



# Operator Assisted Drive Test Report

## Pathankot and Gurdaspur City & Nearby area

### 21<sup>st</sup> Aug to 23<sup>rd</sup> Aug 2024

by

### TRAI Regional office Jaipur

**Key Performance Indicators:** All TSPs have met the Drop Call Rate (DCR) benchmark of 2% except BSNL 3G . All TSPs have met the Call Setup Success Rate (CSSR) of 95%.

The Operator Assisted Drive Test has been carried out by Regional Office, Jaipur with the help of Service Providers in Pathankot and Gurdaspur Cities and surrounding areas from 9:00 AM to 8:00 PM on 21<sup>st</sup> Aug to 23<sup>rd</sup> Aug 2024. The drive test covered drive route of 105 KMs & 6 no hotspots over a period of 3 days. Approximately 190 calls were made for each of the TSPs networks: three 2G networks, one 3G networks and three LTE /5G networks covering four TSPs.

Overview

Voice Summary

Data Summary

# Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test from 21<sup>st</sup> August to 23<sup>rd</sup> August 2024 covering Pathankot and Gurdaspur cities and surrounding areas. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G, 3G and 4G). The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services.

**Voice:** Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

**Data:** Download Throughputs,  
**Drive Test Details :**

**Voice Tests:** Calls were made for 90 sec duration with a wait time of 10 sec between calls in all technologies. The drive test covered a drive route of approximately 105 KMs. Approximately 194 calls were made for each of the 4G networks: three 2G (Lock Mode) networks, two 3G (Dual mode) networks and three VoLTE /5G networks covering 4 unique TSPs.

### Data Tests:

Dynamic data test was conducted for 105 Kms for download throughput in all technologies.

2G – measurement – UE Locked in 2G file size- 500KB

3G – measurement – UE in 3G File Size- 20MB

4G – measurement – UE in LTE /5G File Size- 40MB

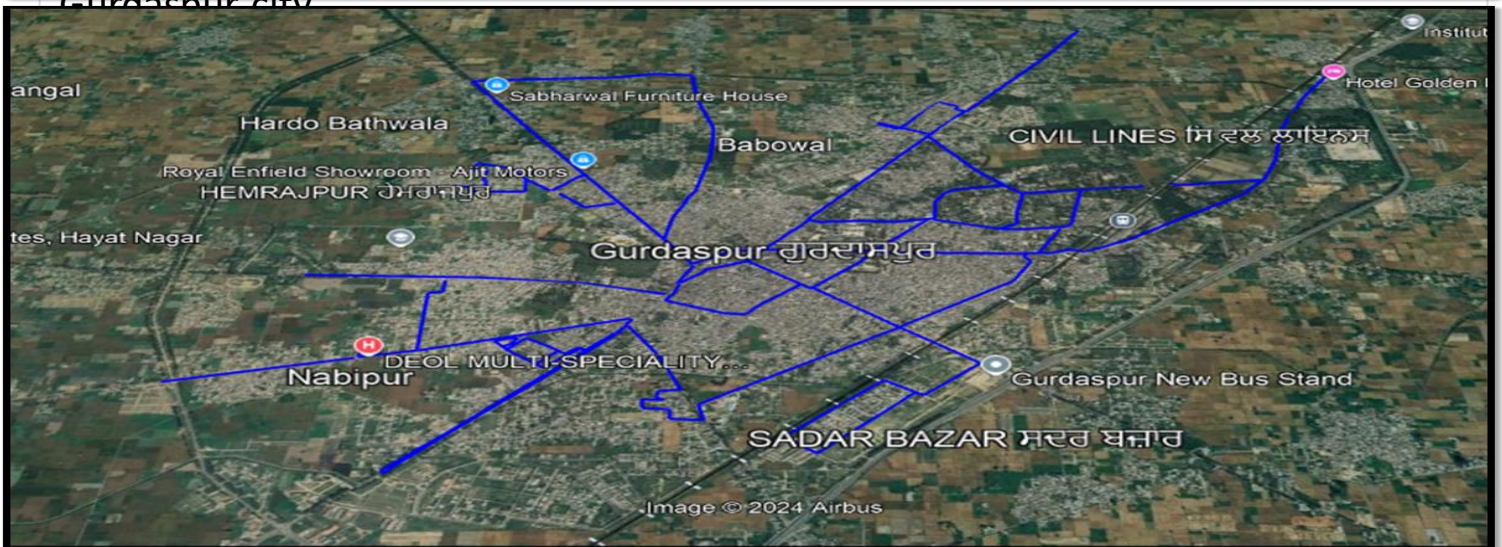
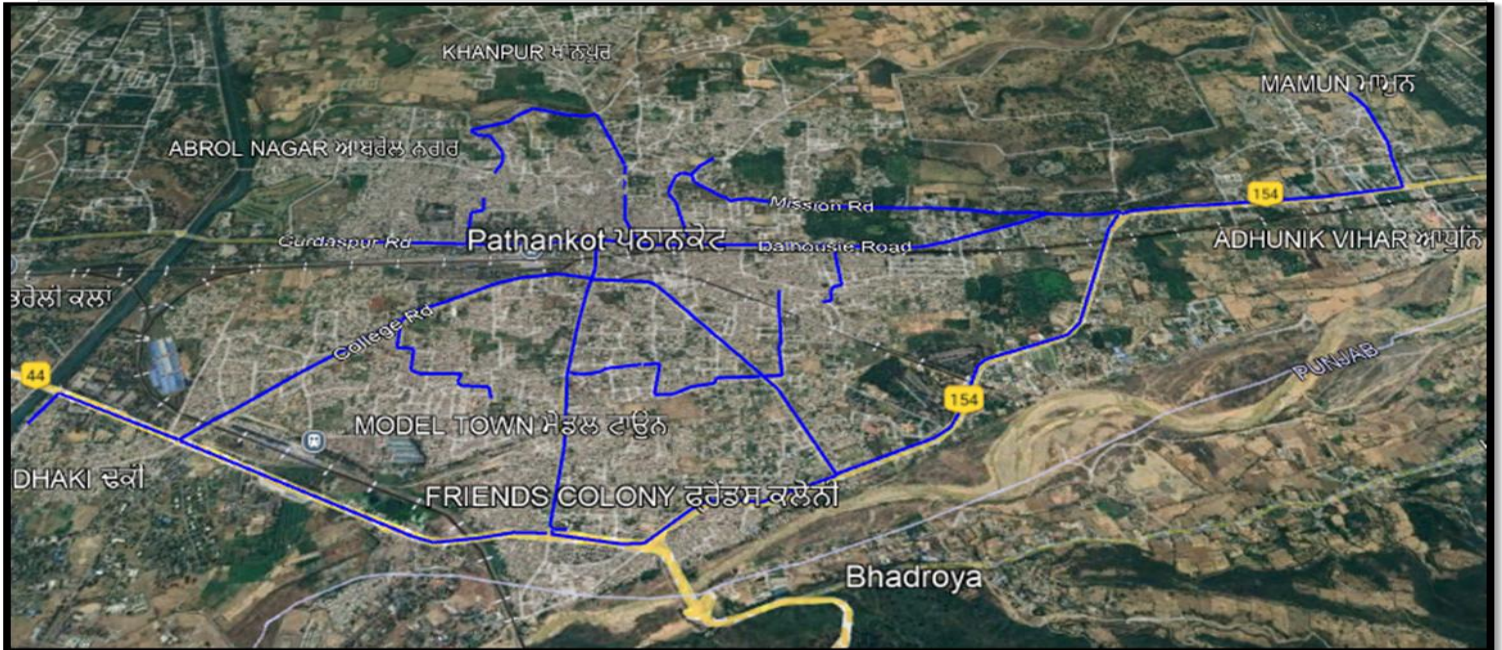
### Static data tests on 6 hotspots

1. Bus Stand, Pathankot
2. Patel Chowk, Pathankot
3. Pathankot Cantt Railway Station, Pathankot
4. Beant Engineering college, Gurdaspur
5. Railway Station, Gurdaspur
6. Court Complex, Gurdaspur

Service	Specifications
Download	2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in, www.flipkart.com and PayTm
Latency	32 Bytes on www.google.com

