



TELECOM REGULATORY AUTHORITY OF INDIA

Operator Assisted Drive Test Report

Firozpur city (Punjab LSA)

March 2026

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1. Introduction

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

Accordingly, TRAI with help of TSPs teams undertake assessment of Quality of Service of mobile service through Operator Assisted Drive Test (OADT).

In OADT, 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.

2. Executive Summary

2.1 Drive test details

This report covers the findings of the OADT undertaken in Punjab License Service Area (LSA) during the month of March 2026 under the supervision of TRAI Regional Office (RO), Jaipur. Details of route/area covered during the OADT is as given below:

Sl. No	Drive test route	Type of route	Distance covered (KMs)/ Locations	From date	To date
1	Firozpur	City	102 Km	27-03-2026	27-03-2026
2	Firozpur	Hotspot	06 Locations	28-03-2026	28-03-2026

Table-1: Drive test summary

2.2 Drive test routes

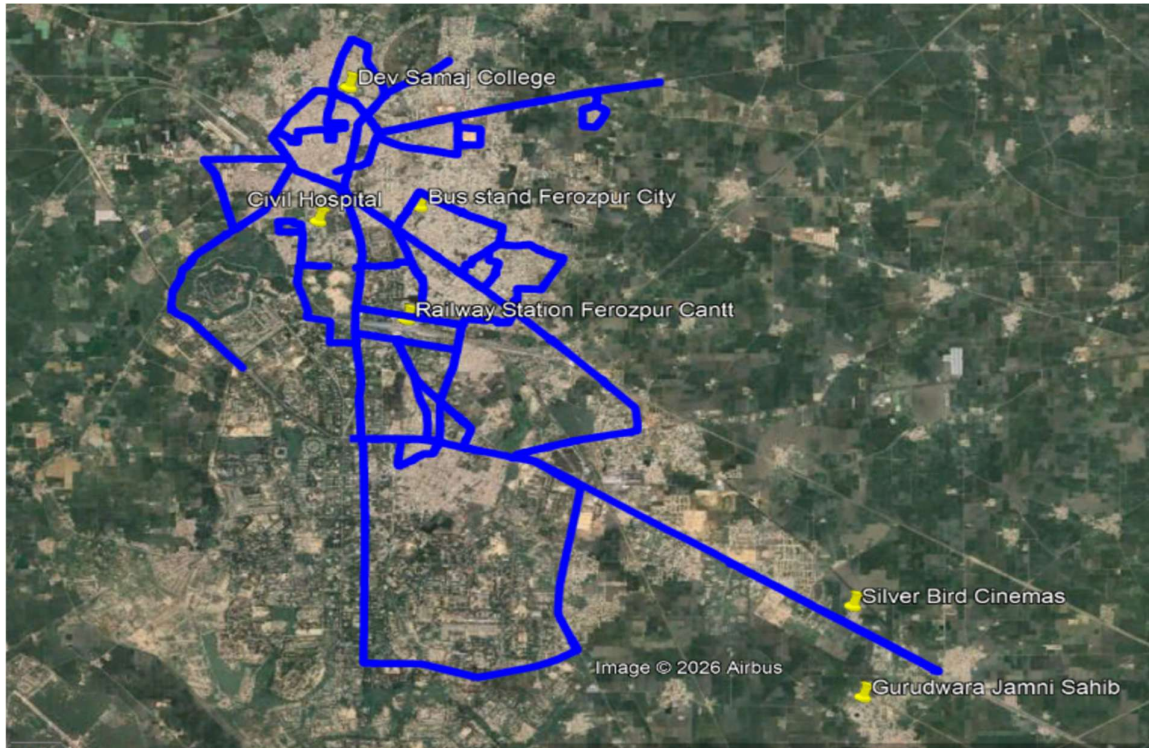


Figure-1: Drive test routes

The map provides overview of drive test routes indicating city drive & hotspots shown on the map.

2.3 Summary of areas covered

a) Ferozpur City- Shershah Chowk, Mall Road - Hussainiwala Crossing - Multani Gate - Bharat Nagar - Makhu Gate - Saheed Bhagat Singh Colony - Jira Gate - Rakhein Road - Khushal Singh Wala - Sundar Nagar - Zira Road - Mori Gate Malwal Road - Namdev Chowk - Ichewala Road - Rikhi Colony - Basti Nizammuddin - Zira Chowk - Indira Colony - Dasehra Ground - Shershah Chowk - Muktsar Road - Panje ke Uttar - Lal Kurti - Army Quarters - satiyawala - Malwal Qadim - Shershah Chowk.

b) Hotspot

1. Jamni Sahib Gurudwara
2. Silver Bird Mall
3. Railway Station Ferozpur Cantt
4. Bus Stand Ferozpur City
5. Civil Hospital
6. Dev Samaj College

2.4 Telecom service providers detected frequency bands

Technologies covered during the OADT and frequency bands in use are summarised in below table.

