



# Operator Assisted Drive Test Report

Haryana Service Area

**Sirsa City –  
Sirsa to Fatehabad Highway &  
Fatehabad City**

(24<sup>th</sup> Feb 2026 to 26<sup>th</sup> Feb 2026)

TRAI Regional Office Jaipur

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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 finalized 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 Haryana License Service Area (LSA) during the month of February 2026 under the supervision of TRAI Regional Office (RO), Jaipur. Details of route/area covered during the OADT is as given below:

Start Date	To Date	Drive Test Route	Type of Route	Distance Covered (Km)/ Hotspot Locations (Nos)
24 Feb 2026	24 Feb 2026	Sirsa	City	85
25 Feb 2026	25 Feb 2026	Fatehabad	City	45
25 Feb 2026	25 Feb 2026	Sirsa to Fatehabad	Highway	45
26 Feb 2026	26 Feb 2026	Sirsa	Hotspot	6

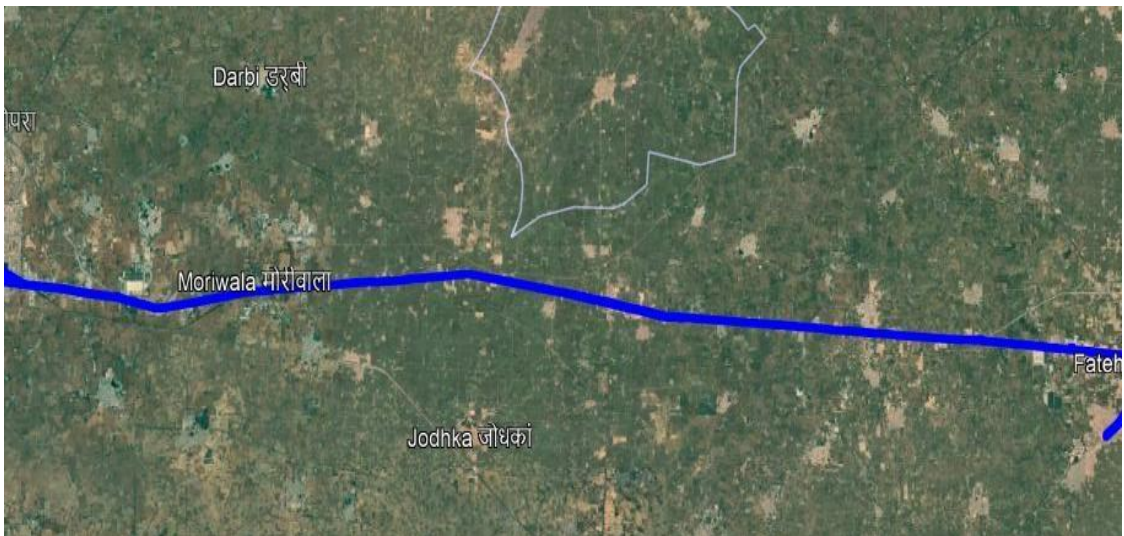
Table-1: Drive test summary

## 2.2 Drive test routes

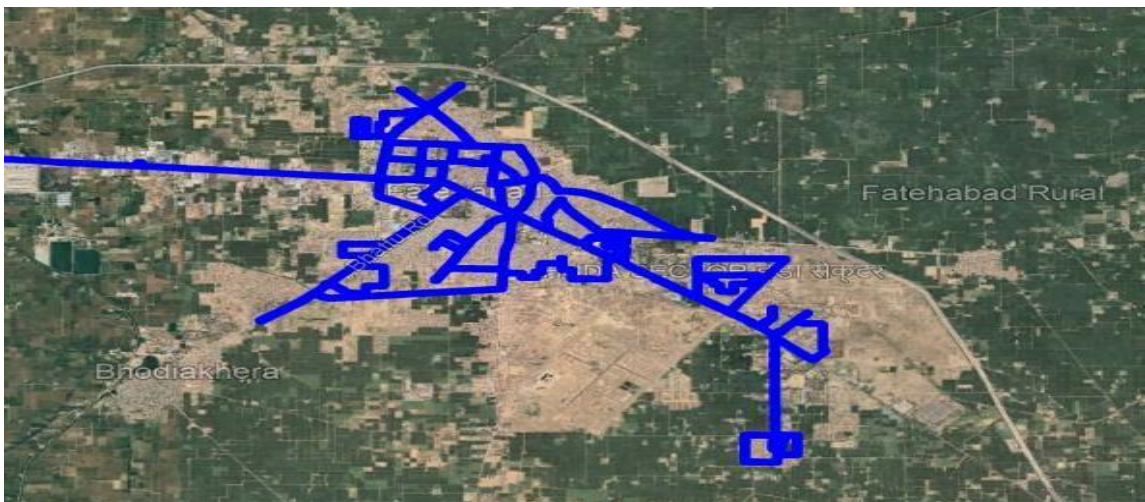
The map provides overview of drive test routes indicating city drive, highway drive and hotspots as per the legends shown on the map.



**Figure-1:** Drive Test Route map (Sirsa City)



**Figure-2:** Drive Test Route map (Sirsa to Fatehabad Highway)



**Figure-3:** Drive Test Route map (Fatehabad City)

## 2.3 Areas covered:

### (a) Sirsa, Sirsa to Fatehabad Highway & Fatehabad City:

- **Sirsa City**- BSNL Exchange, Parshuram Chowk, Rania Gate, Rania Chungi, Baba Tara Baba kutia, ITI Chowk, Valmiki Chowk, Anaj Mandi , Airforce Station , Jcd College , Huda Sector , Prem Nagar , Station, Shah Satnam Chowk & Entire city.
- **Sirsa to Fatehabad Highway.**
- **Fatehabad City**- Parshuram Chowk , Lal Batti Chowk, Fawara Chowk , Fatehabad Police line, Auto Market , Huda Sector , Friends Colony , Paphiya Park & Entire city.

### (b) Hot spots Covered:

S.No	City	Hotspot Locations
1	Sirsa	Bus Stand Sirsa
2		Railway Station Sirsa
3		Tara Baba Kutia
4		Dera Sacha Sauda
5		Mini Secretariat
6		Jcd College

**Table 2:** Hot spot locations covered in OADT

## 2.4 Telecom service providers detected frequency bands:

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

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	BSNL	2G	900
5	BSNL	3G	2100
6	BSNL	4G	700,2100
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 3:** Frequency Bands of Telecom service provider (TSP) covered in OADT.

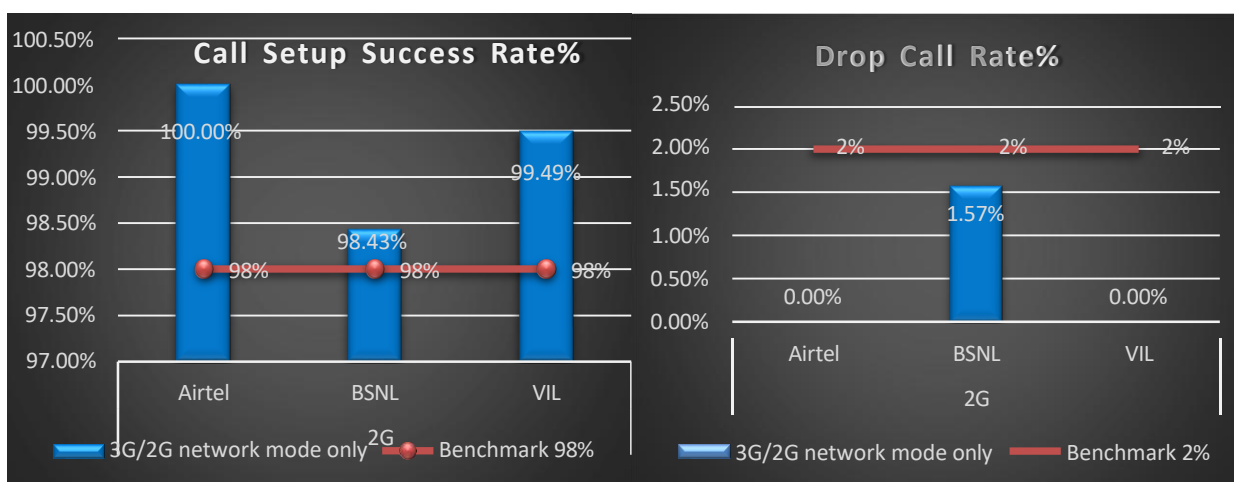
### 3. Detailed QoS Performance Analysis: (2G/3G Network Mode)

This section provides summary of overall QoS performance of the telecom service provider’s network in the Sirsa and Fatehabad City of and Sirsa to Fatehabad Highway Haryana LSA by aggregating the results of drive tests conducted in month of February 2026 covering city drive, hotspots and Highway.

