

प्रभावी विनियमन – सुगम संचार Effective Regulation – Ease of Communication

# **Operator Assisted Drive Test Report**

# Sagar City and nearby Area 13/09/2023 to 15/09/2023 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 Sagar areas from 9:00 AM to 8:00 PM from 13/09/2023 to 15/09/2023. The drive test covered drive route of around 310 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.
Cood PV Quality 9/	≥95%	All TSPs achieved the benchmark. Except for
Good RX Quality %	<u> </u>	Airtel and JIO in Rx Quality of 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)

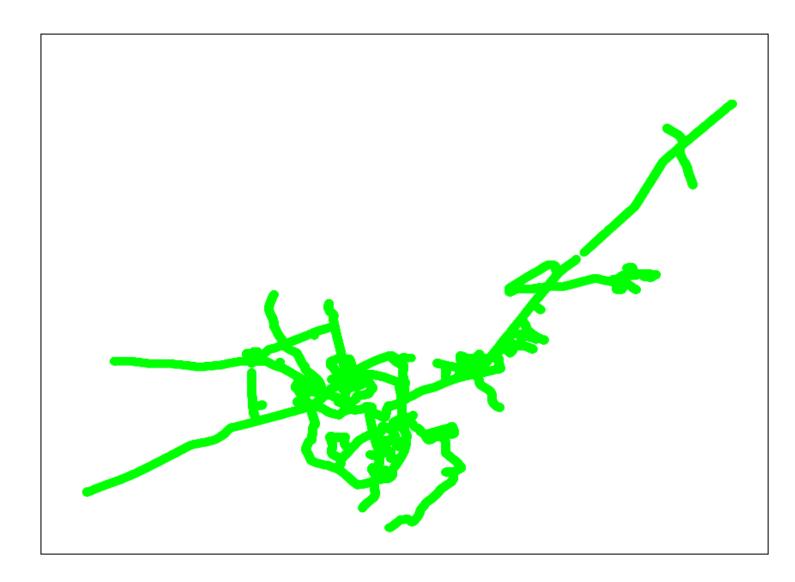
- i. 3G measurement UE in 3G File Size- 20MB
- ii. 4G measurement UE in LTE File Size- 40MB

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

- i. Download-,3G 20 MB, 4G 40MB
- ii. Upload -3G 5 MB, 4G 10MB
- iii. Web browsing 3 links of e-commerce websites <a href="https://www.amazon.in">https://www.amazon.in</a>, <a href="https://www.flipkart.com">https://www.flipkart.com</a>, <a href="https://paytm.com">https://paytm.com</a>.
- iv. Video Streaming 130 sec clip (only in 3G and LTE)
- v. Latency 32 Bytes on <u>www.google.com</u>.

# Overview

# **Voice & Dynamic Data Test Drive Route**

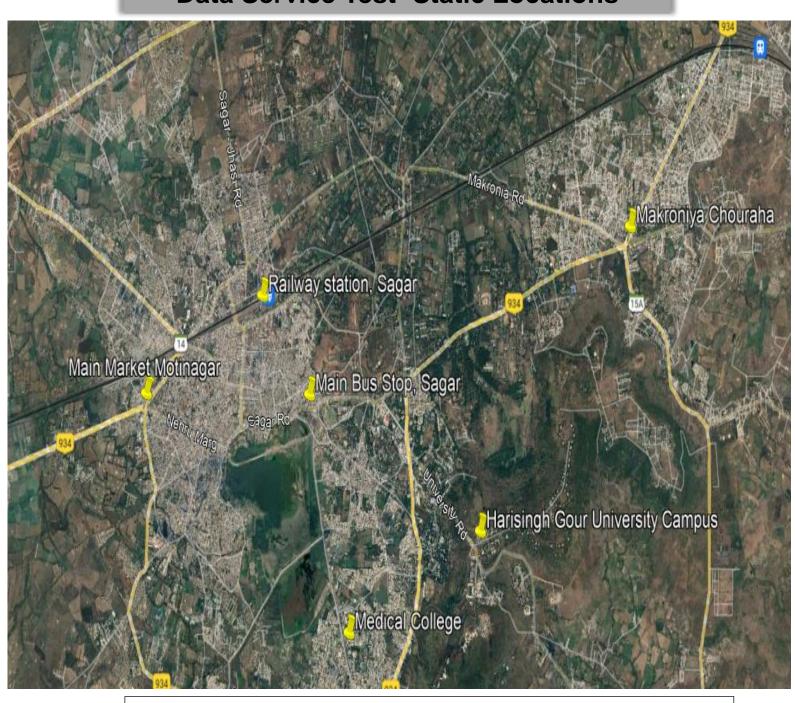


List of important area covered during the drive test

Civil line, Makroniya, Bus stand, Railwat ststion, Tili, Moti Nagar, Rajakhedi, University, Sanjay drive, Parkota,

# Overview

#### **Data Service Test- Static Locations**



#### **Hotspot Locations**

- 1.Railway Station, Sagar
- 2. Main Bus Stop
- 3. Harisingh Gour University Campus
- 4. Medical College
- 5. Main Market Motinagar
- 6. Makroniya Chouraha

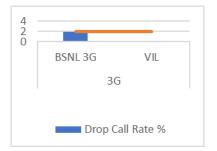
# Voice Calls

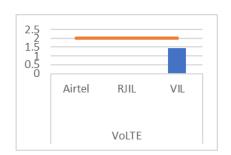
## **Key Observations**

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

Drop Call Rate (%)

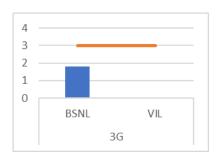


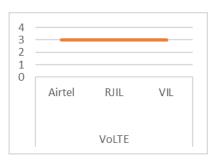




Block Call Rate (%)







KPIs	2G		3G		VoLTE			
	Airtel	BSNL	VIL	BSNL	VIL	Airtel	RJIL	VIL
Drop Call Rate %	0	1.6	0	0.93	NA	0	0	0
Block Call Rate %	0	0.7	0.44	0.90	NA	0	NA	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 ≥ -85 dBm.

