



**TELECOM REGULATORY AUTHORITY OF INDIA**

*Operator Assisted Drive Test Report*

*Bhinmal city (Rajasthan LSA)*

*March 2026*

Contents

- 1. Introduction ..... 2
- 2. Executive Summary ..... 2
  - 2.1 Drive test details ..... 2
  - 2.2 Drive test routes ..... 3
  - 2.3 Summary of areas covered ..... 3
  - 2.4 Telecom service providers detected frequency bands ..... 3
- 3. Detailed QoS performance analysis ..... 4
  - 3.1 Overview..... 5
  - 3.2 City ..... 5
    - 3.2.1 Drive test route.....5
    - 3.2.2 Areas covered .....5
    - 3.2.3 Voice performance.....5-7
    - 3.2.4 Data performance.....7-8
  - 3.3 Hotspots ..... 9
    - 3.3.1 Locations.....9
    - 3.3.2 Hotspot covered .....9
    - 3.3.3 Voice performance.....9-10
    - 3.3.4 Data performance (Auto-selection mode 5G/4G/3G/2G) 1010-11
- 4. TSP wise Signal strength .....11-14
- 5. Conclusion ..... 15

## 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 (LSA)

### 2.1 Drive test details

This report covers the findings of the OADT undertaken in Rajasthan 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	Bhinmal	City	16KM	24-3-2026	24-3-2026
2	Bhinmal	Hotspot	02 Locations	24-3-2026	24-3-2026

**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.

## 2.3 Summary of areas covered

a) **City**- 72 Jinalaya, Mahaveer Nagar Station road, Krishi mandi, Railway Station, LMV chauraha, Bus stand, Mahaveer Chauraha, Khari Road, SDM Office, Vandhar Road, Karda Char rasta, Nahar Hospital, Bhagal Road, Jujani Road, Bus stand chauraha, Holi Cowk, Sivraj Stadium, yatayat karyalay, G.K. Govani college.

### b) Hotspot

1. Bus Stand, Bhinmal
2. Govt. College , Bhinmal

## 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	900,1800,2100,2300
3	Bharti Airtel Ltd.	5G	3500
4	BSNL	2G	900
5	BSNL	3G	-
6	BSNL	4G	700,850
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.

# 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 24<sup>th</sup> March 2026 in Bhinmal. (refer table-1)

##### 3.2.1 Drive test route



Figure- 2: Drive test routes.

##### 3.2.2 Areas covered

72 Jinalaya, Mahaveer Nagar Station road, Krishi mandi, Railway Station, LMV chauraha, Bus stand, Mahaveer Chauraha, Khari Road, SDM Office, Vandhar Road, Karda Char rasta, Nahar Hospital, Bhagal Road, Jujani Road, Bus stand chauraha, Holi Cowk, Sivraj Stadium, yatayat karyalay, G.K. Govani college.

##### 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	54	42	48
Call Setup Success Rate %	100.00	100.00	100
Drop Call Rate %	0.00	0.00	0.00
Call Setup Time-Average (Second)	3.14	3.40	3.38
Handover Success Rate %	100.00	100.00	96.00

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.

Number of unique cell id's covered in Voice test- Technology wise			
Technology	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
3G	NA	NA	NA
2G	25	100	22

