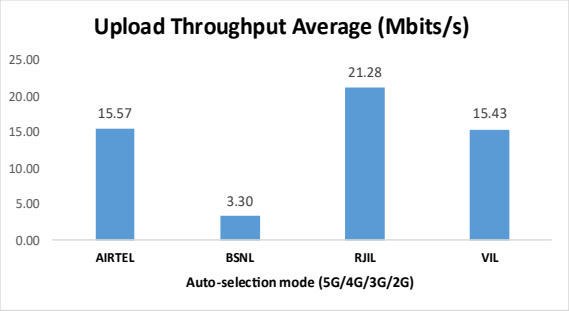


Figure- 5: Download and Upload throughput.

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	1002	NA
4G	1471	594	700	1045
3G	NA	51	NA	NA
2G	11	84	NA	53

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

4. Detailed QoS performance analysis

4.1 Overview

This section covers analysis on performance of various categories of drives like city, hotspots, walk test, highway and railway for all telecom service providers, the results of drive tests conducted are shown individually for respective areas/locations.

4.2 City

Drive test has been conducted from 07th July 2025 to 10th July 2025 in Shahdol & Korba. (Refer Table-1)

4.2.1 Drive test route

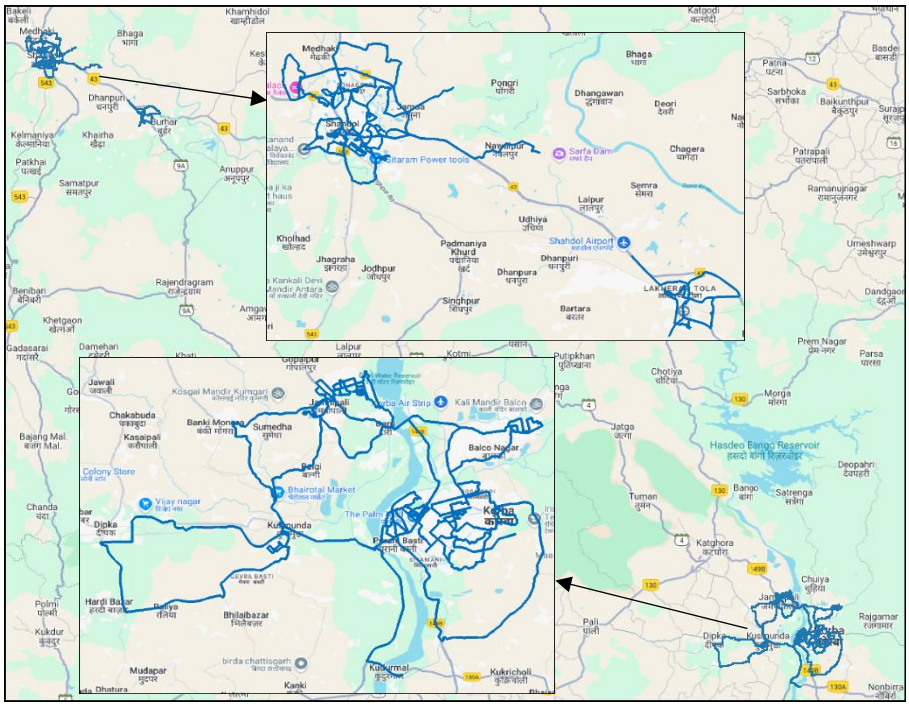


Figure- 6: Drive test routes

4.2.2 Areas covered

Shahdol city- Mendhaki, Sohagpur, Gortara, Jamuna, Kotma, Vikrampur, Lakheran Tola & Saabo etc.

Korba city- Jamnipali, Banki Mongra, Balgi, Dipka, Hardi Bazar, Kusmunda, Kudurmal, Purani Basti, Korba, Balco Nagar & Darri etc.

4.2.3 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	632	640	635
Call Setup Success Rate %	99.68	97.19	99.69
Drop Call Rate %	0.00	1.77	0.00
Call Setup Time-Average (Second)	4.39	4.36	2.89
Handover Success Rate %	98.78	99.80	97.38

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

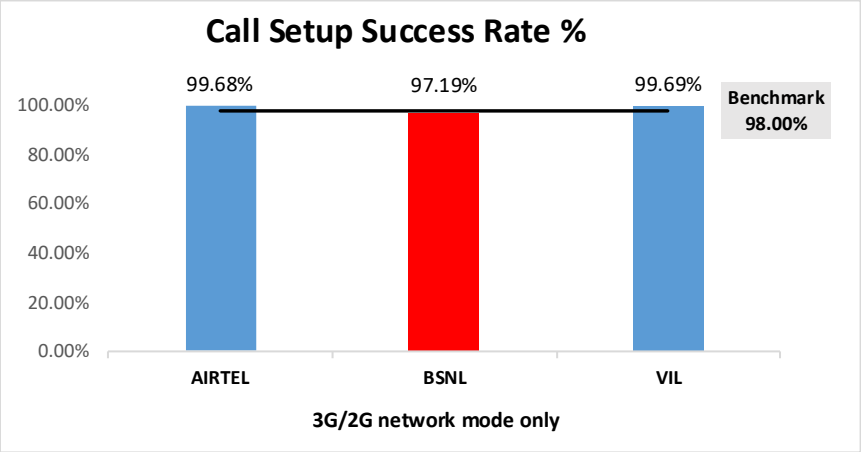


Figure-7: Performance for call setup success rate.

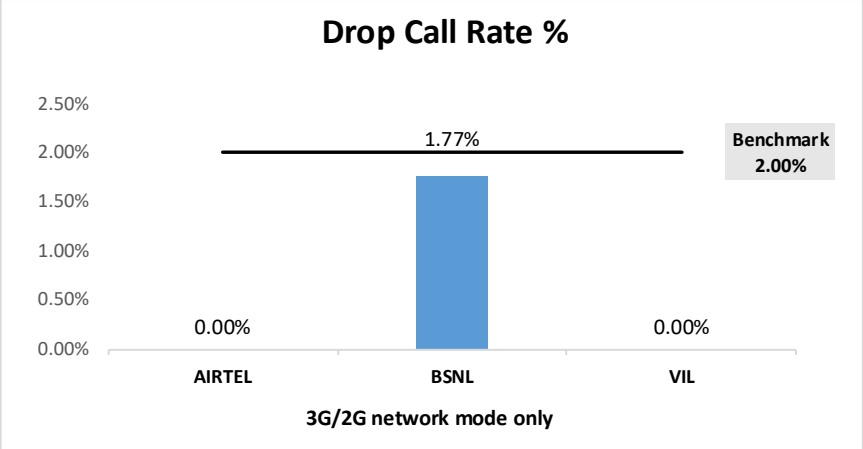


Figure-8: Performance for drop call rate.

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

Technology	Service Provider		
	AIRTEL	BSNL	VIL
3G	NA	40.91%	NA
2G	99.96%	58.90%	99.98%
Limited Service	0.04%	0.19%	0.02%

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

Note-

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

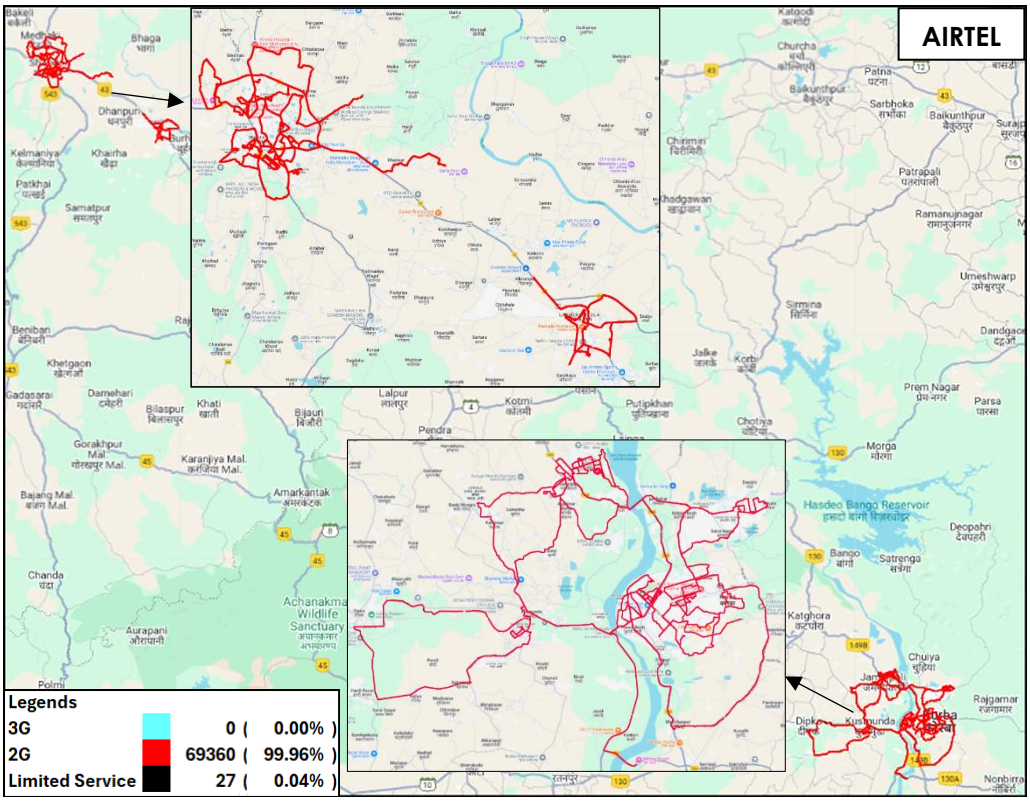


Figure-9: Serving technology plots 3G/2G network mode – AIRTEL.

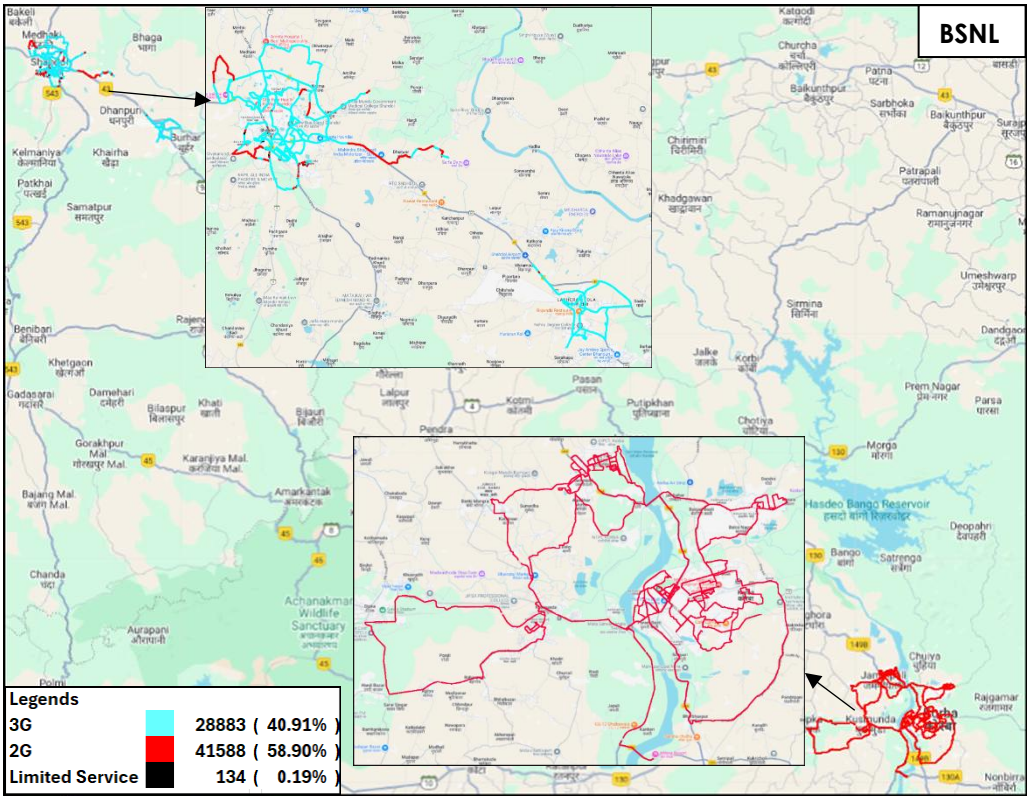


Figure-10: Serving technology plots 3G/2G network mode –BSNL.

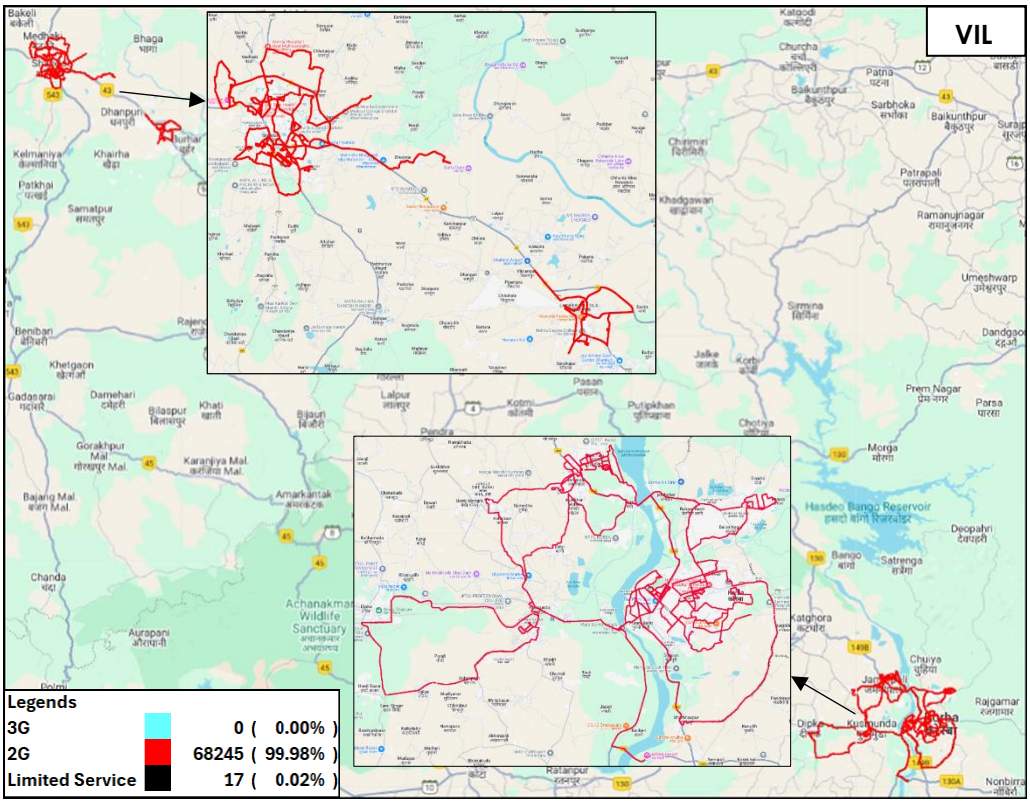


Figure-11: Serving technology plots 3G/2G network mode –VIL.

(c) Network Signal Strength Distribution: The following chart represents signal strength distribution for 3G/2G network mode only. (Refer figure- 52, 53 & 54 for map view)

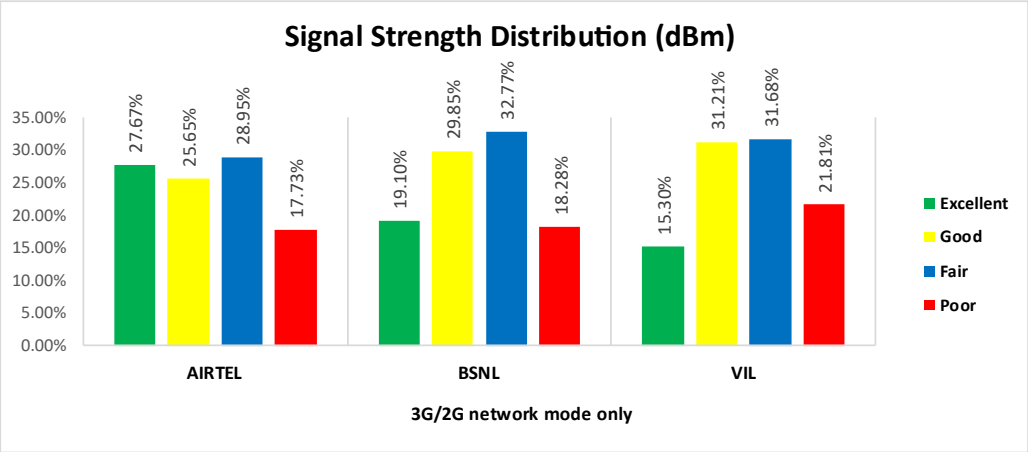


Figure-12: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 28% of samples falling in the excellent signal strength category.
- BSNL has 19% of samples falling in the excellent signal strength category.
- VIL has 15% 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	656	657	681	662
Call Setup Success Rate %	100.00	94.82	99.12	99.70
Drop Call Rate %	0.00	1.77	0.30	0.00
Call Setup Time Average (Second)	1.25	3.61	0.65	0.75
Handover Success Rate %	99.92	99.53	99.87	99.96

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

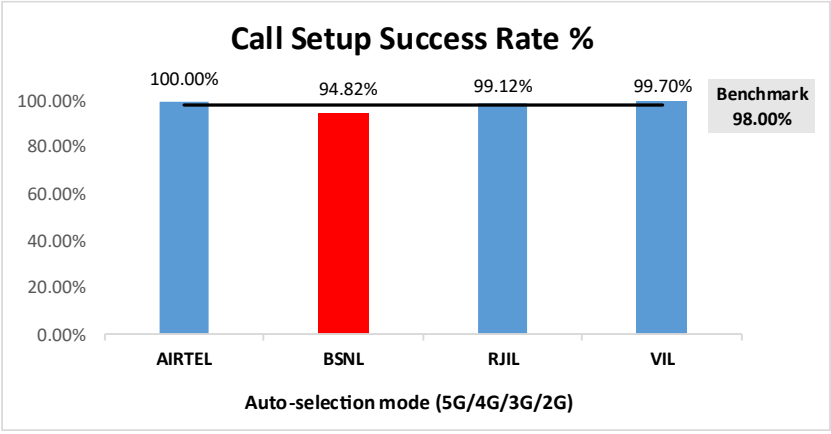


Figure-13: Performance for call setup success rate.

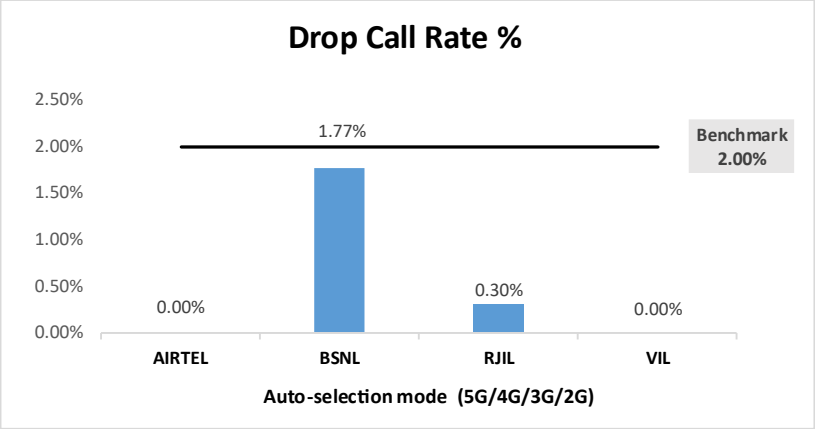


Figure-14: Performance for drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	639	664	623	632
Number of silence call for >4 Sec	3	8	0	5
Silence Call Rate %	0.47	1.20	0.00	0.79
Number of silence instances for >4 Sec	4	10	0	6
Number of silence instances for >3 Sec	9	19	0	13
Number of silence instances for >2 sec	24	40	23	27
RTP Jitter (4G & 5G) in ms	5.21	11.63	7.99	19.01
Packet loss Rate Downlink %	0.74	3.08	0.22	0.67
Packet loss Rate Uplink %	0.64	1.94	0.43	0.61

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	3713	3122	3641	3675
Speech Quality (Average MOS)	3.97	3.13	3.89	3.96
Number of samples with MOS >=4 to <5 (Excellent)	3038	811	2458	2384
Number of samples with MOS >=3 to <4 (Good)	536	1044	968	1140
Number of samples with MOS >=2 to <3 (Fair)	63	917	167	96
Number of samples with MOS >=1 to <2 (Poor)	76	350	48	55
%age of samples with MOS >=4 to <5 (Excellent)	81.82%	25.98%	67.51%	64.87%
%age of samples with MOS >=3 to <4 (Good)	14.44%	33.44%	26.59%	31.02%
%age of samples with MOS >=2 to <3 (Fair)	1.70%	29.37%	4.59%	2.61%
%age of samples with MOS >=1 to <2 (Poor)	2.05%	11.21%	1.32%	1.50%

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

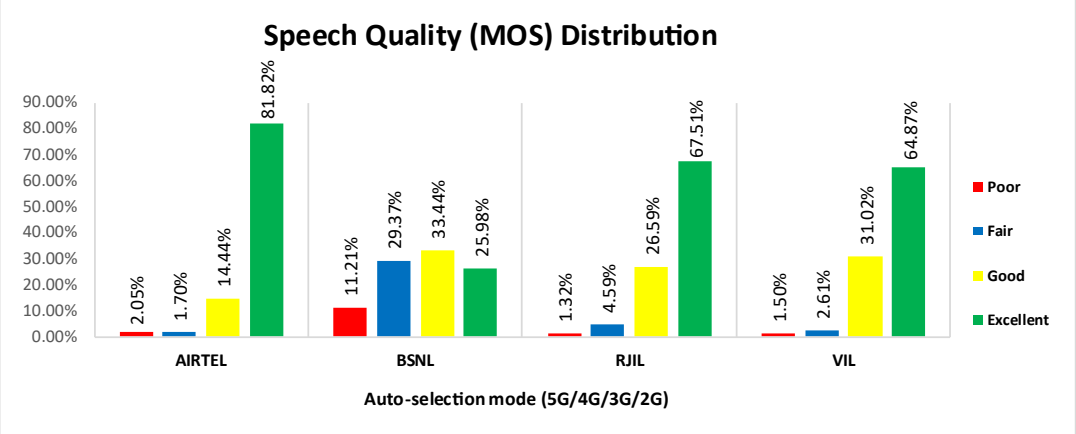


Figure-15: Distribution of samples in MOS range.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	18.52%	NA	19.06%	NA
4G	81.48%	54.80%	80.92%	99.47%
3G	NA	7.56%	NA	NA
2G	0.00%	36.93%	NA	0.53%
Limited Service	0.00%	0.72%	0.01%	0.00%

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

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

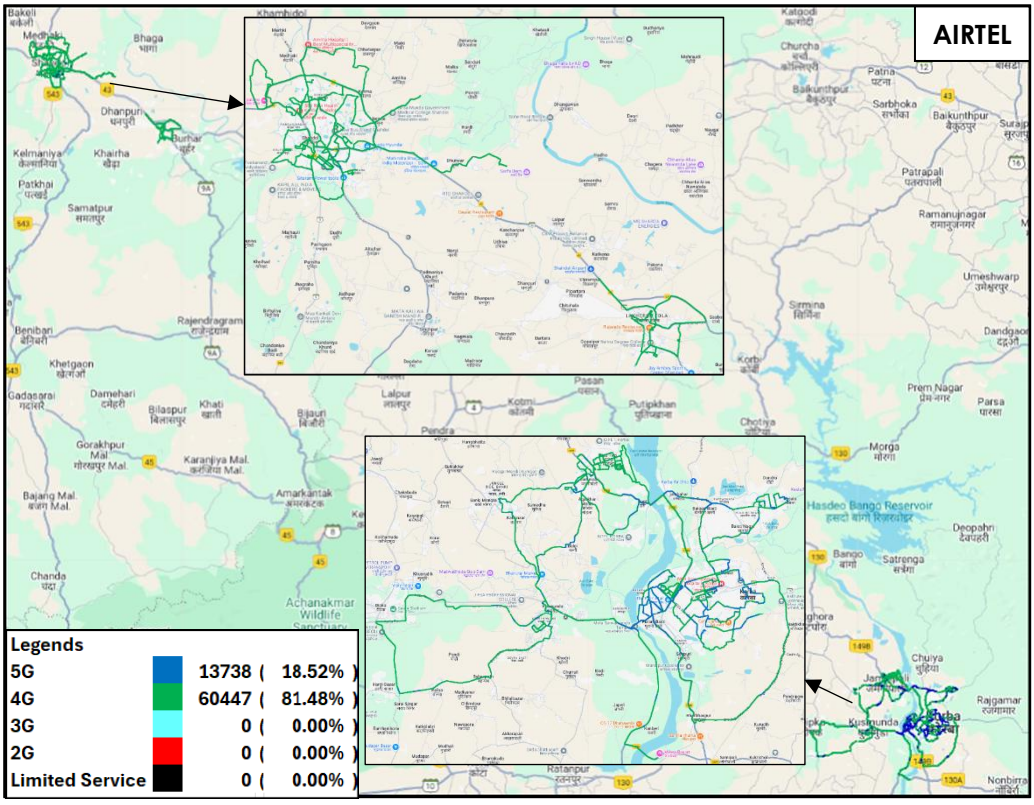


Figure-16: Serving technology plots in auto-selection mode (5G/4G/3G/2G) -AIRTEL.