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

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

2.5 Time duration of drive test

The OADT was conducted during Busy hours of the both days, i.e., Between 9 AM to 1 PM and 5 PM to 9 PM.

Detailed QoS Performance Analysis

3. Detailed QoS performance analysis

3.1 Overview

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

3.2 City

Drive test has been conducted on 27th to 28th March 2026 in Firozpur. (refer Table-1

3.2.1 Drive test route

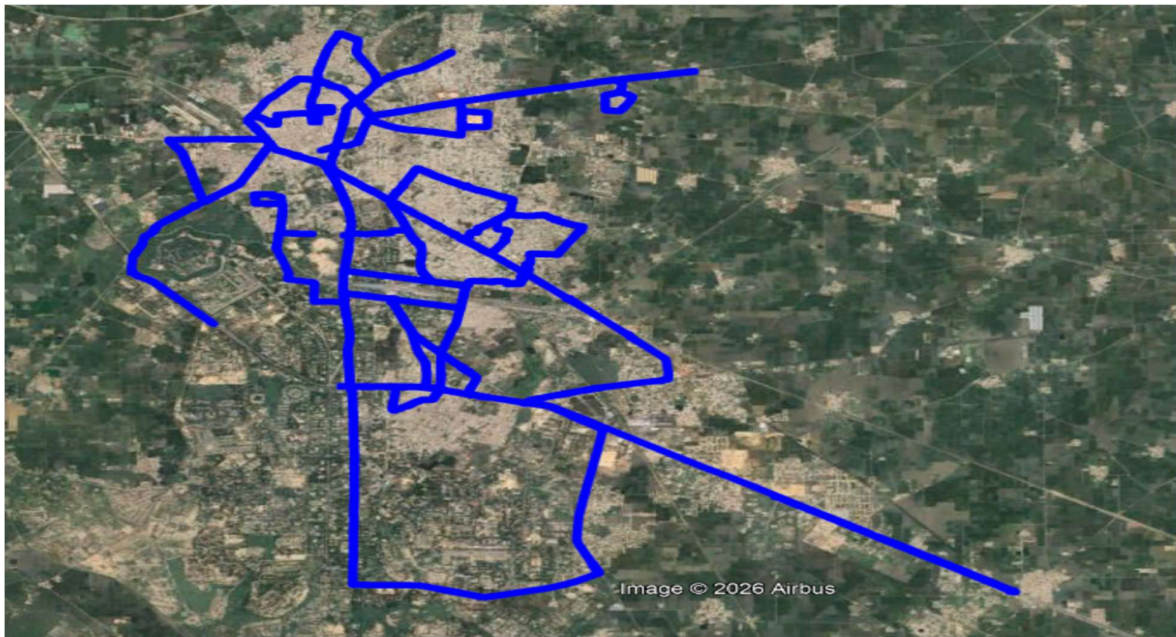


Figure- 2: Drive test routes.

3.2.2 Areas covered

Shershah Chowk - Mall Road - Hussainiwala Crossing - Multani Gate - Bharat Nagar -Makhu Gate - Saheed Bhagat Singh Colony - Jira Gate - Rakhein Road - Khushal Singh Wala - Sundar Nagar - Zira Road - Mori Gate Malwal Road - Namdev Chowk - Ichewala Road - Rikhi Colony - Basti Nizammuddin - Zira Chowk - Indira Colony - Dasehra Ground - Shershah Chowk - Muktsar Road - Panje ke Uttar - Lal Kurti - Army Quarters - satiyawala - Malwal Qadim - Shershah Chowk.

3.2.3 Voice performance

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

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	208	196	183
Call Setup Success Rate %	99.51	99.49	100
Drop Call Rate %	0.96	0.51	0.00
Call Setup Time-Average (Second)	3.45	3.07	2.72
Handover Success Rate %	98.03	99.24	95.98

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

(b) Technology wise Unique cell id's covered in voice test: This section represents technology wise Number of unique cell id's covered in Voice test.

