भादूविप्रा
TRAI

TELECOM REGULATORY AUTHORITY OF INDIA

Independent Drive Test Report

North East LSA

September 2026

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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 North-East License Service Area (LSA) during the month of September-2026 under the supervision of TRAI Regional Office (RO) Kolkata. 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	Lohit District	City	247.3	08-Sep-2026	10-Sep-2026
2	Tezu	Inter Operator Calling	1 Location	10-Sep-2026	10-Sep-2026
3	Silluk-Tin-Ali to Tohangam along NH-13	Highway	154.8	07-Sep-2026	08-Sep-2026
4	Lohit District	Hotspot	13 Locations	07-Sep-2026	10-Sep-2026
5	Tezu	Walk test	1.2	10-Sep-2026	10-Sep-2026

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 test and highway as per the legends shown on the map.

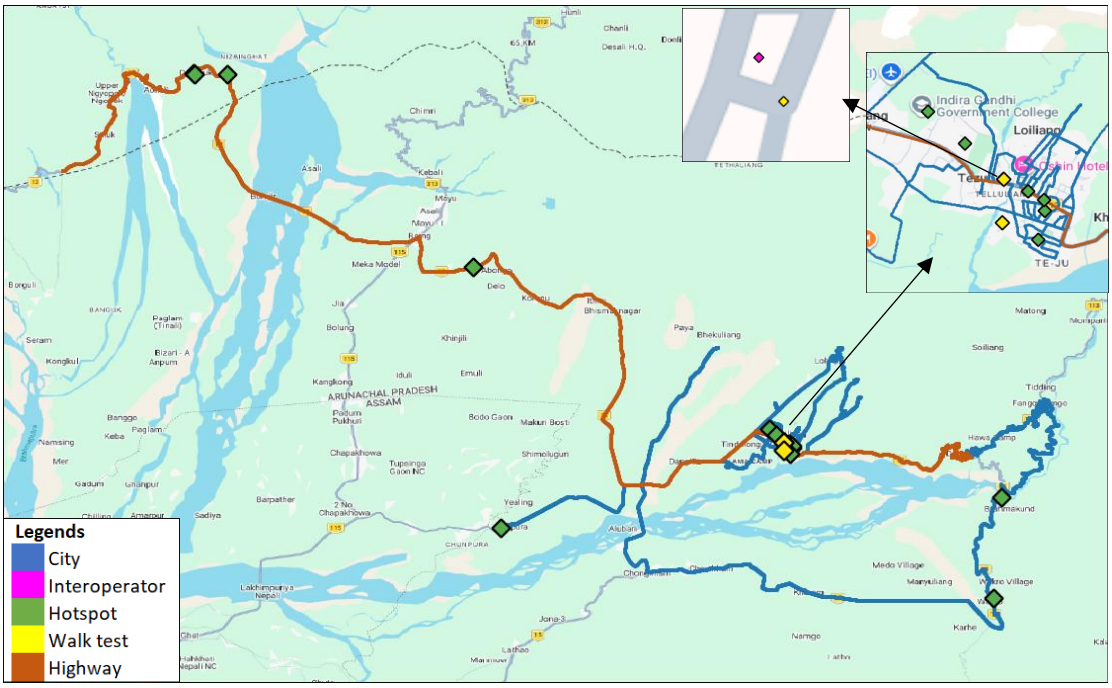


Figure-1: Drive test routes.

2.3 Summary of areas covered

a) City- Sunpura, New Hati Duba, Chongkham, Kherem, Medo, Lamliang, Brahmakund, Hawa Camp, Demwe, Telluliang New, Loiliang, Lohitpur, 43rd Mile, Tezu Gam etc.

b) Hotspot

1. ADC Office Dambuk -Dambuk Aga -Dambuk
2. Dambuk G.H.S.S -Dambuk
3. Dambuk PHC -Dambuk
4. Deputy Commissioner Office -Tezu
5. District And Sessions Court -Tezu
6. District Museum and Community Convention Centre - Jubilee Marg -Tezu
7. Govt. Higher Secondary School, NH13 -Tezu
8. Indira Gandhi Government College- Gas Agency Road -Tezu
9. Parsuram Kund
10. Police Station Wakro
11. Polytechnic College -Roing
12. Sunpura Administrative/Panchayat Area -Jeko
13. Tezu Main Bazaar / Clock Tower

c) Walk Test

1. Denning College for Teacher Education - Tezu
2. Zonal General Hospital - Tezu

d) Highway- Silluk-Tin-Ali to Tohangam along NH-13 Via Silluk, Dambuk, Bomjir, Roing, Abali, Abongo, Koronu, Bhismaknagar, Danglt, Telluliang New, Demwe etc

2.4 Telecom service providers detected frequency bands

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

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

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

2.5 Key findings of Independent Drive Test

1. **Drive Test Area:** The overall mobile network performance across Lohit District (North-East LSA) for the key Parameters has been summarized below:

a) Coverage Gap - The signal strength observed during voice testing on the drive test route in auto-selection mode (5G/4G/3G/2G). (refer figure- 29 to 32)

Parameter	AIRTEL	BSNL	RJIL	VIL
Total Number of Samples captured on Drive test route	37595	31483	37912	22487
Number of Samples having poor signal strength	8393	13481	10750	13557
Number of Samples having limited service (No Coverage)	2335	6002	2597	10875

b) Dropped Calls – The TSP-wise details of dropped calls in auto selection mode (5G/4G/3G/2G). (refer figure-15 to 18)

Parameter	AIRTEL	BSNL	RJIL	VIL
Number of successful Calls Established	271	201	270	157
Number of dropped Calls	12	12	1	17

c) Call Silence Instance - The TSP-wise details of Call silence instance in Auto-selection mode (5G/4G). (refer figure-19 & 22)

Parameter	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider network)	245	159	237	98
Number of silences calls for >3 Sec	6	6	26	2
Total number of silence instances for >3 Sec	8	6	40	2

d) Packet loss rate Downlink & Uplink- The TSP-wise details of packet loss rate in downlink & uplink for Auto-selection mode (5G/4G).

Parameter	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider network)	245	159	237	98
Packet loss Rate Downlink %	1.98	11.99	5.95	1.57
Packet loss Rate Uplink %	1.20	6.55	4.36	1.44

e) Data Download and Upload Throughput-

i) Data Download Throughput: The TSP-wise details of **Average Download (DL) throughput** against declared typical DL Throughput for month, in Auto-selection mode (5G/4G/3G/2G). (refer figure- 34 to 37)

Parameter	Measured in	AIRTEL (upto 5G)	BSNL (upto 4G)	RJIL (upto 5G)	VIL (upto 4G)
Typical Download Throughput declared by TSP	(Mbits/s)	23.00	5.00	15.00	15.00
Average Download Throughput measured during IDT	(Mbits/s)	61.75	2.27	103.49	18.20

ii) Data Upload Throughput: The TSP-wise details of **Average Upload (UL) throughput** against declared typical UL Throughput for month, in Auto-selection mode (5G/4G/3G/2G). (refer figure- 38 to 41)

Parameter	Measured in	AIRTEL (upto 5G)	BSNL (upto 4G)	RJIL (upto 5G)	VIL (upto 4G)
Typical Upload Throughput declared by TSP	(Mbits/s)	10.00	3.00	7.00	8.00
Average Upload Throughput measured during IDT	(Mbits/s)	12.40	3.06	7.08	4.84

2. **Drive Test Route:** The overall mobile network performance on Silluk-Tin-Ali to Tohangam along NH-13 highway route (North-East LSA) for the key Parameters has been summarized below:

a) Coverage Gap - The signal strength observed during voice testing on the drive test route in auto-selection mode (5G/4G/3G/2G). (refer figure- 77 to 80)

Parameter	AIRTEL	BSNL	RJIL	VIL
Total Number of Samples captured on Drive test route	11149	9777	15123	6027
Number of Samples having poor signal strength	3547	5962	6217	4965
Number of Samples having limited service (No Coverage)	2111	3251	121	4610

b) Dropped Calls – The TSP-wise details of dropped calls in auto selection mode (5G/4G/3G/2G). (refer figure-64 to 67)

Parameter	AIRTEL	BSNL	RJIL	VIL
Number of successful Calls Established	62	50	81	32
Number of dropped Calls	12	15	7	8

c) Call Silence Instance - The TSP-wise details of Call silence instance in Auto-selection mode (5G/4G). (refer figure-68 & 70)

Parameter	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider network)	58	31	43	8
Number of silences calls for >3 Sec	3	1	7	0
Total number of silence instances for >3 Sec	4	1	14	0

d) Packet loss rate Downlink & Uplink- The TSP-wise details of packet loss rate in downlink & uplink for Auto-selection mode (5G/4G).

Parameter	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider network)	58	31	43	8
Packet loss Rate Downlink %	3.70	11.30	12.85	0.35
Packet loss Rate Uplink %	3.01	8.61	11.62	0.35

e) Data Download and Upload Throughput-

i) Data Download Throughput: The TSP-wise details of **Average Download (DL) throughput** against declared typical DL Throughput for month, in Auto-selection mode (5G/4G/3G/2G). (refer figure- 81 to 84)

Parameter	Measured in	AIRTEL (upto 5G)	BSNL (upto 4G)	RJIL (upto 5G)	VIL (upto 4G)
Typical Download Throughput declared by TSP	(Mbits/s)	23.00	5.00	15.00	15.00
Average Download Throughput measured during IDT	(Mbits/s)	61.33	2.34	85.84	32.99

ii) Data Upload Throughput: The TSP-wise details of **Average Upload (UL) throughput** against declared typical UL Throughput for month, in Auto-selection mode (5G/4G/3G/2G). (refer figure- 85 to 88)

Parameter	Measured in	AIRTEL (upto 5G)	BSNL (upto 4G)	RJIL (upto 5G)	VIL (upto 4G)
Typical Upload Throughput declared by TSP	(Mbits/s)	10.00	3.00	7.00	8.00
Average Upload Throughput measured during IDT	(Mbits/s)	11.65	2.29	5.02	7.05

QoS Performance Analysis- North East 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 North-East LSA during the month of September-2026 covering city drive, hotspots, walk test and highway. (Refer Table-1)

3.2 Voice performance

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

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	514	681	708
Call Setup Success Rate %	60.70	30.69	31.64
Drop Call Rate %	1.28	4.31	9.82
Call Setup Time-Average (Second)	2.68	3.42	3.75
Handover Success Rate %	100.00	99.77	100.00

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

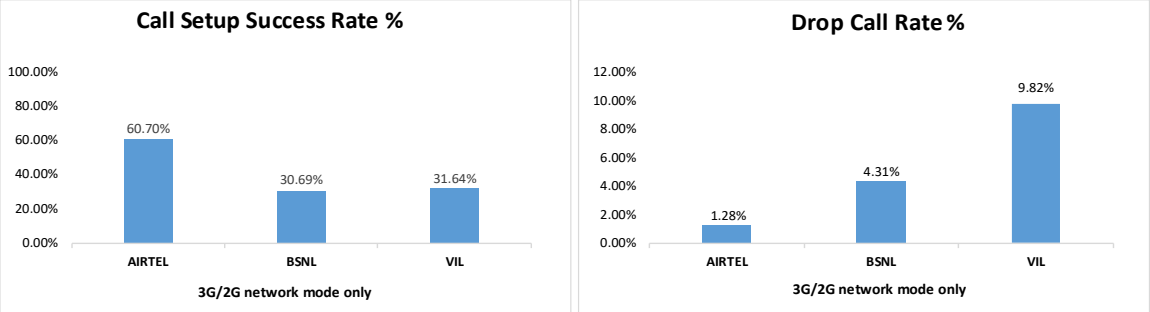


Figure-2: Call setup success rate and drop call rate performance.

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	35	NA
2G	121	73	56

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	713	837	666	920
Call Setup Success Rate %	66.90	46.71	75.83	33.15
Drop Call Rate %	5.24	7.42	1.58	8.85
Call Setup Time-Average (Second)	1.09	8.00	1.19	3.71
Handover Success Rate %	100.00	99.59	99.58	100.00

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

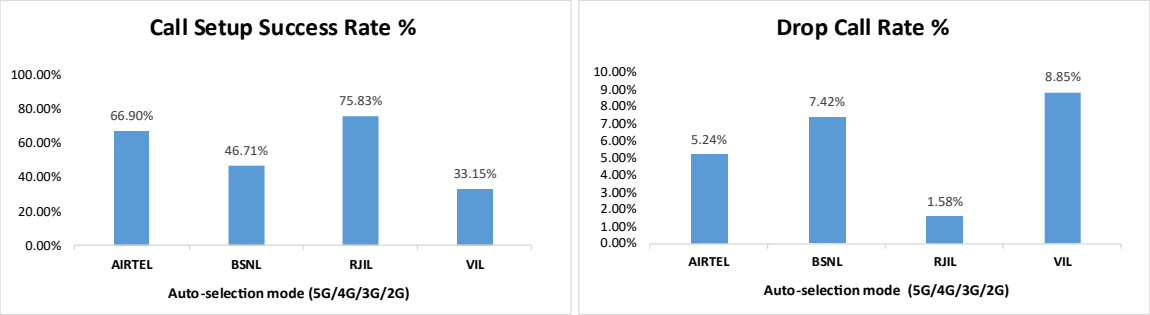


Figure-3: Performance for call setup success rate and drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G – Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	303	190	280	106
Number of silences call for >4 Sec	8	5	26	2
Silence Call Rate %	2.64	2.63	9.29	1.89
Number of silence instances for >4 Sec	11	5	38	2
Number of silence instances for >3 Sec	12	7	54	2
Number of silence instances for >2 sec	17	13	88	2
RTP Jitter (4G & 5G) in ms	5.26	12.69	14.78	4.36
Packet loss Rate Downlink %	2.30	11.90	7.02	1.48
Packet loss Rate Uplink %	1.51	6.81	5.41	1.38

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	46	NA	78	NA
4G	398	140	407	85
3G	NA	22	NA	NA
2G	9	65	NA	78

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.

(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	2696	1663	2477	842
Speech Quality (Average MOS)	3.94	2.69	4.06	4.40
Number of samples with MOS >=4 to <5 (Excellent)	2245	284	1870	731
Number of samples with MOS >=3 to <4 (Good)	307	330	197	43
Number of samples with MOS >=2 to <3 (Fair)	49	560	101	27
Number of samples with MOS >=1 to <2 (Poor)	95	489	309	41
%age of samples with MOS >=4 to <5 (Excellent)	83.27%	17.08%	75.49%	86.82%
%age of samples with MOS >=3 to <4 (Good)	11.39%	19.84%	7.95%	5.11%
%age of samples with MOS >=2 to <3 (Fair)	1.82%	33.67%	4.08%	3.21%
%age of samples with MOS >=1 to <2 (Poor)	3.52%	29.40%	12.47%	4.87%

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

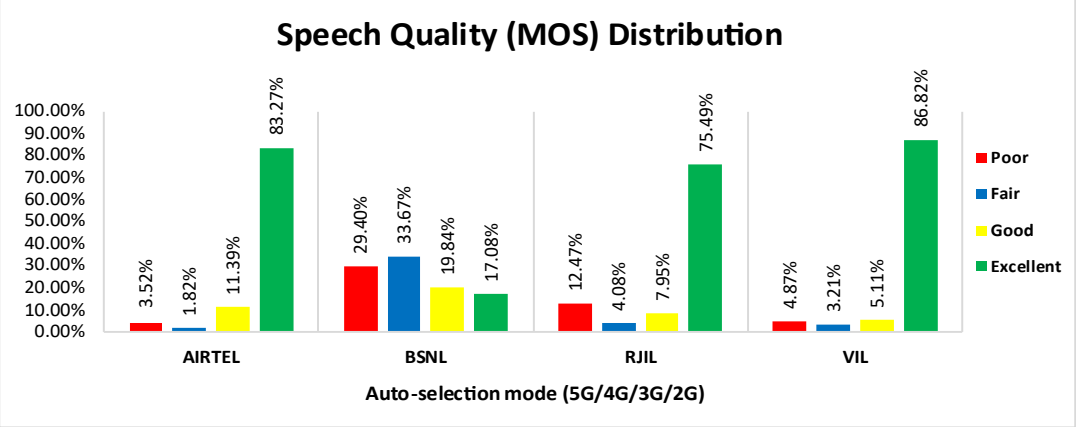


Figure- 4: Distribution of samples in MOS range.

(d) Inter-service provider voice call performance: To check the performance of inter-service providers call setup success rate, total 14 to 15 inter operator calls were attempted at one location which is Near R.K.S Medical Hall. The call setup success rate and call setup time observation is as below.

Call Setup Success Rate %				
From Service Provider	To Service Provider			
	AIRTEL	BSNL	RJIL	VIL
AIRTEL	NA	100.00	100.00	100.00
BSNL	100.00	NA	100.00	100.00
RJIL	100.00	100.00	NA	100.00
VIL	100.00	100.00	100.00	NA

Table-9: Call setup success rate across service providers.

Note-

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

Call setup time average (seconds)				
From Service Provider	To Service Provider			
	AIRTEL	BSNL	RJIL	VIL
AIRTEL	NA	3.54	1.43	2.93
BSNL	8.63	NA	8.58	8.34
RJIL	2.26	4.36	NA	1.57
VIL	2.82	3.70	2.57	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	68.90	2.96	128.47	27.18
	80th Percentile	140.08	4.79	282.74	47.56
	20th Percentile	2.14	0.68	3.38	2.07
Upload Throughput (Mbits/s)	Average	15.03	3.27	7.90	6.48
	80th Percentile	28.72	3.84	11.84	9.55
	20th Percentile	1.02	0.84	0.84	0.36
Latency (ms)	50th Percentile	56.53	70.12	52.47	57.00

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

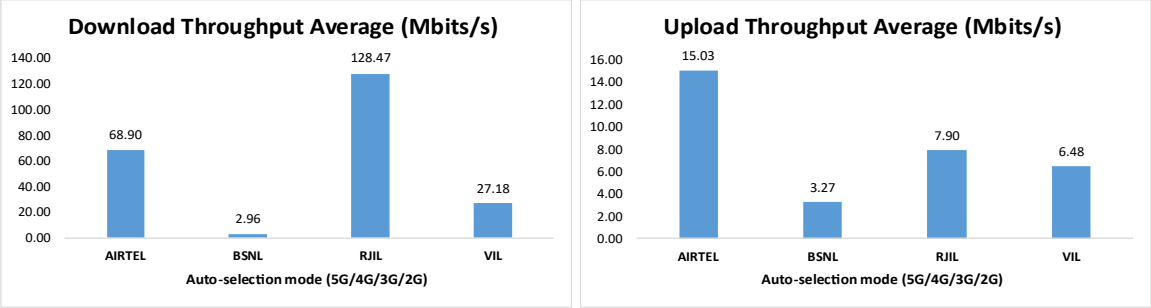


Figure- 5: Download and Upload throughput.

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	53	NA	70	NA
4G	369	157	358	112
3G	NA	30	NA	NA
2G	10	48	NA	91

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.

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 and highway 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 08th September 2026 to 10th September 2026 in Lohit District. (Refer Table-1)

4.2.1 Drive test route



Figure- 6: Drive test routes.

4.2.2 Areas covered

Sunpura, New Hati Duba, Chongkham, Kherem, Medo, Lamliang, Brahmakund, Hawa Camp, Demwe, Telluliang New, Loiliang, Lohitpur, 43rd Mile, Tezu Gam 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	396	500	505
Call Setup Success Rate %	62.63	33.00	37.03
Drop Call Rate %	0.40	3.03	8.02
Call Setup Time-Average (Second)	2.42	3.43	3.77
Handover Success Rate %	100.00	99.73	100.00

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

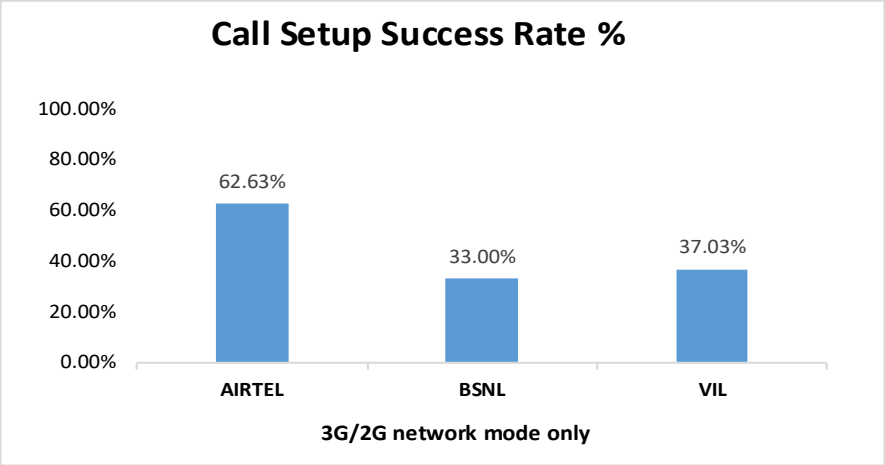


Figure-7: Performance for call setup success rate.

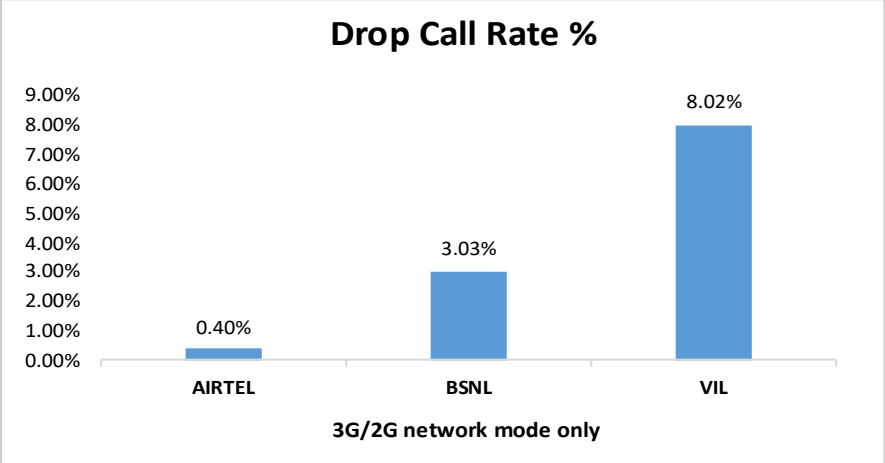


Figure-8: Performance for drop call rate.

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

Technology	Service Provider		
	AIRTEL	**BSNL**	**VIL**
3G	NA	18.83%	NA
2G	89.67%	53.40%	73.76%
Limited Service	10.33%	27.77%	26.24%

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

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

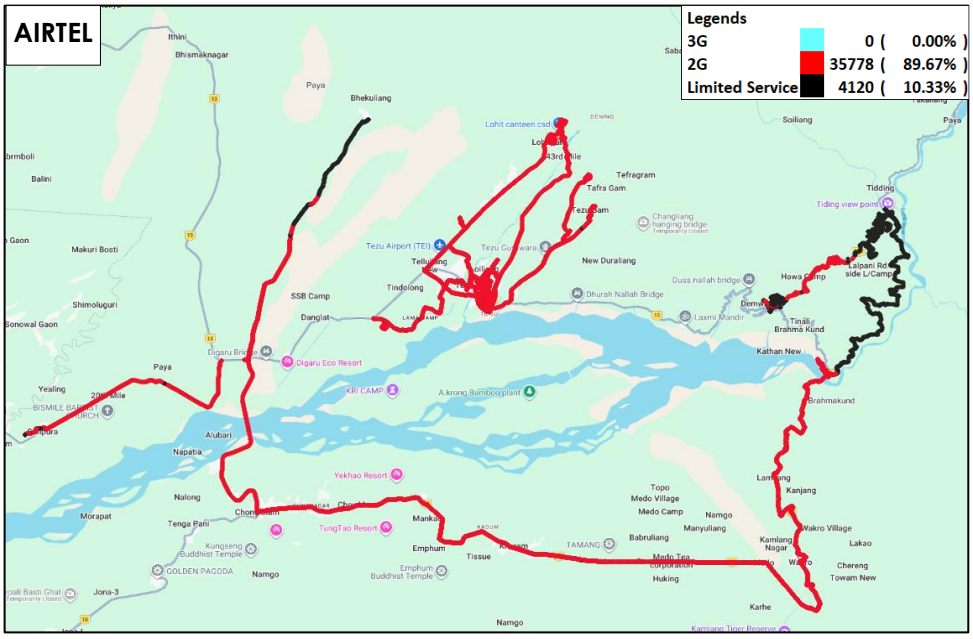


Figure-9: Serving technology plots 3G/2G network mode – AIRTEL.

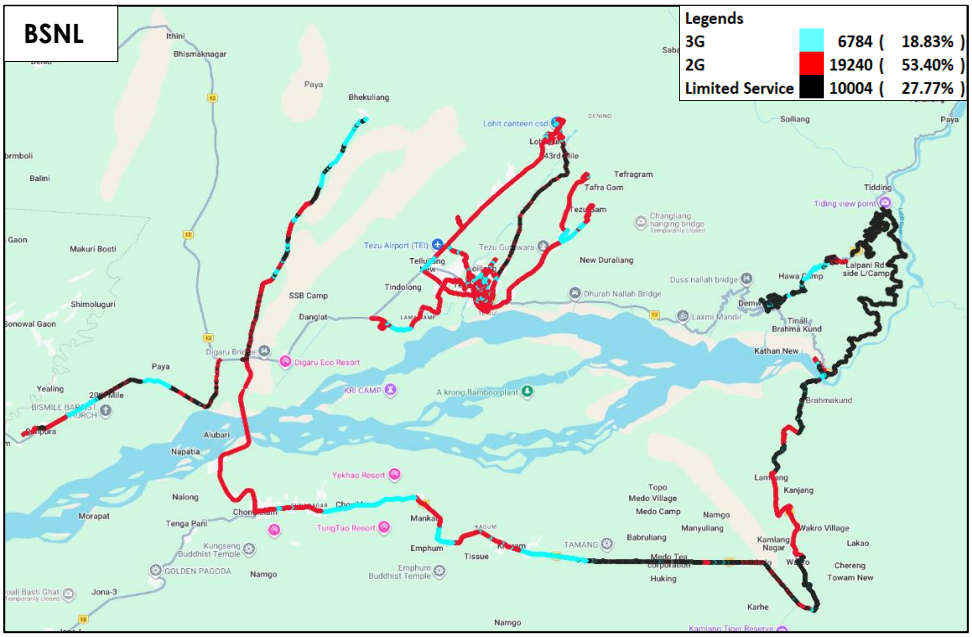


Figure-10: Serving technology plots 3G/2G network mode – BSNL.

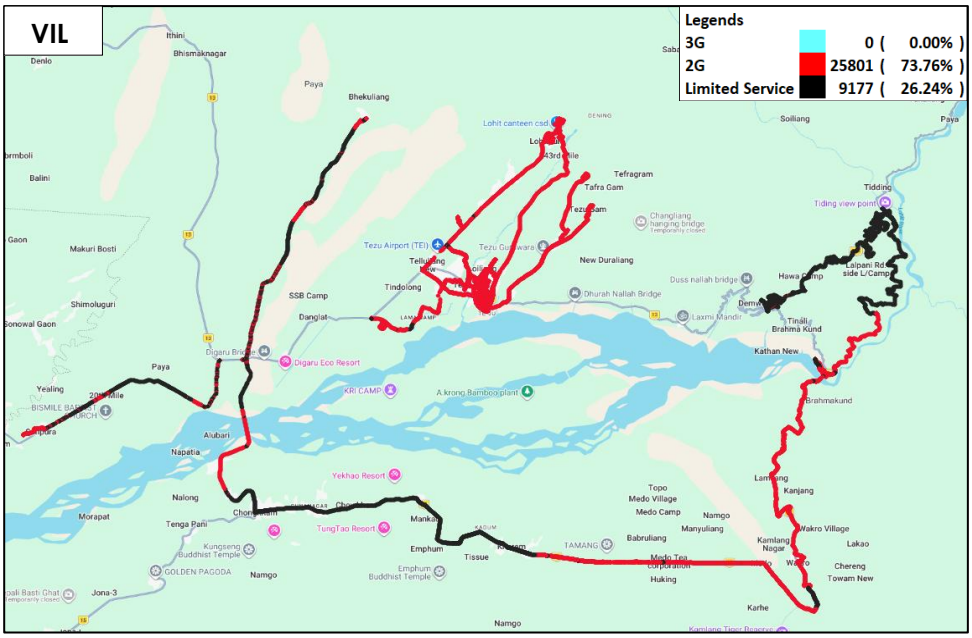


Figure-11: Serving technology plots 3G/2G network mode – VIL.

(c) Network Signal Strength Distribution: The following chart represents signal strength distribution for 3G/2G network mode only. (Refer figure- 94, 95 & 96 for map view)

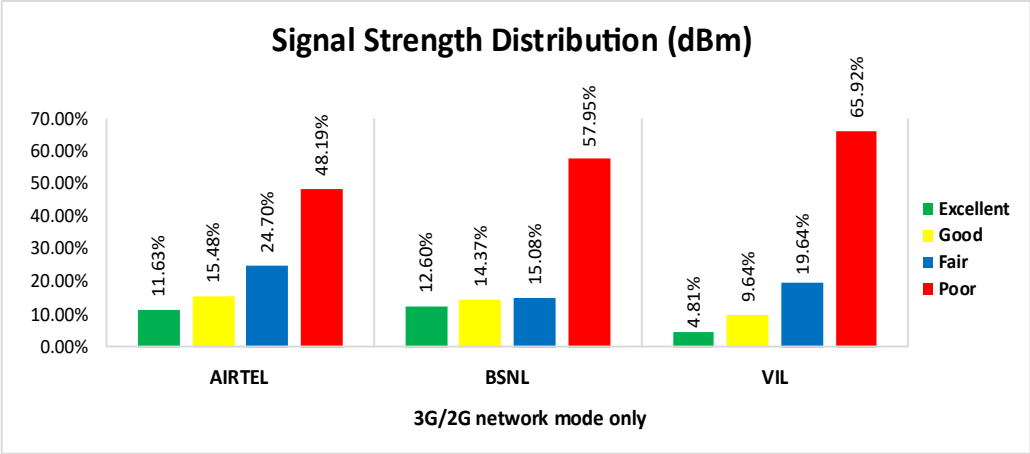


Figure-12: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 12% of samples falling in the excellent signal strength category.
- BSNL has 13% of samples falling in the excellent signal strength category.
- VIL has 5% 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	430	509	425	579
Call Setup Success Rate %	63.02	39.49	63.53	27.12
Drop Call Rate %	4.43	5.97	0.37	10.83
Call Setup Time Average (Second)	1.14	8.00	1.17	3.52
Handover Success Rate %	100.00	99.37	99.65	100.00

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

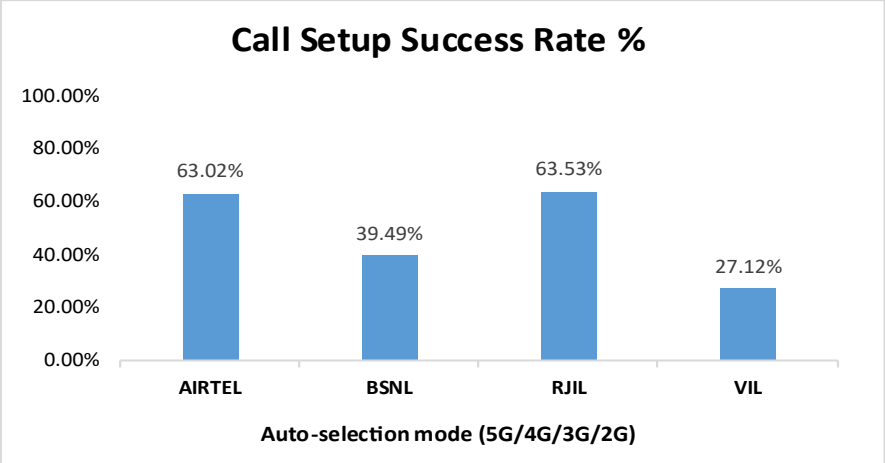


Figure-13: Performance for call setup success rate.