**(a) Sirsa City- 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 and the results are as under:

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	227	189	201
Call Setup Success Rate %	100	98.43	99.49
Drop Call Rate %	0.00	1.57	0.00
Call Setup Time-Average (Second)	3.12	2.95	3.36
Handover Success Rate %	96.77	100	95.93

**Table-4:** Summary of voice call performance in 3G/2G network mode only- Sirsa City.

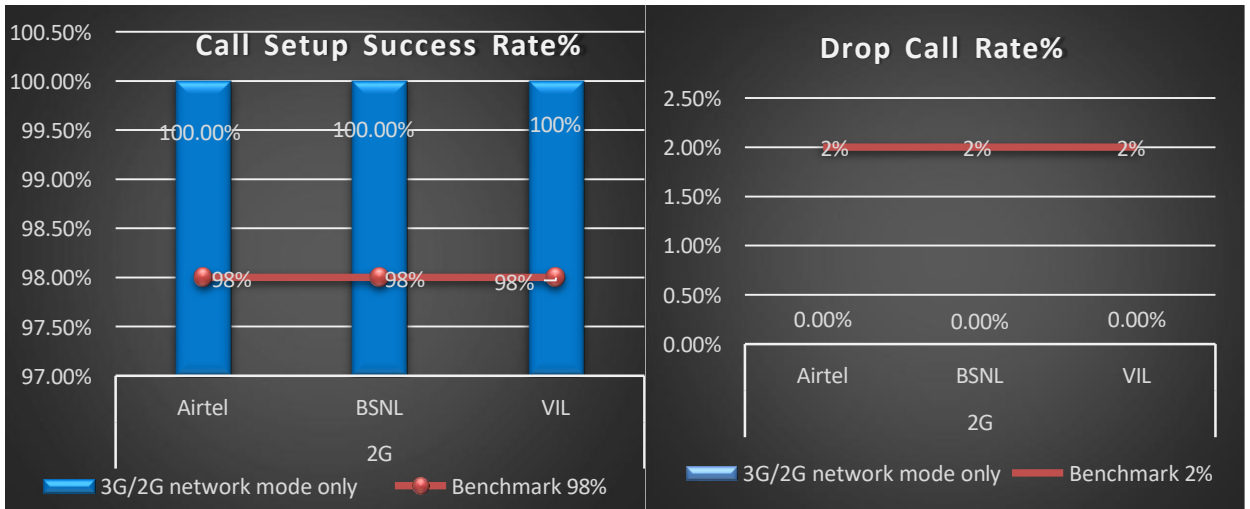


**Figure-4:** Call setup success rate and drop call rate performance- Sirsa City.

**(b) Sirsa to Fatehabad Highway- 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 and the results are as under:

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	61	52	71
Call Setup Success Rate %	100	100.00	100
Drop Call Rate %	0.00	0.00	0
Call Setup Time-Average (Second)	3.12	2.61	3.26
Handover Success Rate %	98.86	100	94.03

**Table-5:** Summary of voice call performance in 3G/2G network mode only- (Sirsa to Fatehabad Highway)

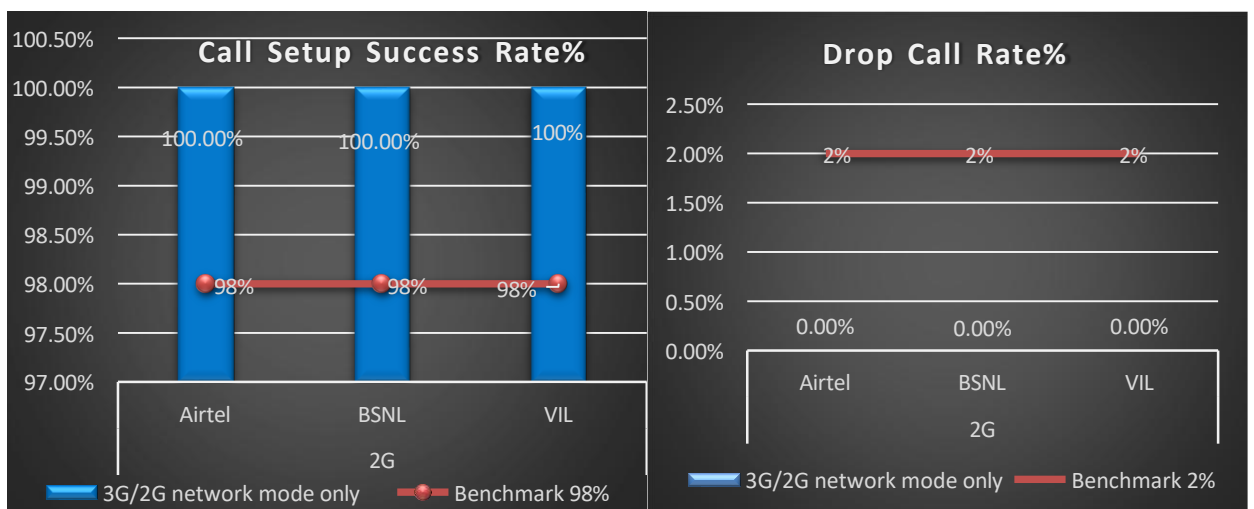


**Figure-5:** Call setup success rate and drop call rate performance- Sirsa to Fatehabad Highway

**(C) Fatehabad City-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 and the results are here under:

Parameters	Service Provider		
	3G/2G network mode only		
	AIRTEL	BSNL	VIL
Call Attempts	156	52	157
Call Setup Success Rate %	100	100.00	100
Drop Call Rate %	0.00	0.00	0.00
Call Setup Time-Average (Second)	3.12	2.61	3.29
Handover Success Rate %	97.26	100	97.53

**Table-6:** Summary of voice call performance in 3G/2G network mode only- (Fatehabad City)



**Figure-6:** Call setup success rate and drop call rate performance- Fatehabad city

**(d) Number of unique cell id's covered in Voice test:**

<b>Sirsa City Number of unique cell id's covered in Voice test- Technology wise</b>			
<b>Technology</b>	<b>Service Provider</b>		
	<b>3G/2G network mode only</b>		
	<b>AIRTEL</b>	<b>BSNL</b>	<b>VIL</b>
<b>3G</b>	NA	185	NA
<b>2G</b>	157	4	113

**Table-7:** Technology wise number of network cell id's latched during drive test. (Sirsa City)

<b>Sirsa to Fatehabad Number of unique cell id's covered in Voice test- Technology wise</b>			
<b>Technology</b>	<b>Service Provider</b>		
	<b>3G/2G network mode only</b>		
	<b>AIRTEL</b>	<b>BSNL</b>	<b>VIL</b>
<b>3G</b>	NA	14	NA
<b>2G</b>	50	38	45

**Table-8:** Technology wise number of network cell id's latched during drive test. (Sirsa to Fatehabad Highway)

<b>Fatehabad City Number of unique cell id's covered in Voice test- Technology wise</b>			
<b>Technology</b>	<b>Service Provider</b>		
	<b>3G/2G network mode only</b>		
	<b>AIRTEL</b>	<b>BSNL</b>	<b>VIL</b>
<b>3G</b>	NA	128	NA
<b>2G</b>	78	0	55

**Table-9:** Technology wise number of network cell id's latched during drive test. (Fatehabad City)

**Note-**

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

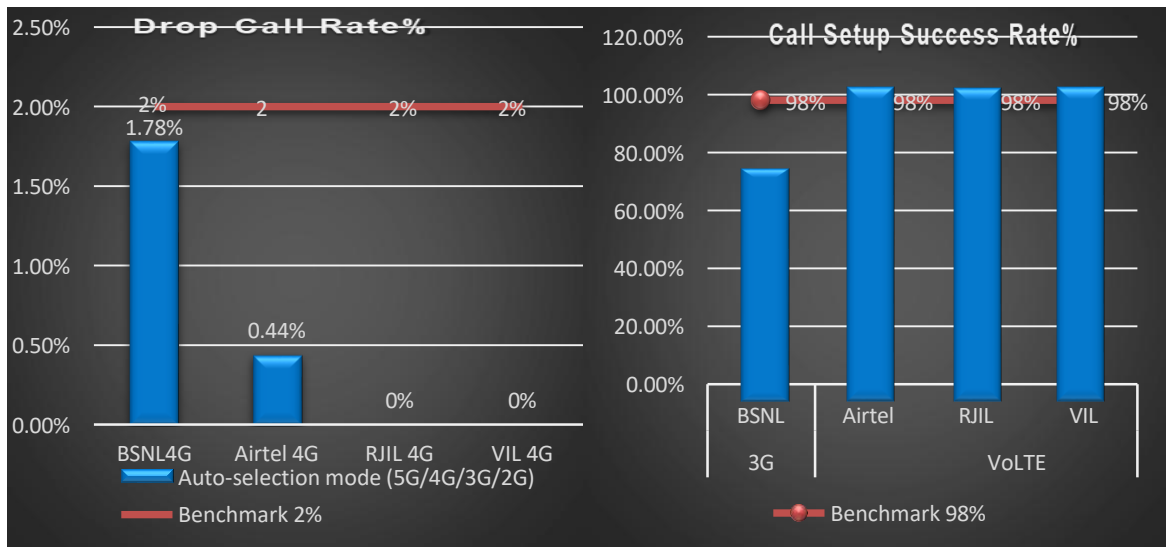
### 3. Detailed QoS Performance Analysis:

(Auto network selection mode 5G/4G/3G/2G)

#### (a) Sirsa City-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	229	216	184	212
Call Setup Success Rate %	100.00	74.53	100.00	100.00
Drop Call Rate %	0.44	1.78	0.00	0.00
Call Setup Time-Average (Second)	1.30	2.46	1.15	0.71
Handover Success Rate %	100.00	100.00	99.65	100.00

**Table-10:** Summary of voice call performance in network auto-selection mode- (Sirsa City).



**Figure-7:** Performance for call setup success rate and drop call rate. (Sirsa City)

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	229	NA	348	199
Packet Drop Rate (Downlink)	0.14	NA	0.79	0.00
Packet Drop Rate (Uplink)	0.15	NA	0.82	0.00
Number of silence call for > 2 sec.	1	NA	3	0
Silence Call Rate %	0%	NA	0.86	0%

**Table-11:** Summary of silence instances & packet loss rate for mobile-to-mobile call (Sirsa City)

Number of unique cell ids covered during Voice test				
	AIRTEL	BSNL	RJIL	VIL
3G	NA	77	NA	NA
2G	NA	4	NA	NA
4G	104	123	63	198
5G	NA	NA	76	NA