# Overview

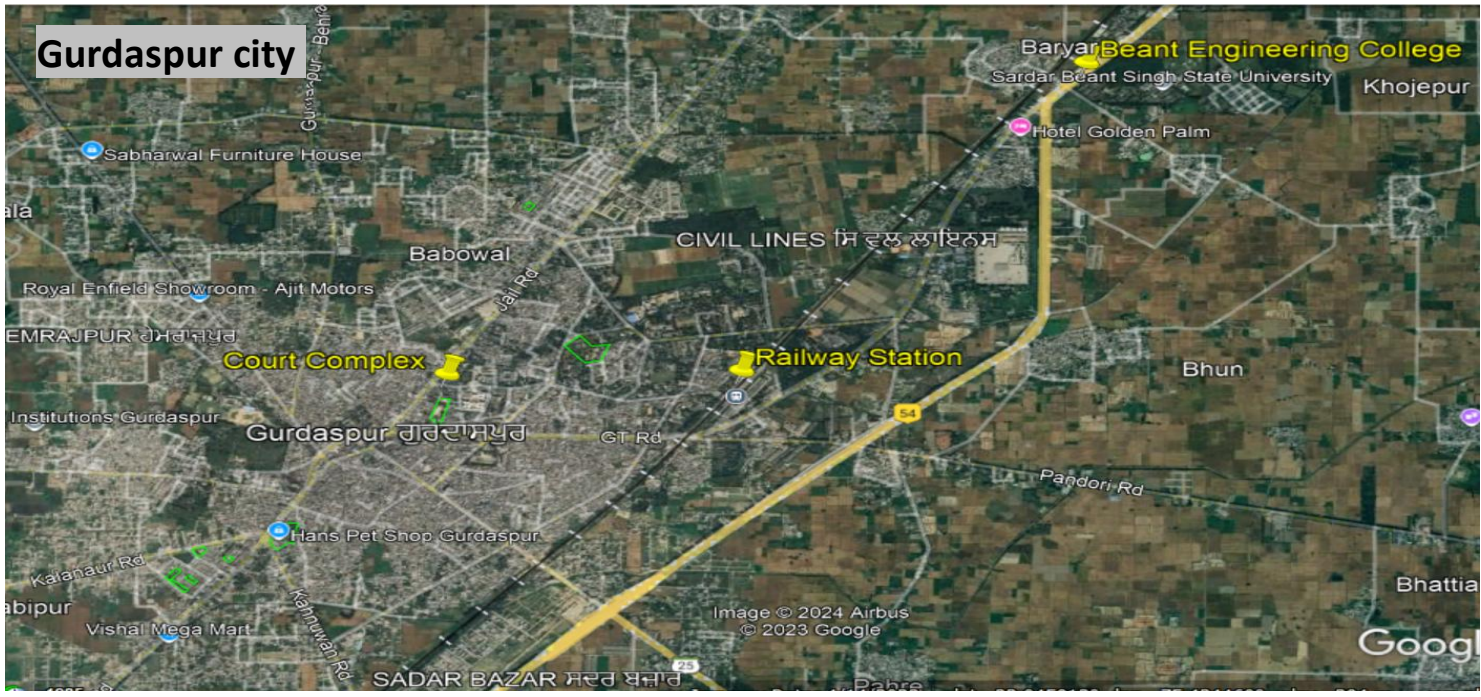
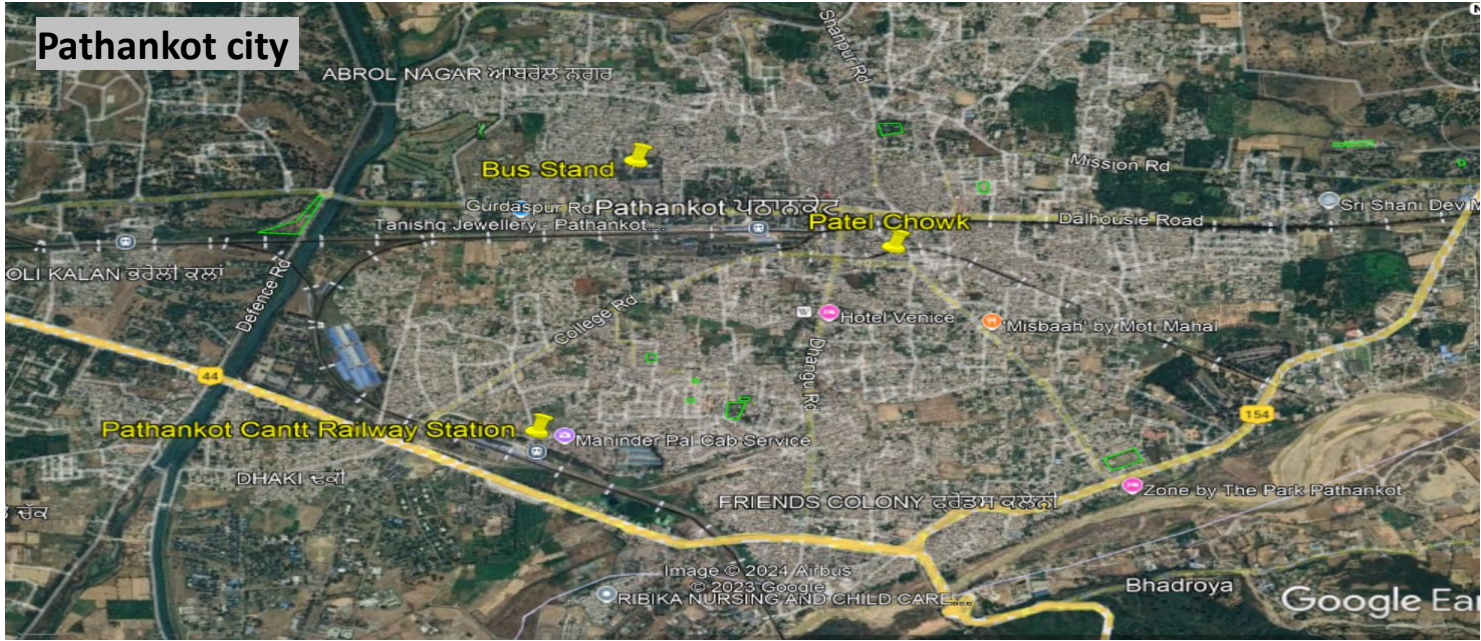
## Voice & Dynamic Data Test Drive Route



Day	Date	Test Scenario	Area to be Covered
1	21-Aug-24	Hotspots- 2G/3G/4G Static Data	Hot Spot Testing (3 No)
2	22-Aug-24	2G/3G/4G Voice and 3G/4G Dynamic Data	Pathankot City + COP
3	23-Aug-24	2G/3G/4G Voice and 3G/4G Dynamic Data + Hotspots- 2G/3G/4G Static Data	Gurdaspur City + 3 Hot spots
4	24-Aug-24	2G/3G/4G Voice and 3G/4G Dynamic Data (Highway route)	Pathankot - Gurdaspur - Batala - Amritsar - Rayya - Beas - Jalandhar - Bhogpur - Dasua - Mukerian - Pathankot

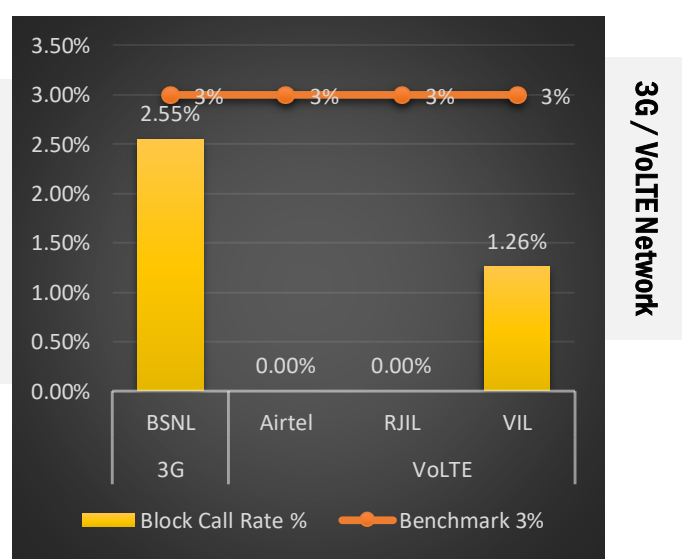
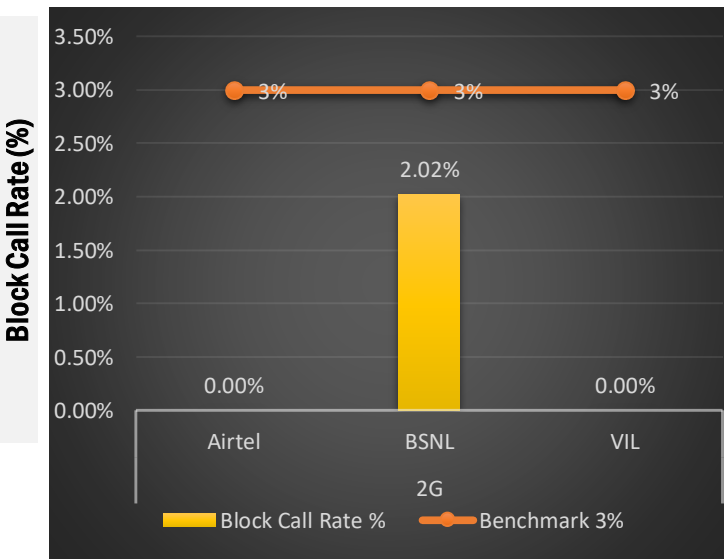
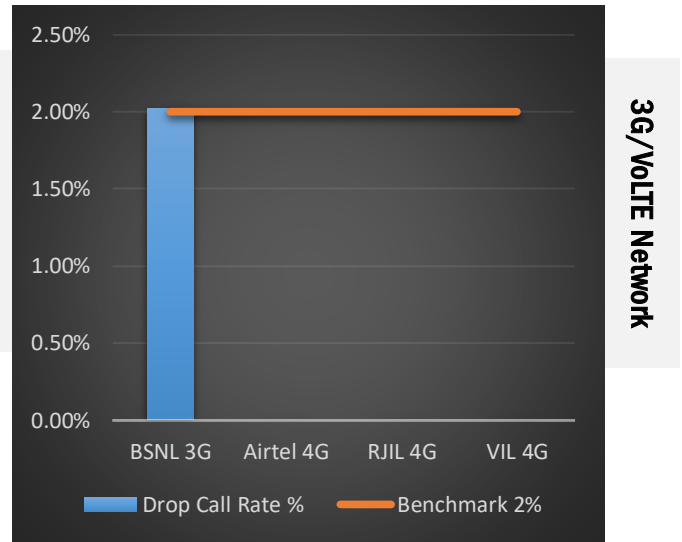
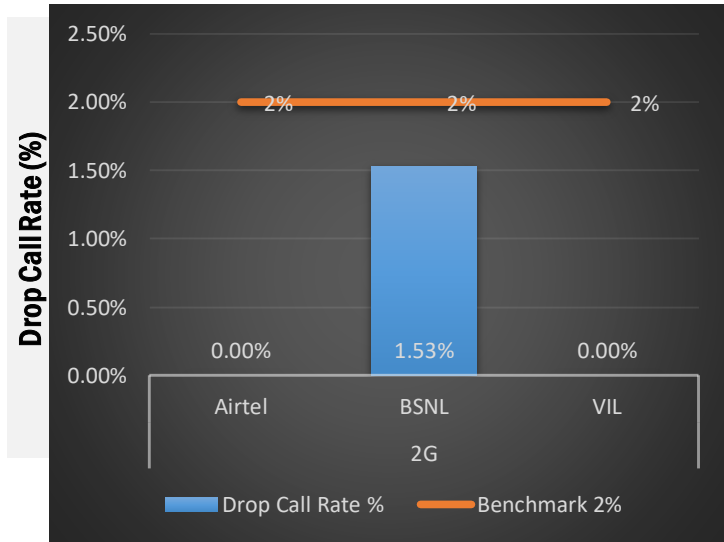


## Data Service Test- Static Locations



Hotspot Locations
1. Bus Stand, Pathankot
2. Patel Chowk, Pathankot
3. Pathankot Cantt Railway Station
4. Beant Engineering College, Gurdaspur
5. Railway Station, Gurdaspur
6. Court Complex, Gurdaspur

### QoS compliance of the TSPs in Pathankot and Gurdaspur City & Nearby area for Voice across technologies 2G/3G/4G-VoLTE:



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0.00%	1.53%	0.00%	2.02%	0.00%	0.00%	0.00%
Block Call Rate %	0.00%	2.02%	0.00%	2.55%	0.00%	0.00%	1.26%

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%).
- b) Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's.