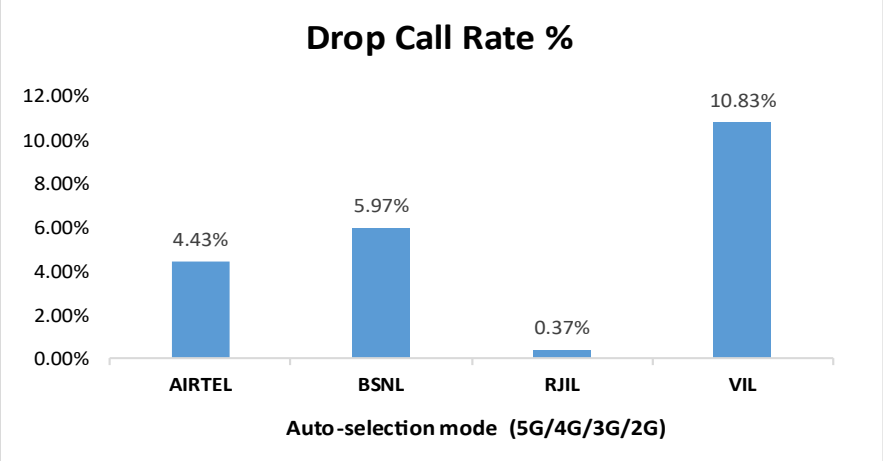


Figure-14: Performance for drop call rate.

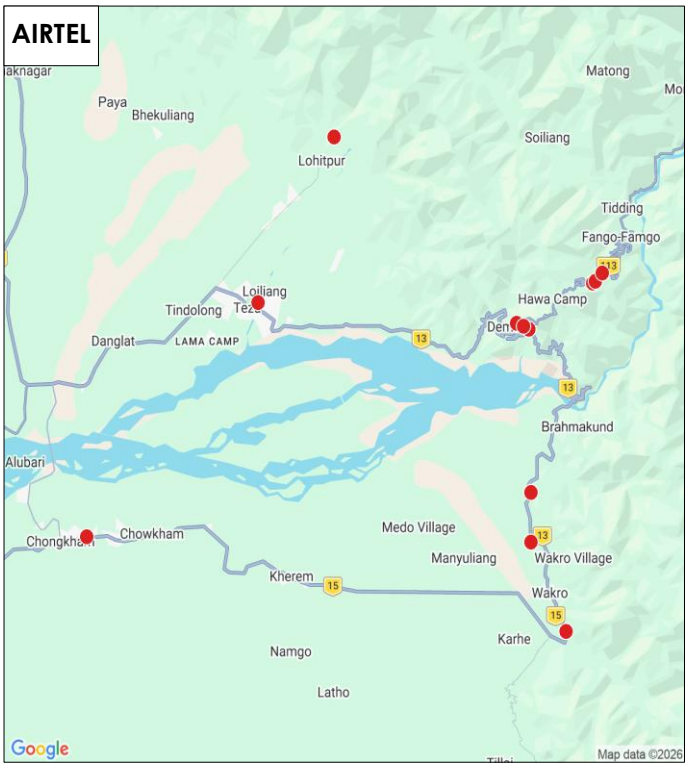


Figure-15: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

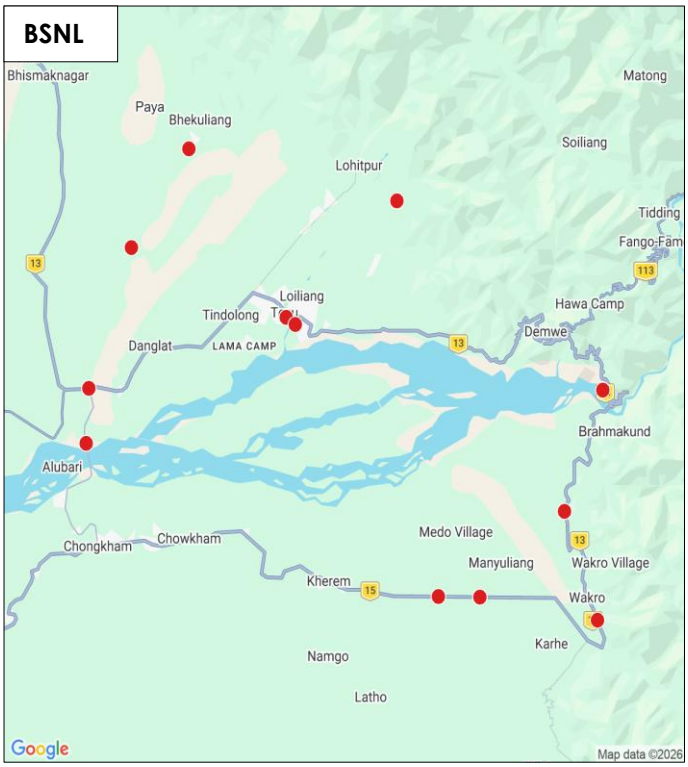


Figure-16: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice - BSNL.

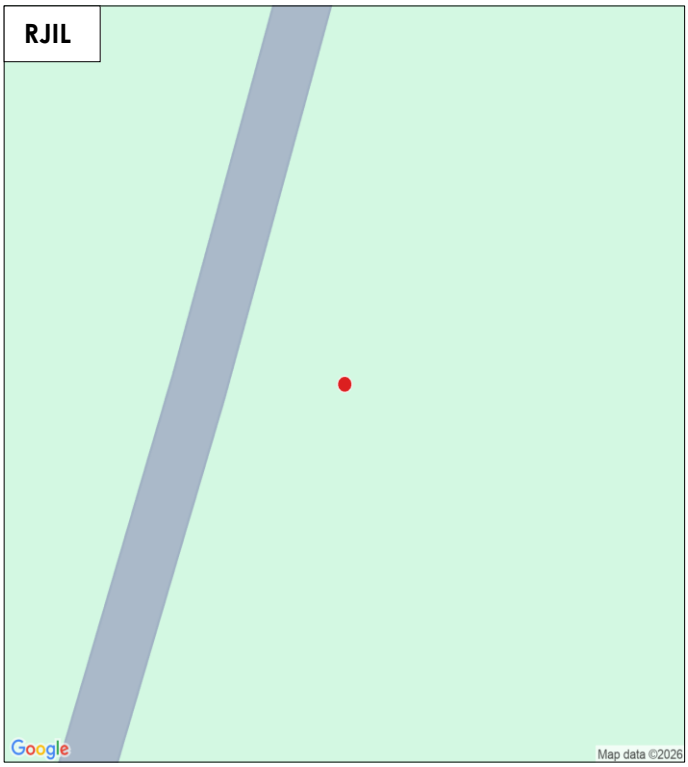


Figure-17: Drop call location in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

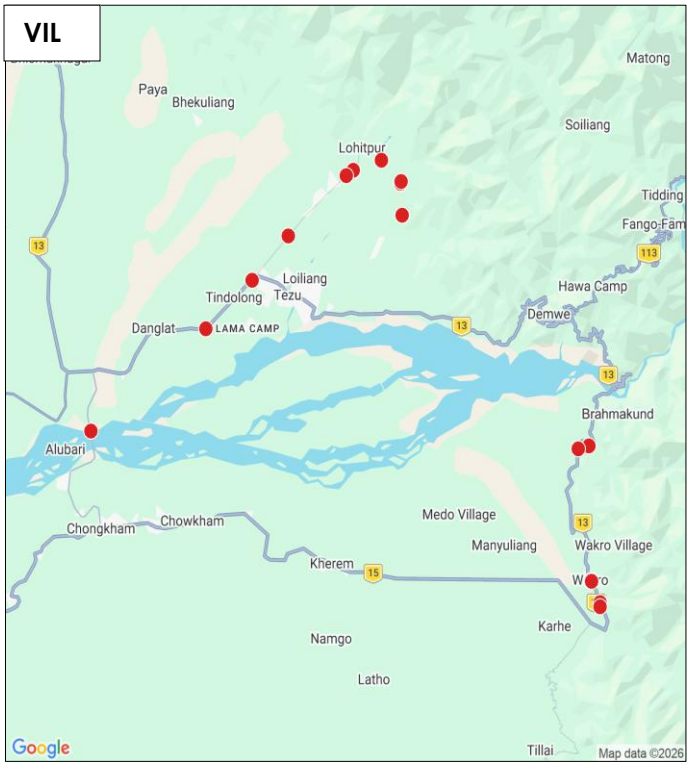


Figure-18: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice - VIL.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G – Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	245	159	237	98
Number of silences call for >4 Sec	6	5	20	2
Silence Call Rate %	2.45	3.14	8.44	2.04
Number of silence instances for >4 Sec	8	5	28	2
Number of silence instances for >3 Sec	8	6	40	2
Number of silence instances for >2 sec	13	10	64	2
RTP Jitter (4G & 5G) in ms	5.15	12.72	14.81	4.42
Packet loss Rate Downlink %	1.98	11.99	5.95	1.57
Packet loss Rate Uplink %	1.20	6.55	4.36	1.44

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

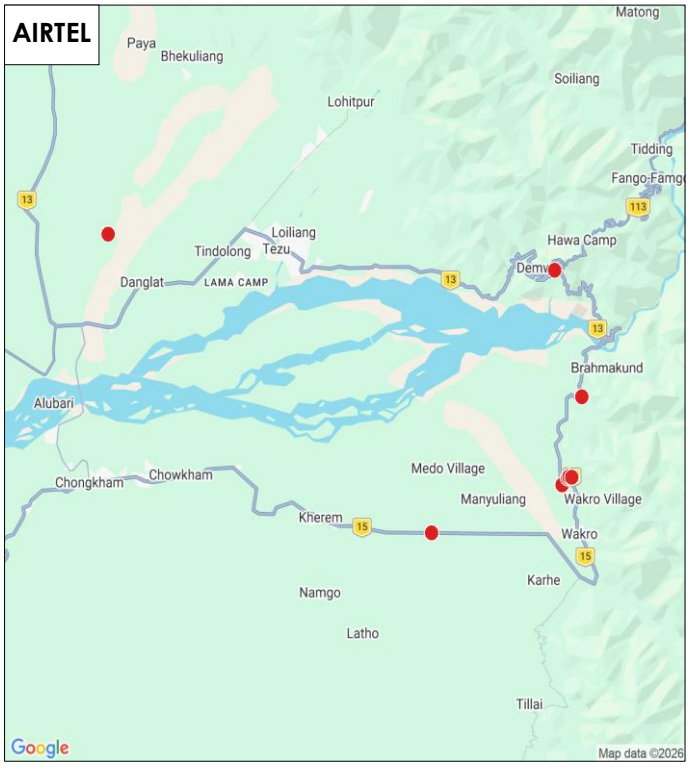


Figure-19: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-AIRTEL.



Figure-20: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-BSNL.

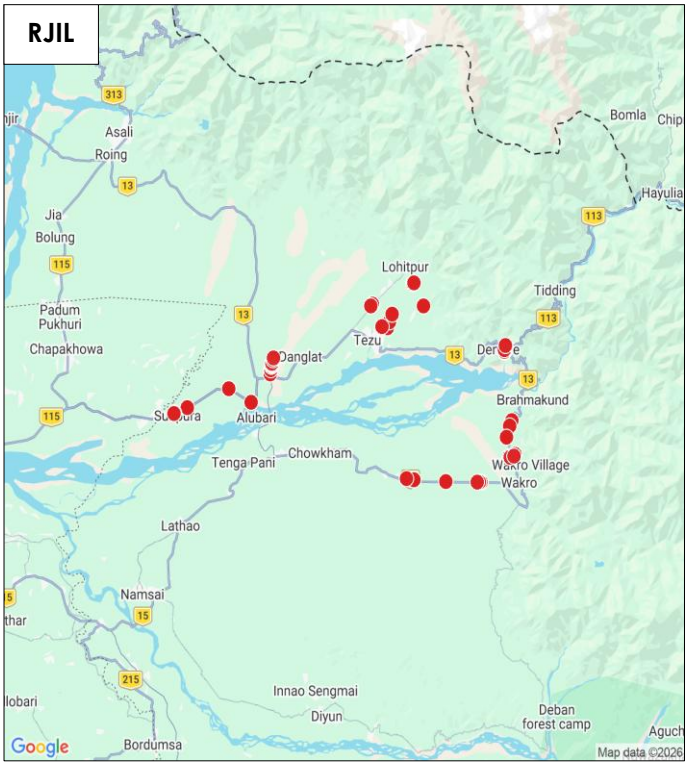


Figure-21: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-RJIL.



Figure-22: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-VIL.

(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	2100	1331	1984	752
Speech Quality (Average MOS)	3.96	2.68	4.10	4.44
Number of samples with MOS >=4 to <5 (Excellent)	1763	240	1515	658
Number of samples with MOS >=3 to <4 (Good)	235	259	164	41
Number of samples with MOS >=2 to <3 (Fair)	38	396	75	25
Number of samples with MOS >=1 to <2 (Poor)	64	436	230	28
%age of samples with MOS >=4 to <5 (Excellent)	83.95%	18.03%	76.36%	87.50%
%age of samples with MOS >=3 to <4 (Good)	11.19%	19.46%	8.27%	5.45%
%age of samples with MOS >=2 to <3 (Fair)	1.81%	29.75%	3.78%	3.32%
%age of samples with MOS >=1 to <2 (Poor)	3.05%	32.76%	11.59%	3.72%

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

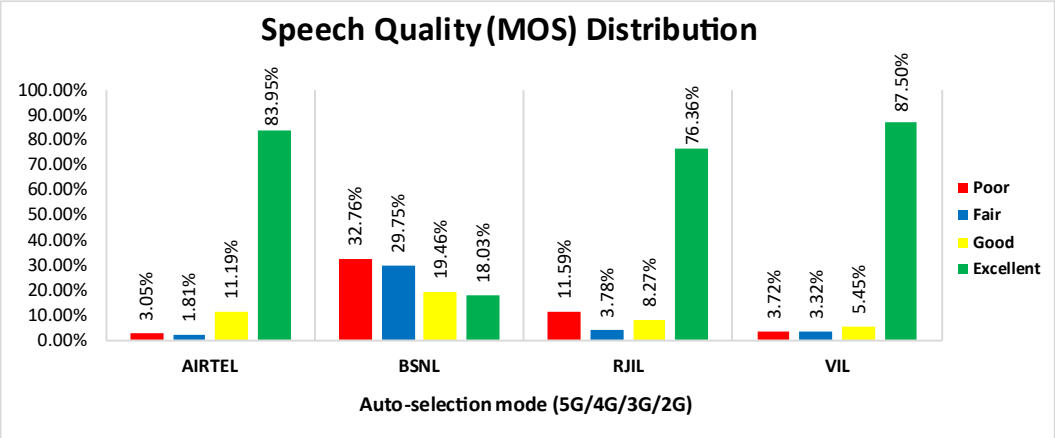


Figure-23: Distribution of samples in MOS range.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	4.53%	NA	25.80%	NA
4G	89.57%	61.50%	67.99%	29.03%
3G	NA	5.43%	NA	NA
2G	0.37%	17.67%	NA	40.01%
Limited Service	5.52%	15.40%	6.21%	30.96%

Table-18: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice .

Note-

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

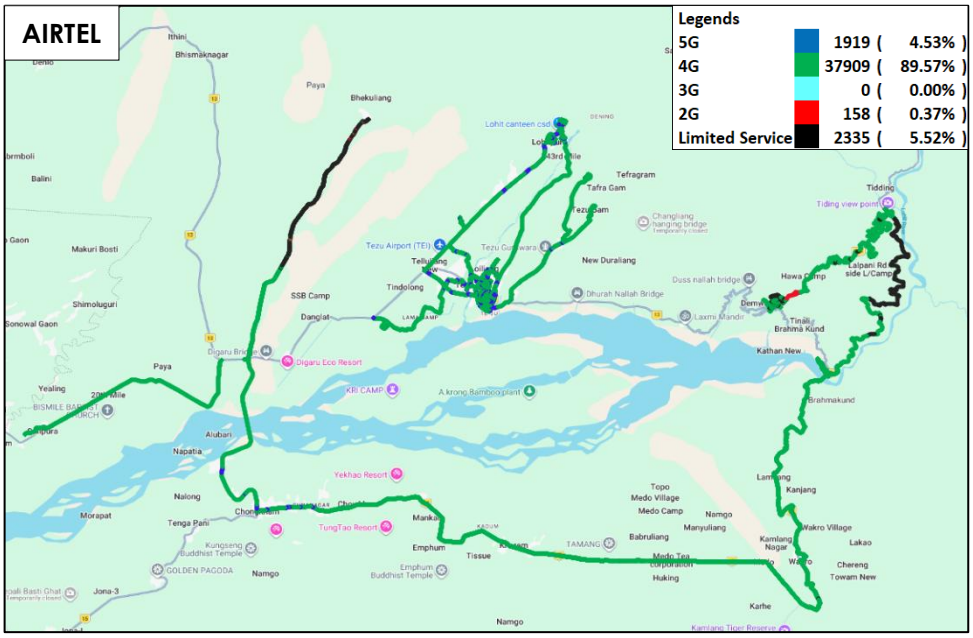


Figure-24: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

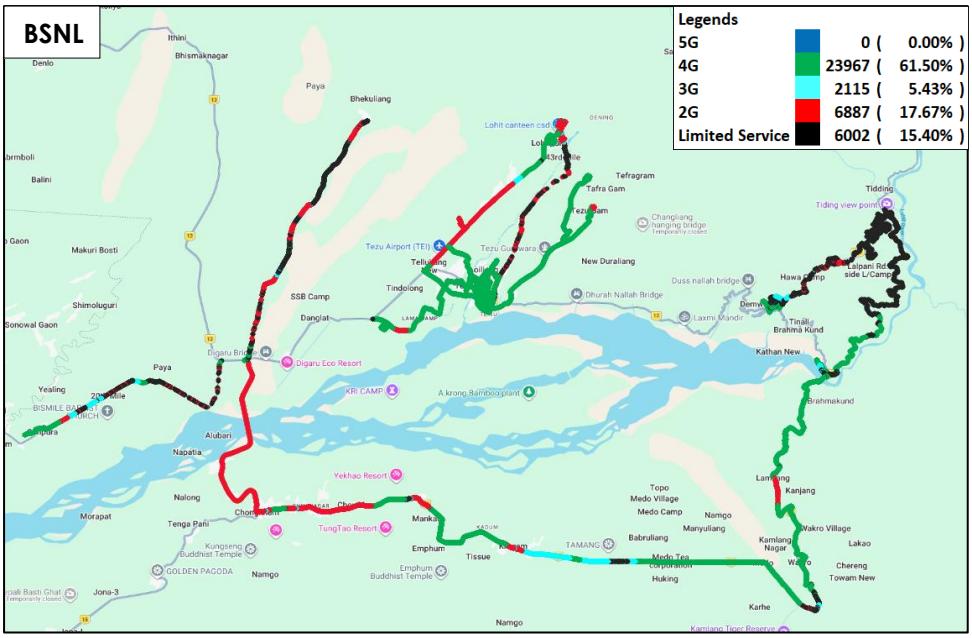


Figure-25: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - BSNL.

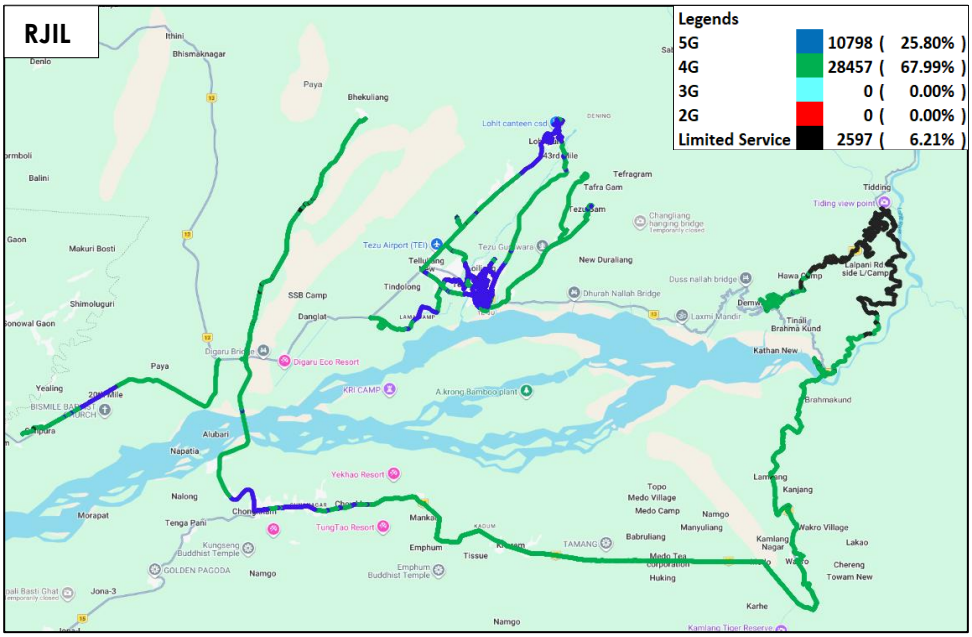


Figure-26: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

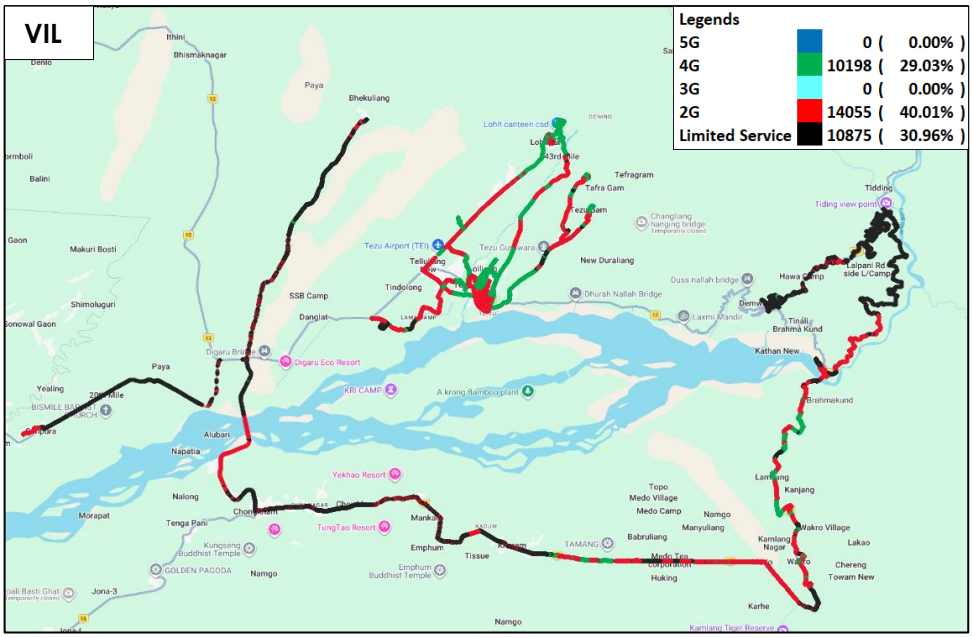


Figure-27: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice VIL.

(g) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-97, 98, 99 & 100 for map view)

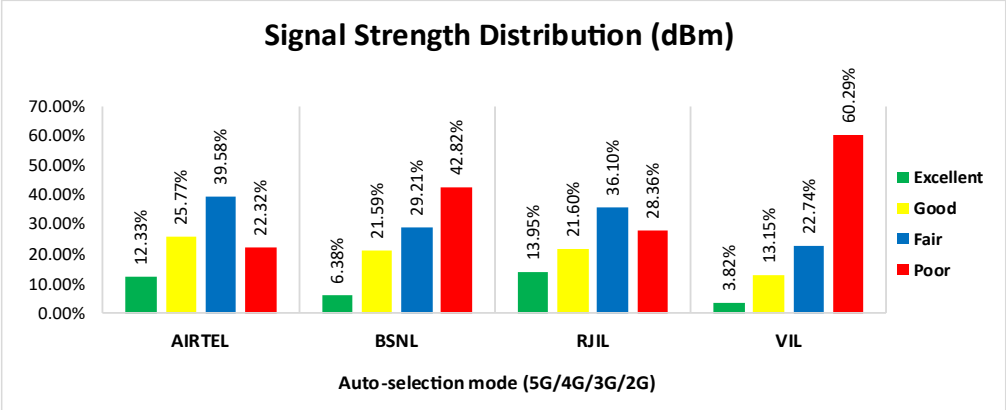


Figure-28: Signal strength distribution auto-selection mode (5G/4G/3G/2G) voice.

Observations:

- Airtel has 12% of samples falling in the excellent signal strength category.
- BSNL has 6% of samples falling in the excellent signal strength category.
- RJIL has 14% of samples falling in the excellent signal strength category.
- VIL has 4% of samples falling in the excellent signal strength category.

(h) Coverage Gap observed

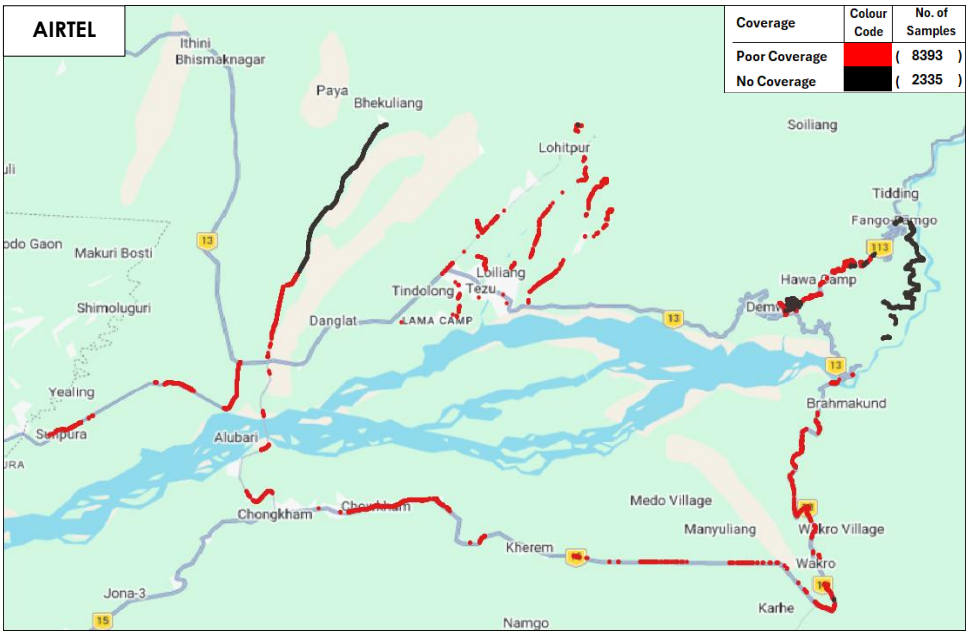


Figure-29: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-AIRTEL.

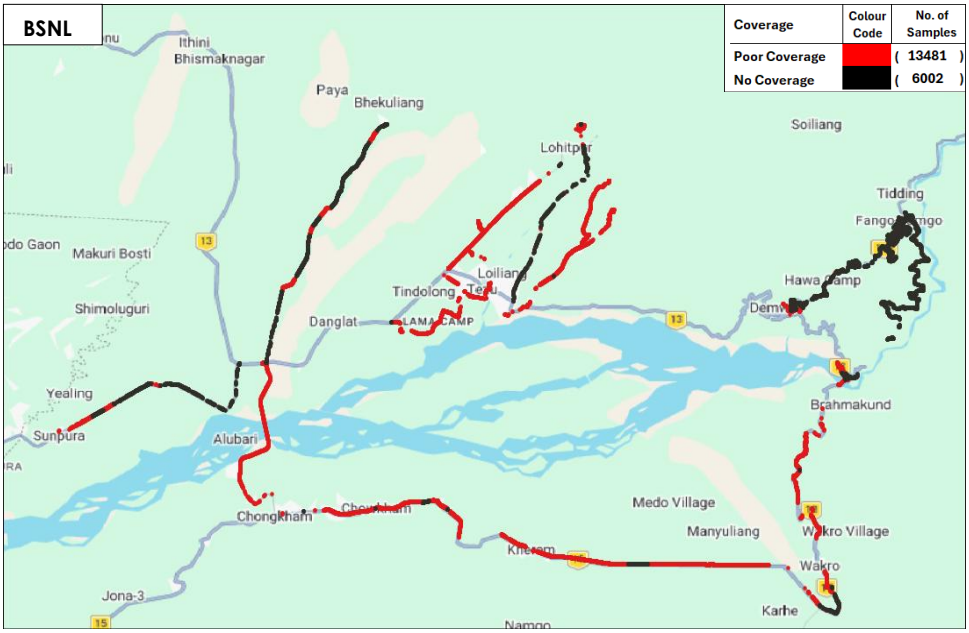


Figure-30: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-BSNL.

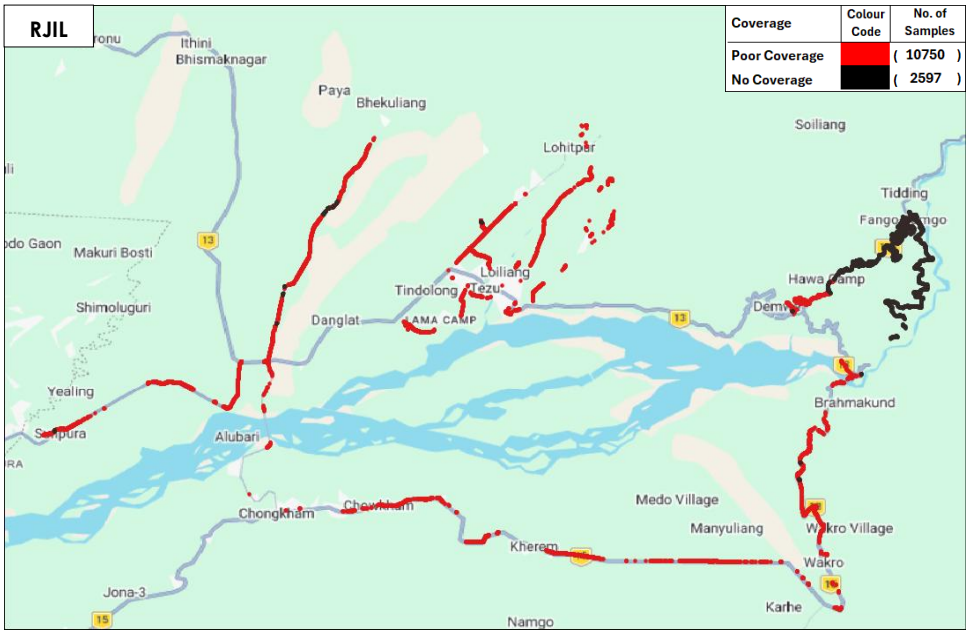


Figure-31: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-RJIL.

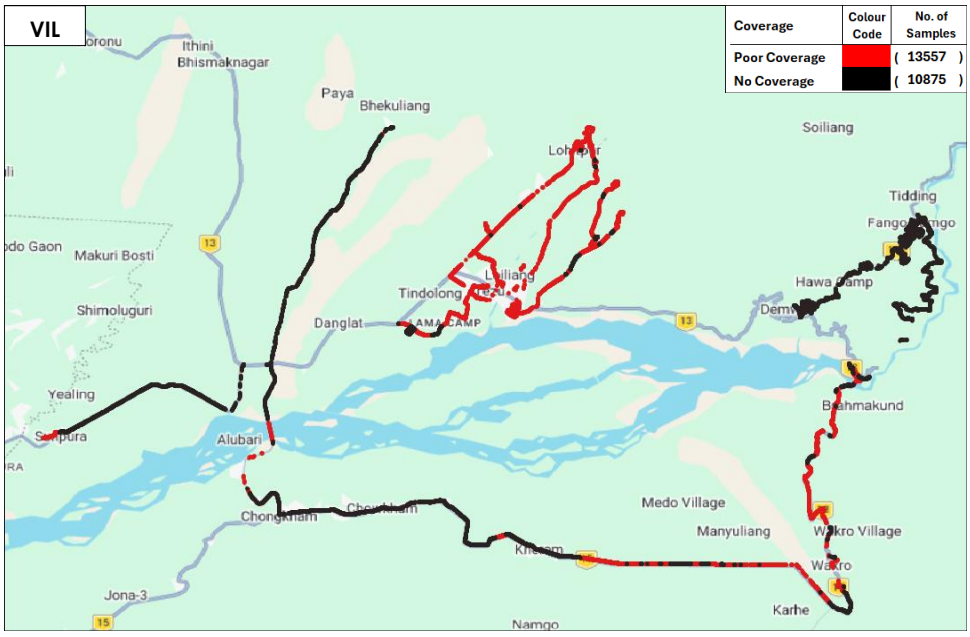


Figure-32: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-VIL.