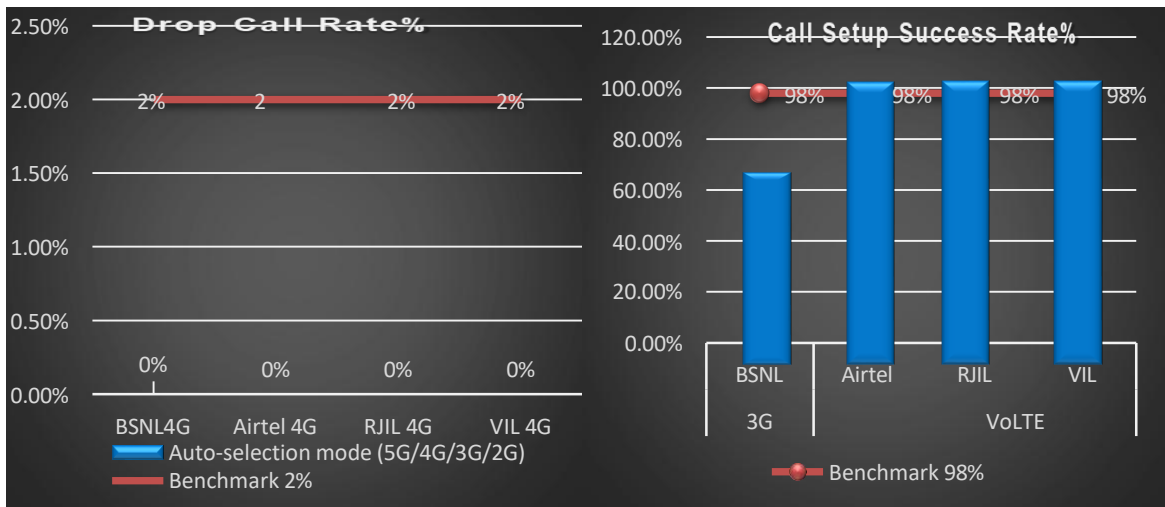
**Table-12:** Technology wise number of network cell id's latched during drive test. (Sirsa City)

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

**(b) Sirsa to Fatehabad Highway 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	66	62	46	51
Call Setup Success Rate %	100.00	77.41	100.00	100.00
Drop Call Rate %	0.00	0.00	0.00	0.00
Call Setup Time-Average (Second)	1.83	2.52	1.37	0.75
Handover Success Rate %	100.00	99.43	100	100.00

**Table-13:** Summary of voice call performance in network auto-selection mode- (Sirsa to Fatehabad Highway)



**Figure-8:** Performance for call setup success rate and drop call rate. (Sirsa to Fatehabad Highway)

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL*	RJIL	VIL
Call Established (within service provider Network)	58	NA	136	78
Packet Drop Rate (Downlink)	0.80	NA	0.86	0.00
Packet Drop Rate (Uplink)	0.77	NA	0.97	0.00
Number of silence call for > 2 sec.	3	NA	2	0
Silence Call Rate %	0%	NA	1.47	0%

**Table-14:** Summary of silence instances & packet loss rate for mobile-to-mobile call (Sirsa to Fatehabad Highway)

**\*BSNL has not tested the 4G Voice parameters due to non-availability of testing equipment.**

Number of unique cell ids covered In Sirsa to Fatehabad Highway during Voice test				
	AIRTEL	BSNL	RJIL	VIL
3G	NA	53	NA	NA
2G	NA	62	NA	NA
4G	62	98	75	85
5G	NA	NA	59	NA

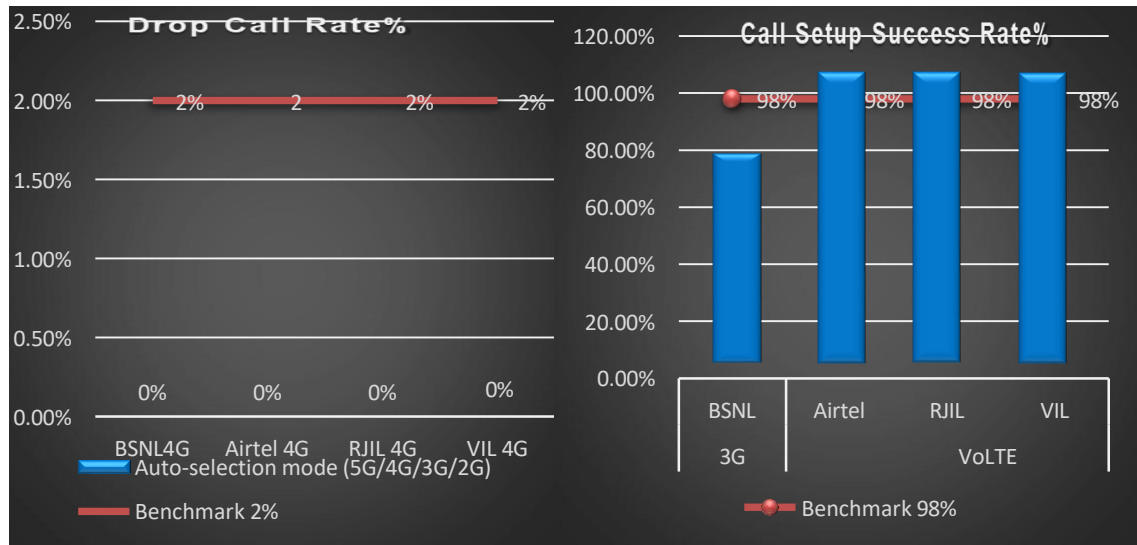
**Table-15:** Technology wise number of network cell id’s latched during drive test. (Sirsa to Fatehabad Highway)

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

**( c ) Fatehabad City 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	163	160	154	177
Call Setup Success Rate %	100.00	72.5	100%	100.00
Drop Call Rate %	0.00	0.00%	0.00%	0.00
Call Setup Time-Average (Second)	1.34	3.76	1.18	0.69
Handover Success Rate %	100.00	100	100	100.00

**Table-16:** Summary of voice call performance in network auto-selection mode- (Fatehabad City)



**Figure-9:** Performance for call setup success rate and drop call rate. (Fatehabad City)

Parameter	Service Provider			
	Mobile-to-Mobile (5G/4G - Open Mode)			
	AIRTEL	BSNL	RJIL	VIL
Call Established (within service provider Network)	151	NA	280	132
Packet Drop Rate (Downlink)	0.1	NA	0.76	0.00
Packet Drop Rate (Uplink)	0.1	NA	0.82	0.00
Number of silence call for > 2 sec.	0	NA	1	0
Silence Call Rate %	0%	NA	1.07	0%

**Table-17:** Summary of silence instances & packet loss rate for mobile-to-mobile call (Fatehabad City)

Number of unique cell ids covered In Fatehabad City during Voice test				
	AIRTEL	BSNL	RJIL	VIL
3G	NA	29	NA	NA
2G	NA	0	NA	NA
4G	45	57	46	89
5G	NA	NA	84	NA

**Table-18:** Technology wise number of network cell id’s latched during drive test. (Fatehabad City)

**(d) Mean Opinion Score (MOS) performance for speech quality:**

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

Sirsa City Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL*	RJIL	VIL
<b>Total Number of MOS Samples</b>	1558	NA	1782	1252
<b>Speech Quality (Average MOS Score)</b>	4.11	NA	4.19	3.92

**Table-19:** Summary of speech quality (MOS) samples. (Sirsa City)

Sirsa to Fatehabad Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL*	RJIL	VIL
<b>Total Number of MOS Samples</b>	375	NA	631	508
<b>Speech Quality (Average MOS Score)</b>	4.04	NA	4.24	3.91

**Table-20:** Summary of speech quality (MOS) samples. (Sirsa to Fatehabad Highway)

Fatehabad City Speech Quality (MOS) distribution	Service Provider			
	AIRTEL	BSNL*	RJIL	VIL
<b>Total Number of MOS Samples</b>	1035	NA	1422	844
<b>Speech Quality (Average MOS Score)</b>	4.10	NA	4.18	3.93

**Table-21:** Summary of speech quality (MOS) samples. (Fatehabad City)

**\*BSNL has not tested the 4G Voice parameters due to non-availability of testing equipment.**

**(e) Sirsa City-Data performance. (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)	<b>Average</b>	154.22	14.82	355.64	21.9
	<b>80th Percentile</b>	192.8	20.12	496.89	33.09
	<b>20th Percentile</b>	02.40	10.45	208.37	10.91
Upload Throughput (Mbits/s)	<b>Average</b>	27.97	6.23	42.75	21.6
	<b>80th Percentile</b>	47.30	4.12	76.83	34.64
	<b>20th Percentile</b>	4.14	2.76	6.09	9.44
Latency (ms)	<b>50th Percentile</b>	11	34.12	23	40

**Table-22:** Summary of data performance in network auto-selection mode. ( Sirsa City)

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
<b>5G</b>	NA	NA	133	NA
<b>4G</b>	109	124	14	255
<b>3G</b>	NA	75	NA	NA
<b>2G</b>	0	4	NA	0

**Table-23:** Technology wise number of network cell id's latched during drive test. (Sirsa City)

**(f) Sirsa to Fatehabad Highway -Data performance. (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	141.38	13.16	353.36	21.16
	80th Percentile	218.80	6.34	547.87	33.90
	20th Percentile	2.30	3.12	202.98	5.20
Upload Throughput (Mbits/s)	Average	24.74	7.32	45.51	21.07
	80th Percentile	50.50	5.47	35.15	34.67
	20th Percentile	6.53	2.89	52.19	8.15
Latency (ms)	50th Percentile	13	36	23	21.50

**Table-24:** Summary of data performance in network auto-selection mode. (Sirsa to Fatehabad Highway)

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	61	NA
4G	62	53	12	91
3G	NA	30	NA	NA
2G	0	16	NA	0

**Table-25:** Technology wise number of network cell id's latched during drive test. (Sirsa to Fatehabad Highway)

**(g) Fatehabad City -Data performance. (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	174.78	11.25	453.84	22.2
	80th Percentile	216.80	5.12	648.63	32.66
	20th Percentile	03.30	3.67	291.37	11.31
Upload Throughput (Mbits/s)	Average	44.47	5.23	45.82	21.97
	80th Percentile	61.80	4.01	70.39	33.25
	20th Percentile	6.60	2.11	17.37	12.02
Latency (ms)	50th Percentile	15	38	23	22.50

**Table-26:** Summary of data performance in network auto-selection mode. (Fatehabad City)

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	73	NA
4G	109	57	18	255
3G	NA	29	NA	NA
2G	0	NA	NA	0

**Table-27:** Technology wise number of network cell id's latched during drive test. (Fatehabad City)

## 5. Hotspots:

Hotspot testing has been done on 26 February 2026. Six locations have been tested in the Sirsa city.

