



प्रभावी विनियमन – सुगम संचार  
Effective Regulation – Ease of Communication

# Operator Assisted Drive Test Report

## Bhopal City and nearby Area

01/05/2023 to 03/05/2023

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 Bhopal City and surrounding areas from 9:00 AM to 8:00 PM from 01/05/2023 to 03/05/2023. The drive test covered drive route of around 402 KMs.

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

### Key Performance Indicators:

KPI	Benchmark	Observations
Block call rate %	$\leq 3\%$	All TSPs achieved the benchmark
Drop call rate %	$\leq 2\%$	All TSPs achieved the benchmark
CSSR %	$\geq 95\%$	All TSPs achieved the benchmark
Mobility HOSR %	$\geq 95\%$	All TSPs achieved the benchmark
Good RX Quality %	$\geq 95\%$	All TSPs achieved the benchmark, Except Airtel in 2G and VoLTE & JIO 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:**

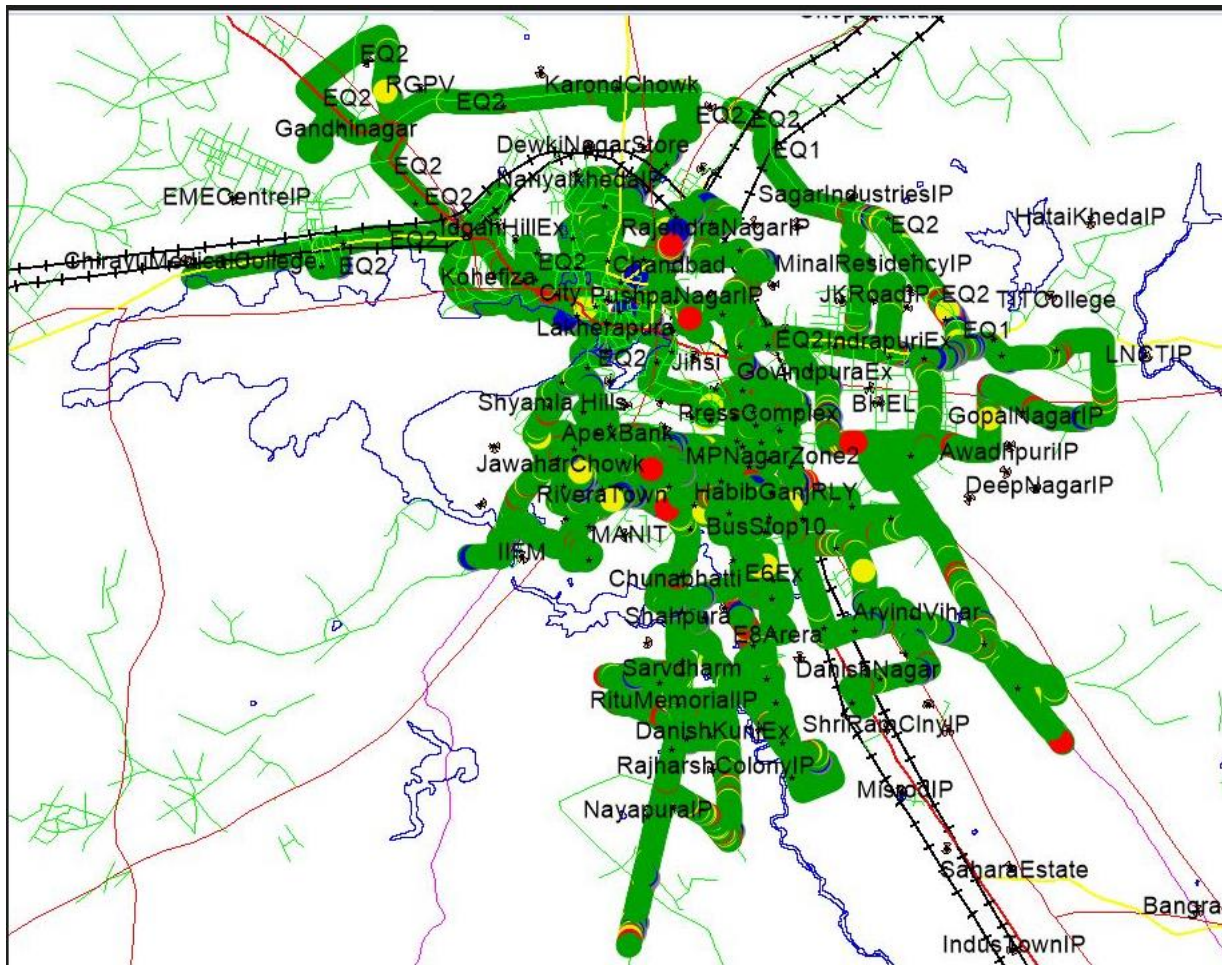
**Dynamic data** – repeat data file download ( to check throughput on the entire route)

- 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).

## Voice & Dynamic Data Test Drive Route



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

\* Bhopal Main Railway Station

\* Rani Kamla Pati Railway Station

\* Nadra Bus Stand

• ISBT

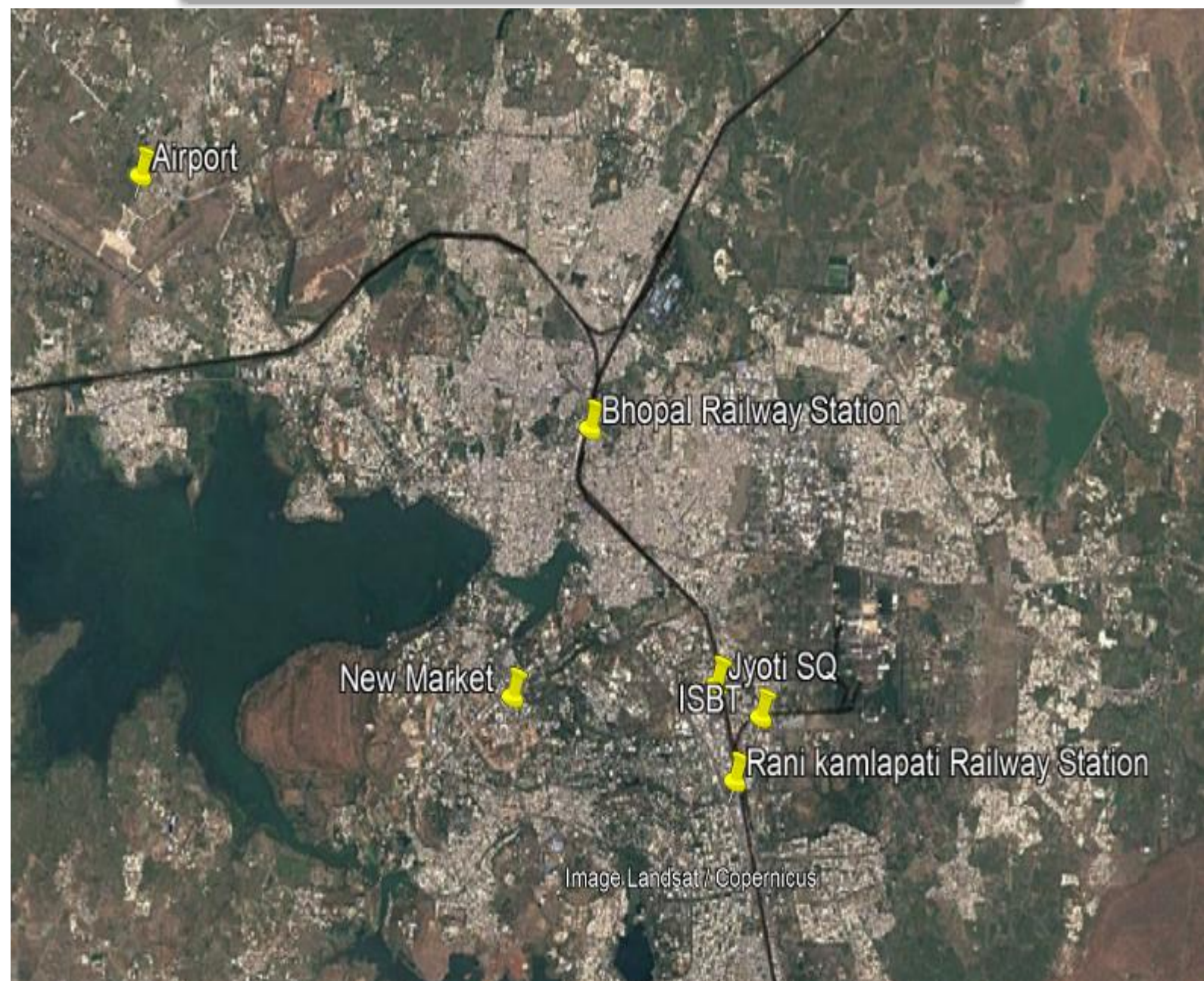
• Airport

\* New Market

\* MP Nagar, Arera Colony, Hoshangabad Road, VIP Road, Kolar Road, BHEL, JK Road, Piplani, Sonagiri, Awadpuri, Old City, Minal, Ayodhya Bypass, Karond, Nehru Nagar, Link Roads and all major Road and important area.

# Overview

## Data Service Test- Static Locations



### Hotspot Locations

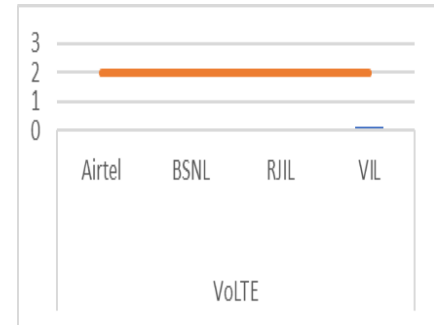
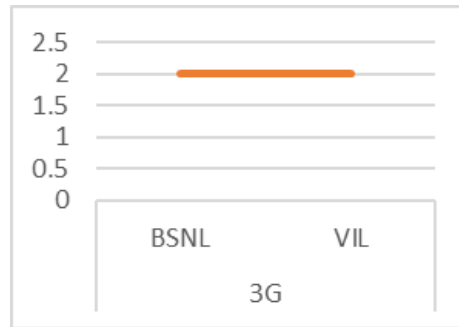
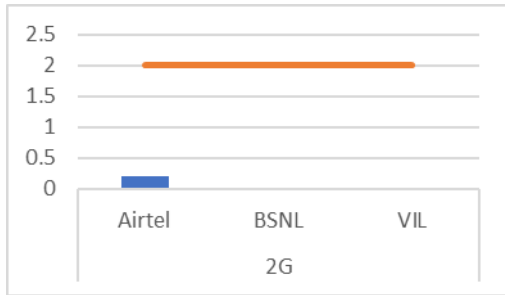
1. Airport
2. Bhopal Railway Station
3. ISBT
4. Jyoti Square MP Nagar
5. New Market
6. Ranikamlapati railway station

# Voice Calls

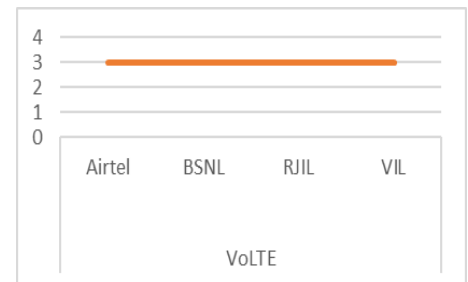
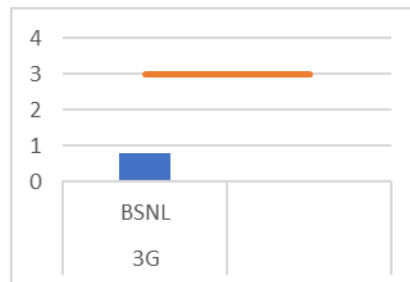
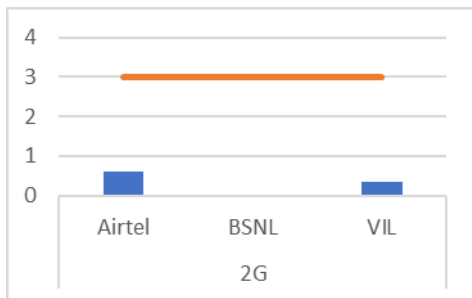
## Key Observations

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 %	0.21	0	0	0	NA	0	0	0
Block Call Rate %	0.61	0	0.35	0.8	NA	0	0	0

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 %	81.76	93.55	85.3

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

TSPs	3G	
	BSNL	VIL
Coverage %	90.96	NA

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	99.85	99.43	99.79

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

TSPs	3G		VoLTE		
	BSNL	VIL	Airtel	VIL	JIO
Time Spent on 3G/4G %	89.2	NA	100	100	100

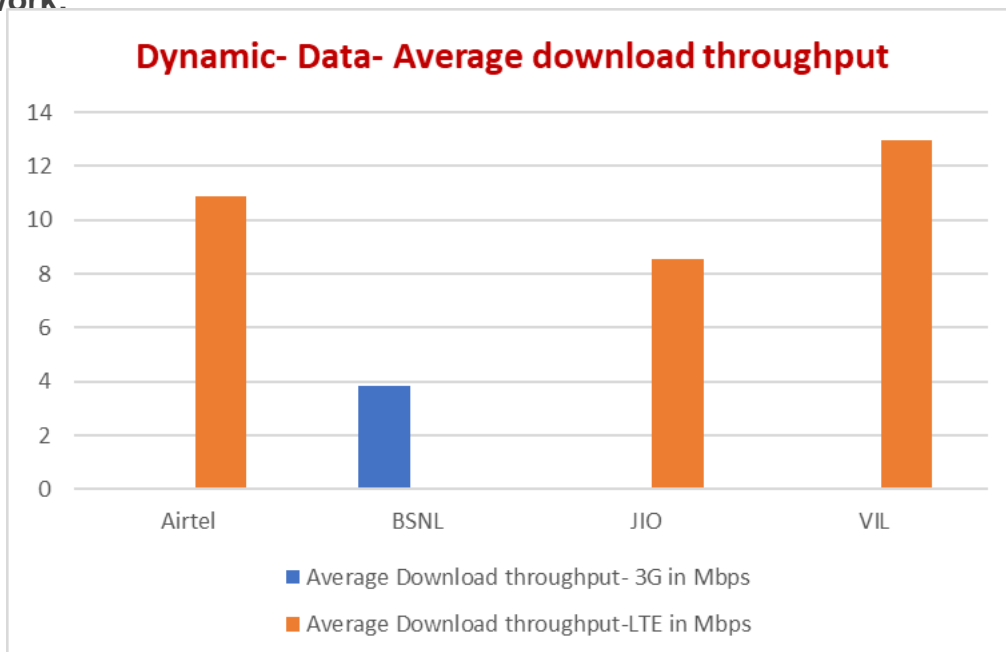
# Data Services Dynamic

## Key Observations

Dynamic Data -Download Throughput was tested.

