

# **Operator Assisted Drive Test (OADT)**

**Jaipur City**

**for**

**Airtel / BSNL / Reliance Jio / VIL**

**OADT for Voice & Data - 16<sup>th</sup> to 18<sup>th</sup> March 2021**

The Operator Assisted Drive Test has been carried out in Jaipur City from **16<sup>th</sup> to 18<sup>th</sup> March 2021**. The drive test covered a drive route of approx. 350 KMs & 03 hotspots in three days. Calls were made for 2G/3G/ 4G VoLTE networks (as applicable in TSP's)

## Overview:

Telecom Regulatory Authority of India has been entrusted with the task of laying down the standards of quality of service to be provided by the service providers and ensuring its enforcement; and, TRAI is 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

TRAI is regularly monitoring the performance of Telecom Service Providers (TSP) against the benchmarks for the various Quality of Service (QoS) parameters laid down by the Authority. TSPs submit Performance Monitoring Reports to TRAI every quarter. TRAI also undertakes audit and assessment of Quality of Service to verify the Quality of Service claimed. In view of complaints on call drops and other network quality issues As per the instructions of TRAI HQ, TRAI Regional Office Jaipur has conducted the drive test with the help of telecom Service Providers of Rajasthan from 16<sup>th</sup> March 2021 to 18<sup>th</sup> March 2021 covering various locations in Jaipur City & surrounding area. The performance of Airtel, BSNL, Vodafone Idea Limited (VIL) and Jio were monitored across various technologies (2G, 3G, and 4G). The drive test reports were generated through TSPs tools and was compiled by the TRAI RO Jaipur. The drive test route was defined on the basis of several factors that include - areas from where call drop complaints are commonly received; areas of heavy usage; residential areas away from arterial roads; office areas; areas where previous Drive tests showed network issues; etc.

### Drive Test Details for Jaipur:

2G – measurement – UE Locked in 2G

3G – measurement – UE in Dual mode (2G and 3G)

4G – measurement – UE in Free mode

**Voice** -Calls were made for 90 sec duration with wait time of 10 sec between calls in all technologies.

**Data:** Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay and Latency

Download- 2G (500KB) ,3G- 20 MB, 4G- 40MB

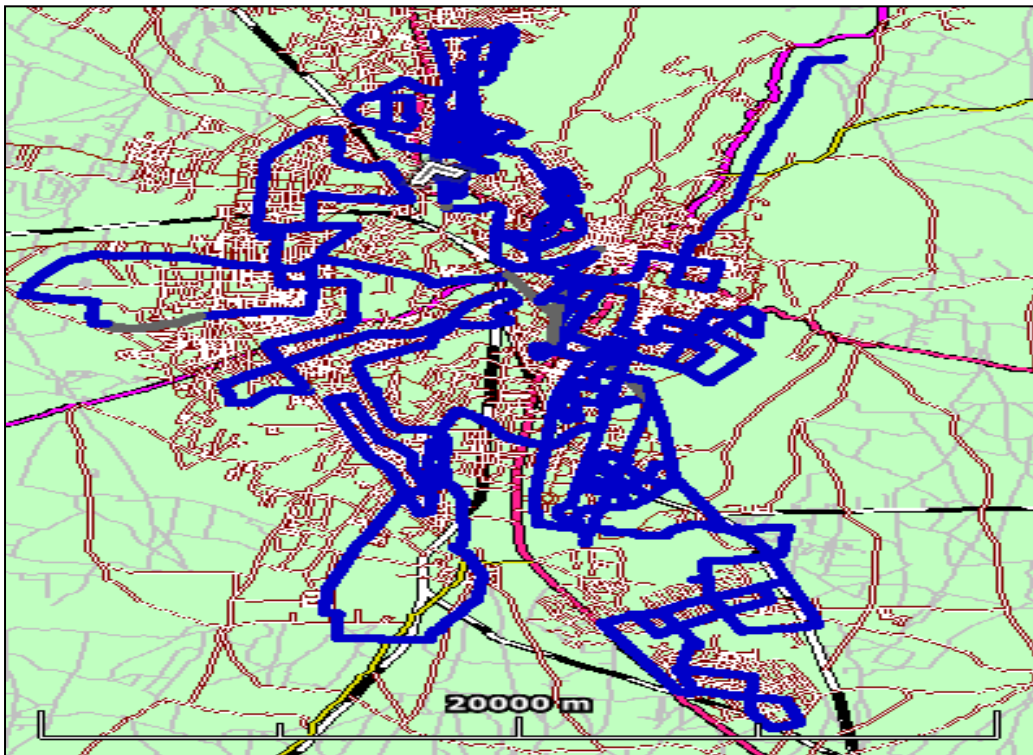
Upload - 2G (100KB) ,3G- 5 MB, 4G- 10MB

Web browsing - 3 links of e commerce websites <https://www.amazon.in>, <https://www.flipkart.com>, <https://paytm.com>.

Video Streaming – 130 sec clip

Latency – 32 Bytes on [www.google.com](http://www.google.com).

Voice drive test route (Map as shown below)



Data testing hotspot locations (Map as shown below)



## Key observations of Voice Call

### Drop Call Rate %(Bench mark < 2%)

TSP	VoLTE Network	3G Network	2G Network
Airtel	0.19%	NA	0.19%
BSNL	NA	0.9%	0%
JIO	0%	NA	NA
VIL	0%	0%	0%

### Block Call Rate % (Benchmark < 3%)

TSP	VoLTE Network	3G Network	2G Network
Airtel	0.37%	NA	0.19%
BSNL	NA	0%	0.4%
JIO	0%	NA	NA
VIL	0.21%	0.83%	0.86%

Technology	Parameter	Airtel	BSNL	JIO	VIL
2G	SDCCH Congestion (<=1%)	0%	0%	NA	0%
	TCH Congestion (<=2%)	0%	0.4%	NA	0%
3G	CSFB Failure %	NA	NA	NA	0%
	SDCCH Congestion %	NA	0%	NA	0%
	RRC Congestion %	NA	0%	NA	0%
	SDCCH and RRC Congestion % (<=1%)	NA	0%	NA	0%
	TCH Congestion %	NA	0%	NA	0%
	RAB Congestion %	NA	0%	NA	0%
	TCH and RAB Congestion % (<=2%)	NA	0%	NA	0%

