



प्रभावी विनियमन – सुगम संचार  
Effective Regulation – Ease of Communication

# Operator Assisted Drive Test Report

## Prayagraj City and nearby Area

01/03/2023 to 03/03/2023

By

**TRAI Regional Office Bhopal**

The Operator Assisted Drive Test has been carried out by Regional Office, Bhopal with the help of Telecom Service Providers for Prayagraj City and surrounding areas from 9:00 AM to 8:00 PM from 01/03/2023 to 03/03/2023. The drive test covered drive route of around 400 KMs.

TSP	Network tested
Airtel	2G & VoLTE
BSNL	2G & 3G
JIO	VoLTE
VIL	2G & VoLTE

### Key Performance Indicators:

KPI	Benchmark	Observations
Block call rate %	≤3%	All TSPs achieved the benchmark
Drop call rate %	≤2%	All TSPs achieved the benchmark
CSSR %	≥95 %	All TSPs achieved the benchmark
Mobility HOSR %	≥95%	All TSPs achieved the benchmark
Good RX Quality %	≥95%	All TSPs achieved the benchmark except Airtel, Jio & VIL in VoLTE

# Overview

Regional Office, TRAI Bhopal conducted Operator Assisted Drive Test. 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:**

- i.2G – measurement – UE Locked in 2G
- ii.3G – measurement – UE in Dual mode (2G and 3G)
- iii.4G – measurement – UE in Free mode

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

### **Data Tests:**

**Dynamic data** – repeat data file download ( to check throughput on the entire route)

- i.2G – measurement – UE Locked in 2G file size- 500KB
- ii.3G – measurement – UE in 3G File Size- 20MB
- iii.4G – measurement – UE in LTE File Size- 40MB

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

- i.Download- 2G - 500KB ,3G - 20 MB, 4G - 40MB
- ii.Upload - 2G -100KB ,3G - 5 MB, 4G - 10MB
- iii.Web browsing - 3 links of e-commerce websites <https://www.amazon.in>, <https://www.flipkart.com>, <https://paytm.com>.
- iv.Video Streaming – 130 sec clip (only in 3G and LTE)
- v.Latency – 32 Bytes on [www.google.com](http://www.google.com).

# Overview

## Voice & Dynamic Data Test Drive Route



### List of important area covered during the drive test

Teliyerganj, NIT collage, Govindpur, Salori, Chhota Baghada, Anand Bhawan Museum

Rajapur, High court, Myoradab, Katra, Civil Line, Prayagraj Junction, Rajrooppur,

Bamrauli, Uparhar, Mundera Mandi, IIIT, Kalindipuram, Kasari Masari, Roshan Bag  
Chakiya, Beniganj, Kareli, Atala, Khuldabad, Malviyanagar, Meerapur, Baluaghat,  
Chowk, Mutthi Ganj

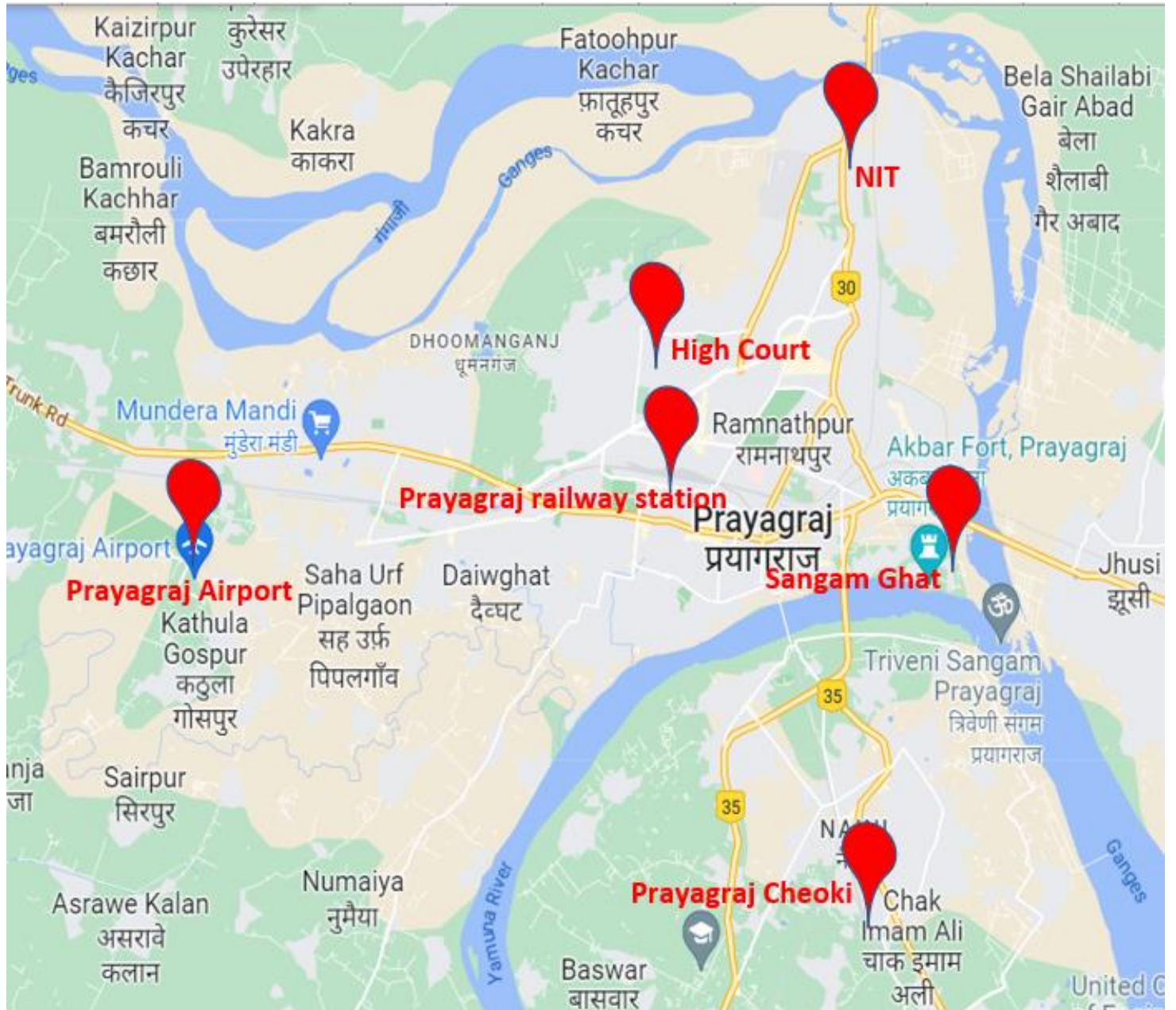
Gau Ghat, Kydganj, Bairahna, Rambag, Parade Ground, Alopi Bag, Daraganj,  
Allahpur, Bakshi Bandh

George Town, Mahewa Arail Ghat, Naini , JP Nagar, Chak Daud Nagar, Cheoki, Chak  
Iman Ali,

United Engineering Collage

# Overview

## Data Service Test- Static Locations

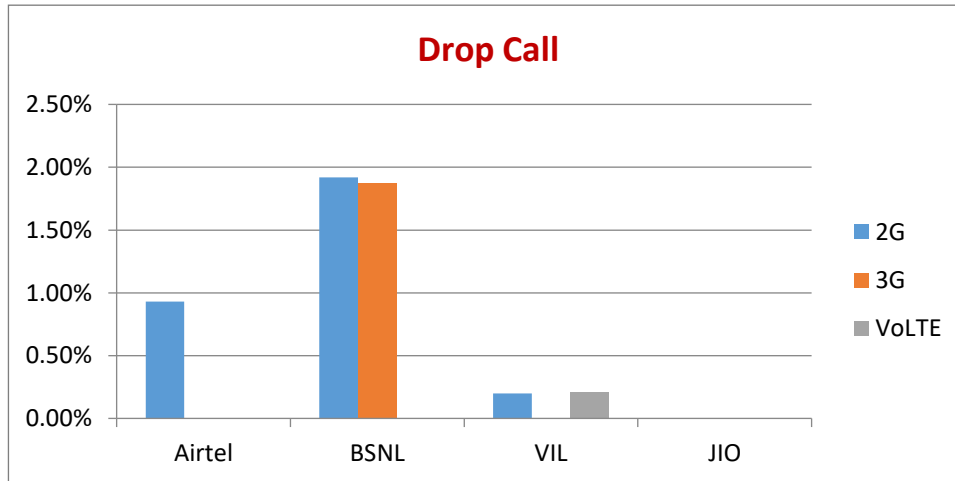


### Hotspot Locations

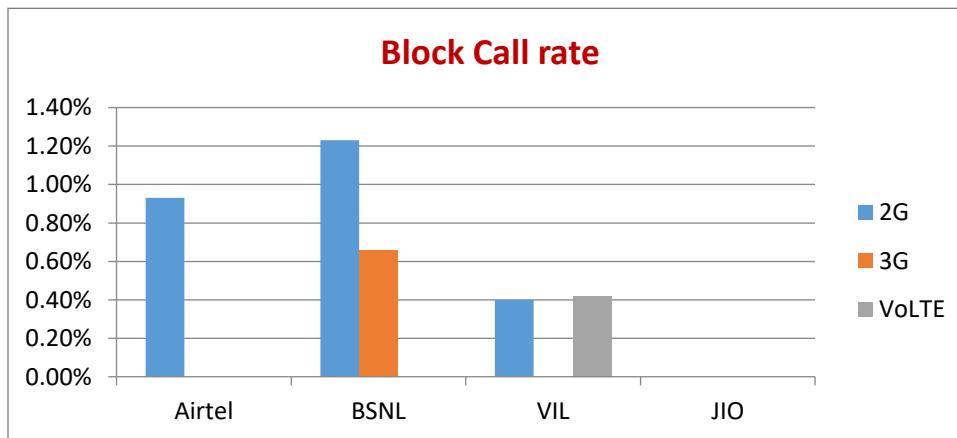
1. Prayagraj railway station
2. Airport
3. High court
4. Sangam ghat
5. NIT
6. Prayagraj Cheoki station

QoS compliance of the TSPs for Voice across technologies 2G/3G/4G-VoLTE:

Drop Call Rate (%)



Block Call Rate (%)



KPIs	2G			3G		VoLTE		
	Airtel	BSNL	VIL	BSNL	VIL	Airtel	RJIL	VIL
Drop Call Rate %	0.93%	1.92%	0.20%	1.87%	NA	0	0	0.21%
Block Call Rate %	0.93%	1.23%	0.40%	0.66%	NA	0	0	0.42%

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 %	85%	94.39%	93%

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

TSPs	3G	
	BSNL	VIL
Coverage %	95%	NA

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	98.42%	99.99%	99%

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

TSPs	3G		VoLTE		
	BSNL	VIL	Airtel	VIL	JIO
Time Spent on 3G/4G %	97.24%	NA	100%	99.89%	100%

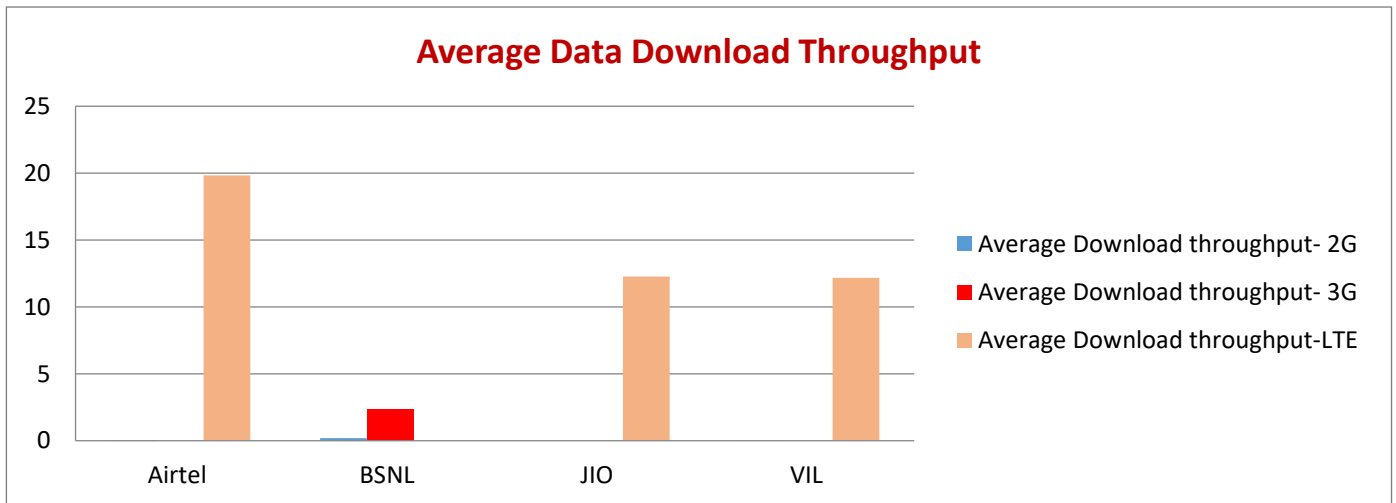
# Data Services Dynamic

**Key Observations**

Dynamic Data -Download Throughput was tested.