### (a) Hotspot Locations:



**Figure- 10:** Hotspot locations

### (b) Hotspot covered :

S. No.	Hotspot Name	Date of Testing
1	Bus Stand Sirsa	26 <sup>th</sup> Feb 2026
2	Railway Station Sirsa	26 <sup>th</sup> Feb 2026
3	Tara Baba Kutia	26 <sup>th</sup> Feb 2026
4	Dera Sacha Sauda	26 <sup>th</sup> Feb 2026
5	Mini Secretariat	26 <sup>th</sup> Feb 2026
6	Jcd College	26 <sup>th</sup> Feb 2026

**Table 28:-** List of Hot spot covered in Sirsa City

### ( c ) Voice performance (5G/4G/3G/2G-Auto mode) at Hotspot locations.

#### 1. Bus Stand Sirsa

Parameters	Airtel	BSNL	RJIL	VIL
No of Call Attempts	10	10	10	10
No of Call Established	10	10	10	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.22	1.93	1.12	0.78

**Table-29:** Voice Performance at Bus Stand Sirsa

## 2. Railway Station Sirsa

Parameters	Airtel	BSNL	RJIL	VIL
No of Call Attempts	10	10	10	10
No of Call Established	10	10	10	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.26	2.45	1.31	0.77

**Table-30:** Voice Performance at Railway Station Sirsa

## 3. Tara Baba Kutia Sirsa

Parameters	Airtel	BSNL	RJIL	VIL
No of Call Attempts	10	10	10	10
No of Call Established	10	10	10	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.24	3.15	1.36	0.74

**Table-31:** Voice Performance at Tara Baba Kutia.

## 4. Dera Sacha Sauda

Parameters	Airtel	BSNL	RJIL	VIL
No of Call Attempts	10	10	10	10
No of Call Established	10	10	10	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.19	3.17	1.18	0.8

**Table-32:** Voice Performance at Dera Sacha sauda.

## 5. Mini Secretariat

Parameters	Airtel	BSNL	RJIL	VIL
No of Call Attempts	10	10	10	10
No of Call Established	10	10	10	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.24	2.05	1.12	0.71

**Table-33:** Voice Performance at Mini Secretariat.

## 6. JCD College

Parameters	Airtel	BSNL	RJIL	VIL
No of Call Attempts	10	10	10	10
No of Call Established	10	10	10	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.25	1.94	1.11	0.77

**Table-34:** Voice Performance at Jcd College.

### (d) 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)	158.58	11.74	299.69	17.08
Download Session Setup Success Rate %	100.00	100.00	100.00	100.00
Upload Throughput Average (Mbits/s)	51.17	4.34	46.44	29.17
Upload Session Setup Success Rate %	100.00	100.00	100.00	100.00
Web Browsing Delay (Second)	8.33	0.68	5.20	4.65
Youtube Initial Buffer Delay (Second)	1.05	0.97	1.01	0.47
Latency (ms)-50th Percentile	14.32	34.07	24.08	46.00
Jitter (ms)	1.66	11.83	8.42	5.47
Packet Loss Rate%	0.00	0.00	0.00	1.23

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

Sirsa Bus stand				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	109.62	11.38	408.24	15.13
Download Session Setup Success Rate %	100	100.00	100.00	100
Upload Throughput Average (Mbits/s)	61.75	2.12	33.37	32.91
Upload Session Setup Success Rate %	100	100.00	100.00	100
Web Browsing Delay (Second)	8.24	1.52	5.39	5.26
Youtube Initial Buffer Delay (Second)	0.66	0.37	0.31	0.40
Latency (ms)-50th Percentile	9.5	34	24	48
Jitter (ms)	1.12	10	5.93	3.95
Packet Loss Rate%	0.02	0	0.00	1.30

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

Sirsa Railway station				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	96.29	17.81	405.60	15.32
Download Session Setup Success Rate %	100	100.00	100.00	100
Upload Throughput Average (Mbits/s)	51.28	7.23	86.16	24.51
Upload Session Setup Success Rate %	100	100.00	100.00	100
Web Browsing Delay (Second)	8.63	0.47	4.70	4.50
Youtube Initial Buffer Delay (Second)	1.12	1.48	0.32	0.39
Latency (ms)-50th Percentile	15.	35.2	22.50	50
Jitter (ms)	2.03	8	8.47	6.06
Packet Loss Rate%	00	0	0.00	1.2

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

Dera Sacha Sauda				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	270.83	9.40	272.67	21.4
Download Session Setup Success Rate %	100	100.00	100.00	100
Upload Throughput Average (Mbits/s)	54.79	5.67	41.87	27.5
Upload Session Setup Success Rate %	100	100.00	100.00	100
Web Browsing Delay (Second)	6.85	0.47	5.43	3.84
Youtube Initial Buffer Delay (Second)	0.68	1.03	0.37	0.49
Latency (ms)-50th Percentile	14.40	33.45	27	40
Jitter (ms)	2.22	11	9.78	7.18
Packet Loss Rate%	0	0	0.00	1.3

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

JCD college				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	156.38	11.92	169.14	21.1
Download Session Setup Success Rate %	100	100.00	100.00	100
Upload Throughput Average (Mbits/s)	65.86	3.56	35.93	23.95
Upload Session Setup Success Rate %	100	100.00	100.00	100
Web Browsing Delay (Second)	9.5	0.24	4.96	4.75
Youtube Initial Buffer Delay (Second)	0.75	1.19	0.32	0.5
Latency (ms)-50th Percentile	14.50	37.23	21	47
Jitter (ms)	0.3	14	9.56	5.24
Packet Loss Rate%	0	0	0.00	1.20

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

Mini Secretariat				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	50.76	13.74	336.04	16.3
Download Session Setup Success Rate %	100	100.00	100.00	100
Upload Throughput Average (Mbits/s)	14.15	4.67	55.05	32.1
Upload Session Setup Success Rate %	100	100.00	100.00	100
Web Browsing Delay (Second)	9.01	0.31	5.35	4.94
Youtube Initial Buffer Delay (Second)	1.97	0.42	2.07	0.43
Latency (ms)-50th Percentile	15	32.13	27	41.50
Jitter (ms)	2.68	11	9.50	5.6
Packet Loss Rate%	0	0	0.00	1

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

Baba Tara kuttia				
Parameters	Service Provider			
	Auto-selection mode (5G/4G/3G/2G)			
	AIRTEL	BSNL	RJIL	VIL
Download Throughput Average (Mbits/s)	267.59	6.19	206.43	13.2
Download Session Setup Success Rate %	100	100.00	100.00	100
Upload Throughput Average (Mbits/s)	59.20	2.79	26.28	34.02
Upload Session Setup Success Rate %	100	100.00	100.00	100
Web Browsing Delay (Second)	7.74	1.04	5.36	4.61
Youtube Initial Buffer Delay (Second)	1.14	1.32	2.67	0.63
Latency (ms)-50th Percentile	17.5	32.43	23	49.5
Jitter (ms)	1.6	17	7.25	4.8
Packet Loss Rate%	0	0	0.00	1.40

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

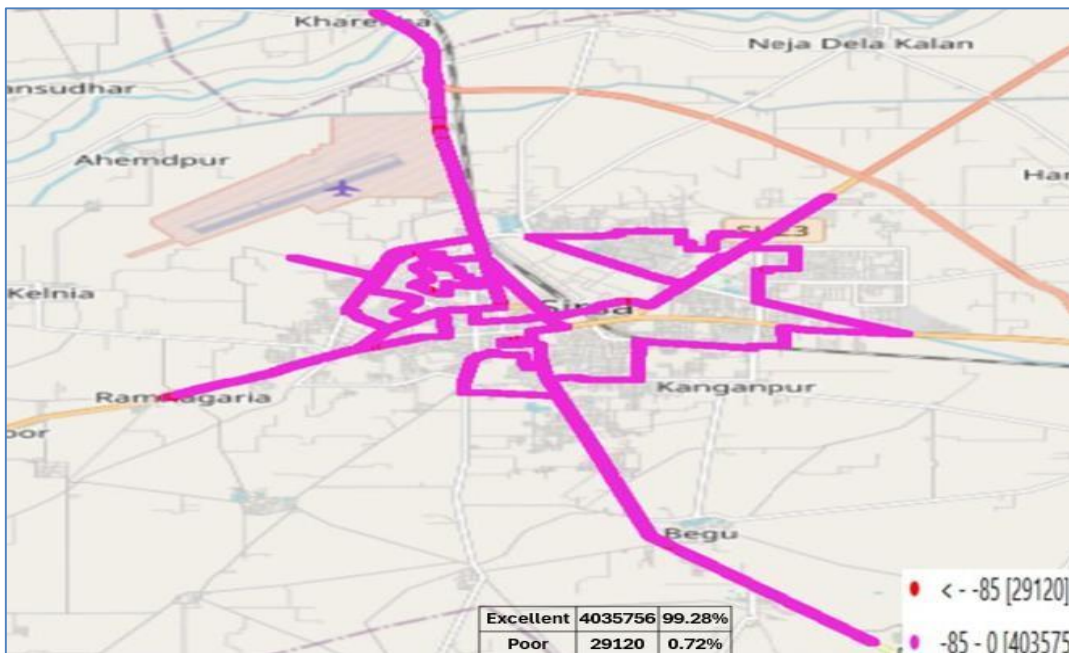
## 6. TSP Wise signal Strength :