### Coverage

#### 1. Percentage of Coverage sample of 2G >= - 85 dBm

TSP	Airtel	BSNL	JIO	VIL
Coverage %	97.87%	96.6%	NA	96.67%

#### 2. Percentage of Coverage sample of 3G >= - 90 dBm

TSP	Airtel	BSNL	JIO	VIL
Coverage %	NA	72.1%	NA	95.90%

### 3. Percentage of Coverage sample of VoLTE >= -110 dBm

TSP	Airtel	BSNL	JIO	VIL
Coverage %	99.76%	NA	99.79%	99.09%

### 4. Percentage of time spent on 3G Network

TSP	Airtel	BSNL	JIO	VIL
Time spent %	NA	28%	NA	99.22%

### 5. Percentage of time spent on VoLTE Network

TSP	Airtel	BSNL	JIO	VIL
Time spent %	100%	NA	100%	99.97%

### 6. Percentage of RLT >= 48

TSP	Airtel	BSNL	JIO	VIL
Percentage of RLT >=48	0	0	-	0

### 7. Average CST in second

TSP	Airtel	BSNL	JIO	VIL
Second in 2G network	3.20	3.161	NA	4.17
Seconds in 3G network	NA	3.417	NA	3.22
Seconds in Volte Network	2.6	NA	0.33	0.85

## Voice call summary

TSP (For 2G)	Airtel	BSNL	JIO	VIL
Call attempts	540	465	NA	466
Block call rate %	0.19	0.4	NA	0.86
CSSR %	99.81	99.6	NA	99.14
Drop call rate %	0.19	0	NA	0.00
Mobility HOSR %	98.31	98.1	NA	99.67
RX Quality %	96.23	97.2	NA	95.11

TSP (For 3G)	Airtel	BSNL	JIO	VIL
Call attempts	NA	459	NA	480
Block call rate %	NA	0	NA	0.83
CSSR %	NA	100	NA	99.17
Drop call rate %	NA	0.9	NA	0.00
Mobility HOSR %	NA	99.9	NA	100

RX Quality %	NA	90.9% (2G <=5 + 3G >=- 14)	NA	97.79
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TSP (For VoLTE)	Airtel	BSNL	JIO	VIL
Call attempts	540	NA	465	482
Block call rate %	0.37	NA	0%	0.21
CSSR %	99.63	NA	100%	99.79
Drop call rate %	0.19	NA	0%	0.00
Mobility HOSR %	99.15	NA	99.51%	99.47
RX Quality %	95.73	NA	91.20%	95.63

### Data Service Static (on Hotspots)

#### Hotspot -1 (Location - Railway Station, Jaipur)

TSP (For 2G)	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	239.13	181	NA	104.5
Upload Throughput in Kbps	64.79	170	NA	89.9
Web browsing delay in second	5.45	61.173 (Amazon), 61.149 (Flipkart), 61.147 (Paytm)	NA	Data not provided
Latency in (msec)	166.83	155	NA	Data not provided

TSP (For 3G)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	6.879	NA	2.68
Upload Throughput in Mbps	NA	1.676	NA	0.99
Video streaming delay in sec	NA	10.66	NA	0.81
Web browsing delay in second	NA	33.929 (Amazon), 23.115 (Flipkart), 17.385 (Paytm)	NA	1.79
Latency in (msec)	NA	89	NA	78

TSP (For 4G )	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	10.67	NA	15.2	23.91
Upload Throughput in Mbps	5.08	NA	5.79	26.38
Video streaming delay in sec	0.71	NA	1.69	0.38
Web browsing delay in second	50.67	NA	5.07/3.57/2.72	1.69
Latency in (msec)	68.67	NA	35.5	62

#### Hotspot -2 (Location – Airport, Jaipur)

TSP ( For 2G)	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	125.24	191	NA	166.95
Upload Throughput in Kbps	44.66	99	NA	56.41
Web browsing delay in second	5.42	61.007 (Amazon), 60.243 (Flipkart), 57.441 (Paytm)	NA	Data not provided
Latency in (msec)	529.66	189	NA	Data not provided

<b>TSP ( For 3G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Mbps	NA	12.089	NA	6.59
Upload Throughput in Mbps	NA	1.154	NA	3.14
Video streaming delay in sec	NA	6.719	NA	0.82
Web browsing delay in second	NA	39.983 (Amazon), 16.094 (Flipkart), 18.253 (Paytm)	NA	2.45
Latency in (msec)	NA	78	NA	64

<b>TSP ( For 4G )</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Mbps	18.42	NA	14.46	25.60
Upload Throughput in Mbps	10.62	NA	13.36	19.79
Video streaming delay in sec	0.55	NA	2.76	0.34
Web browsing delay in second	4.64	NA	2.42/3.55/2.93	1.65
Latency in (msec)	96.33	NA	46.5	44

### Hotspot -3 (Location - Jal-Mahal, Jaipur)

<b>TSP ( For 2G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Kbps	245.33	191	NA	114.76
Upload Throughput in Kbps	129.47	162	NA	84.2
Web browsing delay in second	7.13	43.939 (Amazon), 33.994 (Flipkart), 60.961 (Paytm)	NA	Data not provided
Latency in (msec)	159.67	158	NA	Data not provided

<b>TSP ( For 3G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Mbps	NA	11.117	NA	9.83
Upload Throughput in Mbps	NA	2.974	NA	3.19
Video streaming delay in sec	NA	6.044	NA	0.55
Web browsing delay in second	NA	12.79 (Amazon), 16.134 (Flipkart), 18.25 (Paytm)	NA	2.65
Latency in (msec)	NA	99	NA	48

<b>TSP ( For 4G )</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Mbps	15.78	NA	21.31	41.79
Upload Throughput in Mbps	8.96	NA	6.59	9.90
Video streaming delay in sec	1.05	NA	3.22	0.08
Web browsing delay in second	4.64	NA	3.24/3.0/2.28	1.69
Latency in (msec)	65.5	NA	57.5	47