		2G	
TSPs	Airtel	BSNL	VIL
Coverage %	62.60	80	80.79

b) Percentage of coverage samples for 3G ≥ -90 dBm

	3G	
TSPs	BSNL	VIL
Coverage %	87	NA

b) Percentage of coverage samples for LTE ≥ -110 dBm.

TSPs	VoLTE			
1575	Airtel	JIO	VIL	
Coverage %	98.49	98.01	98.32	

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

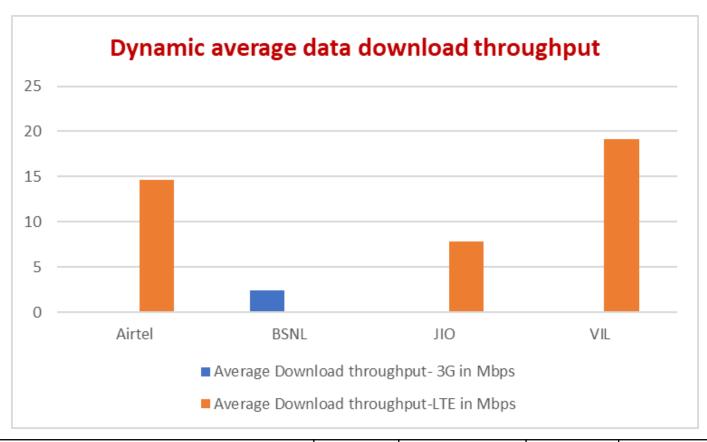
	3G		VolTE		
TSPs	BSNL	VIL	Airtel	VIL	JIO
Time Spent on 3G/4G %	94	NA	100	88.52	100

#### **Key Observations**

# Data Services Dynamic

Dynamic Data -Download Throughput was tested.

**Data Download Performance – Dynamic 3G/4G/5G Network** 



TSP	Airtel	BSNL	JIO	VIL
Average Download throughput- 3G In Mbps	NA	7.5	NA	NA
Average Download throughput-LTE in Mbps	5.38	NA	7.28	26.23
Average Download throughput- 5G in Mbps	NA	NA	NA	NA

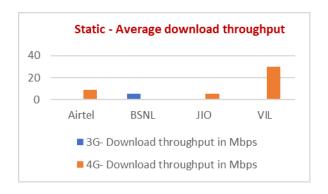
Data Summary

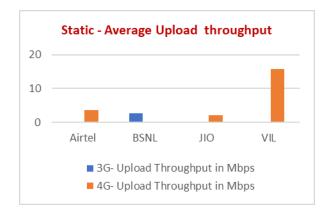
# Data <u>Services Static</u>

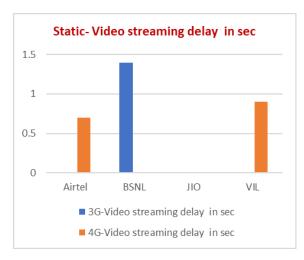
#### **Key Observations**

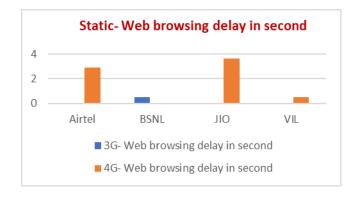
Data was tested at 6 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, PayTm)

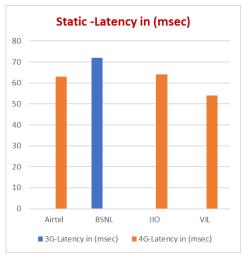
#### 3G/4G/ Network:











# Summary

# **City Level Summary- Voice**

TSP ( For 2G)	Airtel	BSNL	JIO	VIL
Call attempts	389	429	NA	229
Block call rate %	0	0.7	NA	0.44
CSSR %	100	98.3	NA	99.56
Drop call rate %	0	1.6	NA	0
Mobility HOSR %	99.78	95.7	NA	97.40
RX Quality %	97.49	96.31	NA	98.67
Average CST Sec	3.89	6.50	NA	2.36

TSP ( For 3G)	Airtel	BSNL	JIO	VIL
Call attempts	NA	432	NA	NA
Block call rate %	NA	0.9	NA	NA
CSSR %	NA	99.1	NA	NA
Drop call rate %	NA	0.93	NA	NA
Mobility HOSR %	NA	97.2	NA	NA
RX Quality %	NA	98.59	NA	NA
Average CST (Sec)	NA	5.20	NA	NA

TSP ( For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	391	NA	311	241
Block call rate %	0	NA	NA	0.0
CSSR %	100	NA	96.46	100.00
Drop call rate %	0	NA	0	0.0
Mobility HOSR %	99.56	NA	96.82	100.00
RX Quality %	90.70	NA	78.98	96.24
Average CST(Sec)	0.67	NA	1.72	1.32

# Summary

## City Level Summary-Data Services -Static

TSP ( For 3G)	BSNL
Download throughput in Mbps	5.43
<b>Upload Throughput in Mbps</b>	2.75
Video streaming delay in sec	1.4
Web browsing delay in second	0.501
Latency in (msec)	72

TSP ( For LTE )	Airtel	BSNL	JIO	VIL
Download throughput	8.75	NA	5.47	30.14
in Mbps		INA	3.47	30.14
Upload Throughput in	3.62	NA	244	15.79
Mbps		INA	2.14	15.79
Video streaming	0.70	NA	NA	0.9
delay in sec		INA	INA	0.9
Web browsing delay	2.92	NA	2 62	0.5
in second		INA	3.63	0.5
Latency in (msec)	63.07	NA	64	54