Technology	Parameter	Range	Colour
2G	Rx Level	≥ -85 dBm	Magenta
		< -85 dBm	Red
3G	RSCP	≥ -90 dBm	Cyan
		< -90 dBm	Blue
4G	RSRP	≥ -110 dBm	Green
		< -110 dBm	Dark Green
5G	RSRP	≥ -110 dBm	Yellow
		< -110 dBm	Orange

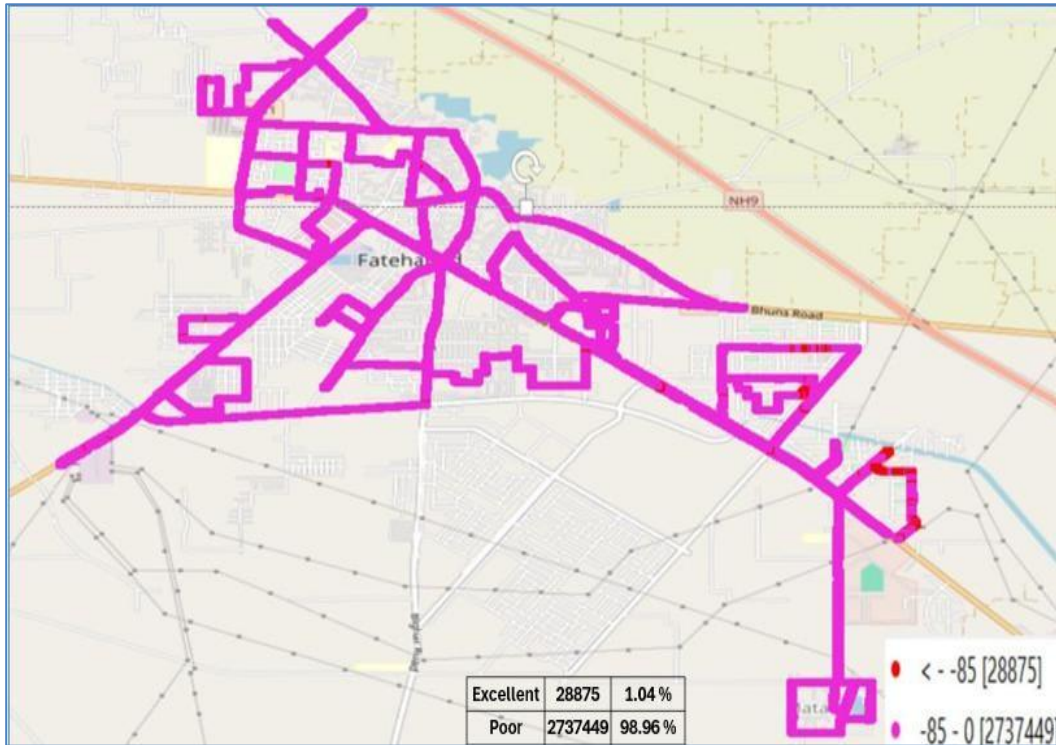
**Table-42 :** Signal strength legend format.