### Summary Data report static

<b>TSP (For 2G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Kbps	<b>198.75</b>	<b>187.667</b>	<b>NA</b>	<b>128.73</b>
Upload Throughput in Kbps	<b>79.64</b>	<b>143.66</b>	<b>NA</b>	<b>76.83</b>
Web browsing delay in second	<b>6</b>	<b>55.37 (Amazon), 51.79 (Flipkart), 59.84 (Paytm)</b>	<b>NA</b>	<b>Data not provided</b>
Latency in (msec)	<b>285.38</b>	<b>167.33</b>	<b>NA</b>	<b>Data not provided</b>

<b>TSP (For 3G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Mbps	<b>NA</b>	<b>10.02</b>	<b>NA</b>	<b>6.37</b>
Upload Throughput in Mbps	<b>NA</b>	<b>1.92</b>	<b>NA</b>	<b>2.44</b>
Video streaming delay in sec	<b>NA</b>	<b>7.80</b>	<b>NA</b>	<b>0.73</b>
Web browsing delay in second	<b>NA</b>	<b>28.900 (Amazon), 18.447 (Flipkart), 17.96 (Paytm)</b>	<b>NA</b>	<b>2.30</b>
Latency in (msec)	<b>NA</b>	<b>88.66</b>	<b>NA</b>	<b>63.33</b>

<b>TSP (For 4G )</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Download throughput in Mbps	<b>14.96</b>	<b>NA</b>	<b>16.99</b>	<b>30.43</b>
Upload Throughput in Mbps	<b>8.22</b>	<b>NA</b>	<b>8.58</b>	<b>18.69</b>
Video streaming delay in sec	<b>0.77</b>	<b>NA</b>	<b>2.55</b>	<b>0.27</b>
Web browsing delay in second	<b>4.51</b>	<b>NA</b>	<b>3.57/3.13/2.64</b>	<b>1.68</b>
Latency in (msec)	<b>73.83</b>	<b>NA</b>	<b>46.5</b>	<b>51.00</b>

### Streaming delay

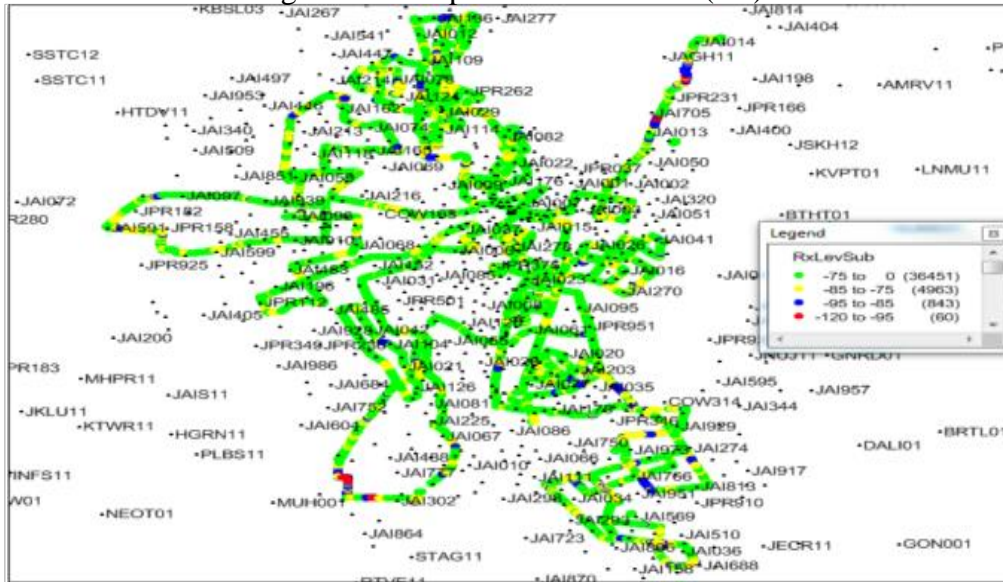
<b>TSP (For 3G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Average Initial Start Time (Sec)	<b>NA</b>	<b>7.80</b>	<b>NA</b>	<b>0.06</b>
Average Interruption time in Second	<b>NA</b>	<b>Data not provided</b>	<b>NA</b>	<b>0.00</b>

<b>TSP (For 4G )</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
Average Initial Start Time (Sec)	<b>0.79</b>	<b>NA</b>	<b>2.55</b>	<b>0.05</b>
Average Interruption time in Second	<b>0.0</b>	<b>NA</b>	<b>0</b>	<b>0.00</b>