### Data Download Performance - Dynamic

3G/4G/ Network:



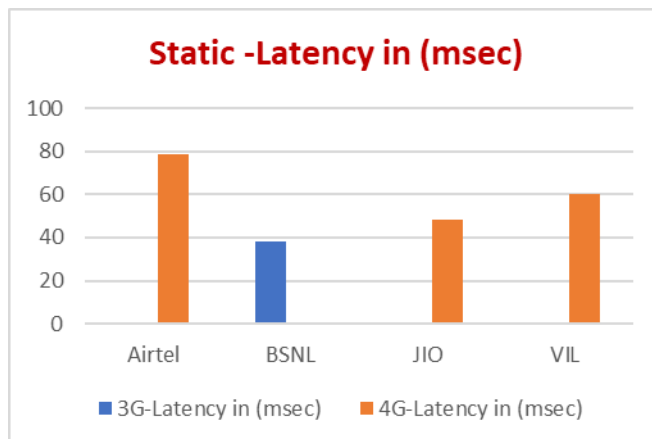
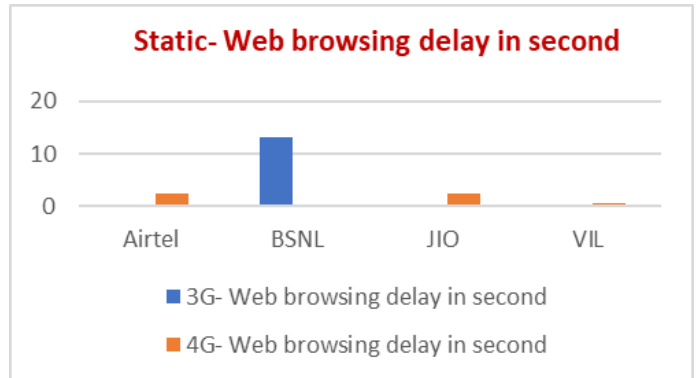
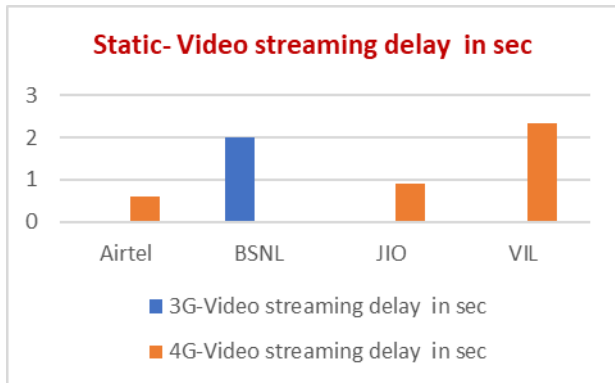
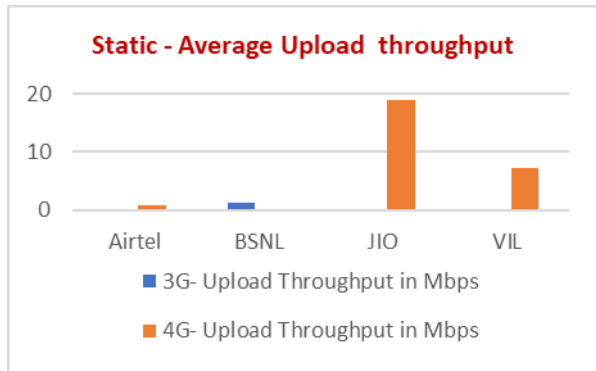
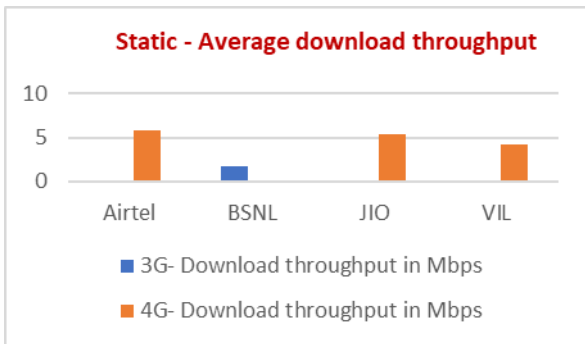
TSP ( For 2G)	Airtel	BSNL	JIO	VIL
Average Download throughput- 2G in Kbps	41.74	152	NA	70.79
Average Download throughput- 3G In Mbps	NA	3.85	NA	NA
Average Download throughput-LTE in Mbps	10.87	NA	8.55	12.98

# 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	490	599	NA	567
Block call rate %	0.61	0	NA	0.35
CSSR %	99.39	100	NA	99.65
Drop call rate %	0.21	0	NA	0.00
Mobility HOSR %	99.51	98.27	NA	96.57
RX Quality %	94.48	96.97	NA	97.83
Average CST Sec	4.35	90	NA	2.39

TSP ( For 3G)	Airtel	BSNL	JIO	VIL
Call attempts	NA	563	NA	NA
Block call rate %	NA	0.18	NA	NA
CSSR %	NA	99.82	NA	NA
Drop call rate %	NA	0	NA	NA
Mobility HOSR %	NA	97.57	NA	NA
RX Quality %	NA	96.05	NA	NA
Average CST (Sec)	NA	NA	NA	NA

TSP ( For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	521	NA	467	535
Block call rate %	0	NA	-	0.00
CSSR %	100	NA	99.57	100.00
Drop call rate %	0	NA	0	0.00
Mobility HOSR %	99.77	NA	99.41	98.87
RX Quality %	86.89	NA	89.28	96.04
Average CST(Sec)	0.76	NA	1.44	0.67

# Summary

## City Level Summary- Data Services -Static

TSP ( For 2G)	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	57.33	175	NA	0.19
Upload Throughput in Kbps	38.01	114	NA	0.24
Web browsing delay in second	101.57	37	NA	1.3
Latency in (msec)	471.70	112	NA	322

TSP ( For 3G)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	4.12	NA	NA
Upload Throughput in Mbps	NA	1.78	NA	NA
Video streaming delay in sec	NA	2	NA	NA
Web browsing delay in second	NA	13	NA	NA
Latency in (msec)	NA	38	NA	NA

TSP ( For LTE )	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	8.52	NA	12.81	29.95
Upload Throughput in Mbps	5.88	NA	5.43	4.19
Video streaming delay in sec	0.61	NA	0.91	2.35
Web browsing delay in second	2.30	NA	2.45	0.6
Latency in (msec)	78.73	NA	48	60

## 1. Hotspot Location-AIRPORT

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	60	265	NA	0.23
Upload Throughput in Kbps	40.53	115	NA	0.28
Web browsing delay in second	80.56	23	NA	1.47
Latency in (msec)	587.93	115	NA	205

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	3.32	NA	NA
Upload Throughput in Mbps	NA	1.23	NA	NA
Video streaming delay in sec	NA	2	NA	NA
Web browsing delay in second	NA	11	NA	NA
Latency in (msec)	NA	85	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	5.41	NA	5.67	12.77
Upload Throughput in Mbps	3.50	NA	4.72	3.2
Video streaming delay in sec	0.85	NA	0.56	2.9
Web browsing delay in second	2.14	NA	2.68	0.8
Latency in (msec)	81.95	NA	52	65

## 2. Hotspot Location- JYOTI SQUARE MP Nagar

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	60.05	145	NA	0.16
Upload Throughput in Kbps	40.42	115	NA	0.19
Web browsing delay in second	70.27	35	NA	1.35
Latency in (msec)	395.06	73	NA	419

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	5.12	NA	NA
Upload Throughput in Mbps	NA	1.82	NA	NA
Video streaming delay in sec	NA	3	NA	NA
Web browsing delay in second	NA	9	NA	NA
Latency in (msec)	NA	53	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	11.93	NA	15.90	30.94
Upload Throughput in Mbps	7.43	NA	4.59	2.9
Video streaming delay in sec	0.52	NA	0.92	2.46
Web browsing delay in second	2.37	NA	2.32	0.6
Latency in (msec)	75.88	NA	50	60

## 3. Hotspot Location-BHOPAL RAILWAY STATION

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	58.01	173	NA	0.14
Upload Throughput in Kbps	34.50	125	NA	0.31
Web browsing delay in second	175.29	42	NA	1.17
Latency in (msec)	502.66	108	NA	181

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	3.79	NA	NA
Upload Throughput in Mbps	NA	1.27	NA	NA
Video streaming delay in sec	NA	3.12	NA	NA
Web browsing delay in second	NA	31	NA	NA
Latency in (msec)	NA	74	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	9.01	NA	10.37	16.9
Upload Throughput in Mbps	6.68	NA	4.71	2.85
Video streaming delay in sec	0.52	NA	1.13	2.17
Web browsing delay in second	2.26	NA	2.238	0.6
Latency in (msec)	72.97	NA	43	61

## 4. Hotspot Location-ISBT

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	52.87	236	NA	0.22
Upload Throughput in Kbps	35.67	128	NA	0.20
Web browsing delay in second	124.13	74	NA	1.13
Latency in (msec)	400.06	98	NA	253

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	4.64	NA	NA
Upload Throughput in Mbps	NA	1.43	NA	NA
Video streaming delay in sec	NA	5	NA	NA
Web browsing delay in second	NA	29	NA	NA
Latency in (msec)	NA	59	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	8.03	NA	19.3	40.2
Upload Throughput in Mbps	5.71	NA	10.21	6.67
Video streaming delay in sec	0.52	NA	0.83	2.14
Web browsing delay in second	2.95	NA	2.52	0.6
Latency in (msec)	89.55	NA	48	60

## 5. Hotspot Location- Rani Kamlapati Railway Station

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	62.16	225	NA	0.12
Upload Throughput in Kbps	43.13	121	NA	0.12
Web browsing delay in second	94.78	79	NA	1.3
Latency in (msec)	408.27	117	NA	229

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	4.92	NA	NA
Upload Throughput in Mbps	NA	1.82	NA	NA
Video streaming delay in sec	NA	3	NA	NA
Web browsing delay in second	NA	29	NA	NA
Latency in (msec)	NA	57	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	7.40	NA	12.79	23.24
Upload Throughput in Mbps	8.51	NA	3.89	6.98
Video streaming delay in sec	0.79	NA	1.08	2.32
Web browsing delay in second	3.17	NA	2.46	0.6
Latency in (msec)	86.86	NA	51	53

## 6. Hotspot Location-NEW MARKET(Near Hanuman Mandir)

	2G			
	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	50.89	196	NA	0.27
Upload Throughput in Kbps	22.58	117	NA	0.34
Web browsing delay in second	54.24	67	NA	1.22
Latency in (msec)	535.72	132	NA	647

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	3.92	NA	NA
Upload Throughput in Mbps	NA	1.32	NA	NA
Video streaming delay in sec	NA	4	NA	NA
Web browsing delay in second	NA	34	NA	NA
Latency in (msec)	NA	73	NA	NA

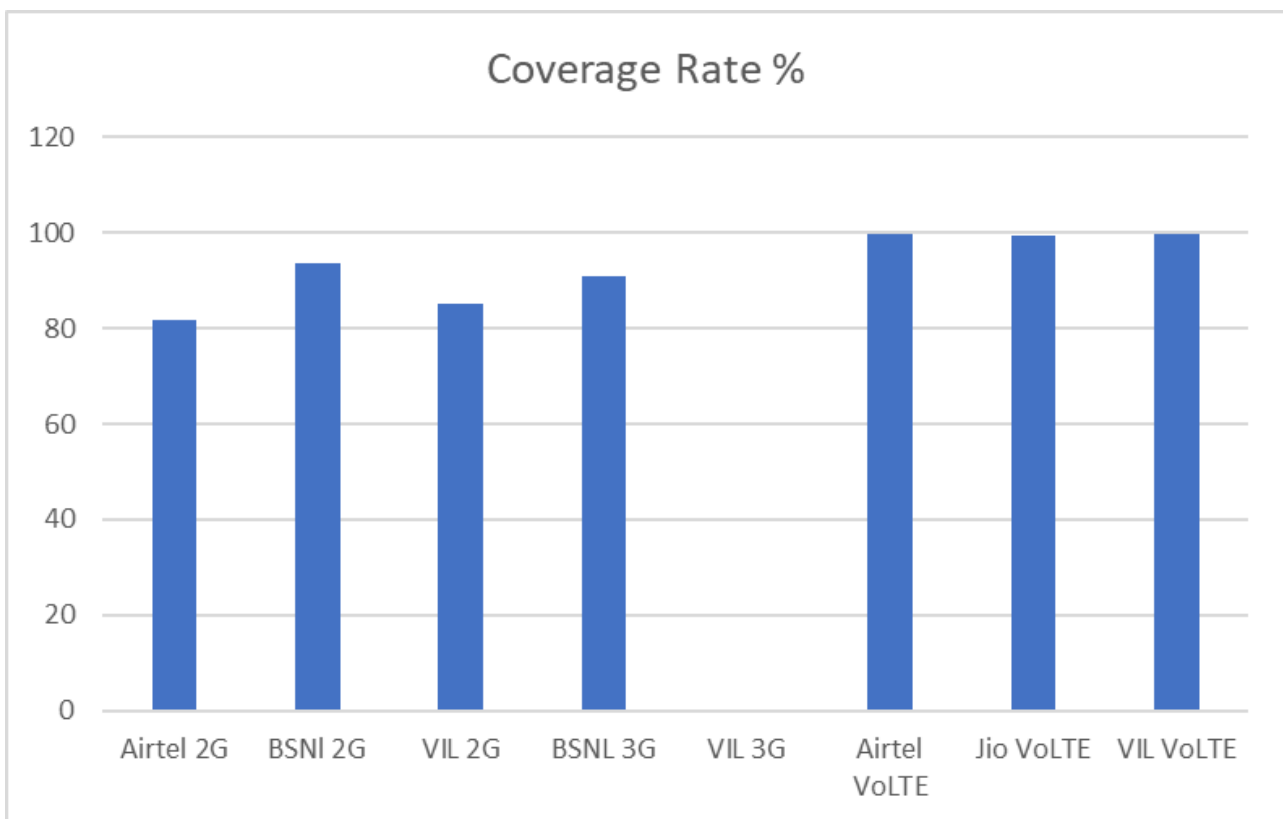
	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	9.38	NA	12.85	55.62
Upload Throughput in Mbps	3.48	NA	4.48	2.56
Video streaming delay in sec	0.47	NA	0.96	2.13
Web browsing delay in second	0.94	NA	2.48	0.5
Latency in (msec)	65.18	NA	49	60