## Data Download Performance - Dynamic

3G/4G/ Network:



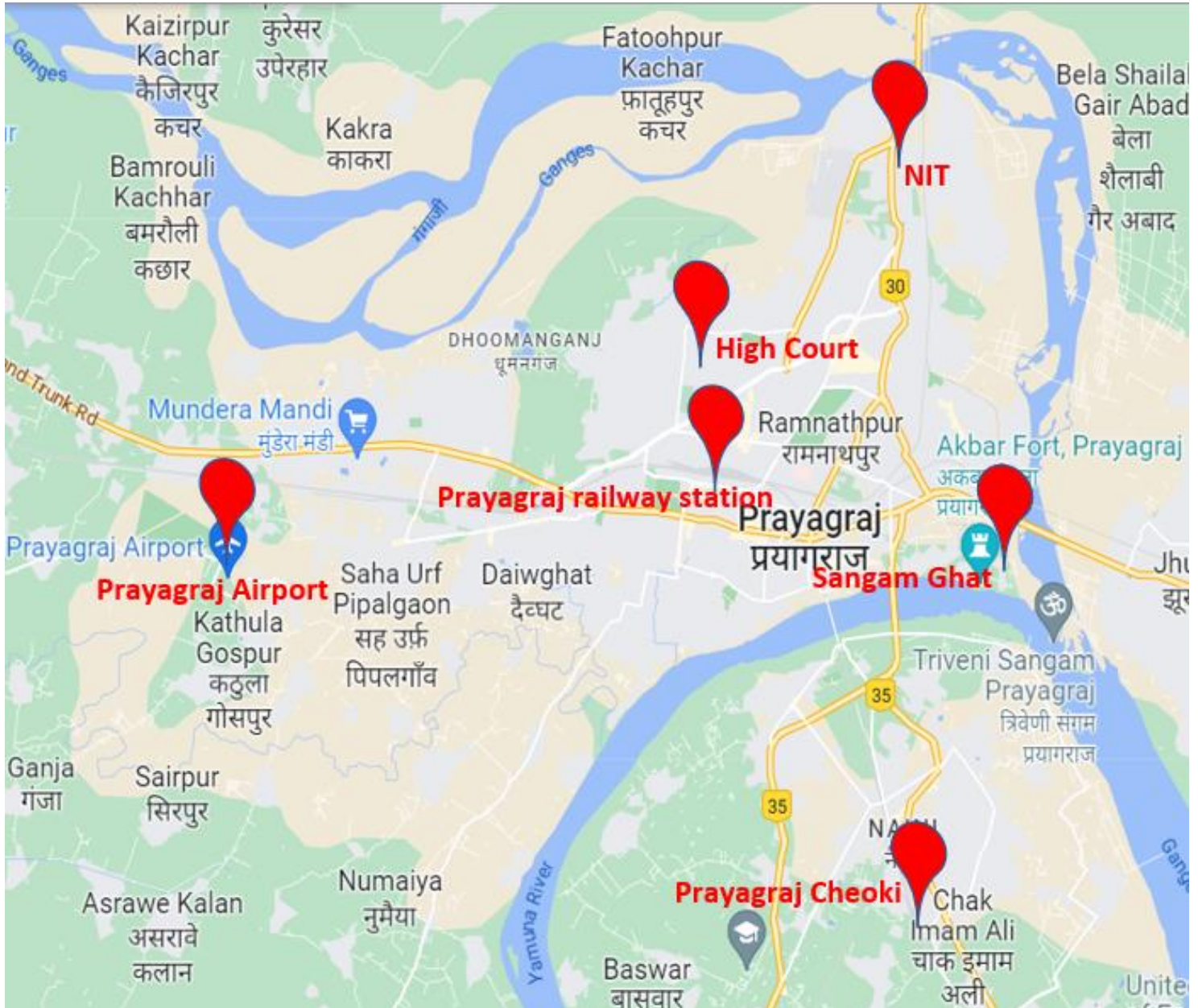
TSP ( For 2G)	Airtel	BSNL	JIO	VIL
Average Download throughput- 2G in Kbps	53	195.24	NA	29.65
Average Download throughput- 3G In Mbps	NA	2.34	NA	NA
Average Download throughput-LTE in Mbps	19.83	NA	12.27	12.18

# Data Services Static

## Key Observations

Data was tested at 6 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, PayTm)

### 3G/4G/ Network:





# Summary

## City Level Summary- Voice

TSP ( For 2G)	Airtel	BSNL	JIO	VIL
Call attempts	532	733	NA	492
Block call rate %	0.93%	1.23%	NA	0.40%
CSSR %	99%	99.32%	NA	99.39%
Drop call rate %	0.93%	1.92%	NA	0.20%
Mobility HOSR %	100%	95.65%	NA	96.34%
RX Quality %	95.24%	95.3%	NA	96.44%
Average CST Sec	1.40	2.9	NA	7.89

TSP ( For 3G)	Airtel	BSNL	JIO	VIL
Call attempts	NA	756	NA	NA
Block call rate %	NA	0.66%	NA	NA
CSSR %	NA	99.21%	NA	NA
Drop call rate %	NA	1.87%	NA	NA
Mobility HOSR %	NA	99.04%	NA	NA
RX Quality %	NA	97.7%	NA	NA
Average CST (Sec)	NA	3.0	NA	NA

TSP ( For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	618	NA	544	474
Block call rate %	0%	NA	0	0.42%
CSSR %	100%	NA	100	99.36%
Drop call rate %	0%	NA	0	0.21%
Mobility HOSR %	100%	NA	99.79	99.62%
RX Quality %	89.06%	NA	94.46	92.20%
Average CST(Sec)	0.54	NA	0.55	0.29

# Summary

## City Level Summary- Data Services -Static

<b>TSP ( For 2G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
<b>Download throughput in Kbps</b>	<b>201.66</b>	<b>186.32</b>	<b>NA</b>	<b>33.33</b>
<b>Upload Throughput in Kbps</b>	<b>141.33</b>	<b>96.48</b>	<b>NA</b>	<b>18.33</b>
<b>Web browsing delay in second</b>	<b>NA</b>	<b>27.4</b>	<b>NA</b>	<b>5.52</b>
<b>Latency in (msec)</b>	<b>453.16</b>	<b>288.6</b>	<b>NA</b>	<b>190</b>

<b>TSP ( For 3G)</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
<b>Download throughput in Mbps</b>	<b>NA</b>	<b>2.46</b>	<b>NA</b>	<b>NA</b>
<b>Upload Throughput in Mbps</b>	<b>NA</b>	<b>0.69</b>	<b>NA</b>	<b>NA</b>
<b>Video streaming delay in sec</b>	<b>NA</b>	<b>3.2</b>	<b>NA</b>	<b>NA</b>
<b>Web browsing delay in second</b>	<b>NA</b>	<b>12.1</b>	<b>NA</b>	<b>NA</b>
<b>Latency in (msec)</b>	<b>NA</b>	<b>124</b>	<b>NA</b>	<b>NA</b>

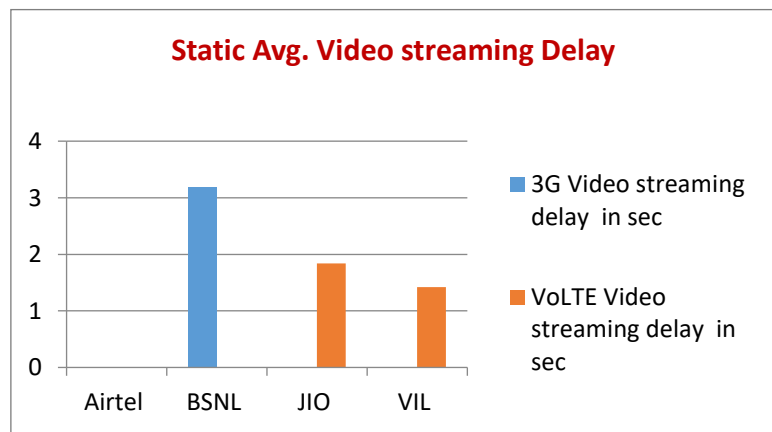
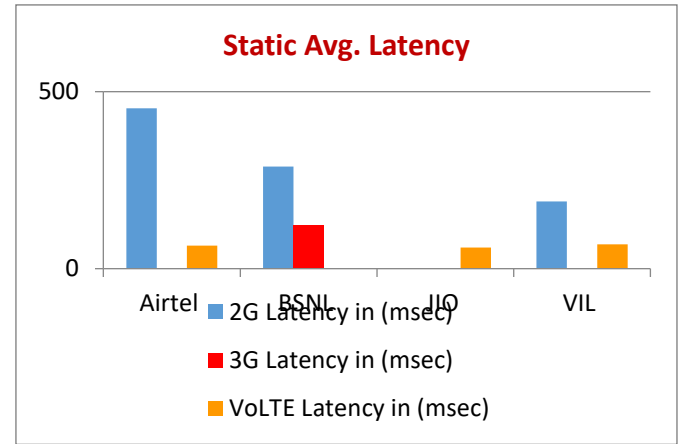
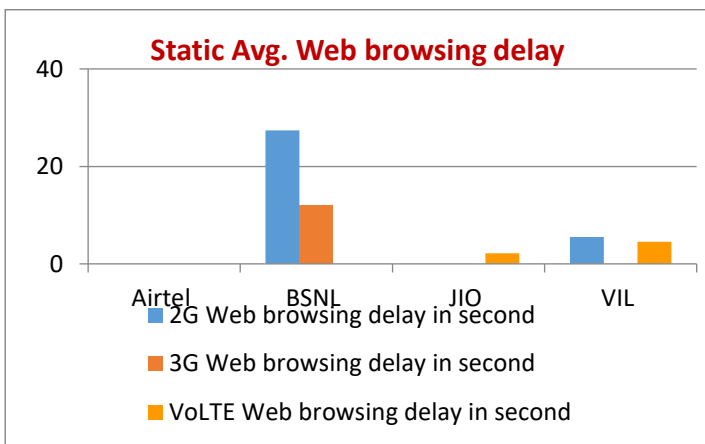
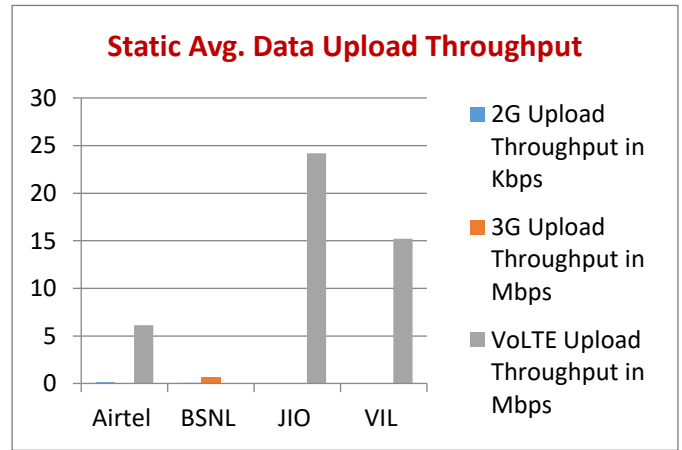
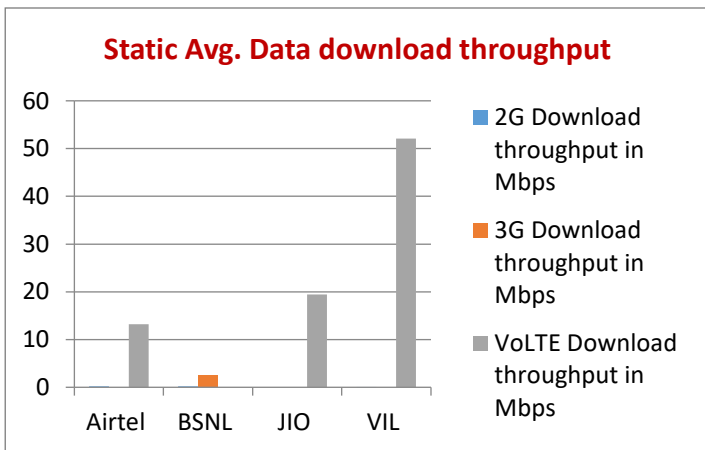
<b>TSP ( For LTE )</b>	<b>Airtel</b>	<b>BSNL</b>	<b>JIO</b>	<b>VIL</b>
<b>Download throughput in Mbps</b>	<b>13.20</b>	<b>NA</b>	<b>19.45</b>	<b>52.09</b>
<b>Upload Throughput in Mbps</b>	<b>6.12</b>	<b>NA</b>	<b>24.20</b>	<b>15.23</b>
<b>Video streaming delay in sec</b>	<b>NA</b>	<b>NA</b>	<b>1.84</b>	<b>1.418</b>
<b>Web browsing delay in second</b>	<b>NA</b>	<b>NA</b>	<b>2.21</b>	<b>4.530</b>
<b>Latency in (msec)</b>	<b>64.88</b>	<b>NA</b>	<b>59.5</b>	<b>68.5</b>

# Data Services Static

## Key Observations

Data was tested at 6 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, PayTm)

### 3G/4G/ Network:



## 1. Hotspot Location- Prayagraj railway station

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	216.68	175	NA	50
Upload Throughput in Kbps	161.01	80	NA	10
Web browsing delay in second		33	NA	5.0
Latency in (msec)	408.33	220	NA	205

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	1.86	NA	NA
Upload Throughput in Mbps	NA	1.71	NA	NA
Video streaming delay in sec	NA	15.2	NA	NA
Web browsing delay in second	NA	23	NA	NA
Latency in (msec)	NA	117	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	5.20	NA	16.22	52.83
Upload Throughput in Mbps	11.81	NA	15.18	12.23
Video streaming delay in sec	NA	NA	1.94	1.856
Web browsing delay in second	NA	NA	2.35	4.121
Latency in (msec)	52.69	NA	64.00	76

## 2. Hotspot Location- Airport

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	113.20	135	NA	30
Upload Throughput in Kbps	85.96	40	NA	10
Web browsing delay in second	NA	29	NA	7.29
Latency in (msec)	485.01	210	NA	149

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	4.73	NA	NA
Upload Throughput in Mbps	NA	0.72	NA	NA
Video streaming delay in sec	NA	8.7	NA	NA
Web browsing delay in second	NA	5.5	NA	NA
Latency in (msec)	NA	124	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	3.75	NA	16.96	35.28
Upload Throughput in Mbps	1.31	NA	26.72	19.35
Video streaming delay in sec	NA	NA	1.81	1.769
Web browsing delay in second	NA	NA	2.20	4.634
Latency in (msec)	60.12	NA	54.00	69

## 3. Hotspot Location- High court

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	167.68	156	NA	20
Upload Throughput in Kbps	107.93	62	NA	10
Web browsing delay in second	NA	28	NA	6.8
Latency in (msec)	495.00	205	NA	234