### (a) Signal strength 2G /3G network mode:

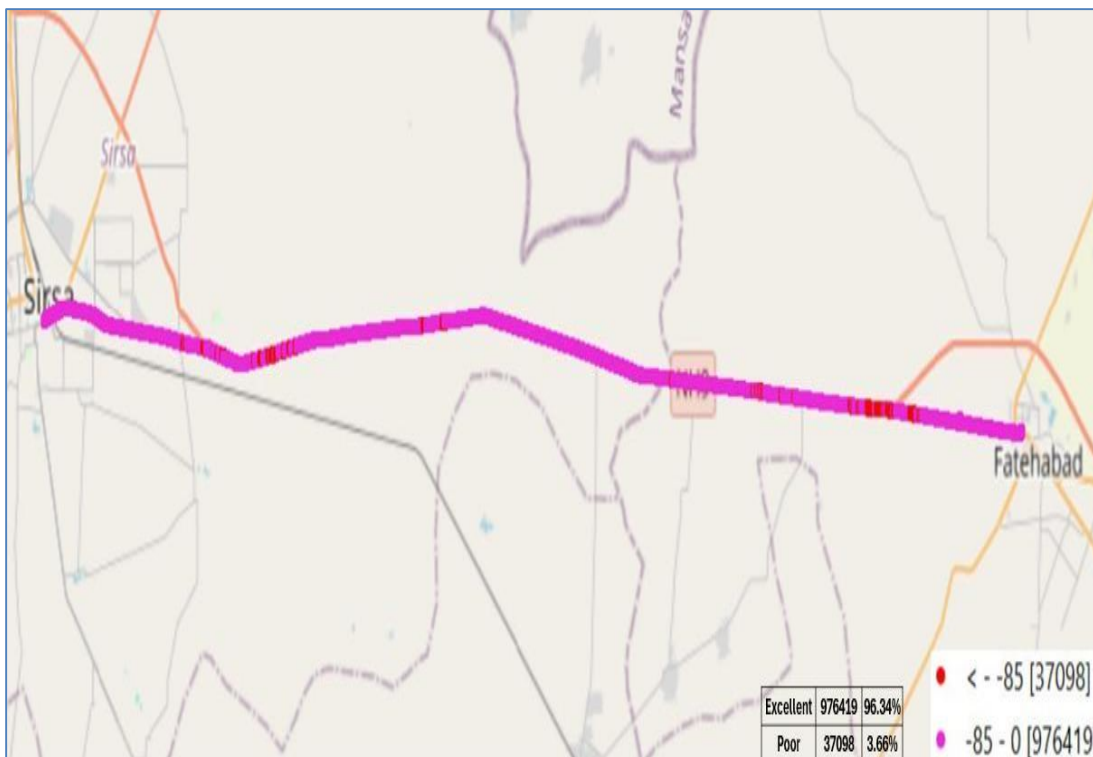
#### A. AIRTEL



**Figure-11:** Sirsa City- Signal strength 2G /3G network mode – AIRTEL

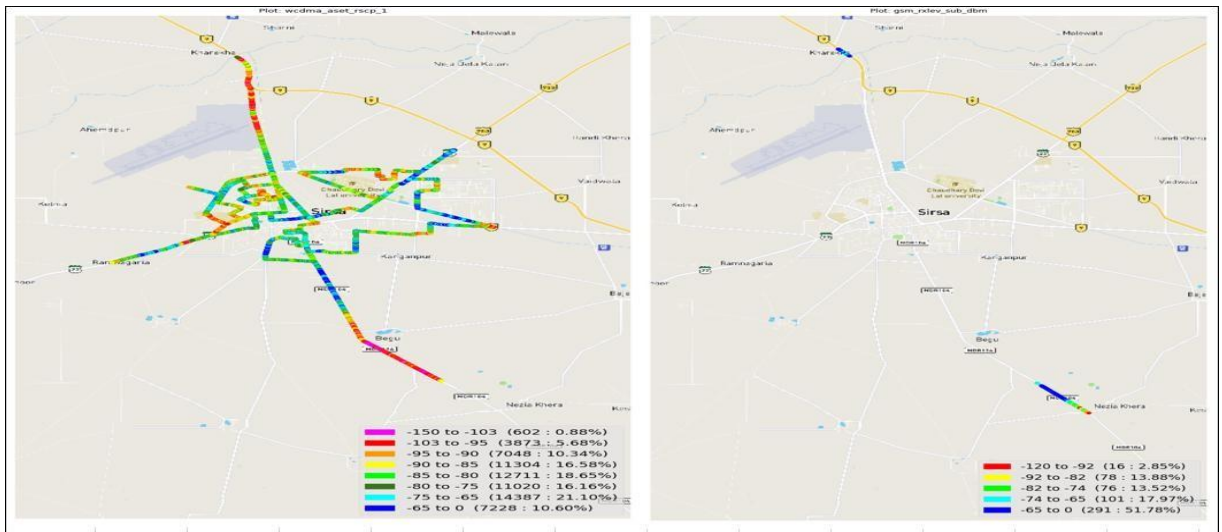


**Figure-12: Fatehabad City- Signal strength 2G /3G network mode – AIRTEL**

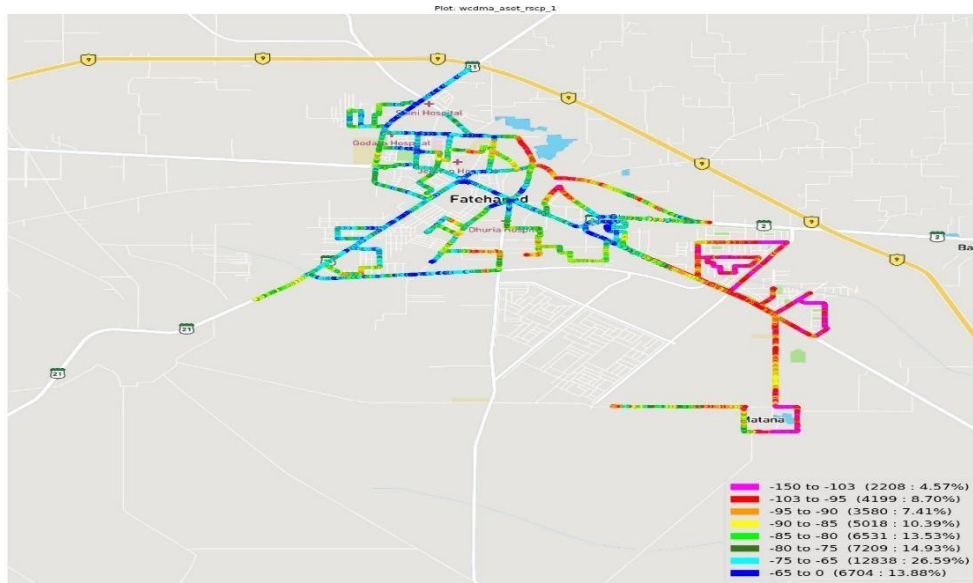


**Figure-13: Sirsa to Fatehabad Highway - Signal strength 2G /3G network mode – AIRTEL**

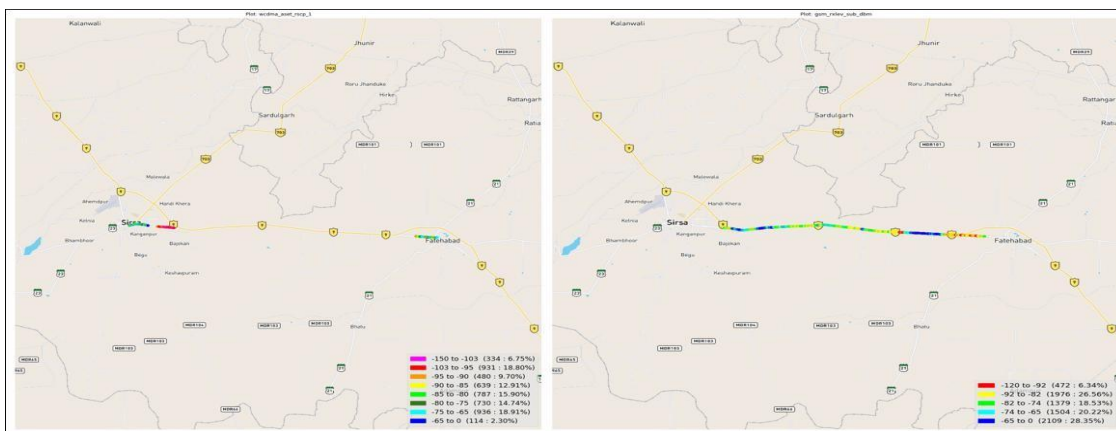
## B. BSNL



**Figure-14: Sirsa City- Signal strength 2G /3G network mode – BSNL**

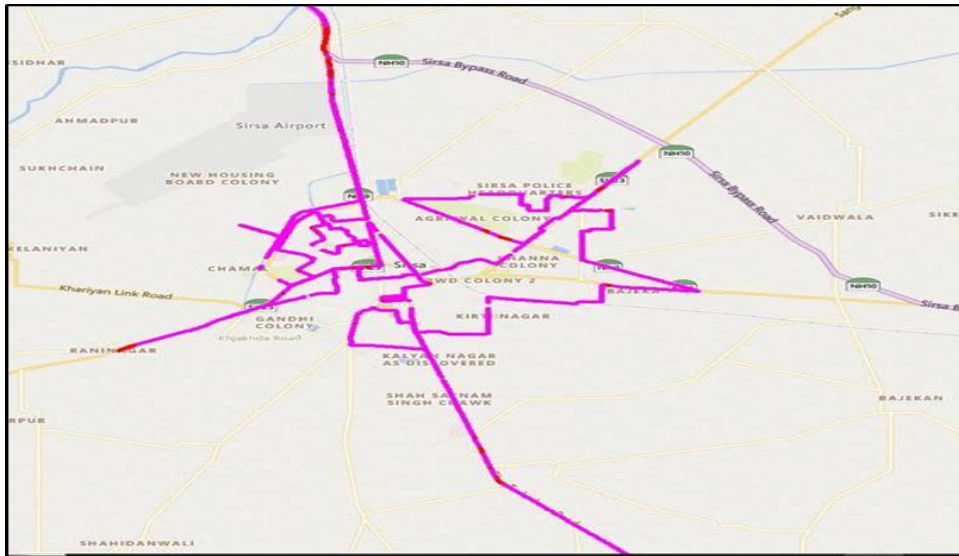


**Figure-15: Fatehabad City- Signal strength 2G /3G network mode – BSNL**

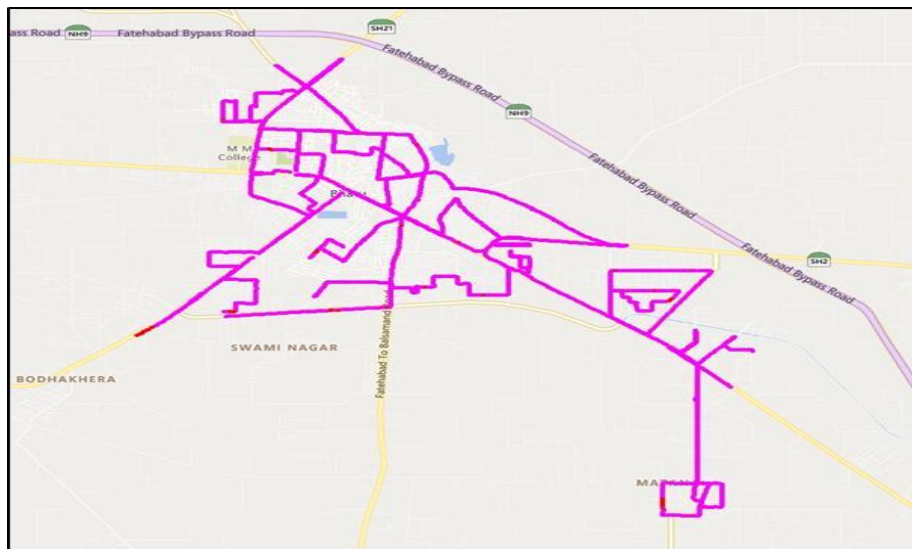


**Figure-16: Sirsa to Fatehabad Highway- Signal strength 2G /3G network mode – BSNL**

### C. VIL



**Figure-17: Sirsa City-** Signal strength 2G /3G network mode – VIL



**Figure-18: Fatehabad City-** Signal strength 2G /3G network mode – VIL



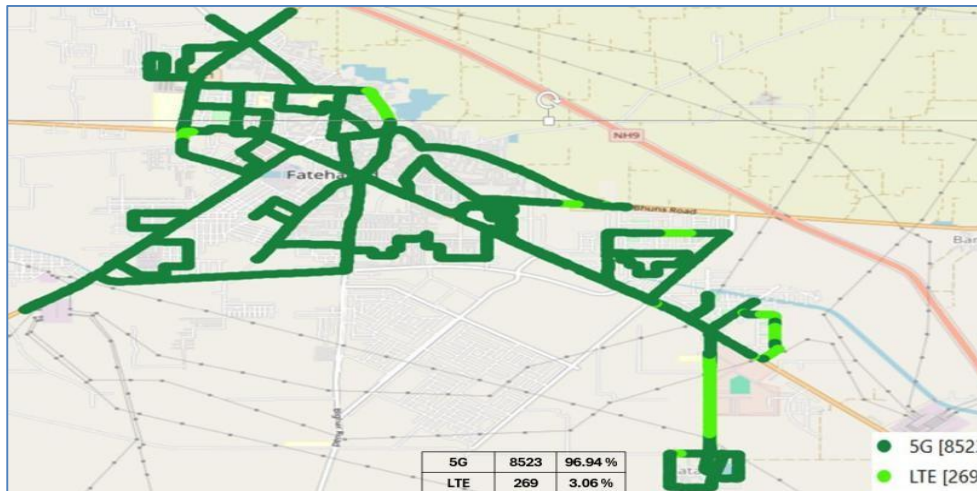
**Figure-19: Sirsa to Fatehabad Highway-** Signal strength 2G /3G network mode – VIL