TSP ( For 5G )	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	NA	NA	NA
Upload Throughput in Mbps	NA	NA	NA	NA
Video streaming delay in sec	NA	NA	NA	NA
Web browsing delay in second	NA	NA	NA	NA
Latency in (msec)	NA	NA	NA	NA

1. Hotspot Location- Railway Station

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	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	3.48	NA	NA
Upload Throughput in Mbps	NA	2.68	NA	NA
Video streaming delay in sec	NA	1.4	NA	NA
Web browsing delay in second	NA	0.932	NA	NA
Latency in (msec)	NA	73	NA	NA
		LTE		
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	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in	14.62	NA	4.75	32.23
Mbps	14.02	INA	4.75	32.23
Upload Throughput in	2.20	NA	2.08	7.12
Mbps	2.20	INA	2.08	7.12
Video streaming delay in	0.63	NA	NA	1.6S
sec	0.03	INA	INA	
Web browsing delay in	2.46	NΙΛ	2.00	0.7S
second	3.16	NA	2.66	
Latency in (msec)	65.63	NA	54	61Ms

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

# 2. Hotspot Location- Main Bus Stop

	3 <b>G</b>			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	4.12	NA	NA
Mbps				
Upload Throughput in	NA	2.4	NA	NA
Mbps				
Video streaming delay in	NA	1.9.	NA	NA
sec				
Web browsing delay in	NA	0.375	NA	NA
second				
Latency in (msec)	NA	67	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in	8.15	NA	6.22	17.84
Mbps	0.15	INA	0.22	17.04
Upload Throughput in	4.19	NA	3.63	20.08
Mbps	4.19	INA	3.03	20.06
Video streaming delay in	0.56	NA	NA NA	1.1
sec	0.50	INA	INA	1.1
Web browsing delay in	2.57	NA	2.24	0.5
second	3.57	INA	3.24	0.5
Latency in (msec)	66.21	NA	55	58

	5G			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Upload Throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Video streaming delay in	NA	NA	NA	NA
sec	INA	INA	INA	INA
Web browsing delay in	NA	NA	NIA	NA
second	INA	INA	NA	INA
Latency in (msec)	NA	NA	NA	NA

# 3. Hotspot Location- Harisingh Gour University Campus

	3 <b>G</b>			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	8.85	NA	NA
Mbps				
Upload Throughput in	NA	3.1	NA	NA
Mbps				
Video streaming delay in	NA	1	NA	NA
sec				
Web browsing delay in	NA	0.093	NA	NA
second				
Latency in (msec)	NA	70	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in	7.90	NA	NΙΛ	17.23
Mbps	7.90	INA	NA	17.23
Upload Throughput in	4.06	NA	NΙΛ	F 6
Mbps	4.06	INA	NA	5.6
Video streaming delay in	0.87	NA	NA	1.0S
sec	0.67	INA	INA	1.05
Web browsing delay in	2.49	NA	NA	0.5S
second	2.49	INA	INA	0.55
Latency in (msec)	60.31	NA	NA	43Ms

	5G			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Upload Throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Video streaming delay in	NA	NA	NA	NA
sec	INA	INA	INA	INA
Web browsing delay in	NA	NA	NIA	NA
second	INA	INA	NA	INA
Latency in (msec)	NA	NA	NA	NA

# 4. Hotspot Location- Medical College

	3G			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	5.01	NA	NA
Mbps				
Upload Throughput in	NA	2.9	NA	NA
Mbps				
Video streaming delay in	NA	1.2	NA	NA
sec				
Web browsing delay in	NA	0.302	NA	NA
second				
Latency in (msec)	NA	64	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in	7.79	NA	8.86	38.31
Mbps	7.79	INA	0.00	30.31
Upload Throughput in	2.22	NA	2.01	22.12
Mbps	2.22	INA	2.01	22.12
Video streaming delay in	0.64	NA	NA	0.6
sec	0.04	INA	INA	0.0
Web browsing delay in	2.07	NA	2.40	0.5
second	2.07	INA	3.40	0.5
Latency in (msec)	63.0	NA	70	47

	5G			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Upload Throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Video streaming delay in	NA	NA	NA	NA
sec	INA	INA	INA	INA
Web browsing delay in	NA	NA	NIA	NA
second	INA	INA	NA	INA
Latency in (msec)	NA	NA	NA	NA

# 5. Hotspot Location- Main Market Motinagar

	3 <b>G</b>			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	6.4	NA	NA
Mbps				
Upload Throughput in	NA	2.8	NA	NA
Mbps				
Video streaming delay in	NA	1.1	NA	NA
sec				
Web browsing delay in	NA	0.794	NA	NA
second				
Latency in (msec)	NA	80	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	6.67	NA	4.85	32.46
Upload Throughput in Mbps	7.23	NA	2.29	10.21
Video streaming delay in sec	0.57	NA	NA	0.7
Web browsing delay in second	1.8	NA	3.00	0.6
Latency in (msec)	56.63	NA	53	61
		5G		
	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	NA	NA	NA
Upload Throughput in Mbps	NA	NA	NA	NA
Video streaming delay in sec	NA	NA	NA	NA
Web browsing delay in second	NA	NA	NA	NA
Latency in (msec)	NA	NA	NA	NA

