भादूविप्रा
TRAI

TELECOM REGULATORY AUTHORITY OF INDIA

Independent Drive Test Report

Delhi LSA

April 2026

Contents

1. Introduction

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

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

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

2. Executive Summary (LSA)

2.1 Drive test details

This report covers the findings of the IDT undertaken in Delhi License Service Area (LSA) during the month of April-2026 under the supervision of TRAI Regional Office (RO) Delhi. Details of metro routes covered during the IDT are as given below:

S. No	Drive test route	Type of route	Distance covered (KMs)	From date	To date
1	Aqua Line, Blue Line 1, Blue Line 2, Green Line, Grey Line, Magenta Line, Magenta Line (Ext.), Orange Line, Pink Line, Pink Line (Ext.), Rapid Metro, Red Line, Violet Line, Yellow Line & Namo Bharat (RRTS)	Metro	490.0	01-Apr-2026	14-Apr-2026

Table-1: Drive test summary.

Note-

- Distance has been derived from official metro authority websites namely Delhi Metro Rail Corporation (DMRC), Noida Metro Rail Corporation (NMRC), and National Capital Region Transport Corporation. Which references are as follows: -
  DMRC - https://delhimetrorail.com/, NMRC - https://www.nmrcnoida.com/
  NCRTC - https://ncrtc.in/details/
- Drive has been conducted 1st, 2nd, 4th and 14th April 2026.

2.2 Drive test routes

The map provides overview of metro drive test routes as per the legend shown on the map.

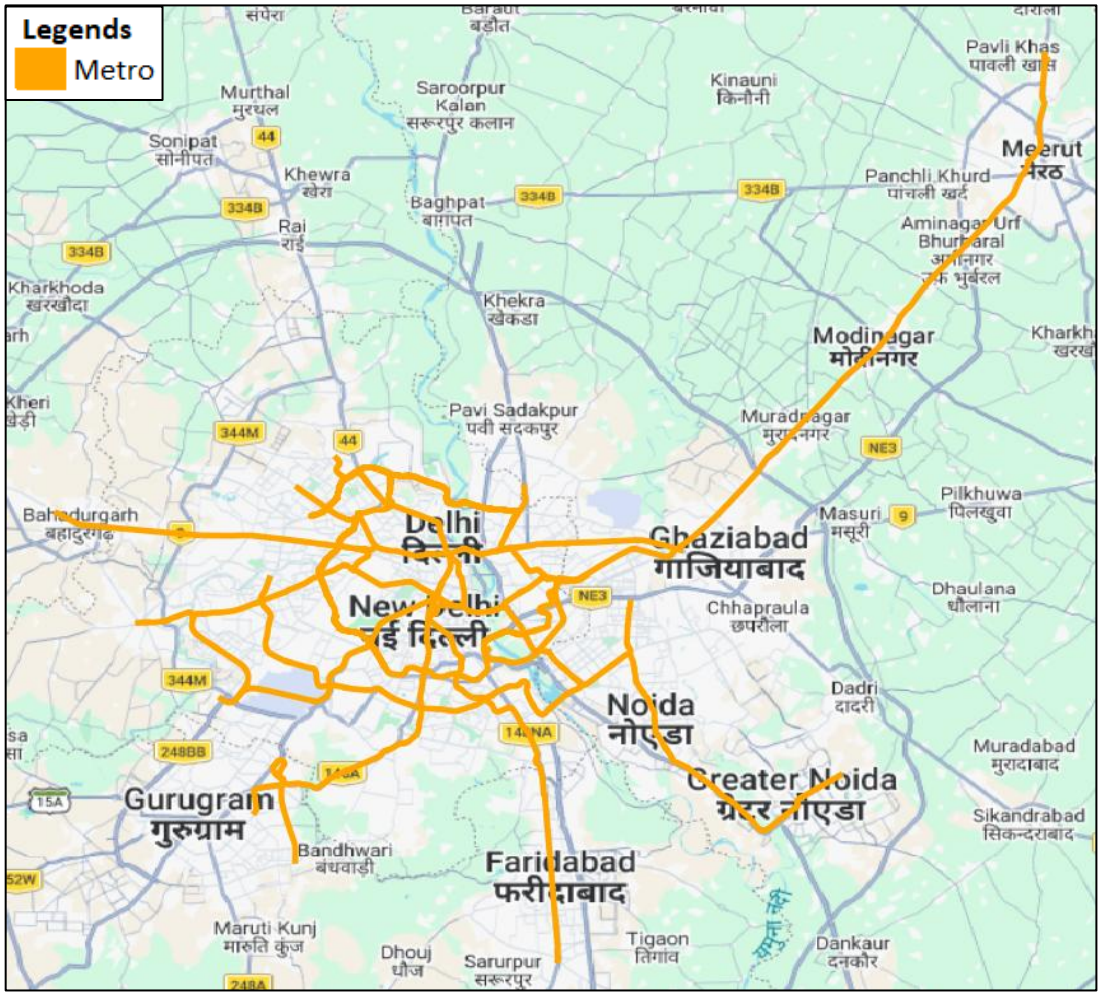


Figure-1: Metro drive test routes.

2.3 Summary of routes covered

a) Metro

1. Sector-51 Noida to Depot Station (Aqua Line)
2. Dwarka Sector-21 to Noida Electronic City (Blue Line 1)
3. Vaishali to Yamuna Bank (Blue Line 2)
4. Kirti Nagar to Brigadier Hoshiyar Singh (Green Line)
5. Dwarka to Dhansa Bus Stand (Grey Line)
6. Botanical Garden to Krishna Park Extension (Magenta Line)
7. Deepali Chowk to Majlis Park (Magenta Line Ext.)
8. New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line)
9. Mayur Vihar-1 to Maujpur-Babarpur (Pink Line)
10. Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.)
11. Sector 55-56 to Phase-3 (Rapid Metro)
12. Shaheed Sthal to Rithala (Red Line)
13. Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line)
14. Samaypur Badli to Millennium City Centre (Yellow Line)
15. Delhi to Meerut (Namo Bharat RRTS)

2.4 Telecom service providers detected frequency bands

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

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

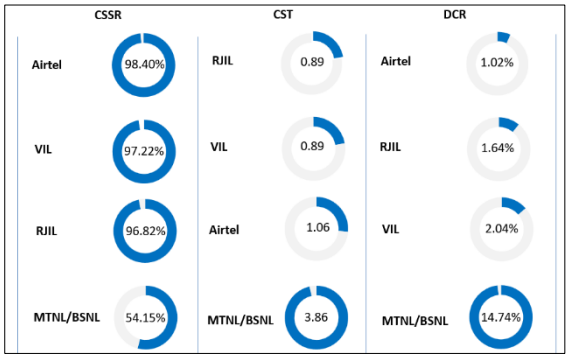
Table-2: Telecom service provider (TSP) covered in IDT.

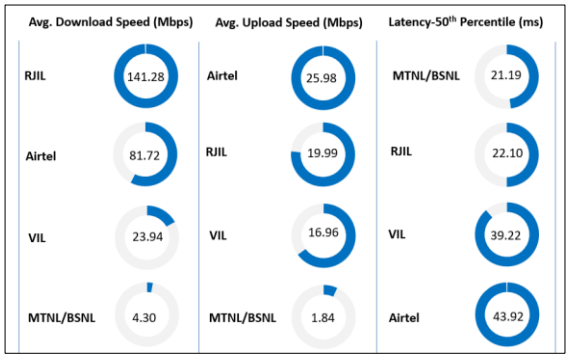
Note-

- MTNL SIM cards were used from Sarai Kale khan to Saheed Sthal while BSNL UP west SIM cards were used from Saheed Sthal to Modipuram (Meerut) during Delhi-Meerut (RRTS) metro route.

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, MTNL/BSNL, RJIL and VIL have 98.40%, 54.15%, 96.82% and 97.22% call setup success rate respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, MTNL/BSNL, RJIL and VIL have call setup time of 1.06, 3.86, 0.89 and 0.89 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, MTNL/BSNL, RJIL and VIL have drop call rate of 1.02%, 14.74%, 1.64% and 2.04% respectively in Auto-selection mode (5G/4G/3G/2G).

Summary-Data services

Data Download performance (Overall): Average download speed of Airtel (5G/4G/2G) is 81.72 Mbps, MTNL/BSNL (4G/3G/2G) is 4.30 Mbps, RJIL (5G/4G) is 141.28 Mbps and VIL (5G/4G/2G) is 23.94 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G/2G) is 25.98 Mbps, MTNL/BSNL (4G/3G/2G) is 1.84 Mbps, RJIL (5G/4G) is 19.99 Mbps and VIL (5G/4G/2G) is 16.96 Mbps.

Latency (Overall): Airtel, MTNL/BSNL, RJIL and VIL 50th percentile latency is 43.92 ms, 21.19 ms, 22.10 ms, 39.22 ms respectively.

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 11.47%, 64.35%, 16.34% & 30.23% of the **Sector-51 Noida to Depot Station (Aqua Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 207 to 210** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 9.88%, 41.31%, 16.19% & 5.71% of the **Sector-51 Noida to Depot Station (Aqua Line) Metro IDT**

route in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 211 to 214** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 1.41%, 54.77%, 0.96% & 0.86% of the **Dwarka Sector-21 to Noida Electronic City (Blue Line 1) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 215 to 218** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 1.60%, 32.66%, 0.88% & 0.98% of the **Dwarka Sector-21 to Noida Electronic City (Blue Line 1) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 219 to 222** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 6.02%, 71.52%, 0.30% & 0.45% of the **Vaishali to Yamuna Bank (Blue Line 2) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 223 to 226** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 1.47%, 36.09%, 0.00% & 0.00% of the **Vaishali to Yamuna Bank (Blue Line 2) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 227 to 230** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.05%, 44.73%, 0.18% & 1.72% of the **Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 231 to 234** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.26%, 33.52%, 0.08% & 0.66% of the **Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 235 to 238** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.42%, 37.50%, 0.26% & 0.00% of the **Dwarka to Dhansa Bus Stand (Grey Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 239 to 242** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.16%, 27.32%, 0.34% & 0.50% of the **Dwarka to Dhansa Bus Stand (Grey Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 243 to 246** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 1.31%, 40.43%, 1.30% & 0.78% of the **Botanical Garden to Krishna Park Extension (Magenta Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 247 to 250** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.95%, 39.26%, 3.61% & 1.14% of the **Botanical Garden to Krishna Park Extension (Magenta Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 251 to 254** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.00%, 18.71%, 0.14% & 0.26% of the **Deepali Chowk to Majlis Park (Magenta Line Ext.) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 255 to 258** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.33%, 1.62%, 0.00% & 0.00% of the **Deepali Chowk to Majlis Park (Magenta Line Ext.) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 259 to 262** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during voice testing has been observed in 4.44%, 45.69%, 1.33% & 0.36% of the **New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 105** as per the **Section 4.2** under Para-4 (Detailed QoS performance analysis)}. Reference has not been taken from Annexure as plot not given due underground route

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during data testing has been observed in 2.99%, 51.97%, 1.59% & 1.68% of the **New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 108** as per the **Section 4.2** under Para-4 (Detailed QoS performance analysis)} Reference has not been taken from Annexure as plot not given due underground route

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 5.57%, 37.15%, 2.09% & 0.79% of the **Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 263 to 266** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 2.07%, 23.09%, 1.03% & 0.88% of the **Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 267 to 270** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.14%, 42.88%, 0.00% & 0.00% of the **Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 271 to 274** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.17%, 17.97%, 0.00% & 0.13% of the **Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 275 to 278** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.64%, 63.25%, 0.15% & 0.00% of the **Sector 55-56 to Phase-3 (Rapid Metro) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 279 to 282** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.22%, 36.86%, 0.00% & 0.29% of the **Sector 55-56 to Phase-3 (Rapid Metro) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 283 to 286** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.31%, 46.19%, 0.22% & 1.35% of the **Shaheed Sthal to Rithala (Red Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 287 to 290** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 0.79%, 30.10%, 0.04% & 0.55% of the **Shaheed Sthal to Rithala (Red Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 291 to 294** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 1.67%, 64.68%, 4.52% & 4.98% of the **Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 295 to 298** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 1.44%, 14.77%, 0.58% & 0.73% of the **Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 299 to 302** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 0.46%, 34.82%, 1.05% & 1.01% of the **Samaypur Badli to Millennium City Centre (Yellow Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 303 to 306** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 2.15%, 14.20%, 0.78% & 0.88% of the **Samaypur Badli to Millennium City Centre (Yellow Line) Metro IDT route** in case of Airtel, MTNL, RJIL and VIL respectively. {refer **figure- 307 to 310** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **voice** testing has been observed in 4.85%, 46.33%, 6.92% & 1.57% of the **Delhi to Meerut (Namo Bharat RRTS) Metro IDT route** in case of Airtel, MTNL/BSNL, RJIL and VIL respectively. {refer **figure- 311 to 314** as per the **Section 6.1** under Para-6 (Annexure)}

- The Poor signal strength in auto-selection mode (5G/4G/3G/2G) during **data** testing has been observed in 3.36%, 24.85%, 3.10% & 2.60% of the **Delhi to Meerut (Namo Bharat RRTS) Metro IDT route** in case of Airtel, MTNL/BSNL, RJIL and VIL respectively. {refer **figure- 315 to 318** as per the **Section 6.1** under Para-6 (Annexure)}

QoS Performance Analysis- Delhi 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 metro drive tests conducted in the Delhi LSA during the month of April-2026. (Refer Table-1)

3.2 Voice performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL/BSNL	RJIL	VIL
Call Attempts	499	639	503	504
Call Setup Success Rate %	98.40	54.15	96.82	97.22
Drop Call Rate %	1.02	14.74	1.64	2.04
Call Setup Time-Average (Second)	1.06	3.86	0.89	0.89
Handover Success Rate %	99.78	99.78	99.83	99.77

Table-3: Summary of voice call performance in network auto-selection mode.

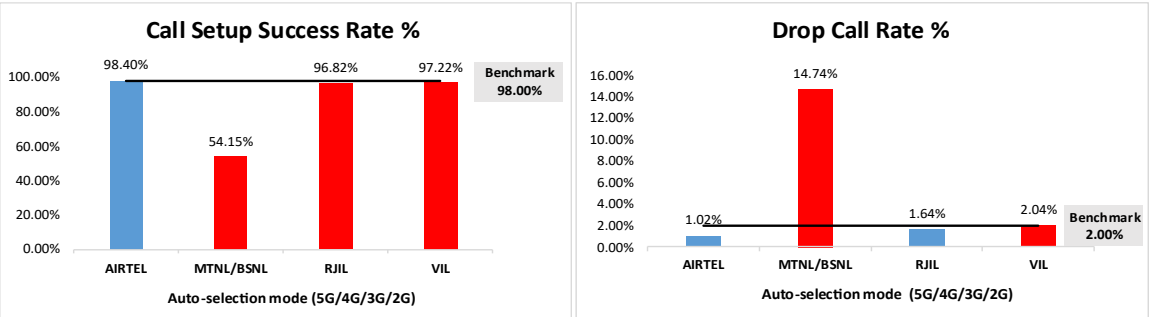


Figure-2: Performance for call setup success rate and drop call rate.

Number of unique cell Id's covered in Voice test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL/BSNL	RJIL	VIL
5G	0	NA	705	0
4G	3663	16	3515	2752
3G	NA	279	NA	NA
2G	3	195	NA	17

Table-4: 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.

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	MTNL/BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	81.72	4.30	141.28	23.94
	80th Percentile	119.86	6.17	229.94	37.88
	20th Percentile	18.71	2.02	38.55	8.58
Upload Throughput (Mbits/s)	Average	25.98	1.84	19.99	16.96
	80th Percentile	42.61	2.69	32.37	33.47
	20th Percentile	5.26	0.78	4.67	2.52
Latency (ms)	50th Percentile	43.92	21.19	22.10	39.22

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

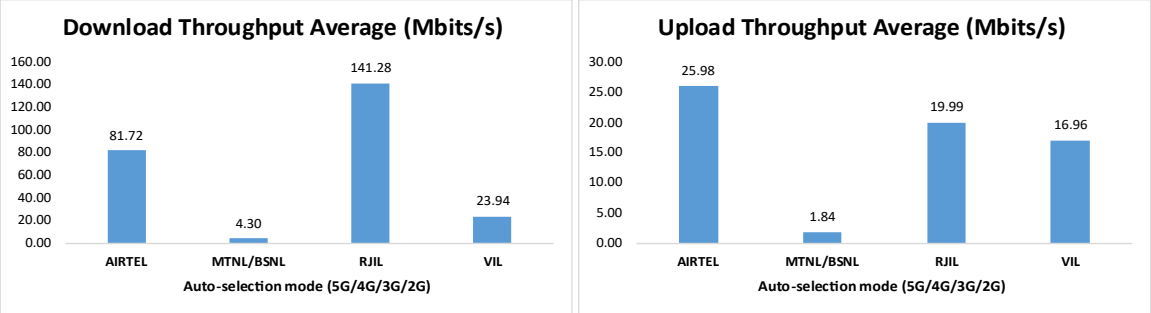


Figure- 3: Download and Upload throughput

Number of unique cell Id's covered in Data test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL/BSNL	RJIL	VIL
5G	0	NA	1855	0
4G	3561	77	278	2351
3G	NA	237	NA	NA
2G	4	123	NA	4

Table-6: 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 metro routes drive. The results of drive tests conducted are shown individually for respective routes.

4.2 Metro

Drive test has been conducted on 1st, 2nd, 4th & 14th April 2026 covering fifteen metro routes. (Refer Table-1)

4.2.1 Drive test route

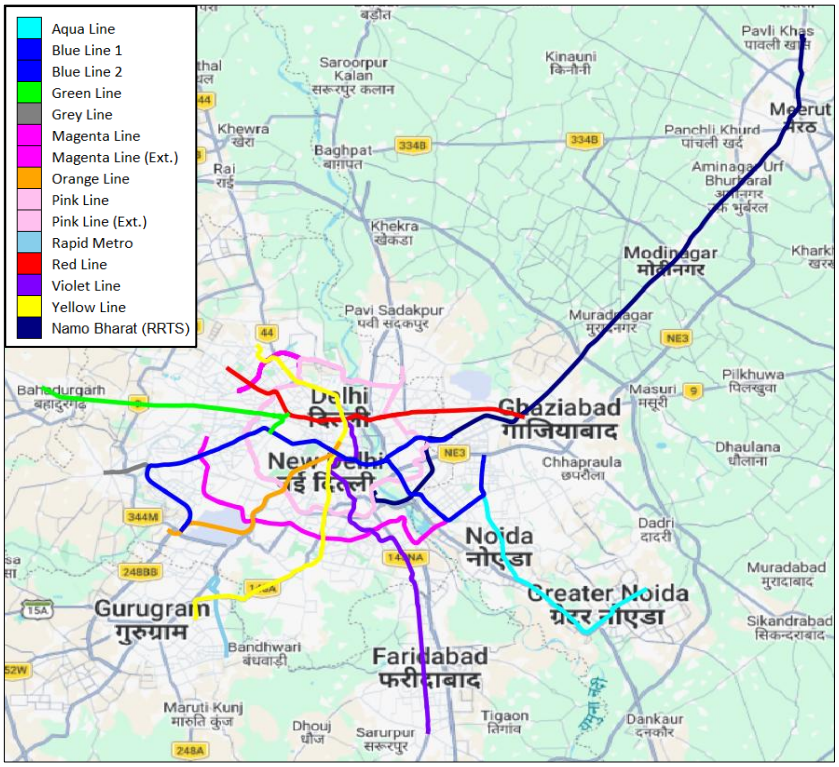


Figure-4: Metro drive test routes.

4.2.2 Routes Covered

1. Sector-51 Noida to Depot Station (Aqua Line)
2. Dwarka Sector-21 to Noida Electronic City (Blue Line 1)
3. Vaishali to Yamuna Bank (Blue Line 2)
4. Kirti Nagar to Brigadier Hoshiyar Singh (Green Line)
5. Dwarka to Dhansa Bus Stand (Grey Line)
6. Botanical Garden to Krishna Park Extension (Magenta Line)
7. Deepali Chowk to Majlis Park (Magenta Line Ext.)
8. New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line)
9. Mayur Vihar-1 to Maujpur-Babarpur (Pink Line)
10. Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.)
11. Sector 55-56 to Phase-3 (Rapid Metro)
12. Shaheed Sthal to Rithala (Red Line)
13. Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line)
14. Samaypur Badli to Millennium City Centre (Yellow Line)
15. Delhi to Meerut (Namo Bharat RRTS)

4.2.2.1 Sector-51 Noida to Depot Station (Aqua Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	26	78	25	26
Call Setup Success Rate %	100.00	8.97	100.00	96.15
Drop Call Rate %	0.00	28.57	0.00	0.00
Call Setup Time Average (Second)	1.05	3.27	1.02	1.21
Handover Success Rate %	98.80	100.00	99.82	100.00

Table-7: Summary of voice call performance in network auto-selection mode.

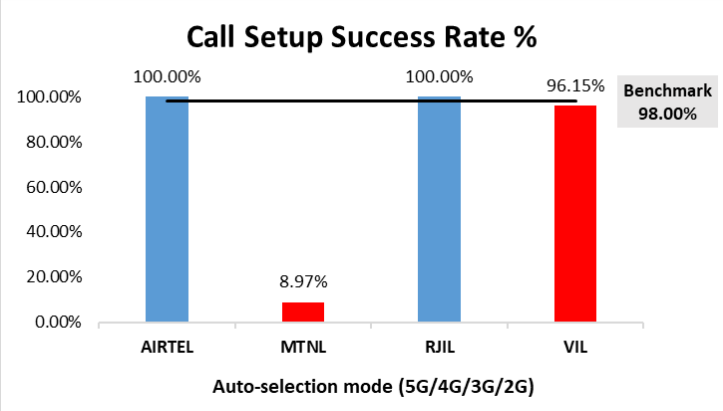


Figure-5: Performance for call setup success rate.

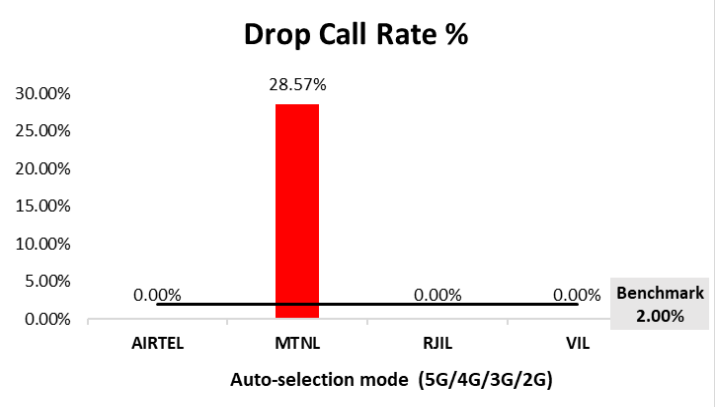


Figure-6: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	2.84%	NA	21.19%	0.00%
4G	97.16%	0.00%	78.81%	98.11%
3G	NA	98.22%	NA	NA
2G	0.00%	1.78%	NA	1.89%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-8: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

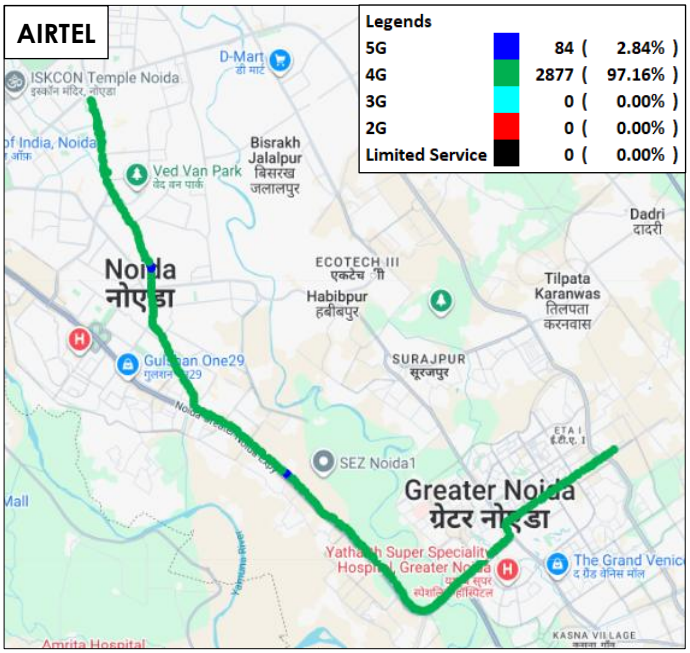


Figure-7: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

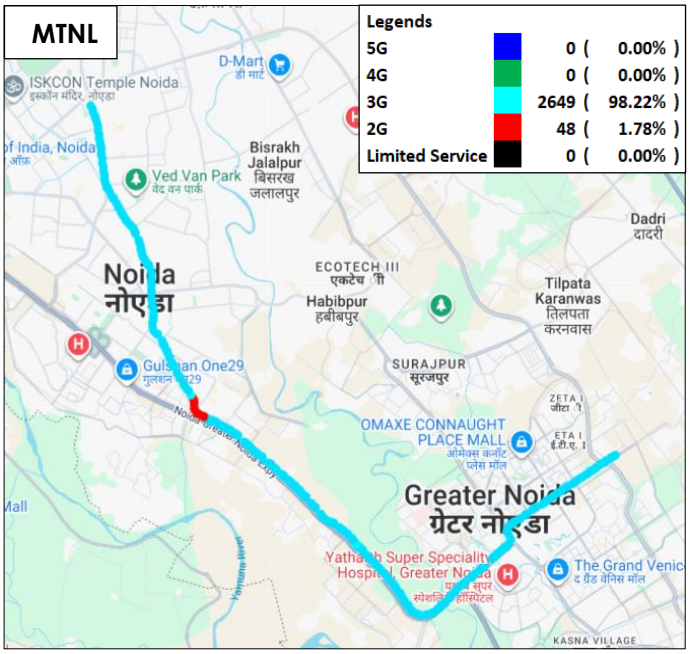


Figure-8: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

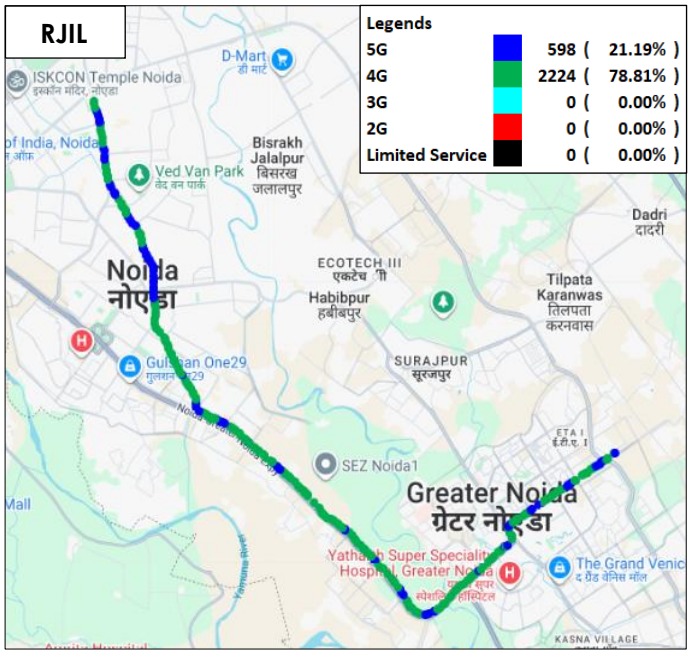


Figure-9: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

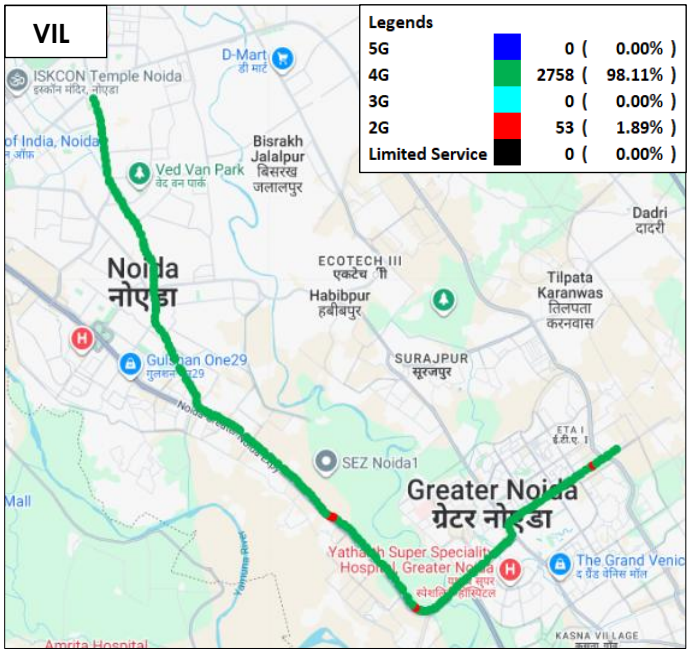


Figure-10: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-207, 208, 209 & 210 for map view)

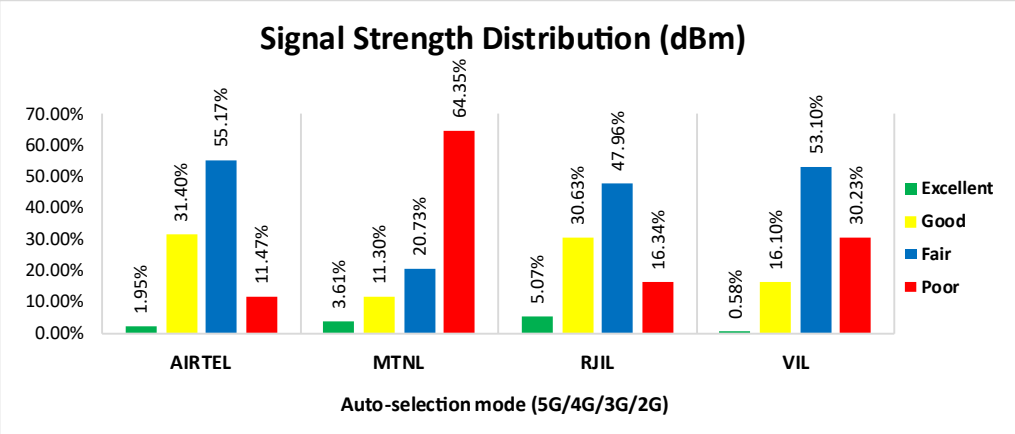


Figure-11: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 2% of samples falling in the excellent signal strength category.
- MTNL has 4% of samples falling in the excellent signal strength category.
- RJIL has 5% of samples falling in the excellent signal strength category.
- VIL has 1% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	54.56	3.21	139.97	19.98
	80th Percentile	90.16	3.80	234.10	34.40
	20th Percentile	9.34	2.33	32.96	5.17
Upload Throughput (Mbits/s)	Average	9.47	1.40	9.64	9.48
	80th Percentile	14.94	2.43	16.36	15.34
	20th Percentile	2.69	0.09	2.32	2.30
Latency (ms)	50th Percentile	46.81	35.40	23.78	40.07

Table-9: Summary of Data performance in network auto-selection mode.

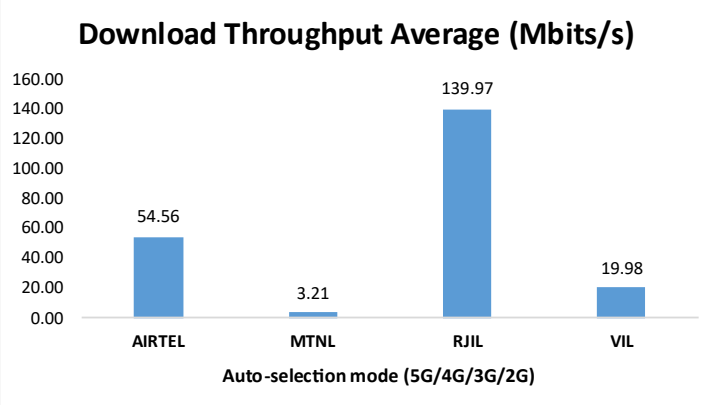


Figure 12: Download throughput.

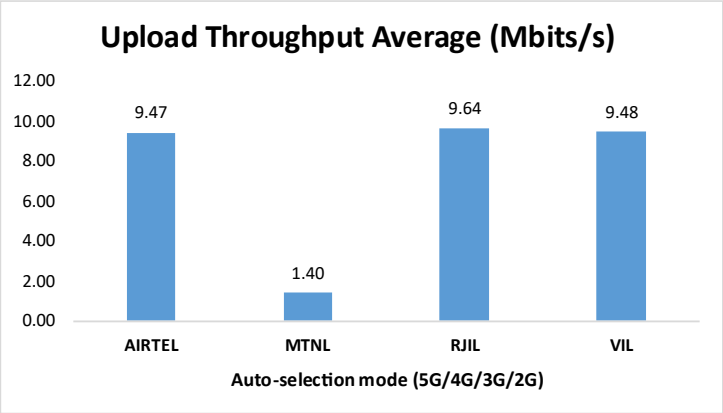


Figure-13: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	61.72%	NA	89.44%	36.20%
4G	38.28%	0.00%	10.56%	63.80%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-10: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

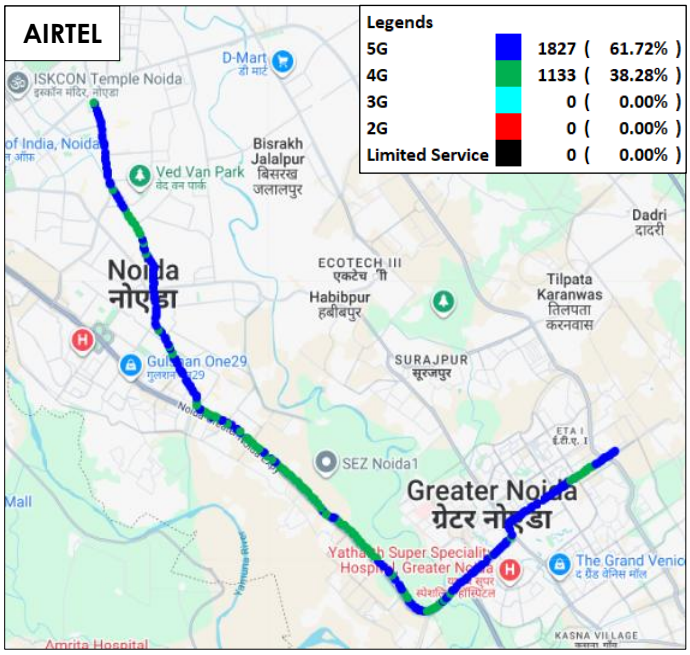


Figure-14: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

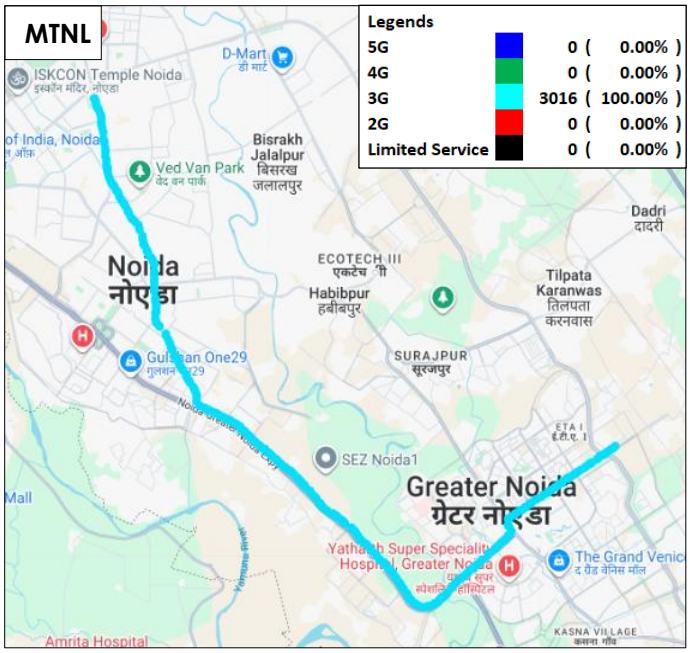


Figure-15: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

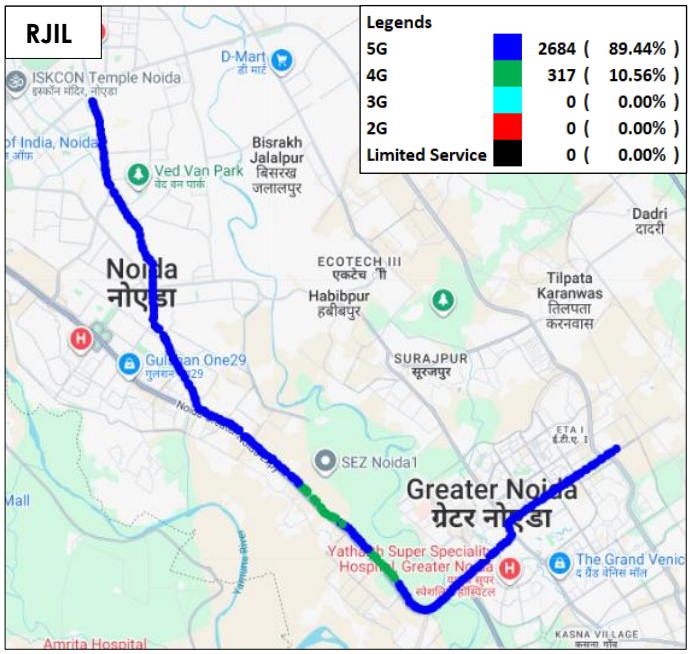


Figure-16: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

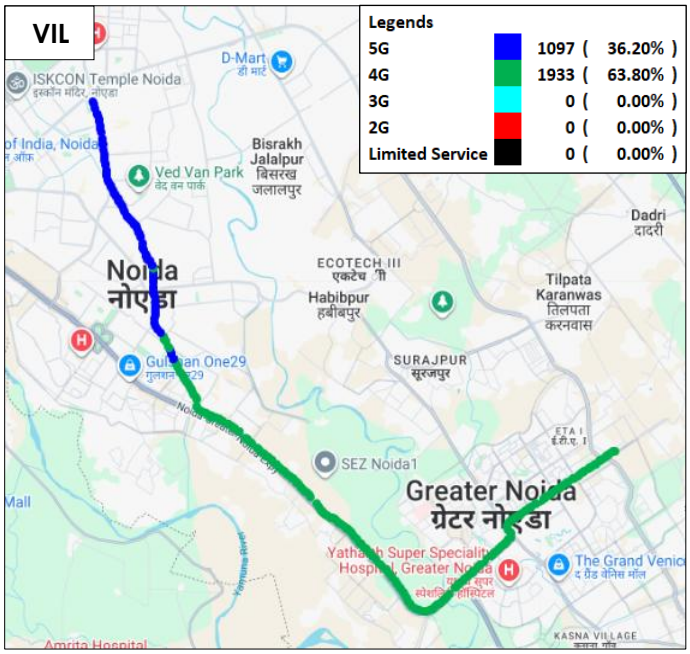


Figure-17: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-211, 212, 213 & 214 for map view)

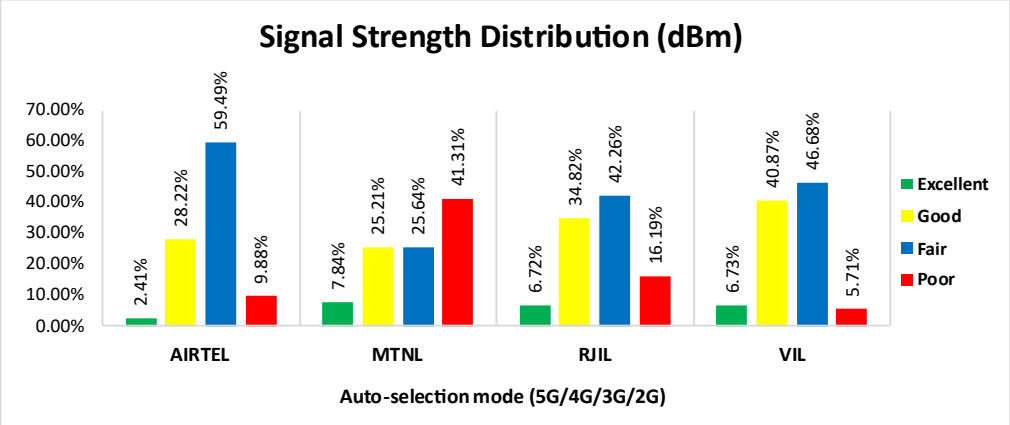


Figure-18: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 2% of samples falling in the excellent signal strength category.
- MTNL has 8% of samples falling in the excellent signal strength category.
- RJIL has 7% of samples falling in the excellent signal strength category.
- VIL has 7% of samples falling in the excellent signal strength category.

4.2.2.2 Dwarka Sector-21 to Noida Electronic City (Blue Line 1)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	62	68	62	64
Call Setup Success Rate %	100.00	76.47	100.00	98.44
Drop Call Rate %	1.61	13.46	0.00	0.00
Call Setup Time Average (Second)	0.83	4.73	0.59	0.54
Handover Success Rate %	99.86	100.00	99.91	99.60

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

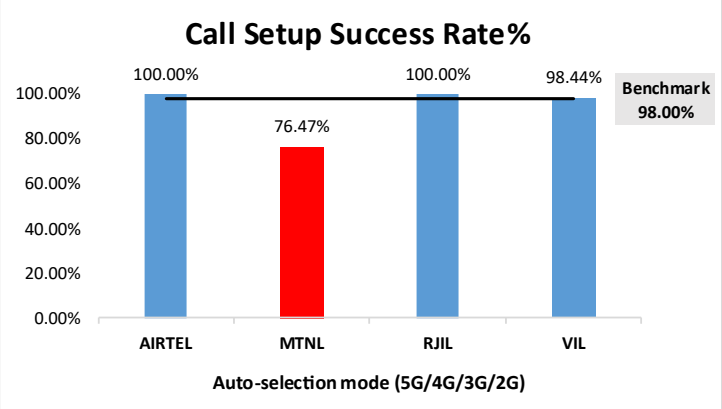


Figure-19: Performance for call setup success rate.

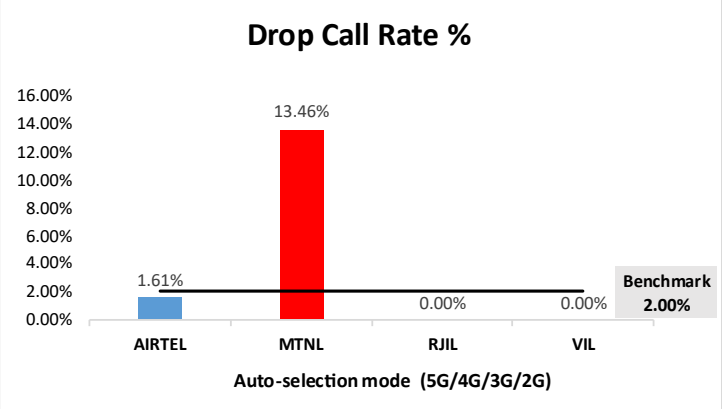


Figure-20: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	0.90%	NA	11.25%	0.00%
4G	99.10%	0.00%	88.75%	100.00%
3G	NA	96.51%	NA	NA
2G	0.00%	1.27%	NA	0.00%
Limited Service	0.00%	2.22%	0.00%	0.00%

Table-12: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

Figure-21: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

Figure-22: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

Figure-23: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

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

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-215, 216, 217 & 218 for map view)

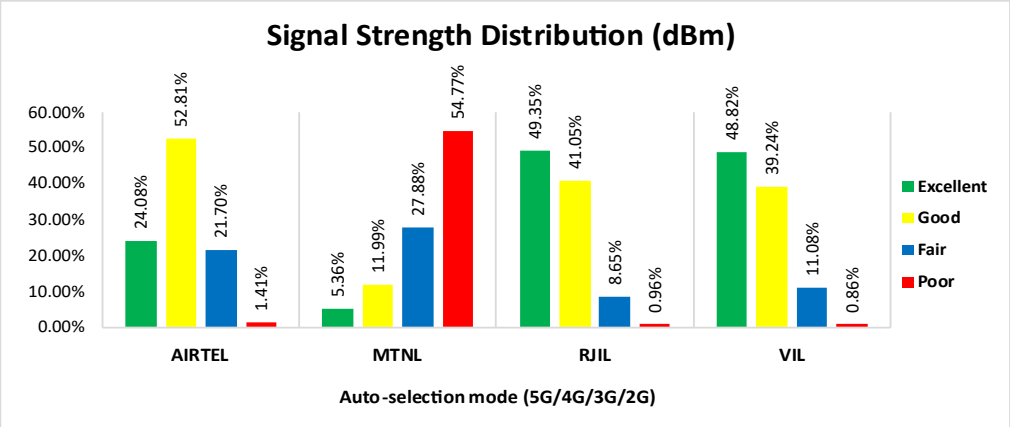


Figure-25: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 24% of samples falling in the excellent signal strength category.
- MTNL has 5% of samples falling in the excellent signal strength category.
- RJIL has 49% of samples falling in the excellent signal strength category.
- VIL has 49% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	135.13	4.35	175.71	32.21
	80th Percentile	211.98	6.02	262.28	45.68
	20th Percentile	46.70	2.93	73.34	15.39
Upload Throughput (Mbits/s)	Average	32.55	1.40	24.05	18.83
	80th Percentile	49.47	2.12	34.41	38.10
	20th Percentile	14.53	0.61	7.24	2.82
Latency (ms)	50th Percentile	45.22	16.86	23.30	39.53

Table-13: Summary of Data performance in network auto-selection mode.

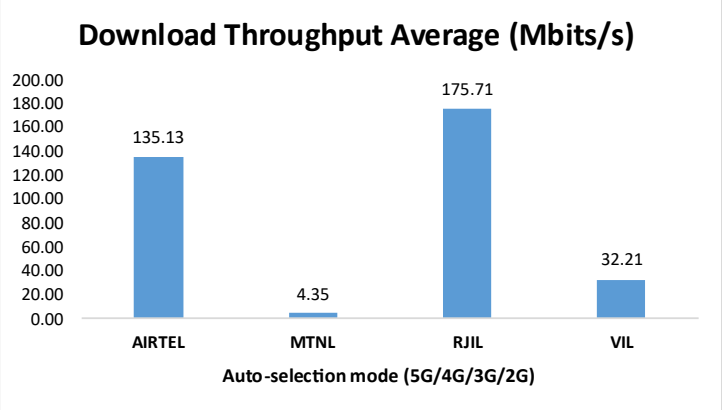


Figure 26: Download throughput.

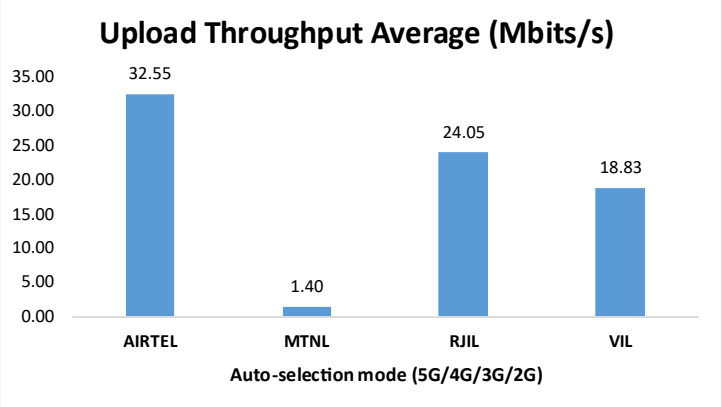


Figure-27: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	85.60%	NA	89.05%	59.73%
4G	14.34%	0.00%	10.95%	40.27%
3G	NA	95.36%	NA	NA
2G	0.06%	2.05%	NA	0.00%
Limited Service	0.00%	2.58%	0.00%	0.00%

Table-14: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

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

Figure-28: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

Figure-29: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

Figure-30: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

Figure-31: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-219, 220, 221 & 22 for map view)

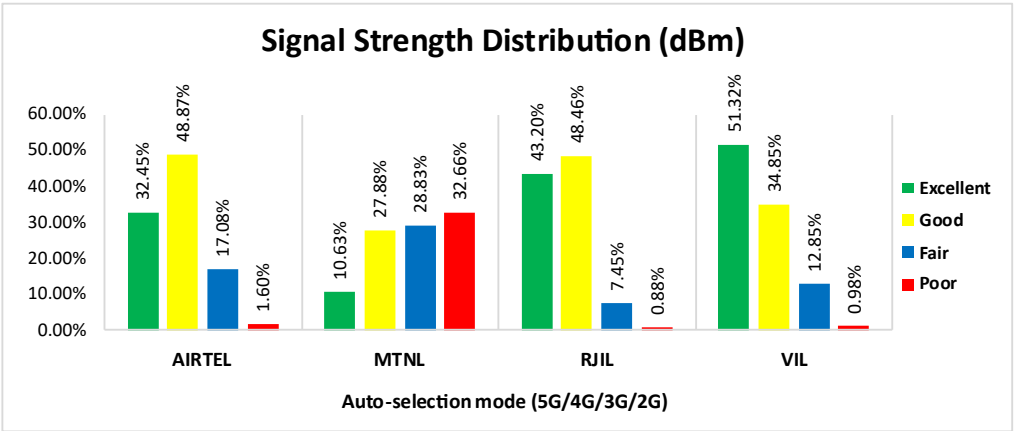


Figure-32: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 32% of samples falling in the excellent signal strength category.
- MTNL has 11% of samples falling in the excellent signal strength category.
- RJIL has 43% of samples falling in the excellent signal strength category.
- VIL has 51% of samples falling in the excellent signal strength category.

4.2.2.3 Vaishali to Yamuna Bank (Blue Line 2)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	13	14	13	12
Call Setup Success Rate %	100.00	92.86	100.00	100.00
Drop Call Rate %	7.69	23.08	7.69	0.00
Call Setup Time Average (Second)	0.76	5.35	0.55	0.88
Handover Success Rate %	100.00	100.00	100.00	100.00

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

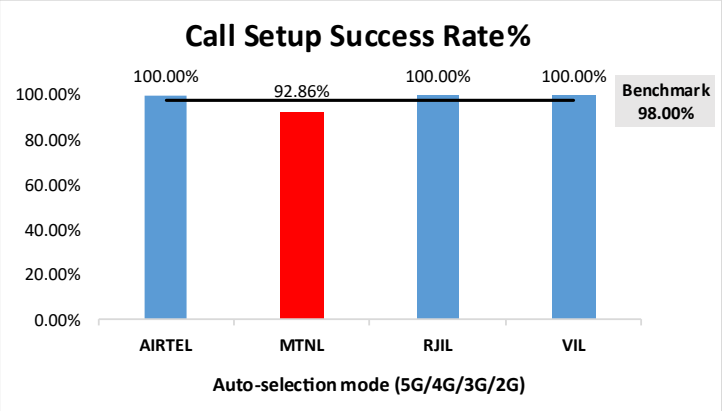


Figure-33: Performance for call setup success rate.

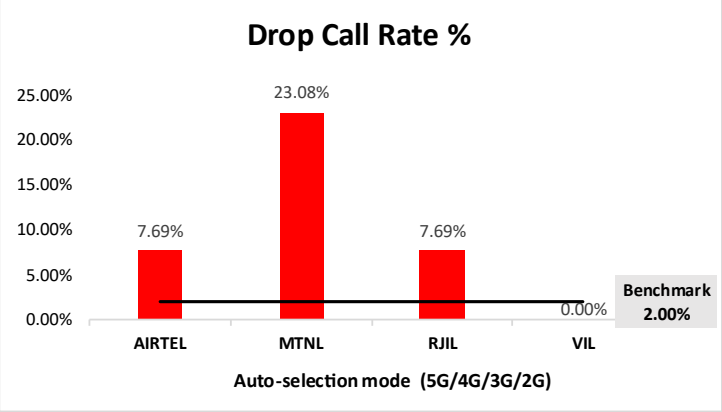


Figure-34: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	0.29%	NA	19.09%	0.00%
4G	99.71%	0.00%	80.91%	100.00%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-16: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

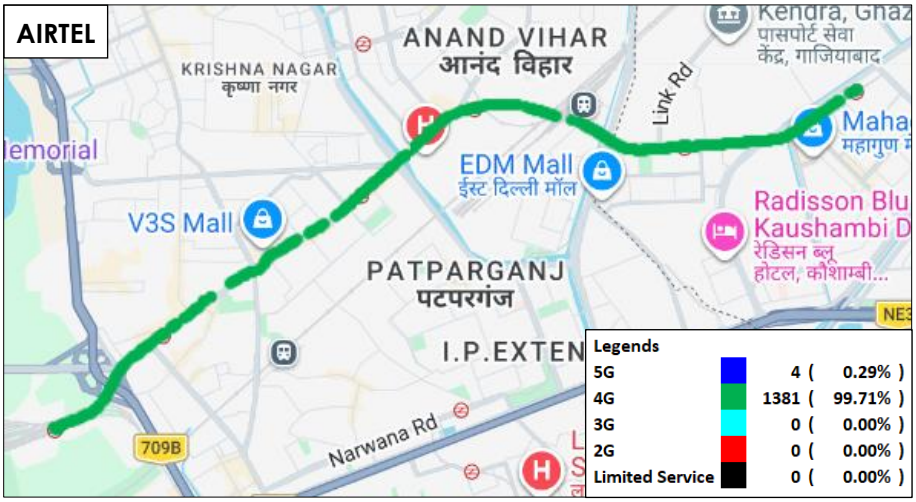


Figure-35: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

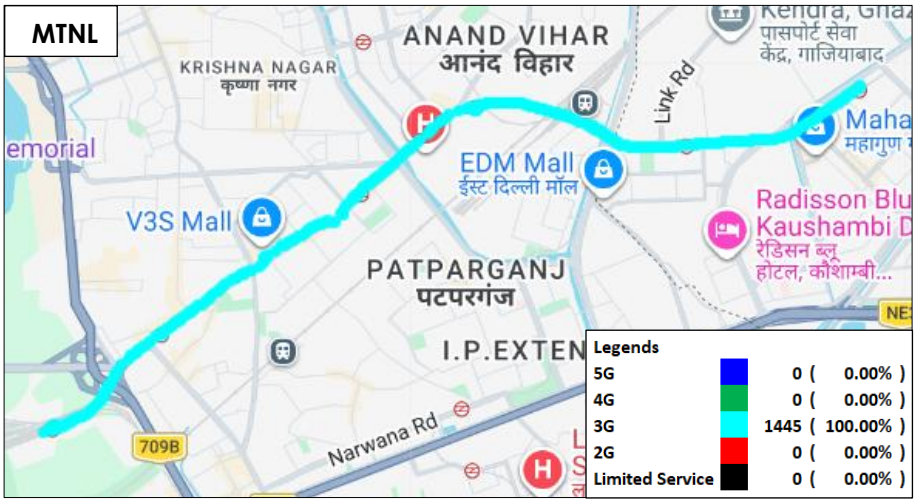


Figure-36: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

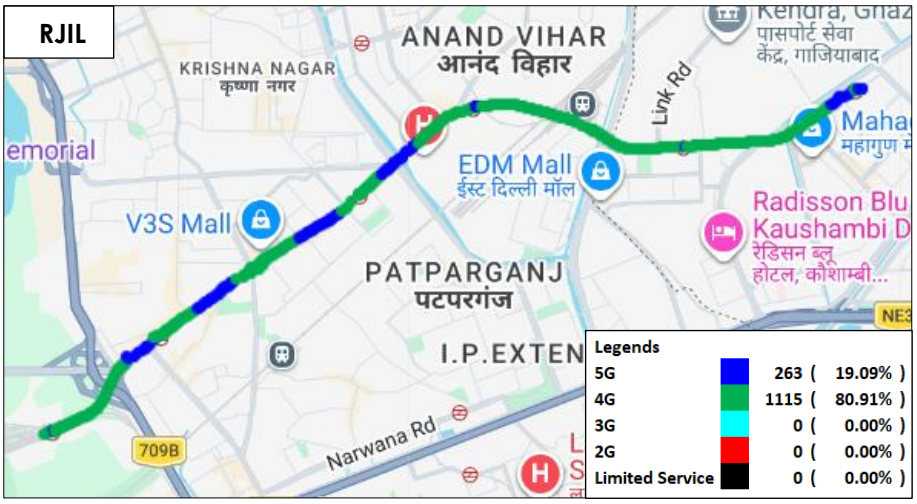


Figure-37: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

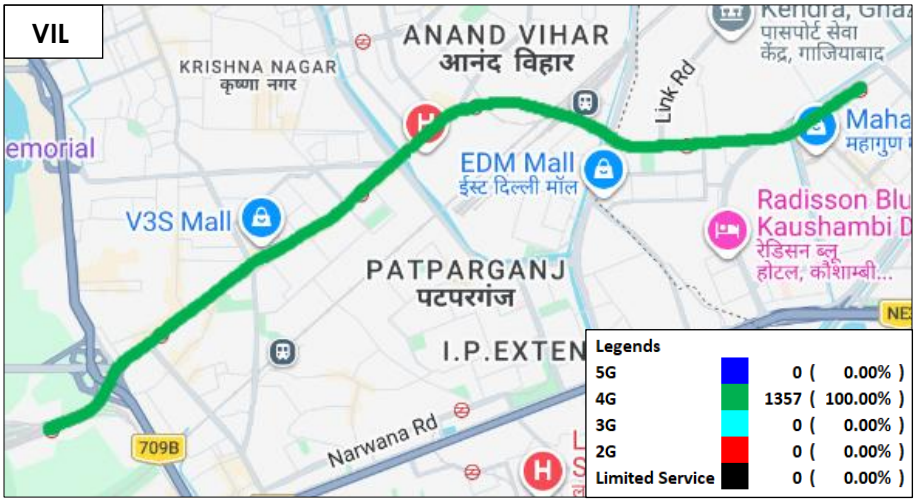


Figure-38: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-223, 224, 225 & 226 for map view)

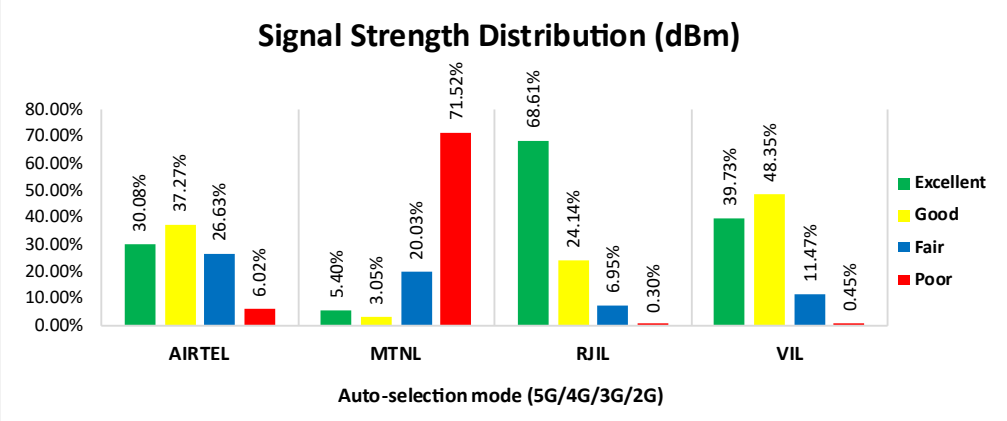


Figure-39: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 30% of samples falling in the excellent signal strength category.
- MTNL has 5% of samples falling in the excellent signal strength category.
- RJIL has 69% of samples falling in the excellent signal strength category.
- VIL has 40% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	238.92	4.16	235.27	22.91
	80th Percentile	565.64	5.93	293.09	32.36
	20th Percentile	41.67	2.83	157.71	13.46
Upload Throughput (Mbits/s)	Average	42.42	1.64	32.37	14.00
	80th Percentile	77.47	2.65	58.23	26.27
	20th Percentile	11.66	0.52	13.32	2.19
Latency (ms)	50th Percentile	37.72	15.17	17.94	40.87

Table-17: Summary of Data performance in network auto-selection mode.