# Voice Calls

## Key Observations

### Coverage

a) Percentage of coverage samples for 2G  $\geq$  -85 dBm.

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	99%	82.26%	97%

b) Percentage of coverage samples for 3G  $\geq$  -90 dBm

TSPs	3G
	BSNL
Coverage %	71.95%

c) Percentage of coverage samples for LTE  $\geq$  -110 dBm.

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	98%	99.61%	100%

d) Percentage of time spent on 3G/4G network

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	79.34%	100%	100%	100%

# Summary

## City Level Summary- Data Services

Data Services Static	3G / 4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (Mbps)	4.06	28.06	71.99	32.11
Upload Throughput(Mbps)	1.01	12.61	20.64	26.39
Video Streaming Delay (sec)	12.4	3.26	1.33	4.15
Web Browsing Delay (sec)	92.49	57.16	55.53	38
Latency (msec)	4.06	28.06	71.99	32.11

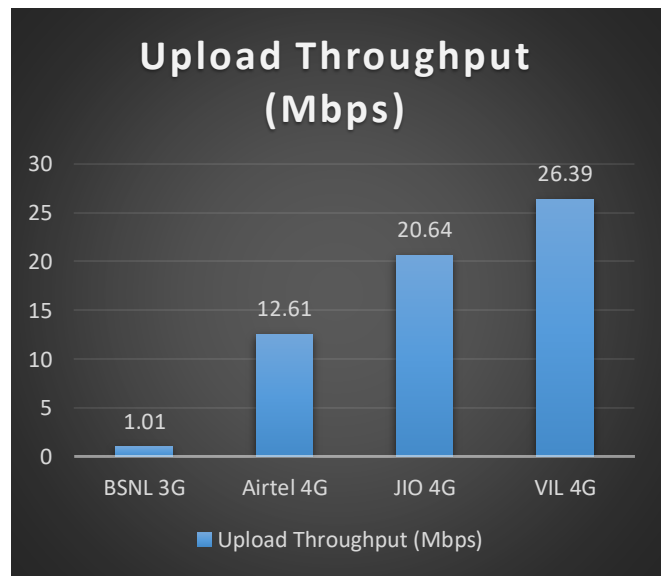
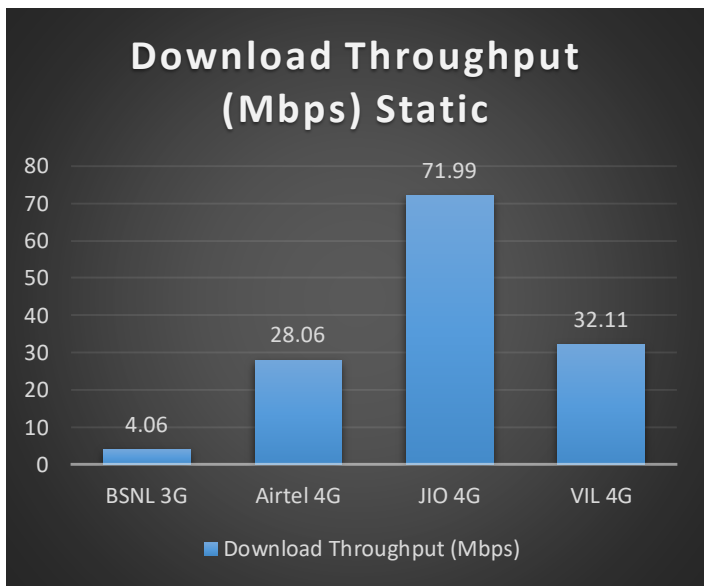
# Data Services Static

## Key Observations

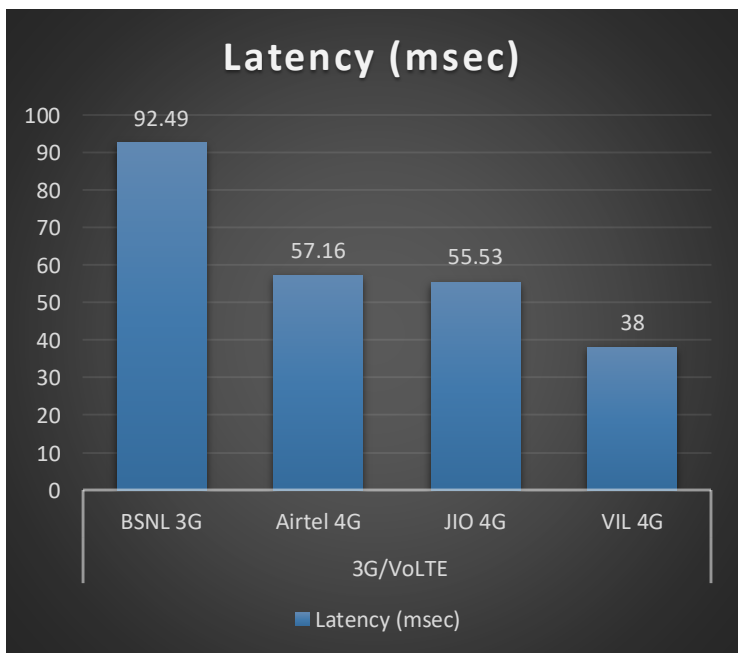
Data was tested at 5 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, Paytm)

### Data Download and Upload Performance Static (Mbps)

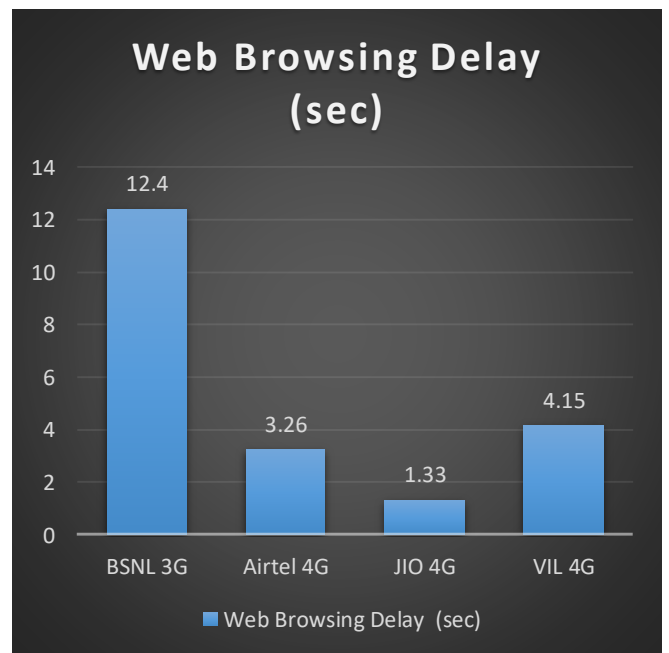
3G/4G/ Network:



### Latency (ms)



### Web Browsing (Sec)





# Data Services Dynamic

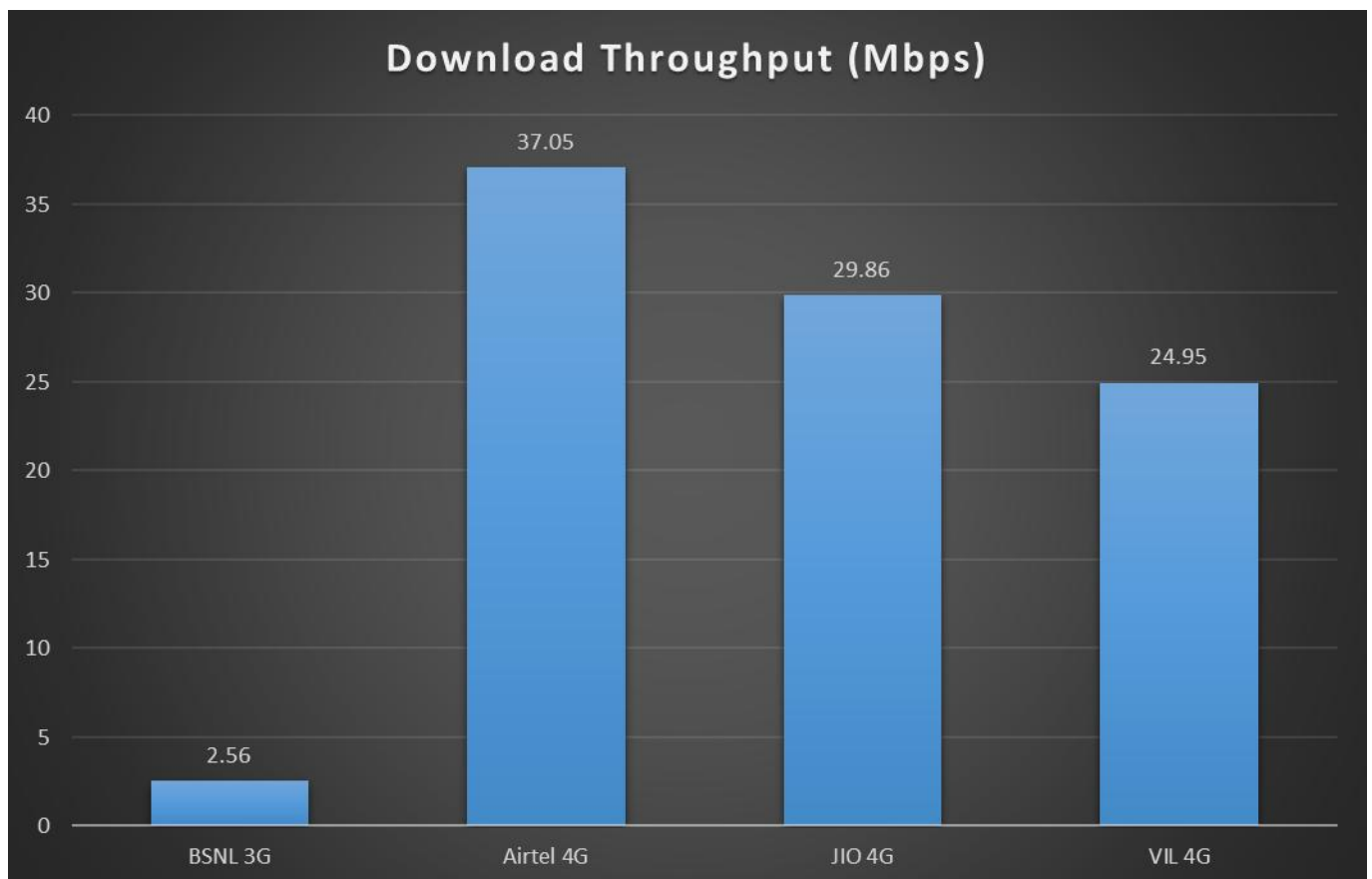
## Key Observations

Dynamic Data was tested for whole voice route. Download Throughput was tested.