# 6. Hotspot Location- Macronia Chouraha

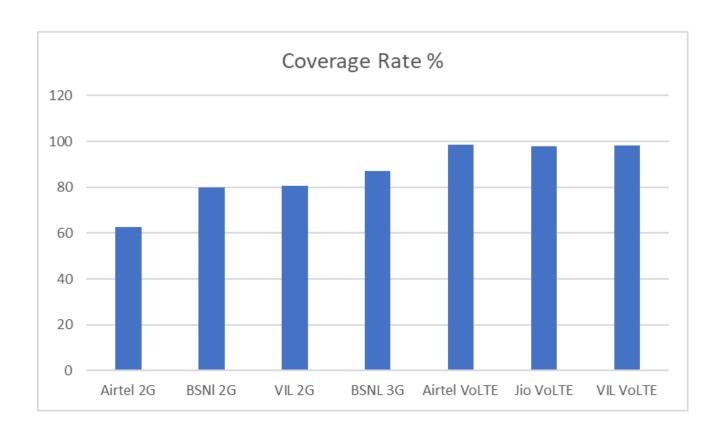
	3 <b>G</b>			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	4.7	NA	NA
Mbps				
Upload Throughput in	NA	2.6	NA	NA
Mbps				
Video streaming delay in	NA	1.8	NA	NA
sec				
Web browsing delay in	NA	0.511	NA	NA
second				
Latency in (msec)	NA	76	NA	NA

	LTE			
	Airtel	BSNL	JIO	VIL
Download throughput in	7.38	NA	7.45	42.80
Mbps	7.30	INA	7.43	
Upload Throughput in	1.79	NA	2.56	29.63
Mbps	1.79	INA	2.50	
Video streaming delay in	0.83	NA NA	NA NA	0.4
sec	0.03	INA	INA	
Web browsing delay in	4.45	NA NA	2.40	0.6
second	4.40	INA	2.40	
Latency in (msec)	66.66	NA	70	54

	5G			
	Airtel	BSNL	JIO	VIL
Download throughput in	NA	NA	NA	NA
Mbps	INA	INA	INA	INA
Upload Throughput in	NA	NA	NΙΛ	NA
Mbps	INA	INA	NA	INA
Video streaming delay in	NA	NA	NA	NA
sec	INA	INA	INA	INA
Web browsing delay in	NA NA	NA NA	NIA	NA
second	INA	INA	NA	INA
Latency in (msec)	NA	NA	NA	NA

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	62.60
BSNI 2G	80
VIL 2G	80.79
BSNL 3G	87
Airtel VoLTE	98.49
Jio VoLTE	98.01
VIL VoLTE	98.32



**TSP- Airtel** 

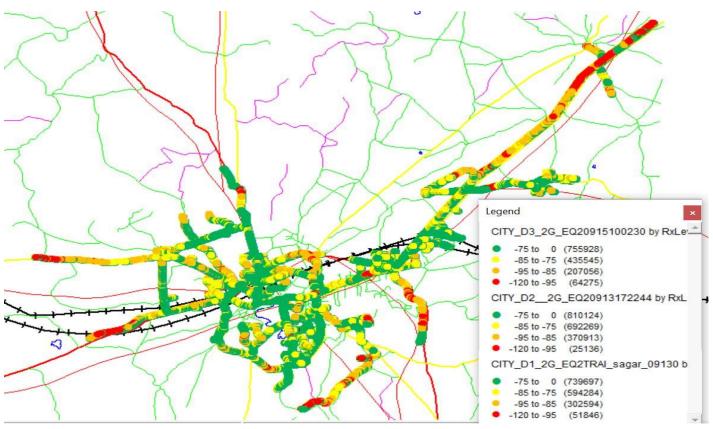
Technology	Coverage %
2G	62.60



2G				
Overall RxLevel	# Samples	% PDF	Legends	
[Max, >=-75]	1958413	31.73		
[-75, >=-85)	1905375	30.87		
[-85, >=-95)	2261383	36.64		
[-95, >=Min)	47198	0.76		
Total	6172369	100		

#### **TSP-BSNL**

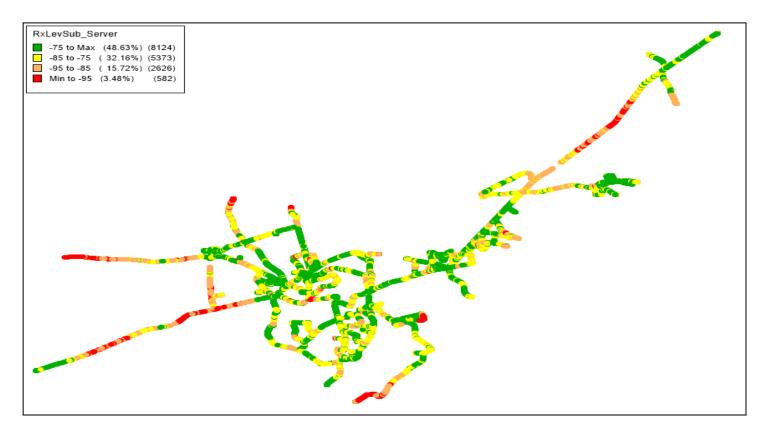
Technology	Coverage %
2G	80 %



	2G				
Overall RxLevel	# Samples	% PDF	Legends		
[Max, >=-75]	2305749	45.66			
[-75, >=-85)	1722098	34.10			
[-85, >=-95)	880563	17.44			
[-95, >=Min)	141257	2.7			
Total	5049667				

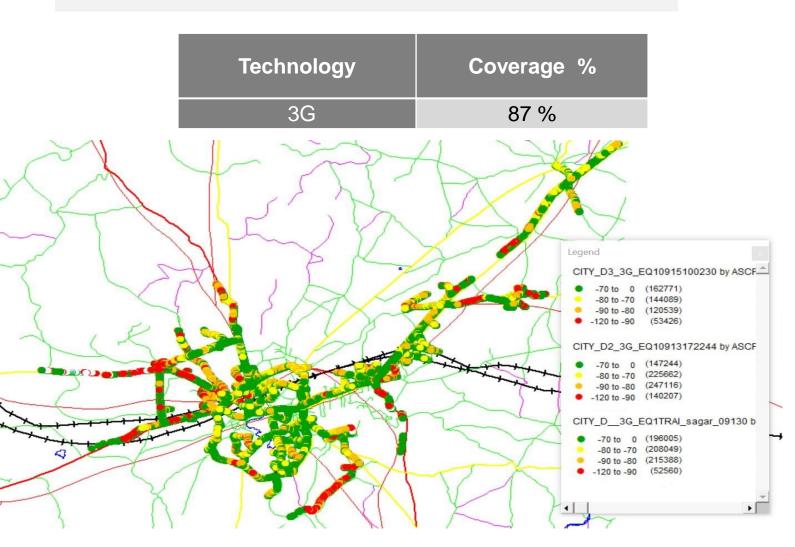
# TSP- VI

Technology	Coverage %
2G	80.79



	2G		
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	8124	48.63%	
[-75, >=-85)	5373	32.16%	
[-85, >=-95)	2626	15.72%	
[-95, >=Min)	582	3.48%	
Total	16705	100%	