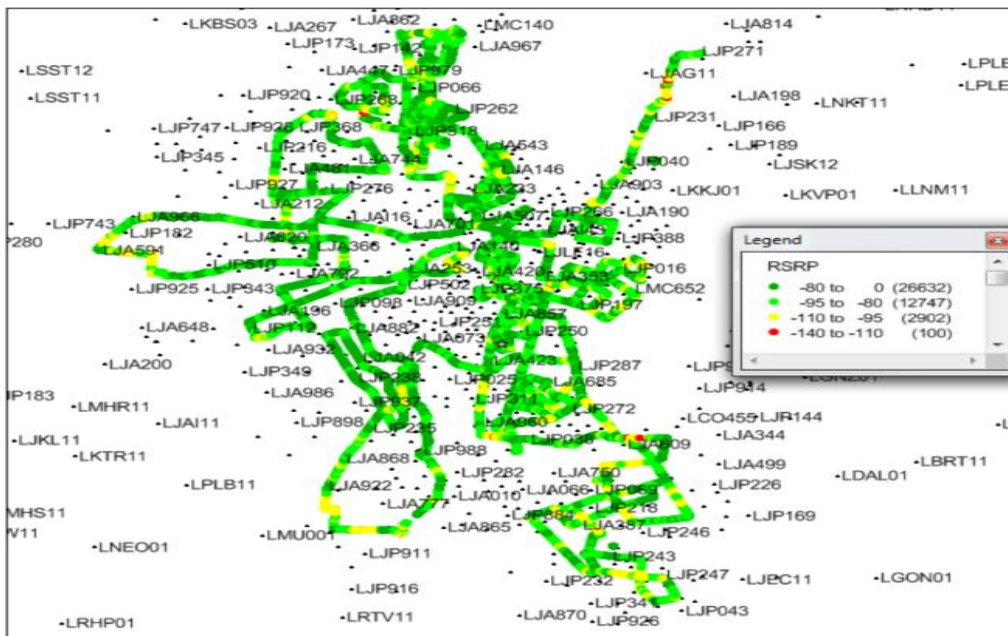


# AIRTEL Coverage Plots

## Coverage Plot of Jaipur Drive test done (2G)

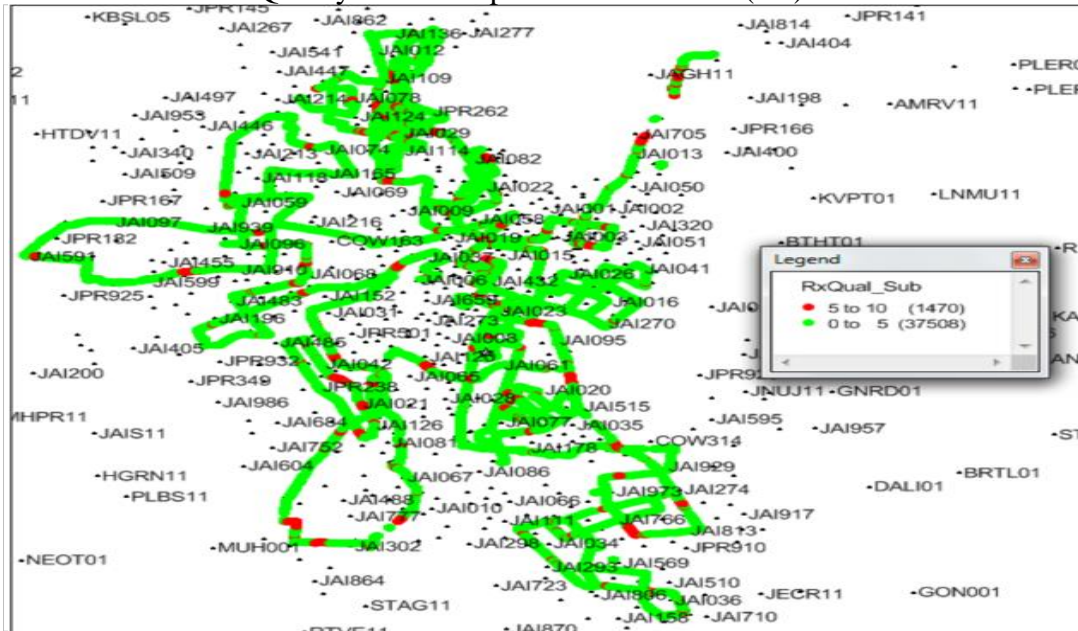


## Coverage Plot of Jaipur Drive test done (4G)

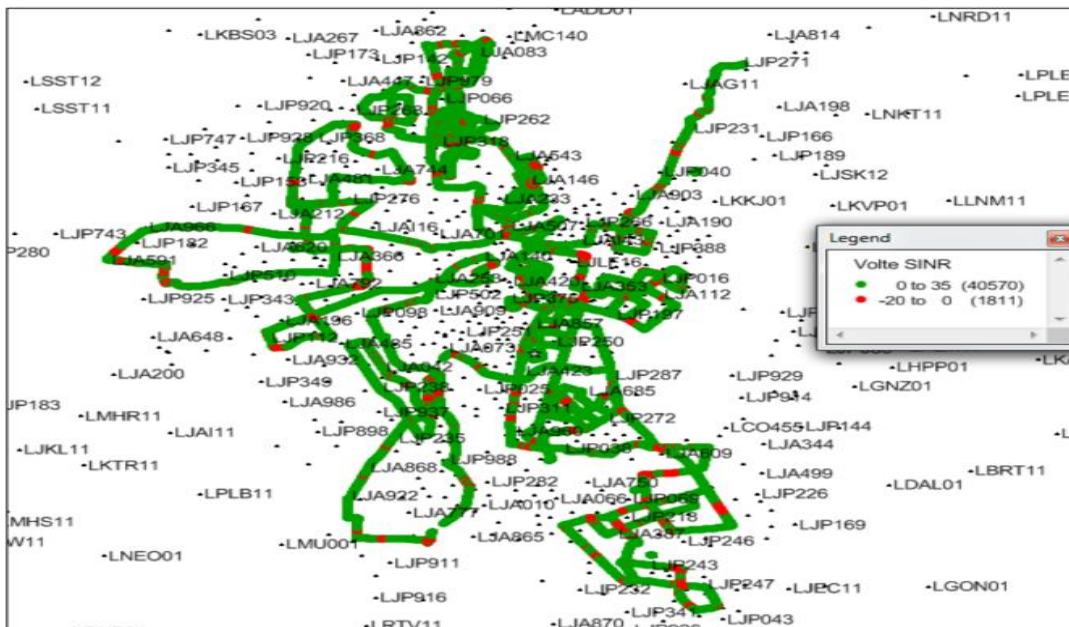