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

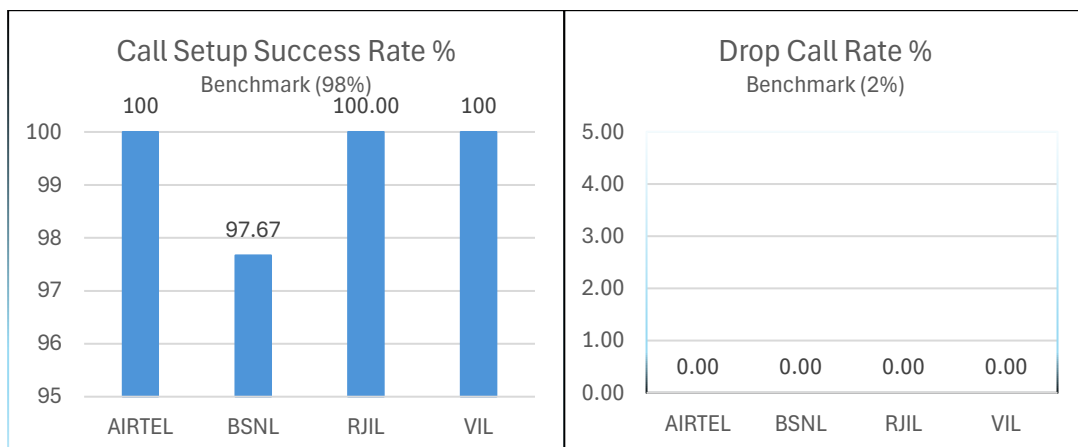
**Note-**

- RJIL does not have 3G/2G network.
- NA- Service provider doesn't provide services in respective technology.

**(c) 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	54	44	57	47
Call Setup Success Rate %	100.00	97.67	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time Average (Second)	1.80	2.46	0.69	1.61
Handover Success Rate %	100.00	100.00	99.69	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
<b>Call Established (within service provider Network)</b>	54	*	49	100
<b>Silence Call Rate %</b>	2.70	*	0.00	0.00
<b>Number of silence instances for &gt;2 sec</b>	1	*	4	0
<b>Packet loss Rate Downlink %</b>	0.23	*	4.26	0
<b>Packet loss Rate Uplink %</b>	0.10	*	3.95	0

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

\*The BSNL drive test tool kit does not provide silence call rate/instances, packet loss rate, or downlink and uplink data.

**(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). 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
<b>Total Number of MOS Samples for calls in table-6</b>	251	*	244	324
<b>Speech Quality (Average MOS Score)</b>	4.09	*	4.22	4.05

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

\*The BSNL drive test tool kit does not provide silence call rate/instances, packet loss rate, or downlink and uplink data.

**(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
<b>5G</b>	NA	NA	23	NA
<b>4G</b>	0	13	27	28
<b>3G</b>	48	NA	NA	NA
<b>2G</b>	0	10	NA	0

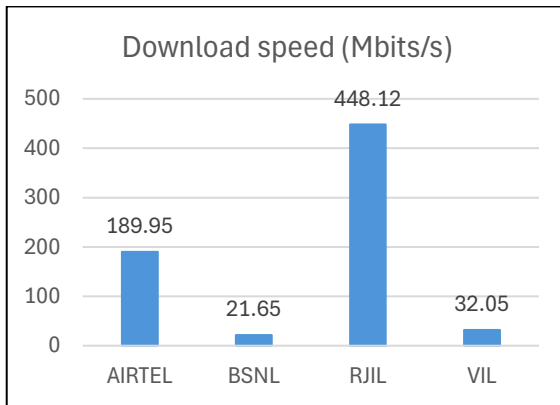
**Table-8:** Technology wise number of network cell id's latched during drive test.

### 3.2.4 Data performance

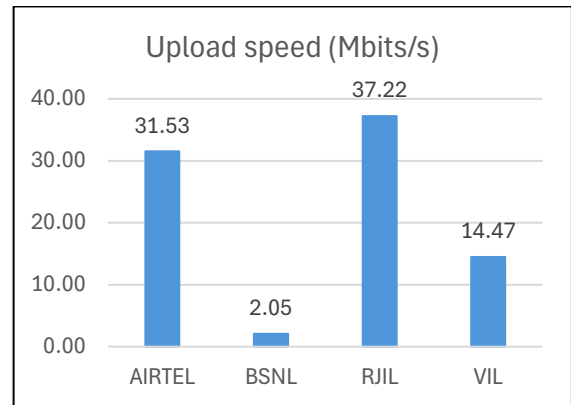
#### (a) Data Parameters (Auto-selection mode- 5G/4G/3G/2G)