#### **TSP-BSNL**



	3G		
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	506020	26.45	
[-70, >=-80)	577800	30.20	
[-80, >=-90)	583043	30.48	
[-90, >=Min)	246193	12.87	
Total	1913056		

**TSP- Airtel** 

Technology	Coverage %
VoLTE	98.49



VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	3101321	24.48	
[-80, >=-90)	5222314	41.22	
[-90, >=-110)	4153317	32.78	
[-110, >=Min)	191501	1.51	
Total	12668453	100	

# **TSP-JIO**

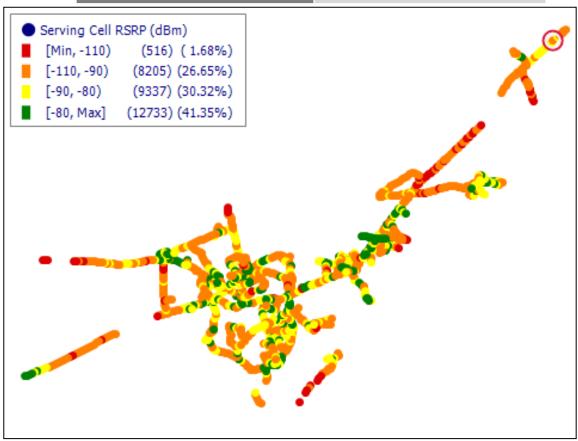
Technology	Coverage %
VoLTE	98.01%



	VoLTE		
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	11685	26.13%	
[-80, >=-90)	14731	32.95%	
[-90, >=-110)	17406	38.93%	
[-110, >=Min)	891	1.99%	
Total	44713		

**TSP-VI** 

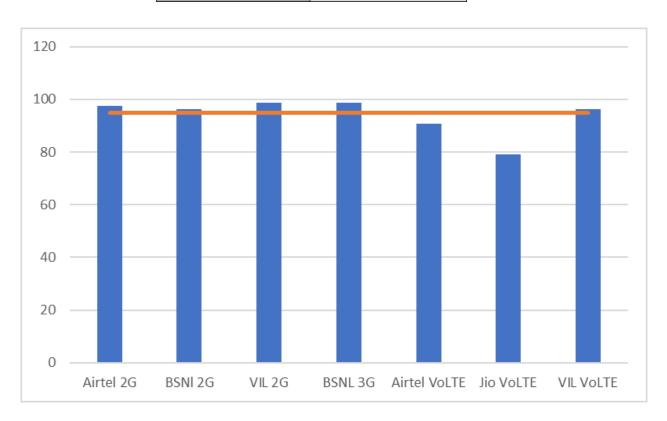




	VoLTE		
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	12733	41.35	
[-80, >=-90)	9337	30.32	
[-90, >=-110)	8205	26.65	
[-110, >=Min)	516	1.68	
Total	30791	100	

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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	97.49
BSNI 2G	96.31
VIL 2G	98.67
BSNL 3G	98.59
Airtel VoLTE	90.70
Jio VoLTE	78.98
VIL VoLTE	96.24



For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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 %
2G	97.49

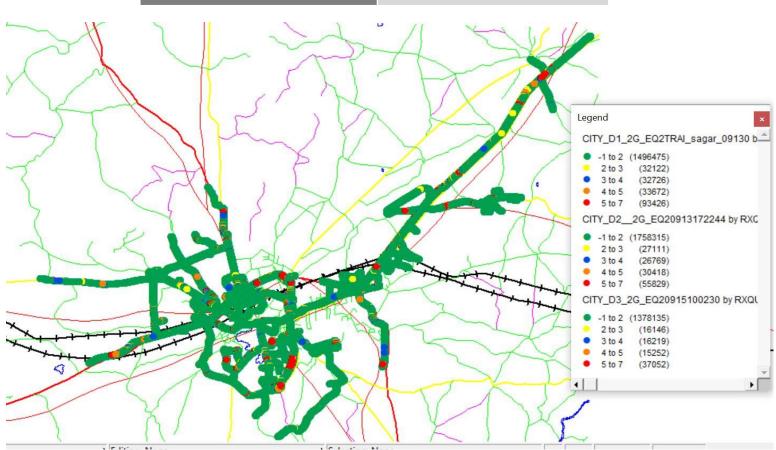


Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	5095174	82.54	
(2, <=3)	336136	5.45	
(3 , <=4)	252066	4.08	
<b>(4</b> , <b>&lt;=5)</b>	334231	5.42	
(5 , <=Max)	154799	2.51	
Total	6172406	100	

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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-BSNL**