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	61.75	2.27	103.49	18.20
	80th Percentile	131.50	3.19	182.08	41.95
	20th Percentile	2.09	0.56	1.99	0.12
Upload Throughput (Mbits/s)	Average	12.40	3.06	7.08	4.84
	80th Percentile	23.15	4.47	10.26	9.49
	20th Percentile	0.96	0.84	0.84	0.00
Latency (ms)	50th Percentile	55.81	70.15	48.49	59.58

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

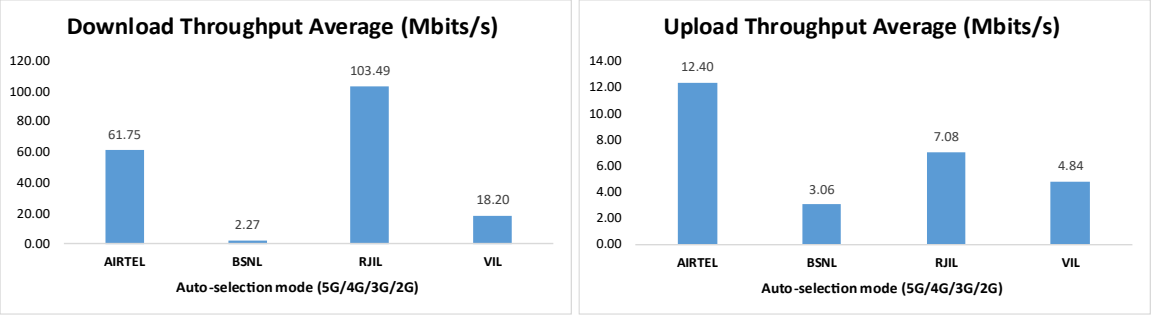


Figure- 33: Download & Upload throughput.

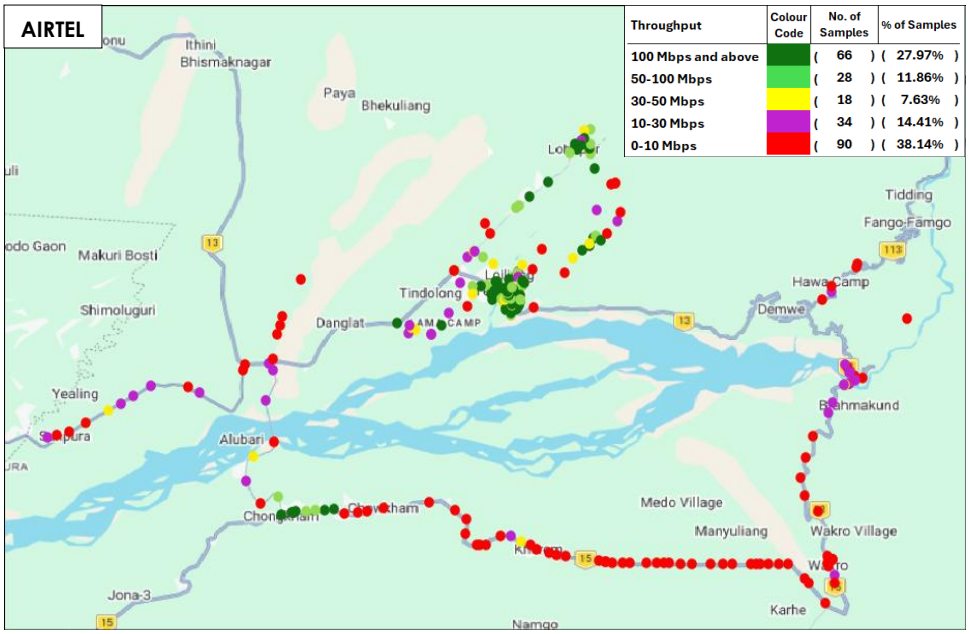


Figure-34: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – AIRTEL.

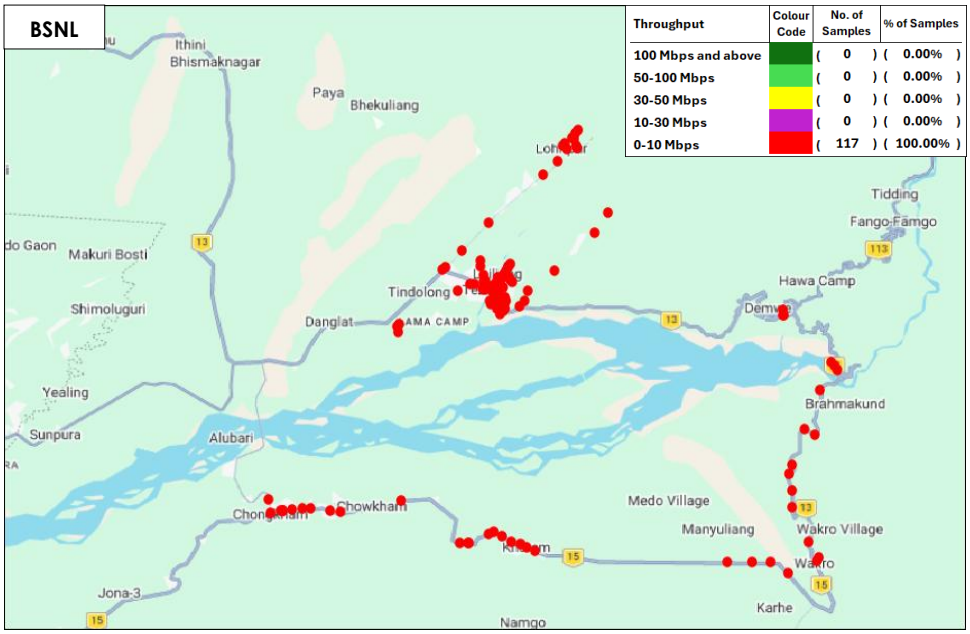


Figure-35: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – BSNL.

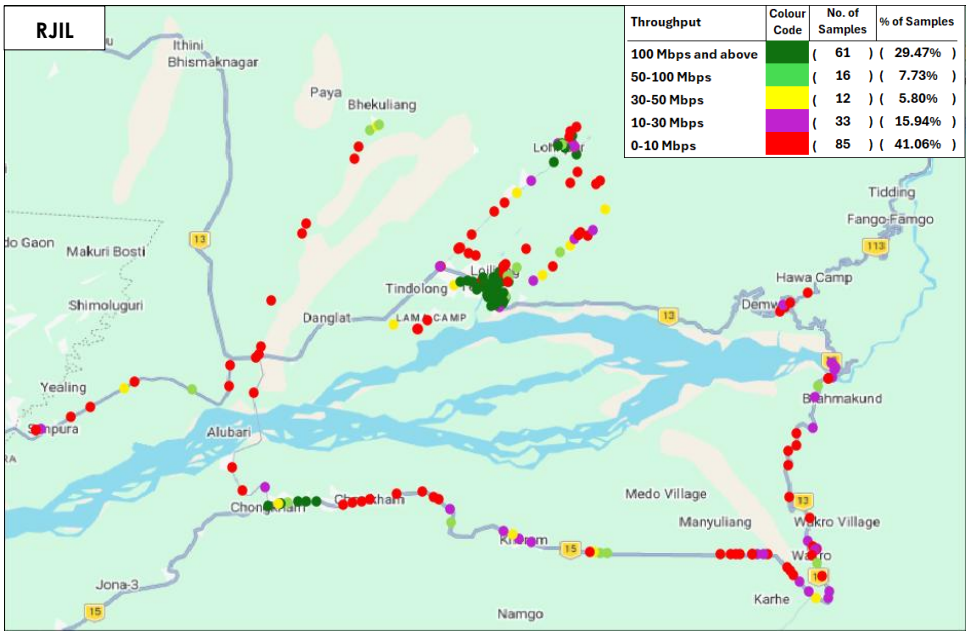


Figure-36: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – RJIL.

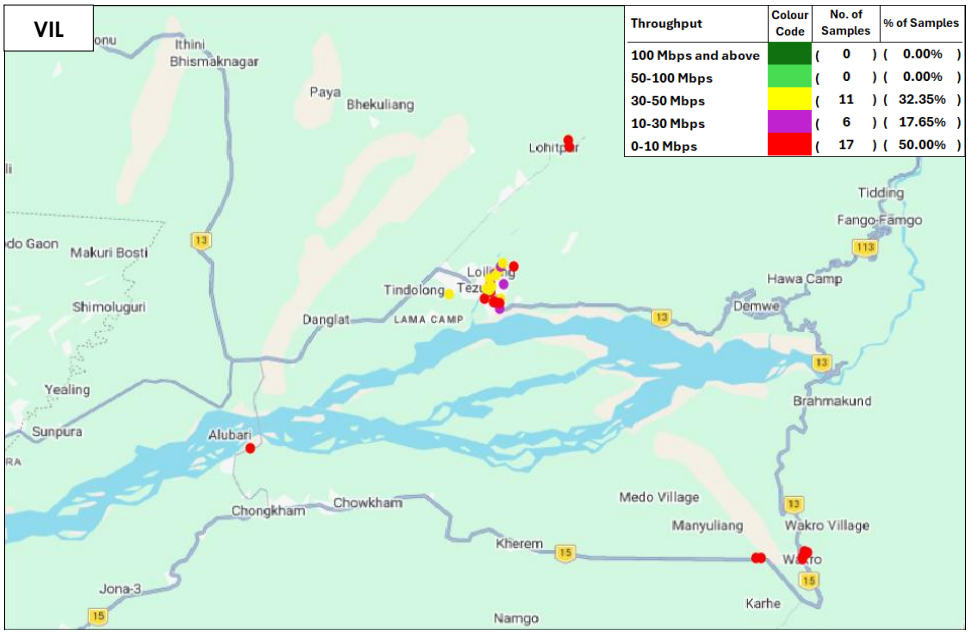


Figure-37: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – VIL.

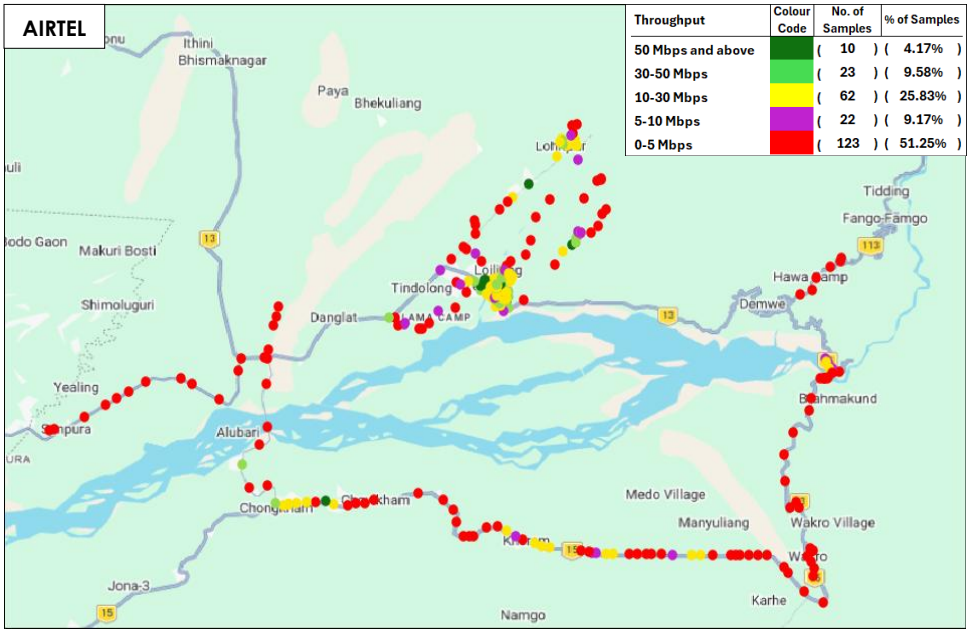


Figure-38: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – AIRTEL.

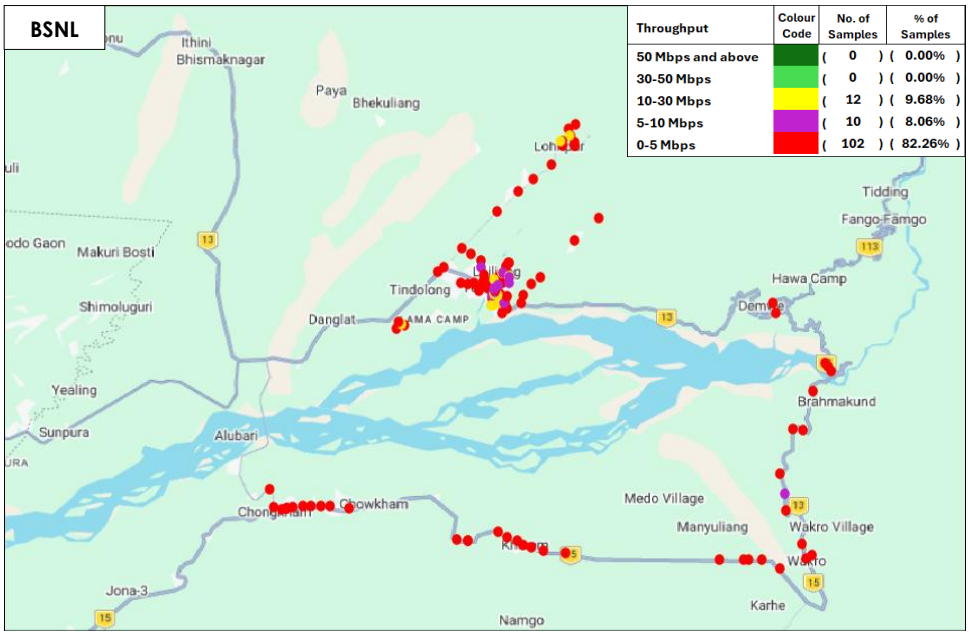


Figure-39: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – BSNL.

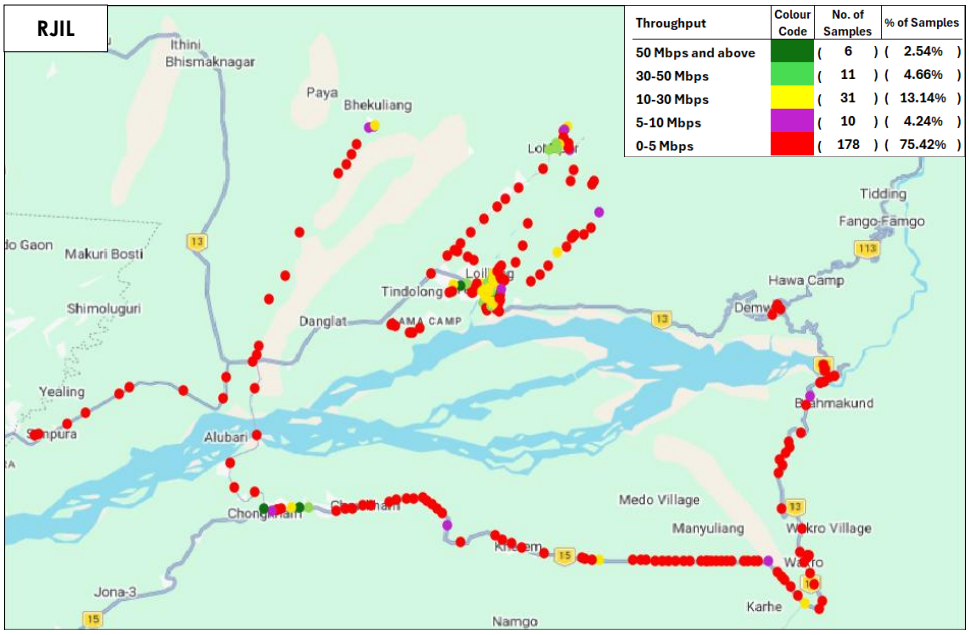


Figure-40: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – RJIL.

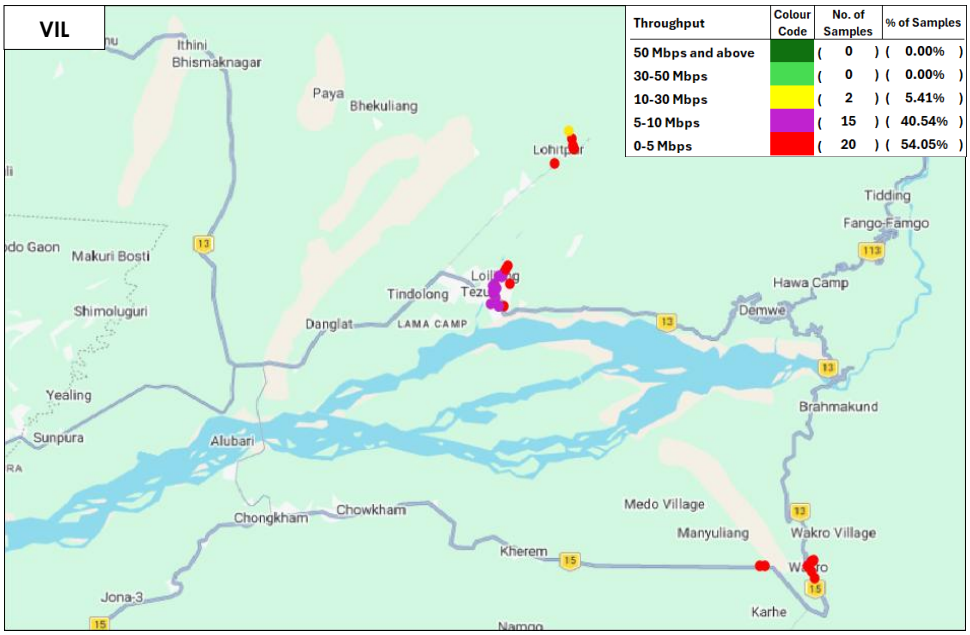


Figure-41: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – VIL.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	30.89%	NA	23.68%	NA
4G	56.80%	46.81%	67.18%	14.01%
3G	NA	26.64%	NA	NA
2G	0.18%	3.17%	NA	33.41%
Limited Service	12.14%	23.38%	9.14%	52.58%

Table-20: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

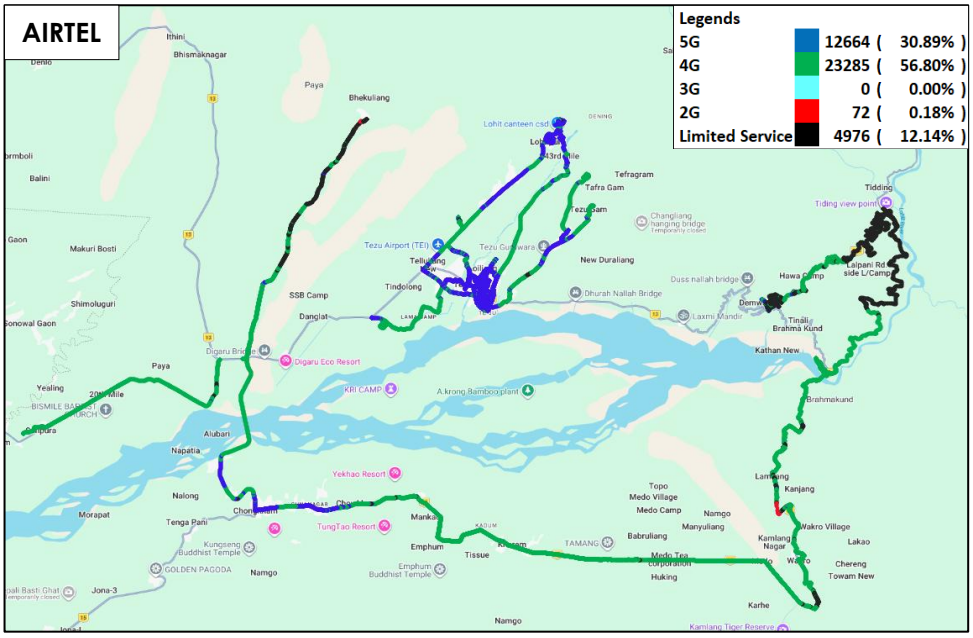


Figure-42: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – AIRTEL.

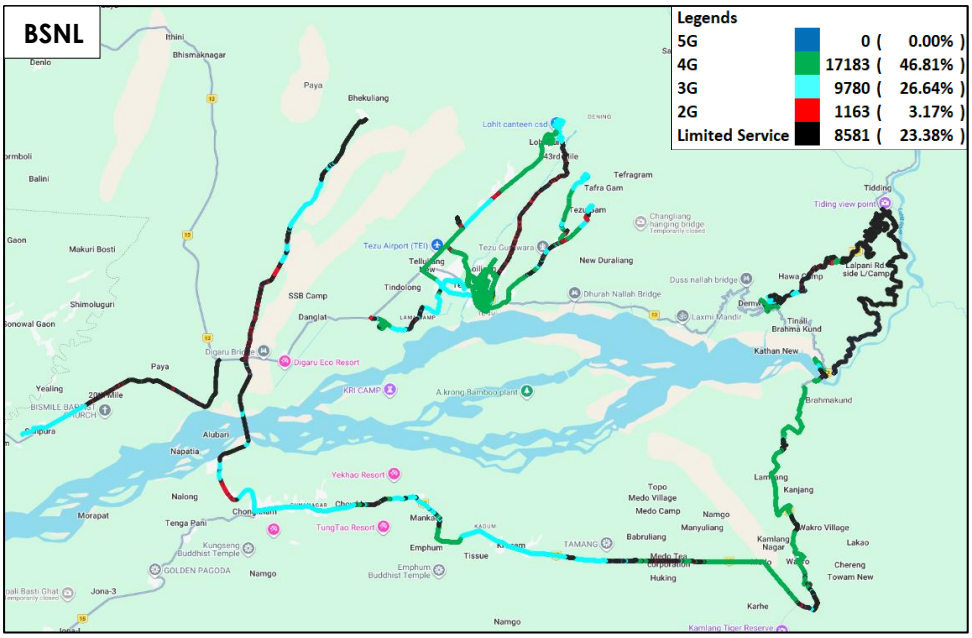


Figure-43: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – BSNL.

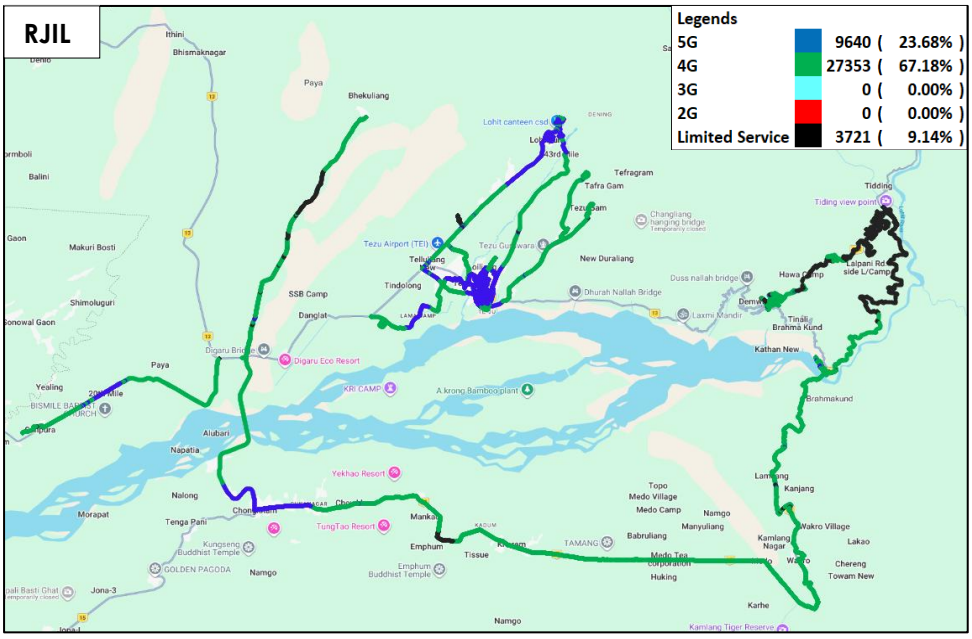


Figure-44: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – RJIL.

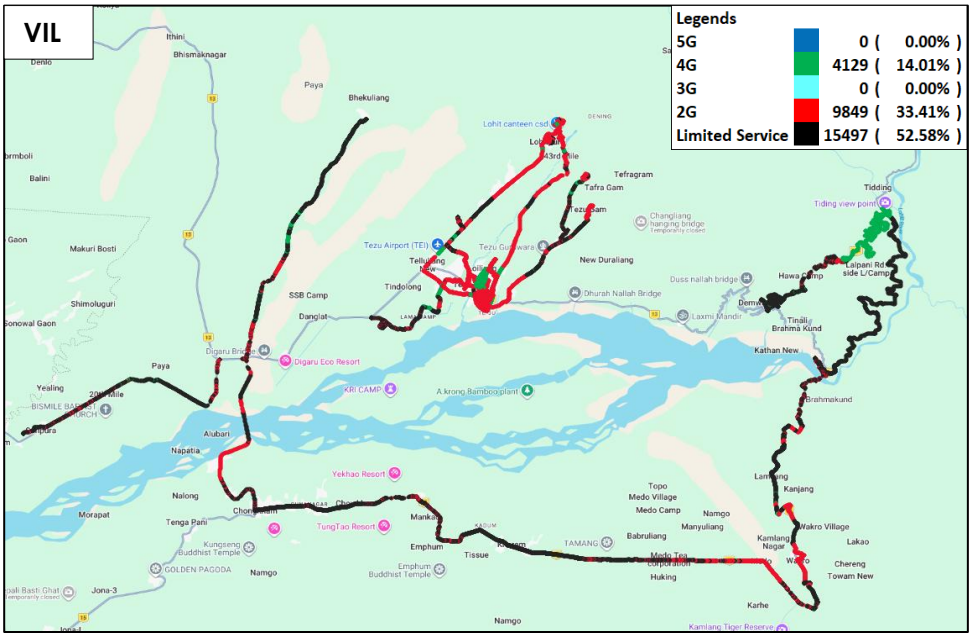


Figure-45: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-101, 102, 103 & 104 for map view)

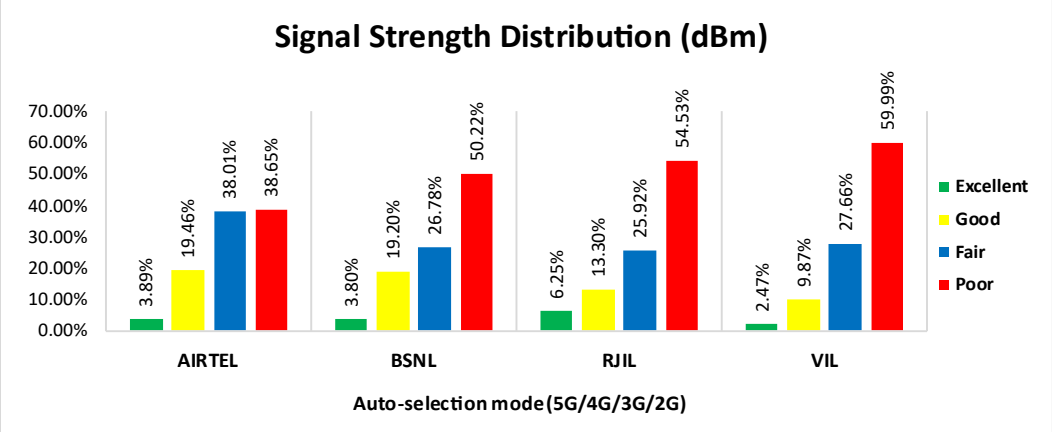


Figure-46: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 4% of samples falling in the excellent signal strength category.
- BSNL has 4% of samples falling in the excellent signal strength category.
- RJIL has 6% of samples falling in the excellent signal strength category.
- VIL has 2% of samples falling in the excellent signal strength category.

4.3 Hotspots

Hotspot testing has been done from 07th September 2026 to 10th September 2026. Thirteen locations have been tested in Lohit District. (Refer Table-1)

4.3.1 Locations

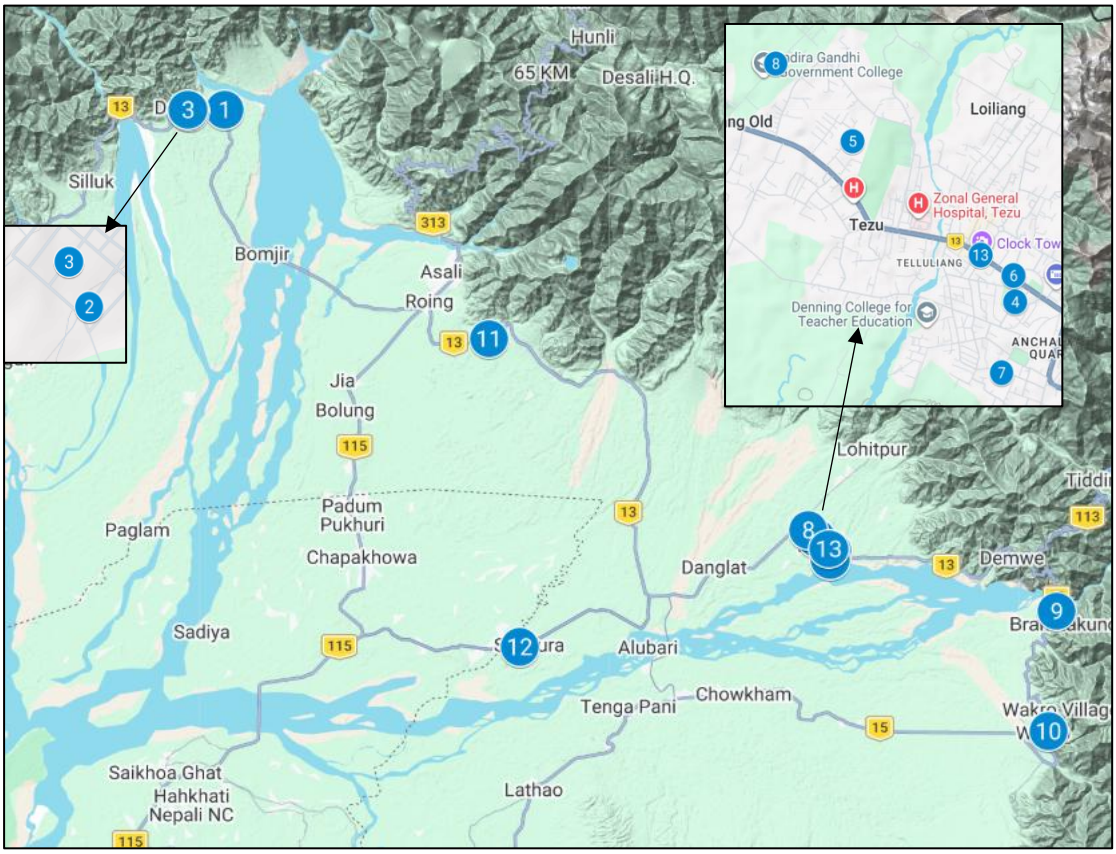


Figure- 47: Hotspot locations.

4.3.2 Hotspot covered

1. ADC Office Dambuk -Dambuk Aga -Dambuk
2. Dambuk G.H.S.S -Dambuk
3. Dambuk PHC -Dambuk
4. Deputy Commissioner Office -Tezu
5. District And Sessions Court -Tezu
6. District Museum and Community Convention Centre - Jubilee Marg -Tezu
7. Govt. Higher Secondary School, NH13 -Tezu
8. Indira Gandhi Government College- Gas Agency Road -Tezu
9. Parsuram Kund
10. Police Station Wakro
11. Polytechnic College -Roing
12. Sunpura Administrative/Panchayat Area -Jeko
13. Tezu Main Bazaar / Clock Tower

4.3.3 Voice performance

Overall Voice Performance				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	130	130	130	130
Call Setup Success Rate %	92.31	89.23	100.00	70.77
Drop Call Rate %	0.83	1.72	0.00	2.17
Call Setup Time-Average (Second)	0.61	8.61	0.71	4.03

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

ADC Office Dambuk- Dambuk Aga- Dambuk				
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	50.00	100.00	40.00
Drop Call Rate %	10.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.39	2.40	0.75	4.02

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

Dambuk G.H.S.S- Dambuk				
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	70.00	100.00	50.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.40	10.27	0.59	2.60

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

Dambuk PHC- Dambuk				
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	90.00	100.00	90.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.48	9.93	0.60	2.13

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

Deputy Commissioner Office- Tezu				
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	80.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.52	8.53	0.58	1.25

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

District and Sessions Court- Tezu				
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	80.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.50	8.53	0.65	5.09

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

District Museum And Community Convention Centre- Jubilee Marg- Tezu				
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)	0.55	8.97	0.52	5.47

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

Govt. Higher Secondary School- NH13- Tezu				
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	10.00	0.00	0.00
Call Setup Time-Average (Second)	0.43	7.83	0.57	4.53

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

Indira Gandhi Government College- Gas Agency Road- Tezu				
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	70.00
Drop Call Rate %	0.00	0.00	0.00	14.29
Call Setup Time-Average (Second)	0.42	6.31	0.58	4.26

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

Parsuram Kund				
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	80.00	100.00	60.00
Drop Call Rate %	0.00	0.00	0.00	16.67
Call Setup Time-Average (Second)	0.80	9.26	0.79	4.79

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

Police Station Wakro- Wakro				
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	80.00	100.00	50.00
Drop Call Rate %	0.00	12.50	0.00	0.00
Call Setup Time-Average (Second)	0.58	10.34	0.58	6.05

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

Polytechnic College- Roing				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	10	10	10	10
Call Setup Success Rate %	0.00	90.00	100.00	0.00
Drop Call Rate %	-	0.00	0.00	-
Call Setup Time-Average (Second)	-	10.31	1.76	-

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

Note- "-"Call setup time & drop call rate have not been reported as all calls were failed at this location.

