



TELECOM REGULATORY AUTHORITY OF INDIA

Independent Drive Test Report

West Bengal LSA

July 2025

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1. Introduction

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

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

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

2. Executive Summary (LSA)

2.1 Drive test details

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

S. No	Drive test route	Type of route	Distance covered (KMs)	From date	To date
1	Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha towns and adjoining areas	City	691.0	1-July-2025	17-July-2025
2	Durgapur and Tamluk	Inter Operator Calling	2 Locations	07-July-2025	19-July-2025
3	Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha	Hotspot	23 Locations	02-July-2025	19-July-2025
4	Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha	Walk Test	7.0	1-July-2025	18-July-2025

Table-1: Drive test summary.

Note-

- Asansol, Durgapur, Bardhaman citiy & adjoining area drive have been done from 1st July to 5th July 2025 and Tamluk, Haldia, Contai, Digha citiy adjoining area drive have been done from 15th July to 17th July 2025.
- Hotspot testing has been done in Asansol, Durgapur & Bardhaman citiy on 2nd July, 4th July, 5th July & 7th July 2025 and in Tamluk, Haldia, Contai & Digha citiy on 17th July to 19th July 2025.
- Walk test testing has been done in Asansol, Durgapur & Bardhaman citiy on 1st July, 3rd July & 4th July 2025 and in Tamluk, Haldia, Contai & Digha citiy on 15th July, 16th July & 18th July 2025.

2.2 Drive test routes

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

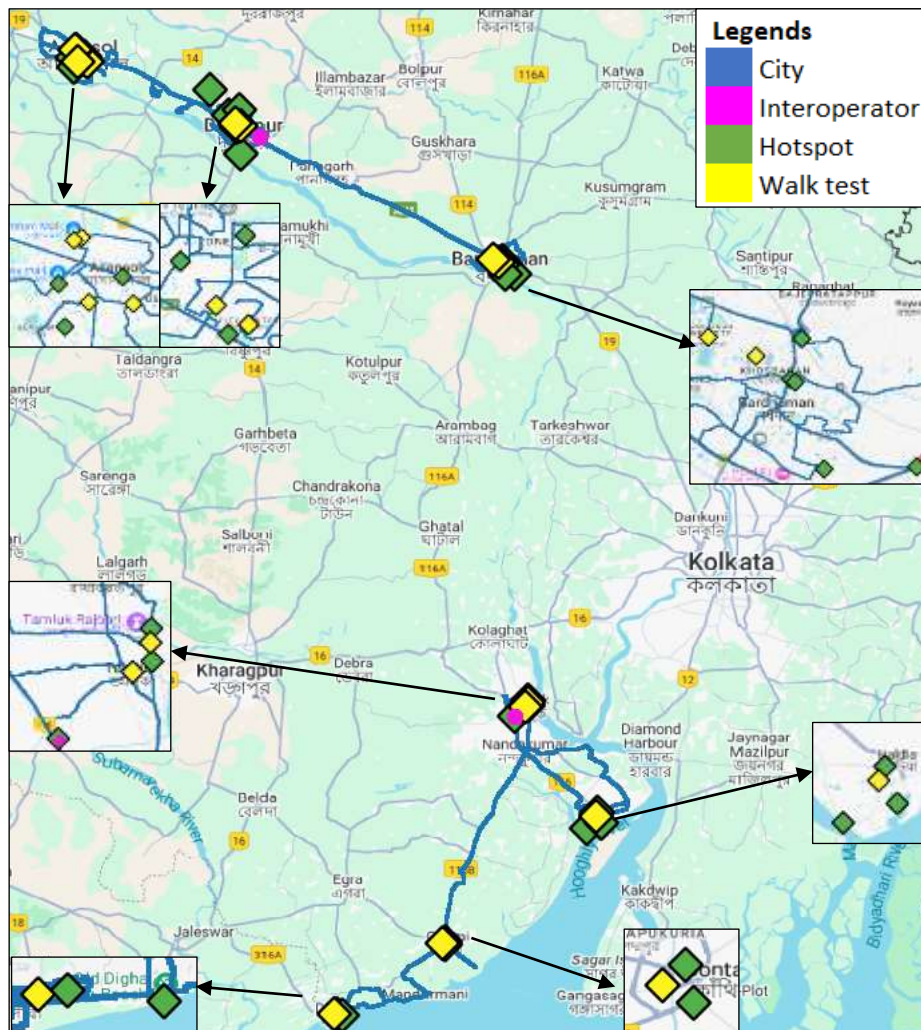


Figure-1: Drive test routes.

2.3 Summary of areas covered

a) City-Nearby Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha towns and adjoining areas.

b) Hotspot-

1. Asansol Railway Station
2. Bardhaman Railway Station
3. Bargabhima Mandir
4. Benachity Market
5. Burdwan Ullash More Bus Stop, Ullash
6. City Centre Haldia, Ambuja City Centre
7. Coast Guard Station, Haldia
8. Contai Bazaar, Jalalkhanbar, Contai
9. Curzon Gate
10. D.M. Office, Tamluk

11. Digha Bus Stand, Kumarpur, Contai
12. D.M. Office, Burdwan
13. Dsp Main Hospital, Durgapur
14. Durgapur Barrage
15. Durgapur Bus Stand
16. Galaxy Mall, Burnpur, Asansol
17. Haldia International Airport L2 Terminal
18. Jagannathdham Temple , Digha
19. Kazi Nazrul Islam Airport, Durgapur
20. Old Digha Sea Beach
21. Sail Isp Burnpur Hospital Asansol
22. St. Xaviernulls College, Barddhaman
23. Tamralipta Mahavidyalaya, Tamluk

c) Walk Test

1. Asansol Super Speciality Hospital, Asansol
2. Bidhan Chandra College, Burdwan
3. Burdwan Medical College and Hospital
4. Burdwan University
5. Digha Railway Station
6. District Magistrate Office, Asansol Sadar
7. Durgapur City Center
8. Haldia Institute Of Technology
9. National Institute Of Technology, Durgapur
10. Prabhat Kumar College, Contai
11. Sentrum Mall, Asansol
12. Tamluk District Court
13. Tamralipto Government Medical College, Sriram Pur, Tamluk

2.4 Telecom service providers detected frequency bands

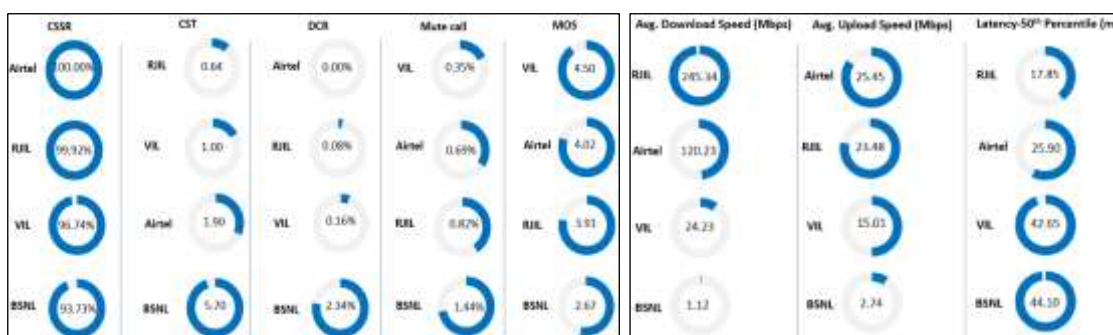
Technologies covered during the IDT and frequency bands in use are summarised in table below:

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	900
10	Vodafone Idea Ltd.	4G	900,1800,2100,2500

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

2.5 Performance against key QoS parameters

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



Summary-Voice services

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 100.00%, 93.73%, 99.92% and 96.74% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL and VIL have call setup time of 1.90, 5.70, 0.64 & 1.00 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.00%, 2.34%, 0.08% & 0.16% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate 0.69%, 1.44%, 0.82% and 0.35% respectively in packet switched network (5G/4G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have Average MOS of 4.02, 2.67, 3.91 & 4.50 respectively.

Summary-Data services

Data Download performance (Overall):

Average download speed of Airtel (5G/4G/2G) is 120.23 Mbps, BSNL (4G/3G/2G) is 1.12 Mbps, RJIL (5G/4G) is 245.34 Mbps and VIL (4G/2G) is 24.23 Mbps.

Data Upload performance (Overall):

Average upload speed of Airtel (5G/4G/2G) is 25.45 Mbps, BSNL (4G/3G/2G) is 2.74 Mbps, RJIL (5G/4G) is 23.48 Mbps and VIL (4G/2G) is 15.01 Mbps.

Latency (Overall): Airtel, BSNL, RJIL and VIL 50th percentile latency is 25.90 ms, 44.10 ms, 17.85 ms and 42.65 ms.

Data performance - Hotspots (in Mbps):

Airtel- 4G D/L: 44.40 4G U/L: 7.19
 5G D/L: 140.69 5G U/L: 40.68
 BSNL- 4G D/L: 1.65 4G U/L: 3.48
 RJIL- 4G D/L: 35.45 4G U/L: 11.61
 5G D/L: 226.65 5G U/L: 22.59
 VIL- 4G D/L: 21.11 4G U/L: 12.79

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

QoS Performance Analysis- West Bengal LSA

3. QoS performance analysis-LSA level

3.1 Overview

This section provides summary of overall QoS performance of the telecom service provider's network in the LSA by aggregating the results of drive tests conducted in the LSA during the month of July-2025 covering city drive, hotspots and walk test (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	839	870	847
Call Setup Success Rate %	99.52	98.97	98.94
Drop Call Rate %	0.36	2.44	0.12
Call Setup Time-Average (Second)	5.29	2.52	4.58
Handover Success Rate %	99.51	99.61	99.65

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

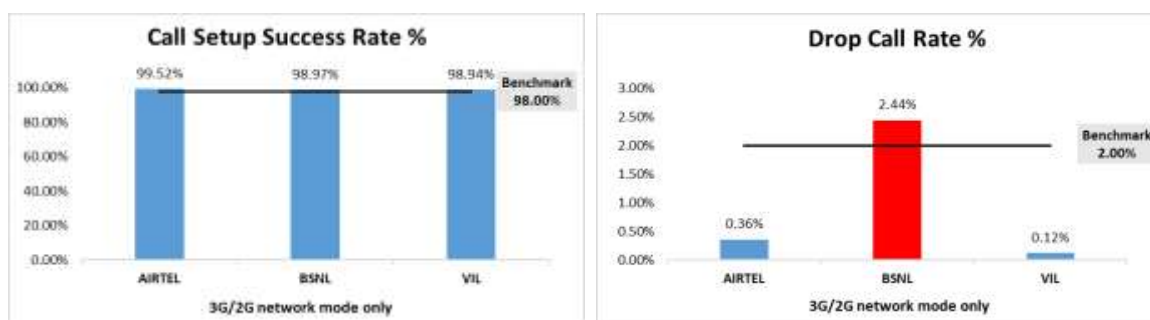


Figure-2: Call setup success rate and drop call rate performance.

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	185	NA
2G	1130	226	865

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	1252	1324	1282	1287
Call Setup Success Rate %	100.00	93.73	99.92	96.74
Drop Call Rate %	0.00	2.34	0.08	0.16
Call Setup Time-Average (Second)	1.90	5.70	0.64	1.00
Handover Success Rate %	99.92	99.40	99.89	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)	873	902	858	862
Number of silence call for >4 Sec	6	13	7	3
Silence Call Rate %	0.69	1.44	0.82	0.35
Number of silence instances for >4 Sec	6	15	13	4
Number of silence instances for >3 Sec	16	40	20	13
Number of silence instances for >2 sec	37	65	58	80
RTP Jitter (4G & 5G) in ms	5.11	7.83	7.74	13.13
Packet loss Rate Downlink %	0.52	4.49	0.44	0.62
Packet loss Rate Uplink %	0.50	4.32	0.70	0.55

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

Number of unique cell Id's covered in Voice test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
5G	0	NA	1011	NA
4G	2291	557	2905	1274
3G	NA	87	NA	NA
2G	0	224	NA	22

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

Note-

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

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

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

Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
Total Number of MOS Samples for calls table-6	7601	6185	7550	7552
Speech Quality (Average MOS)	4.02	2.67	3.91	4.50
Number of samples with MOS ≥ 4 to <5 (Excellent)	6493	1316	5571	6650
Number of samples with MOS ≥ 3 to <4 (Good)	926	729	1547	680
Number of samples with MOS ≥ 2 to <3 (Fair)	94	2356	290	151
Number of samples with MOS ≥ 1 to <2 (Poor)	88	1784	142	71
%age of samples with MOS ≥ 4 to <5 (Excellent)	85.42%	21.28%	73.79%	88.06%
%age of samples with MOS ≥ 3 to <4 (Good)	12.18%	11.79%	20.49%	9.00%
%age of samples with MOS ≥ 2 to <3 (Fair)	1.24%	38.09%	3.84%	2.00%
%age of samples with MOS ≥ 1 to <2 (Poor)	1.16%	28.84%	1.88%	0.94%

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

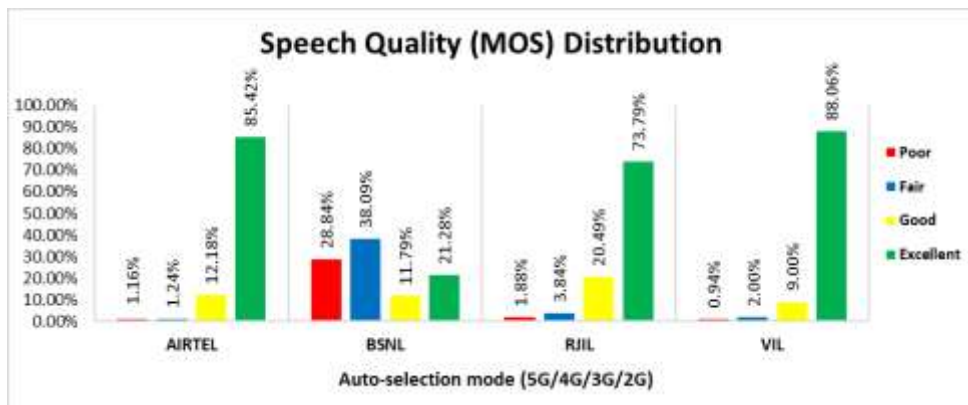


Figure- 4: Distribution of samples in MOS range.

(d) Inter-service provider voice call performance: To check the performance of inter-service provider call setup success rate, total 62 to 71 inter operator calls were attempted at two locations which are Hotel Pritika Durgapur and Tamluk RTO Office. 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	93.55	95.38	100.00
BSNL	100.00	NA	96.97	100.00
RJIL	100.00	100.00	NA	100.00
VIL	100.00	100.00	98.51	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	8.27	3.43	2.65
BSNL	4.13	NA	7.87	7.16
RJIL	1.79	2.19	NA	1.82
VIL	1.97	2.49	2.07	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	120.23	1.12	245.34	24.23
	80th Percentile	199.83	1.57	439.16	35.63
	20th Percentile	31.18	0.49	48.47	12.13
Upload Throughput (Mbits/s)	Average	25.45	2.74	23.48	15.01
	80th Percentile	46.63	3.88	43.27	25.97
	20th Percentile	5.04	1.10	3.98	3.79
Latency (ms)	50th Percentile	25.90	44.10	17.85	42.65

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

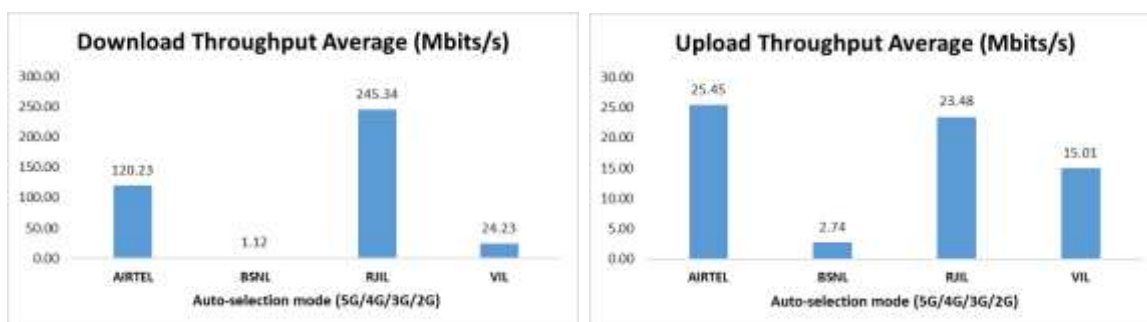


Figure-5: Download and Upload throughput.

Number of unique cell Id's covered in Data test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
5G	0	NA	1428	NA
4G	2301	579	797	1410
3G	NA	156	NA	NA
2G	2	67	NA	72

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

Note-

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

Detailed QoS Performance Analysis

4. Detailed QoS performance analysis

4.1 Overview

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

4.2 City

Drive test has been conducted on 1st July 2025 and 17th July 2025 in Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha towns and adjoining areas. (Refer Table-1)

4.2.1 Drive test route

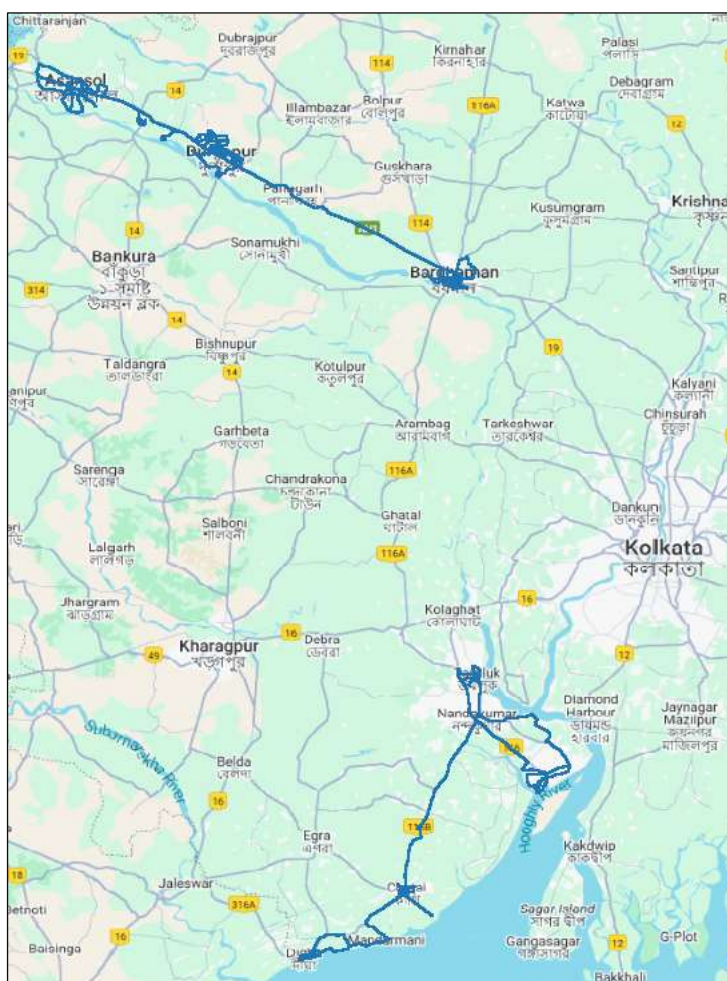


Figure- 6: Drive test routes

4.2.2 Areas covered

Nearby Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha towns and adjoining areas.

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	839	870	847
Call Setup Success Rate %	99.52	98.97	98.94
Drop Call Rate %	0.36	2.44	0.12
Call Setup Time-Average (Second)	5.29	2.52	4.58
Handover Success Rate %	99.51	99.61	99.65

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

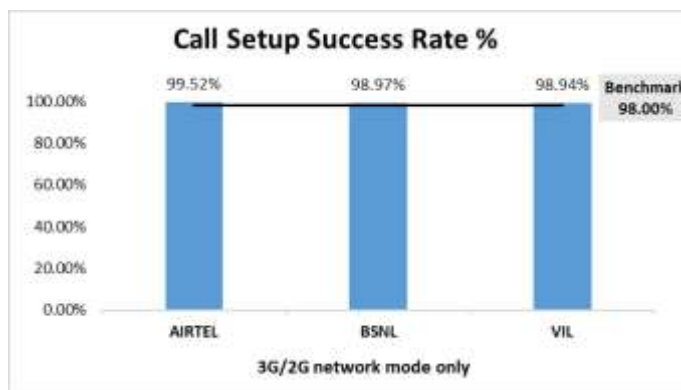


Figure-7: Performance for call setup success rate.

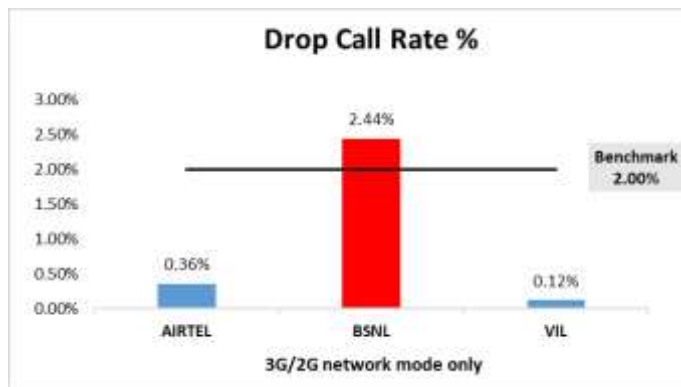


Figure-8: Performance for drop call rate.