### Data Download Performance (kbps) - Dynamic

3G/4G/ Network:

Data Services Dynamic	3G/VoLTE			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (Mbps)	<b>2.56</b>	<b>37.05</b>	<b>29.86</b>	<b>24.95</b>



Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	196	196	191
Blocked Call Rate (%)	0%	2.02%	0%
CSSR% (Accessibility)	100%	97.98%	100%
Drop Call Rate (%)	0%	1.53%	0%
Mobility HOSR (%)	99.99%	97.5%	100%
Rx Quality (%)	97%	100%	96%
Average CST Sec	3.39	2.33	3.79

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	198	196	194	193
Blocked Call Rate (%)	2.55%	0%	0%	1.26%
CSSR% (Accessibility)	97.45%	100%	100%	98.74%
Drop Call Rate (%)	2.02%	0%	0%	0%
Mobility HOSR (%)	95.3%	99.99%	99.75%	99.63%
Rx Quality (%)	89.28%	94.24%	91.17%	88.01%
Average CST Sec	1.77	1.34	0.75	2.39

## Data Services static

<b><u>Bus stand</u></b>	<b>3G</b>	<b>4G</b>		
	<b>BSNL</b>	<b>Airtel</b>	<b>JIO</b>	<b>VIL</b>
<b>Download Throughput (mbps)</b>	<b>3.47</b>	<b>23.56</b>	<b>71.03</b>	<b>43.93</b>
<b>Upload Throughput (mbps)</b>	<b>1.14</b>	<b>12,2</b>	<b>19.81</b>	<b>35.52</b>
<b>Video Streaming Delay (Secs.)</b>	<b>Na</b>	<b>1.6</b>	<b>0.81</b>	<b>0.704</b>
<b>Web Browsing Delay (sec)</b>	<b>13.11</b>	<b>3,6</b>	<b>1.10</b>	<b>4.43</b>
<b>Latency (msec)</b>	<b>55.2</b>	<b>52</b>	<b>50.50</b>	<b>42</b>

<b>Patel Chowk</b>	<b>3G</b>	<b>4G</b>		
	<b>BSNL</b>	<b>Airtel</b>	<b>JIO</b>	<b>VIL</b>
<b>Download Throughput (mbps)</b>	<b>3.25</b>	<b>22.33</b>	<b>106.25</b>	<b>23.71</b>
<b>Upload Throughput (mbps)</b>	<b>0.89</b>	<b>9.17</b>	<b>20.22</b>	<b>34.61</b>
<b>Video Streaming Delay (Secs.)</b>	<b>NA</b>	<b>1.8</b>	<b>0.74</b>	<b>1.004</b>
<b>Web Browsing Delay (sec)</b>	<b>25.42</b>	<b>3.3</b>	<b>1.43</b>	<b>4.47</b>
<b>Latency (msec)</b>	<b>54.7</b>	<b>65</b>	<b>54</b>	<b>36</b>

<b>Railway station</b>	<b>3G</b>	<b>4G</b>		
	<b>BSNL</b>	<b>Airtel</b>	<b>JIO</b>	<b>VIL</b>
<b>Download Throughput (mbps)</b>	<b>3.16</b>	<b>28.3</b>	<b>127.67</b>	<b>28.69</b>
<b>Upload Throughput (mbps)</b>	<b>1.04</b>	<b>14.32</b>	<b>20.14</b>	<b>9.04</b>
<b>Video Streaming Delay (Secs.)</b>	<b>NA</b>	<b>1.5</b>	<b>0.72</b>	<b>0.881</b>
<b>Web Browsing Delay (sec)</b>	<b>11.43</b>	<b>3.2</b>	<b>1.13</b>	<b>3.55</b>
<b>Latency (msec)</b>	<b>56.5</b>	<b>58</b>	<b>48.5</b>	<b>35</b>



## Data Services static

<b><u>Beant College</u></b>	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	6.99	34.56	42.56	53.15
Upload Throughput (mbps)	1.04	14,27	22.53	24.23
Video Streaming Delay (Secs.)	NA	1.3	0.87	1.045
Web Browsing Delay (sec)	14.42	3,3	1.57	2.83
Latency (msec)	85.05	57	56.8	44

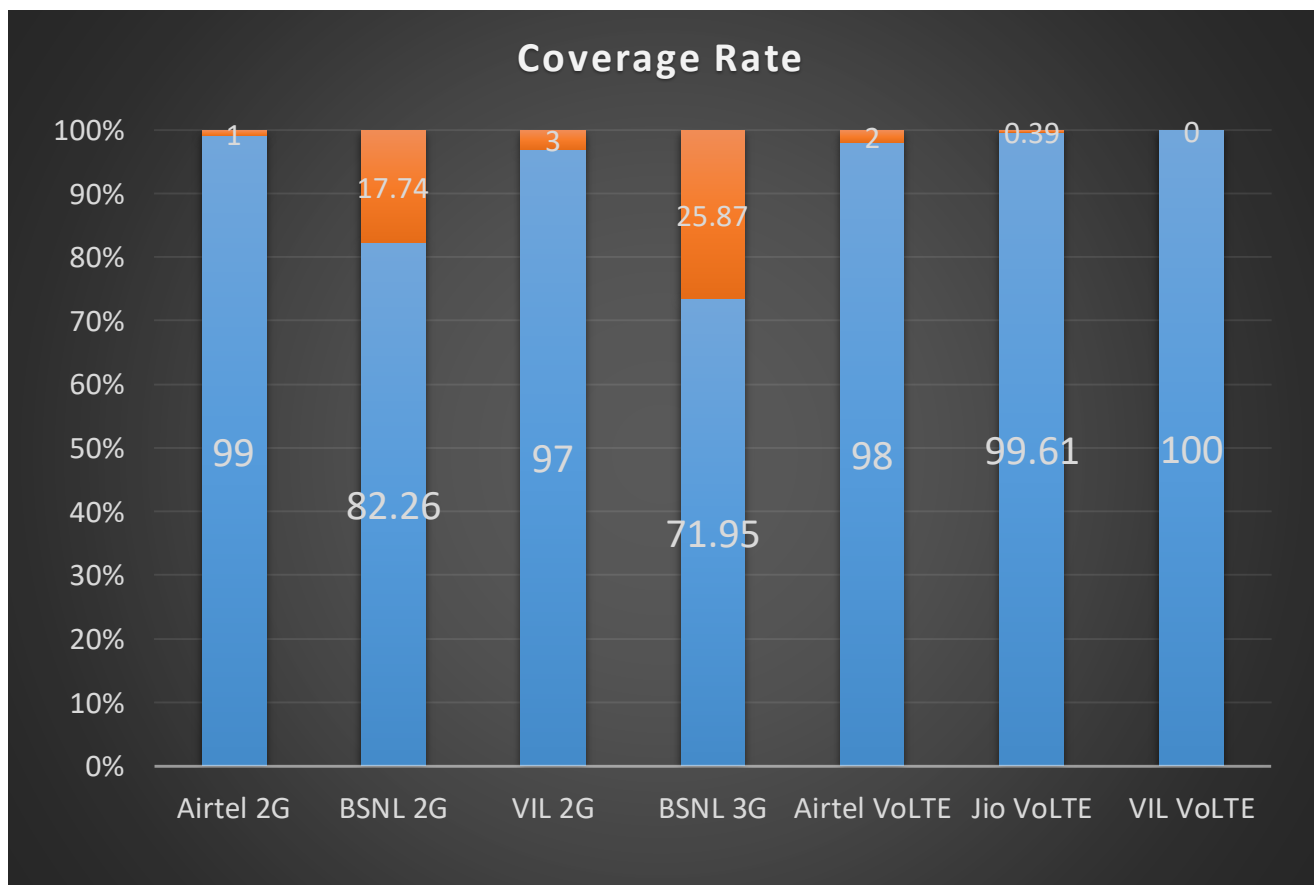
<b><u>COURT GURDASPUR</u></b>	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	4.46	139	37.09	33.83
Upload Throughput (mbps)	0.68	89.2	18.35	22.79
Video Streaming Delay (Secs.)	NA	8.7	0.77	0.977
Web Browsing Delay (sec)	13.79	401	1.48	2.65
Latency (msec)	51.4	72.6	63.6	43

<b><u>Railway Station Gurdaspur</u></b>	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	6.54	31.3	47.34	11.91
Upload Throughput (mbps)	1.16	14.57	22.79	14.45
Video Streaming Delay (Secs.)	NA	1.3	0.64	0.852
Web Browsing Delay (sec)	13.79	3.1	1.28	3.43
Latency (msec)	89	50	59.8	43

## Coverage Details

RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call session. The Coverage rate is calculated on the basis of % of samples in which the Rx level  $\geq$  -85 dBm, RSCP is  $\geq$  -90 dBm & RSRP  $\geq$  -110dBm. The details are as follows.