Sunpura Administrative/Panchayat Area- Jeko				
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)	1.87	8.52	0.64	7.03

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

Tezu Main Bazaar / Clock Tower				
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)	0.37	8.69	0.58	1.28

Table-34: 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)	91.28	3.93	232.03	20.15
Download Throughput 80th Percentile (Mbit/s)	161.66	5.81	440.83	40.49
Download Throughput 20th Percentile (Mbit/s)	15.20	0.44	10.95	1.26
Download Session Setup Success Rate %	92.31	90.77	87.69	27.69
Upload Throughput Average (Mbits/s)	23.53	3.93	14.47	4.97
Upload Throughput 80th Percentile (Mbit/s)	41.93	3.83	27.84	9.52
Upload Throughput 20th Percentile (Mbit/s)	1.26	1.81	0.67	0.00
Upload Session Setup Success Rate %	92.31	90.77	96.92	30.77
Web Browsing Delay (Second)	6.90	4.78	6.00	7.53
Youtube Initial Buffer Delay (Second)	2.38	3.06	0.99	0.97
Latency (ms) – 50th Percentile	56.45	70.34	55.98	56.61
Jitter (ms)	27.27	11.54	15.01	29.43
Packet Loss Rate%	21.45	30.82	25.96	84.53
Packet Loss Rate- 90th percentile	73.40	93.50	97.60	100.00

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

ADC Office Dambuk- Dambuk Aga- Dambuk				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	2.60	-	3.10	-
Download Session Setup Success Rate %	100.00	0.00	20.00	0.00
Upload Throughput Average (Mbits/s)	0.46	-	0.84	-
Upload Session Setup Success Rate %	100.00	0.00	60.00	0.00
Web Browsing Delay (Second)	19.55	-	14.69	-
Youtube Initial Buffer Delay (Second)	-	-	-	-
Latency (ms) – 50th Percentile	100.01	-	59.98	-
Jitter (ms)	95.70	-	67.47	-
Packet Loss Rate%	57.10	100.00	25.70	100.00

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

Note- "-"Respective tests were failed.

Dambuk G.H.S.S- Dambuk				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	237.56	3.98	440.35	-
Download Session Setup Success Rate %	100.00	100.00	100.00	0.00
Upload Throughput Average (Mbits/s)	38.12	14.04	27.51	-
Upload Session Setup Success Rate %	100.00	100.00	100.00	0.00
Web Browsing Delay (Second)	4.38	3.10	5.97	-
Youtube Initial Buffer Delay (Second)	0.77	1.12	1.03	-
Latency (ms) – 50th Percentile	52.74	65.76	56.72	-
Jitter (ms)	33.01	1.95	3.75	-
Packet Loss Rate%	0.10	1.00	0.00	100.00

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

Note- "-"Respective tests were failed.

Dambuk PHC- Dambuk				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	152.59	4.97	351.29	3.04
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	44.00	6.78	58.52	0.94
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	8.86	3.48	5.78	12.23
Youtube Initial Buffer Delay (Second)	5.27	2.31	1.24	-
Latency (ms) – 50th Percentile	63.15	63.96	70.57	128.21
Jitter (ms)	18.60	2.50	12.99	126.46
Packet Loss Rate%	1.20	4.10	13.90	98.50

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

Note- "-"YouTube tests were failed.

Deputy Commissioner Office- Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	136.57	2.26	515.28	35.41
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	26.90	2.69	27.48	9.46
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	5.68	3.73	5.16	7.39
Youtube Initial Buffer Delay (Second)	2.07	1.73	0.70	0.94
Latency (ms) – 50th Percentile	50.20	68.37	40.11	55.23
Jitter (ms)	3.47	3.27	3.25	4.47
Packet Loss Rate%	20.00	20.40	19.20	0.10

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

District and Sessions Court- Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	38.37	2.74	330.82	-
Download Session Setup Success Rate%	100.00	100.00	100.00	0.00
Upload Throughput Average (Mbits/s)	25.60	3.13	10.70	-
Upload Session Setup Success Rate %	100.00	100.00	100.00	0.00
Web Browsing Delay (Second)	6.16	3.33	4.73	-
Youtube Initial Buffer Delay (Second)	0.79	1.37	0.87	-
Latency (ms)- 50th Percentile	55.99	68.28	41.41	-
Jitter (ms)	8.55	13.27	2.75	-
Packet Loss Rate%	0.20	2.80	0.40	100.00

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

Note- "-"Respective tests were failed.

District Museum and Community Convention Centre- Jubilee Marg- Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	92.18	10.94	291.80	-
Download Session Setup Success Rate %	100.00	100.00	100.00	0.00
Upload Throughput Average (Mbits/s)	10.49	2.83	15.29	-
Upload Session Setup Success Rate %	100.00	100.00	100.00	0.00
Web Browsing Delay (Second)	4.49	3.11	4.53	-
Youtube Initial Buffer Delay (Second)	2.48	1.29	0.80	-
Latency (ms) – 50th Percentile	63.32	66.49	41.44	-
Jitter (ms)	61.34	13.60	4.04	-
Packet Loss Rate%	25.30	4.70	0.30	100.00

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

Note- "-"Respective tests were failed.

Govt. Higher Secondary School- NH13- Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	142.53	5.76	83.87	-
Download Session Setup Success Rate%	100.00	100.00	100.00	0.00
Upload Throughput Average (Mbits/s)	15.01	2.27	2.09	-
Upload Session Setup Success Rate %	100.00	80.00	100.00	0.00
Web Browsing Delay (Second)	7.01	3.86	8.33	-
Youtube Initial Buffer Delay (Second)	1.67	1.77	-	-
Latency (ms)- 50th Percentile	52.12	69.88	69.51	-
Jitter (ms)	3.95	3.53	25.83	-
Packet Loss Rate%	0.20	1.40	7.10	100.00

Table-42: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-"Respective tests were failed.

Indira Gandhi Government College- Gas Agency Road- Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	33.18	10.27	106.07	-
Download Session Setup Success Rate %	100.00	80.00	100.00	0.00
Upload Throughput Average (Mbits/s)	66.53	2.02	2.62	-
Upload Session Setup Success Rate %	100.00	100.00	100.00	0.00
Web Browsing Delay (Second)	9.44	3.87	6.31	-
Youtube Initial Buffer Delay (Second)	3.54	1.46	-	-
Latency (ms) – 50th Percentile	55.06	66.57	45.84	-
Jitter (ms)	30.62	2.72	4.60	-
Packet Loss Rate%	3.40	28.30	0.00	100.00

Table-43: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-"Respective tests were failed.

Parsuram Kund				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	28.93	0.36	9.58	-
Download Session Setup Success Rate %	100.00	100.00	100.00	0.00
Upload Throughput Average (Mbits/s)	3.84	0.97	0.46	-
Upload Session Setup Success Rate %	100.00	100.00	100.00	0.00
Web Browsing Delay (Second)	7.65	6.87	-	-
Youtube Initial Buffer Delay (Second)	4.10	11.65	-	-
Latency (ms) – 50th Percentile	56.10	108.86	101.31	-
Jitter (ms)	7.41	34.37	21.51	-
Packet Loss Rate%	1.30	93.50	72.30	100.00

Table-44: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-"Respective tests were failed.

Police Station Wakro- Wakro				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	1.31	0.19	15.68	0.03
Download Session Setup Success Rate %	100.00	100.00	100.00	80.00
Upload Throughput Average (Mbits/s)	0.84	3.14	0.42	0.00
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	15.21	8.08	15.67	-
Youtube Initial Buffer Delay (Second)	-	3.60	-	-
Latency (ms) – 50th Percentile	143.71	118.85	63.40	-
Jitter (ms)	57.36	28.33	6.71	-
Packet Loss Rate%	69.30	86.80	0.90	100.00

Table-45: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-"Respective tests were failed.

Polytechnic College- Roing				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	-	0.23	0.88	-
Download Session Setup Success Rate %	0.00	100.00	20.00	0.00
Upload Throughput Average (Mbits/s)	-	4.42	1.07	-
Upload Session Setup Success Rate %	0.00	100.00	100.00	0.00
Web Browsing Delay (Second)	-	8.90	-	-
Youtube Initial Buffer Delay (Second)	-	4.13	-	-
Latency (ms) – 50th Percentile	-	83.17	-	-
Jitter (ms)	-	33.14	-	-
Packet Loss Rate%	100.00	52.70	100.00	100.00

Table-46: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-"Respective tests were failed.

Sunpura Administrative/Panchayat Area- Jeko				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	66.24	3.70	4.40	-
Download Session Setup Success Rate %	100.00	100.00	100.00	0.00
Upload Throughput Average (Mbits/s)	1.23	3.00	0.87	-
Upload Session Setup Success Rate %	100.00	100.00	100.00	0.00
Web Browsing Delay (Second)	17.42	3.64	-	-
Youtube Initial Buffer Delay (Second)	-	1.27	-	-
Latency (ms) – 50th Percentile	56.86	74.04	128.86	-
Jitter (ms)	7.56	3.18	23.05	-
Packet Loss Rate%	0.60	0.80	97.60	100.00

Table-47: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-"Respective tests were failed.

Tezu Main Bazaar / Clock Tower				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	163.25	2.32	495.28	37.13
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	49.34	1.58	34.77	9.49
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	4.34	6.15	4.43	7.02
Youtube Initial Buffer Delay (Second)	0.71	7.31	1.32	0.99
Latency (ms) – 50th Percentile	46.95	75.19	46.37	57.52
Jitter (ms)	5.38	4.09	4.51	31.20
Packet Loss Rate%	0.10	4.20	0.10	0.30

Table-48: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

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

Overall Data Performance					
Parameters		**Service Provider**			
		AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	**Download Throughput Average (Mbits/s)**	107.80	-	247.06	-
	Upload Throughput Average (Mbits/s)	36.31	-	17.07	-
4G	**Download Throughput Average (Mbits/s)**	21.14	2.54	32.51	14.48
	Upload Throughput Average (Mbits/s)	9.35	6.49	4.37	4.34

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

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

ADC Office Dambuk- Dambuk Aga- Dambuk					
Parameters		**Service Provider**			
		AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	**Download Throughput Average (Mbits/s)**	-	-	5.43	-
	Upload Throughput Average (Mbits/s)	-	-	1.49	-
4G	**Download Throughput Average (Mbits/s)**	0.16	2.25	5.64	-
	Upload Throughput Average (Mbits/s)	0.48	0.91	0.67	-

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

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

Dambuk G.H.S.S- Dambuk					
Parameters		**Service Provider**			
		AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	**Download Throughput Average (Mbits/s)**	223.22	-	427.02	-
	Upload Throughput Average (Mbits/s)	46.50	-	28.54	-
4G	**Download Throughput Average (Mbits/s)**	30.11	5.04	79.20	0.58
	Upload Throughput Average (Mbits/s)	30.14	8.05	6.26	1.02

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

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

Dambuk PHC- Dambuk					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	195.37	-	317.12	-
	Upload Throughput Average (Mbits/s)	46.42	-	44.47	-
4G	Download Throughput Average (Mbits/s)	11.95	3.92	36.19	5.11
	Upload Throughput Average (Mbits/s)	25.19	5.78	3.79	0.83

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

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

Deputy Commissioner Office- Tezu					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	129.51	-	494.84	-
	Upload Throughput Average (Mbits/s)	26.63	-	21.00	-
4G	Download Throughput Average (Mbits/s)	89.45	2.07	41.97	27.97
	Upload Throughput Average (Mbits/s)	6.31	7.68	6.13	9.48

Table-53: Overall Summary of 5G only & 4G only data download & upload speed.

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

District and Sessions Court- Tezu					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	28.71	-	329.08	-
	Upload Throughput Average (Mbits/s)	26.88	-	13.21	-
4G	Download Throughput Average (Mbits/s)	9.21	3.90	8.31	-
	Upload Throughput Average (Mbits/s)	1.84	9.12	17.65	-

Table-54: Overall Summary of 5G only & 4G only data download & upload speed.

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

District Museum and Community Convention Centre - Jubilee Marg - Tezu					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	71.96	-	298.24	-
	Upload Throughput Average (Mbits/s)	20.29	-	18.83	-
4G	Download Throughput Average (Mbits/s)	17.51	2.12	75.74	-
	Upload Throughput Average (Mbits/s)	8.90	11.29	8.40	-

Table-55: Overall Summary of 5G only & 4G only data download & upload speed.

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

Govt. Higher Secondary School- NH13- Tezu					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	79.42	-	73.58	-
	Upload Throughput Average (Mbits/s)	23.59	-	1.76	-
4G	Download Throughput Average (Mbits/s)	18.66	2.65	16.44	-
	Upload Throughput Average (Mbits/s)	4.87	4.22	0.66	-

Table-56: Overall Summary of 5G only & 4G only data download & upload speed.

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

Indira Gandhi Government College- Gas Agency Road- Tezu					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	14.70	-	138.95	-
	Upload Throughput Average (Mbits/s)	24.95	-	2.84	-
4G	Download Throughput Average (Mbits/s)	20.70	3.53	25.86	6.96
	Upload Throughput Average (Mbits/s)	6.10	19.42	2.20	0.94

Table-57: Overall Summary of 5G only & 4G only data download & upload speed.

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

Parsuram Kund					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	-	-
	Upload Throughput Average (Mbits/s)	-	-	-	-
4G	Download Throughput Average (Mbits/s)	6.36	0.22	3.15	-
	Upload Throughput Average (Mbits/s)	3.60	1.96	1.01	-

Table-58: Overall Summary of 5G only & 4G only data download & upload speed.

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

Police Station Wakro- Wakro					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	-	-
	Upload Throughput Average (Mbits/s)	-	-	-	-
4G	Download Throughput Average (Mbits/s)	2.34	0.17	41.34	1.46
	Upload Throughput Average (Mbits/s)	6.62	1.62	0.67	0.90

Table-59: Overall Summary of 5G only & 4G only data download & upload speed.

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

Polytechnic College- Roing					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	-	-
	Upload Throughput Average (Mbits/s)	-	-	-	-
4G	Download Throughput Average (Mbits/s)	-	0.42	0.20	-
	Upload Throughput Average (Mbits/s)	-	5.38	1.79	-

Table-60: Overall Summary of 5G only & 4G only data download & upload speed.

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

Sunpura Administrative/Panchayat Area- Jeko					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	14.79	-
	Upload Throughput Average (Mbits/s)	-	-	4.99	-
4G	Download Throughput Average (Mbits/s)	30.96	3.26	4.65	-
	Upload Throughput Average (Mbits/s)	3.84	4.58	0.45	-

Table-61: Overall Summary of 5G only & 4G only data download & upload speed.

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

Tezu Main Bazaar / Clock Tower					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	103.51	-	380.34	-
	Upload Throughput Average (Mbits/s)	60.54	-	33.90	-
4G	Download Throughput Average (Mbits/s)	17.32	3.14	53.35	28.42
	Upload Throughput Average (Mbits/s)	10.77	4.40	7.16	9.47

Table-62: 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 10th September 2026. Two locations have been tested in Tezu. (Refer Table-1)

4.4.1 Walk test locations

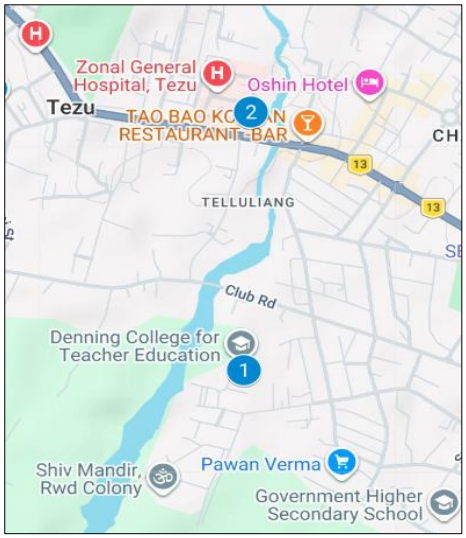


Figure-48: Walk Test locations.

4.4.2 Walk Test Covered

1. Denning College for Teacher Education - Tezu
2. Zonal General Hospital - Tezu

4.4.3 Voice Performance

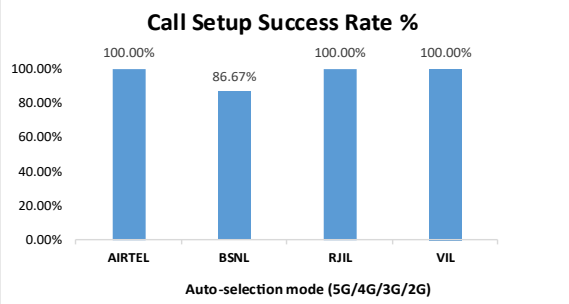
i) Denning College for Teacher Education - Tezu

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

Denning College for Teacher Education - Tezu				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	12	15	12	12
Call Setup Success Rate %	100.00	86.67	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.41	5.33	0.58	1.69
Handover Success Rate %	100.00	100.00	100.00	-

Table-63: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Note- "- "No Handover attempt in VIL.



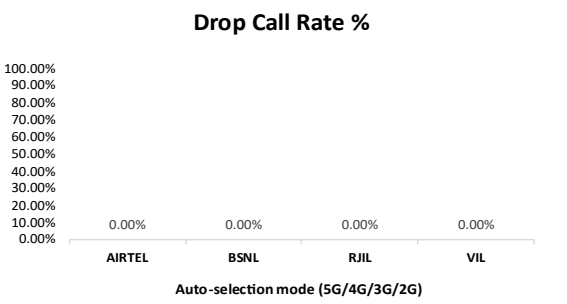


Figure- 49: Performance for call setup success rate and drop call rate.

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

Denning College For Teacher Education- Tezu				
Technology	**Service Provider**			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	10.81%	NA	100.00%	NA
4G	89.19%	40.56%	0.00%	100.00%
3G	NA	15.73%	NA	NA
2G	0.00%	43.72%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-64: Time spent on technology during walk test.

(c) Network Signal Strength distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G).

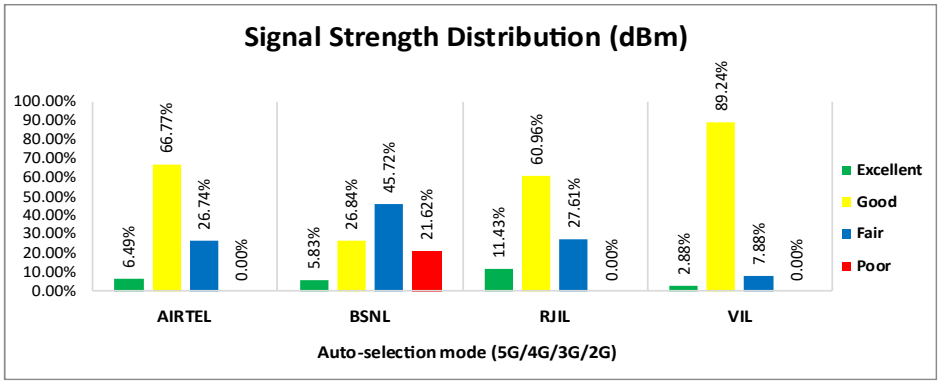


Figure-50: Signal strength distribution auto-selection mode (5G/4G/3G/2G).

ii) Zonal General Hospital - Tezu

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

Zonal General Hospital - Tezu				
Parameters	**Service Provider**			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Call Attempt	12	13	12	12
Call Setup Success Rate %	100.00	84.62	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	0.48	6.98	0.55	1.34
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-65: Summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

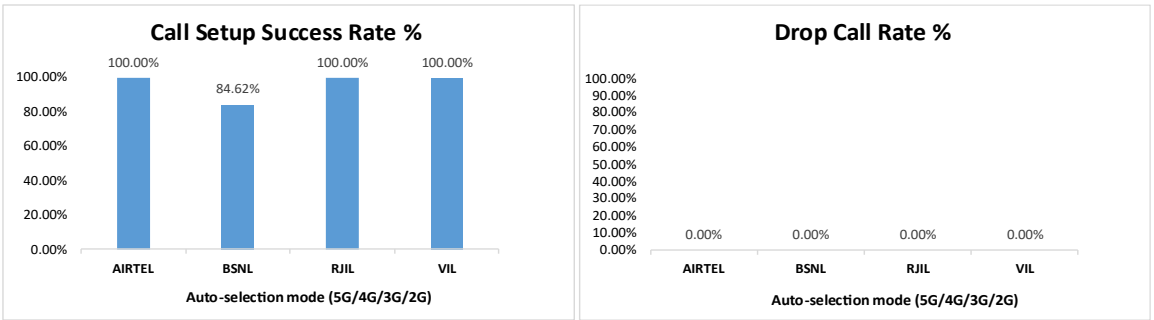


Figure- 51: Performance for call setup success rate and drop call rate.

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

Zonal General Hospital - Tezu				
Technology	**Service Provider**			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	16.23%	NA	0.00%	NA
4G	83.77%	75.18%	100.00%	100.00%
3G	NA	13.32%	NA	NA
2G	0.00%	11.33%	NA	0.00%
Limited service	0.00%	0.17%	0.00%	0.00%

Table-66: Time spent on technology during walk test.

(c) Network Signal Strength distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G).

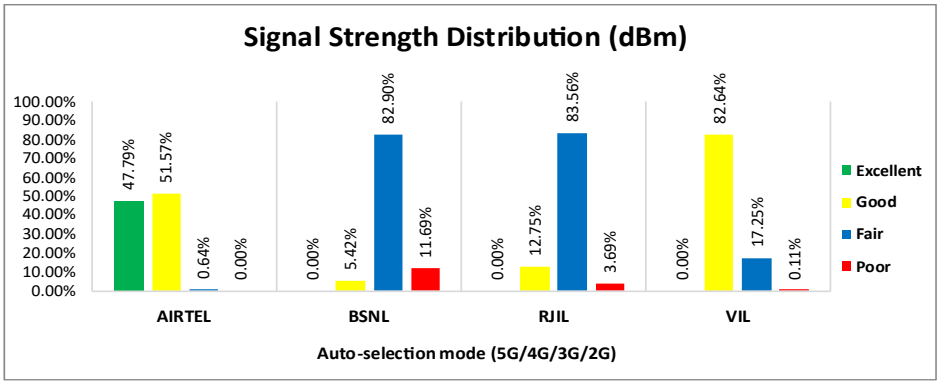


Figure-52: Signal strength distribution auto-selection mode (5G/4G/3G/2G).

4.4.4 Data Performance

i) Denning College for Teacher Education - Tezu

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

Denning College For Teacher Education- Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	105.77	3.92	228.09	39.95
Download Throughput 80th Percentile	161.05	5.67	304.97	48.27
Download Throughput 20th Percentile	49.93	2.66	67.42	31.55
Download Session Setup Success Rate %	100.00	92.86	100.00	100.00
Upload Throughput Average (Mbits/s)	26.60	6.49	11.58	9.59
Upload Throughput 80th Percentile	44.31	10.70	18.57	9.66
Upload Throughput 20th Percentile	12.23	2.65	1.76	9.51
Upload Session Setup Success Rate %	100.00	92.86	100.00	100.00
Latency (ms)-50th Percentile	51.43	69.57	42.10	56.94

Table-67: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

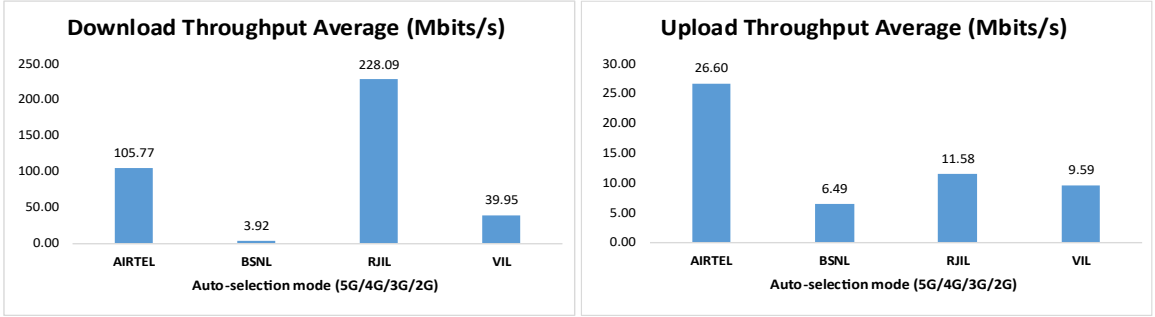


Figure- 53: Download and Upload throughput.

ii) Zonal General Hospital - Tezu

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

Zonal General Hospital - Tezu				
Parameters	**Service Provider**			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
Download Throughput Average (Mbits/s)	92.25	4.71	240.41	40.55
Download Throughput 80th Percentile	171.88	6.42	311.42	47.30
Download Throughput 20th Percentile	25.64	3.37	190.40	28.23
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	28.80	1.31	8.85	9.48
Upload Throughput 80th Percentile	40.96	2.09	11.72	9.65
Upload Throughput 20th Percentile	19.46	0.33	5.30	9.39
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Latency (ms)-50th Percentile	55.41	65.72	47.68	57.99

Table-68: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

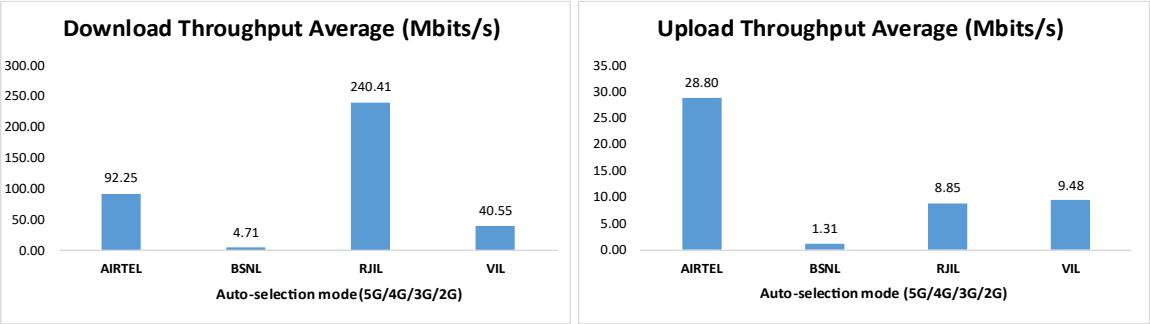


Figure- 54: Download and Upload throughput.

4.5 Highway

Drive test has been conducted from 07th September 2026 to 08th September 2026 covering one Highway route. (Refer Table-1)

4.5.1 Drive test route



Figure-55: Drive test route Highway.

4.5.2 Routes Covered

Silluk-Tin-Ali to Tohangam along NH-13 Via Silluk, Dambuk, Bomjir, Roing, Abali, Abongo, Koronu, Bhismaknagar, Danglt, Telluliang New, Demwe etc

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	118	181	203
Call Setup Success Rate %	54.24	24.31	18.23
Drop Call Rate %	4.69	9.09	18.92
Call Setup Time-Average (Second)	3.69	3.34	3.63
Handover Success Rate %	100.00	100.00	100.00

Table-69: Summary of voice call performance in 3G/2G network mode only.

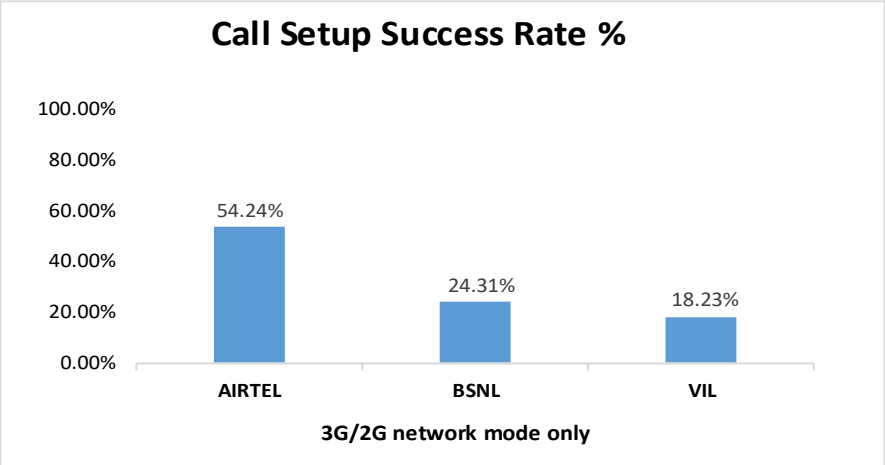


Figure-56: Performance for call setup success rate.

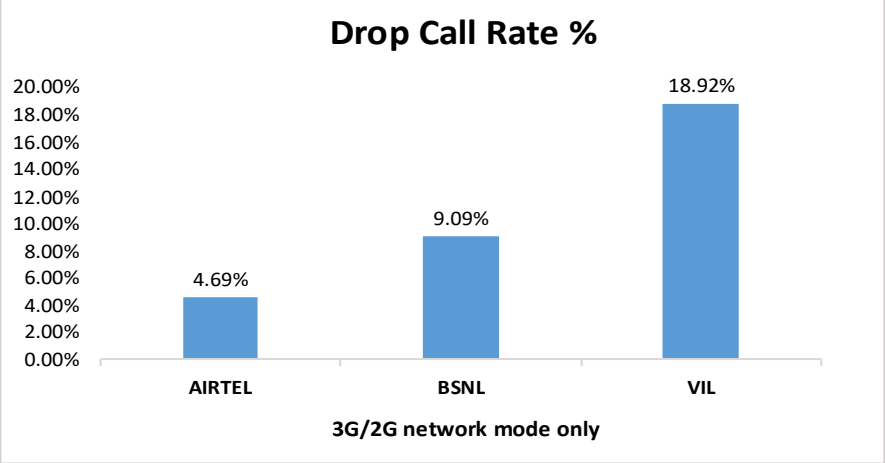


Figure-57: Performance for drop call rate.

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

Technology	Service Provider		
	AIRTEL	**BSNL**	**VIL**
3G	NA	14.63%	NA
2G	92.54%	65.76%	72.46%
Limited Service	7.46%	19.62%	27.54%

Table-70: Time spent on technology during drive test 3G/2G network mode.

Note-

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

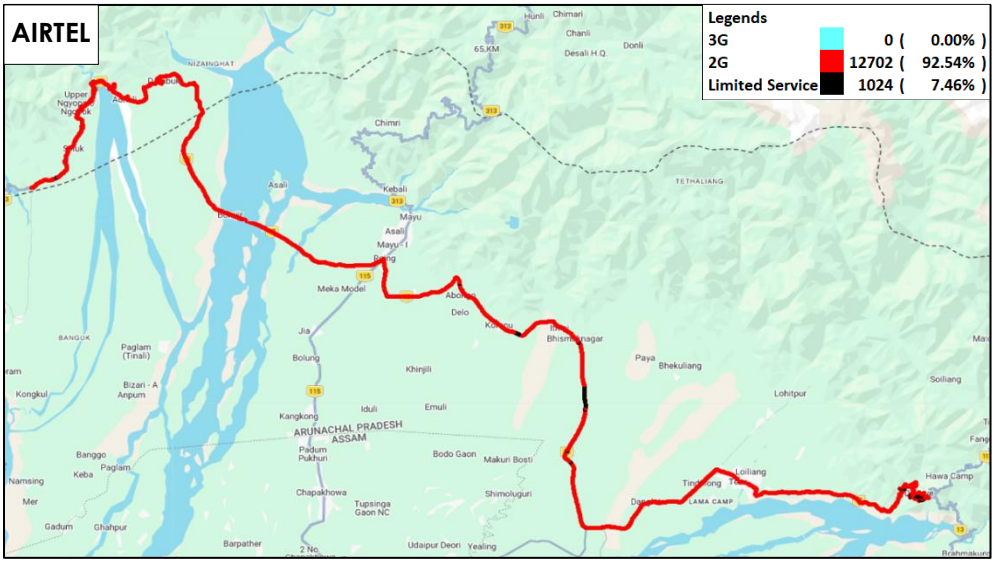


Figure-58: Serving technology plots 3G/2G network mode – AIRTEL.