Technology	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
3G	NA	NA	NA
2G	113	51	112

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

Note-

- RJIL does not have 3G/2G network.
- NA- Cells not captured in respective technology.

(c) Network Signal Strength distribution: The following chart represents signal strength distribution for 3G/2G network mode only.

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

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempts	207	191	194	184
Call Setup Success Rate %	99.51	95.81	100	99.46
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time Average (Second)	1.99	3.19	0.98	1.37
Handover Success Rate %	100.00	100.00	99.87	100.00

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

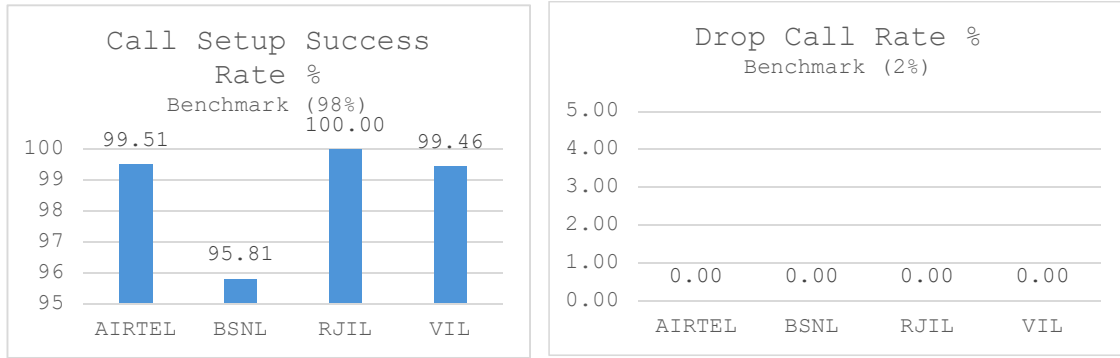


Figure-3: Performance for call setup success rate and Call drop rate.

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	206	191	210	171
Call Silence Rate %	0.00	*	0.95	0.00
Number of silence instances for >2 sec	0	*	3	0
Packet loss Rate Downlink %	0.1	NA	2.54	0.41
Packet loss Rate Uplink %	0.2	NA	2.51	0.37

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

*The Call silence rate not captured due to Test Kit issue.

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

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

Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
Total Number of MOS Samples for calls in table-6	1140	1013	1854	1108
Speech Quality (Average MOS Score)	4.11	3.44	4.22	4.07

Table-7: Summary of speech quality (MOS) samples.

(f) Technology wise Unique cell id's covered in voice test: This section represents technology wise Number of unique cell id's covered in Voice test.

Number of unique cell id's covered in Voice test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
5G	NA	NA	144	NA
4G	166	76	85	170
3G	NA	NA	NA	NA
2G	--	Nil	NA	NA

Table-8: Technology wise number of network cell id's latched during drive test.

-- No SRVCC/CSFB to 2G happened.

