



Operator Assisted Drive Test Report

Dehradun SSA

28th Feb to 2nd March 2022

By

TRAI Regional office Bhopal

Key Performance Indicators: All TSPs have met the Drop Call Rate (DCR) benchmark of 2% except BSNL in 3G. All TSPs have met the Call Setup Success Rate (CSSR) of 95%. Some TSPs did not meet Rx Quality parameter.

The Operator Assisted Drive Test has been carried out by Regional Office, Bhopal with the help of Service Providers in Dehradun City and surrounding areas from 9:00 AM to 8:00 PM from 28th February To 2nd March 2022. The drive test covered drive route of around 340 KMs & 6 hotspots over a period of 3 days. Approximately 570 calls were made for each of the 2G/3G/4G networks: three 2G networks, one 3G networks, and three LTE networks covering four TSPs.

Overview

Voice
Summary

Data
Summary

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: Calls were made for the 90-sec duration with a wait time of 10 sec between calls in all technologies. Calls were made for each of the offered 2G/3G/4G networks covering 4 unique TSPs.

Data Tests:

The **dynamic data test** was conducted for the whole drive test route for download throughput in all technologies.

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

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

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

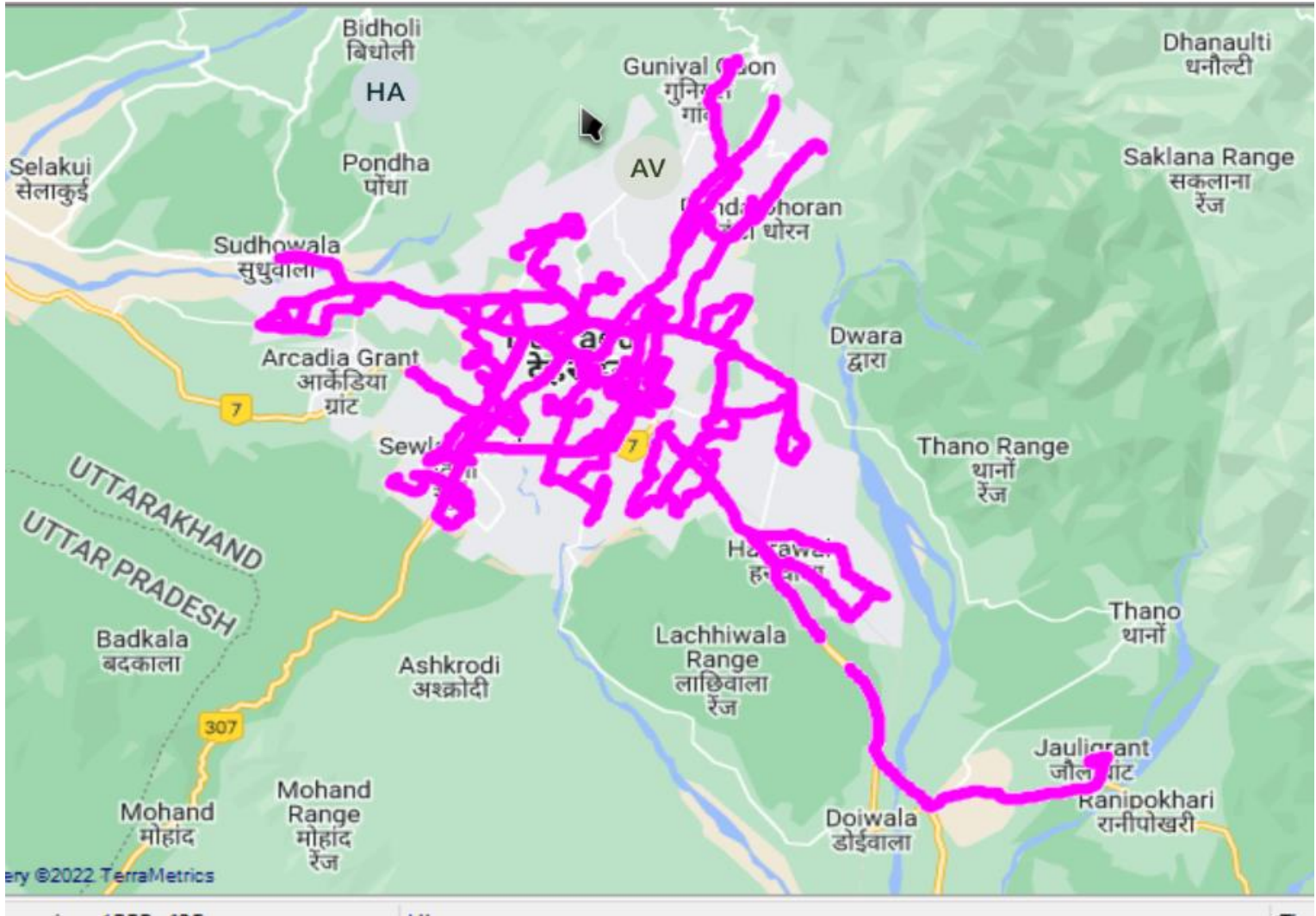
Static data tests on 6 hotspots

1. **Uttarakhand Technical University**
2. **ISBT**
3. **Railway station**
4. **Clock tower**
5. **Vidhan sabha**
6. **Airport**

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

Overview

Voice & Dynamic Data Test Drive Route



List of important area covered during the drive test

Clock tower,Rajpur road,Sahstradhar road,Raipur,Dalanwala,Survey chowk,

Ballupru chowk,Prem nagar,Sudhowala,ISBT,Kargi chowk,cleman town,transport

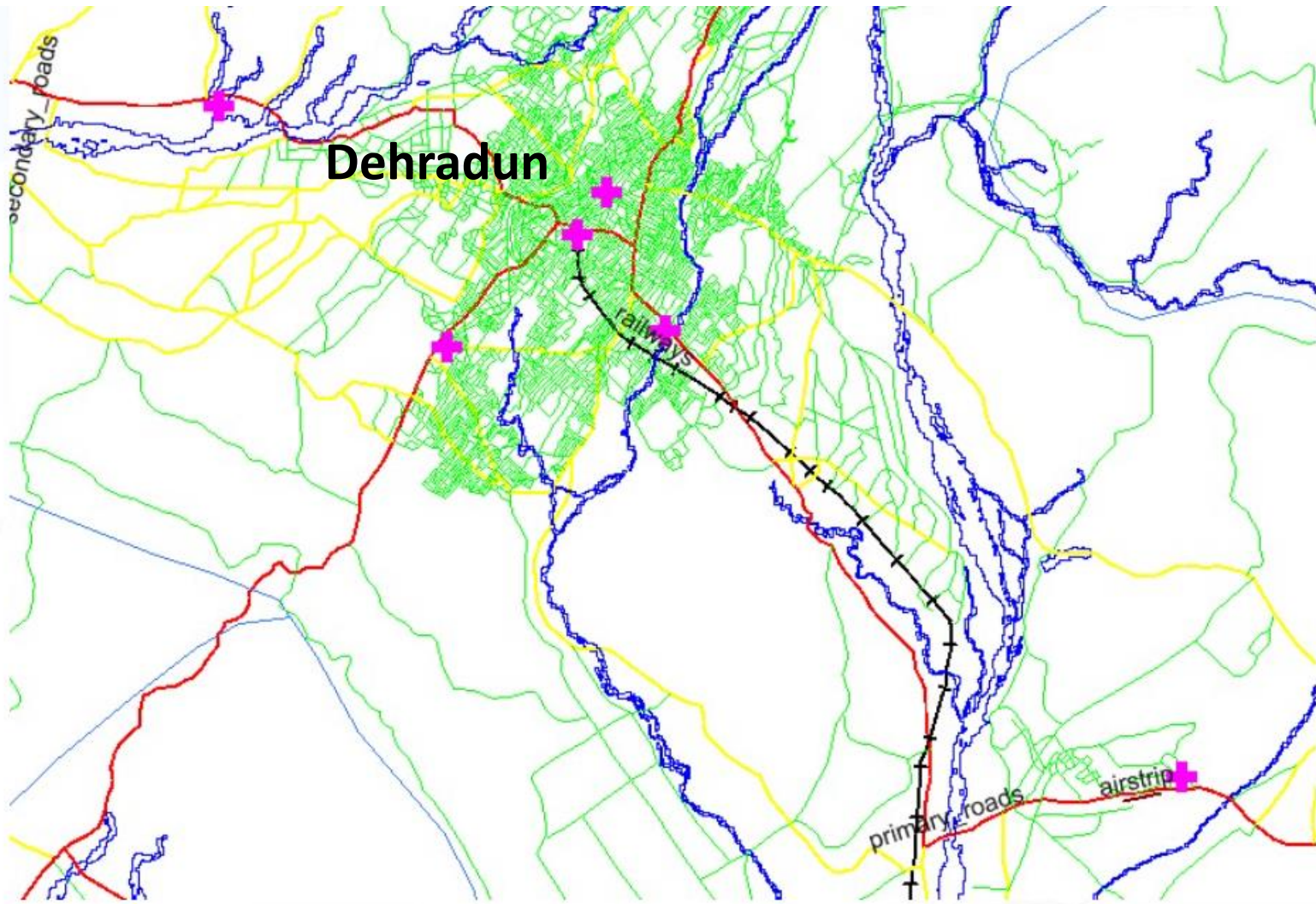
Rispana pull,vidhan sabha,kedarpuram,Jogiwala,Ring road,Miyanwala