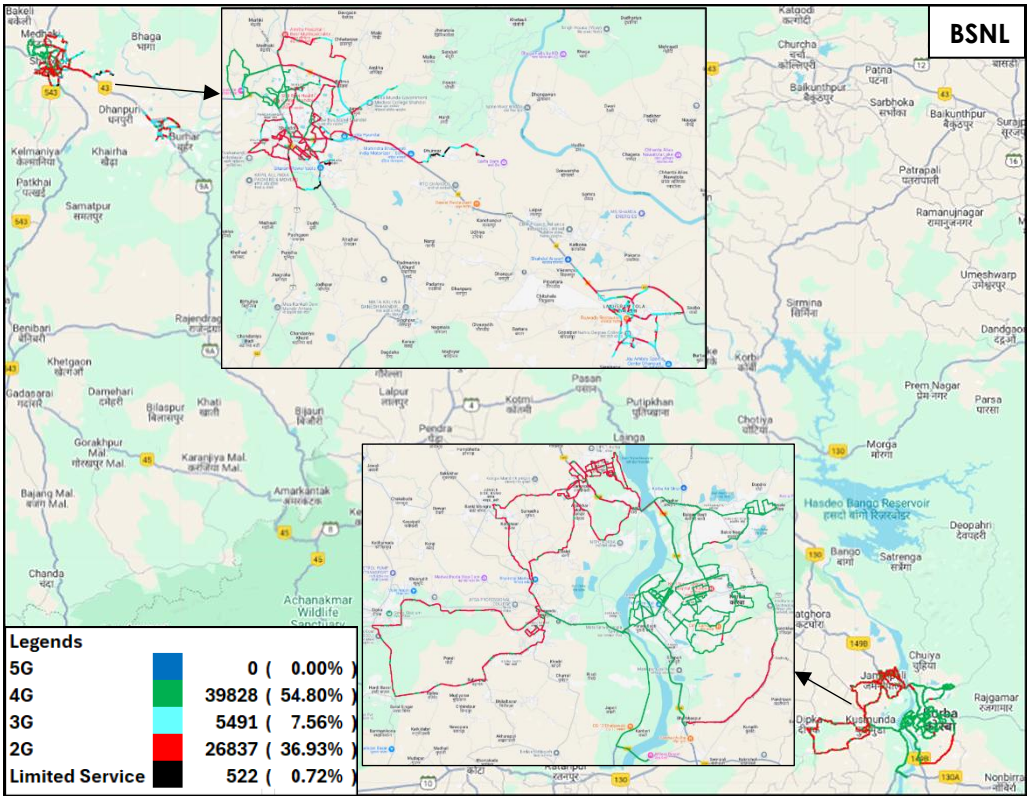


Figure-17: Serving technology plots in auto-selection mode (5G/4G/3G/2G - 4G being rolled out in LSA) -BSNL

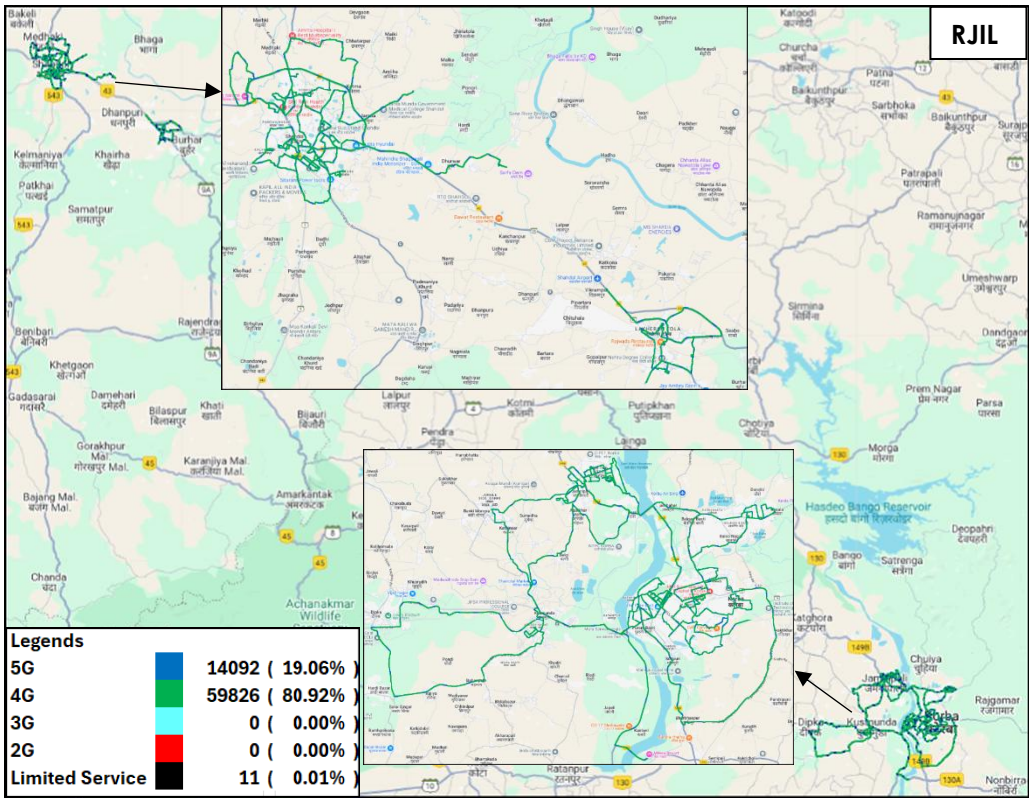


Figure-18: Serving technology plots in auto-selection mode (5G/4G/3G/2G)- RJIL.

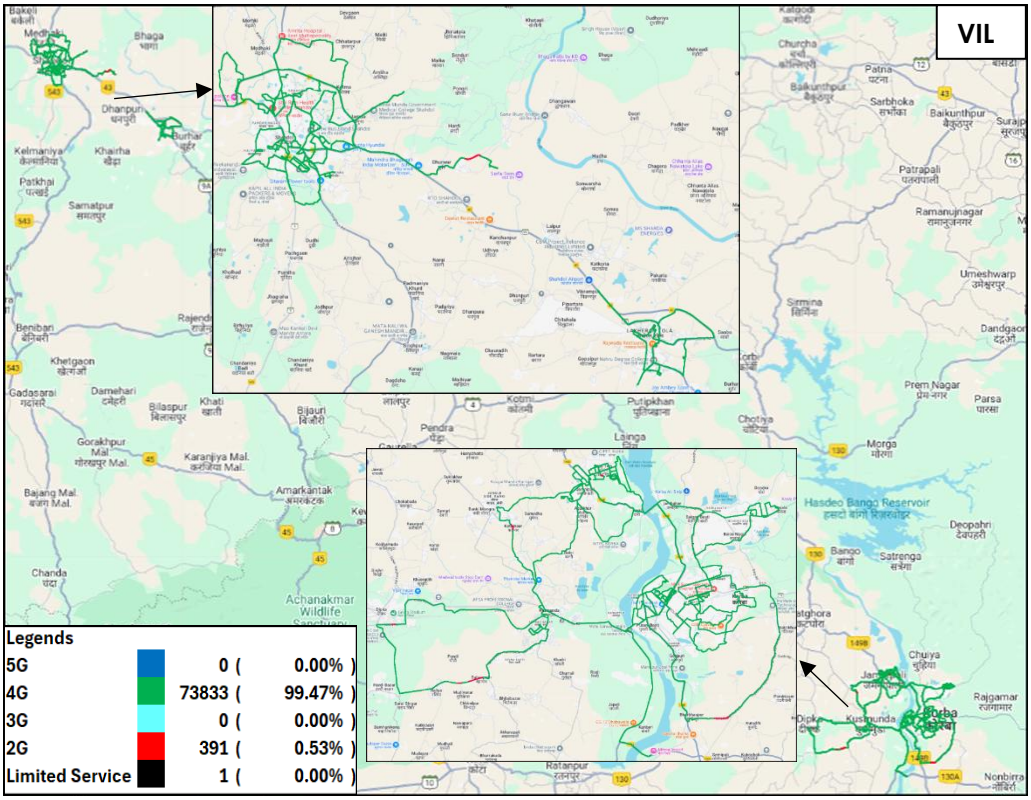


Figure-19: Serving technology plots in auto-selection mode (5G/4G/3G/2G) – VIL

(g) Network Signal Strength Distribution: The following chart provide signal strength distribution for auto-selection mode (5G/4G/3G/2G). (Refer figure-55, 56, 57 & 58 for map view)

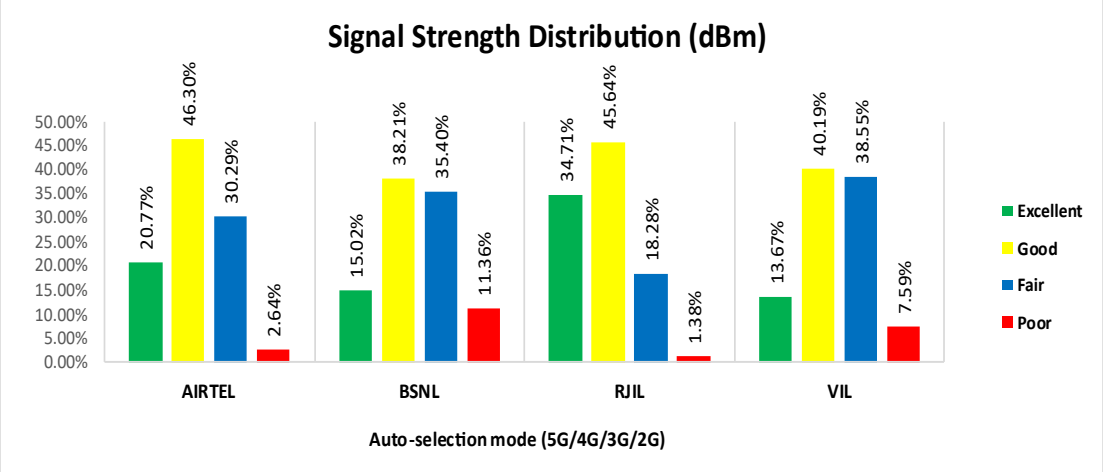


Figure-20: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

Observations:

- Airtel has 21% of samples falling in the excellent signal strength category.
- BSNL has 15% of samples falling in the excellent signal strength category.
- RJIL has 35% of samples falling in the excellent signal strength category.
- VIL has 14% 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	82.98	1.19	271.82	31.24
	80th Percentile	161.59	1.68	468.28	51.01
	20th Percentile	11.83	0.58	69.40	7.86
Upload Throughput (Mbits/s)	Average	15.59	3.40	24.26	14.25
	80th Percentile	21.32	4.20	42.51	25.40
	20th Percentile	3.89	2.01	4.62	3.34
Latency (ms)	50th Percentile	46.90	66.00	26.10	32.10

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

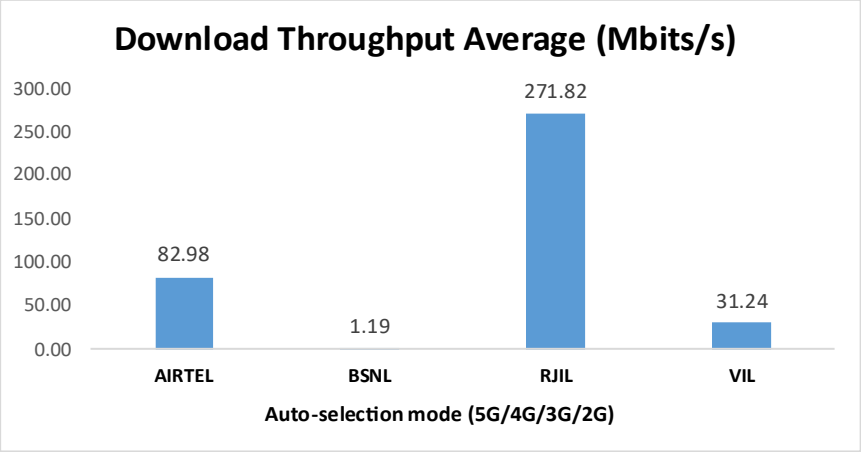


Figure- 21: Download throughput

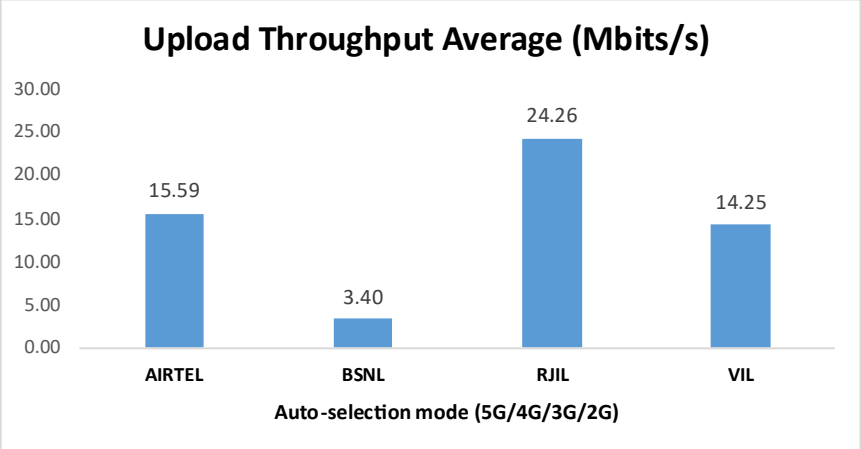


Figure- 22: Upload throughput

4.3 Hotspots

Hotspot testing has been done on 07th July to 11th July 2025. Ten locations have been tested in Shahdol & Korba.

4.3.1 Locations

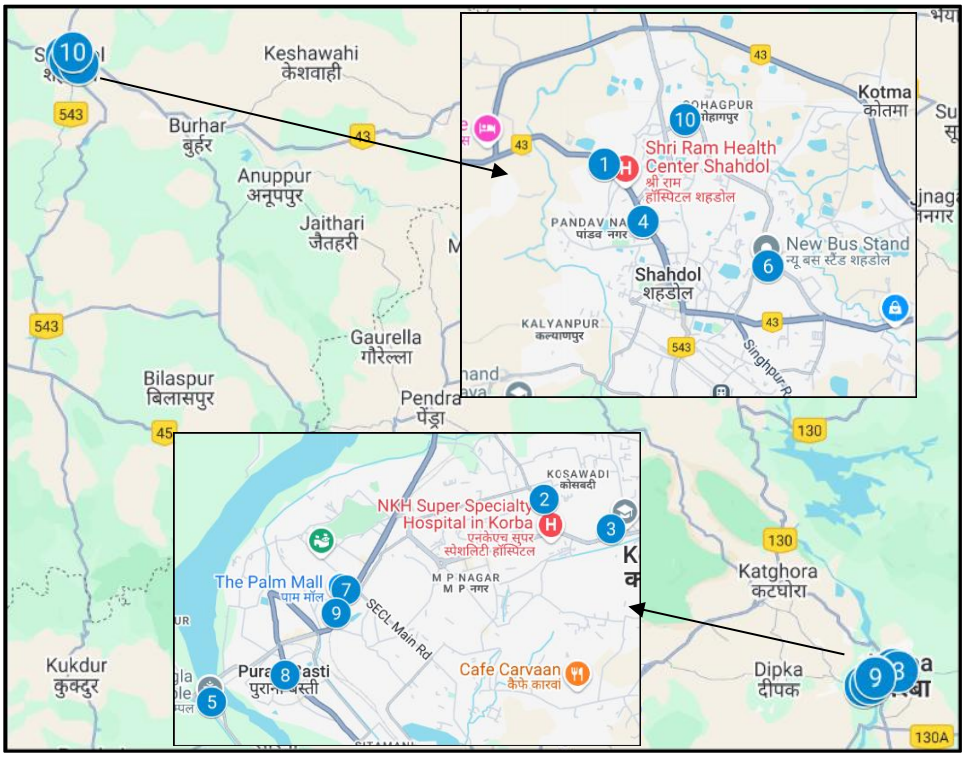


Figure- 23: Hotspot locations

4.3.2 Hotspot covered

1. District and Session Court Shahdol
2. District Court Korba
3. Indira Gandhi District Hospital Korba
4. Kushabhai Thakrey, District Hospital Shahdol
5. Mata Sarwamangla Temple Korba
6. New Bus Stand Shahdol
7. New Bus Stand T.P Nagar Korba
8. Old Bus Stand Korba
9. Palm Mall Korba
10. The Virateshwar Temple Shahdol

4.3.3 Voice performance

Overall Voice Performance				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	100	100	100	100
Call Setup Success Rate %	100.00	96.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.27	2.18	0.57	0.72

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

District and Session Court Shahdol				
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)	1.16	1.05	0.53	0.63

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

District Court Korba				
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)	1.21	2.22	0.56	0.67

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

Indira Gandhi District Hospital Korba				
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)	1.19	2.16	0.53	0.59

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

Kushabhai Thakrey, District Hospital Shahdol				
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)	1.21	1.65	0.61	0.63

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

Mata Sarwamangla Temple Korba				
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)	1.27	2.07	0.60	0.66

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

New Bus Stand Shahdol				
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)	1.20	2.07	0.60	0.67

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

New Bus Stand T.P Nagar Korba				
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)	1.25	2.12	0.57	0.71

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

Old Bus Stand Korba				
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)	1.67	4.43	0.57	1.34

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

Palm Mall Korba				
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)	1.32	2.21	0.54	0.61

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

The Virateshwar Temple Shahdol				
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	60.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.16	1.52	0.56	0.65

Table-30: 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)	144.22	2.03	332.78	30.35
Download Throughput 80th Percentile (Mbit/s)	269.43	3.16	467.22	37.25
Download Throughput 20th Percentile (Mbit/s)	15.34	0.58	196.58	11.01
Download Session Setup Success Rate %	100.00	86.00	96.00	94.00
Upload Throughput Average (Mbits/s)	15.73	3.28	24.98	16.05
Upload Throughput 80th Percentile (Mbit/s)	24.28	4.70	33.75	31.09
Upload Throughput 20th Percentile (Mbit/s)	3.75	1.59	6.82	1.87
Upload Session Setup Success Rate %	100.00	90.00	98.00	94.00
Web Browsing Delay (Second)	3.46	4.11	2.44	4.02
Youtube Initial Buffer Delay (Second)	1.57	3.03	0.78	1.42
Latency (ms) - 50th Percentile	43.30	70.00	22.45	31.90
Jitter (ms)	8.97	16.00	7.79	13.97
Packet Loss Rate%	2.94	48.53	1.21	1.42
Packet Loss Rate- 90th percentile	4.32	100.00	3.34	2.68

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

District and Session Court Shahdol				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	4.91	1.10	199.91	32.27
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	5.82	3.74	12.37	38.73
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	3.33	4.43	2.42	2.41
Youtube Initial Buffer Delay (Second)	1.95	2.24	0.66	0.76
Latency (ms) - 50th Percentile	46.63	-	18.15	27.05
Jitter (ms)	3.02	-	2.22	2.75
Packet Loss Rate%	0.30	100.00	0.00	0.30

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

Note- "- "Latency test failed.

District Court Korba				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	271.14	2.07	393.35	98.39
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	9.46	3.52	34.01	40.40
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.45	3.61	2.27	4.38
Youtube Initial Buffer Delay (Second)	0.76	1.41	0.79	1.07
Latency (ms) - 50th Percentile	42.58	79.00	27.13	33.35
Jitter (ms)	22.72	8.99	6.60	10.68
Packet Loss Rate%	2.00	26.10	0.00	0.80

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

Indira Gandhi District Hospital Korba				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	391.64	2.24	543.46	26.86
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	22.23	4.51	29.66	2.80
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.18	3.61	2.31	3.61
Youtube Initial Buffer Delay (Second)	0.64	3.59	0.73	2.23
Latency (ms) – 50th Percentile	9.80	74.75	25.85	32.95
Jitter (ms)	2.68	14.65	4.28	21.08
Packet Loss Rate%	0.00	14.20	0.00	1.10

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

Kushabhai Thakrey, District Hospital Shahdol				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	21.12	0.17	603.12	22.98
Download Session Setup Success Rate %	100.00	20.00	100.00	100.00
Upload Throughput Average (Mbits/s)	1.34	1.53	50.78	28.00
Upload Session Setup Success Rate %	100.00	40.00	100.00	100.00
Web Browsing Delay (Second)	4.75	2.23	2.22	2.26
Youtube Initial Buffer Delay (Second)	8.62	-	0.73	0.84
Latency (ms) - 50th Percentile	47.38	-	19.00	28.45
Jitter (ms)	3.42	-	2.36	4.00
Packet Loss Rate%	0.00	100.00	0.00	0.00

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

Note- "- "Youtube & Latency tests failed.