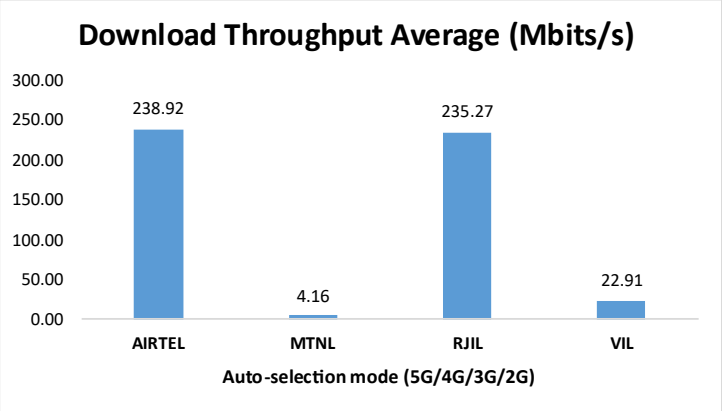


Figure 40: Download throughput.

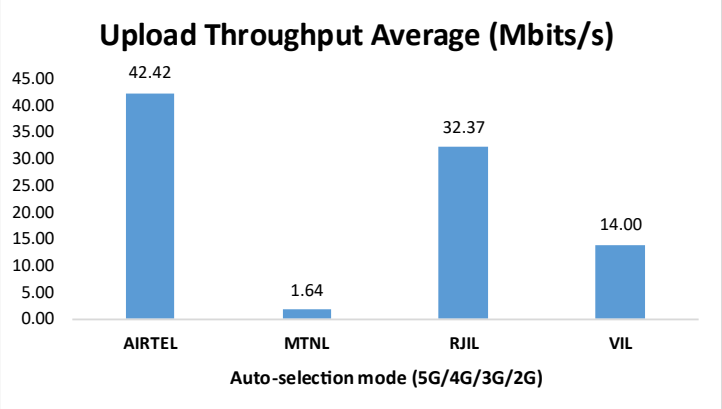


Figure-41: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	69.93%	NA	100.00%	41.85%
4G	30.07%	0.00%	0.00%	58.15%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

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

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

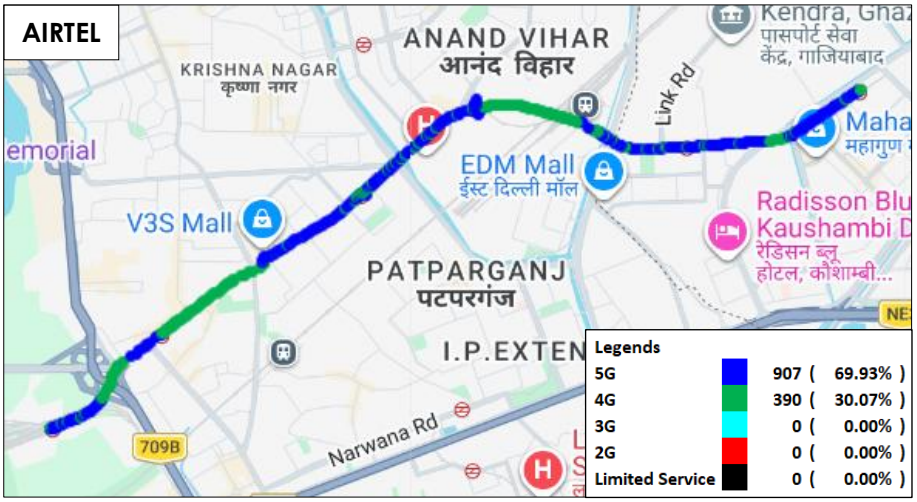


Figure-42: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

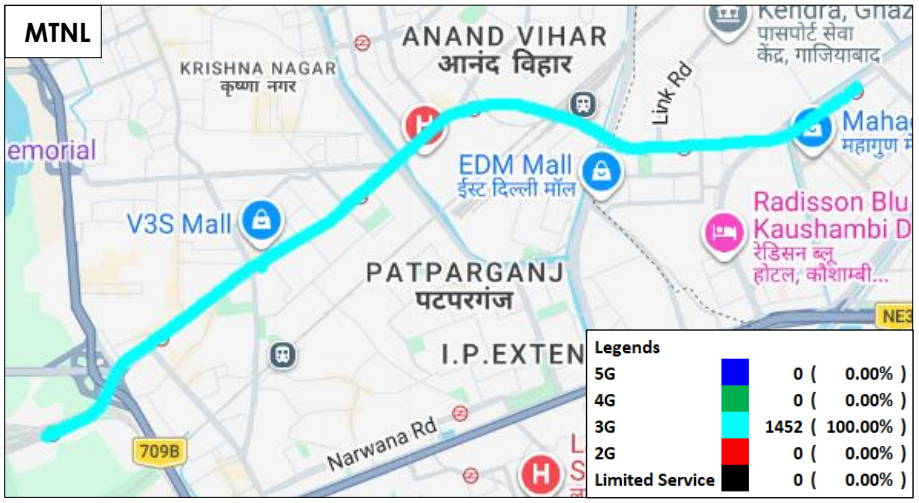


Figure-43: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

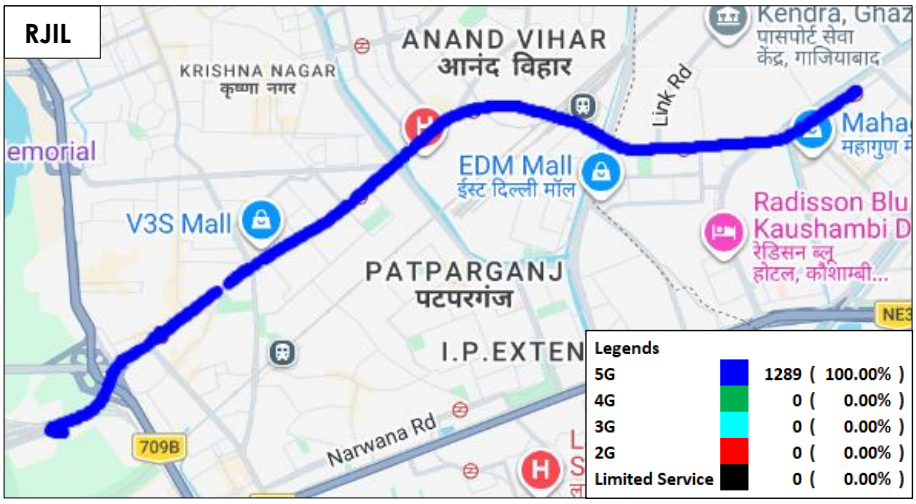


Figure-44: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

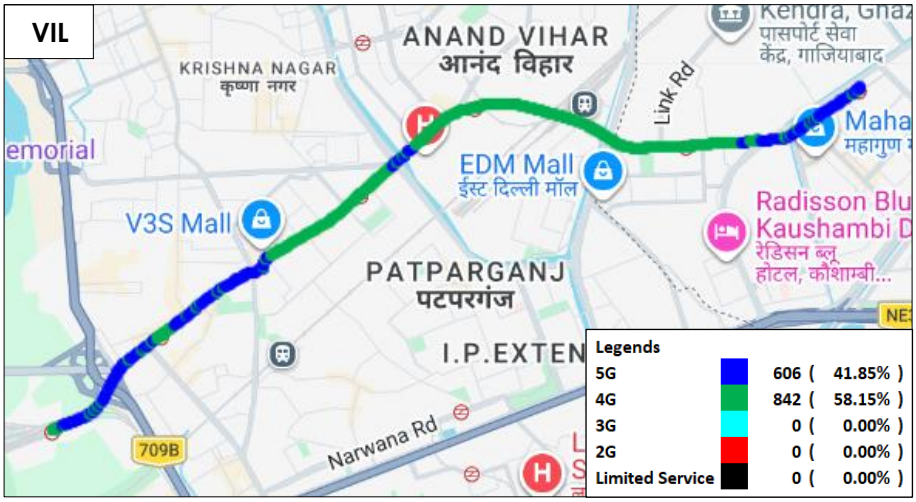


Figure-45: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-227, 228, 229 & 230 for map view)

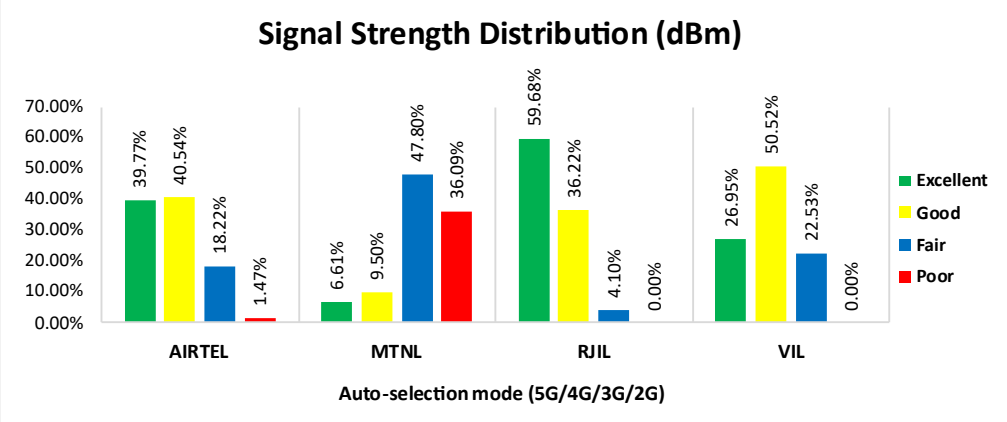


Figure-46: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 40% of samples falling in the excellent signal strength category.
- MTNL has 7% of samples falling in the excellent signal strength category.
- RJIL has 60% of samples falling in the excellent signal strength category.
- VIL has 27% of samples falling in the excellent signal strength category.

4.2.2.4 Kirti Nagar to Brigadier Hoshiyar Singh (Green Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	36	48	36	34
Call Setup Success Rate %	100.00	58.33	97.22	100.00
Drop Call Rate %	0.00	14.29	2.86	0.00
Call Setup Time Average (Second)	0.84	3.57	1.03	0.85
Handover Success Rate %	100.00	100.00	99.85	99.07

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

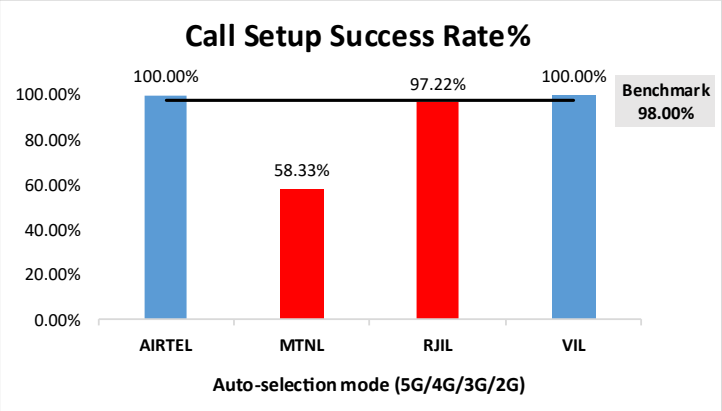


Figure-47: Performance for call setup success rate.

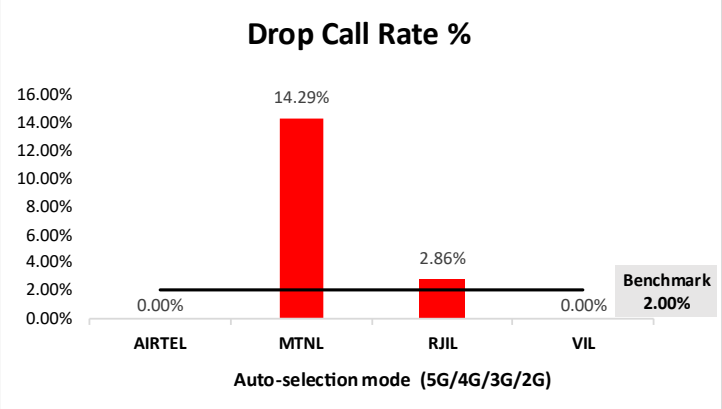


Figure-48: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	2.96%	NA	12.16%	0.00%
4G	97.04%	0.00%	87.84%	100.00%
3G	NA	99.24%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.76%	0.00%	0.00%

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

Note-

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

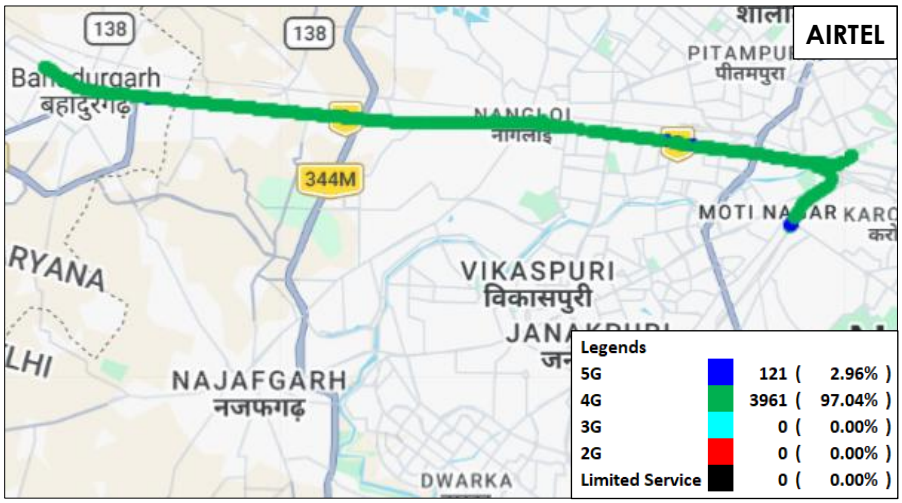


Figure-49: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

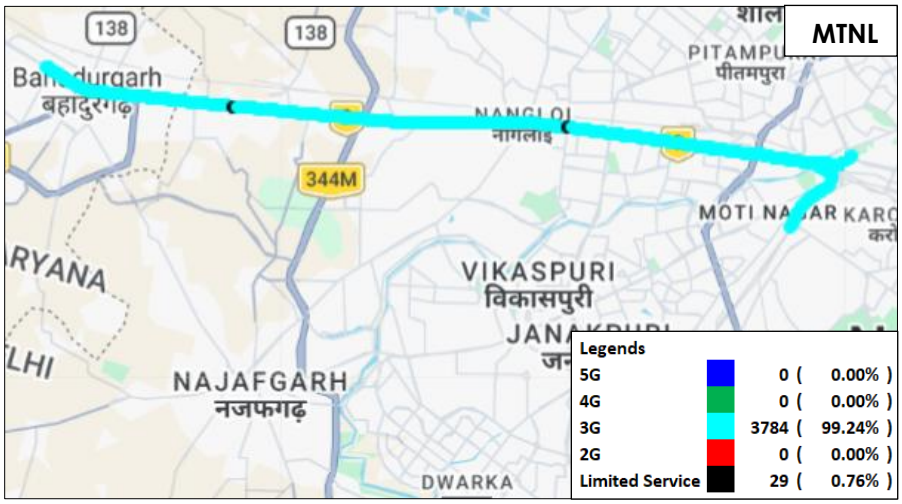


Figure-50: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

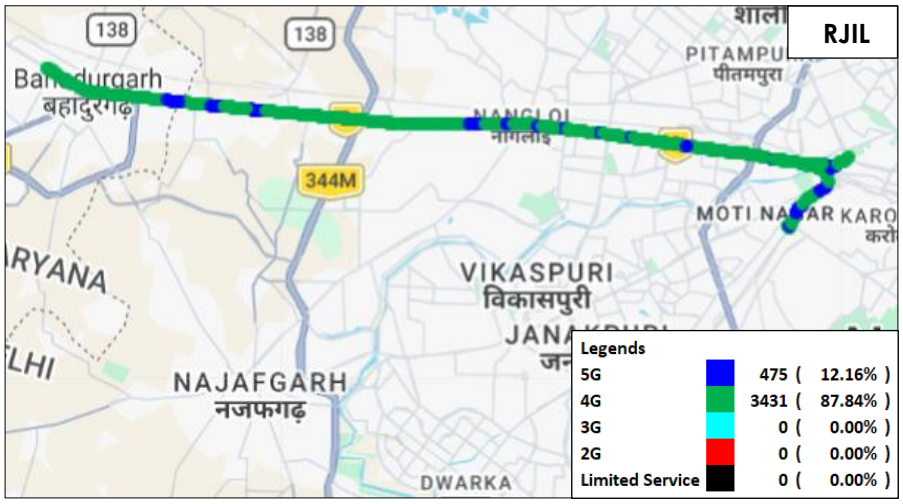


Figure-51: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

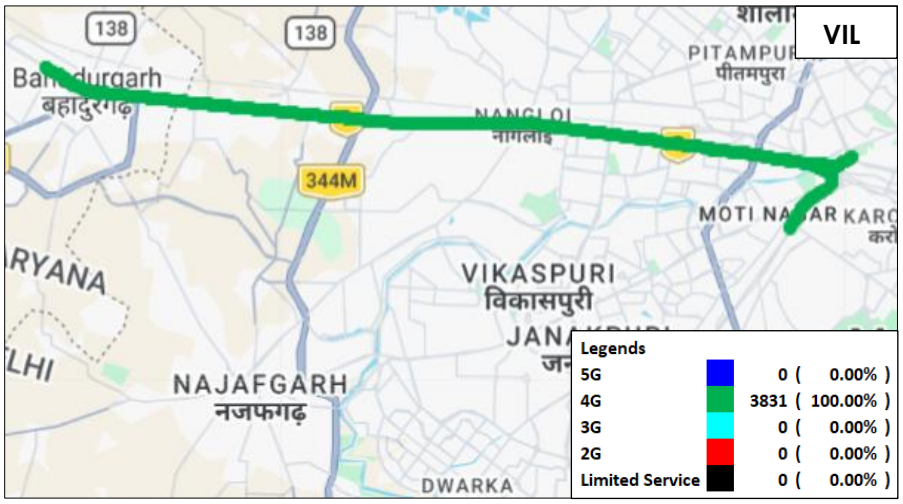


Figure-52: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-231, 232, 233 & 234 for map view)

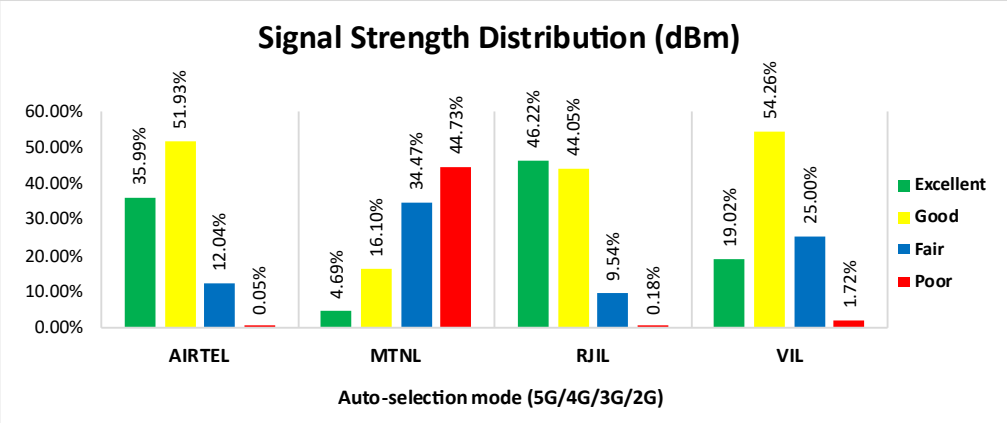


Figure-53: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 36% of samples falling in the excellent signal strength category.
- MTNL has 5% of samples falling in the excellent signal strength category.
- RJIL has 46% of samples falling in the excellent signal strength category.
- VIL has 19% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	90.43	3.88	118.57	24.46
	80th Percentile	133.76	6.17	203.26	42.00
	20th Percentile	46.41	1.51	43.32	7.31
Upload Throughput (Mbits/s)	Average	36.91	1.33	21.16	17.95
	80th Percentile	45.40	1.90	31.65	31.79
	20th Percentile	16.68	0.12	8.09	2.64
Latency (ms)	50th Percentile	39.81	22.30	21.97	40.54

Table-21: Summary of Data performance in network auto-selection mode.

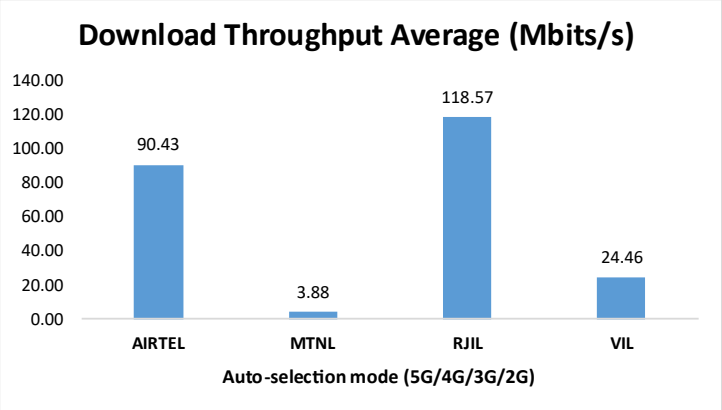


Figure 54: Download throughput.

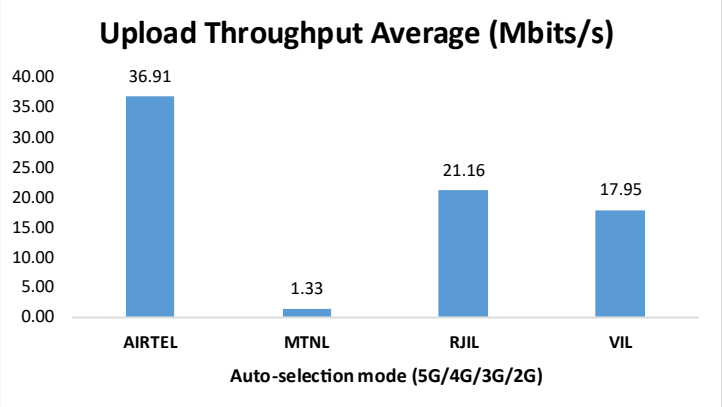


Figure-55: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	91.88%	NA	99.79%	46.08%
4G	8.12%	0.00%	0.21%	53.92%
3G	NA	93.77%	NA	NA
2G	0.00%	4.65%	NA	0.00%
Limited Service	0.00%	1.58%	0.00%	0.00%

Table-22: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

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

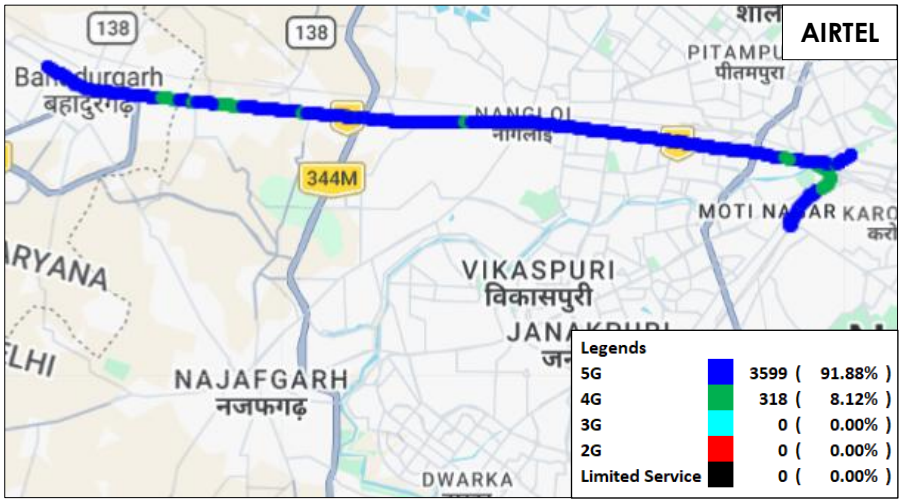


Figure-56: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

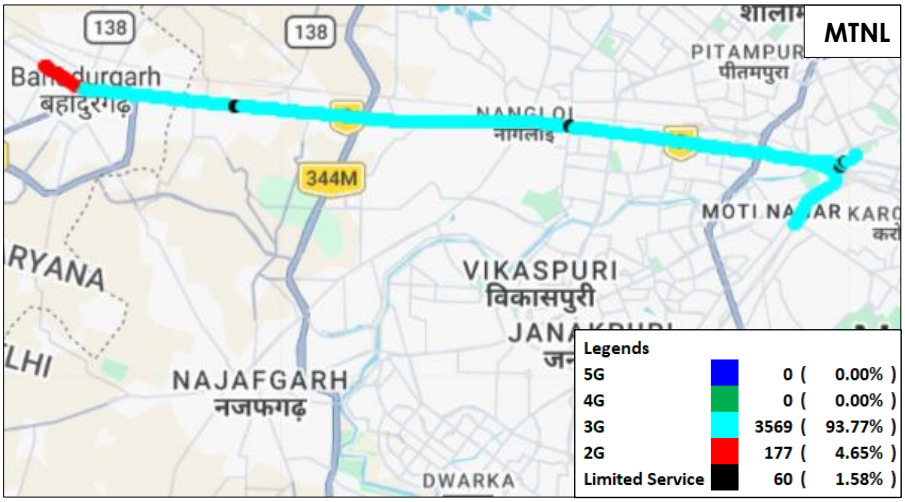


Figure-57: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

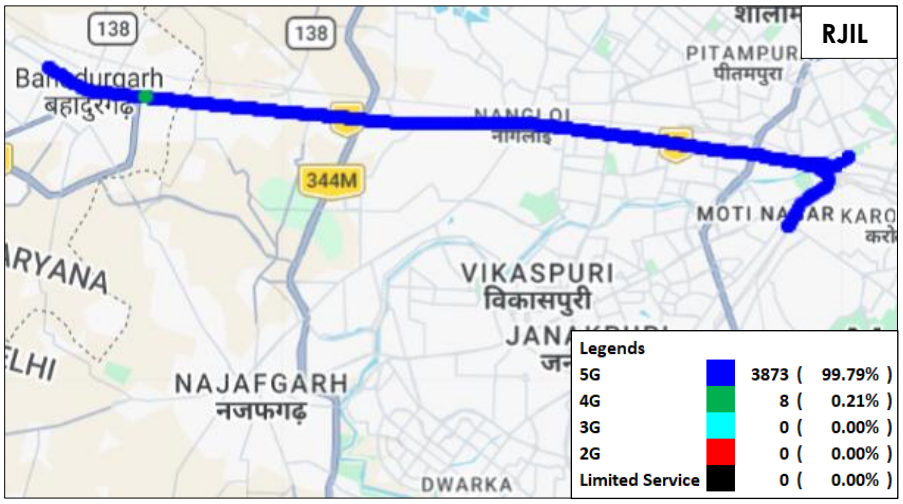


Figure-58: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

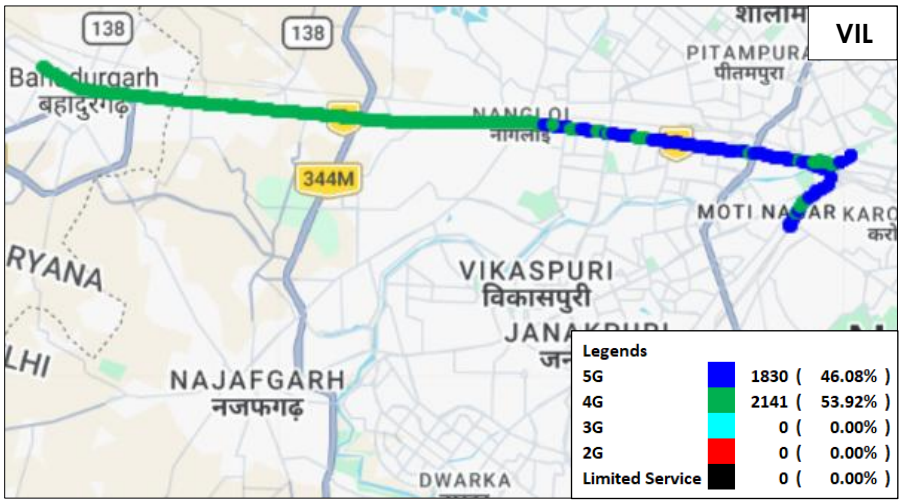


Figure-59: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-235, 236, 237 & 238 for map view)

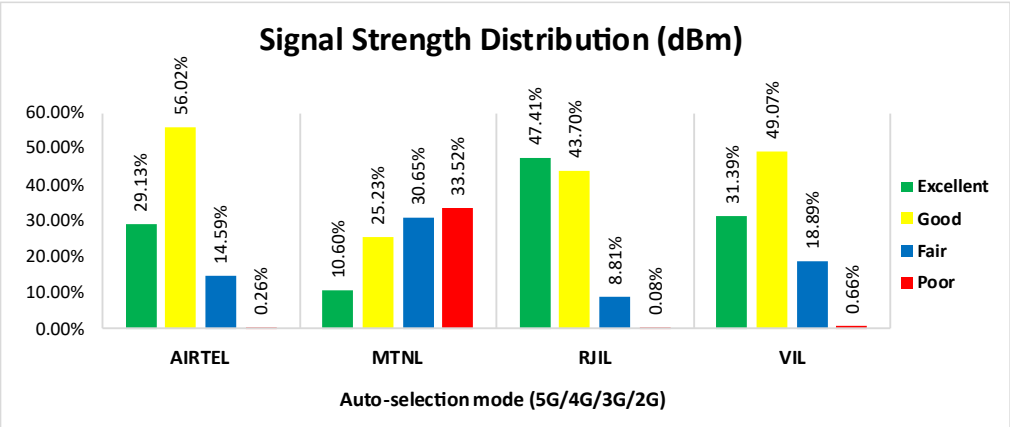


Figure-60: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 29% of samples falling in the excellent signal strength category.
- MTNL has 11% of samples falling in the excellent signal strength category.
- RJIL has 47% of samples falling in the excellent signal strength category.
- VIL has 31% of samples falling in the excellent signal strength category.

4.2.2.5 Dwarka to Dhansa Bus Stand (Grey Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	11	12	11	11
Call Setup Success Rate %	100.00	66.67	100.00	100.00
Drop Call Rate %	0.00	12.50	0.00	0.00
Call Setup Time Average (Second)	0.72	3.05	0.53	0.46
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-23: Summary of voice call performance in network auto-selection mode.

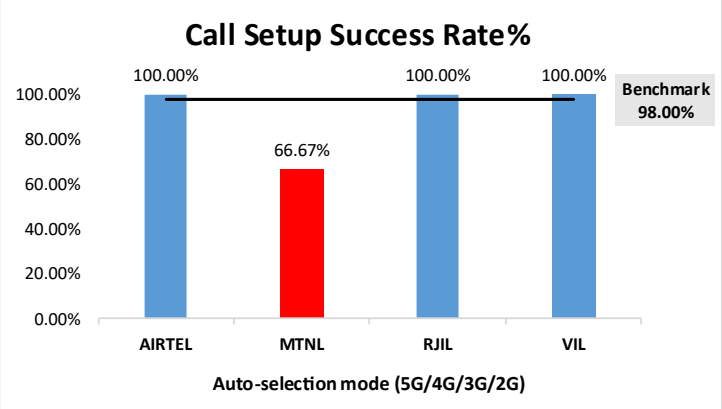


Figure-61: Performance for call setup success rate.

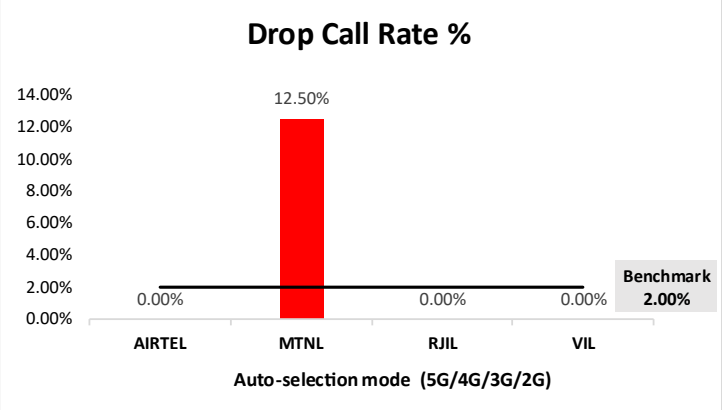


Figure-62: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	0.00%	NA	11.59%	0.00%
4G	100.00%	0.00%	88.41%	100.00%
3G	NA	86.90%	NA	NA
2G	0.00%	4.70%	NA	0.00%
Limited Service	0.00%	8.40%	0.00%	0.00%

Table-24: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

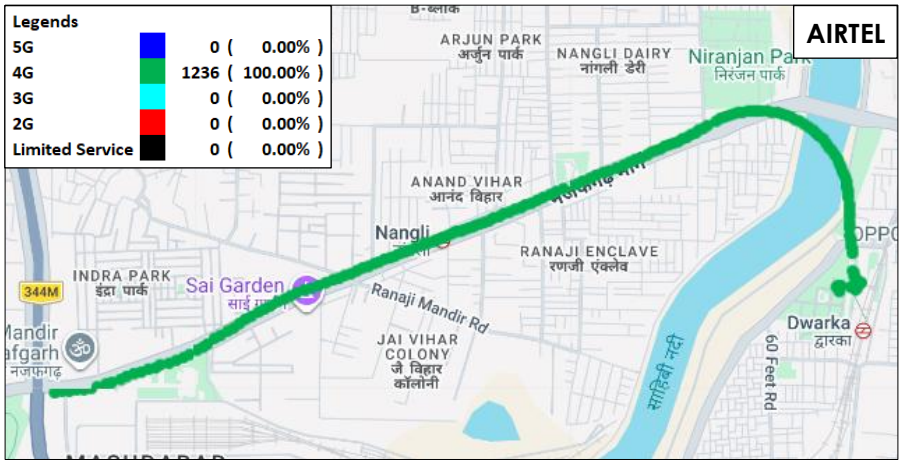


Figure-63: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

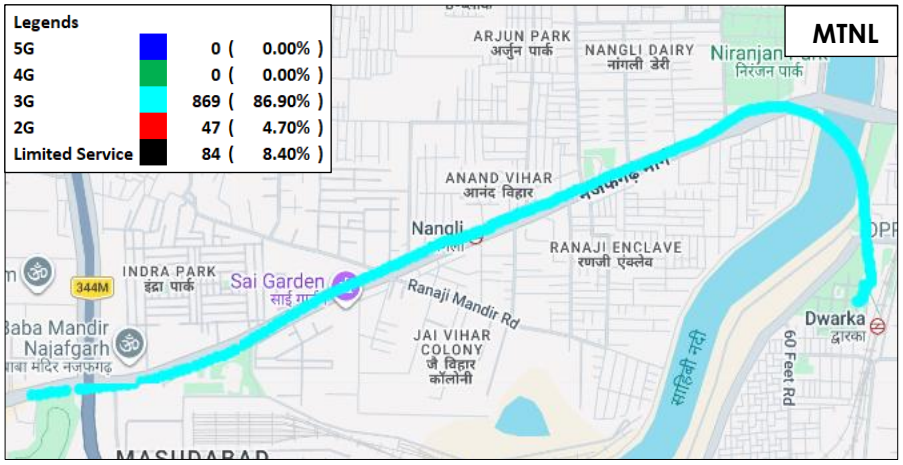


Figure-64: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

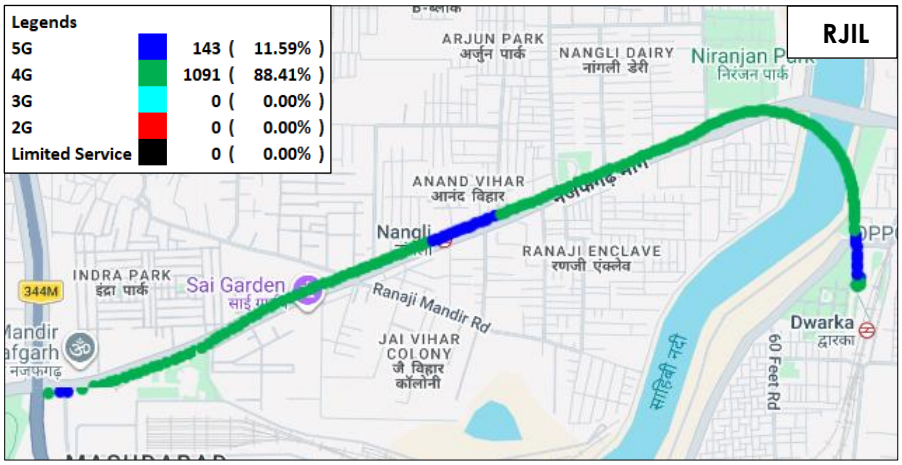


Figure-65: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

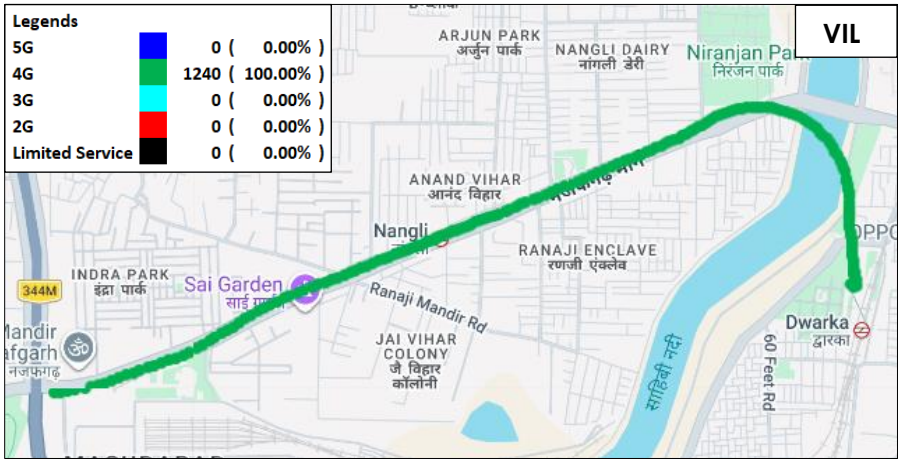


Figure-66: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-239, 240, 241 & 242 for map view)

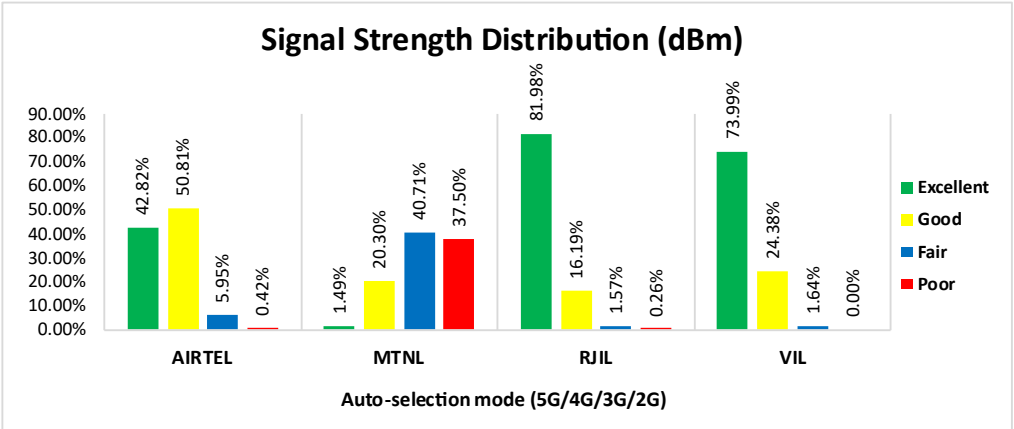


Figure-67: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 43% of samples falling in the excellent signal strength category.
- MTNL has 1% of samples falling in the excellent signal strength category.
- RJIL has 82% of samples falling in the excellent signal strength category.
- VIL has 74% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	154.50	4.33	237.10	27.22
	80th Percentile	264.96	6.07	352.83	33.73
	20th Percentile	69.74	2.44	53.07	27.92
Upload Throughput (Mbits/s)	Average	48.82	2.84	38.44	26.57
	80th Percentile	84.04	3.27	75.55	44.66
	20th Percentile	10.23	2.52	3.49	10.12
Latency (ms)	50th Percentile	46.28	21.19	22.22	38.11

Table-25: Summary of Data performance in network auto-selection mode.

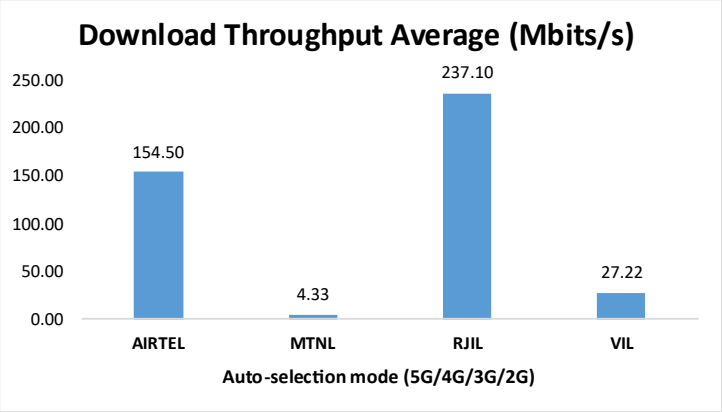


Figure 68: Download throughput.

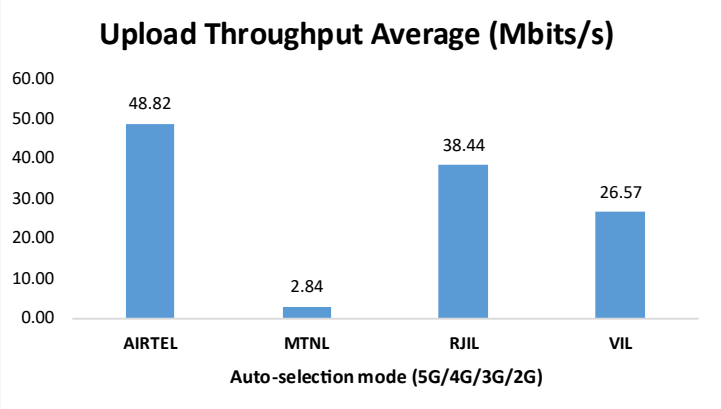


Figure-69: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	55.53%	NA	56.43%	49.51%
4G	44.47%	0.00%	43.57%	50.49%
3G	NA	87.82%	NA	NA
2G	0.00%	4.65%	NA	0.00%
Limited Service	0.00%	7.52%	0.00%	0.00%

Table-26: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

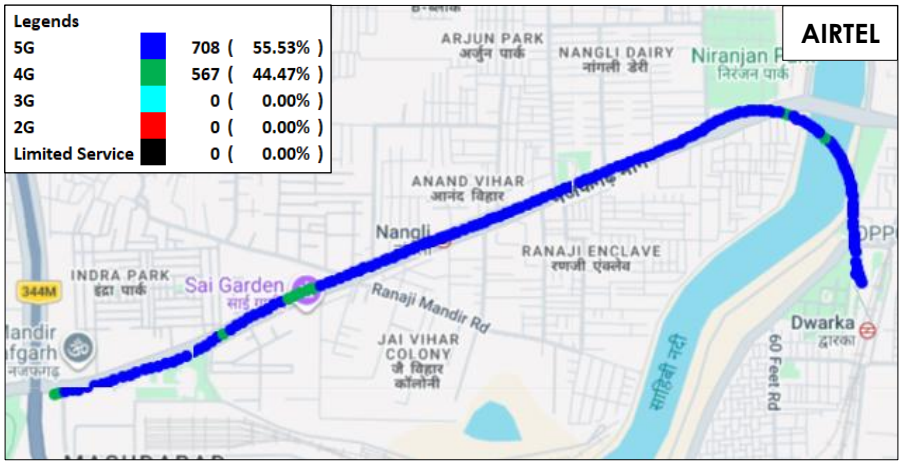


Figure-70: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

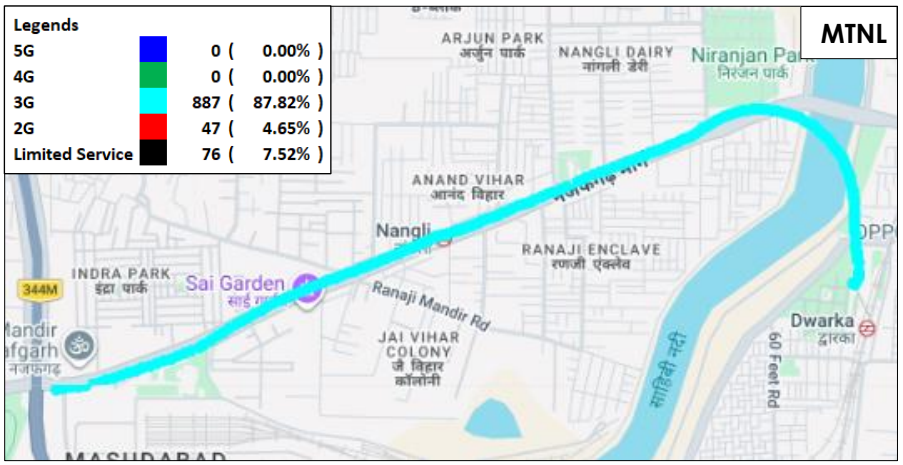


Figure-71: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

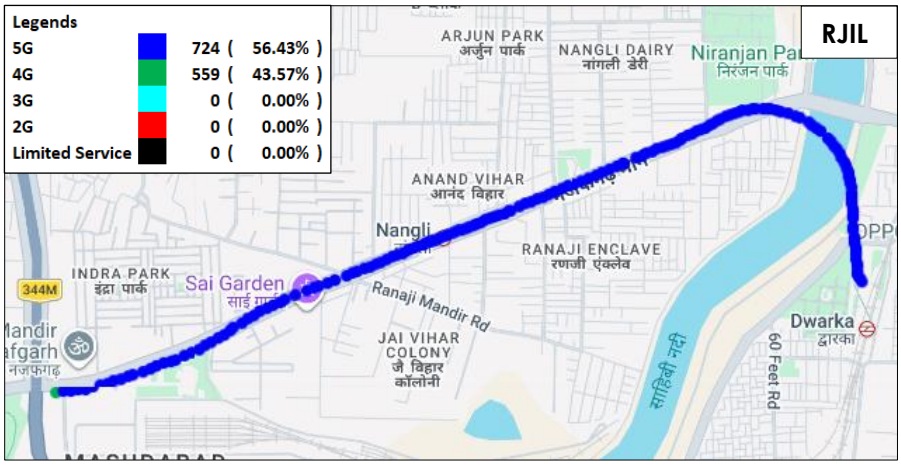


Figure-72: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

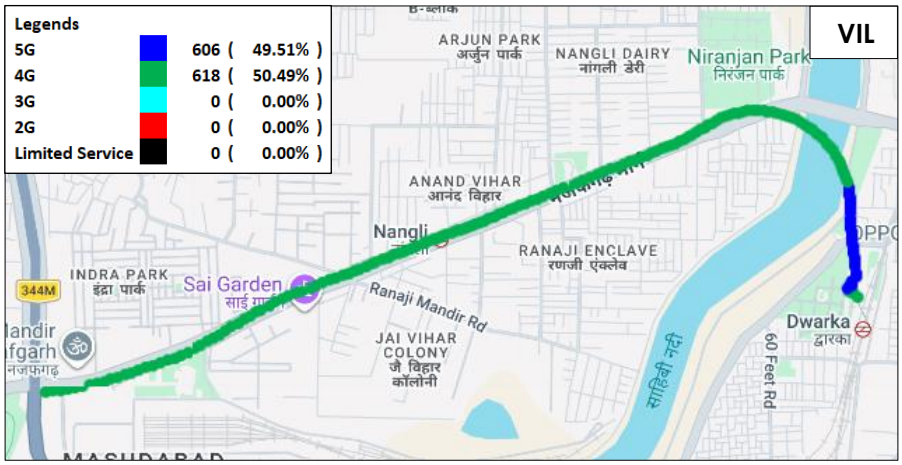


Figure-73: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-243, 244, 245 & 246 for map view)

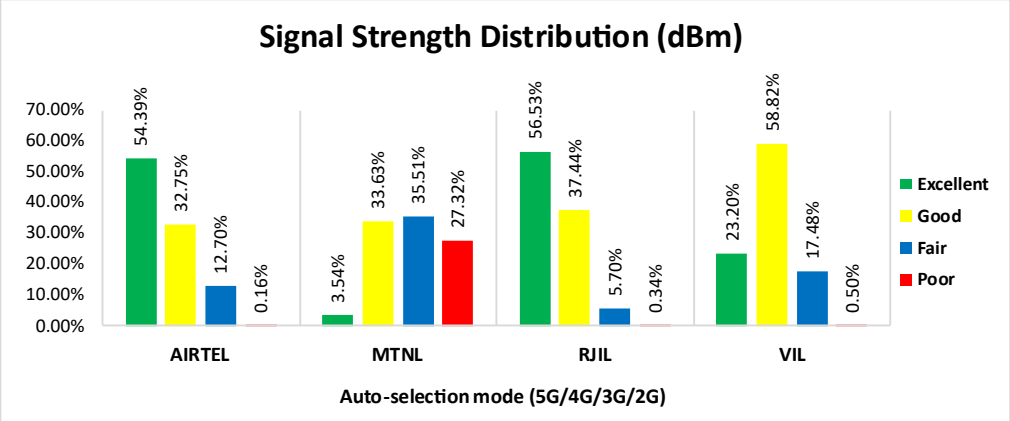


Figure-74: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 54% of samples falling in the excellent signal strength category.
- MTNL has 4% of samples falling in the excellent signal strength category.
- RJIL has 57% of samples falling in the excellent signal strength category.
- VIL has 23% of samples falling in the excellent signal strength category.

4.2.2.6 Botanical Garden to Krishna Park Extension (Magenta Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	43	60	42	42
Call Setup Success Rate %	100.00	23.33	95.24	95.24
Drop Call Rate %	0.00	35.71	0.00	2.50
Call Setup Time Average (Second)	0.97	4.55	1.02	1.08
Handover Success Rate %	100.00	100.00	99.77	100.00

Table-27: Summary of voice call performance in network auto-selection mode.

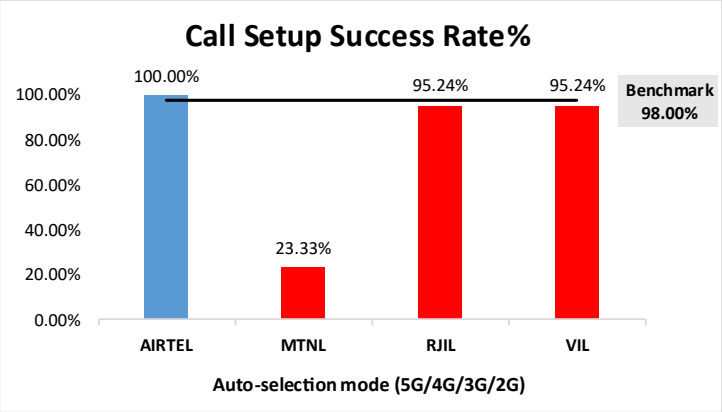


Figure-75: Performance for call setup success rate.

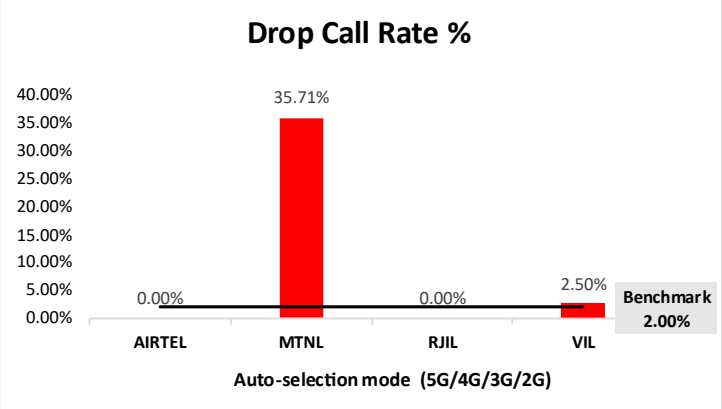


Figure-76: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	2.35%	NA	5.19%	0.00%
4G	97.65%	0.00%	93.44%	98.53%
3G	NA	57.28%	NA	NA
2G	0.00%	22.79%	NA	0.17%
Limited Service	0.00%	19.93%	1.37%	1.30%

Table-28: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

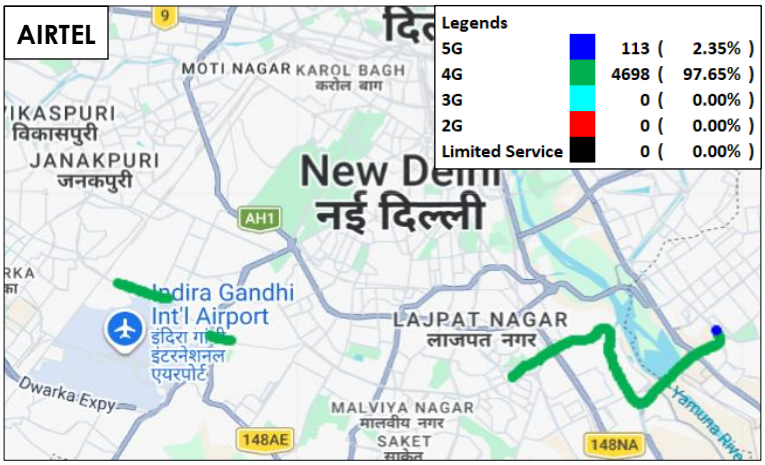


Figure-77: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

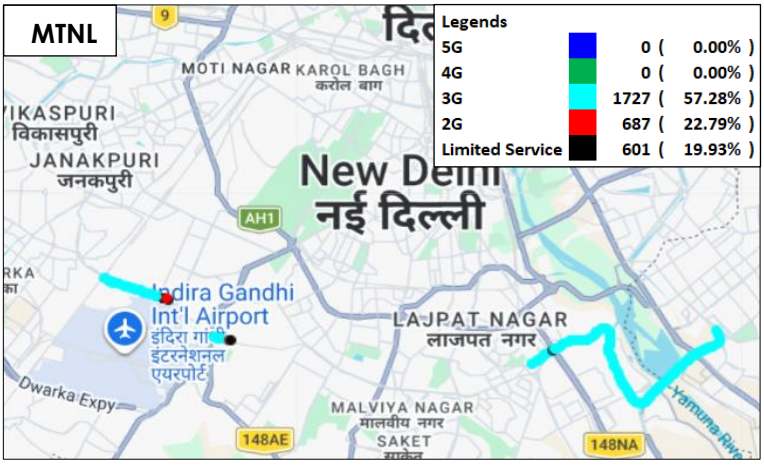


Figure-78: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

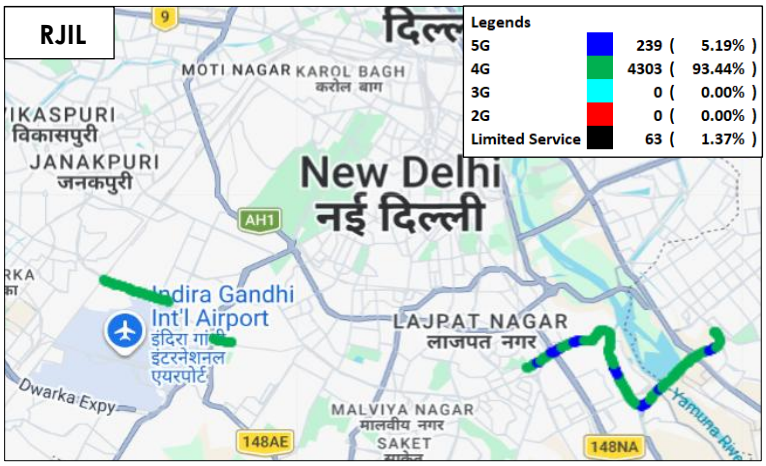


Figure-79: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

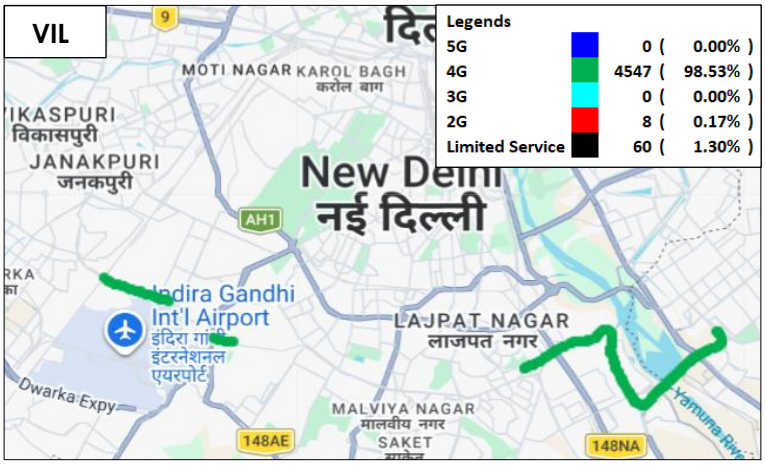


Figure-80: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-247, 248, 249 & 250 for map view)

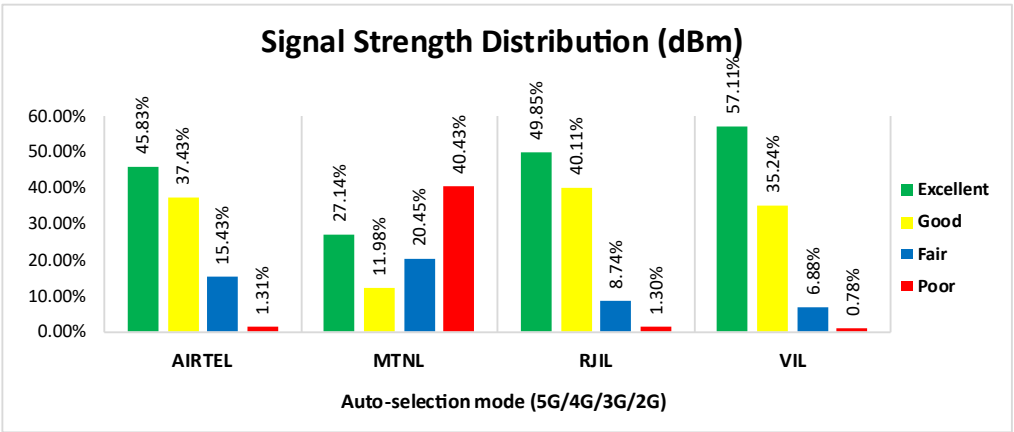


Figure-81: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 46% of samples falling in the excellent signal strength category.
- MTNL has 27% of samples falling in the excellent signal strength category.
- RJIL has 50% of samples falling in the excellent signal strength category.
- VIL has 57% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	53.07	3.37	58.95	22.58
	80th Percentile	77.75	5.74	97.57	35.97
	20th Percentile	9.84	0.95	2.49	6.70
Upload Throughput (Mbits/s)	Average	10.50	1.56	8.93	12.60
	80th Percentile	22.02	3.20	14.28	26.61
	20th Percentile	1.63	0.10	1.52	1.64
Latency (ms)	50th Percentile	50.07	21.62	24.47	36.92

Table-29: Summary of Data performance in network auto-selection mode.