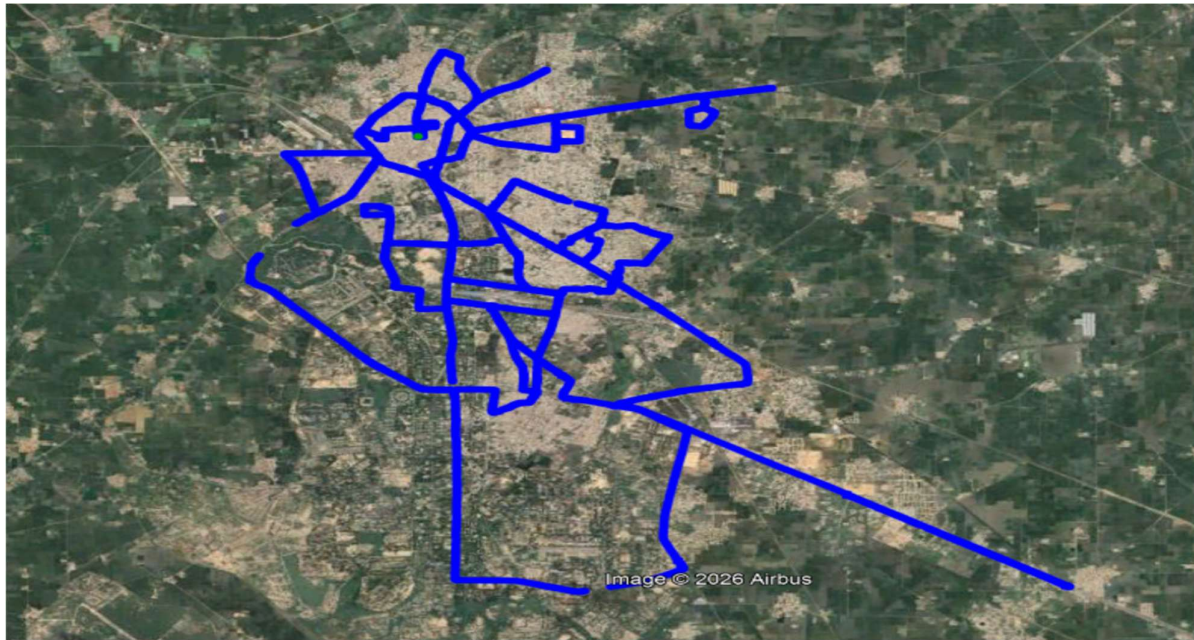


Figure-4: Serving technology plots in auto-selection (5G/4G/3G/2G)- RJIL.

(g) Network Signal Strength distribution: The following chart provides signal strength distribution for auto-selection mode (5G/4G/3G/2G). (refer figure-14 for map view)

3.2.4 Data performance

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

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	105.00	19.85	316.30	28.87
	80th Percentile	240.00	27.02	452.49	58.49
	20th Percentile	2.00	3.97	179.37	12.55
Upload Throughput (Mbits/s)	Average	26.00	2.77	40.39	25.38
	80th Percentile	50.00	5.5	65.21	40.62
	20th Percentile	5.00	0.55	14.58	14.84
Latency (ms)	50th Percentile	31.00	175.51	14.00	23.50

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

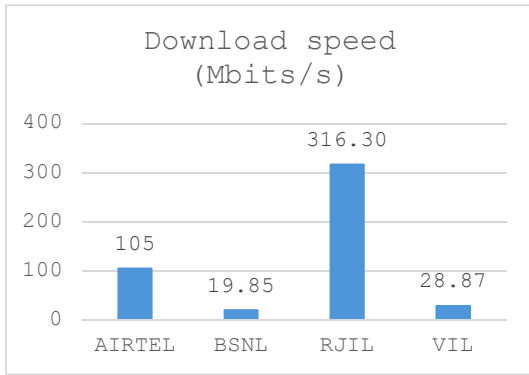


Figure- 5: Download throughput.

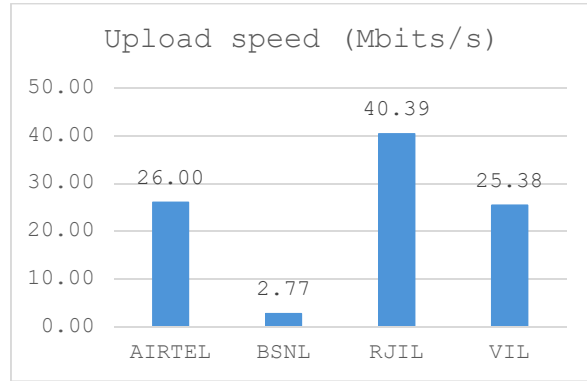


Figure- 6: Upload throughput

(b) Technology wise Unique cell id’s covered in data test: This section represents technology wise Number of unique cell id’s covered in Voice test.

Number of unique cell id’s covered in Data test- Technology wise				
Technology	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
5G	85	NA	140	NA
4G	122	61	3	137
3G	NA	NA	NA	NA
2G	--	Nil	NA	NA

Table-10: Technology wise number of network cell id’s latched during drive test.

NA- Cells not captured in respective technology.

-- No SRVCC/CSFB to 2G happened

3.3 Hotspots

Hotspot testing has been done on 28th March 2026. Six locations were tested in the city.