TSP	Coverage Rate %
Airtel 2G	99%
BSNL 2G	82.26%
VIL 2G	97%
BSNL 3G	71.95%
Airtel VoLTE	98%
Jio VoLTE	99.61%
VIL VoLTE	100%



## TSP-AIRTEL

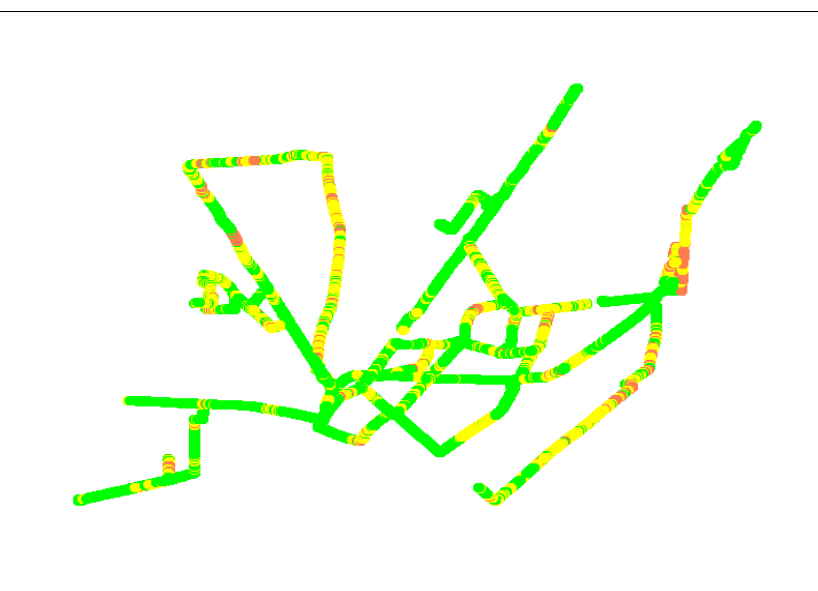
Technology	Coverage %
2G	99%

### 2G (PATHANKOT)



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	1333577	88.70%	
[-75, >=-85)	146644	9.75%	
[-85, >=-95)	21436	1.43%	
[-95, >=Min)	1804	.12%	
<b>Total</b>	<b>1503461</b>	<b>100%</b>	

### 2G (GURDASPUR)



2G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-75]	1495934	82.25%	
[-75, >=-85)	302299	16.62%	
[-85, >=-95)	20374	1.13%	
[-95, >=Min)	75	0%	
<b>Total</b>	<b>1818682</b>	<b>100%</b>	



## TSP-AIRTEL

Technology	Coverage %
VoLTE	98 %

### Volte (PATHANKOT)



VoLTE /5G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-80]	1513554	61.08%	Green
[-80, >=-90)	648609	26.18%	Yellow
[-90, >=-110)	241780	9.76%	Orange
[-110, >=Min)	73974	2.98%	Red
<b>Total</b>	<b>2477917</b>	<b>100%</b>	

### Volte (GURDASPUR)



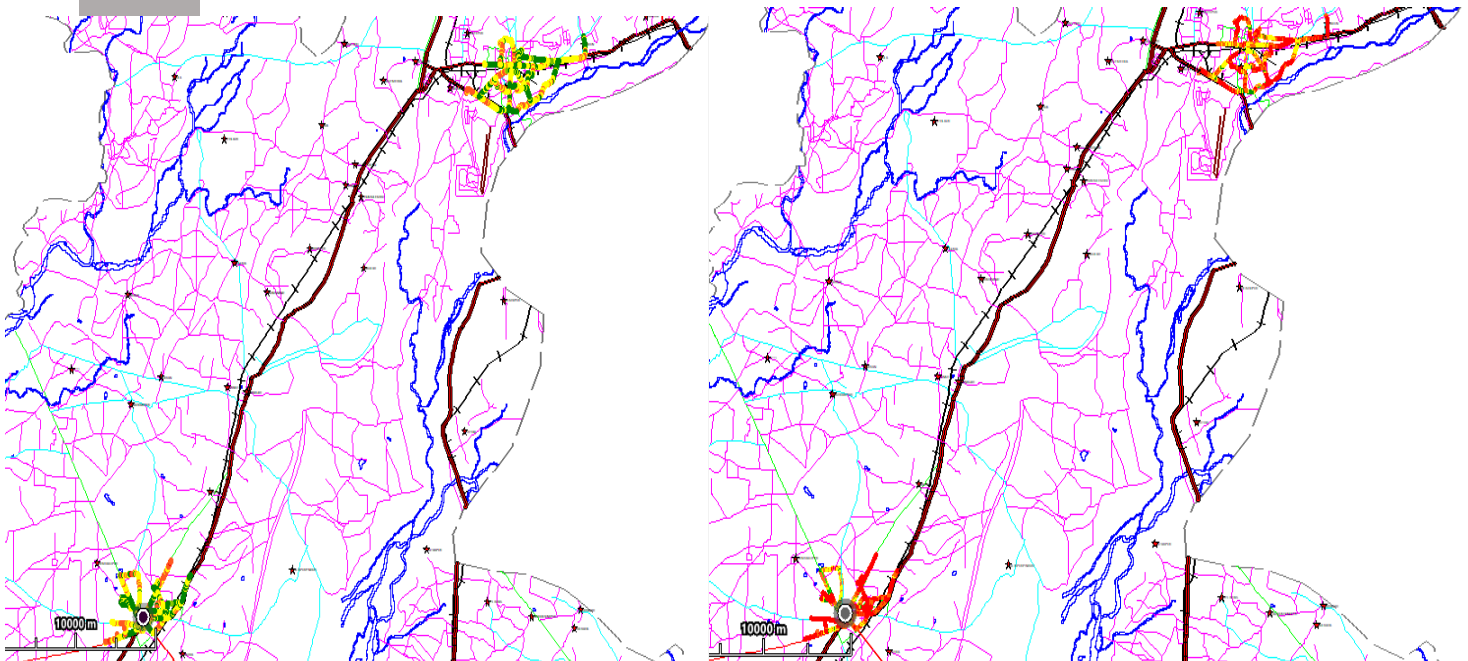
VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	2066118	62.16%	Green
[-80, >=-90)	820385	24.68%	Yellow
[-90, >=-110)	415846	12.51%	Orange
[-110, >=Min)	21928	.65%	Red
<b>Total</b>	<b>3324277</b>	<b>100%</b>	

## TSP- BSNL

Technology	Coverage %
2G	82.26%
3G	71.95%

2G

3G

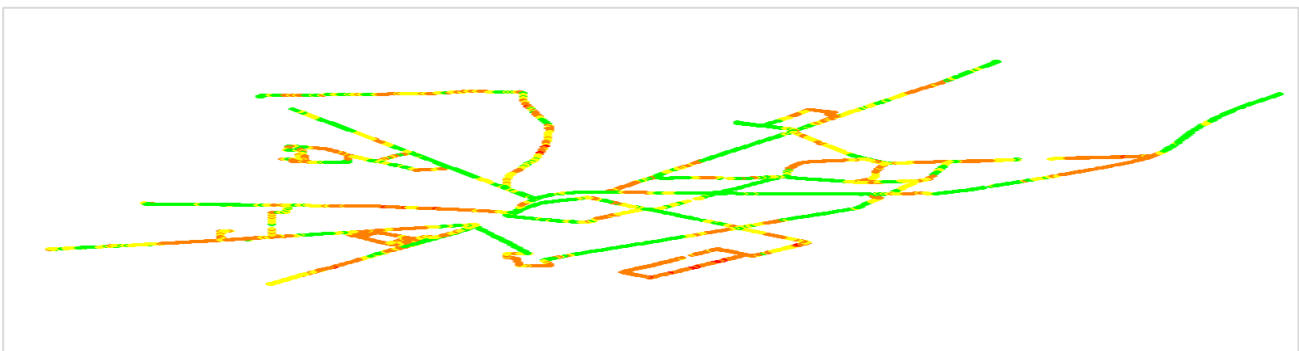


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	8539	38.87%	
[-75, >=-85)	9533	43.39%	
[-85, >=-95)	3702	16.86%	
[-95, >=Min)	194	0.88%	
<b>Total</b>	<b>21968</b>	<b>100%</b>	

3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	1153	5.17%	
[-70, >=-80)	4485	20.12%	
[-80, >=-90)	10414	46.68%	
[-90, >=Min)	6253	28.03%	
<b>Total</b>	<b>22305</b>	<b>100%</b>	

## JIO

Technology	Coverage %
VoLTE	99.61%



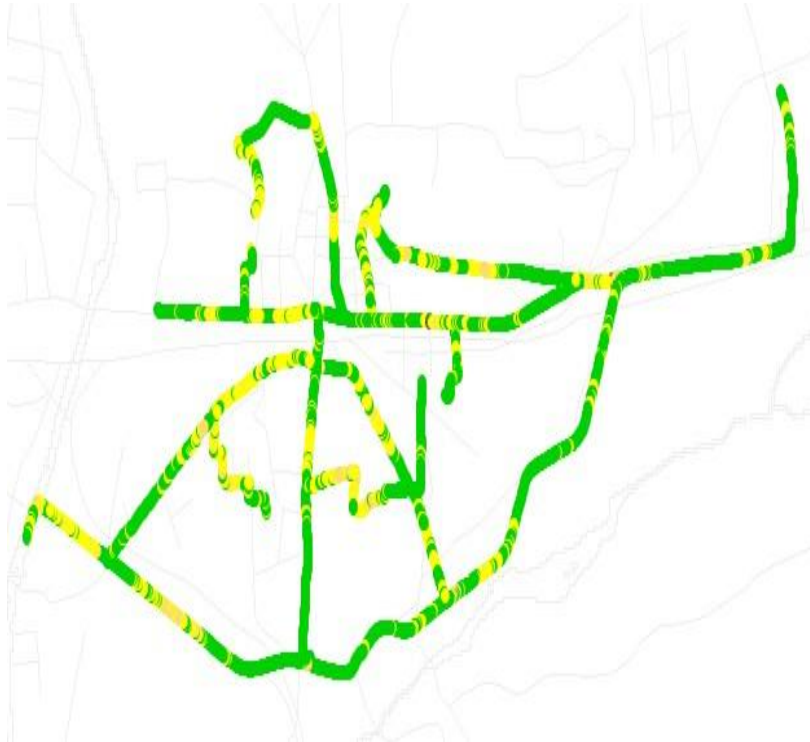
VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	35191	81.70%	<span style="background-color: green; width: 20px; height: 10px;"></span>
[-80, >=-90)	6329	14.69%	<span style="background-color: yellow; width: 20px; height: 10px;"></span>
[-90, >=-110)	1548	3.59%	<span style="background-color: orange; width: 20px; height: 10px;"></span>
[-110, >=Min)	5	0.02%	<span style="background-color: red; width: 20px; height: 10px;"></span>
<b>Total</b>	<b>43073</b>	<b>100%</b>	