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	10.25	NA	NA
Upload Throughput in Mbps	NA	1.89	NA	NA
Video streaming delay in sec	NA	7.4	NA	NA
Web browsing delay in second	NA	6.9	NA	NA
Latency in (msec)	NA	112	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	27.78	NA	20.76	55.42
Upload Throughput in Mbps	5.34	NA	36.58	20.44
Video streaming delay in sec	NA	NA	1.91	1.185
Web browsing delay in second	NA	NA	2.09	4.624
Latency in (msec)	62.48	NA	56.00	61

## 4. Hotspot Location- Sangam ghat

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	237.60	120	NA	30
Upload Throughput in Kbps	169.94	45	NA	10
Web browsing delay in second	NA	42	NA	6.32
Latency in (msec)	441.67	240	NA	189

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	3.87	NA	NA
Upload Throughput in Mbps	NA	2.06	NA	NA
Video streaming delay in sec	NA	14	NA	NA
Web browsing delay in second	NA	9.4	NA	NA
Latency in (msec)	NA	135	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	26.32	NA	23.451	36.87
Upload Throughput in Mbps	8.94	NA	37.01	5.59
Video streaming delay in sec	NA	NA	1.83	1.011
Web browsing delay in second	NA	NA	2.30	4.007
Latency in (msec)	54.14	NA	61.00	79

## 5. Hotspot Location- NIT

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	216.68	146	NA	20
Upload Throughput in Kbps	159.94	62	NA	10
Web browsing delay in second	NA	34	NA	7.10
Latency in (msec)	451.09	232	NA	201

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	2.87	NA	NA
Upload Throughput in Mbps	NA	5.89	NA	NA
Video streaming delay in sec	NA	16.3	NA	NA
Web browsing delay in second	NA	102	NA	NA
Latency in (msec)	NA	124	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	10.99	NA	23.88	102.93
Upload Throughput in Mbps	3.17	NA	14.32	12.72
Video streaming delay in sec	NA	NA	1.87	1.528
Web browsing delay in second	NA	NA	2.11	5.419
Latency in (msec)	94.41	NA	60.00	63



## 6. Hotspot Location- Prayagraj Cheoki

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	261.95	140	NA	50
Upload Throughput in Kbps	167.96	48	NA	60
Web browsing delay in second	NA	33	NA	7.5
Latency in (msec)	439.00	228	NA	172

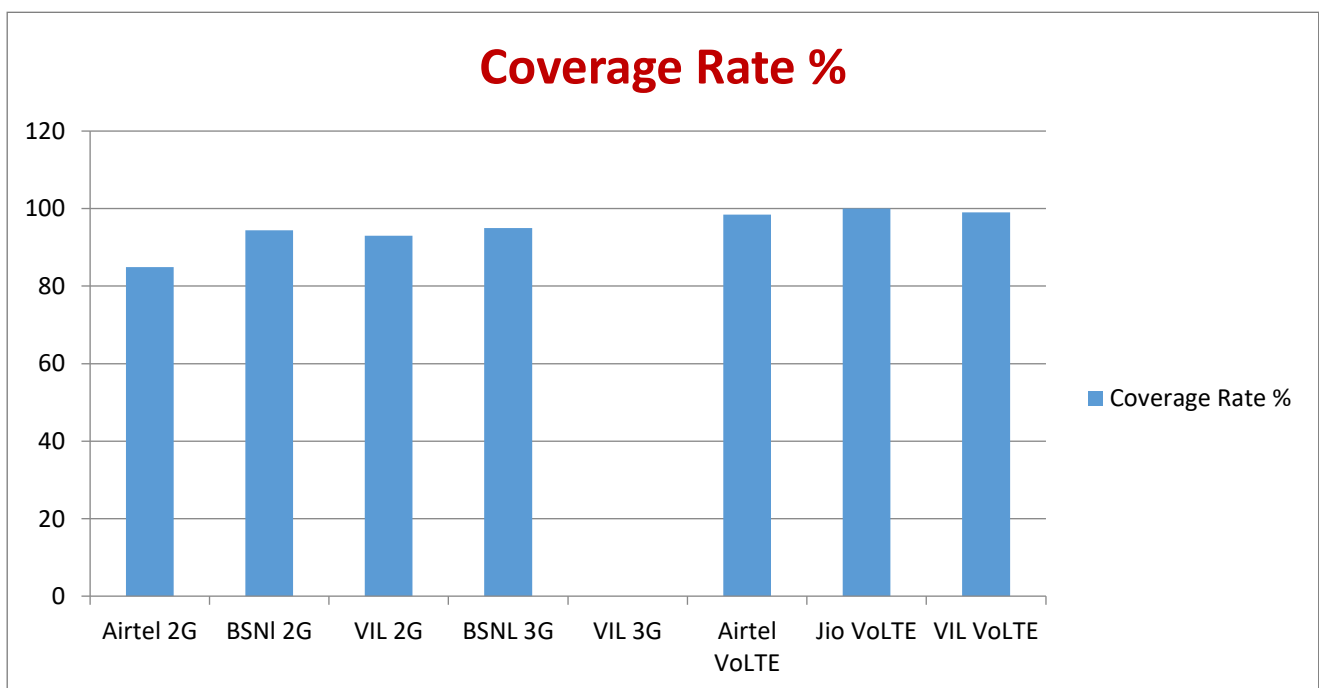
	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	1.04	NA	NA
Upload Throughput in Mbps	NA	0.29	NA	NA
Video streaming delay in sec	NA	5.7	NA	NA
Web browsing delay in second	NA	5.6	NA	NA
Latency in (msec)	NA	104	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	5.21	NA	15.43	49.26
Upload Throughput in Mbps	6.16	NA	15.41	21.09
Video streaming delay in sec	NA	NA	1.66	1.16
Web browsing delay in second	NA	NA	2.20	4.376
Latency in (msec)	65.46	NA	59.00	63

## Coverage Details

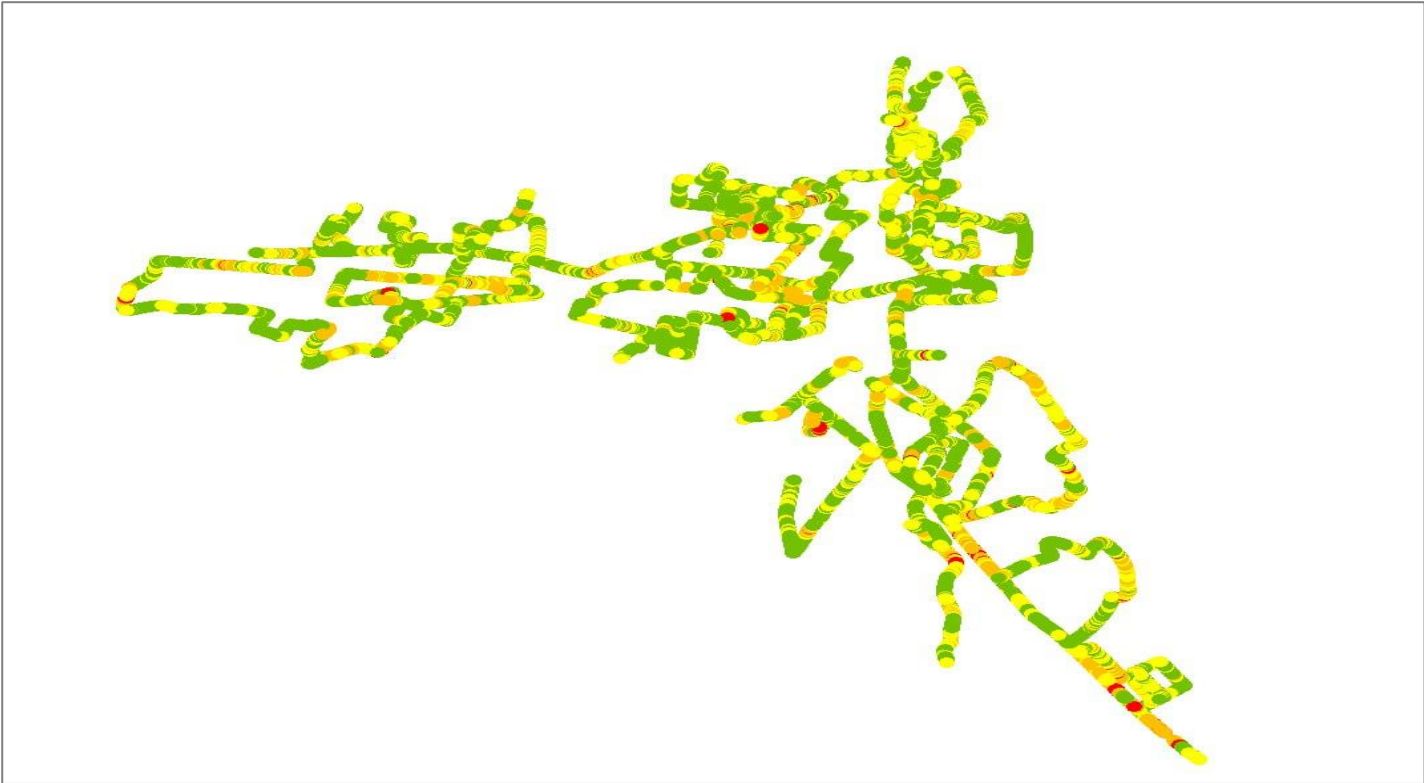
RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call session. The Coverage rate is calculated on the basis of % of samples in which the Rx level  $\geq$  -85 dBm, RSCP is  $\geq$  -90 dBm & RSRP  $\geq$  -110dBm. The details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

TSP	Coverage Rate %
Airtel 2G	84.89
BSNI 2G	94.39
VIL 2G	93
BSNL 3G	95
VIL 3G	NA
Airtel VoLTE	98.42
Jio VoLTE	99.99
VIL VoLTE	99



**TSP-Airtel**

Technology	Coverage %
2G	84.89%

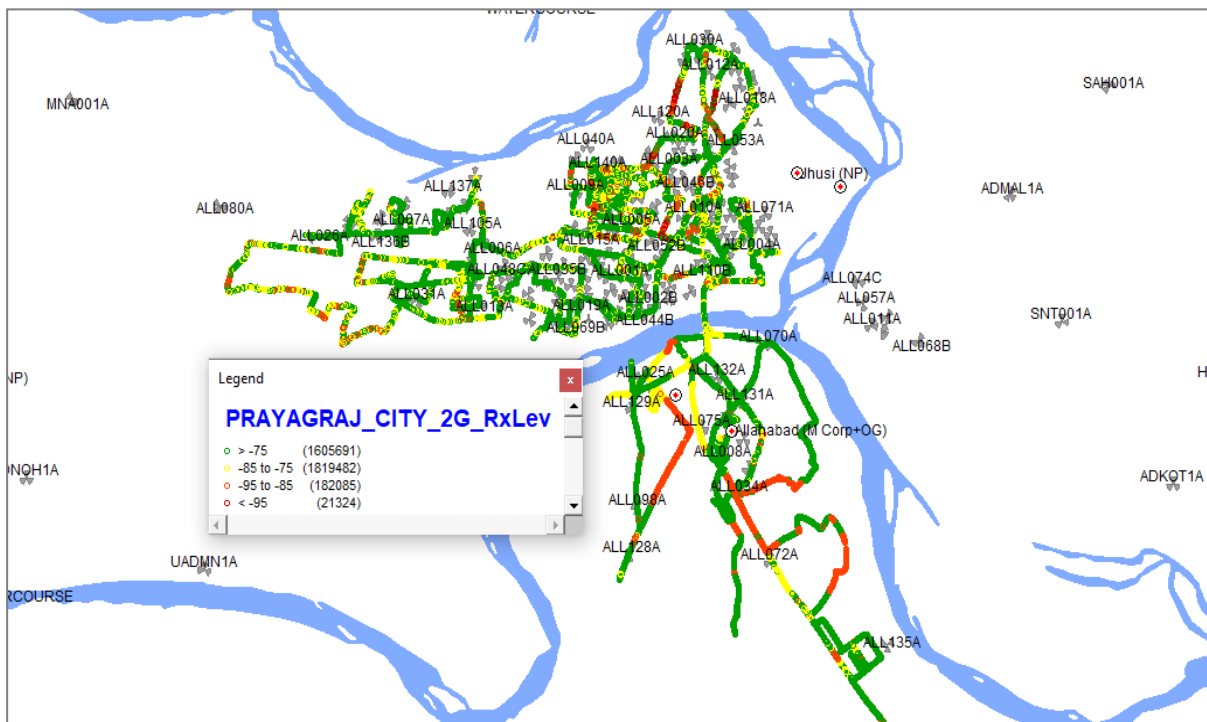


Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	2902363	52.58	Green
[-75, >=-85)	1784084	32.32	Yellow
[-85, >=-95)	779476	14.12	Orange
[-95, >=Min)	54457	0.99	Red
<b>Total</b>	<b>5520380</b>	<b>100.00</b>	

# Coverage Details

## TSP-BSNL

Technology	Coverage %
2G	99.41%







2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	1605691	44.25%	
[-75, >=-85)	1819482	50.14%	
[-85, >=-95)	182085	5.02%	
[-95, >=Min)	21324	0.59%	
<b>Total</b>			