**(b) Signal strength auto-selection mode 5G/4G/3G/2G:**

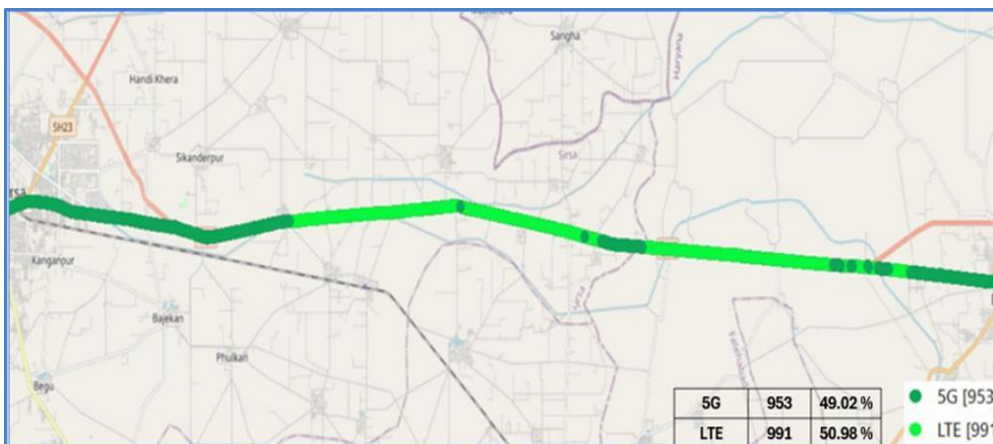
**A. AIRTEL**



**Figure 20:- Sirsa City**-Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL



**Figure 21:- Fatehabad City**-Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL



**Figure 22:- Sirsa to Fatehabad Highway**-Signal strength auto-selection mode 5G/4G/3G/2G – AIRTEL

## B. BSNL

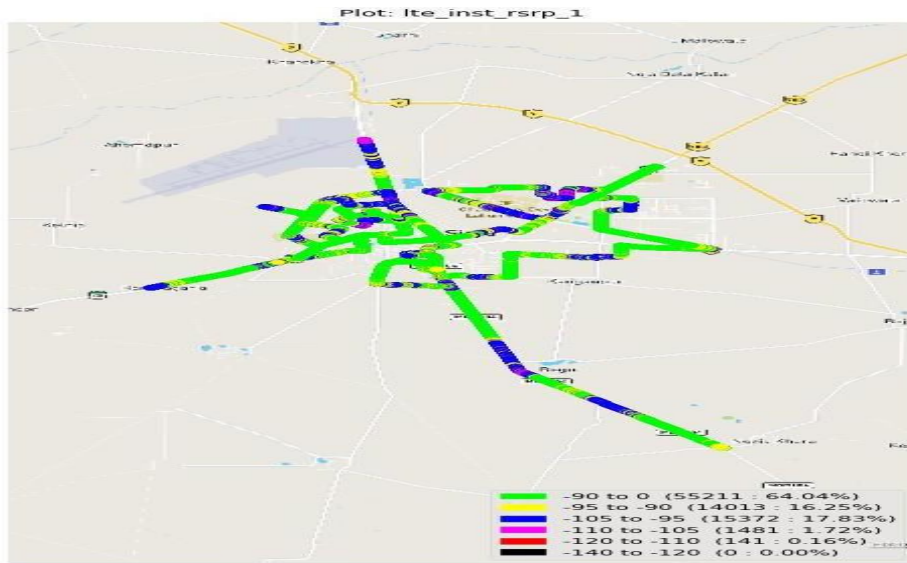


Figure 23--: Sirsa City-Signal strength auto-selection mode 4G/3G/2G- BSNL

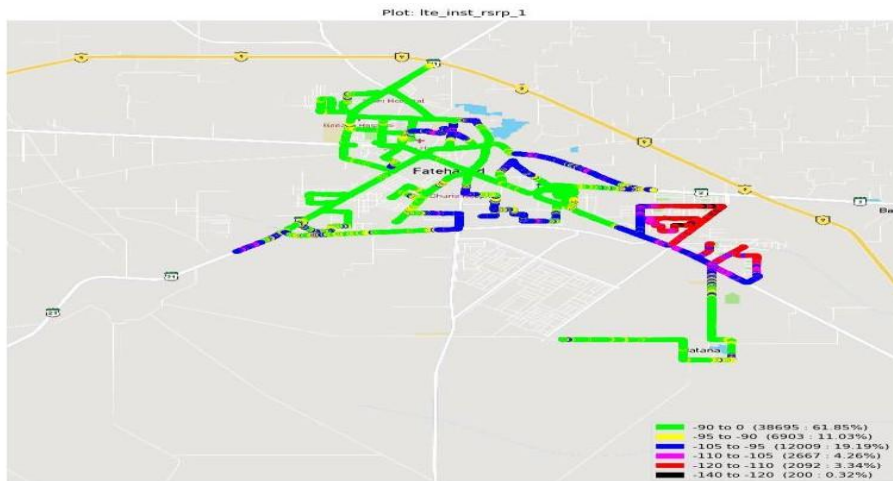


Figure 24--: Fatehabad City-Signal strength auto-selection mode 4G/3G/2G- BSNL

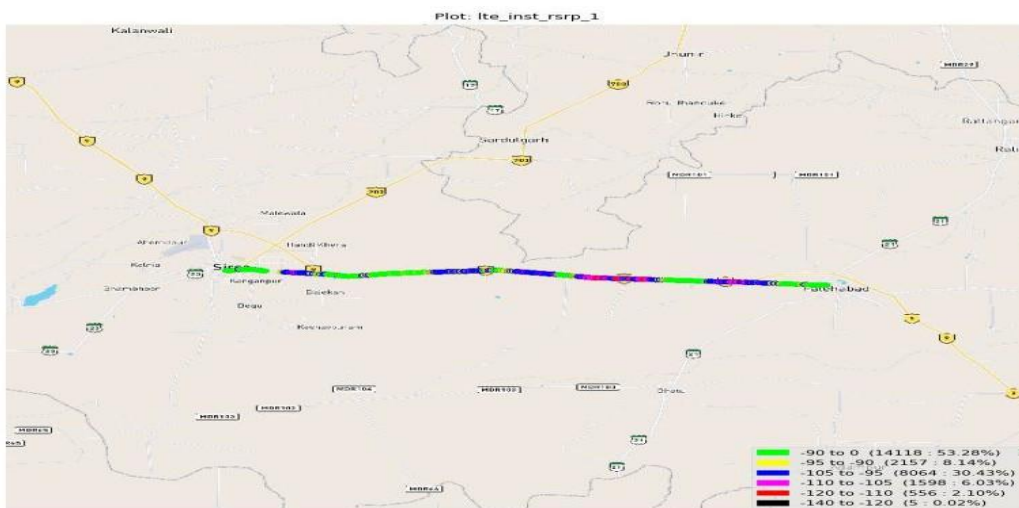
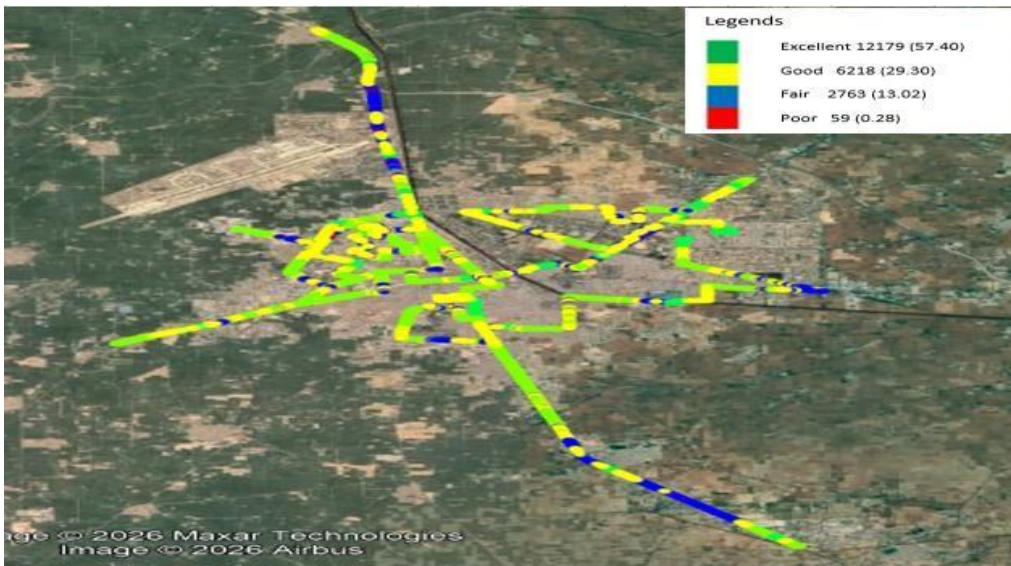
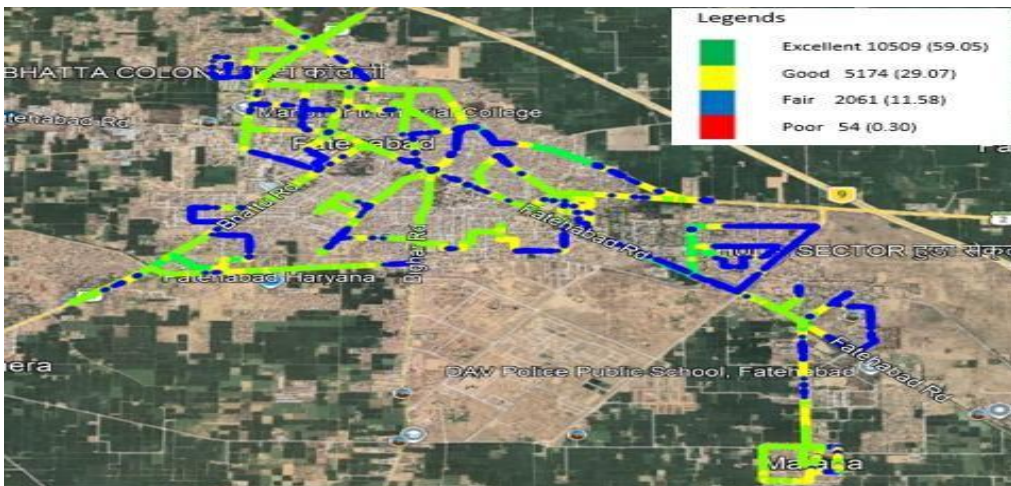


Figure 25--: Sirsa to Fatehabad Highway-Signal strength auto-selection mode 4G/3G/2G- BSNL