## 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	81.76
BSNI 2G	93.55
VIL 2G	85.3
BSNL 3G	90.96
VIL 3G	NA
Airtel VoLTE	99.85
Jio VoLTE	99.43
VIL VoLTE	99.86







## TSP-Airtel

Technology	Coverage %
2G	81.76



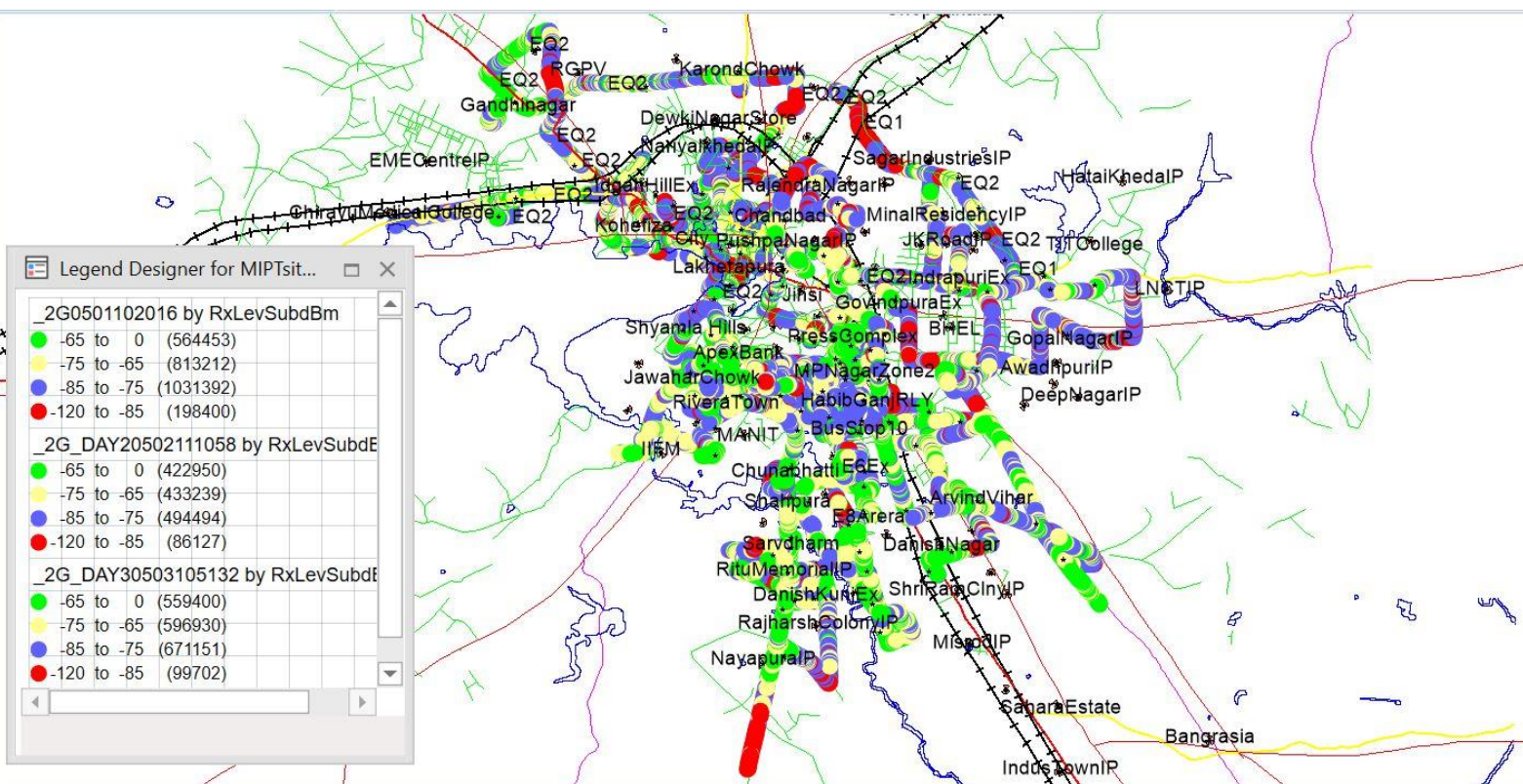
2G

Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	2999669	53.37145	
[-75, >=-85)	1595597	28.38957	
[-85, >=-95)	967584	17.21569	
[-95, >=Min)	57513	1.023297	
<b>Total</b>			

# Coverage Details

## TSP- BSNL

Technology	Coverage %
2G	93.55

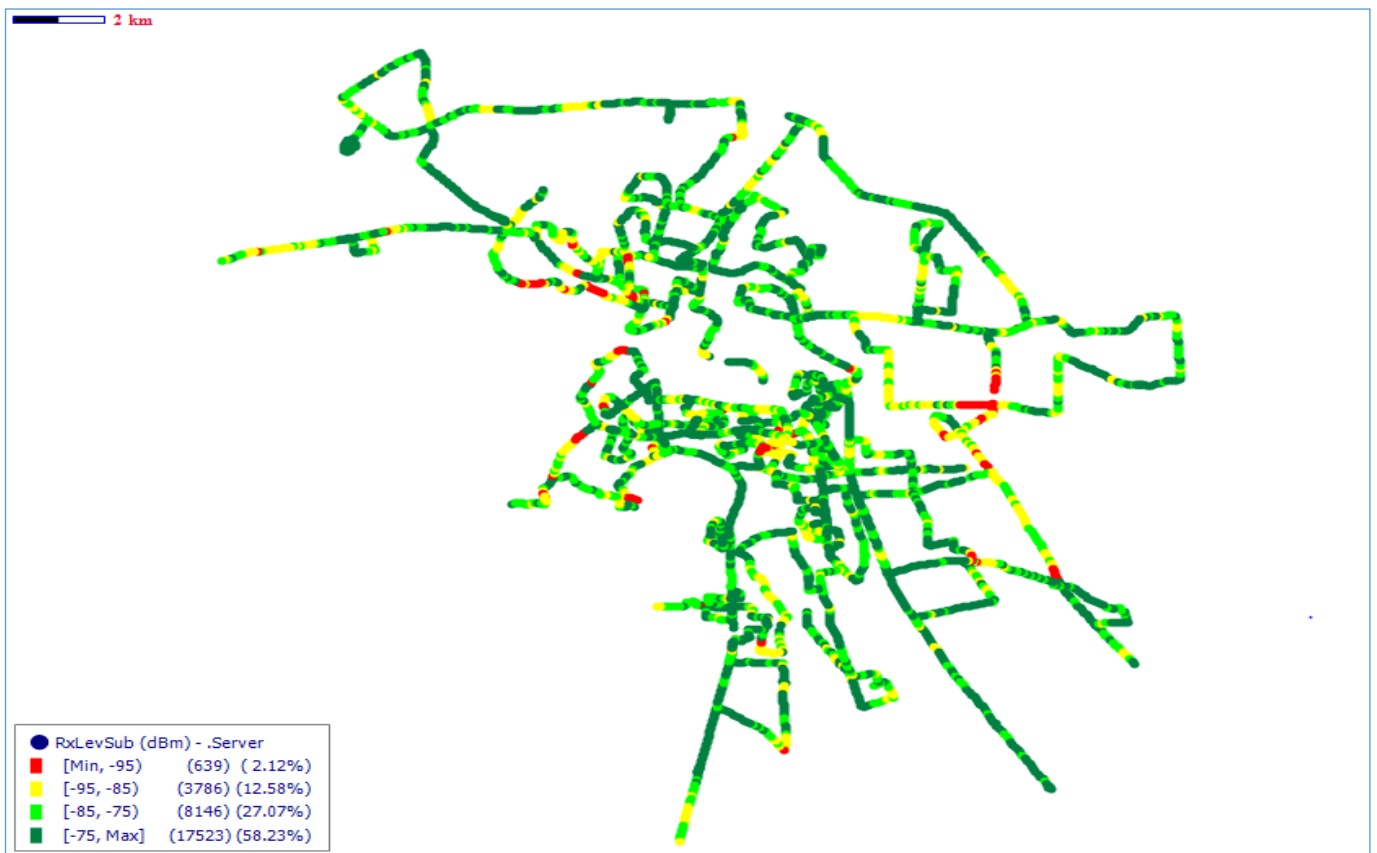


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-65]	1546803	25.90	Green
[-65, >=-75)	1843381	30.86	Yellow
[-75, >=-85)	2197037	36.79	Blue
[-85, >=Min)	384229	6.43	Red
<b>Total</b>	<b>5971450</b>	<b>100</b>	

# Coverage Details

## TSP - VI

Technology	Coverage %
2G	85.3%

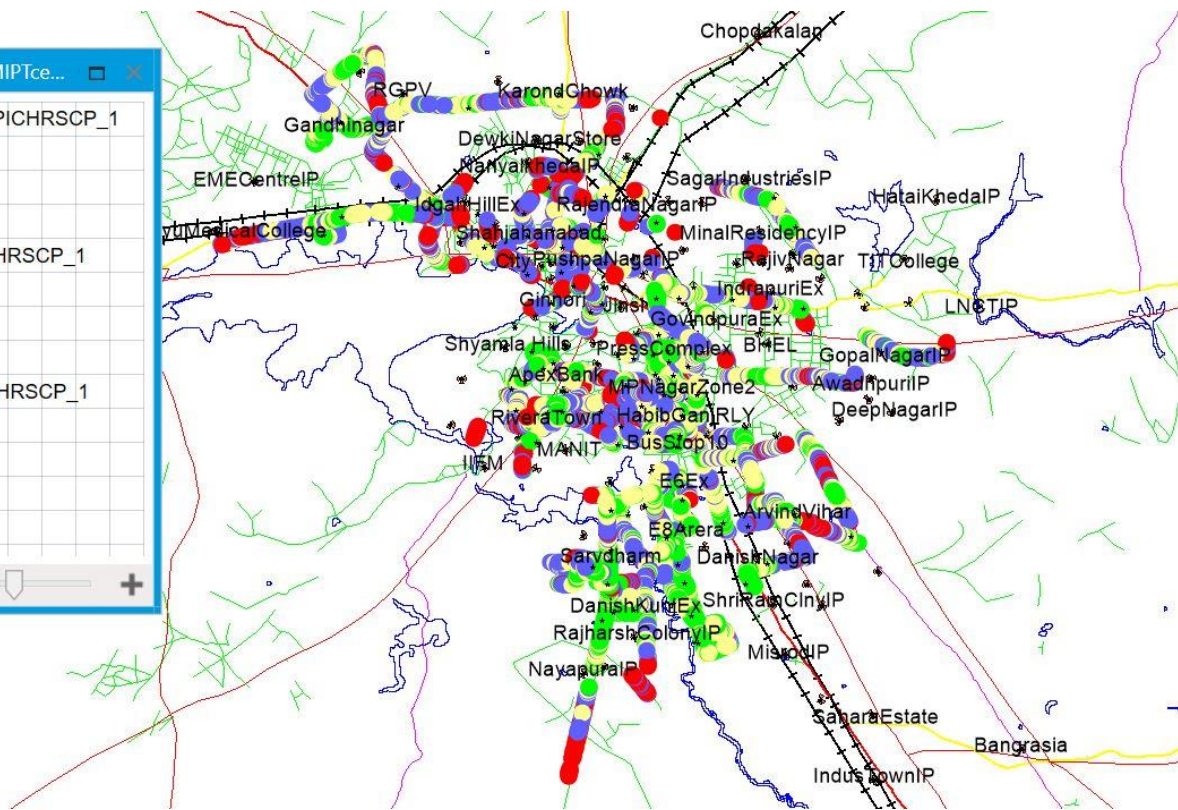
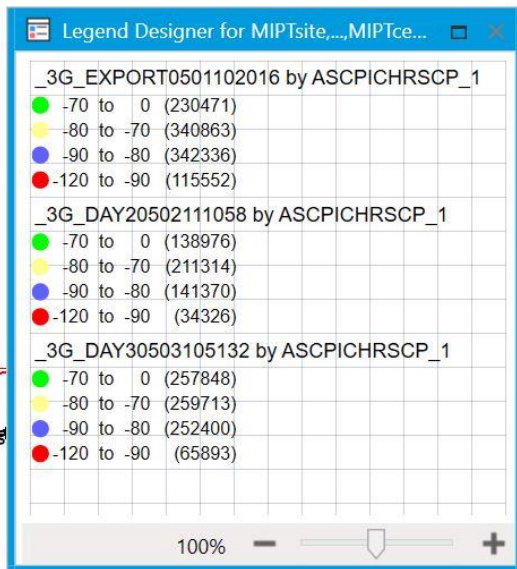


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	17523	58.23%	
[-75, >=-85)	8146	27.07%	
[-85, >=-95)	3786	12.58%	
[-95, >=Min)	639	2.12%	
<b>Total</b>	<b>30094</b>	<b>100%</b>	

# Coverage Details

## TSP- BSNL

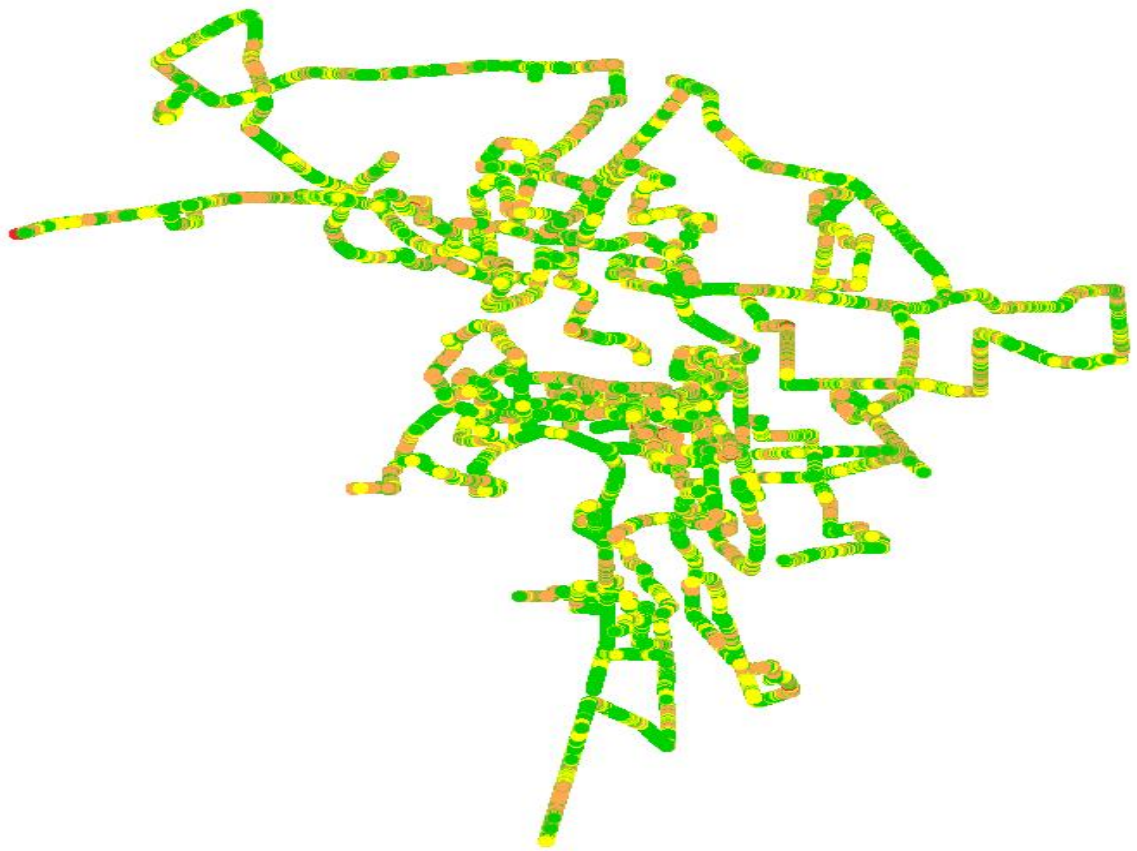
Technology	Coverage %
3G	90.96







3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	627295	26.23	Green
[-70, >=-80)	811890	33.95	Yellow
[-80, >=-90)	736106	30.78	Blue
[-90, >=Min)	215771	9.02	Red
<b>Total</b>	<b>2391062</b>	<b>100</b>	