Mata Sarwamangla Temple Korba				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	145.76	2.10	116.94	35.86
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	5.40	3.08	5.00	6.40
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	4.18	4.74	2.41	5.56
Youtube Initial Buffer Delay (Second)	1.13	2.32	0.87	2.97
Latency (ms)- 50th Percentile	64.25	81	32.30	33.55
Jitter (ms)	29.93	9.1	9.16	30.32
Packet Loss Rate%	25.20	29.00	0.30	2.20

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

New Bus Stand Shahdol				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	61.66	0.21	309.07	5.96
Download Session Setup Success Rate%	100.00	60.00	100.00	80.00
Upload Throughput Average (Mbits/s)	9.78	0.00	30.48	30.55
Upload Session Setup Success Rate %	100.00	60.00	100.00	60.00
Web Browsing Delay (Second)	3.92	-	2.22	2.50
Youtube Initial Buffer Delay (Second)	2.12	-	0.70	1.09
Latency (ms)- 50th Percentile	43.35	220.25	25.53	37.75
Jitter (ms)	5.06	54.19	6.29	15.64
Packet Loss Rate%	0.50	99.30	0.00	7.00

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

Note- "- "Web Browsing & Latency tests were failed.

New Bus Stand T.P Nagar Korba				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	138.93	4.66	173.55	21.92
Download Session Setup Success Rate%	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	24.86	5.03	3.58	1.51
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.86	3.35	4.38	6.55
Youtube Initial Buffer Delay (Second)	1.07	2.55	1.31	1.39
Latency (ms)- 50th Percentile	46.60	64.50	37.15	32.40
Jitter (ms)	6.00	17.37	18.16	14.78
Packet Loss Rate%	0.00	4.60	2.70	1.10

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

Old Bus Stand Korba				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	126.10	2.74	281.68	14.36
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	33.93	4.50	27.21	3.55
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.22	2.90	2.19	2.84
Youtube Initial Buffer Delay (Second)	1.09	4.75	0.75	0.76
Latency (ms)- 50th Percentile	49.30	49.95	19.20	34.25
Jitter (ms)	6.34	32.30	4.40	18.31
Packet Loss Rate%	0.20	9.40	0.00	0.80

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

Palm Mall Korba				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	265.05	2.20	277.84	21.39
Download Session Setup Success Rate%	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	40.18	3.21	27.71	1.25
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.67	6.51	1.70	7.76
Youtube Initial Buffer Delay (Second)	0.94	3.56	0.74	-
Latency (ms)- 50th Percentile	41.43	63.00	24.53	32.25
Jitter (ms)	4.85	10.23	19.90	18.83
Packet Loss Rate%	1.20	2.70	9.10	0.80

Table-40: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "- "Youtube tests were failed.

The Virateshwar Temple Shahdol				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	15.84	0.18	413.11	10.86
Download Session Setup Success Rate%	100.00	80.00	80.00	60.00
Upload Throughput Average (Mbits/s)	7.92	0.00	29.98	8.70
Upload Session Setup Success Rate %	100.00	100.00	80.00	80.00
Web Browsing Delay (Second)	2.48	3.64	2.24	2.48
Youtube Initial Buffer Delay (Second)	1.07	12.23	0.71	1.11
Latency (ms)- 50th Percentile	18.85	-	16.78	26.70
Jitter (ms)	5.61	-	4.49	3.40
Packet Loss Rate%	0.00	100.00	0.00	0.10

Table-41: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G)

Note- "- "Latency & Jitter tests were failed.

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)	252.48	-	375.42	-
	Upload Throughput Average (Mbits/s)	37.58	-	26.84	-
4G	Download Throughput Average (Mbits/s)	40.42	1.63	41.82	28.11
	Upload Throughput Average (Mbits/s)	7.24	5.09	13.17	14.19

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

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

District and Session Court Shahdol					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	448.90	-
	Upload Throughput Average (Mbits/s)	-	-	22.61	-
4G	Download Throughput Average (Mbits/s)	5.06	1.36	75.87	25.75
	Upload Throughput Average (Mbits/s)	6.51	8.15	15.15	29.80

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

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

District Court Korba					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	225.16	-	449.87	-
	Upload Throughput Average (Mbits/s)	24.88	-	33.34	-
4G	Download Throughput Average (Mbits/s)	81.38	1.88	14.51	96.58
	Upload Throughput Average (Mbits/s)	6.47	3.13	7.70	35.76

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

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

Indira Gandhi District Hospital Korba					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	238.33	-	468.52	-
	Upload Throughput Average (Mbits/s)	11.76	-	19.09	-
4G	Download Throughput Average (Mbits/s)	30.36	2.23	31.27	22.51
	Upload Throughput Average (Mbits/s)	2.28	3.97	6.35	1.89

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

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

Kushabhai Thakrey, District Hospital Shahdol					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	694.97	-
	Upload Throughput Average (Mbits/s)	-	-	61.35	-
4G	Download Throughput Average (Mbits/s)	12.61	0.92	33.90	24.91
	Upload Throughput Average (Mbits/s)	7.60	12.75	15.01	20.38

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

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

Mata Sarwamangla Temple Korba					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	83.76	-	171.93	-
	Upload Throughput Average (Mbits/s)	12.58	-	5.44	-
4G	Download Throughput Average (Mbits/s)	30.90	1.97	21.71	24.89
	Upload Throughput Average (Mbits/s)	3.35	3.84	6.05	6.66

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

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

New Bus Stand Shahdol					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	267.12	-
	Upload Throughput Average (Mbits/s)	-	-	33.50	-
4G	Download Throughput Average (Mbits/s)	73.02	0.01	39.17	6.54
	Upload Throughput Average (Mbits/s)	17.18	0.32	6.32	24.69

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

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

New Bus Stand T.P Nagar Korba					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	118.48	-	170.04	-
	Upload Throughput Average (Mbits/s)	39.73	-	5.40	-
4G	Download Throughput Average (Mbits/s)	20.92	3.04	24.58	22.59
	Upload Throughput Average (Mbits/s)	3.86	3.78	3.63	2.04

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

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

Old Bus Stand Korba					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	381.40	-	417.23	-
	Upload Throughput Average (Mbits/s)	52.49	-	32.77	-
4G	Download Throughput Average (Mbits/s)	38.76	2.24	117.35	11.72
	Upload Throughput Average (Mbits/s)	3.64	5.41	52.49	1.36

Table-50: Overall Summary of 5G only & 4G only data download & upload speed.

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

Palm Mall Korba					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	259.75	-	248.30	-
	Upload Throughput Average (Mbits/s)	36.62	-	27.14	-
4G	Download Throughput Average (Mbits/s)	63.67	1.76	35.86	14.51
	Upload Throughput Average (Mbits/s)	13.79	2.70	12.16	1.76

Table-51: Overall Summary of 5G only & 4G only data download & upload speed.

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

The Virateshwar Temple Shahdol					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	369.65	-
	Upload Throughput Average (Mbits/s)	-	-	27.76	-
4G	Download Throughput Average (Mbits/s)	47.53	0.59	22.98	26.79
	Upload Throughput Average (Mbits/s)	7.76	2.32	6.87	12.23

Table-52: Overall Summary of 5G only & 4G only data download & upload speed.

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

4.4 Walk Test

Walk Test has been conducted on 08th July and 10th July 2025. Five locations have been tested in Shahdol & Korba.

4.4.1 Walk test locations

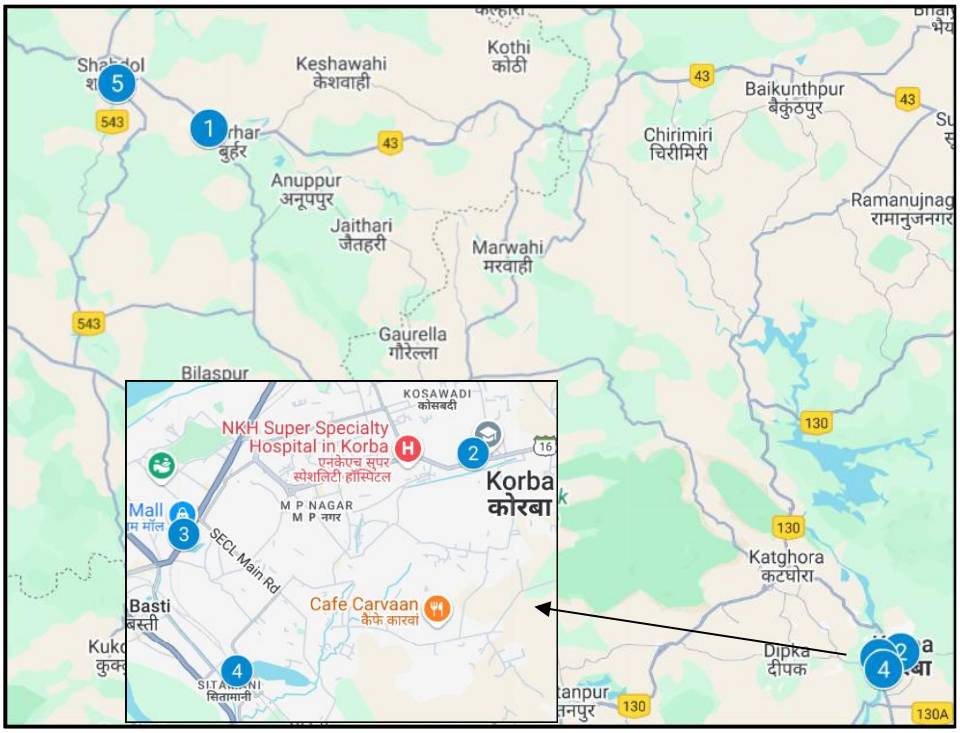


Figure-24: Walk Test locations.

4.4.2 Walk Test Covered

1. Burhar Railway Station
2. Indira Gandhi District Hospital Korba
3. Palm Mall Korba
4. Korba Railway Station
5. Shahdol Railway Station

4.4.3 Voice Performance

Burhar Railway Station				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	10	11	9	11
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)	1.17	3.78	0.59	0.70

Table-53: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Indira Gandhi District Hospital Korba				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	14	13	13	13
Call Setup Success Rate %	100.00	92.31	92.31	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.32	2.26	0.55	0.68

Table-54: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Palm Mall Korba				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	13	13	12	13
Call Setup Success Rate %	100.00	92.31	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.19	2.34	0.57	0.84

Table-55: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Korba Railway Station				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	16	15	17	17
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)	1.33	2.58	0.51	0.77

Table-56: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Shahdol Railway Station				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	17	19	17	17
Call Setup Success Rate %	100.00	84.21	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.20	2.21	0.60	0.70

Table-57: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

4.4.4 Data Performance

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

Burhar Railway Station				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	27.96	1.10	18.33	2.43
Download Session Setup Success Rate %	100.00	90.91	100.00	100.00
Upload Throughput Average (Mbits/s)	12.23	4.22	9.03	26.78
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Latency (ms) - 50th Percentile	46.30	-	29.80	55.00

Table-58: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "- "Latency tests were failed.

Indira Gandhi District Hospital Korba				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	331.91	2.58	498.25	63.21
Download Session Setup Success Rate %	100.00	100.00	86.67	100.00
Upload Throughput Average (Mbits/s)	43.40	5.95	38.67	21.60
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Latency (ms) - 50th Percentile	35.10	70.50	22.70	33.50

Table-59: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Palm Mall Korba				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	211.04	4.81	155.96	19.43
Download Session Setup Success Rate %	100.00	93.33	92.31	100.00
Upload Throughput Average (Mbits/s)	32.49	7.08	16.97	8.39
Upload Session Setup Success Rate %	100.00	86.67	100.00	100.00
Latency (ms) - 50th Percentile	44.63	40.83	30.33	35.10

Table-60: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Korba Railway Station				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	227.25	6.46	237.31	33.71
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	34.44	6.75	25.61	29.19
Upload Session Setup Success Rate %	100.00	100.00	100.00	89.47
Latency (ms) - 50th Percentile	35.75	59.50	23.65	33.88

Table-61: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Shahdol Railway Station				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	232.33	0.79	271.08	38.97
Download Session Setup Success Rate %	100.00	89.47	88.89	100.00
Upload Throughput Average (Mbits/s)	40.14	2.56	17.13	35.70
Upload Session Setup Success Rate %	100.00	84.21	94.44	100.00
Latency (ms) - 50th Percentile	41.22	-	25.89	26.80

Table-62: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "- "Latency tests were failed.

4.5 Highway

Drive test has been conducted on 08th July 2025 covering one highway route. (Refer Table-1)

4.5.1 Drive test route

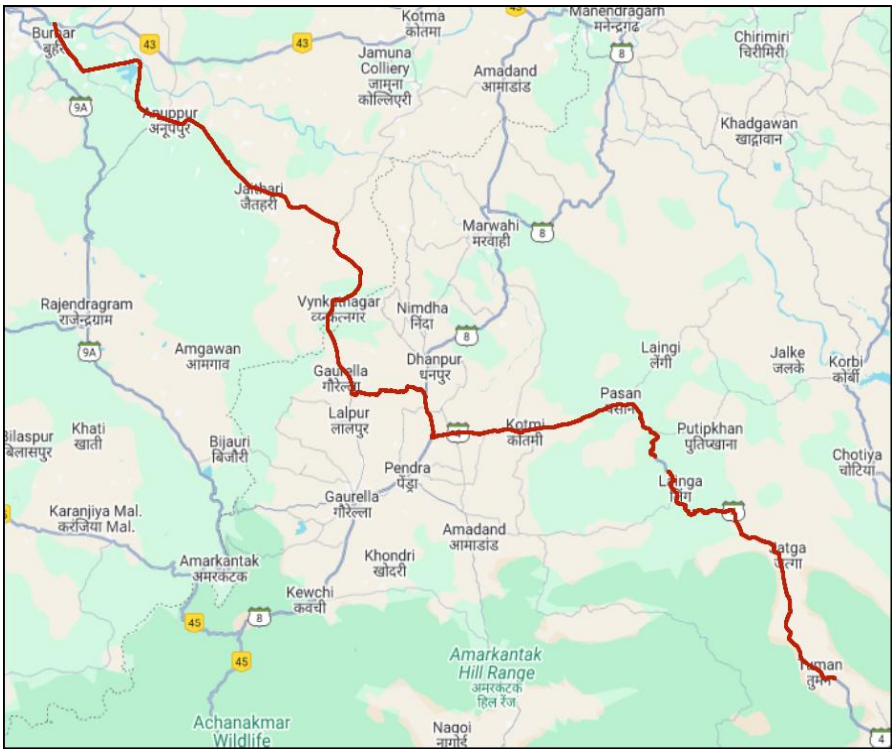


Figure-25: Drive test route highway.

4.5.2 Routes Covered

Shahdol to Korba via Anuppur, Vynkatnagar, Pasan and Tuman.

4.5.3 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	97	115	84
Call Setup Success Rate %	48.45	39.13	64.29
Drop Call Rate %	4.26	20.00	9.26
Call Setup Time-Average (Second)	4.88	4.27	3.09
Handover Success Rate %	100.00	97.96	98.57

Table-63: Summary of voice call performance in 3G/2G network mode only.

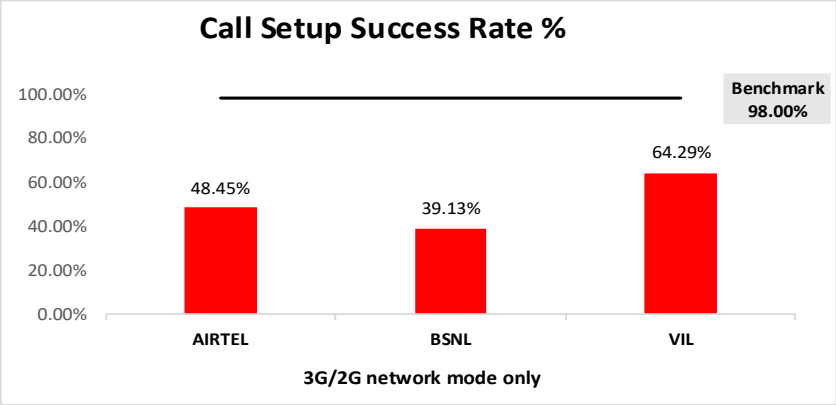


Figure-26: Performance for call setup success rate.

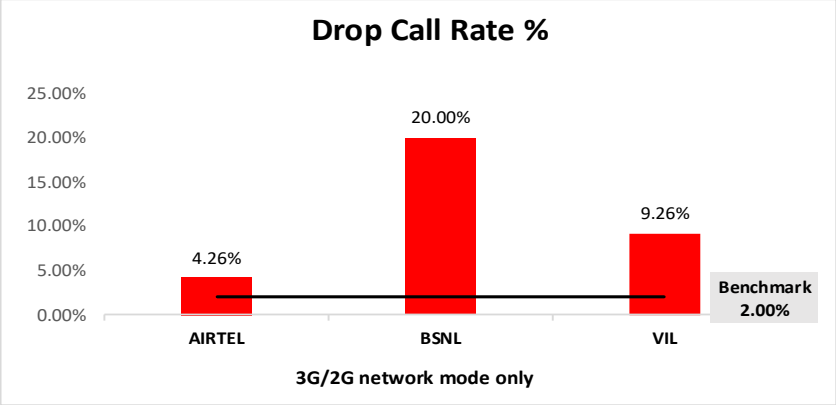


Figure-27: Performance for drop call rate.

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

Technology	Service Provider		
	AIRTEL	**BSNL**	**VIL**
3G	NA	34.82%	NA
2G	94.06%	55.79%	95.73%
Limited Service	5.94%	9.39%	4.27%

Table-64: Time spent on technology during drive test 3G/2G network mode only.

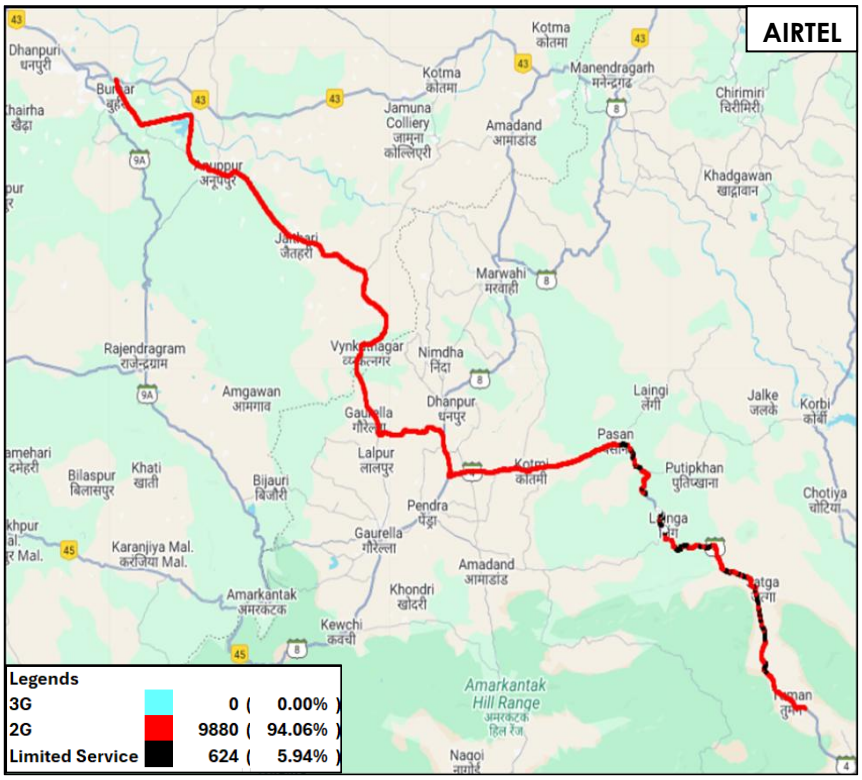


Figure-28: Serving technology plots 3G/2G network mode-AIRTEL.

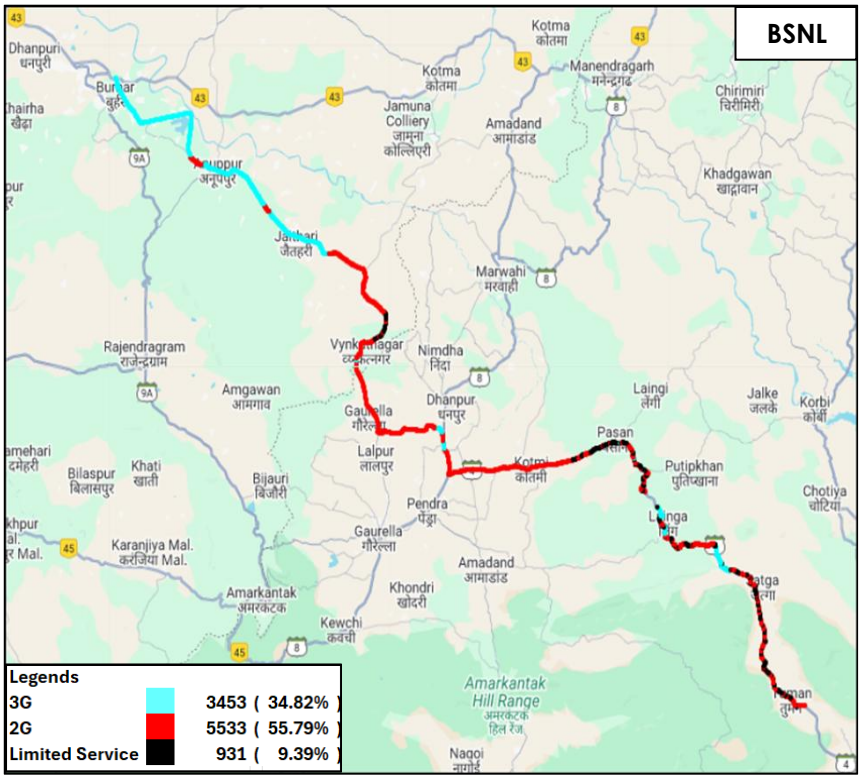


Figure-29: Serving technology plots 3G/2G network mode – BSNL.