VIL

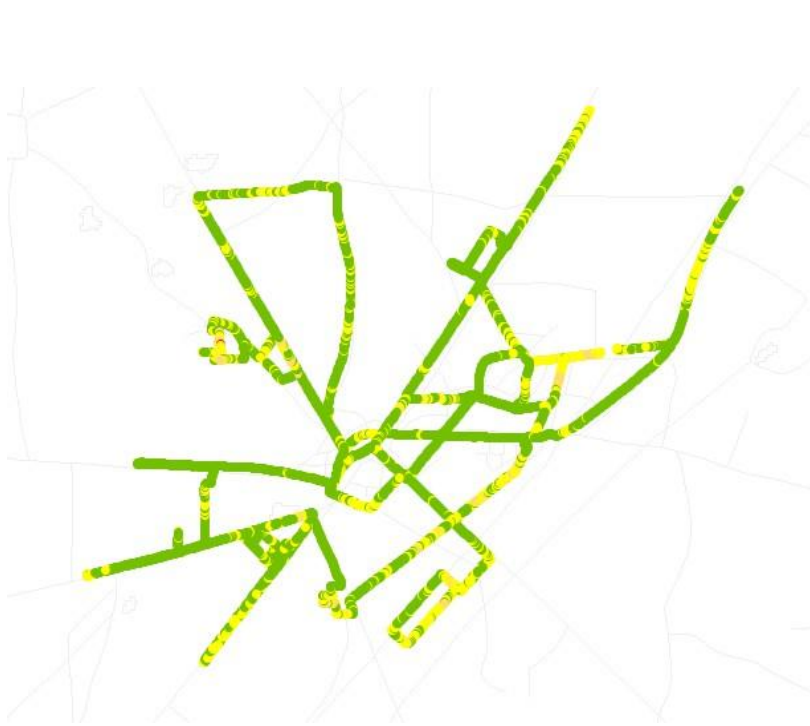
Technology	Coverage Rate %
2G	97%

2G (PATHANKOT)



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	467788	67.62%	
[-75, >=-85)	194898	28.17%	
[-85, >=-95)	28790	4.16%	
[-95, >=Min)	330	0.05%	
<b>Total</b>	<b>691806</b>	<b>100%</b>	

2G (GURDASPUR)

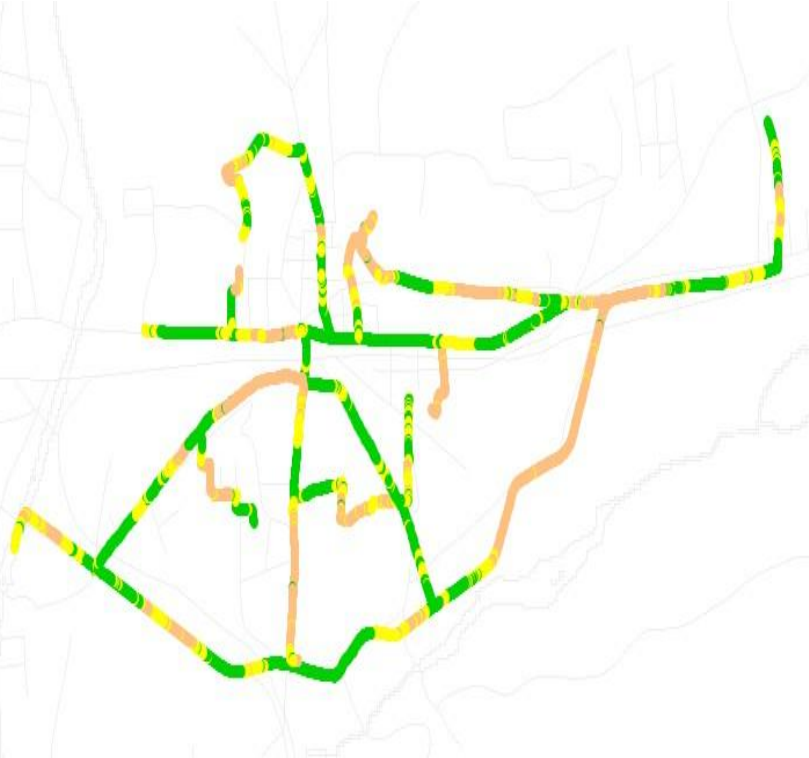


2G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-75]	848071	78%	
[-75, >=-85)	212605	20%	
[-85, >=-95)	25544	2%	
[-95, >=Min)	298	0%	
<b>Total</b>	<b>1086518</b>	<b>100%</b>	

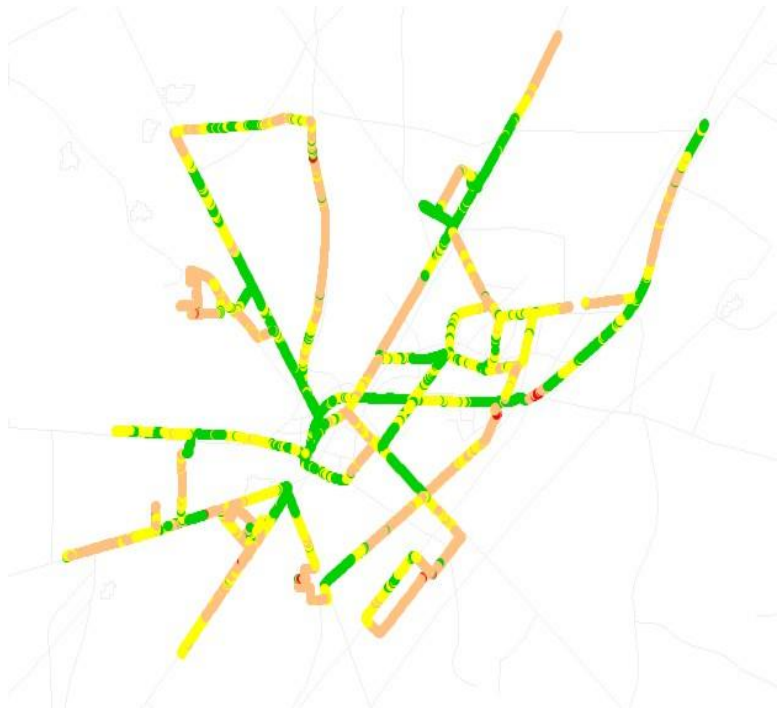
VIL

Technology	Coverage Rate %
Volte	100%

Volte (PATHANKOT)



Volte (GURDASPUR)



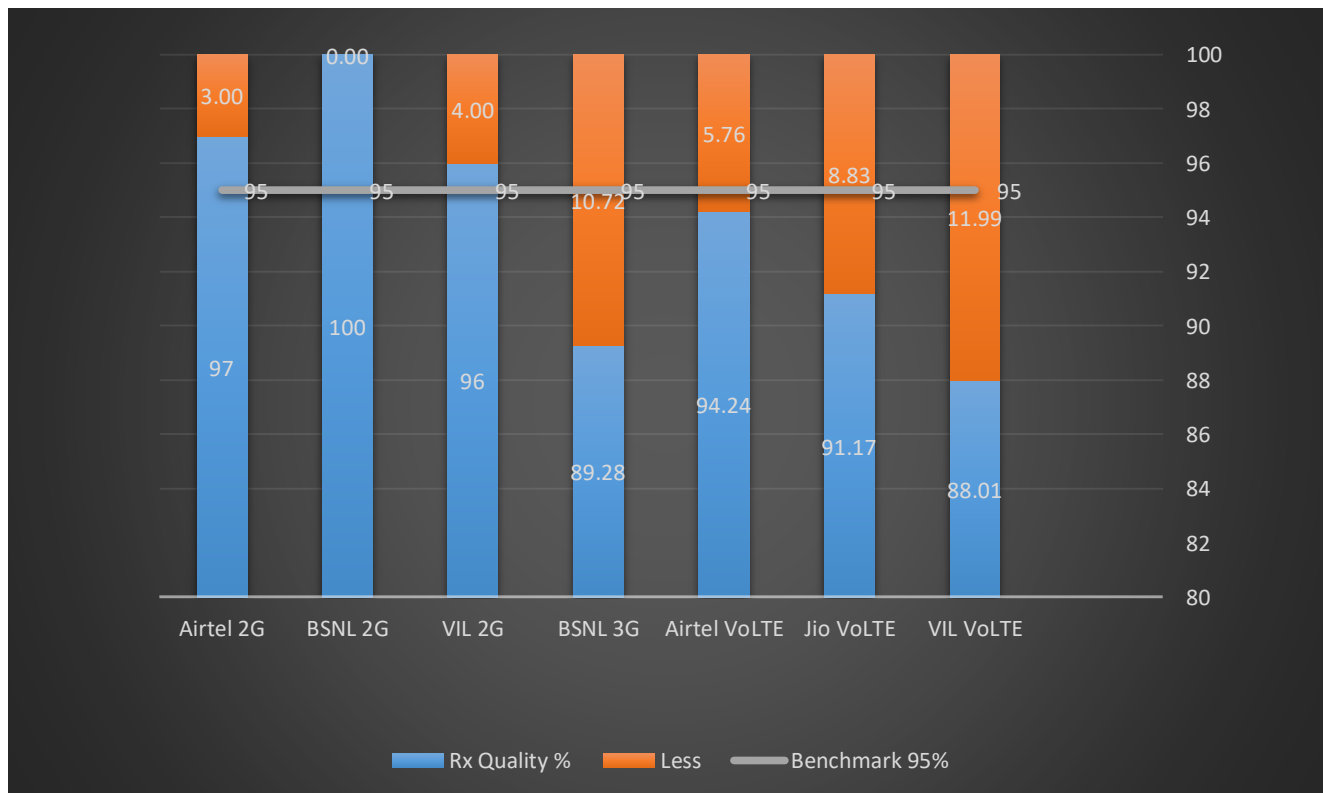
VoLTE /5G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-80]	1069083	52.56%	Green
[-80, >=-90)	469337	23.07%	Yellow
[-90, >=-110)	494012	24.29%	Orange
[-110, >=Min)	1648	0.08%	Red
<b>Total</b>	<b>2034080</b>	<b>100%</b>	

VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	1409462	33.83%	Green
[-80, >=-90)	1709624	41.02%	Yellow
[-90, >=-110)	1034621	24.83%	Orange
[-110, >=Min)	13512	0.32%	Red
<b>Total</b>	<b>4167219</b>	<b>100%</b>	

## II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual  $\leq 5$  for GSM TSPs, EcNo  $\geq -14$  dBm for 3G TSP sand SINR  $> 0$  in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be  $\geq 95\%$ .