Technology	Rx Quality %
2G	96.31 %

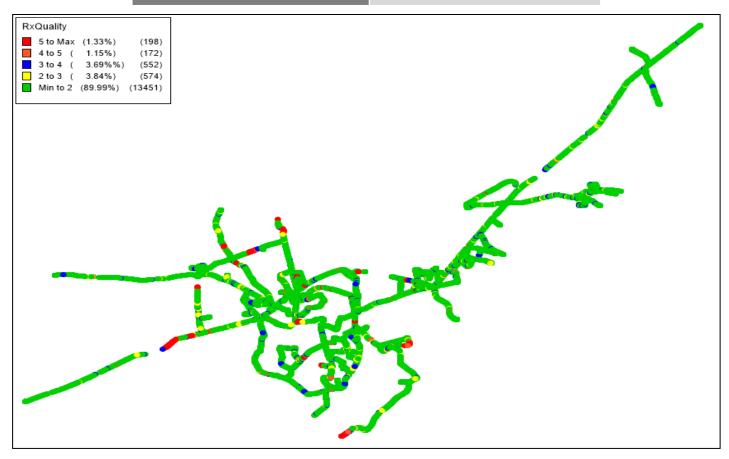


Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	4632925	91.75	
(2, <=3)	75379	1.49	
(3 , <=4)	75734	1.50	
(4 , <=5)	79342	1.57	
(5 , <=Max)	186307	3.69	
Total	5049687		

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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- VI

Technology	Rx Quality %
2G	98.67

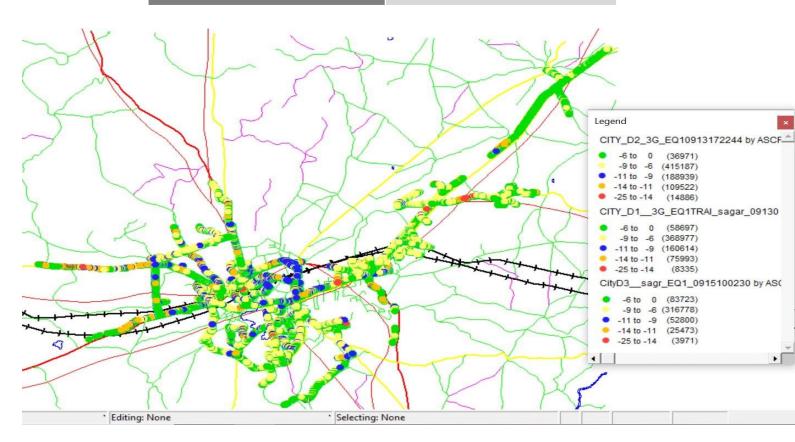


Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	13451	89.99%	
(2, <=3)	574	3.84%	
(3 , <=4)	552	3.69%	
(4 , <=5)	172	1.15%	
(5 , <=Max)	198	1.33%	
Total	14947	100%	

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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-BSNL**

Technology	Rx Quality %
3G	98.59%



Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	179391	9.34	
(-6, <=-9)	1100942	57.32	
(-9, <=-11)	402353	20.95	
(-11, <=-14)	210988	10.98	
(-14, <= Min)	27192	1.41	
Total	1920866		

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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	90.70

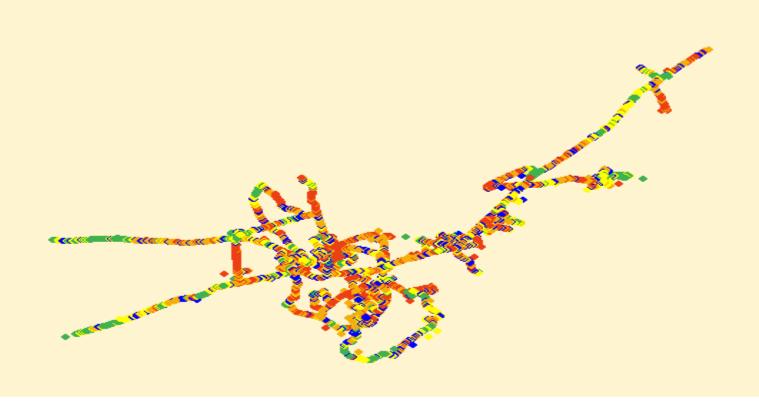


Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	1177904	9.30	
(0, <=5)	2770440	21.86	
(5, <=10)	3929761	31.02	
(10, <=15)	2613143	20.63	
(15, <=Max)	2177205	17.19	
Total	12668453	100	

For measuring voice quality, as per the QoS norms, RxQual <= 5 for GSM TSPs, EcNo >= -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	78.98%

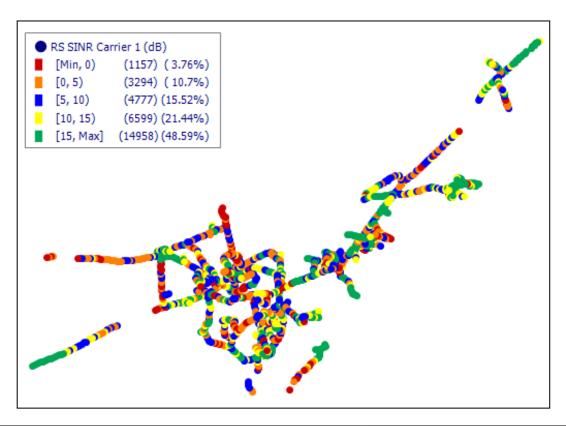


Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	9399	21.01%	
(0, <=5)	12160	27.20%	
(5, <=10)	8249	18.45%	
(10, <=15)	9152	20.47%	
(15, <=Max)	5753	12.87%	
Total	44713		

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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%.