Miyanwala,Nehrugram,Nehru colony,Balawala,Nakronda,,Race course,

Miyanwala,doiwala,Jollygrant,Airport

Overview

Data Service Test- Static Locations



Hotspot Locations

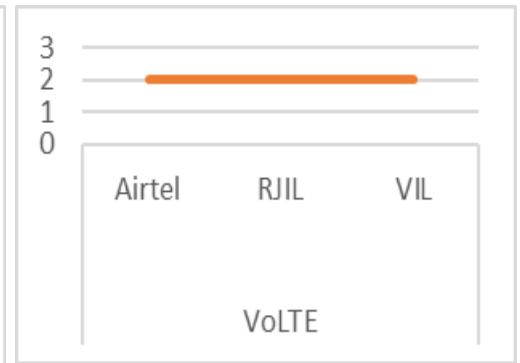
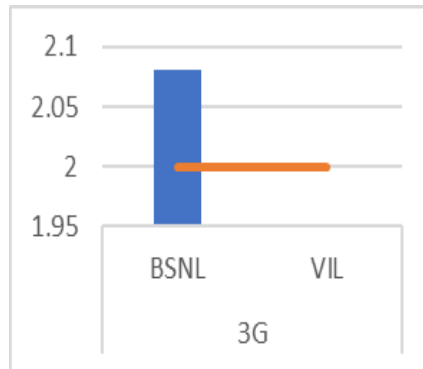
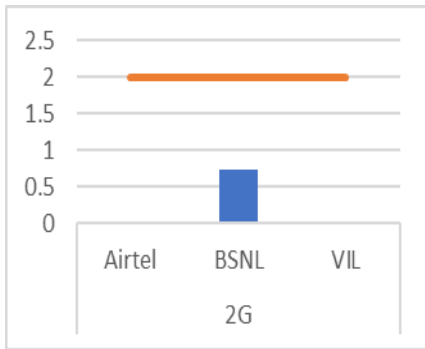
- 1-Clock Tower
- 2-Railway Station
- 3-Uttarakand University
- 4-Airport
- 5-Vidhansabha
- 6-ISBT Bus Stand

Voice Calls

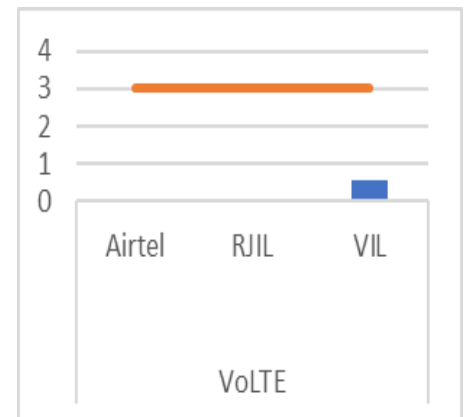
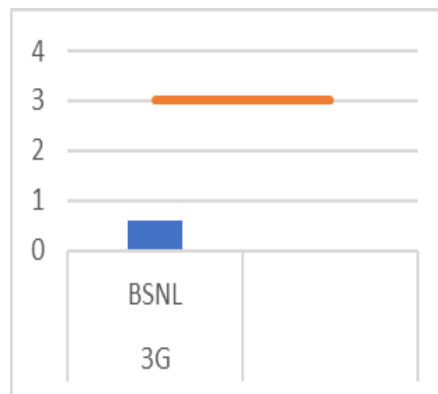
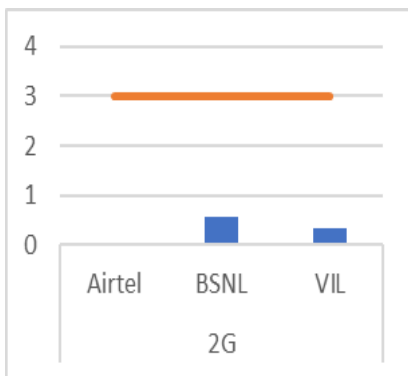
Key Observations

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	0.728	0	2.077		0	0	0
Block Call Rate %	0	0.579	0.34	0.590		0	0	0.54

a) All TSPs have met the 2% QoS benchmark of Drop Call Rate (DCR%) except BSNL in 3G

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 %	95.6	91	86.6

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

TSPs	3G	
	BSNL	VIL
Coverage %	80.75	NA

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	97	98.49	99.1

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

TSPs	3G		VoLTE		
	BSNL	VIL	Airtel	VIL	JIO
Time Spent on 3G/4G %	80	NA	95.92	100	99.61

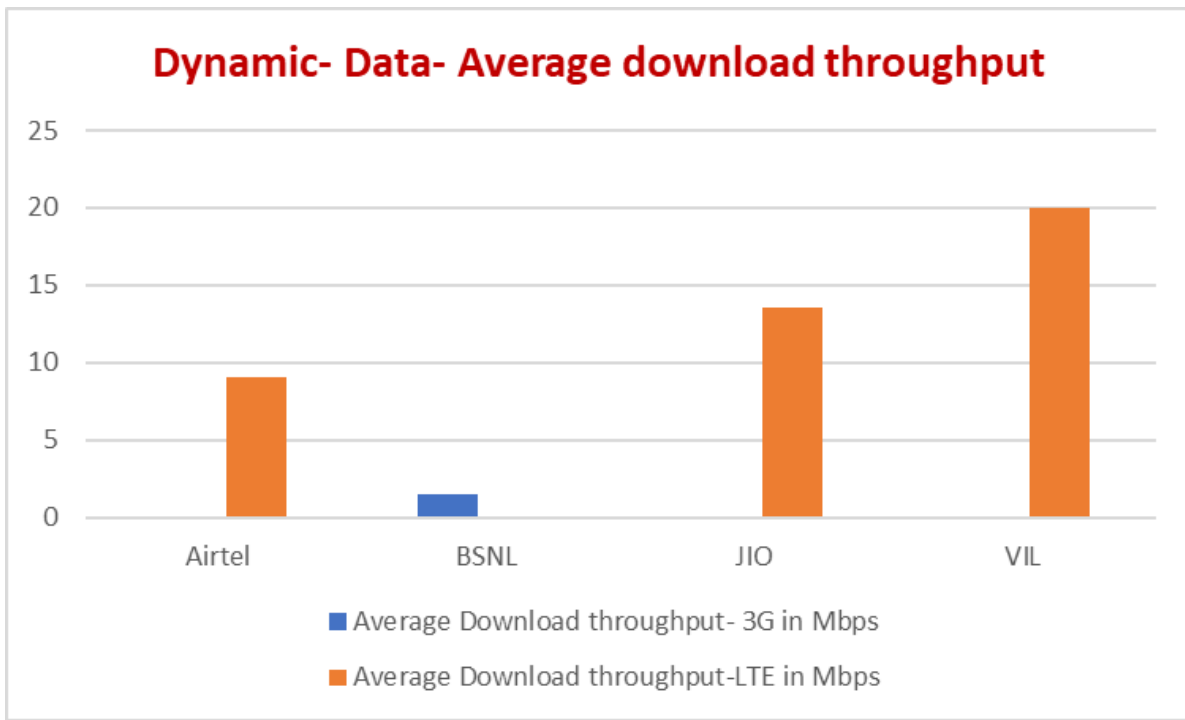
Data Services Dynamic

Key Observations

Dynamic Data was tested for 340 Kms. Download Throughput was tested.

Data Download Performance (kbps) - Dynamic

3G/4G/ Network:



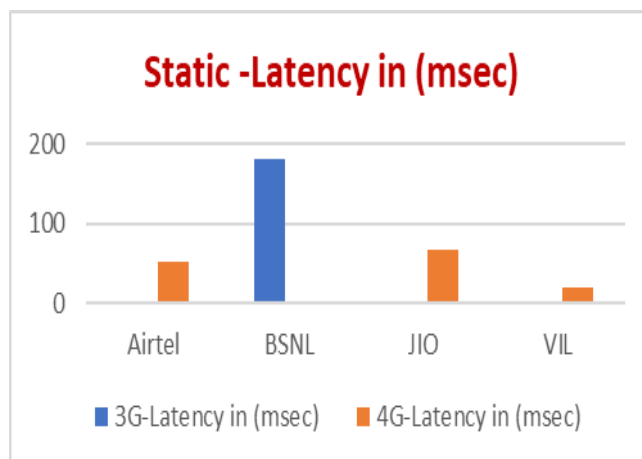
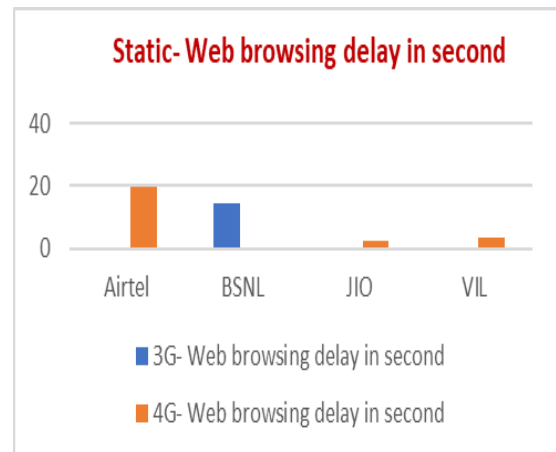
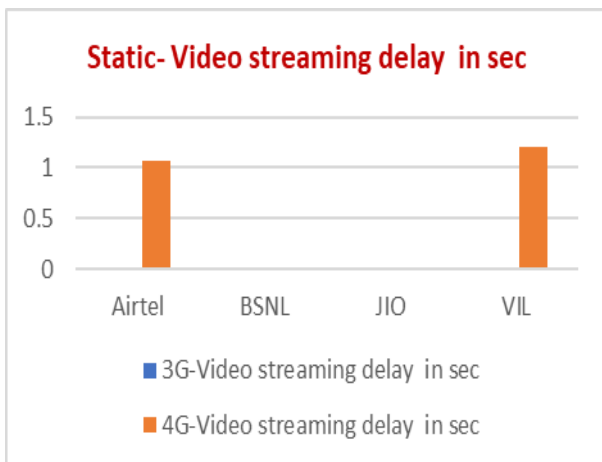
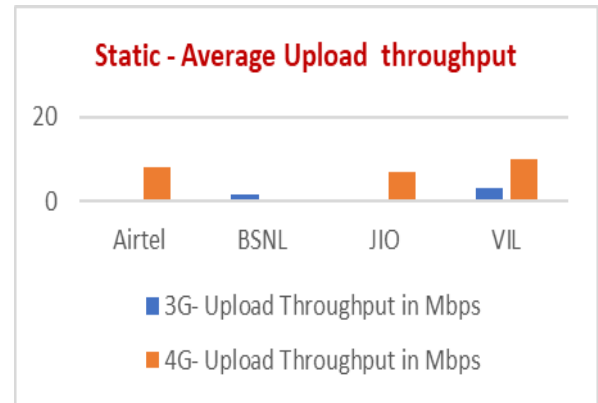
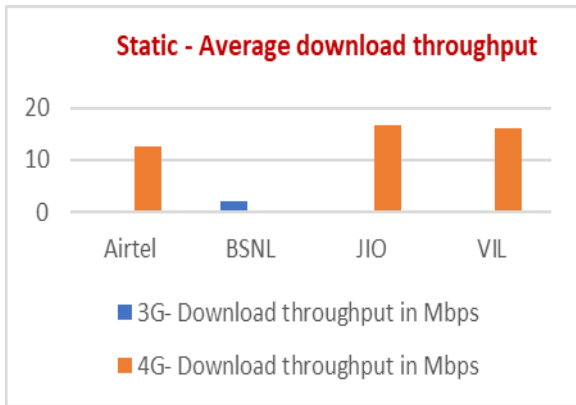
TSP (For 2G)	Airtel	BSNL	JIO	VIL
Average Download throughput- 2G in Kbps	79.28	87.88	NA	NA
Average Download throughput- 3G In Mbps	NA	1.46	NA	NA
Average Download throughput-LTE in Mbps	9.065	NA	13.57	20