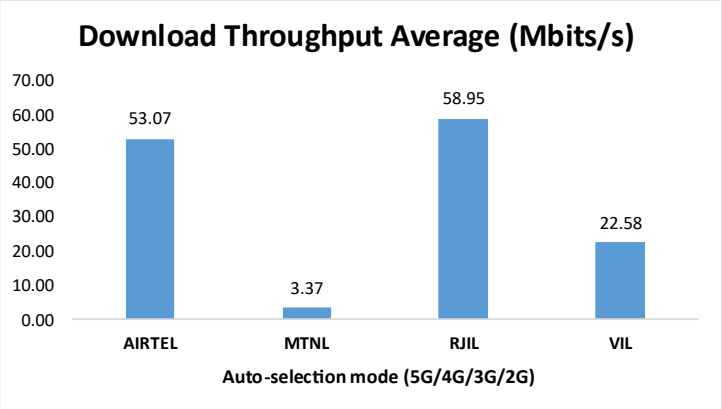


Figure 82: Download throughput.

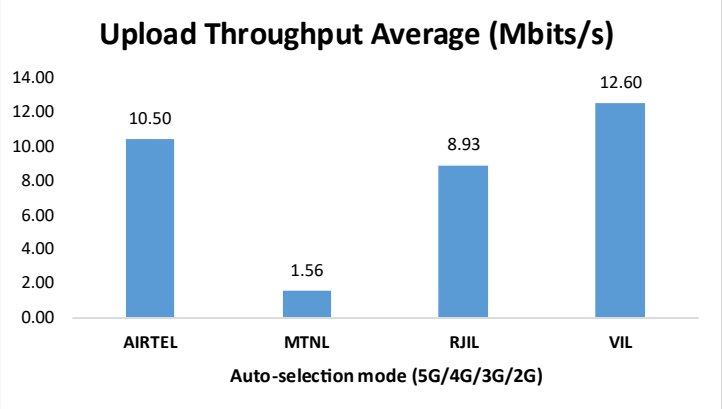


Figure-83: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	36.94%	NA	37.86%	30.55%
4G	63.06%	0.00%	61.31%	67.14%
3G	NA	59.87%	NA	NA
2G	0.00%	19.17%	NA	0.17%
Limited Service	0.00%	20.97%	0.83%	2.14%

Table-30: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

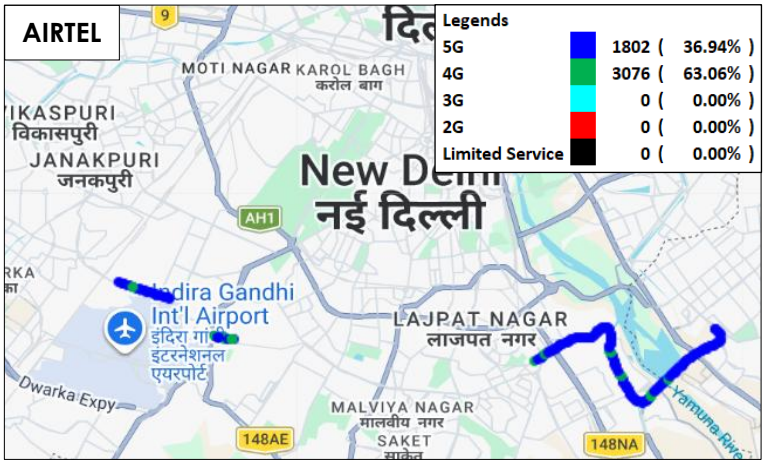


Figure-84: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

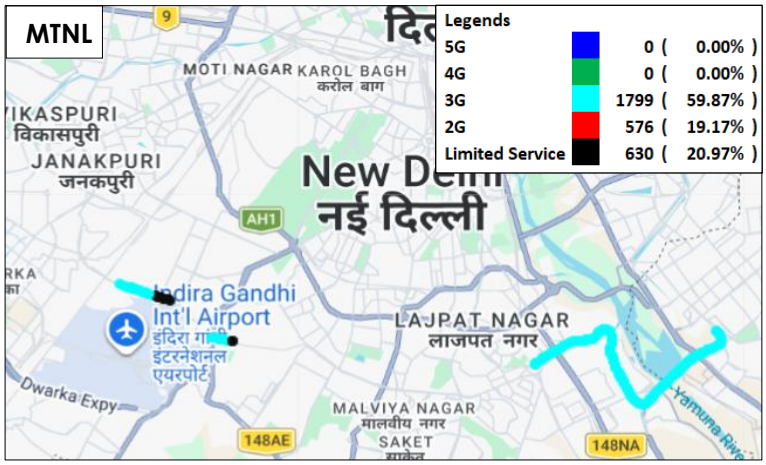


Figure-85: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

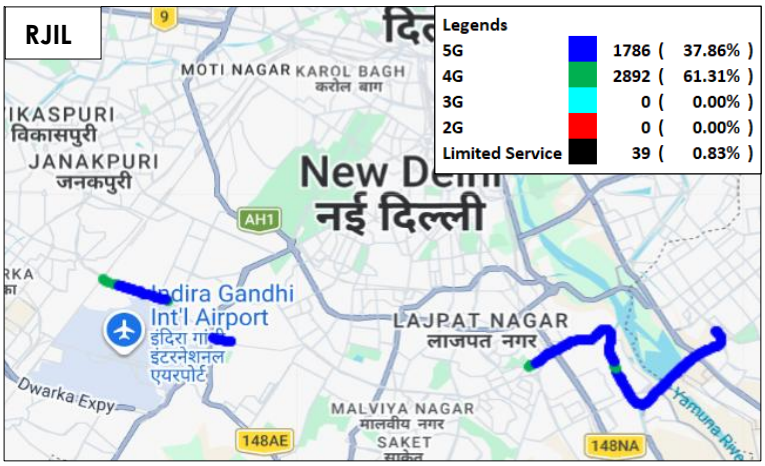


Figure-86: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

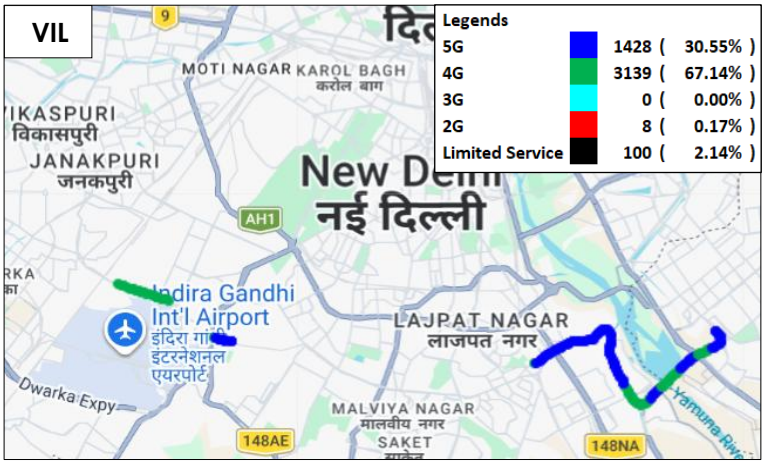


Figure-87: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-251, 252, 253 & 254 for map view)

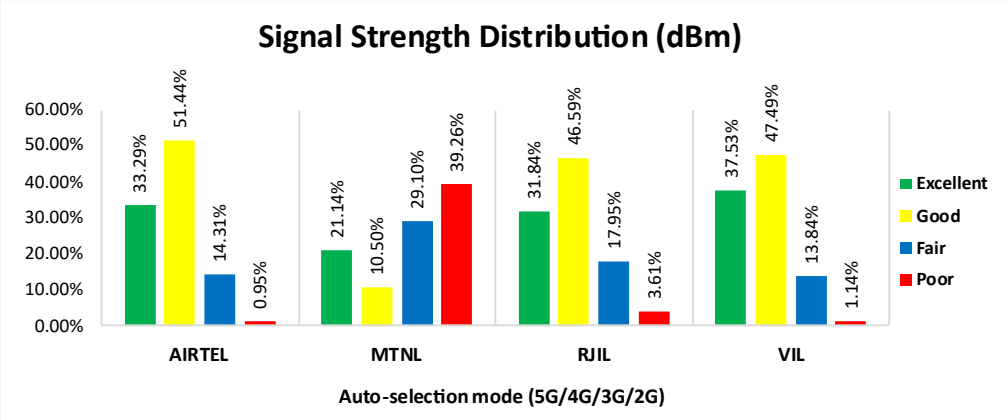


Figure-88: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 33% of samples falling in the excellent signal strength category.
- MTNL has 21% of samples falling in the excellent signal strength category.
- RJIL has 32% of samples falling in the excellent signal strength category.
- VIL has 38% of samples falling in the excellent signal strength category.

4.2.2.7 Deepali Chowk to Majlis Park (Magenta Line Ext.)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	13	12	13	14
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	7.14
Call Setup Time Average (Second)	0.91	2.87	0.53	0.55
Handover Success Rate %	100.00	100.00	99.16	99.02

Table-31: Summary of voice call performance in network auto-selection mode.

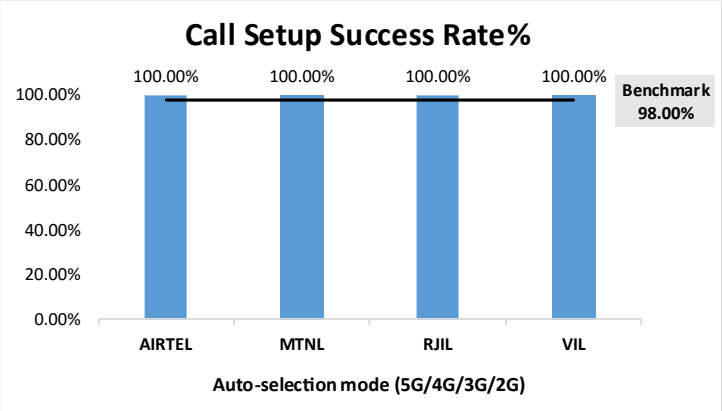


Figure-89: Performance for call setup success rate.

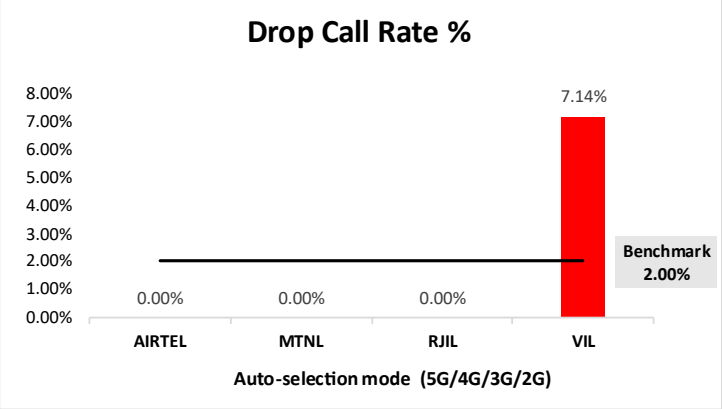


Figure-90: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	1.63%	NA	19.40%	0.00%
4G	98.37%	0.00%	80.60%	100.00%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-32: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

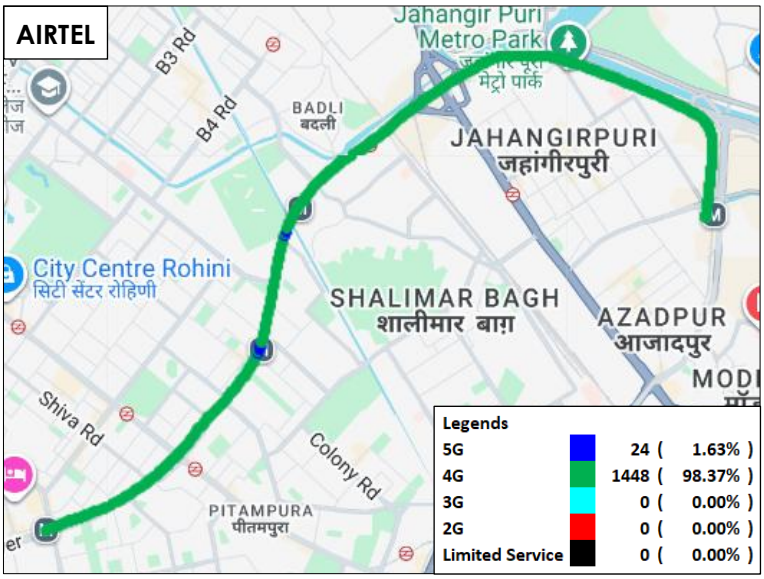


Figure-91: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

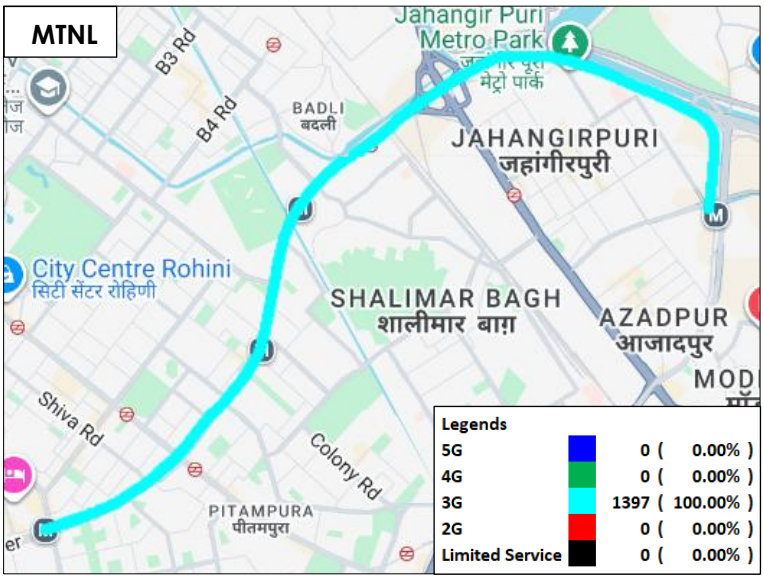


Figure-92: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

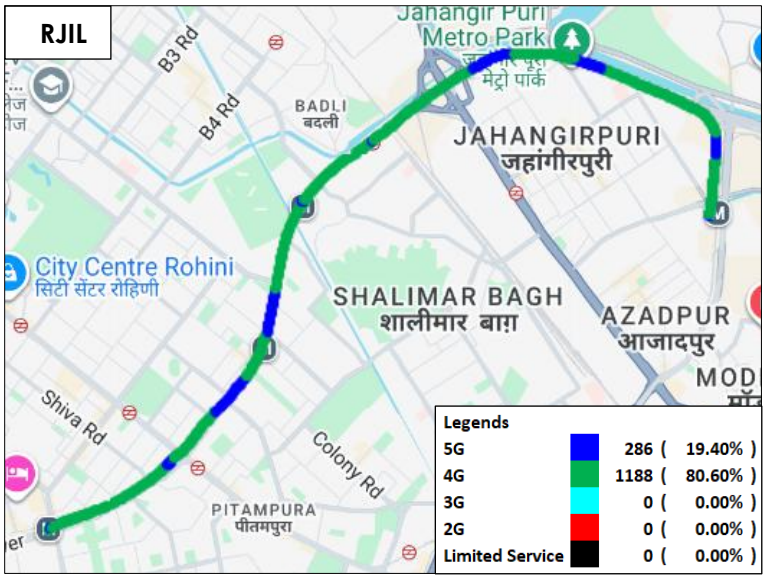


Figure-93: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

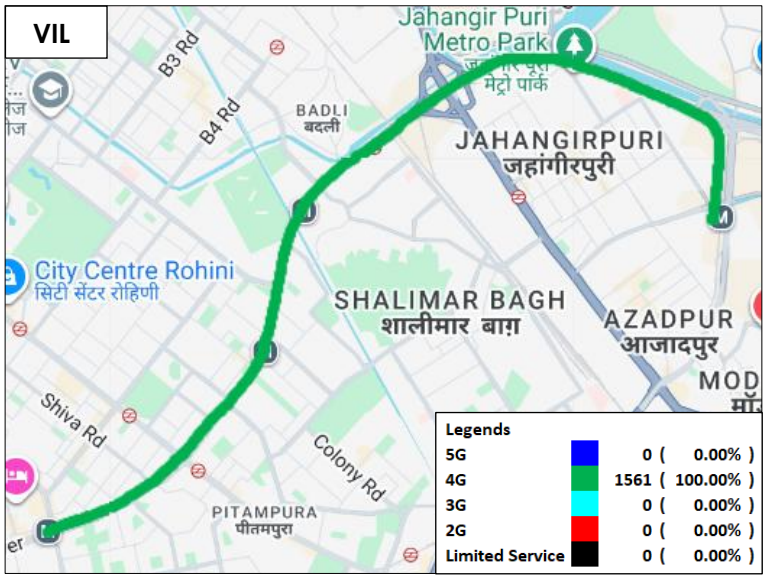


Figure-94: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-255, 256, 257 & 258 for map view)

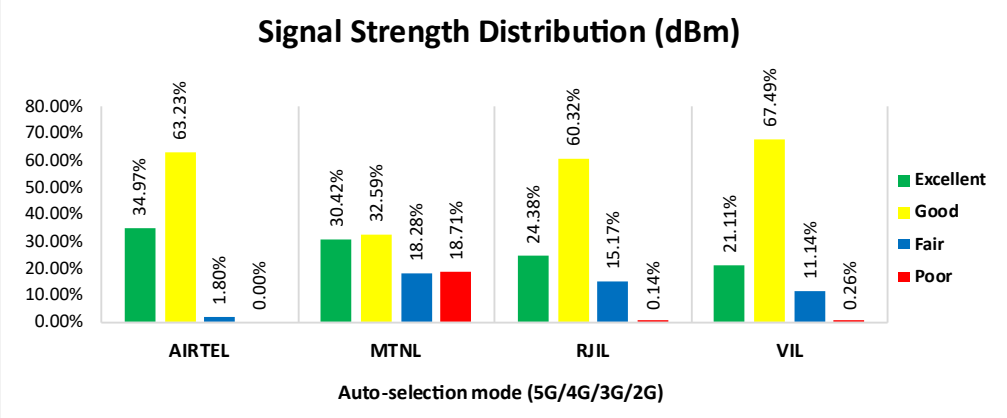


Figure-95: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 35% of samples falling in the excellent signal strength category.
- MTNL has 30% of samples falling in the excellent signal strength category.
- RJIL has 24% of samples falling in the excellent signal strength category.
- VIL has 21% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	101.80	5.55	160.56	22.75
	80th Percentile	174.04	6.96	199.74	36.10
	20th Percentile	25.09	3.45	114.96	7.54
Upload Throughput (Mbits/s)	Average	43.99	2.86	24.99	19.63
	80th Percentile	58.99	4.01	36.81	37.79
	20th Percentile	36.65	2.22	11.38	2.71
Latency (ms)	50th Percentile	38.96	20.06	21.27	39.95

Table-33: Summary of Data performance in network auto-selection mode.

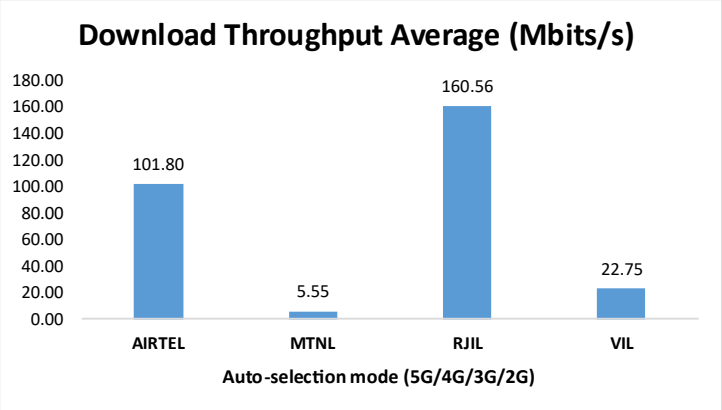


Figure 96: Download throughput.

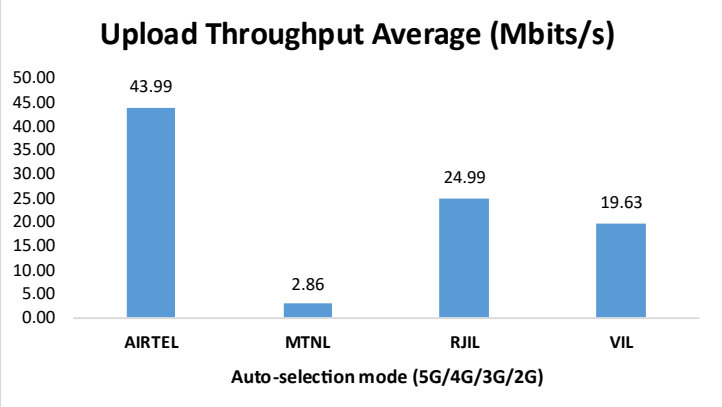


Figure-97: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	90.83%	NA	100.00%	43.00%
4G	9.17%	0.00%	0.00%	57.00%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-34: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

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

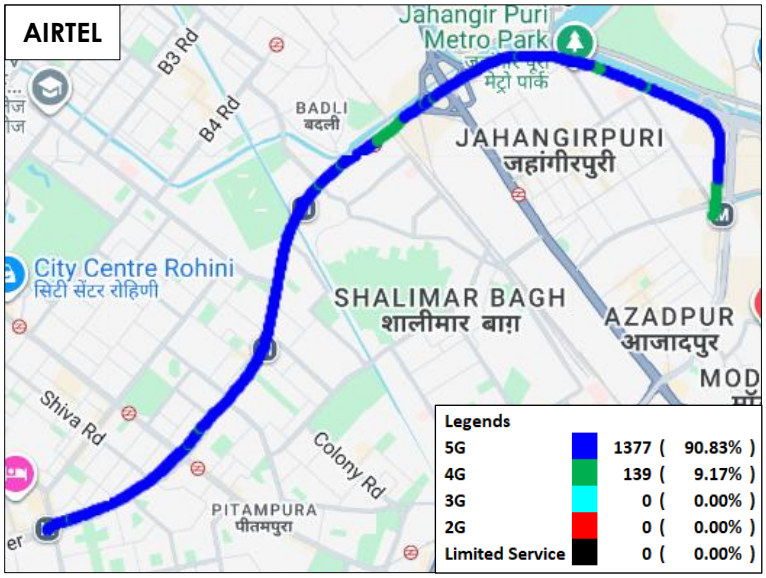


Figure-98: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

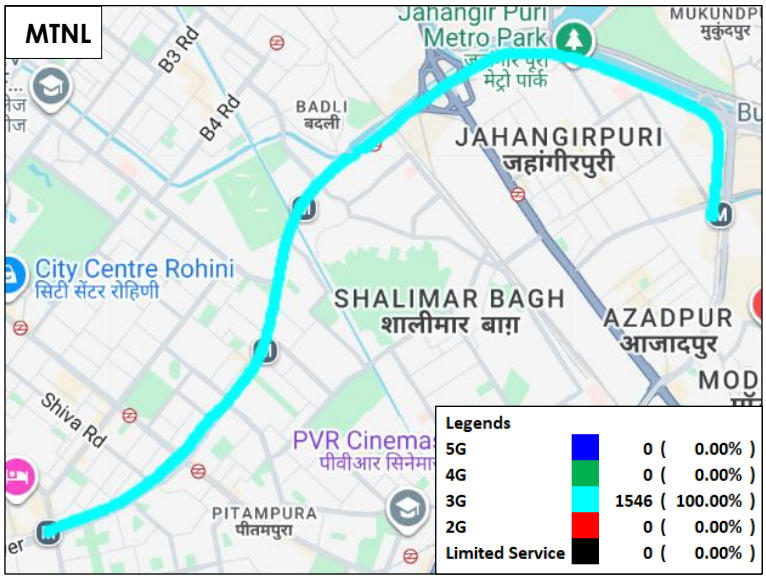


Figure-99: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

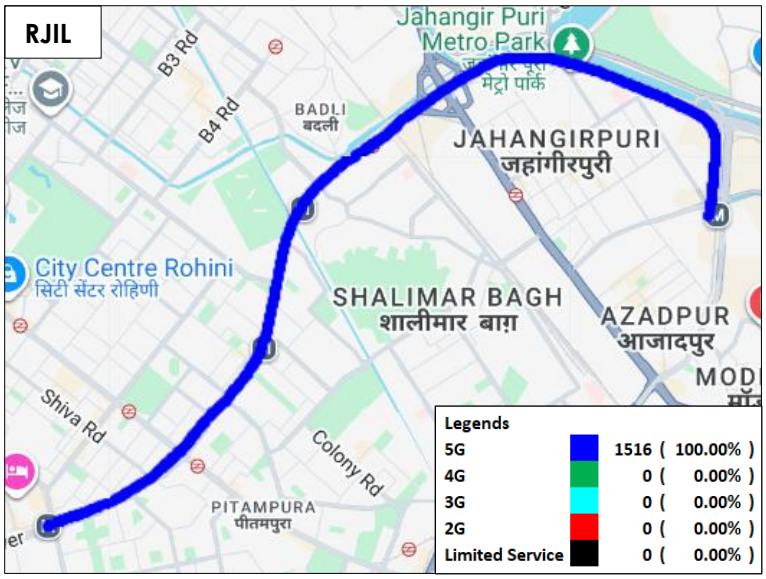


Figure-100: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

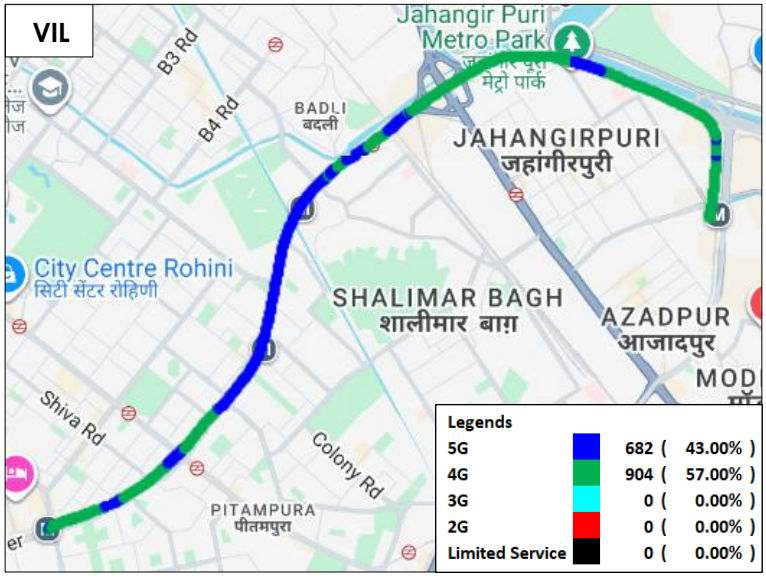


Figure-101: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-259, 260, 261 & 262 for map view)

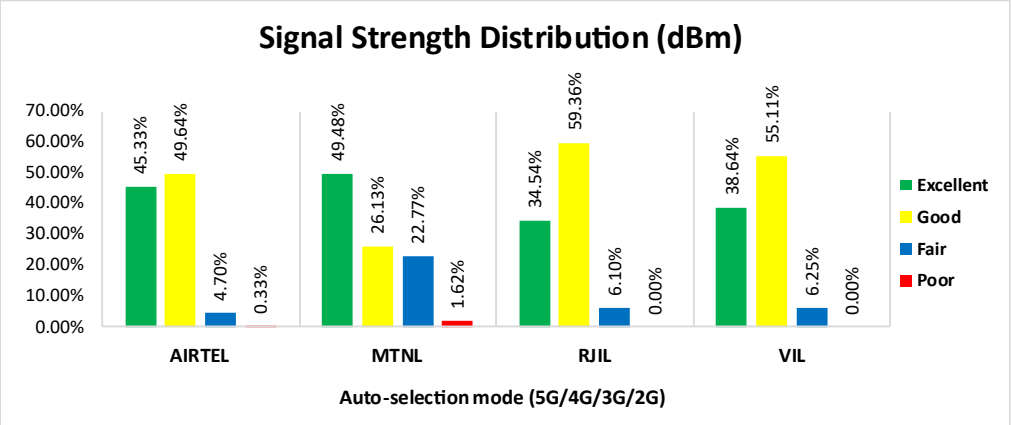


Figure-102: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 45% of samples falling in the excellent signal strength category.
- MTNL has 49% of samples falling in the excellent signal strength category.
- RJIL has 35% of samples falling in the excellent signal strength category.
- VIL has 39% of samples falling in the excellent signal strength category.

4.2.2.8 New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	18	25	18	17
Call Setup Success Rate %	100.00	16.00	88.89	100.00
Drop Call Rate %	0.00	75.00	6.25	0.00
Call Setup Time Average (Second)	0.75	7.72	1.55	0.57
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-35: Summary of voice call performance in network auto-selection mode.

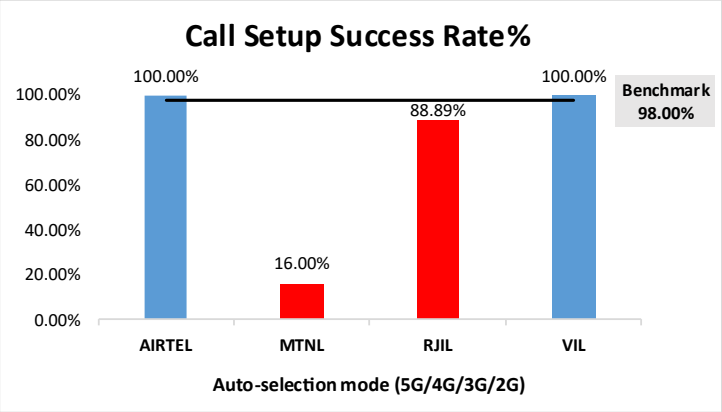


Figure-103: Performance for call setup success rate.

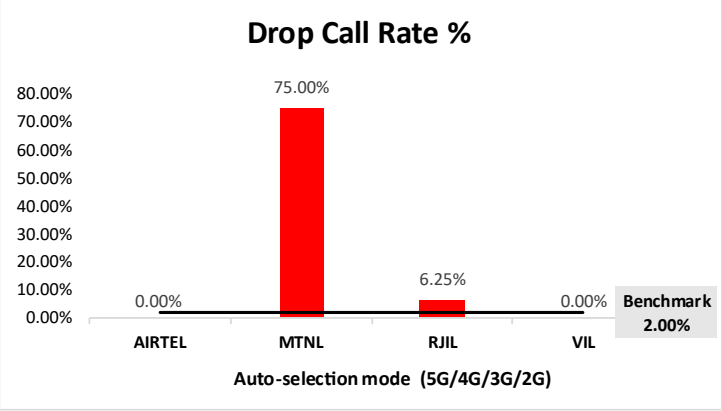


Figure-104: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	0.00%	NA	0.00%	0.00%
4G	100.00%	0.00%	96.46%	100.00%
3G	NA	39.47%	NA	NA
2G	0.00%	31.92%	NA	0.00%
Limited Service	0.00%	28.61%	3.54%	0.00%

Table-36: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

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

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

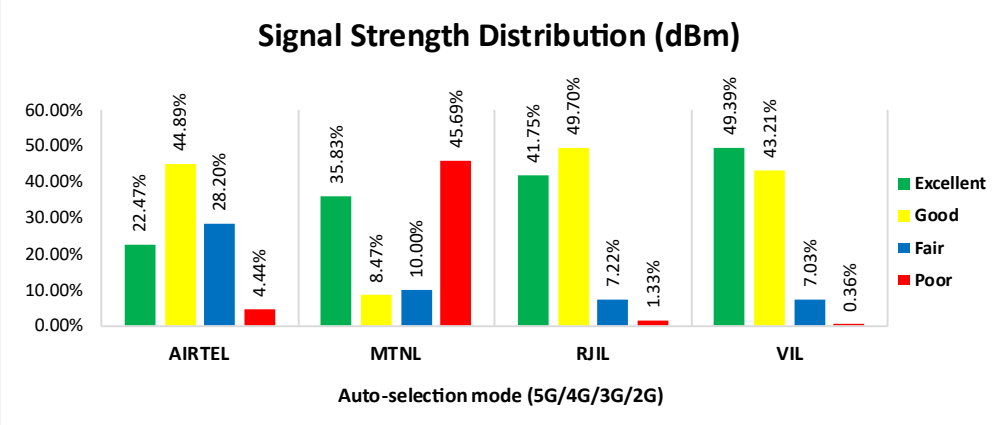


Figure-105: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:
- Airtel has 22% of samples falling in the excellent signal strength category.
- MTNL has 36% of samples falling in the excellent signal strength category.
- RJIL has 42% of samples falling in the excellent signal strength category.
- VIL has 49% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	70.98	2.26	95.56	25.04
	80th Percentile	102.58	3.13	127.80	31.00
	20th Percentile	39.83	1.44	13.20	17.96
Upload Throughput (Mbits/s)	Average	48.78	0.89	10.59	10.15
	80th Percentile	104.31	1.35	16.82	15.05
	20th Percentile	10.16	0.41	2.16	2.03
Latency (ms)	50th Percentile	44.81	-	24.04	38.55

Table-37: Summary of Data performance in network auto-selection mode.

Note-"-"Ping tests were failed.

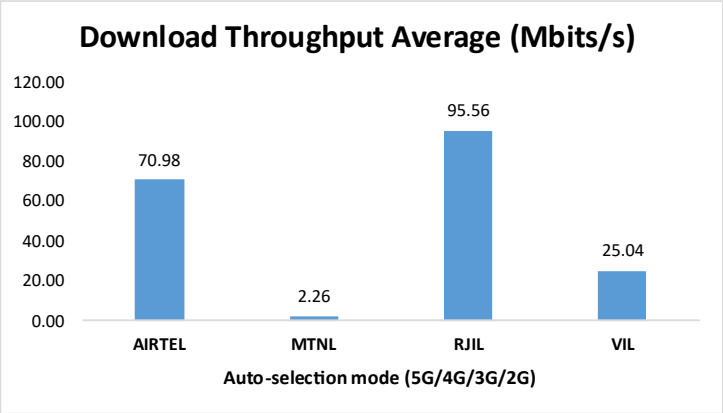


Figure 106: Download throughput.

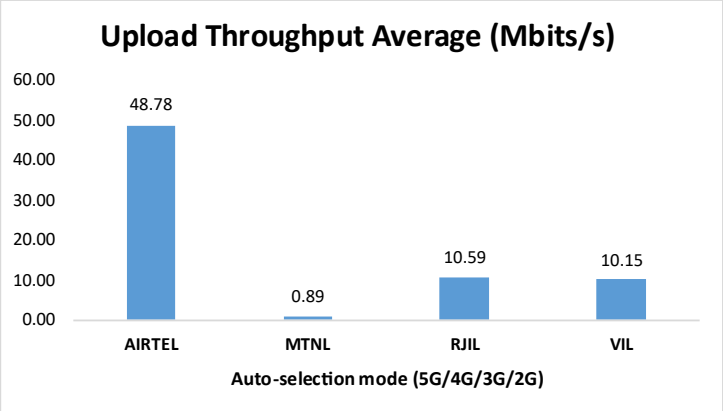


Figure-107: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	54.35%	NA	20.82%	14.67%
4G	45.65%	0.00%	76.45%	85.33%
3G	NA	38.73%	NA	NA
2G	0.00%	16.67%	NA	0.00%
Limited Service	0.00%	44.60%	2.73%	0.00%

Table-38: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

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

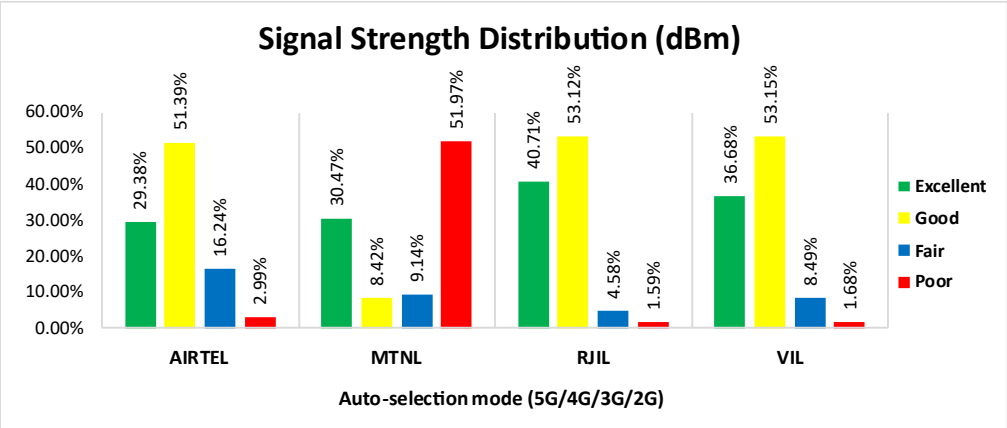


Figure-108: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 29% of samples falling in the excellent signal strength category.
- MTNL has 30% of samples falling in the excellent signal strength category.
- RJIL has 41% of samples falling in the excellent signal strength category.
- VIL has 37% of samples falling in the excellent signal strength category.

4.2.2.9 Mayur Vihar-1 to Maujpur-Babarpur (Pink Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	48	60	48	46
Call Setup Success Rate %	100.00	51.67	100.00	100.00
Drop Call Rate %	2.08	22.58	0.00	0.00
Call Setup Time Average (Second)	1.96	3.65	0.90	0.80
Handover Success Rate %	100.00	100.00	99.87	100.00

Table-39: Summary of voice call performance in network auto-selection mode.

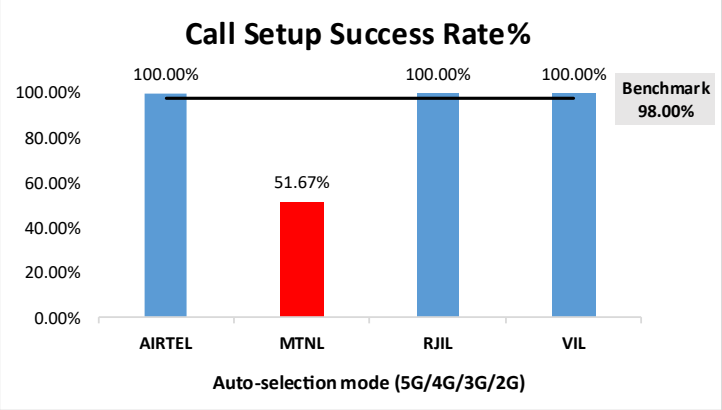


Figure-109: Performance for call setup success rate.

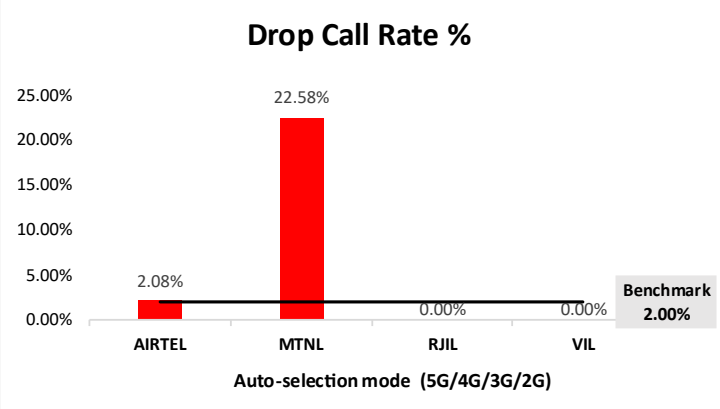


Figure-110: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	0.07%	NA	9.72%	0.00%
4G	99.93%	0.00%	90.28%	100.00%
3G	NA	82.18%	NA	NA
2G	0.00%	6.27%	NA	0.00%
Limited Service	0.00%	11.55%	0.00%	0.00%

Table-40: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

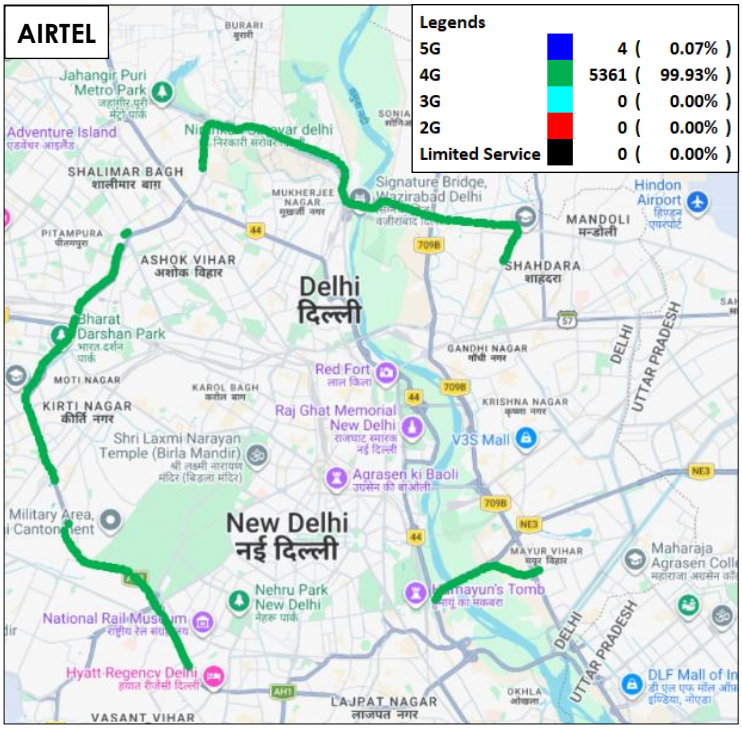


Figure-111: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

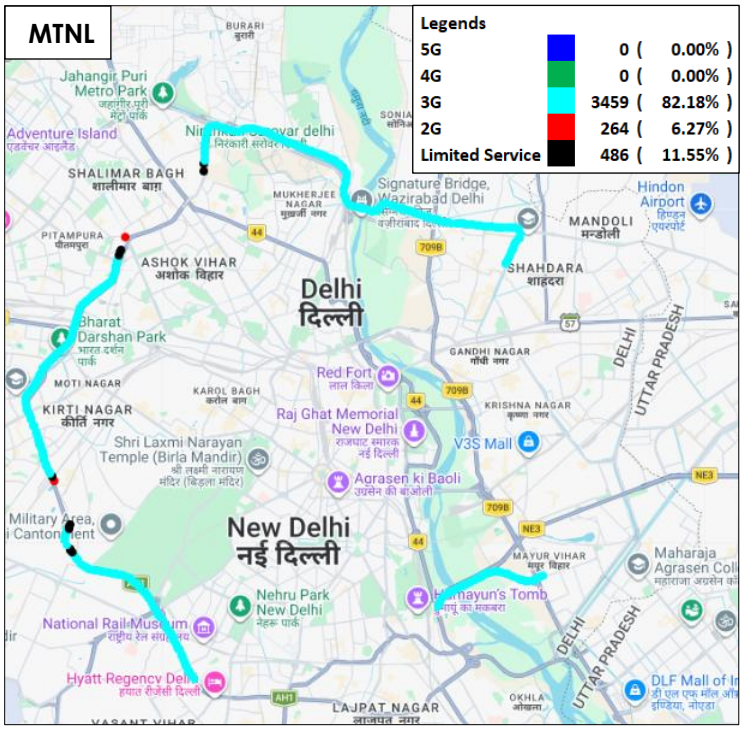


Figure-112: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

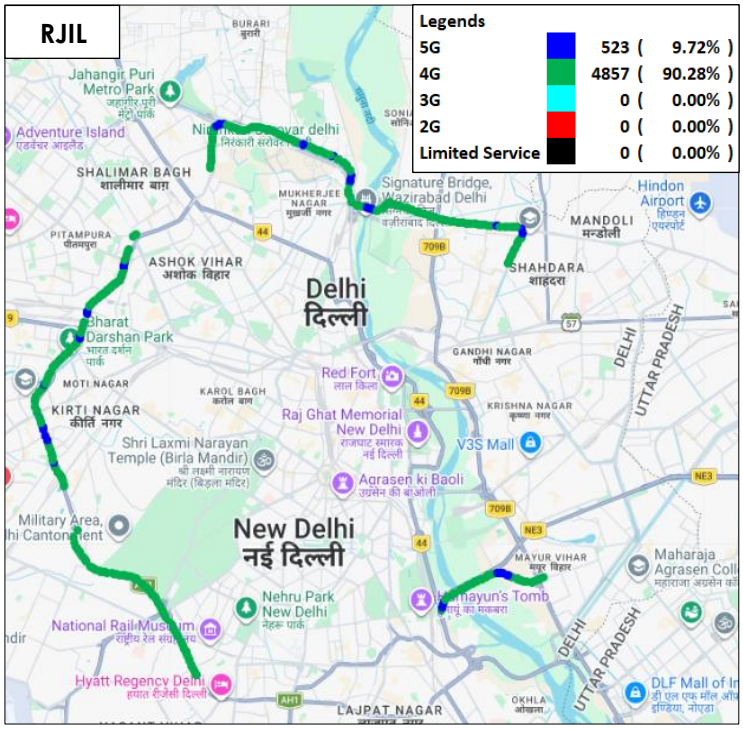


Figure-113: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

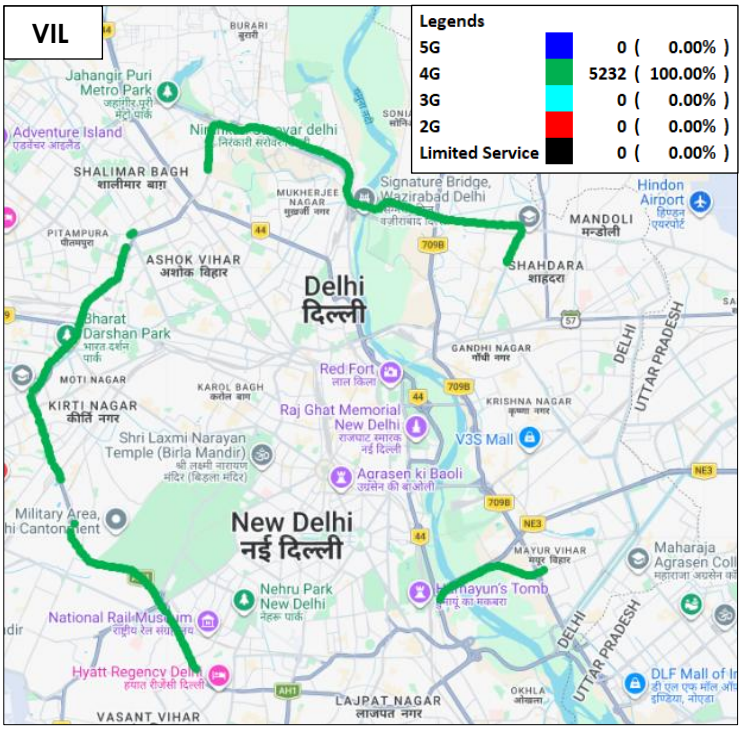


Figure-114: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-263, 264, 265 & 266 for map view)

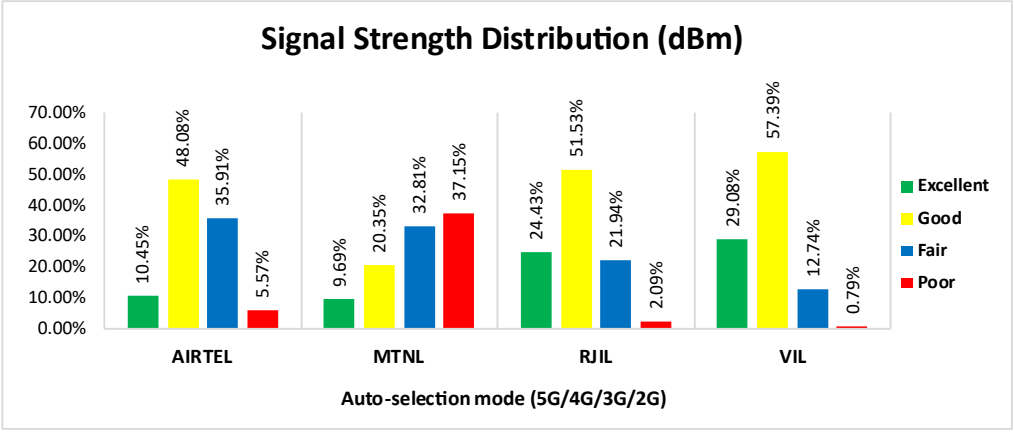


Figure-115: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 10% of samples falling in the excellent signal strength category.
- MTNL has 10% of samples falling in the excellent signal strength category.
- RJIL has 24% of samples falling in the excellent signal strength category.
- VIL has 29% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	57.34	2.69	91.12	18.99
	80th Percentile	90.83	3.26	129.24	31.45
	20th Percentile	12.83	1.50	16.67	4.26
Upload Throughput (Mbits/s)	Average	19.38	1.94	16.67	11.98
	80th Percentile	31.83	3.34	29.55	18.73
	20th Percentile	1.93	1.06	1.84	2.17
Latency (ms)	50th Percentile	44.63	21.07	22.65	37.33

Table-41: Summary of Data performance in network auto-selection mode.

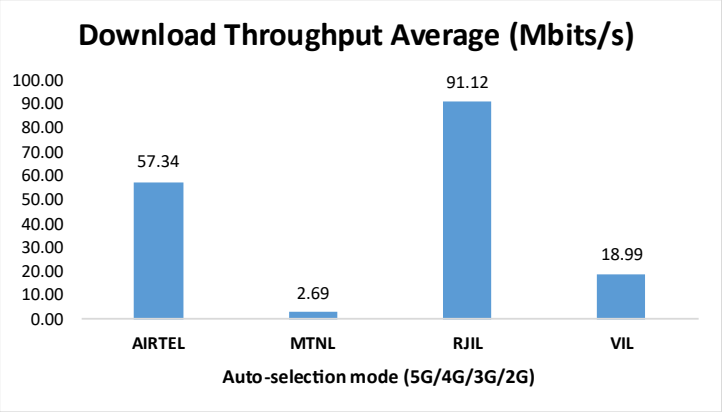


Figure 116: Download throughput.

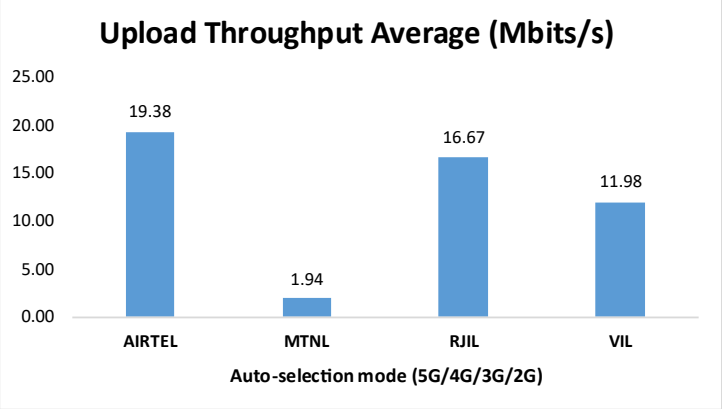


Figure-117: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	54.08%	NA	66.38%	27.06%
4G	45.92%	0.00%	33.62%	72.94%
3G	NA	82.84%	NA	NA
2G	0.00%	2.79%	NA	0.00%
Limited Service	0.00%	14.37%	0.00%	0.00%

Table-42: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

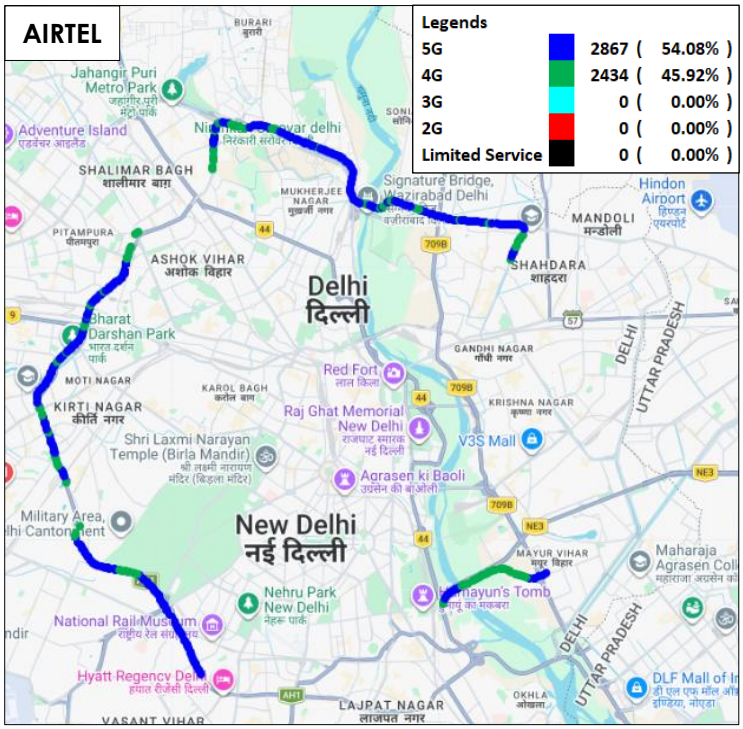


Figure-118: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

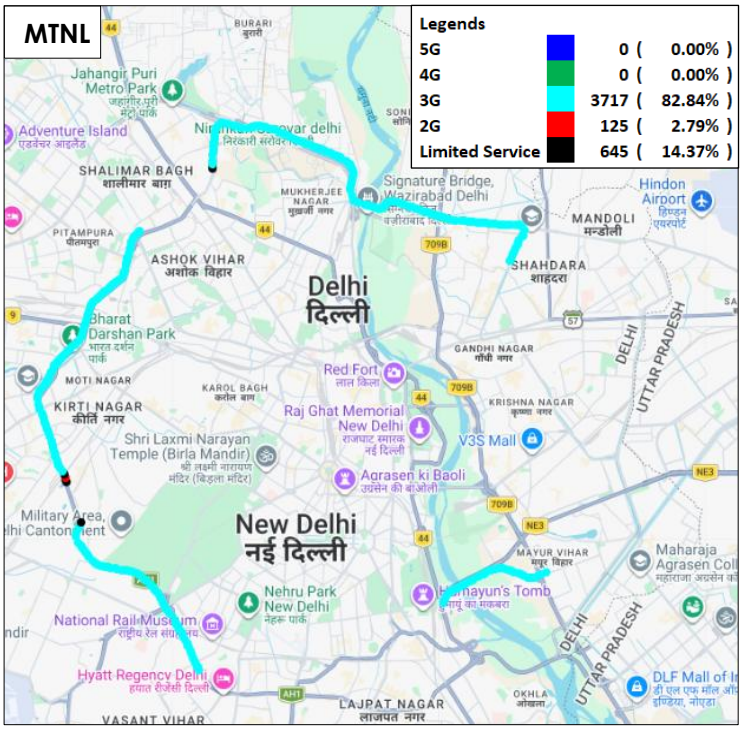


Figure-119: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

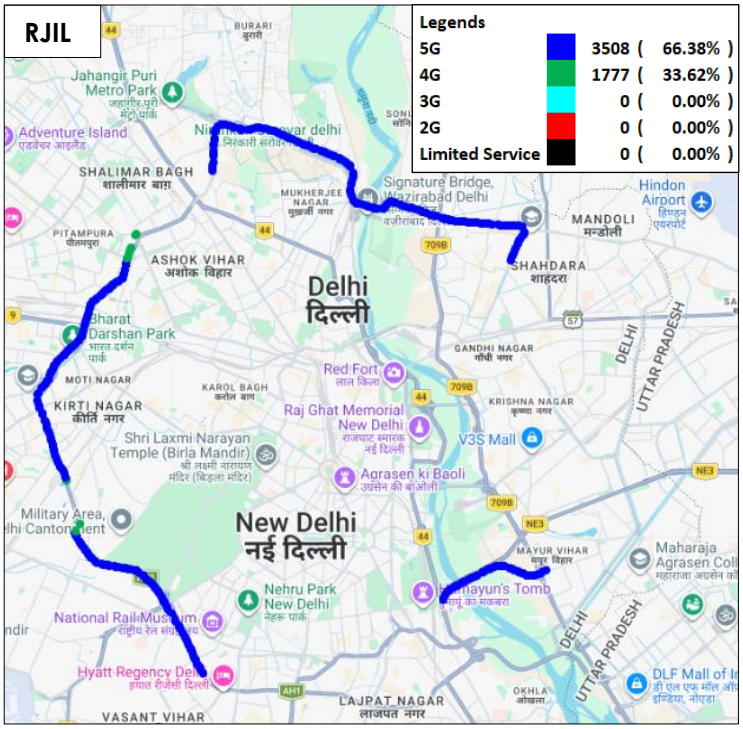


Figure-120: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

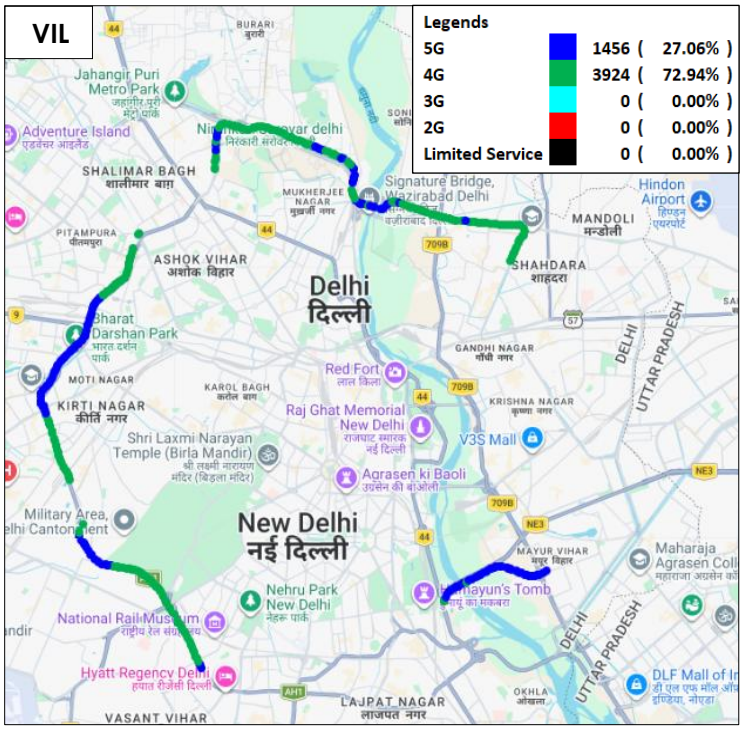


Figure-121: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-267, 268, 269 & 270 for map view)

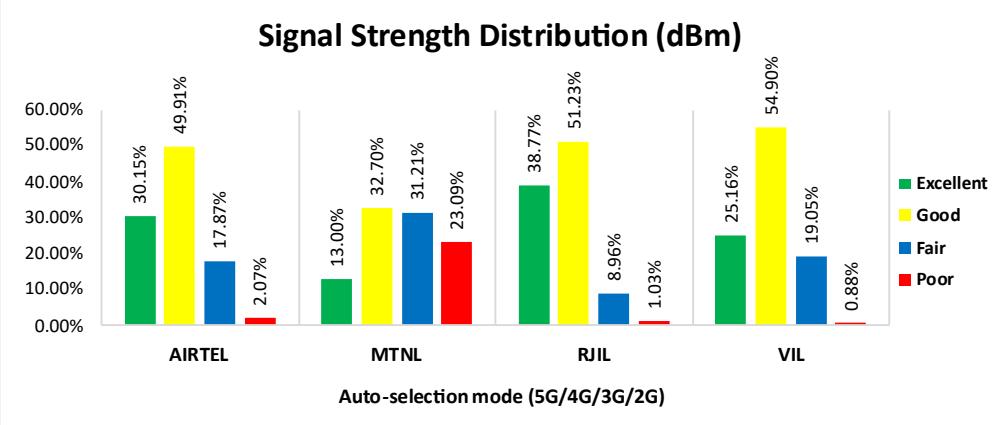


Figure-122: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 30% of samples falling in the excellent signal strength category.
- MTNL has 13% of samples falling in the excellent signal strength category.
- RJIL has 39% of samples falling in the excellent signal strength category.
- VIL has 25% of samples falling in the excellent signal strength category.