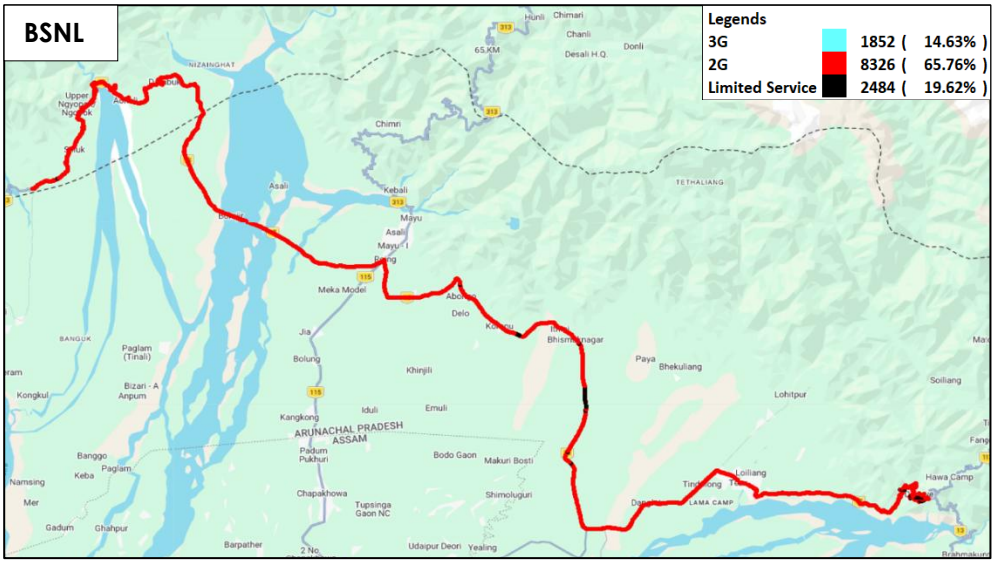


Figure-59: Serving technology plots 3G/2G network mode – BSNL.

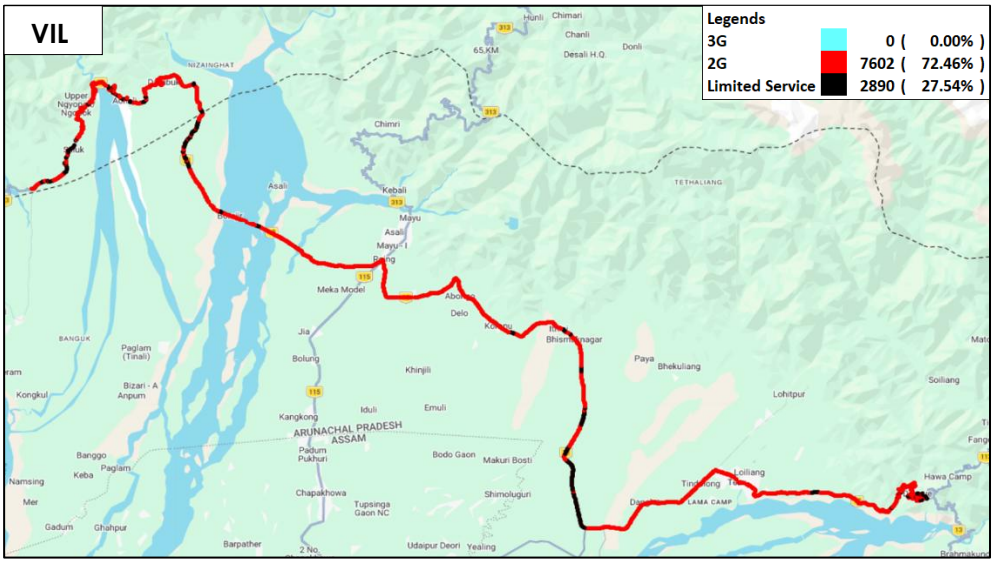


Figure-60: Serving technology plots 3G/2G network mode – VIL.

(c) Network Signal Strength Distribution: The following chart represents signal strength distribution for 3G/2G network mode only. (Refer figure- 105, 106 & 107 for map view)

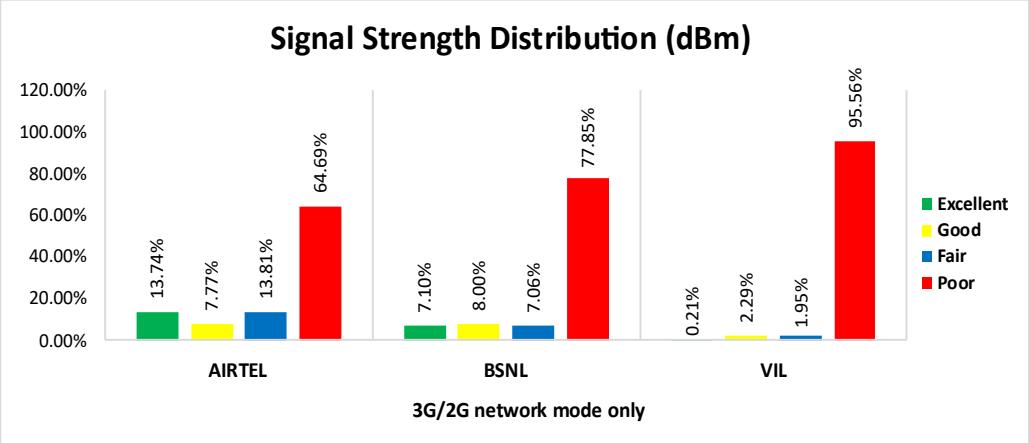


Figure-61: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 14% of samples falling in the excellent signal strength category.
- BSNL has 7% of samples falling in the excellent signal strength category.
- VIL has 0% 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	129	170	87	187
Call Setup Success Rate %	48.06	29.41	93.10	17.11
Drop Call Rate %	19.35	30.00	8.64	25.00
Call Setup Time Average (Second)	2.03	7.31	2.21	5.44
Handover Success Rate %	100.00	100.00	99.32	100.00

Table-71: Summary of voice call performance in network auto-selection mode.

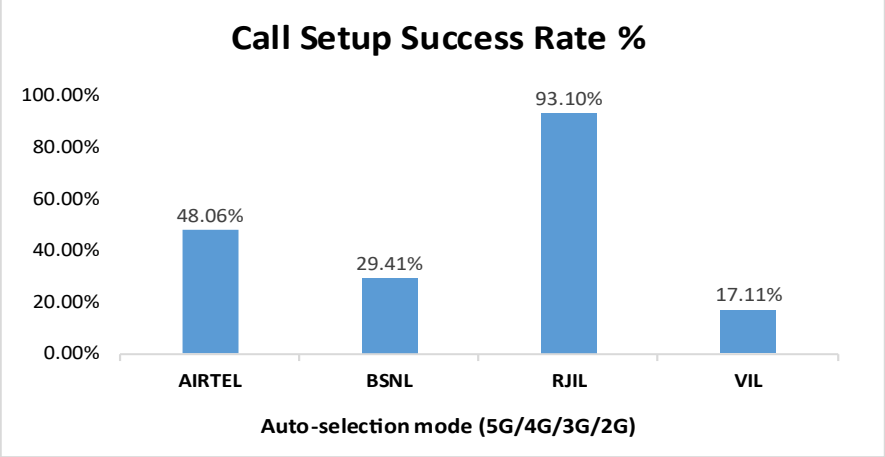


Figure-62: Performance for call setup success rate.

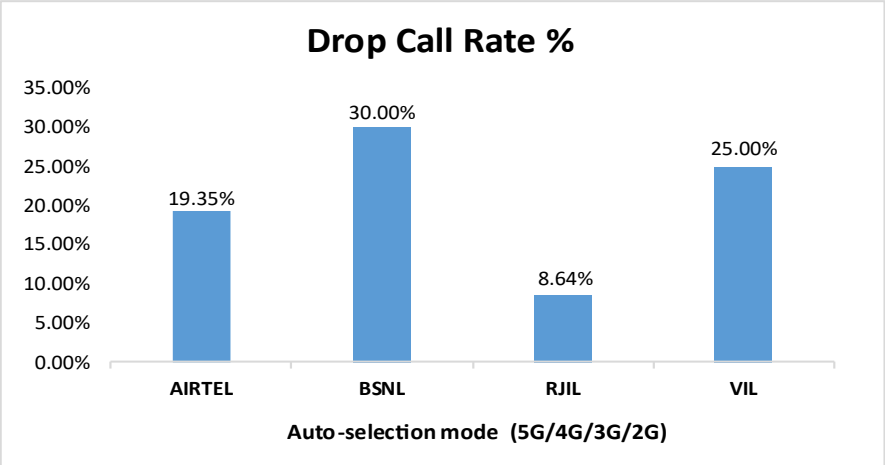


Figure-63: Performance for drop call rate.

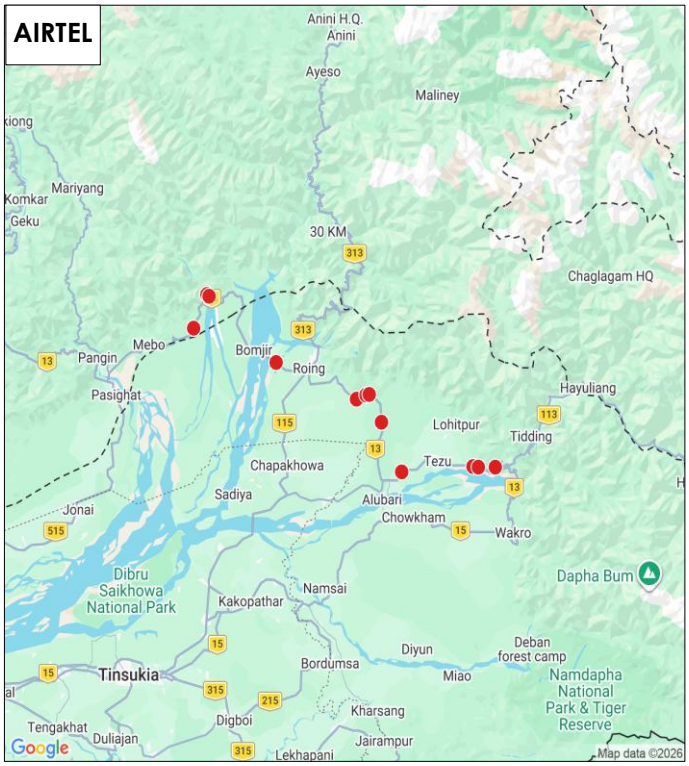


Figure-64: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

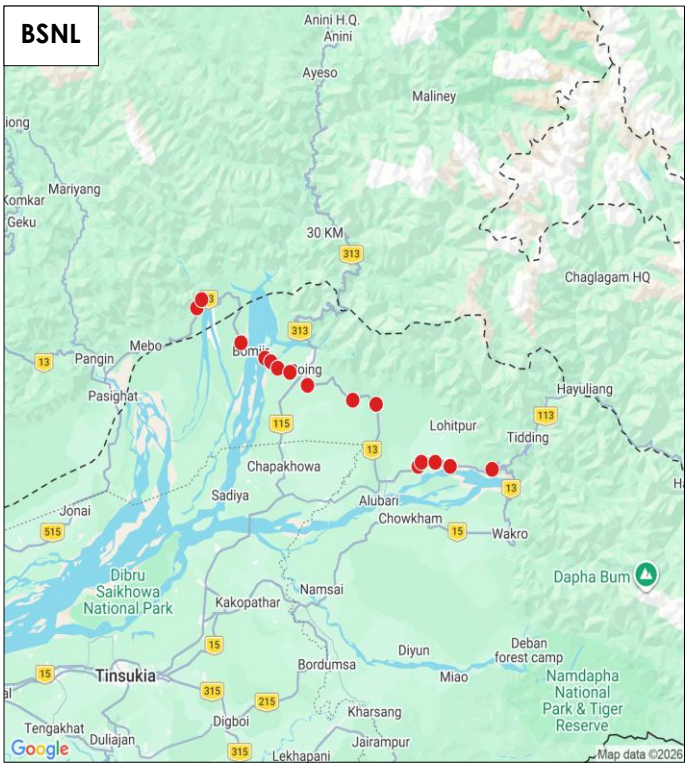


Figure-65: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice - BSNL.

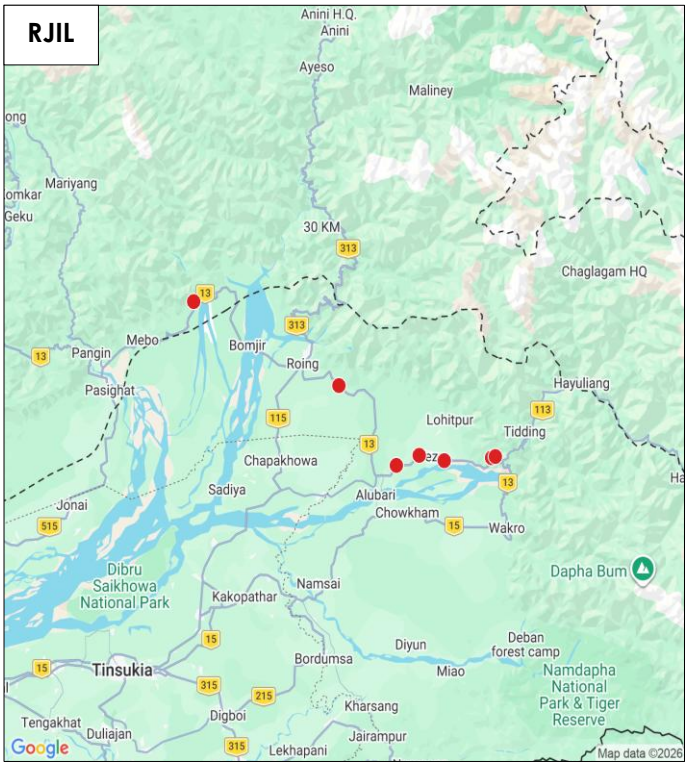


Figure-66: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice – RJIL

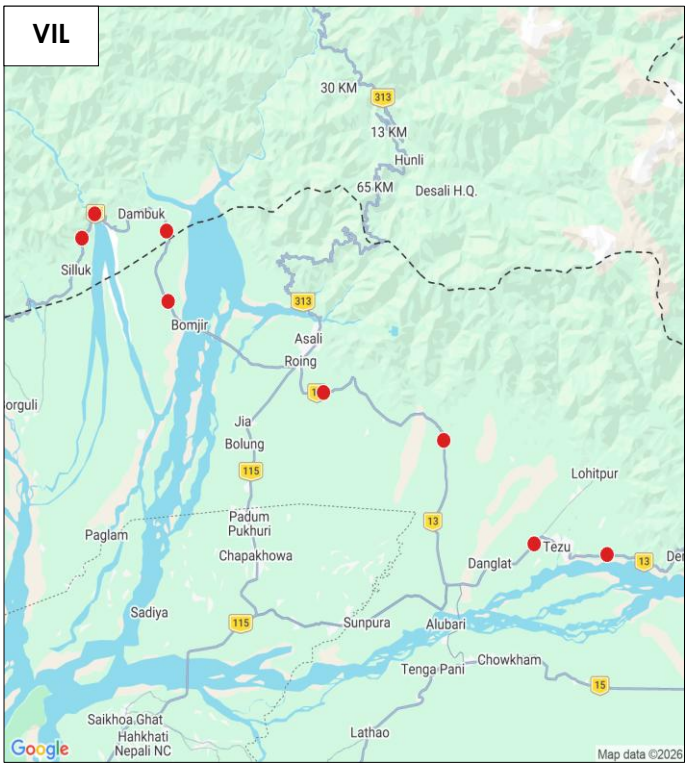


Figure-67: Drop call locations in auto-selection mode (5G/4G/3G/2G) voice - VIL.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G – Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	58	31	43	8
Number of silences call for >4 Sec	2	0	6	0
Silence Call Rate %	3.45	0.00	13.95	0.00
Number of silence instances for >4 Sec	3	0	10	0
Number of silence instances for >3 Sec	4	1	14	0
Number of silence instances for >2 sec	4	3	24	0
RTP Jitter (4G & 5G) in ms	5.61	12.56	14.66	3.89
Packet loss Rate Downlink %	3.70	11.30	12.85	0.35
Packet loss Rate Uplink %	3.01	8.61	11.62	0.35

Table-72: Summary of silence instances & packet loss rate for mobile to mobile call.



Figure-68: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-AIRTEL.

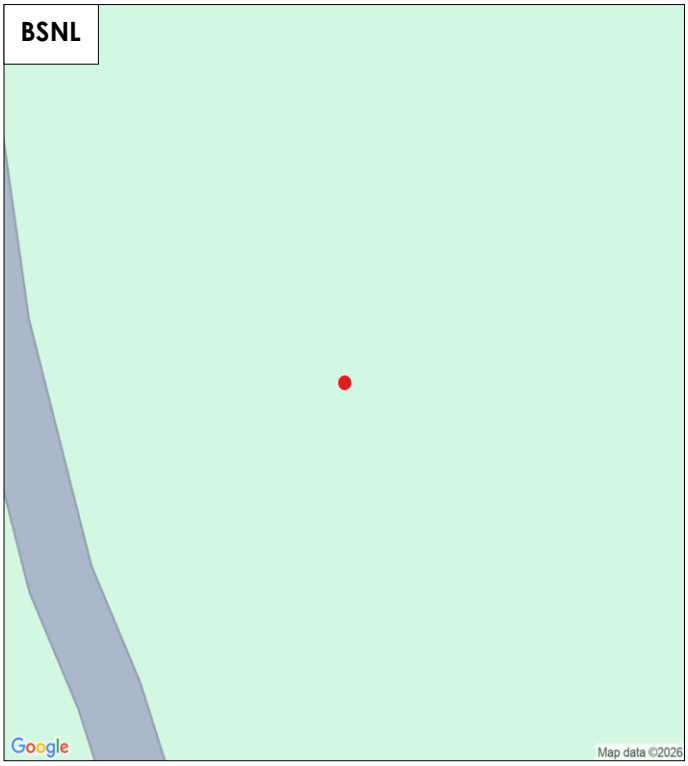


Figure-69: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-BSNL.

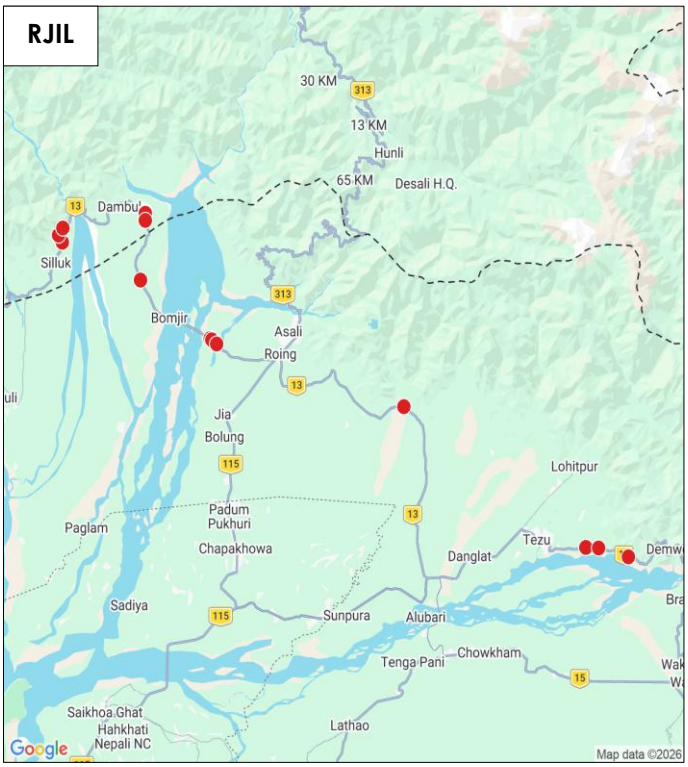


Figure-70: Number of silence instances for >3 Sec Mobile-to-Mobile (5G/4G-Open Mode)-RJIL.

(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-72	596	332	493	90
Speech Quality (Average MOS)	3.89	2.74	3.93	4.12
Number of samples with MOS >=4 to <5 (Excellent)	482	44	355	73
Number of samples with MOS >=3 to <4 (Good)	72	71	33	2
Number of samples with MOS >=2 to <3 (Fair)	11	164	26	2
Number of samples with MOS >=1 to <2 (Poor)	31	53	79	13
%age of samples with MOS >=4 to <5 (Excellent)	80.87%	13.25%	72.01%	81.11%
%age of samples with MOS >=3 to <4 (Good)	12.08%	21.39%	6.69%	2.22%
%age of samples with MOS >=2 to <3 (Fair)	1.85%	49.40%	5.27%	2.22%
%age of samples with MOS >=1 to <2 (Poor)	5.20%	15.96%	16.02%	14.44%

Table-73: Summary of speech quality (MOS) samples.

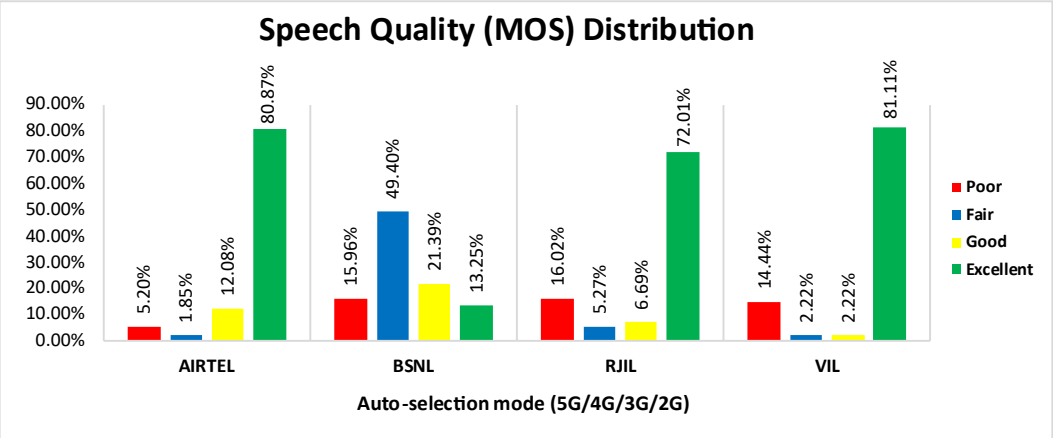


Figure-71: Distribution of samples in MOS range.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	3.07%	NA	15.63%	NA
4G	78.81%	40.47%	83.61%	33.62%
3G	NA	4.50%	NA	NA
2G	3.33%	31.42%	NA	26.55%
Limited Service	14.79%	23.61%	0.77%	39.82%

Table-74: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice .

Note-

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

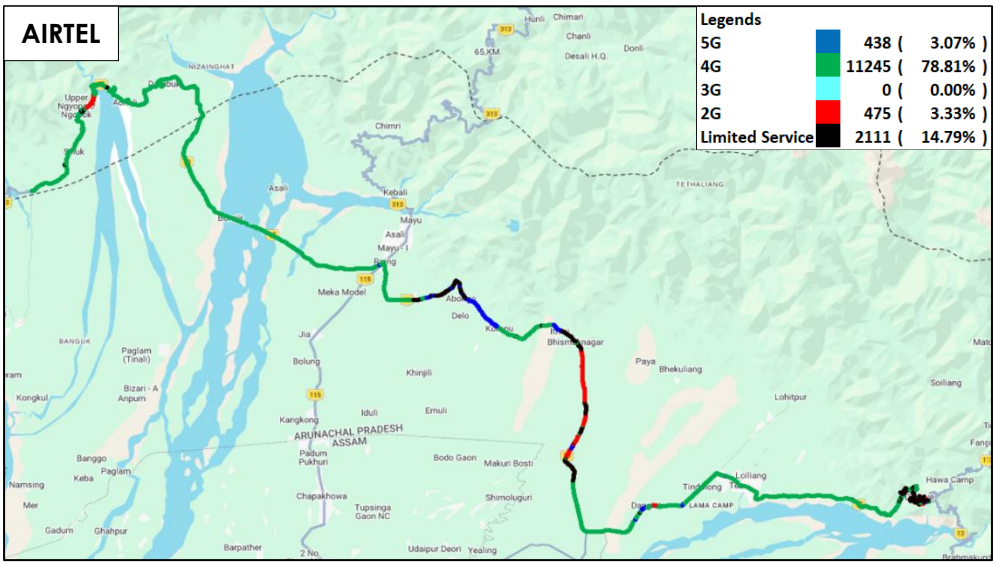


Figure-72: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

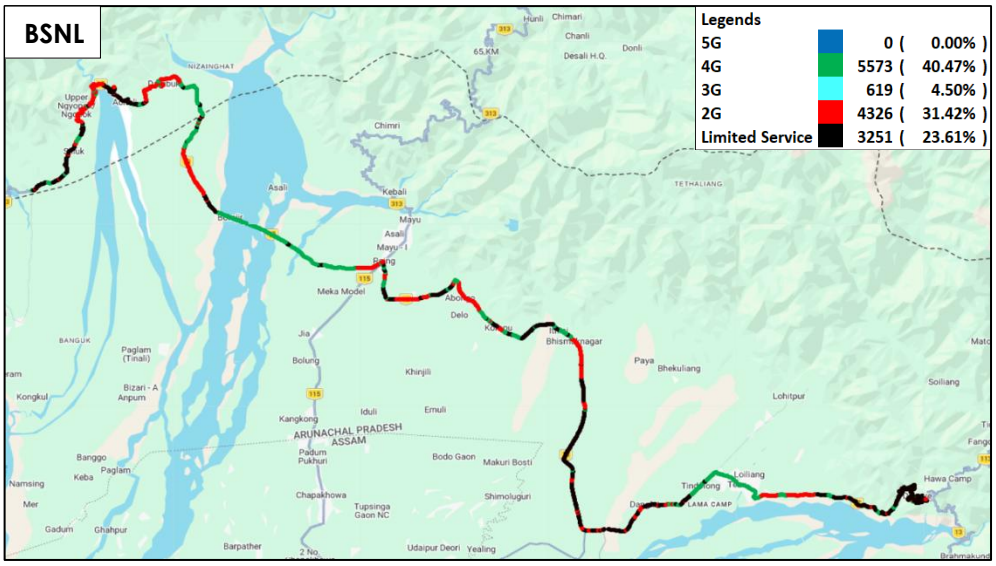


Figure-73: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - BSNL.

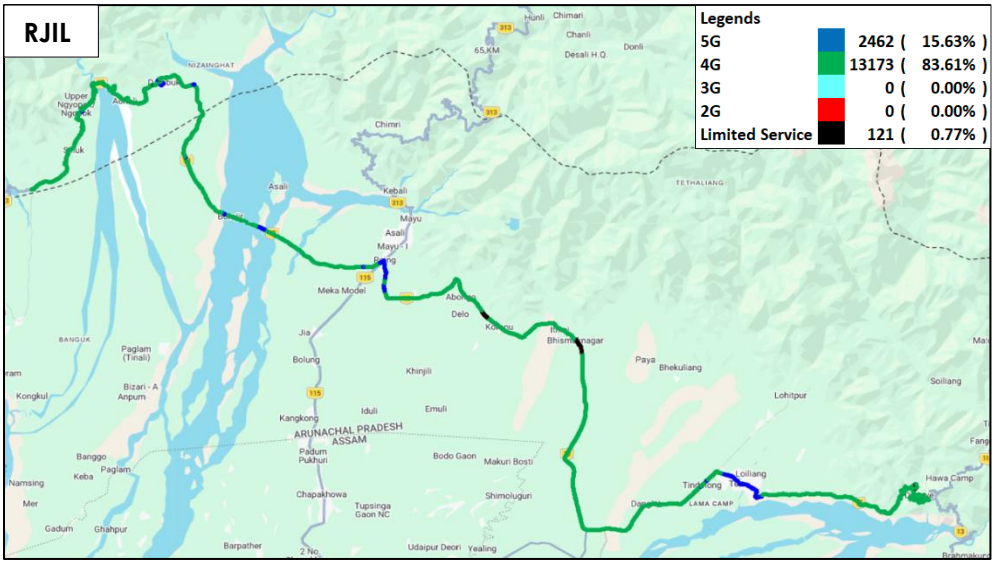


Figure-74: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

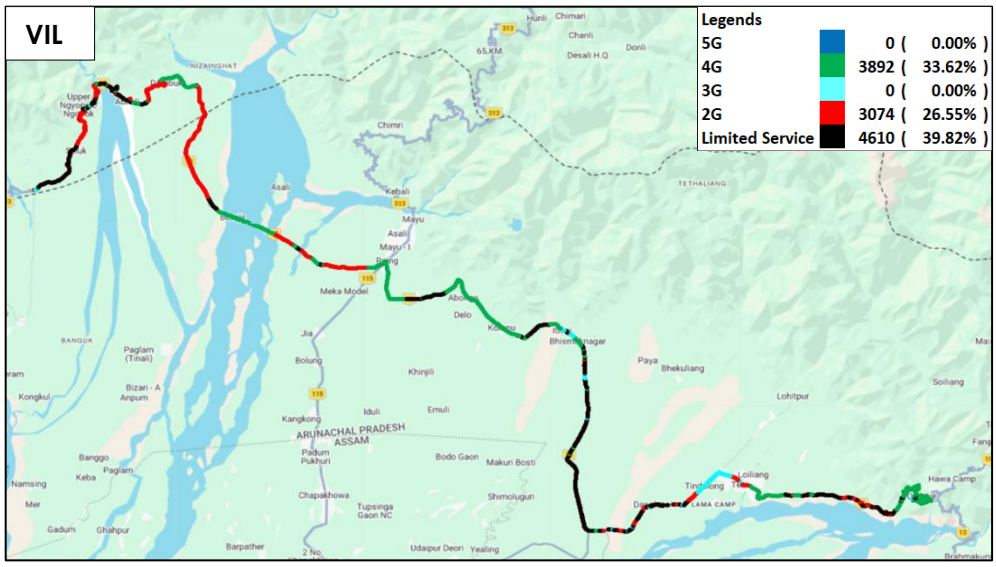


Figure-75: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice-VIL.

(g) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-108, 109, 110 & 111 for map view)

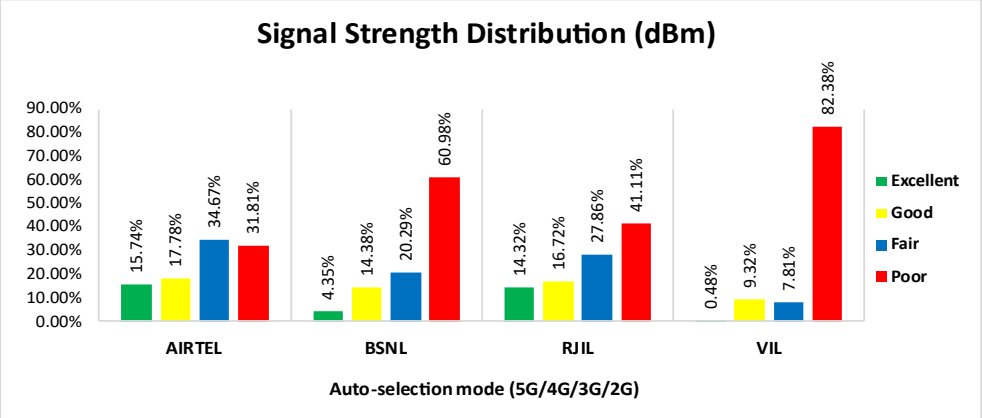


Figure-76: Signal strength distribution auto-selection mode (5G/4G/3G/2G) voice.

Observations:

- Airtel has 16% of samples falling in the excellent signal strength category.
- BSNL has 4% of samples falling in the excellent signal strength category.
- RJIL has 14% of samples falling in the excellent signal strength category.
- VIL has 0% of samples falling in the excellent signal strength category.