Parameters		Service Provider			
		Auto-selection mode (5G/4G/3G/2G)			
		AIRTEL	BSNL	RJIL	VIL
Download Throughput (Mbits/s)	Average	126.94	21.65	272.71	24.10
	80th Percentile	189.95	29.30	448.12	32.05
	20th Percentile	59.3	12.50	58.57	16.90
Upload Throughput (Mbits/s)	Average	31.53	2.05	37.22	14.47
	80th Percentile	46.17	2.35	52.65	26.51
	20th Percentile	31.53	1.80	10.98	4.33
Latency (ms)	50th Percentile	14.00	35.0	28.50	38.00

**Table-9:** Summary of Data performance in network auto-selection mod



**Figure- 4:** Download throughput.



**Figure- 5:** 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	NA	NA	37	NA
4G	NA	12	8	28
3G	48	*	NA	NA
2G	25	*	NA	0

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

\*3G technology is not available in Bhinmal city & Data test in 2g not required.

### 3.3 Hotspots

Hotspot testing has been done on 24<sup>th</sup> March 2026. Two locations have been tested in the city.

#### 3.3.1 Locations

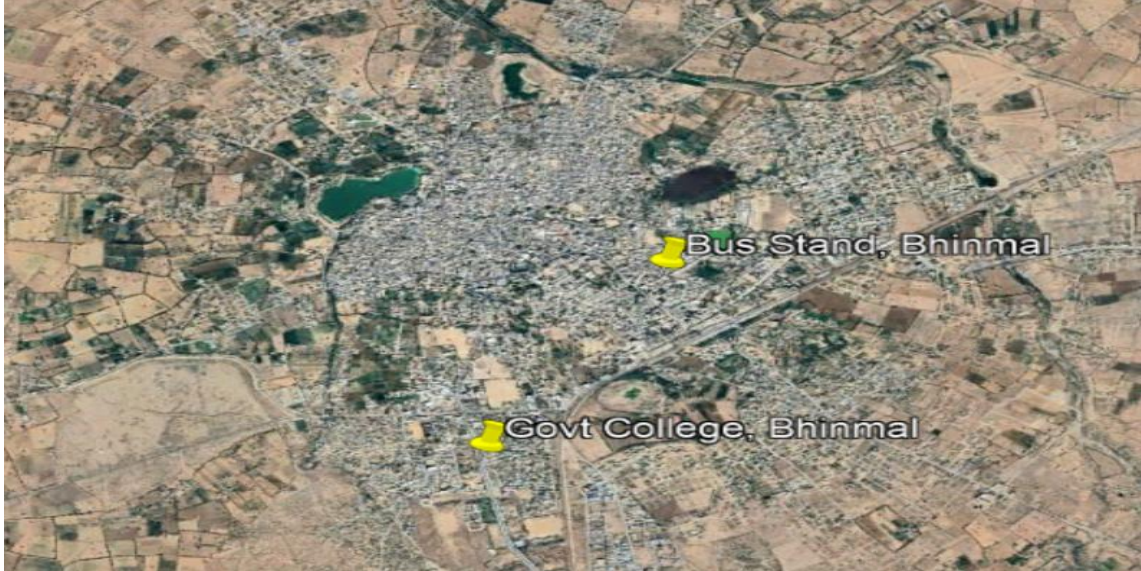


Figure- 6: Hotspot locations

#### 3.3.2 Hotspot covered

1. Bus stand, Bhinmal
2. Govt. College , Bhinmal

#### 3.3.3 Voice performance

Overall Voice Performance				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Call Attempt	20	20	20	20
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)	1.50	1.85	0.60	0.23

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

Voice Performance-Bus Stand , Bhinmal				
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)	1.16	1.60	0.67	0.21

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

Voice Performanc- Govt. College , Bhinmal				
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)	1.85	2.11	0.53	0.25