## AIRTEL Quality Plots

### Quality Plot of Jaipur Drive test done (2G)

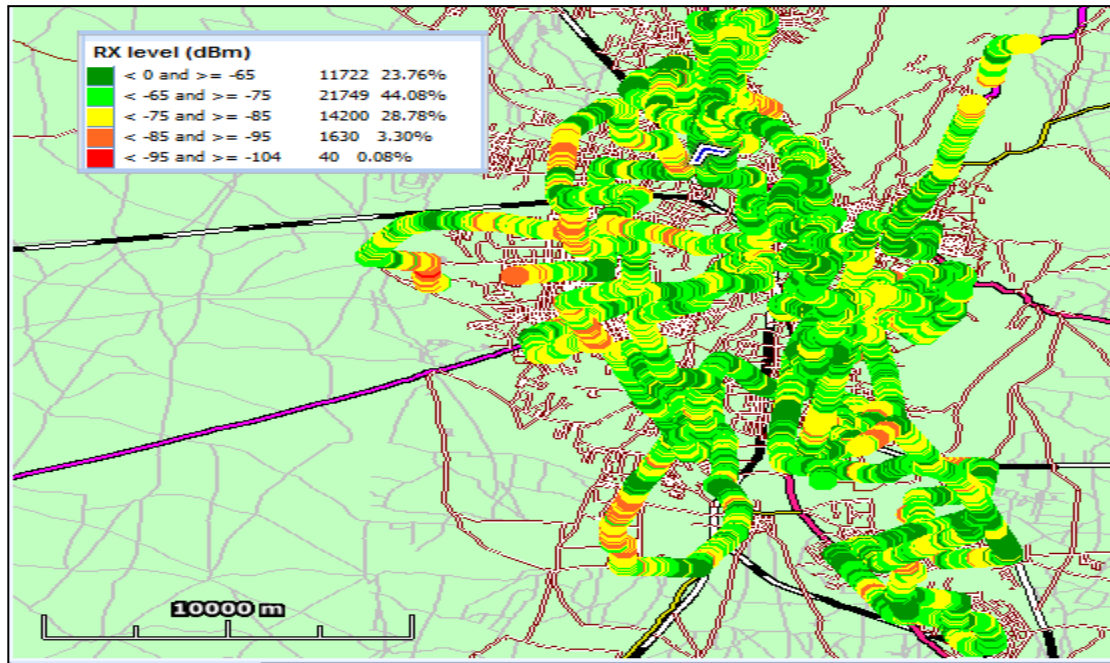


### Quality Plot of Jaipur Drive test done (4G)

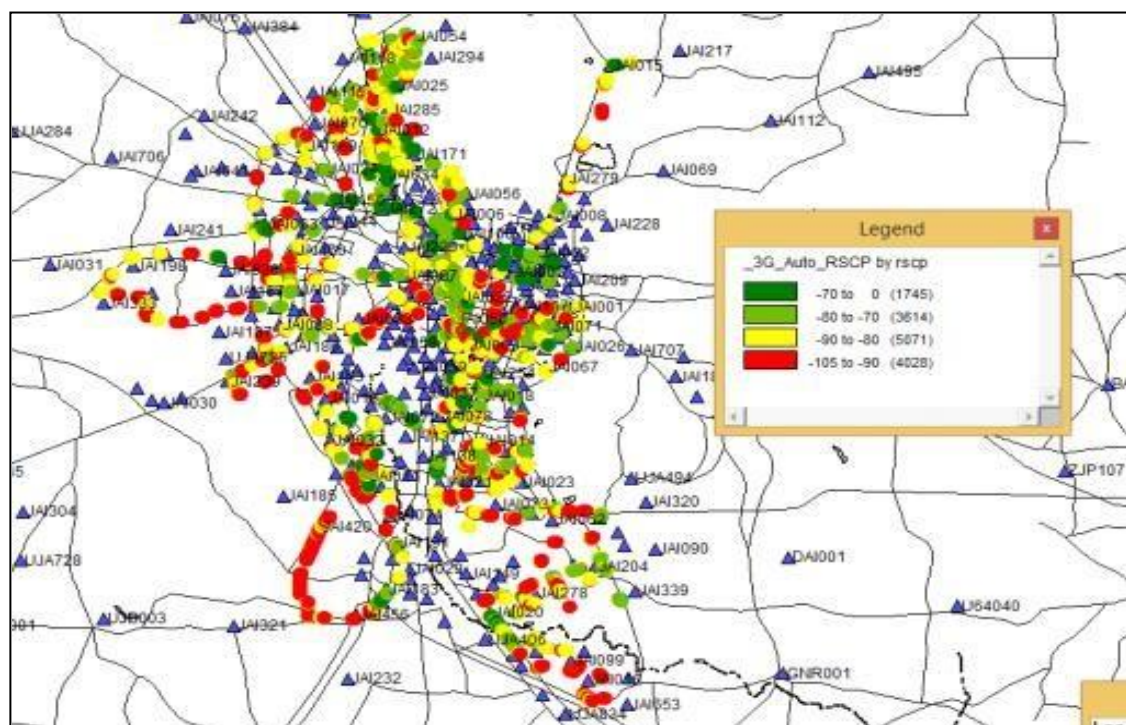