(h) Coverage Gap observed

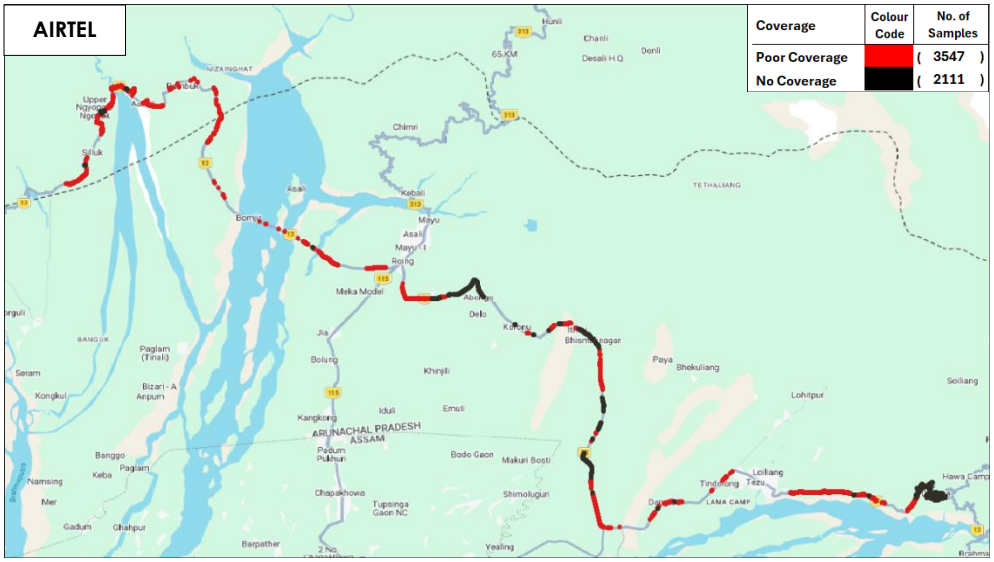


Figure-77: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-AIRTEL.

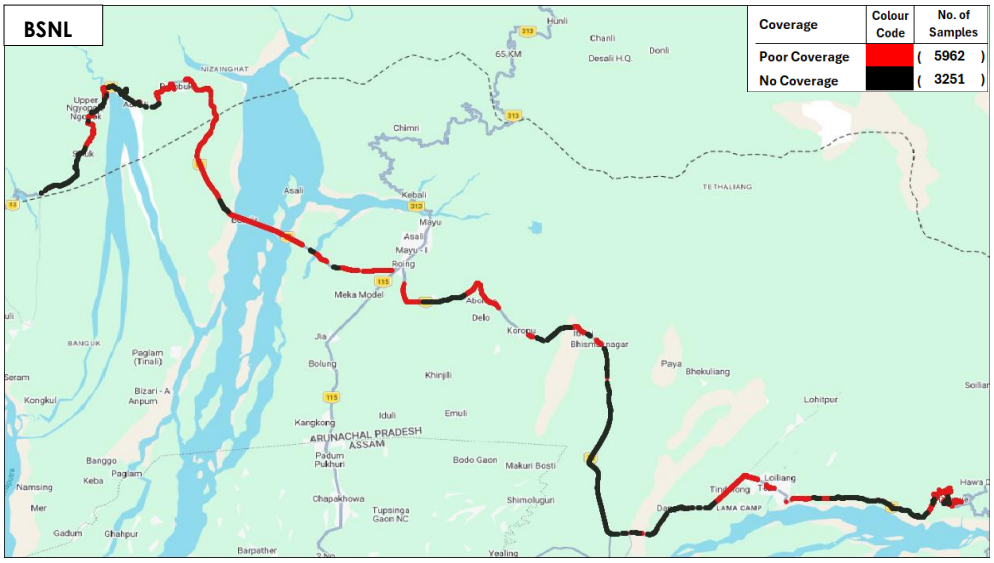


Figure-78: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-BSNL.

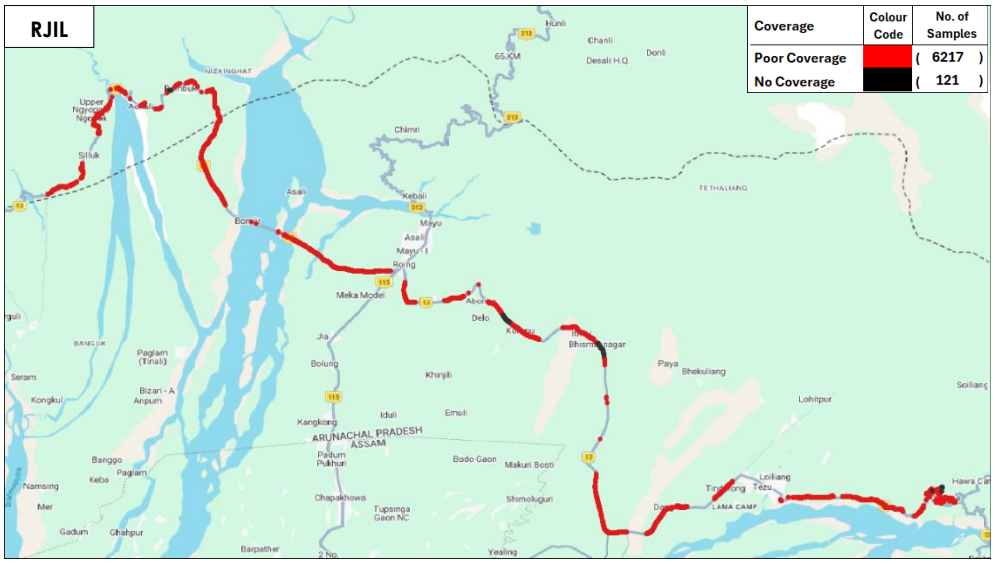


Figure-79: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-RJIL.

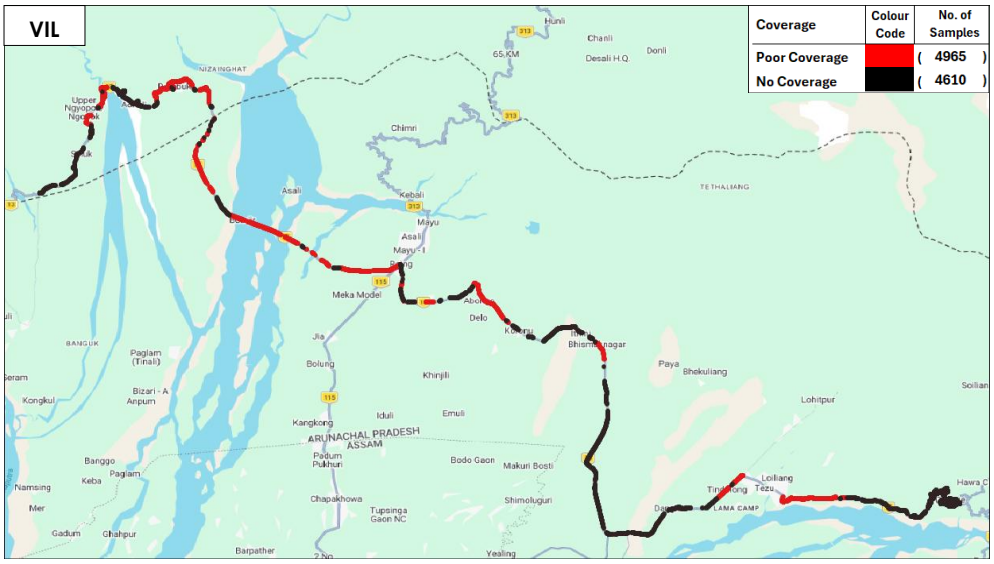


Figure-80: Poor coverage & no coverage locations in auto-selection mode (5G/4G/3G/2G) voice-VIL.

4.5.4 Data performance

(b) 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	61.33	2.34	85.84	32.99
	80th Percentile	116.33	3.17	84.31	47.39
	20th Percentile	0.39	0.72	3.38	23.20
Upload Throughput (Mbits/s)	Average	11.65	2.29	5.02	7.05
	80th Percentile	22.69	1.99	4.57	9.38
	20th Percentile	0.84	0.83	0.84	3.73
Latency (ms)	50th Percentile	61.82	73.63	57.03	51.44

Table-75: Summary of Data performance in network auto-selection mode.

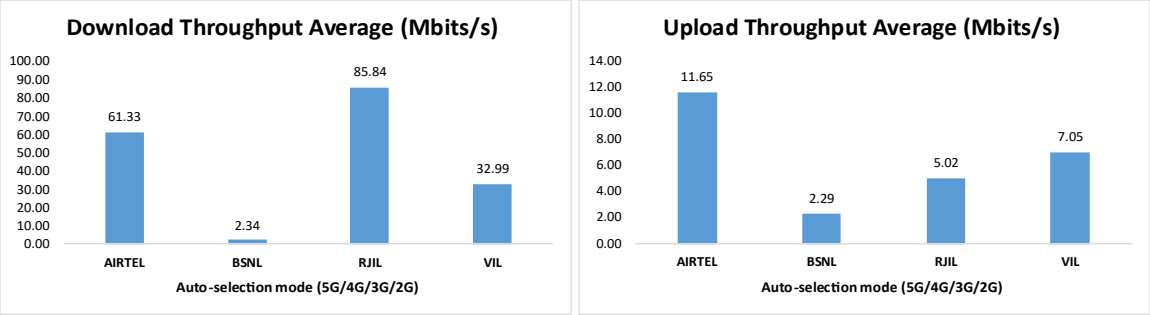


Figure- 33: Download & Upload throughput.

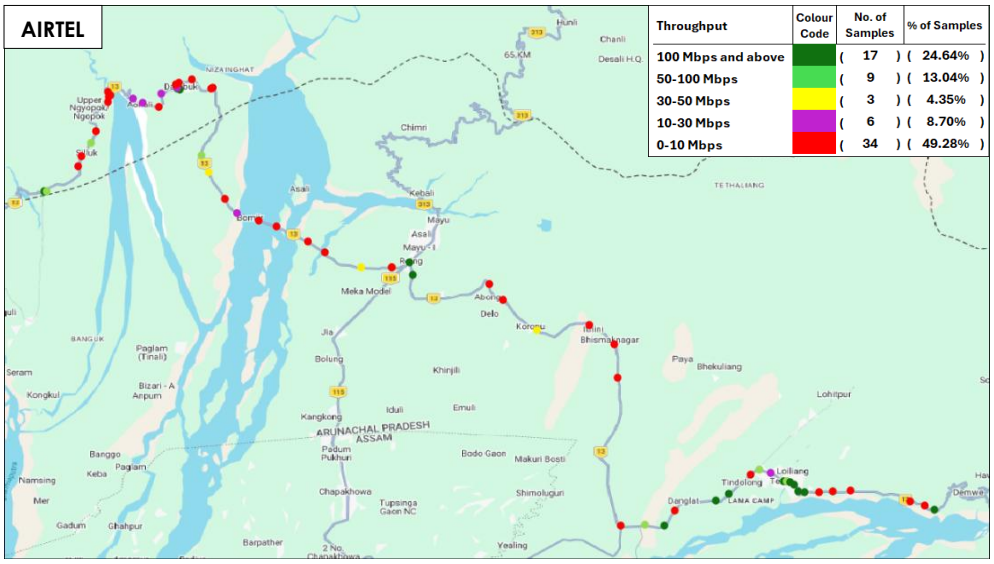


Figure-81: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – AIRTEL.

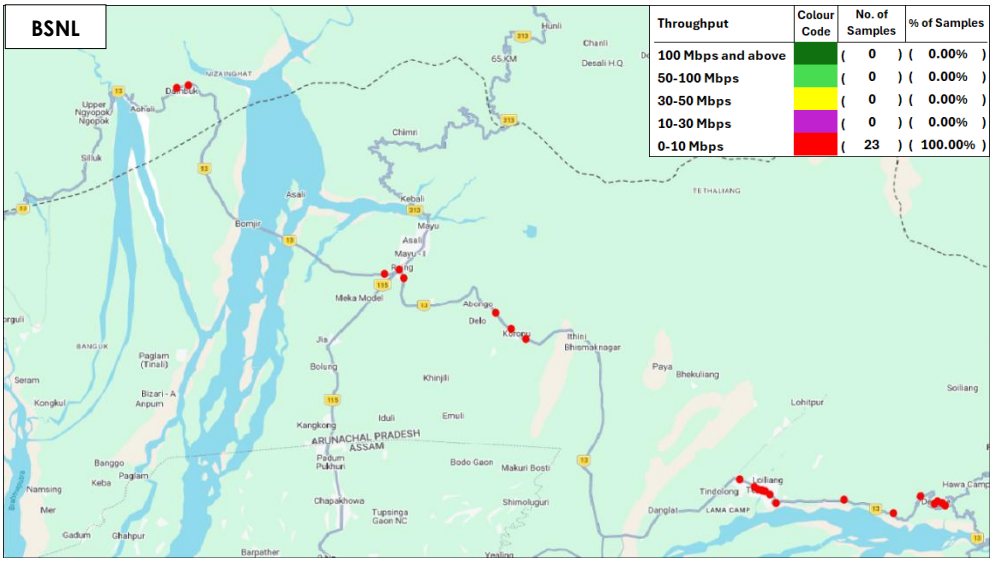


Figure-82: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – BSNL.

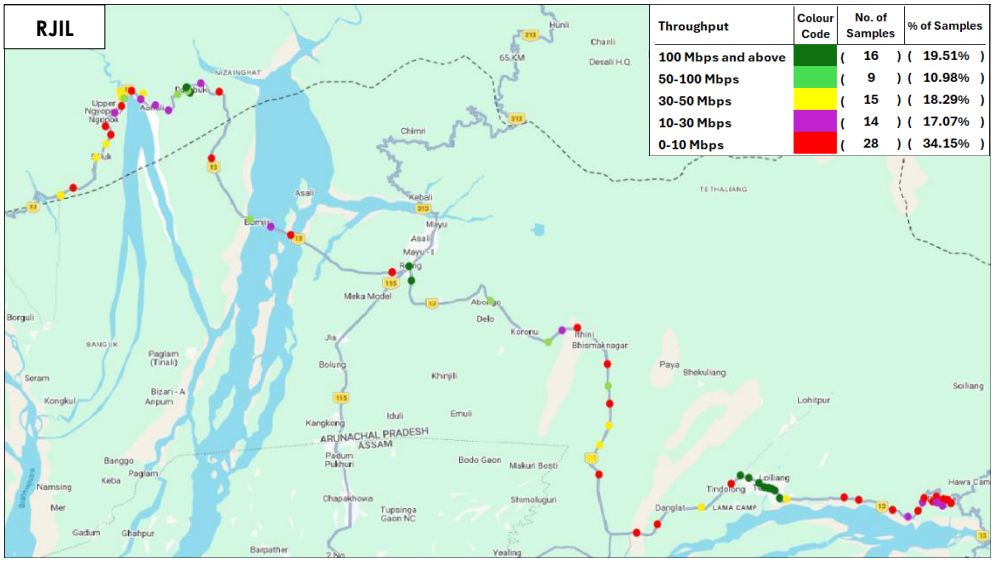


Figure-83: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – RJIL.

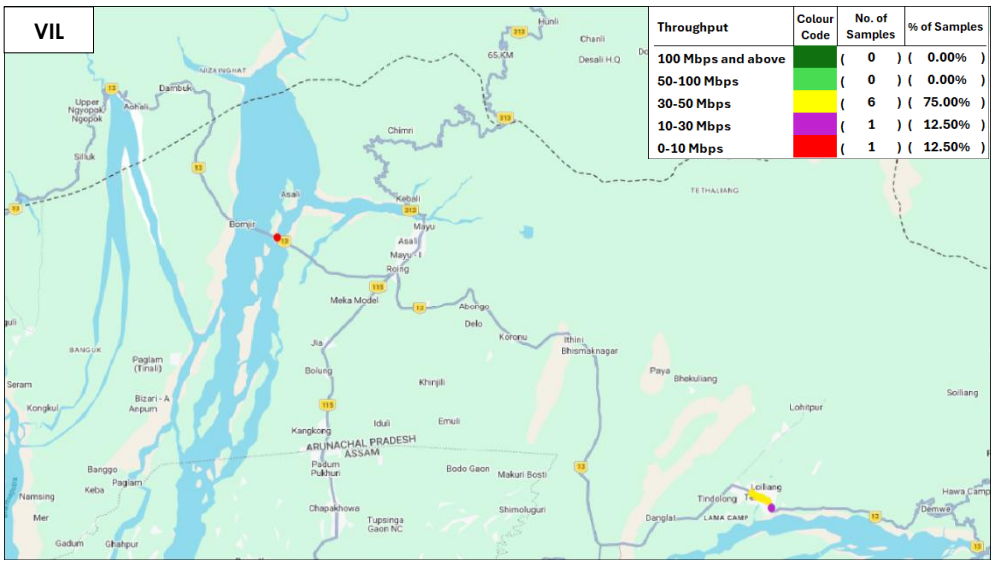


Figure-84: Download throughput distribution auto-selection mode (5G/4G/3G/2G) – VIL.

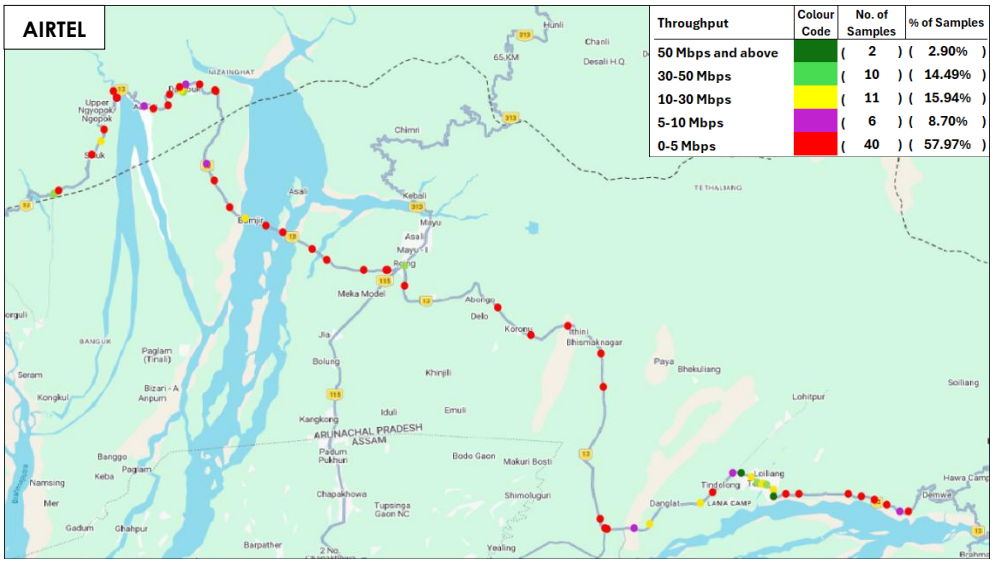


Figure-85: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – AIRTEL.

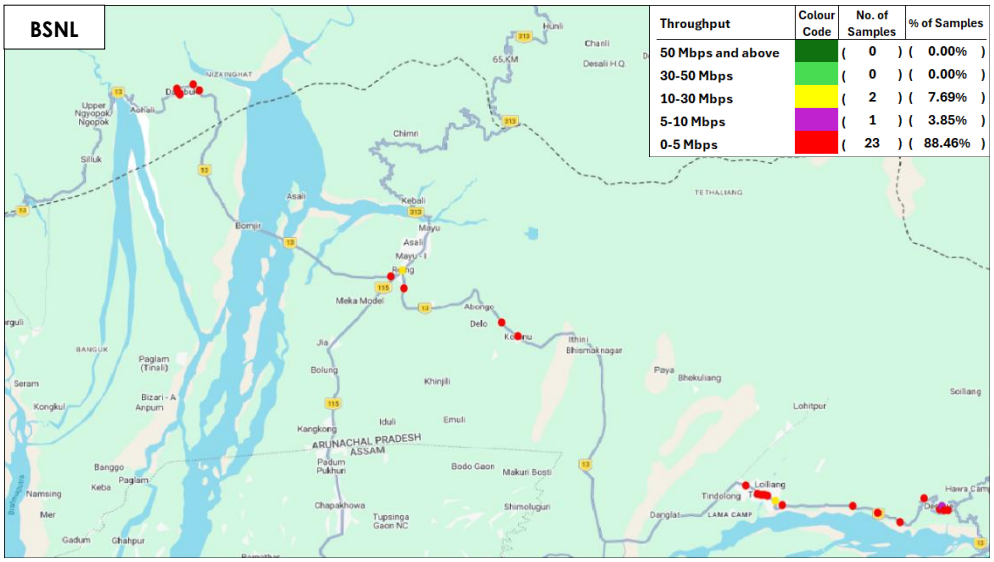


Figure-86: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – BSNL.

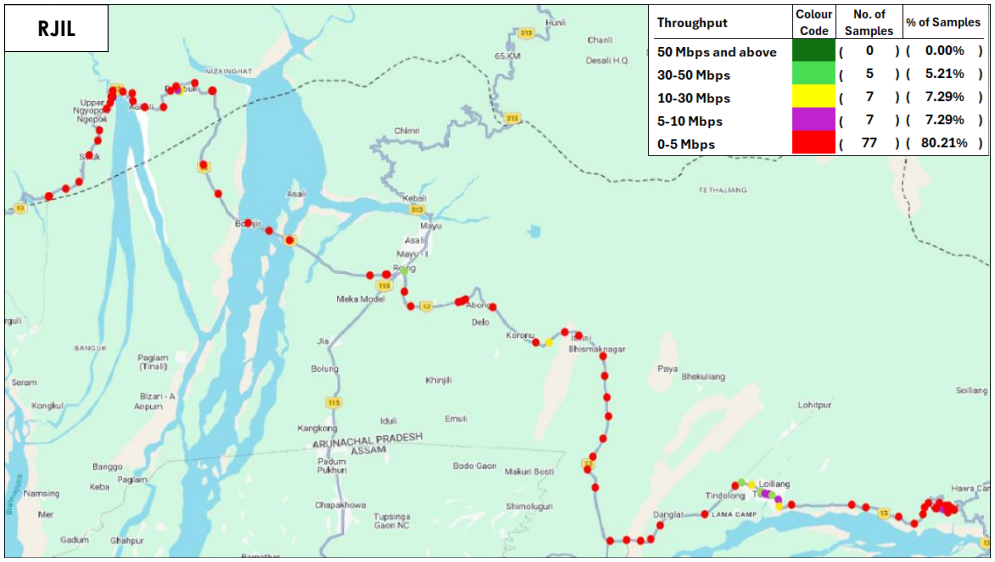


Figure-87: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – RJIL.

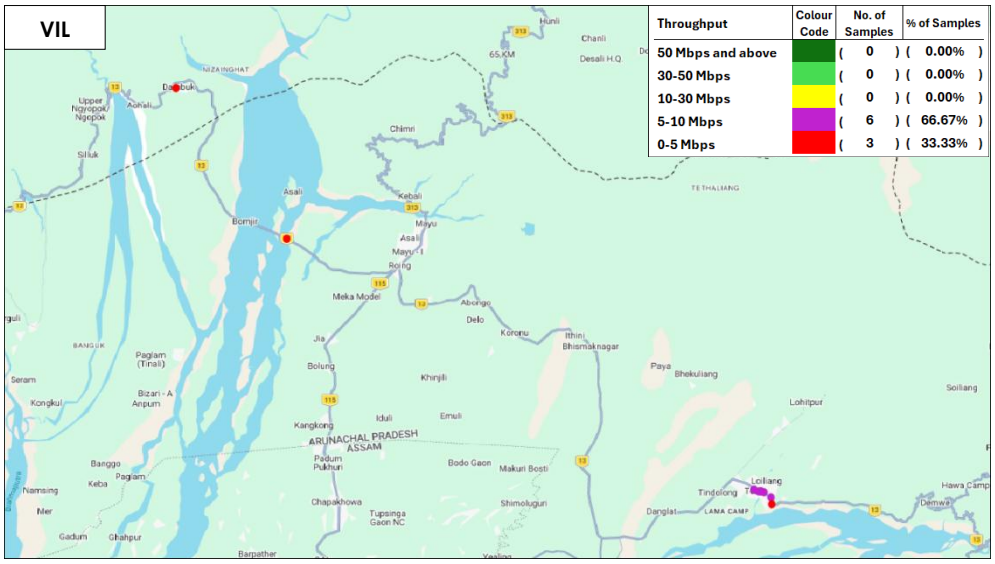


Figure-88: Upload throughput distribution auto-selection mode (5G/4G/3G/2G) – VIL.

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

Technology	Service Provider			
	AIRTEL	**BSNL**	**RJIL**	**VIL**
5G	15.78%	NA	16.00%	NA
4G	60.39%	38.43%	81.27%	17.50%
3G	NA	8.48%	NA	NA
2G	0.76%	13.22%	NA	9.32%
Limited Service	23.07%	39.86%	2.73%	73.18%

Table-76: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

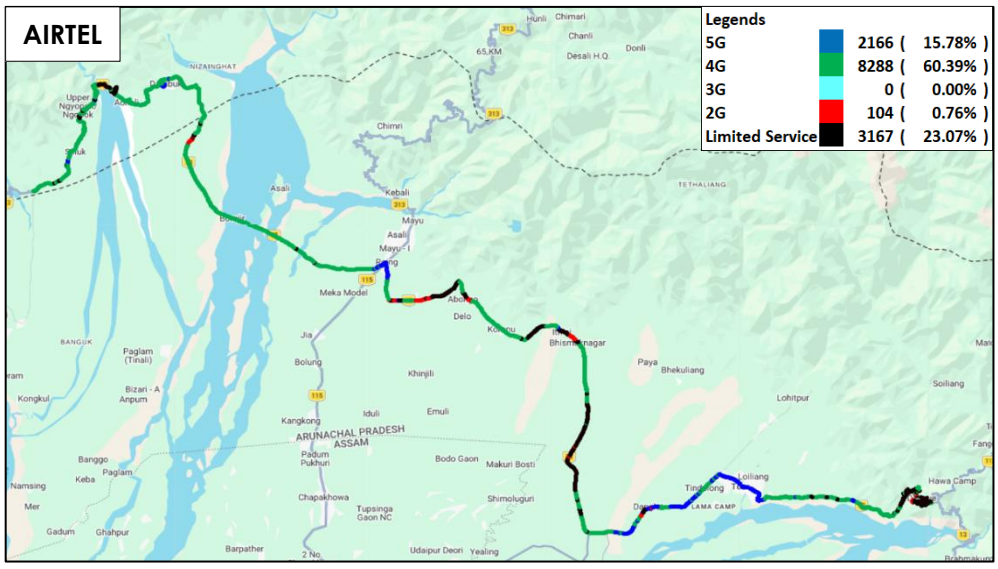


Figure-89: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – AIRTEL.

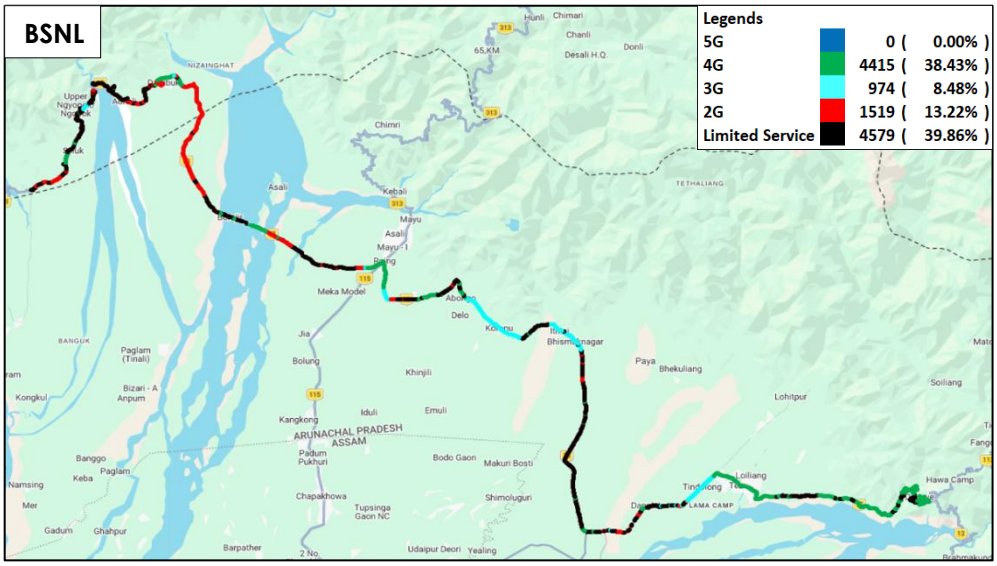


Figure-90: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – BSNL.

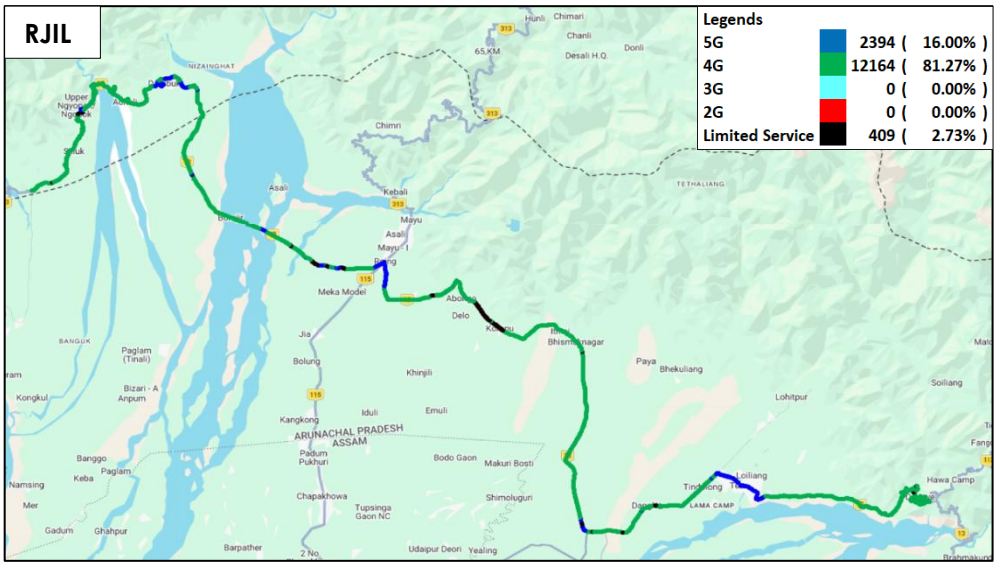


Figure-91: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – RJIL.

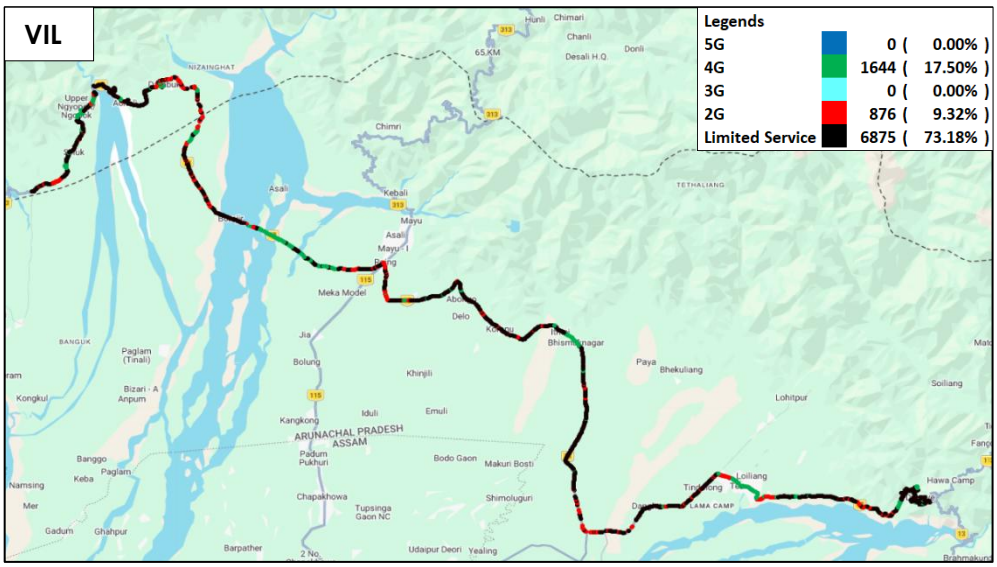


Figure-92: Serving technology plots in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-112, 113, 114 & 115 for map view)

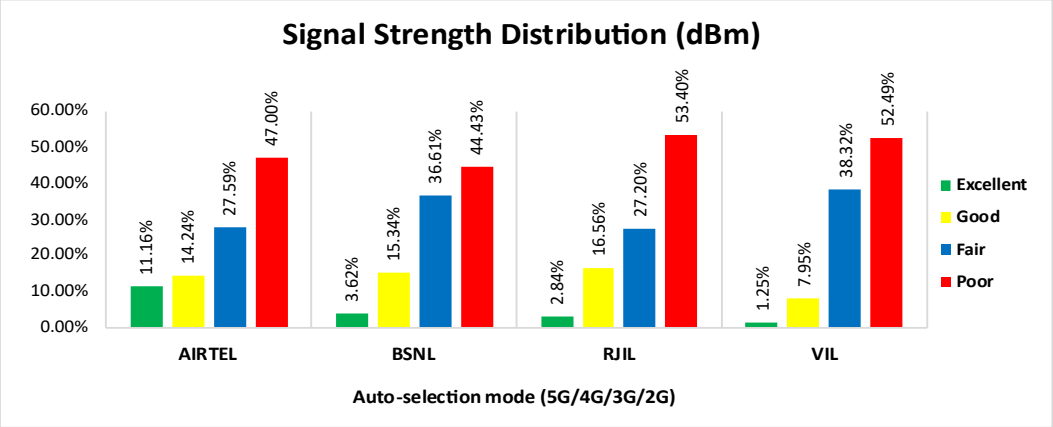


Figure-93: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 11% of samples falling in the excellent signal strength category.
- BSNL has 4% of samples falling in the excellent signal strength category.
- RJIL has 3% of samples falling in the excellent signal strength category.
- VIL has 1% of samples falling in the excellent signal strength category.