4.2.2.10 Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	27	29	28	27
Call Setup Success Rate %	100.00	86.21	100.00	100.00
Drop Call Rate %	0.00	8.00	0.00	0.00
Call Setup Time Average (Second)	0.85	3.55	0.52	0.56
Handover Success Rate %	99.61	100.00	99.82	99.61

Table-43: Summary of voice call performance in network auto-selection mode.

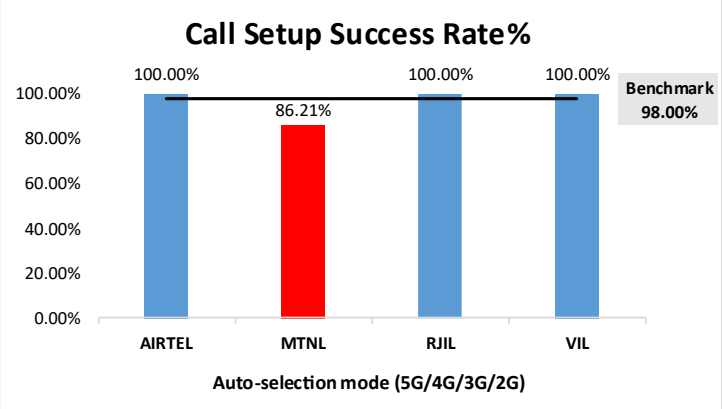


Figure-123: Performance for call setup success rate.

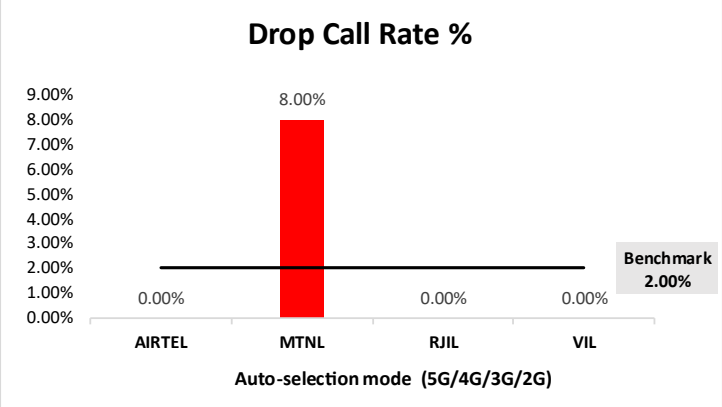


Figure-124: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	0.53%	NA	10.31%	0.00%
4G	99.47%	0.00%	89.69%	100.00%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-44: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

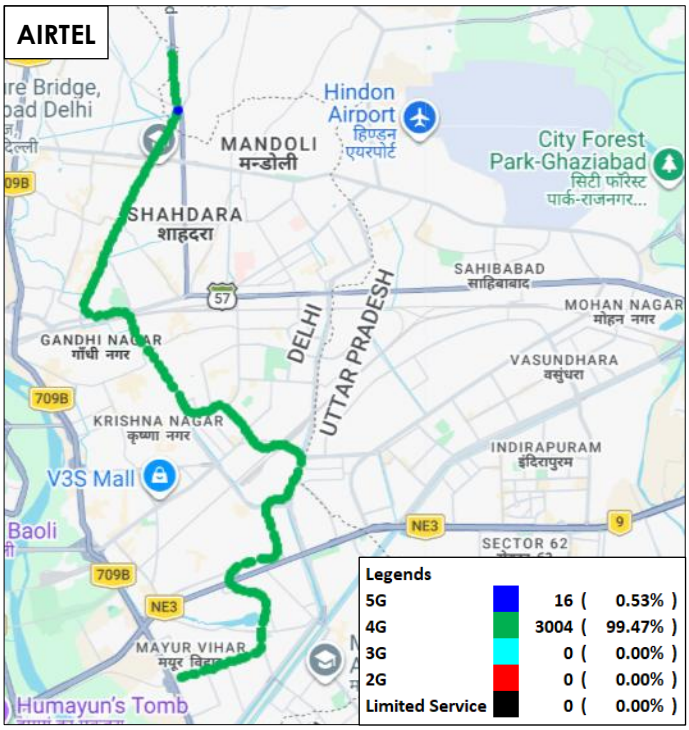


Figure-125: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

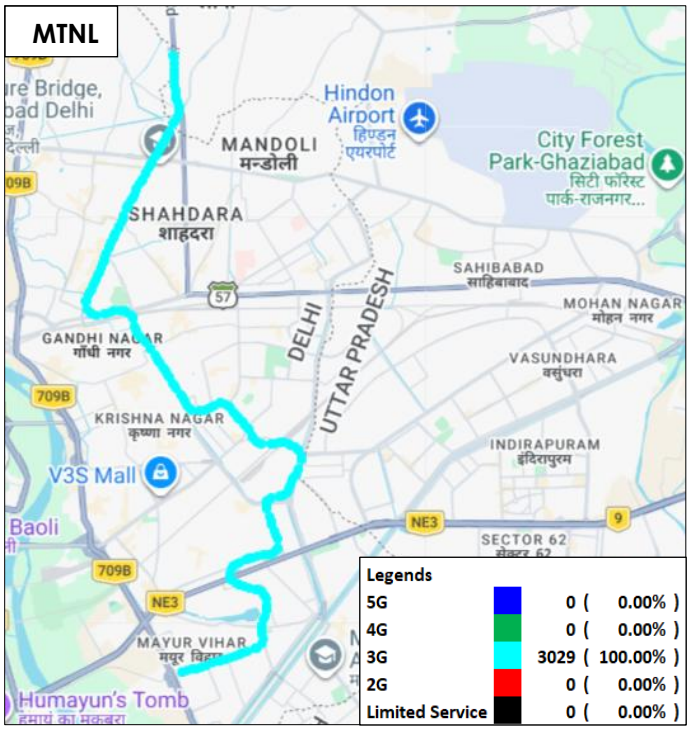


Figure-126: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

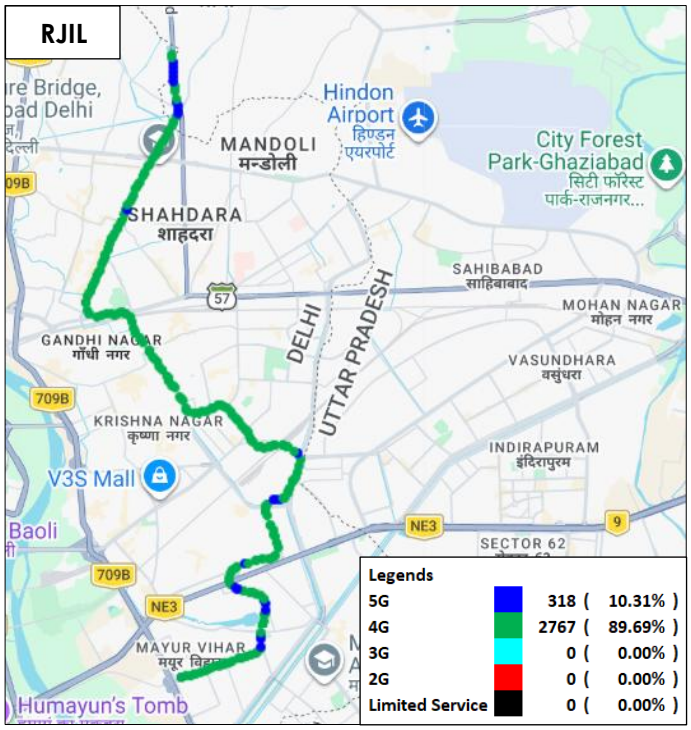


Figure-127: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

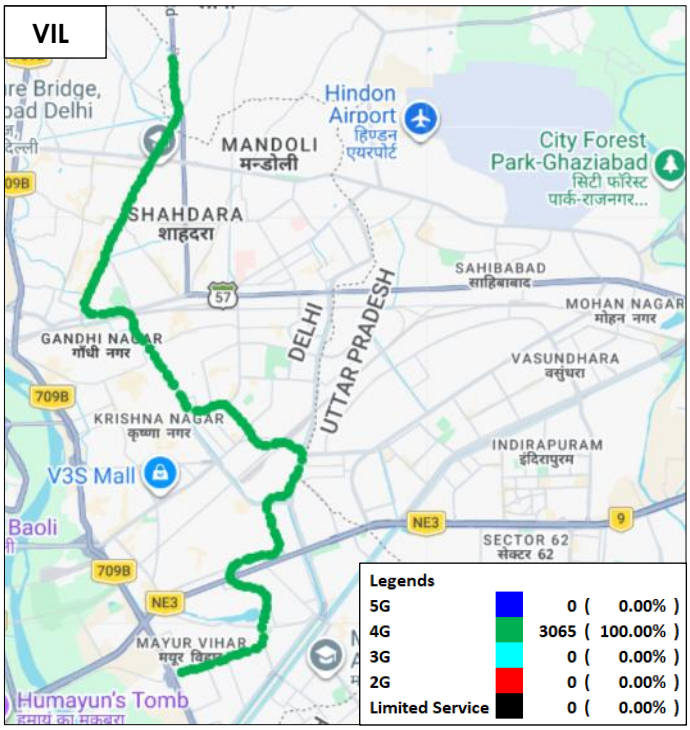


Figure-128: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-271, 272, 273 & 274 for map view)

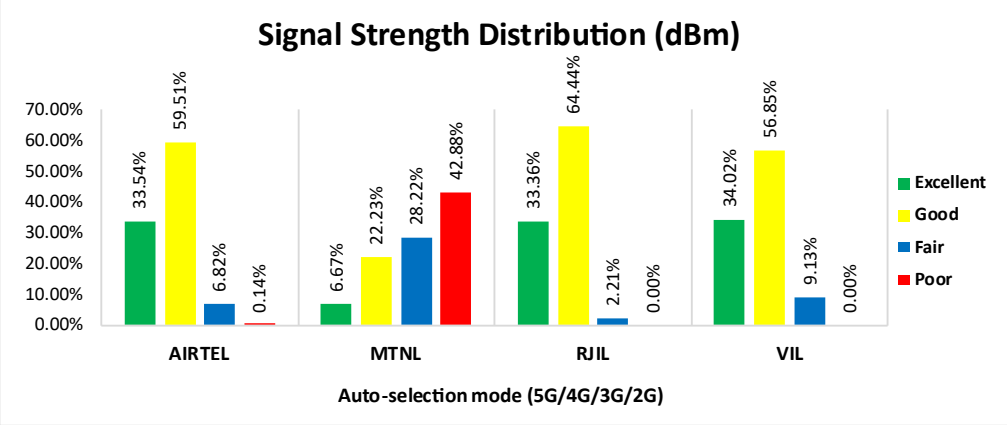


Figure-129: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 34% of samples falling in the excellent signal strength category.
- MTNL has 7% of samples falling in the excellent signal strength category.
- RJIL has 33% of samples falling in the excellent signal strength category.
- VIL has 34% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	83.59	4.08	115.11	16.21
	80th Percentile	122.80	5.65	194.24	28.56
	20th Percentile	37.73	2.59	45.81	6.10
Upload Throughput (Mbits/s)	Average	34.72	1.65	24.83	13.81
	80th Percentile	43.20	2.22	32.44	32.32
	20th Percentile	20.88	1.13	12.55	2.49
Latency (ms)	50th Percentile	42.46	19.10	23.95	38.66

Table-45: Summary of Data performance in network auto-selection mode.

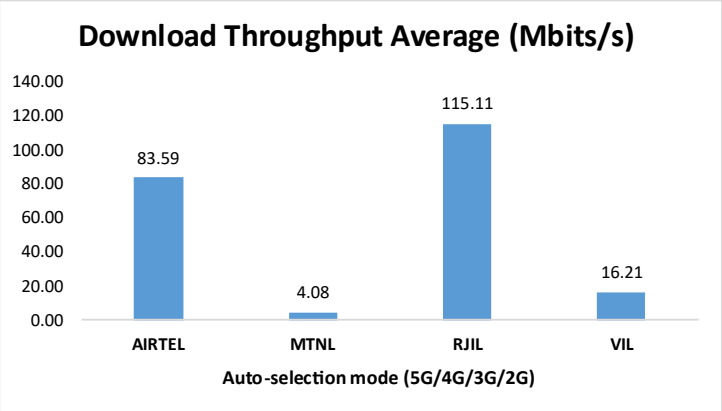


Figure 130: Download throughput.

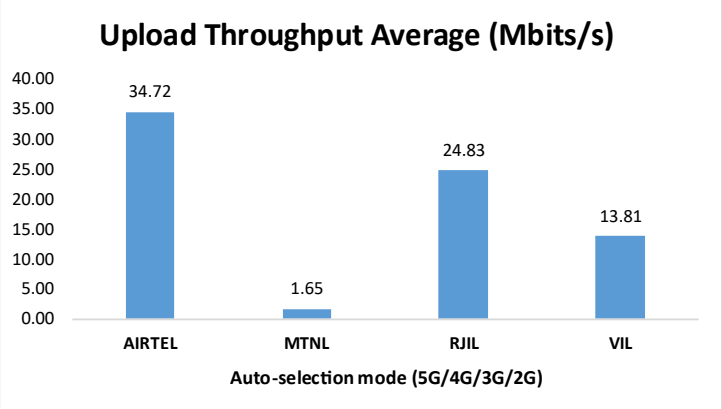


Figure-131: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	89.86%	NA	99.93%	28.33%
4G	10.14%	0.00%	0.07%	71.67%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-46: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

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

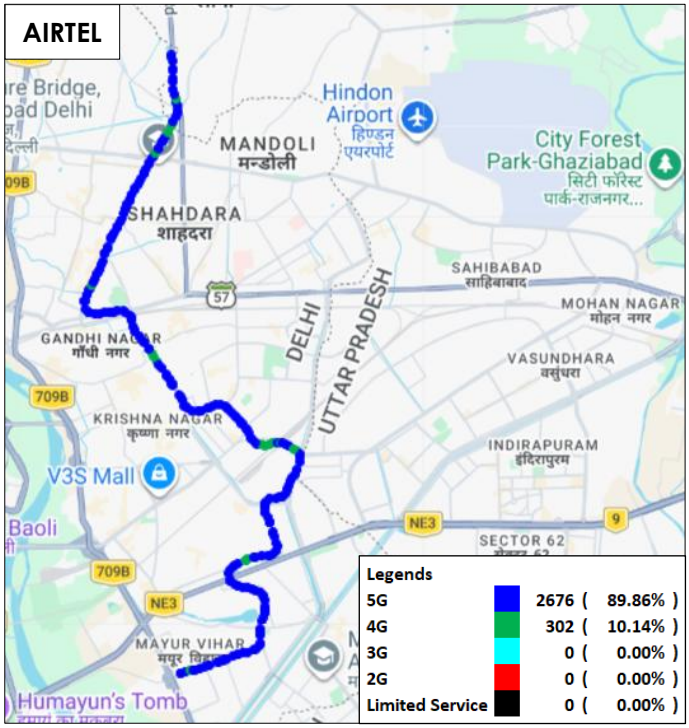


Figure-132: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

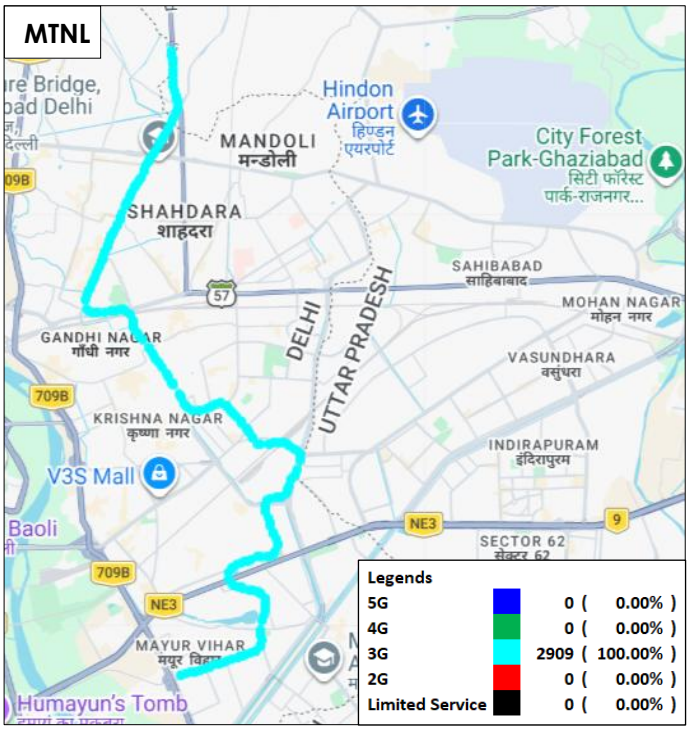


Figure-133: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

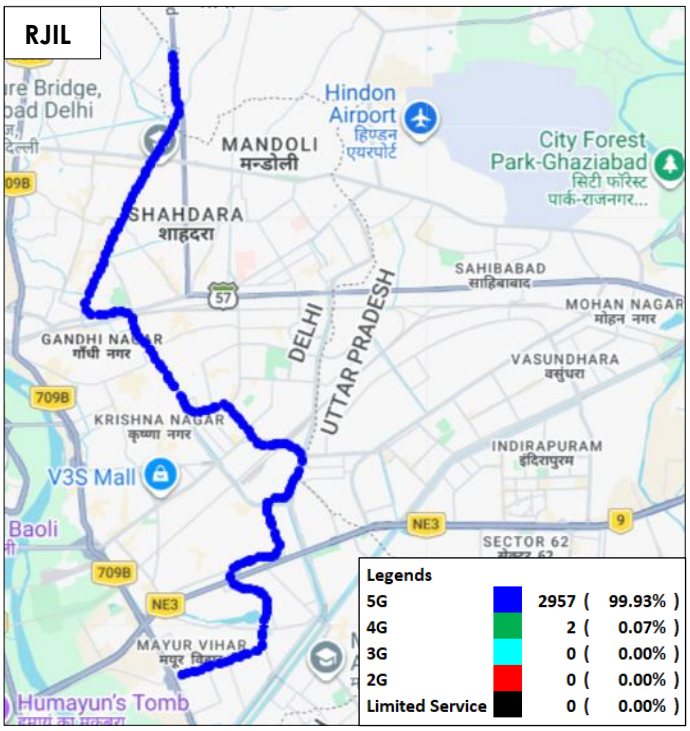


Figure-134: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

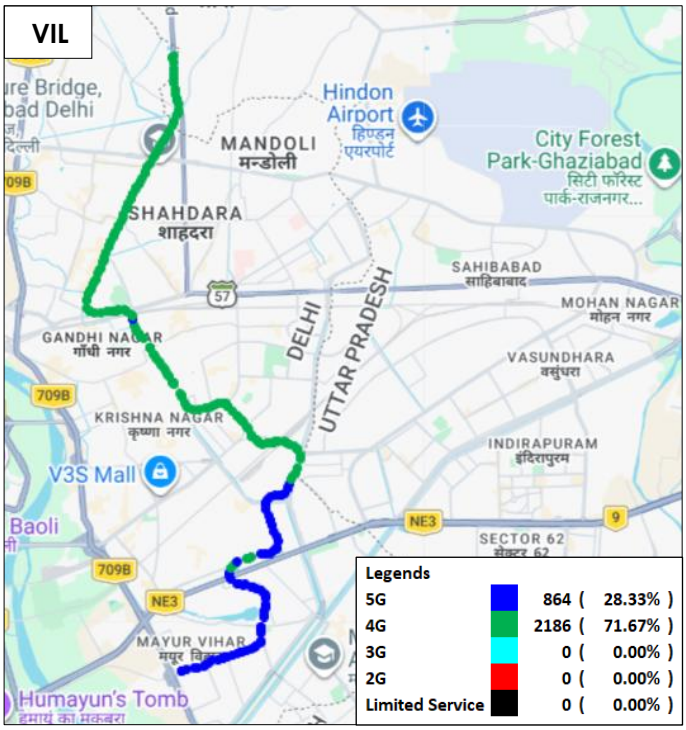


Figure-135: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-275, 276, 277 & 278 for map view)

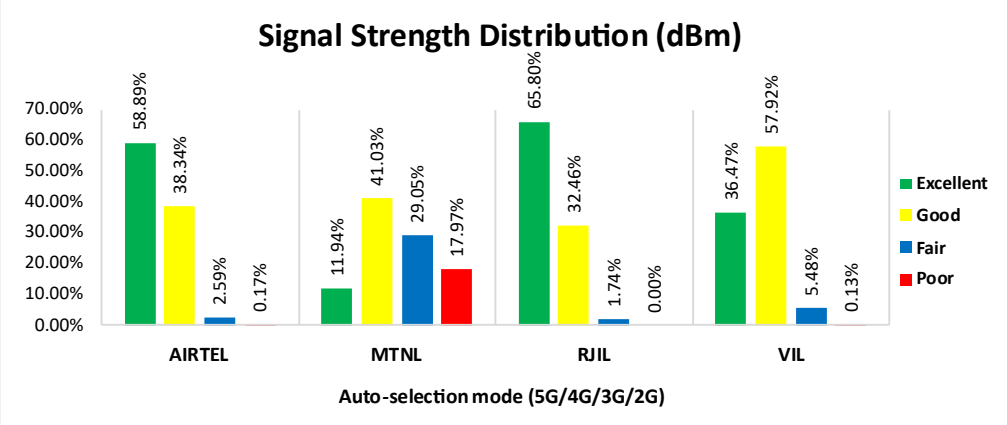


Figure-136: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 59% of samples falling in the excellent signal strength category.
- MTNL has 12% of samples falling in the excellent signal strength category.
- RJIL has 66% of samples falling in the excellent signal strength category.
- VIL has 36% of samples falling in the excellent signal strength category.

4.2.2.11 Sector 55-56 to Phase-3 (Rapid Metro)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	13	14	13	13
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	28.57	0.00	0.00
Call Setup Time Average (Second)	0.82	4.11	0.55	0.52
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-47: Summary of voice call performance in network auto-selection mode.

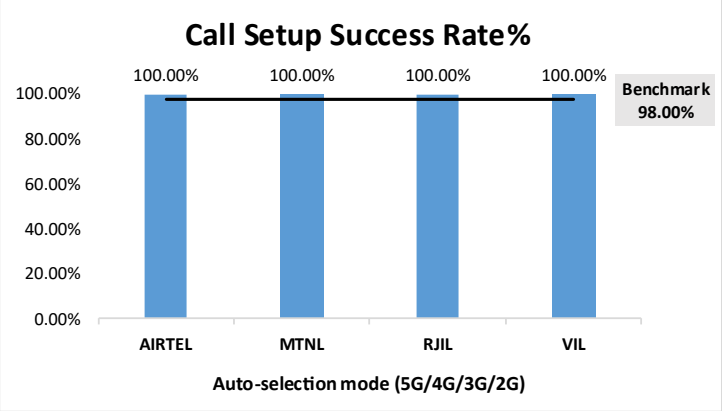


Figure-137: Performance for call setup success rate.

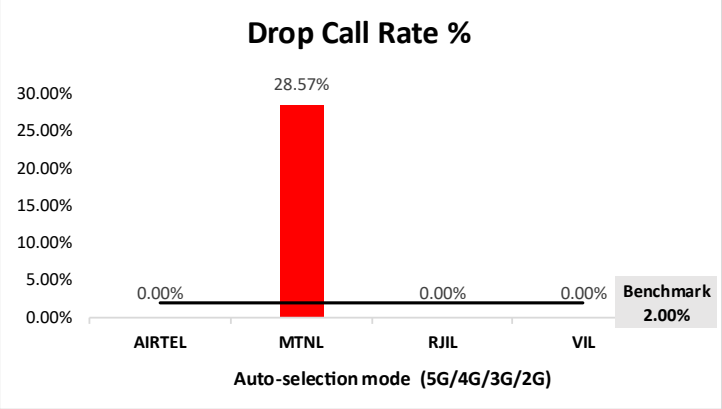


Figure-138: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	0.00%	NA	20.15%	0.00%
4G	100.00%	0.00%	79.85%	100.00%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-48: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

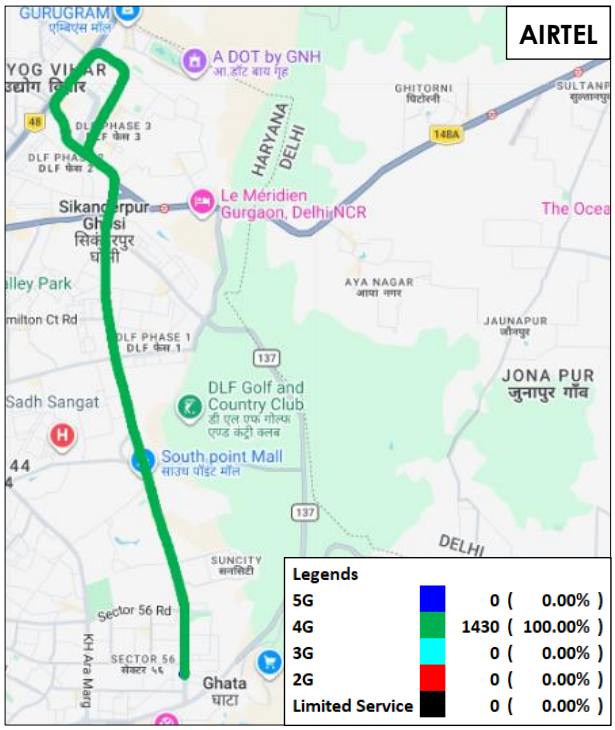


Figure-139: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

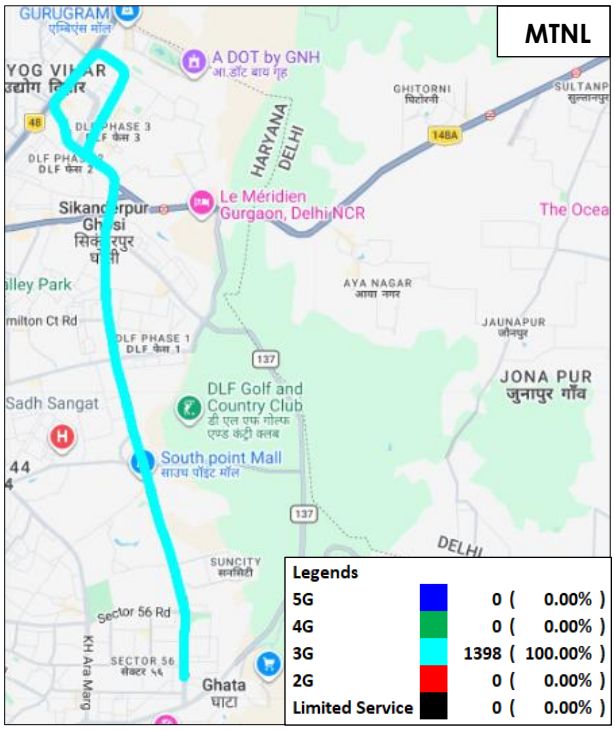


Figure-140: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

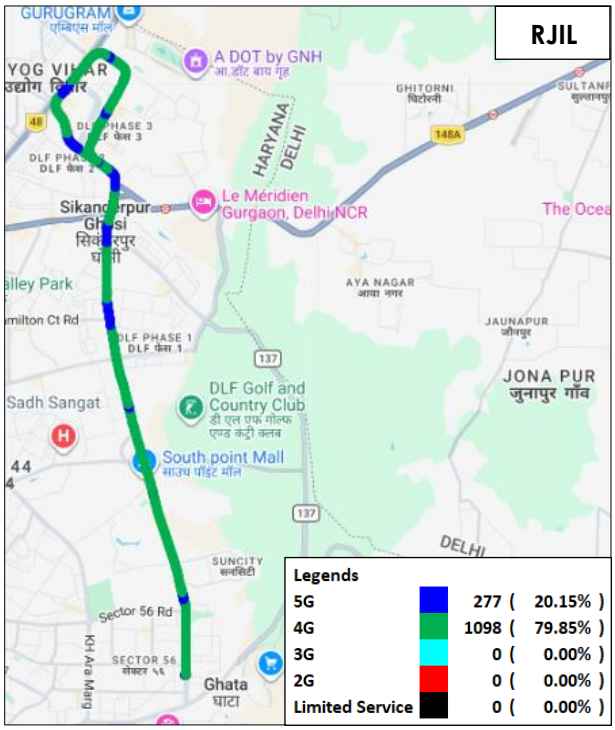


Figure-141: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

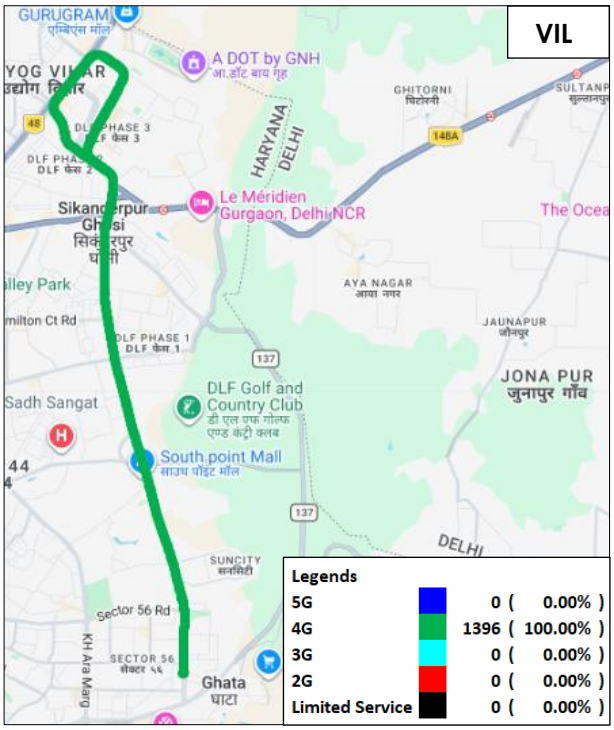


Figure-142: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-279, 280, 281 & 282 for map view)

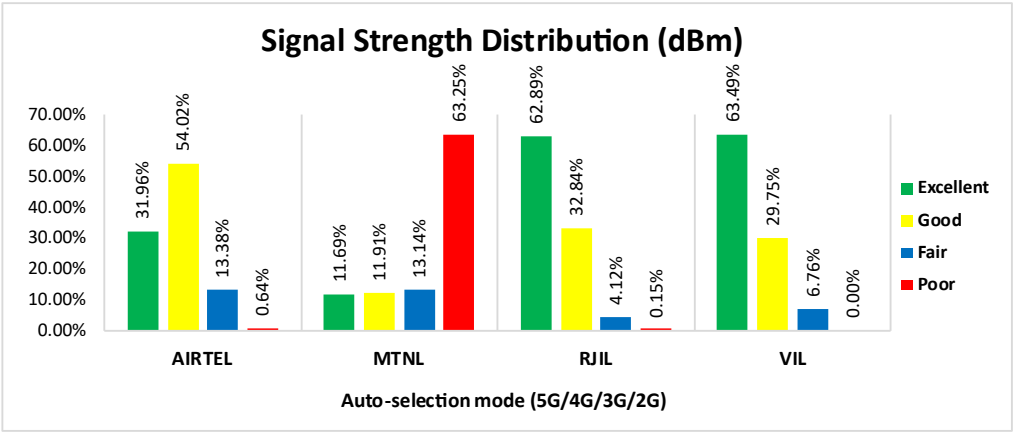


Figure-143: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 32% of samples falling in the excellent signal strength category.
- MTNL has 12% of samples falling in the excellent signal strength category.
- RJIL has 63% of samples falling in the excellent signal strength category.
- VIL has 63% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	70.21	4.53	216.99	37.00
	80th Percentile	114.90	7.52	312.28	47.55
	20th Percentile	20.76	1.17	130.53	29.76
Upload Throughput (Mbits/s)	Average	22.97	1.70	22.44	40.36
	80th Percentile	33.84	1.97	36.08	47.33
	20th Percentile	8.19	1.14	6.64	32.87
Latency (ms)	50th Percentile	55.61	26.62	21.16	39.93

Table-49: Summary of Data performance in network auto-selection mode.

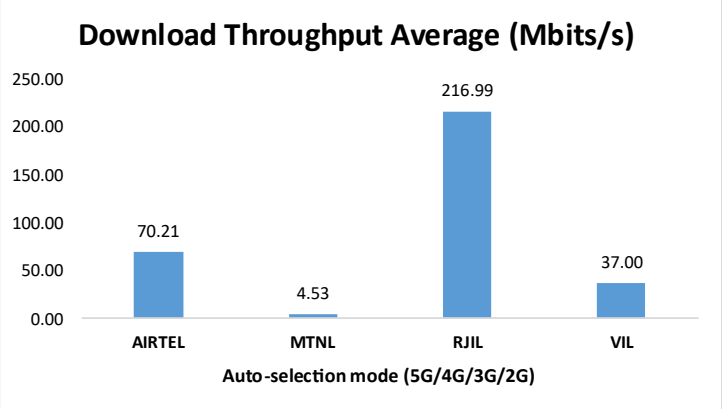


Figure 144: Download throughput.

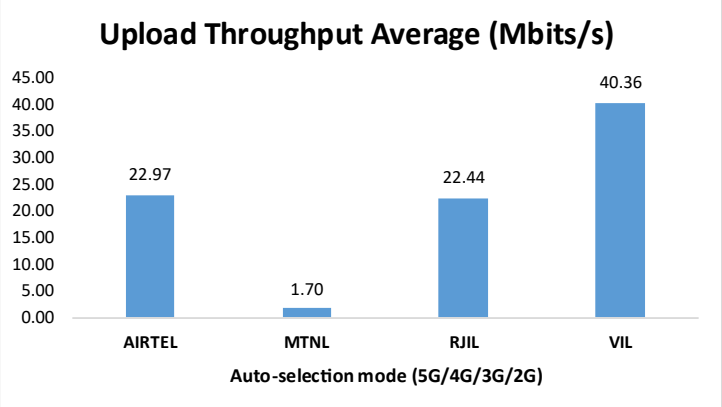


Figure-145: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	75.61%	NA	100.00%	88.78%
4G	24.39%	0.00%	0.00%	11.22%
3G	NA	100.00%	NA	NA
2G	0.00%	0.00%	NA	0.00%
Limited Service	0.00%	0.00%	0.00%	0.00%

Table-50: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

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

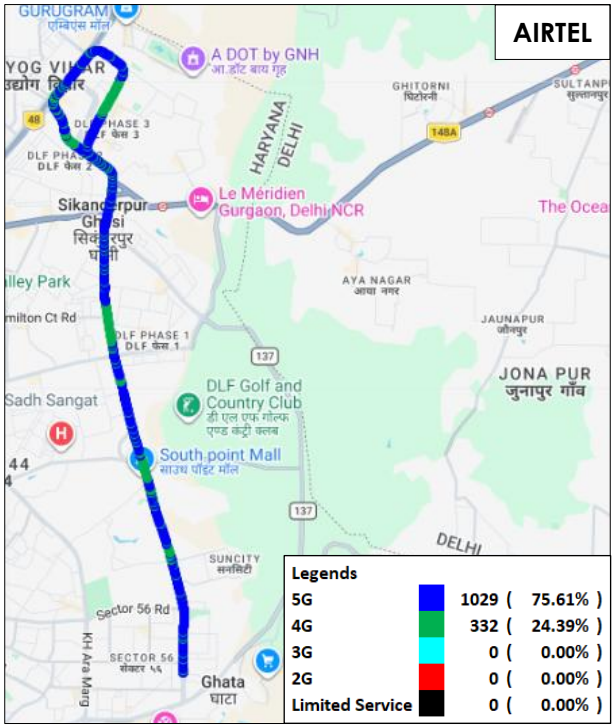


Figure-146: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

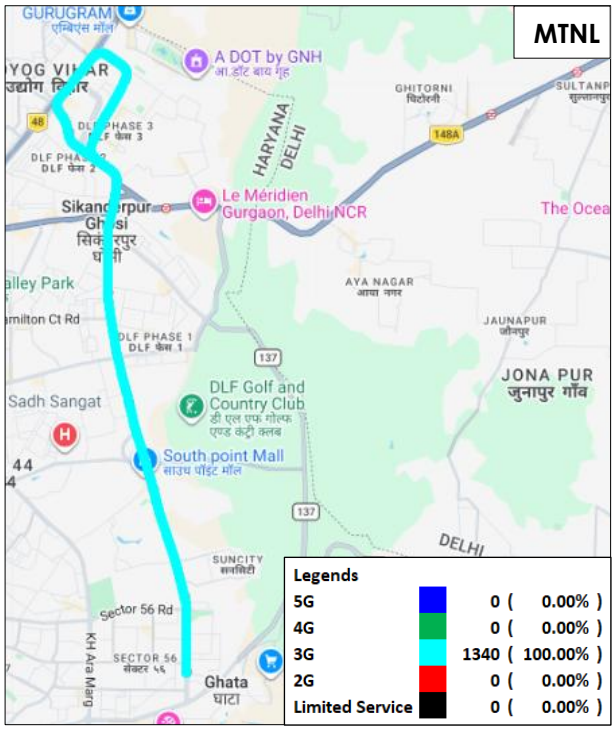


Figure-147: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

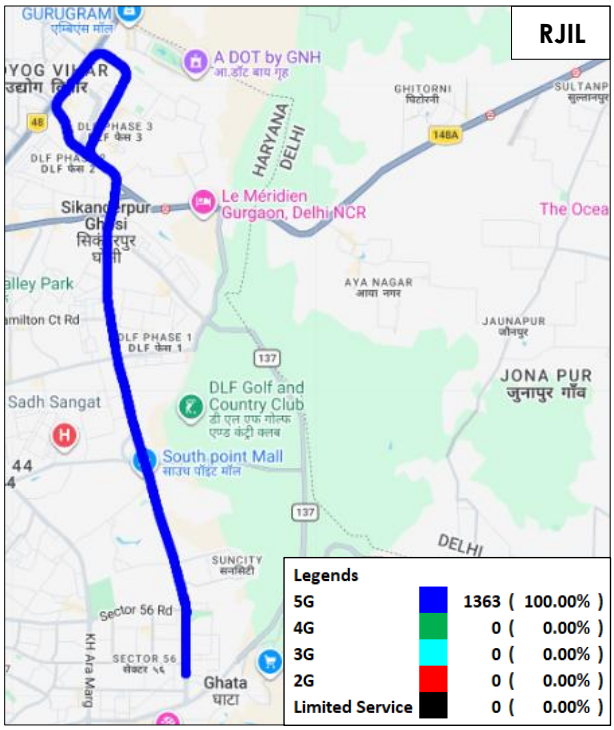


Figure-148: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

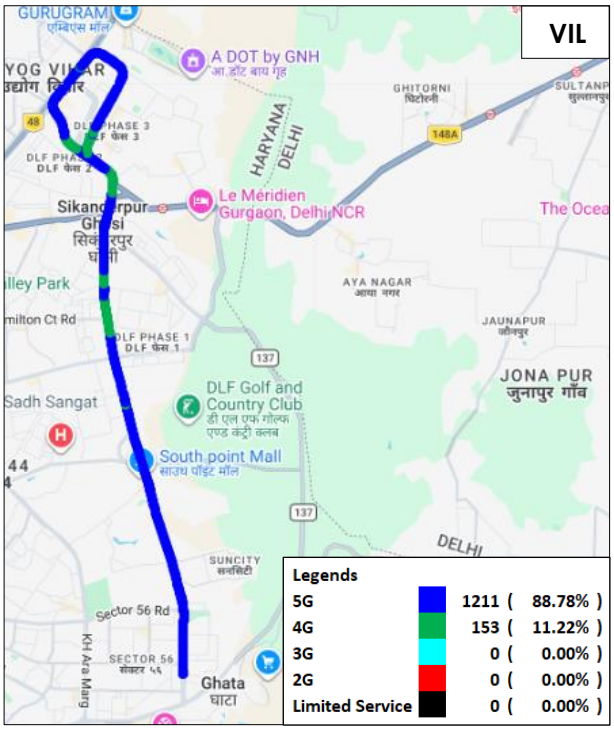


Figure-149: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-283, 284, 285 & 286 for map view)

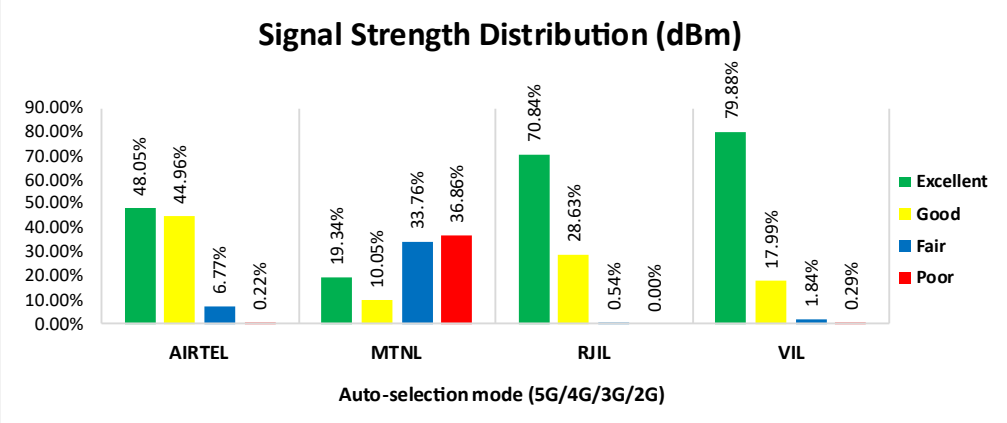


Figure-150: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 48% of samples falling in the excellent signal strength category.
- MTNL has 19% of samples falling in the excellent signal strength category.
- RJIL has 71% of samples falling in the excellent signal strength category.
- VIL has 80% of samples falling in the excellent signal strength category.

4.2.2.12 Shaheed Sthal to Rithala (Red Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	47	52	47	49
Call Setup Success Rate %	100.00	84.62	100.00	97.96
Drop Call Rate %	0.00	9.09	0.00	0.00
Call Setup Time Average (Second)	0.82	1.27	0.52	0.59
Handover Success Rate %	100.00	100.00	100.00	100.00

Table-51: Summary of voice call performance in network auto-selection mode.

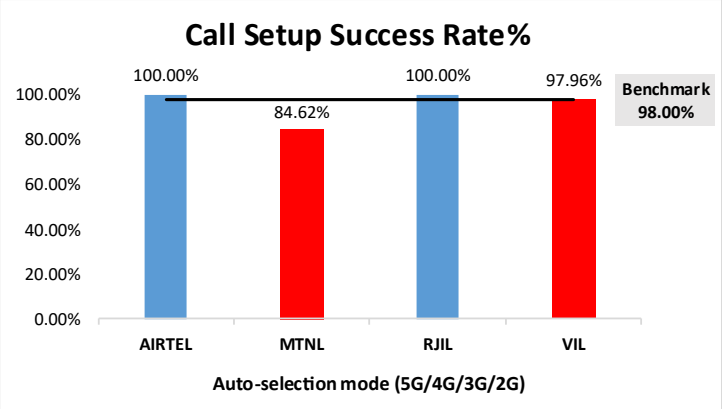


Figure-151: Performance for call setup success rate.

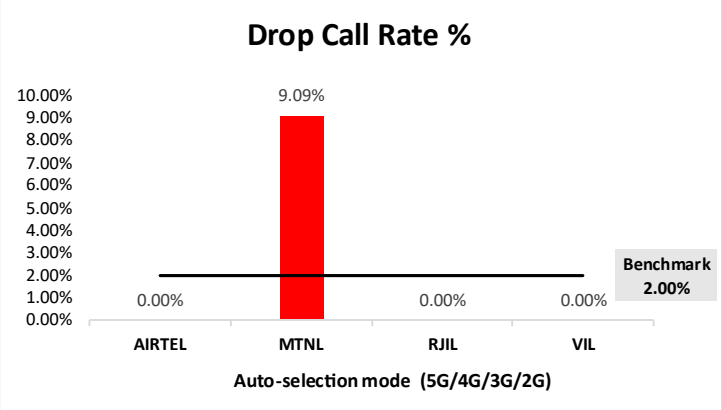


Figure-152: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	1.78%	NA	78.84%	0.04%
4G	98.22%	0.00%	21.16%	99.96%
3G	NA	96.35%	NA	NA
2G	0.00%	0.59%	NA	0.00%
Limited Service	0.00%	3.06%	0.00%	0.00%

Table-52: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

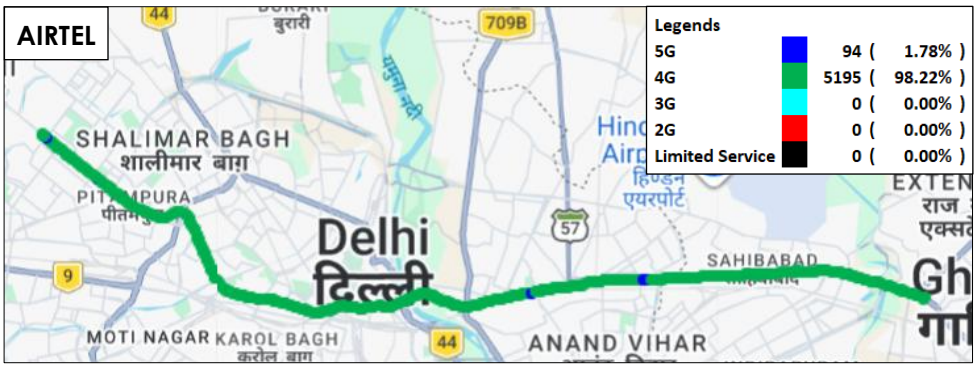


Figure-153: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

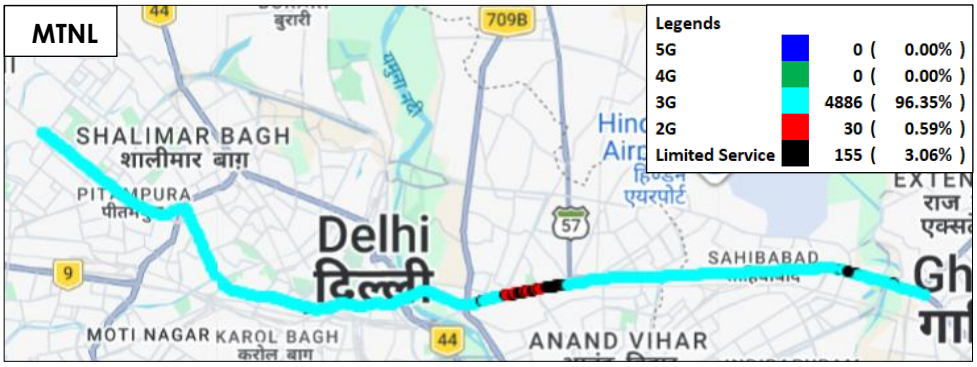


Figure-154: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

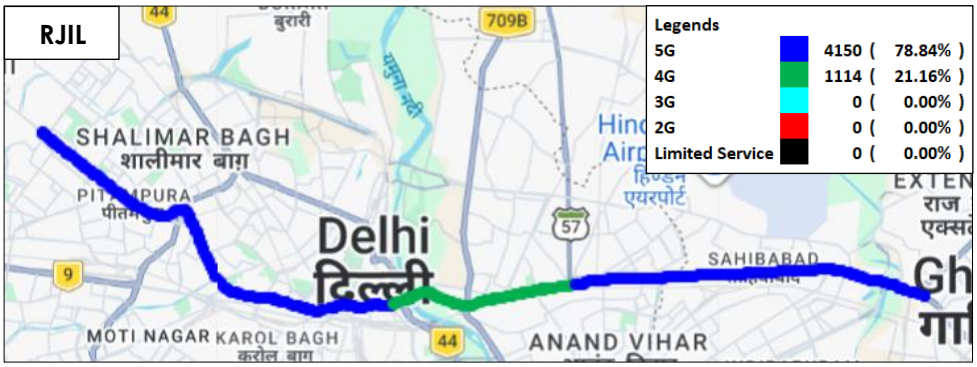


Figure-155: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

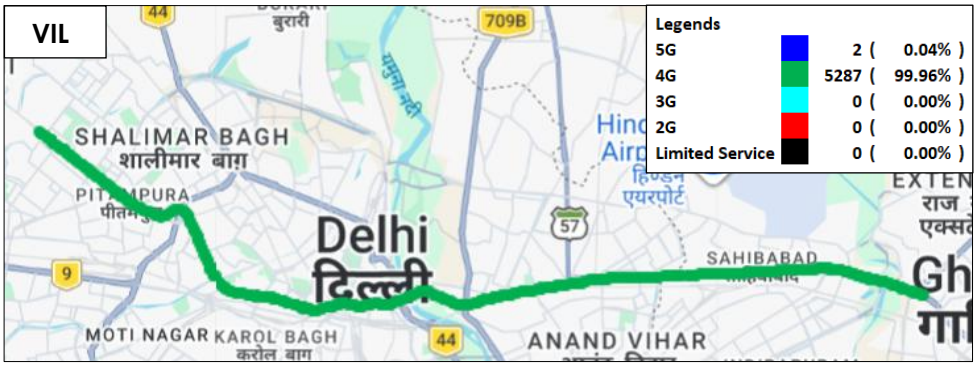


Figure-156: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-287, 288, 289 & 290 for map view)

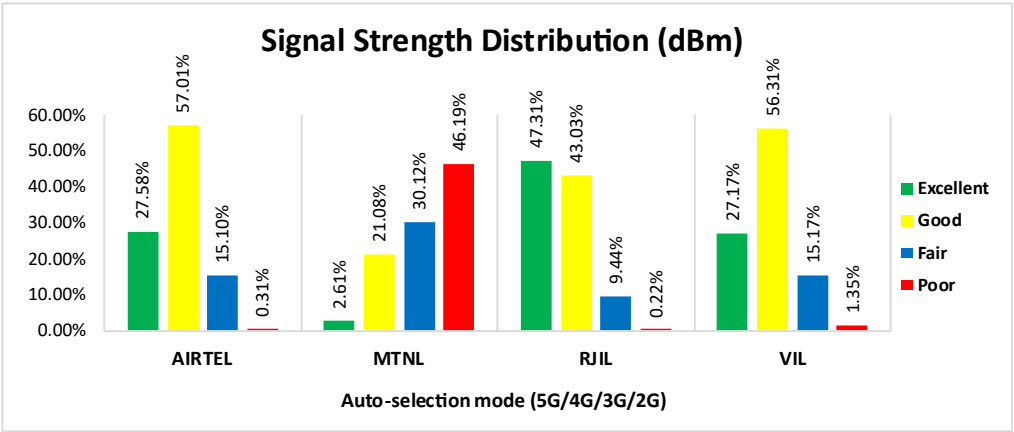


Figure-157: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 28% of samples falling in the excellent signal strength category.
- MTNL has 3% of samples falling in the excellent signal strength category.
- RJIL has 47% of samples falling in the excellent signal strength category.
- VIL has 27% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	57.95	-	208.16	24.19
	80th Percentile	99.37	-	375.58	42.33
	20th Percentile	22.01	-	44.67	7.72
Upload Throughput (Mbits/s)	Average	29.11	-	31.52	22.83
	80th Percentile	45.22	-	52.41	39.33
	20th Percentile	11.55	-	13.63	3.18
Latency (ms)	50th Percentile	40.54	-	22.52	39.73

Table-53: Summary of Data performance in network auto-selection mode.

Note-"-"Respective tests were failed.

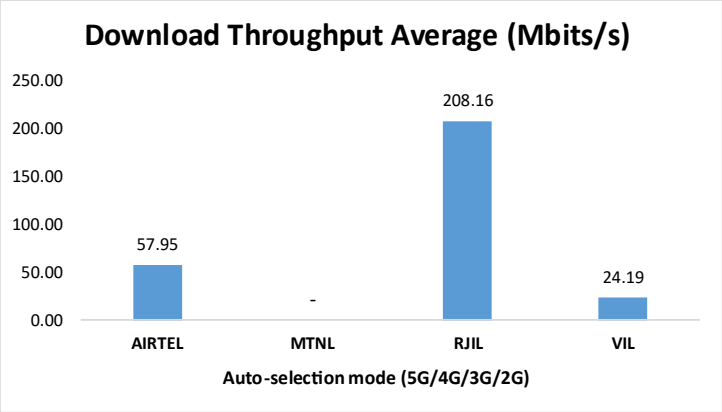


Figure 158: Download throughput.

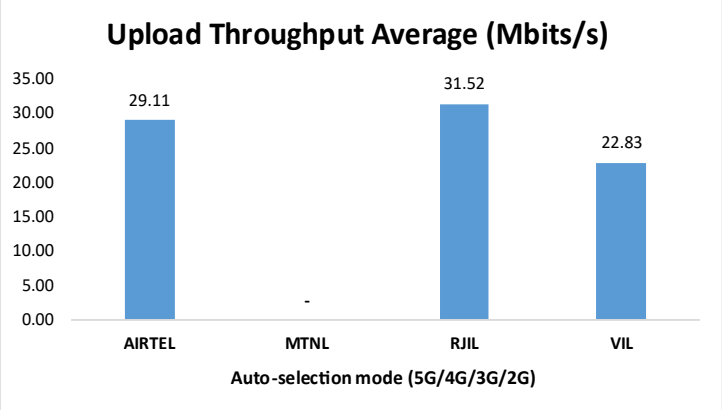


Figure-159: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	86.17%	NA	100.00%	55.53%
4G	13.83%	0.00%	0.00%	44.47%
3G	NA	95.52%	NA	NA
2G	0.00%	1.56%	NA	0.00%
Limited Service	0.00%	2.91%	0.00%	0.00%

Table-54: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

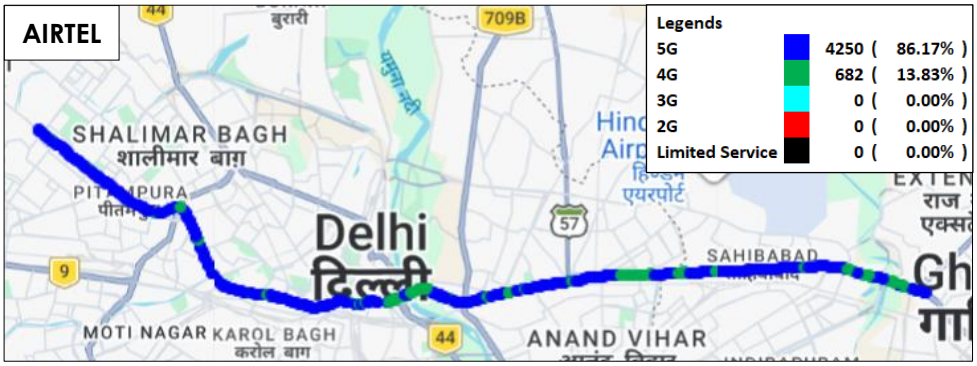


Figure-160: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

Figure-161: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

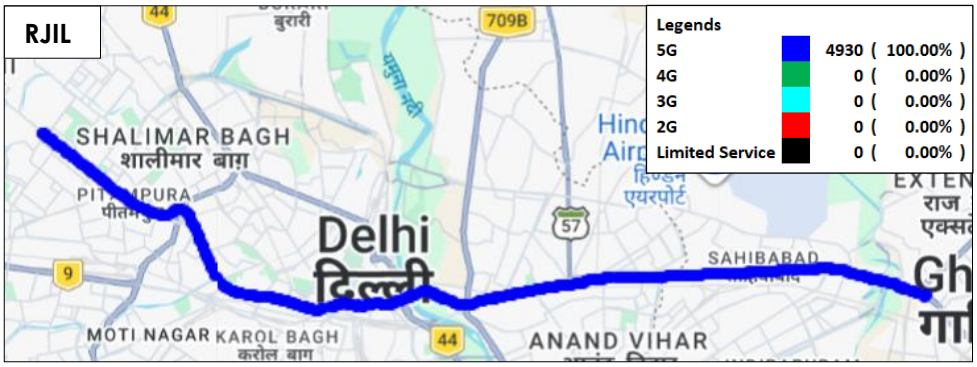


Figure-162: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

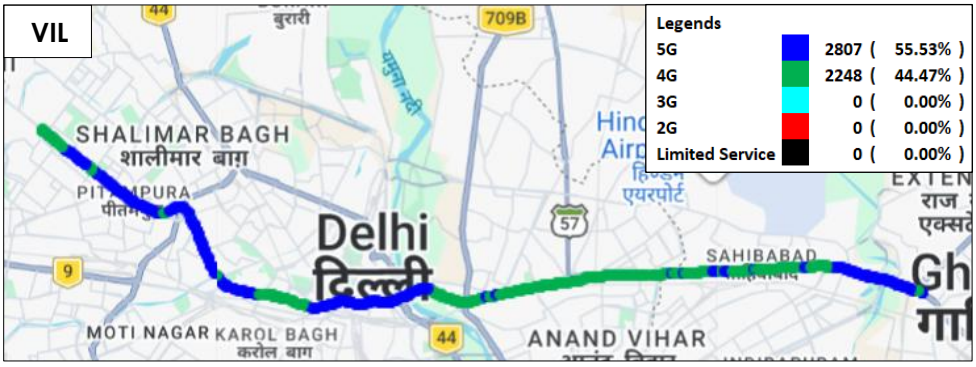


Figure-163: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-291, 292, 293 & 294 for map view)

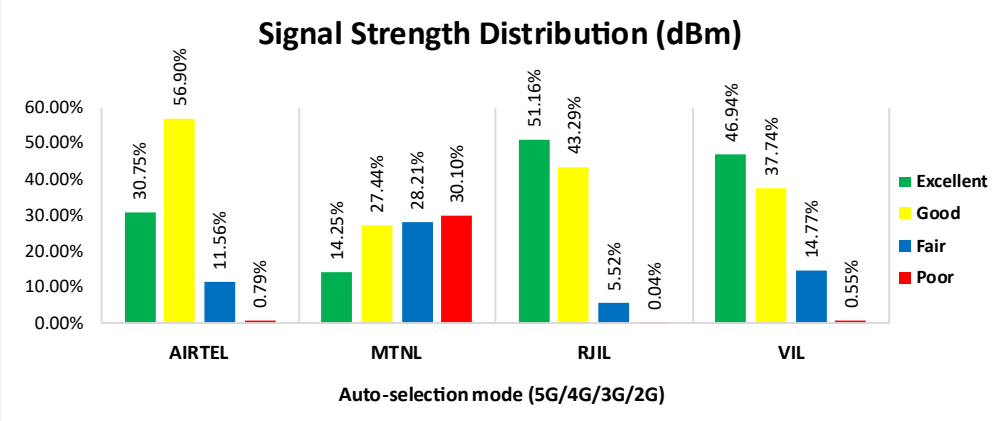


Figure-164: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 31% of samples falling in the excellent signal strength category.
- MTNL has 14% of samples falling in the excellent signal strength category.
- RJIL has 51% of samples falling in the excellent signal strength category.
- VIL has 47% of samples falling in the excellent signal strength category.