## BSNL Coverage plots

### 1. BSNL 2G

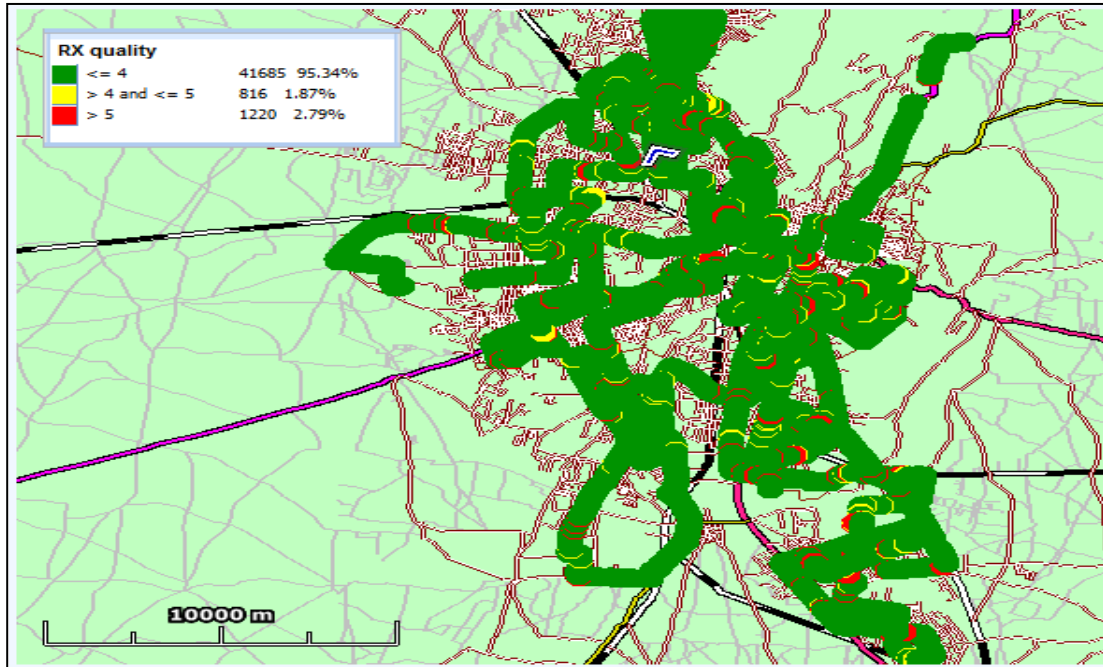


### 2. BSNL 3G

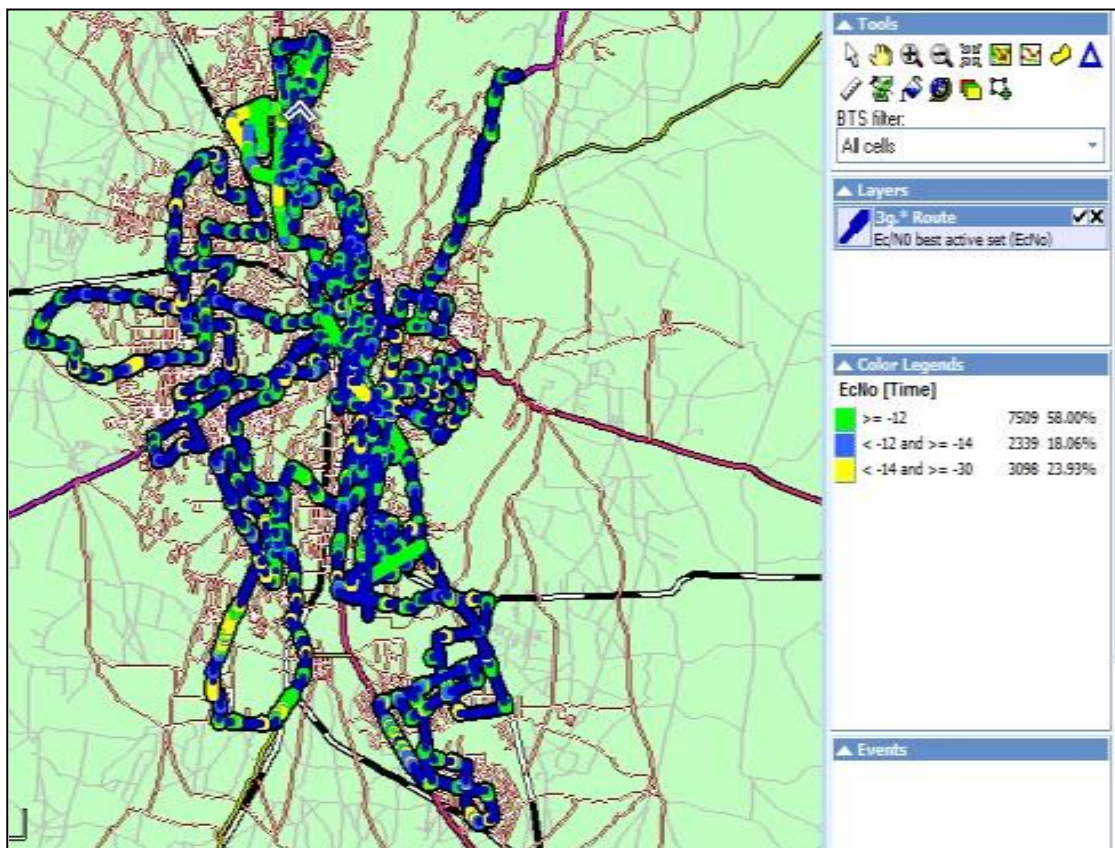


## Quality plots

### 1. BSNL 2G

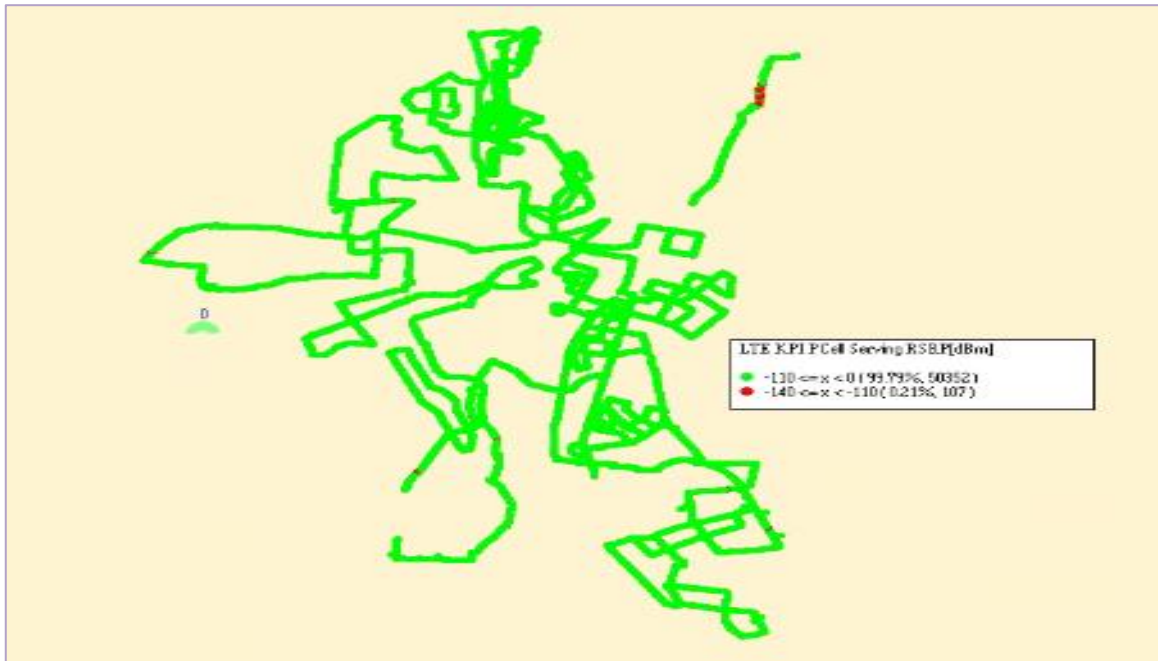


### 2. BSNL 3G



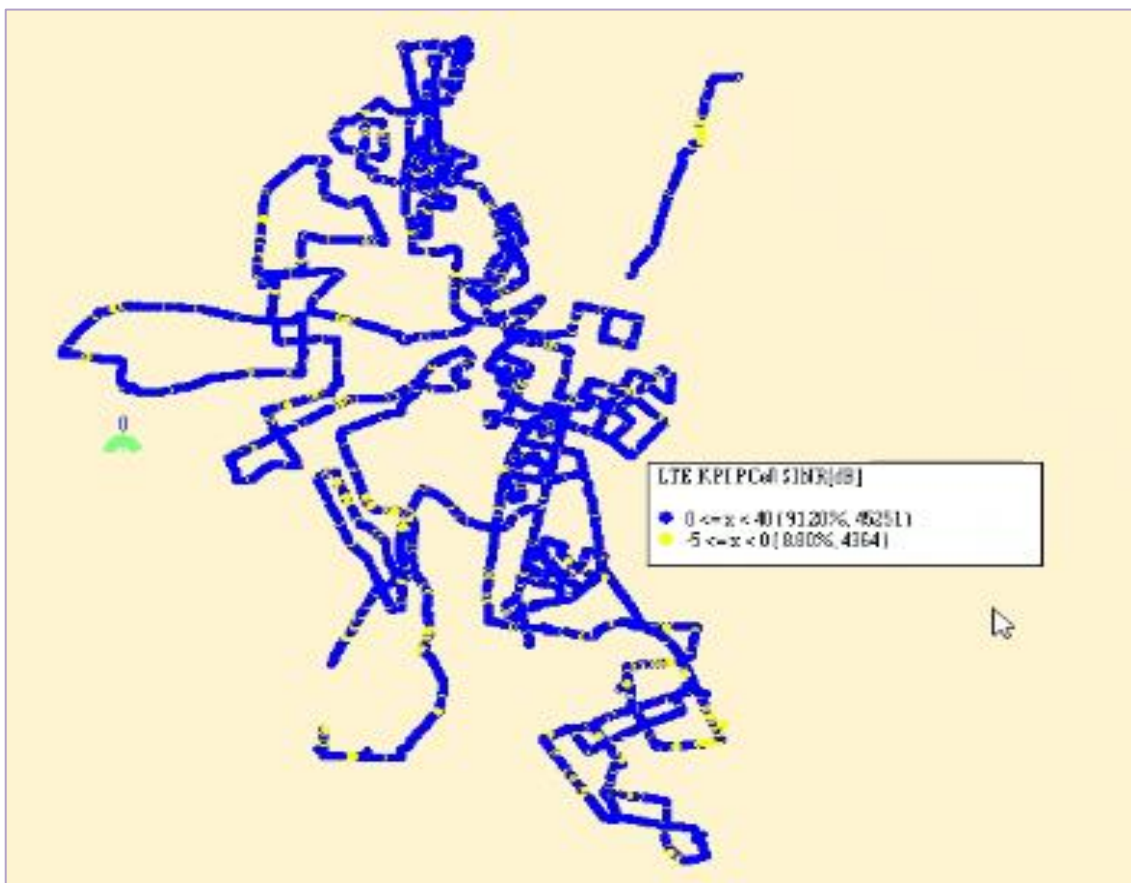