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

Technology	Service Provider		
	AIRTEL	BSNL	VIL
3G	NA	67.92%	NA
2G	99.94%	32.05%	99.97%
Limited Service	0.06%	0.03%	0.03%

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

Note-

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

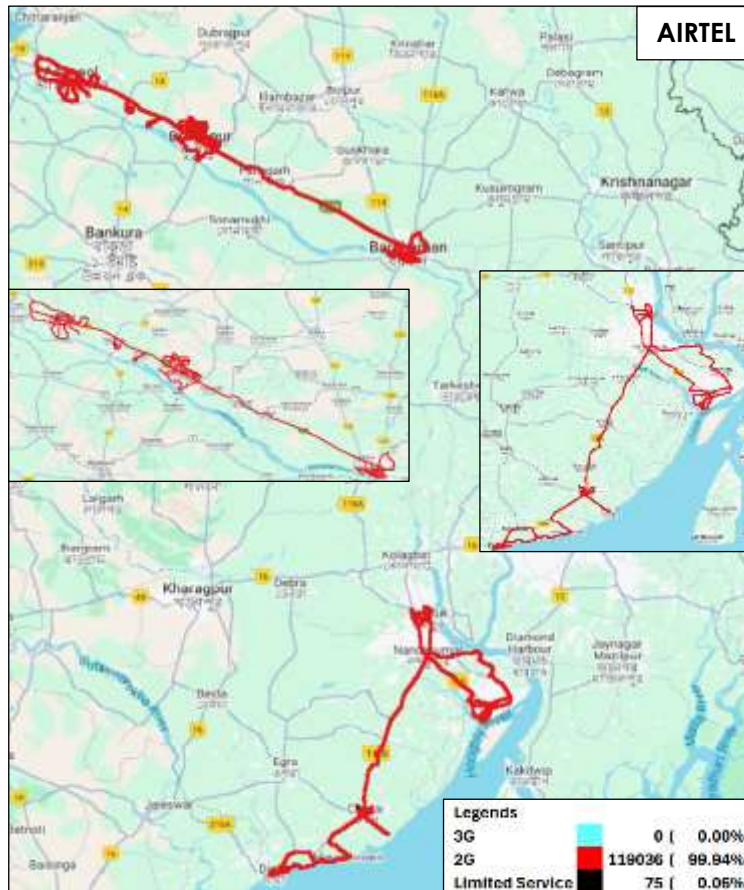


Figure-9: Serving technology plots 3G/2G network mode – AIRTEL

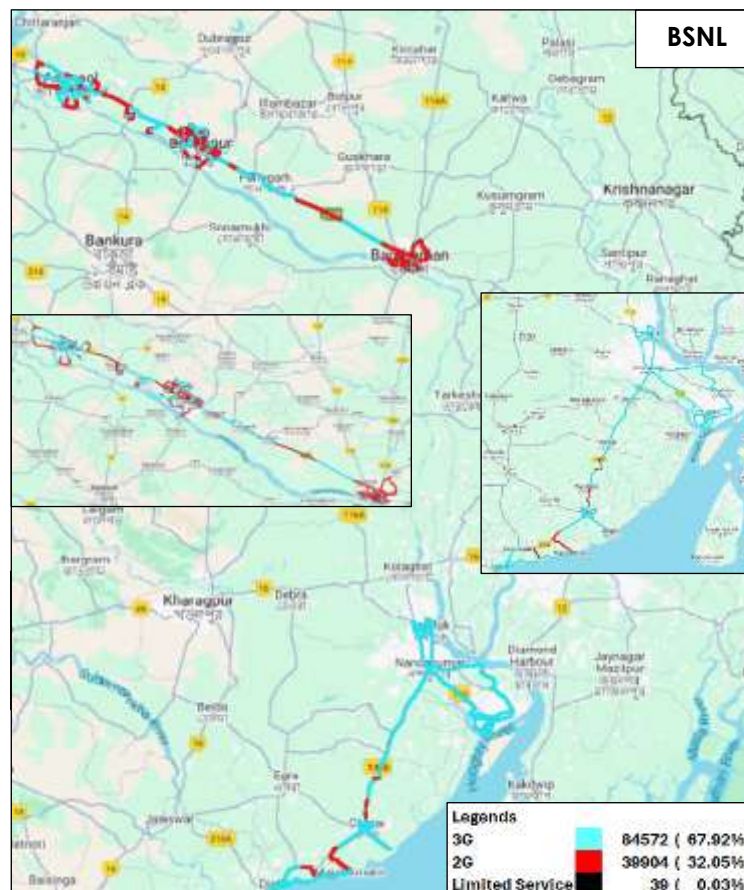


Figure-10: Serving technology plots 3G/2G network mode –BSNL.



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- 64, 65 & 66 for map view)

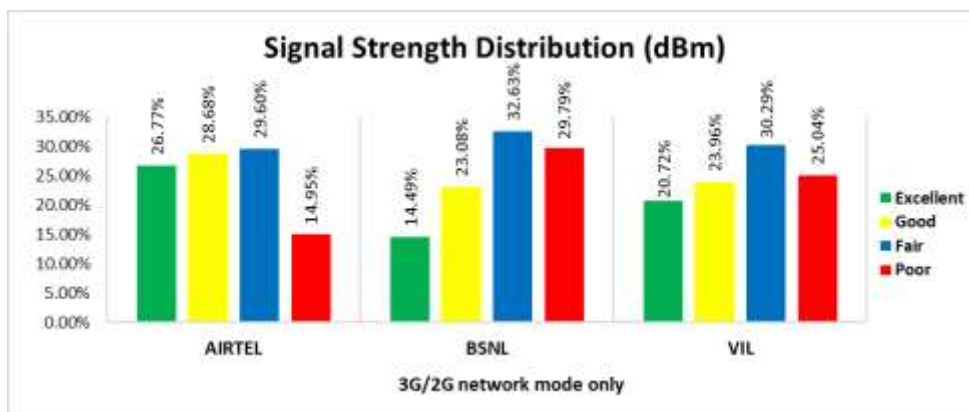


Figure-12: Signal strength distribution 3G/2G network mode only.

Observations:

- Airtel has 27% of samples falling in the excellent signal strength category.
- BSNL has 14% of samples falling in the excellent signal strength category.
- VIL has 21% 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	875	939	900	906
Call Setup Success Rate %	100.00	92.12	99.89	95.36
Drop Call Rate %	0.00	3.12	0.11	0.23
Call Setup Time Average (Second)	1.89	5.72	0.63	1.03
Handover Success Rate %	99.91	99.30	99.91	100.00

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

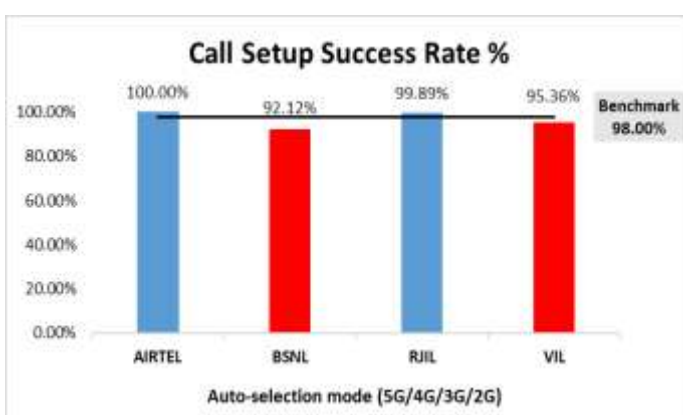


Figure-13: Performance for call setup success rate.

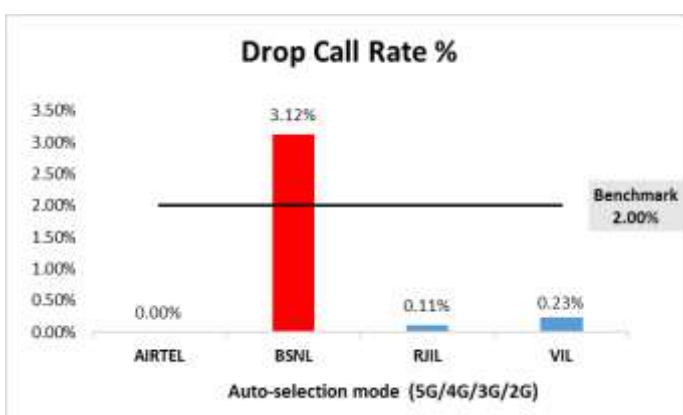


Figure-14: Performance for drop call rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	873	902	858	862
Number of silence call for >4 Sec	6	13	7	3
Silence Call Rate %	0.69	1.44	0.82	0.35
Number of silence instances for >4 Sec	6	15	13	4
Number of silence instances for >3 Sec	16	40	20	13
Number of silence instances for >2 sec	37	65	58	80
RTP Jitter (4G & 5G) in ms	5.11	7.83	7.74	13.13
Packet loss Rate Downlink %	0.52	4.49	0.44	0.62
Packet loss Rate Uplink %	0.50	4.32	0.70	0.55

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

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

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

Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
Total Number of MOS Samples for calls in table-16	7601	6185	7550	7552
Speech Quality (Average MOS)	4.02	2.67	3.91	4.50
Number of samples with MOS ≥ 4 to <5 (Excellent)	6493	1316	5571	6650
Number of samples with MOS ≥ 3 to <4 (Good)	926	729	1547	680
Number of samples with MOS ≥ 2 to <3 (Fair)	94	2356	290	151
Number of samples with MOS ≥ 1 to <2 (Poor)	88	1784	142	71
%age of samples with MOS ≥ 4 to <5 (Excellent)	85.42%	21.28%	73.79%	88.06%
%age of samples with MOS ≥ 3 to <4 (Good)	12.18%	11.79%	20.49%	9.00%
%age of samples with MOS ≥ 2 to <3 (Fair)	1.24%	38.09%	3.84%	2.00%
%age of samples with MOS ≥ 1 to <2 (Poor)	1.16%	28.84%	1.88%	0.94%

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

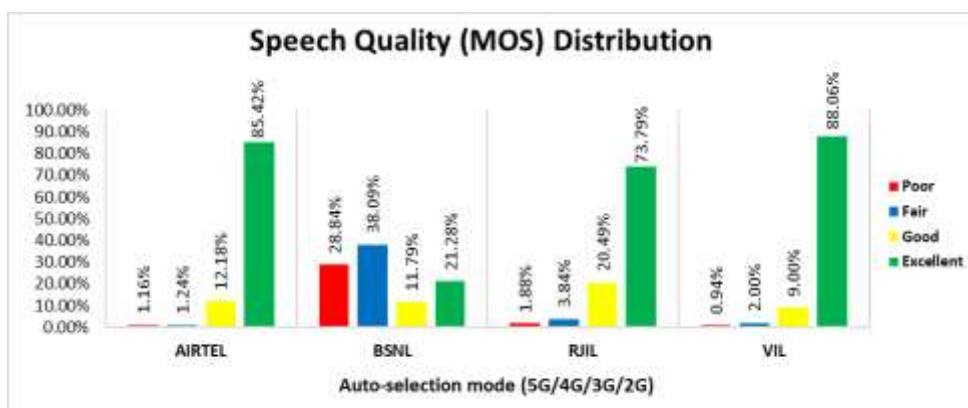


Figure-15: Distribution of samples in MOS range.

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

Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	7.25%	NA	16.75%	NA
4G	92.75%	59.31%	83.25%	99.10%
3G	NA	18.96%	NA	NA
2G	0.00%	21.58%	NA	0.89%
Limited Service	0.00%	0.15%	0.00%	0.01%

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

Note-

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



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

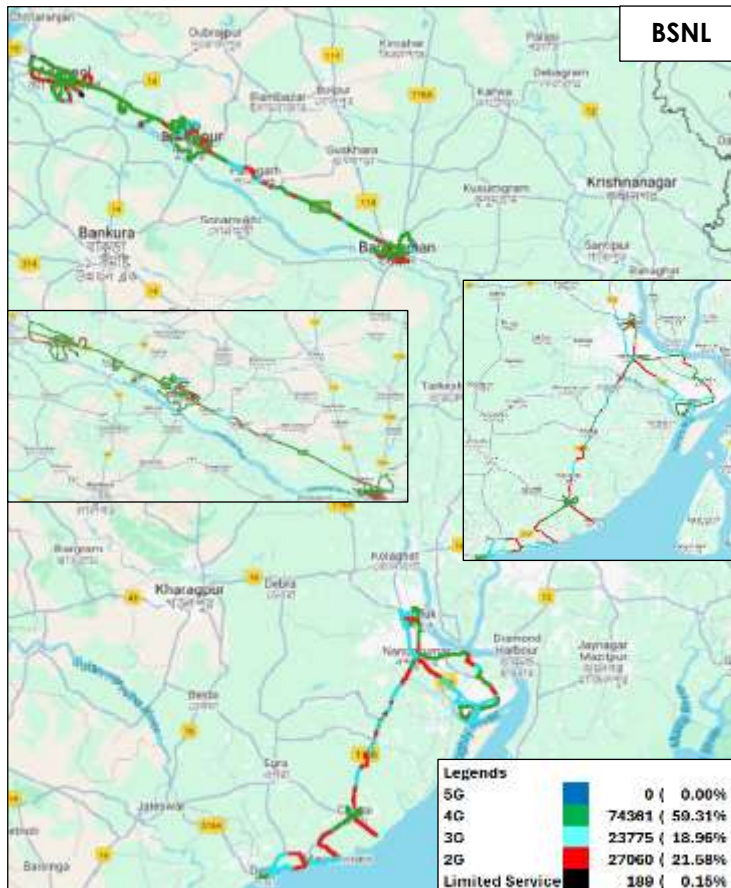


Figure-17: Serving technology plots in auto-selection mode (5G/4G/3G/2G-4G network being rolled out) -BSNL.



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



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

(g) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G). (Refer figure-67, 68, 69 & 70 for map view)

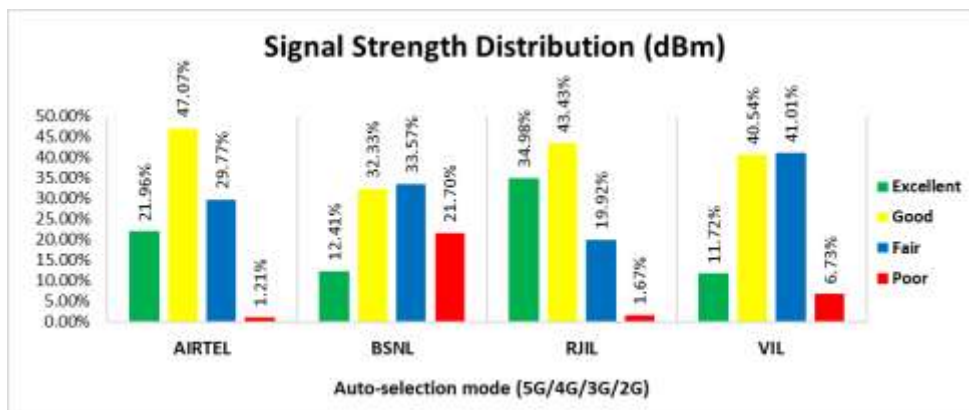


Figure-20: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

Observations:

- Airtel has 22% of samples falling in the excellent signal strength category.
- BSNL has 12% of samples falling in the excellent signal strength category.
- RJIL has 35% of samples falling in the excellent signal strength category.
- VIL has 12% of samples falling in the excellent signal strength category.

4.2.4 Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	110.42	1.08	246.43	23.70
	80th Percentile	184.54	1.55	440.11	35.35
	20th Percentile	29.16	0.40	48.47	11.23
Upload Throughput (Mbits/s)	Average	24.03	2.68	23.35	15.03
	80th Percentile	44.24	4.02	43.02	25.80
	20th Percentile	4.62	0.85	3.75	3.82
Latency (ms)	50th Percentile	25.95	45.35	17.20	42.00

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

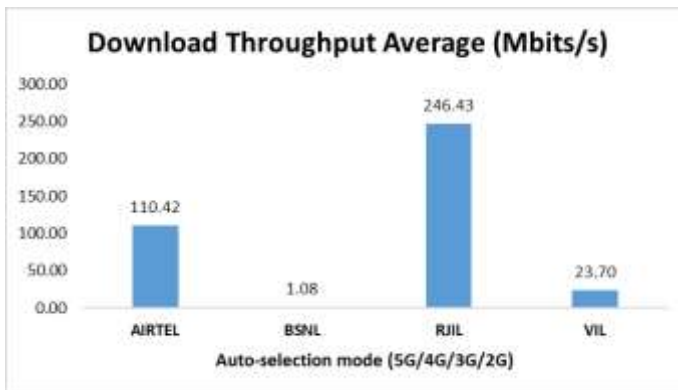


Figure- 21: Download throughput.

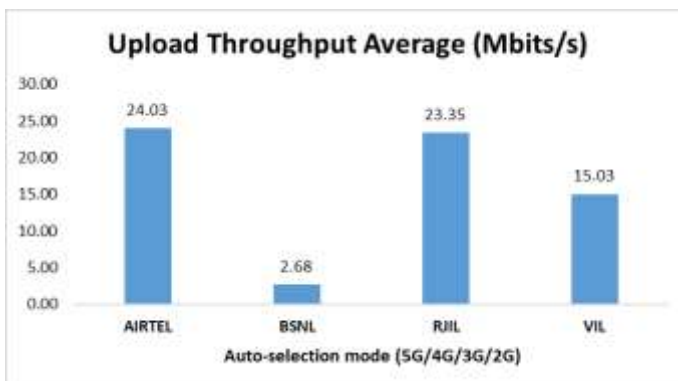


Figure- 22: Upload throughput.

4.3 Hotspots

Hotspots testing has been done on 2nd July 2025 and 19th July 2025. Twenty three locations have been tested in the Asansol, Durgapur, Bardhaman, Tamluk, Haldia, Contai and Digha town.

4.3.1 Locations

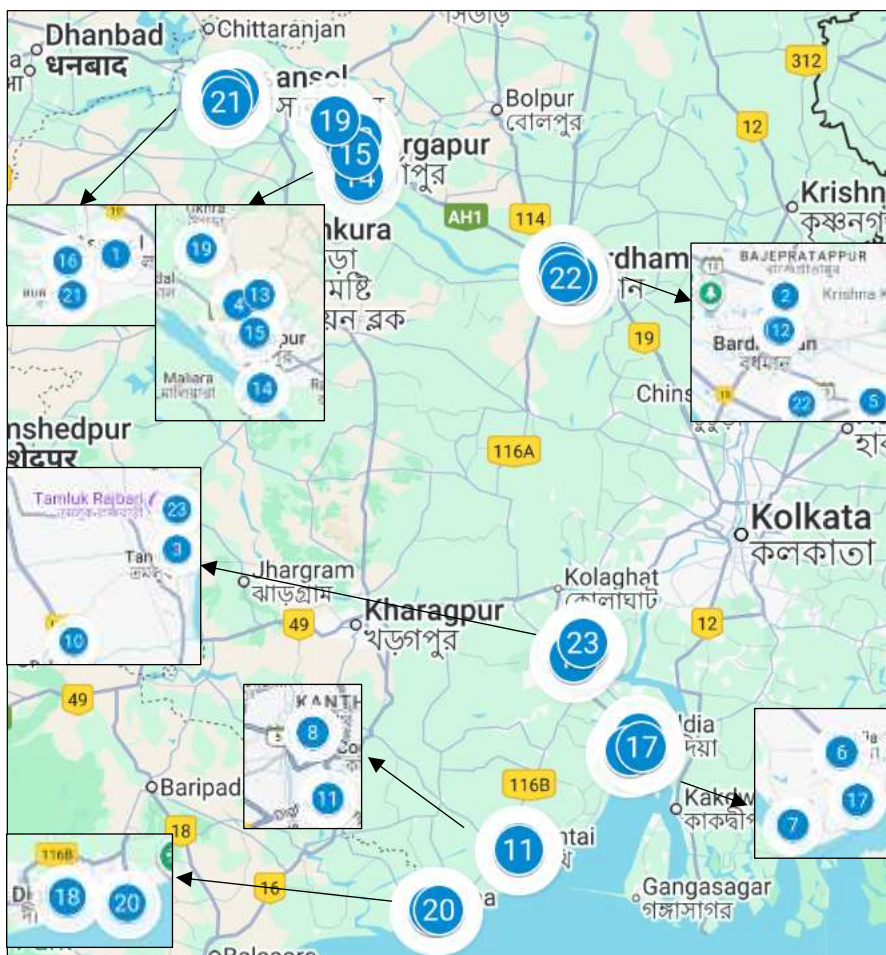


Figure- 23: Hotspot locations

4.3.2 Hotspot covered

1. Asansol Railway Station
2. Bardhaman Railway Station
3. Bargabhimanda Mandir
4. Benachity Market
5. Burdwan Ullash More Bus Stop, Ullash
6. City Centre Haldia, Ambuja City Centre
7. Coast Guard Station, Haldia
8. Contai Bazaar, Jalalkhanbar, Contai
9. Curzon Gate
10. D.M. Office, Tamluk
11. Digha Bus Stand, Kumarpur, Contai
12. D.M. Office, Burdwan
13. Dsp Main Hospital, Durgapur

14. Durgapur Barrage
15. Durgapur Bus Stand
16. Galaxy Mall, Burnpur, Asansol
17. Haldia International Airport L2 Terminal
18. Jagannathdham Temple , Digha
19. Kazi Nazrul Islam Airport, Durgapur
20. Old Digha Sea Beach
21. Sail Isp Burnpur Hospital Asansol
22. St. Xaviernulls College, Bardhaman
23. Tamralipta Mahavidyalaya, Tamluk

4.3.3 Voice performance

Overall Voice Performance				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	230	230	230	230
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.43	0.00	0.00
Call Setup Time-Average (Second)	1.93	5.49	0.69	0.93

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

Asansol Railway Station				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	2.18	7.21	0.68	0.91

Table-21: 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.