4.2.2.13 Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	46	55	46	46
Call Setup Success Rate %	100.00	56.36	100.00	100.00
Drop Call Rate %	0.00	12.90	0.00	0.00
Call Setup Time Average (Second)	1.24	6.04	1.44	0.89
Handover Success Rate %	99.28	100.00	100.00	99.66

Table-55: Summary of voice call performance in network auto-selection mode.

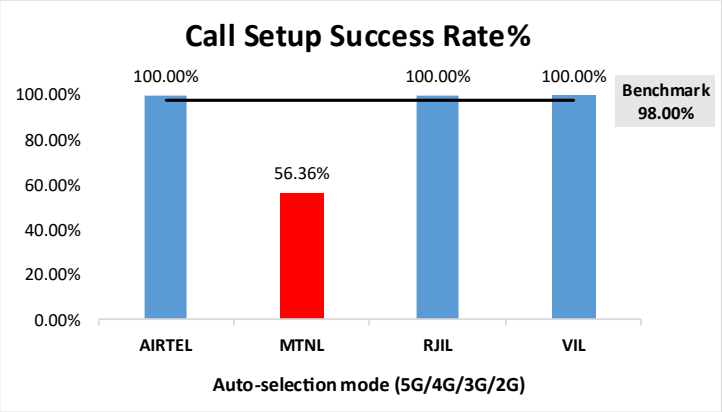


Figure-165: Performance for call setup success rate.

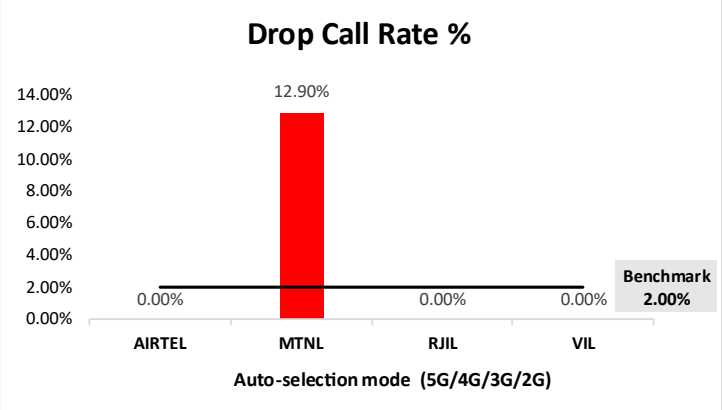


Figure-166: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	0.46%	NA	12.20%	0.00%
4G	99.54%	0.00%	87.80%	97.84%
3G	NA	82.75%	NA	NA
2G	0.00%	8.59%	NA	2.03%
Limited Service	0.00%	8.66%	0.00%	0.13%

Table-56: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

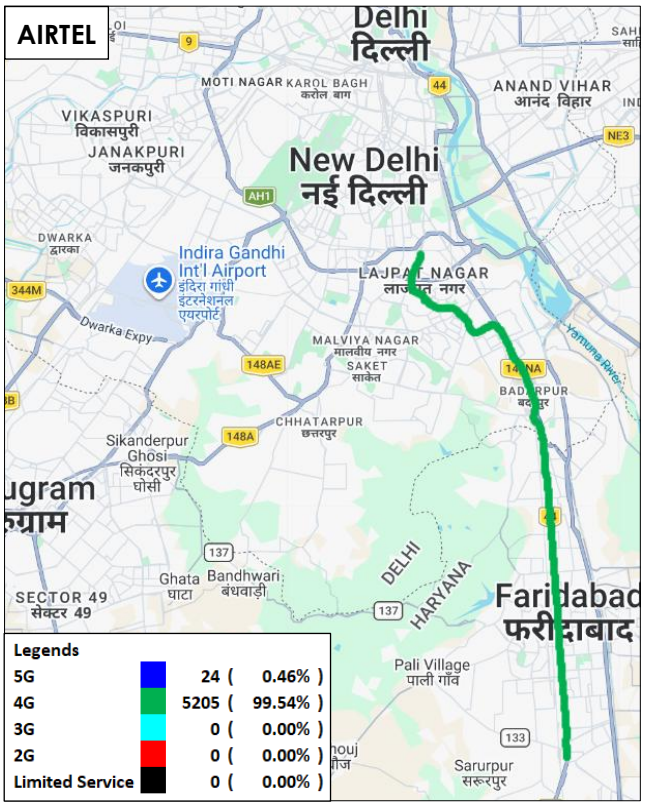


Figure-167: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

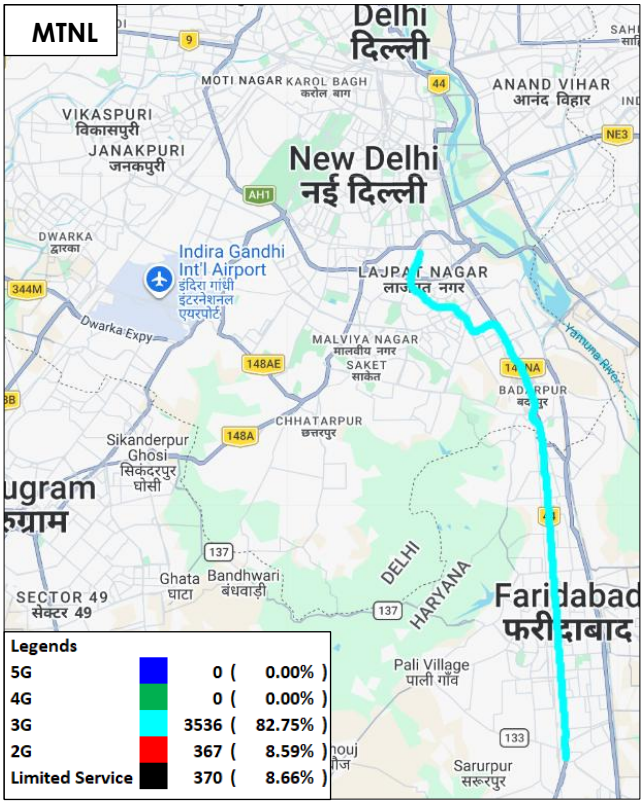


Figure-168: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

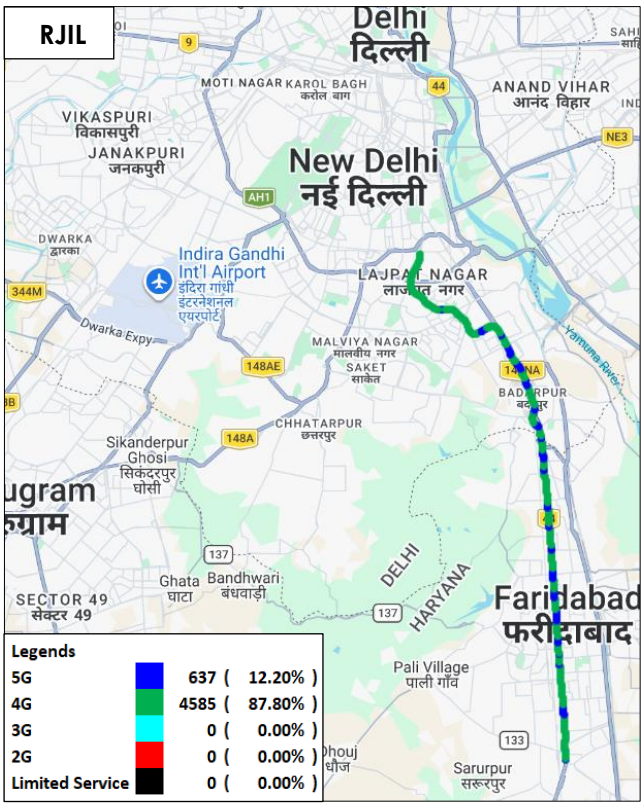


Figure-169: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

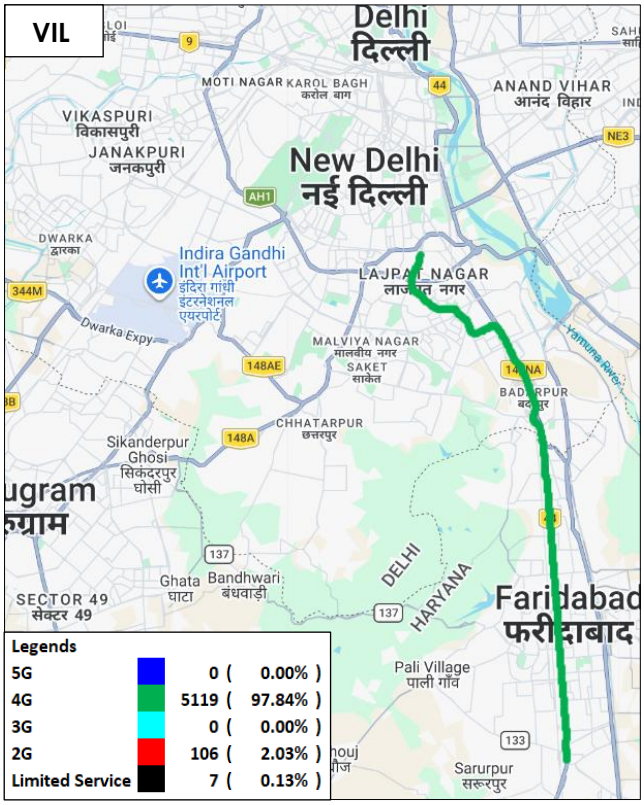


Figure-170: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-295, 296, 297 & 298 for map view)

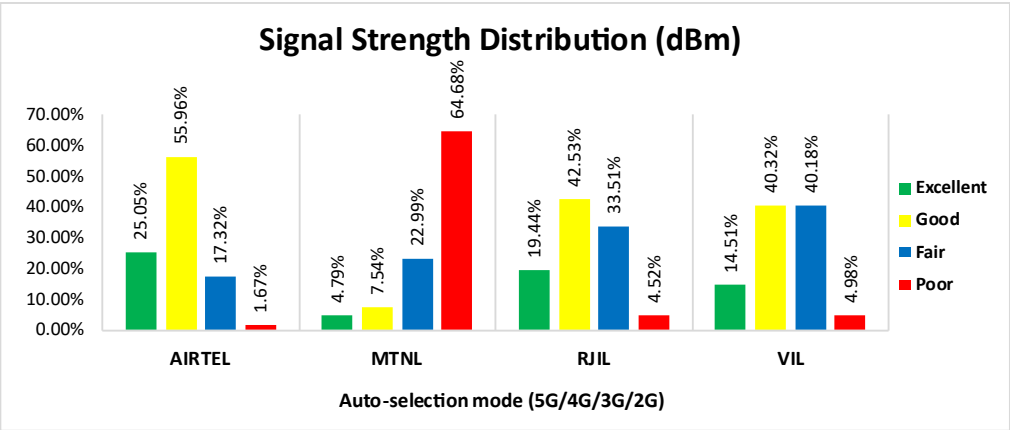


Figure-171: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 25% of samples falling in the excellent signal strength category.
- MTNL has 5% of samples falling in the excellent signal strength category.
- RJIL has 19% of samples falling in the excellent signal strength category.
- VIL has 15% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	58.43	4.76	150.69	21.74
	80th Percentile	88.77	6.36	230.31	36.21
	20th Percentile	11.76	2.70	61.64	6.64
Upload Throughput (Mbits/s)	Average	24.53	1.71	21.68	18.29
	80th Percentile	48.02	3.03	36.71	41.07
	20th Percentile	4.53	0.58	5.00	2.10
Latency (ms)	50th Percentile	41.38	19.79	26.45	39.51

Table-57: Summary of Data performance in network auto-selection mode.

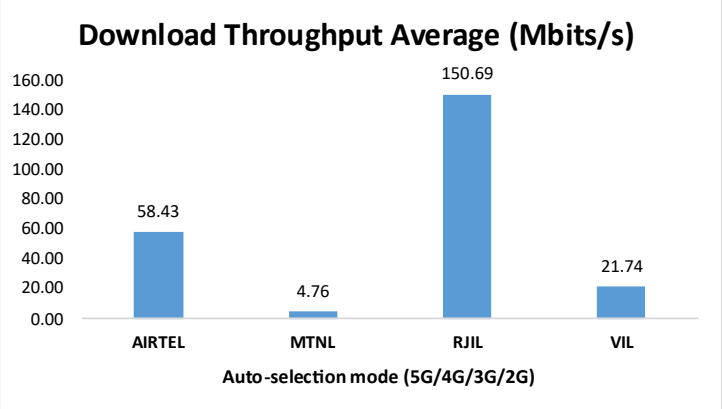


Figure 172: Download throughput.

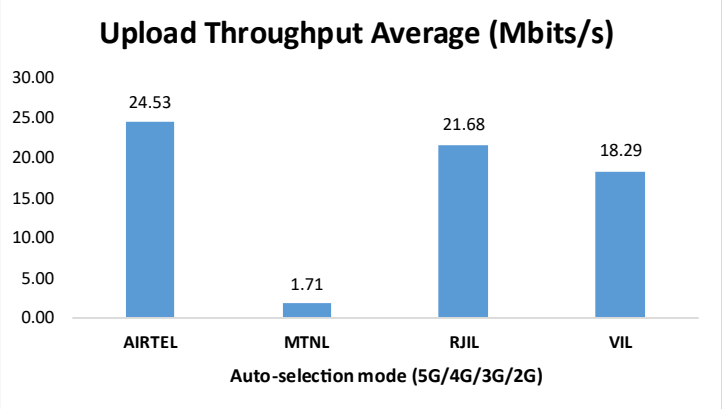


Figure-173: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	60.79%	NA	77.26%	42.31%
4G	39.21%	0.00%	17.58%	57.69%
3G	NA	85.42%	NA	NA
2G	0.00%	6.99%	NA	0.00%
Limited Service	0.00%	7.59%	5.16%	0.00%

Table-58: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

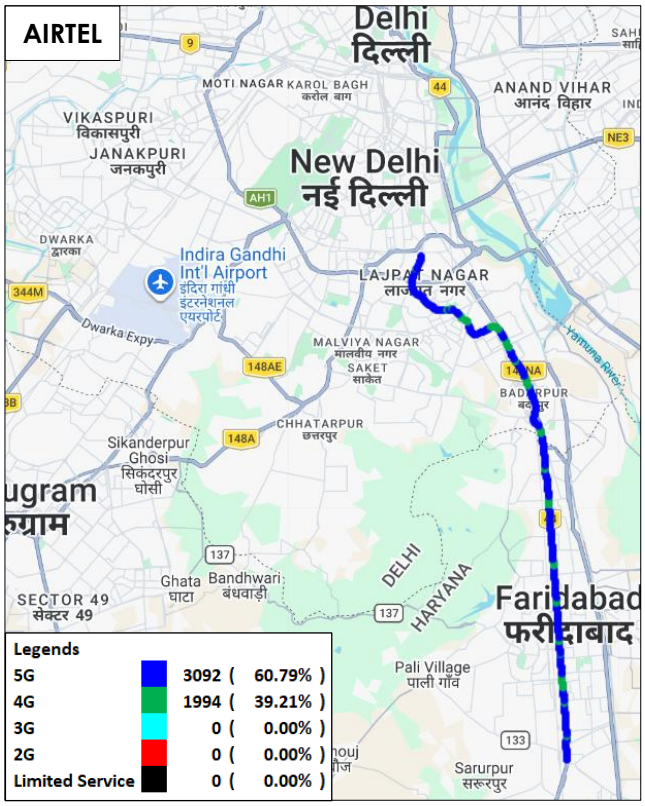


Figure-174: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

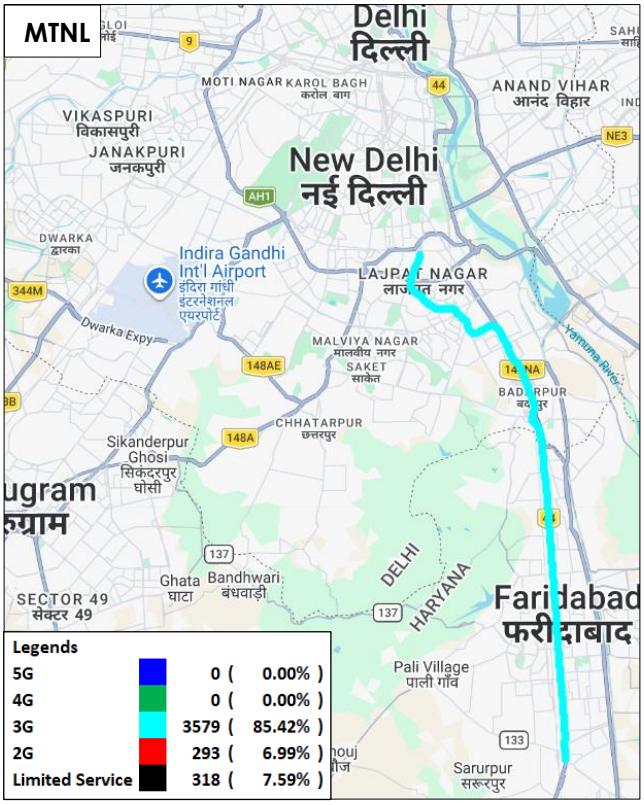


Figure-175: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

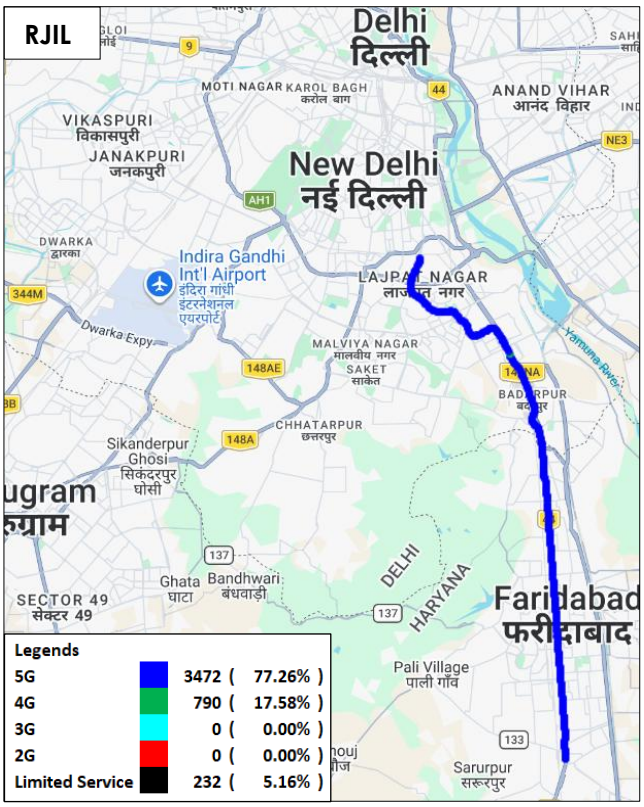


Figure-176: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

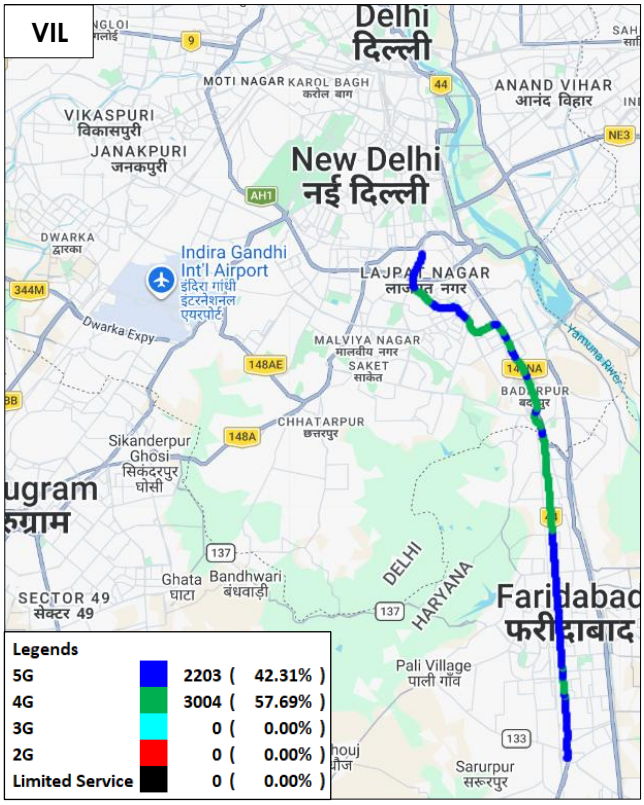


Figure-177: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-299, 300, 301 & 302 for map view)

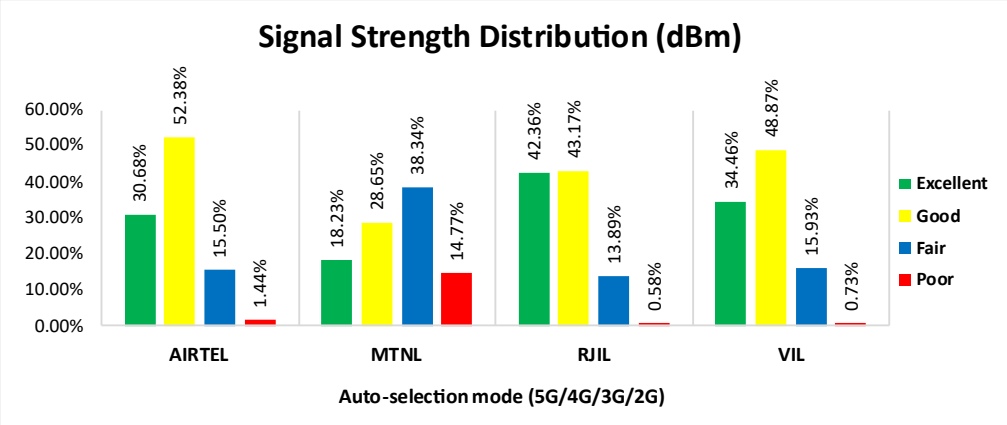


Figure-178: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 31% of samples falling in the excellent signal strength category.
- MTNL has 18% of samples falling in the excellent signal strength category.
- RJIL has 42% of samples falling in the excellent signal strength category.
- VIL has 34% of samples falling in the excellent signal strength category.

4.2.2.14 Samaypur Badli to Millennium City Centre (Yellow Line)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL	RJIL	VIL
Call Attempts	50	63	52	52
Call Setup Success Rate %	100.00	39.68	98.08	96.15
Drop Call Rate %	0.00	4.00	1.96	0.00
Call Setup Time Average (Second)	1.09	2.98	1.08	1.27
Handover Success Rate %	100.00	100.00	99.44	100.00

Table-59: Summary of voice call performance in network auto-selection mode.

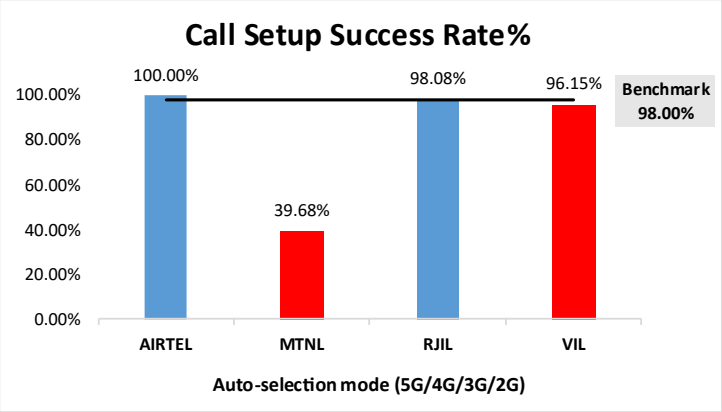


Figure-179: Performance for call setup success rate.

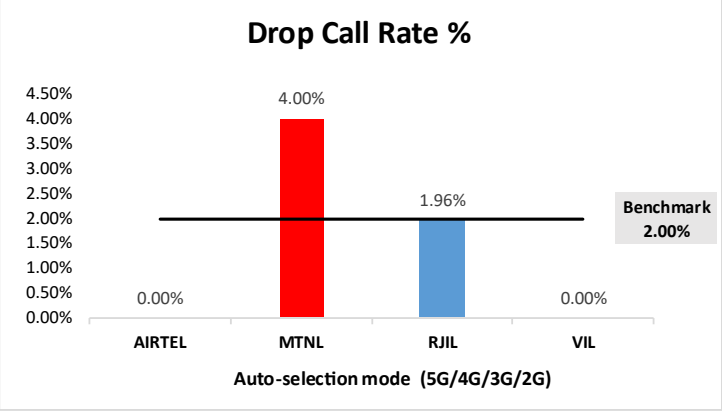


Figure-180: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	**MTNL**	**RJIL**	**VIL**
5G	2.72%	NA	8.73%	0.42%
4G	97.28%	0.00%	91.27%	99.34%
3G	NA	71.07%	NA	NA
2G	0.00%	15.07%	NA	0.24%
Limited Service	0.00%	13.86%	0.00%	0.00%

Table-60: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

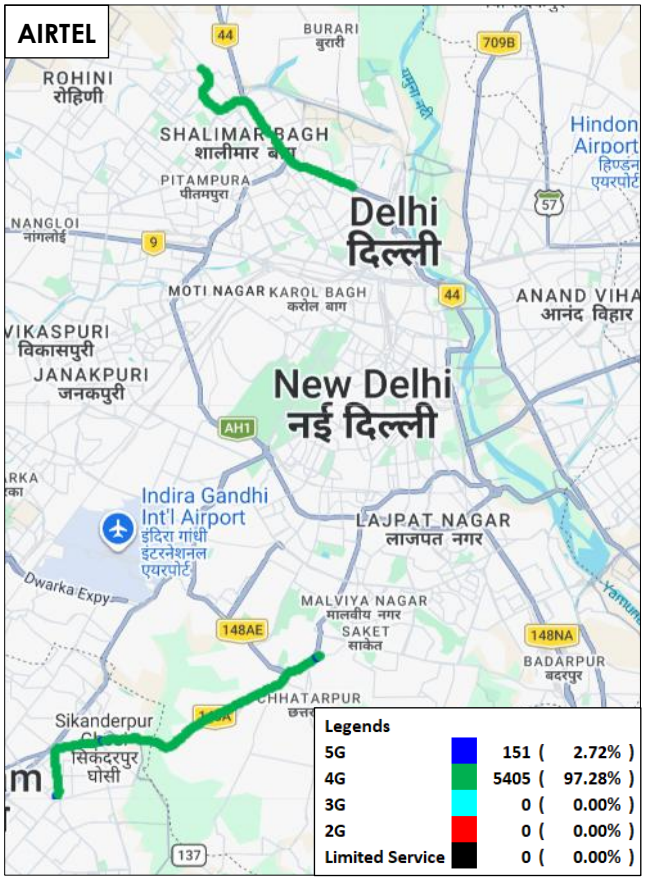


Figure-181: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – AIRTEL.

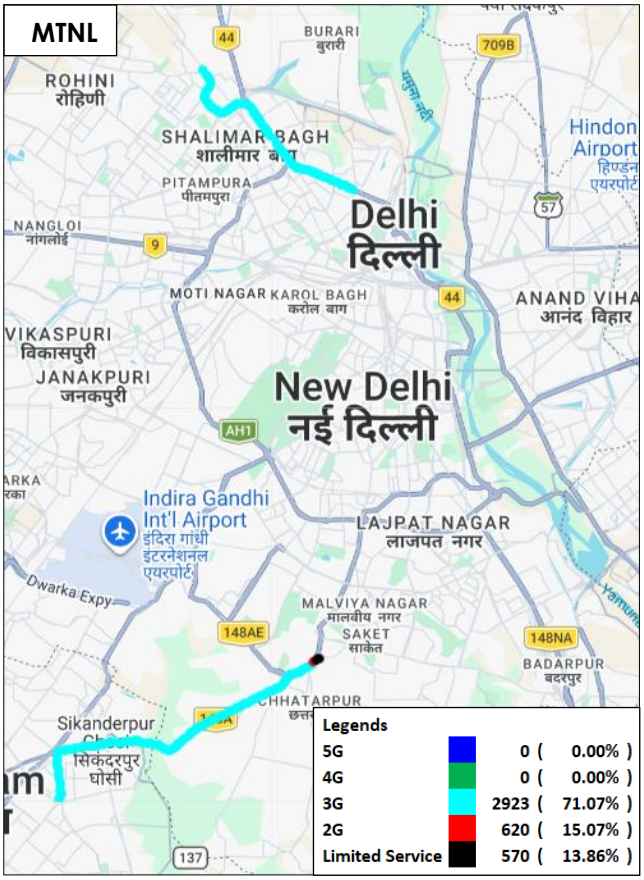


Figure-182: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - MTNL.

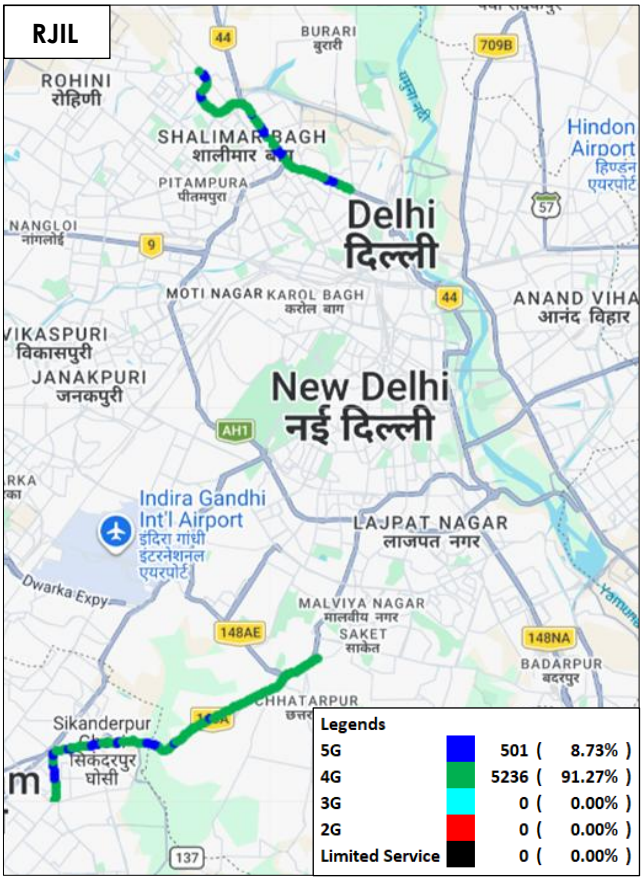


Figure-183: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

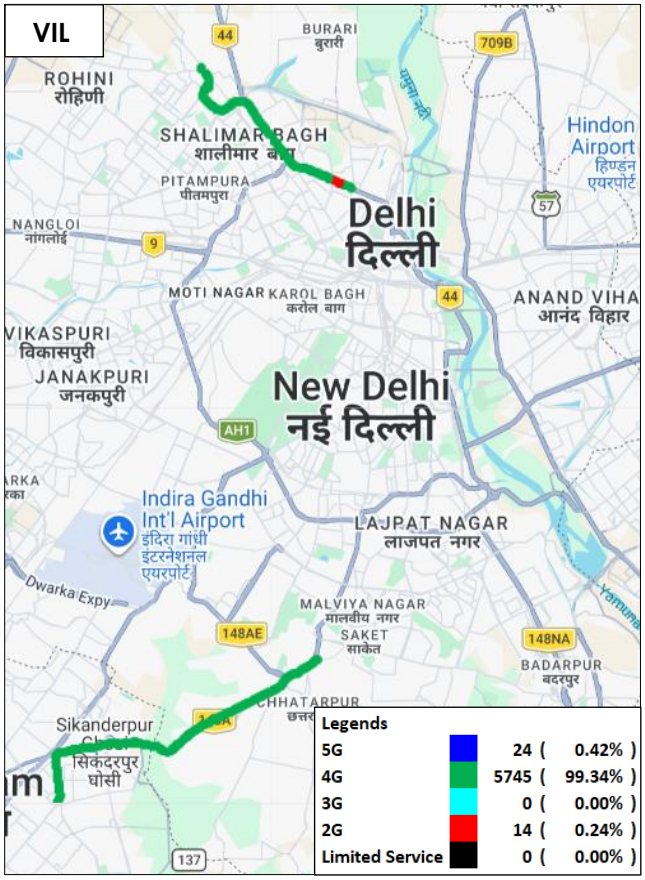


Figure-184: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-303, 304, 305 & 306 for map view)

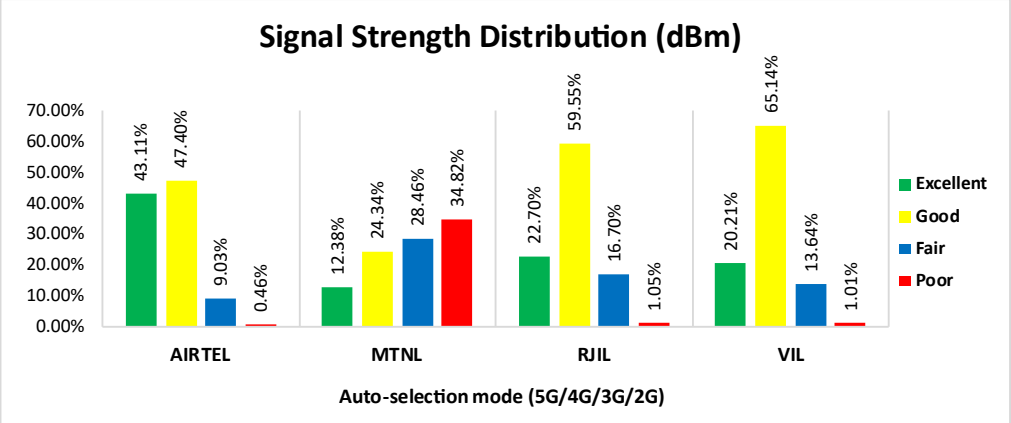


Figure-185: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 43% of samples falling in the excellent signal strength category.
- MTNL has 12% of samples falling in the excellent signal strength category.
- RJIL has 23% of samples falling in the excellent signal strength category.
- VIL has 20% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	92.07	3.61	116.79	18.72
	80th Percentile	143.07	5.07	167.63	29.78
	20th Percentile	9.58	1.94	4.57	7.27
Upload Throughput (Mbits/s)	Average	21.63	2.18	14.07	11.26
	80th Percentile	39.50	2.93	26.23	19.87
	20th Percentile	1.16	1.46	1.13	2.25
Latency (ms)	50th Percentile	44.79	18.63	22.39	37.59

Table-61: Summary of Data performance in network auto-selection mode.

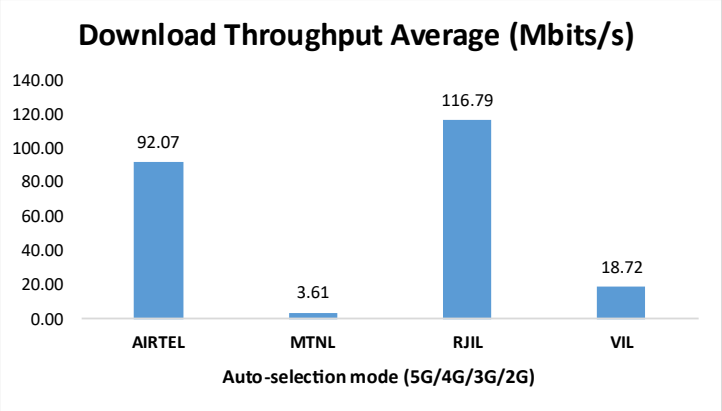


Figure 186: Download throughput.

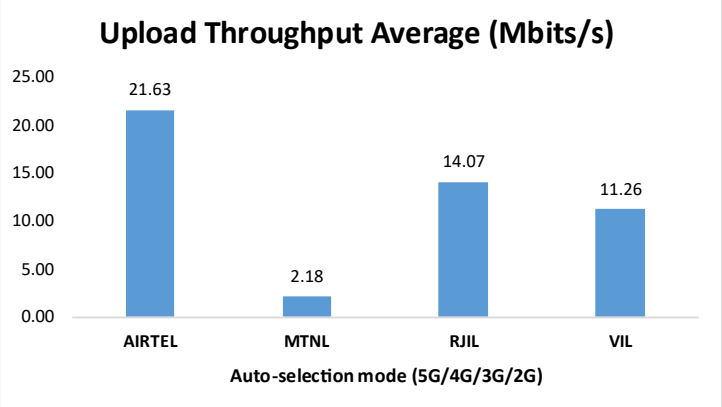


Figure-187: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	MTNL	RJIL	VIL
5G	48.01%	NA	51.79%	29.30%
4G	51.99%	0.00%	48.21%	70.53%
3G	NA	73.58%	NA	NA
2G	0.00%	13.29%	NA	0.17%
Limited Service	0.00%	13.14%	0.00%	0.00%

Table-62: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

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

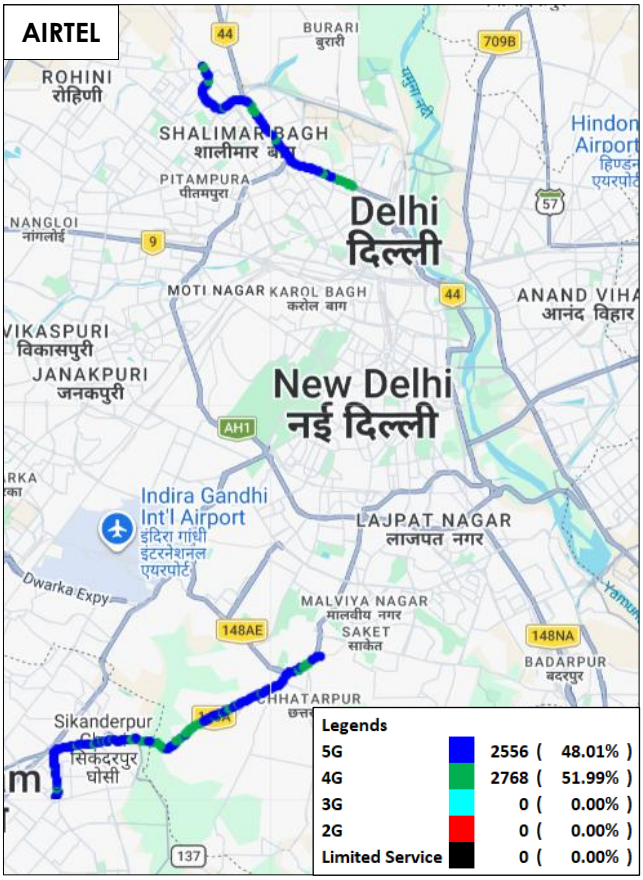


Figure-188: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

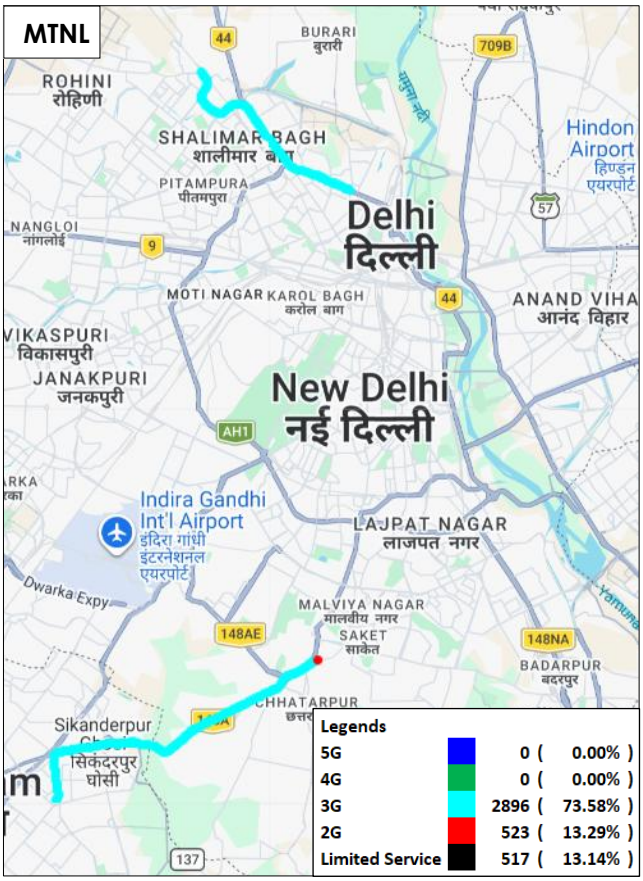


Figure-189: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - MTNL.

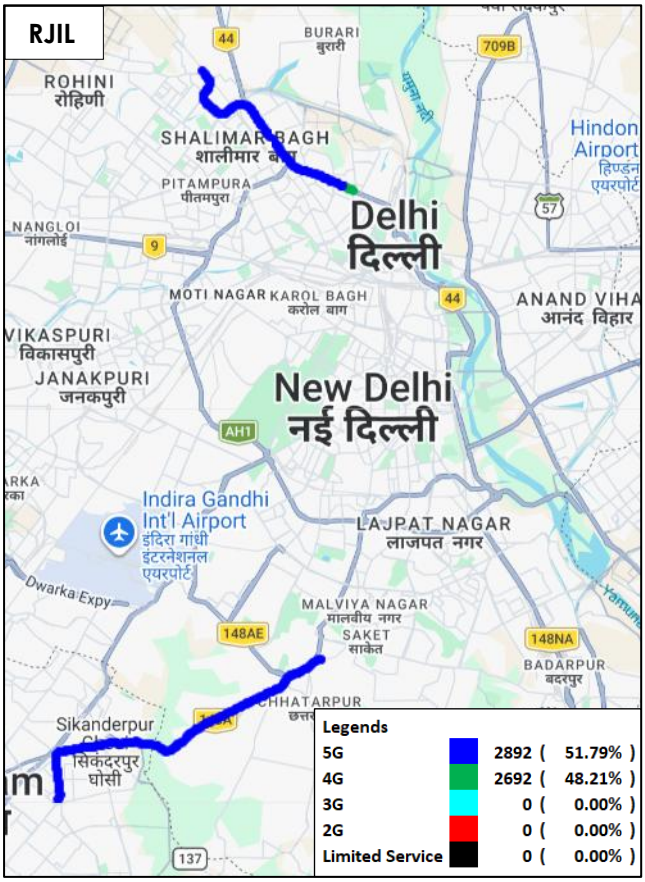


Figure-190: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - RJIL.

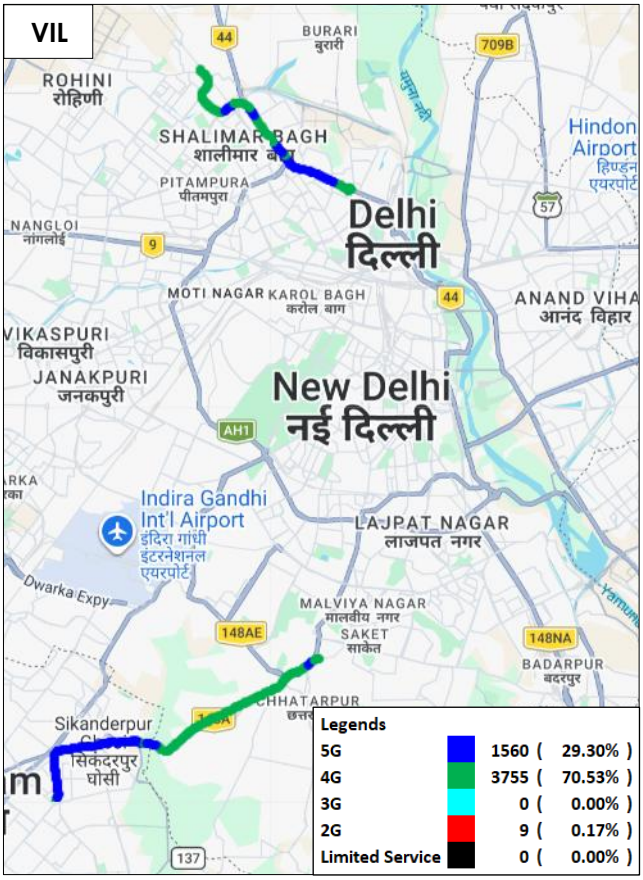


Figure-191: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-307, 308, 309 & 310 for map view)

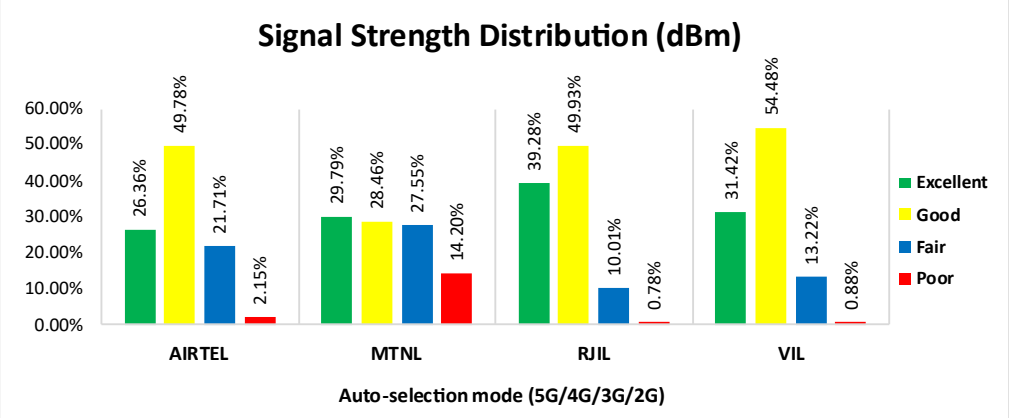


Figure-192: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 26% of samples falling in the excellent signal strength category.
- MTNL has 30% of samples falling in the excellent signal strength category.
- RJIL has 39% of samples falling in the excellent signal strength category.
- VIL has 31% of samples falling in the excellent signal strength category.

4.2.2.15 Delhi to Meerut (Namo Bharat RRTS)

i) Voice Performance

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	MTNL/BSNL	RJIL	VIL
Call Attempts	46	49	49	51
Call Setup Success Rate %	82.61	77.55	79.59	86.27
Drop Call Rate %	5.26	10.53	10.26	18.18
Call Setup Time Average (Second)	1.28	4.32	1.06	1.67
Handover Success Rate %	99.50	94.44	99.69	100.00

Table-63: Summary of voice call performance in network auto-selection mode.

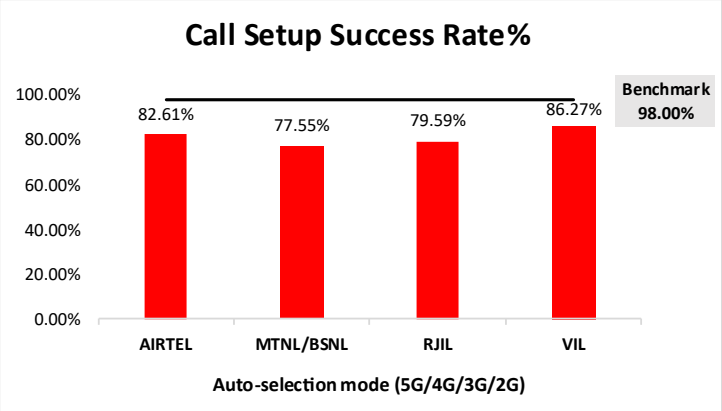


Figure-193: Performance for call setup success rate.

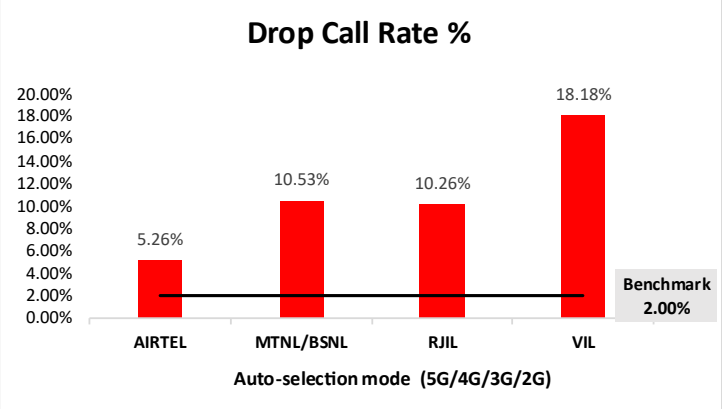


Figure-194: Performance for drop call rate.

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

Technology	Service Provider			
	AIRTEL	MTNL/BSNL	RJIL	VIL
5G	1.47%	NA	8.99%	2.05%
4G	91.15%	5.70%	81.08%	87.11%
3G	NA	47.00%	NA	NA
2G	0.26%	41.04%	NA	6.10%
Limited Service	7.12%	6.25%	9.93%	4.74%

Table-64: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) voice.

Note-

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

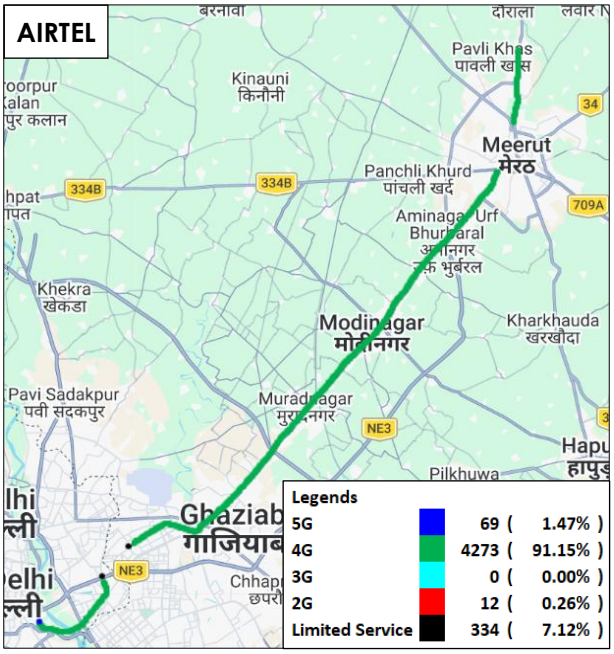


Figure-195: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

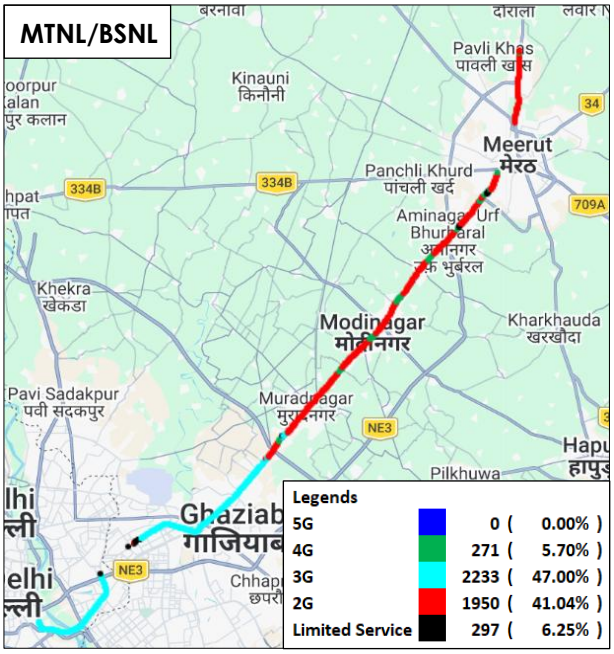


Figure-196: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice – MTNL/BSNL.

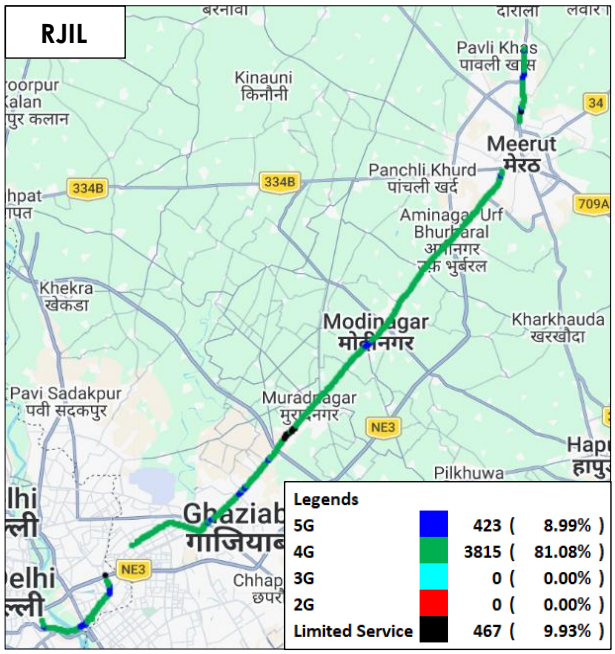


Figure-197: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - RJIL.

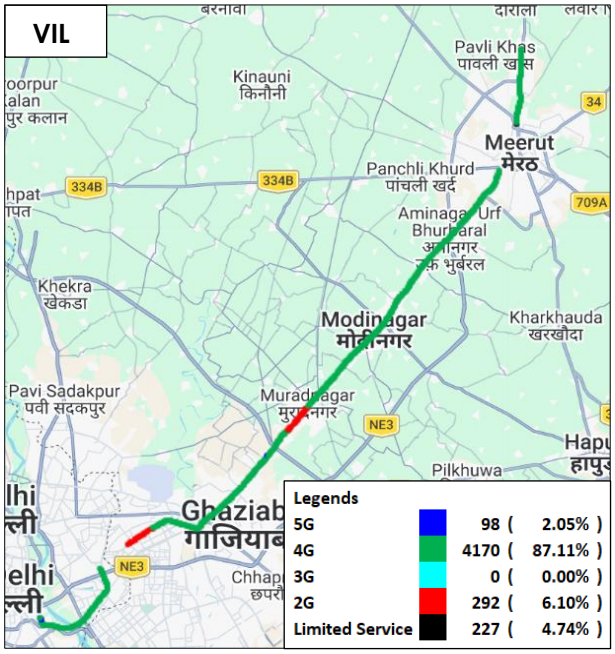


Figure-198: Serving technology plots in auto-selection mode (5G/4G/3G/2G) voice - VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) voice. (Refer figure-311, 312, 313 & 314 for map view)

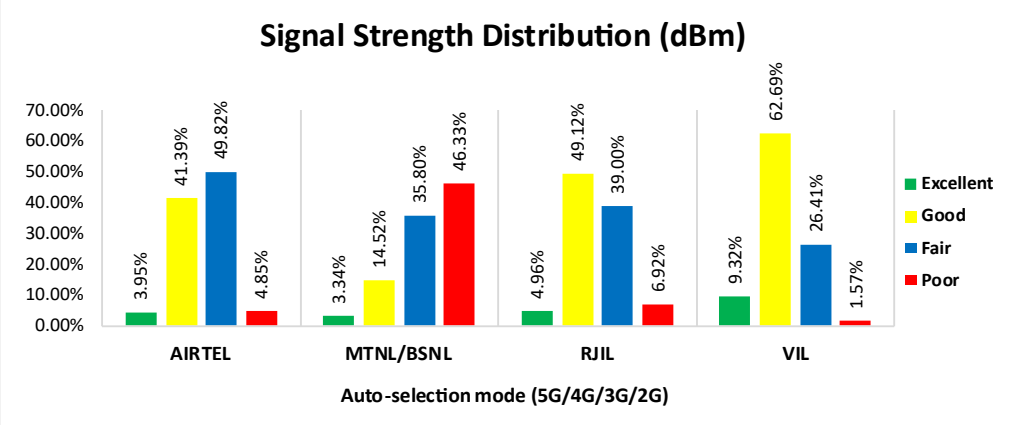


Figure-199: Signal strength distribution auto-selection mode 5G/4G/3G/2G voice.

Observations:

- Airtel has 4% of samples falling in the excellent signal strength category.
- MTNL/BSNL has 3% of samples falling in the excellent signal strength category.
- RJIL has 5% of samples falling in the excellent signal strength category.
- VIL has 9% of samples falling in the excellent signal strength category.

ii) Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	MTNL/BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	37.08	6.59	117.51	28.33
	80th Percentile	61.22	10.91	179.37	40.32
	20th Percentile	5.50	1.80	62.62	16.57
Upload Throughput (Mbits/s)	Average	9.16	3.07	13.83	20.81
	80th Percentile	13.14	4.24	23.64	33.01
	20th Percentile	3.59	1.21	4.84	10.12
Latency (ms)	50th Percentile	44.43	25.94	16.79	34.94

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

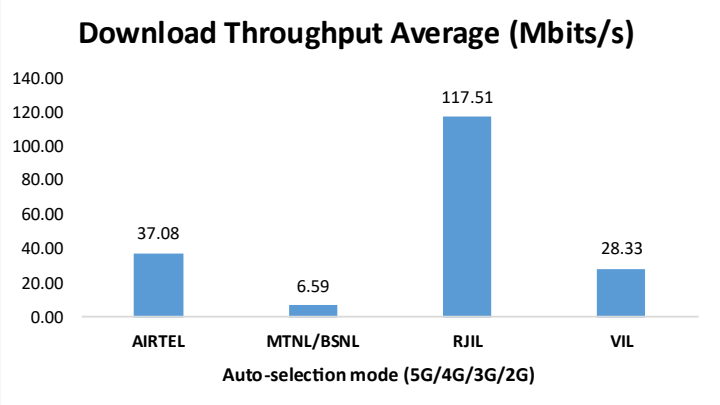


Figure 200: Download throughput.