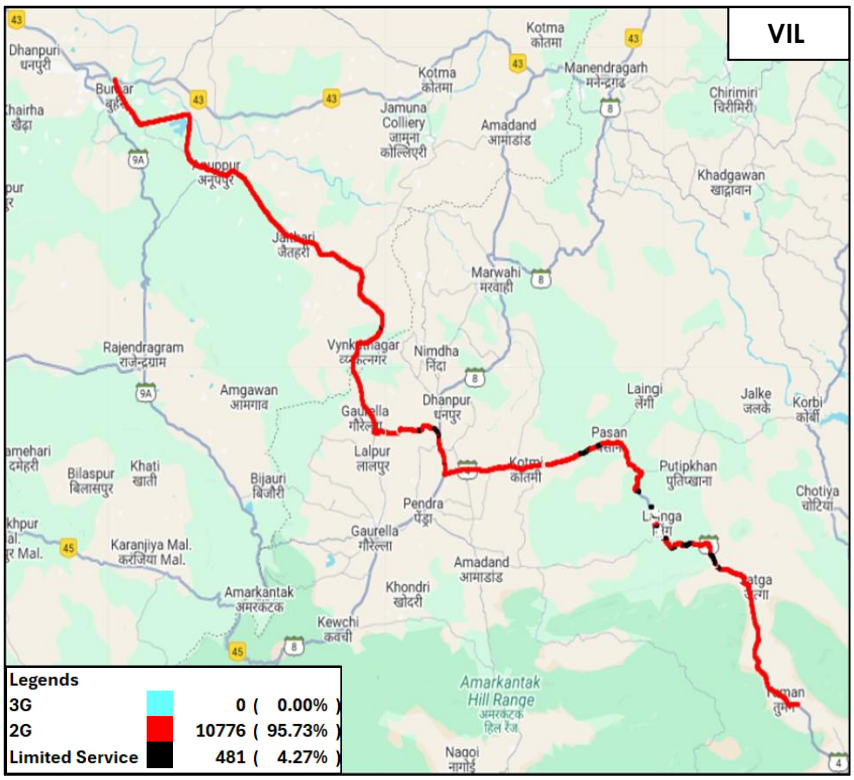


Figure-30: Serving technology plots 3G/2G network mode –VIL.

(c) Network Signal Strength distribution: The following chart represents signal strength distribution for 3G/2G network mode only. (refer figure-59, 60 & 61 for map view)

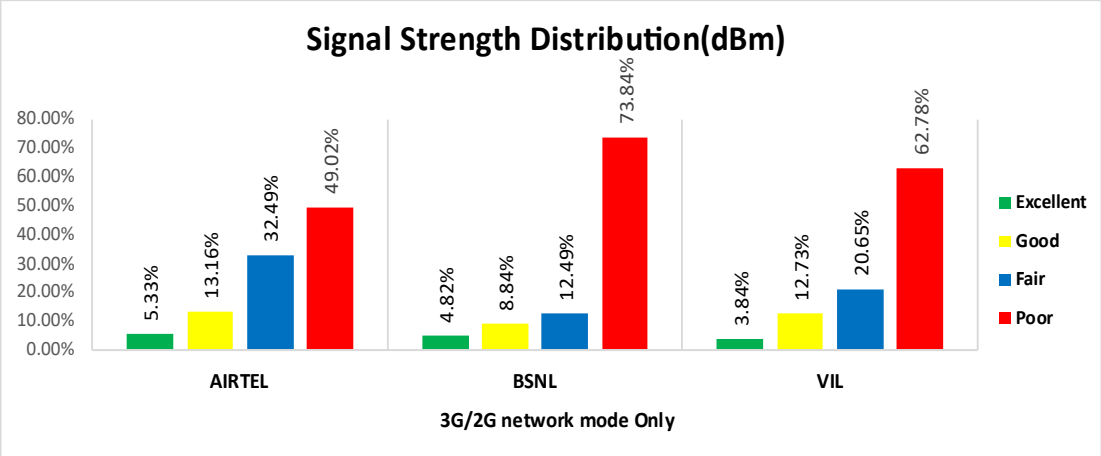


Figure-31: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 5% of samples falling in the excellent signal strength category.
- BSNL has 5% of samples falling in the excellent signal strength category.
- VIL has 4% 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	103	127	67	90
Call Setup Success Rate %	46.60	31.50	97.01	67.78
Drop Call Rate %	6.25	17.50	0.00	8.20
Call Setup Time Average (Second)	1.32	5.79	0.61	1.44
Handover Success Rate %	99.73	98.18	99.92	100.00

Table-65: Summary of voice call performance in network auto-selection mode.

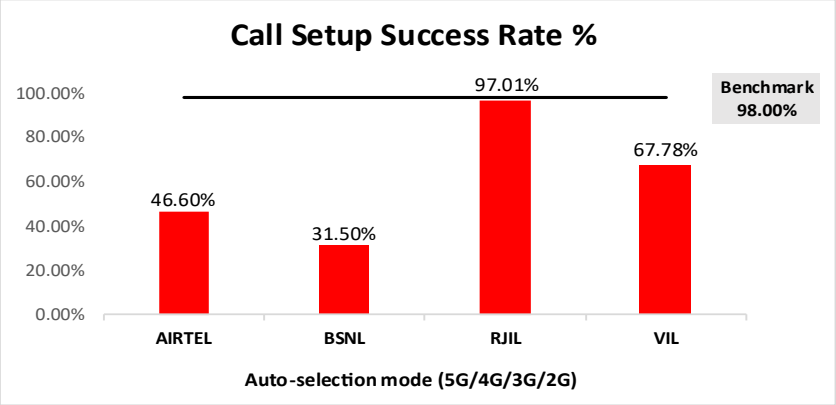


Figure-32: Performance for call setup success rate.

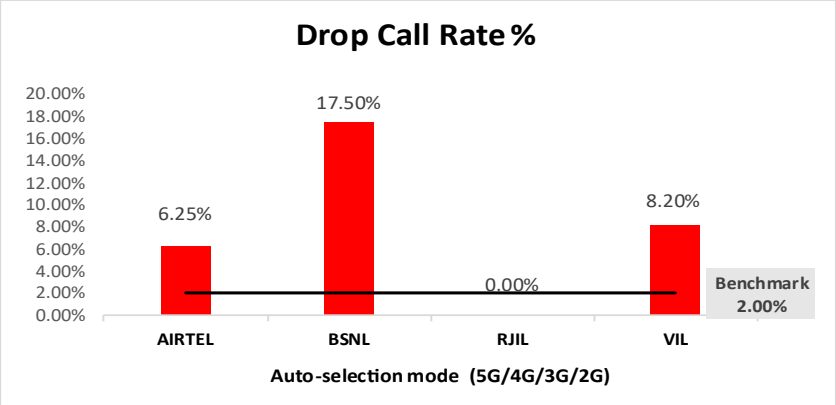


Figure-33: Performance for drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	39	37	54	46
Number of silence call for >4 Sec	1	0	1	1
Silence Call Rate %	2.56	0.00	1.85	2.17
Number of silence instances for >4 Sec	1	0	2	1
Number of silence instances for >3 Sec	2	0	4	4
Number of silence instances for >2 sec	7	3	9	8
RTP Jitter (4G & 5G) in ms	6.17	3.58	8.74	13.86
Packet loss Rate Downlink %	3.31	9.05	0.49	2.99
Packet loss Rate Uplink %	2.48	-	1.02	2.89

Table-66: 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-53	480	301	689	526
Speech Quality (Average MOS)	3.86	2.46	3.83	3.81
Number of samples with MOS >=4 to <5 (Excellent)	368	0	451	337
Number of samples with MOS >=3 to <4 (Good)	72	78	189	120
Number of samples with MOS >=2 to <3 (Fair)	18	154	33	39
Number of samples with MOS >=1 to <2 (Poor)	22	69	16	30
%age of samples with MOS >=4 to <5 (Excellent)	76.67%	0.00%	65.46%	64.07%
%age of samples with MOS >=3 to <4 (Good)	15.00%	25.91%	27.43%	22.81%
%age of samples with MOS >=2 to <3 (Fair)	3.75%	51.16%	4.79%	7.41%
%age of samples with MOS >=1 to <2 (Poor)	4.58%	22.92%	2.32%	5.70%

Table-67: Summary of speech quality (MOS) samples.

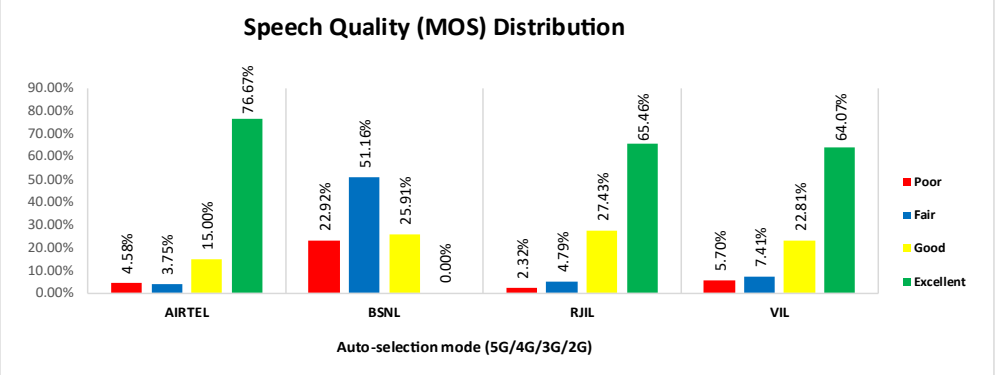


Figure-34: Distribution of samples in MOS range.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	0.67%	NA	3.56%	NA
4G	82.54%	12.88%	96.34%	68.41%
3G	NA	12.50%	NA	NA
2G	1.08%	56.19%	NA	25.90%
Limited Service	15.70%	18.43%	0.10%	5.69%

Table-68: Time spent on technology during drive test.

Note-

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

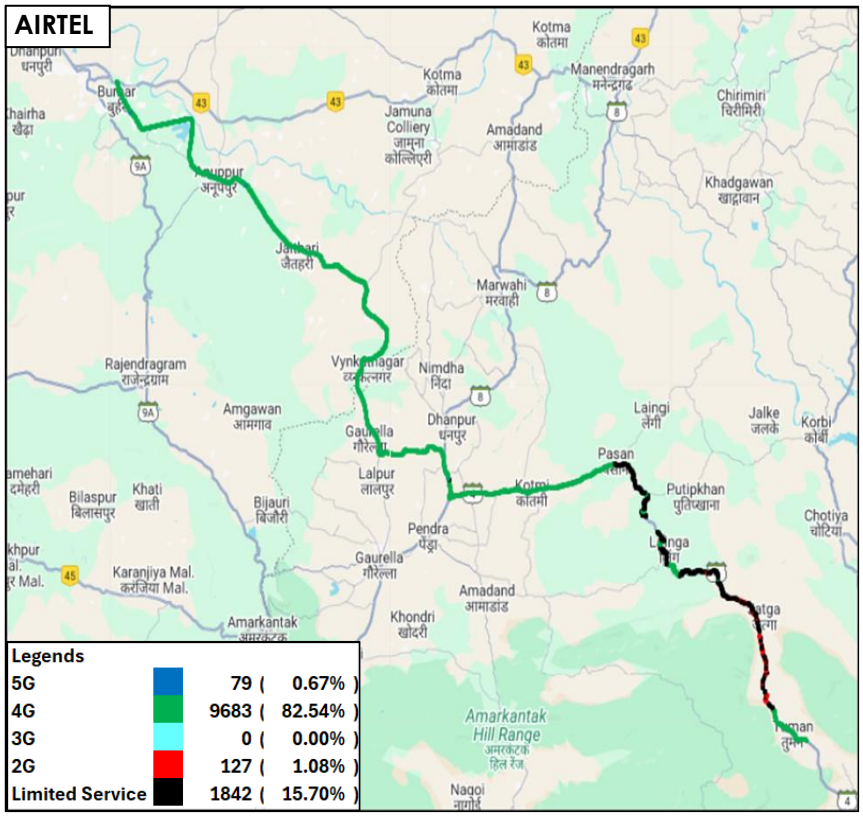


Figure-35: Serving technology plots in auto-selection mode (5G/4G/3G/2G) –AIRTEL.

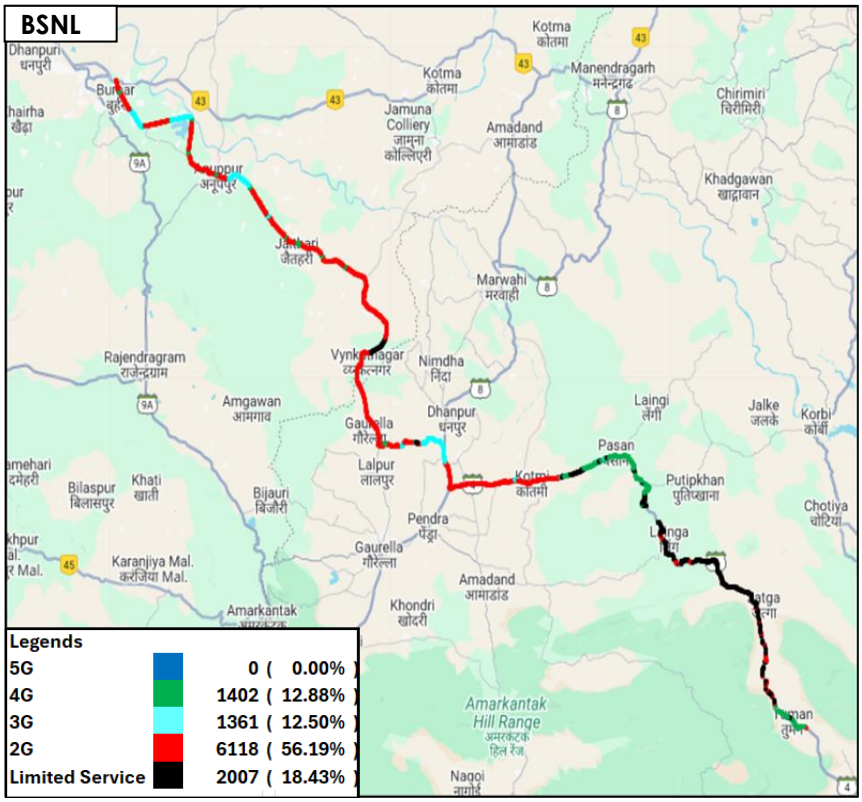


Figure-36: Serving technology plots in auto-selection mode (5G/4G/3G/2G) –BSNL.

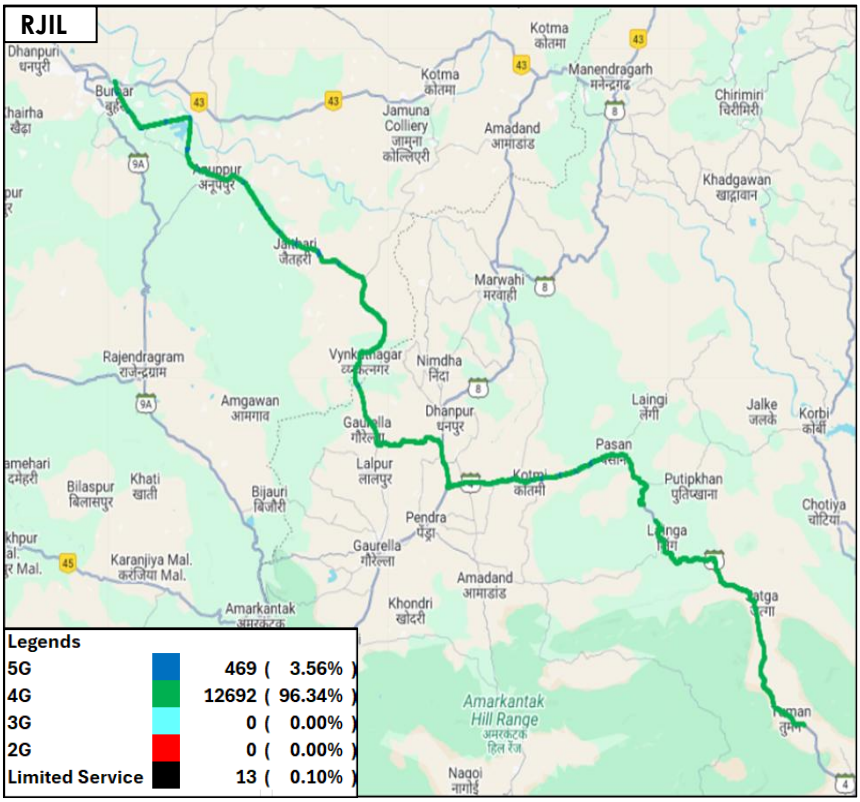


Figure-37: Serving technology plots in auto-selection (5G/4G/3G/2G)- RJIL.

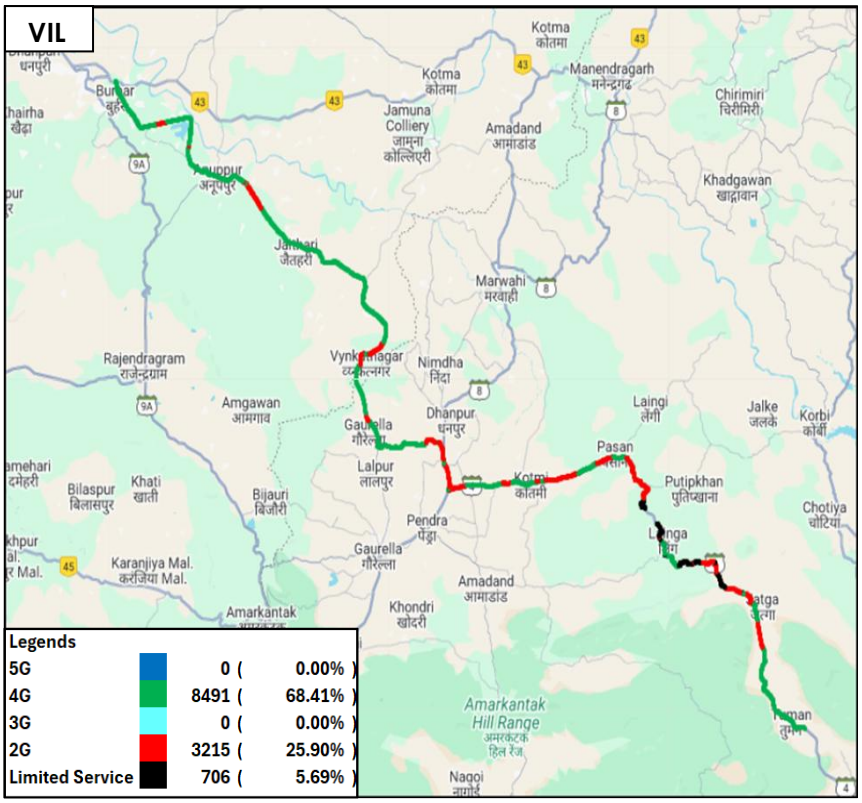


Figure-38: Serving technology plots in auto-selection mode (5G/4G/3G/2G) – VIL.

(g) Network Signal Strength distribution: The following chart provide signal strength distribution for auto-selection mode (5G/4G/3G/2G). (refer figure-62, 63, 64 & 65 for map view)

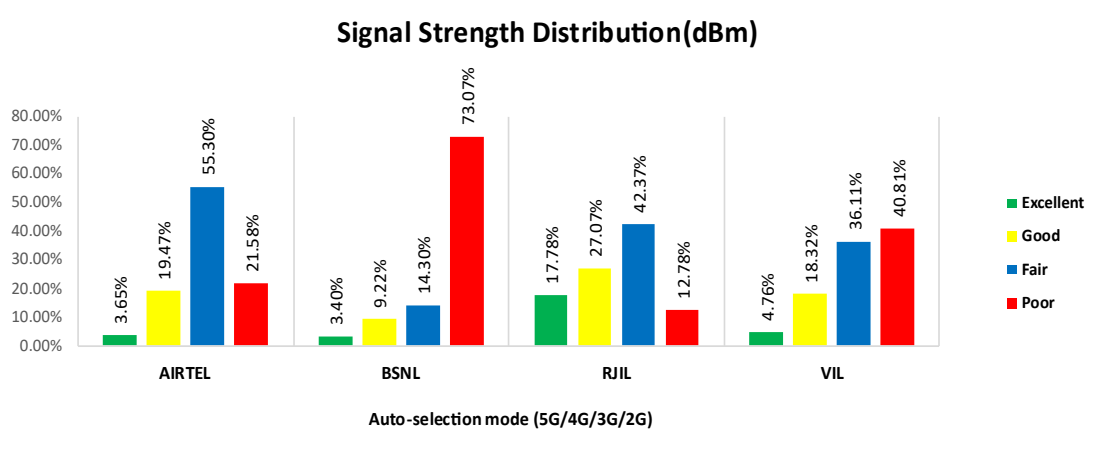


Figure-39: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

Observations:

- Airtel has 4% of samples falling in the excellent signal strength category.
- BSNL has 3% of samples falling in the excellent signal strength category.
- RJIL has 18% of samples falling in the excellent signal strength category.
- VIL has 5% of samples falling in the excellent signal strength category.

4.5.4 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	31.42	0.95	77.51	32.48
	80th Percentile	31.80	1.52	90.53	64.08
	20th Percentile	2.31	0.18	2.00	3.41
Upload Throughput (Mbits/s)	Average	6.06	1.81	11.62	11.86
	80th Percentile	9.68	3.33	19.82	25.03
	20th Percentile	1.35	0.11	0.72	1.96
Latency (ms)	50th Percentile	51.00	81.00	30.63	31.55

Table-69: Summary of Data performance in network auto-selection mode.

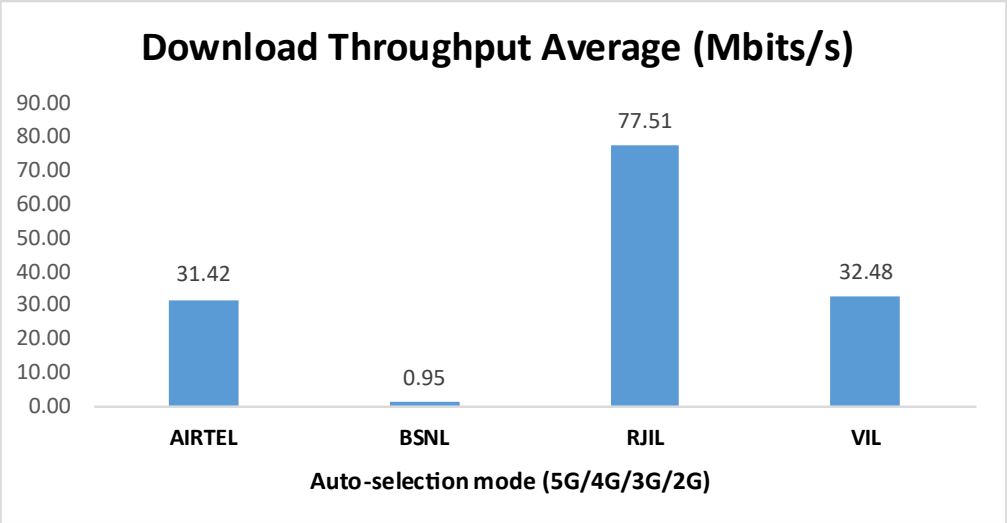


Figure-40: Download throughput.