3.3.1 Locations

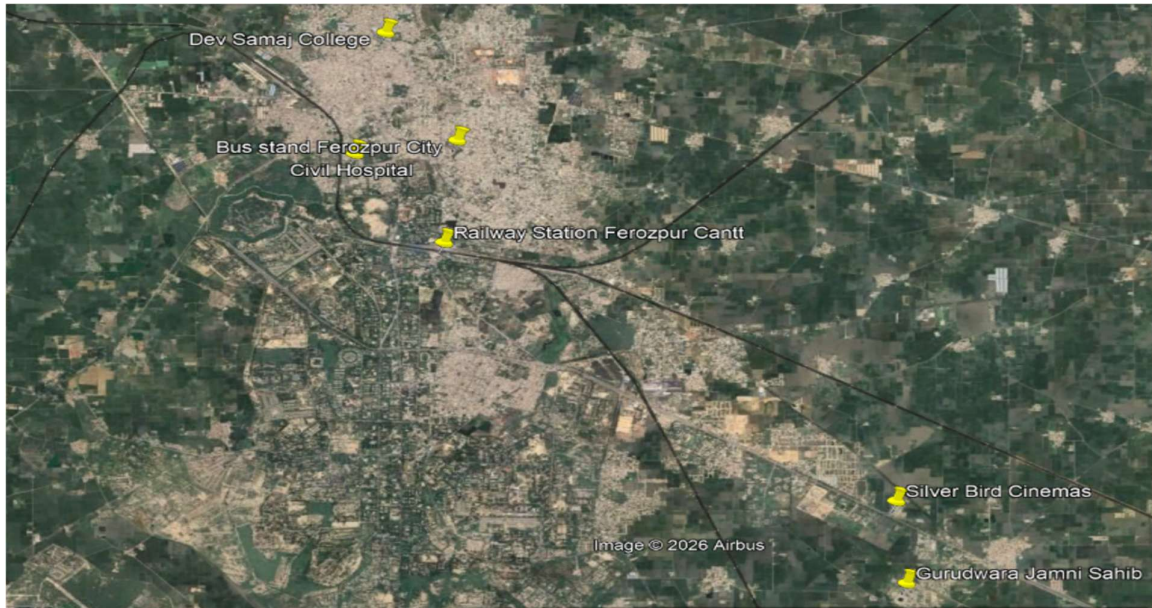


Figure-7: Hotspot locations

3.3.2 Hotspot covered

1. Jamni Sahib Gurudwara
2. Silver Bird Mall
3. Railway Station Firozpur Cantt
4. Bus Stand Firozpur City
5. Civil Hospital
6. Dev Samaj College

3.3.3 Voice performance

Overall Voice Performance				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	60	60	60	60
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.34	2.69	1.03	1.25

Table-11: Overall summary of voice call performance in network auto-selection mode (5G/4G/3G/2G).

Jamni Sahib Gurudwara				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.25	2.84	1.06	0.90

Table-12: Summary of voice call performance in network auto-selection mode 5G/4G/3G/2G).

Silver Bird Mall				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.40	2.91	1.00	1.32

Table-13: Summary of voice call performance in network auto-selection mode 5G/4G/3G/2G).

Railway Station Firozpur Cantt				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.33	2.62	0.90	1.4

Table-14: Summary of voice call performance in network auto-selection mode 5G/4G/3G/2G).

Bus Stand Firozpur City				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.30	2.53	1.02	1.25

Table-15: Summary of voice call performance in network auto-selection mode 5G/4G/3G/2G).

Civil Hospital				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.48	2.72	1.08	1.21

Table-16: Summary of voice call performance in network auto-selection mode 5G/4G/3G/2G).

Dev Samaj College				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	10	10	10	10
Call Setup Success Rate %	100.00	100.00	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Sec)	1.32	2.54	1.13	1.42

Table-17: Summary of voice call performance in network auto-selection mode 5G/4G/3G/2G).

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

Overall Data Performance				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	287.67	26.84	329.30	45.00
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	57.67	3.05	46.37	34.46
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.64	5.61	1.20	8.10
Youtube Initial Buffer Delay (Second)	0.85	22.73	0.40	1.68
Latency (ms)-50th Percentile	15.67	39.07	18.50	27.25
Jitter (ms)	3.95	1.41	4.29	3.78
Packet Loss Rate%	0.00	Kit issue	0.18	0.00

Table-18: Overall Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Jamni Sahib Gurudwara				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	275.00	33.47	381.32	66.06
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	64.00	0.81	29.10	42.15
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.59	2.71	0.97	8.07
Youtube Initial Buffer Delay (Second)	0.71	23.04	0.39	1.81
Latency (ms)-50th Percentile	13.00	43.04	18.50	28.5
Jitter (ms)	2.00	1.76	3.71	3.73
Packet Loss Rate%	0.00	Kit Issue	0.04	0.00

Table-19: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G)