**C. RJIL**



**Figure 26:- Sirsa City-Signal strength auto-selection mode 5G/4G/3G/2G- RJIL**

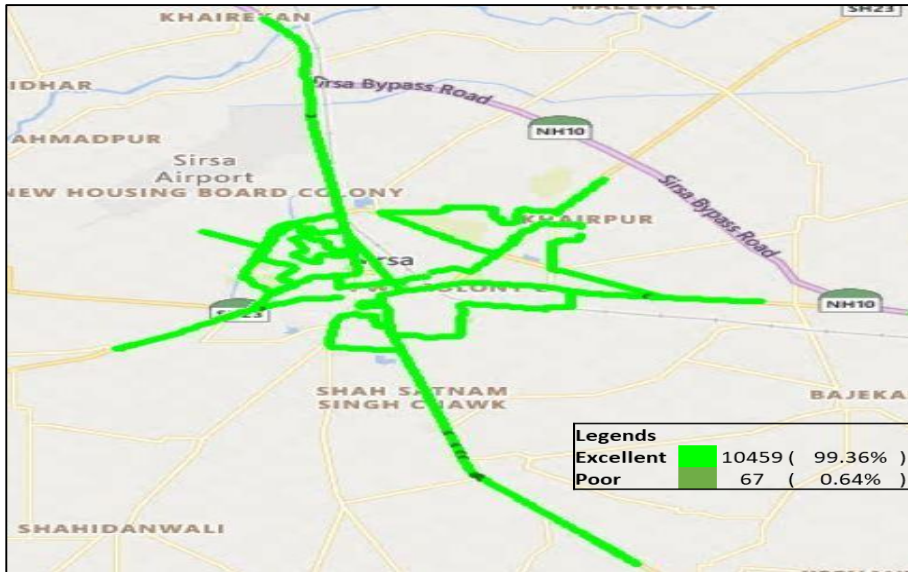


**Figure 27:- Fatehabad City-Signal strength auto-selection mode 5G/4G/3G/2G- RJIL**

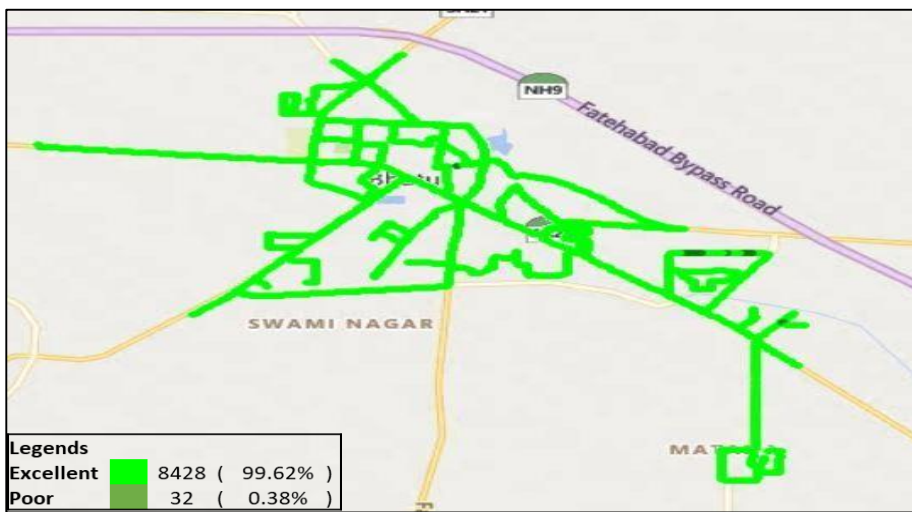


**Figure 28:- Sirsa to Fatehabad Highway-Signal strength auto-selection mode 5G/4G/3G/2G- RJIL**

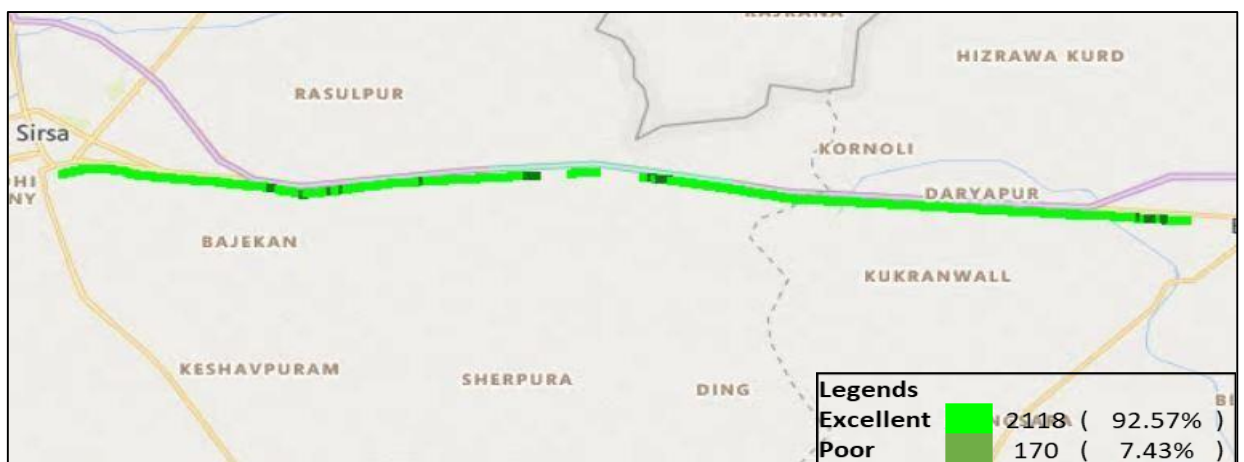
**D. VIL**



**Figure 29--: Sirsa City-Signal strength auto-selection mode 5G/4G/3G/2G- VIL**



**Figure 30--: Fatehabad City-Signal strength auto-selection mode 5G/4G/3G/2G- VIL**



**Figure 31--: Sirsa to Fatehabad Highway-Signal strength auto-selection mode 5G/4G/3G/2G- VIL**

## 7. Conclusion:

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

### A. Sirsa City

S.No.	KPIs (Auto-selection mode (5G/4G/3G/2G))	Measured in	AIRTEL	BSNL	RJIL	VIL
1	Call Setup Success Rate (CSSR)	%	100.00	74.53	100.00	100.00
2	Drop Call Rate (DCR)	%	0.44	1.78	0.00	0.00
3	Call Silence rate (Mute Call)	%	0.00	NA*	0.00	0.00
4	Average MOS Score	1-5	4.11	NA*	4.19	3.92
5	TSP Offered typical download speed (In Mbps)	(Mbits/s)	6.13	19.06	15	15
6	Average Download Throughput (Data Speed)	(Mbits/s)	154.22	14.82	355.64	21.9
7	TSP Offered typical upload speed (In Mbps)	(Mbits/s)	4.8	10.7	7	8
8	Average Upload Throughput (Data Speed)	(Mbits/s)	27.97	6.23	42.75	21.6

**Table-43** : Operator wise comparative Analysis of various key parameters- Sirsa City

### B. Fatehabad City

S.No.	KPIs (Auto-selection mode (5G/4G/3G/2G))	Measured in	AIRTEL	BSNL	RJIL	VIL
1	Call Setup Success Rate (CSSR)	%	100.00	72.5	100.00	100.00
2	Drop Call Rate (DCR)	%	0.00	0.00	0.00	0.00
3	Call Silence rate (Mute Call)	%	0.00	NA*	0.00	0.00
4	Average MOS Score	1-5	4.10	NA*	4.18	3.93
5	TSP Offered typical download speed (In Mbps)	(Mbits/s)	6.13	19.06	15	15
6	Average Download Throughput (Data Speed)	(Mbits/s)	174.78	11.25	453.84	22.2
7	TSP Offered typical upload speed (In Mbps)	(Mbits/s)	4.8	10.7	7	8
8	Average Upload Throughput (Data Speed)	(Mbits/s)	44.47	5.23	45.82	21.97

**Table-44** : Operator wise comparative Analysis of various key parameters- Fatehabad City

### C. Sirsa to Fatehabad Highway

S.No.	KPIs (Auto-selection mode (5G/4G/3G/2G))	Measured in	AIRTEL	BSNL	RJIL	VIL
1	Call Setup Success Rate (CSSR)	%	100.00	77.41	100.00	100.00
2	Drop Call Rate (DCR)	%	0.00	0.00	0.00	0.00
3	Call Silence rate (Mute Call)	%	0.00	NA*	0.00	0.00
4	Average MOS Score	1-5	4.04	NA*	4.24	3.91
5	TSP Offered typical download speed (In Mbps)	(Mbits/s)	6.13	19.06	15	15
6	Average Download Throughput (Data Speed)	(Mbits/s)	141.38	13.16	353.36	21.16
7	TSP Offered typical upload speed (In Mbps)	(Mbits/s)	4.8	10.7	7	8
8	Average Upload Throughput (Data Speed)	(Mbits/s)	24.74	7.32	45.51	21.07

**Table-45** : Operator wise comparative Analysis of various key parameters- Sirsa to Fatehabad Highway

**\*BSNL has not tested the 4G Voice parameters due to non-availability of testing equipment.**

**BSNL response:****Voice:**

"CSSR% low in BSNL 4G LTE calls stemmed from multiple IMS crashes experienced during the drive test. Our recently developed indigenous IMS is undergoing frequent updates to incorporate new features, which occasionally leads to errors. The CDOT team has successfully diagnosed and resolved this issue. Additionally, the limited number of our LTE sites results in significant coverage gaps. Addressing this requires an increase in the number of LTE sites."

**Data:**

"The limited number of sites within our network has resulted in insufficient coverage, leading to a diminished Signal-to-Interference-plus-Noise Ratio (SINR) and subsequently, reduced Downlink (DL) Quadrature Amplitude Modulation (QAM). This directly impacts the average throughput."