Bardhaman Railway Station				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.89	7.19	0.62	0.91

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

Bargabhima Mandir				
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)	2.18	2.75	0.55	0.97

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

Benachity Market				
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)	1.85	5.48	0.54	0.85

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

Burdwan Ullash More Bus Stop, Ullash				
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)	1.82	3.61	0.57	0.86

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

City Centre Haldia, Ambuja City Centre				
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)	1.88	2.16	0.64	0.83

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

Coast Guard Station, Haldia				
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)	1.97	2.58	0.61	0.97

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

Contai Bazaar, Jalalkhanbar, Contai				
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)	1.80	1.99	0.49	0.94

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

Curzon Gate				
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)	1.90	7.22	0.57	0.91

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

D.M. Office, Tamluk				
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)	1.78	7.07	0.58	0.92

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

Digha Bus Stand, Kumarpur, Contai				
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)	2.29	7.45	0.60	0.93

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

D.M. Office, Burdwan				
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)	1.86	7.15	0.51	0.95

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

Dsp Main Hospital, Durgapur				
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)	1.97	7.68	0.55	0.90

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

Durgapur Barrage				
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)	1.85	7.63	0.51	1.00

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

Durgapur Bus Stand				
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)	2.25	5.95	2.83	0.98

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

Galaxy Mall, Burnpur, Asansol				
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)	1.72	7.12	0.51	0.88

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

Haldia International Airport L2 Terminal				
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)	1.91	2.37	0.78	1.01

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

Jagannathdham Temple , Digha				
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)	1.81	7.49	0.58	0.89

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

Kazi Nazrul Islam Airport, Durgapur				
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)	1.81	7.23	0.59	0.98

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

Old Digha Sea Beach				
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)	1.83	2.07	0.60	0.98

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

Sail Isp Burnpur Hospital Asansol				
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)	2.08	7.49	0.52	0.84

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

St. Xaviernulls College, Bardhaman				
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)	1.86	2.05	0.95	0.89

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

Tamralipta Mahavidyalaya, Tamluk				
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)	1.93	7.41	0.54	1.02

Table-43: 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)	129.45	1.43	204.01	24.90
Download Throughput 80th Percentile (Mbit/s)	216.69	2.00	318.56	34.16
Download Throughput 20th Percentile (Mbit/s)	37.11	0.62	32.27	14.64
Download Session Setup Success Rate %	96.52	89.57	90.43	100.00
Upload Throughput Average (Mbits/s)	28.82	2.68	15.29	12.51
Upload Throughput 80th Percentile (Mbit/s)	57.92	3.22	21.42	20.45
Upload Throughput 20th Percentile (Mbit/s)	5.91	1.22	3.27	3.13
Upload Session Setup Success Rate %	96.52	88.70	98.26	100.00
Web Browsing Delay (Second)	2.51	3.27	3.13	2.88
Youtube Initial Buffer Delay (Second)	1.19	3.51	1.25	1.44
Latency (ms) - 50th Percentile	26.95	43.40	18.90	43.95
Jitter (ms)	16.67	17.80	14.80	5.66
Packet Loss Rate%	5.27	87.15	2.96	1.72
Packet Loss Rate- 90th percentile	12.18	100.00	1.54	5.08

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

Asansol Railway Station				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	159.62	1.52	173.55	11.82
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	12.44	2.78	7.02	9.94
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.31	2.77	2.23	2.87
Youtube Initial Buffer Delay (Second)	0.87	1.44	0.59	0.90
Latency (ms) - 50th Percentile	32.25	-	13.60	35.25
Jitter (ms)	13.64	-	12.19	3.15
Packet Loss Rate%	1.70	100.00	0.30	0.60

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

Note- Ping tests were failed.

Bardhaman Railway Station				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	113.01	0.62	70.36	11.76
Download Session Setup Success Rate %	100.00	80.00	100.00	100.00
Upload Throughput Average (Mbits/s)	33.05	0.00	3.91	6.41
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.16	6.05	3.27	2.46
Youtube Initial Buffer Delay (Second)	0.84	16.20	1.70	1.14
Latency (ms) - 50th Percentile	33.95	-	26.40	57.50
Jitter (ms)	9.17	-	10.79	6.79
Packet Loss Rate%	0.00	100.00	0.30	3.80

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

Note- Ping tests were failed.

Bargabhima Mandir				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	60.08	0.59	21.22	32.20
Download Session Setup Success Rate %	100.00	40.00	80.00	100.00
Upload Throughput Average (Mbits/s)	5.74	0.46	8.95	4.77
Upload Session Setup Success Rate %	100.00	60.00	100.00	100.00
Web Browsing Delay (Second)	2.68	2.84	3.10	2.89
Youtube Initial Buffer Delay (Second)	0.89	-	1.55	1.02
Latency (ms) - 50th Percentile	22.00	-	20.65	52.00
Jitter (ms)	5.86	-	4.13	4.31
Packet Loss Rate%	0.00	100.00	0.00	0.30

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

Note-"" Youtube & Ping tests were failed.

Benachity Market				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	111.17	3.23	654.72	34.87
Download Session Setup Success Rate %	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	19.85	11.39	62.02	4.91
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.39	2.91	2.25	2.63
Youtube Initial Buffer Delay (Second)	0.73	3.53	0.59	1.11
Latency (ms) - 50th Percentile	43.30	37.00	17.08	50.50
Jitter (ms)	21.90	4.14	2.31	5.03
Packet Loss Rate%	4.70	0.70	0.00	0.10

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

Burdwan Ullash More Bus Stop, Ullash				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	125.99	0.19	188.52	16.97
Download Session Setup Success Rate%	100.00	20.00	100.00	100.00
Upload Throughput Average (Mbits/s)	23.51	0.00	4.45	3.47
Upload Session Setup Success Rate %	100.00	20.00	100.00	100.00
Web Browsing Delay (Second)	2.33	2.38	2.24	2.31
Youtube Initial Buffer Delay (Second)	0.66	-	0.79	0.93
Latency (ms)- 50th Percentile	21.90	-	17.15	39.35
Jitter (ms)	2.98	-	36.90	5.63
Packet Loss Rate%	0.00	100.00	0.50	0.50

Table-49: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-"" Youtube & Ping tests were failed.

City Centre Haldia, Ambuja City Centre				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	137.53	1.37	23.86	30.16
Download Session Setup Success Rate %	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	38.64	1.74	2.68	4.03
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	1.71	2.19	5.49	2.29
Youtube Initial Buffer Delay (Second)	0.71	2.64	3.71	1.83
Latency (ms) - 50th Percentile	26.25	-	32.78	52.50
Jitter (ms)	8.31	-	7.77	3.12
Packet Loss Rate%	0.50	100.00	0.10	0.10

Table-50: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-"-" Ping tests were failed.

Coast Guard Station, Haldia				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	21.99	2.03	23.81	26.07
Download Session Setup Success Rate %	80.00	60.00	60.00	100.00
Upload Throughput Average (Mbits/s)	2.47	4.57	3.69	1.30
Upload Session Setup Success Rate %	80.00	60.00	80.00	100.00
Web Browsing Delay (Second)	4.39	1.74	2.58	7.20
Youtube Initial Buffer Delay (Second)	2.77	1.66	0.99	3.51
Latency (ms) - 50th Percentile	53.50	8079.00	29.18	48.05
Jitter (ms)	35.14	1337.58	7.80	5.57
Packet Loss Rate%	6.10	99.70	0.10	0.40

Table-51: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Contai Bazaar, Jalalkhanbar,Contai				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	159.21	0.83	150.63	30.31
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	19.66	2.08	9.30	36.23
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.19	2.78	2.18	2.73
Youtube Initial Buffer Delay (Second)	0.62	4.52	0.67	0.92
Latency (ms) - 50th Percentile	15.40	-	19.45	39.18
Jitter (ms)	3.21	-	38.95	9.51
Packet Loss Rate%	0.10	100.00	1.30	12.80

Table-52: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-"-" Ping tests were failed.

Curzon Gate				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	275.83	0.82	143.76	35.83
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	70.65	3.23	53.30	33.85
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.08	3.13	2.45	2.41
Youtube Initial Buffer Delay (Second)	0.78	1.45	0.74	0.84
Latency (ms) - 50th Percentile	17.30	-	14.65	38.90
Jitter (ms)	81.72	-	3.02	6.83
Packet Loss Rate%	3.00	100.00	0.00	2.10

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

Note- Ping tests were failed.

D.M. Office, Tamluk				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	100.62	0.61	202.10	17.70
Download Session Setup Success Rate %	80.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	6.01	1.70	3.37	4.14
Upload Session Setup Success Rate %	80.00	80.00	100.00	100.00
Web Browsing Delay (Second)	4.42	3.84	2.56	2.81
Youtube Initial Buffer Delay (Second)	0.82	7.57	1.39	0.95
Latency (ms) - 50th Percentile	37.60	-	20.75	40.00
Jitter (ms)	9.66	-	6.37	5.78
Packet Loss Rate%	0.60	100.00	0.00	0.50

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

Note- Ping tests were failed.

Digha Bus Stand, Kumarpur, Contai				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	109.11	0.82	126.42	41.66
Download Session Setup Success Rate %	100.00	80.00	80.00	100.00
Upload Throughput Average (Mbits/s)	64.92	2.63	7.31	60.33
Upload Session Setup Success Rate %	100.00	80.00	100.00	100.00
Web Browsing Delay (Second)	2.48	2.65	2.83	2.53
Youtube Initial Buffer Delay (Second)	3.24	3.09	0.86	1.07
Latency (ms) - 50th Percentile	21.95	-	16.25	39.55
Jitter (ms)	2.94	-	3.25	2.20
Packet Loss Rate%	0.40	100.00	0.00	0.20

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

Note- Ping tests were failed.

Dm Office, Burdwan				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	213.52	1.07	400.16	19.50
Download Session Setup Success Rate %	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	20.84	3.36	13.24	17.56
Upload Session Setup Success Rate %	100.00	80.00	100.00	100.00
Web Browsing Delay (Second)	2.20	2.44	2.98	2.77
Youtube Initial Buffer Delay (Second)	0.87	1.64	1.07	1.24
Latency (ms) - 50th Percentile	20.38	-	23.15	46.65
Jitter (ms)	2.58	-	35.87	14.22
Packet Loss Rate%	0.00	100.00	1.60	8.40

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

Note--" Ping tests were failed.

Dsp Main Hospital, Durgapur				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	98.58	4.48	221.71	11.94
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	26.22	2.31	13.70	4.80
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.35	2.64	2.34	2.47
Youtube Initial Buffer Delay (Second)	3.20	3.75	0.57	1.08
Latency (ms) - 50th Percentile	20.15	44.95	12.05	38.10
Jitter (ms)	2.80	9.78	2.72	4.68
Packet Loss Rate%	0.00	2.80	0.10	0.10

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

Durgapur Barrage				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	242.80	2.51	344.67	30.07
Download Session Setup Success Rate %	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	5.20	2.03	21.77	1.62
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.23	5.06	1.92	3.37
Youtube Initial Buffer Delay (Second)	0.78	4.18	0.58	2.63
Latency (ms) - 50th Percentile	57.00	-	16.30	41.65
Jitter (ms)	23.36	-	4.32	7.43
Packet Loss Rate%	13.70	100.00	0.00	0.30

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

Note--" Ping tests were failed.

Durgapur Bus Stand				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	246.94	2.70	2.62	32.46
Download Session Setup Success Rate %	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	68.59	2.07	31.84	5.74
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.01	3.45	9.23	2.53
Youtube Initial Buffer Delay (Second)	0.83	2.49	5.03	0.84
Latency (ms) - 50th Percentile	16.65	-	63.50	51.00
Jitter (ms)	10.77	-	13.86	4.29
Packet Loss Rate%	0.40	100.00	39.20	0.20

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

Note-"-" Ping tests were failed.

Galaxy Mall, Burnpur, Asansol				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	357.99	0.73	213.97	37.27
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	90.95	0.57	18.99	10.24
Upload Session Setup Success Rate %	100.00	80.00	100.00	100.00
Web Browsing Delay (Second)	2.21	2.92	2.26	2.76
Youtube Initial Buffer Delay (Second)	0.68	2.49	0.57	1.11
Latency (ms) - 50th Percentile	20.05	-	13.30	44.10
Jitter (ms)	2.04	-	46.16	5.55
Packet Loss Rate%	0.00	100.00	0.60	0.40

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

Note-"-" Ping tests were failed.

Haldia International AirPort L2 Terminal				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	1.77	0.76	22.58	2.83
Download Session Setup Success Rate %	60.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	-	2.90	0.72	2.70
Upload Session Setup Success Rate %	60.00	100.00	80.00	100.00
Web Browsing Delay (Second)	8.44	3.22	6.63	2.87
Youtube Initial Buffer Delay (Second)	-	3.87	2.77	5.57
Latency (ms) - 50th Percentile	110.00	-	38.95	46.25
Jitter (ms)	52.86	-	53.94	7.59
Packet Loss Rate%	64.80	100.00	22.20	5.40

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

Note-"-" Youtbe & Ping tests were failed.

Jagannathdham Temple , Digha				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	46.76	1.18	182.00	17.84
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	11.37	2.47	6.03	22.67
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.74	3.20	2.64	3.11
Youtube Initial Buffer Delay (Second)	0.94	1.58	0.77	0.80
Latency (ms) - 50th Percentile	35.78	-	24.25	41.08
Jitter (ms)	5.48	-	5.60	5.46
Packet Loss Rate%	0.10	100.00	0.00	0.60

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

Note-"-" Ping tests were failed.

Kazi Nazrul Islam Airport, Durgapur				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	17.95	1.16	107.31	22.65
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	3.38	1.54	4.08	14.66
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.96	5.26	2.88	2.48
Youtube Initial Buffer Delay (Second)	2.60	3.48	0.81	0.89
Latency (ms) - 50th Percentile	35.15	-	13.75	36.23
Jitter (ms)	30.23	-	8.53	5.91
Packet Loss Rate%	4.00	100.00	0.60	0.50

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

Note-"-" Ping tests were failed.

Old Digha Sea Beach				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	83.81	1.62	345.28	23.38
Download Session Setup Success Rate %	100.00	80.00	100.00	100.00
Upload Throughput Average (Mbits/s)	63.20	1.34	19.65	4.66
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.24	3.50	2.37	2.59
Youtube Initial Buffer Delay (Second)	0.70	5.35	0.72	1.01
Latency (ms) - 50th Percentile	23.55	52.00	18.50	48.30
Jitter (ms)	7.72	10.10	12.65	4.03
Packet Loss Rate%	0.80	1.30	0.80	0.90

Table-64: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Sail Isp Burnpur Hospital Asansol				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	100.20	0.74	30.46	36.05
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	3.48	1.78	2.11	7.18
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.45	3.07	5.24	2.68
Youtube Initial Buffer Delay (Second)	1.23	2.20	5.61	1.33
Latency (ms) - 50th Percentile	37.80	-	14.03	43.40
Jitter (ms)	21.26	-	15.68	4.19
Packet Loss Rate%	5.10	100.00	0.40	0.20

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

Note- "-" Ping tests were failed.

St. Xaviernulls College, Bardhaman				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	72.03	1.36	271.48	19.98
Download Session Setup Success Rate %	100.00	100.00	80.00	100.00
Upload Throughput Average (Mbits/s)	5.99	2.21	9.79	1.36
Upload Session Setup Success Rate %	100.00	80.00	100.00	100.00
Web Browsing Delay (Second)	2.65	2.39	2.35	3.18
Youtube Initial Buffer Delay (Second)	0.94	2.05	0.95	4.08
Latency (ms) - 50th Percentile	56.50	-	22.18	54.50
Jitter (ms)	25.64	-	4.21	5.89
Packet Loss Rate%	15.20	100.00	0.00	1.10

Table-66: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-" Ping tests were failed.

Tamralipta Mahavidyalaya, Tamluk				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	42.56	0.52	705.29	29.41
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	8.50	0.56	35.59	21.69
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	2.53	4.38	2.07	2.73
Youtube Initial Buffer Delay (Second)	0.88	6.87	0.57	0.92
Latency (ms) - 50th Percentile	35.10	-	17.20	43.65
Jitter (ms)	4.46	-	3.91	3.02
Packet Loss Rate%	0.00	100.00	0.00	0.10

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

Note- "-" Ping tests were failed.

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

Overall Data Performance					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	140.69	-	226.65	-
	Upload Throughput Average (Mbits/s)	40.68	-	22.59	-
4G	Download Throughput Average (Mbits/s)	44.40	1.65	35.45	21.11
	Upload Throughput Average (Mbits/s)	7.19	3.48	11.61	12.79

Table-68: Overall Summary of 5G only & 4G only data download & upload speed.

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

Asansol Railway Station					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	100.18	-	149.76	-
	Upload Throughput Average (Mbits/s)	33.49	-	10.72	-
4G	Download Throughput Average (Mbits/s)	42.15	1.07	6.79	17.97
	Upload Throughput Average (Mbits/s)	6.20	2.97	3.09	16.00

Table-69: Overall Summary of 5G only & 4G only data download & upload speed.

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

Bardhaman Railway Station					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	65.65	-	21.78	-
	Upload Throughput Average (Mbits/s)	47.69	-	7.11	-
4G	Download Throughput Average (Mbits/s)	20.31	1.84	12.63	2.64
	Upload Throughput Average (Mbits/s)	6.26	3.21	11.04	3.60

Table-70: Overall Summary of 5G only & 4G only data download & upload speed.

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

Bargabhma Mandir					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	127.03	-	461.42	-
	Upload Throughput Average (Mbits/s)	7.03	-	34.16	-
4G	Download Throughput Average (Mbits/s)	45.36	2.07	62.92	28.36
	Upload Throughput Average (Mbits/s)	8.17	4.70	11.65	4.34

Table-71: Overall Summary of 5G only & 4G only data download & upload speed.

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

Benachity Market					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	50.21	-	631.51	-
	Upload Throughput Average (Mbits/s)	12.77	-	64.42	-
4G	Download Throughput Average (Mbits/s)	140.53	2.95	99.06	32.30
	Upload Throughput Average (Mbits/s)	9.13	-	24.27	6.43

Table-72: Overall Summary of 5G only & 4G only data download & upload speed.

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

Burdwan Ullash More Bus Stop, Ullash					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	168.63	-
	Upload Throughput Average (Mbits/s)	-	-	9.59	-
4G	Download Throughput Average (Mbits/s)	39.06	0.61	7.34	7.27
	Upload Throughput Average (Mbits/s)	6.89	1.78	5.17	6.14

Table-73: Overall Summary of 5G only & 4G only data download & upload speed.

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

City Centre Haldia, Ambuja City Centre					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	94.53	-	18.63	-
	Upload Throughput Average (Mbits/s)	42.60	-	3.13	-
4G	Download Throughput Average (Mbits/s)	35.33	0.84	22.01	12.61
	Upload Throughput Average (Mbits/s)	7.15	-	5.82	17.67

Table-74: Overall Summary of 5G only & 4G only data download & upload speed.

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

Coast Guard Station, Haldia					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	11.01	-	22.50	-
	Upload Throughput Average (Mbits/s)	-	-	5.46	-
4G	Download Throughput Average (Mbits/s)	21.20	2.60	14.70	23.96
	Upload Throughput Average (Mbits/s)	2.13	4.45	1.96	5.14

Table-75: Overall Summary of 5G only & 4G only data download & upload speed.

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

Contai Bazaar, Jalalkhanbar, Contai					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	129.87	-	175.20	-
	Upload Throughput Average (Mbits/s)	30.74	-	14.13	-
4G	Download Throughput Average (Mbits/s)	21.82	1.02	30.23	23.77
	Upload Throughput Average (Mbits/s)	4.53	3.45	19.12	21.01

Table-76: Overall Summary of 5G only & 4G only data download & upload speed.

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

Curzon Gate					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	383.18	-
	Upload Throughput Average (Mbits/s)	-	-	86.82	-
4G	Download Throughput Average (Mbits/s)	68.22	1.46	53.49	31.85
	Upload Throughput Average (Mbits/s)	9.78	3.82	50.97	33.55

Table-77: Overall Summary of 5G only & 4G only data download & upload speed.

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

D.M. Office, Tamluk					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	68.09	-	242.03	-
	Upload Throughput Average (Mbits/s)	23.95	-	14.83	-
4G	Download Throughput Average (Mbits/s)	43.10	1.20	72.32	13.04
	Upload Throughput Average (Mbits/s)	6.82	2.69	10.00	8.78

Table-78: Overall Summary of 5G only & 4G only data download & upload speed.