### JIO Coverage plot

#### 1. VoLTE : Jio



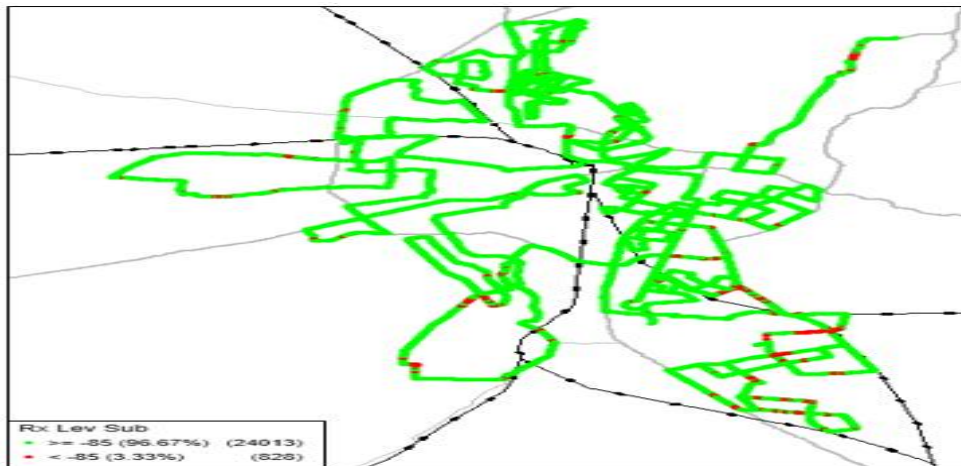
### JIO Quality plot

#### 1. VoLTE :Jio

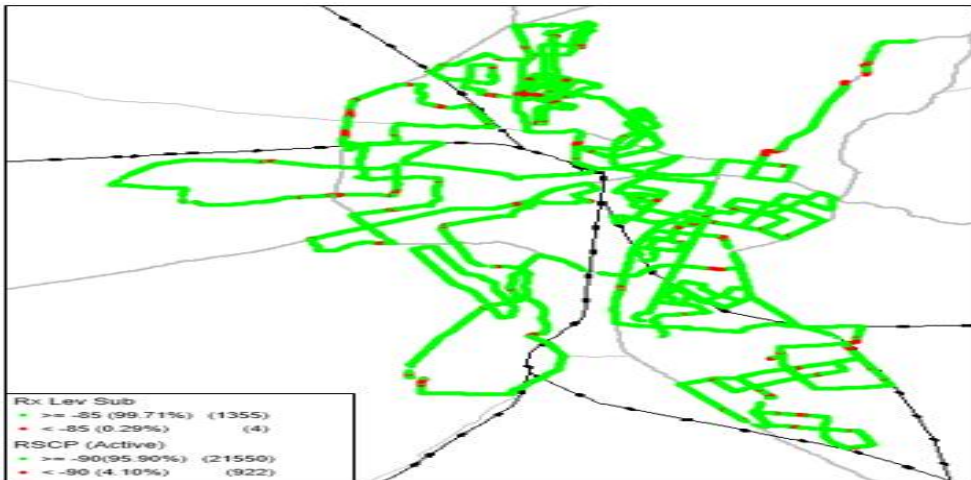


# Voda Idea Coverage plots

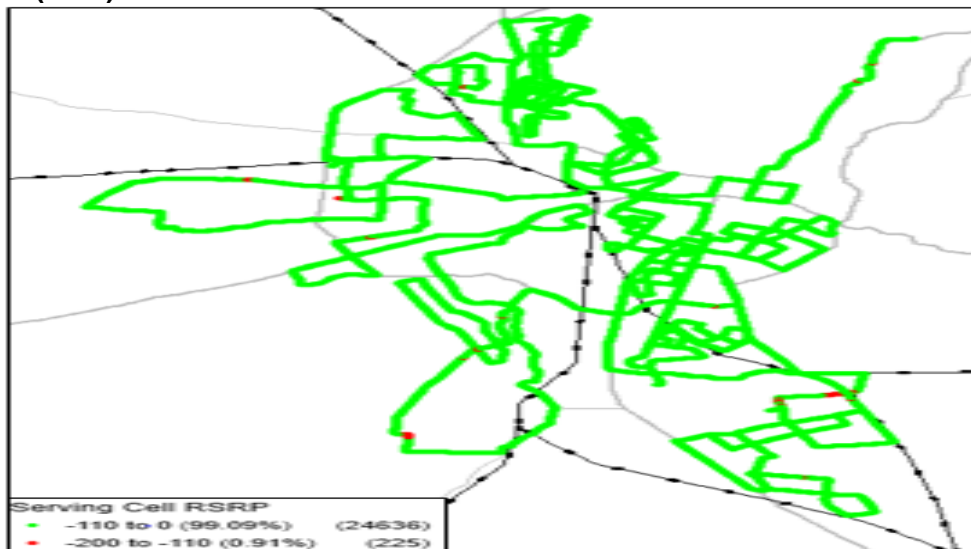