## TSP- Airtel

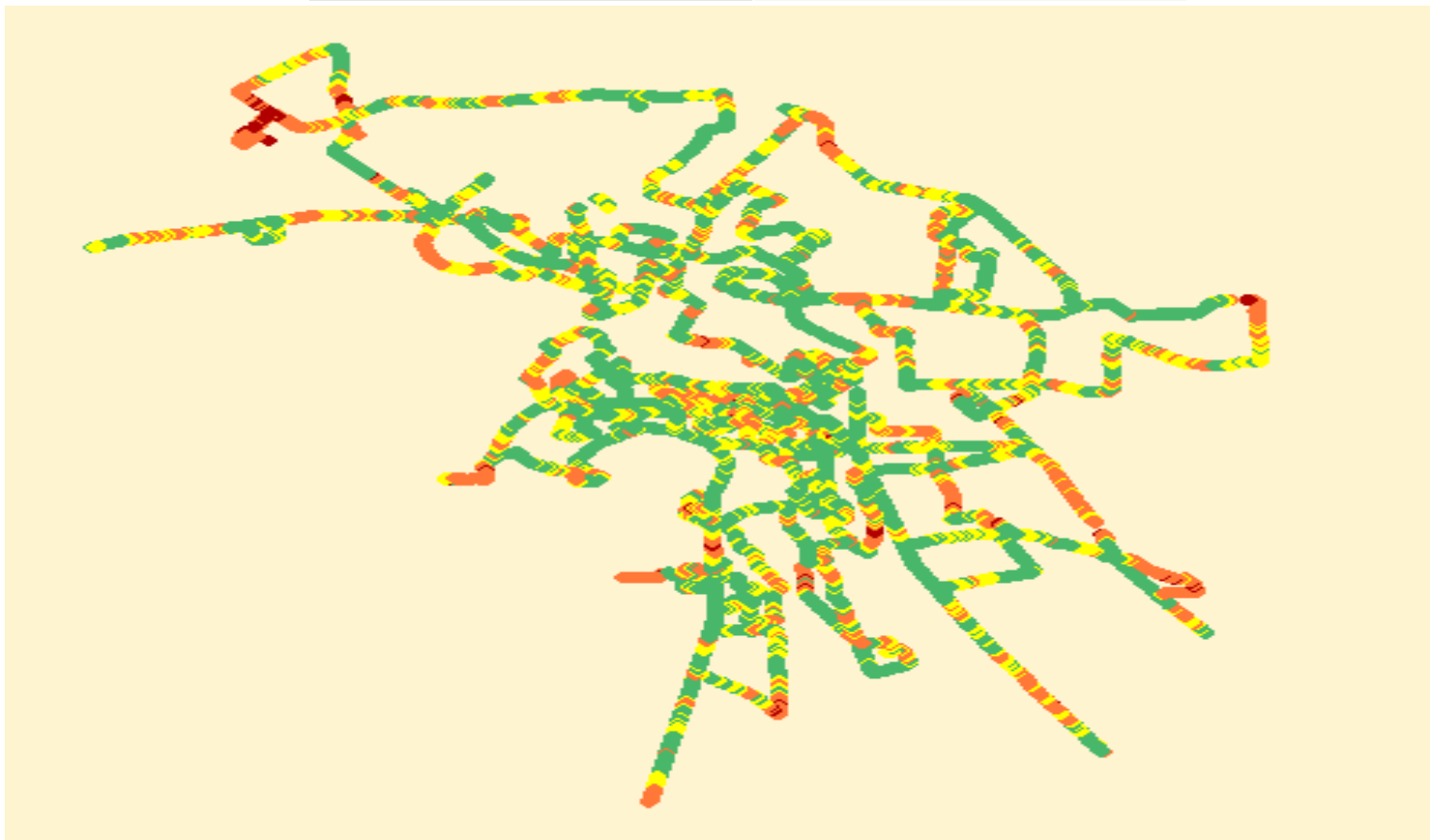
Technology	Coverage %
VoLTE	99.85







VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	2178506	22.25628	
[-80, >=-90)	1504702	15.37249	
[-90, >=-110)	6091285	62.23042	
[-110, >=Min)	13782	0.140801	
<b>Total</b>			

## TSP- JIO

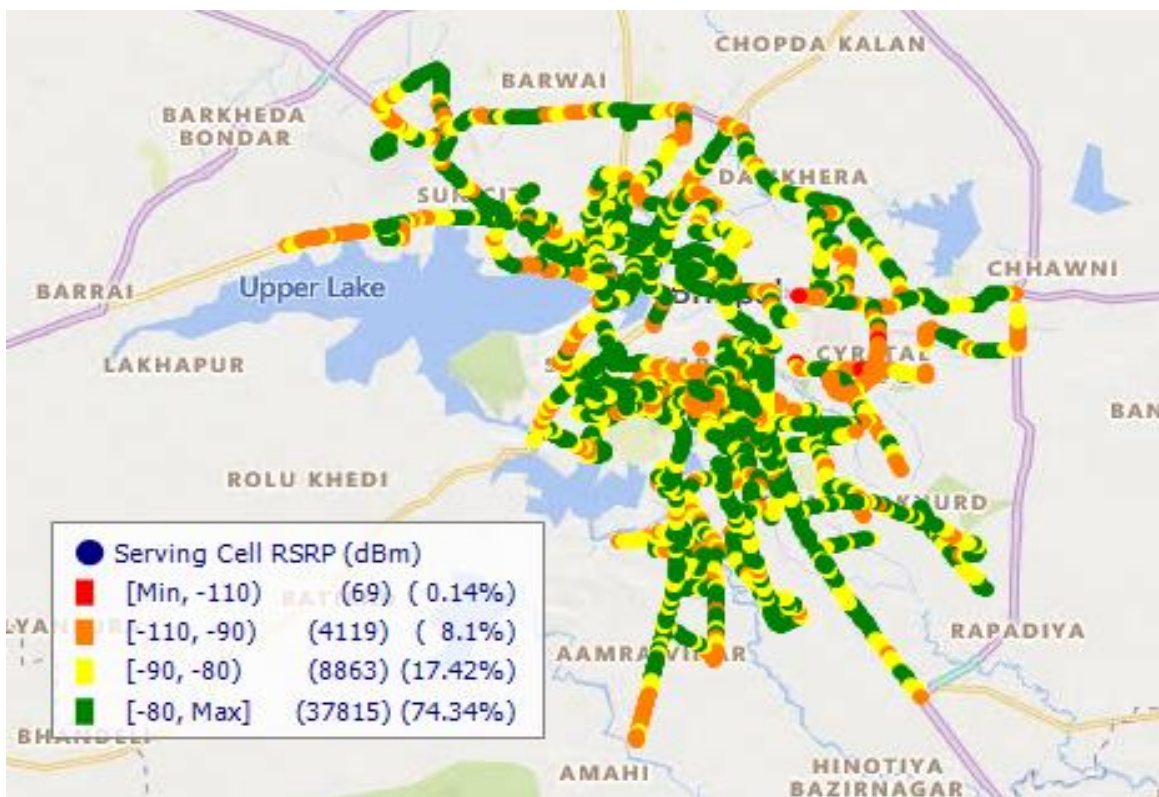
Technology	Coverage %
VoLTE	99.43%



VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	30647	55.98%	
[-80, >=-90)	14889	27.20%	
[-90, >=-110)	8893	16.25%	
[-110, >=Min)	313	0.57%	
<b>Total</b>	<b>54742</b>		

## TSP- VI

Technology	Coverage %
VoLTE	99.86%



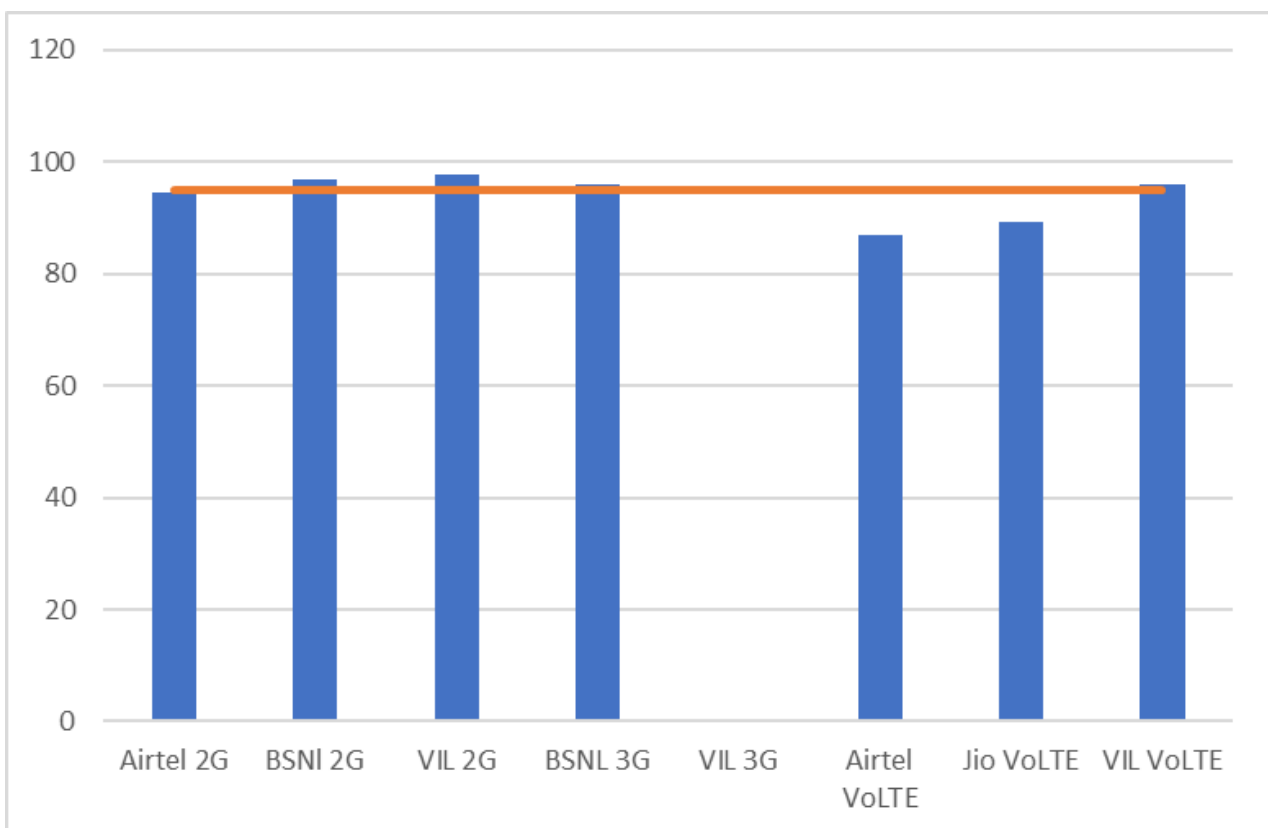
VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	37815	74.34%	
[-80, >=-90)	8863	17.42%	
[-90, >=-110)	4119	8.1%	
[-110, >=Min)	69	0.14%	
<b>Total</b>	<b>50866</b>	<b>100%</b>	



## 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	94.48
BSNI 2G	96.97
VIL 2G	97.83
BSNL 3G	96.05
VIL 3G	NA
Airtel VoLTE	86.89
Jio VoLTE	89.28
VIL VoLTE	96.04