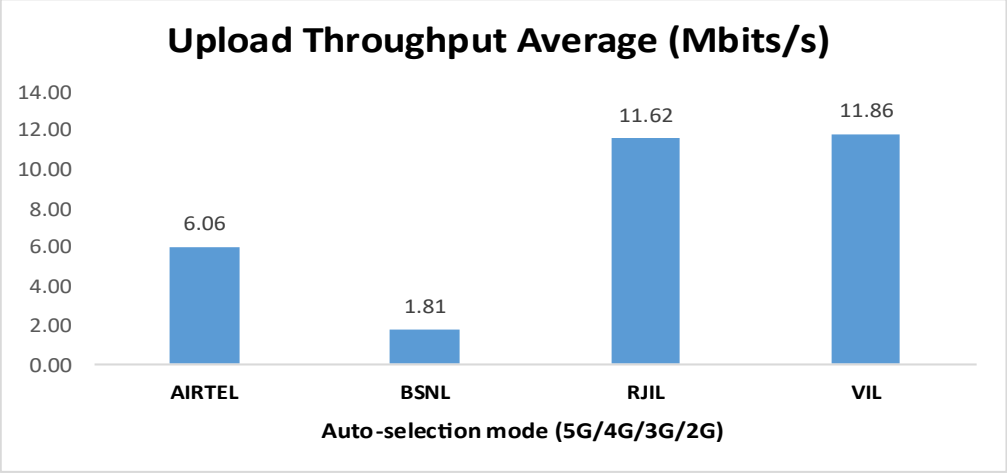


Figure-41: Upload throughput.

4.6 Railway

Drive test has been conducted on 11th July 2025 covering one railway route. (Refer Table-1)

4.6.1 Drive test route

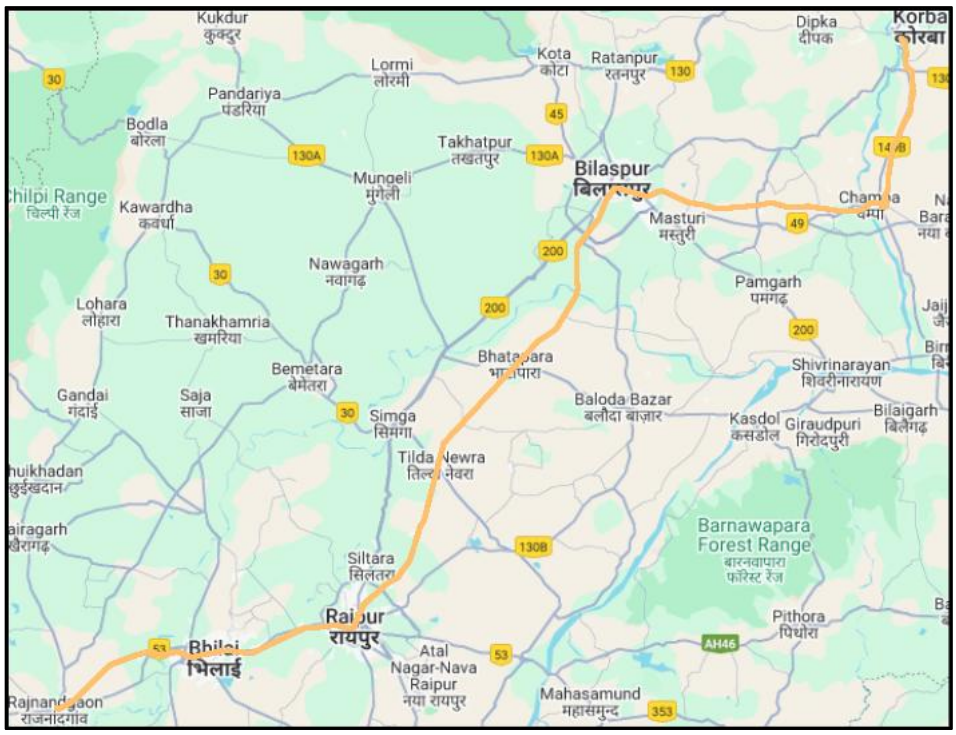


Figure-42: Drive test route Railway

4.6.2 Routes Covered

1. Korba to Rajnandgaon via Bilaspur, Raipur and Bhilai.

4.6.3 Voice Performance

(a) 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	114	145	116	114
Call Setup Success Rate %	100.00	75.86	100.00	99.12
Drop Call Rate %	0.00	12.73	0.00	0.88
Call Setup Time Average (Second)	1.41	4.20	0.88	0.89
Handover Success Rate %	99.84	99.82	99.93	99.61

Table-70: Summary of voice call performance in network auto-selection mode.

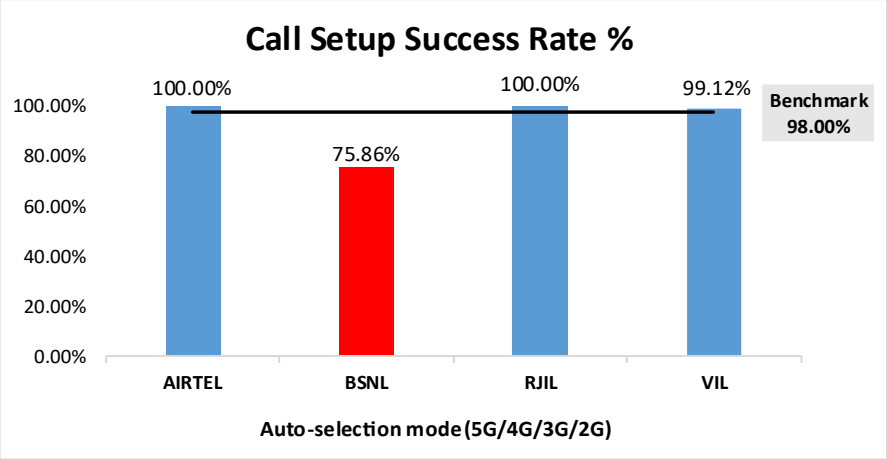


Figure-43: Performance for call setup success rate.

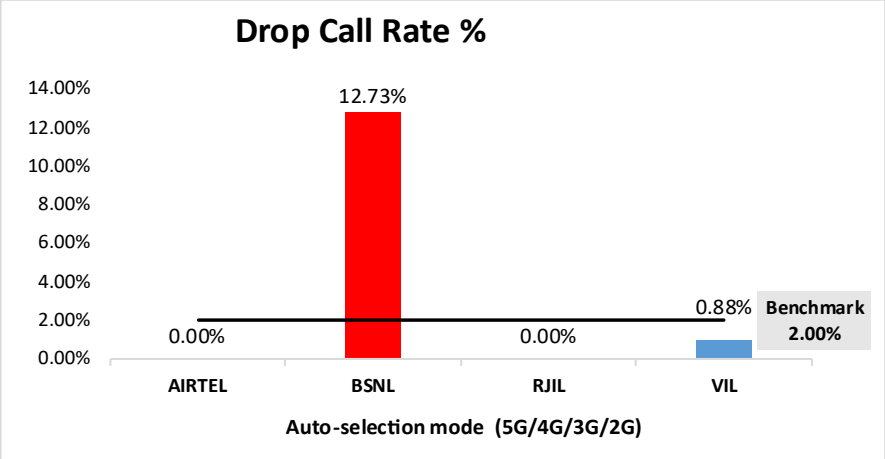


Figure-44: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	10.30%	NA	6.96%	NA
4G	89.70%	52.28%	93.04%	89.15%
3G	NA	19.42%	NA	NA
2G	0.00%	24.21%	NA	10.85%
Limited Service	0.00%	4.08%	0.00%	0.00%

Table-71: Time spent on technology during drive test.

Note-

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

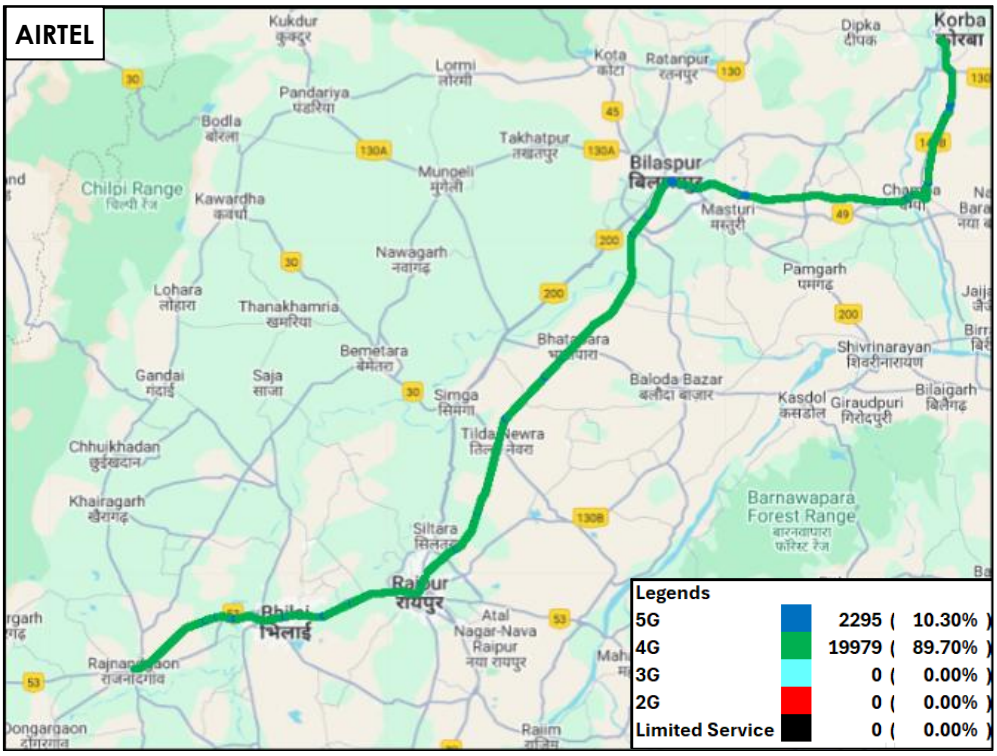


Figure-45: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-AIRTEL.

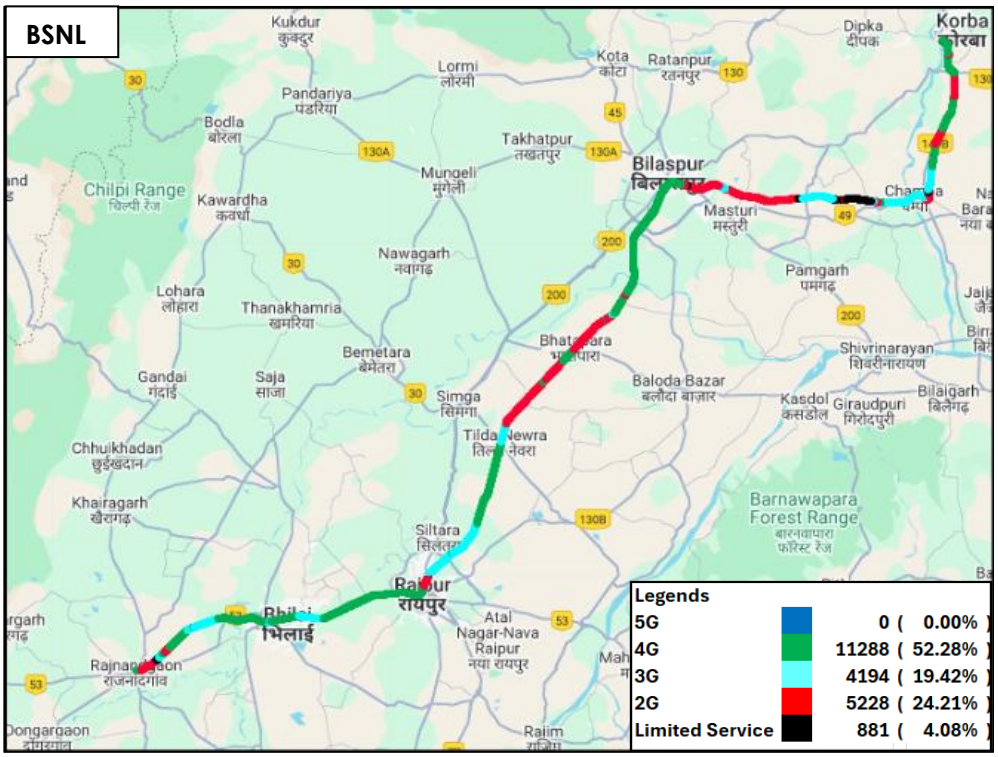


Figure-46: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-BSNL.

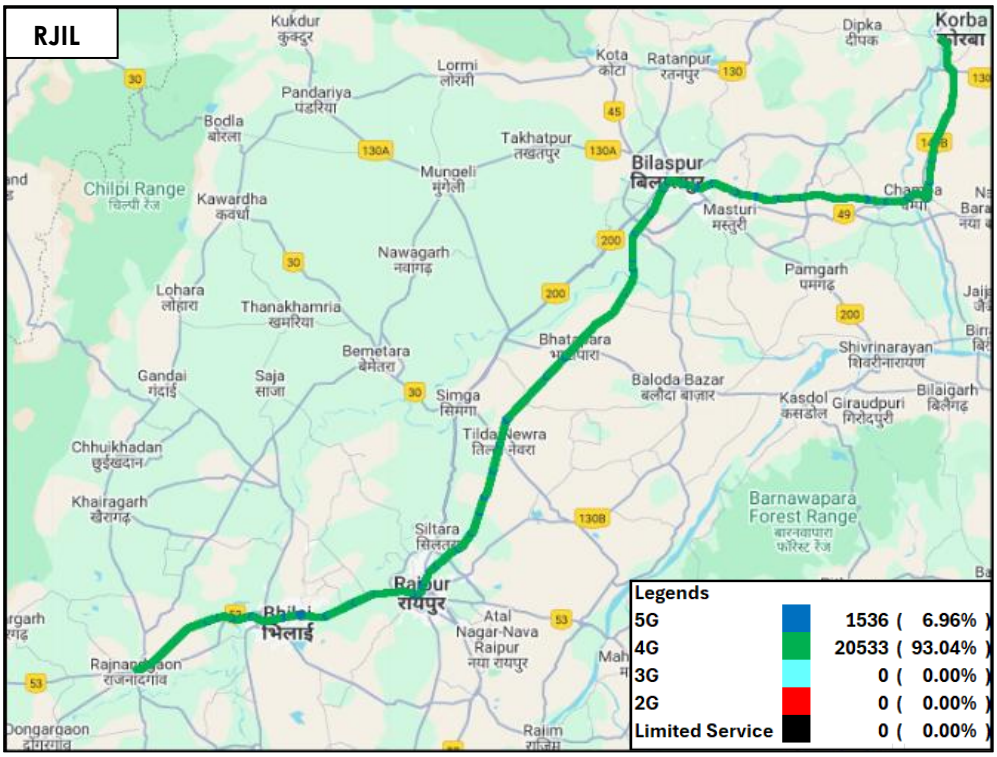


Figure-47: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-RJIL.

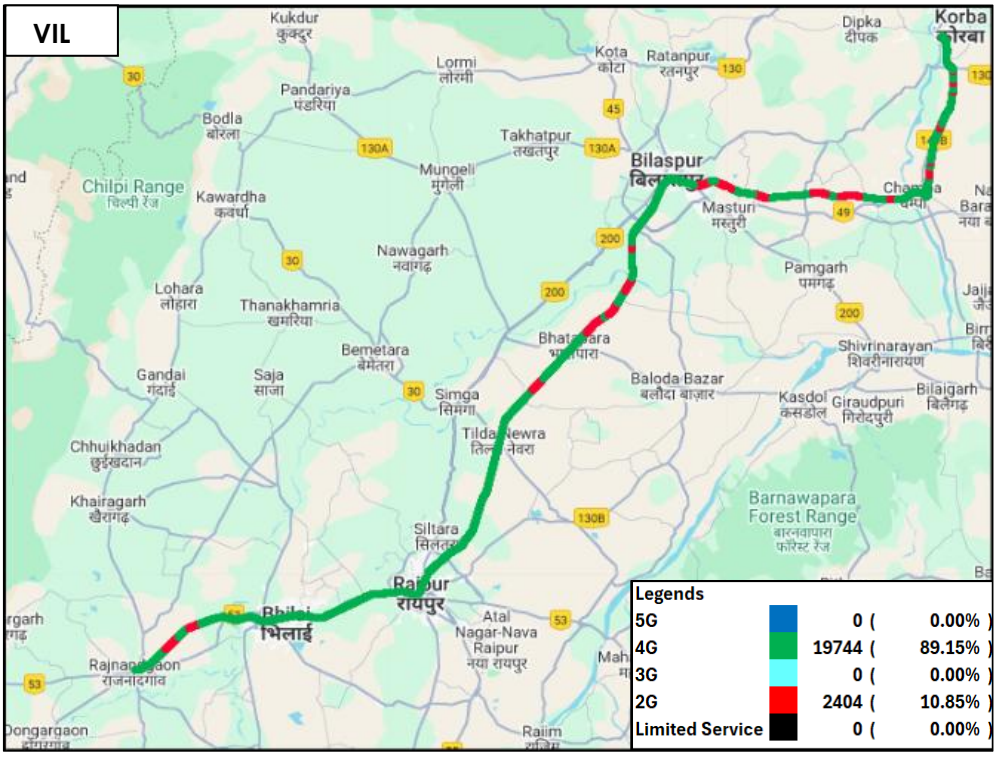


Figure-48: Serving technology plots in auto-selection mode (5G/4G/3G/2G)-VIL.

(c) Network Signal Strength Distribution: The following chart provide signal strength distribution for auto-selection mode (5G/4G/3G/2G). (Refer figure-66, 67, 68 & 69 for map view)

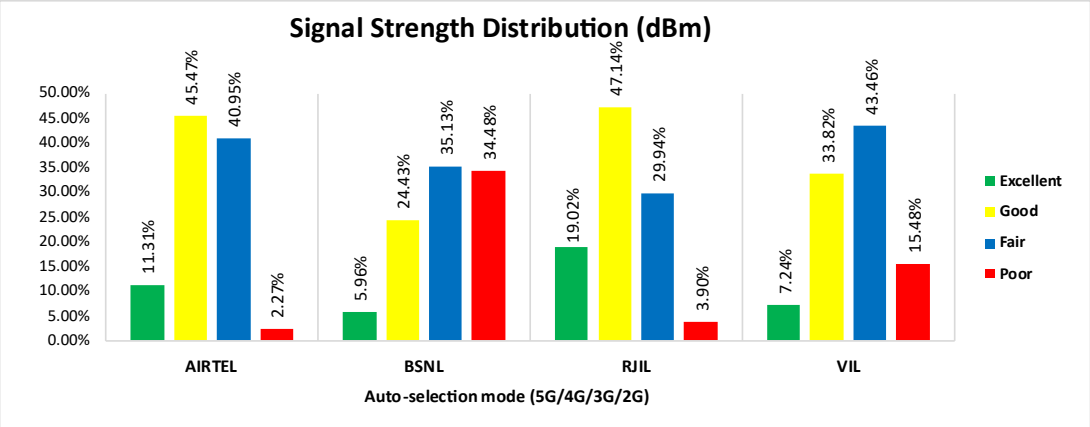


Figure-49: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

Observations:

- Airtel has 11% of samples falling in the excellent signal strength category.
- BSNL has 6% of samples falling in the excellent signal strength category.
- RJIL has 19% of samples falling in the excellent signal strength category.
- VIL has 7% of samples falling in the excellent signal strength category.

4.6.4 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	42.28	0.98	138.48	23.03
	80th Percentile	67.67	1.44	246.41	39.98
	20th Percentile	2.50	0.51	8.47	5.69
Upload Throughput (Mbits/s)	Average	12.10	2.41	13.35	16.03
	80th Percentile	16.59	3.44	17.71	28.48
	20th Percentile	3.30	1.02	3.41	3.89
Latency (ms)	50th Percentile	49.90	64.00	29.85	36.60

Table-72: Summary of Data performance in network auto-selection mode.