**Table-13:** 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)	258.55	20.21	397.67	48.85
Download Throughput 80th Percentile (Mbit/s)	314.23	25.80	567.59	60.21
Download Throughput 20th Percentile (Mbit/s)	59.3	9.50	254.95	37.48
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	30.68	8.50	103.34	4.97
Upload Throughput 80th Percentile (Mbit/s)	33.71	10.35	124.72	7.03
Upload Throughput 20th Percentile (Mbit/s)	31.53	6.50	82.79	2.91
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	4.69	2.57	3.32	1.55
Youtube Initial Buffer Delay (Second)	0.90	2.56	0.96	0.95
Latency (ms)-50th Percentile	19.00	64.52	21.00	60.80
Jitter (ms)	2.45	9.73	6.23	5.54
Packet Loss Rate%	0.00	0.00	0.70	0.00
Packet Loss Rate- 90th percentile	0.00	0.00	1.1	0.00

**Table-14:** Overall Summary of Data performance in network auto-selection mode (5G/4G/3G/2G).

Bus Stand , Bhinmal				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	78.00	2.07	566.13	29.91
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	21.73	8.52	126.21	1.54
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	4.94	2.35	2.86	1.52
Youtube Initial Buffer Delay (Second)	1.02	10.42	0.40	1.08
Latency (ms)-50th Percentile	20.00	42.00	21.00	76.00
Jitter (ms)	1.48	10.50	5.89	6.66
Packet Loss Rate%	0.00	0.00	0.20	0.00

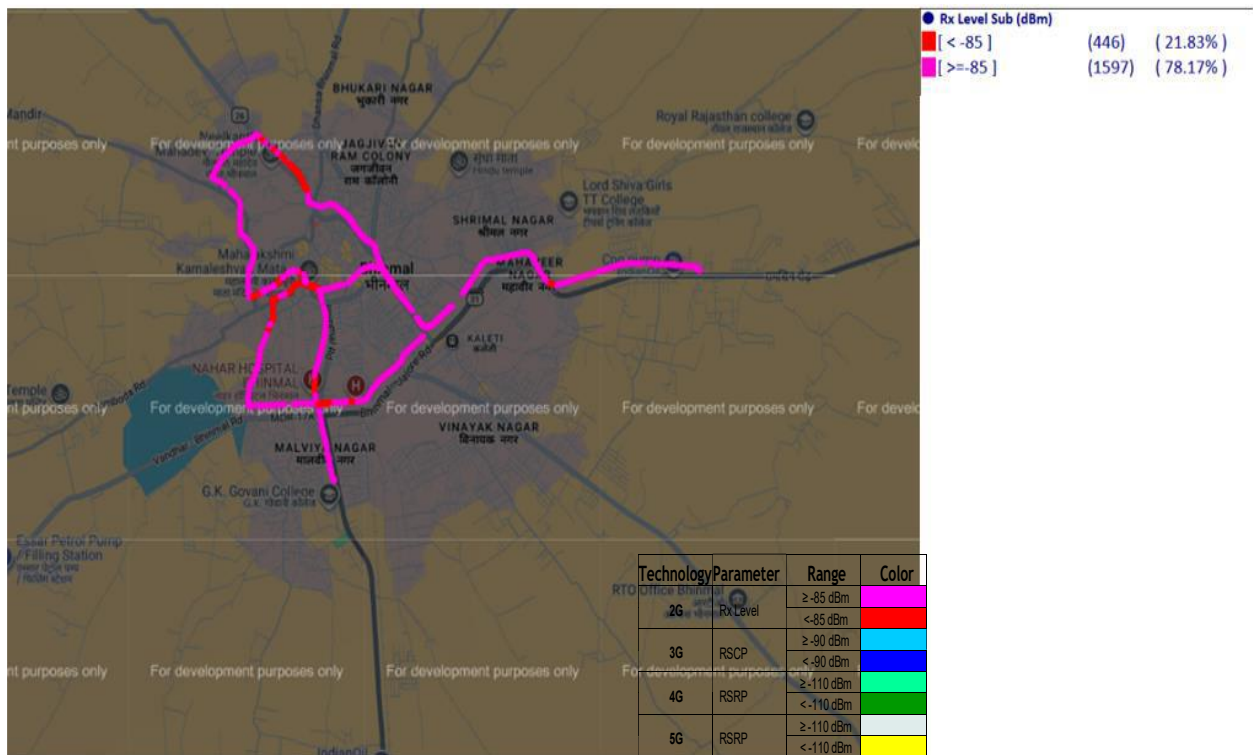
**Table-15:** Summary of Data performance in network auto-selection mode (5G/4G/3G/2G)