## 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	94.48



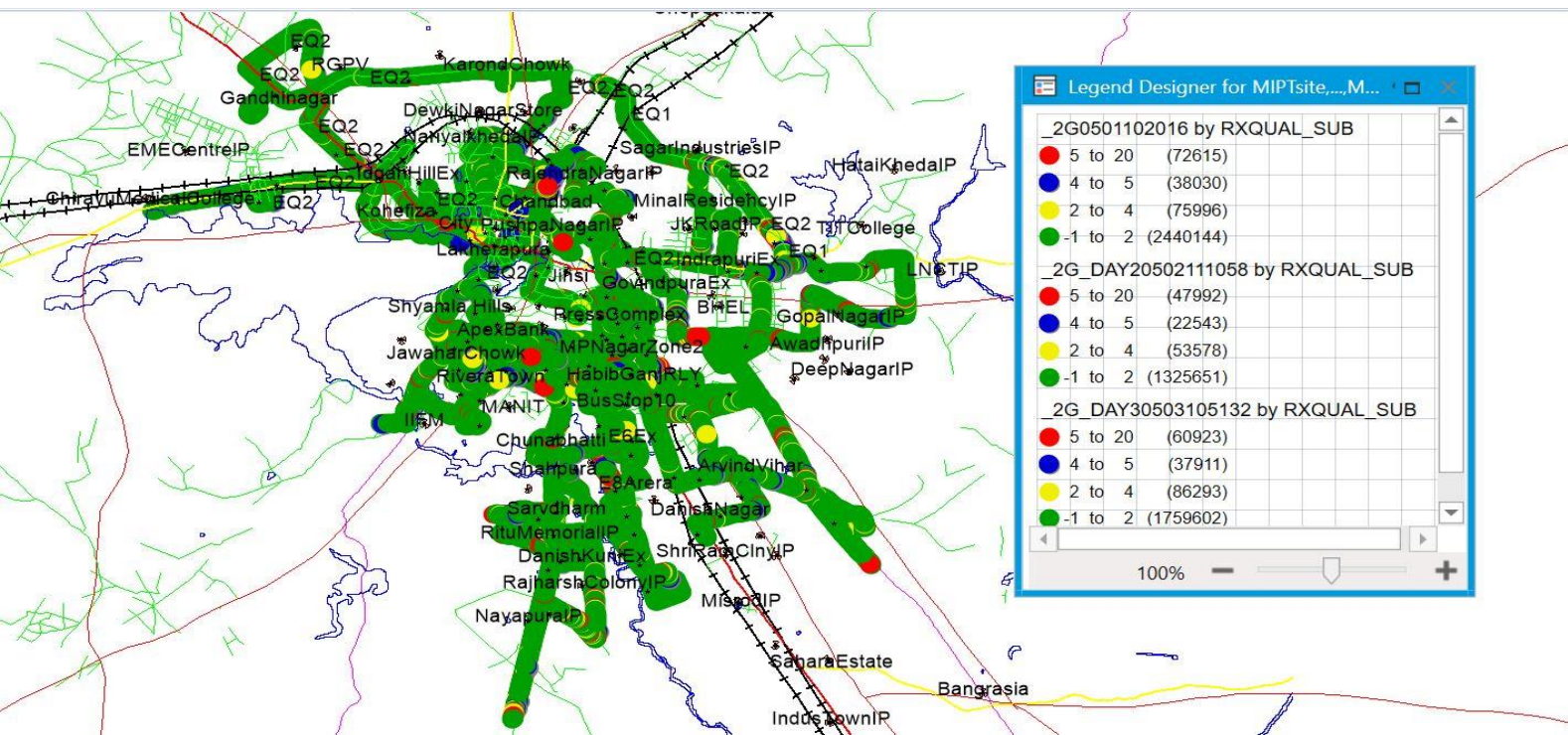
Overall Rx Quality	# Samples	% PDF	Legends
(Min, $\leq 2$ )	4521264	80.44434	
(2, $\leq 3$ )	227712	4.051553	
(3, $\leq 4$ )	209939	3.735328	
(4, $\leq 5$ )	351552	6.25497	
(5, $\leq \text{Max}$ )	309896	5.513808	
<b>Total</b>			

# 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- BSNL

Technology	Rx Quality %
2G	96.97



Overall Rx Quality	# Samples	% PDF	Legends
(Min, $\leq 2$ )	5525397	91.76	Green
(2, $\leq 4$ )	215867	3.58	Yellow
(4, $\leq 5$ )	98484	1.63	Blue
(5, $\leq$ Max)	181530	3.014	Red
<b>Total</b>	<b>6021278</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- VI

Technology	Rx Quality %
2G	97.83%



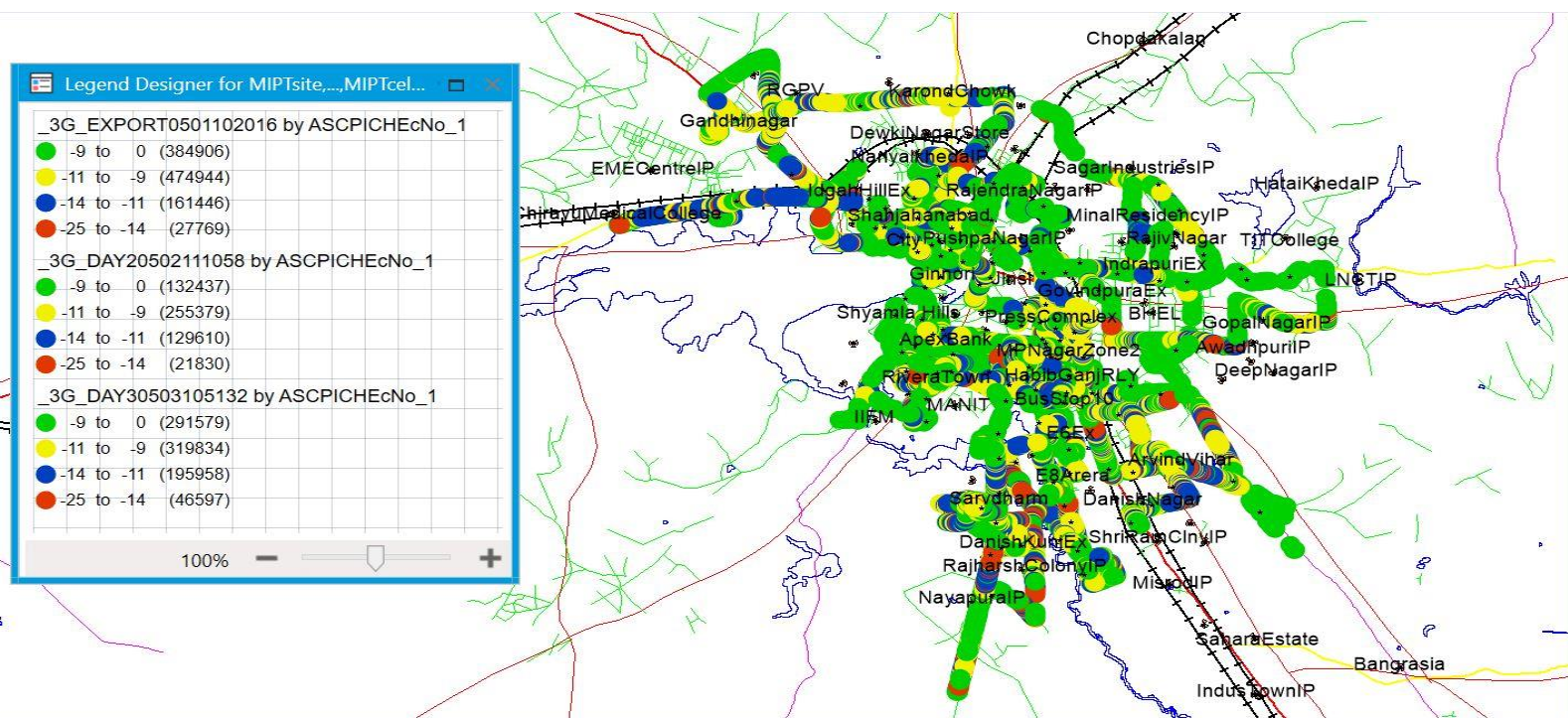
Overall Rx Quality	# Samples	% PDF	Legends
(Min, $\leq 2$ )	22143	86.67%	
(2, $\leq 3$ )	1632	6.39%	
(3, $\leq 4$ )	784	3.07%	
(4, $\leq 5$ )	438	1.71%	
(5, $\leq \text{Max}$ )	553	2.16%	
<b>Total</b>	<b>25550</b>	<b>100%</b>	

# 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	96.05



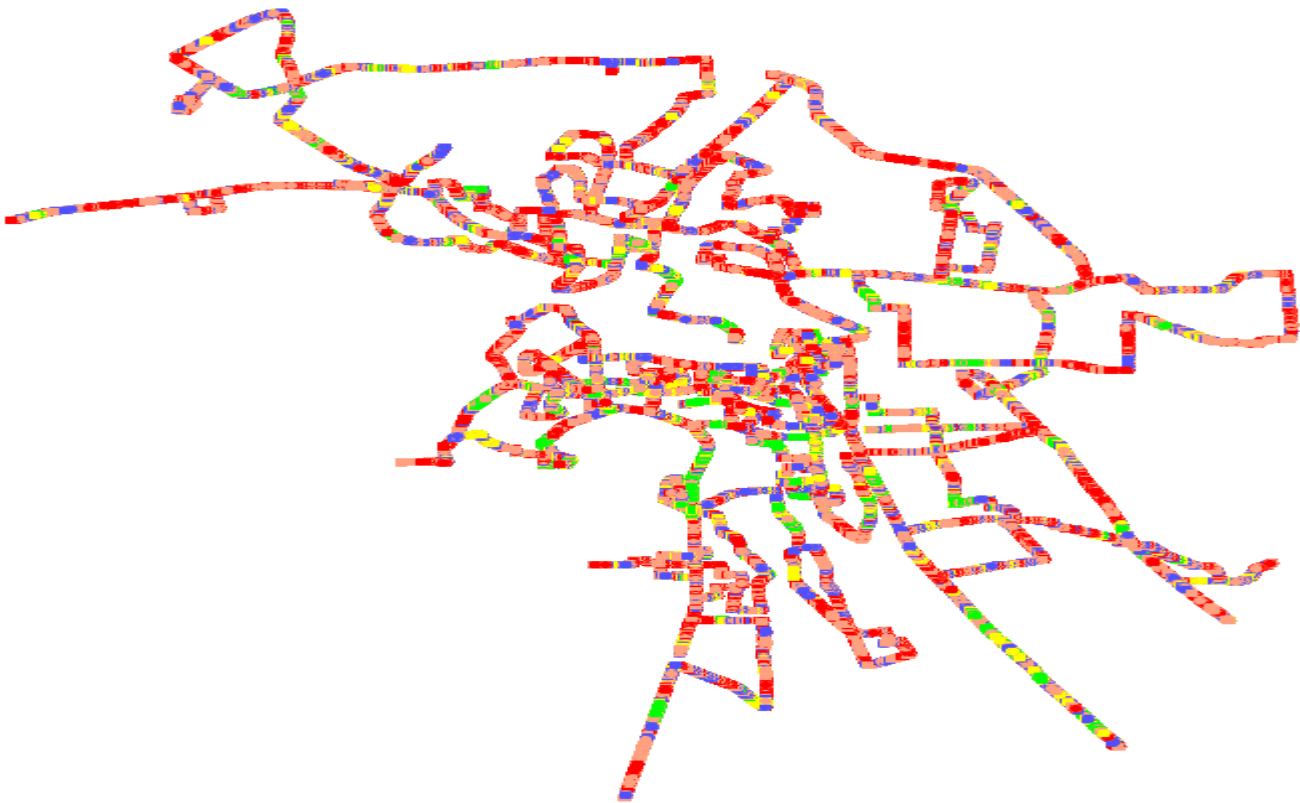
Overall Ec/No	# Samples	% PDF	Legends
(Max, $\leq -9$ )	808922	33.12	
(-9, $\leq -11$ )	1050157	42.99	
(-11, $\leq -14$ )	487014	19.94	
(-14, $\leq$ Min)	96196	3.93	
<b>Total</b>	<b>2442289</b>	<b>100</b>	

## 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-.Airtel

Technology	Rx Quality %
VoLTE	86.89



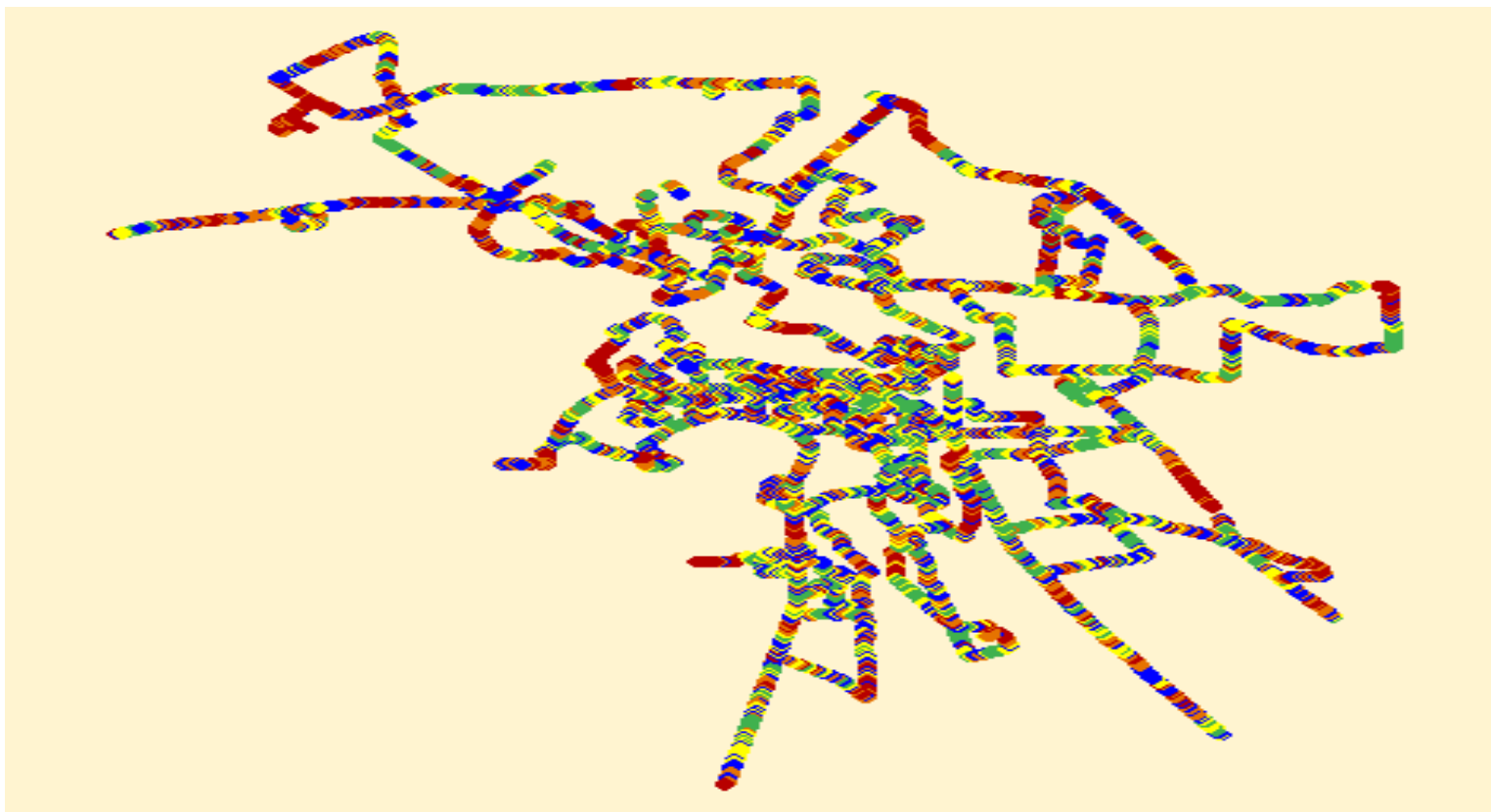
Overall SINR	# Samples		Legends
(Min, $\leq 0$ )	1283269	13.1	
(0, $\leq 5$ )	7218080	73.73	
(5, $\leq 10$ )	725837	7.41	
(10, $\leq 15$ )	355261	3.62	
(15, $\leq \text{Max}$ )	207087	2.11	
<b>Total</b>			