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

Digha Bus Stand, Kumarpur, Contai					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	303.72	-	264.00	-
	Upload Throughput Average (Mbits/s)	75.42	-	17.20	-
4G	Download Throughput Average (Mbits/s)	35.12	0.75	16.12	39.39
	Upload Throughput Average (Mbits/s)	19.70	3.76	6.62	52.68

Table-79: Overall Summary of 5G only & 4G only data download & upload speed.

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

Dm Office, Burdwan					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	353.66	-
	Upload Throughput Average (Mbits/s)	-	-	25.50	-
4G	Download Throughput Average (Mbits/s)	66.26	1.46	31.64	19.85
	Upload Throughput Average (Mbits/s)	7.43	2.88	26.66	19.00

Table-80: Overall Summary of 5G only & 4G only data download & upload speed.

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

Dsp Main Hospital, Durgapur					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	220.42	-	252.59	-
	Upload Throughput Average (Mbits/s)	37.05	-	19.43	-
4G	Download Throughput Average (Mbits/s)	50.54	6.73	11.39	16.41
	Upload Throughput Average (Mbits/s)	5.86	3.18	1.30	3.16

Table-81: Overall Summary of 5G only & 4G only data download & upload speed.

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

Durgapur Barrage					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	261.66	-	321.29	-
	Upload Throughput Average (Mbits/s)	31.63	-	17.91	-
4G	Download Throughput Average (Mbits/s)	46.30	2.49	24.44	28.69
	Upload Throughput Average (Mbits/s)	4.49	4.86	6.74	3.96

Table-82: Overall Summary of 5G only & 4G only data download & upload speed.

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

Durgapur Bus Stand					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	0.20	-
	Upload Throughput Average (Mbits/s)	-	-	38.90	-
4G	Download Throughput Average (Mbits/s)	28.13	2.13	0.28	36.06
	Upload Throughput Average (Mbits/s)	7.81	4.62	10.11	36.11

Table-83: Overall Summary of 5G only & 4G only data download & upload speed.

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

Galaxy Mall, Burnpur, Asansol					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	497.67	-	-	-
	Upload Throughput Average (Mbits/s)	77.50	-	-	-
4G	Download Throughput Average (Mbits/s)	153.92	0.90	121.37	36.55
	Upload Throughput Average (Mbits/s)	19.96	2.93	23.27	9.44

Table-84: Overall Summary of 5G only & 4G only data download & upload speed.

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

Haldia International Airport L2 Terminal					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	3.61	-	1.87	-
	Upload Throughput Average (Mbits/s)	2.15	-	0.00	-
4G	Download Throughput Average (Mbits/s)	1.14	0.72	1.12	2.04
	Upload Throughput Average (Mbits/s)	1.26	1.41	0.00	2.79

Table-85: Overall Summary of 5G only & 4G only data download & upload speed.

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

Jagannathdham Temple , Digha					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	256.95	-
	Upload Throughput Average (Mbits/s)	-	-	14.65	-
4G	Download Throughput Average (Mbits/s)	33.79	0.80	36.91	9.82
	Upload Throughput Average (Mbits/s)	4.38	2.72	5.13	20.88

Table-86: Overall Summary of 5G only & 4G only data download & upload speed.

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

Kazi Nazrul Islam Airport, Durgapur					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	124.01	-
	Upload Throughput Average (Mbits/s)	-	-	4.38	-
4G	Download Throughput Average (Mbits/s)	14.04	1.19	4.95	13.66
	Upload Throughput Average (Mbits/s)	1.34	-	2.15	8.38

Table-87: Overall Summary of 5G only & 4G only data download & upload speed.

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

Old Digha Sea Beach					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	59.92	-	406.35	-
	Upload Throughput Average (Mbits/s)	58.46	-	25.16	-
4G	Download Throughput Average (Mbits/s)	24.75	-	32.09	18.17
	Upload Throughput Average (Mbits/s)	8.78	-	3.21	3.88

Table-88: Overall Summary of 5G only & 4G only data download & upload speed.

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

Sail Isp Burnpur Hospital Asansol					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	186.31	-	68.29	-
	Upload Throughput Average (Mbits/s)	-	-	4.48	-
4G	Download Throughput Average (Mbits/s)	33.87	0.67	62.43	34.79
	Upload Throughput Average (Mbits/s)	5.95	3.91	8.56	6.36

Table-89: Overall Summary of 5G only & 4G only data download & upload speed.

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

St. Xaviernulls College, Bardhaman					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	103.22	-	216.96	-
	Upload Throughput Average (Mbits/s)	14.06	-	15.64	-
4G	Download Throughput Average (Mbits/s)	26.59	1.38	33.96	18.00
	Upload Throughput Average (Mbits/s)	3.57	3.71	6.33	2.42

Table-90: Overall Summary of 5G only & 4G only data download & upload speed

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

Tamralipta Mahavidyalaya, Tamluk					
Parameters		Service Provider			
		AIRTEL	BSNL	RJIL	VIL
5G	Download Throughput Average (Mbits/s)	-	-	415.98	-
	Upload Throughput Average (Mbits/s)	-	-	45.24	-
4G	Download Throughput Average (Mbits/s)	29.65	0.66	55.65	18.37
	Upload Throughput Average (Mbits/s)	6.55	3.26	15.63	2.51

Table-91: 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 1st July 2025 and 18th July 2025. Thirteen locations have been tested in the Asansol & Tamluk city.

4.4.1 Walk test locations

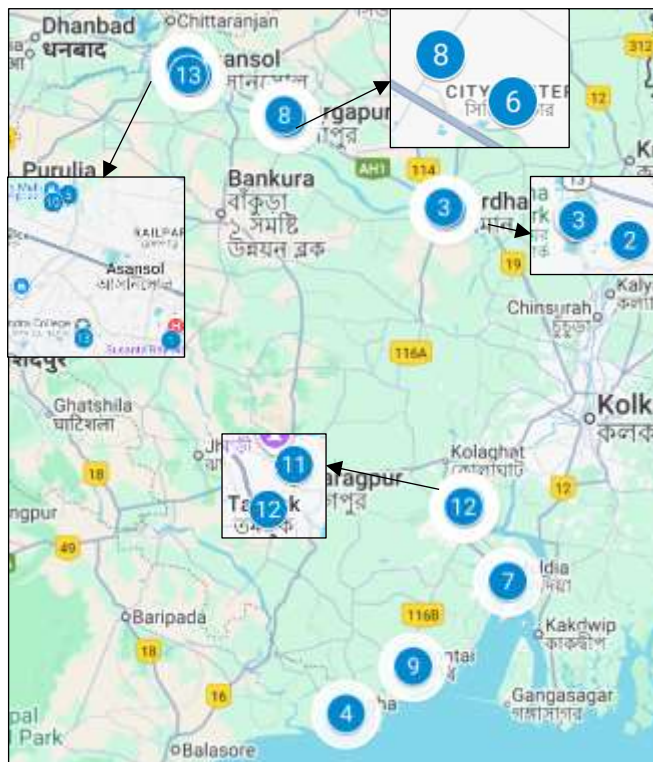


Figure-24: Walk Test locations.

4.4.2 Walk test covered

1. Asansol Super Speciality Hospital, Asansol
2. Bidhan Chandra College, Burdwan
3. Burdwan Medical College and Hospital
4. Burdwan University
5. Digha Railway Station
6. District Magistrate Office, Asansol Sadar
7. Durgapur City Center
8. Haldia Institute Of Technology
9. National Institute Of Technology, Durgapur
10. Prabhat Kumar College, Contai
11. Sentrum Mall, Asansol
12. Tamluk District Court
13. Tamralipto Government Medical College, Sriram Pur, Tamluk

4.4.3 Voice performance

i) Asansol Super Speciality Hospital, Asansol

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

Asansol Super Speciality Hospital, Asansol				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	12	11	11
Call Setup Success Rate %	100.00	91.67	100.00	100.00
Drop Call Rate %	0.00	9.09	0.00	0.00
Call Setup Time-Average (Sec)	1.80	2.48	0.59	0.93
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-92: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

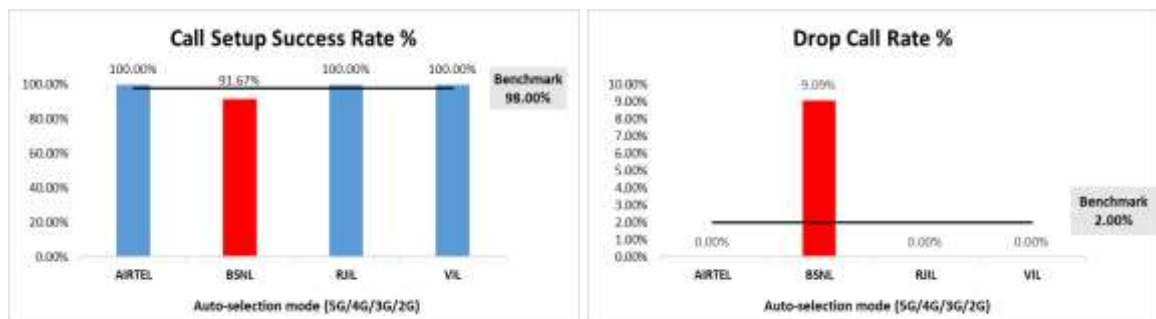


Figure-25: Performance for call setup success rate and drop call rate.

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

Asansol Super Speciality Hospital, Asansol				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	1.32%	NA	14.39%	NA
4G	98.68%	9.13%	85.61%	100.00%
3G	NA	90.87%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-93: Time spent on technology during walk test.

Note-

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

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

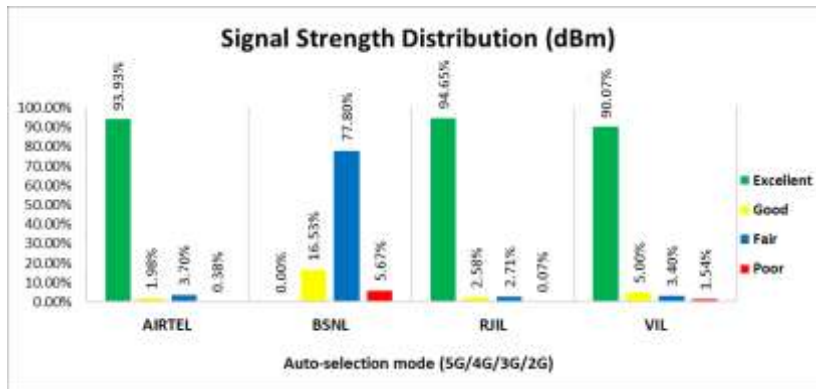


Figure-26: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

ii) Bidhan Chandra College, Burdwan

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

Bidhan Chandra College, Burdwan				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	16	12	11
Call Setup Success Rate %	100.00	56.25	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.90	7.26	0.70	0.93
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-94: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).



Figure- 27: Performance for call setup success rate and drop call rate.

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

Bidhan Chandra College, Burdwan				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	7.37%	NA	15.08%	NA
4G	92.63%	99.88%	84.92%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.12%	0.00%	0.00%

Table-95: Time spent on technology during walk test.

Note-

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

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

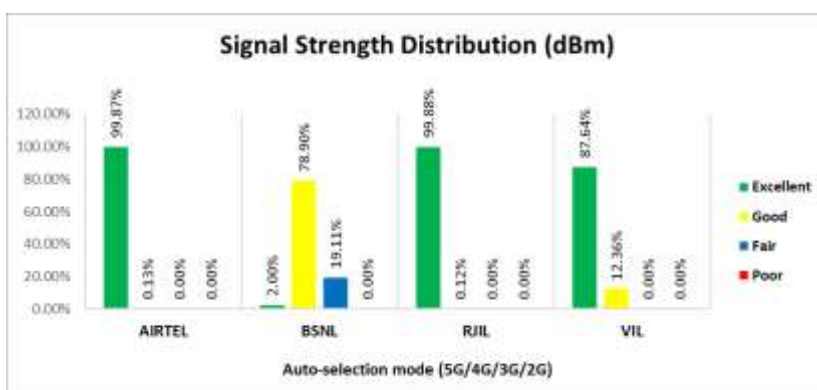


Figure-28: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

iii) Burdwan Medical College and Hospital

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

Burdwan Medical College and Hospital				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	12	12
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 (Sec)	1.95	2.40	0.57	0.88
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-96: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

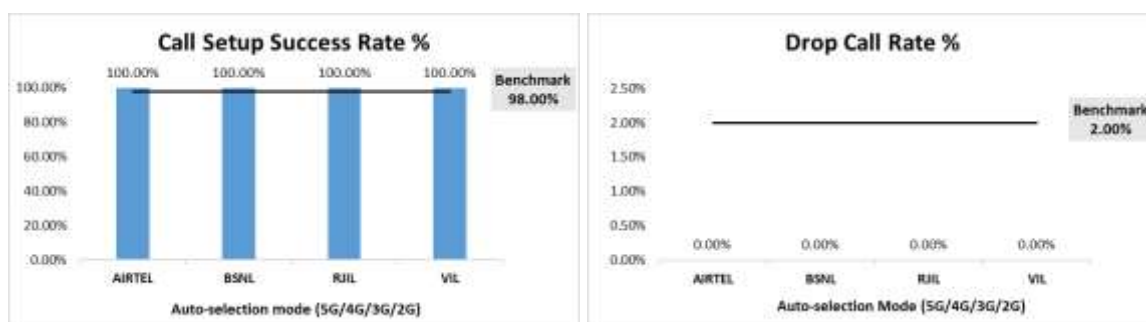


Figure-29: Performance for call setup success rate and drop call rate.

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

Burdwan Medical College and Hospital				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	4.91%	NA	14.62%	NA
4G	95.09%	20.09%	85.38%	100.00%
3G	NA	6.08%	NA	NA
2G	0.00%	73.76%	NA	0.00%
Limited service	0.00%	0.06%	0.00%	0.00%

Table-97: Time spent on technology during walk test.

Note-

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

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

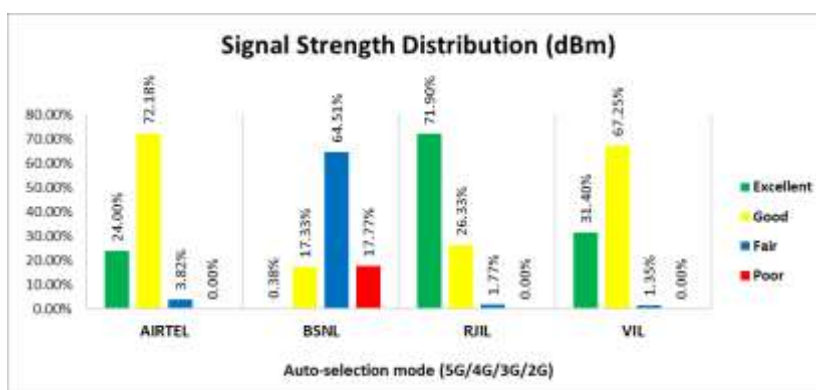


Figure-30: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

iv) Burdwan University

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

Burdwan University				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	11	11
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.92	2.62	0.64	0.94
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-98: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

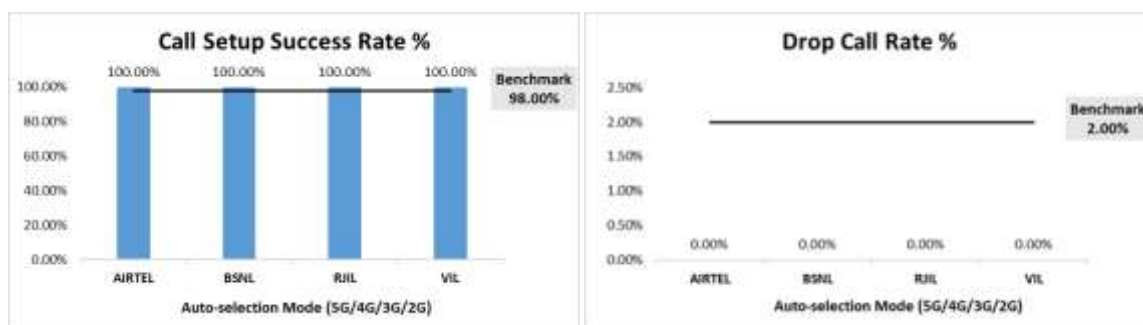


Figure-31: Performance for call setup success rate and drop call rate.

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

Burdwan University				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	4.26%	NA	0.00%	NA
4G	95.74%	14.31%	100.00%	100.00%
3G	NA	1.31%	NA	NA
2G	0.00%	83.94%	NA	0.00%
Limited service	0.00%	0.44%	0.00%	0.00%

Table-99: Time spent on technology during walk test.

Note-

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

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

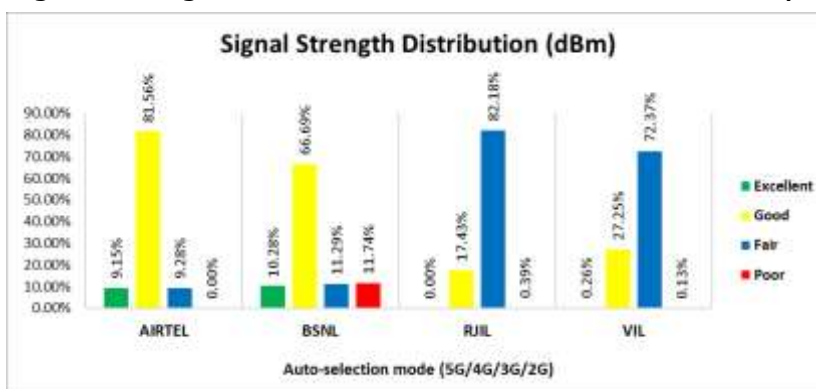


Figure-32: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

v) Digha Railway Station

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

Digha Railway Station				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	11	11
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.86	7.35	0.51	0.98
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-100: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

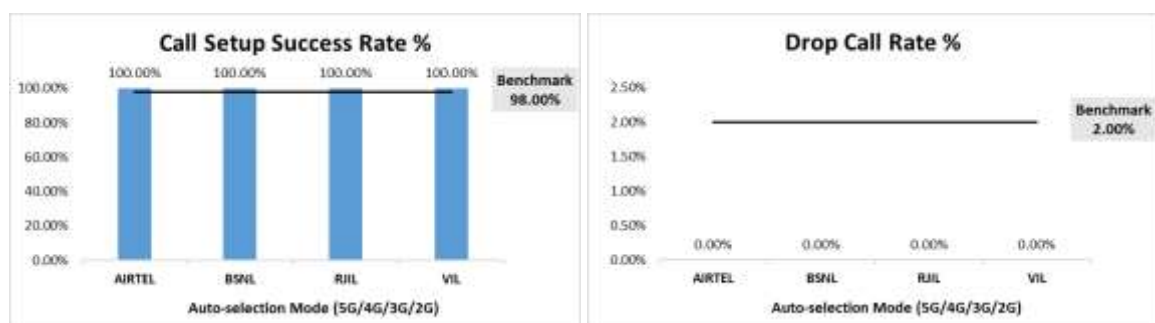


Figure-33: Performance for call setup success rate and drop call rate

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

Digha Railway Station				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	0.00%	NA	14.31%	NA
4G	100.00%	100.00%	85.69%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-101: Time spent on technology during walk test.

Note-

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

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

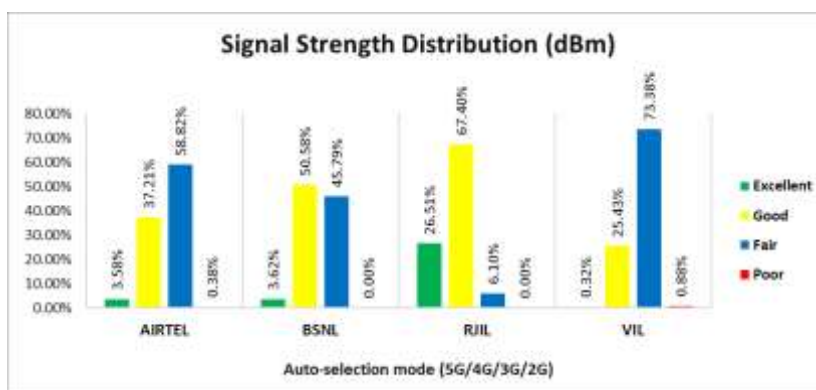


Figure-34: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

vi) District Magistrate Office, Asansol Sadar

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

District Magistrate Office, Asansol Sadar				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	14	14	14	14
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 (Sec)	1.87	7.40	0.64	0.94
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-102: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

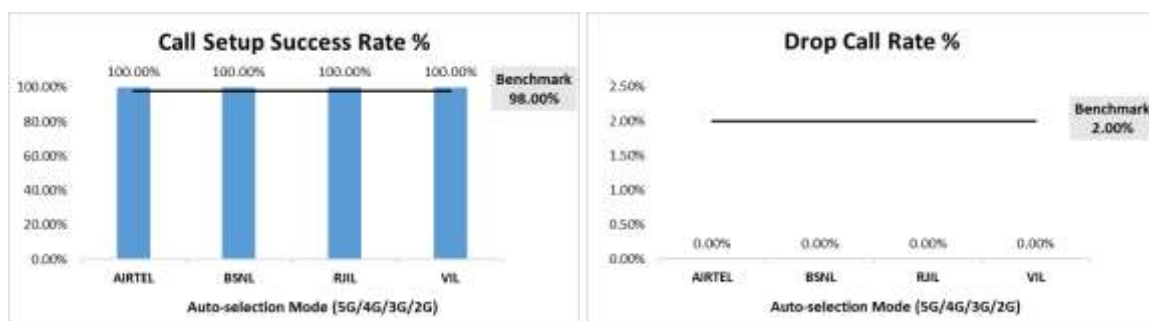


Figure-35: Performance for call setup success rate and drop call rate.