Govt. College , Bhinmal				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	438.90	20.35	229.21	67.78
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	39.62	8.50	80.47	8.4
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	4.43	2.57	3.77	1.65
Youtube Initial Buffer Delay (Second)	0.78	10.29	1.51	0.92
Latency (ms)-50th Percentile	18.00	42.00	21.50	57
Jitter (ms)	3.42	9.56	6.57	5.26
Packet Loss Rate%	0.00	0.00	1.2	0.00

**Table-16:** Summary of Data performance in network auto-selection mode (5G/4G/3G/2G)

## 4. TSP wise signal strength(Bhinmal City):

### 4.1 AIRTEL



**Figure-7:** Signal strength 3G/2G network mode –AIRTEL



Figure-8: Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL

## 4.2 BSNL

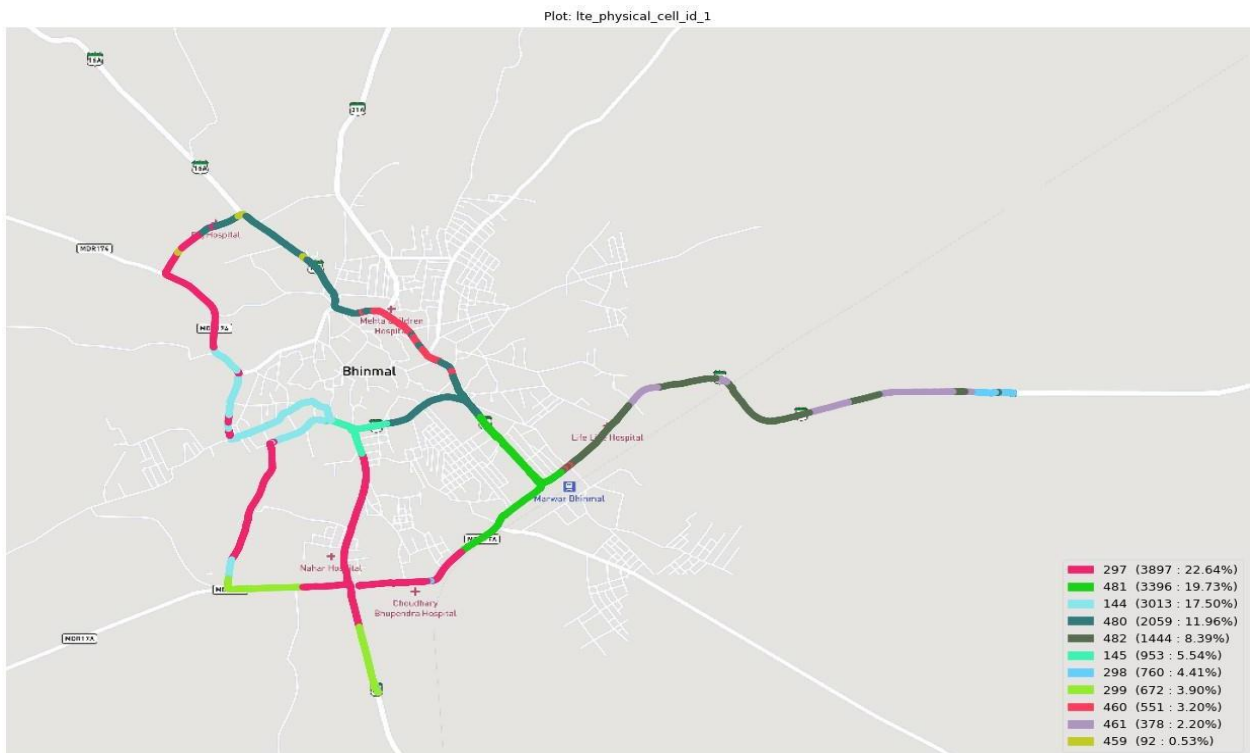


Figure-9: Signal strength 3G/2G network mode –BSNL

Plot: lte\_inst\_rsrp\_1



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

### 4.3 RJIL

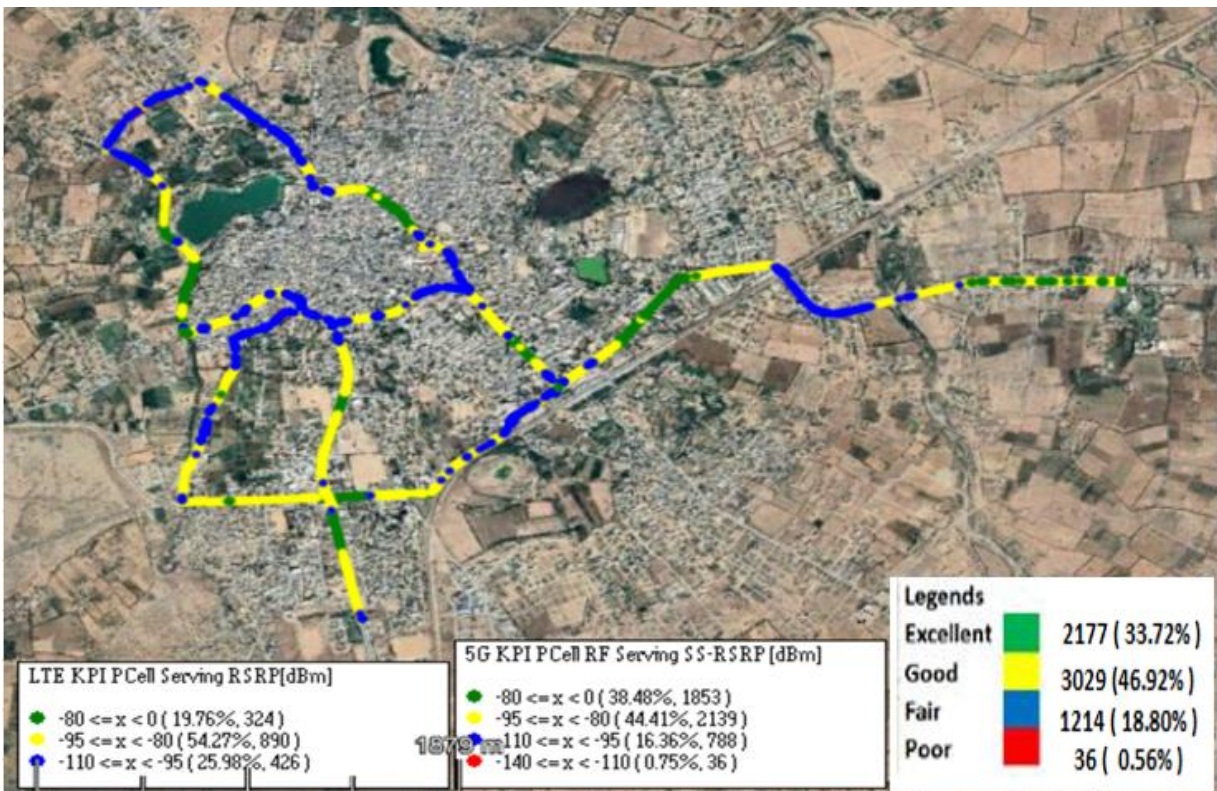


Figure-11: Signal strength auto-selection mode 5G/4G/3G/2G – RJIL.