## 1. 2G



## 2. 2G/3G dual

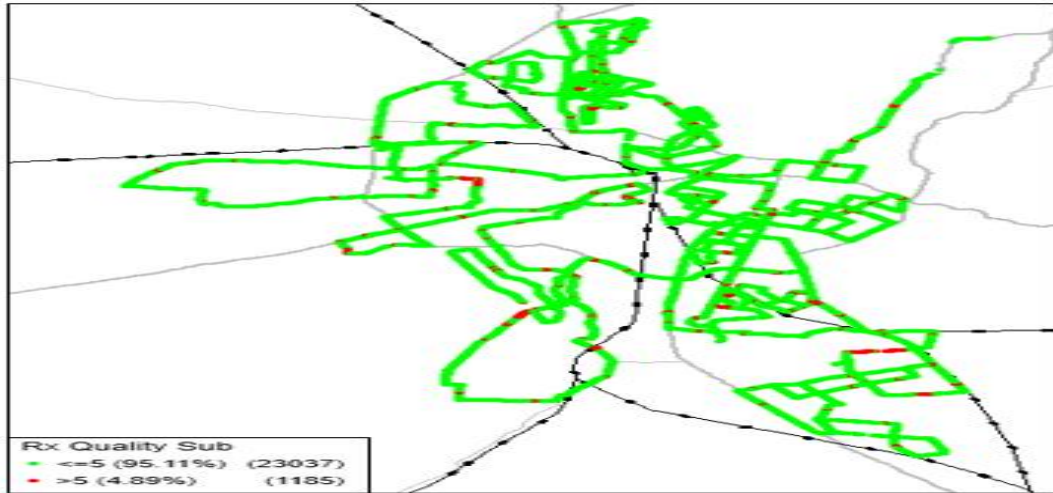


## 3. VoLTE (Free)

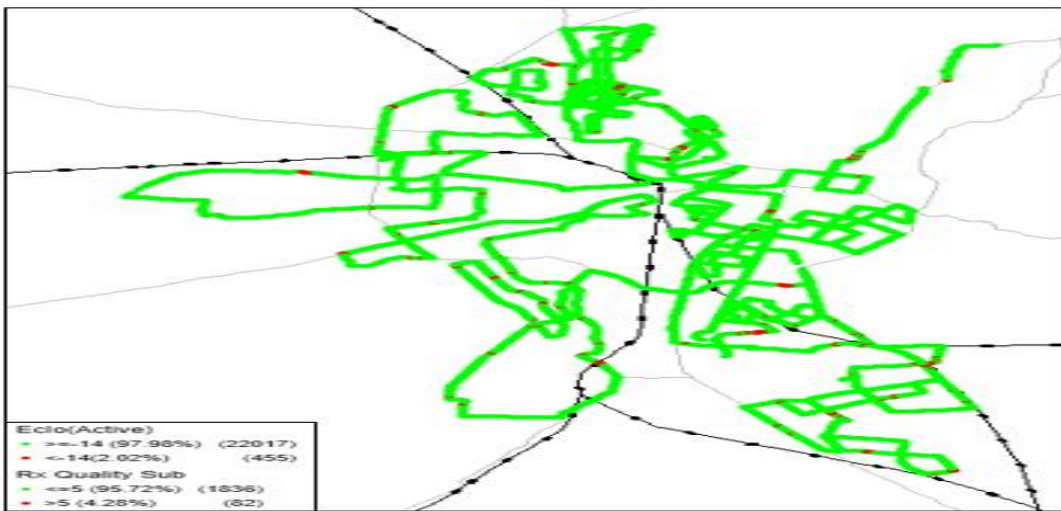


# Voda Idea Quality plots

1: 2G



2. 2G/3G dual



3. VoLTE (Free)