Silver Bird Mall				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	215.00	7.54	186.01	55.32
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	31.00	1.71	21.57	28.76
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.86	20.37	1.38	8.06
Youtube Initial Buffer Delay (Second)	0.88	22.97	0.39	1.51
Latency (ms)-50th Percentile	25.00	36.34	18.00	26.0
Jitter (ms)	3.86	1.26	4.21	2.31
Packet Loss Rate%	0.00	Kit issue	0.04	0.00

Table-20: Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Railway Station Firozpur Cantt				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	203.00	25.60	337.42	25.50
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	67.00	7.32	25.46	24.03
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.40	2.35	1.07	8.09
Youtube Initial Buffer Delay (Second)	1.02	22.46	0.46	2.01
Latency (ms)-50th Percentile	15	33.61	18.50	24.00
Jitter (ms)	12.34	1.31	4.42	3.48
Packet Loss Rate%	0.00	Kit issue	0.02	0.00

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

Bus Stand Firozpur City				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	319.00	23.03	375.38	29.52
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	63.00	4.82	53.68	33.70
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	7.7	2.70	1.36	8.15
Youtube Initial Buffer Delay (Second)	0.83	23.04	0.37	2.09
Latency (ms)-50th Percentile	13.00	41.04	19.00	28.00
Jitter (ms)	1.51	1.47	4.64	4.58
Packet Loss Rate%	0.00	Kit issue	0.00	0.00

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

Civil Hospital				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	328.00	39.69	305.19	57.54
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	55.00	2.23	68.84	37.82
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.10	3.32	1.29	8.1
Youtube Initial Buffer Delay (Second)	0.93	22.52	0.41	0.90
Latency (ms)-50th Percentile	15.00	42.00	19.00	28.5
Jitter (ms)	2.75	1.57	4.70	3.86
Packet Loss Rate%	0.00	Kit issue	0.06	0.00

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

Dev Samaj College				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	386.00	31.70	390.47	36.05
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	66.00	1.40	79.57	40.32
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	6.20	2.23	1.11	8.10
Youtube Initial Buffer Delay (Second)	0.70	22.32	0.39	1.732
Latency (ms)-50th Percentile	13	38.40	17.50	28.50
Jitter (ms)	1.21	1.07	4.08	4.69
Packet Loss Rate%	0.00	Kit issue	0.06	0.00