5. Voice & Data Key findings

5.1 Overall Voice

1. **Call Setup Success Rate:**
   a) Airtel, BSNL and VIL have 60.70%, 30.69% and 31.64% call setup success rate respectively in 3G/2G network mode. (refer table-3)

   b) Airtel, BSNL, RJIL and VIL have 66.90%, 46.71%, 75.83% and 33.15% call setup success rate respectively in auto-selection mode (5G/4G/3G/2G). (refer table-5)

   c) All operators have 100.00% call setup success rate while calling on peer service provider's network for inter-operator calls. (refer table-9)

2. **Call Setup Time**:
   a) Airtel, BSNL and VIL call setup time is 2.68, 3.42 & 3.75 seconds respectively in 3G/2G network mode. (refer table-3)

   b) Airtel, BSNL, RJIL & VIL call setup time is 1.09, 8.00, 1.19 & 3.71 seconds respectively in auto-selection mode (5G/4G/3G/2G). (refer table-5)

3. **Call Silence/Mute Rate**: In packet switched network (4G/5G) Airtel, BSNL, RJIL and VIL have 2.64%, 2.63%, 9.29% and 1.89% silence call rate respectively. Further Airtel, BSNL, RJIL & VIL downlink RTP packet loss is 2.30%, 11.90%, 7.02% and 1.48% respectively. In uplink Airtel, BSNL, RJIL & VIL RTP packet loss is 1.51%, 6.81%, 5.41% & 1.38% respectively. (refer table-6)

4. **Drop Call Rate**:
   a) Airtel, BSNL and VIL drop call rate is 1.28%, 4.31% and 9.82% respectively in 3G/2G network mode. (refer table-3)

   b) Airtel, BSNL, RJIL and VIL drop call rate is 5.24%, 7.42%, 1.58% and 8.85% 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 68.90 Mbps, 2.96 Mbps, 128.47 Mbps and 27.18 Mbps respectively. (refer table-11)

   b) Airtel, BSNL, RJIL and VIL average upload speeds are 15.03 Mbps, 3.27 Mbps, 7.90 Mbps and 6.48 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 91.28 Mbps, 3.93 Mbps, 232.03 Mbps and 20.15 Mbps respectively. (refer table-35)

   b) Airtel, BSNL, RJIL and VIL average upload speeds are 23.53 Mbps, 3.93 Mbps, 14.47 Mbps and 4.97 Mbps respectively. (refer table-35)

3. **Data session setup success rate (static i.e. while stationary):**
   a) Airtel, BSNL, RJIL and VIL have 92.31%, 90.77%, 87.69% and 27.69% download session setup success rate respectively. (refer table-35)

   b) Airtel, BSNL, RJIL and VIL have 92.31%, 90.77%, 96.92% and 30.77% upload session setup success rate respectively. (refer table-35)

5.3 Operator wise Key Findings

1. Airtel:

Voice

- 60.70% call setup success rate and 1.28% drop call rate have been observed in 3G/2G network mode for LSA. (refer table-3)
- 66.90% call setup success rate and 5.24% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. (refer table-5)
- 62.63% call setup success rate and 0.40% drop call rate have been observed in 3G/2G network mode for city drive. (refer table-13)
- 63.02% call setup success rate and 4.43% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. (refer table-15)
- 92.31% call setup success rate and 0.83% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. (refer table-21)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at both walk test locations. (refer table-63 & 65)
- 54.24% call setup success rate and 4.69% drop call rate have been observed in 3G/2G network mode for highway drive. (refer table-69)
- 48.06% call setup success rate and 19.35% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. (refer table-71)

Data

- Airtel has 68.90 Mbps average download speed & 15.03 Mbps average upload speed for LSA. (refer table-11)
- Airtel has 61.75 Mbps average download speed & 12.40 Mbps average upload speed across the measured routes for city drive. (refer table-19)
- ADC Office Dambuk- Dambuk Aga- Dambuk, District and Sessions Court- Tezu, District Museum and Community Convention Centre- Jubilee Marg- Tezu, Indira Gandhi Government College- Gas Agency Road- Tezu, Parsuram Kund, Police Station Wakro- Wakro, Polytechnic College- Roing and Sunpura Administrative/Panchayat Area- Jeko have less download speed (less than 100 Mbps) out of total 13 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-36, 40, 41, 43, 44, 45, 46 & 47)
- ADC Office Dambuk- Dambuk Aga- Dambuk, District Museum and Community Convention Centre- Jubilee Marg- Tezu, Govt. Higher Secondary School- NH13- Tezu, Parsuram Kund, Police Station Wakro- Wakro, Polytechnic College- Roing and Sunpura Administrative/Panchayat Area- Jeko have less upload speed (less than 20 Mbps) out of total 13 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-36, 41, 42, 44, 45, 46 & 47)
- Zonal General Hospital - Tezu has less download speed (less than 100 Mbps) out of total 2 Walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-68)
- Airtel has 61.33 Mbps average download speed & 11.65 Mbps average upload speed across the measured routes for highway drive. (refer table-75)

2. BSNL:

Voice

- 30.69% call setup success rate and 4.31% drop call rate have been observed in 3G/2G network mode for LSA. (refer table-3)
- 46.71% call setup success rate and 7.42% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. (refer table-5)
- 33.00% call setup success rate and 3.03% drop call rate have been observed in 3G/2G network mode for city drive. (refer table-13)
- 39.49% call setup success rate and 5.97% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. (refer table-15)
- 89.23% call setup success rate and 1.72% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. (refer table-21)
- 86.67% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Denning College for Teacher Education - Tezu walk test location. (refer table-63)
- 84.62% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Zonal General Hospital - Tezu walk test location. (refer table- 65)
- 24.31% call setup success rate and 9.09% drop call rate have been observed in 3G/2G network mode for highway drive. (refer table-69)
- 29.41% call setup success rate and 30.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. (refer table-71)

Data

- BSNL has 2.96 Mbps average download speed & 3.27 Mbps average upload speed for LSA. (refer table-11)
- BSNL has 2.27 Mbps average download speed & 3.06 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) except District Museum and Community Convention Centre- Jubilee Marg- Tezu and Indira Gandhi Government College- Gas Agency Road- Tezu for auto-selection mode (5G/4G/3G/2G). (refer table-36, 37, 38, 39, 40, 42, 44, 45, 46, 47 and 48)
- ADC Office Dambuk- Dambuk Aga- Dambuk, Parsuram Kund and Tezu Main Bazaar / Clock Tower have less upload speed (less than 2 Mbps) out of total 13 hotspots locations for auto-selection mode (5G/4G/3G/2G). (refer table-36, 44 & 48)
- Both walk test locations have less download speed (less than 10 Mbps) for auto-selection mode (5G/4G/3G/2G). (refer table-67 & 68)
- Zonal General Hospital - Tezu has less upload speed (less than 2 Mbps) out of total 2 Walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-68)
- BSNL has 2.34 Mbps average download speed & 2.29 Mbps average upload speed across the measured routes for highway drive. (refer table-75)

3. RJIL:

Voice

- 75.83% call setup success rate and 1.58% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. (refer table-5)
- 63.53% call setup success rate and 0.37% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. (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. (refer table-21)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at both walk test locations. (refer table-63 & 65)
- 93.10% call setup success rate and 8.64% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. (refer table-71)

Data

- RJIL has 128.47 Mbps average download speed & 7.90 Mbps average upload speed for LSA. (refer table-11)
- RJIL has 103.49 Mbps average download speed & 7.08 Mbps average upload speed across the measured routes for city drive. (refer table-19)
- ADC Office Dambuk- Dambuk Aga- Dambuk, Govt. Higher Secondary School- NH13- Tezu, Parsuram Kund, Police Station Wakro- Wakro, Polytechnic College- Roing and Sunpura Administrative/Panchayat Area- Jeko have less download speed (less than 100 Mbps) out of total 13 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-36, 42, 44, 45, 46 & 47)
- ADC Office Dambuk- Dambuk Aga- Dambuk, District and Sessions Court- Tezu, District Museum and Community Convention Centre- Jubilee Marg- Tezu, Govt. Higher Secondary School- NH13- Tezu, Indira Gandhi Government College- Gas Agency Road- Tezu, Parsuram Kund, Police Station Wakro- Wakro, Polytechnic College- Roing and Sunpura Administrative/Panchayat Area- Jeko have less upload speed (less than 20 Mbps) out of total 13 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-36, 40, 41, 42, 43, 44, 45, 46 & 47)
- Both walk test locations have less upload speed (less than 20 Mbps) for auto-selection mode (5G/4G/3G/2G). (refer table-67 & 68)
- RJIL has 85.84 Mbps average download speed & 5.02 Mbps average upload speed across the measured routes for highway drive. (refer table-75)

4. VIL:

Voice

- 31.64% call setup success rate and 9.82% drop call rate have been observed in 3G/2G network mode for LSA. (refer table-3)
- 33.15% call setup success rate and 8.85% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. (refer table-5)
- 37.03% call setup success rate and 8.02% drop call rate have been observed in 3G/2G network mode for city drive. (refer table-13)
- 27.12% call setup success rate and 10.83% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. (refer table-15)

- 70.77% call setup success rate and 2.17% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. (refer table-21)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at both walk test locations. (refer table-63 & 65)

- 18.23% call setup success rate and 18.92% drop call rate have been observed in 3G/2G network mode for highway drive. (refer table-69)

- 17.11% call setup success rate and 25.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. (refer table-71)

Data

- VIL has 27.18 Mbps average download speed & 6.48 Mbps average upload speed for LSA. (refer table-11)

- VIL has 18.20 Mbps average download speed & 4.84 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) except Deputy Commissioner Office- Tezu and Tezu Main Bazaar / Clock Tower for auto-selection mode (5G/4G/3G/2G). (refer table-36, 37, 38, 40, 41, 42, 43, 44, 45, 46 & 47)

- All hotspot locations have less upload speed (less than 2 Mbps) except Deputy Commissioner Office- Tezu and Tezu Main Bazaar / Clock Tower for auto-selection mode (5G/4G/3G/2G). (refer table-36, 37, 38, 40, 41, 42, 43, 44, 45, 46 & 47)

- VIL has 32.99 Mbps average download speed & 7.05 Mbps average upload speed across the measured routes for highway drive. (refer table-75)

6. Annexure

6.1 Route wise coverage map

6.1.1 City

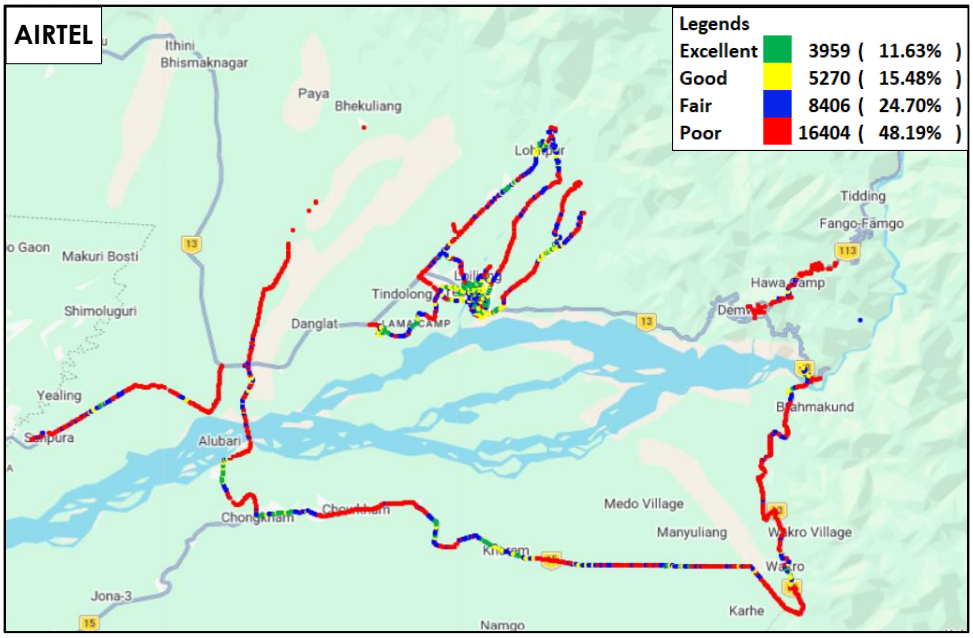


Figure-94: Signal strength 3G/2G network mode voice - AIRTEL.

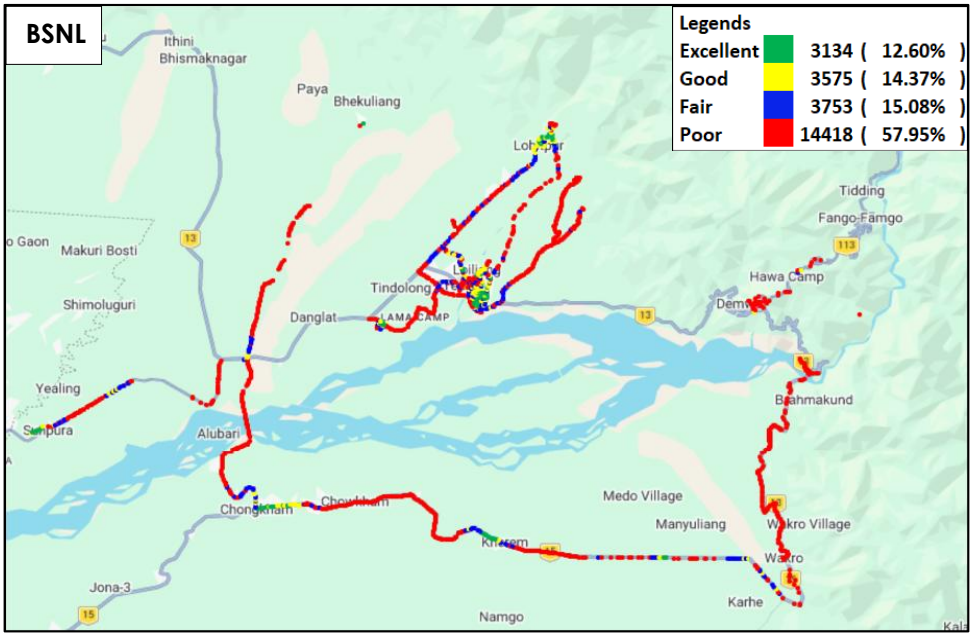


Figure-95: Signal strength 3G/2G network mode voice - BSNL.

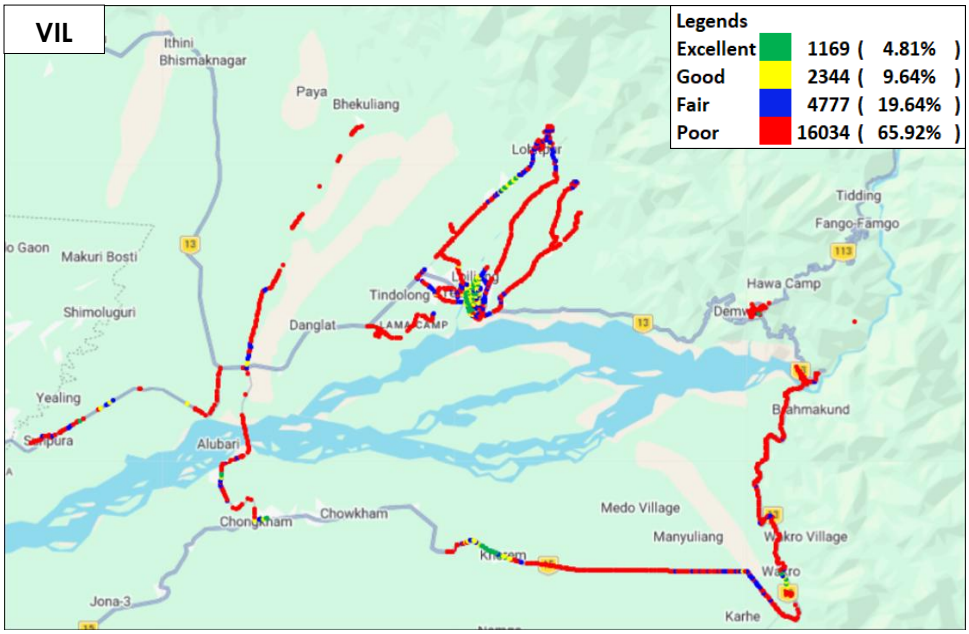


Figure-96: Signal strength 3G/2G network mode voice - VIL.

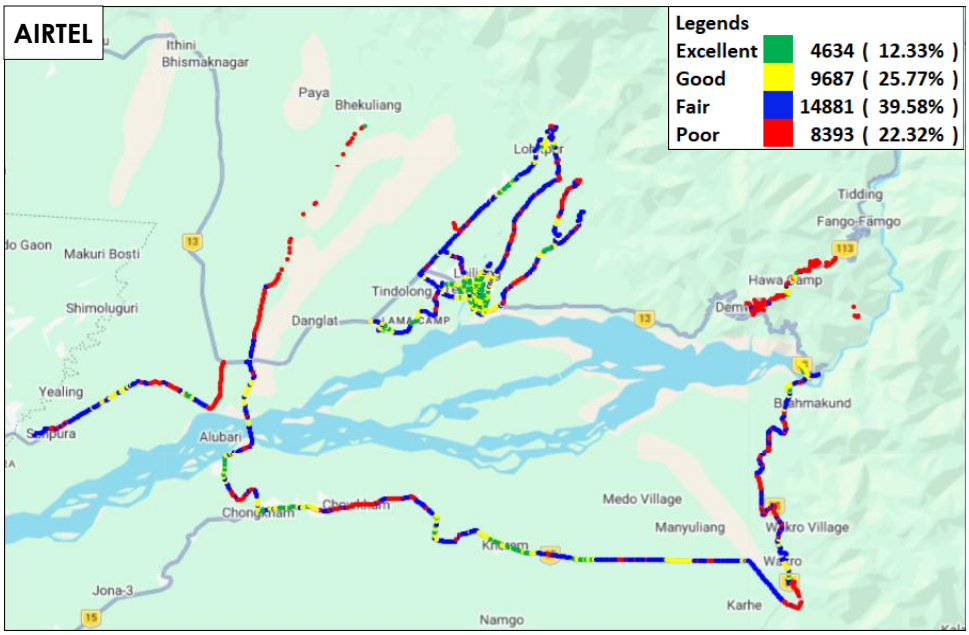


Figure-97: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

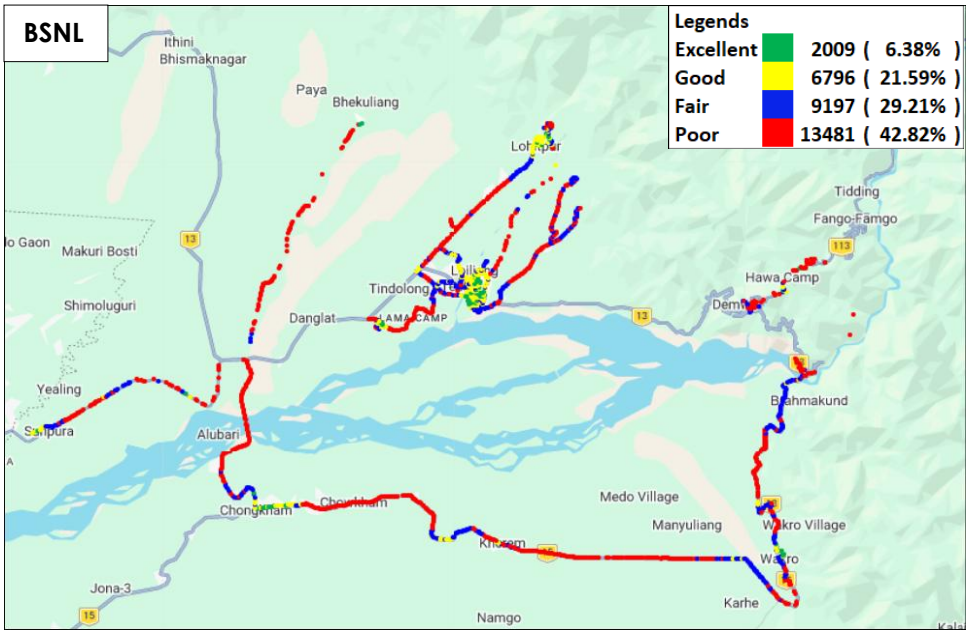


Figure-98: Signal strength auto-selection mode (5G/4G/3G/2G) voice - BSNL.

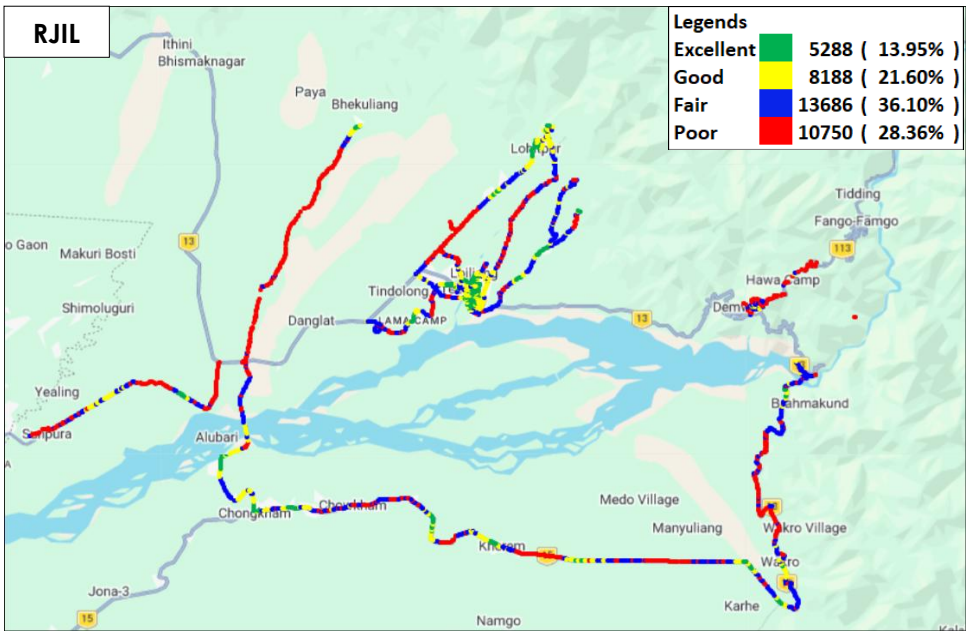


Figure-99: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

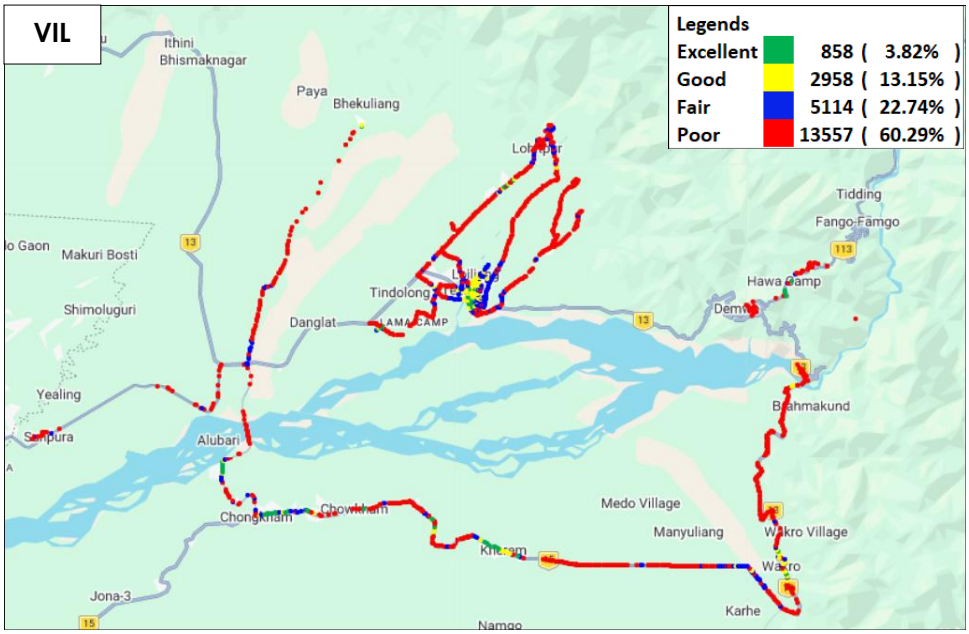


Figure-100: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

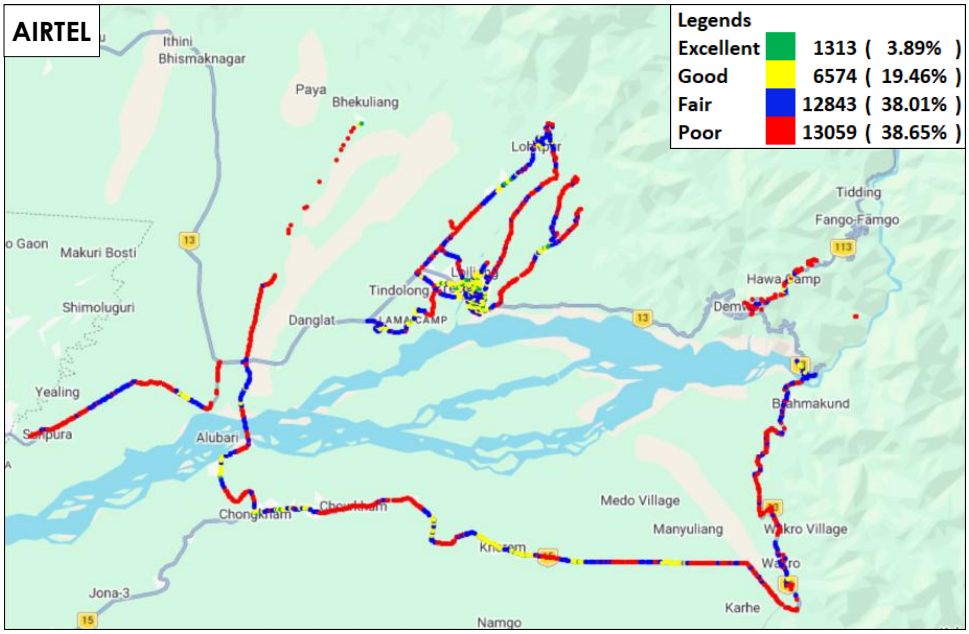


Figure-101: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

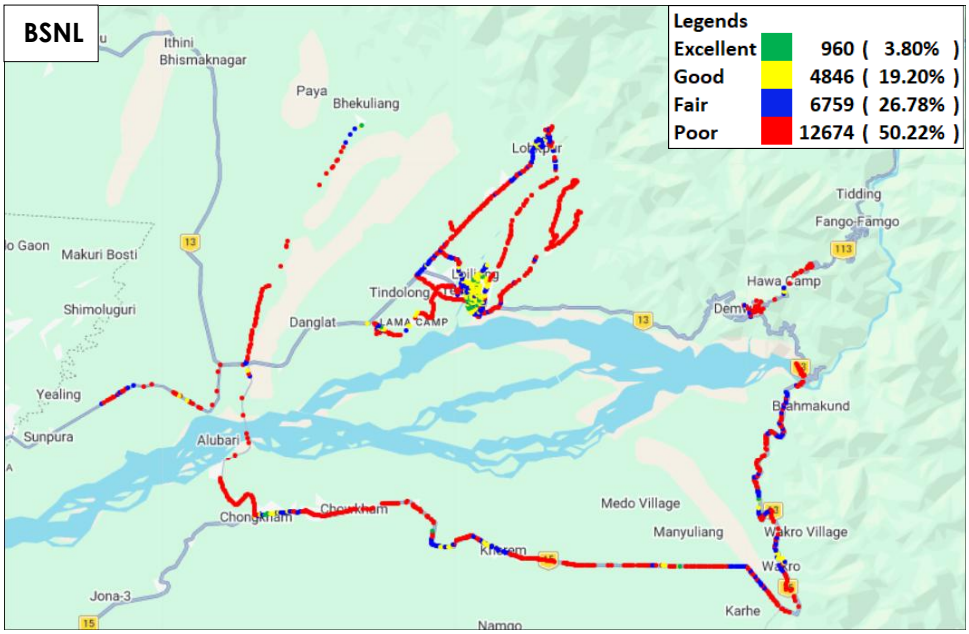


Figure-102: Signal strength auto-selection mode (5G/4G/3G/2G) data - BSNL.

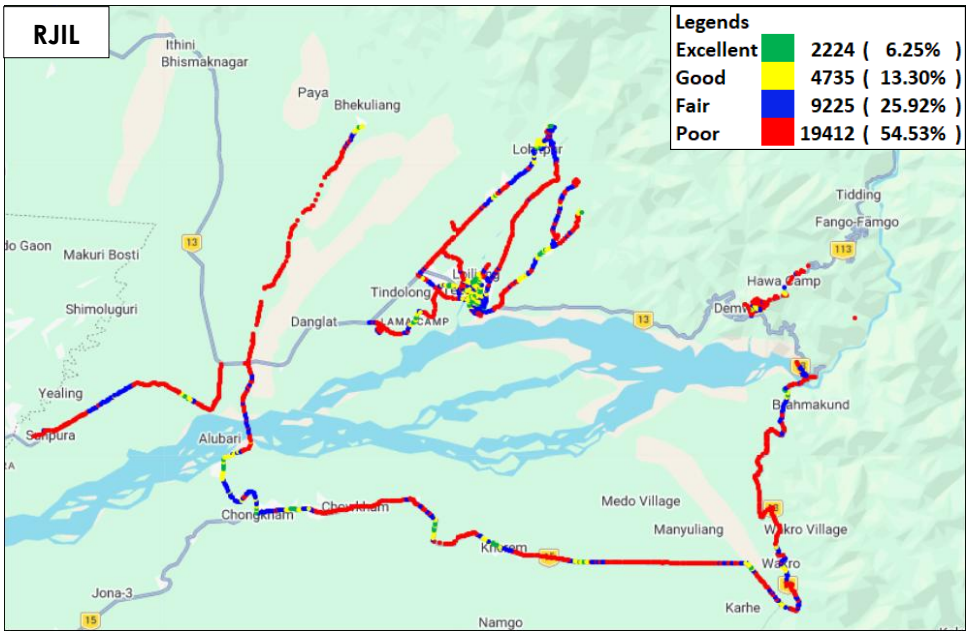


Figure-103: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

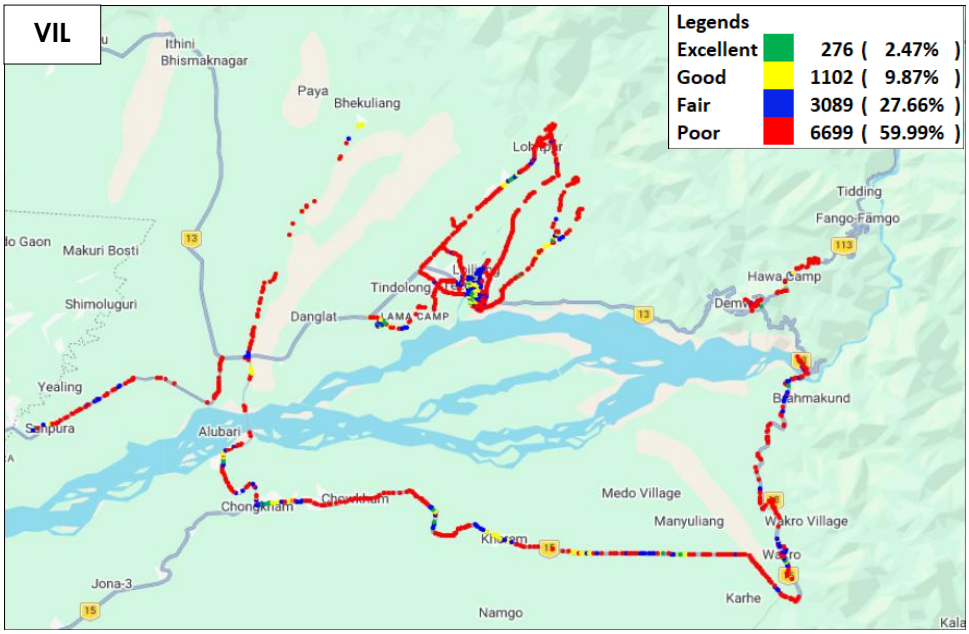


Figure-104: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

6.1.2 Highway

i) Silluk-Tin-Ali to Tohangam along NH-13

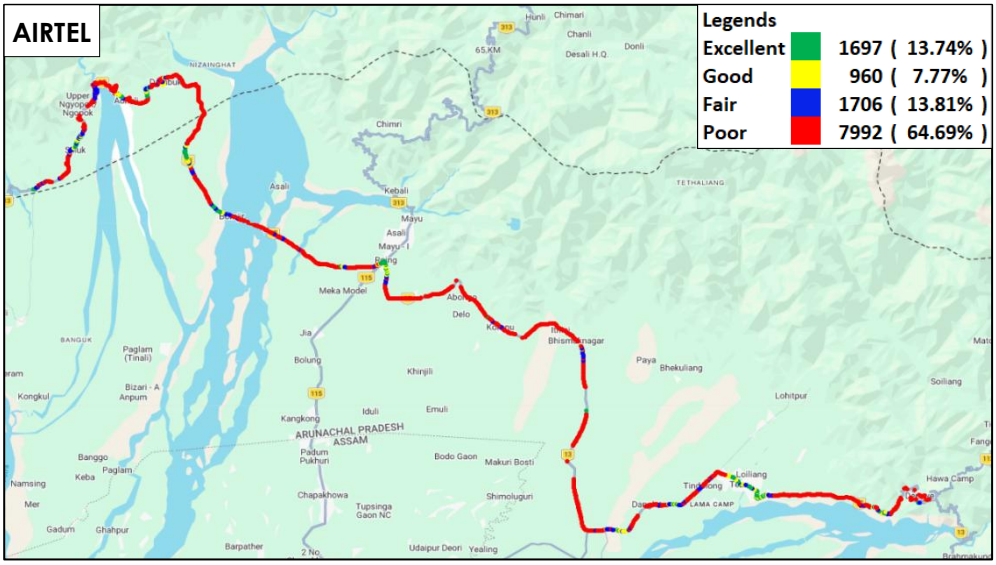


Figure-105: Signal strength 3G/2G network mode voice - AIRTEL.