## TSP - VIL

Technology	Coverage %
2G	93%

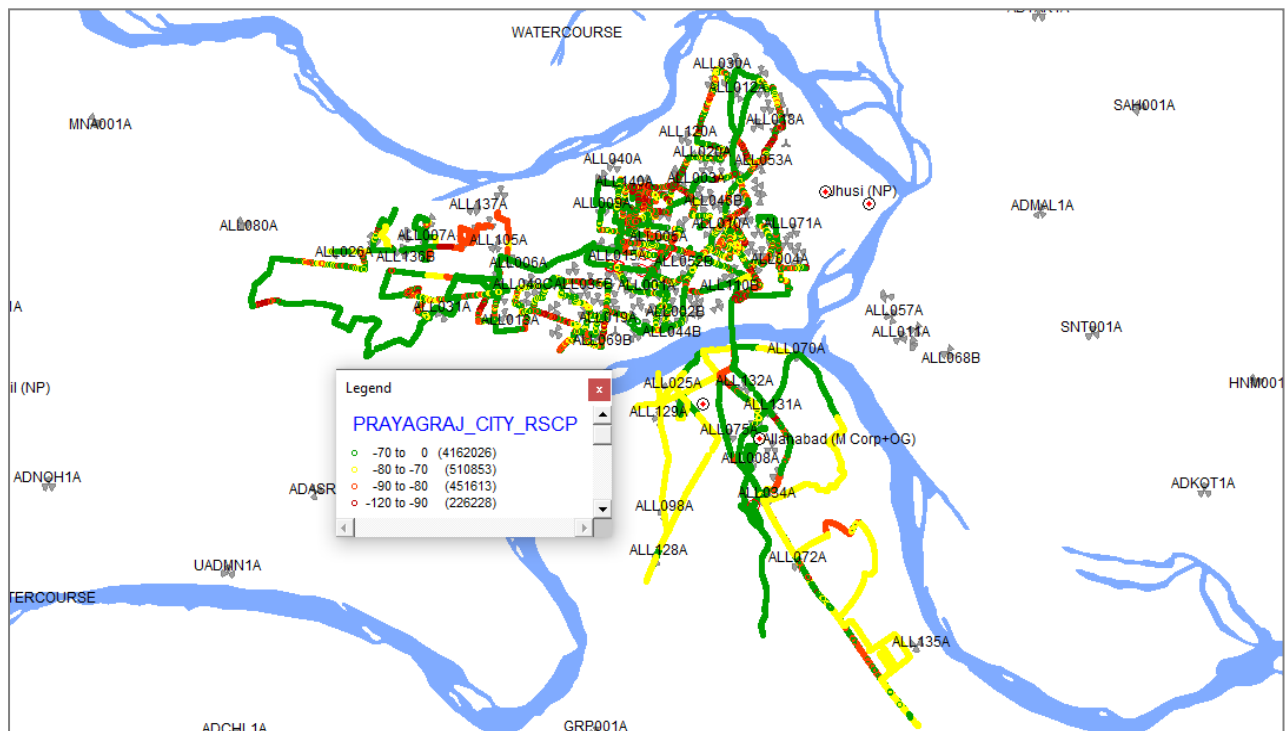


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	14923	61%	
[-75, >=-85]	7784	32%	
[-85, >=-95]	1761	7%	
[-95, >=Min)	45	0. %	
<b>Total</b>	<b>24513</b>	<b>100%</b>	

# Coverage Details

## TSP-BSNL

Technology	Coverage %
3G	95%

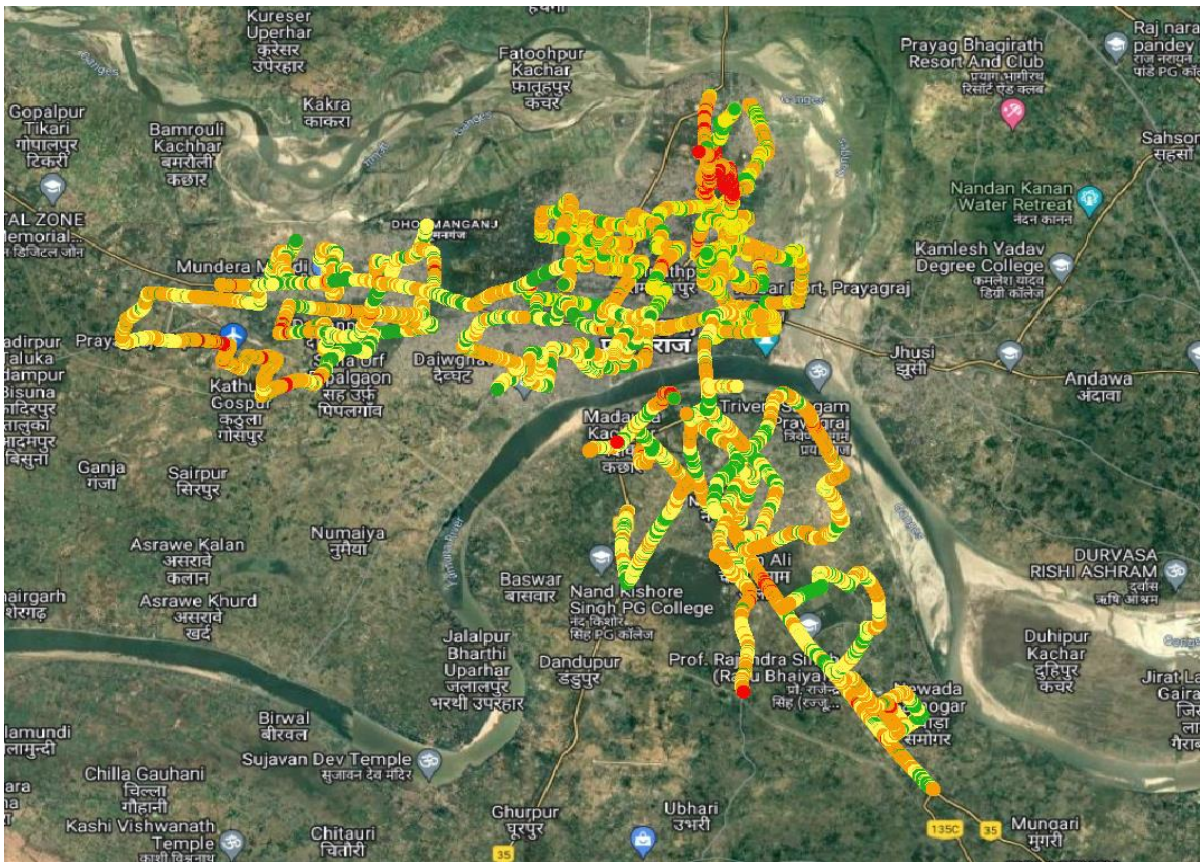


3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	4162026	77%	
[-70, >=-80)	510853	9%	
[-80, >=-90)	451613	8%	
[-90, >=Min)	266228	5%	
<b>Total</b>			

# Coverage Details

## TSP-Airtel

Technology	Coverage %
VoLTE	98.42%

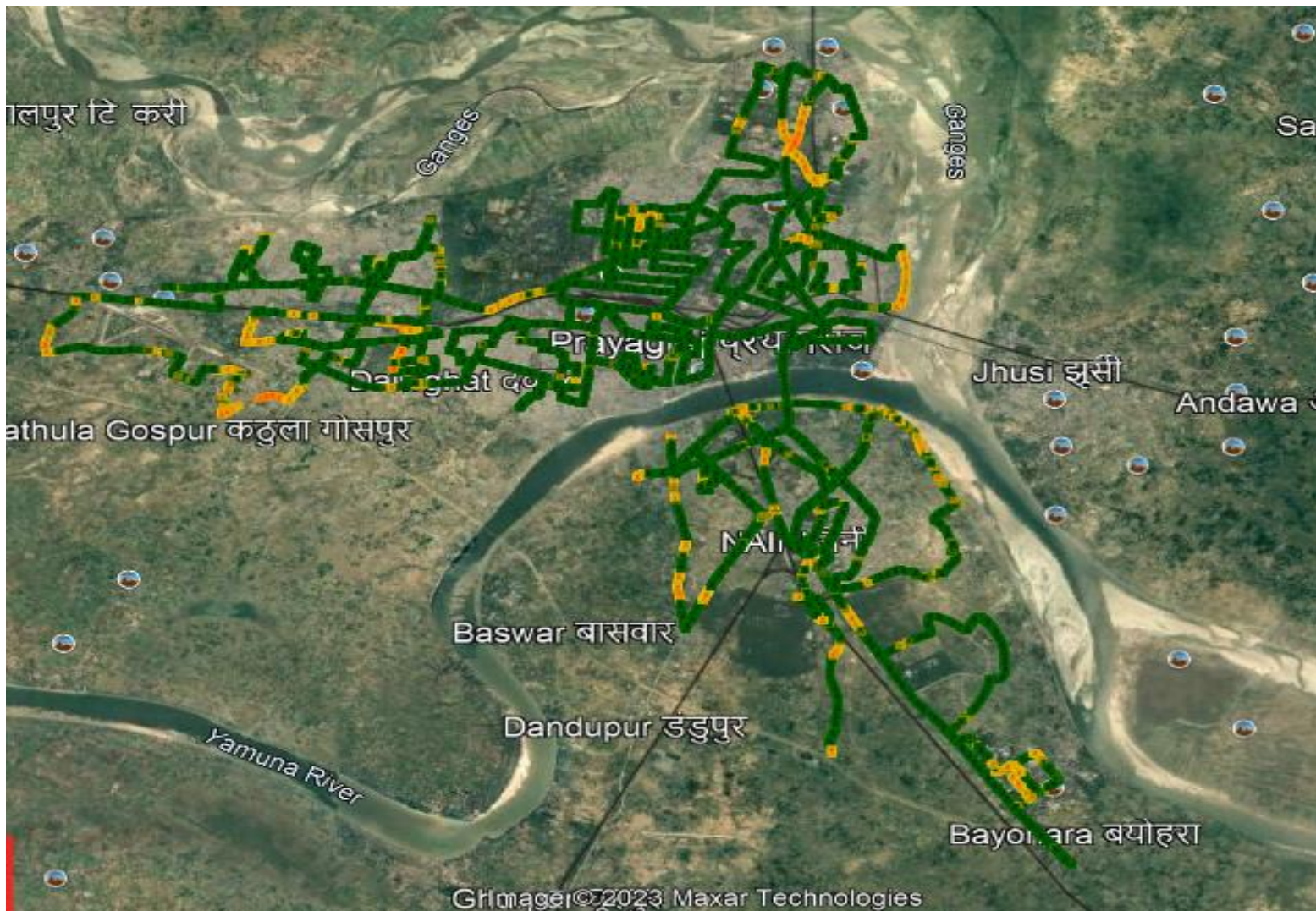


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	1681788	20.27	<span style="background-color: green; width: 20px; height: 10px; display: inline-block;"></span>
[-80, >=-90)	3044585	36.69	<span style="background-color: yellow; width: 20px; height: 10px; display: inline-block;"></span>
[-90, >=-110)	3440678	41.47	<span style="background-color: orange; width: 20px; height: 10px; display: inline-block;"></span>
[-110, >=Min)	130462	1.572	<span style="background-color: red; width: 20px; height: 10px; display: inline-block;"></span>
<b>Total</b>	<b>8297513</b>	<b>100</b>	

## Coverage Details

### TSP-Jio

Technology	Coverage %
VoLTE	99.99







VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	44934	76.44%	<span style="background-color: green; width: 20px; height: 10px;"></span>
[-80, >=-90)	12547	21.34%	<span style="background-color: yellow; width: 20px; height: 10px;"></span>
[-90, >=-110)	1298	2.21%	<span style="background-color: orange; width: 20px; height: 10px;"></span>
[-110, >=Min)	110	0.01%	<span style="background-color: red; width: 20px; height: 10px;"></span>
<b>Total</b>	<b>58784</b>		



## TSP - VIL

Technology	Coverage %
VoLTE	99%

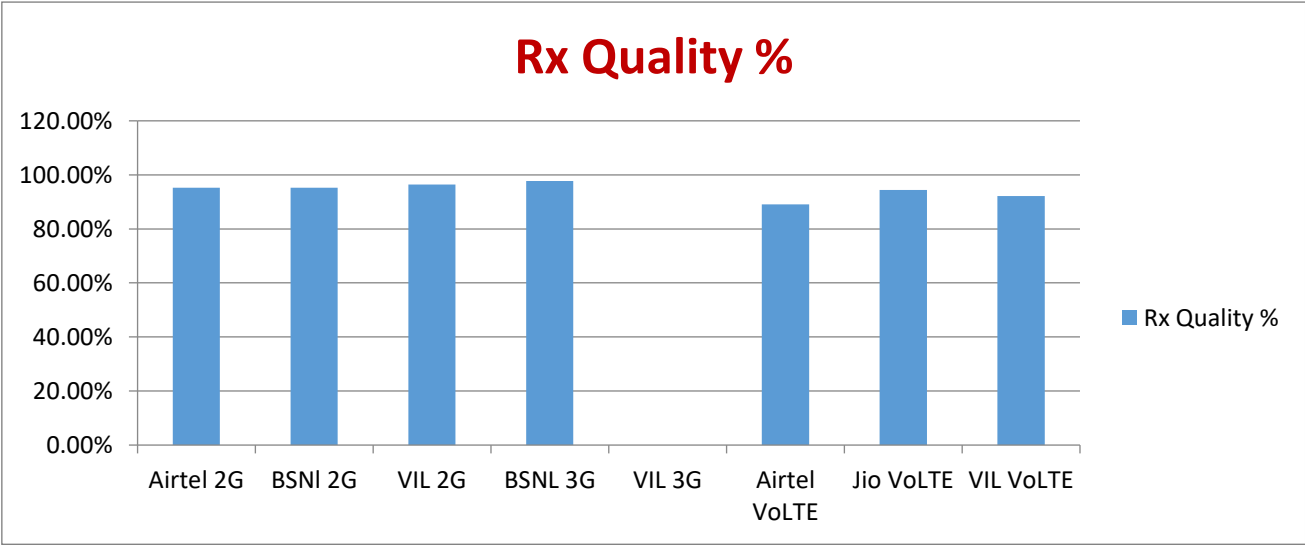


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	13315	26%	
[-80, >=-90)	15341	30%	
[-90, >=-110)	21623	43%	
[-110, >=Min)	391	1%	
<b>Total</b>	<b>50670</b>	<b>100%</b>	

# 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	95.24%
BSNI 2G	95.3%
VIL 2G	96.44%
BSNL 3G	97.7%
VIL 3G	NA
Airtel VoLTE	89.06%
Jio VoLTE	94.46%
VIL VoLTE	92.20%