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

4. TSP wise signal strength(Firozpur City):

4.1 AIRTEL



Fig- 8: Signal strength 3G/2G network mode :Airtel



Figure-9: Signal strength auto-selection mode 5G/4G/3G/2G – Airtel

4.2 BSNL



Figure-8: Signal strength 3G/2G network mode – BSNL

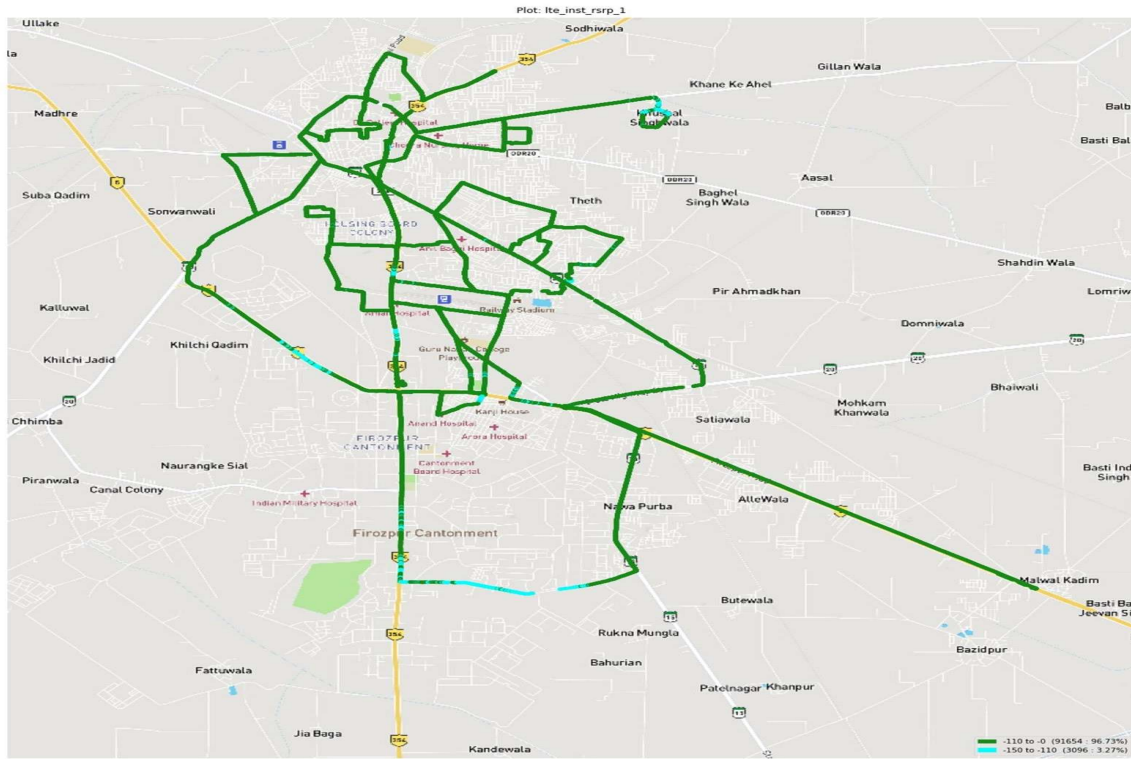


Figure-9: Signal strength auto-selection mode 5G/4G/3G/2G – BSNL

4.3 RJIL

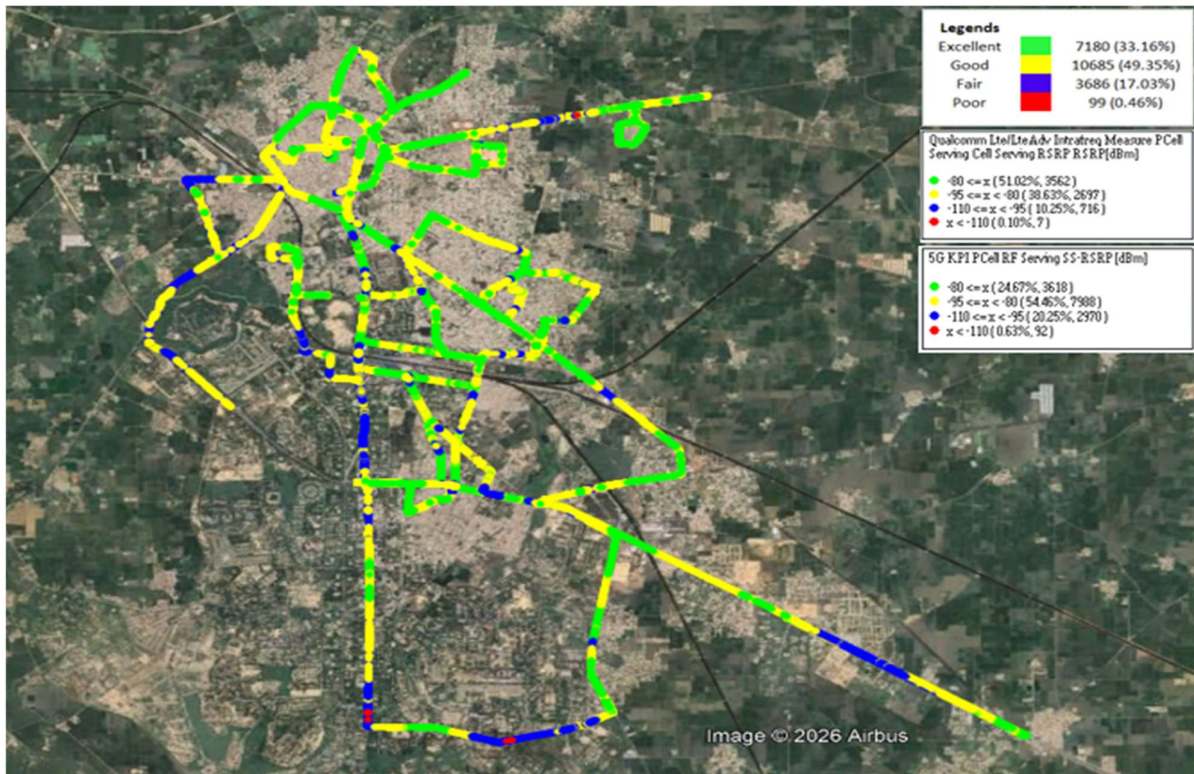


Figure-10: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

4.4 VIL

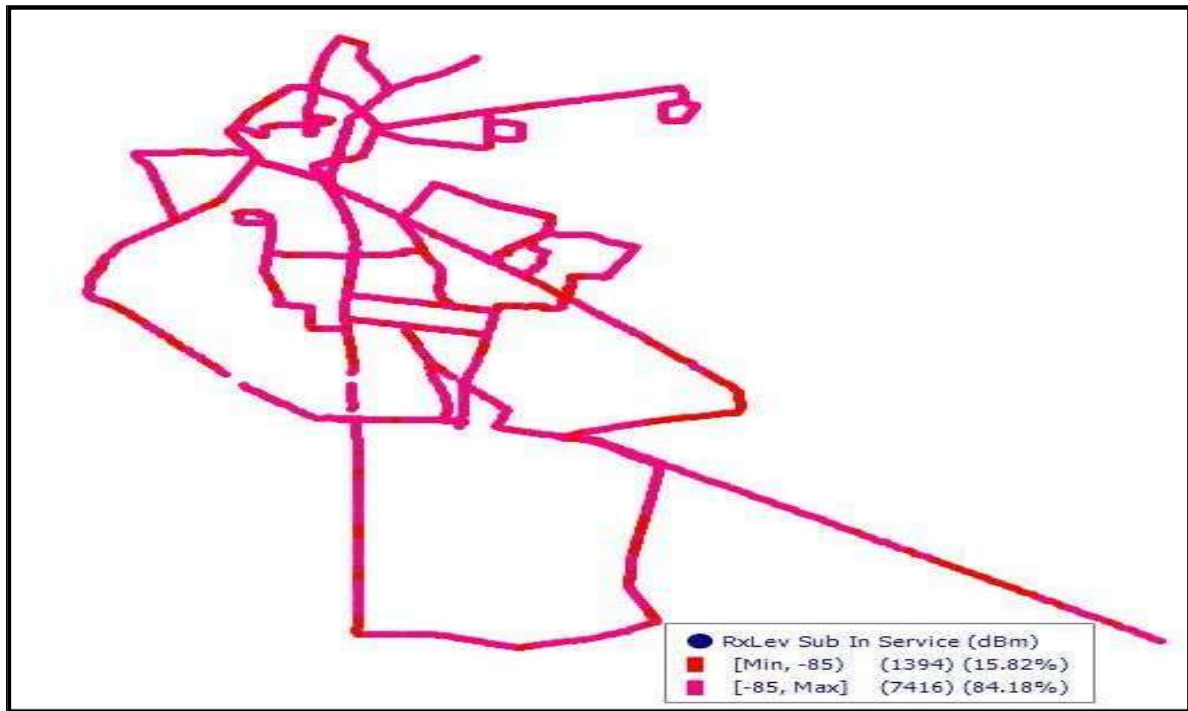


Figure-11: Signal strength 3G/2G network mode-VIL



Figure-12: Signal strength auto-selection mode 5G/4G/3G/2G - VIL

5. Conclusion:

1. The operator wise comparative Analysis of various key parameters is given in table below:

Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Setup Success Rate %	99.51	95.81	100	99.46
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time Average (Second)	1.99	3.19	0.98	1.37
Silence Call Rate %	0.00	*	0.95	0.00
Average MOS score	4.11	3.44	4.22	4.07
Download Throughput (Declared)	34.58	5	15	15
Download Throughput (Average)	105.00	19.85	316.30	28.87
Upload Throughput (Declared)	15.89	3	7	8
Upload Throughput (Average)	26.00	2.77	40.39	25.38
Latency in ms (50 th percentile)	31.00	175.51	14.00	23.50

Table:25 Operator wise comparative analysis of QoS parameters

*The Call silence rate not captured by BSNL due to Test Kit issue.

2. A detail of actionable items and status are given here under:

(A) BSNL Actionable Items:

1. Call Setup Success rate (95.81%) BSNL not meeting the QoS benchmark.

BSNL Reply: CSSR was low due to four Calls blocked. Optimization has been one at three locations and proposal for one new site has already been sent to circle office against Tower Vision ID- ATPUFER1125 at Lat 30.90711 Long 74.61895 and will be installed in next phase.

2. Latency (175.51 ms) BSNL not meeting the QoS benchmark:

BSNL Reply: High latency observed near Multani Gate, Ramgarhia road, backside district hospital, Basti Nizamudin and cantt area, due to on 3 sites media issue observed and now rectified. In Cantt area due to less coverage for that new site already proposed.

(B) No actionable items are there iroz for other TSPs.

Note:

1. BSNL has been asked to provide post rectification drive test report and give definite timelines for proposal of new site to be installed.