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

District Magistrate Office, Asansol Sadar				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	8.75%	NA	14.83%	NA
4G	91.25%	100.00%	85.17%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-103: Time spent on technology during walk test.

Note-

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

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

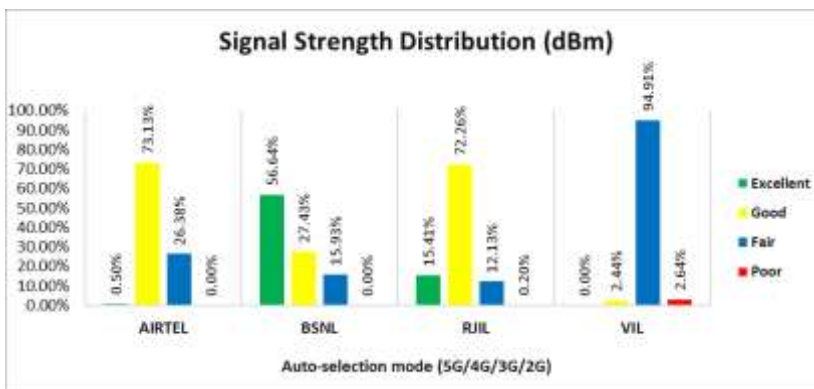


Figure-36: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

vii) Durgapur City Center

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

Durgapur City Center				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	12	12
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 (Sec)	1.88	2.18	0.56	1.03
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-104: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

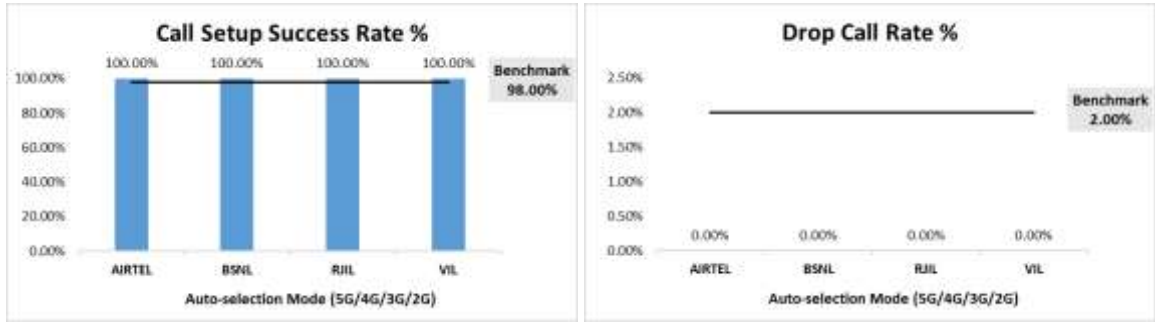


Figure-37: Performance for call setup success rate and drop call rate

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

Durgapur City Center				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	0.19%	NA	15.08%	NA
4G	99.81%	0.00%	84.92%	100.00%
3G	NA	18.50%	NA	NA
2G	0.00%	81.50%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-105: Time spent on technology during walk test.

Note-

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

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

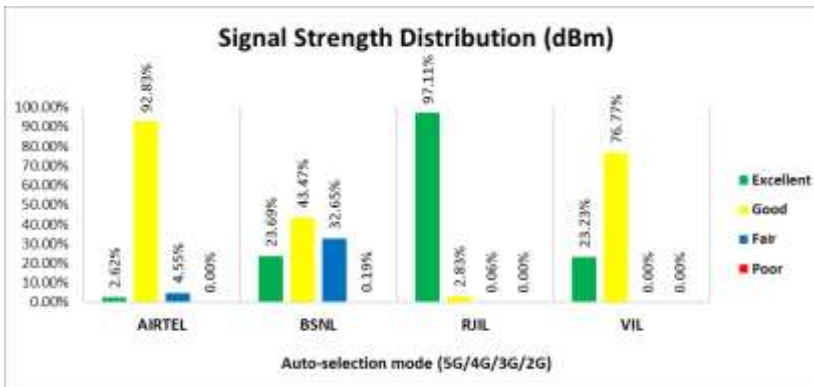


Figure-38: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

viii) Haldia Institute Of Technology

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

Haldia Institute Of Technology				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	11	11
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.90	7.54	0.59	0.91
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-106: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

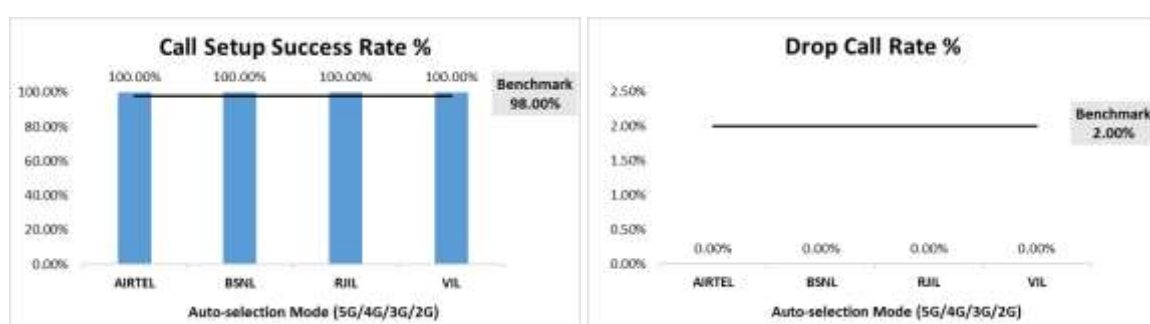


Figure-39: Performance for call setup success rate and drop call rate.

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

Haldia Institute Of Technology				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	10.52%	NA	14.97%	NA
4G	89.48%	99.94%	85.03%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.06%	0.00%	0.00%

Table-107: Time spent on technology during walk test.

Note-

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

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

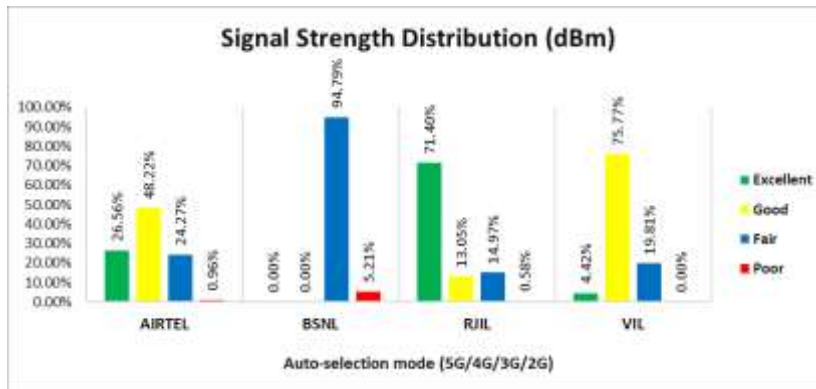


Figure-40: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

ix) National Institute Of Technology, Durgapur

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

National Institute Of Technology, Durgapur				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	12	12	12	12
Call Setup Success Rate %	100.00	91.67	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.82	8.02	0.74	0.89
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-108: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

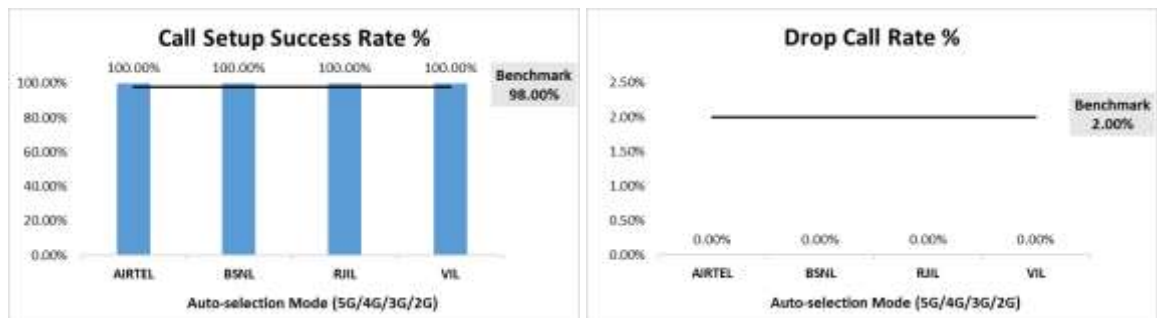


Figure-41: Performance for call setup success rate and drop call rate.

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

National Institute Of Technology, Durgapur				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	8.10%	NA	13.83%	NA
4G	91.90%	100.00%	86.17%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-109: Time spent on technology during walk test.

Note-

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

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

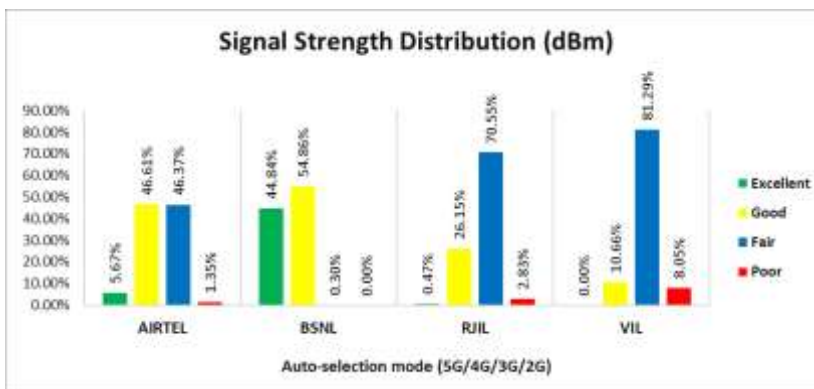


Figure-42: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

x) Prabhat Kumar College, Contai

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

Prabhat Kumar College, Contai				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	12	12	12
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 (Sec)	1.92	7.39	0.50	0.90
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-110: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

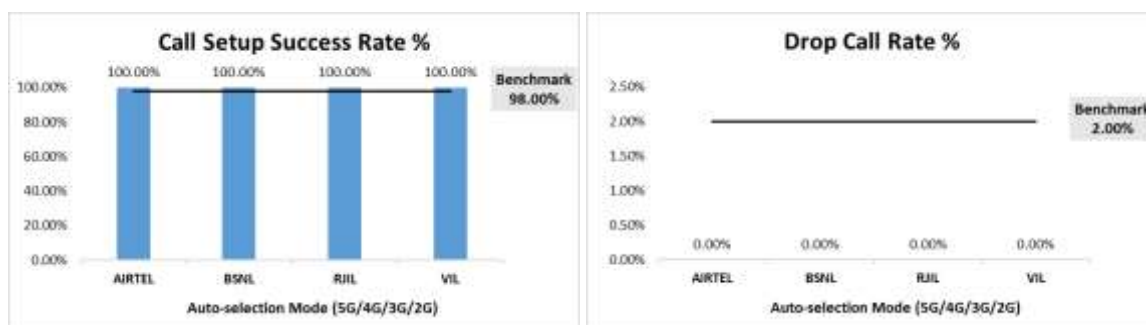


Figure-43: Performance for call setup success rate and drop call rate

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

Prabhat Kumar College, Contai				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	7.79%	NA	100.00%	NA
4G	92.21%	100.00%	0.00%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-111: Time spent on technology during walk test.

Note-

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

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

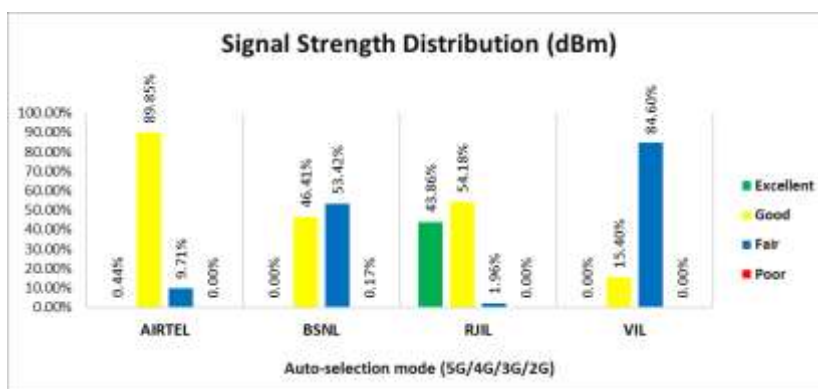


Figure-44: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

xi) Sentrum Mall, Asansol

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

Sentrum Mall, Asansol				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	12	11
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.94	7.24	0.73	1.00
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-112: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

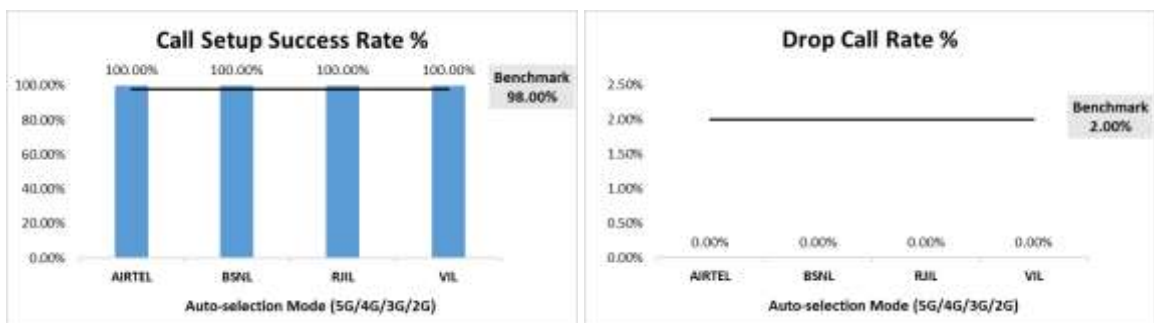


Figure-45: Performance for call setup success rate and drop call rate

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

Sentrum Mall, Asansol				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	8.95%	NA	15.56%	NA
4G	91.05%	100.00%	84.44%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-113: Time spent on technology during walk test.

Note-

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

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

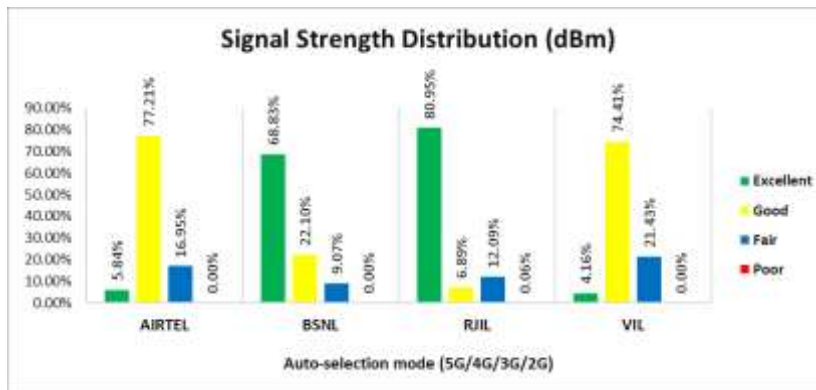


Figure-46: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

xii) Tamluk District Court

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

Tamluk District Court				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	12	11	12
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 (Sec)	1.87	7.24	0.51	0.92
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-114: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

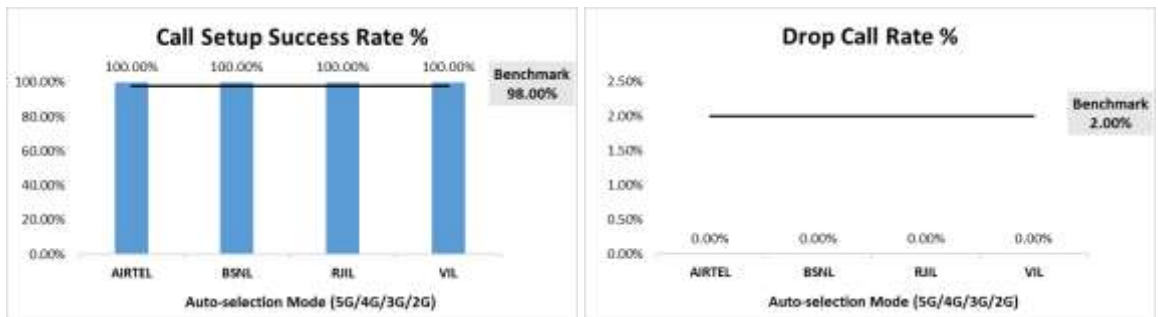


Figure-47: Performance for call setup success rate and drop call rate

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

Tamluk District Court				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	8.66%	NA	14.60%	NA
4G	91.34%	100.00%	85.40%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-115: Time spent on technology during walk test.

Note-

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

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

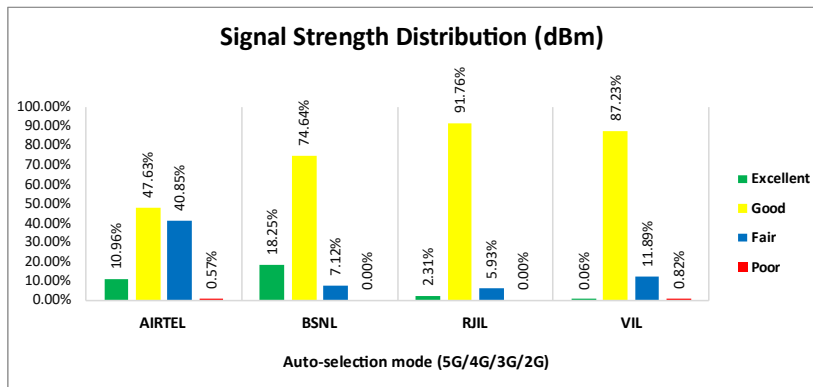


Figure-48: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

xiii) Tamralipto Government Medical College, Sriram Pur, Tamluk

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

Tamralipto Government Medical College, Sriram Pur, Tamluk				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	11	11	11	11
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.96	7.24	0.94	0.95
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-116: Summary of Voice performance in network auto-selection mode (5G/4G/3G/2G).

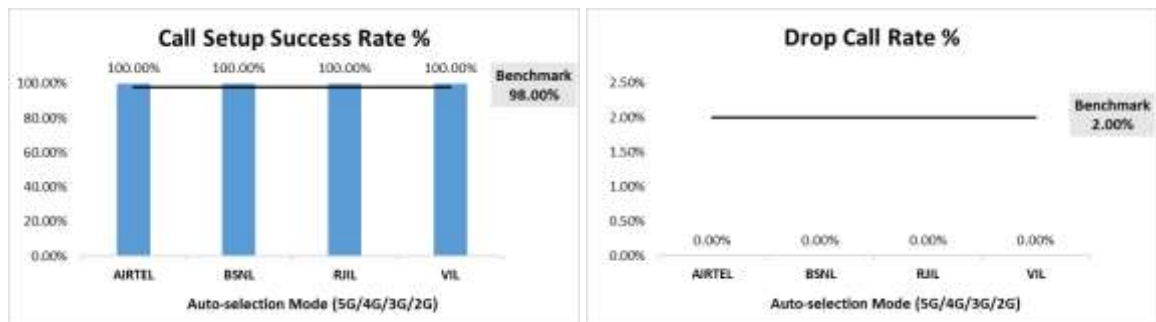


Figure-49: Performance for call setup success rate and drop call rate.

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

Tamralipto Government Medical College, Sriram Pur, Tamluk				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
5G	3.01%	NA	14.40%	NA
4G	96.99%	100.00%	85.60%	100.00%
3G	NA	0.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited service	0.00%	0.00%	0.00%	0.00%

Table-117: Time spent on technology during walk test.

Note-

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

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

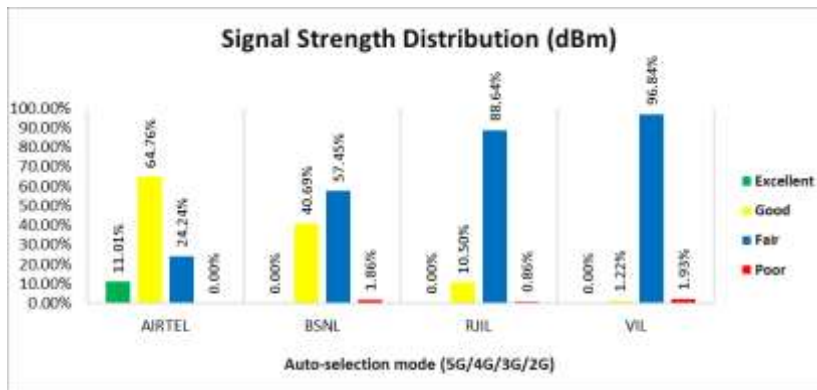


Figure-50: Signal strength distribution auto-selection mode 5G/4G/3G/2G.