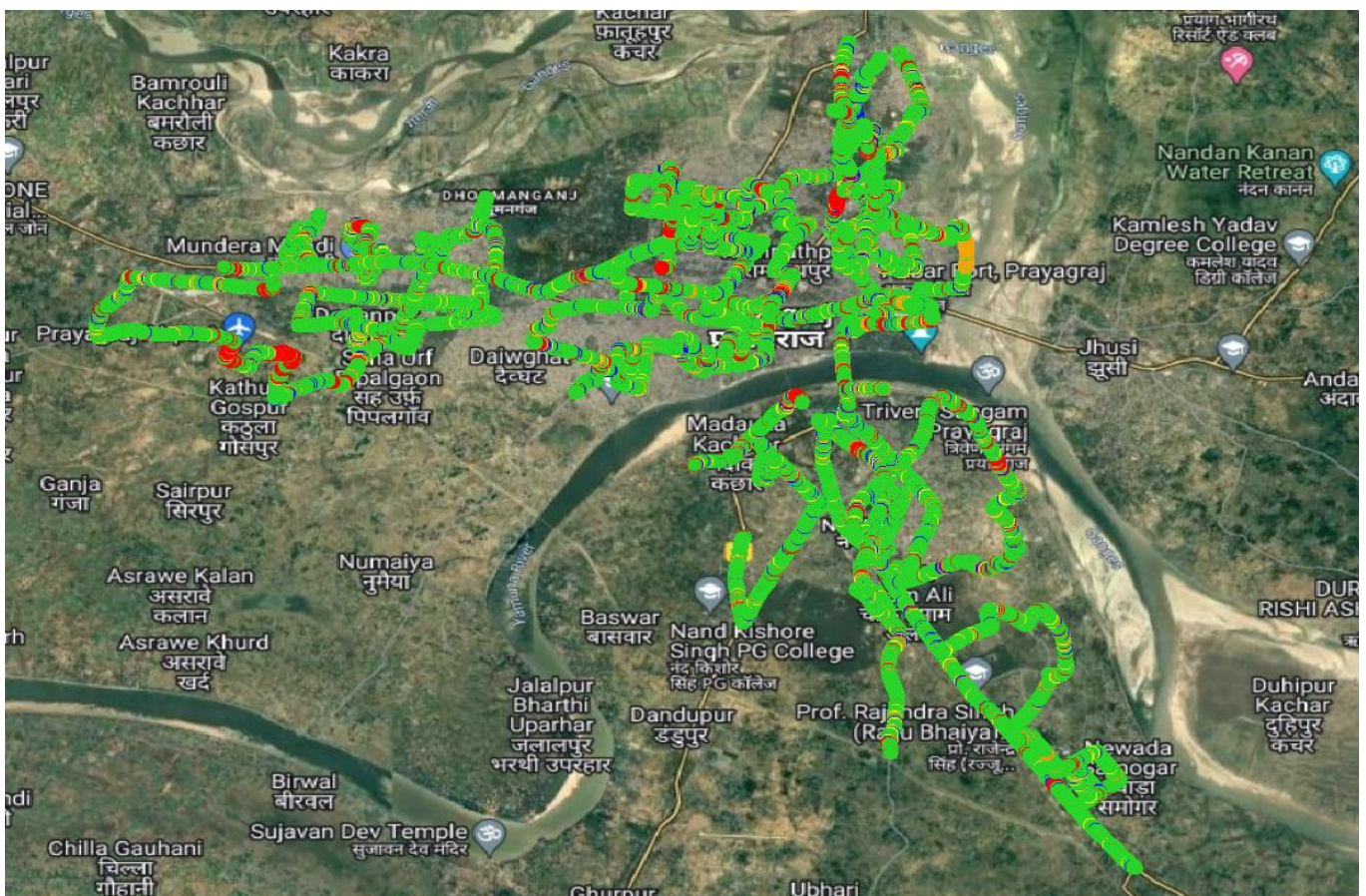


## Quality Details

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  $\geq 95\%$ .

### TSP-Airtel

Technology	Rx Quality %
2G	95.24%



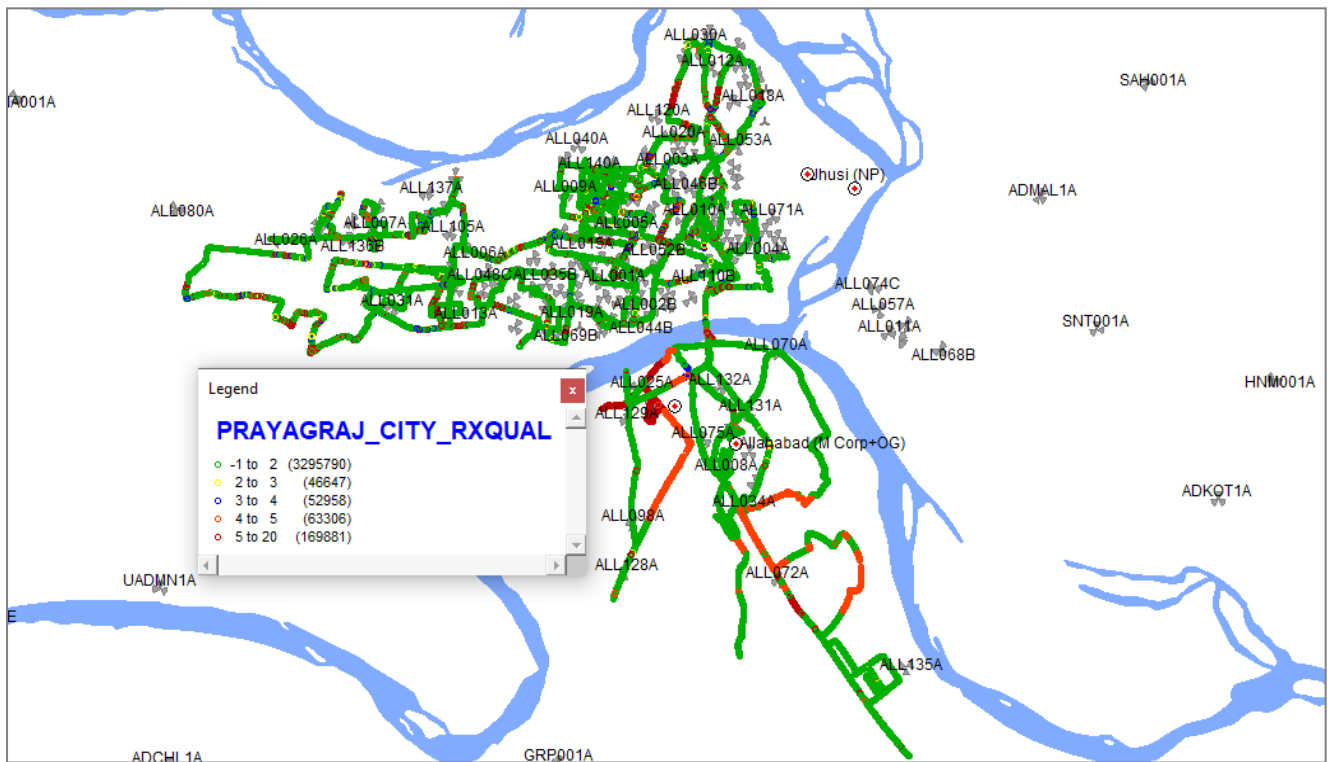
Overall Rx Quality	# Samples	% PDF	Legends
(Min, $\leq 2$ )	4009719	81.71	<span style="color: green;">■</span>
(2, $\leq 3$ )	200975	4.10	<span style="color: yellow;">■</span>
(3, $\leq 4$ )	216410	4.41	<span style="color: blue;">■</span>
(4, $\leq 5$ )	246585	5.02	<span style="color: orange;">■</span>
(5, $\leq$ Max)	233657	4.76	<span style="color: red;">■</span>
<b>Total</b>	<b>4907346</b>	<b>100</b>	

# Quality Details

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  $\geq 95\%$ .

## TSP-BSNL

Technology	Rx Quality %
2G	95.3%



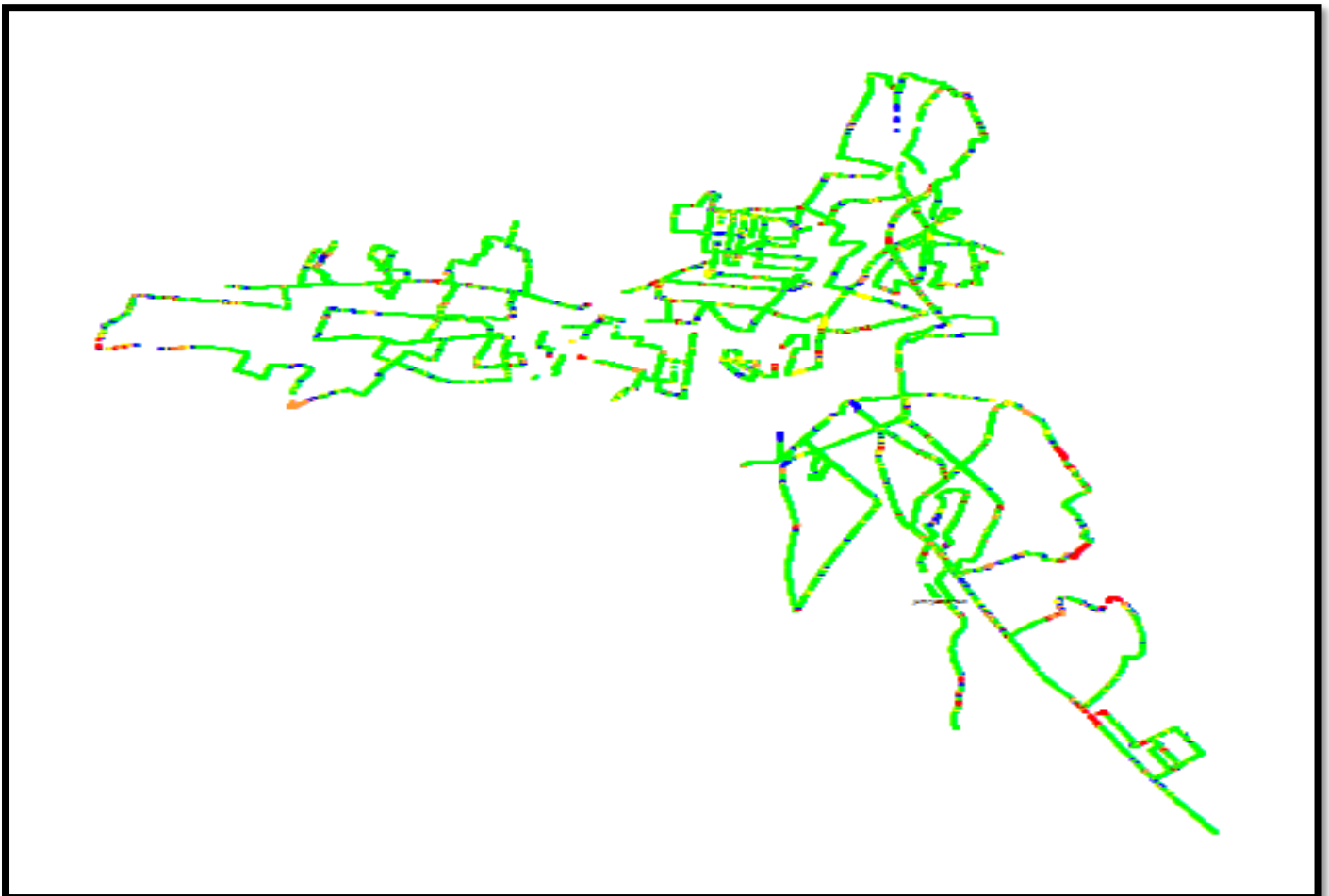
Overall Rx Quality	# Samples	% PDF	Legends
(Min, $\leq 2$ )	3295790	90.8%	
(2, $\leq 3$ )	46647	1.3%	
(3, $\leq 4$ )	52958	1.5%	
(4, $\leq 5$ )	63306	1.7%	
(5, $\leq$ Max)	169881	4.7%	
<b>Total</b>			

## Quality Details

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  $\geq 95\%$ .

### TSP - VIL

Technology	Rx Quality %
2G	96.44%



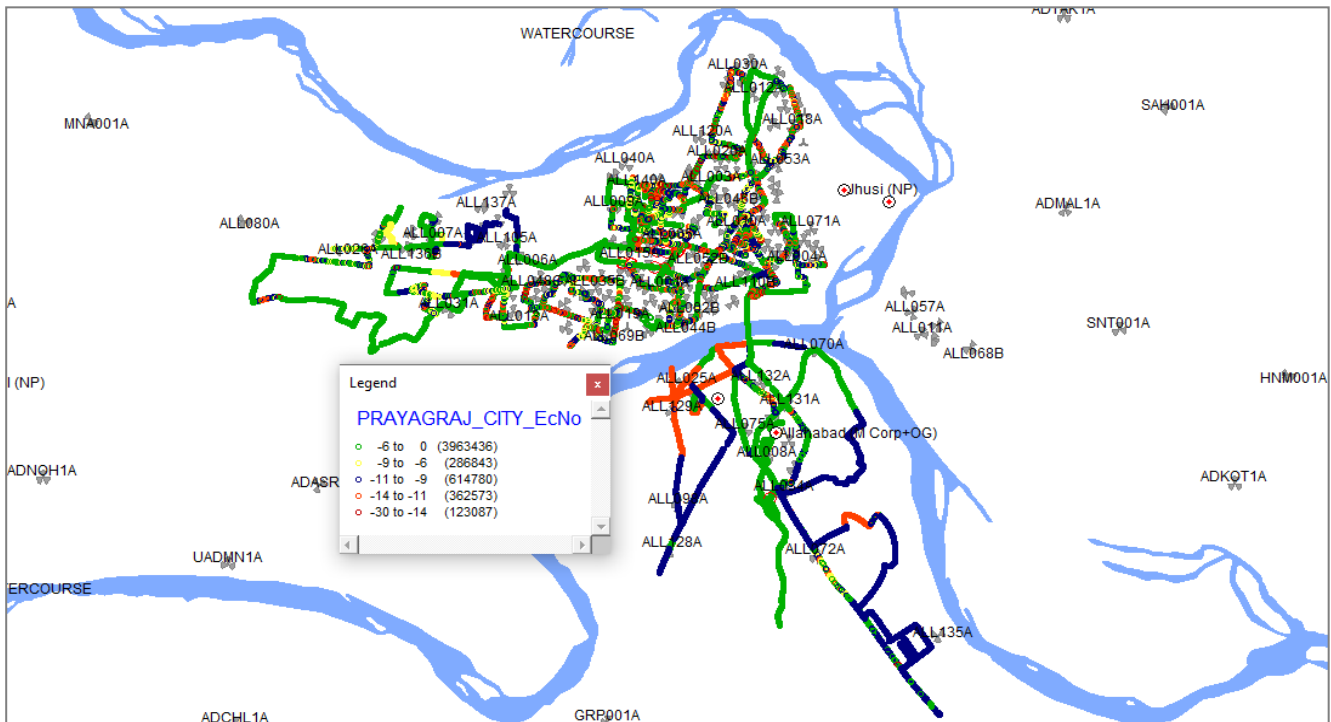
Overall Rx Quality	# Samples	% PDF	Legends
(Min, $\leq 2$ )	18082	78.56%	
(2, $\leq 3$ )	1948	8.46%	
(3, $\leq 4$ )	1302	5.66%	
(4, $\leq 5$ )	866	3.76%	
(5, $\leq$ Max)	820	3.56%	
<b>Total</b>	<b>23018</b>	<b>100%</b>	

# Quality Details

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  $\geq 95\%$ .