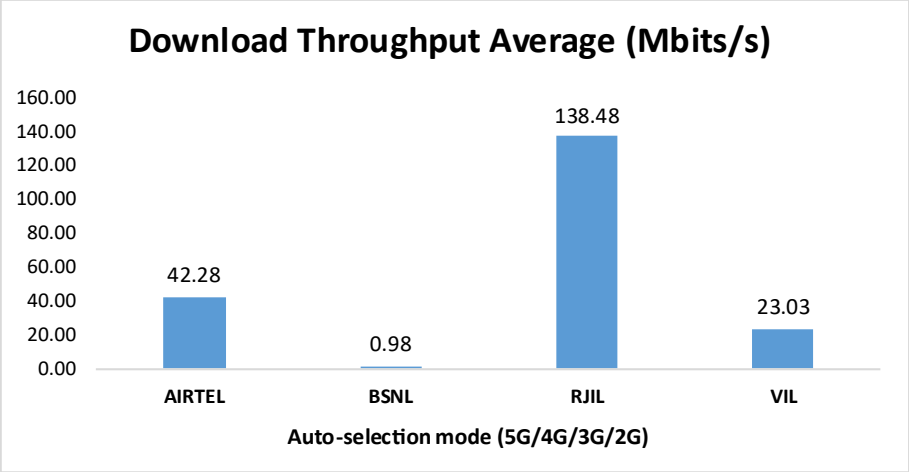


Figure-50: Download throughput

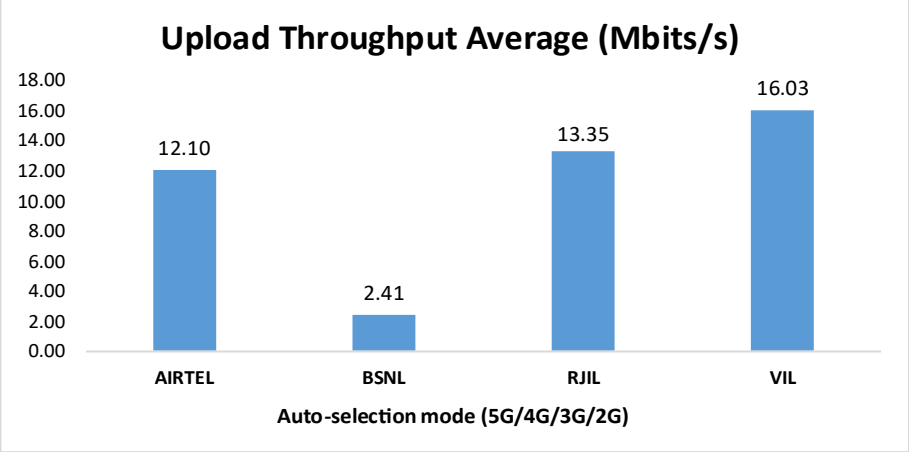


Figure-51: Upload throughput

5. Voice & Data Key findings

5.1 Overall Voice

1. **Call Setup Success Rate:**
   a) Airtel, BSNL and VIL have 92.87%, 88.34% and 95.55% call setup success rate respectively in 3G/2G network mode. (refer table-3)

   b) Airtel, BSNL, RJIL and VIL have 94.73%, 85.00%, 99.13% and 96.91% call setup success rate respectively in auto-selection mode (5G/4G/3G/2G). (refer table-5)

   c) Airtel had a 100.00% call setup success rate while calling RJIL and VIL whereas call blocking was observed when calling BSNL. (refer to table-9)

   d) BSNL had call blocking when calling Airtel, RJIL and VIL. (refer to table-9)

   e) RJIL had call blocking when calling Airtel, BSNL and VIL. (refer to table-9)

   f) VIL had a 100.00% call setup success rate while calling Airtel and RJIL whereas call blocking was observed when calling BSNL. (refer to table-9)

2. **Call Setup Time**:
   a) Airtel, BSNL and VIL call setup time is 4.43, 4.36 & 2.91 seconds respectively in 3G/2G network mode. (refer table-3)

   b) Airtel, BSNL, RJIL & VIL call setup time is 1.27, 3.56, 0.66 & 0.80 seconds respectively in auto-selection mode (5G/4G/3G/2G). (refer table-5)

3. **Call Silence/Mute Rate**: In packet switched network (4G/5G) BSNL, VIL, Airtel & RJIL have 1.14%, 0.88% 0.59% & 0.15% silence call rate respectively. Further BSNL has higher RTP packet loss rate in downlink (3.86%) compared to Airtel (0.90%), VIL (0.84%), RJIL (0.25%). In uplink the RTP packet loss rate is higher for BSNL (1.94%) compared to VIL (0.77%), Airtel (0.74%), RJIL (0.48%). (refer table-6)

4. **Drop Call Rate**:
   a) Airtel, BSNL and VIL drop call rate is 0.30%, 3.00% and 0.73% respectively in 3G/2G network mode. (refer table-3)

   b) Airtel, BSNL, RJIL and VIL drop call rate is 0.30%, 3.42%, 0.20% and 0.60% 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 82.67 Mbps, 1.34 Mbps, 228.09 Mbps and 29.78 Mbps respectively. (refer table-11)

   b) Airtel, BSNL, RJIL and VIL average upload speeds are 15.57 Mbps, 3.30 Mbps, 21.28 Mbps and 15.43 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 144.22 Mbps, 2.03 Mbps, 332.78 Mbps and 30.35 Mbps respectively. (refer table-31)

   b) Airtel, BSNL, RJIL and VIL average upload speeds are 15.73 Mbps, 3.28 Mbps, 24.98 Mbps and 16.05 Mbps respectively. (refer table-31)

3. **Data session setup success rate (static i.e. while stationary):**
   a) Airtel, BSNL, RJIL and VIL have 100.00%, 86.00%, 96.00% and 94.00% download session setup success rate respectively. (refer table-31)

   b) Airtel, BSNL, RJIL and VIL have 100.00%, 90.00%, 98.00% and 94.00% upload session setup success rate respectively. (refer table-31)

5.3 Operator wise Key Findings

1. Airtel:

Voice

- 92.87% call setup success rate and 0.30% drop call rate have been observed in 3G/2G network mode for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-3)

- 94.73% call setup success rate and 0.30% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-5)

- 99.68% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) 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 in auto-selection mode (5G/4G/3G/2G) 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 in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)

- 100.00% call setup success rate and 0.00% drop call rate have been observed for auto-selection mode (5G/4G/3G/2G) for all walk test location. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-53, 54, 55, 56 & 57)

- 48.45% call setup success rate and 4.26% drop call rate have been observed in 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

- 46.60% call setup success rate and 6.25% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-65)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for railway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-70)

Data

- Airtel has 82.67 Mbps average download speed & 15.57 Mbps average upload speed for LSA. (refer table-11)

- Airtel has 82.98 Mbps average download speed & 15.59 Mbps average upload speed across the measured routes for city drive. (refer table-19)

- District and Session Court Shahdol, Kushabhai Thakrey-District Hospital Shahdol, New Bus Stand Shahdol and The Virateshwar Temple Shahdol have

less download speed (less than 100 Mbps) out of total 10 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-32, 35, 37 & 41)

- District and Session Court Shahdol, District Court Korba, Kushabhai Thakrey-District Hospital Shahdol, Mata Sarwamangla Temple Korba, New Bus Stand Shahdol and The Virateshwar Temple Shahdol have less upload speed (less than 20 Mbps) out of total 10 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table- 32, 33, 35, 36, 37 & 41)

- Burhar Railway Station Walk test location has less upload speed (less than 100 Mbps) out of total 5 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-58)

- Burhar Railway Station Walk test location has less upload speed (less than 20 Mbps) out of total 5 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-58)

- Airtel has 31.42 Mbps average download speed & 6.06 Mbps average upload speed across the measured routes for highway drive. (refer table-69)

- Airtel has 42.28 Mbps average download speed & 12.10 Mbps average upload speed across the measured routes for railway drive. (refer table-72)

2. BSNL:

Voice

- 88.34% call setup success rate and 3.00% drop call rate have been observed in 3G/2G network mode for LSA. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-3)

- 85.00% call setup success rate and 3.42% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-5)

- 97.19% call setup success rate and 1.77% drop call rate have been observed in 3G/2G network mode for city drive. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-13)

- 94.82% call setup success rate and 1.77% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-15)

- 96.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-20)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Burhar Railway Station and Korba Railway Station Walk test locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-53 & 56)

- 92.31% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Indira Gandhi District Hospital Korba & Palm Mall Korba Walk test locations. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-54 & 55)

- 84.21% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Shahdol Railway Station Walk test

location. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-57)

- 39.13% call setup success rate and 20.00% drop call rate have been observed in 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

- 31.50% call setup success rate and 17.50% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-65)

- 75.86% call setup success rate and 12.73% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for railway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-70)

Data

- BSNL has 1.34 Mbps average download speed & 3.30 Mbps average upload speed for LSA. (refer table-11)

- BSNL has 1.19 Mbps average download speed & 3.40 Mbps average upload speed across the measured routes for city drive. (refer table-19)

- All hotspot locations have less download speed (less than 10 Mbps) for auto-selection mode (5G/4G/3G/2G). (refer table- 32, 33, 34, 35, 36, 37, 38, 39, 40 & 41)

- Kushabhai Thakrey-District Hospital, New Bus Stand Korba and The Virateshwar Temple Shahdol have less upload speed (less than 2 Mbps) out of total 10 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-35, 37 & 41)

- All Walk test locations have less download speed (less than 10 Mbps) for auto-selection mode (5G/4G/3G/2G). (refer table-58, 59, 60, 61 & 62)

- BSNL has 0.95 Mbps average download speed & 1.81 Mbps average upload speed across the measured routes for highway drive. (refer table-69)

- BSNL has 0.98 Mbps average download speed & 2.41 Mbps average upload speed across the measured routes for railway drive. (refer table-72)

3. RJIL:

Voice

- 99.13% call setup success rate and 0.20% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-5)

- 99.12% call setup success rate and 0.30% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) 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 in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at all walk test locations except Indira Gandhi District Hospital Korba. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-53, 55, 56 & 57)

- 92.31% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Indira Gandhi District Hospital Korba walk test location. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-54)

- 97.01% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-65)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for railway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-70)

Data

- RJIL has 228.09 Mbps average download speed & 21.28 Mbps average upload speed for LSA. (refer table-11)

- RJIL has 271.82 Mbps average download speed & 24.26 Mbps average upload speed across the measured routes for city drive. (refer table-19)

- District and Session Court Shahdol, Mata Sarwamangla Temple Korba and New Bus Stand T.P Nagar Korba have less upload speed (less than 20 Mbps) out of total 10 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-32, 36 & 38)

- Burhar Railway Station Walk test location has less upload speed (less than 100 Mbps) out of total 5 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-58)

- Burhar Railway Station, Palm Mall Korba and Shahdol Railway Station Walk test location have less upload speed (less than 20 Mbps) out of total 5 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-58, 60 & 62)

- RJIL has 77.51 Mbps average download speed & 11.62 Mbps average upload speed across the measured routes for highway drive. (refer table-69)

- RJIL has 138.48 Mbps average download speed & 13.35 Mbps average upload speed across the measured routes for railway drive. (refer table-72)

4. VIL:

Voice

- 95.55% call setup success rate and 0.73% drop call rate have been observed in 3G/2G network mode for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-3)

- 96.91% call setup success rate and 0.60% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-5)

- 99.69% call setup success rate and 0.00% drop call rate have been observed in 3G/2G network mode for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-13)

- 99.70% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) 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 in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all walk test locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-53, 54, 55, 56 & 57)

- 64.29% call setup success rate and 9.26% drop call rate have been observed in 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

- 67.78% call setup success rate and 8.20% drop call rate have been observed in 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-65)

- 99.12% call setup success rate and 0.88% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for railway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-70)

Data

- VIL has 29.78 Mbps average download speed & 15.43 Mbps average upload speed for LSA. (refer table-11)

- VIL has 31.24 Mbps average download speed & 14.25 Mbps average upload speed across the measured routes for city drive. (refer table-19)

- New Bus Stand Shahdol has less download speed (less than 10 Mbps) out of total 10 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-37)

- New Bus Stand T.P Nagar Korba and Palm Mall Korba have less upload speed (less than 2 Mbps) out of total 10 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-38 & 40)

- Burhar Railway Station Walk test location has less download speed (less than 10 Mbps) out of total 5 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-58)

- VIL has 32.48 Mbps average download speed & 11.86 Mbps average upload speed across the measured routes for highway drive. (refer table-69)

- VIL has 23.03 Mbps average download speed & 16.03 Mbps average upload speed across the measured routes for railway drive. (refer table-72)

6. Annexure

6.1 Route wise coverage map

6.1.1 City

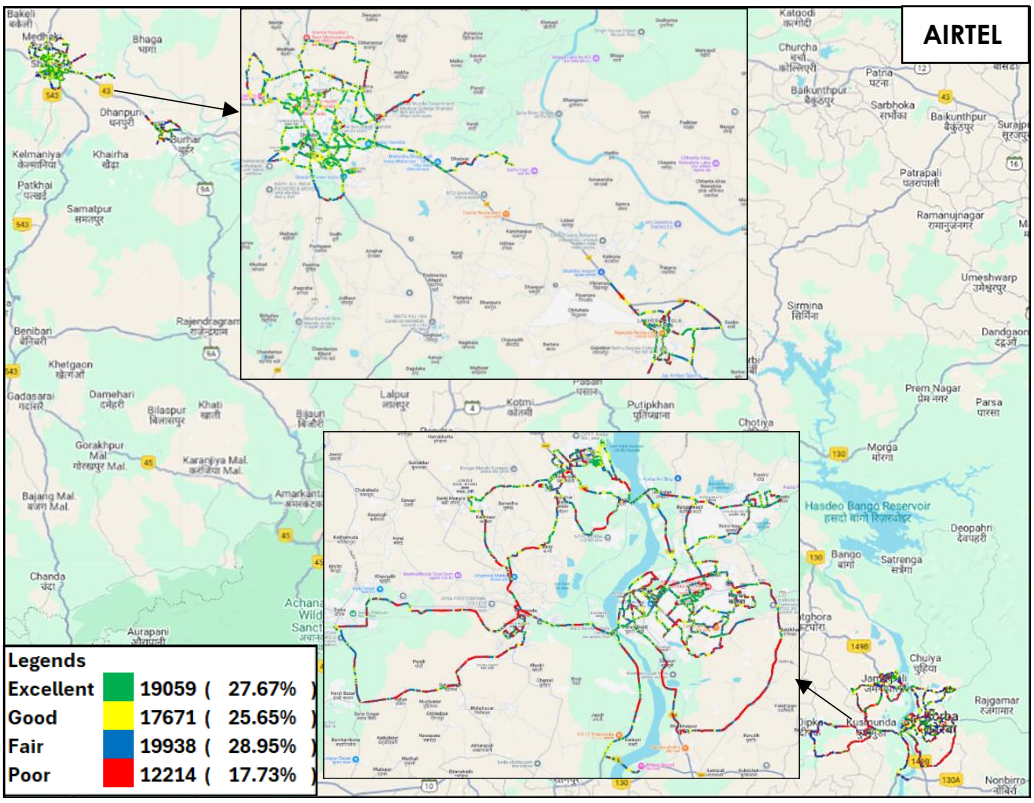


Figure-52: Signal strength 3G/2G network mode – AIRTEL.

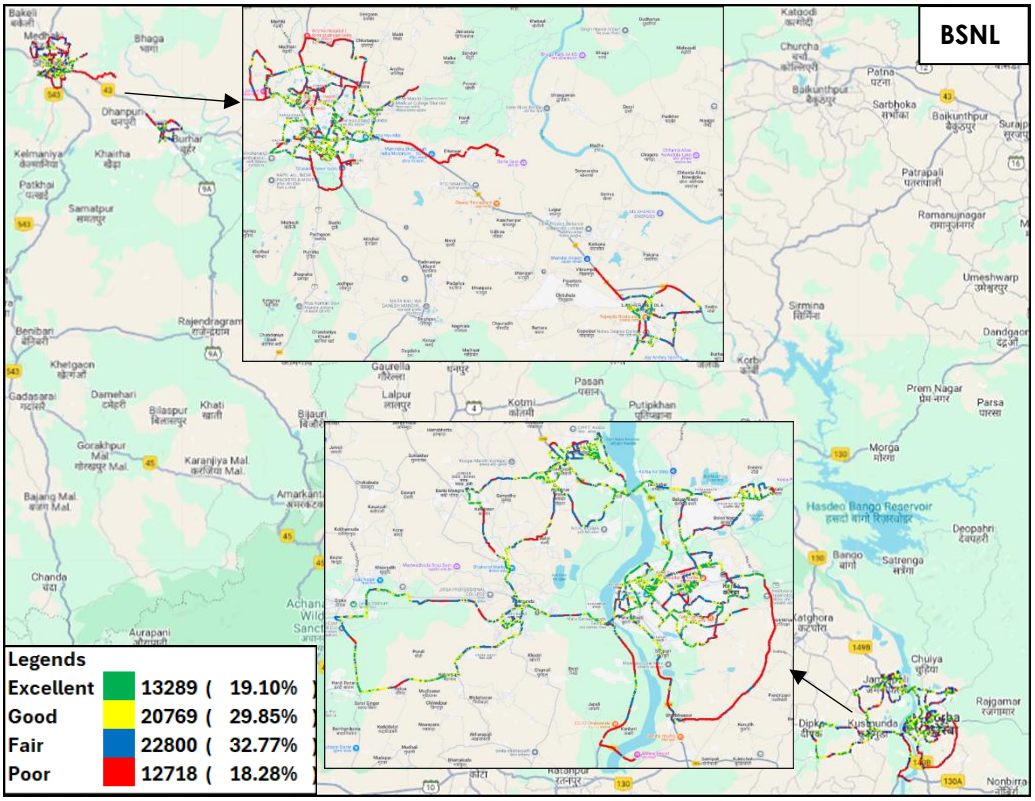


Figure-53: Signal strength 3G/2G network mode – BSNL.

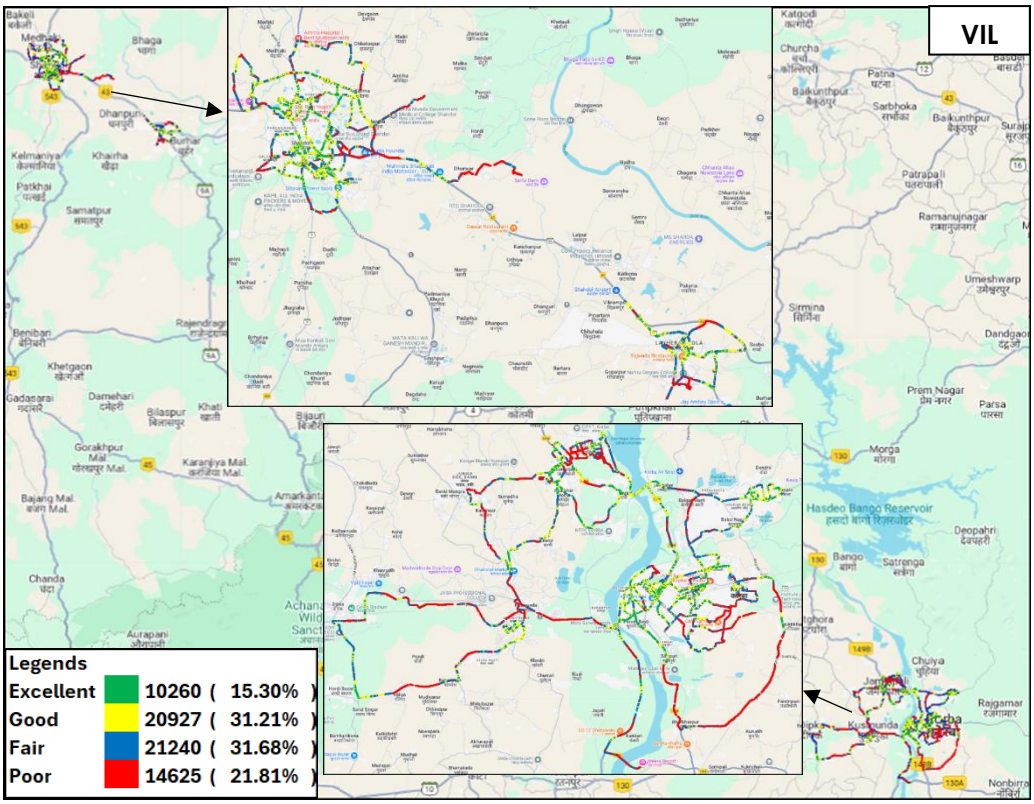


Figure-54: Signal strength 3G/2G network mode – VIL.

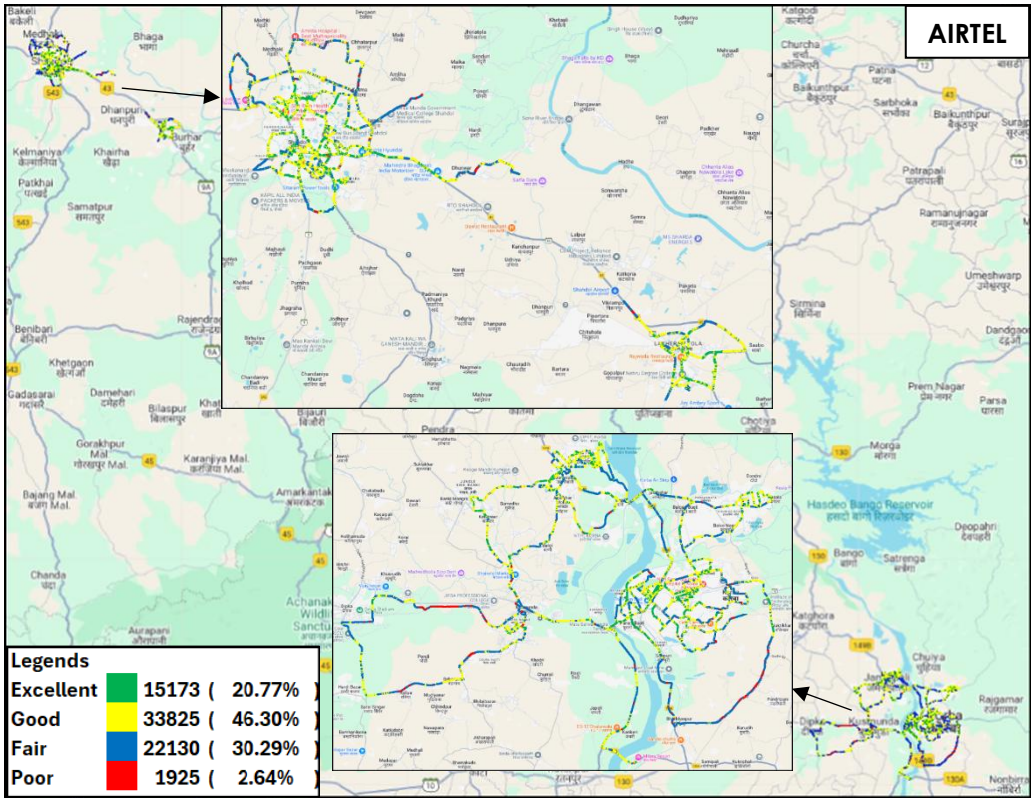


Figure-55: Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL.

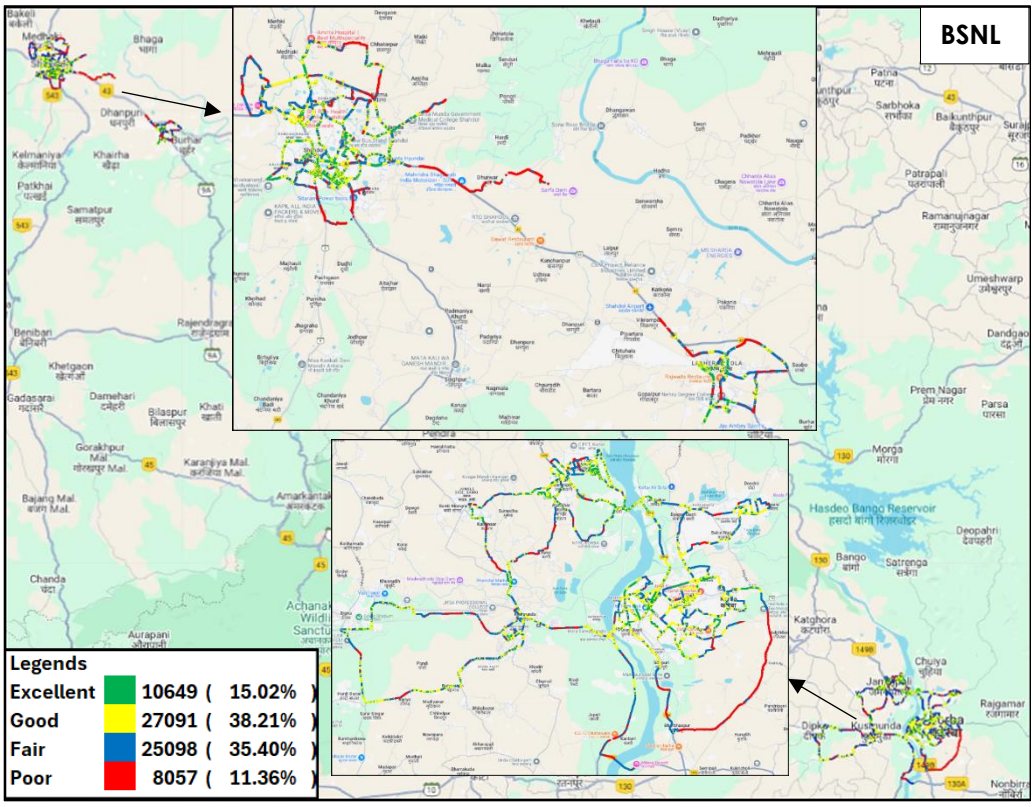


Figure-56: Signal strength auto-selection mode 5G/4G/3G/2G – BSNL.