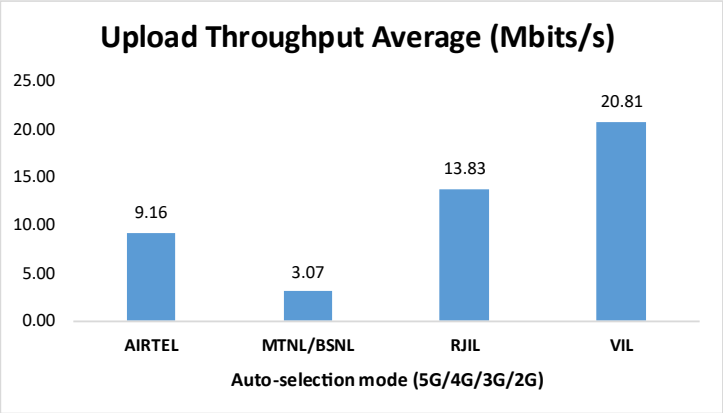


Figure-201: Upload throughput.

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

Technology	Service Provider			
	AIRTEL	**MTNL/BSNL**	**RJIL**	**VIL**
5G	67.50%	NA	90.25%	34.31%
4G	25.15%	55.55%	1.85%	61.08%
3G	NA	37.68%	NA	NA
2G	0.42%	1.25%	NA	0.53%
Limited Service	6.92%	5.52%	7.90%	4.08%

Table-66: Time spent on technology during drive test in auto-selection mode (5G/4G/3G/2G) data.

Note-

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

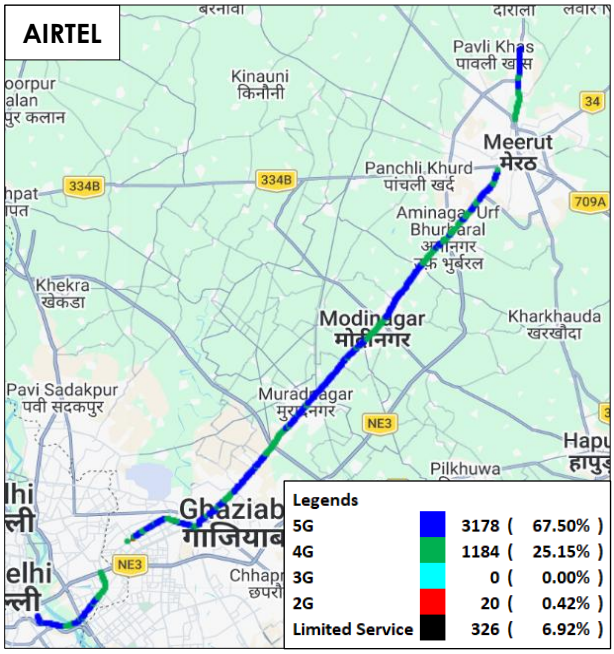


Figure-202: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

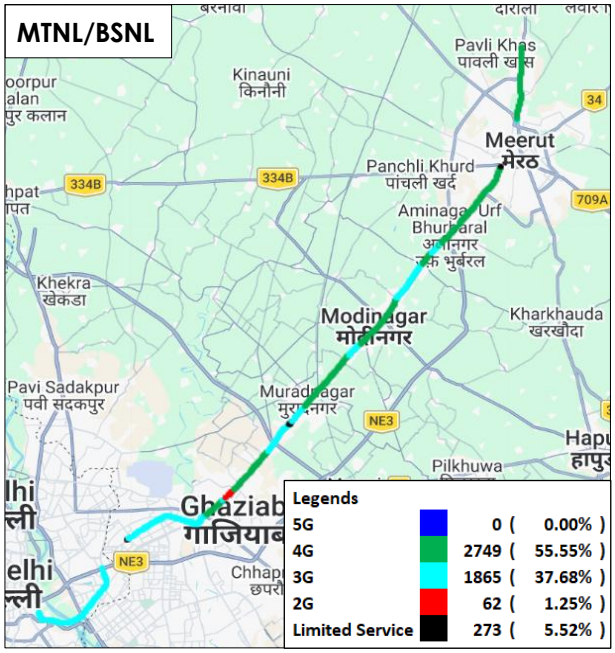


Figure-203: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – MTNL/BSNL.

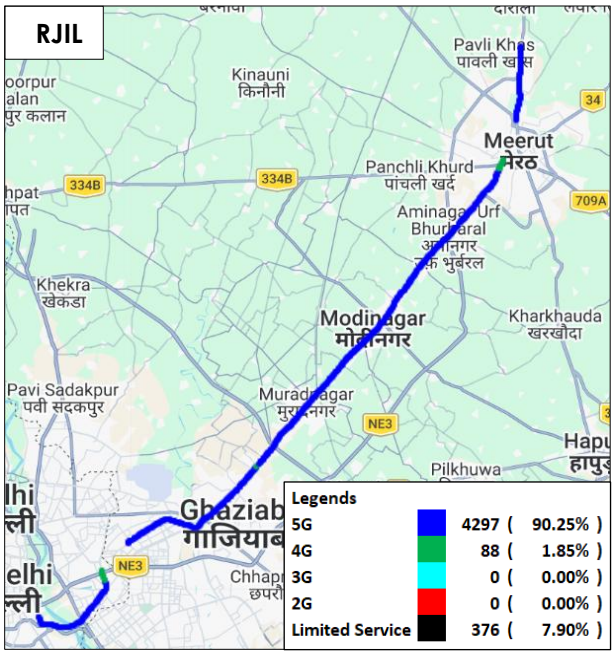


Figure-204: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – RJIL.

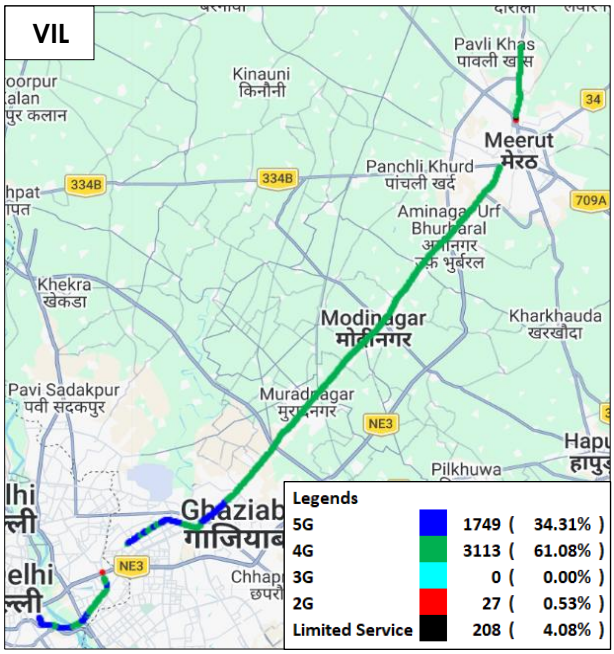


Figure-205: Serving technology plot in auto-selection mode (5G/4G/3G/2G) data – VIL.

(c) Network Signal Strength Distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G) data. (Refer figure-315, 316, 317 & 318 for map view)

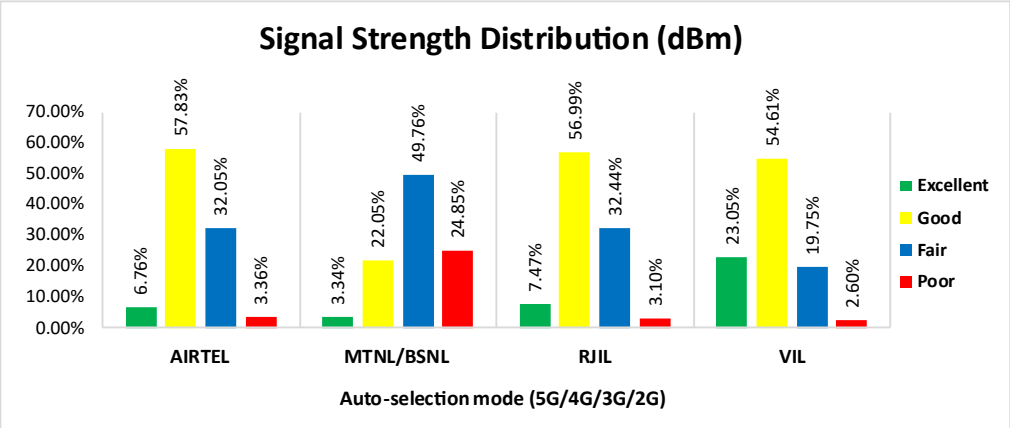


Figure-206: Signal strength distribution auto-selection mode (5G/4G/3G/2G) data.

Observations:

- Airtel has 7% of samples falling in the excellent signal strength category.
- MTNL/BSNL has 3% of samples falling in the excellent signal strength category.
- RJIL has 7% of samples falling in the excellent signal strength category.
- VIL has 23% of samples falling in the excellent signal strength category.

5. Voice & Data Key findings

5.1 Overall Voice

1. Call Setup Success Rate:

a) Airtel, MTNL/BSNL, RJIL and VIL have 98.40%, 54.15%, 96.82% and 97.22% call setup success rate respectively in auto-selection mode (5G/4G/3G/2G). (refer table-3)

2. Call Setup Time:

a) Airtel, MTNL/BSNL, RJIL & VIL call setup time is 1.06, 3.86, 0.89 and 0.89 seconds respectively in auto-selection mode (5G/4G/3G/2G). (refer table-3)

3. Drop Call Rate:

a) Airtel, MTNL/BSNL, RJIL and VIL drop call rate is 1.02%, 14.74%, 1.64% and 2.04% respectively in auto-selection mode (5G/4G/3G/2G). (refer table-3)

5.2 Overall Data

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

a) Airtel, MTNL/BSNL, RJIL and VIL average download speeds are 81.72 Mbps, 4.30 Mbps, 141.28 Mbps and 23.94 Mbps respectively. (refer table-5)

b) Airtel, MTNL/BSNL, RJIL and VIL average upload speeds are 25.98 Mbps, 1.84 Mbps, 19.99 Mbps and 16.96 Mbps respectively. (refer table-5)

5.3 Operator wise Key Findings

1.Airtel:

Voice

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector-51 Noida to Depot Station (Aqua Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-7)

- 100.00% call setup success rate and 1.61% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-11)

- 100.00% call setup success rate and 7.69% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Vaishali to Yamuna Bank (Blue Line 2) metro route. Performance is not meeting the benchmark of 2.00% for drop call 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 Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-19)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka to Dhansa Bus Stand (Grey Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-23)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-27)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro roue. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-31)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-35)

- 100.00% call setup success rate and 2.08% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. Performance is not meeting the benchmark of 2.00% for drop call rate. (refer table-39)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-43)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector 55-56 to Phase-3 (Rapid Metro) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-47)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shaheed Sthal to Rithala (Red Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-51)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-55)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-59)

- 82.61% call setup success rate and 5.26% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Delhi to Meerut (Namo Bharat RRTS) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

Data

- Airtel has 54.56 Mbps average download speed & 9.47 Mbps average upload speed across measured routes for Sector-51 Noida to Depot Station (Aqua Line) metro route. (refer table-9)

- Airtel has 135.13 Mbps average download speed & 32.55 Mbps average upload speed across measured routes for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. (refer table-13)

- Airtel has 238.92 Mbps average download speed & 42.42 Mbps average upload speed across measured routes for Vaishali to Yamuna Bank (Blue Line 2) metro route. (refer table-17)

- Airtel has 90.43 Mbps average download speed & 36.91 Mbps average upload speed across measured routes for Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. (refer table-21)

- Airtel has 154.50 Mbps average download speed & 48.82 Mbps average upload speed across measured routes for Dwarka to Dhansa Bus Stand (Grey Line) metro route. (refer table-25)

- Airtel has 53.07 Mbps average download speed & 10.50 Mbps average upload speed across measured routes for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. (refer table-29)

- Airtel has 101.80 Mbps average download speed & 43.99 Mbps average upload speed across measured routes for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro route. (refer table-33)

- Airtel has 70.98 Mbps average download speed & 48.78 Mbps average upload speed across measured routes for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. (refer table-37)

- Airtel has 57.34 Mbps average download speed & 19.38 Mbps average upload speed across measured routes for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. (refer table-41)

- Airtel has 83.59 Mbps average download speed & 34.72 Mbps average upload speed across measured routes for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. (refer table-45)

- Airtel has 70.21 Mbps average download speed & 22.97 Mbps average upload speed across measured routes for Sector 55-56 to Phase-3 (Rapid Metro) metro route. (refer table-49)

- Airtel has 57.95 Mbps average download speed & 29.11 Mbps average upload speed across measured routes for Shaheed Sthal to Rithala (Red Line) metro route. (refer table-53)

- Airtel has 58.43 Mbps average download speed & 24.53 Mbps average upload speed across measured routes for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. (refer table-57)

- Airtel has 92.07 Mbps average download speed & 21.63 Mbps average upload speed across measured routes for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. (refer table-61)

- Airtel has 37.08 Mbps average download speed & 9.16 Mbps average upload speed across measured routes for Delhi to Meerut (Namo Bharat RRTS) metro route. (refer table-65)

2. MTNL/BSNL:

Voice

- 8.97% call setup success rate and 28.57% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector-51 Noida to Depot Station (Aqua Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-7)

- 76.47% call setup success rate and 13.46% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-11)

- 92.86% call setup success rate and 23.08% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Vaishali to Yamuna Bank (Blue Line 2) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-15)

- 58.33% call setup success rate and 14.29% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-19)

- 66.67% call setup success rate and 12.50% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka to Dhansa Bus Stand (Grey Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-23)

- 23.33% call setup success rate and 35.71% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-27)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-31)

- 16.00% call setup success rate and 75.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-35)

- 51.67% call setup success rate and 22.58% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-39)

- 86.21% call setup success rate and 8.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-43)

- 100.00% call setup success rate and 28.57% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector 55-56 to Phase-3 (Rapid Metro) metro route. Performance is not meeting the benchmark of 2.00% for drop call rate. (refer table-47)

- 84.62% call setup success rate and 9.09% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shaheed Sthal to Rithala (Red Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-51)

- 56.36% call setup success rate and 12.90% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-55)

- 39.68% call setup success rate and 4.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-59)

- 77.55% call setup success rate and 10.53% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Delhi to Meerut (Namo Bharat RRTS) metro drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

Data

- MTNL has 3.21 Mbps average download speed & 1.40 Mbps average upload speed across measured routes for Sector-51 Noida to Depot Station (Aqua Line) metro route. (refer table-9)

- MTNL has 4.35 Mbps average download speed & 1.40 Mbps average upload speed across measured routes for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. (refer table-13)

- MTNL has 4.16 Mbps average download speed & 1.64 Mbps average upload speed across measured routes for Vaishali to Yamuna Bank (Blue Line 2) metro route. (refer table-17)

- MTNL has 3.88 Mbps average download speed & 1.33 Mbps average upload speed across measured routes for Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. (refer table-21)

- MTNL has 4.33 Mbps average download speed & 2.84 Mbps average upload speed across measured routes for Dwarka to Dhansa Bus Stand (Grey Line) metro route. (refer table-25)

- MTNL has 3.37 Mbps average download speed & 1.56 Mbps average upload speed across measured routes for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. (refer table-29)

- MTNL has 5.55 Mbps average download speed & 2.86 Mbps average upload speed across measured routes for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro route. (refer table-33)

- MTNL has 2.26 Mbps average download speed & 0.89 Mbps average upload speed across measured routes for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. (refer table-37)

- MTNL has 2.69 Mbps average download speed & 1.94 Mbps average upload speed across measured routes for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. (refer table-41)

- MTNL has 4.08 Mbps average download speed & 1.65 Mbps average upload speed across measured routes for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. (refer table-45)

- MTNL has 4.53 Mbps average download speed & 1.70 Mbps average upload speed across measured routes for Sector 55-56 to Phase-3 (Rapid Metro) metro route. (refer table-49)

- MTNL's all download & upload are failed across measured routes for Shaheed Sthal to Rithala (Red Line) metro route. (refer table-53)

- MTNL has 4.76 Mbps average download speed & 1.71 Mbps average upload speed across measured routes for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. (refer table-57)

- MTNL has 3.61 Mbps average download speed & 2.18 Mbps average upload speed across measured routes for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. (refer table-61)

- MTNL/BSNL has 6.59 Mbps average download speed & 3.07 Mbps average upload speed across measured routes for Delhi to Meerut (Namo Bharat RRTS) metro route. (refer table-65)

3. RJIL:

Voice

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector-51 Noida to Depot Station (Aqua Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-7)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-11)

- 100.00% call setup success rate and 7.69% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Vaishali to Yamuna Bank (Blue Line 2) metro route. Performance is not meeting the benchmark of 2.00% for drop call rate. (refer table-15)

- 97.22% call setup success rate and 2.86% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-19)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) Dwarka to Dhansa Bus Stand (Grey Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-23)

- 95.24% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-27)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-31)

- 88.89% call setup success rate and 6.25% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-35)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-39)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-43)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector 55-56 to Phase-3 (Rapid

Metro) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-47)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shaheed Sthal to Rithala (Red Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-51)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-55)

- 98.08% call setup success rate and 1.96% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-59)

- 79.59% call setup success rate and 10.26% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Delhi to Meerut (Namo Bharat RRTS) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

Data

- RJIL has 139.97 Mbps average download speed & 9.64 Mbps average upload speed across measured routes for Sector-51 Noida to Depot Station (Aqua Line) metro route. (refer table-9)

- RJIL has 175.71 Mbps average download speed & 24.05 Mbps average upload speed across measured routes for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. (refer table-13)

- RJIL has 235.27 Mbps average download speed & 32.37 Mbps average upload speed across measured routes for Vaishali to Yamuna Bank (Blue Line 2) metro route. (refer table-17)

- RJIL has 118.57 Mbps average download speed & 21.16 Mbps average upload speed across measured routes for Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. (refer table-21)

- RJIL has 237.10 Mbps average download speed & 38.44 Mbps average upload speed across measured routes for Dwarka to Dhansa Bus Stand (Grey Line) metro route. (refer table-25)

- RJIL has 58.95 Mbps average download speed & 8.93 Mbps average upload speed across measured routes for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. (refer table-29)

- RJIL has 160.56 Mbps average download speed & 24.99 Mbps average upload speed across measured routes for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro route. (refer table-33)

- RJIL has 95.56 Mbps average download speed & 10.59 Mbps average upload speed across measured routes for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. (refer table-37)

- RJIL has 91.12 Mbps average download speed & 16.67 Mbps average upload speed across measured routes for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. (refer table-41)

- RJIL has 115.11 Mbps average download speed & 24.83 Mbps average upload speed across measured routes for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. (refer table-45)

- RJIL has 216.99 Mbps average download speed & 22.44 Mbps average upload speed across measured routes for Sector 55-56 to Phase-3 (Rapid Metro) metro route. (refer table-49)

- RJIL has 208.16 Mbps average download speed & 31.52 Mbps average upload speed across measured routes for Shaheed Sthal to Rithala (Red Line) metro route. (refer table-53)

- RJIL has 150.69 Mbps average download speed & 21.68 Mbps average upload speed across measured routes for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. (refer table-57)

- RJIL has 116.79 Mbps average download speed & 14.07 Mbps average upload speed across measured routes for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. (refer table-61)

- RJIL has 117.51 Mbps average download speed & 13.83 Mbps average upload speed across measured routes for Delhi to Meerut (Namo Bharat RRTS) metro route. (refer table-65)

4. VIL:

Voice

- 96.15% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector-51 Noida to Depot Station (Aqua Line) metro route. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-7)

- 98.44% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-11)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Vaishali to Yamuna Bank (Blue Line 2) metro route. 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 Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-19)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Dwarka to Dhansa Bus Stand (Grey Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-23)

- 95.24% call setup success rate and 2.50% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-27)

- 100.00% call setup success rate and 7.14% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Deepali Chowk to Majlis Park

(Magenta Line Ext.) metro route. Performance is not meeting the benchmark of 2.00% for drop call rate. (refer table-31)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-35)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-39)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-43)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Sector 55-56 to Phase-3 (Rapid Metro) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-47)

- 97.96% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Shaheed Sthal to Rithala (Red Line) metro route. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-51)

- 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. Performance is well within the benchmark of 98.00% & 2.00% respectively. (refer table-55)

- 96.15% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. Performance is not meeting the benchmark of 98.00% for call setup success rate. (refer table-59)

- 86.27% call setup success rate and 18.18% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Delhi to Meerut (Namo Bharat RRTS) metro route. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. (refer table-63)

Data

- VIL has 19.98 Mbps average download speed & 9.48 Mbps average upload speed across measured routes for Sector-51 Noida to Depot Station (Aqua Line) metro route. (refer table-9)

- VIL has 32.21 Mbps average download speed & 18.83 Mbps average upload speed across measured routes for Dwarka Sector-21 to Noida Electronic City (Blue Line 1) metro route. (refer table-13)

- VIL has 22.91 Mbps average download speed & 14.00 Mbps average upload speed across measured routes for Vaishali to Yamuna Bank (Blue Line 2) metro route. (refer table-17)

- VIL has 24.46 Mbps average download speed & 17.95 Mbps average upload speed across measured routes for Kirti Nagar to Brigadier Hoshiyar Singh (Green Line) metro route. (refer table-21)

- VIL has 27.22 Mbps average download speed & 26.57 Mbps average upload speed across measured routes for Dwarka to Dhansa Bus Stand (Grey Line) metro route. (refer table-25)

- VIL has 22.58 Mbps average download speed & 12.60 Mbps average upload speed across measured routes for Botanical Garden to Krishna Park Extension (Magenta Line) metro route. (refer table-29)

- VIL has 22.75 Mbps average download speed & 19.63 Mbps average upload speed across measured routes for Deepali Chowk to Majlis Park (Magenta Line Ext.) metro route. (refer table-33)

- VIL has 25.04 Mbps average download speed & 10.15 Mbps average upload speed across measured routes for New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line) metro route. (refer table-37)

- VIL has 18.99 Mbps average download speed & 11.98 Mbps average upload speed across measured routes for Mayur Vihar-1 to Maujpur-Babarpur (Pink Line) metro route. (refer table-41)

- VIL has 16.21 Mbps average download speed & 13.81 Mbps average upload speed across measured routes for Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.) metro route. (refer table-45)

- VIL has 37.00 Mbps average download speed & 40.36 Mbps average upload speed across measured routes for Sector 55-56 to Phase-3 (Rapid Metro) metro route. (refer table-49)

- VIL has 24.19 Mbps average download speed & 22.83 Mbps average upload speed across measured routes for Shaheed Sthal to Rithala (Red Line) metro route. (refer table-53)

- VIL has 21.74 Mbps average download speed & 18.29 Mbps average upload speed across measured routes for Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line) metro route. (refer table-57)

- VIL has 18.72 Mbps average download speed & 11.26 Mbps average upload speed across measured routes for Samaypur Badli to Millennium City Centre (Yellow Line) metro route. (refer table-61)

- VIL has 28.33 Mbps average download speed & 20.81 Mbps average upload speed across measured routes for Delhi to Meerut (Namo Bharat RRTS) metro route. (refer table-65)

6. Annexure

6.1 Route wise coverage map

6.1.1 Metro

i) Sector-51 Noida to Depot Station (Aqua Line)

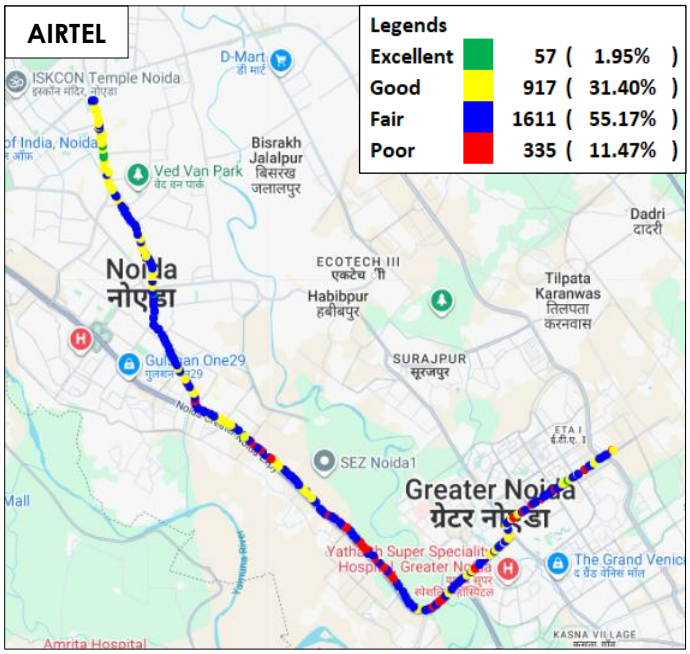


Figure-207: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

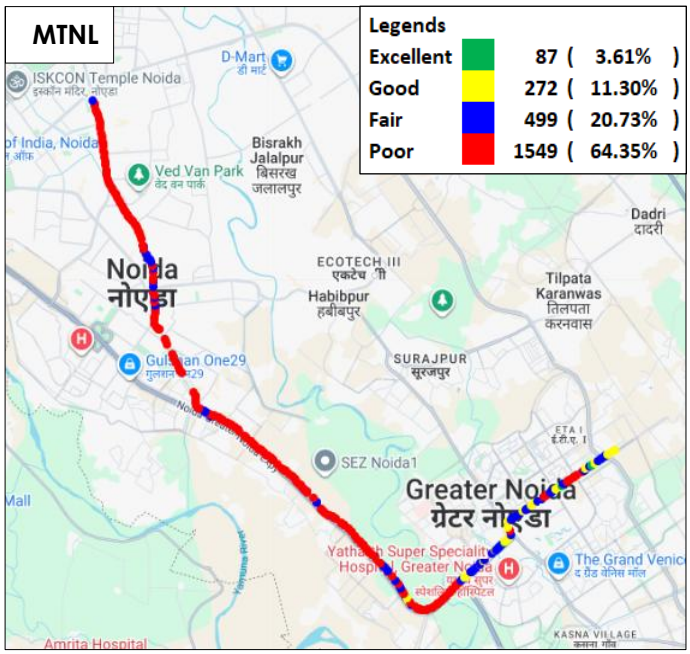


Figure-208: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

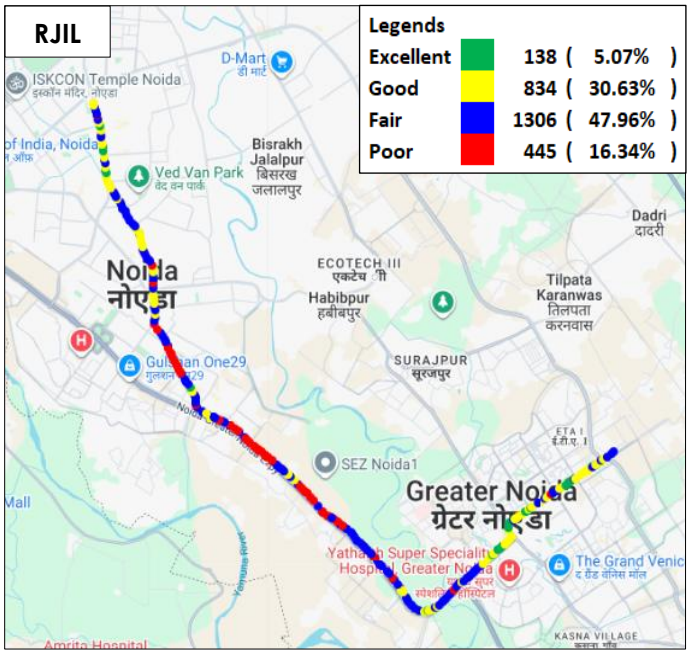


Figure-209: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

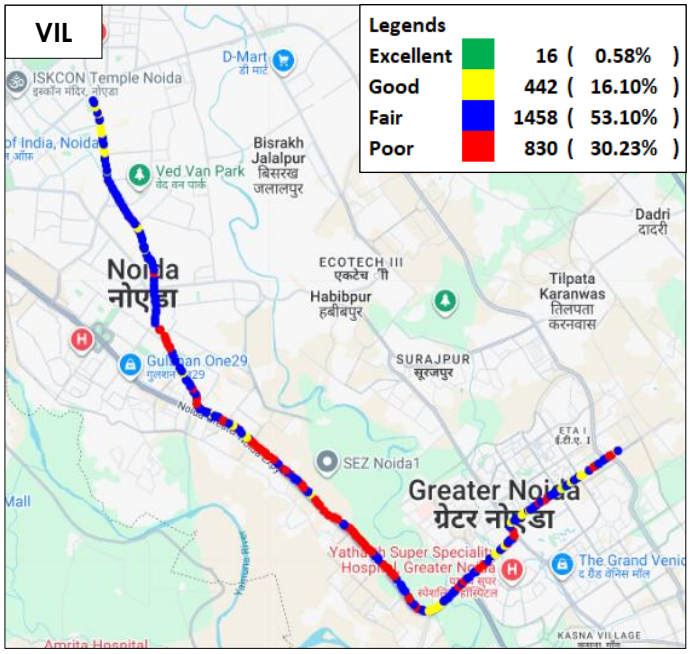


Figure-210: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

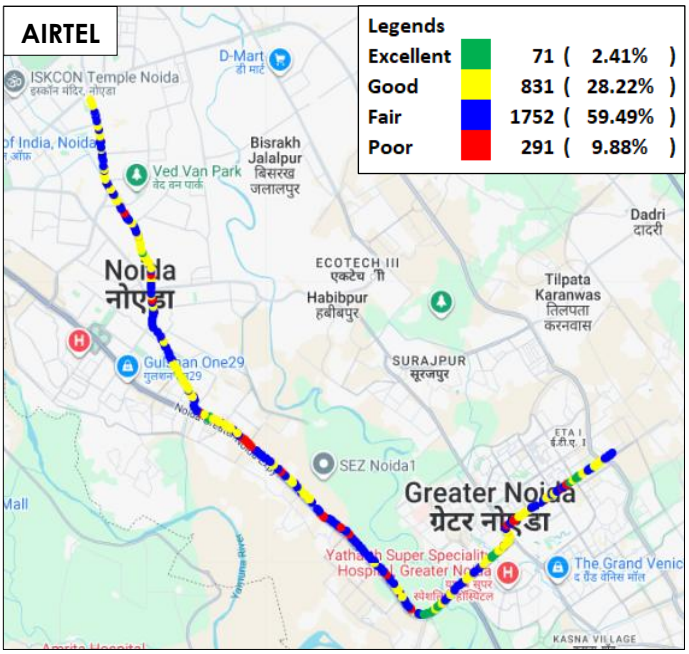


Figure-211: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

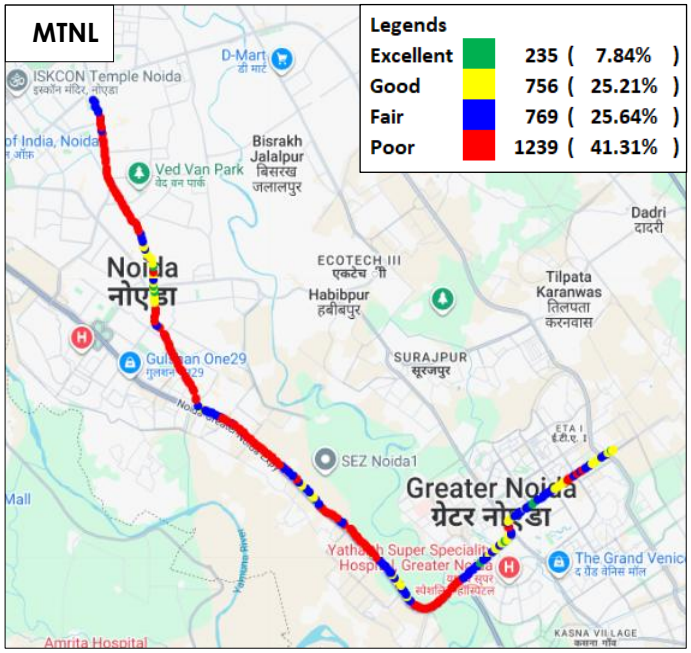


Figure-212: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

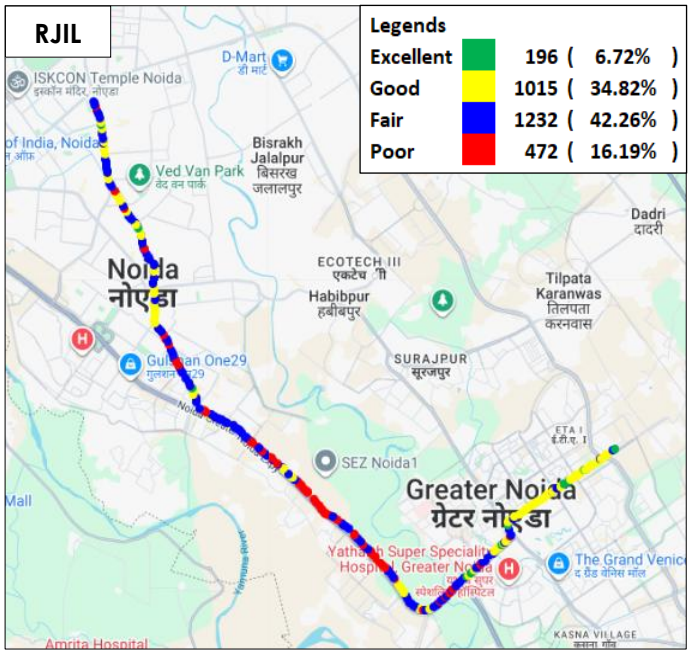


Figure-213: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

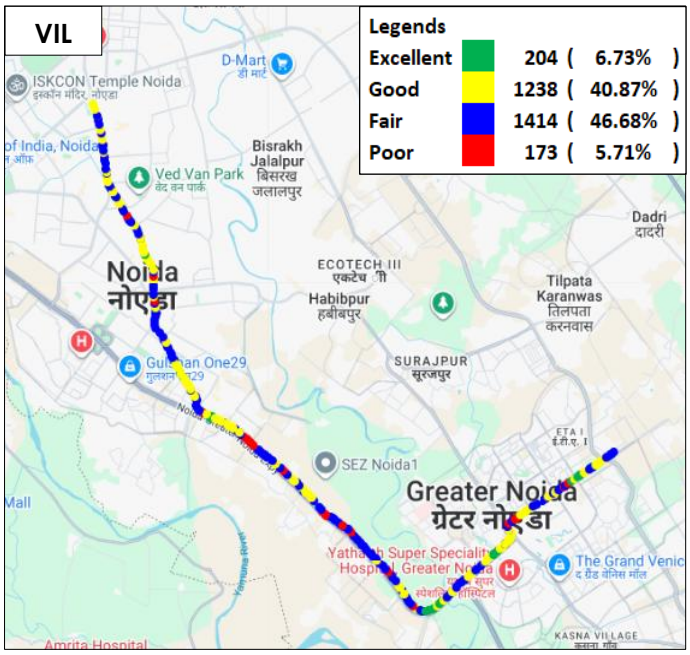


Figure-214: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

ii) Dwarka Sector-21 to Noida Electronic City (Blue Line 1)

Figure-215: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

Figure-216: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

Figure-217: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

Figure-218: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

Figure-219: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

Figure-220: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

Figure-221: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

Figure-222: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

iii) Vaishali to Yamuna Bank (Blue Line 2)

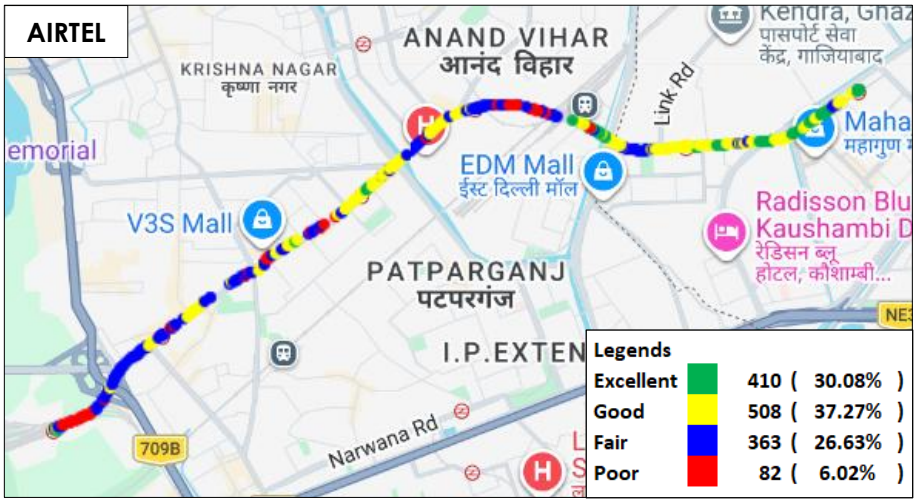


Figure-223: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

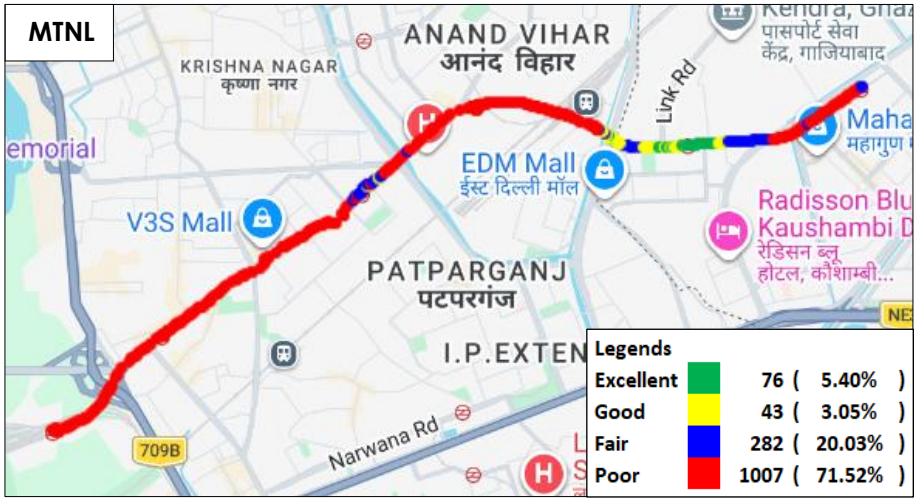


Figure-224: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

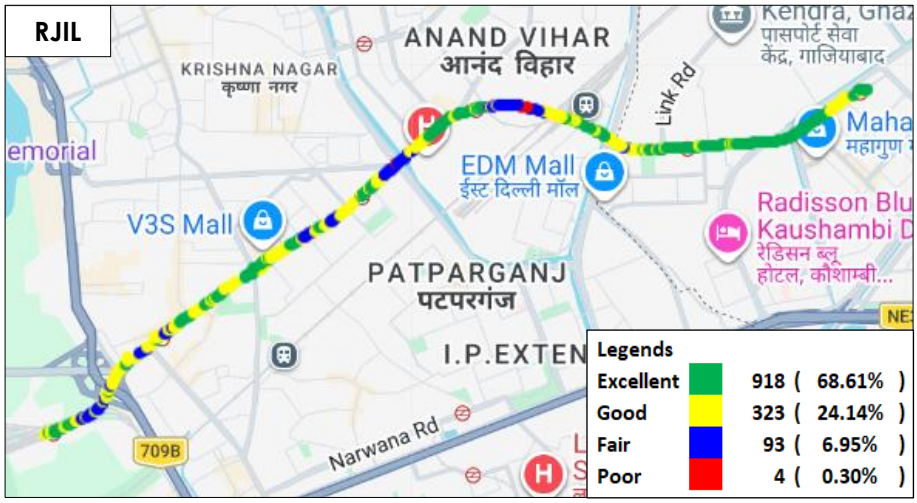


Figure-225: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

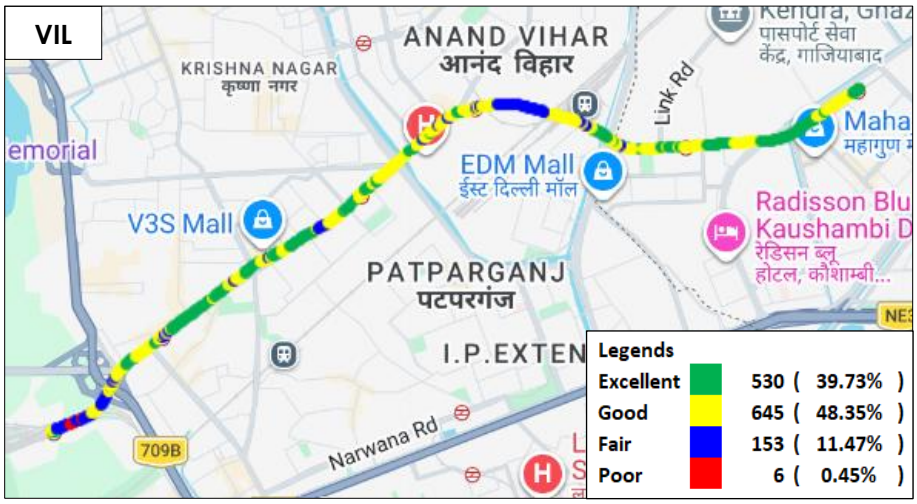


Figure-226: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

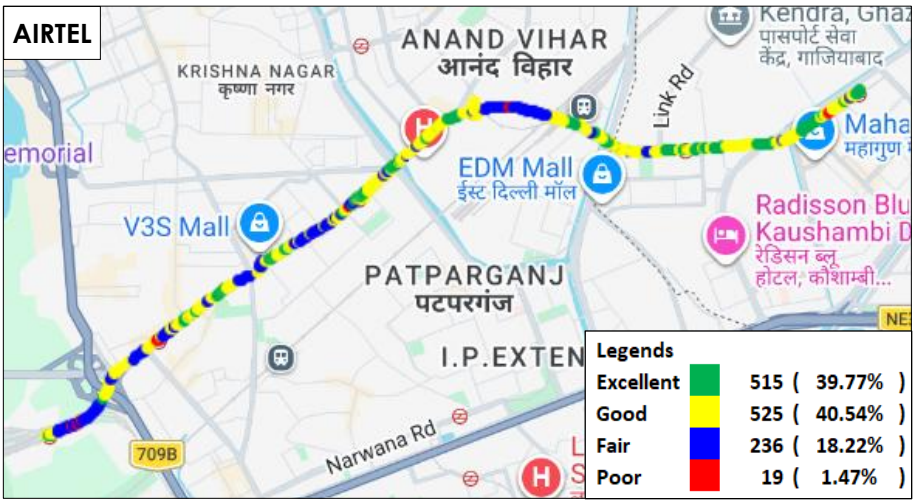


Figure-227: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

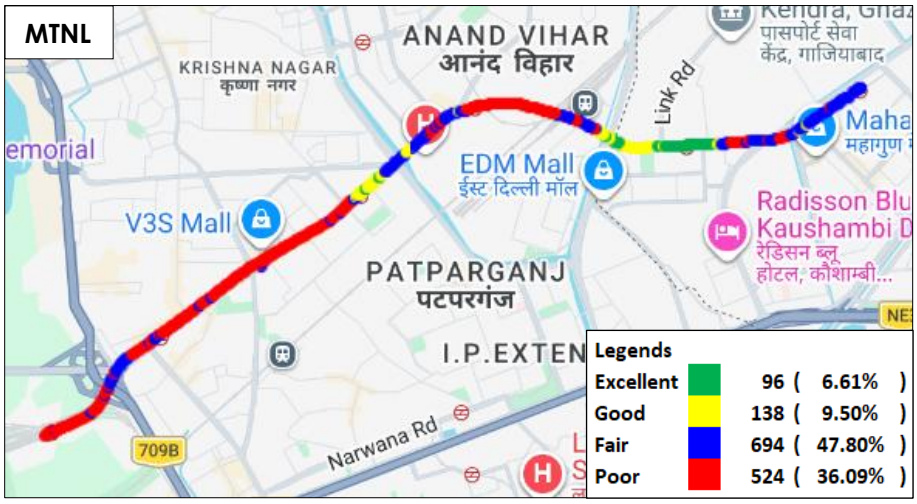


Figure-228: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

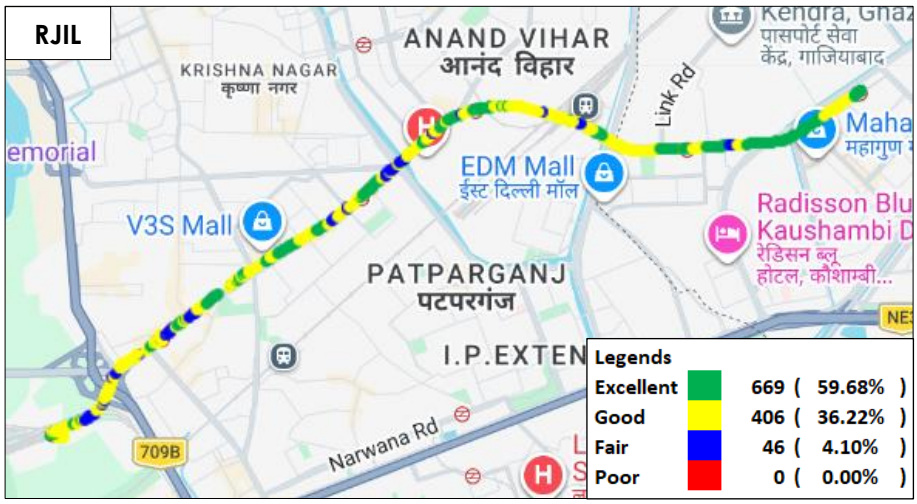


Figure-229: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

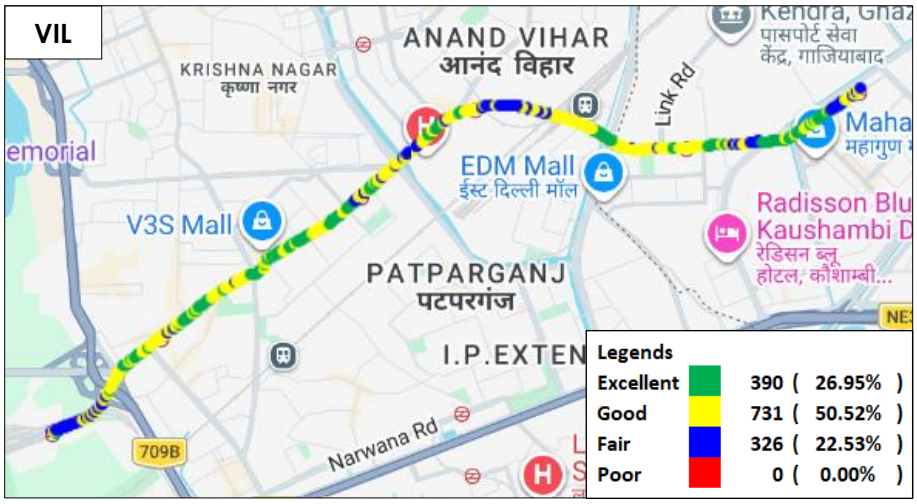


Figure-230: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

iv) Kirti Nagar to Brigadier Hoshiyar Singh (Green Line)

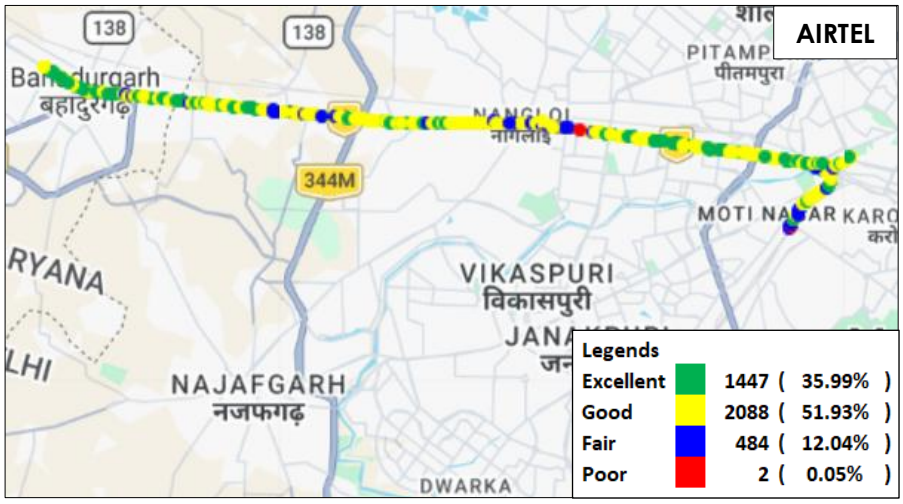


Figure-231: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

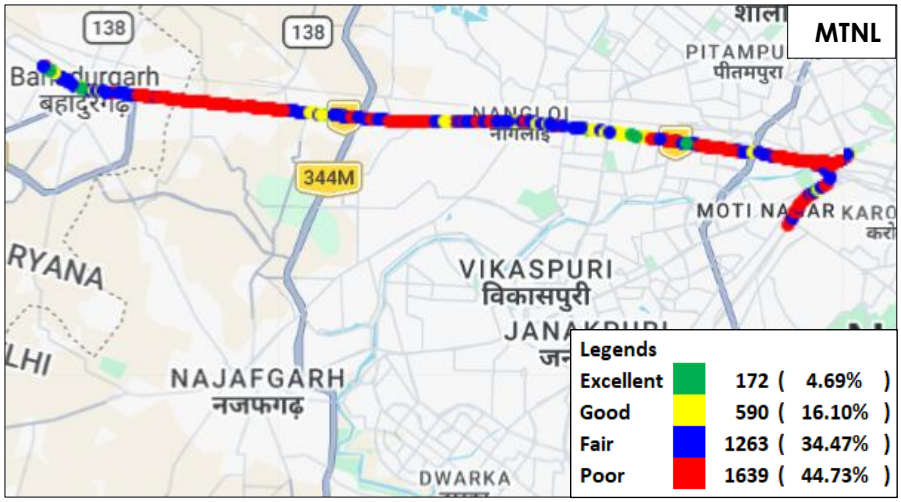


Figure-232: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

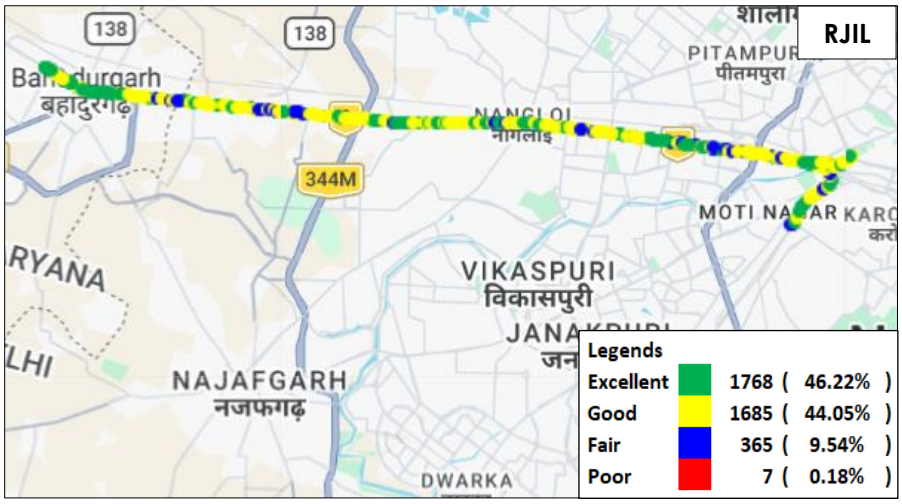


Figure-233: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

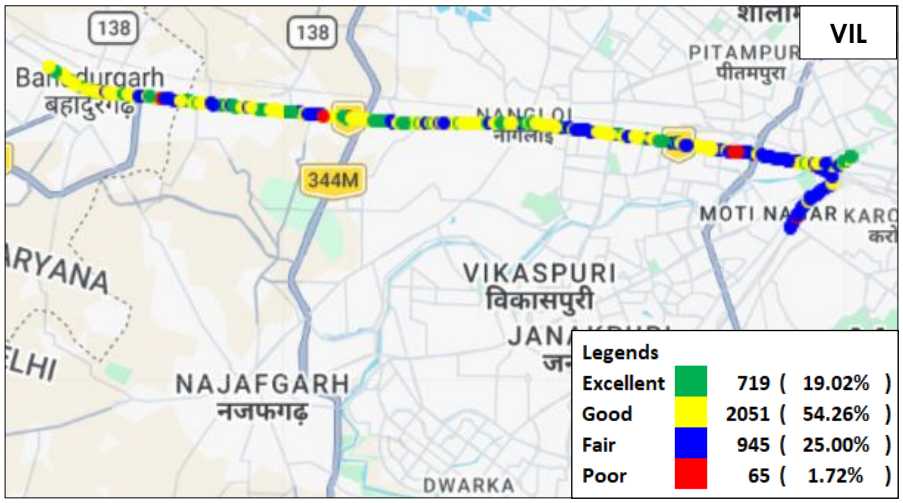


Figure-234: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

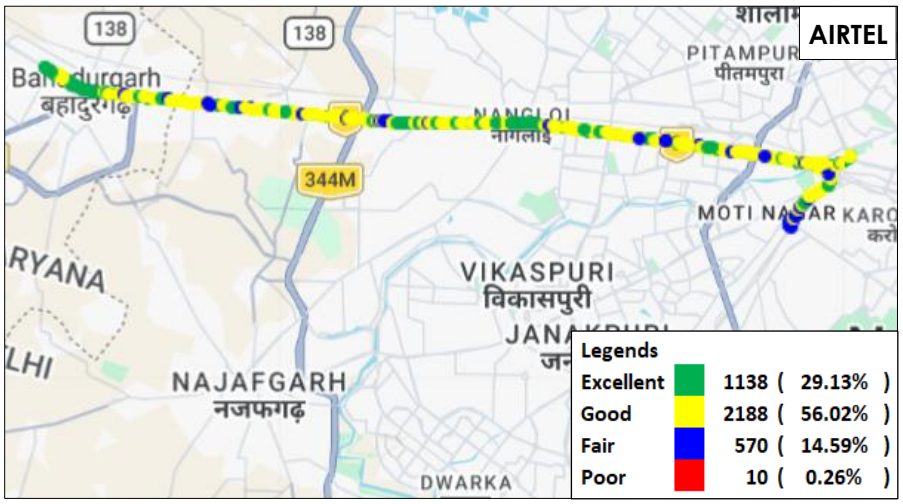


Figure-235: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

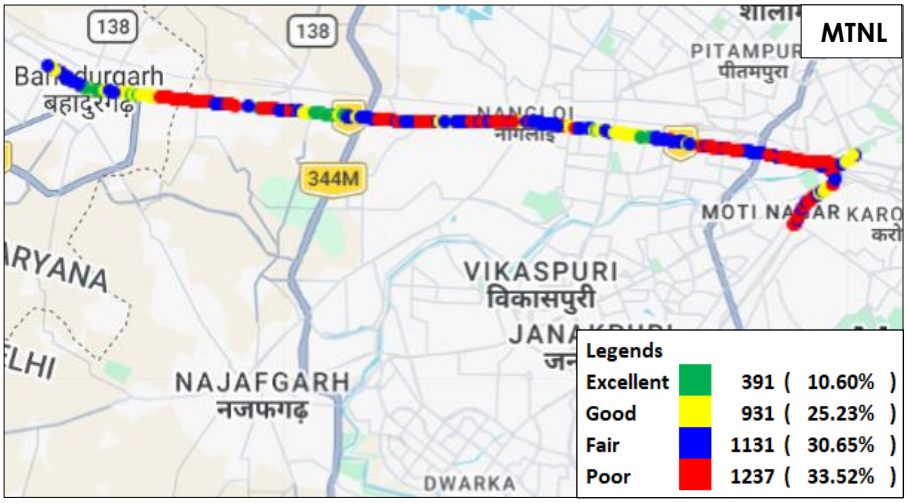


Figure-236: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

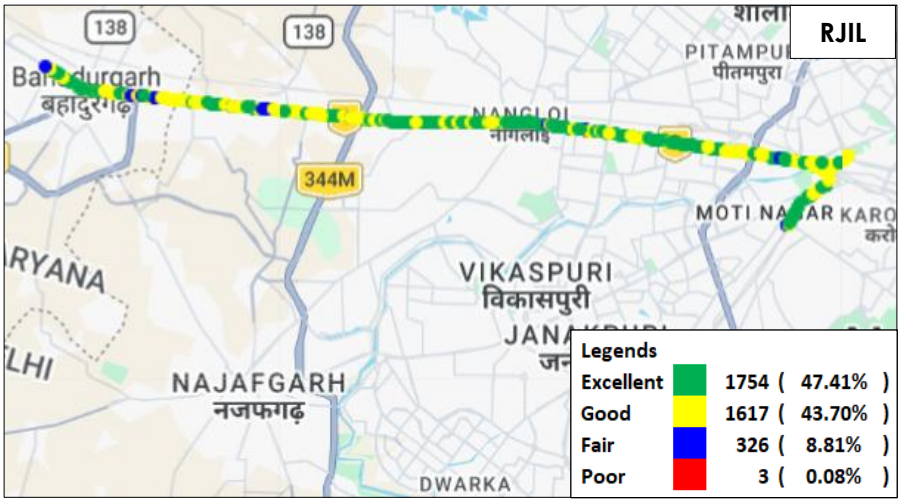


Figure-237: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

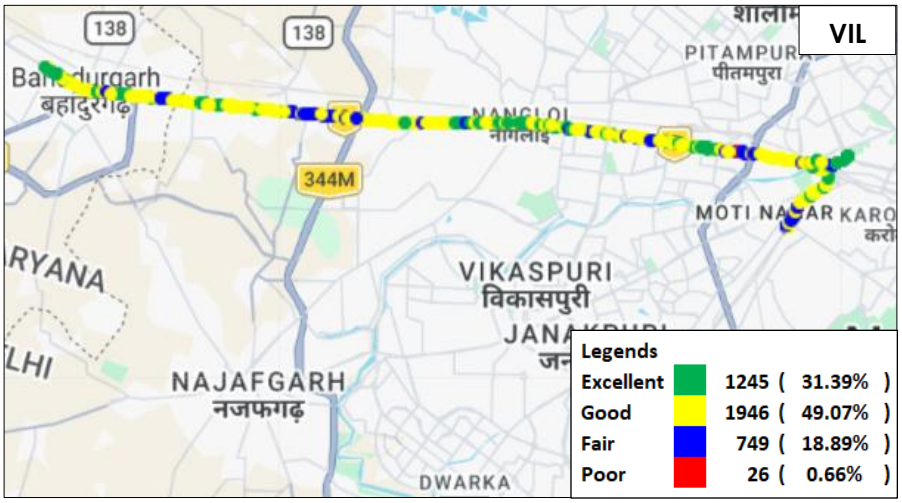


Figure-238: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

v) Dwarka to Dhansa Bus Stand (Grey Line)