4.4.4 Data performance

i) Asansol Super Speciality Hospital, Asansol

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

Jharkhand High Court				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbps/s)	469.90	0.71	603.22	35.80
Download Throughput 80 th Percentile	531.43	0.85	673.97	41.69
Download Throughput 20 th Percentile	445.57	0.56	527.39	31.66
Download Session Setup Success Rate %	100.00	57.89	94.12	100.00
Upload Throughput Average (Mbps/s)	70.26	2.44	80.32	32.85
Upload Throughput 80 th Percentile	77.57	2.93	90.18	34.93
Upload Throughput 20 th Percentile	71.74	2.04	78.93	32.89
Upload Session Setup Success Rate %	100.00	73.68	94.12	100.00
Latency (ms)-50 th Percentile	14.25	23.28	12.00	41.10

Table-118: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

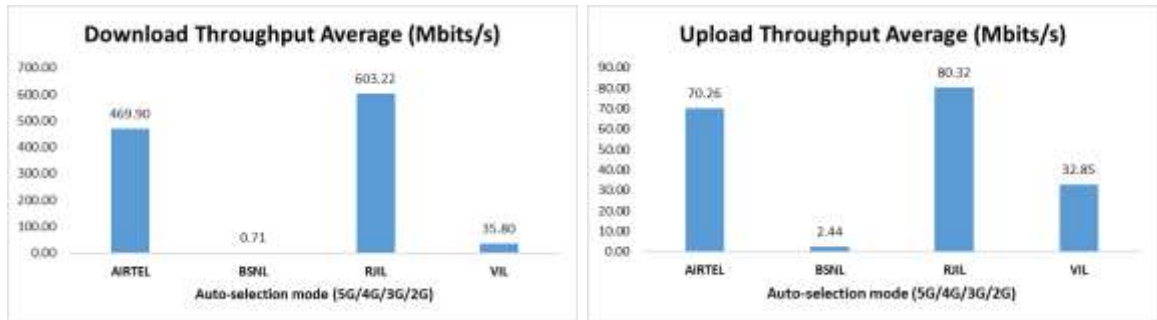


Figure- 51: Download and Upload throughput.

ii) Bidhan Chandra College, Burdwan

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

Bidhan Chandra College, Burdwan				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	230.84	0.95	487.37	38.03
Download Throughput 80 th Percentile	246.03	1.13	606.22	42.22
Download Throughput 20 th Percentile	212.37	0.84	380.72	35.88
Download Session Setup Success Rate %	100.00	87.50	66.67	100.00
Upload Throughput Average (Mbits/s)	87.85	2.90	70.09	35.30
Upload Throughput 80 th Percentile	96.51	3.56	78.49	35.91
Upload Throughput 20 th Percentile	80.61	2.31	65.17	35.01
Upload Session Setup Success Rate %	100.00	93.33	93.33	100.00
Latency (ms)-50 th Percentile	14.20	-	10.60	44.05

Table-119: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-" Ping tests were failed.

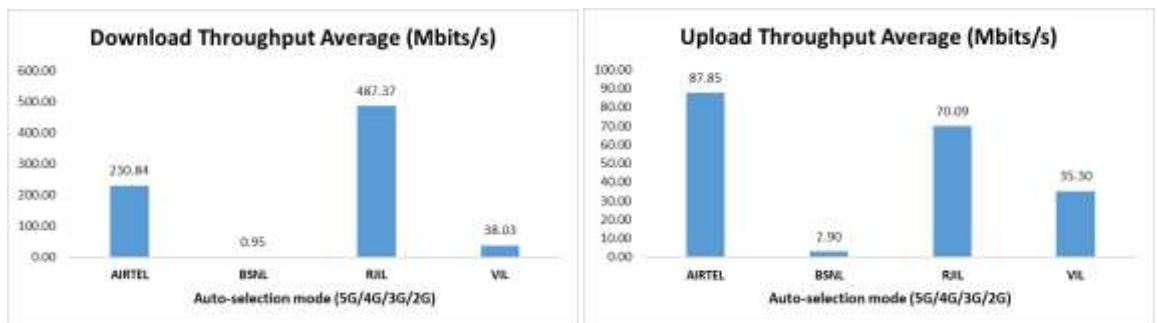


Figure- 52: Download and Upload throughput.

iii) Burdwan Medical College and Hospital

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

Burdwan Medical College and Hospital				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	194.92	1.21	232.66	36.43
Download Throughput 80th Percentile	265.91	1.32	376.23	38.23
Download Throughput 20th Percentile	144.50	1.03	100.35	34.84
Download Session Setup Success Rate %	100.00	100.00	50.00	100.00
Upload Throughput Average (Mbits/s)	39.92	3.04	43.44	11.10
Upload Throughput 80th Percentile	50.57	3.53	53.01	15.15
Upload Throughput 20th Percentile	24.66	2.45	40.99	7.57
Upload Session Setup Success Rate %	100.00	100.00	93.33	100.00
Latency (ms)-50th Percentile	18.10	33.05	15.25	45.13

Table-120: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

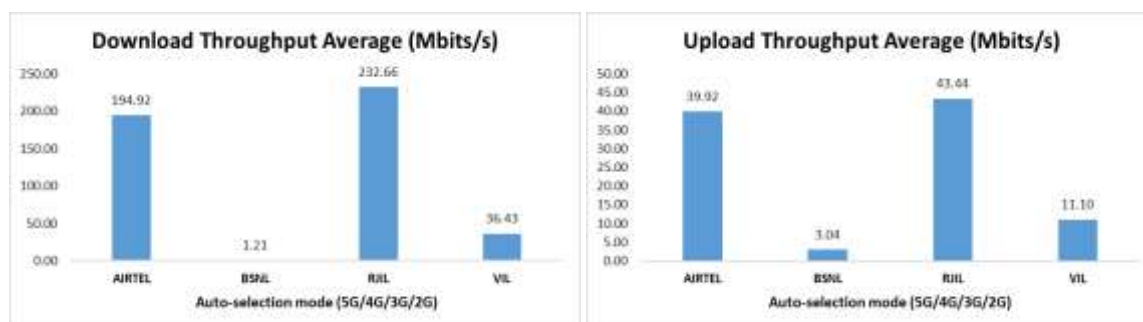


Figure- 53: Download and Upload throughput.

iv) Burdwan University

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

Burdwan University				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	362.22	0.19	65.99	34.39
Download Throughput 80th Percentile	462.09	0.37	91.77	39.66
Download Throughput 20th Percentile	332.94	0.03	1.87	30.90
Download Session Setup Success Rate %	100.00	92.31	93.75	100.00
Upload Throughput Average (Mbits/s)	47.77	0.67	6.74	15.22
Upload Throughput 80th Percentile	52.24	1.14	6.65	17.43
Upload Throughput 20th Percentile	41.03	0.02	4.35	13.35
Upload Session Setup Success Rate %	100.00	69.23	100.00	100.00
Latency (ms)-50th Percentile	15.50	-	21.25	42.20

Table-121: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-"-" Ping tests were failed.

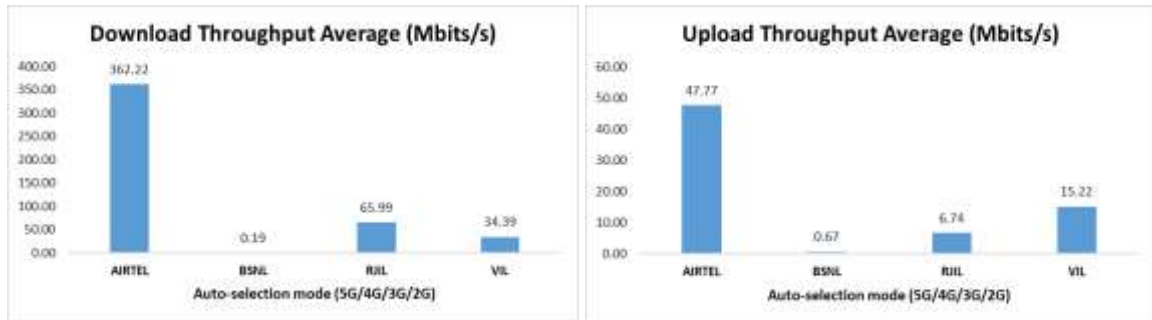


Figure- 54: Download and Upload throughput.

v) Digha Railway Station

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

Digha Railway Station				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	47.61	1.19	185.16	26.53
Download Throughput 80th Percentile	46.74	1.54	245.95	35.56
Download Throughput 20th Percentile	16.46	0.84	104.51	18.20
Download Session Setup Success Rate %	100.00	100.00	93.33	100.00
Upload Throughput Average (Mbits/s)	21.16	5.10	20.77	10.73
Upload Throughput 80th Percentile	38.35	7.94	36.27	19.87
Upload Throughput 20th Percentile	4.60	2.45	5.89	3.30
Upload Session Setup Success Rate %	100.00	92.86	100.00	100.00
Latency (ms)-50th Percentile	29.95	-	22.13	47.25

Table-122: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- "-" Ping tests were failed.

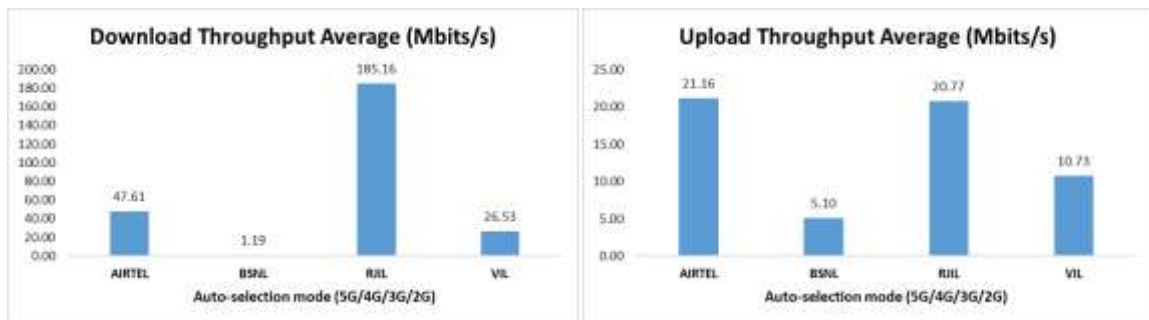


Figure- 55: Download and Upload throughput.

vi) District Magistrate Office, Asansol Sadar

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

District Magistrate Office, Asansol Sadar				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	30.80	1.17	170.14	30.55
Download Throughput 80th Percentile	37.68	1.43	236.91	35.54
Download Throughput 20th Percentile	13.00	0.92	110.80	26.46
Download Session Setup Success Rate %	100.00	100.00	92.86	100.00
Upload Throughput Average (Mbits/s)	12.17	4.54	7.42	9.84
Upload Throughput 80th Percentile	13.56	5.42	8.25	14.69
Upload Throughput 20th Percentile	10.35	3.83	4.45	1.98
Upload Session Setup Success Rate %	100.00	100.00	92.86	100.00
Latency (ms)-50th Percentile	28.93	-	12.55	37.50

Table-123: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note-“-” Ping tests were failed.

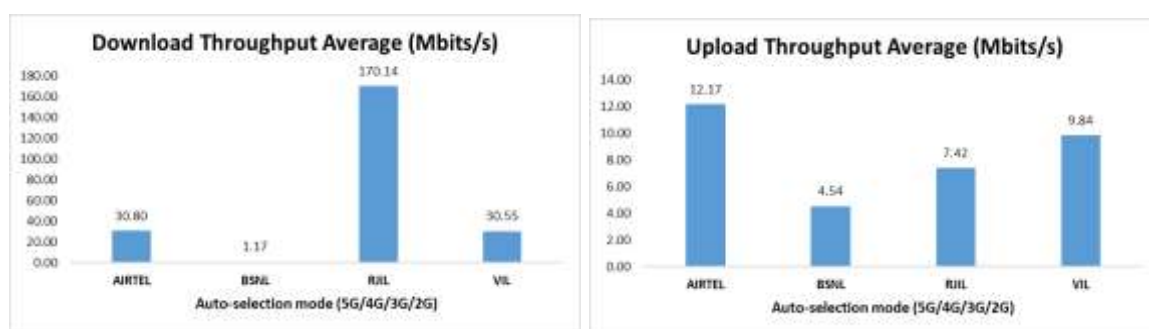


Figure- 56: Download and Upload throughput.

vii) Durgapur City Center

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

Durgapur City Center				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	116.47	2.28	22.53	34.59
Download Throughput 80th Percentile	151.63	2.47	33.13	38.63
Download Throughput 20th Percentile	63.46	2.09	11.85	31.96
Download Session Setup Success Rate %	100.00	100.00	46.67	100.00
Upload Throughput Average (Mbits/s)	9.82	2.17	14.06	23.58
Upload Throughput 80th Percentile	10.77	2.66	17.33	31.52
Upload Throughput 20th Percentile	4.96	1.91	8.41	14.64
Upload Session Setup Success Rate %	100.00	100.00	86.67	100.00
Latency (ms)-50th Percentile	32.55	41.55	18.65	40.83

Table-124: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

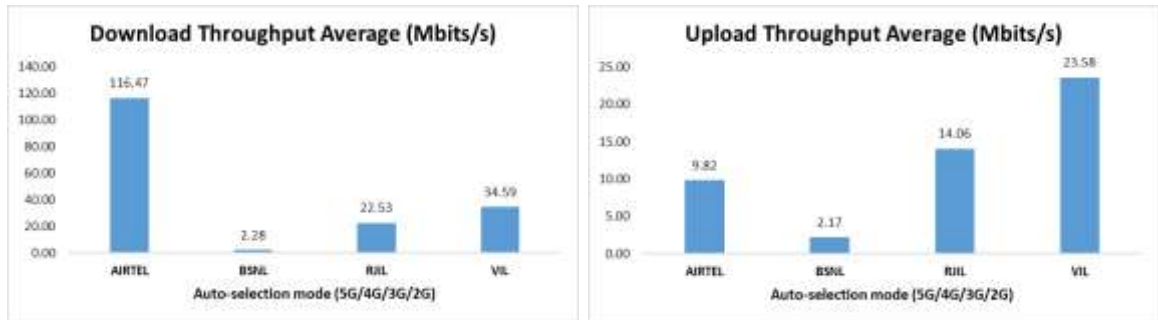


Figure- 57: Download and Upload throughput.

viii) Haldia Institute Of Technology

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

Haldia Institute Of Technology				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	82.88	1.60	470.90	18.23
Download Throughput 80th Percentile	111.34	2.08	589.43	29.80
Download Throughput 20th Percentile	62.11	1.36	371.25	7.10
Download Session Setup Success Rate %	100.00	100.00	87.50	100.00
Upload Throughput Average (Mbits/s)	10.46	2.11	63.74	16.54
Upload Throughput 80th Percentile	17.44	2.25	97.11	24.79
Upload Throughput 20th Percentile	4.39	1.95	18.56	6.35
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Latency (ms)-50th Percentile	30.85	40.05	28.85	43.08

Table-125: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).



Figure- 58: Download and Upload throughput.

ix) National Institute Of Technology, Durgapur

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

National Institute Of Technology, Durgapur				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	97.68	0.86	49.42	23.64
Download Throughput 80th Percentile	202.90	1.08	69.68	33.65
Download Throughput 20th Percentile	29.63	0.66	4.08	12.99
Download Session Setup Success Rate %	100.00	87.50	75.00	100.00
Upload Throughput Average (Mbits/s)	7.76	2.89	3.33	8.29
Upload Throughput 80th Percentile	9.69	3.37	4.46	11.16
Upload Throughput 20th Percentile	3.46	1.88	1.74	3.64
Upload Session Setup Success Rate %	100.00	87.50	87.50	100.00
Latency (ms)-50th Percentile	25.30	-	19.35	40.40

Table-126: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- Ping tests were failed.

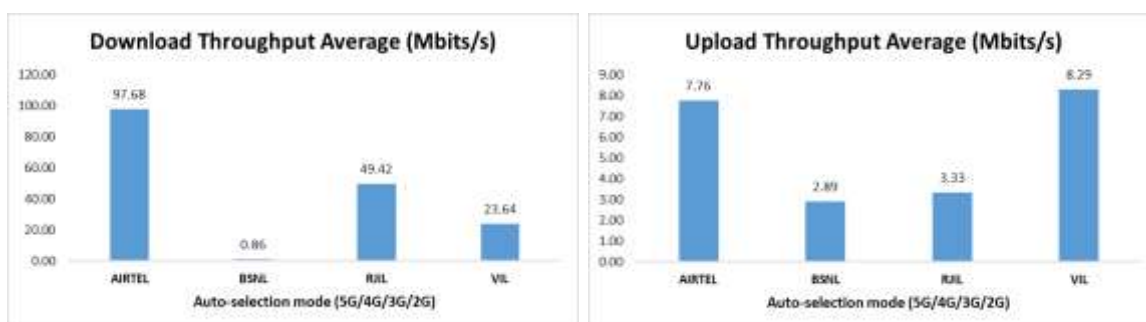


Figure- 59: Download and Upload throughput.

x) Prabhat Kumar College, Contai

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

Prabhat Kumar College, Contai				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	114.22	1.19	264.27	19.36
Download Throughput 80th Percentile	157.62	1.39	305.46	24.24
Download Throughput 20th Percentile	54.40	0.97	228.34	13.83
Download Session Setup Success Rate %	100.00	87.50	53.33	100.00
Upload Throughput Average (Mbits/s)	12.87	2.77	12.77	7.84
Upload Throughput 80th Percentile	19.90	3.29	13.16	9.96
Upload Throughput 20th Percentile	4.65	2.24	8.25	6.43
Upload Session Setup Success Rate %	100.00	87.50	80.00	100.00
Latency (ms)-50th Percentile	32.28	-	18.08	39.75

Table-127: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- Ping tests were failed.

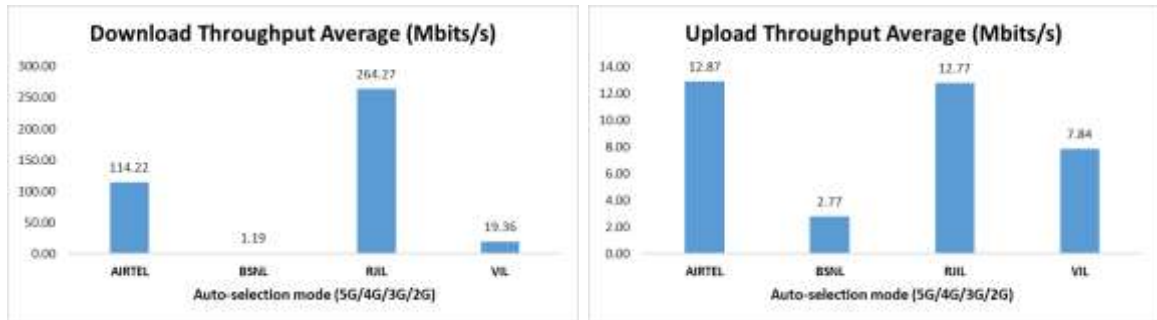


Figure- 60: Download and Upload throughput.

xi) Sentrum Mall, Asansol

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

Sentrum Mall, Asansol				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	315.27	1.22	141.84	24.51
Download Throughput 80th Percentile	357.66	1.44	148.86	32.44
Download Throughput 20th Percentile	284.22	1.07	61.43	17.26
Download Session Setup Success Rate %	100.00	93.75	66.67	100.00
Upload Throughput Average (Mbits/s)	46.16	4.80	7.17	19.02
Upload Throughput 80th Percentile	59.04	5.25	10.77	31.88
Upload Throughput 20th Percentile	28.00	4.20	1.21	7.19
Upload Session Setup Success Rate %	100.00	100.00	93.33	100.00
Latency (ms)-50th Percentile	14.00	-	14.23	39.95

Table-128: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note- Ping tests were failed.

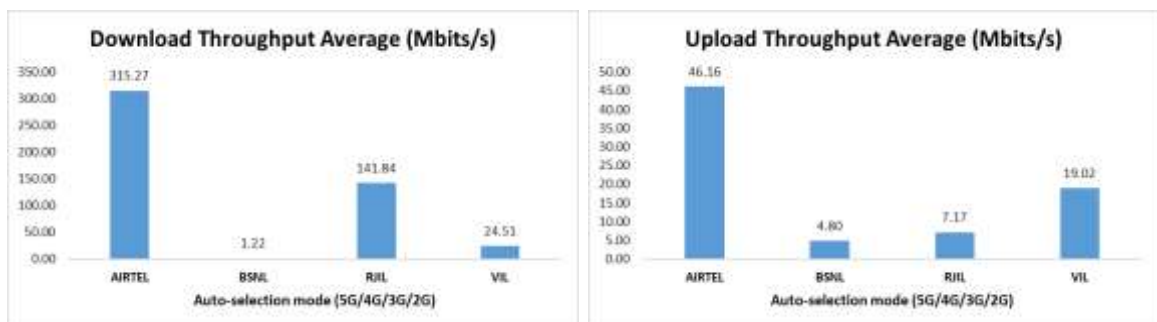


Figure- 61: Download and Upload throughput.

xii) Tamluk District Court

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

Tamluk District Court				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	142.69	0.76	395.36	21.90
Download Throughput 80th Percentile	186.97	1.01	437.58	29.36
Download Throughput 20th Percentile	116.63	0.49	349.76	15.49
Download Session Setup Success Rate %	100.00	88.24	100.00	100.00
Upload Throughput Average (Mbits/s)	19.86	2.30	19.29	12.27
Upload Throughput 80th Percentile	28.66	3.02	25.04	21.47
Upload Throughput 20th Percentile	11.48	1.56	12.06	3.41
Upload Session Setup Success Rate %	100.00	82.35	100.00	100.00
Latency (ms)-50th Percentile	16.48	-	17.98	42.63

Table-129: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note--" Ping tests were failed.