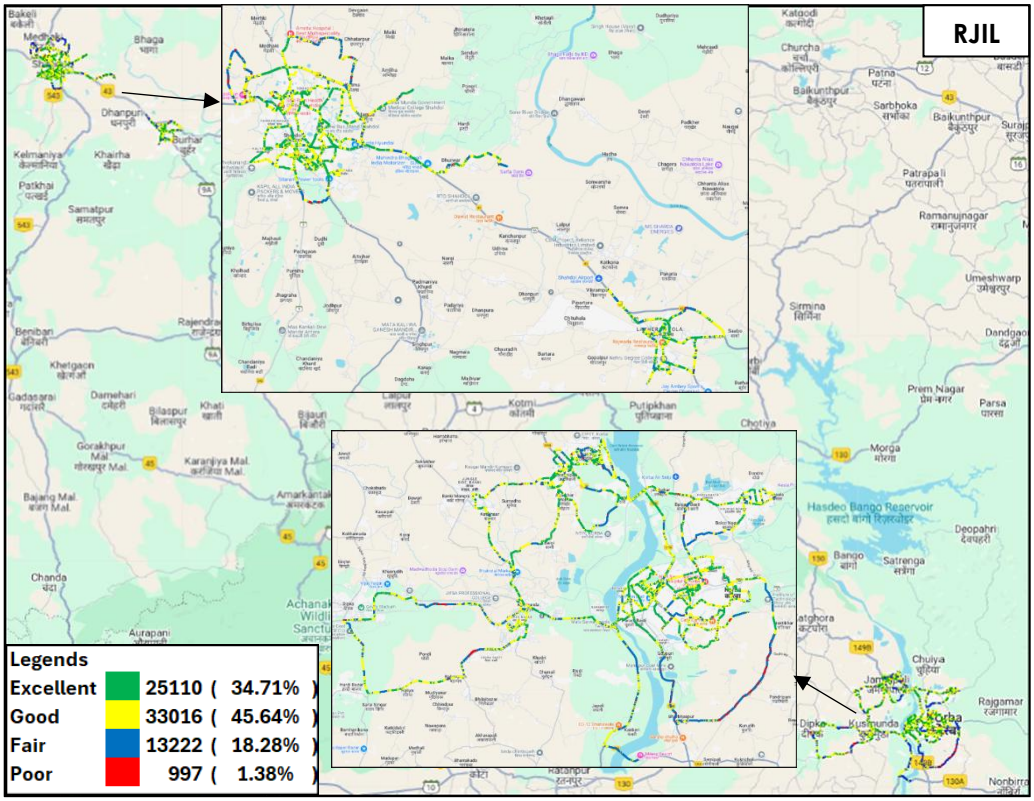


Figure-57: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

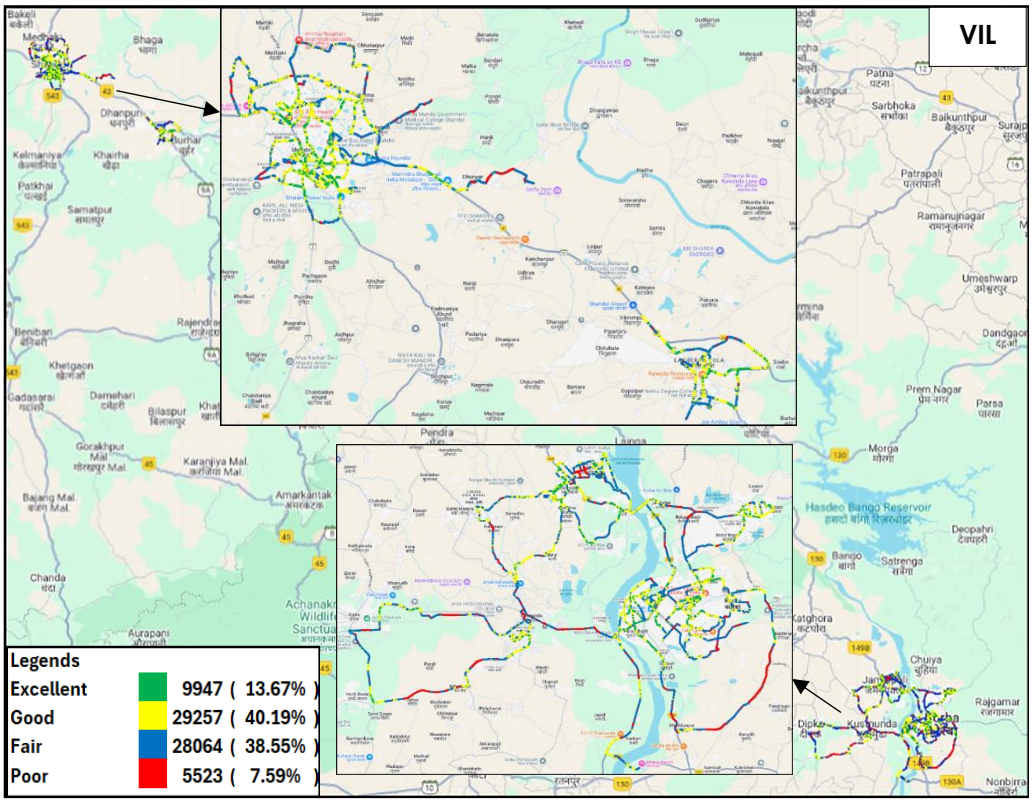


Figure-58: Signal strength auto-selection mode 5G/4G/3G/2G – VIL.

6.1.2 Highway

i) Shahdol to Korba

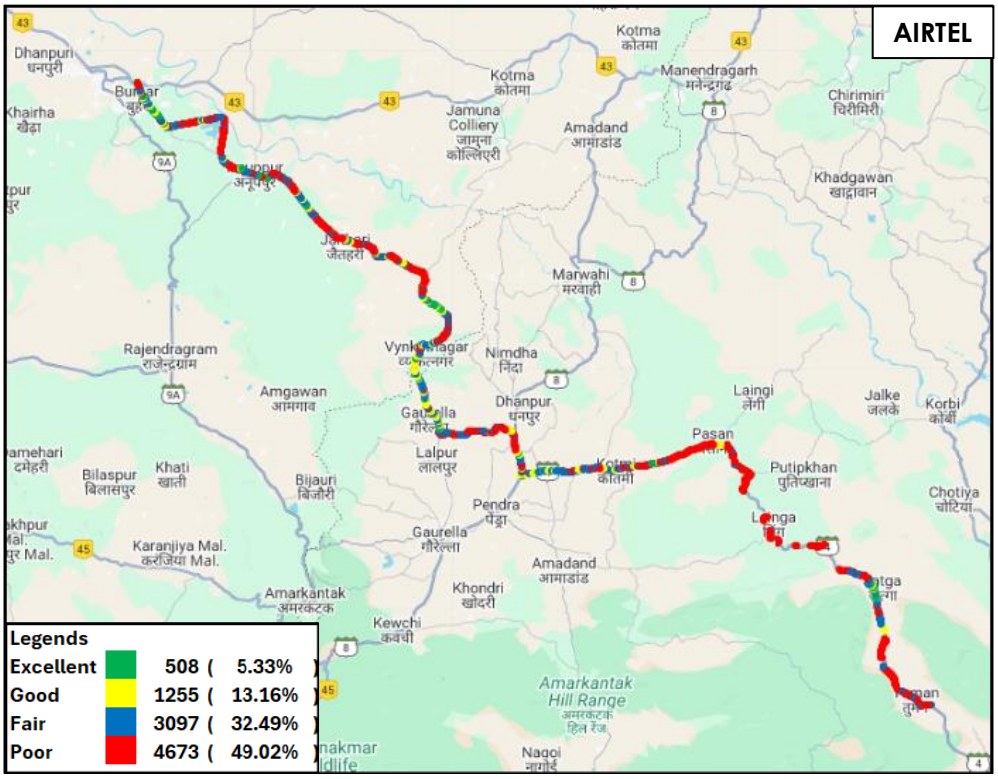


Figure-59: Signal strength 3G/2G network mode – AIRTEL.

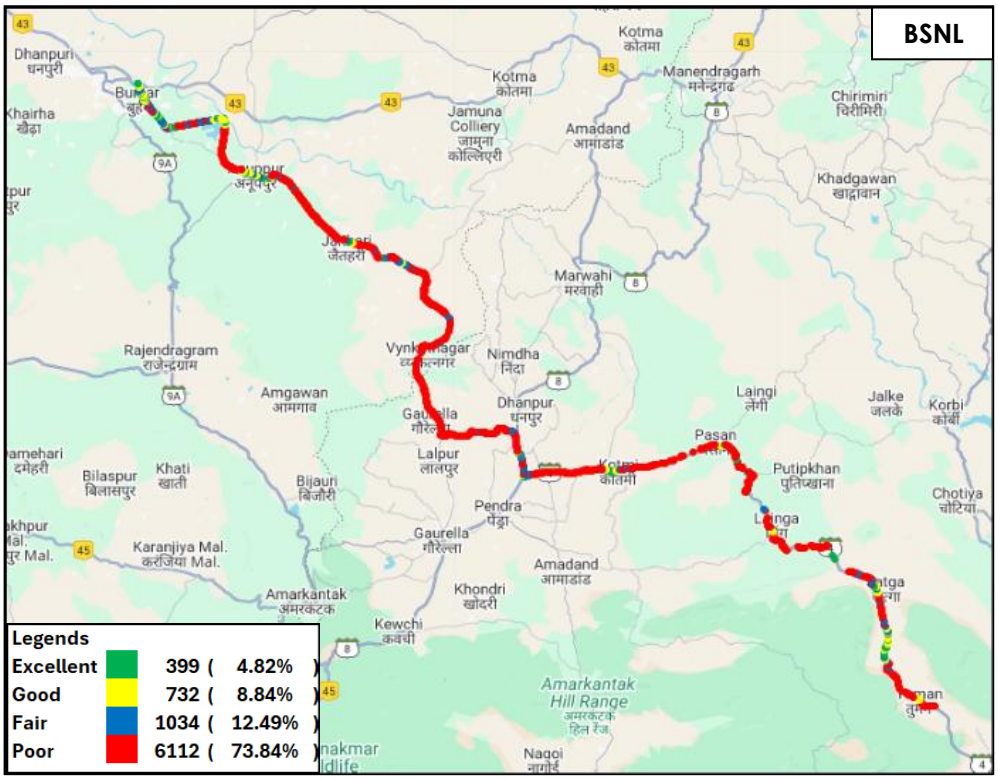


Figure-60: Signal strength 3G/2G network mode – BSNL.

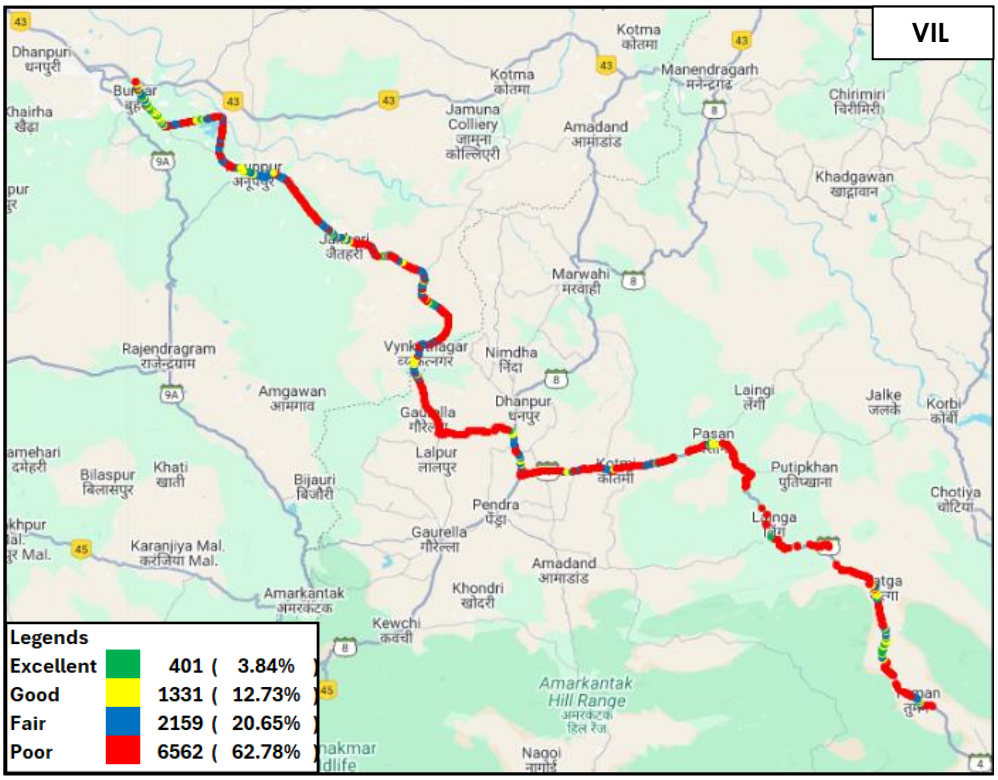


Figure-61: Signal strength 3G/2G network mode – VIL.

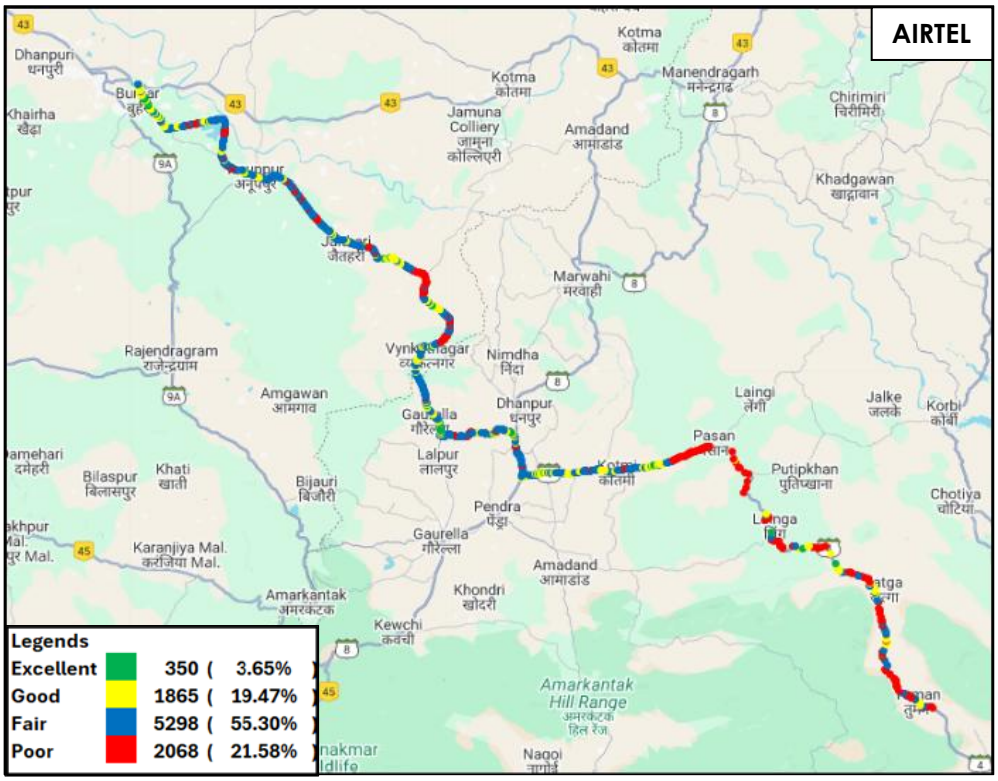


Figure-62: Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL.

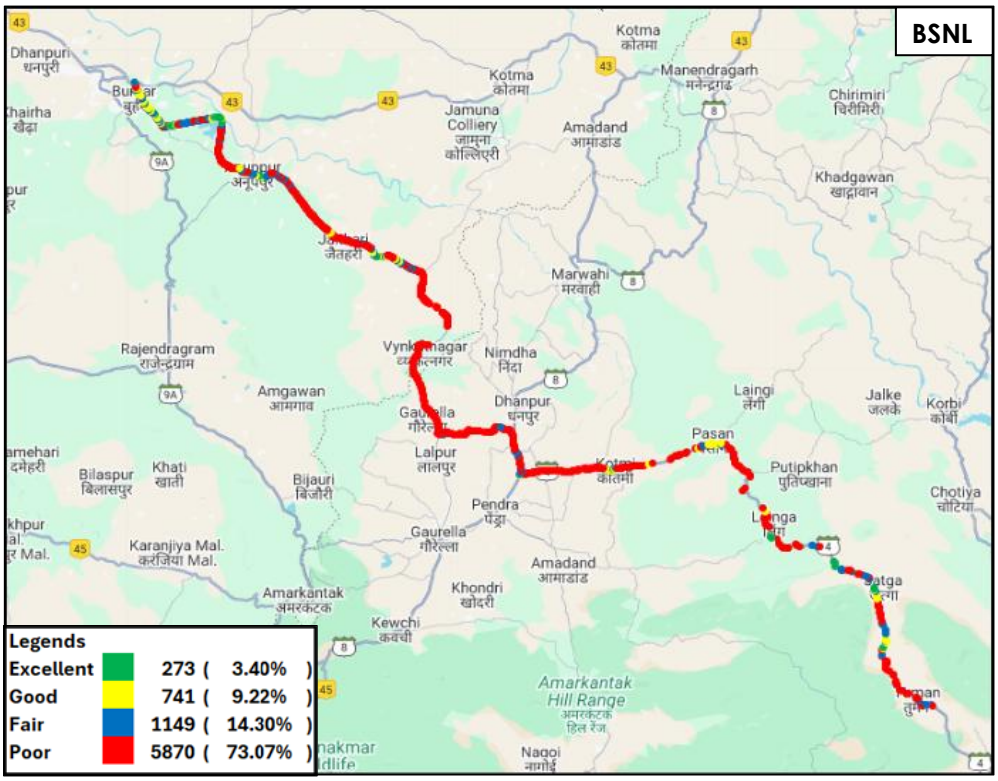


Figure-63: Signal strength auto-selection mode 5G/4G/3G/2G – BSNL.

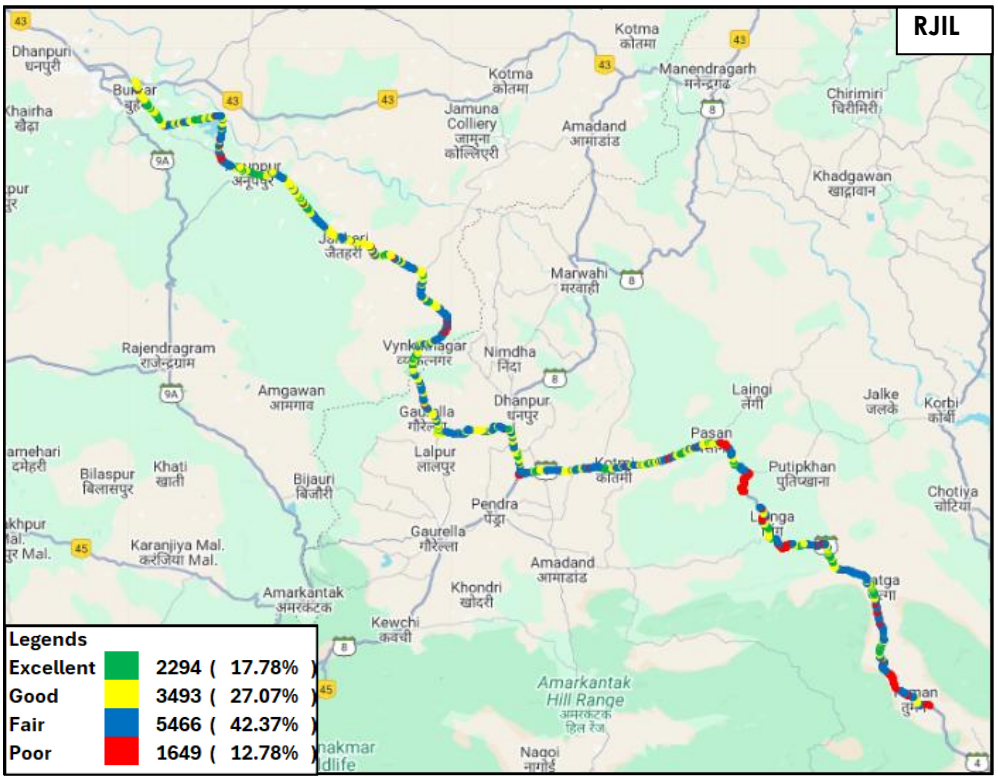


Figure-64: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

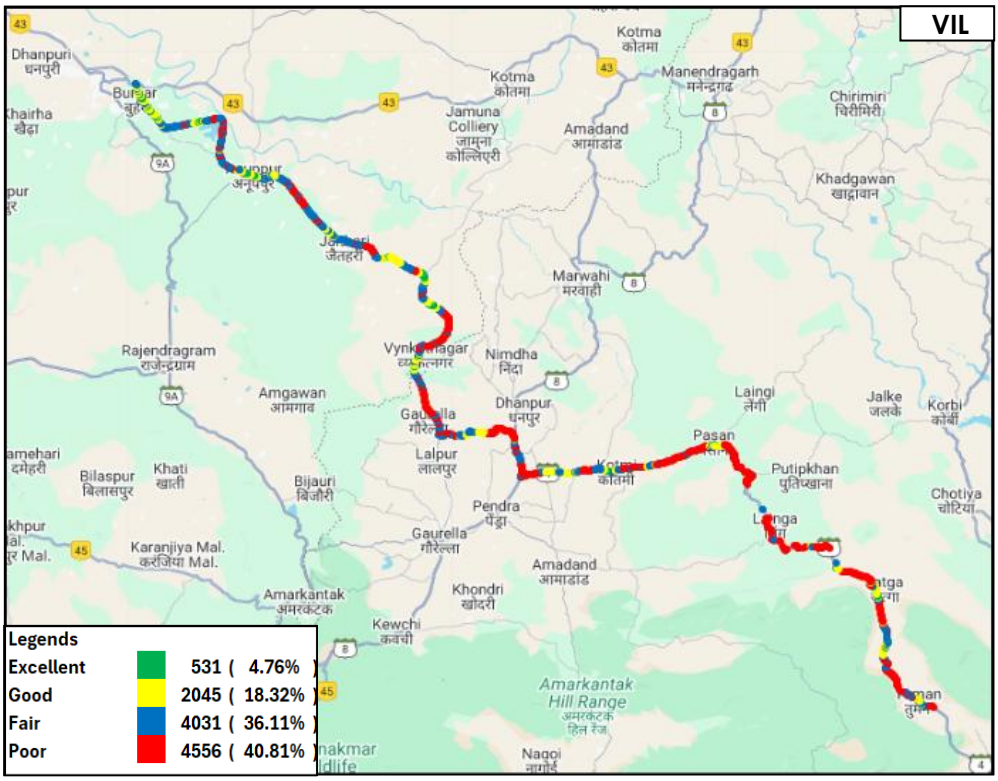


Figure-65: Signal strength auto-selection mode 5G/4G/3G/2G – VIL.