TSP	Rx Quality %
Airtel 2G	97%
BSNL 2G	100%
VIL 2G	96%
BSNL 3G	89.28%
Airtel VoLTE	94.24%
Jio VoLTE	91.17%
VIL VoLTE	88.01%



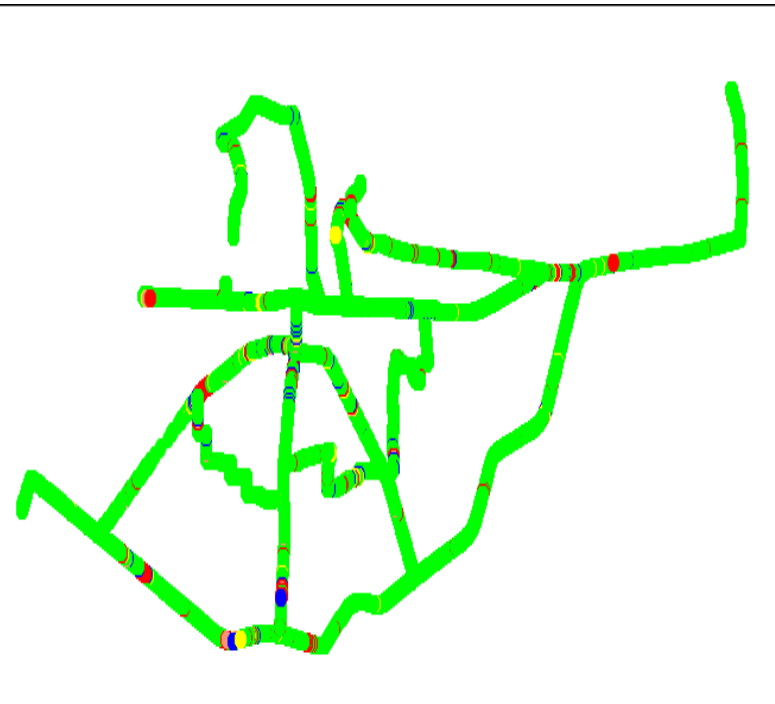


## II. Quality Details

### Airtel

Technology	Rx Quality %
2G	97%

#### 2G (PATHANKOT)



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1450850	96.50%	Green
(2, <=3)	8969	.59%	Yellow
(3, <=4)	11552	.76%	Blue
(4, <=5)	9358	.63%	Orange
(5, <=Max)	22742	1.52%	Red
<b>Total</b>	<b>1503471</b>	<b>100%</b>	

#### 2G (GURDASPUR)



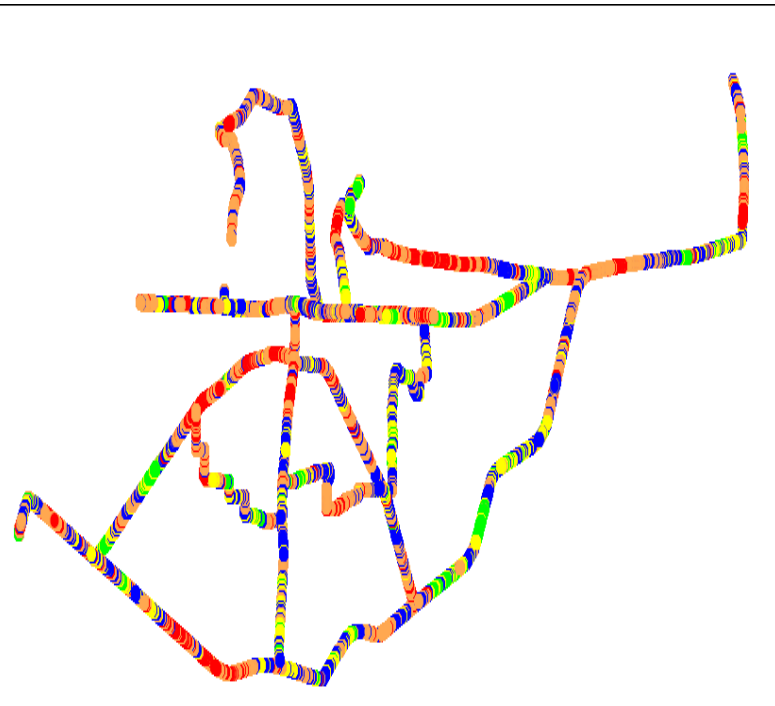
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1741847	95.77%	Red
(2, <=3)	26853	1.47%	Orange
(3, <=4)	17375	.95%	Orange
(4, <=5)	12374	.69%	Blue
(5, <=Max)	20233	1.12%	Yellow
<b>Total</b>	<b>1818672</b>	<b>100%</b>	Green

## II. Quality Details

### Airtel

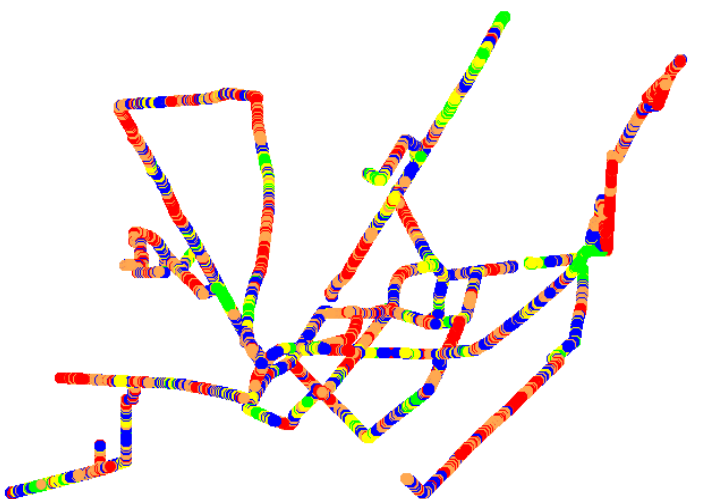
Technology	Rx Quality %
VoLTE	94.24%

#### Volte (PATHANKOT)



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	134151	5.41%	Green
(0, <=5)	660070	26.64%	Yellow
(5, <=10)	329709	13.30%	Blue
(10, <=15)	218885	8.85%	Orange
(15, <=Max)	1135102	45.80%	Red
<b>Total</b>	<b>2477917</b>	<b>100%</b>	

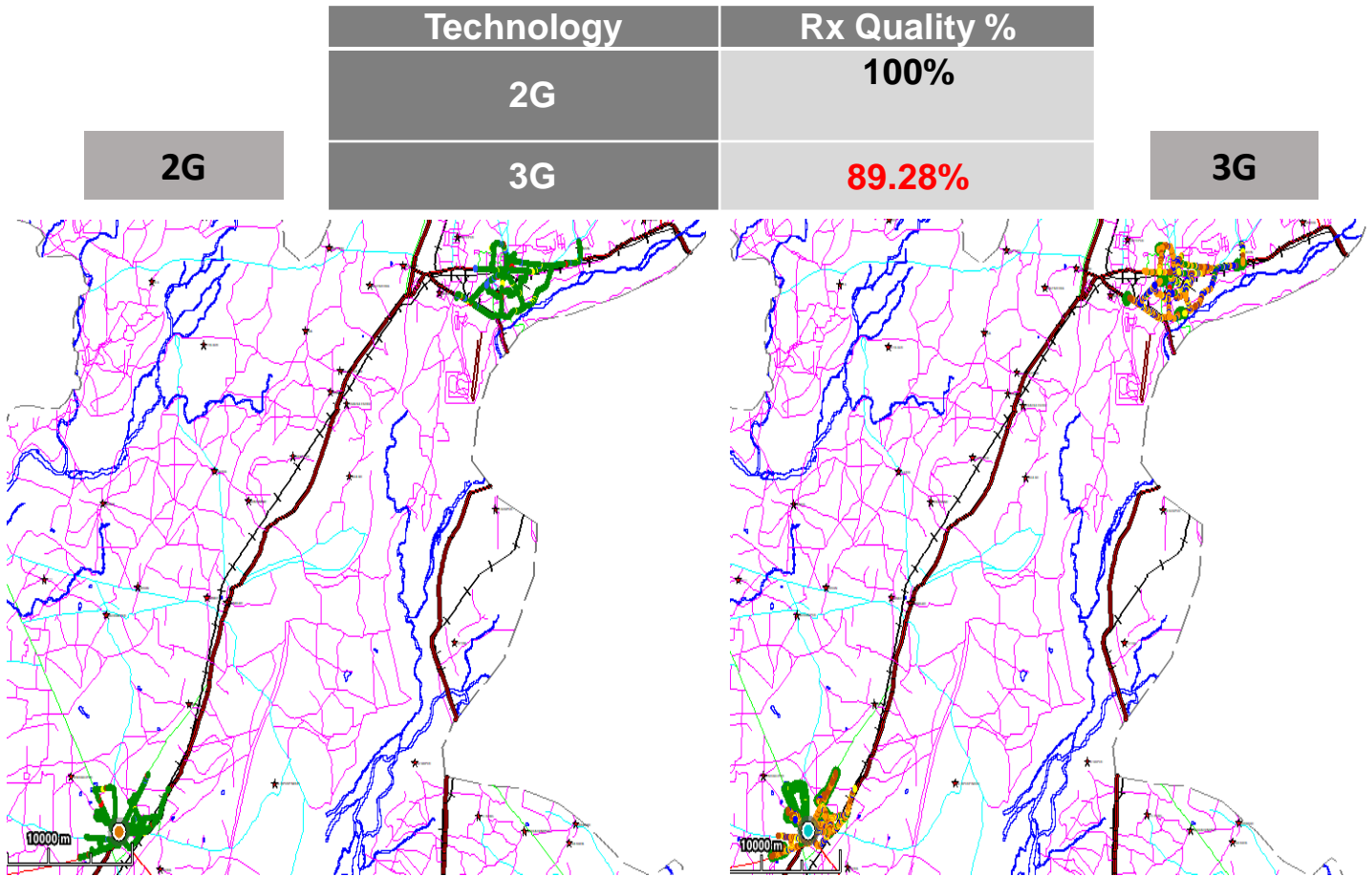
#### Volte (GURDASPUR)



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	203495	6.13%	Red
(0, <=5)	410411	12.34%	Orange
(5, <=10)	409505	12.32%	Orange
(10, <=15)	308452	9.28%	Blue
(15, <=Max)	1992414	59.93%	Yellow
<b>Total</b>	<b>3324277</b>	<b>100%</b>	Green