## TSP-BSNL

Technology	Rx Quality %
3G	97.7%



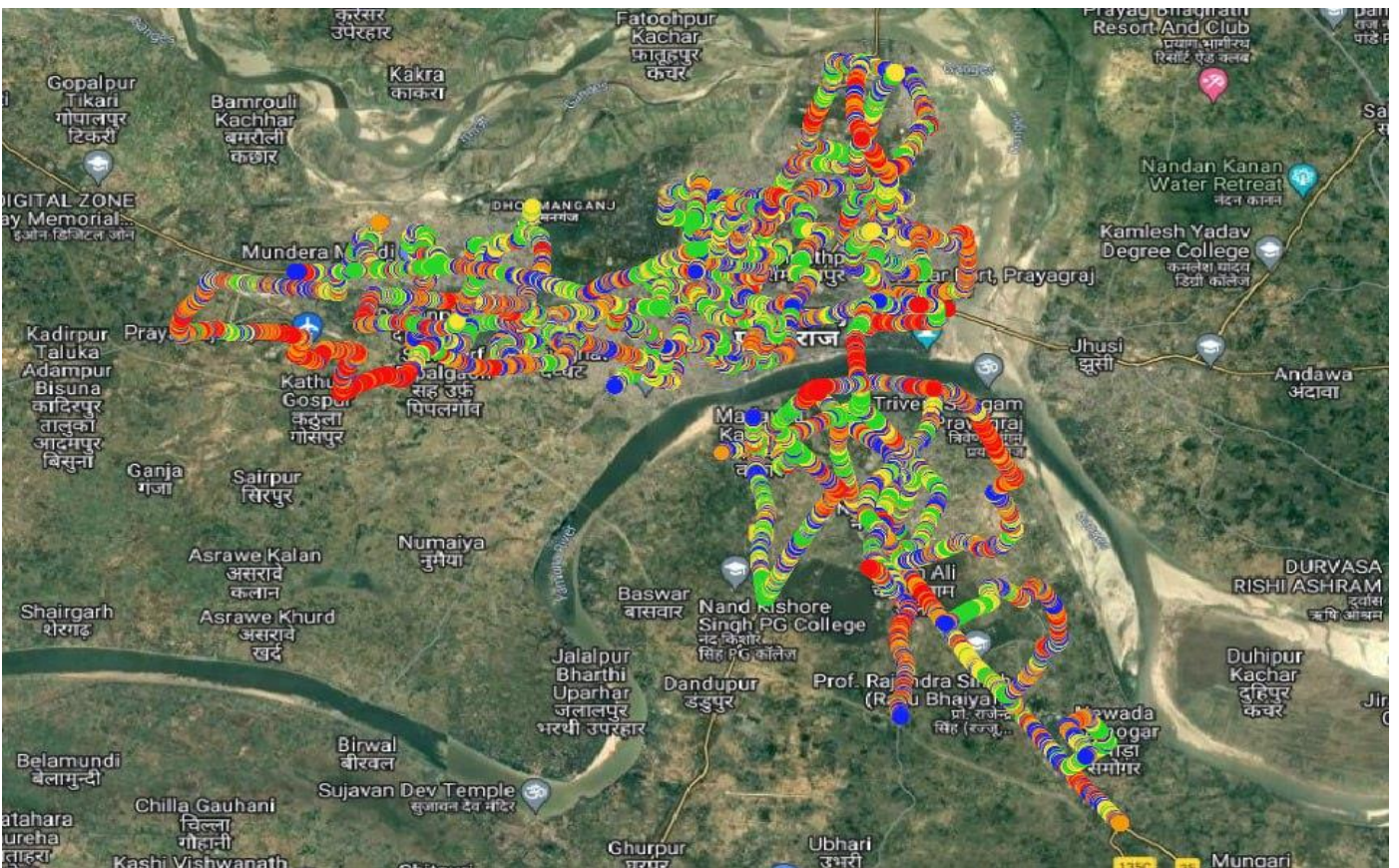
Overall Ec/No	# Samples	% PDF	Legends
(Max, $\leq -6$ )	3963436	74.07%	
(-6, $\leq -9$ )	286843	5.4%	
(-9, $\leq -11$ )	614780	11.5%	
(-11, $\leq -14$ )	362573	6.8%	
(-14, $\leq$ Min)	123087	2.3%	
<b>Total</b>			

## 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-Airtel

Technology	Rx Quality %
VoLTE	89.06%



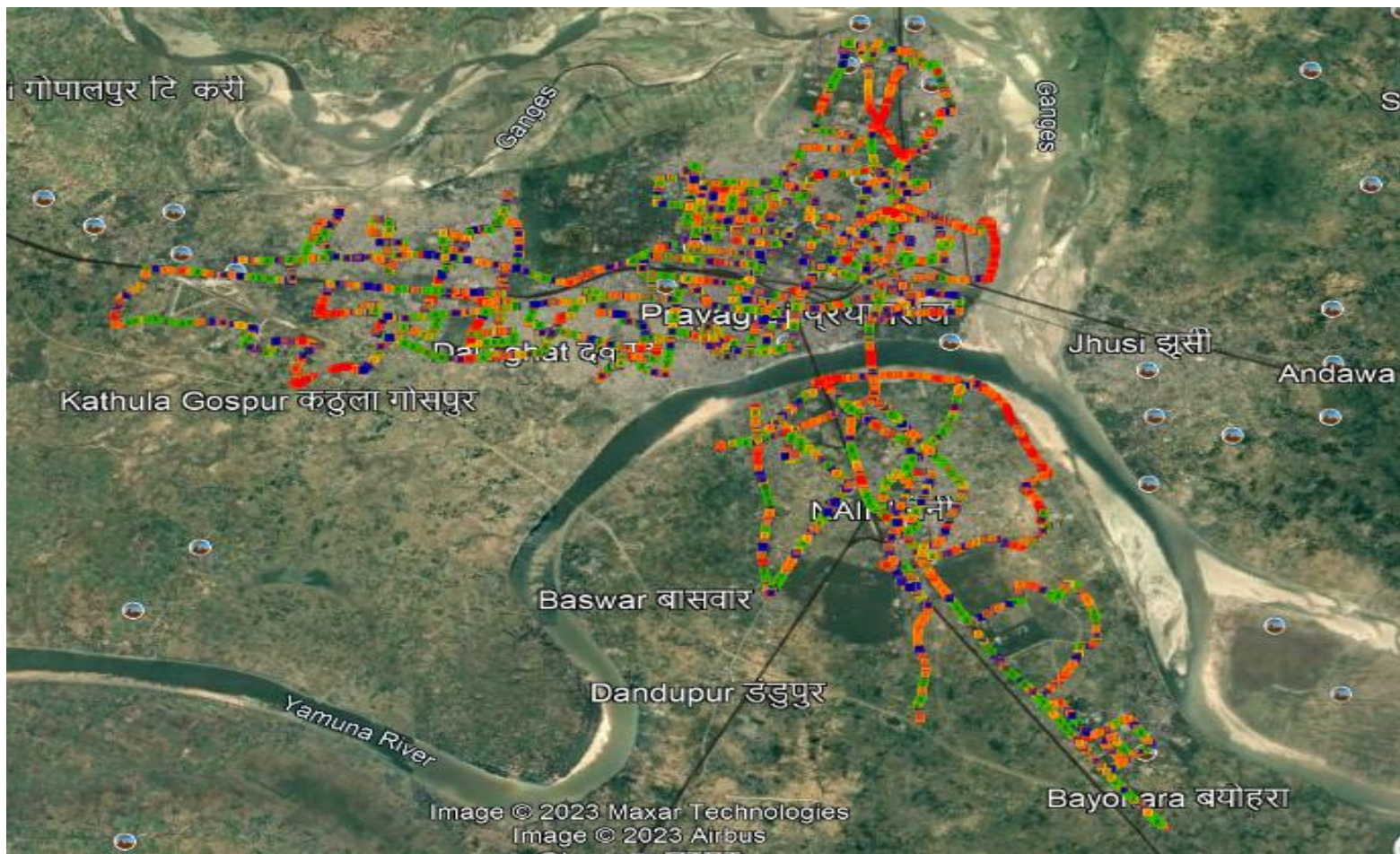
Overall SINR	# Samples	% PDF	Legends
(Min, $\leq 0$ )	31120	10.94	Red
(0, $\leq 5$ )	57829	20.33	Orange
(5, $\leq 10$ )	71525	25.14	Blue
(10, $\leq 15$ )	69313	24.37	Yellow
(15, $\leq$ Max)	54688	19.22	Green
<b>Total</b>	<b>284475</b>	<b>100</b>	

## Quality Details

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  $\geq 95\%$ .

### TSP-Jio

Technology	Rx Quality %
VoLTE	94.46



Overall SINR	# Samples	% PDF	Legends
(Min, $\leq 0$ )	3258	5.54%	Red
(0, $\leq 5$ )	2592	4.41%	Orange
(5, $\leq 10$ )	30983	52.71%	Blue
(10, $\leq 15$ )	11976	20.37	Yellow
(15, $\leq$ Max)	9975	16.97%	Green
<b>Total</b>	<b>58784</b>		








## 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 - VIL

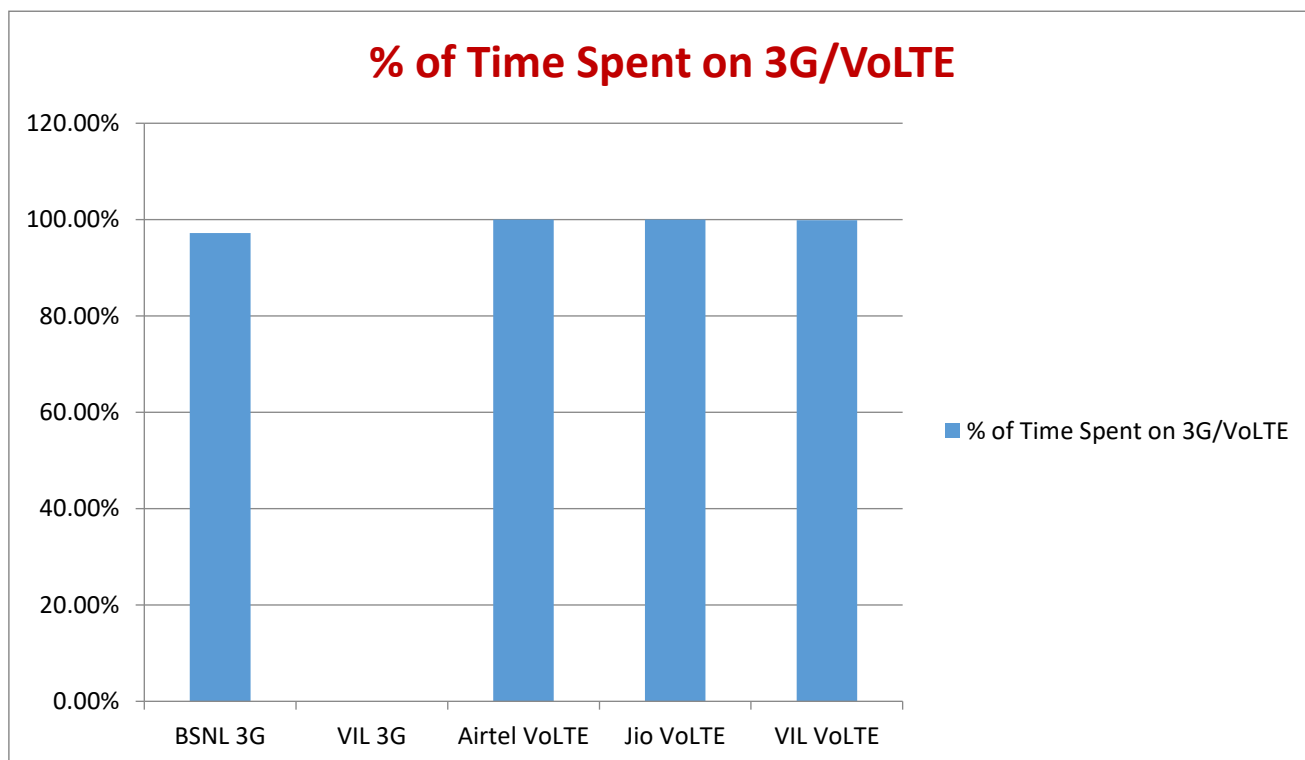
Technology	Rx Quality %
VoLTE	<b>92.20%</b>



Overall SINR	# Samples	% PDF	Legends
(Min, $\leq 0$ )	3953	7.80%	
(0, $\leq 5$ )	14187	28.01%	
(5, $\leq 10$ )	12261	24.20%	
(10, $\leq 15$ )	9629	19.01%	
(15, $\leq \text{Max}$ )	10628	20.98%	
<b>Total</b>	<b>50658</b>	<b>100%</b>	