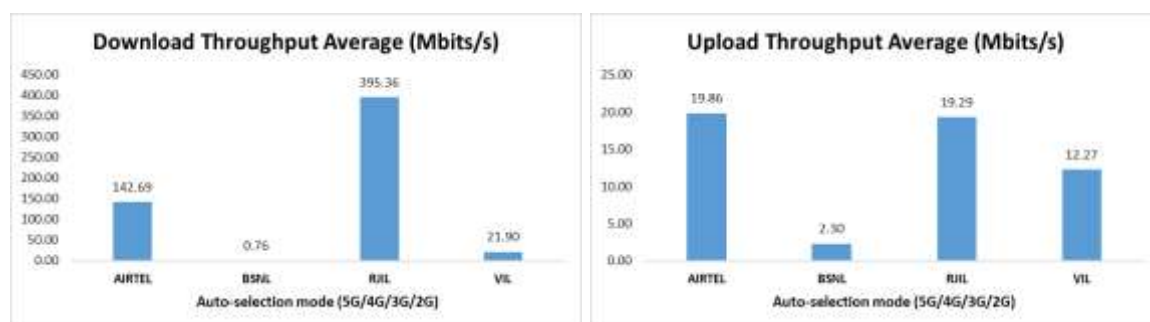


Figure- 62: Download and Upload throughput.

xiii) Tamralipto Government Medical College, Sriram Pur, Tamluk

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

Tamralipto Government Medical College, Sriram Pur, Tamluk				
Parameters	Service Provider			
	Auto-Selection Mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	38.11	0.83	180.04	4.79
Download Throughput 80th Percentile	82.69	0.99	230.53	7.13
Download Throughput 20th Percentile	6.49	0.79	145.29	1.73
Download Session Setup Success Rate %	100.00	100.00	93.33	100.00
Upload Throughput Average (Mbits/s)	19.98	2.80	6.61	3.48
Upload Throughput 80th Percentile	34.88	3.23	8.48	4.55
Upload Throughput 20th Percentile	7.48	2.41	4.99	2.59
Upload Session Setup Success Rate %	100.00	93.33	100.00	100.00
Latency (ms)-50th Percentile	33.05	-	17.43	43.90

Table-130: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Note--" Ping tests were failed.

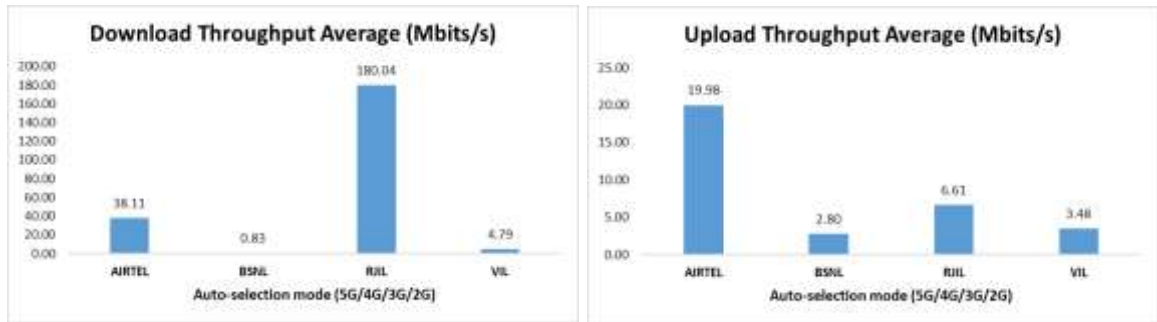


Figure- 63: Download and Upload throughput.

5. Voice & Data Key findings

5.1 Overall Voice

1. Call Setup Success Rate:

- a) Airtel, BSNL and VIL have 99.52%, 98.97% and 98.94% call setup success rate respectively in 3G/2G network mode. (refer table-3)
- b) Airtel, BSNL, RJIL and VIL have 100.00%, 93.73%, 99.92% and 96.74% call setup success rate respectively in auto-selection mode (5G/4G/3G/2G). (refer table-5)
- c) Airtel had 100.00% call setup success rate while calling VIL whereas call blocking was observed when calling BSNL and RJIL. (refer to Table-9)
- d) BSNL had a 100.00% call setup success rate while calling Airtel and VIL whereas call blocking was observed when calling RJIL. (refer to Table-9)
- e) RJIL had a 100.00% call setup success rate while calling Airtel, BSNL and VIL. (refer to Table-9)
- f) VIL had a 100.00% call setup success rate while calling Airtel and BSNL whereas call blocking was observed when calling RJIL. (refer to Table-9)

2. Call Setup Time:

- a) Airtel, BSNL and VIL call setup time is 5.29, 2.52 and 4.58 seconds respectively in 3G/2G network mode. (refer table-3)
- b) Airtel, BSNL, RJIL & VIL call setup time is 1.90, 5.70, 0.64 and 1.00 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 & VIL have 0.69%, 1.44%, 0.82% & 0.35% silence call rate respectively. Further Airtel, BSNL, RJIL & VIL downlink RTP packet loss rate is 0.52%, 4.49%, 0.44% & 0.62% respectively. In uplink Airtel, BSNL, RJIL & VIL RTP packet loss rate is 0.50%, 4.32%, 0.70% & 0.55% respectively. (refer table-6)

4. Drop Call Rate:

- a) Airtel, BSNL and VIL drop call rate is 0.36%, 2.44% and 0.12% respectively in 3G/2G network mode. (refer table-3)
- b) Airtel, BSNL, RJIL and VIL drop call rate is 0.00%, 2.34%, 0.08% and 0.16% 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 120.23 Mbps, 1.12 Mbps, 245.34 Mbps and 24.23 Mbps respectively. (refer table-11)
- b) Airtel, BSNL, RJIL and VIL average upload speeds are 25.45 Mbps, 2.74 Mbps, 23.48 Mbps and 15.01 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 129.45 Mbps, 1.43 Mbps, 204.01 Mbps and 24.90 Mbps respectively. (refer table-44)

- b) Airtel, BSNL, RJIL and VIL average upload speeds are 28.82 Mbps, 2.68 Mbps, 15.29 Mbps and 12.51 Mbps respectively. (refer table-44)

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

- a) Airtel, BSNL, RJIL and VIL have 96.52%, 89.57%, 90.43% and 100.00% download session setup success rate respectively. (refer table-44)
- b) Airtel, BSNL, RJIL and VIL have 96.52%, 88.70%, 98.26% and 100.00% upload session setup success rate respectively. (refer table-44)

5.3 Operator wise Key Findings

1. Airtel:

Voice

- 99.52% call setup success rate and 0.36% drop call rate have been observed in 3G/2G network mode for LSA/city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-3 & 13)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-5)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all walk test locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114 & 116)

Data

- Airtel has 120.23 Mbps average download speed & 25.45 Mbps average upload speed for LSA. (refer table-11)
- Airtel has 110.42 Mbps average download speed & 24.03 Mbps average upload speed across the measured routes for city drive. (refer table-19)
- Bargabhma Mandir, Coast Guard Station Haldia, Dsp Main Hospital Durgapur, Haldia International Airport L2 Terminal, Jagannathdham Temple Digha, Kazi Nazrul Islam Airport Durgapur, Old Digha Sea Beach, St. Xaviernulls College Bardhaman and Tamralipta Mahavidyalaya Tamluk have less download speed (less than 100 Mbps) out of total 23 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-47, 51, 57, 61, 62, 63, 64, 66 & 67)
- Asansol Railway Station, Bargabhma Mandir, Benachity Market, Coast Guard Station Haldia, Contai Bazaar Jalalkhanbar Contai, D.M. Office Tamluk, Durgapur Barrage, Haldia International Airport L2 Terminal, Jagannathdham Temple Digha, Kazi Nazrul Islam Airport Durgapur, Sail Isp Burnpur Hospital Asansol, St. Xaviernulls College Bardhaman and Tamralipta Mahavidyalaya Tamluk have less upload speed (less than 20 Mbps) out of total 23 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-45, 47, 48, 51, 52, 54, 58, 61, 62, 63, 65, 66 & 67)

- Digha Railway Station, District Magistrate Office Asansol Sadar, Haldia Institute Of Technology, National Institute Of Technology Durgapur and Tamralipto Government Medical College Sriram Pur Tamluk have less download speed (less than 100 Mbps) out of total 13 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table- 122, 123, 125, 126 & 130)
- District Magistrate Office Asansol Sadar, Durgapur City Center, Haldia Institute Of Technology, National Institute Of Technology Durgapur, Prabhat Kumar College Contai, Tamluk District Court and Tamralipto Government Medical College Sriram Pur Tamluk have less upload speed (less than 20 Mbps) out of total 13 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table- 123, 124, 125, 126, 127, 129 & 130)

2. BSNL:

Voice

- 98.97% call setup success rate and 2.44% drop call rate have been observed in 3G/2G network mode for LSA/city drive. Performance is not meeting the benchmark of 2.00% for drop call rate. (refer table-3 & 13)
- 93.73% call setup success rate and 2.34% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-5)
- 92.12% call setup success rate and 3.12% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.43% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 91.67% call setup success rate and 9.09% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Asansol Super Speciality Hospital Asansol Walk test location. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-92)
- 56.25% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at Bidhan Chandra College Burdwan Walk test location. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-94)
- 91.67% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) at National Institute Of Technology Durgapur Walk test location. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-108)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all walk test locations except Asansol Super Speciality Hospital Asansol, Bidhan Chandra College Burdwan & National Institute Of Technology Durgapur. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table- 96, 98, 100, 102, 104, 106, 110, 112, 114 & 116)

Data

- BSNL has 1.12 Mbps average download speed & 2.74 Mbps average upload speed for LSA. (refer table-11)
- BSNL has 1.08 Mbps average download speed & 2.68 Mbps average upload speed across the measured routes for city drive. (refer table-19)

- All hotspot locations have less download speed (less than 10 Mbps) for auto-selection mode (5G/4G/3G/2G). (refer table- 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66 & 67)
- Bardhaman Railway Station, Bargabhma Mandir, Burdwan Ullash More Bus Stop Ullash, City Centre Haldia Ambuja City Centre, D.M. Office Tamluk, Galaxy Mall Burnpur Asansol, Kazi Nazrul Islam Airport Durgapur, Old Digha Sea Beach, Sail Isp Burnpur Hospital Asansol and Tamralipta Mahavidyalaya Tamluk have less upload speed (less than 2 Mbps) out of total 23 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-46, 47, 49, 50, 54, 60, 63, 64, 65 & 67)
- All walk test locations have less download speed (less than 10 Mbps) for auto-selection mode (5G/4G/3G/2G). (refer table-118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129 & 130)
- Burdwan University walk test location has less upload speed (less than 2 Mbps) out of total 13 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table- 121)

3. RJIL:

Voice

- 99.92% call setup success rate and 0.08% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-5)
- 99.89% call setup success rate and 0.11% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all walk test locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114 & 116)

Data

- RJIL has 245.34 Mbps average download speed & 23.48 Mbps average upload speed for LSA. (refer table-11)
- RJIL has 246.43 Mbps average download speed & 23.35 Mbps average upload speed across the measured routes in city drive. (refer table-19)
- Bardhaman Railway Station, Bargabhma Mandir, City Centre Haldia Ambuja City Centre, Coast Guard Station Haldia, Durgapur Bus Stand, Haldia International Airport L2 Terminal and Sail Isp Burnpur Hospital Asansol have less upload speed (less than 100 Mbps) out of total 23 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-46, 47, 50, 51, 59, 61 & 65)
- All hotspot locations have less upload speed (less than 20 Mbps) expect Benachity Market, Curzon Gate, Durgapur Barrage, Durgapur Bus Stand and Tamralipta Mahavidyalaya Tamluk for auto-selection mode (5G/4G/3G/2G). (refer table-48, 53, 58, 59 & 67)

- Burdwan University, Durgapur City Center and National Institute Of Technology Durgapur have less download speed (less than 100 Mbps) out of total 13 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table- 121, 124 & 126)
- Burdwan University, District Magistrate Office Asansol Sadar, Durgapur City Center, National Institute Of Technology Durgapur, Prabhat Kumar College Contai, Sentrum Mall Asansol, Tamluk District Court and Tamralipto Government Medical College Sriram Pur Tamluk have less upload speed (less than 20 Mbps) out of total 13 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table- 121, 123, 124, 126, 127, 128, 129 & 130)

4. VIL:

Voice

- 98.94% call setup success rate and 0.12% drop call rate have been observed in 3G/2G network mode for LSA/city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-3 & 13)
- 96.74% call setup success rate and 0.16% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-5)
- 95.36% call setup success rate and 0.23% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-15)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-20)
- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all walk test locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114 & 116)

Data

- VIL has 24.23 Mbps average download speed & 15.01 Mbps average upload speed for LSA. (refer table-11)
- VIL has 23.70 Mbps average download speed & 15.03 Mbps average upload speed across the measured routes for city drive. (refer table-19)
- Haldia International Airport L2 Terminal has less download speed (less than 10 Mbps) out of total 23 hotspot locations for auto-selection mode (5G/4G/3G/2G). (refer table-61)
- Coast Guard Station Haldia, Durgapur Barrage and St. Xaviernulls College Bardhaman have less upload speed (less than 2 Mbps) out of total 23 Hotspots for auto-selection mode (5G/4G/3G/2G). (refer table- 51, 58 & 66)
- Tamralipto Government Medical College Sriram Pur Tamluk has less download speed (less than 10 Mbps) out of total 13 walk test locations for auto-selection mode (5G/4G/3G/2G). (refer table-130)

6. Annexure

6.1 Route wise coverage map

6.1.1 City

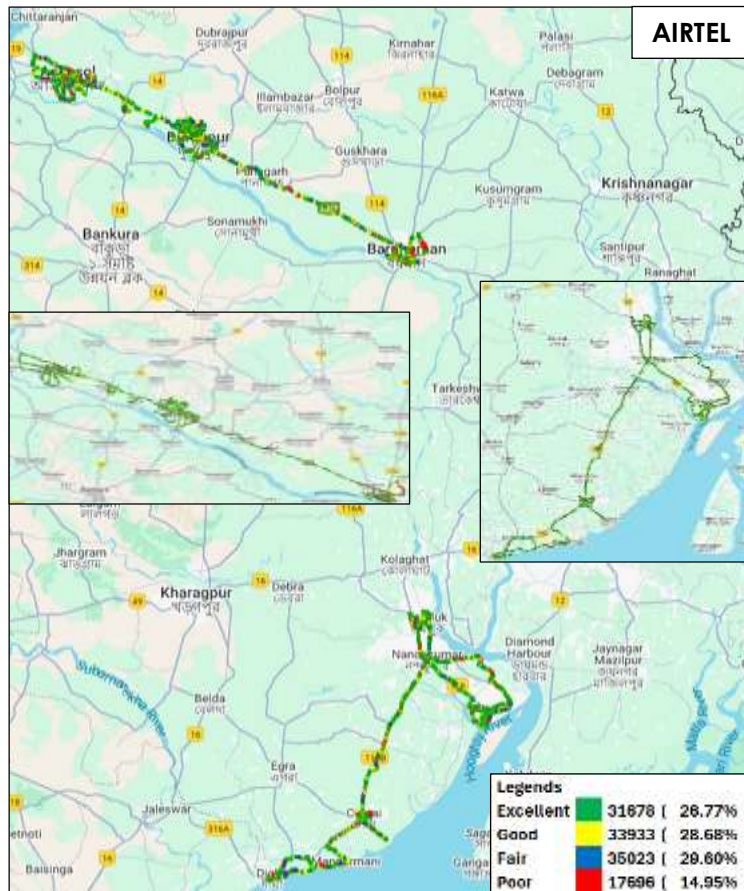


Figure-64: Signal strength 3G/2G network mode – AIRTEL.

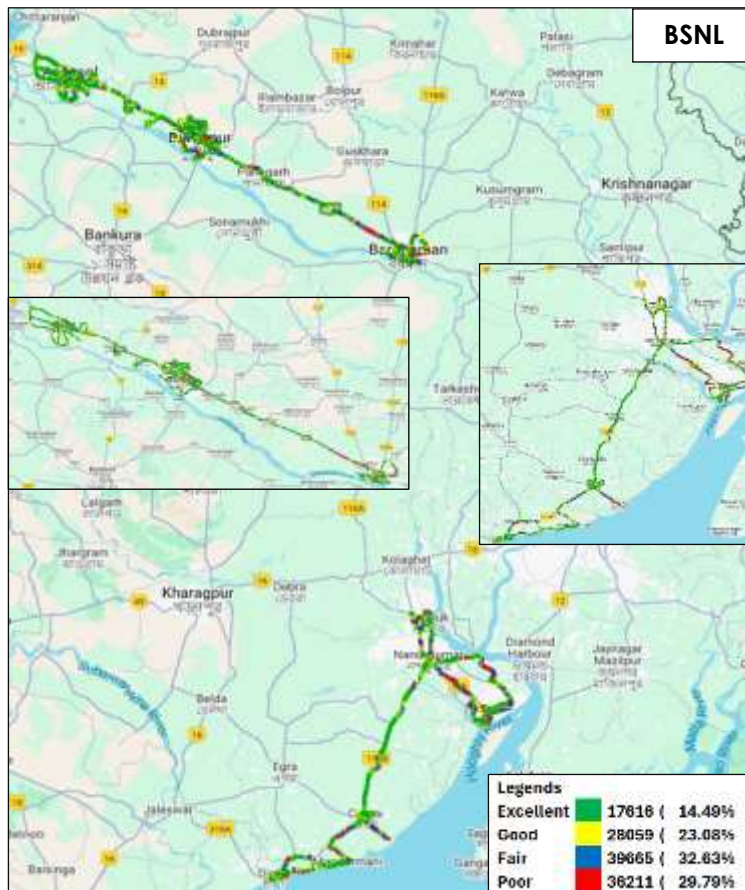


Figure-65: Signal strength 3G/2G network mode – BSNL.

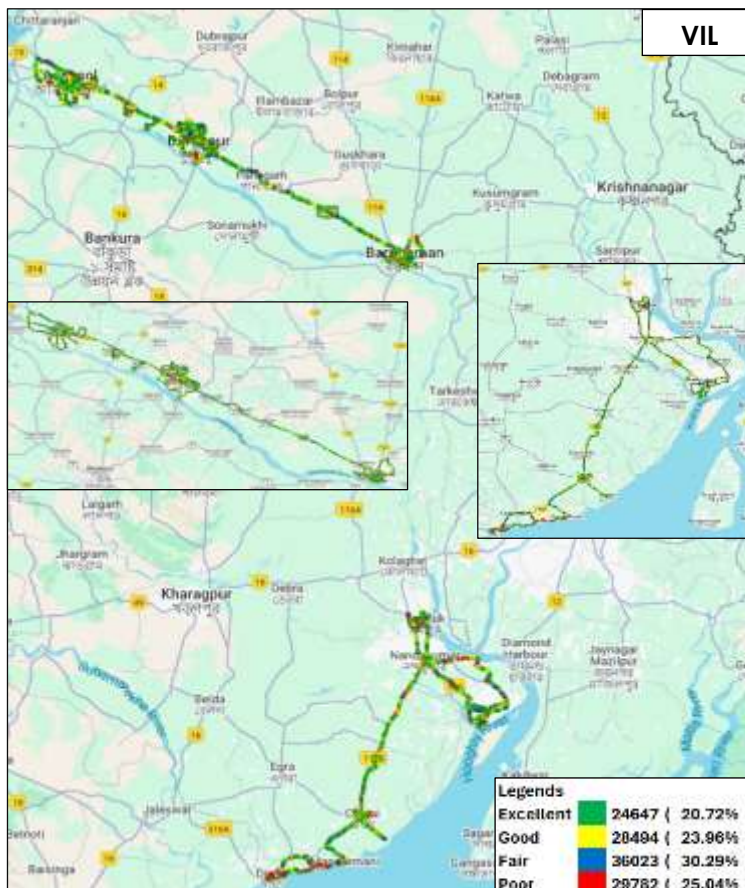


Figure-66: Signal strength 3G/2G network mode – VIL.

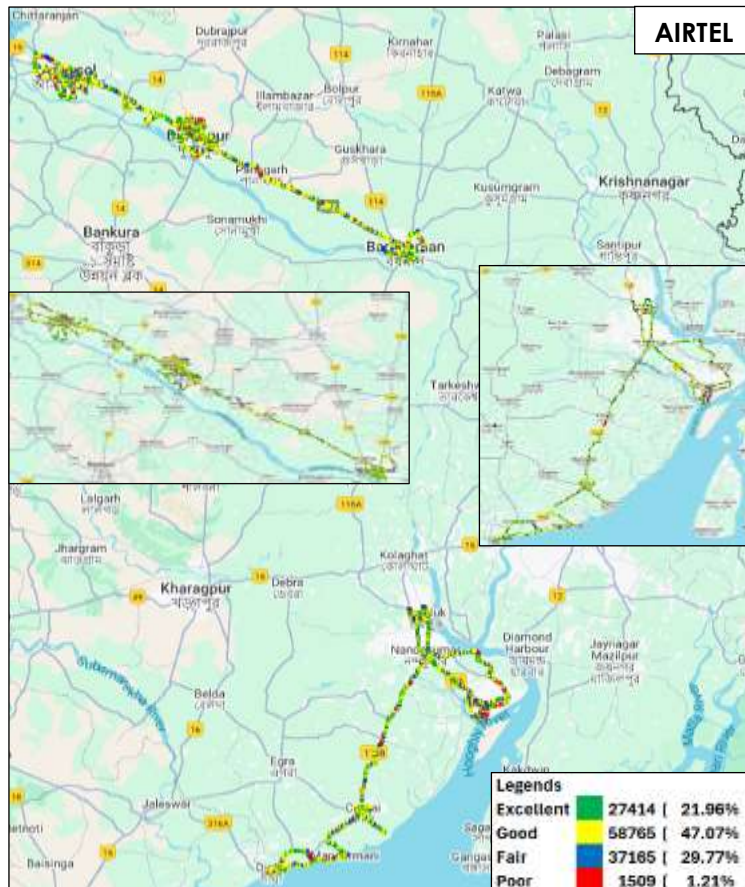


Figure-67: Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL.