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	594	690	NA	571
Block call rate %	0	0.579	NA	0.34
CSSR %	100	99.42	NA	99.65
Drop call rate %	0.16	0.728	NA	0
Mobility HOSR %	99.36	98.777	NA	99.22
RX Quality %	97.69	97.207	NA	94.8
Average CST Sec	3.7	3.37	NA	3.01

TSP (For 3G)	Airtel	BSNL	JIO	VIL
Call attempts	NA	678	NA	NA
Block call rate %	NA	0.590	NA	NA
CSSR %	NA	99.41	NA	NA
Drop call rate %	NA	2.077	NA	NA
Mobility HOSR %	NA	91.81	NA	NA
RX Quality %	NA	95.74	NA	NA
Average CST (Sec)	NA	3.75	NA	NA

TSP (For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	594	NA	568	553
Block call rate %	0	NA	0.00	0.56
CSSR %	100	NA	99.65	99.27
Drop call rate %	0	NA	0.00	0
Mobility HOSR %	99.97	NA	99.47	99.64
RX Quality %	86.32	NA	97.47	84.5
Average CST(Sec)	1.44	NA	0.67	3.11

Summary

City Level Summary- Data Services -Static

TSP (For 2G)	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	123	96	NA	113
Upload Throughput in Kbps	84	133	NA	61
Web browsing delay in second	83	32	NA	201
Latency in (msec)	123	345	NA	220

TSP (For 3G)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	2.05	NA	NA
Upload Throughput in Mbps	NA	1.66	NA	NA
Video streaming delay in sec	NA	NA	NA	NA
Web browsing delay in second	NA	14.48	NA	NA
Latency in (msec)	NA	181.94	NA	NA

TSP (For LTE)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	12.61	NA	16.74	16
Upload Throughput in Mbps	8.04	NA	7.15	10
Video streaming delay in sec	1.07	NA	0	1.2
Web browsing delay in second	19.61	NA	2.56	3.3
Latency in (msec)	53.5	NA	67.73	21

Hotspot-1	2G			
Location- Uttarakhand Technical University	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	156.51	133	NA	110.4
Upload Throughput in Kbps	102.40	133.33	NA	66.6
Web browsing delay in second	51.71	28.48	NA	160
Latency in (msec)	102.19	282.35	NA	202

Hotspot-1	3G			
Location- Uttarakhand Technical University	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	2.47	NA	NA
Upload Throughput in Mbps	NA	1.72	NA	NA
Video streaming delay in sec	NA	NA	NA	NA
Web browsing delay in second	NA	10.09	NA	NA
Latency in (msec)	NA	160.27	NA	NA

Hotspot-1	LTE			
Location- Uttarakhand Technical University	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	8.13	NA	13.92	10.6
Upload Throughput in Mbps	13.507	NA	6.44	7.2
Video streaming delay in sec	0.58	NA	0	1.3
Web browsing delay in second	4.74	NA	2.59	3.8
Latency in (msec)	52.01	NA	69	26

Hotspot-2	2G			
Location- ISBT	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	130.52	74.34	NA	99.2
Upload Throughput in Kbps	81.92	46.62	NA	46.8
Web browsing delay in second	88.83	31.24	NA	203
Latency in (msec)	125.80	427.80	NA	204

Hotspot-2	3G			
Location- ISBT	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	1.19	NA	NA
Upload Throughput in Mbps	NA	1.52	NA	NA
Video streaming delay in sec	NA	NA	NA	NA
Web browsing delay in second	NA	18.46	NA	NA
Latency in (msec)	NA	176.28	NA	NA

Hotspot-2	LTE			
Location- ISBT	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	7.735	NA	31.68	19.8
Upload Throughput in Mbps	12.94	NA	5.42	11.6
Video streaming delay in sec	0.52	NA	0	1.1
Web browsing delay in second	4.73	NA	2.34	3.2
Latency in (msec)	54.73	NA	74.6	34

Hotspot-3	2G			
Location-Railway Station	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	140.47	61.16	NA	132.4
Upload Throughput in Kbps	74.47	32.42	NA	69.8
Web browsing delay in second	68.06	32.56	NA	223
Latency in (msec)	147.05	370.35	NA	198

Hotspot-3	3G			
Location-Railway Station	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	1.79	NA	NA
Upload Throughput in Mbps	NA	1.72	NA	NA
Video streaming delay in sec	NA		NA	NA
Web browsing delay in second	NA	12.88	NA	NA
Latency in (msec)	NA	112.17	NA	NA

Hotspot-3	LTE			
Location-Railway Station	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	13.33	NA	9.32	26.4
Upload Throughput in Mbps	3.994	NA	3.97	14.2
Video streaming delay in sec	0.44	NA	0	1.4
Web browsing delay in second	8.78	NA	2.71	3.6
Latency in (msec)	66.94	NA	62.8	29

Hotspot-4	2G			
Location-Clock Tower	Airtel	BSNL	JIO	VIL
Download throughput in Kbps	107.77	119.50	NA	168.4
Upload Throughput in Kbps	91.02	86.87	NA	98.6
Web browsing delay in second	98.01	25.98	NA	116
Latency in (msec)	104.03	258.0	NA	176

Hotspot-4	3G			
Location-Clock Tower	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	1.88	NA	NA
Upload Throughput in Mbps	NA	1.61	NA	NA
Video streaming delay in sec	NA		NA	NA
Web browsing delay in second	NA	12.84	NA	NA
Latency in (msec)	NA	109.30	NA	NA

Hotspot-4	LTE			
Location-Clock Tower	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	9.38	NA	11.28	28.4
Upload Throughput in Mbps	5.24	NA	16.28	12.8
Video streaming delay in sec	0.45	NA	0	1.1
Web browsing delay in second	5.77	NA	2.82	3.2
Latency in (msec)	42.82	NA	66.4	27

Hotspot-5	2G			
Location-Vidhan Sabha	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	45.48	145.59	NA	104
Upload Throughput in Mbps	40.96	81.58	NA	54.7
Web browsing delay in second	141.09	36.36	NA	206.4
Latency in (msec)	116.44	340.12	NA	266

Hotspot-5	3G			
Location-Vidhan Sabha	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	2.71	NA	NA
Upload Throughput in Mbps	NA	1.089	NA	NA
Video streaming delay in sec	NA		NA	NA
Web browsing delay in second	NA	17.50	NA	NA
Latency in (msec)	NA	153.60	NA	NA

Hotspot-5	LTE			
Location-Vidhan Sabha	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	23.04	NA	27.05	16.7
Upload Throughput in Mbps	11.98	NA	7.88	9.8
Video streaming delay in sec	.40	NA	0	1.5
Web browsing delay in second	6.22	NA	2.39	3.2
Latency in (msec)	51	NA	64.2	36

Hotspot-6	2G			
Location-Airport	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	160.00	106.81	NA	68.6
Upload Throughput in Mbps	117.03	77.51	NA	32.1
Web browsing delay in second	51.22	23.75	NA	298.4
Latency in (msec)	142.60	394.16	NA	279