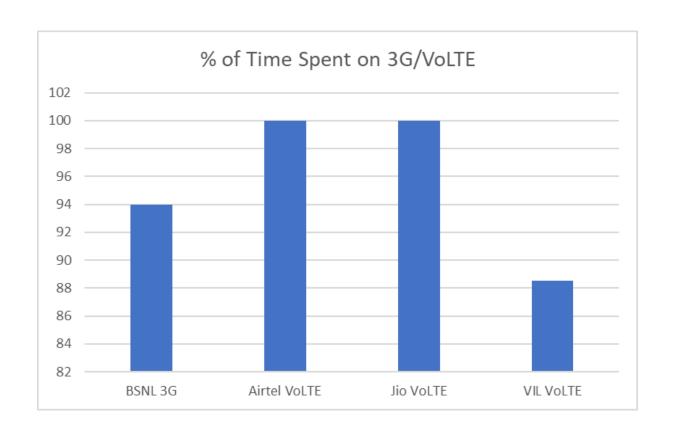
**TSP-VI** 

Technology	Rx Quality %
VoLTE	96.24



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	1157	3.76	
(0, <=5)	3294	10.7	
(5, <=10)	4777	15.52	
(10, <=15)	6599	21.44	
(15, <=Max)	14958	48.59	
Total	30785	100	

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	94
Airtel VoLTE	100
Jio VoLTE	100
VIL VoLTE	88.52