## II. Quality Details

### BSNL



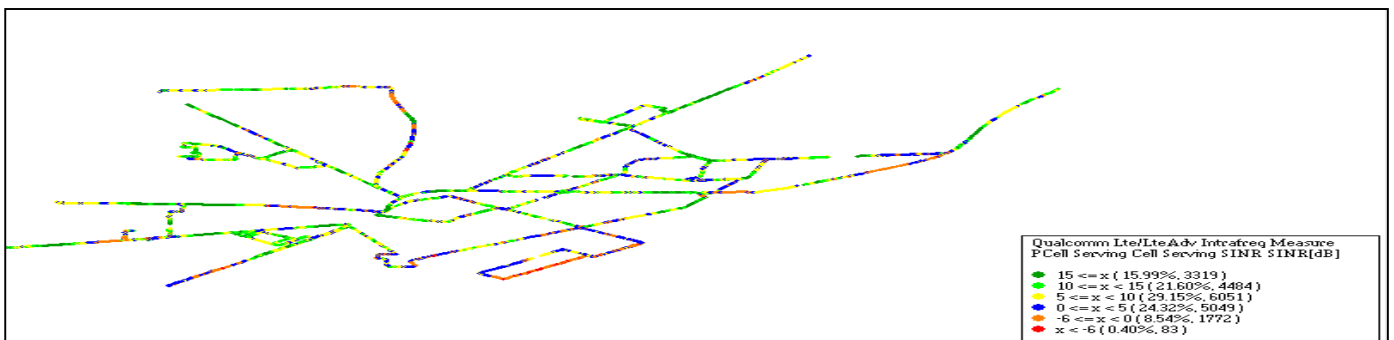
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	18337	94.79	
(2, <=3)	382	1.97	
(3, <=4)	355	1.84	
(4, <=5)	271	1.40	
(5, <=Max)	0	0	
<b>Total</b>	<b>19345</b>	<b>100%</b>	

Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	4630	21.51	
(-6, <=-9)	2308	10.72	
(-9, <=-11)	4325	20.08	
(-11, <=-14)	8002	37.15	
(-14, <= Min)	2270	10.54	
<b>Total</b>	<b>21535</b>	<b>100%</b>	

For measuring voice quality, as per the QoS norms, RxQual  $\leq 5$  for GSM TSPs, EcNo  $\geq -14$  dBm for 3G TSP and SINR  $> 0$  in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be  $\geq 95\%$ .

## JIO

Technology	Rx Quality %
VoLTE	<b>91.17%</b>



Overall SINR	# Samples	% PDF	Legends
(Min, $\leq -6$ )	83	0.40%	
( $-6, \leq 0$ )	1772	8.53%	
(0, $\leq 5$ )	5049	24.32%	
(5, $\leq 10$ )	6051	29.16%	
(10, $\leq 15$ )	4484	21.60%	
(15, $\leq$ Max)	3319	15.99%	
<b>Total</b>	<b>20758</b>	<b>100%</b>	

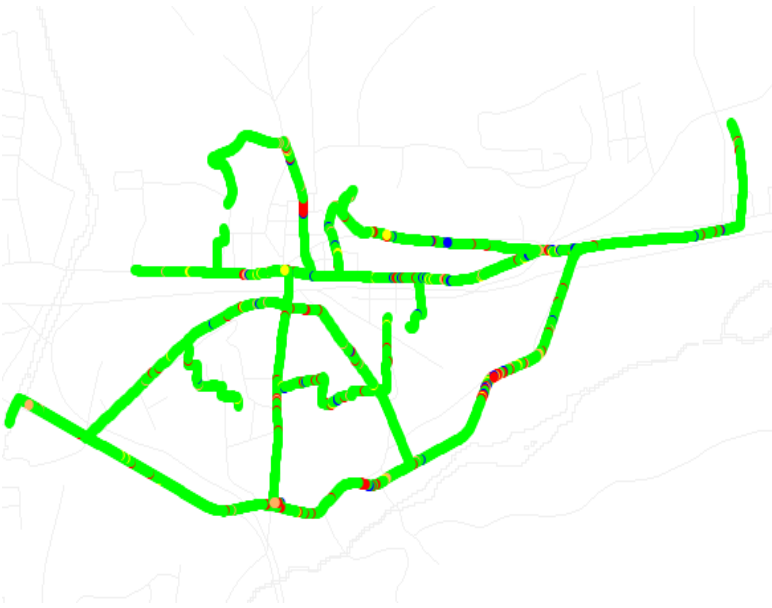


## II. Quality Details

### VIL

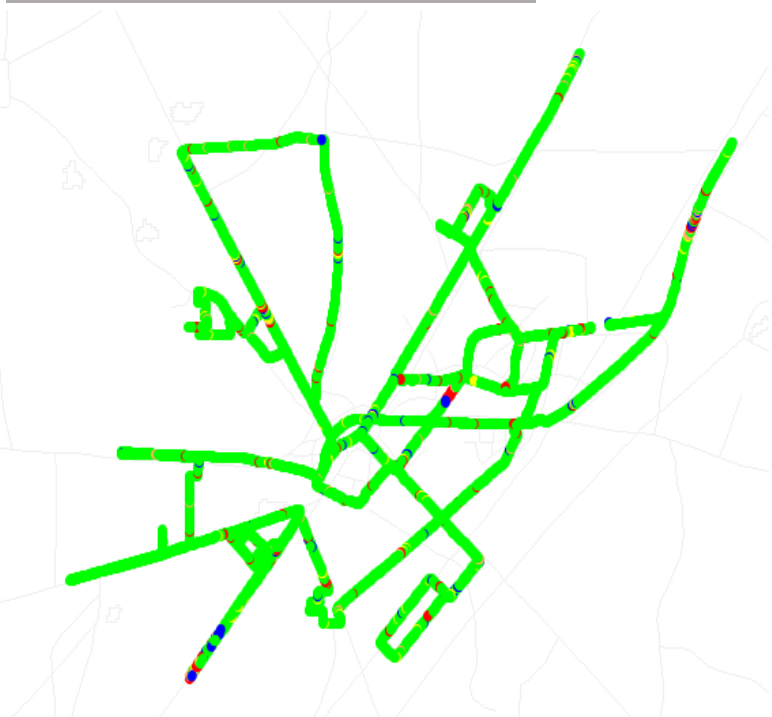
Technology	Rx Quality %
2G	96%

#### 2G (PATHANKOT)



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	636196	91.96%	
(2, <=3)	10916	1.57%	
(3, <=4)	10082	1.46%	
(4, <=5)	10101	1.46%	
(5, <=Max)	24511	3.55%	
<b>Total</b>	<b>691806</b>	<b>100%</b>	

#### 2G (GURDASPUR)



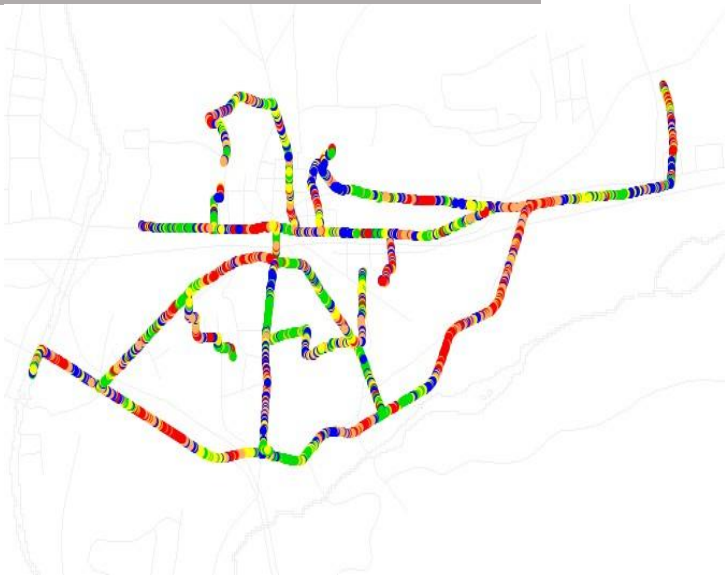
Overall SINR	# Samples	% PDF	Legend s
(Min, <=2)	1021830	94.05%	
(2, <=3)	14188	1.31%	
(3, <=4)	12210	1.12%	
(4, <=5)	11581	1.07%	
(5, <=Max)	26709	2.45%	
<b>Total</b>	<b>1086518</b>	<b>100%</b>	

## II. Quality Details

### VIL

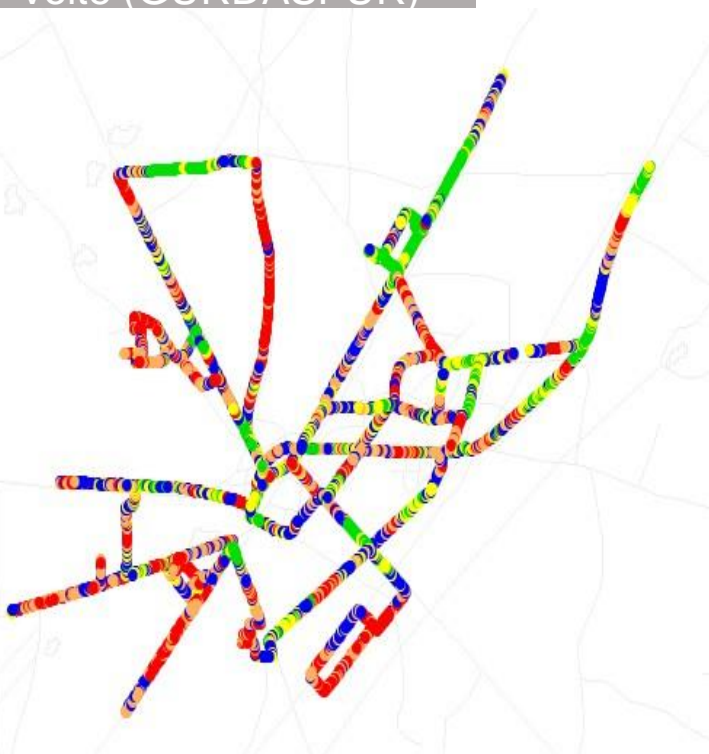
Technology	Rx Quality %
Volte	<b>88.01%</b>

#### Volte (PATHANKOT)



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=0)	237374	11.67%	Green
(0, <=5)	373678	18.37%	Yellow
(5, <=10)	447420	22.0%	Blue
(10, <=15)	415056	20.4%	Orange
(15, <=Max)	560552	27.56%	Red
<b>Total</b>	<b>2034080</b>	<b>100%</b>	

#### Volte (GURDASPUR)



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	513163	12.31%	Red
(0, <=5)	693235	16.63%	Orange
(5, <=10)	726207	17.43%	Blue
(10, <=15)	1029662	24.71%	Yellow
(15, <=Max)	1204952	28.92%	Green
<b>Total</b>	<b>4167219</b>	<b>100%</b>	

### III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	79.34%
Airtel VoLTE	100%
Jio VoLTE	100%
VIL VoLTE	100%