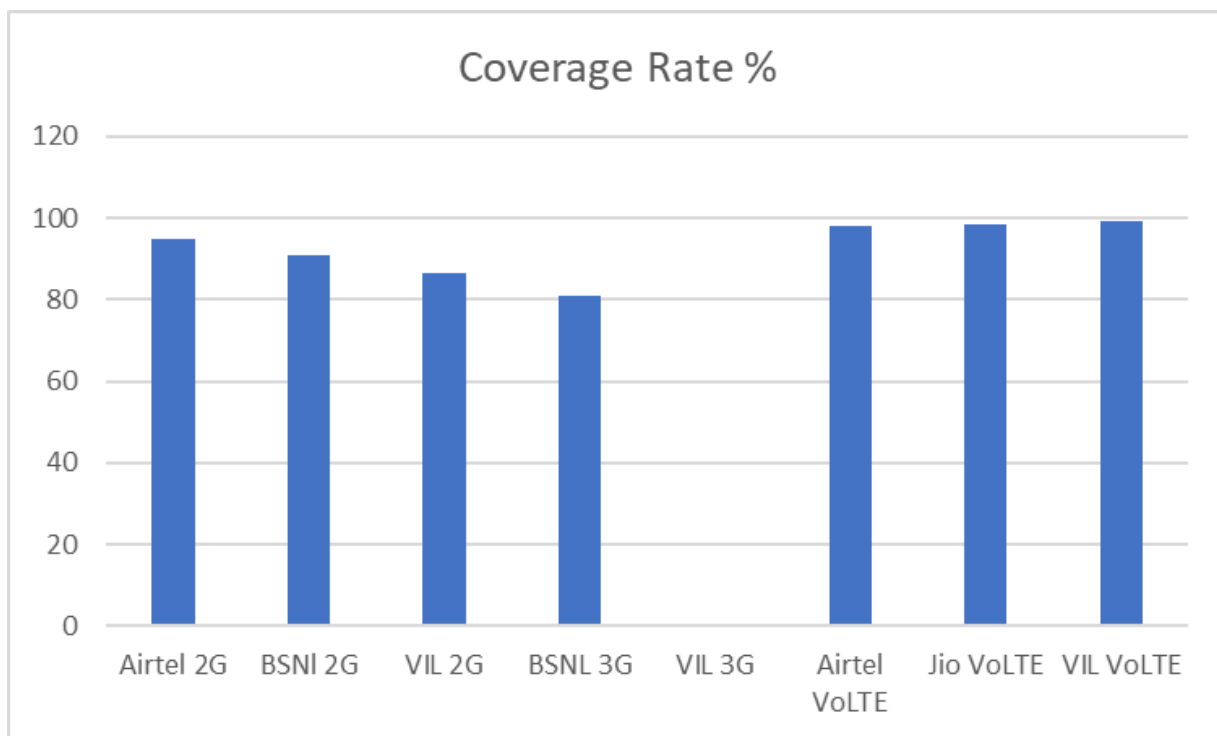
Hotspot-6	3G			
Location-Airport	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	NA	1.87	NA	NA
Upload Throughput in Mbps	NA	1.26	NA	NA
Video streaming delay in sec	NA	NA	NA	NA
Web browsing delay in second	NA	13.88	NA	NA
Latency in (msec)	NA	128.63	NA	NA

Hotspot-6	LTE			
Location-Airport	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	13.138	NA	7.17	4.6
Upload Throughput in Mbps	14.06	NA	2.91	1.2
Video streaming delay in sec	0.59	NA	0	2.4
Web browsing delay in second	4.04	NA	2.53	5.3
Latency in (msec)	87.44	NA	69.40	64

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.

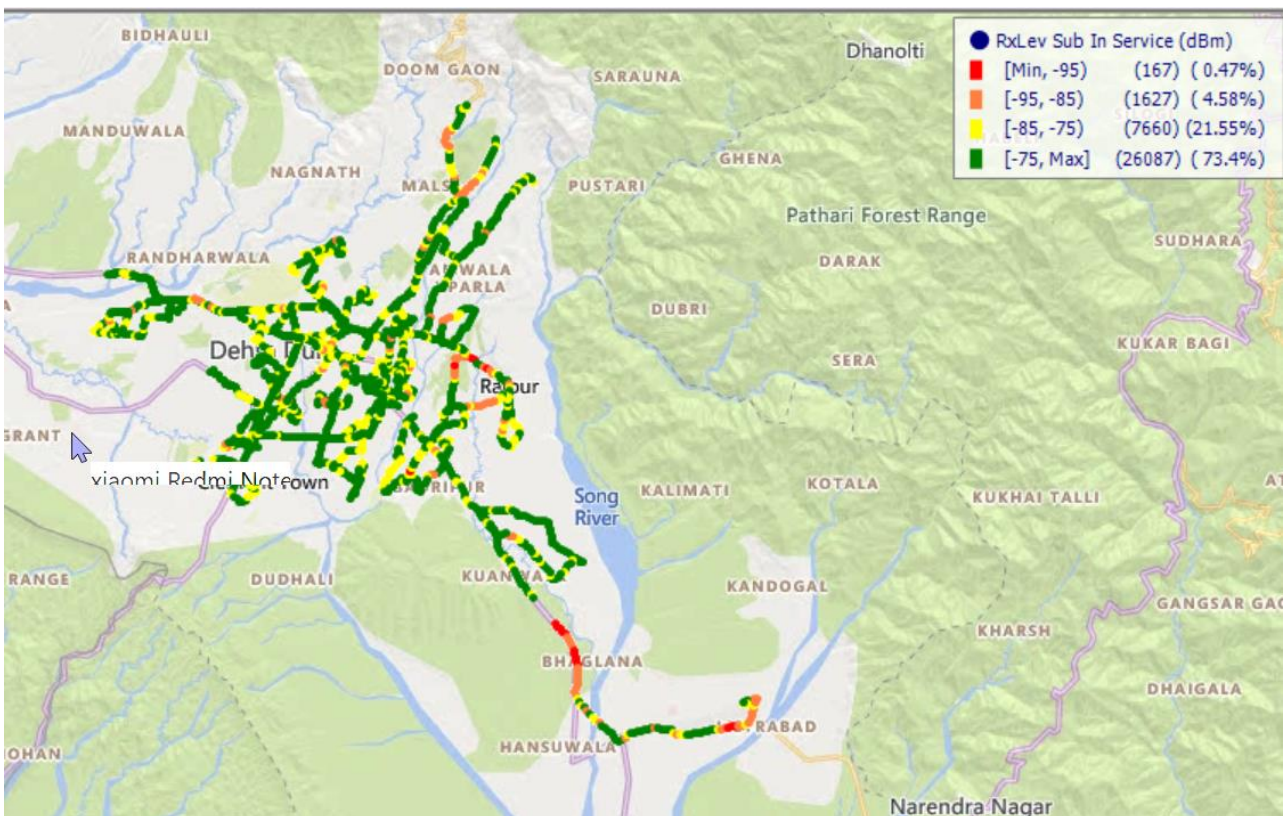
TSP	Coverage Rate %
Airtel 2G	95
BSNI 2G	91
VIL 2G	86.6
BSNL 3G	80.75
VIL 3G	NA
Airtel VoLTE	98
Jio VoLTE	98.49
VIL VoLTE	99.1