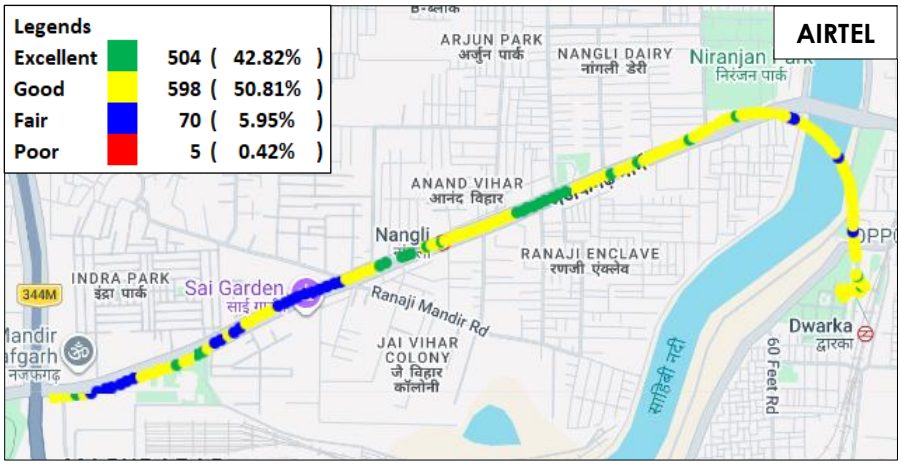


Figure-239: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

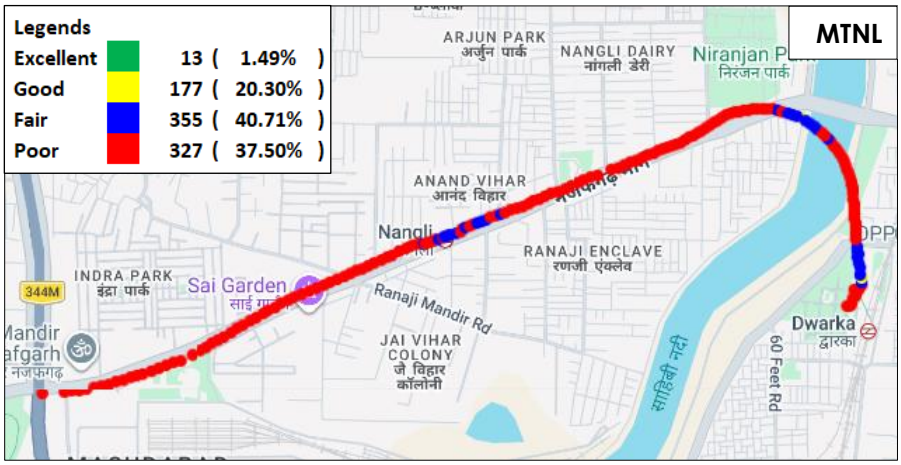


Figure-240: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

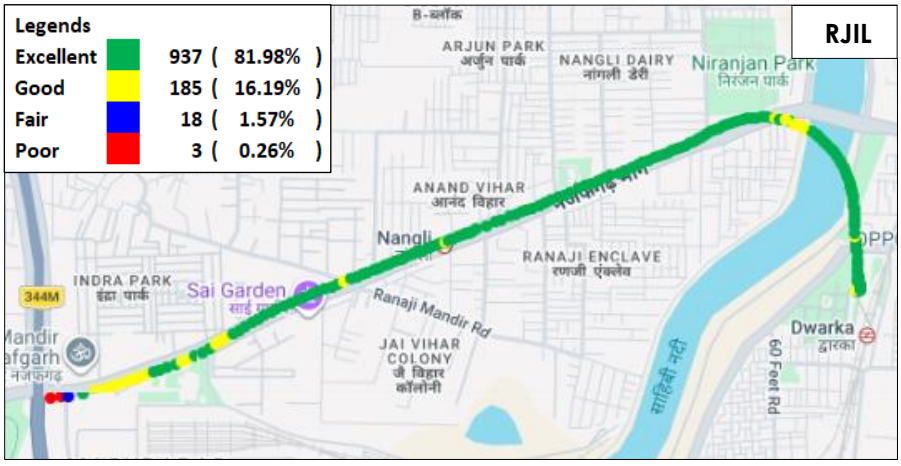


Figure-241: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

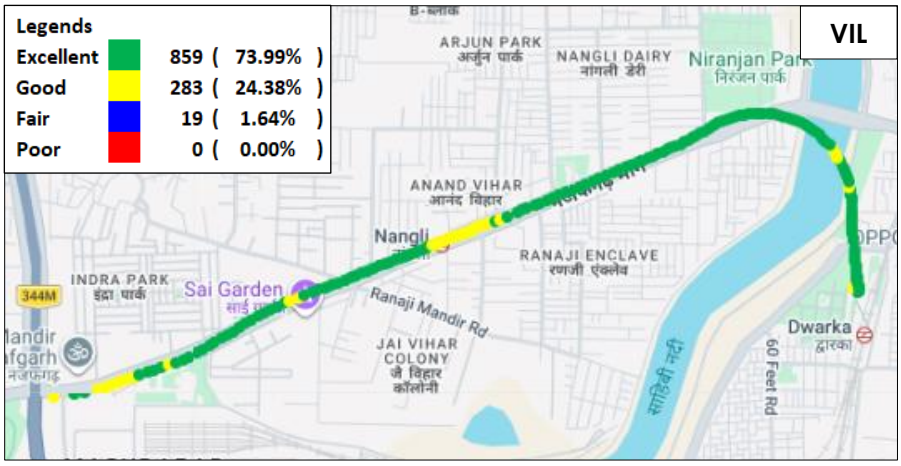


Figure-242: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

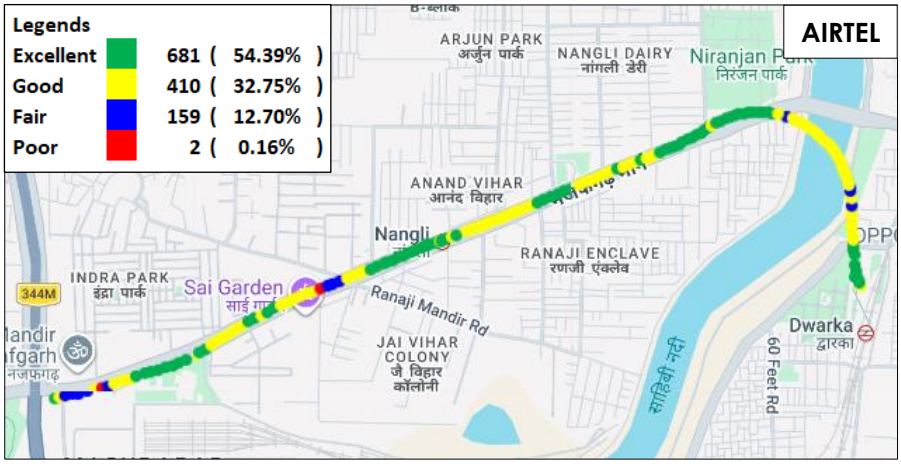


Figure-243: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

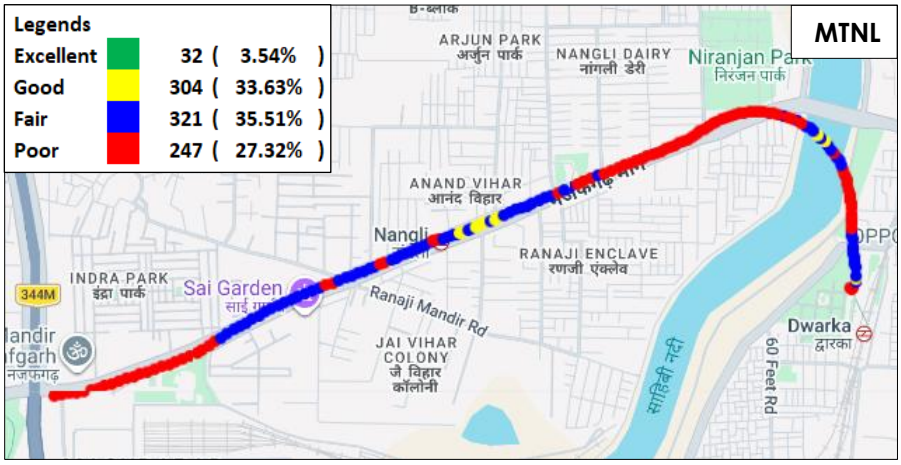


Figure-244: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

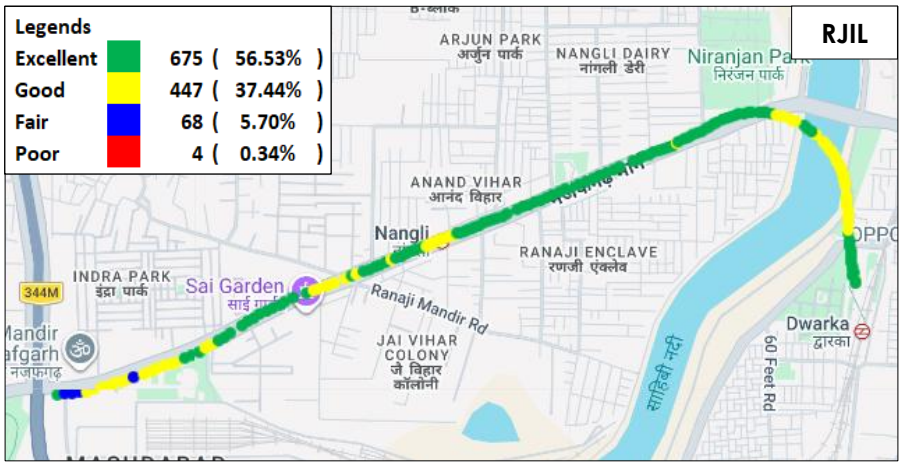


Figure-245: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

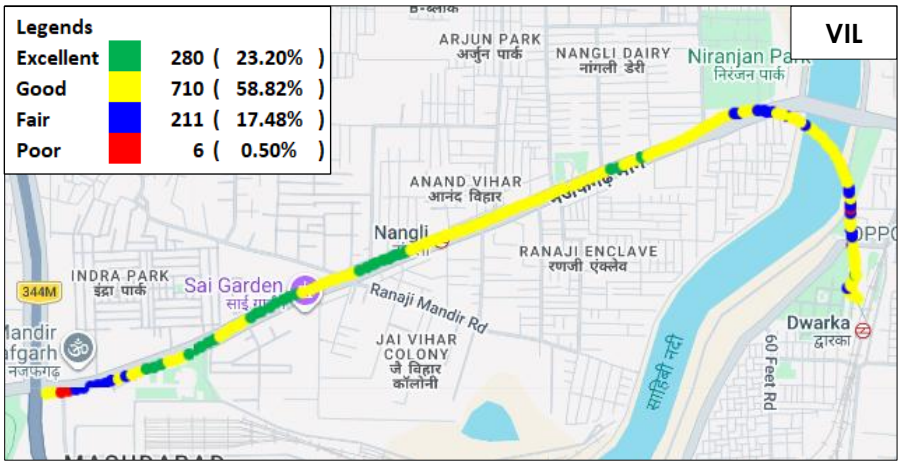


Figure-246: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

vi) Botanical Garden to Krishna Park Extension (Magenta Line)

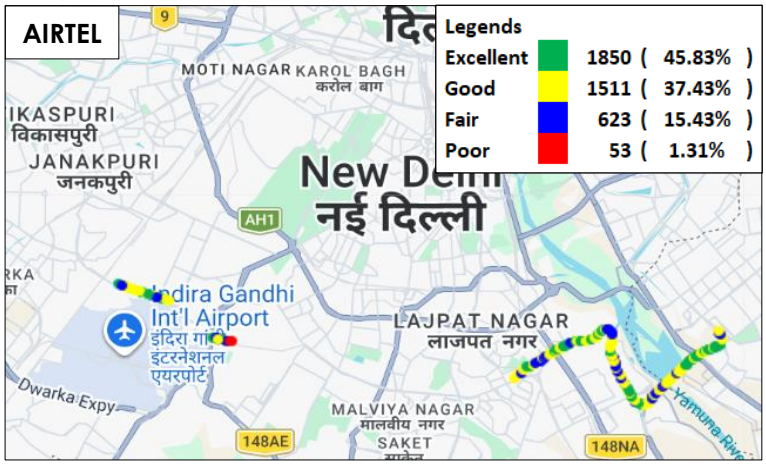


Figure-247: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

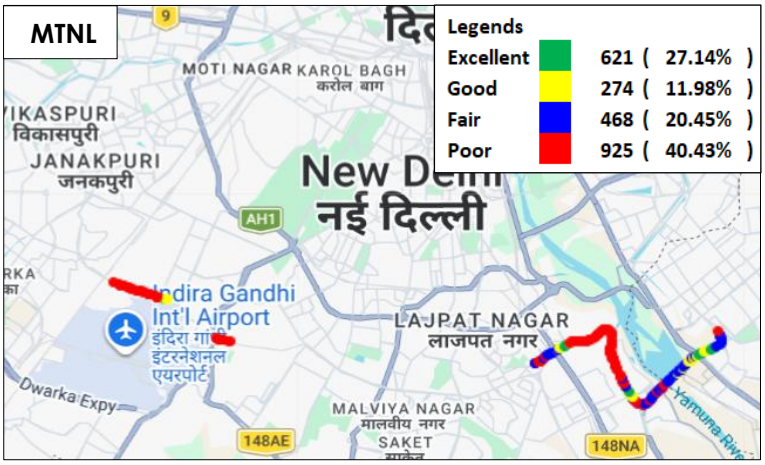


Figure-248: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

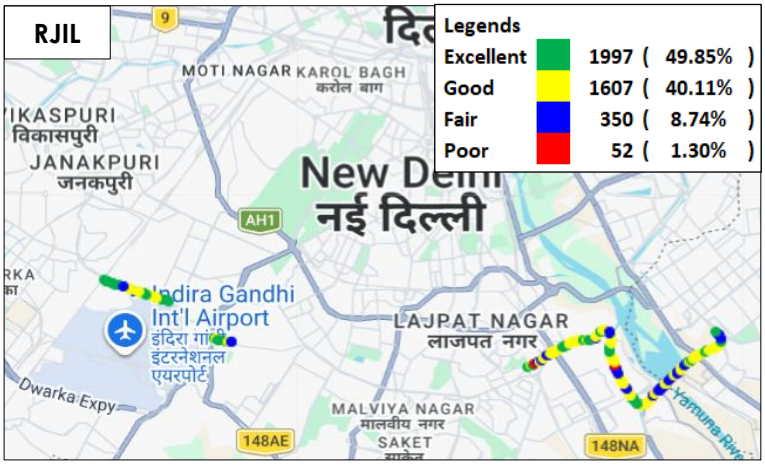


Figure-249: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

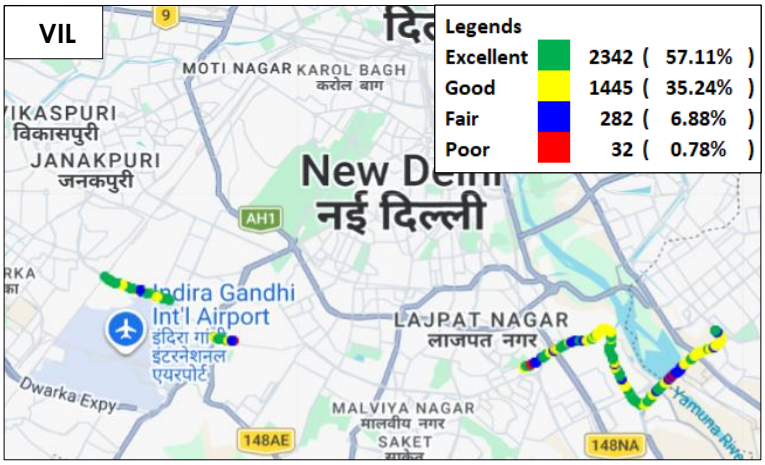


Figure-250: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

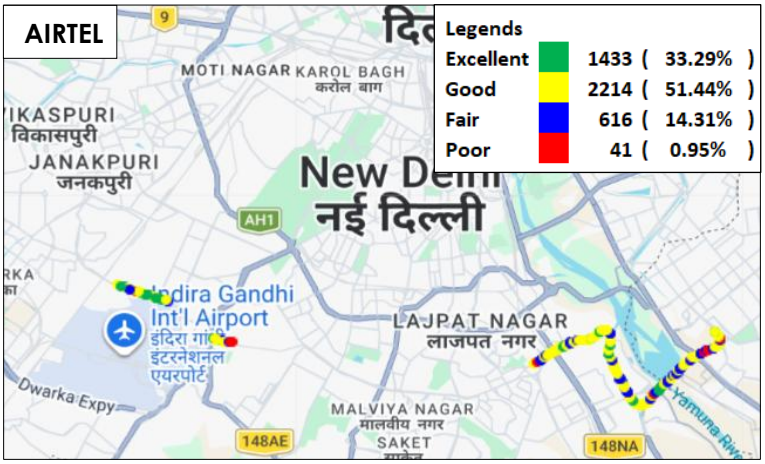


Figure-251: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

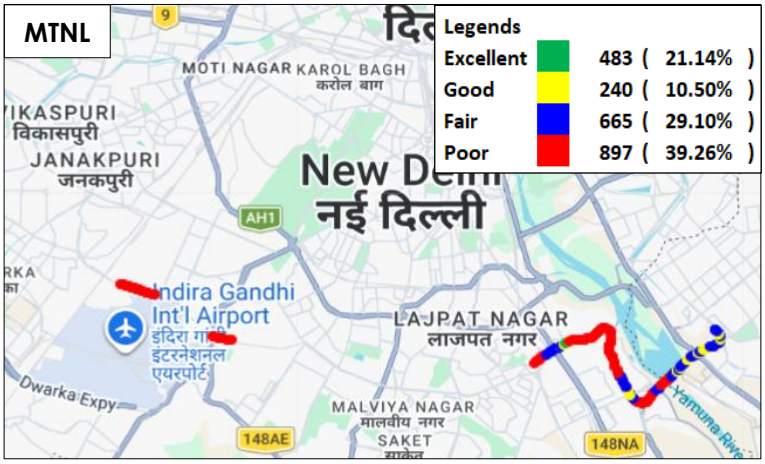


Figure-252: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

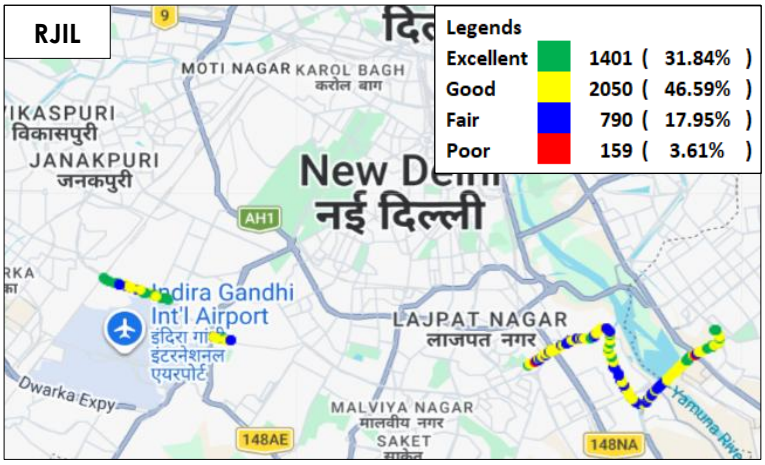


Figure-253: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

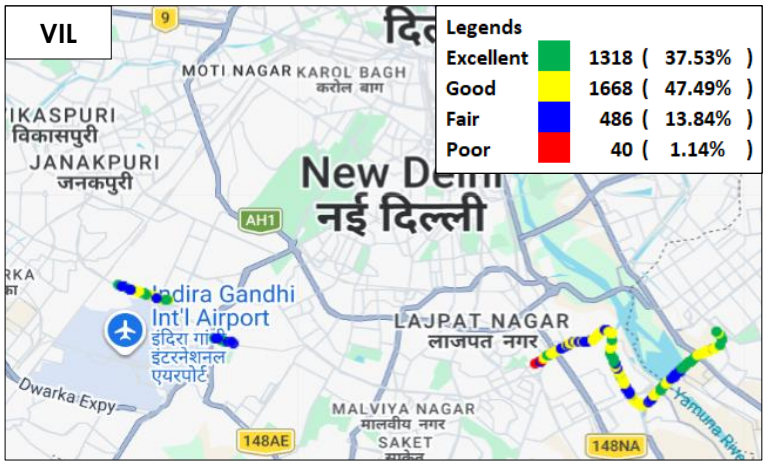


Figure-254: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

vii) Deepali Chowk to Majlis Park (Magenta Line Ext.)

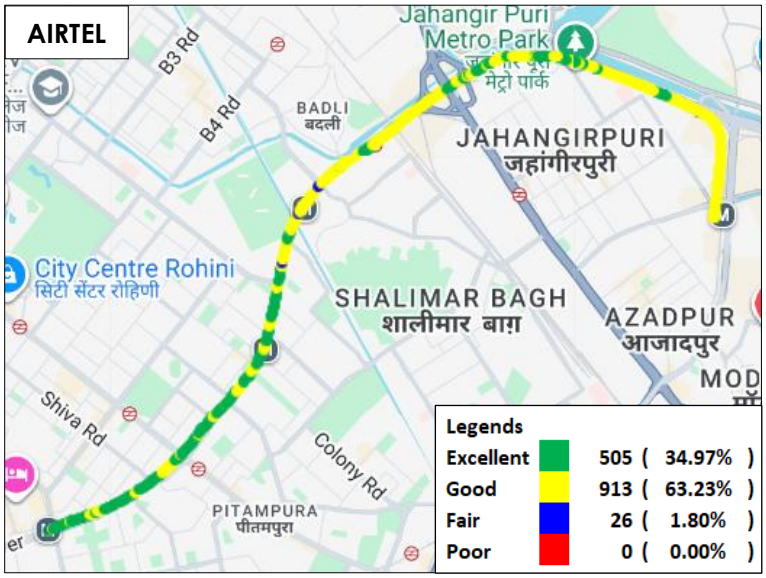


Figure-255: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

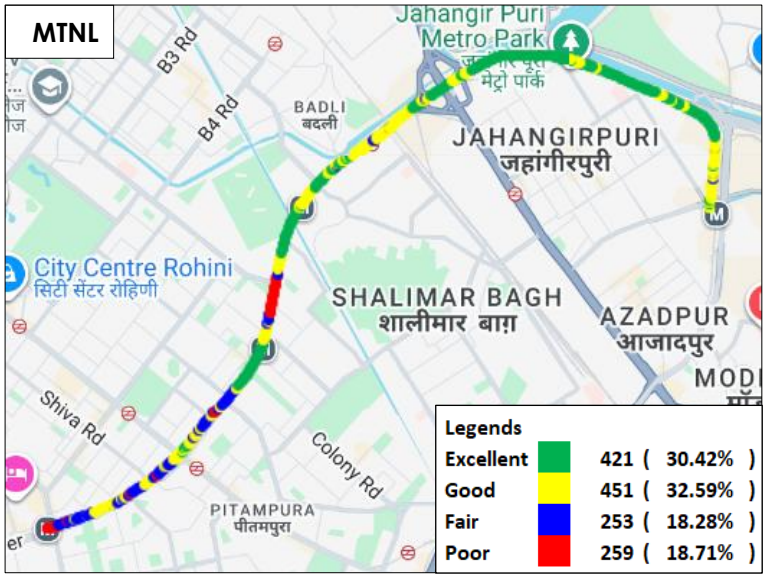


Figure-256: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

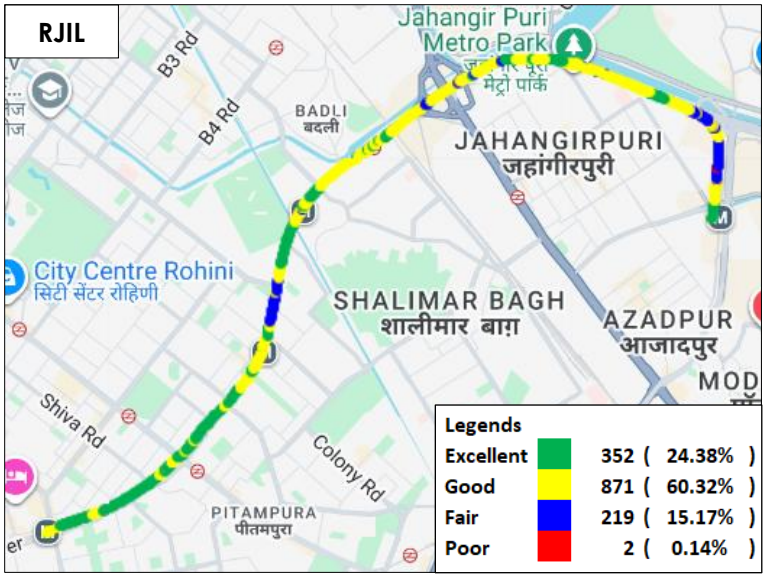


Figure-257: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

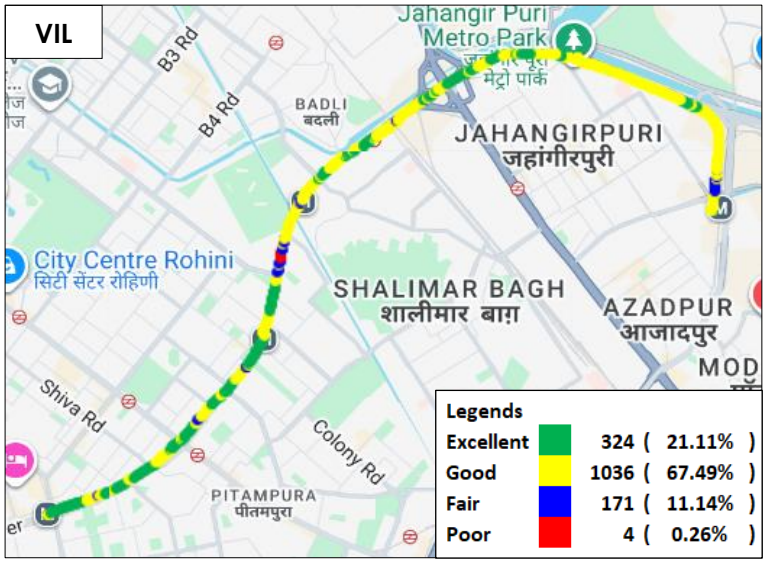


Figure-258: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

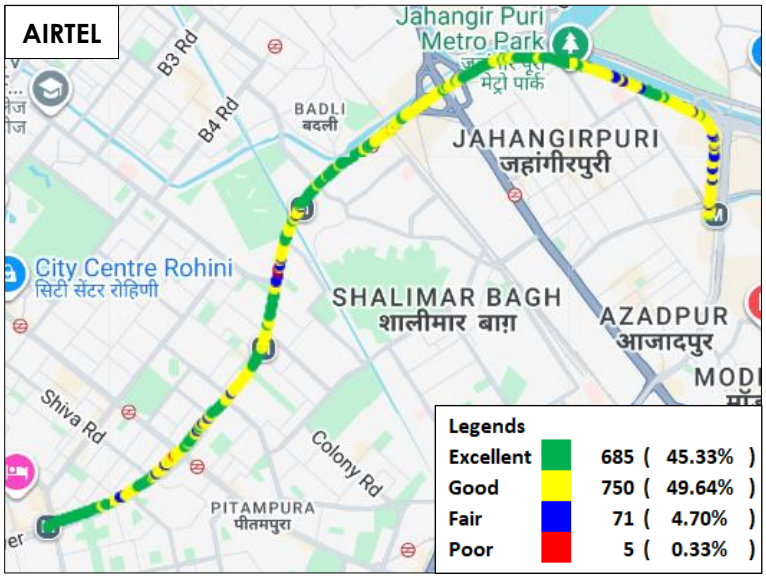


Figure-259: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

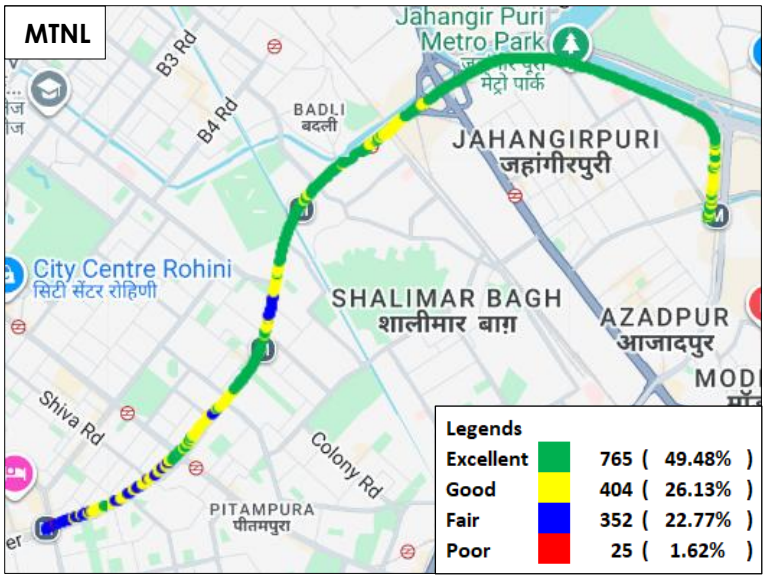


Figure-260: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

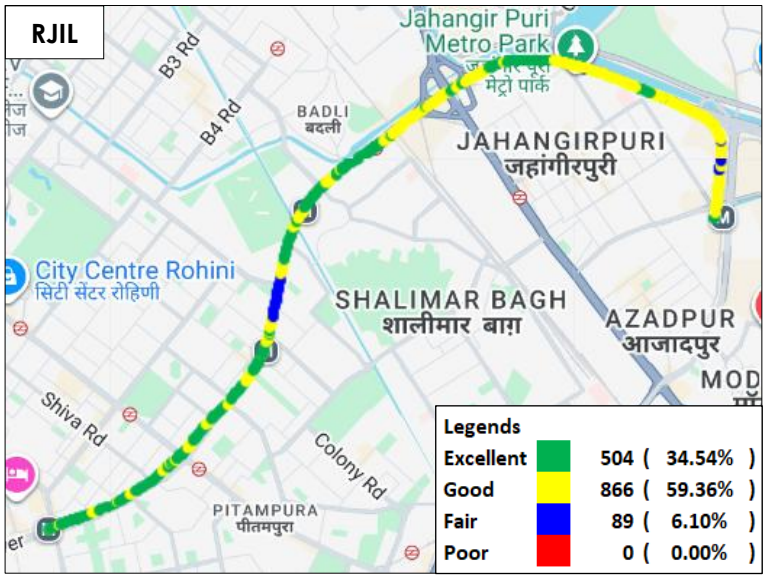


Figure-261: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

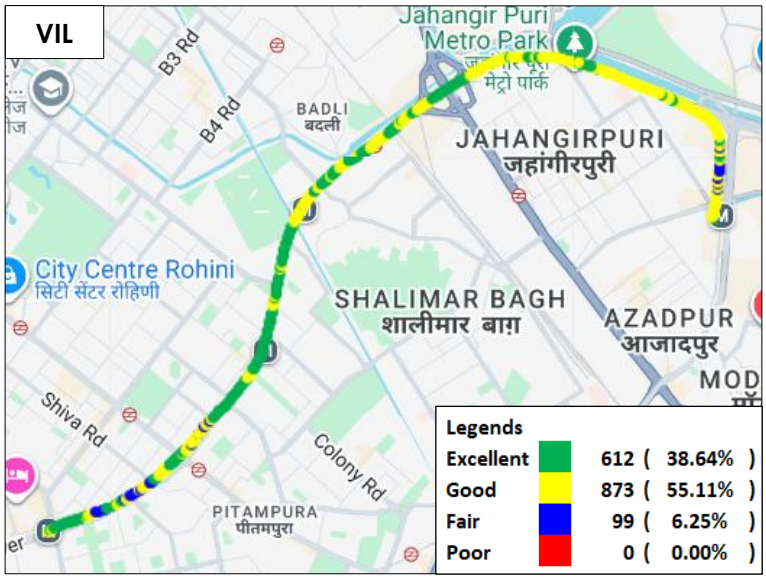


Figure-262: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

viii) New Delhi to Yashobhoomi Dwarka Sector-25 (Orange Line)

Note- The route from Yashobhoomi Dwarka Sector 25 to New Delhi is underground, that is why there is no coverage plot.

ix) Mayur Vihar-1 to Maujpur-Babarpur (Pink Line)

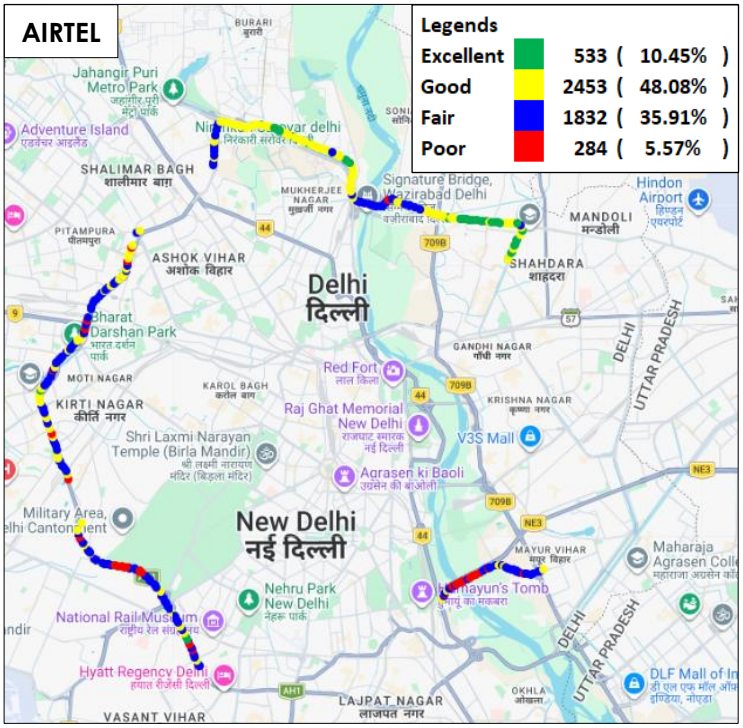


Figure-263: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

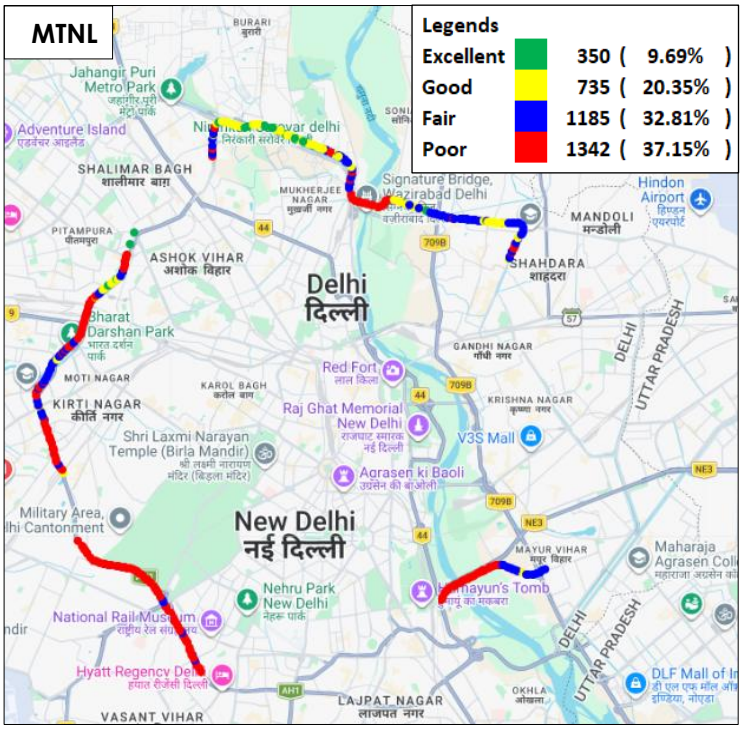


Figure-264: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

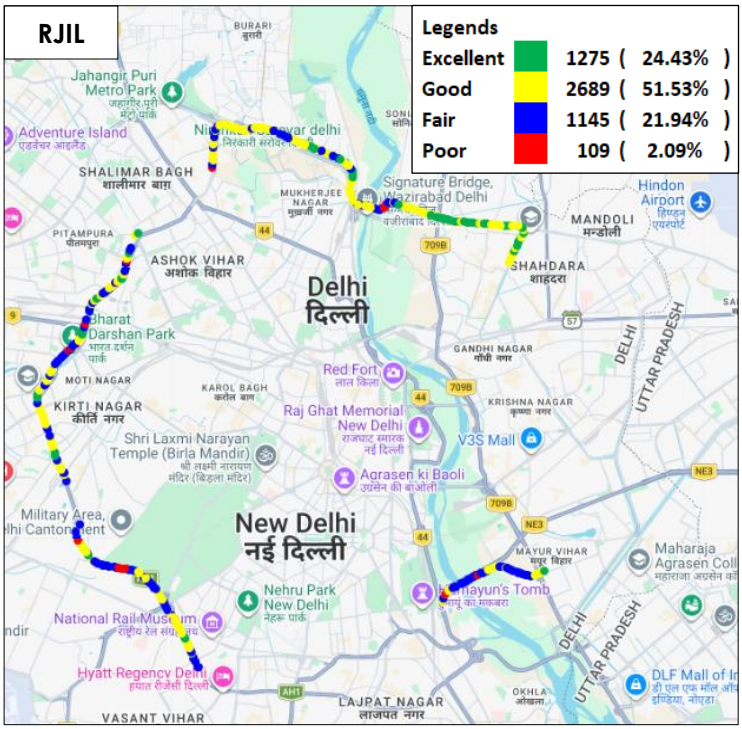


Figure-265: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

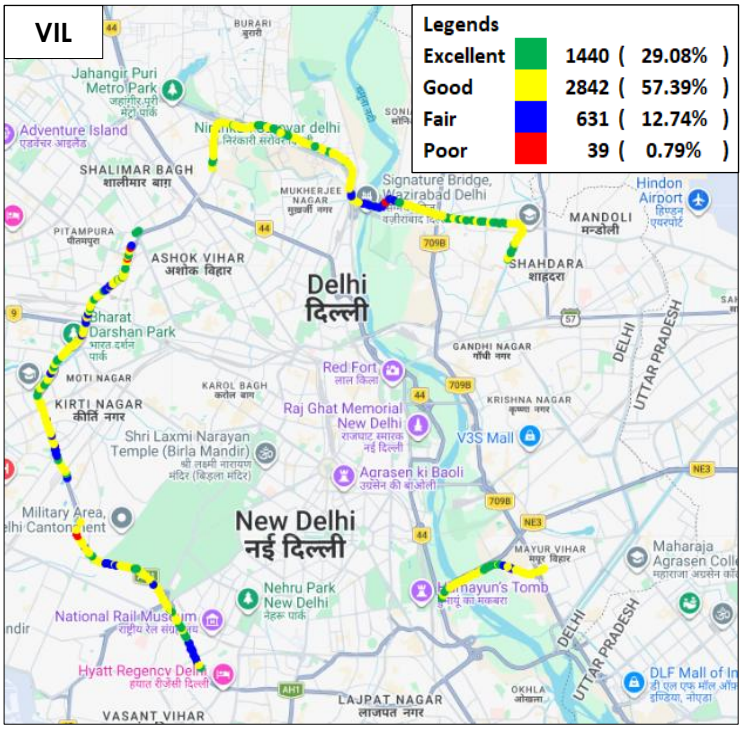


Figure-266: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

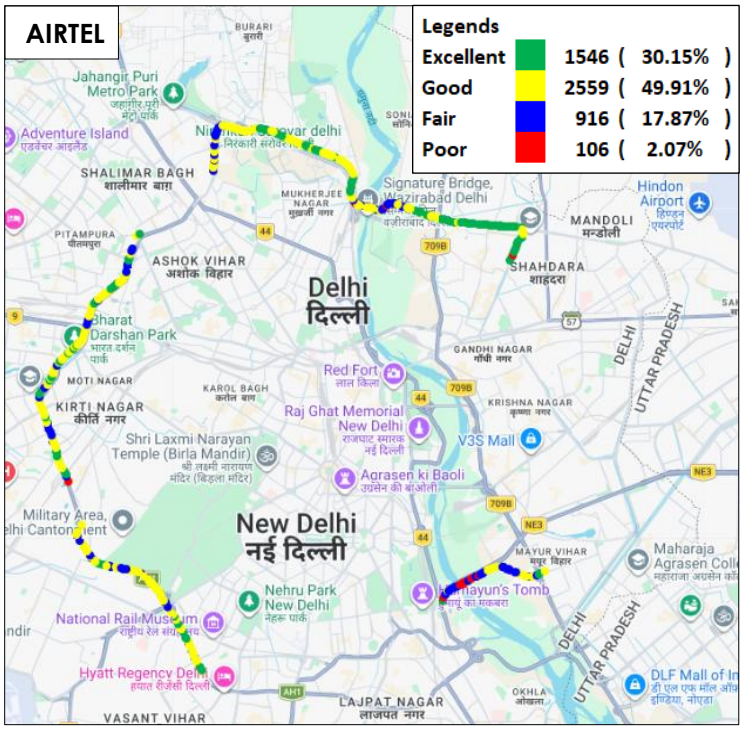


Figure-267: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

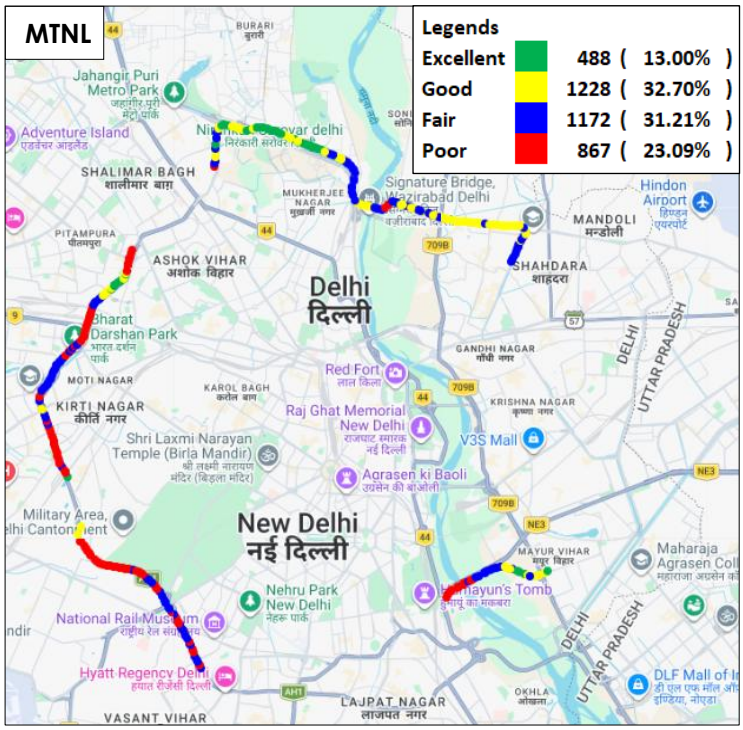


Figure-268: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

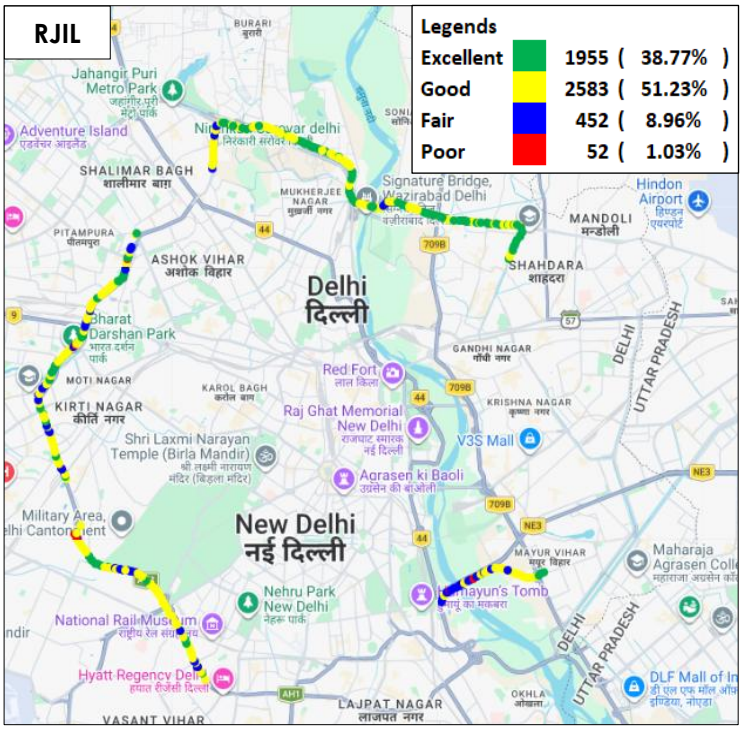


Figure-269: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

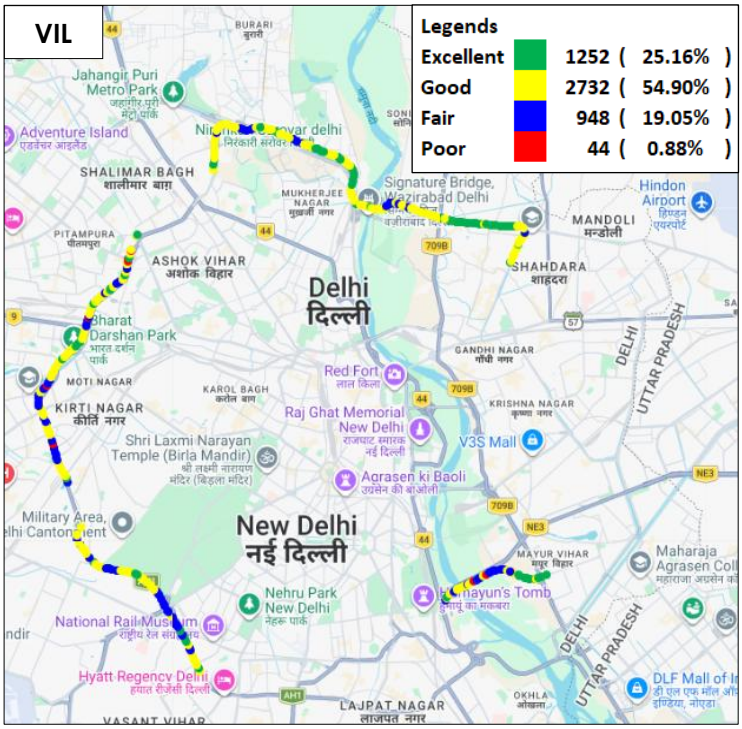


Figure-270: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

x) Shiv Vihar to Mayur Vihar-1 (Pink Line Ext.)

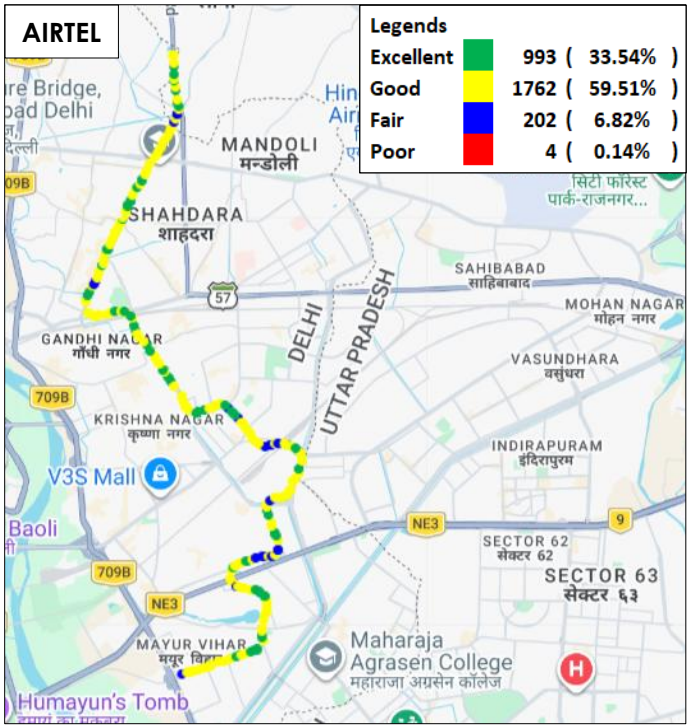


Figure-271: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

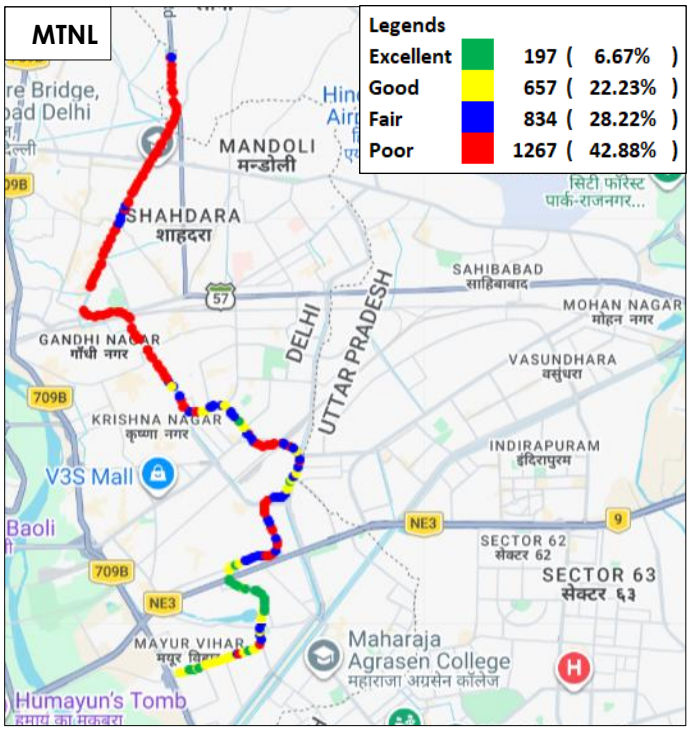


Figure-272: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

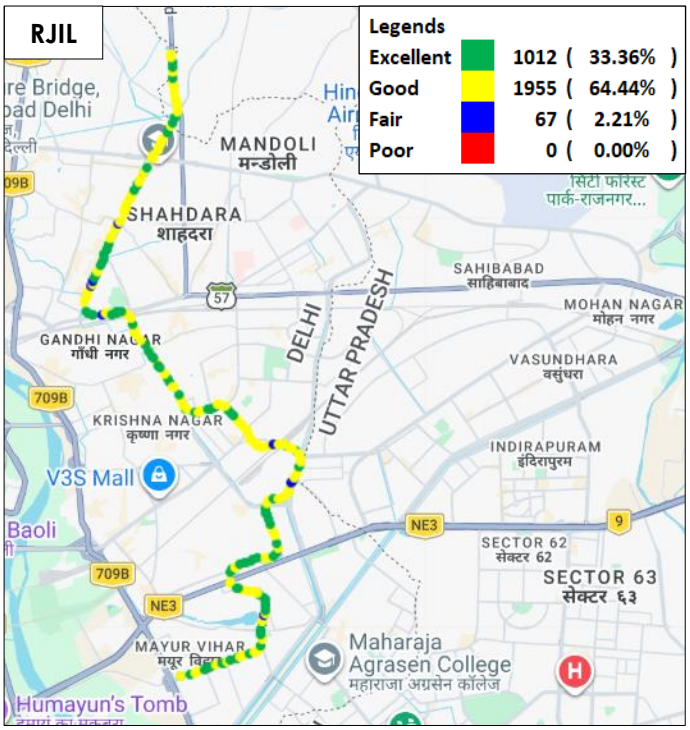


Figure-273: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

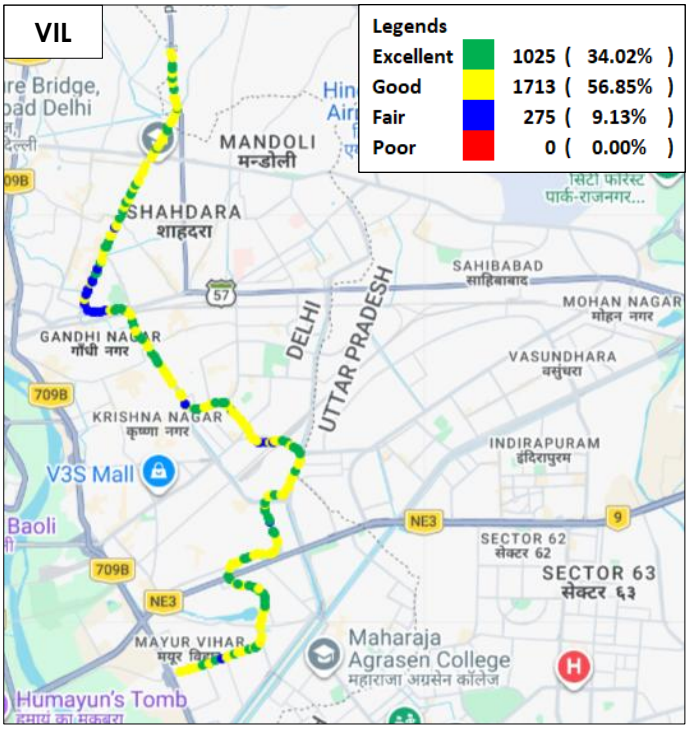


Figure-274: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

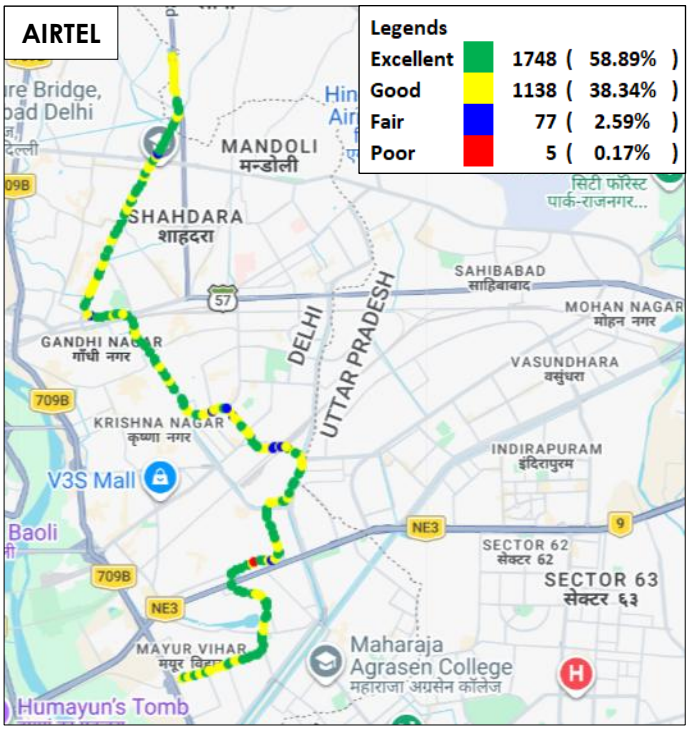


Figure-275: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

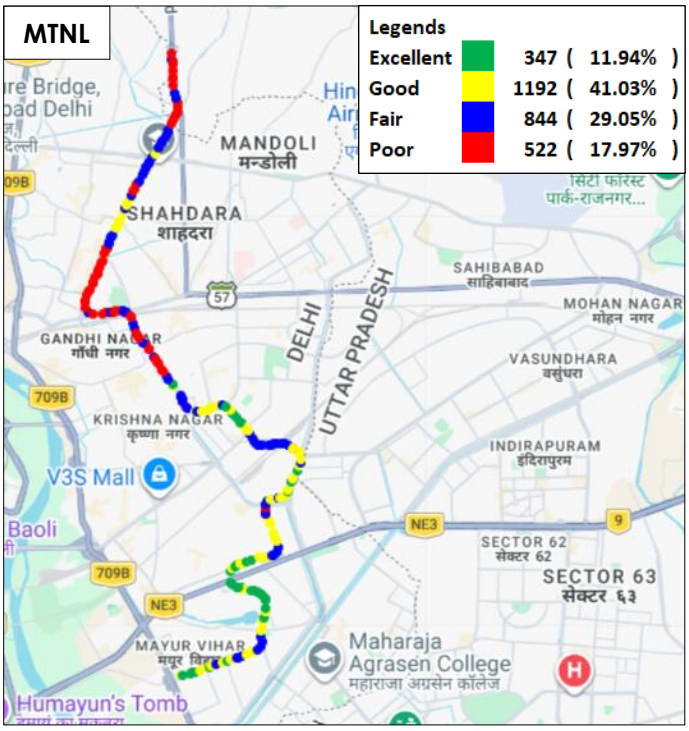


Figure-276: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

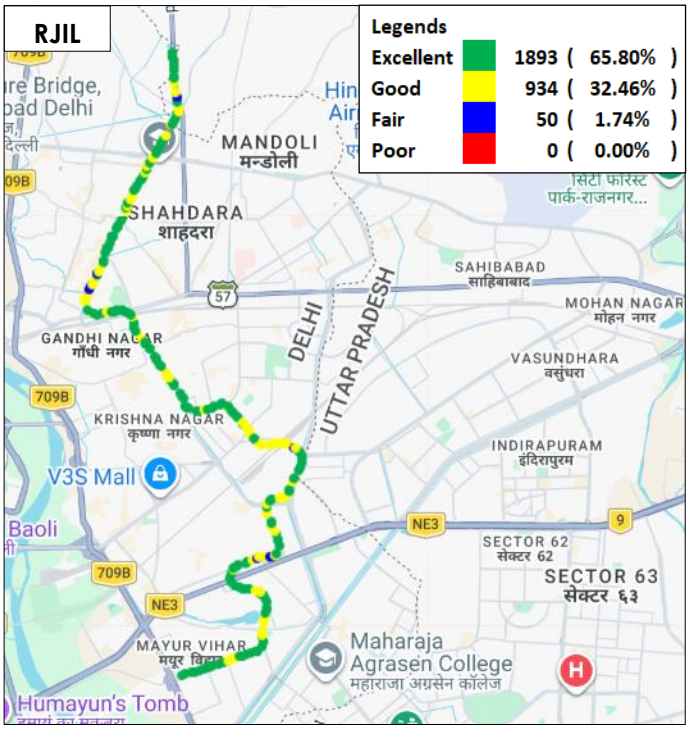


Figure-277: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

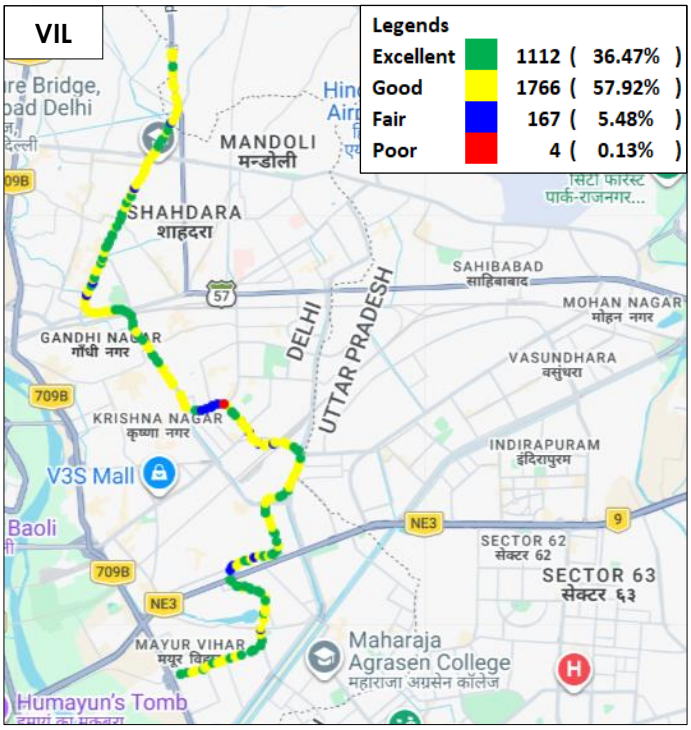


Figure-278: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

xi) Sector 55-56 to Phase-3 (Rapid Metro)