# Technology Details

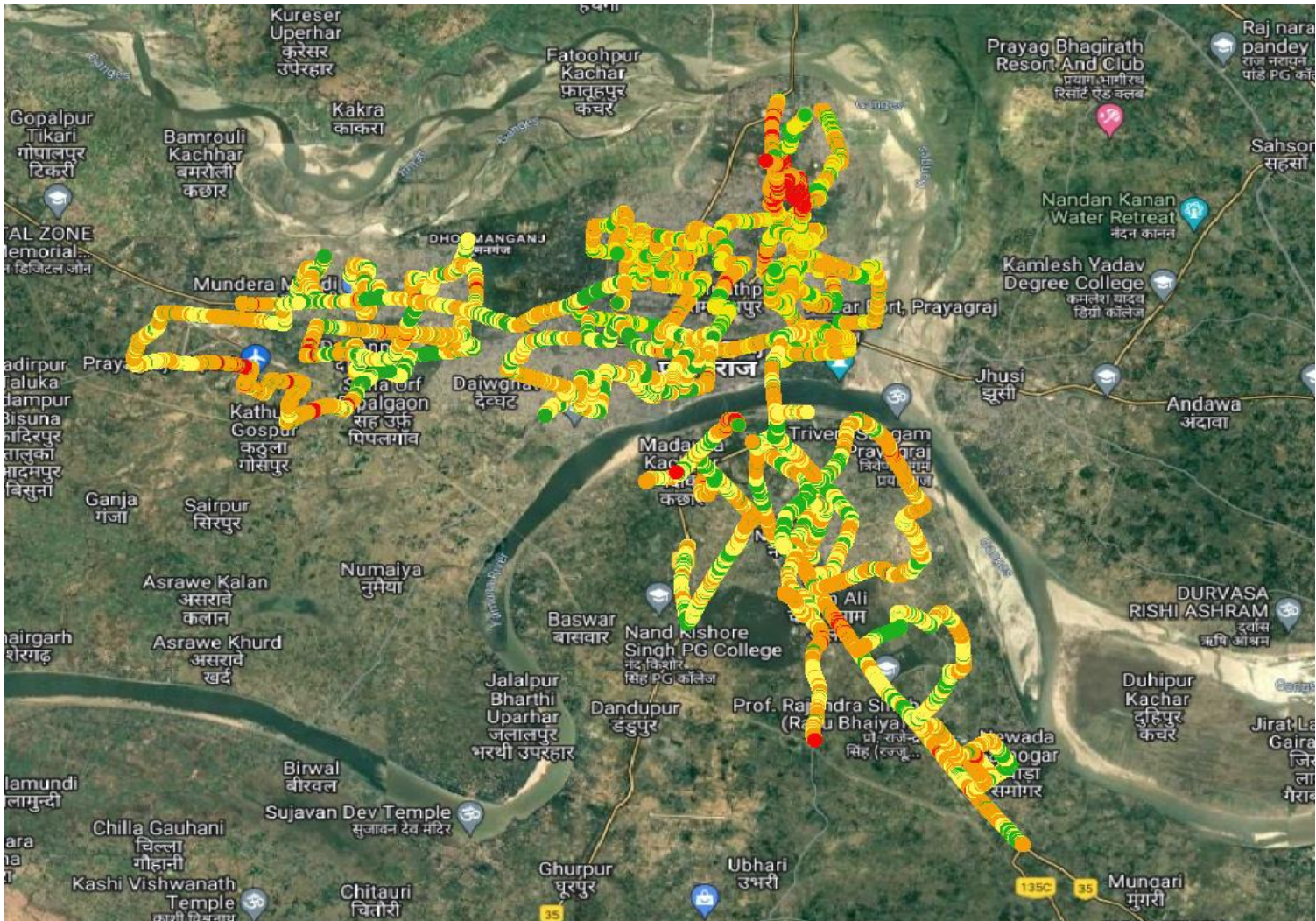
TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	97.24%
VIL 3G	NA
Airtel VoLTE	100%
Jio VoLTE	100%
VIL VoLTE	99.89%



# Technology Details

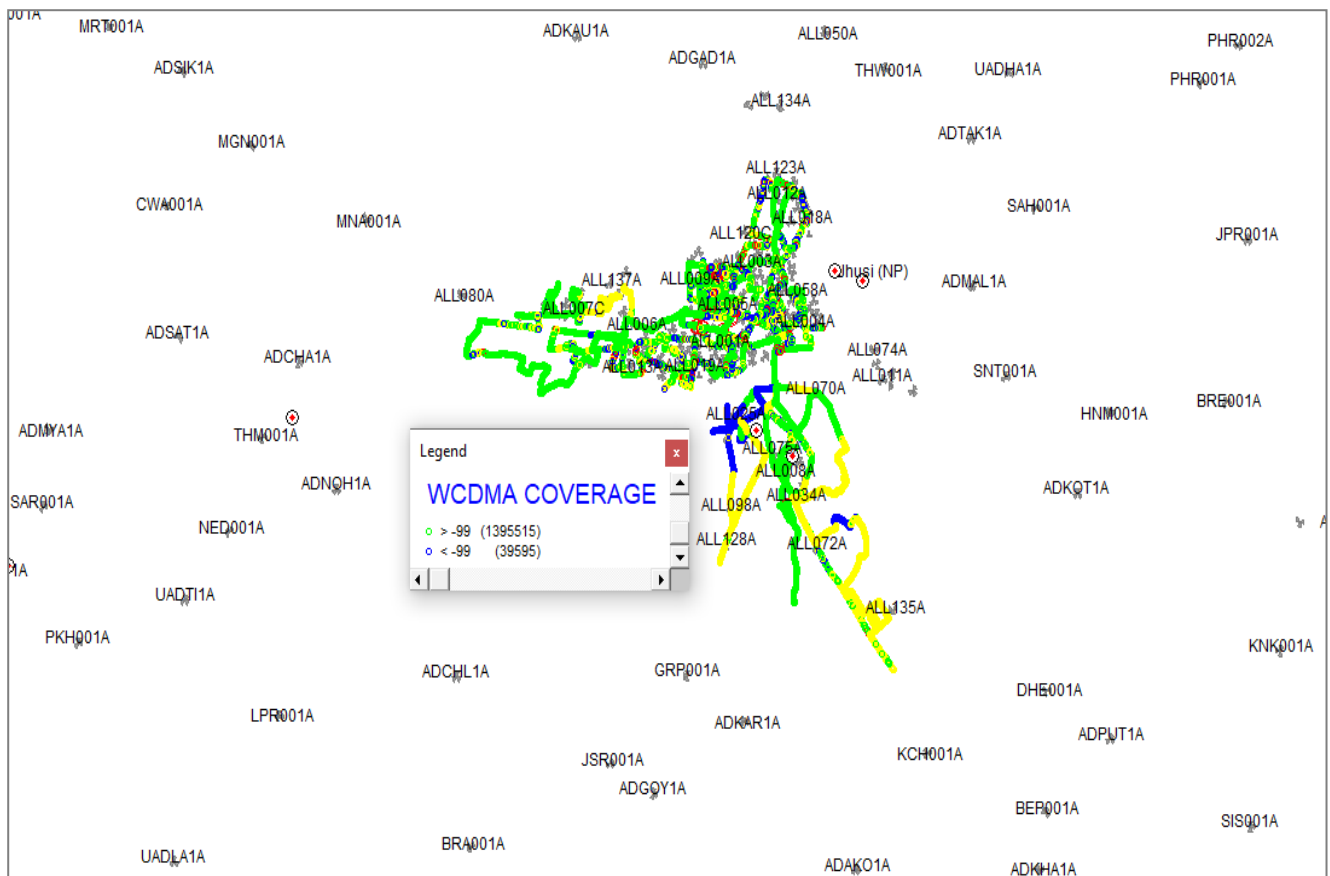
## Airtel

Technology	% of Time Spent on
3G	NA
VoLTE	100%



## TSP-BSNL

Technology	% of Time Spent on
3G	97.24%
VoLTE	NA

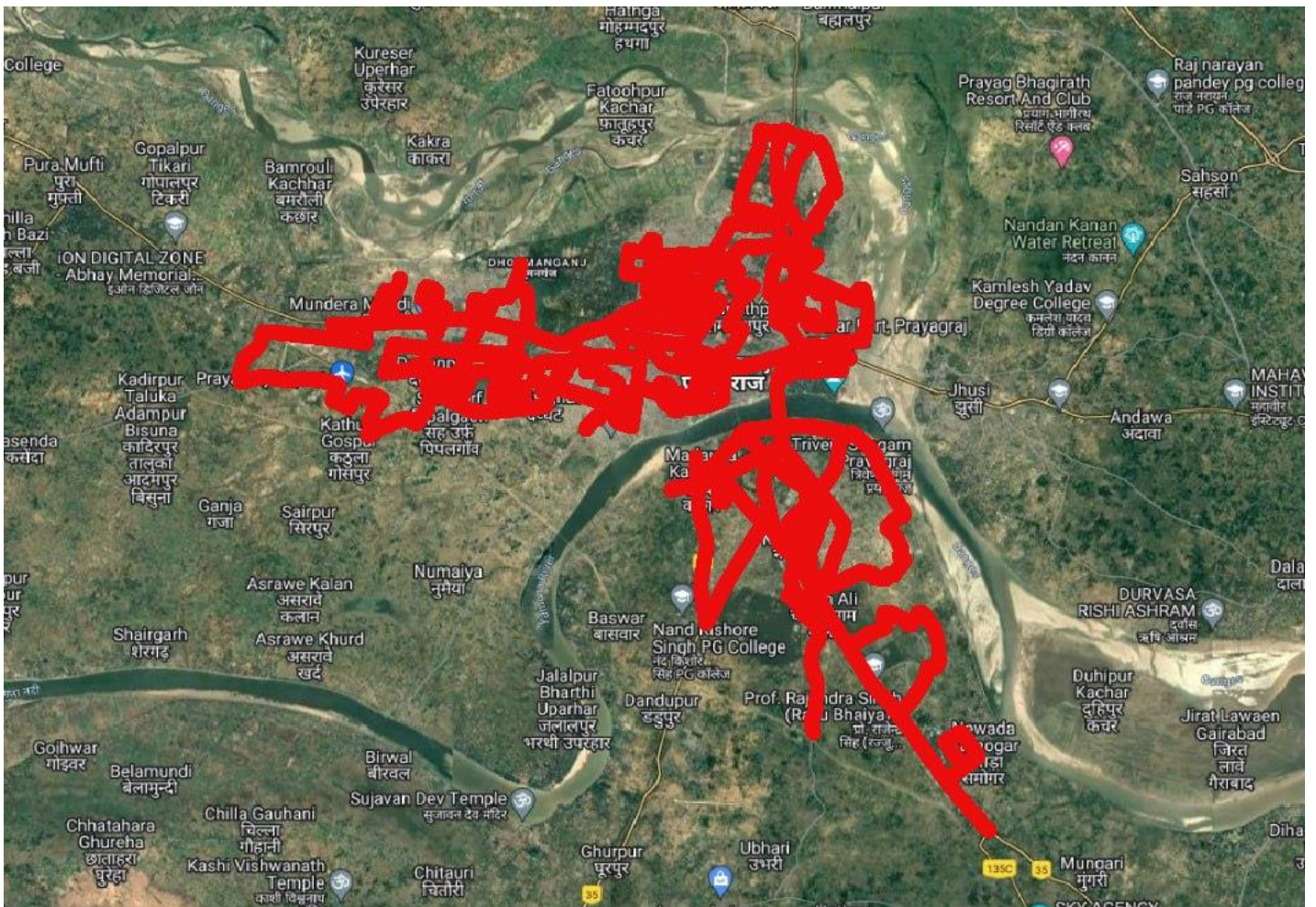


# Dynamic Data Test

## TSP-Airtel

### Data Statistics - Dynamic data testing

Data KPIs - Overall	2G
Download Throughput (Kbps)	53Kbps



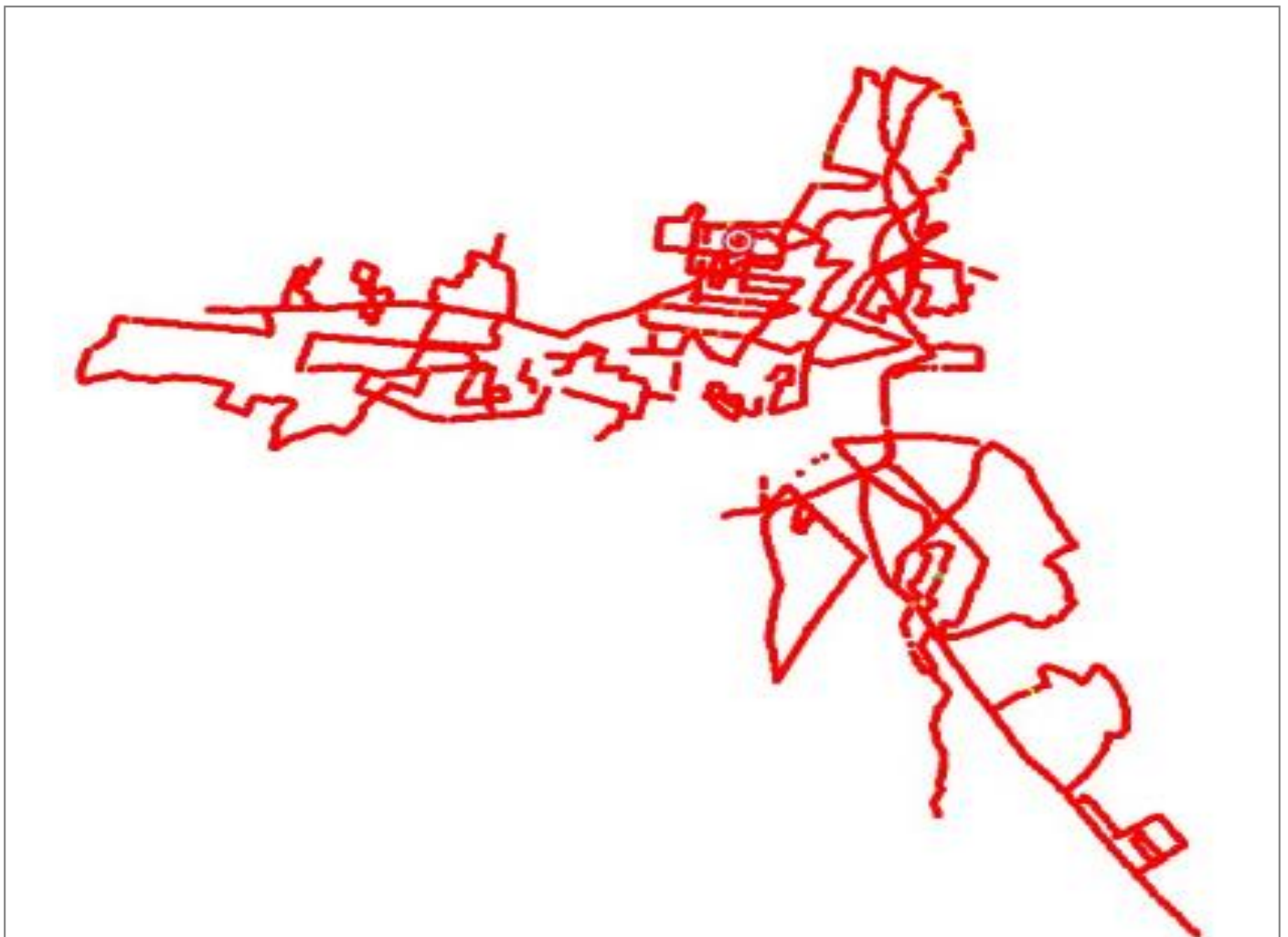
DL throughput	No of Sample	% PDF	Legends
< 100 Kbps	289321	100	Red
100-150Kbps	25	0.01	Orange
150-200Kbps	9	0	Yellow
>200Kbps	10	0	Green
<b>Total</b>	<b>289365</b>	<b>100</b>	