Coverage Details

TSP- Airtel

Technology	Coverage %
2G	95



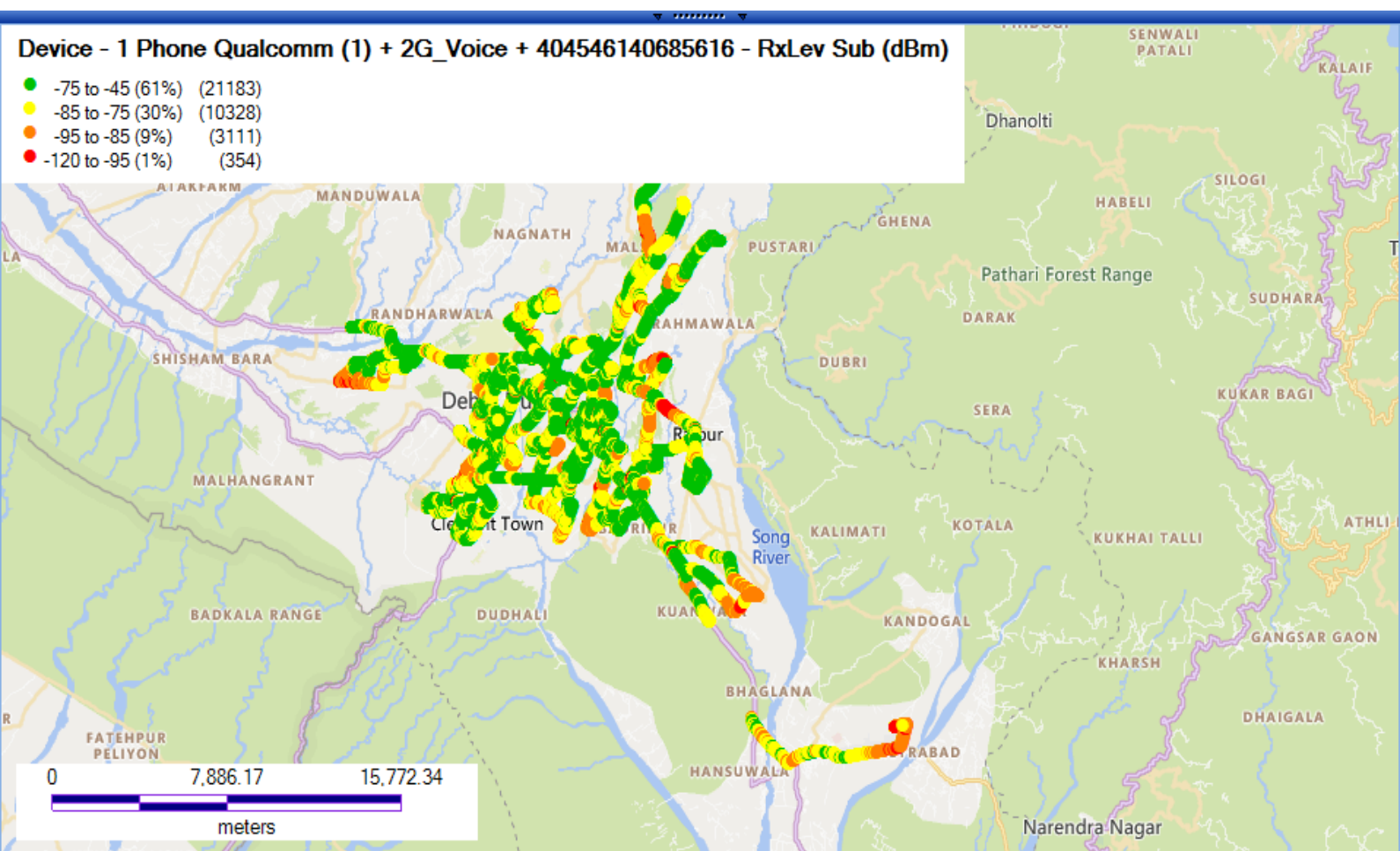
2G

Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	26087	73%	
[-75, >=-85)	7660	22%	
[-85, >=-95)	1627	5%	
[-95, >=Min)	167	0%	
Total	35541		

Coverage Details

TSP-BSNL

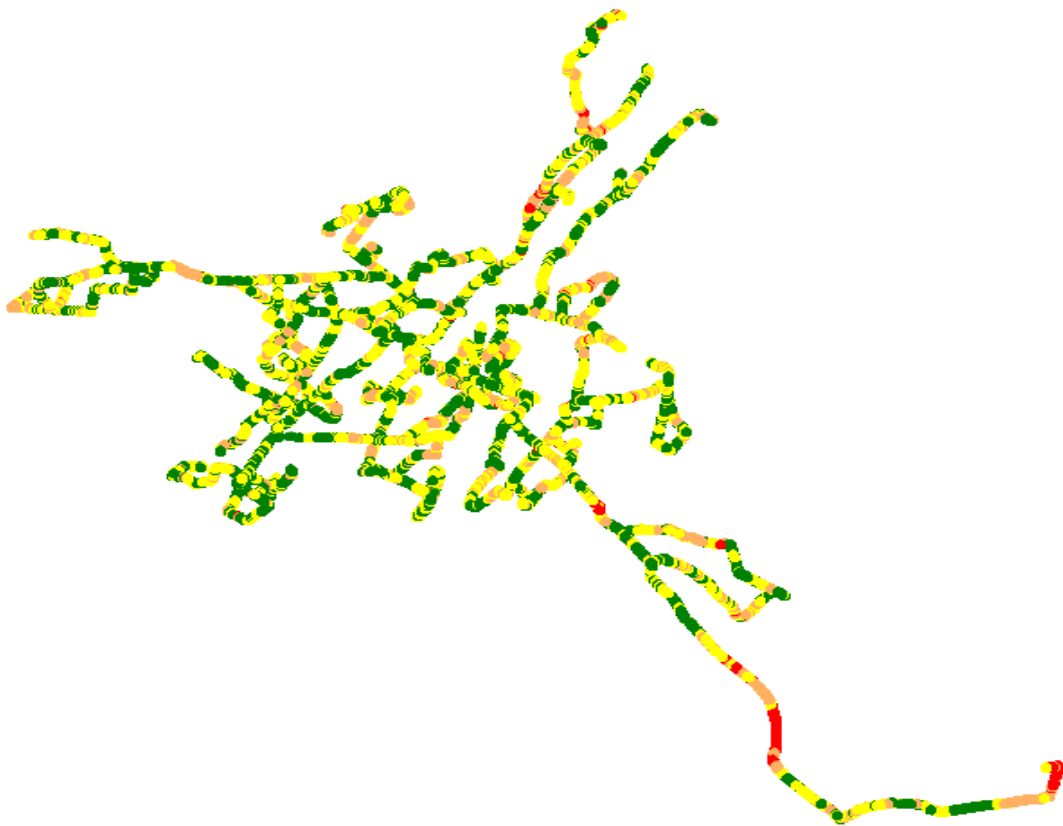
Technology	Coverage %
2G	100


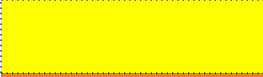




Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	21183	61	
[-75, >=-85)	10328	30	
[-85, >=-95)	3111	9	
[-95, >=Min)	354	1	
Total	34976	100	

TSP- VIL

Technology	Coverage %
2G	86.6

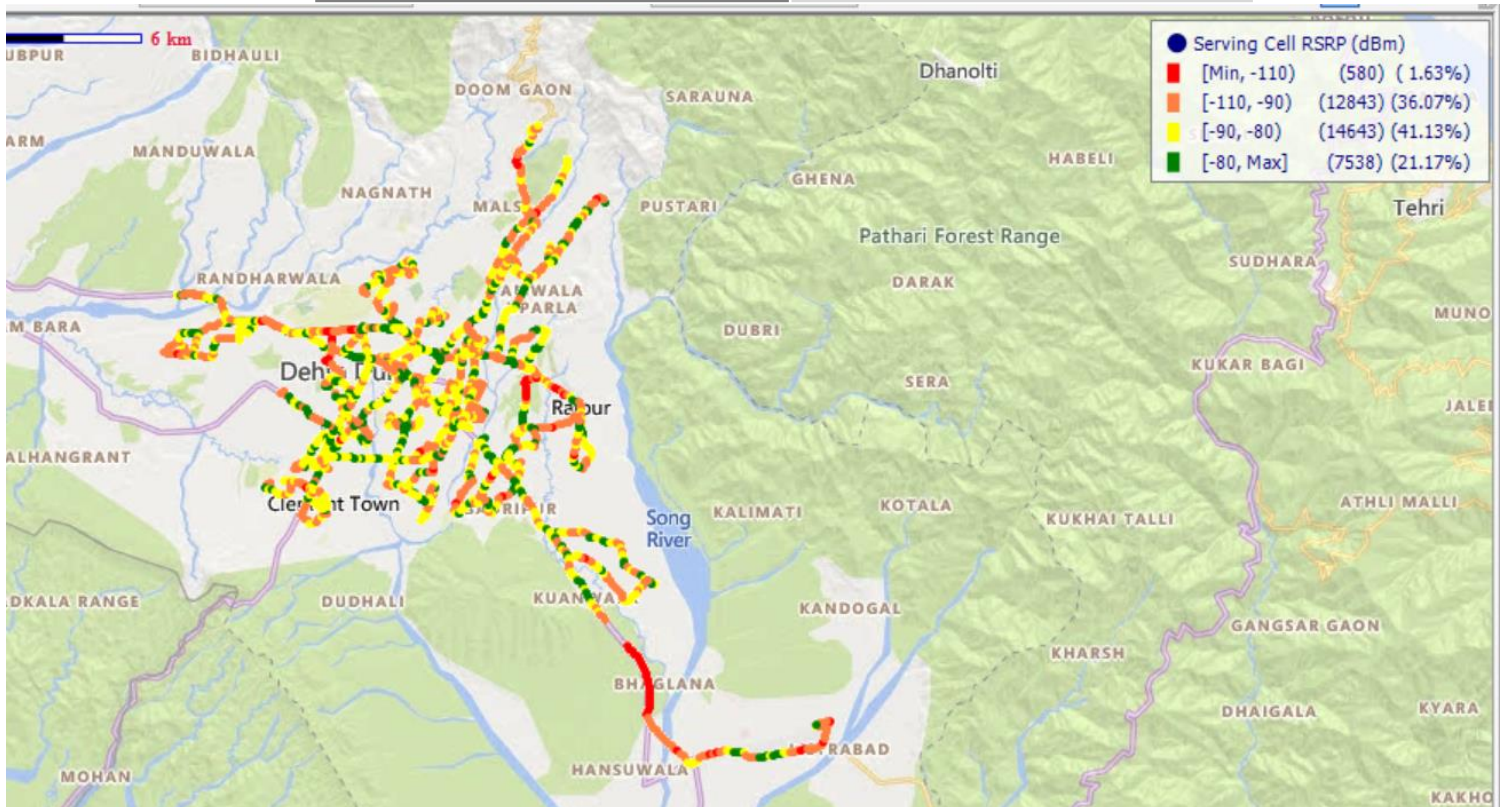


2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	2819990	42	
[-75, >=-85)	2897468	44	
[-85, >=-95)	795639	12	
[-95, >=Min)	117838	2	
Total	6630935	100	