## 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- JIO

Technology	Rx Quality %
VoLTE	89.28%



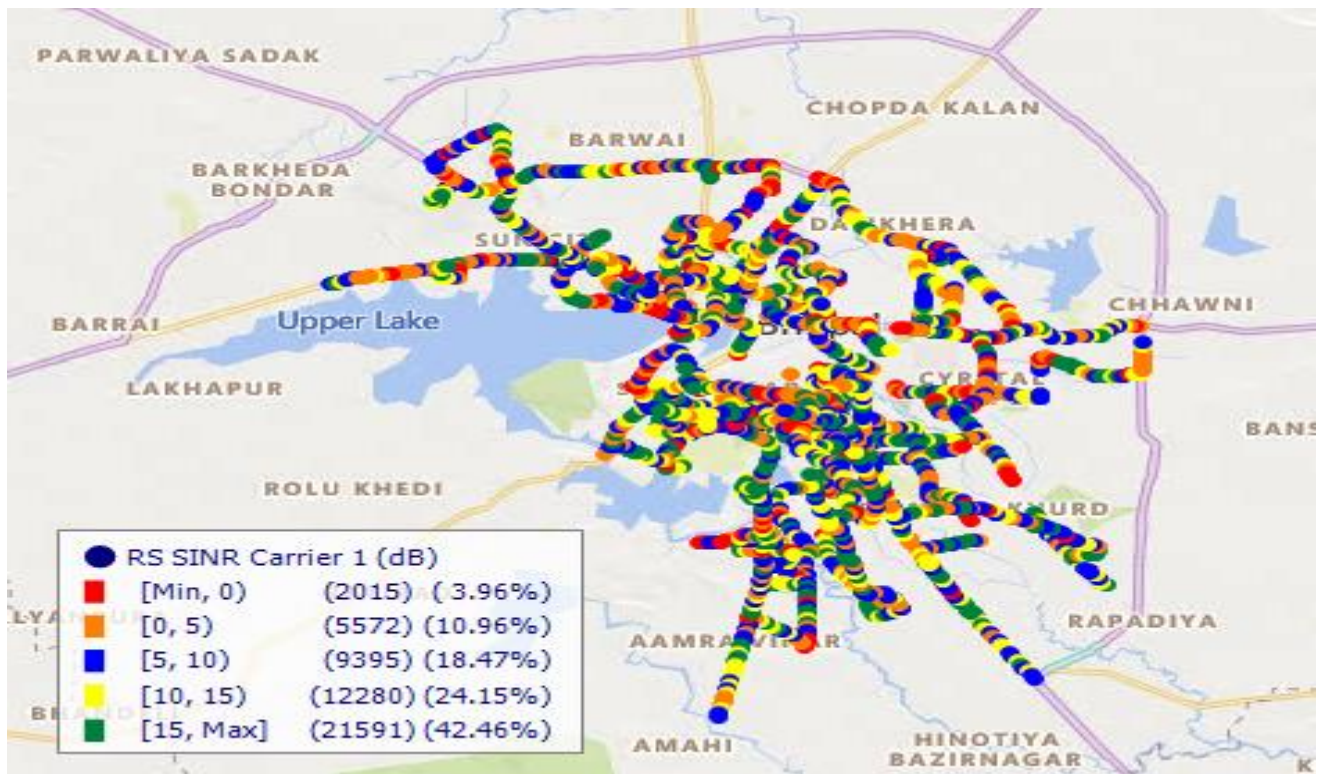
Overall SINR	# Samples	% PDF	Legends
(Min, $\leq 0$ )	5870	10.72%	
(0, $\leq 5$ )	11316	20.67%	
(5, $\leq 10$ )	13785	25.18%	
(10, $\leq 15$ )	12209	22.30%	
(15, $\leq \text{Max}$ )	11562	21.12%	
<b>Total</b>	<b>54742</b>		

## 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- VI

Technology	Rx Quality %
VoLTE	96.04

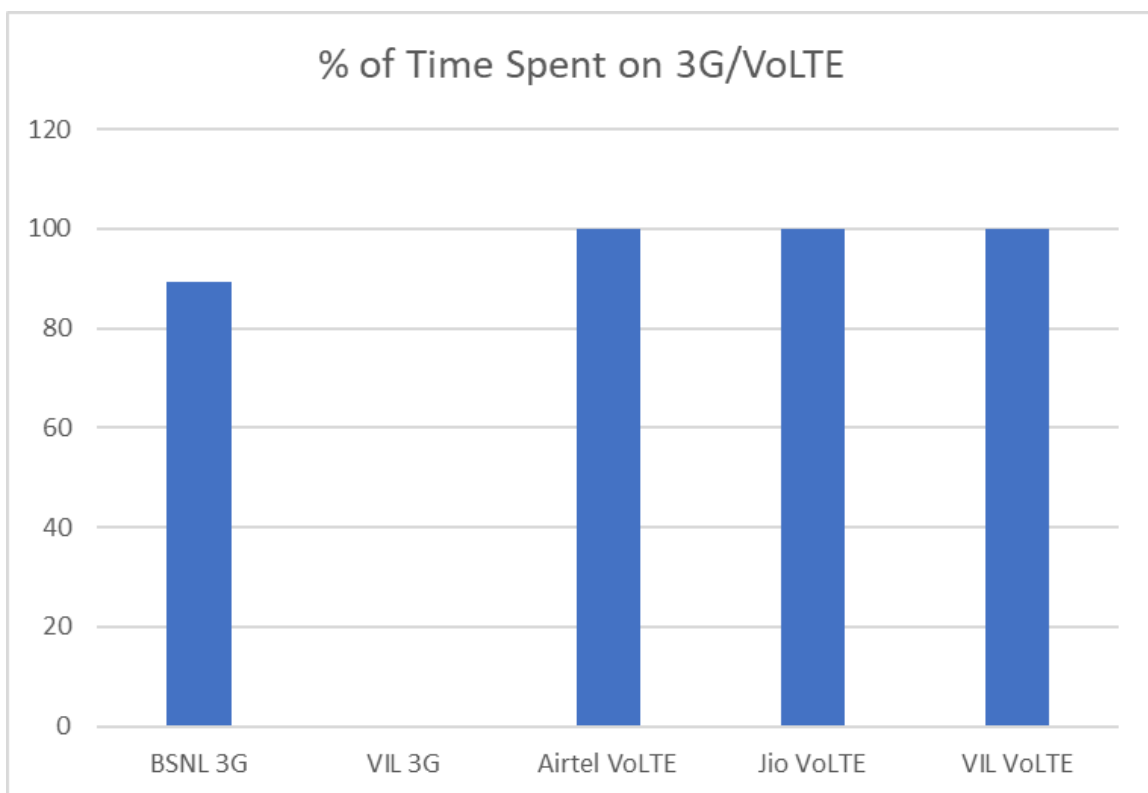


Overall SINR	# Samples	% PDF	Legends
(Min, $\leq 0$ )	2015	3.96%	
(0, $\leq 5$ )	5572	10.96%	
(5, $\leq 10$ )	9395	18.47%	
(10, $\leq 15$ )	12280	24.15%	
(15, $\leq \text{Max}$ )	21591	42.46%	
<b>Total</b>	<b>50853</b>	<b>100%</b>	



## Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	89.2
VIL 3G	NA
Airtel VoLTE	100
Jio VoLTE	100
VIL VoLTE	100