### 4.4 VIL

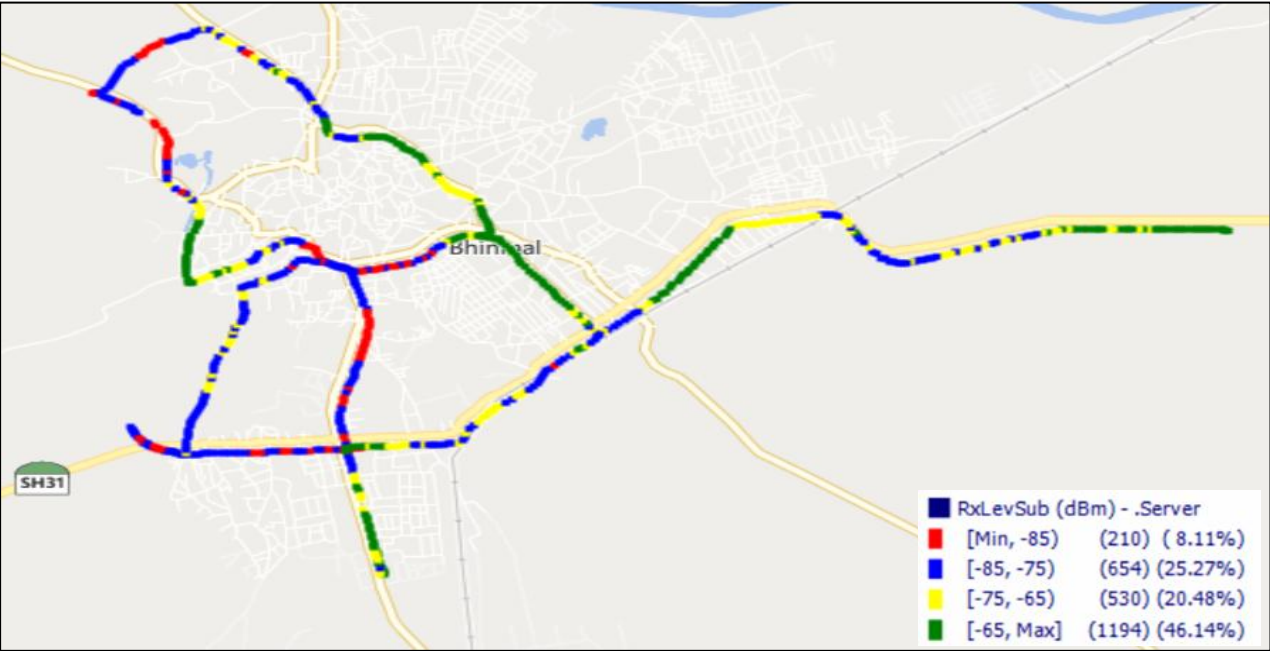


Figure-12: Signal strength 3G/2G network mode -VIL



Figure-13: Signal strength auto-selection mode 5G/4G/3G/2G - VIL

## 5. Conclusion:

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 %	100.00	97.67	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time Average (Second)	1.80	2.46	0.69	1.61
Silence Call Rate %	0.00	*	0.00	0.00
Average MOS score	4.09	*	4.22	4.05
Download Throughput (Declared)	18.14	5.0	15.0	15.0
Download Throughput (Average)	126.94	21.65	272.71	24.10
Upload Throughput (Declared)	9.26	3.0	7.0	8.0
Upload Throughput (Average)	31.53	2.05	37.22	14.47
Latency in m sec (50 <sup>th</sup> percentile)	14.00	35	28.50	38.00

**Table:18:** Operator wise comparative analysis of QoS parameters

\*The BSNL drive test tool kit does not provide silence call rate/instances, packet loss rate, or downlink and uplink data.

### BSNL :

1. Call Setup Success rate (97.67%) BSNL not meeting the QoS benchmark.

**BSNL Reply: Once the 4g(LTE) optimization of Bhinmal City complete, the issue will be resolved, and the drive report will be submitted.**

2. Average upload throughput (2.05 Mbps) BSNL not meeting the QoS benchmark:

**BSNL Reply: Matter taken up with M/s TCS team for further rectification for low Average upload throughput.**