Coverage Details

TSP- Airtel

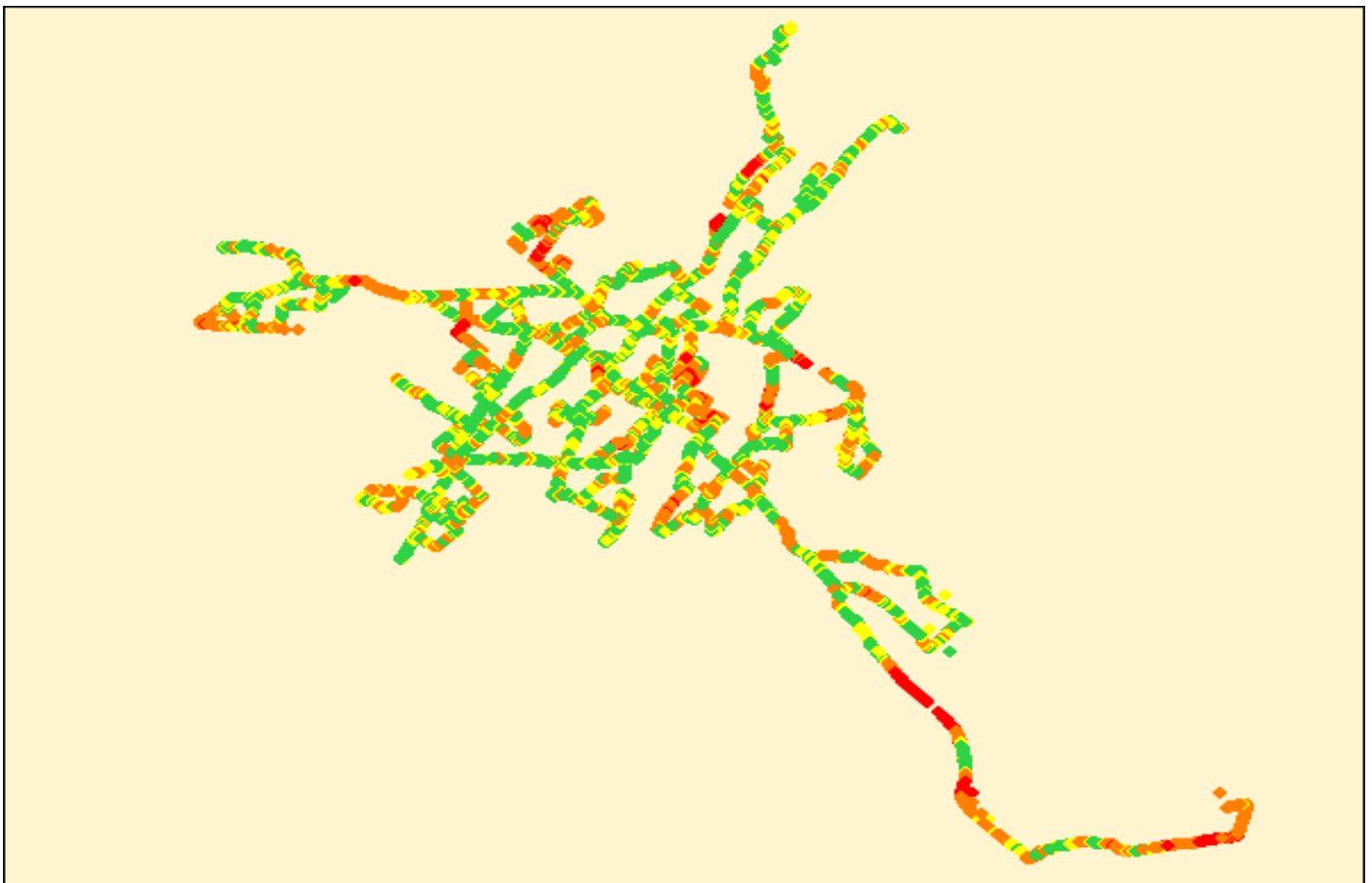
Technology	Coverage %
VoLTE	98







Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	7538	21%	
[-80, >=-90)	14643	41%	
[-90, >=-110)	12843	36%	
[-110, >=Min)	580	2%	
Total	35604		

TSP- JIO

Technology	Coverage %
VoLTE	98.49%

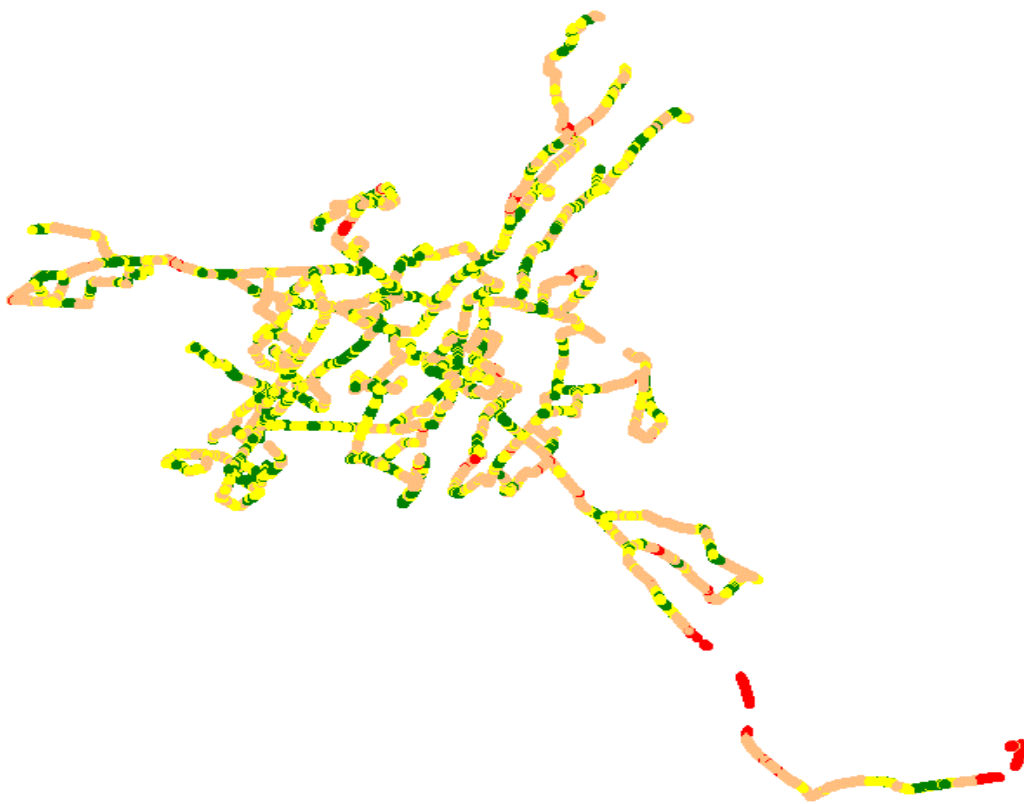






VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	28835	46.28%	
[-80, >=-90)	16716	26.83%	
[-90, >=-110)	15810	25.38%	
[-110, >=Min)	939	1.51%	
Total			

TSP- VIL

Technology	Coverage %
VoLTE	99.1

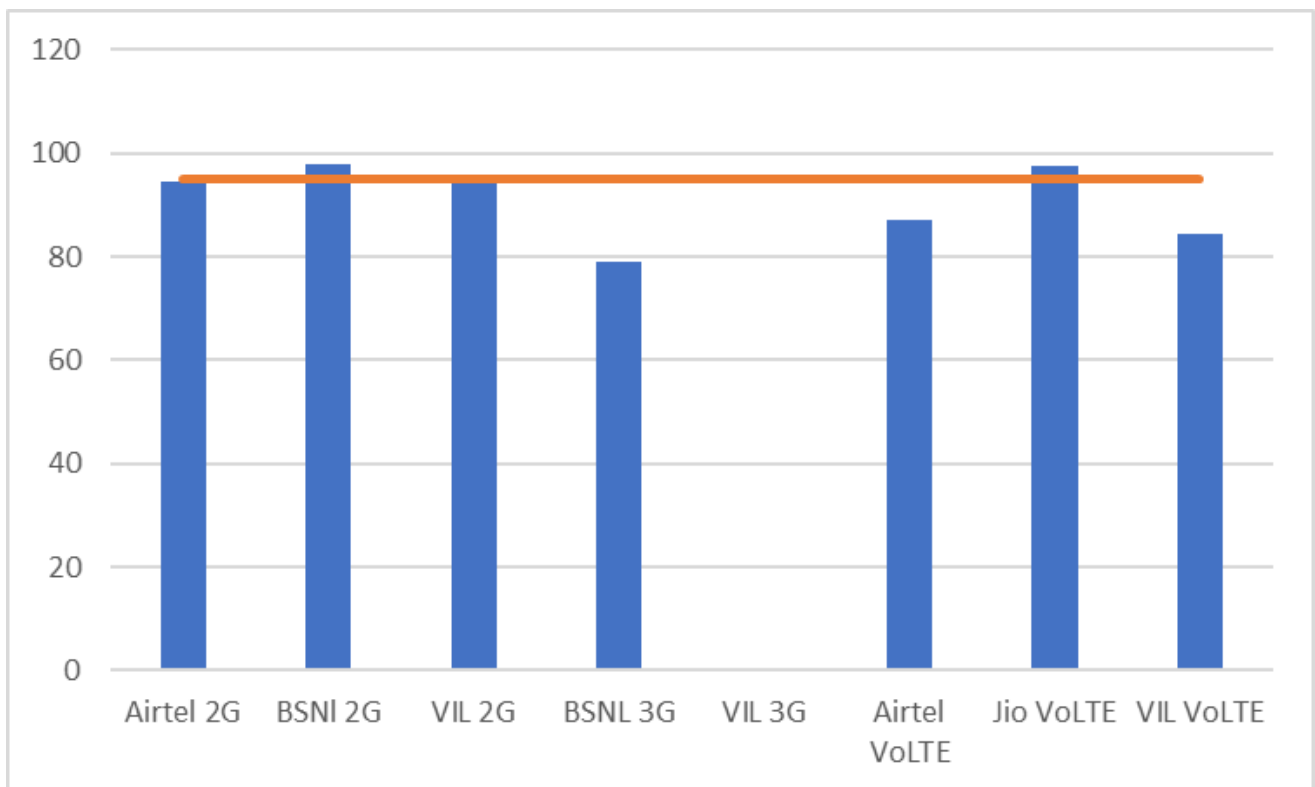


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	2283777	21	
[-80, >=-90)	4239262	39	
[-90, >=-110)	4292687	39	
[-110, >=Min)	129626	1	
Total	10945352	100	