6.1.3 Railway

i) Korba to Rajnandgaon

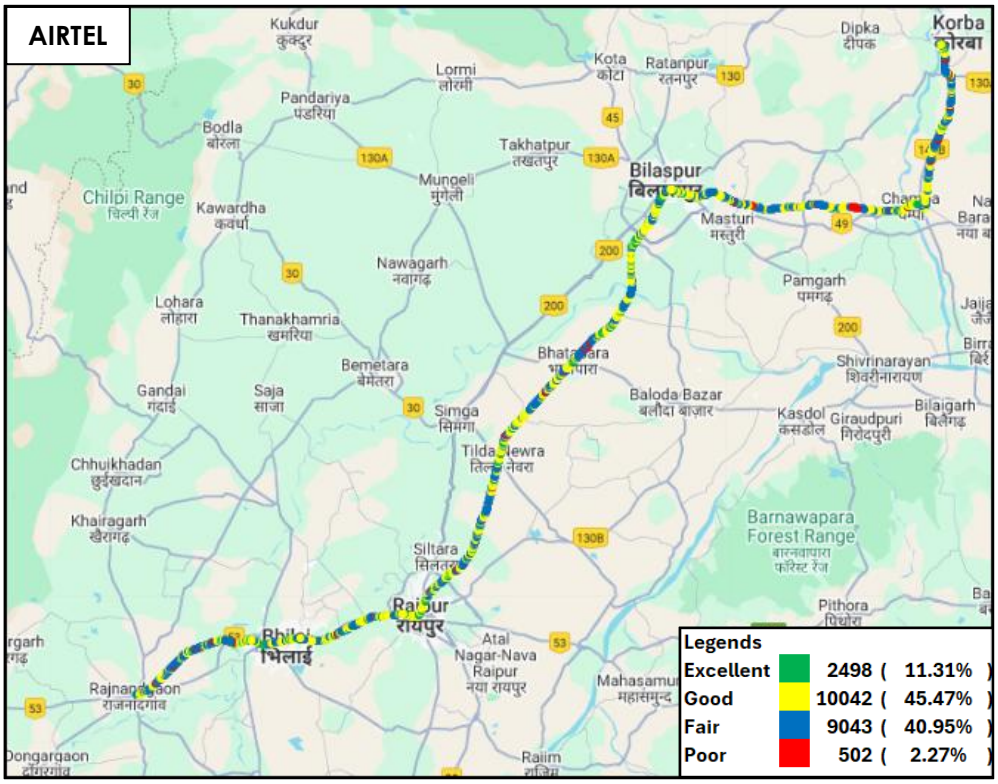


Figure-66: Signal strength auto-selection mode 5G/4G/3G/2G –AIRTEL.

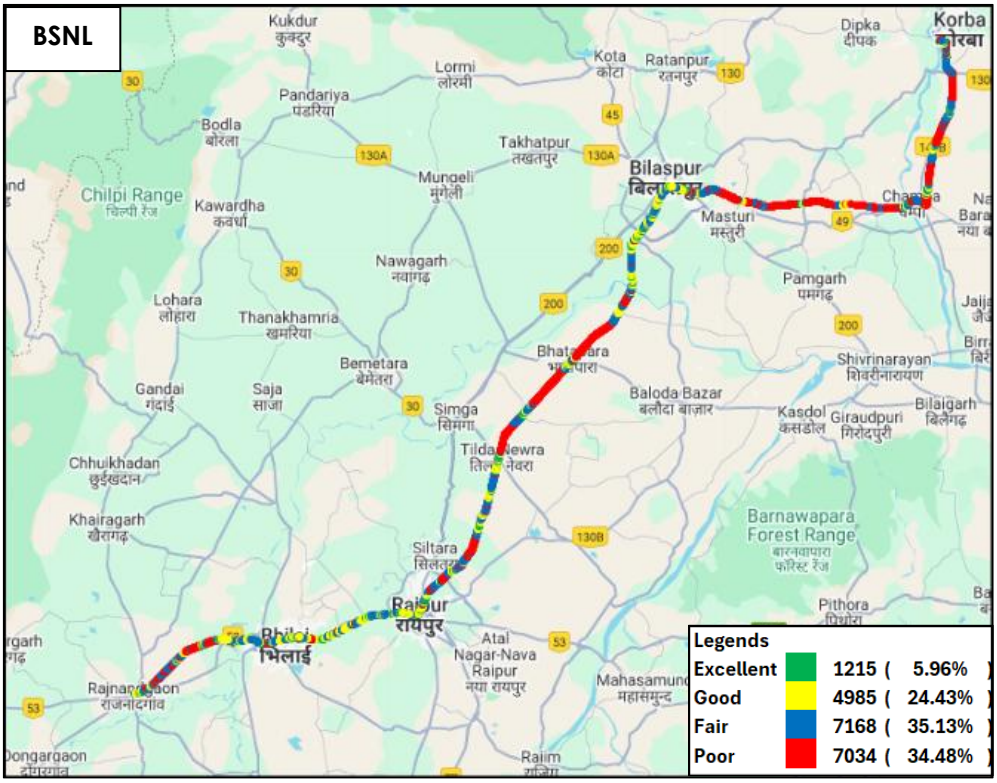


Figure-67: Signal strength auto-selection mode 5G/4G/3G/2G -BSNL.

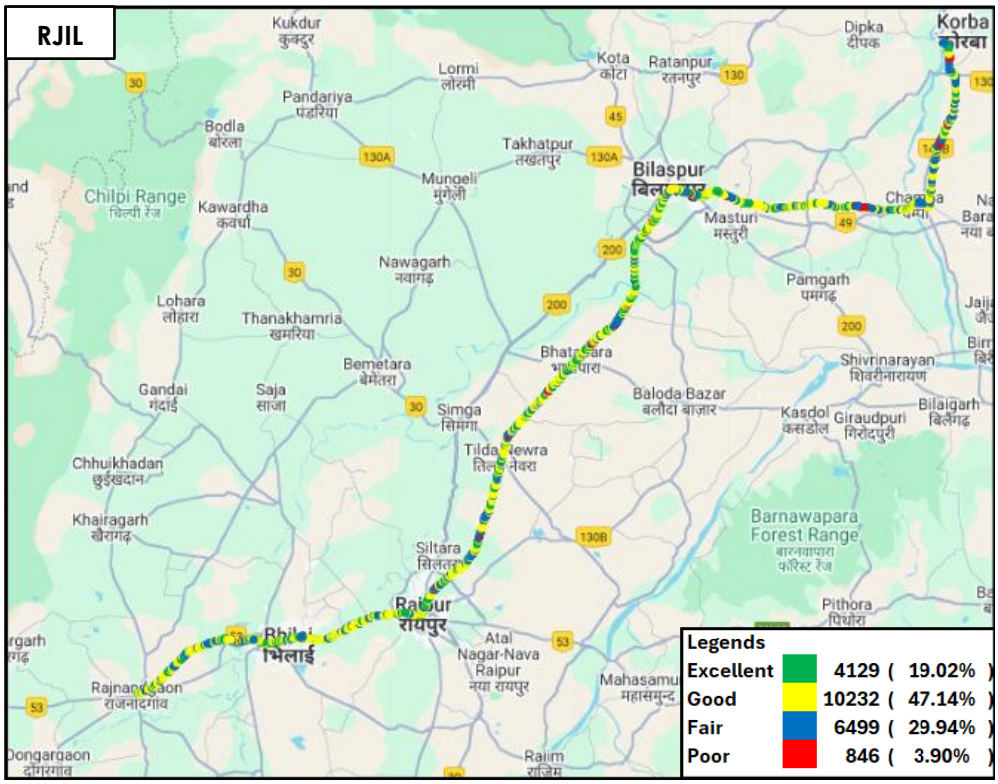


Figure-68: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

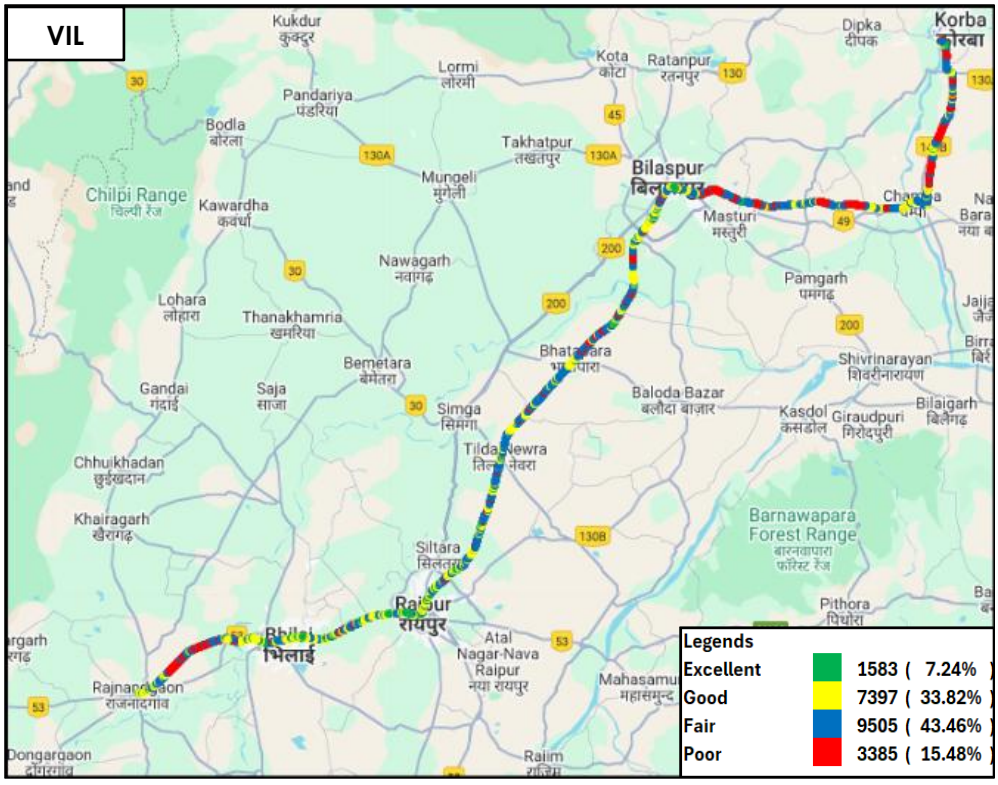


Figure-69: Signal strength auto-selection mode 5G/4G/3G/2G – VIL.

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-73: 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

Table-74: 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.

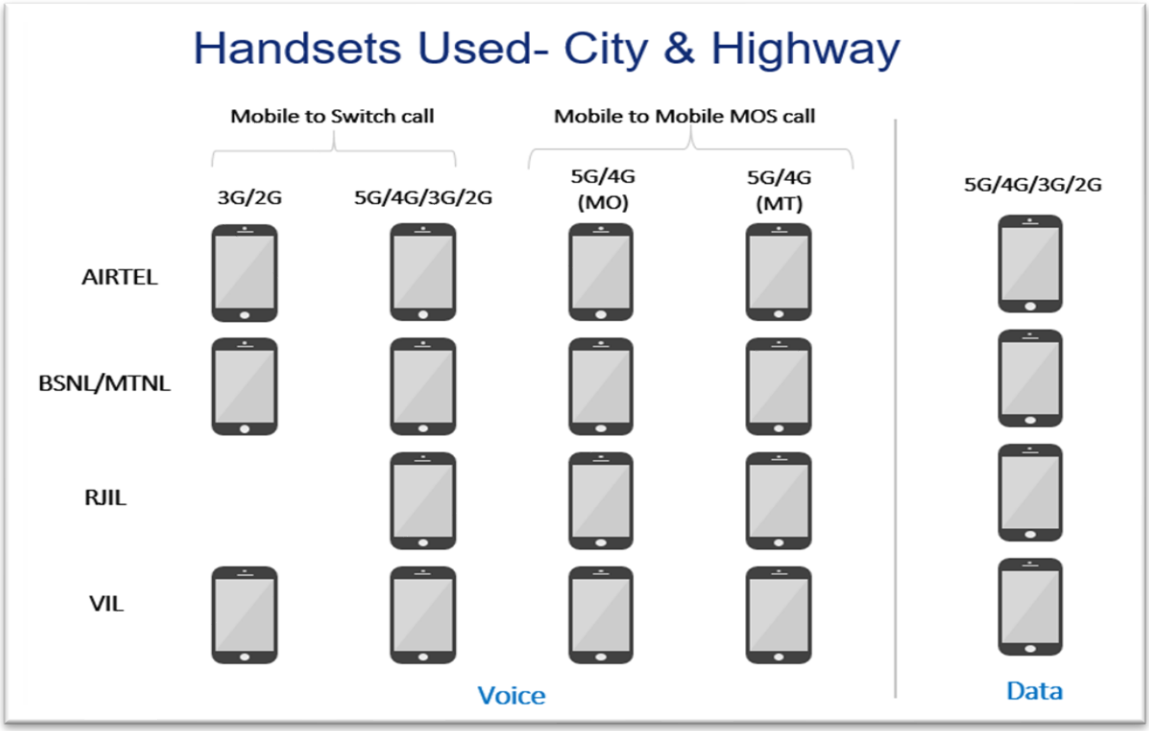


Figure-70: Number of handsets used in city & highway drive.

MO: Mobile originating

MT: Mobile terminating

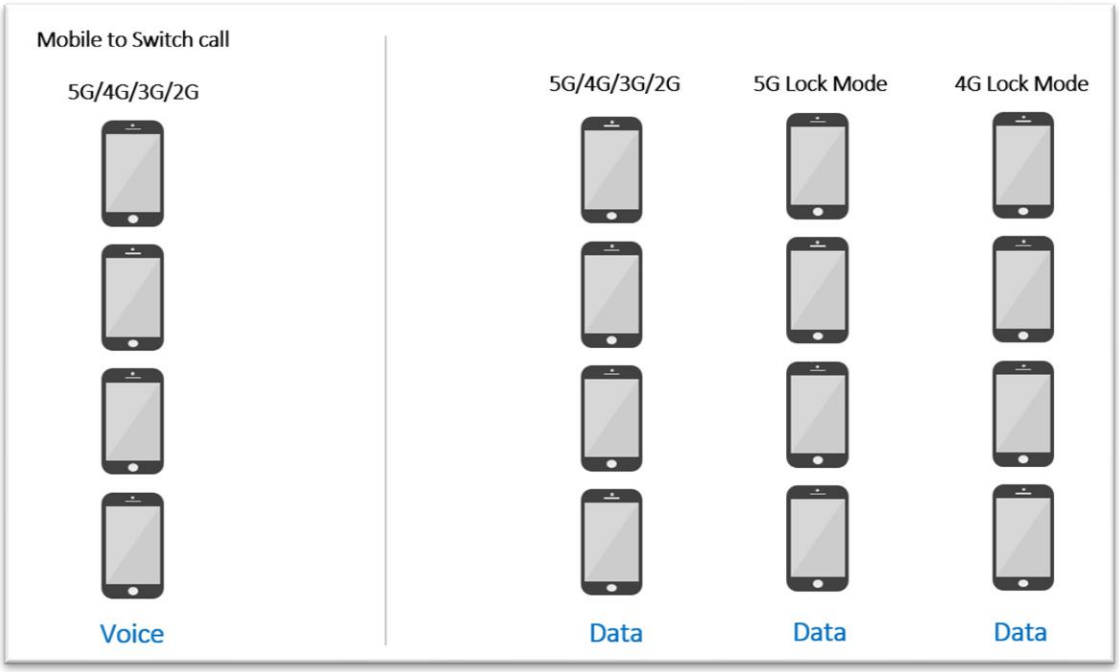


Figure-71: Number of handsets used in railway/metro/walktest/hotspot/ Railway area

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)

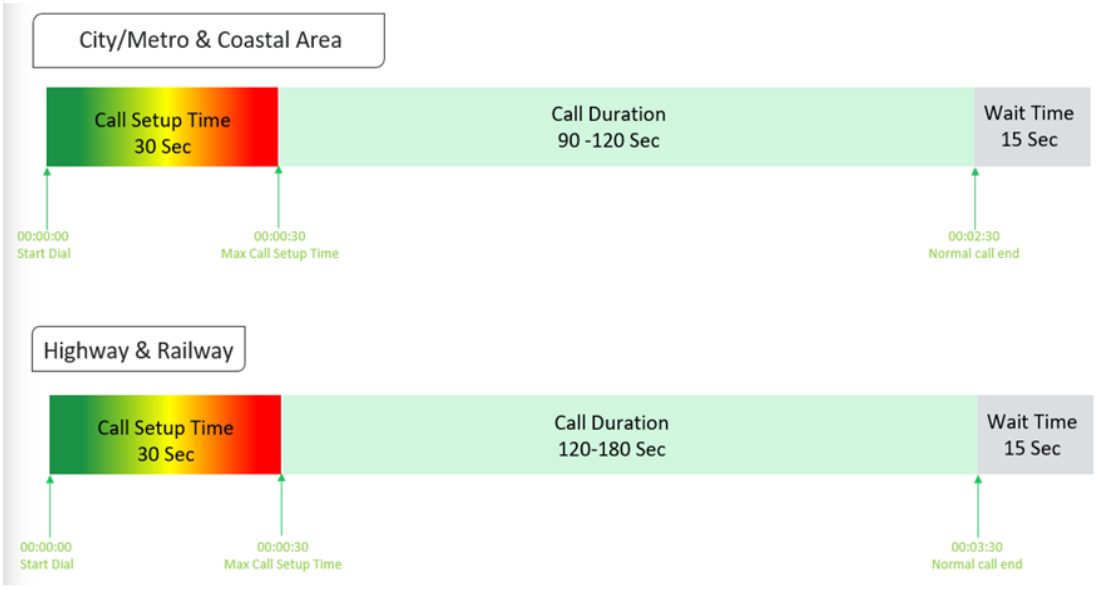


Figure-72: Voice test script for city/railway/metro/highway & Railway area

- 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-73: 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

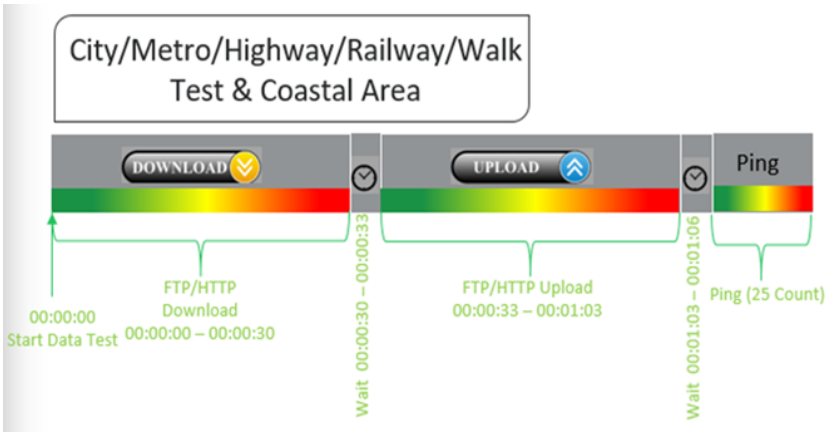


Figure-74: Data test script used in city/metro/railway/highway/walk test & Railway area

(d) Static Data(internet) testing

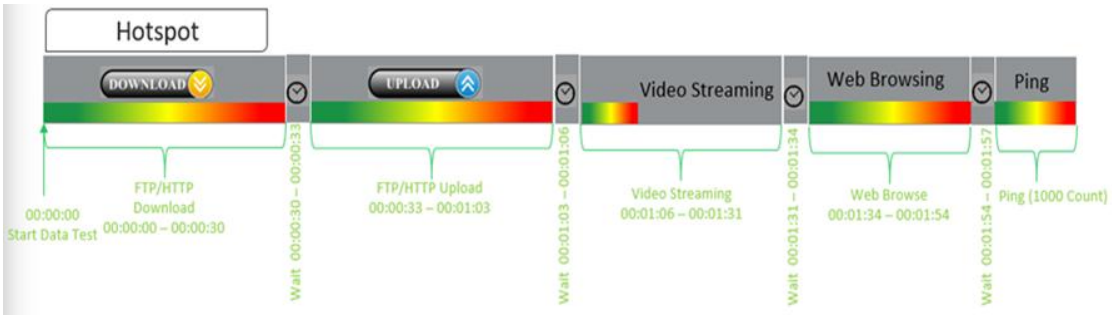


Figure-75: Data test script used at hotspot

- 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	(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: (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. CSSR = (Total Call Established/ Total Call Attempt) *100 As per QoS Regulation 2024 benchmark value is **>=98%**
Drop Call Rate	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 Drop Call Rate = (Total Call Drop/Total Call Established) *100 As per QoS Regulation 2024 benchmark value is **<=2%**
Call Setup Time	Time taken from call initiate to call alerting/ringing. Call Setup Time = T2- T1 T2- Ringing (VoLTE/VoNR) & Alerting (for WCDMA & GSM), T1- Invite (VoLTE/VoNR) & CM Service Request (for WCDMA & GSM)
Voice Quality (MOS)	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: Excellent: MOS $\geq$ 4 and < 5 Good : MOS $\geq$ 3 and < 4 Fair : MOS $\geq$ 2 and < 3 Poor : MOS $\geq$ 1 and < 2
Handover Success Rate	Handover Success Rate = Count of successful handovers (All Technology Handover combined) / Total count of Handover Attempt (All Technology Handover combined) *100 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.
Silence Call	A call which has ≥ 4 sec continuous RTP gap is considered as a Silence Call. Silence call rate = (count of silence call / Total calls established) *100 If a call observes multiple silence count >=4 sec in a particular established call it has been taken as one silent event.

<table>
<tr><td>Jitter</td><td>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 Si is the RTP timestamp from packet i, and Ri 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:
D(i,j) = (Rj - Ri) - (Sj - Si)

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
J(i) = J(i-1) + (|D(i-1,i)| - J(i-1))/16 or 8</td></tr>
<tr><td>Downlink Packet Drop Rate</td><td>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)</td></tr>
<tr><td>Uplink Packet Drop Rate</td><td>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).</td></tr>
<tr><td>Signal Strength</td><td>Signal strength is the signal power level received by the wireless user.

<table>
<tr><td rowspan="2">Parameter Name</td><td rowspan="2">Technology</td><td colspan="4">Signal Strength (dBm)</td></tr>
<tr><td>Excellent</td><td>Good</td><td>Fair</td><td>Poor</td></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>
</td></tr>
</table>

Table-75: Network performance parameter and definition voice

7.2.2 Network Performance Parameters Data tests

Parameter Name	Definition
Download Speed (Mbps)	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. Download Speed = Total bytes transferred during download / Total time for transfer • 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)	The upload speed is the data transmission rate that is achieved for uploading a test file from a test device to a test server. Upload Speed = Total bytes transferred during upload / Total time for transfer. • 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-76: 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.

Hardik Rajeshbhai Patel

Digitally signed by Hardik Rajeshbhai Patel
Date: 2025.08.21 16:46:02 +05'30'