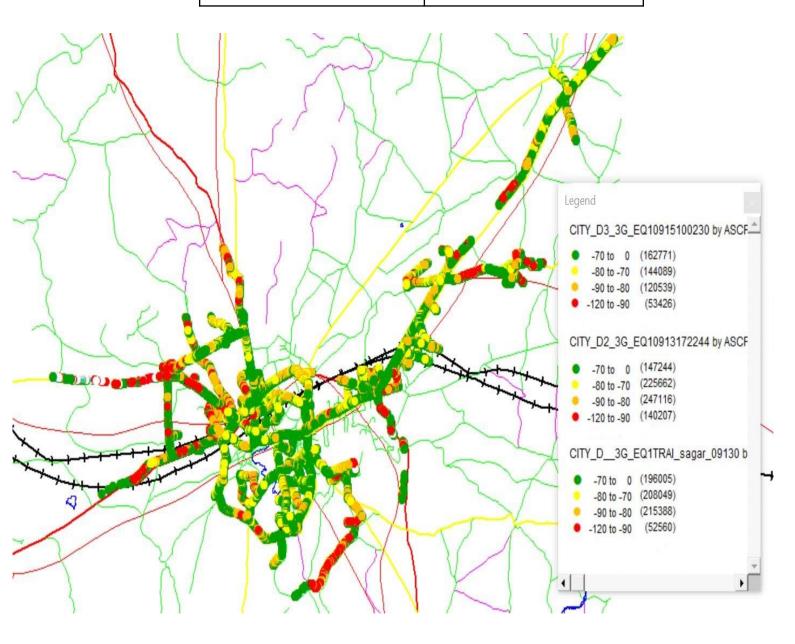
# **TSP-Airtel**

Technology	% of Time Spent on
3G	
VoLTE	100%



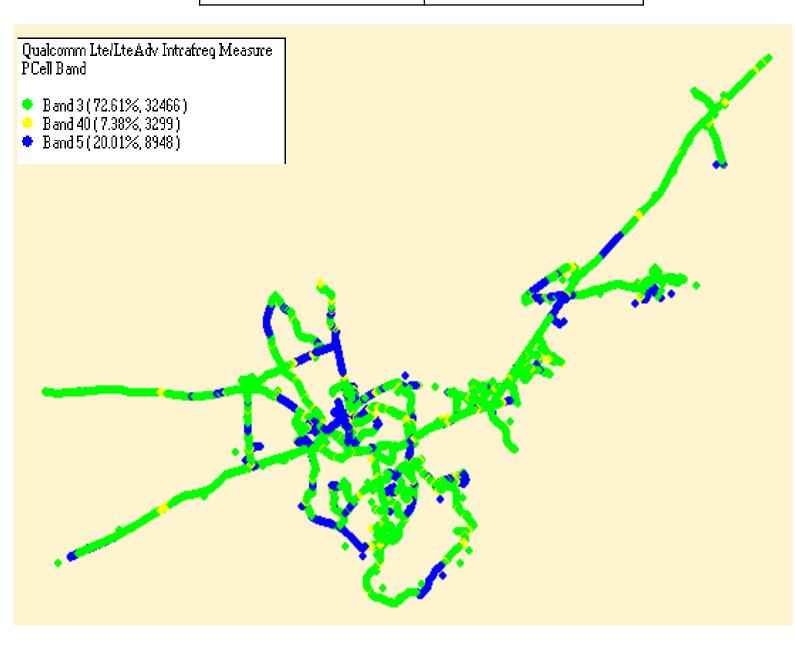
#### **TSP-BSNL**

Technology	% of Time Spent on
3G	94%
VoLTE	NA



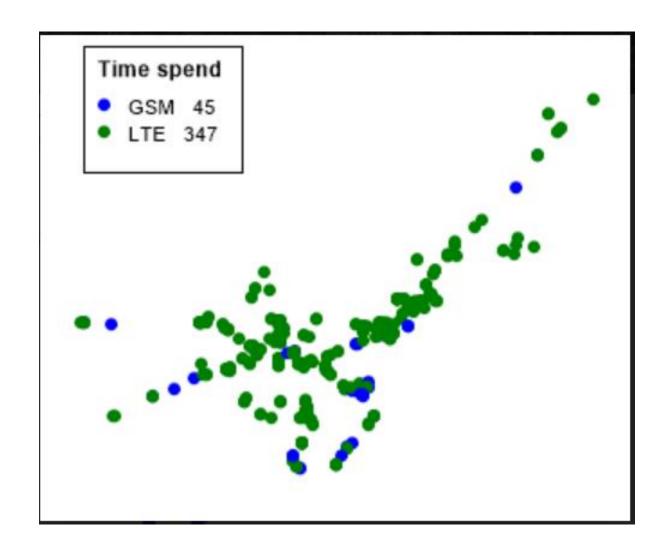
## **TSP-JIO**

Technology	% of Time Spent on
3G	
VoLTE	100%



TSP- VI

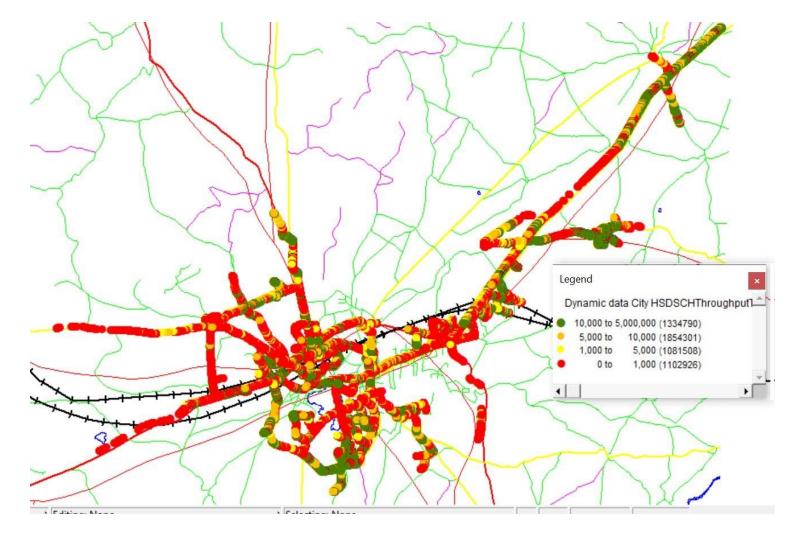
Technology	% of Time Spent on
3G	
VoLTE	88.52



#### **TSP-BSNL**

#### **Data Statistics - Dynamic data testing**

Data KPIs - Overall	3G	
Download Throughput (Mbps)	7.5 Mbps	



DL throughput	No of Sample	%	Legends
< 1 Mbps	1102926	20.53	
1-5 Mbps	1081508	20.13	
5-10 Mbps	1854301	34.51	
>10Mbps	1334790	24.84	

#### **TSP-Airtel**

#### **Data Statistics - Dynamic data testing**

Data KPIs - Overall	LTE	
Download Throughput (Mbps)	5.38	

Plot: ftp\_download\_throughput



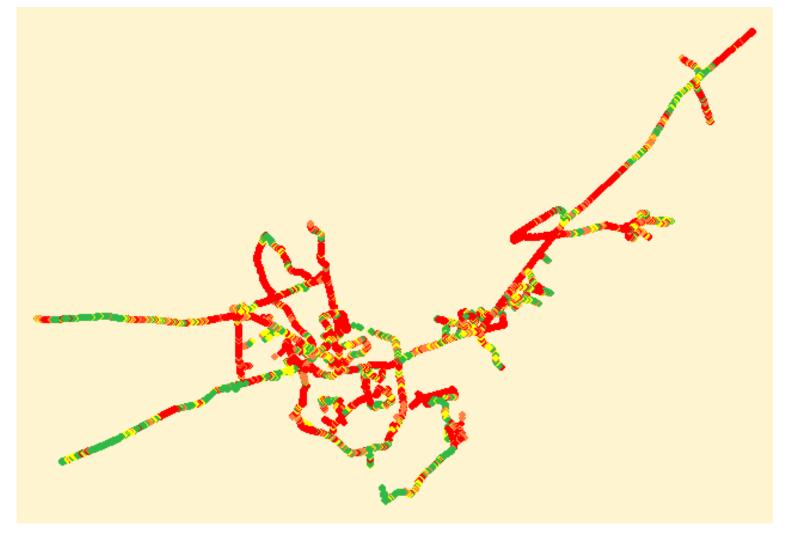


DL throughput	No of Sample	%	Legends
< 2Mbps	6460	12.97	
2-5 Mbps	24105	48.38	
5-10 Mbps	14076	28.25	
>10Mbps	5181	10.40	

**TSP-JIO** 

#### **Data Statistics - Dynamic data testing**

Data KPIs - Overall	LTE	
Download Throughput (Mbps)	7.28	

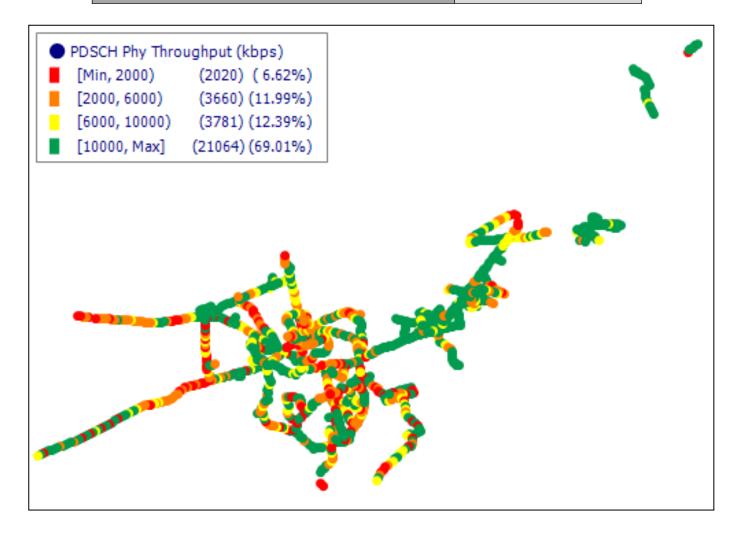


DL throughput	No of Sample	%	Legends
< 2Mbps	30463	40.04%	
2-5 Mbps	15416	20.26%	
5-10 Mbps	14498	19.05%	
>10Mbps	15712	20.65%	

TSP- VI

#### **Data Statistics - Dynamic data testing**

Data KPIs - Overall	LTE	
Download Throughput (Mbps)	26.23	



DL throughput	No of Sample	%	Legends
< 2Mbps	2020	6.62	
2-5 Mbps	3660	11.99	
5-10 Mbps	3781	12.39	
>10Mbps	21064	69.00	