Quality Details

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	94.63
BSNI 2G	98
VIL 2G	94.8
BSNL 3G	79
VIL 3G	NA
Airtel VoLTE	87
Jio VoLTE	97.47
VIL VoLTE	84.5

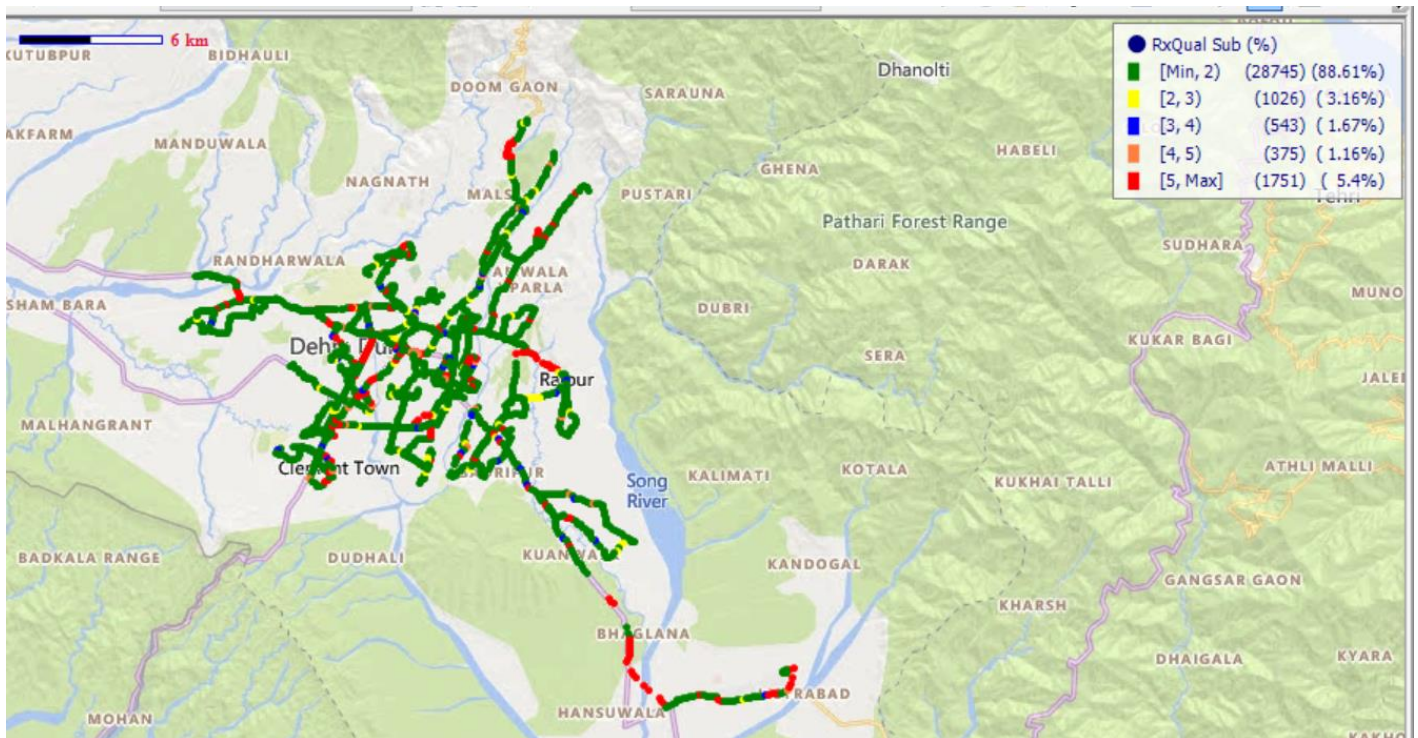


Quality Details

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TSP- Airtel

Technology	Rx Quality %
2G	95



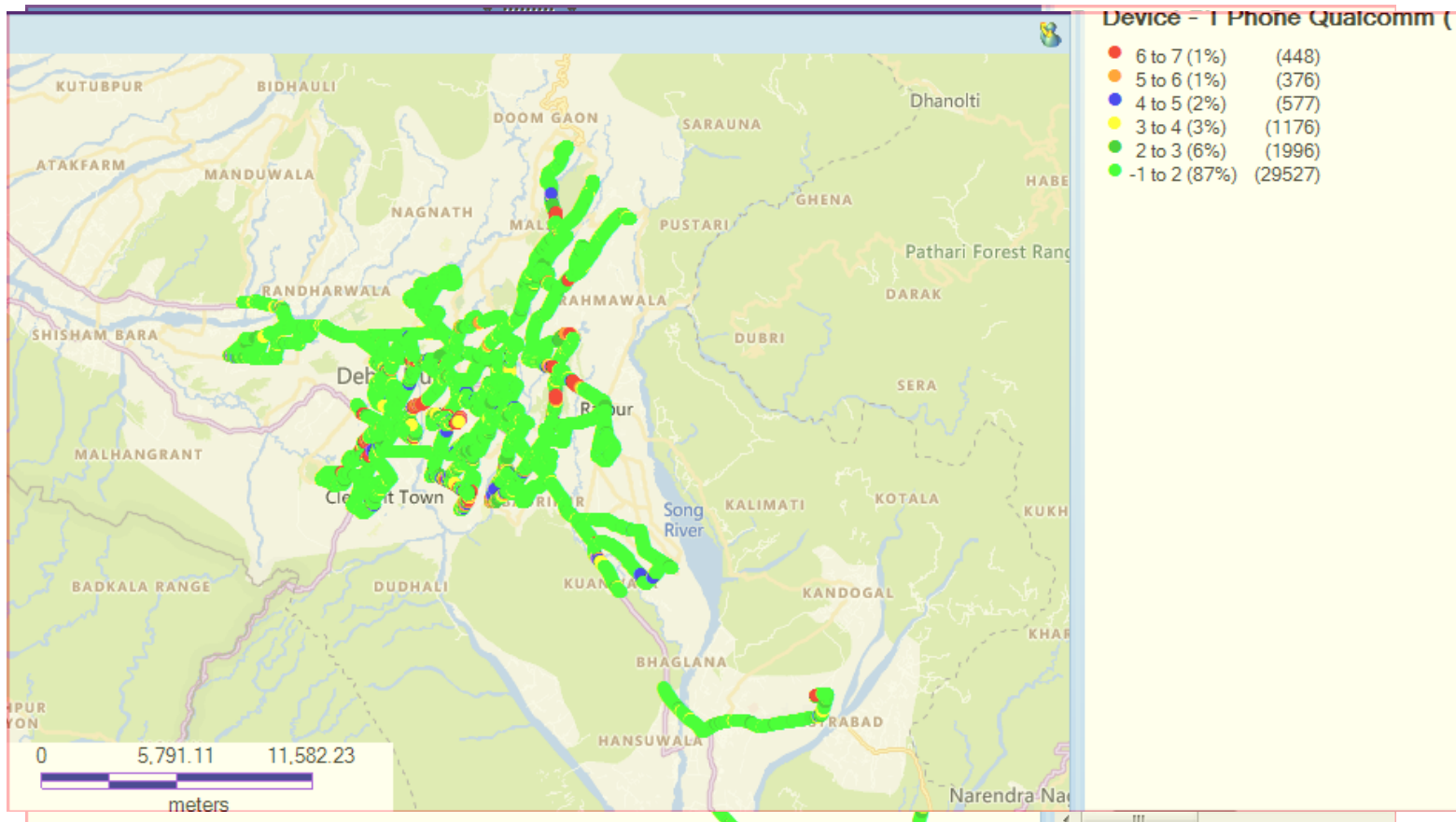
Overall Rx Quality	# Samples	% PDF	Legends
(Min, ≤ 2)	28745	89%	
(2, ≤ 3)	1026	3%	
(3, ≤ 4)	543	2%	
(4, ≤ 5)	375	1%	
(5, $\leq \text{Max}$)	1751	5%	
Total	32440		

Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -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	98