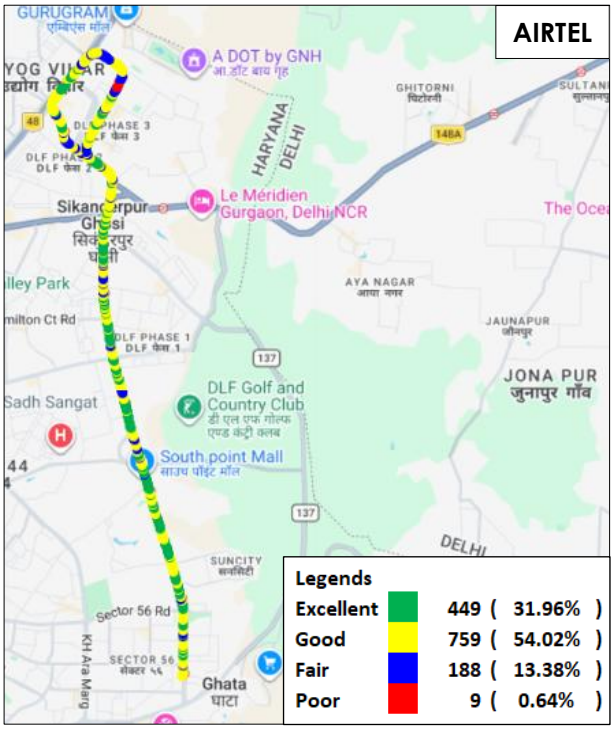


Figure-279: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

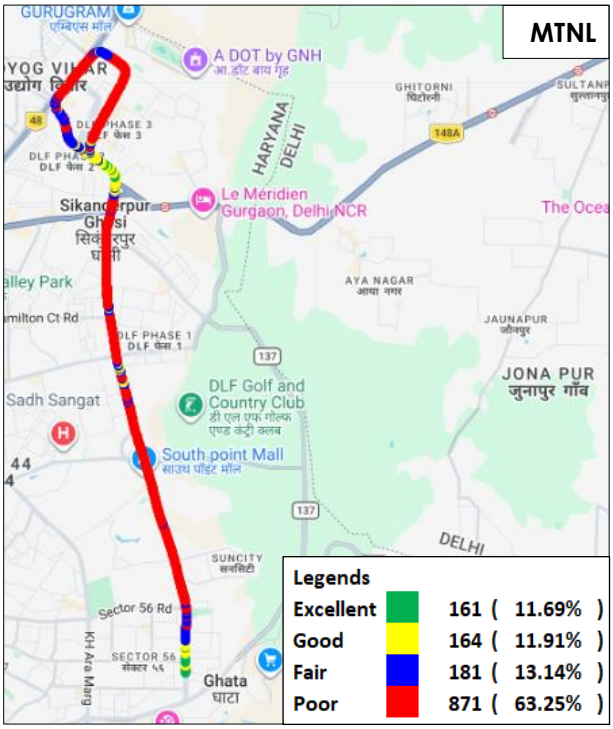


Figure-280: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

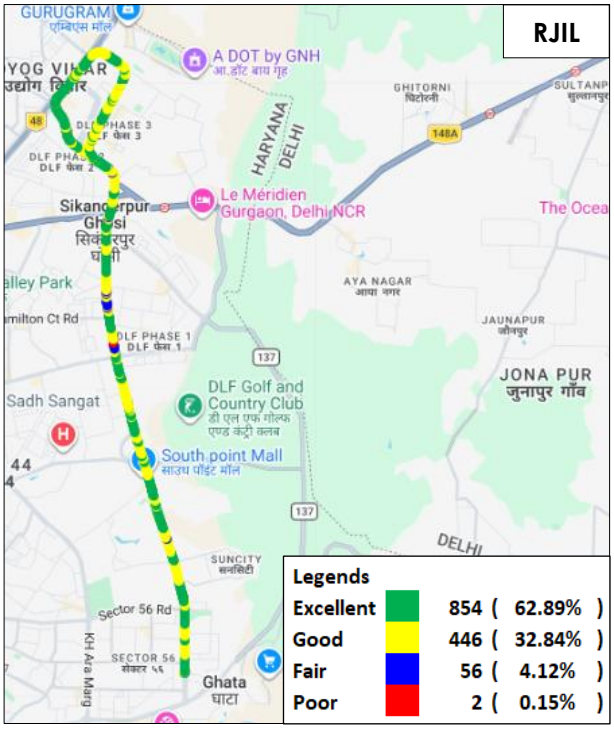


Figure-281: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

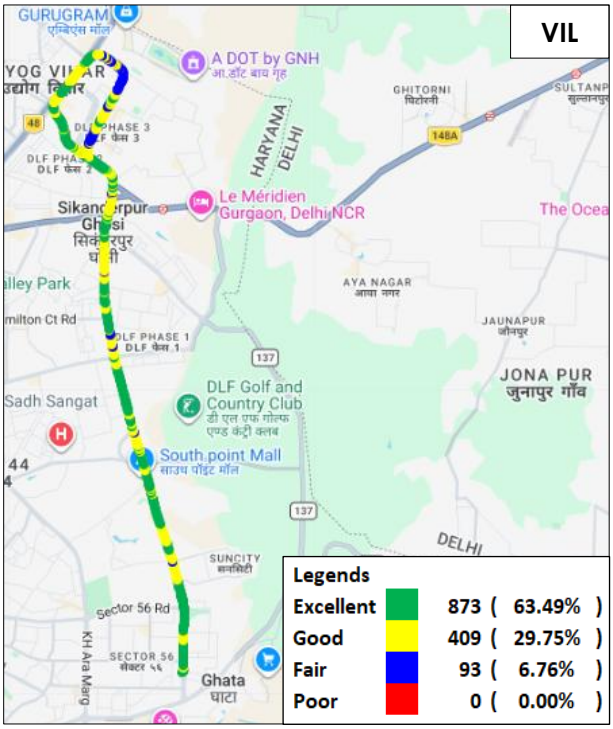


Figure-282: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

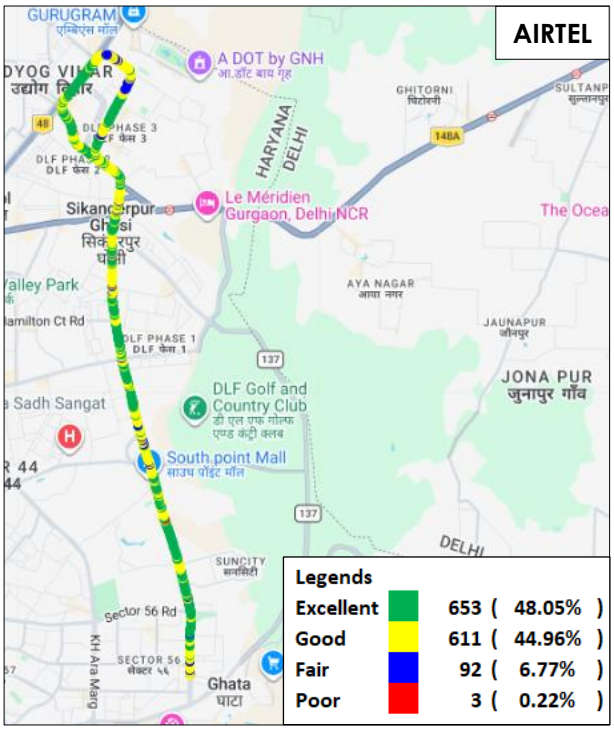


Figure-283: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

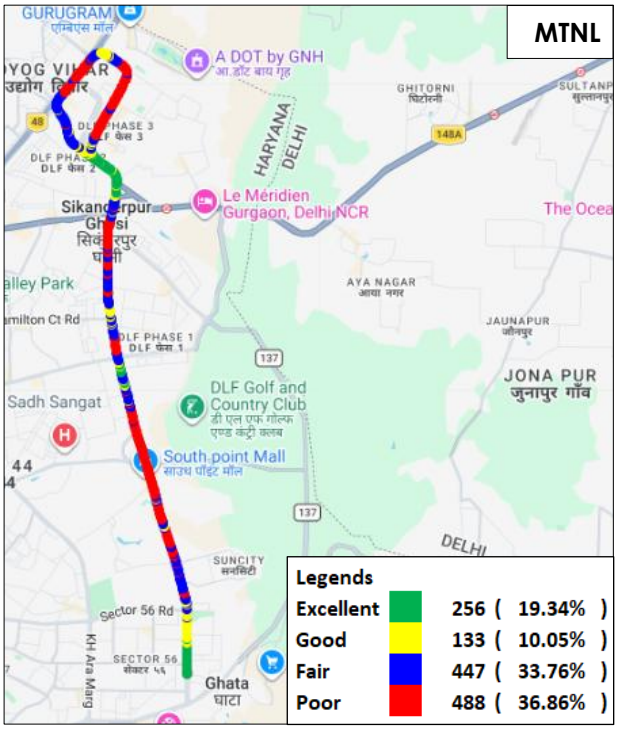


Figure-284: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

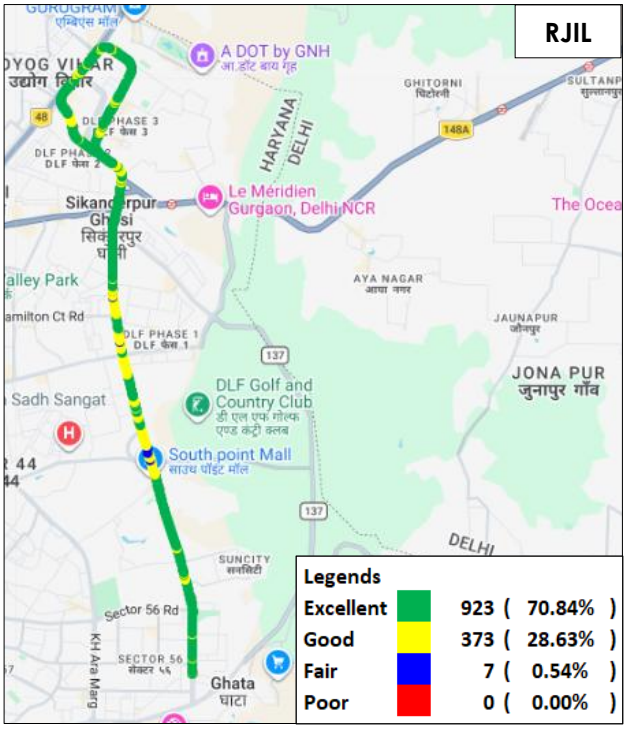


Figure-285: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

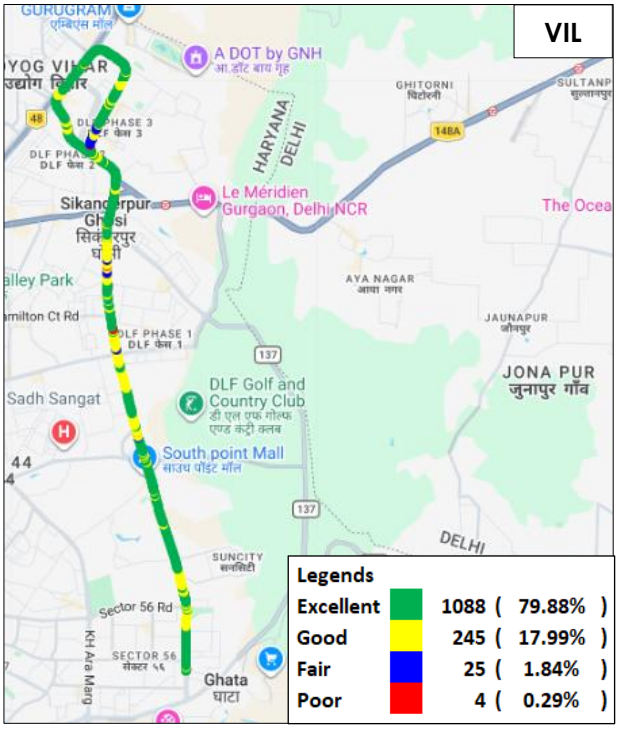


Figure-286: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

xii) Shaheed Sthal to Rithala (Red Line)

Figure-287: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

Figure-288: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

Figure-289: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

Figure-290: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

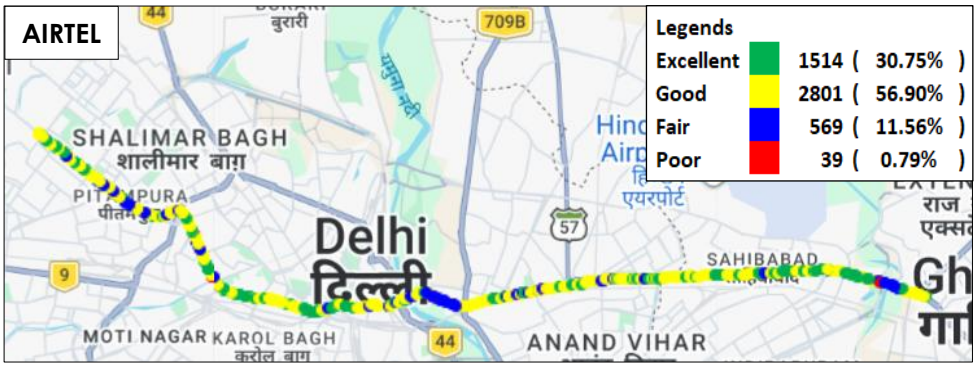


Figure-291: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

Figure-292: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

Figure-293: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

Figure-294: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

xiii) Raja Nahar Singh (Ballabhgarh) to Kashmere Gate (Violet Line)

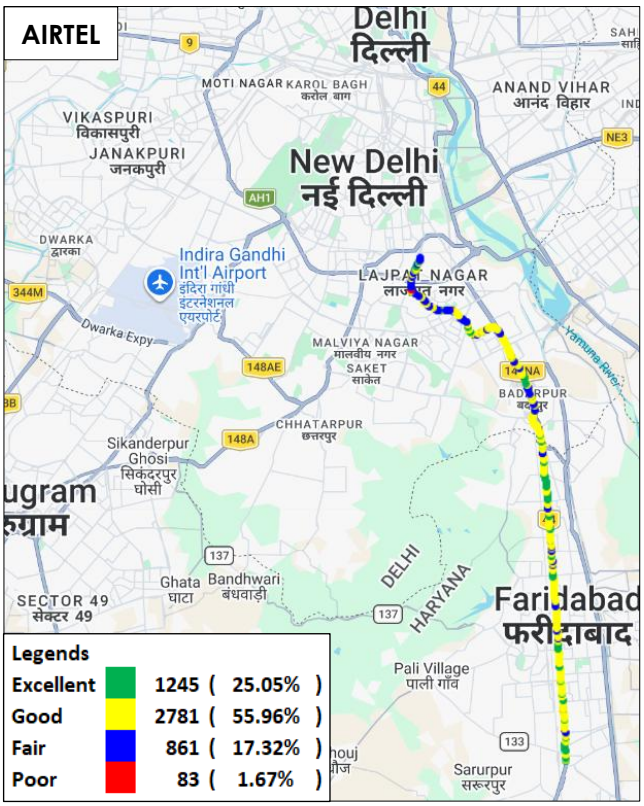


Figure-295: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

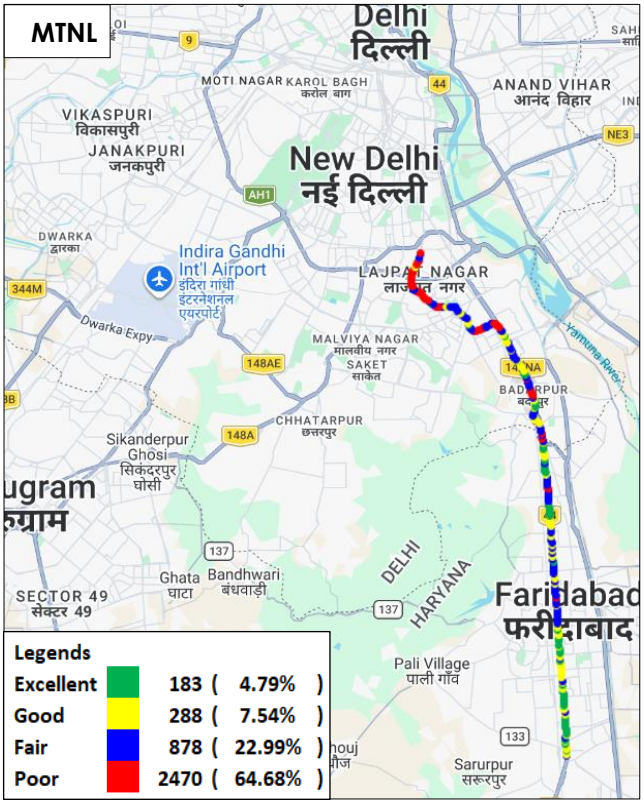


Figure-296: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

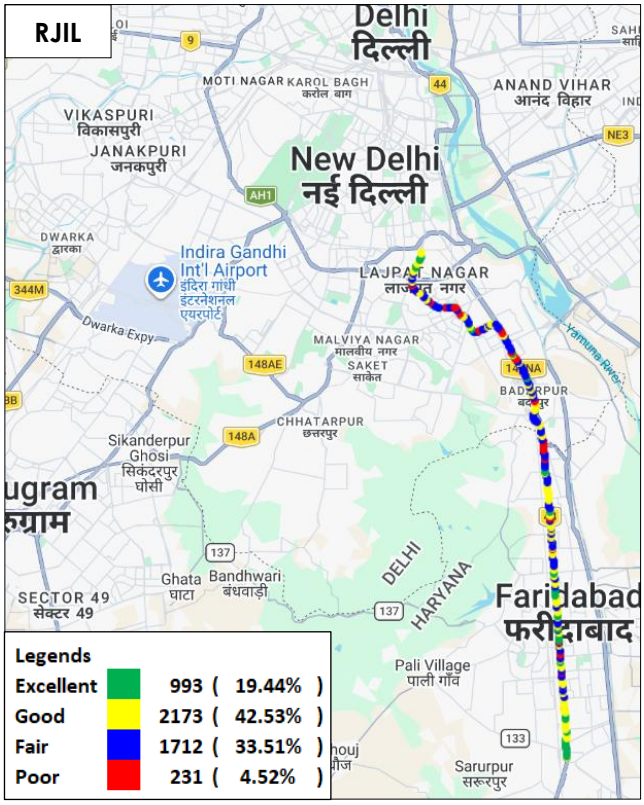


Figure-297: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

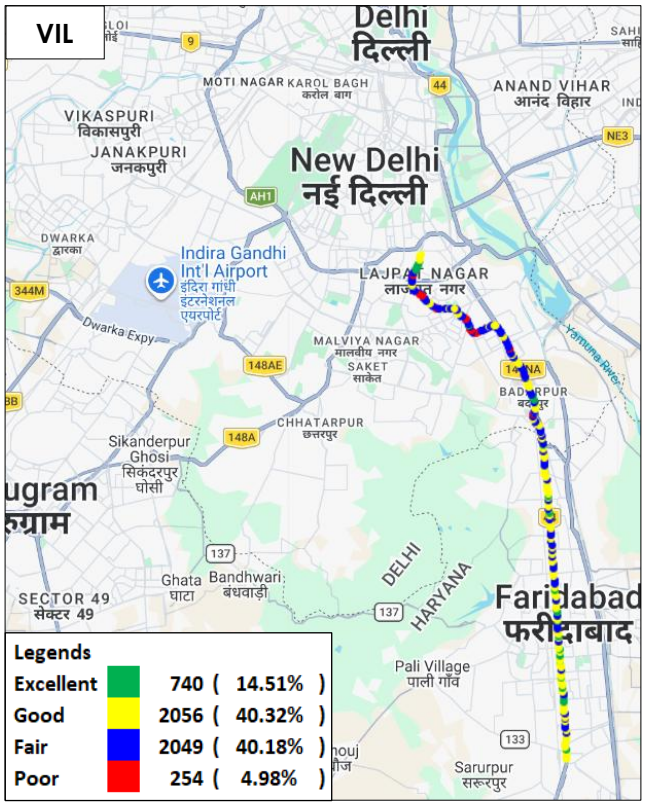


Figure-298: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

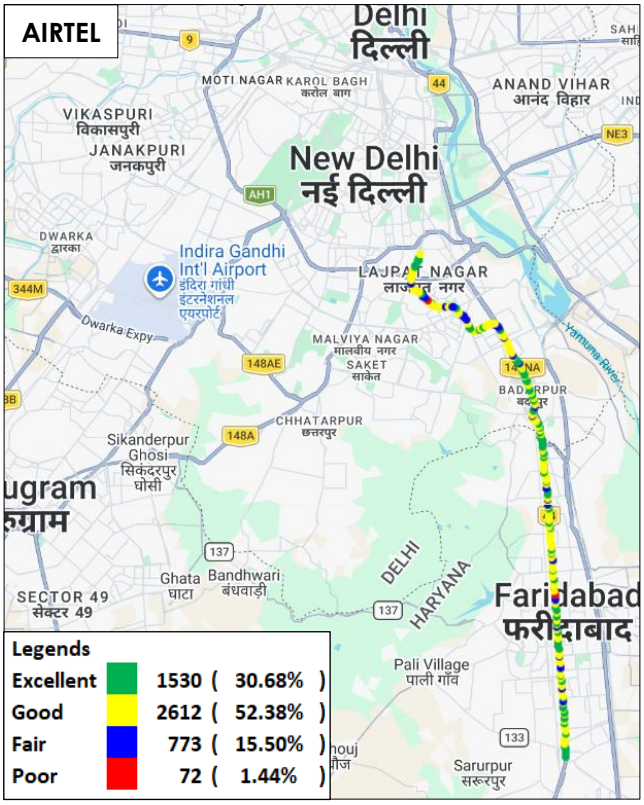


Figure-299: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

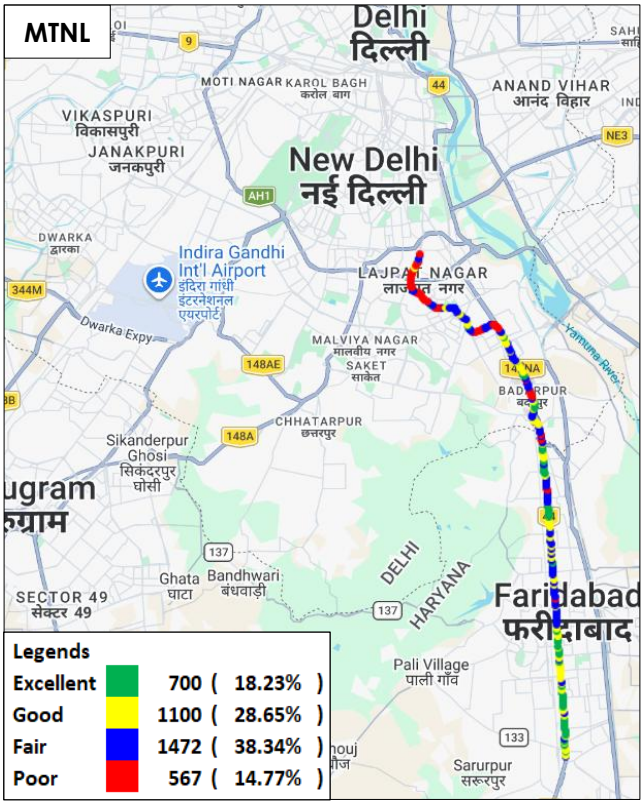


Figure-300: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

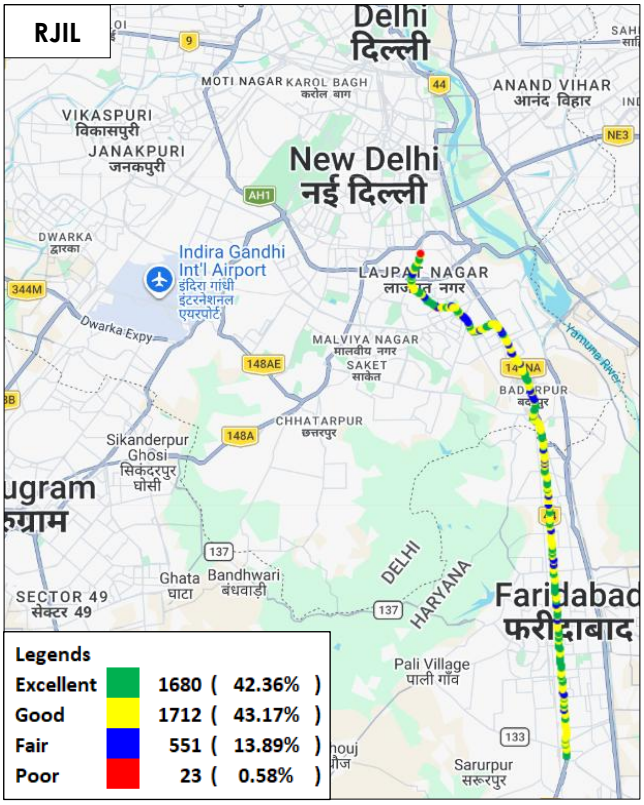


Figure-301: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

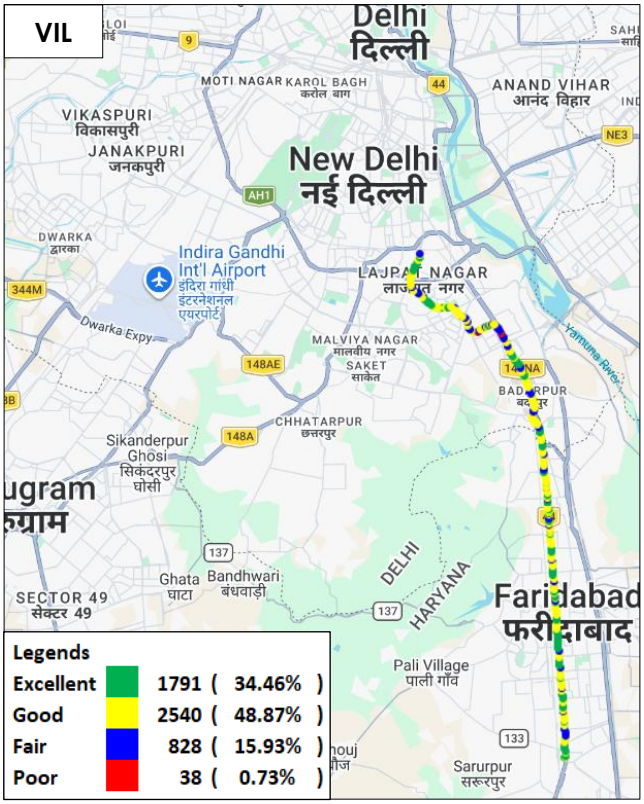


Figure-302: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

xiv) Samaypur Badli to Millennium City Centre (Yellow Line)

Figure-303: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

Figure-304: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL.

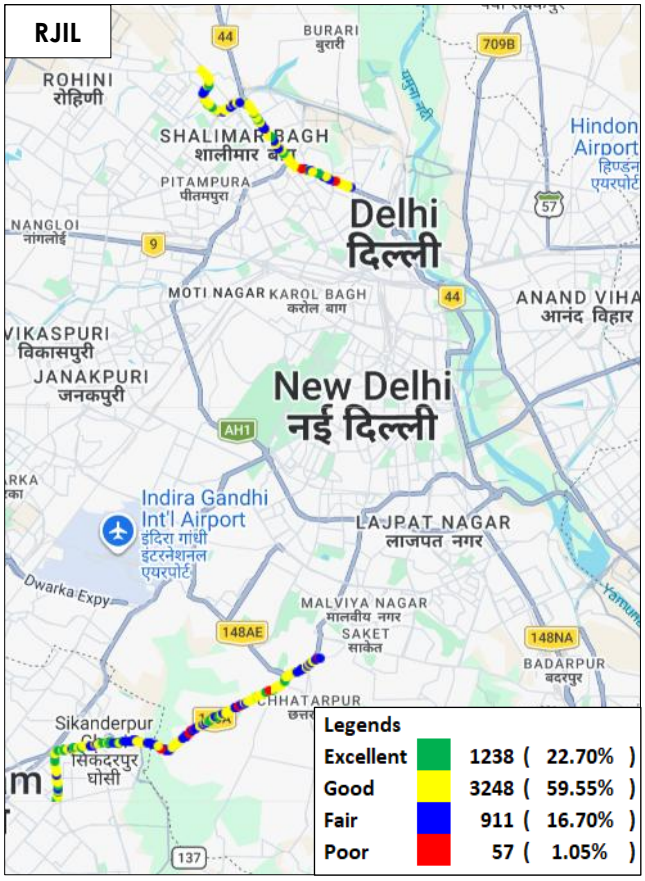


Figure-305: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

Figure-306: Signal strength auto-selection mode (5G/4G/3G/2G) voice – VIL.

Figure-307: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

Figure-308: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL.

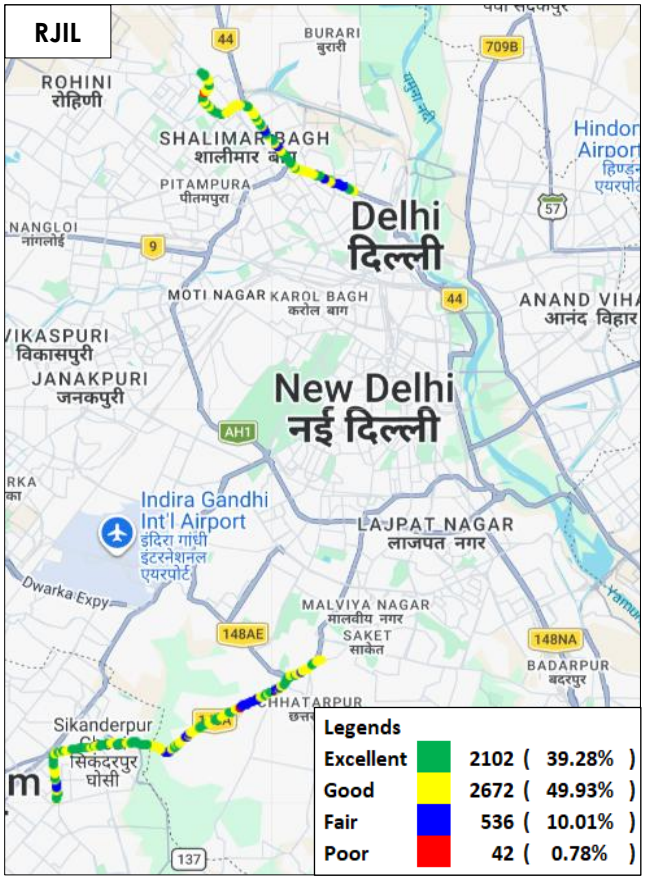


Figure-309: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

Figure-310: Signal strength auto-selection mode (5G/4G/3G/2G) data – VIL.

xv) Delhi to Meerut (Namo Bharat RRTS)

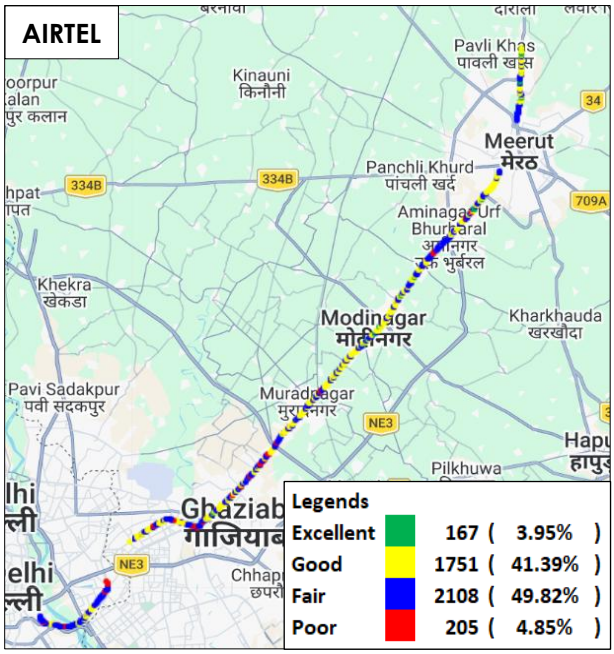


Figure-311: Signal strength auto-selection mode (5G/4G/3G/2G) voice - AIRTEL.

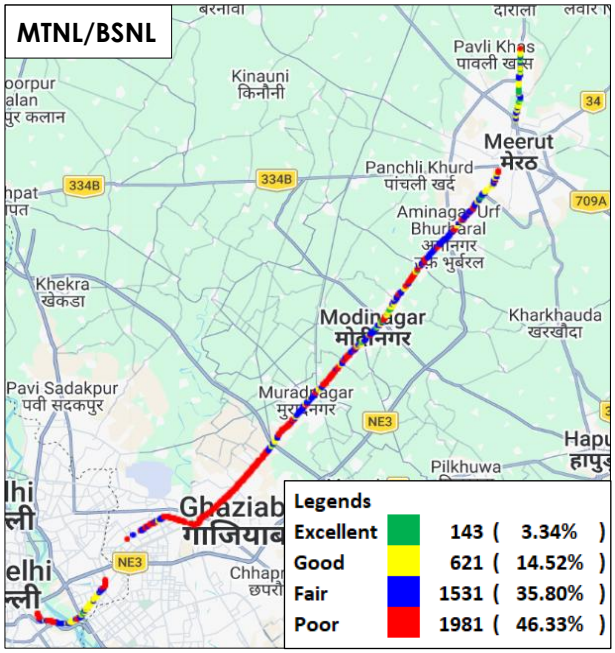


Figure-312: Signal strength auto-selection mode (5G/4G/3G/2G) voice - MTNL/BSNL.

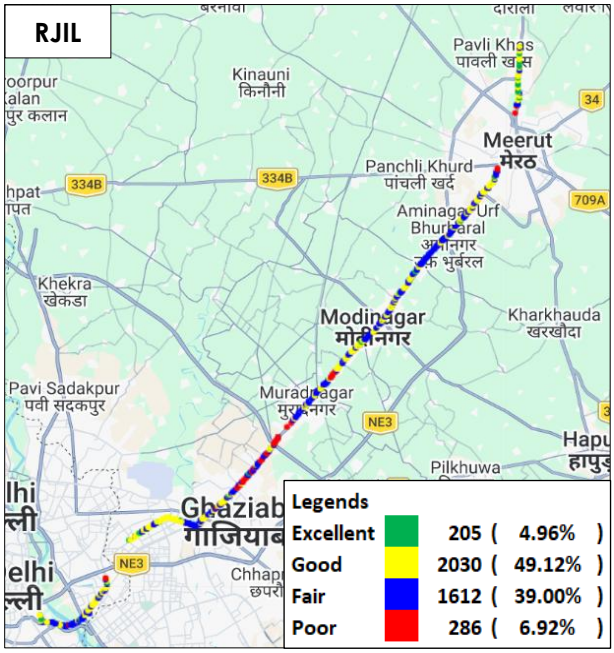


Figure-313: Signal strength auto-selection mode (5G/4G/3G/2G) voice - RJIL.

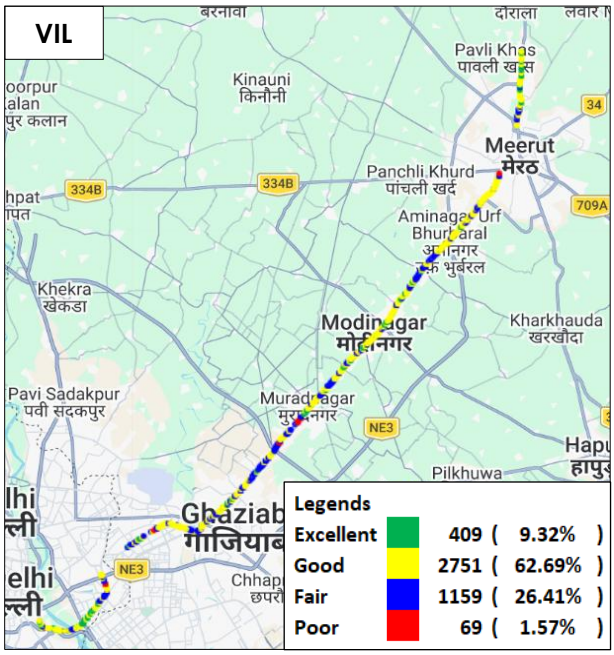


Figure-314: Signal strength auto-selection mode (5G/4G/3G/2G) voice - VIL.

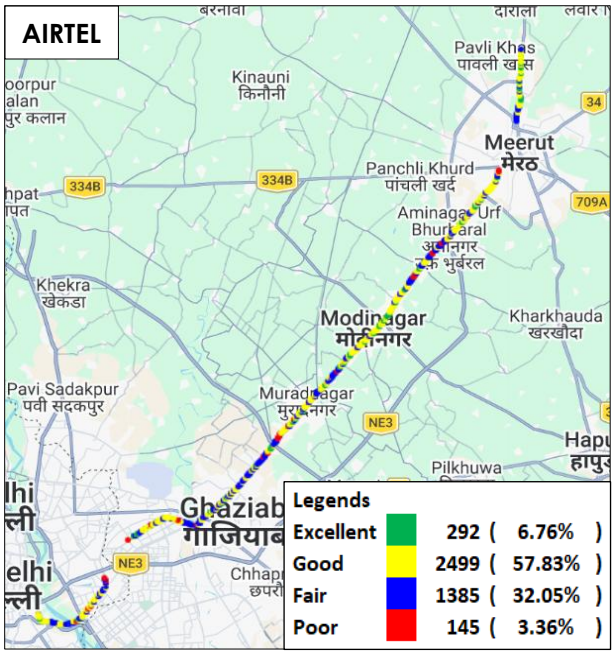


Figure-315: Signal strength auto-selection mode (5G/4G/3G/2G) data - AIRTEL.

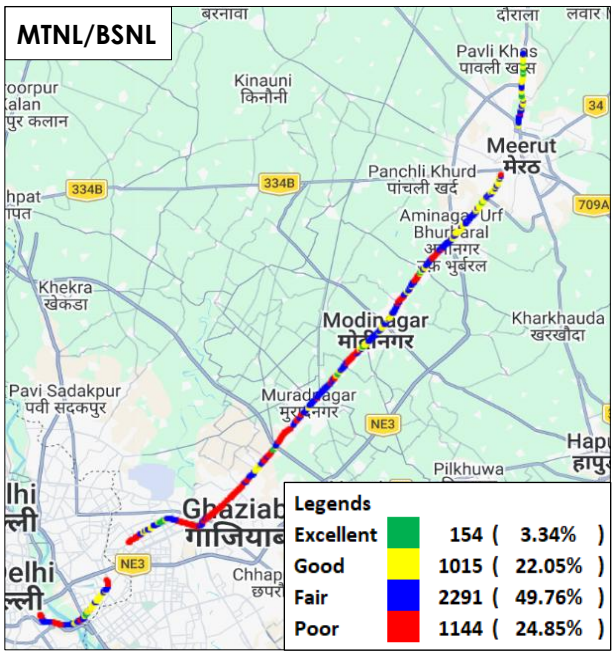


Figure-316: Signal strength auto-selection mode (5G/4G/3G/2G) data - MTNL/BSNL.

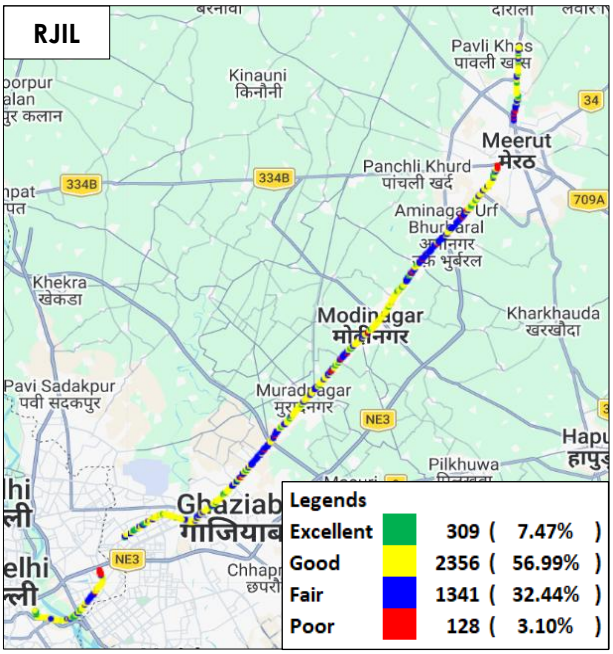


Figure-317: Signal strength auto-selection mode (5G/4G/3G/2G) data - RJIL.

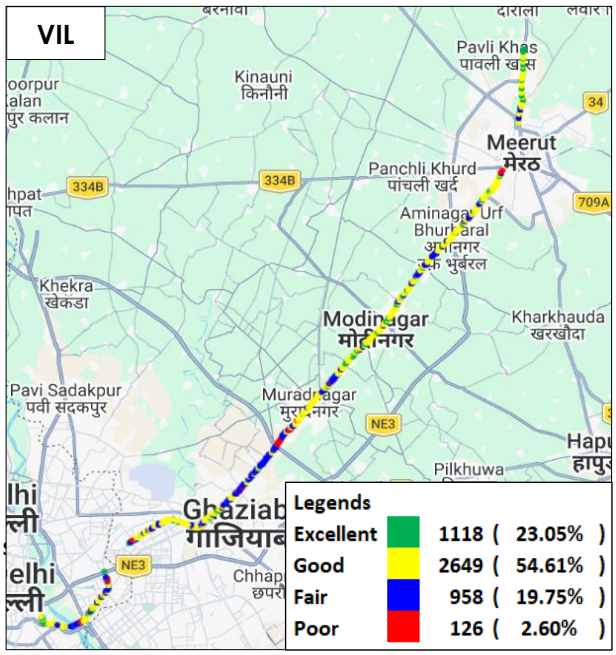


Figure-318: Signal strength auto-selection mode (5G/4G/3G/2G) data - VIL.

7. Appendix

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

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

7.1 Appendix-I

7.1.1 Drive test setup

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

Table-67: 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.
- 90 Sec calls were made in highway route drive.

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

Latency & Jitter (TWAMP-UDP)		25 count- Dynamic 500 count- Hotspot Payload- 42 bytes in all drive
Packet Loss Rate (TWAMP-UDP & TCP)		500 counts (TWAMP-UDP) 500 counts (TCP) at each hotspot Payload- 42 bytes in all drive

Table-68: Data test detail

Note-

- 5 Data iteration to be done at each hotspot location.
- Minimum 5 iteration to be made during the walk test. Iteration count will be increased based on walk test distance.
- TWAMP-UDP & TCP test to be performed only once at hotspot location.
- Youtube & Web browsing test to be performed at static location only.
- All values are taken up to two decimal places with round off.
- Airtel server was used for FTP Download, FTP Upload, TCP and TWAMP testing, for Airtel.
- Delhi-based TRAI server was used for HTTP Download, HTTP Upload, TCP and TWAMP testing, for MTNL/BSNL.
- RJIL server was used for FTP Download, FTP Upload, TCP and TWAMP testing, for RJIL.
- VIL server was used for HTTP Download, HTTP Upload, TCP and TWAMP testing, for VIL.

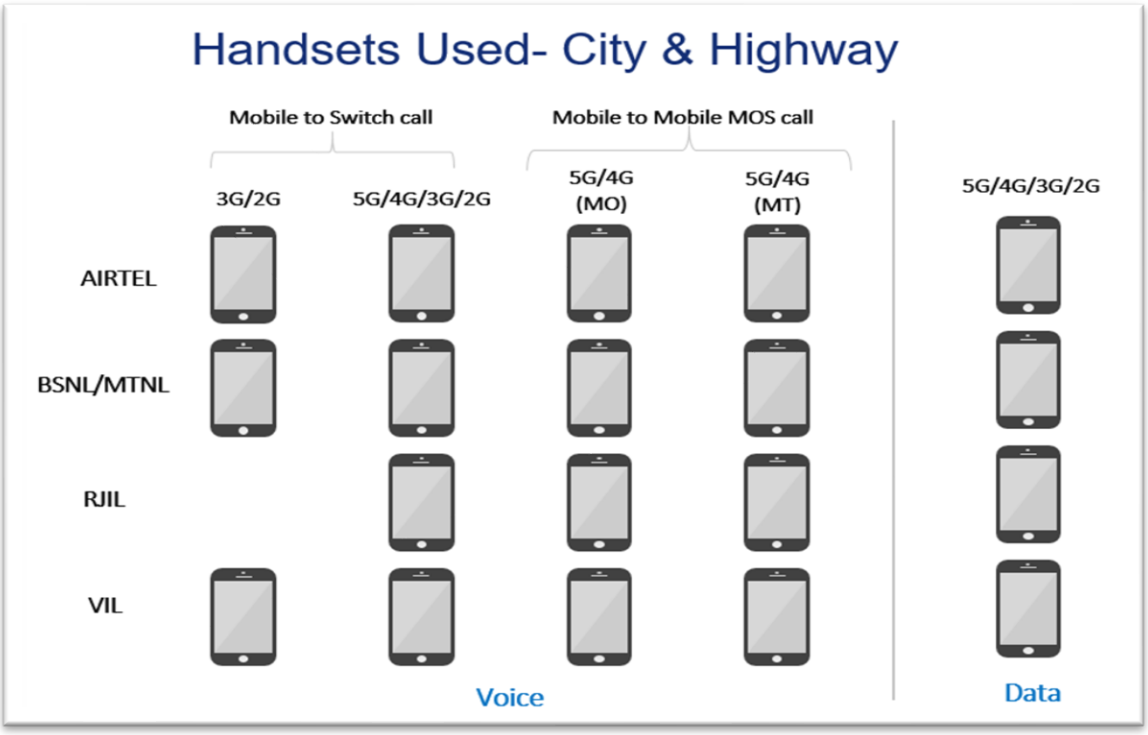


Figure-319: Number of handsets used in city & highway drive

MO: Mobile originating

MT: Mobile terminating

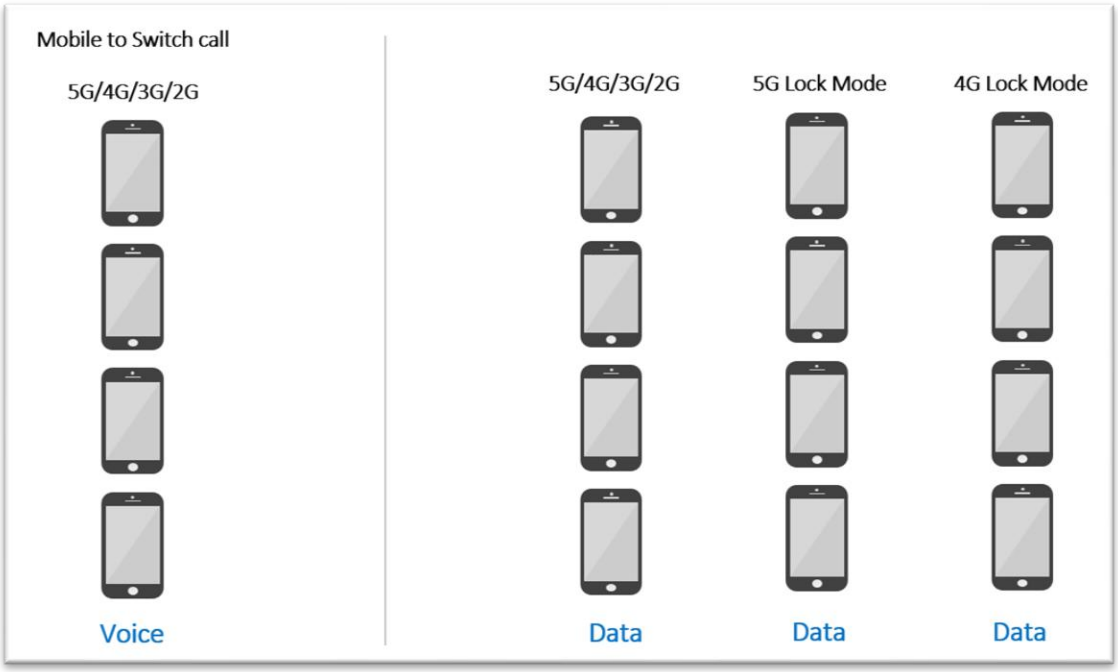


Figure-320: Number of handsets used in Metro/metro/walktest/hotspot/coastal area.

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)

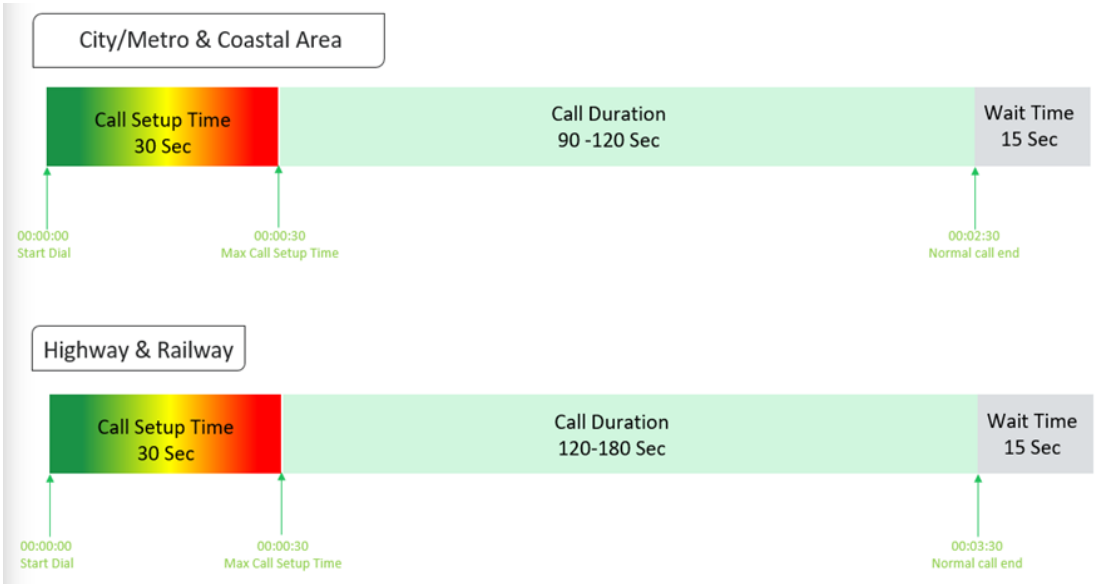


Figure-321: Voice test script for city/Metro/metro/highway & coastal area

- 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-322: 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

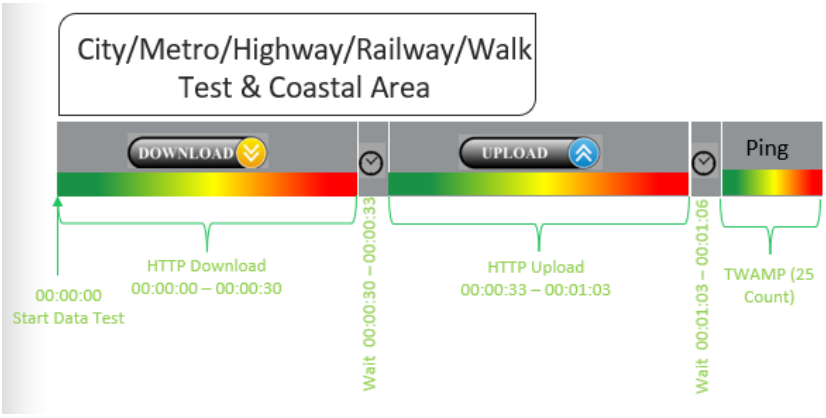


Figure-323: Data test script used in city/metro/Metro/highway/walk test & coastal area

(d) Static Data(internet) testing

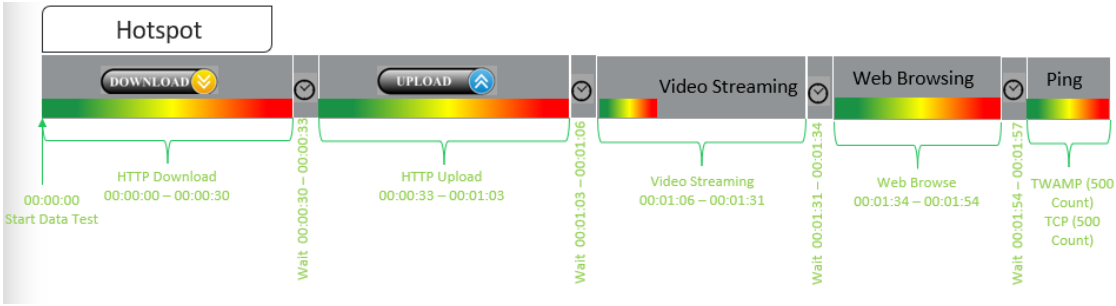


Figure-324: Data test script used at hotspot

- 5 Data iteration done at each hotspot location
- Min. 5 iteration made during the walk test.
- Web browsing duration mentioned above is for one web site only.
- One ping iteration (with 500 Count of each- TWAMP & TCP) done at hotspot location.

7.2 Appendix-II

7.2.1 Network Performance Parameters for Voice calls

Parameter Name	Definition
Call Setup Success Rate	(i) Call Setup Success Rate is defined as the ratio of Established Calls to Call Attempts. 'Established Calls' mean the following events have happened in call setup: (a) Call attempt is made (b) The signaling channel is allocated (c) The call is routed to the outwards path of the terminating network (d) An alert signal is received by caller in the form of ring back tone, busy tone, or an announcement. CSSR = (Total Call Established/ Total Call Attempt) *100 As per QoS Regulation 2024 benchmark value is **>=98%**
Drop Call Rate	Call drop represents the service provider network's ability to maintain a call once it has been successfully established. This parameter shall include both incoming calls and outgoing calls which, once they have been established and have an assigned traffic channel/ bearer, are dropped, or interrupted before their normal completion by the user, the cause of the early termination being within the service provider's network Drop Call Rate = (Total Call Drop/Total Call Established) *100 As per QoS Regulation 2024 benchmark value is **<=2%**
Call Setup Time	Time taken from call initiate to call alerting/ringing. Call Setup Time = T2- T1 T2- Ringing (VoLTE/VoNR) & Alerting (for WCDMA & GSM), T1- Invite (VoLTE/VoNR) & CM Service Request (for WCDMA & GSM)
Voice Quality (MOS)	Voice quality in mobile networks is measured with algorithms based on ITU-T P.863 (POLQA). The grading for Voice quality has been given as: Excellent: MOS $\geq$ 4 and < 5 Good : MOS $\geq$ 3 and < 4 Fair : MOS $\geq$ 2 and < 3 Poor : MOS $\geq$ 1 and < 2
Handover Success Rate	Handover Success Rate = Count of successful handovers (All Technology Handover combined) / Total count of Handover Attempt (All Technology Handover combined) *100 Handover type which are considered- 2G Inter & Intra cell, 3G Soft & IRAT, 4G Inter & Intra frequency & SRVCC, 5G Inter & Intra frequency & 5G to 4G handovers.
Silence Call	A call which has ≥ 4 sec continuous RTP gap is considered as a Silence Call. Silence call rate = (count of silence call / Total calls established) *100 If a call observes multiple silence count >=4 sec in a particular established call it has been taken as one silent event.

<table>
<tr><td>Jitter</td><td>The inter arrival jitter is the difference in the relative transit time for two packets. The relative transit time is the difference between a packet's Real-time Transport Protocol (RTP) timestamp and the receiver's clock at the time of arrival, measured in the same units. If Si is the RTP timestamp from packet i, and Ri is the time of arrival in RTP timestamps units for packet i, then for two packets i and j the inter-arrival jitter D can be expressed as:
D(i,j) = (Rj - Ri) - (Sj - Si)

The interarrival jitter is calculated continuously as each data packet i is received from source SSRC_n, using this difference D for that packet and the previous packet i-1 in order of arrival (not necessarily in sequence), according to the formula
J(i) = J(i-1) + (|D(i-1,i)| - J(i-1))/16 or 8</td></tr>
<tr><td>Downlink Packet Drop Rate</td><td>Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source_SSRC and sequence number) at call originating handset.
This KPI is calculated from MOS call for packet call only (VoNR/VoLTE)</td></tr>
<tr><td>Uplink Packet Drop Rate</td><td>Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source_SSRC and sequence number) at call terminating handset. This KPI is calculated from MOS call for packet call only (VoNR/VoLTE).</td></tr>
<tr><td>Signal Strength</td><td>Signal strength is the signal power level received by the wireless user.

<table>
<tr><td rowspan="2">Parameter Name</td><td rowspan="2">Technology</td><td colspan="4">Signal Strength (dBm)</td></tr>
<tr><td>Excellent</td><td>Good</td><td>Fair</td><td>Poor</td></tr>
<tr><td>Rx Level</td><td>GSM</td><td>0 to ≥ -65</td><td><-65 to ≥ -75</td><td><-75 to ≥-85</td><td><-85 to min</td></tr>
<tr><td>RSCP</td><td>WCDMA</td><td>0 to ≥ -70</td><td><-70 to ≥ -80</td><td><-80 to ≥ -90</td><td><-90 to min</td></tr>
<tr><td>RSRP</td><td>LTE</td><td>0 to ≥ -80</td><td><-80 to ≥ -95</td><td><-95 to ≥-110</td><td><-110 to min</td></tr>
<tr><td>SS_RSRP</td><td>NR</td><td>0 to ≥ -80</td><td><-80 to ≥ -95</td><td><-95 to ≥-110</td><td><-110 to min</td></tr>
</table>
</td></tr>
</table>

Table-69: Network performance parameter and definition voice

7.2.2 Network Performance Parameters Data tests

Parameter Name	Definition
Download Speed (Mbps)	The download speed is defined as the data transmission rate that is achieved for downloading a test file from a test server to a test device. Download Speed = Total bytes transferred during download / Total time for transfer • 80th percentile (upper range) & 20th percentile (lower range) value has been calculated for download throughput in dynamic drive and Hotspot combine data
Upload Speed (Mbps)	The upload speed is the data transmission rate that is achieved for uploading a test file from a test device to a test server. Upload Speed = Total bytes transferred during upload / Total time for transfer. • 80th percentile (upper range) & 20th percentile (lower range) value has been calculated for upload throughput in dynamic drive and Hotspot combine data.
Download Session Setup Success Rate	(total download session established (successfully connected to server)/ total download session attempt) *100. This KPI has been calculated for Hotspot only.

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

Table-70: Network performance parameter and definition Data

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

Hardik Rajeshbhai Patel
Digitally signed by Hardik Rajeshbhai Patel
Date: 2026.04.25 22:13:20 +05'30'