## TSP - VIL

### Data Statistics - Dynamic data testing

Data KPIs - Overall	2G
Download Throughput (Kbps)	29.65



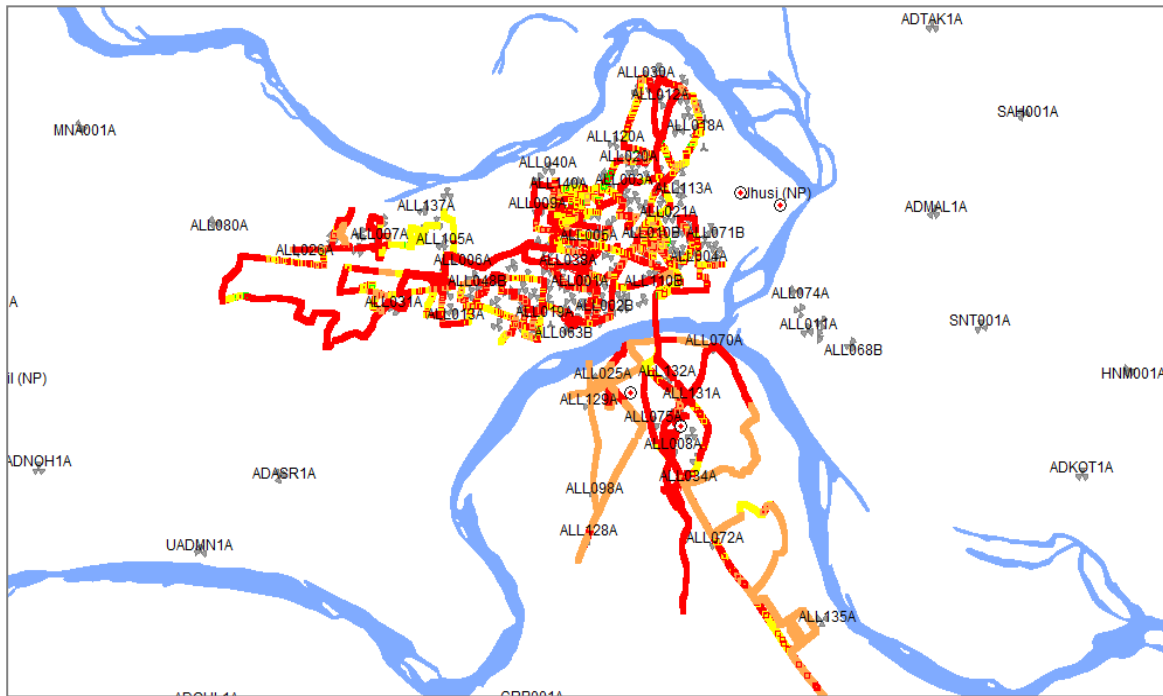
DL throughput	No of Sample	%	Legends
< 100 Kbps	21748	98.51%	Red
100-150Kbps	207	0.94%	Orange
150-200Kbps	83	0.38%	Yellow
>200Kbps	39	0.18%	Green

# Dynamic Data Test

## BSNL

### Data Statistics - Dynamic data testing

Data KPIs - Overall	3G
Download Throughput (Mbps)	2.34



DL throughput	No of Sample	%	Legends
< 1 Mbps	104393196	60.81	Red
1-5 Mbps	44432062	25.88	Orange
5-10 Mbps	16991515	9.89	Yellow
>10Mbps	336951	0.19	Green

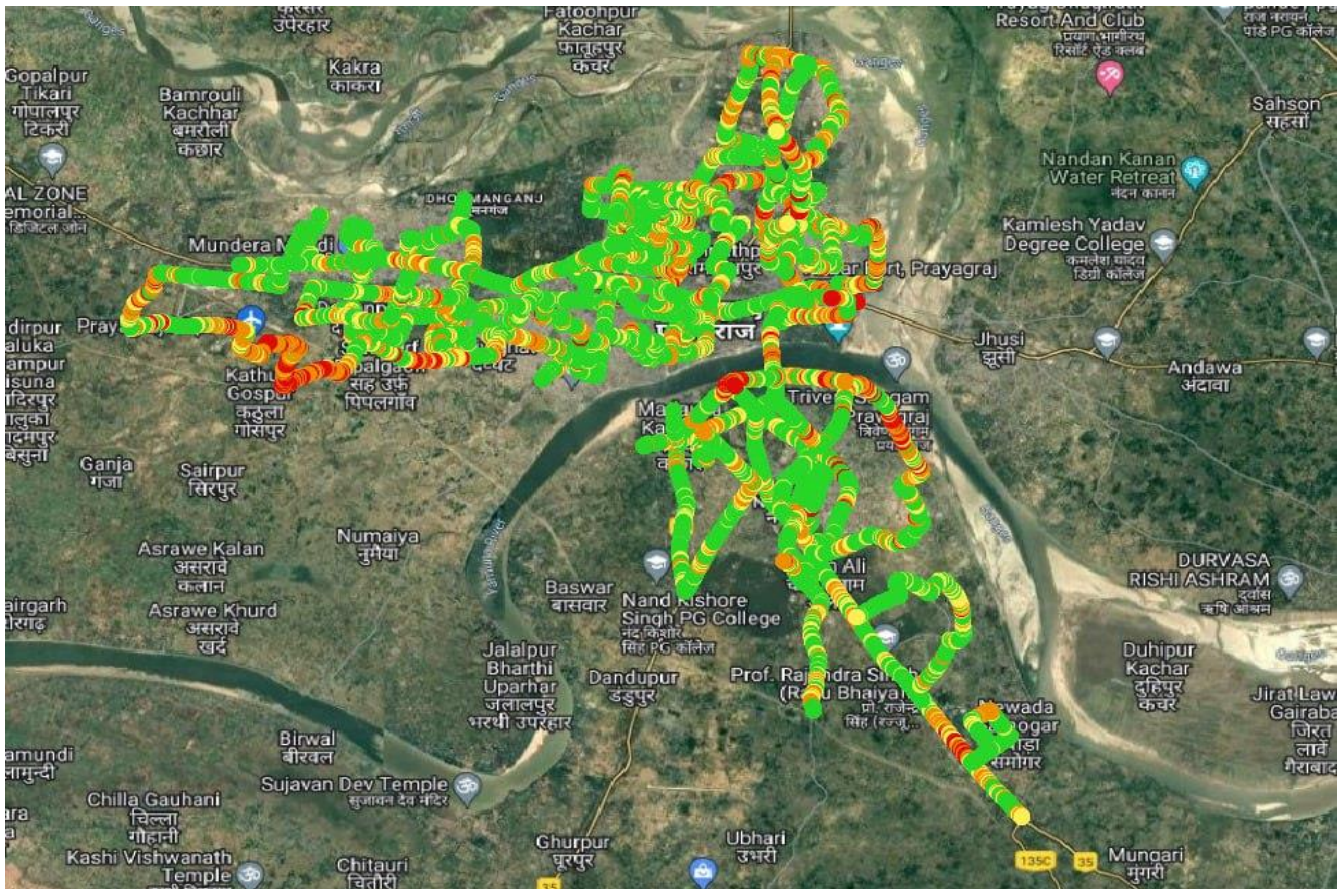


# Dynamic Data Test

**Airtel**

## Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	19.83Mbps



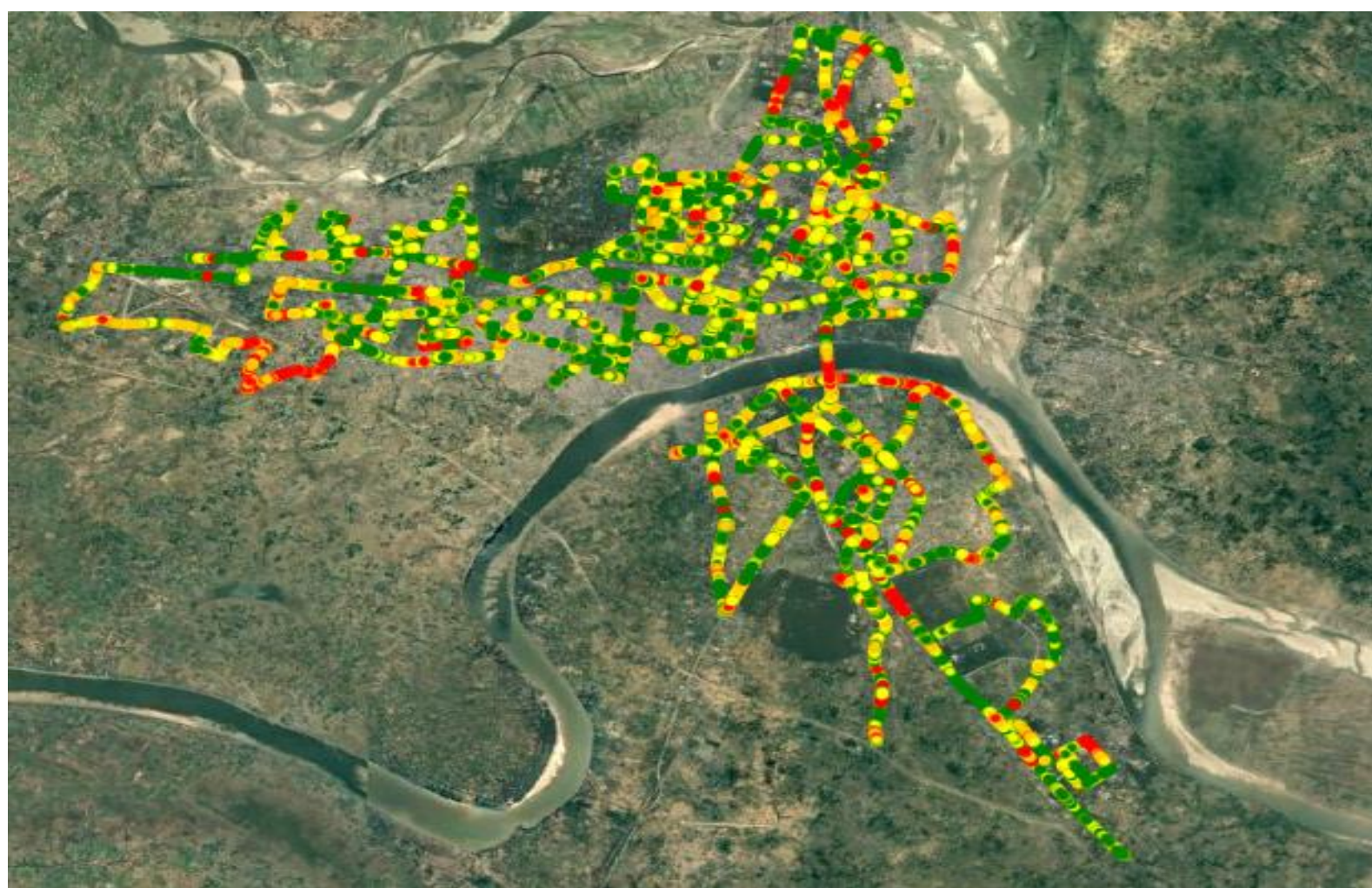
DL throughput	No of Sample	%	Legends
< 1 Mbps	11251	6.06	Red
1-5 Mbps	32714	17.61	Orange
5-10 Mbps	29099	15.67	Yellow
>10Mbps	112670	60.66	Green
<b>Total</b>	<b>185734</b>	<b>100</b>	

# Dynamic Data Test

**Jio**

## Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	12.27



DL throughput	No of Sample	%	Legends
< 1 Mbps	4655	7.06%	Red
1-5 Mbps	10984	16.67%	Orange
5-10 Mbps	17651	26.79%	Yellow
>10Mbps	32603	49.48%	Green
<b>Total</b>	<b>68784</b>		

## TSP - VIL

### Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	12.18



DL throughput	No of Sample	%	Legends
< 2Mbps	7907	16%	<span style="display: inline-block; width: 20px; height: 10px; background-color: red;"></span>
2-5 Mbps	1496	3%	<span style="display: inline-block; width: 20px; height: 10px; background-color: orange;"></span>
5-10 Mbps	574	1%	<span style="display: inline-block; width: 20px; height: 10px; background-color: yellow;"></span>
>10Mbps	39042	80%	<span style="display: inline-block; width: 20px; height: 10px; background-color: green;"></span>