# Technology Details

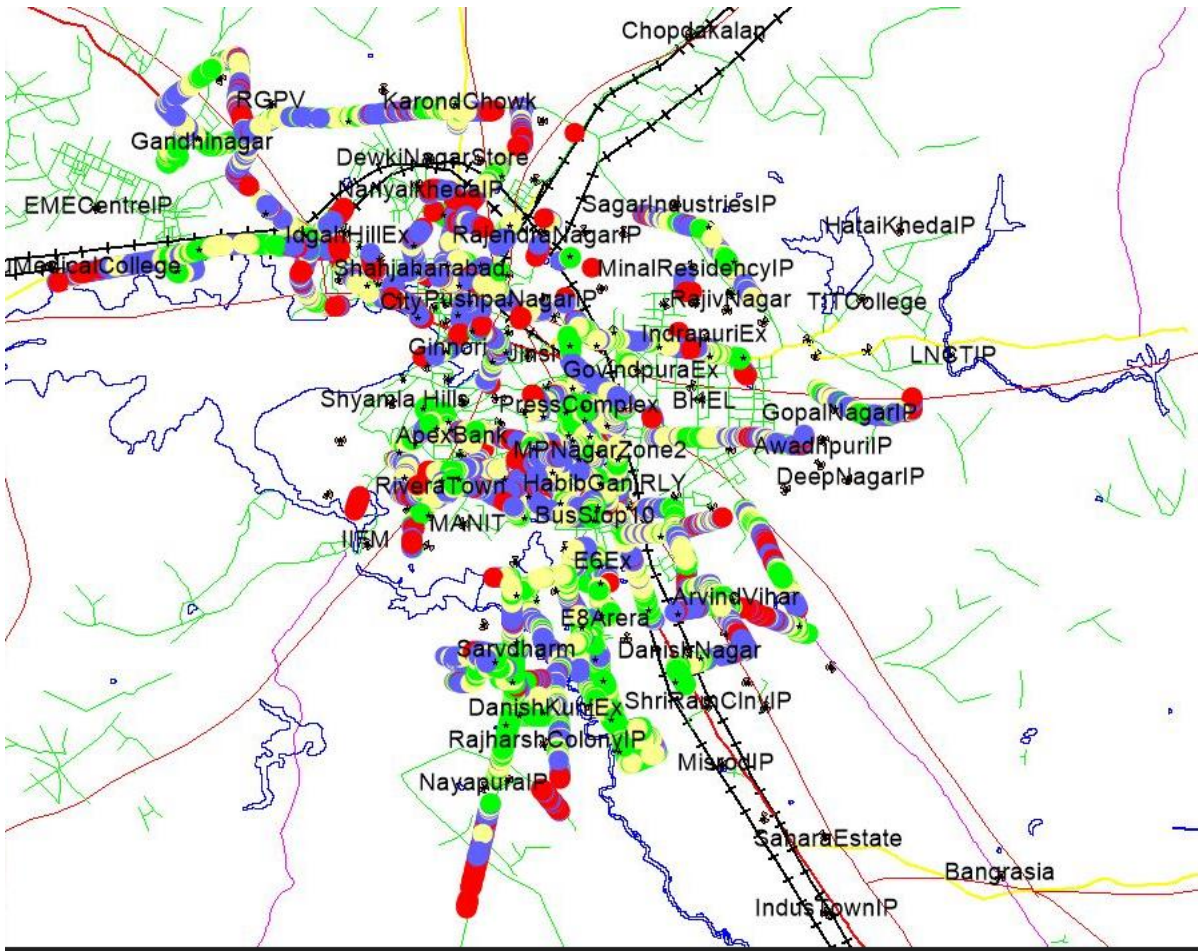
## TSP-Airtel

Technology	% of Time Spent on
3G	
VoLTE	100%



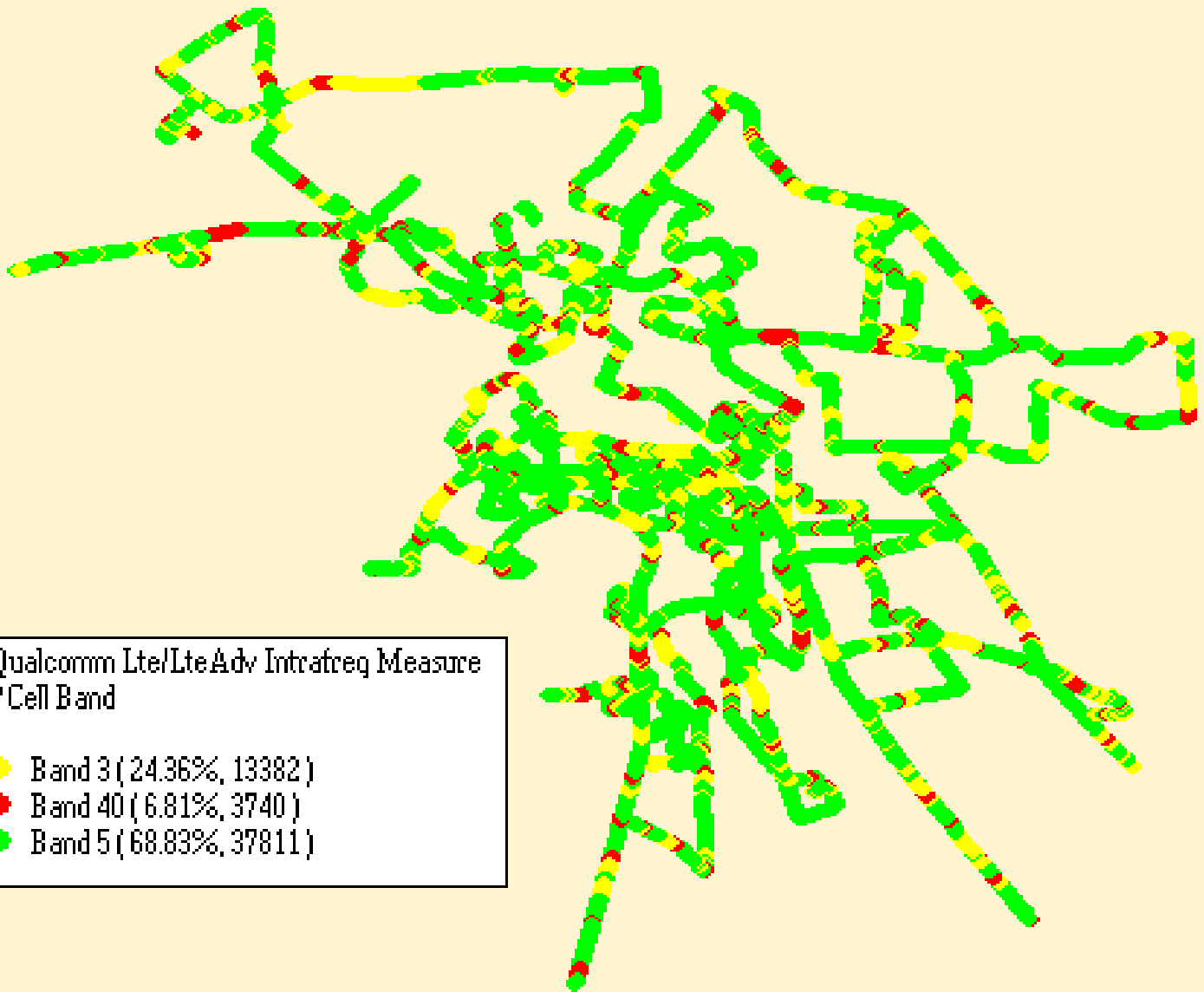
## TSP-BSNL

Technology	% of Time Spent on
3G	89.2%
VoLTE	



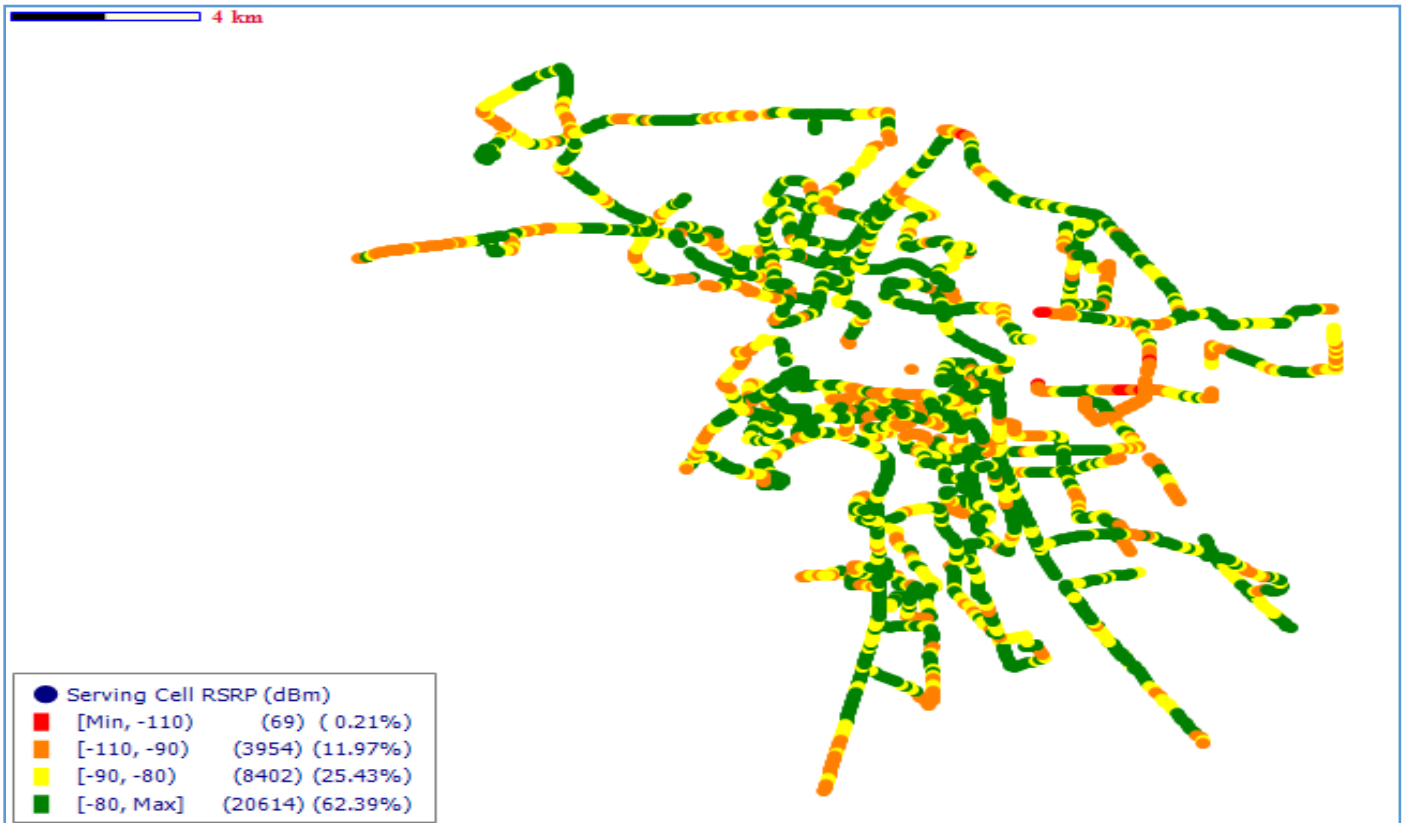
## TSP- JIO

Technology	% of Time Spent on
3G	
VoLTE	100%



## TSP- VI

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

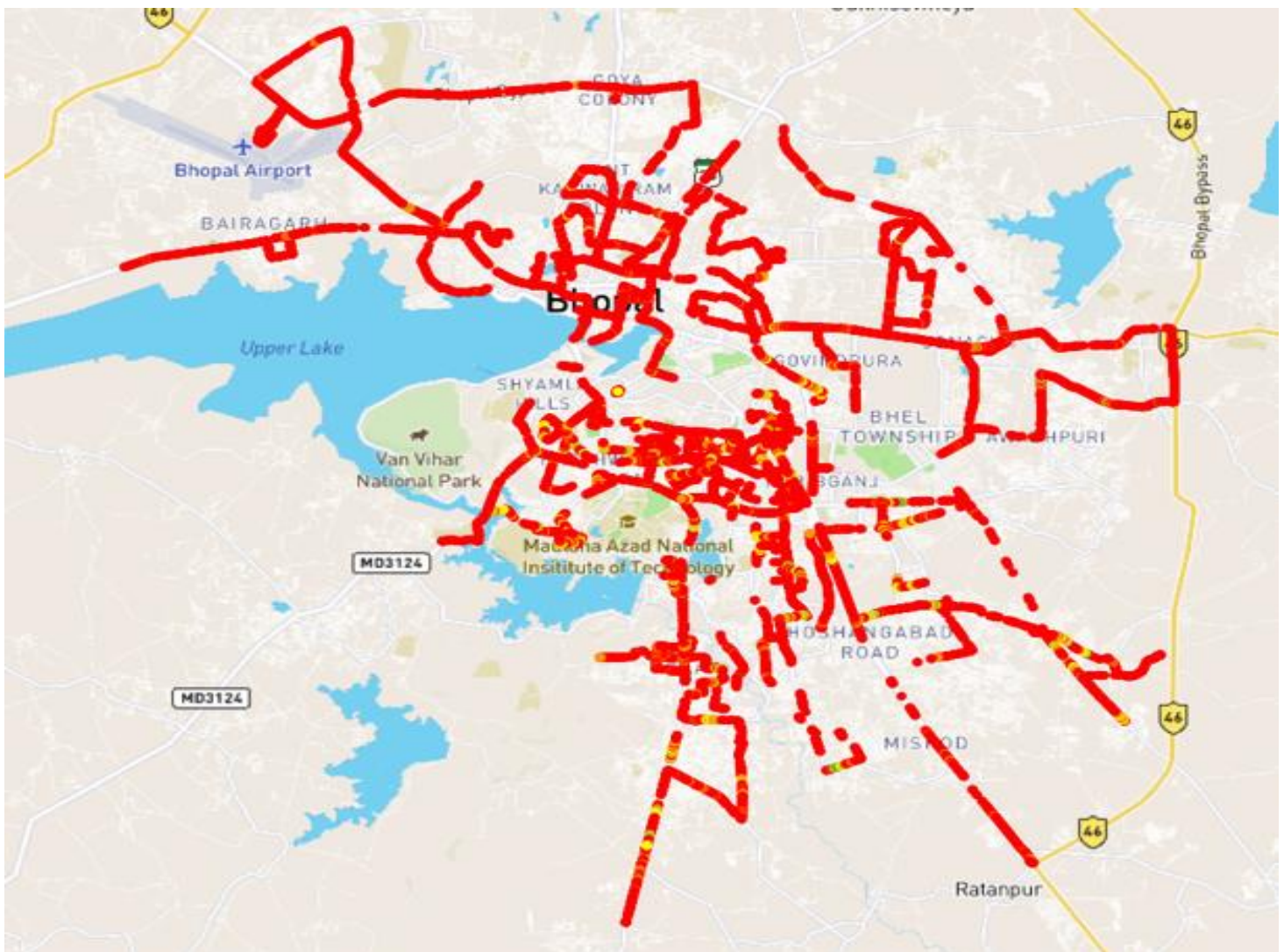


# Dynamic Data Test

## TSP- Airtel

### Data Statistics - Dynamic data testing

Data KPIs - Overall	2G
Download Throughput (Kbps)	41.74



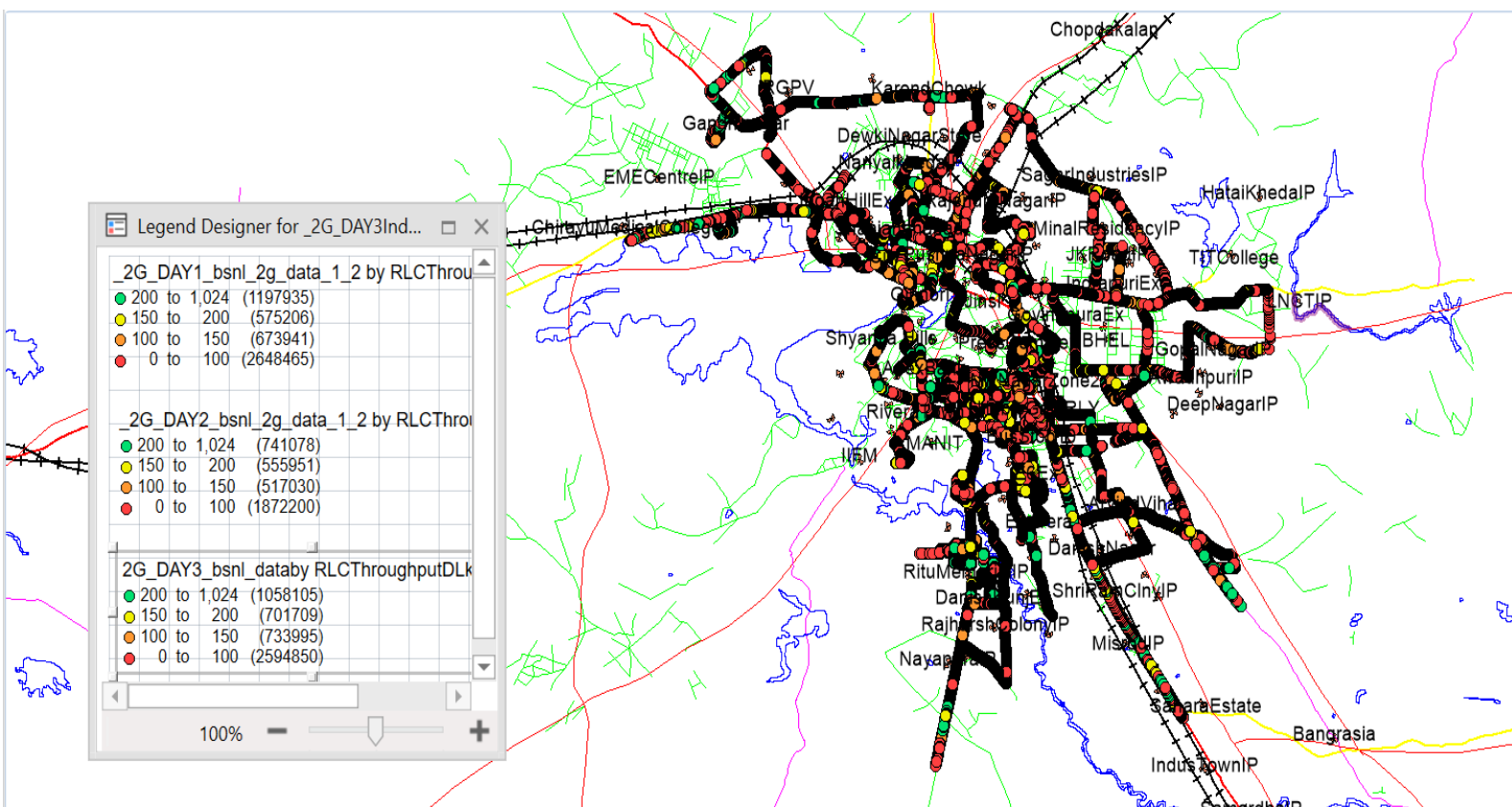
DL throughput	No of Sample	%	Legends
< 100 Kbps	46944	83.241	Red
100-150Kbps	2660	4.7167	Orange
150-200Kbps	2198	3.8975	Yellow
>200Kbps	4593	8.1443	Green

# Dynamic Data Test

## TSP-BSNL

### Data Statistics - Dynamic data testing

Data KPIs - Overall	2G
Download Throughput (Kbps)	152 Kbps



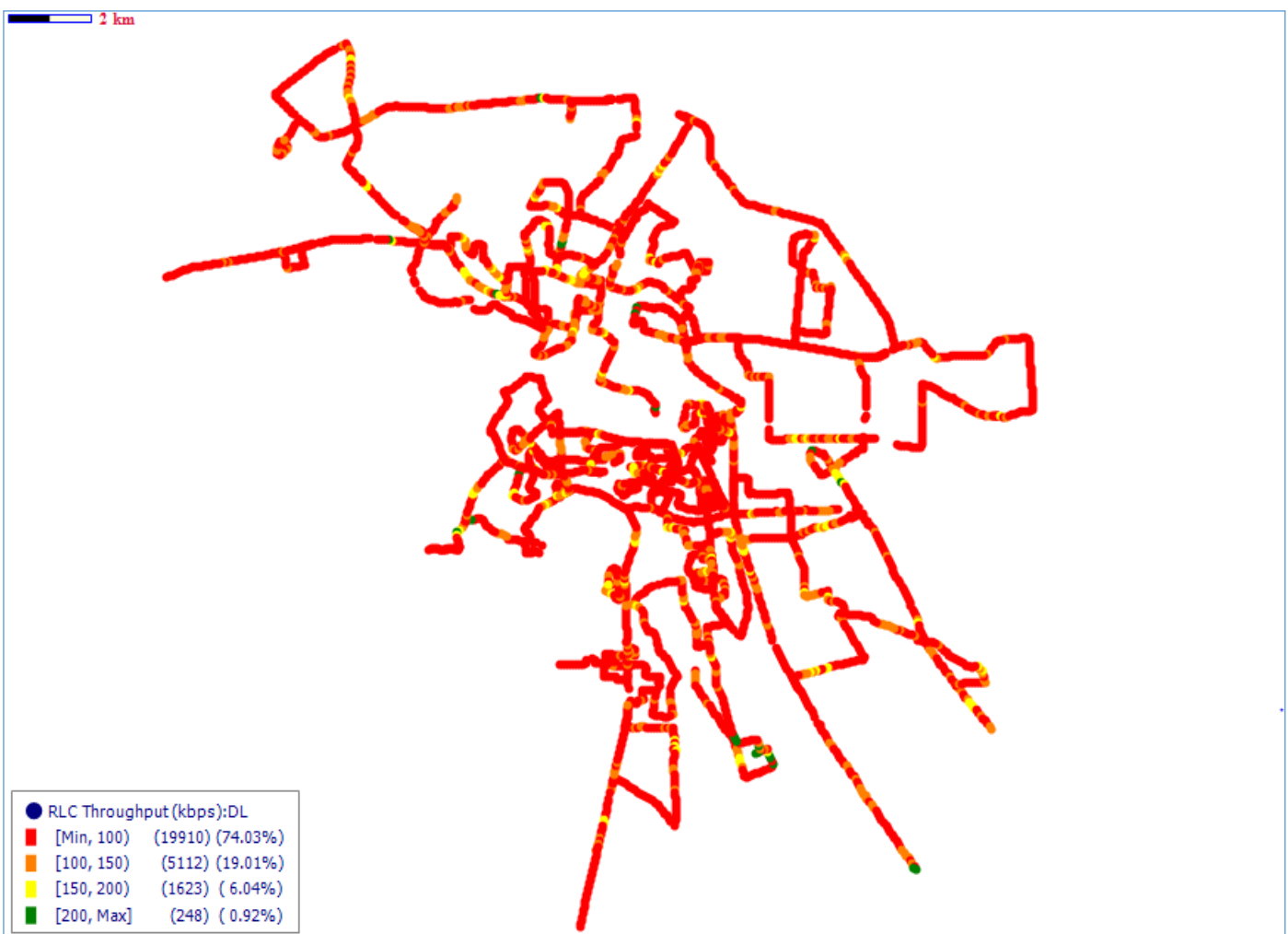
DL throughput	No of Sample	%	Legends
< 100 Kbps	7115515	51.29	Red
100-150Kbps	1924966	13.87	Orange
150-200Kbps	1832866	13,21	Yellow
>200Kbps	2997118	21.60	Green