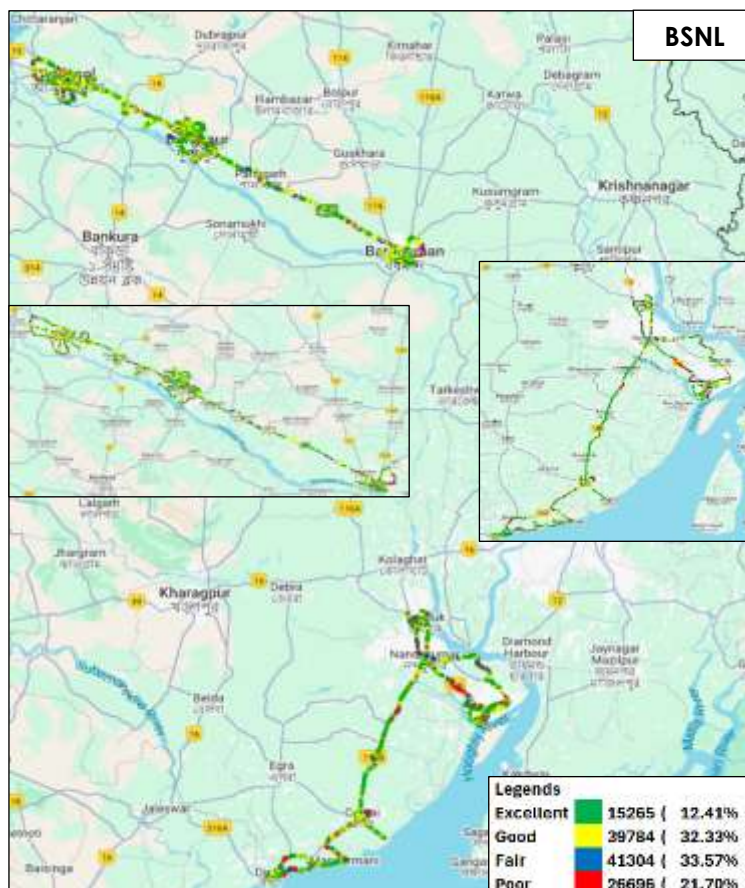


Figure-68: Signal strength auto-selection mode 5G/4G/3G/2G (4G network being rolled out) – BSNL.

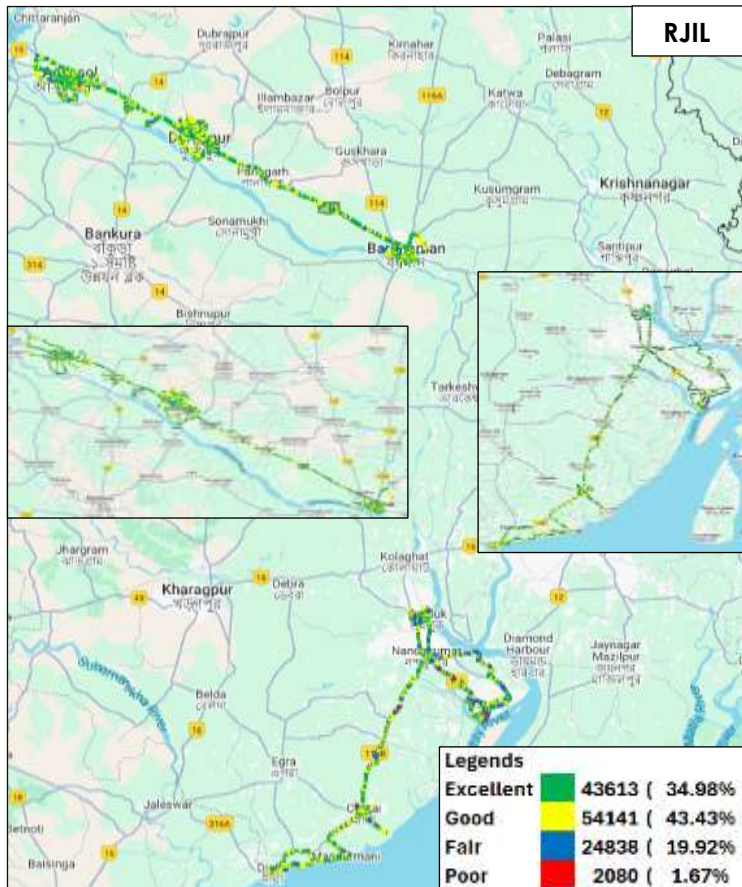


Figure-69: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

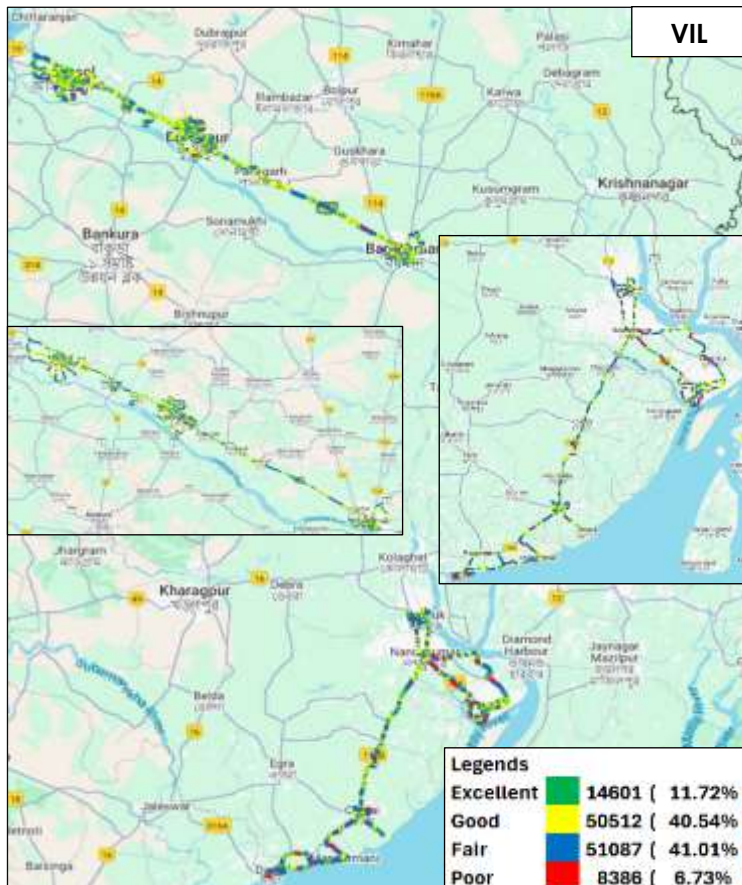


Figure-70: Signal strength auto-selection mode 5G/4G/3G/2G – VIL.

7. Appendix

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

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

7.1 Appendix-I

7.1.1 Drive test setup

Voice Call		
Call details	Technology	Detail
Call Setup Timeout	<ul style="list-style-type: none"> • 3G/2G auto mode- switch Call • 5G/4G/3G/2G auto mode- switch Call • 5G/4G MOS Call 	30 Sec
Call Duration		120 Sec
Wait/ Guard Time		15 Sec

Table-131: Voice test detail

Note-

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

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

Latency		25 count- Dynamic 1000 count- Hotspot Payload- 512 bytes in all drive
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Table-132: Data test detail

Note-

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

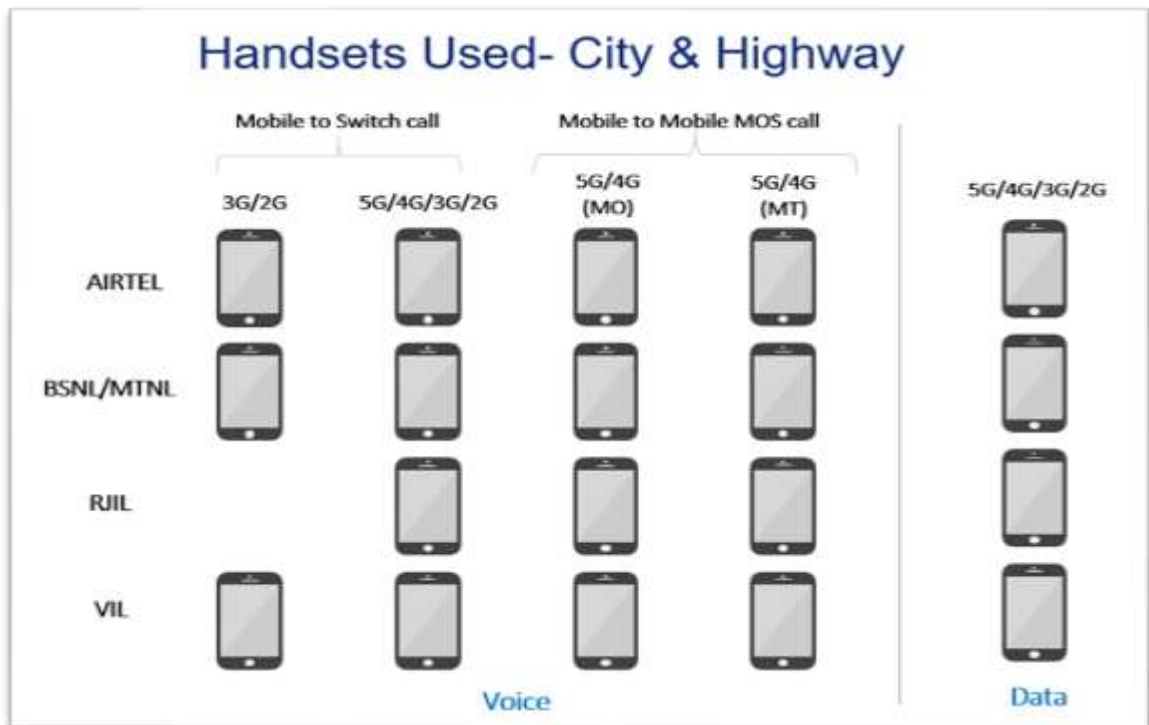


Figure-71: Number of handsets used in city & highway drive

MO: Mobile originating

MT: Mobile terminating

Handsets Used- Railway/Metro/Walk Test/ Hotspot & Coastal Area

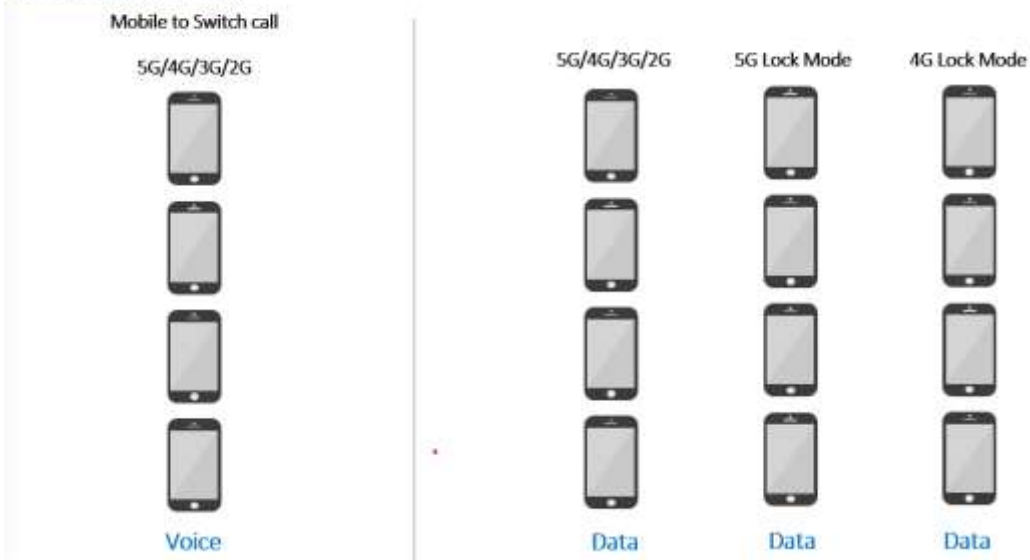


Figure-72: Number of handsets used in railway/metro/walktest/hotspot & coastal area

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)

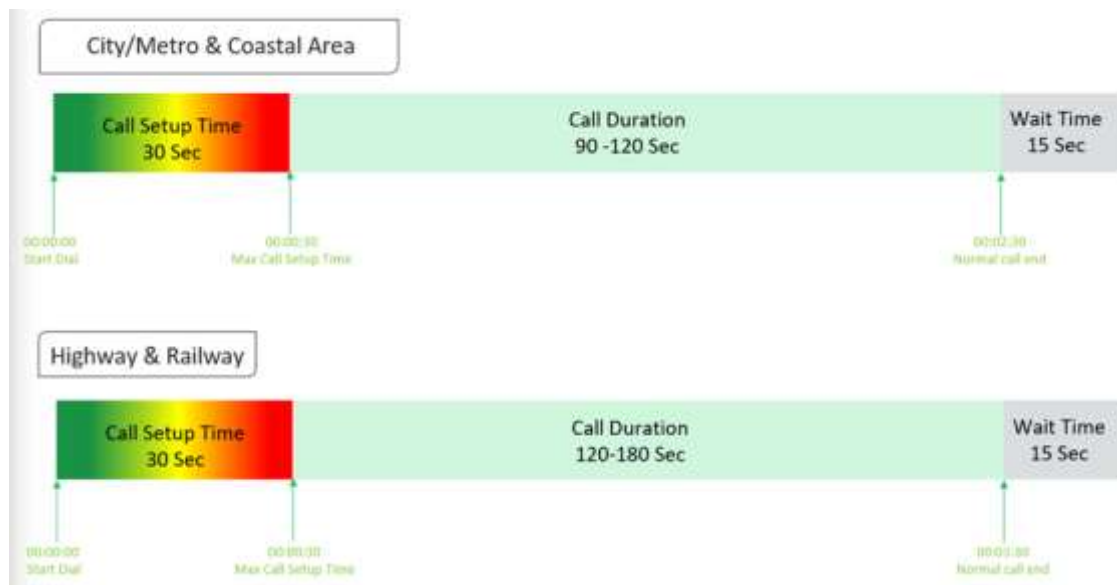


Figure-73: Voice test script for city/railway/metro/highway & coastal area

- 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-74: 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-75: Data test script used in city/metro/railway/highway/walk test & coastal area

(d) Static Data(internet) testing

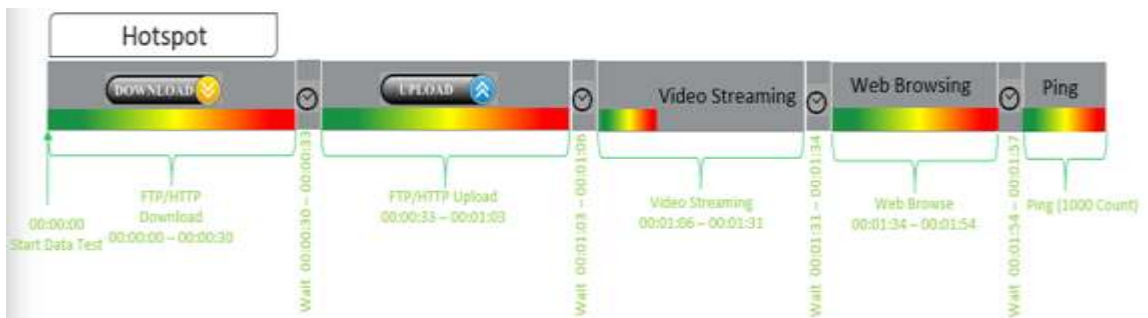


Figure-76: Data test script used at hotspot

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

7.2 Appendix-II

7.2.1 Network Performance Parameters for Voice calls

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

Jitter	<p>The inter arrival jitter is the difference in the relative transit time for two packets. The relative transit time is the difference between a packet's Real-time Transport Protocol (RTP) timestamp and the receiver's clock at the time of arrival, measured in the same units. If S_i is the RTP timestamp from packet i, and R_i is the time of arrival in RTP timestamps units for packet i, then for two packets i and j the inter-arrival jitter D can be expressed as:</p> $D(i,j) = (R_j - R_i) - (S_j - S_i)$ <p>The interarrival jitter is calculated continuously as each data packet i is received from source $SSRC_n$, using this difference D for that packet and the previous packet $i-1$ in order of arrival (not necessarily in sequence), according to the formula</p> $J(i) = J(i-1) + (D(i-1,i) - J(i-1))/16 \text{ or } 8$																																		
Downlink Packet Drop Rate	<p>Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source_SSRC and sequence number) at call originating handset.</p> <p>This KPI is calculated from MOS call for packet call only (VoNR/VoLTE)</p>																																		
Uplink Packet Drop Rate	<p>Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source_SSRC and sequence number) at call terminating handset. This KPI is calculated from MOS call for packet call only (VoNR/VoLTE).</p>																																		
Signal Strength	<p>Signal strength is the signal power level received by the wireless user.</p> <table><tr><th rowspan="2">Parameter Name</th><th rowspan="2">Technology</th><th colspan="4">Signal Strength (dBm)</th></tr><tr><th>Excellent</th><th>Good</th><th>Fair</th><th>Poor</th></tr><tr><td>Rx Level</td><td>GSM</td><td>0 to ≥ -65</td><td><-65 to ≥ -75</td><td><-75 to ≥ -85</td><td><-85 to min</td></tr><tr><td>RSCP</td><td>WCDMA</td><td>0 to ≥ -70</td><td><-70 to ≥ -80</td><td><-80 to ≥ -90</td><td><-90 to min</td></tr><tr><td>RSRP</td><td>LTE</td><td>0 to ≥ -80</td><td><-80 to ≥ -95</td><td><-95 to ≥ -110</td><td><-110 to min</td></tr><tr><td>SS_RSRP</td><td>NR</td><td>0 to ≥ -80</td><td><-80 to ≥ -95</td><td><-95 to ≥ -110</td><td><-110 to min</td></tr></table>	Parameter Name	Technology	Signal Strength (dBm)				Excellent	Good	Fair	Poor	Rx Level	GSM	0 to ≥ -65	<-65 to ≥ -75	<-75 to ≥ -85	<-85 to min	RSCP	WCDMA	0 to ≥ -70	<-70 to ≥ -80	<-80 to ≥ -90	<-90 to min	RSRP	LTE	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min	SS_RSRP	NR	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min
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Table-133: Network performance parameter and definition voice

7.2.2 Network Performance Parameters Data tests

Parameter Name	Definition
Download Speed (Mbps)	<p>The download speed is defined as the data transmission rate that is achieved for downloading a test file from a test server to a test device.</p> <p>Download Speed = Total bytes transferred during download / Total time for transfer</p> <ul style="list-style-type: none"> 80th percentile (upper range) & 20th percentile (lower range) value has been calculated for download throughput in dynamic drive and Hotspot combine data
Upload Speed (Mbps)	<p>The upload speed is the data transmission rate that is achieved for uploading a test file from a test device to a test server.</p> <p>Upload Speed = Total bytes transferred during upload / Total time for transfer.</p> <ul style="list-style-type: none"> 80th percentile (upper range) & 20th percentile (lower range) value has been calculated for upload throughput in dynamic drive and Hotspot combine data.
Download Session Setup Success Rate	<p>(total download session established (successfully connected to server)/ total download session attempt) *100.</p> <p>This KPI has been calculated for Hotspot only.</p>

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	<p>Web browsing test is used to measure performance in terms of opening a web/HTTP page.</p> <p>Time taken to open the web page successfully is considered as web browsing delay/web page download time.</p>
Video Streaming Delay	The Video streaming delay is time taken from start of video transfer to First video frame displayed in player.
Latency	<p>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.</p> <p>The Latency is measured in milliseconds (ms).</p> <p>To calculate the one-way latency we just do half of the round-trip time. 50th percentile of one way latency has been reported.</p>
Jitter	<p>Measure of variation in time in arrival of packets from a source to destination</p> <p>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</p> <p>$IPDV(i) = D(i) - D(i-1)$ then Stdvs of IPDV is considered as jitter.</p>
Packet Loss Rate	<p>Number of packets lost out of total packet transferred during test. Packet loss rate = (Total packet lost / Total packet sent) *100</p> <p>* Packet delay (using ping) >90 ms considered as packet loss and included in packet loss rate.</p> <p>* Packet loss rate is calculated based on ICMP</p> <p>* 90th percentile for Packet loss rate has been reported in overall Hotspot performance summary.</p>

Table-134: 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.