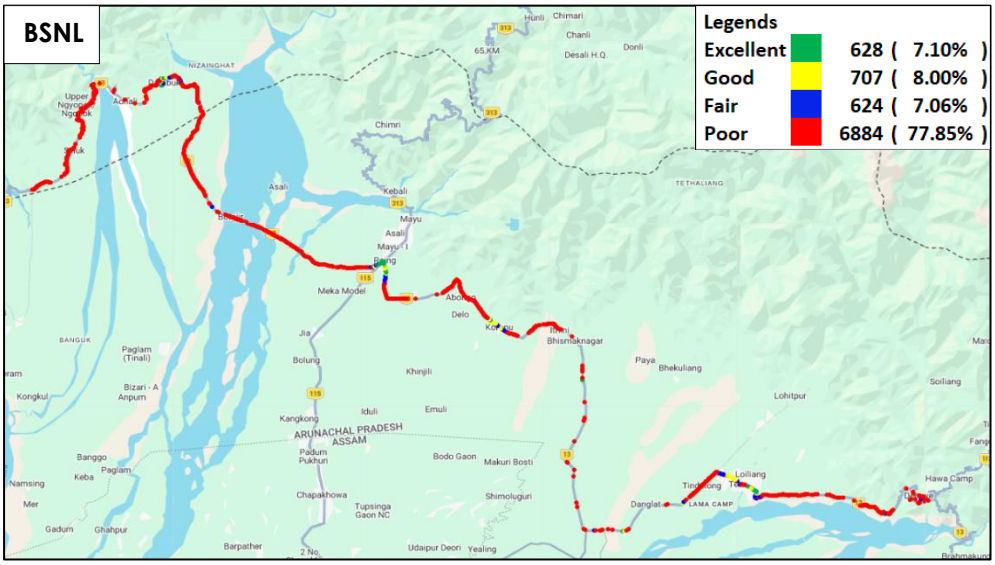


Figure-106: Signal strength 3G/2G network mode voice - BSNL.

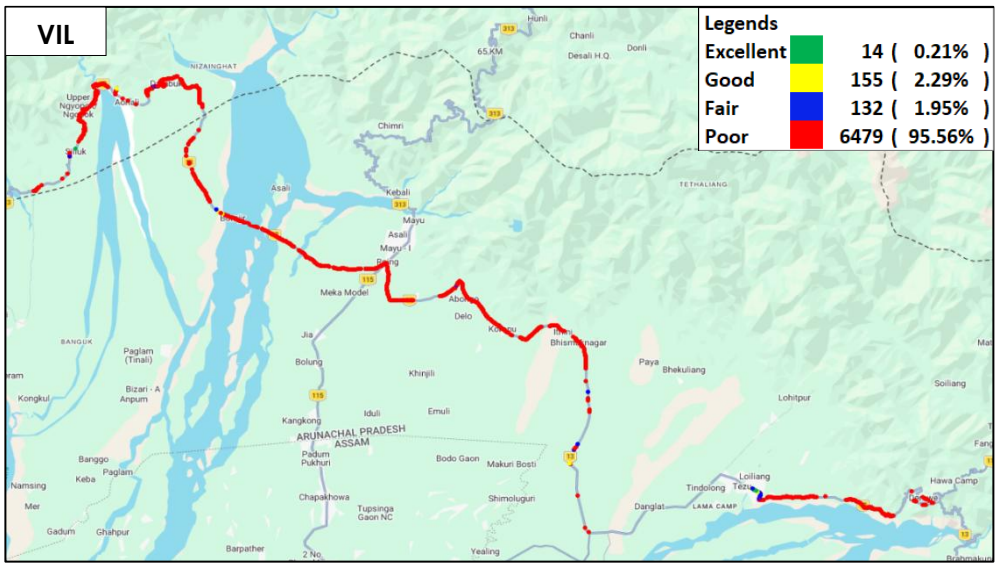


Figure-107: Signal strength 3G/2G network mode voice - VIL.

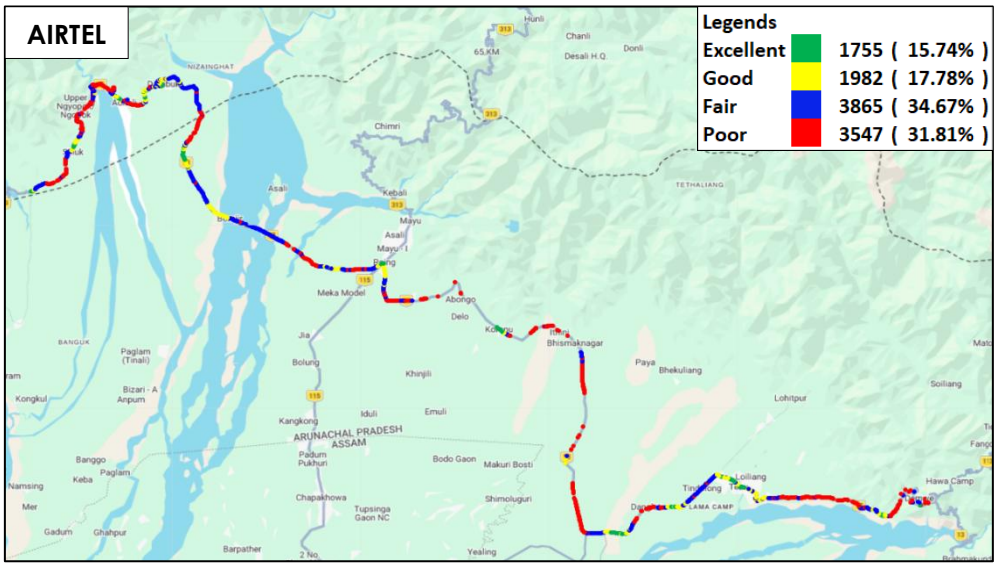


Figure-108: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

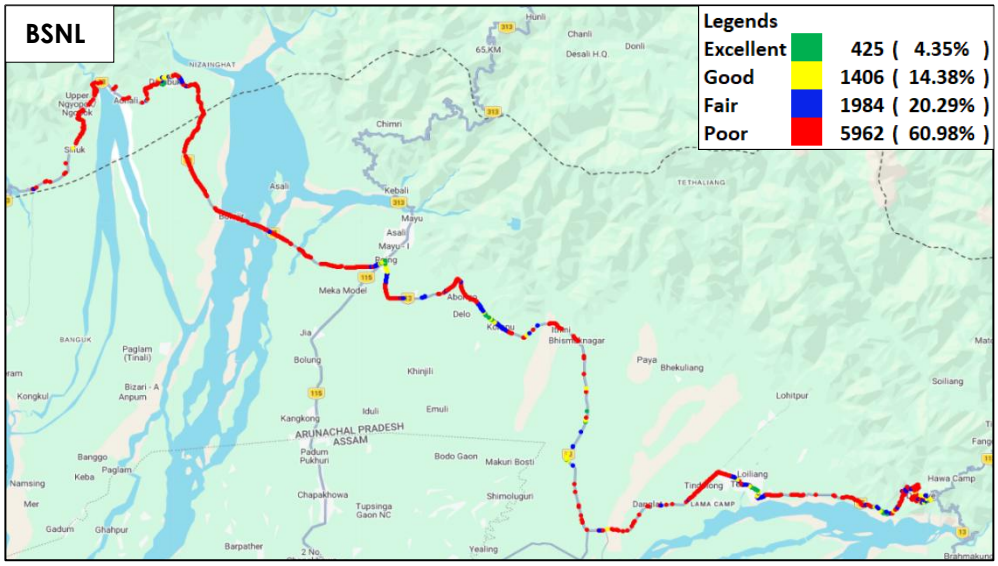


Figure-109: Signal strength auto-selection mode (5G/4G/3G/2G) voice - BSNL.

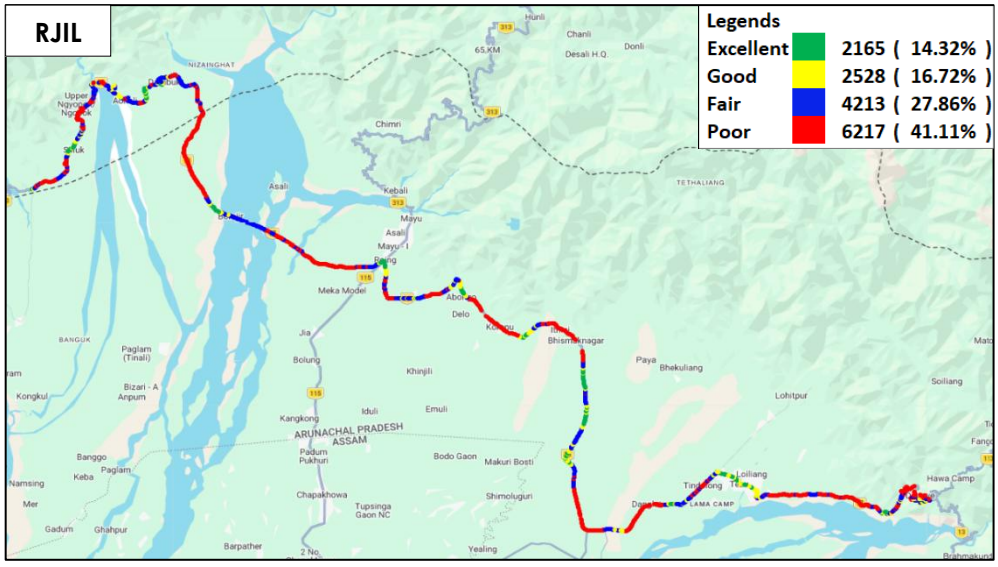


Figure-110: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

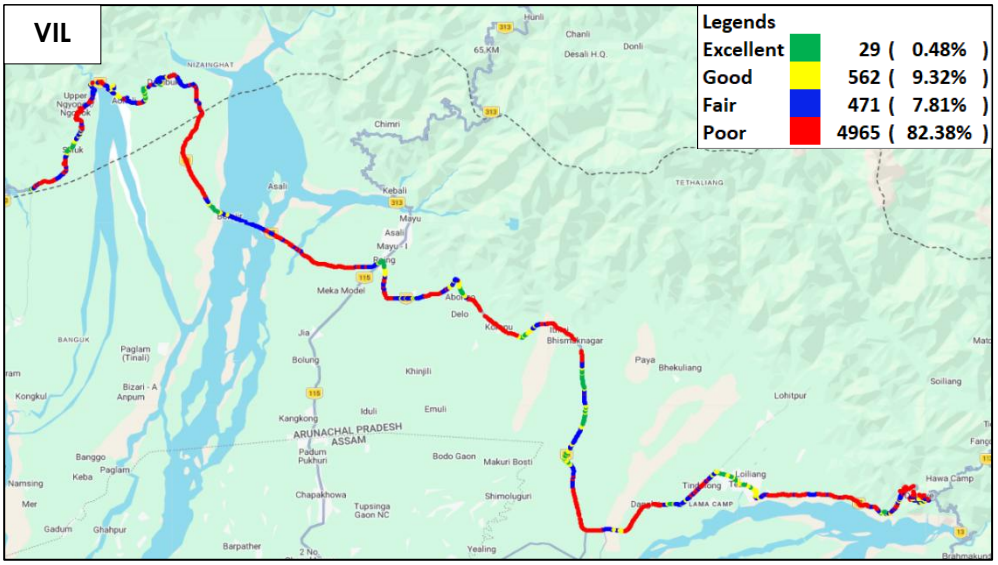


Figure-111: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

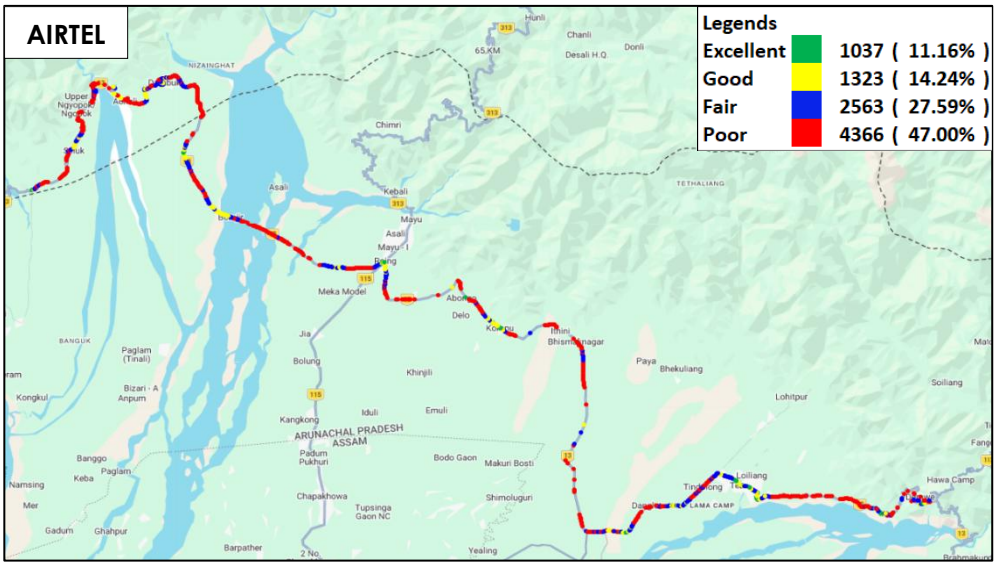


Figure-112: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

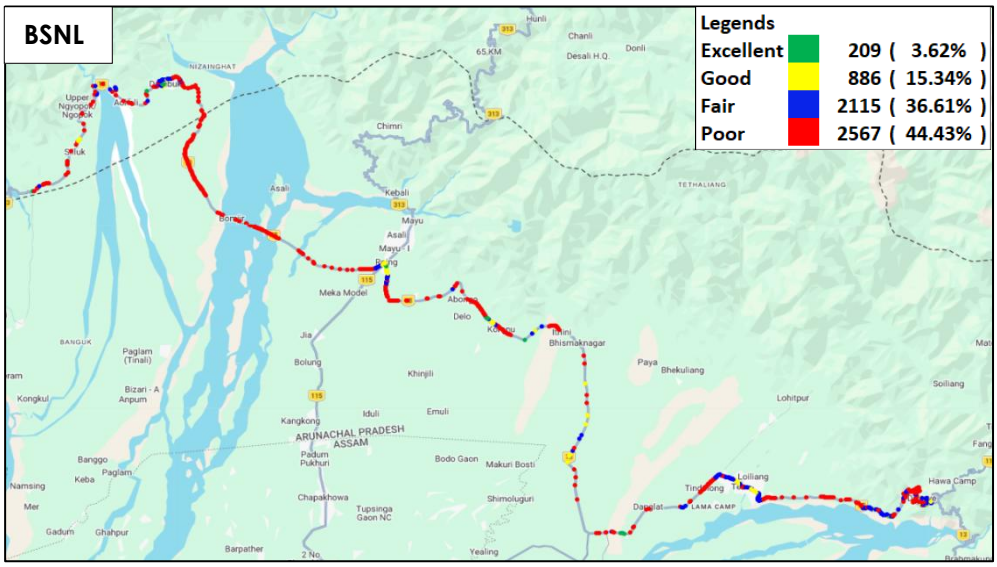


Figure-113: Signal strength auto-selection mode (5G/4G/3G/2G) data - BSNL.

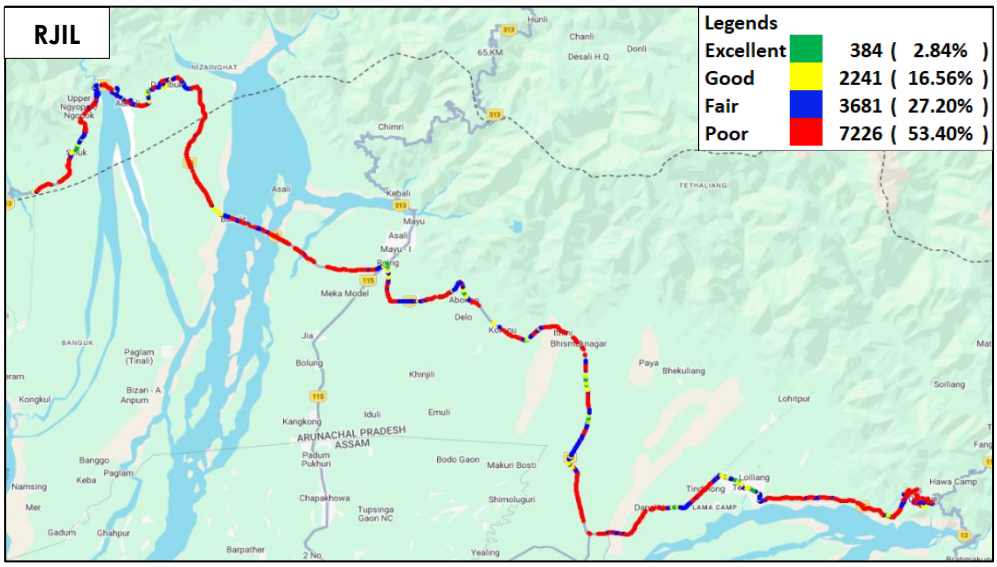


Figure-114: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

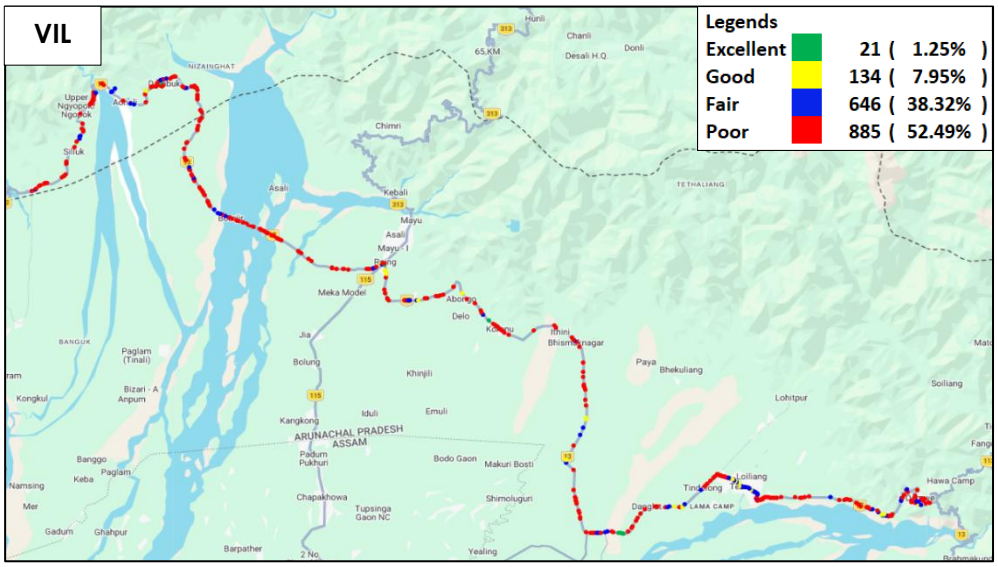


Figure-115: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

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		120/180 seconds
Wait/ Guard Time		15 Sec

Table-77: 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.

Data Test		
Test Type	**Technology**	**Detail**
FTP/HTTP Download	5G/4G/3G/2G Auto Mode	500 MB File- 30 Sec Timeout, (Multithread 3- TCP Connection at a time)
FTP/HTTP 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.bank.in) 20 sec timeout (only at Hotspot)

Latency & Jitter (TWAMP-UDP)		25 count- Dynamic 500 count- Hotspot Payload- 512 bytes in all drive
Packet Loss Rate (TWAMP-UDP & TCP)		500 counts (TWAMP-UDP) 500 counts (TCP) at each hotspot Payload- 512 bytes in all drive

Table-78: 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.
- TWAMP-UDP & TCP 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.
- Delhi-based TRAI server was used for HTTP Download, HTTP Upload, TCP and TWAMP testing for Airtel, BSNL and RJIL.
- VIL server was used for HTTP Download, HTTP Upload, TCP and TWAMP testing, for VIL.

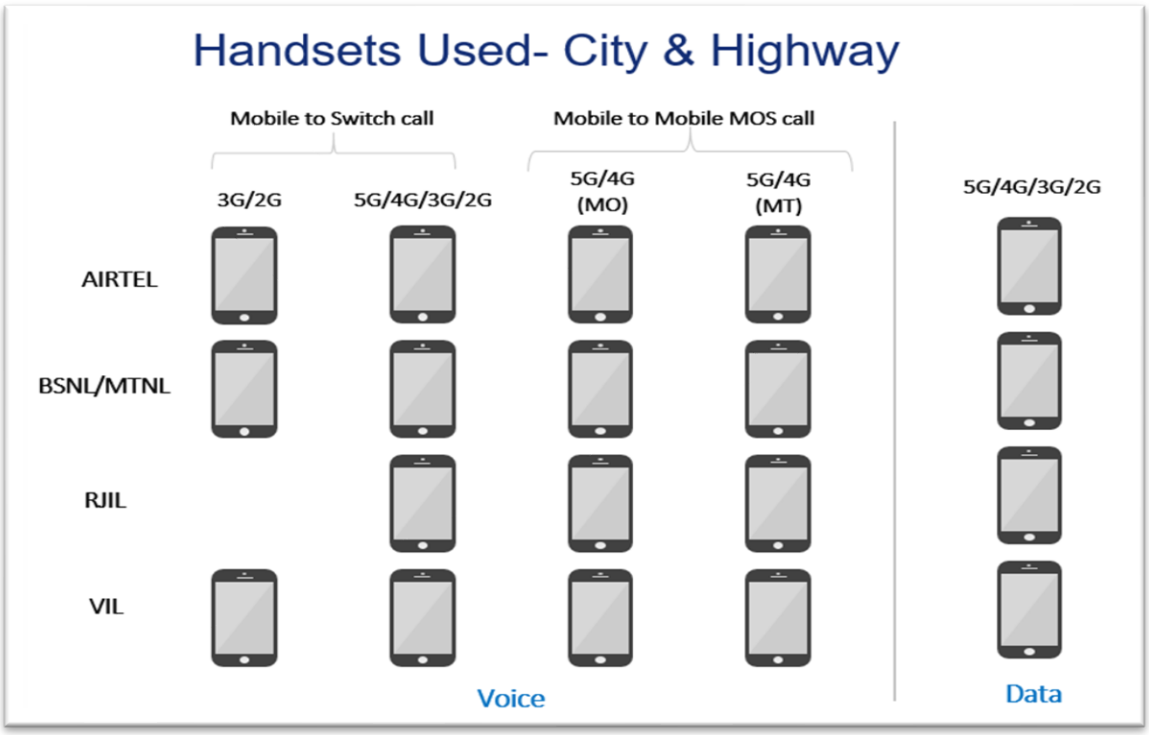


Figure-116: Number of handsets used in city & highway drive

MO: Mobile originating

MT: Mobile terminating

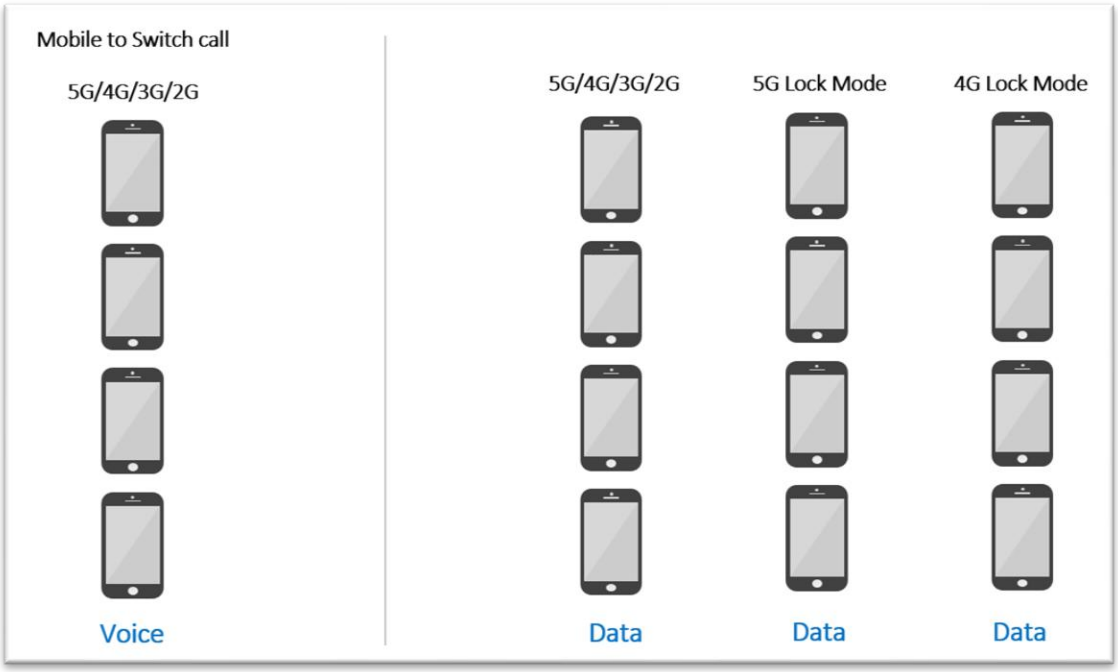


Figure-117: Number of handsets used in railway/metro/walktest/hotspot/ coastal area

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

7.1.2 Drive test Methodology

(a) Dynamic voice testing (on the move)

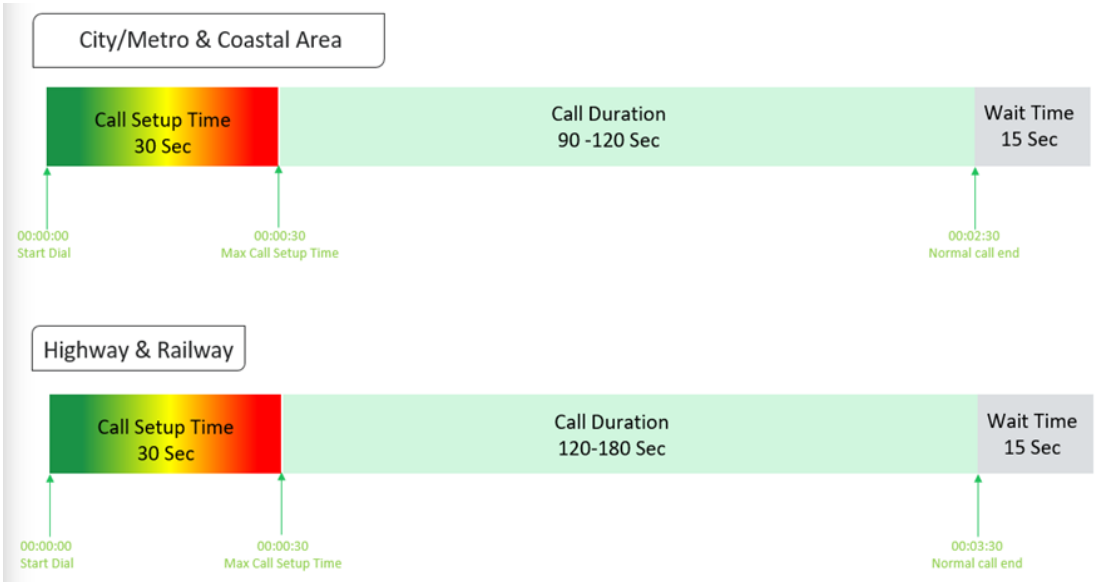


Figure-118: Voice test script for city/railway/metro/highway & coastal area

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

(b) Hotspot voice testing



Figure-119: 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

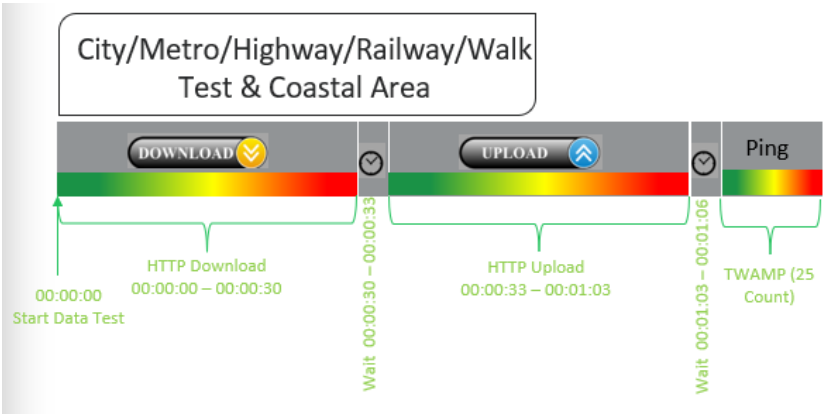


Figure-120: Data test script used in city/metro/railway/highway/walk test & coastal area

(d) Static Data(internet) testing

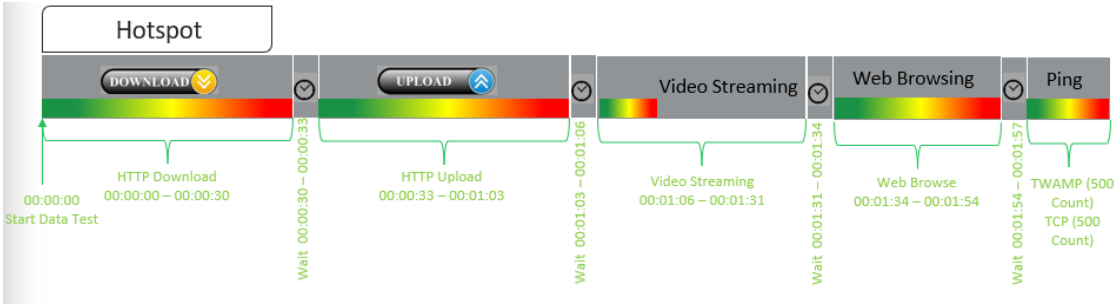


Figure-121: Data test script used at hotspot

- 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.
- One ping iteration (with 500 Count of each- TWAMP & TCP) 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-79: 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 (TWAMP-UDP)	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 (TWAMP-UDP)	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 (TWAMP-UDP & TCP)	Number of packets lost out of total packet transferred during test. Packet loss rate = (Total packet lost / Total packet sent) *100 * Packet delay (using TWAMP-UDP & TCP) >90 ms considered as packet loss and included in packet loss rate. * Packet loss rate is calculated based on TWAMP-UDP & TCP. *90th percentile for Packet loss rate has been reported in overall Hotspot performance summary.

Table-80: 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: 2026.10.01 15:39:58 +05'30'