# Dynamic Data Test

## TSP- VI

### Data Statistics - Dynamic data testing

Data KPIs - Overall	2G
Download Throughput (Kbps)	70.79 kbps



DL throughput	No of Sample	%	Legends
< 100 Kbps	19910	74.03%	Red
100-150Kbps	5112	19.01%	Orange
150-200Kbps	1623	6.04%	Yellow
>200Kbps	248	0.92%	Green

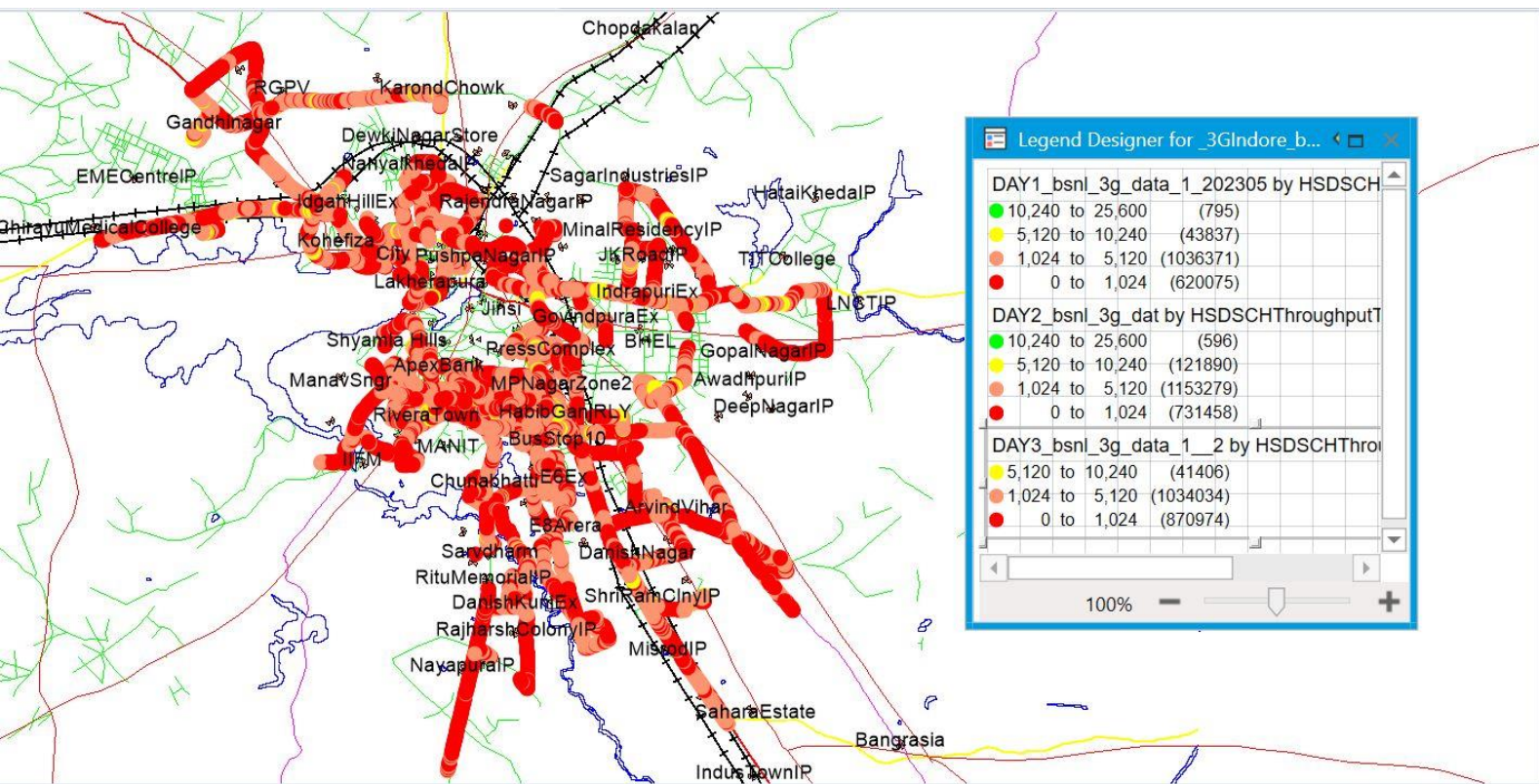


# Dynamic Data Test

## TSP- BSNL

### Data Statistics - Dynamic data testing

Data KPIs - Overall	3G
Download Throughput (Mbps)	3.85 Mbps



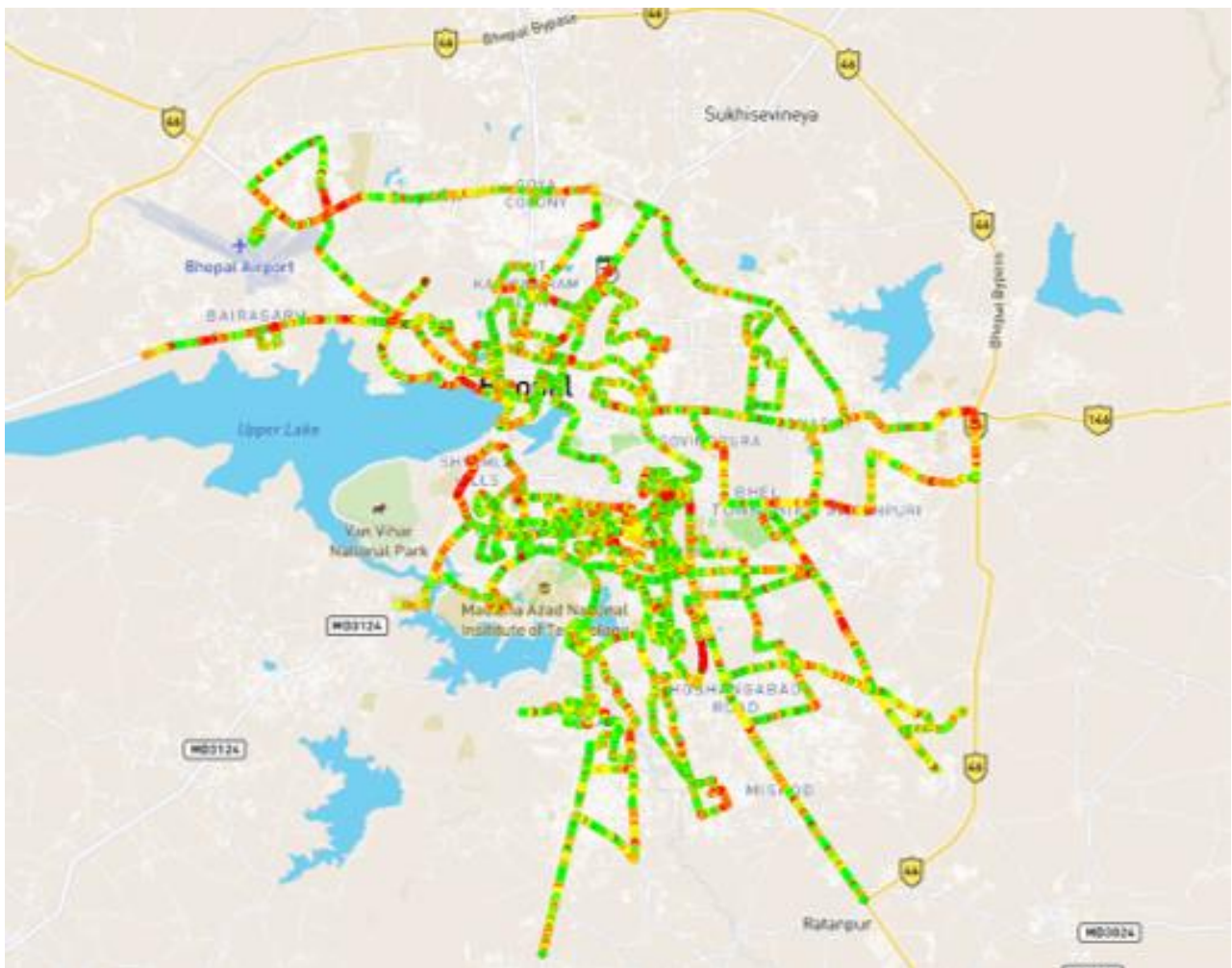
DL throughput	No of Sample	%	Legends
< 1 Mbps	2222507	39.30	Red
1-5 Mbps	3223684	57.00	Orange
5-10 Mbps	207133	3.66	Yellow
>10Mbps	1391	0.024	Green

# Dynamic Data Test

## TSP- Airtel

### Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	10.88



DL throughput	No of Sample	%	Legends
< 2Mbps	6614	12.148	Red
2-5 Mbps	9555	17.549	Orange
5-10 Mbps	17162	31.521	Yellow
>10Mbps	21115	38.782	Green

## TSP- JIO

### Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	8.55



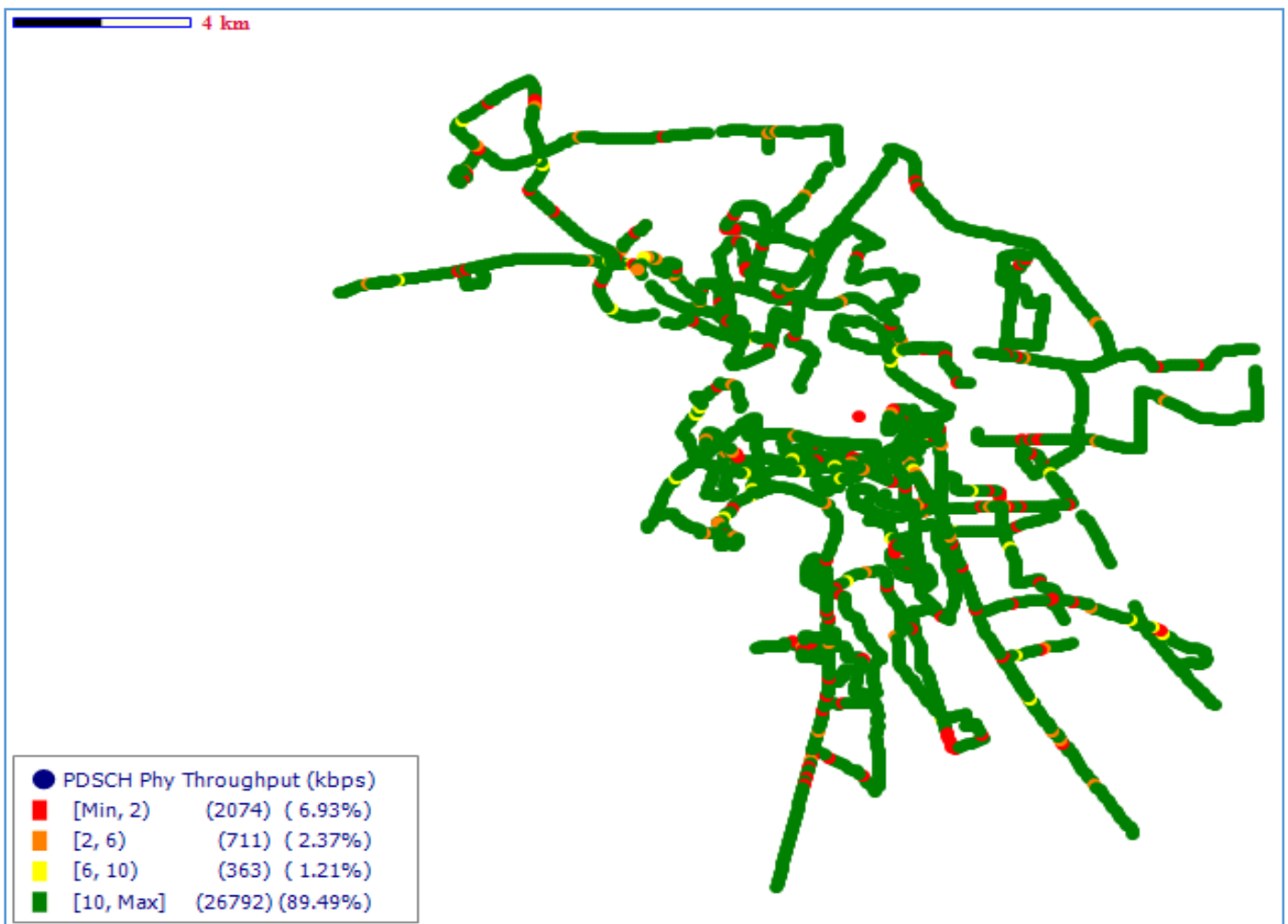
DL throughput	No of Sample	%	Legends
< 2Mbps	23534	48.28%	Red
2-5 Mbps	10453	21.45%	Orange
5-10 Mbps	8992	18.45%	Yellow
>10Mbps	5762	11.82%	Green

# Dynamic Data Test

## TSP- VI

### Data Statistics - Dynamic data testing

Data KPIs – Overall	LTE
Download Throughput (Mbps)	12.98%



DL throughput	No of Sample	%	Legends
< 2Mbps	2074	6.93%	■
2-5 Mbps	711	2.37%	■
5-10 Mbps	363	1.21%	■
>10Mbps	26792	89.49%	■