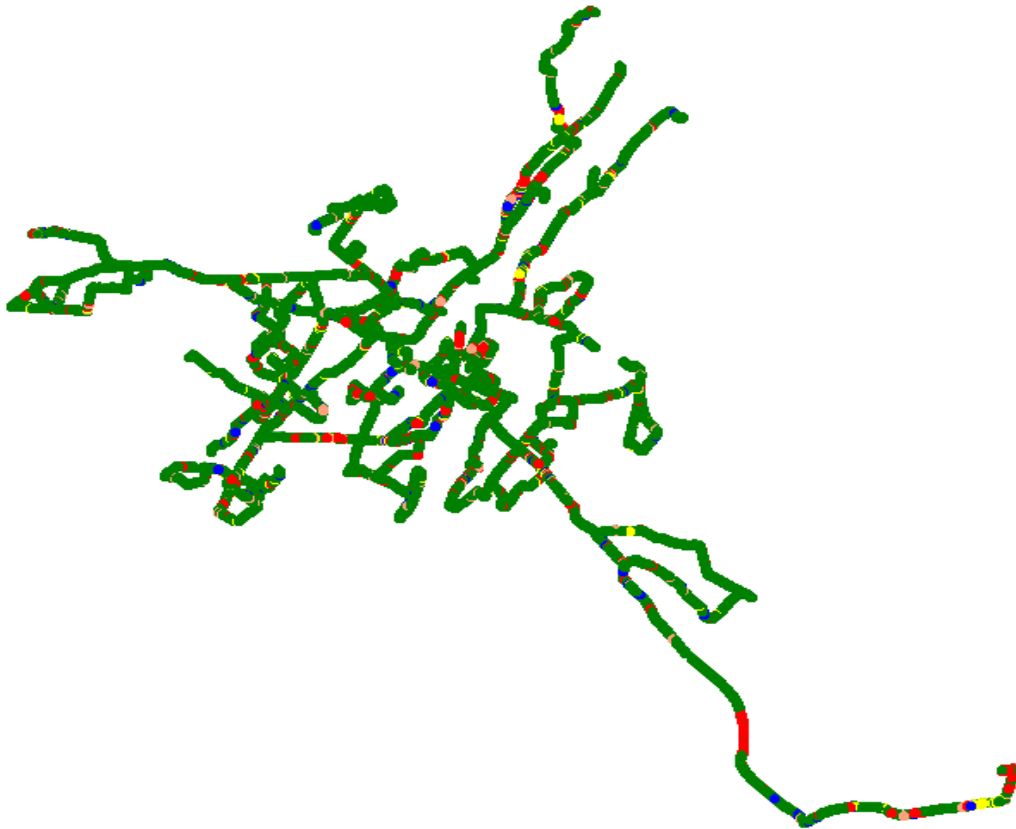
Overall Rx Quality	# Samples	% PDF	Legends
(Min, ≤ 2)	29527	87	
(2, ≤ 3)	1996	6	
(3, ≤ 4)	1176	3	
(4, ≤ 5)	577	2	
(5, $\leq \text{Max}$)	824	2	
Total	34100	100	

Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -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	94.8



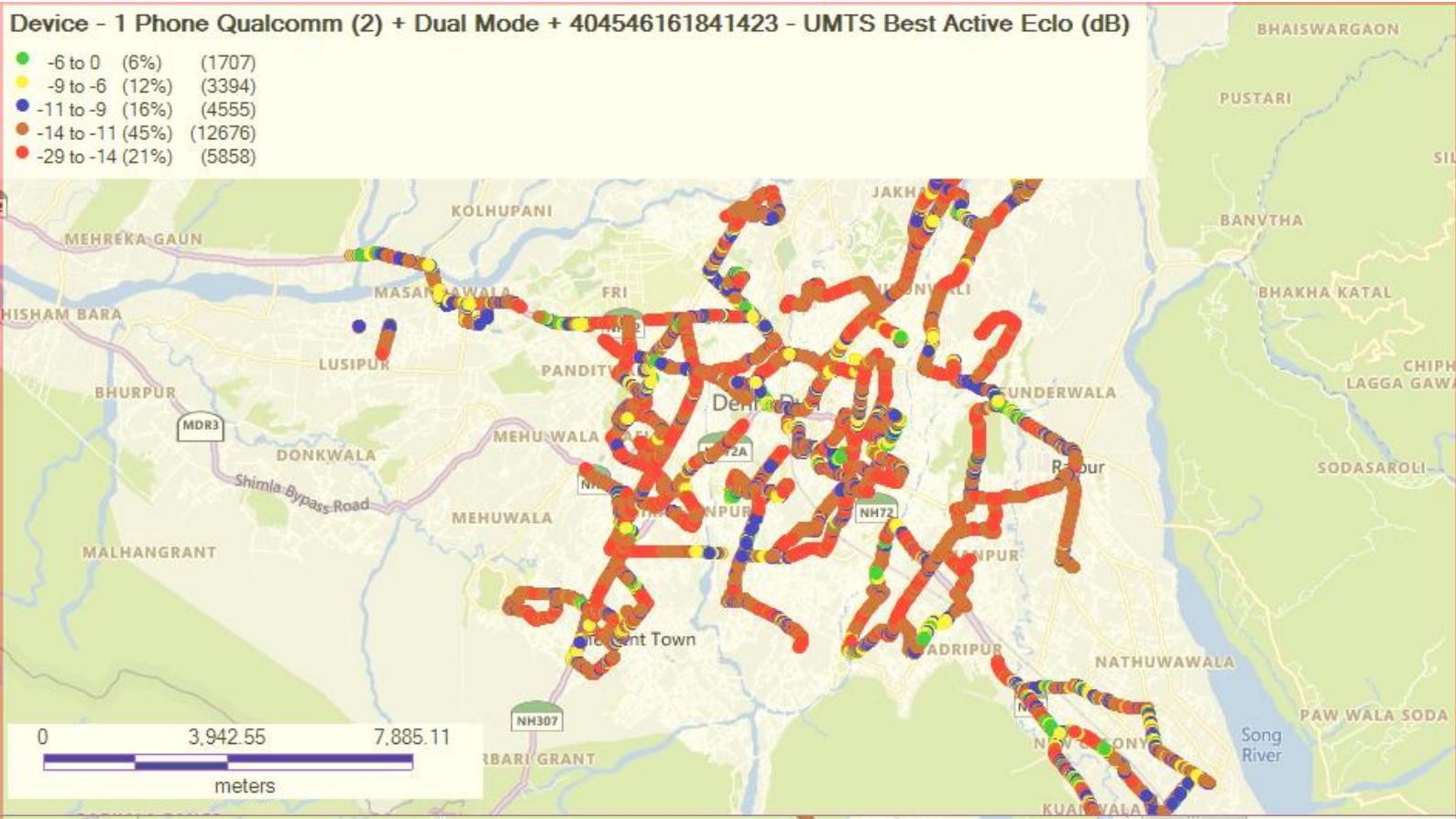
Overall Rx Quality	# Samples	% PDF	Legends
(Min, ≤ 2)	5893470	88	
(2, ≤ 3)	108855	2	
(3, ≤ 4)	117559	2	
(4, ≤ 5)	124363	2	
(5, $\leq \text{Max}$)	433328	6	
Total	7677575	100	

Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -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	79



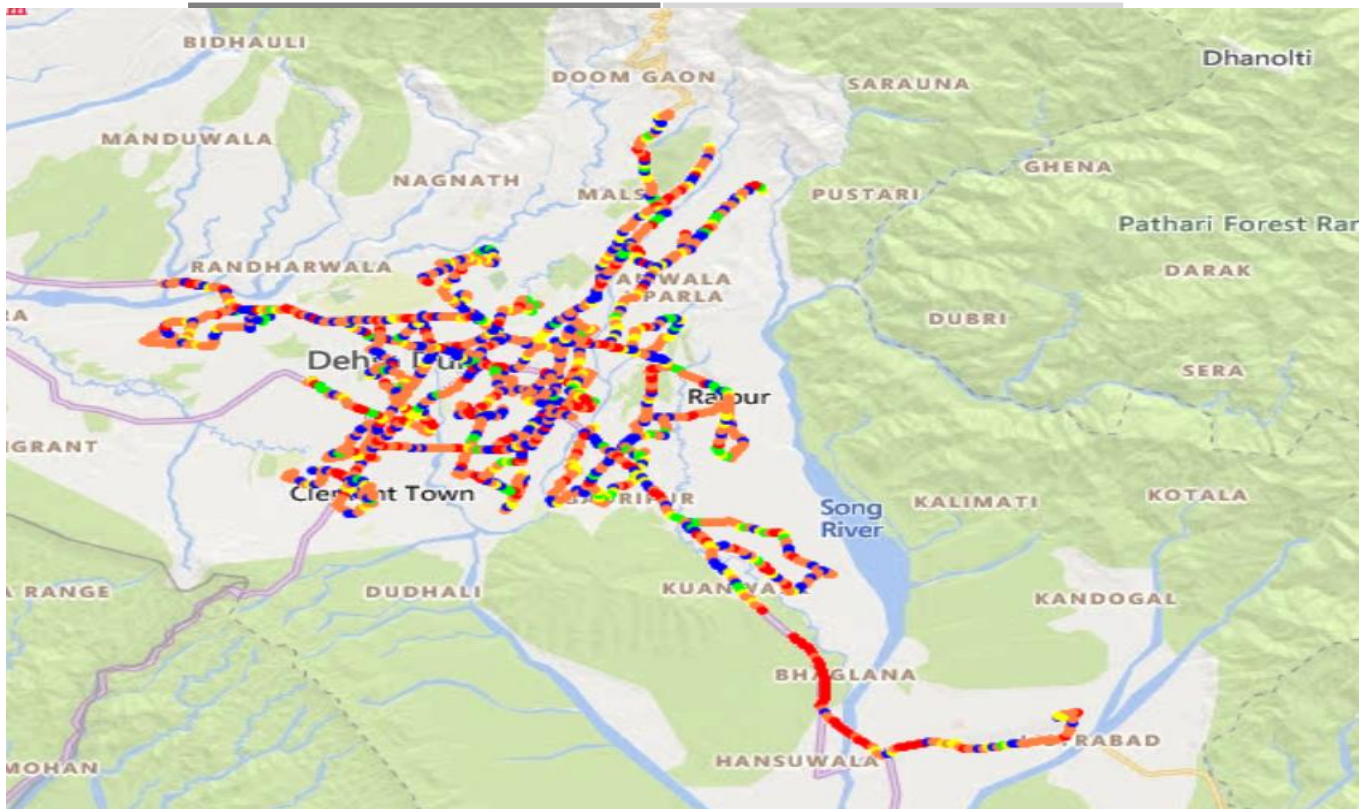
Overall Ec/No	# Samples	% PDF	Legends
(Max, ≤ -6)	1707	6	
(-6, ≤ -9)	3394	12	
(-9, ≤ -11)	4555	16	
(-11, ≤ -14)	12676	45	
(-14, \leq Min)	5858	21	
Total	28190	100	






Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -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 %
VoLTE	86



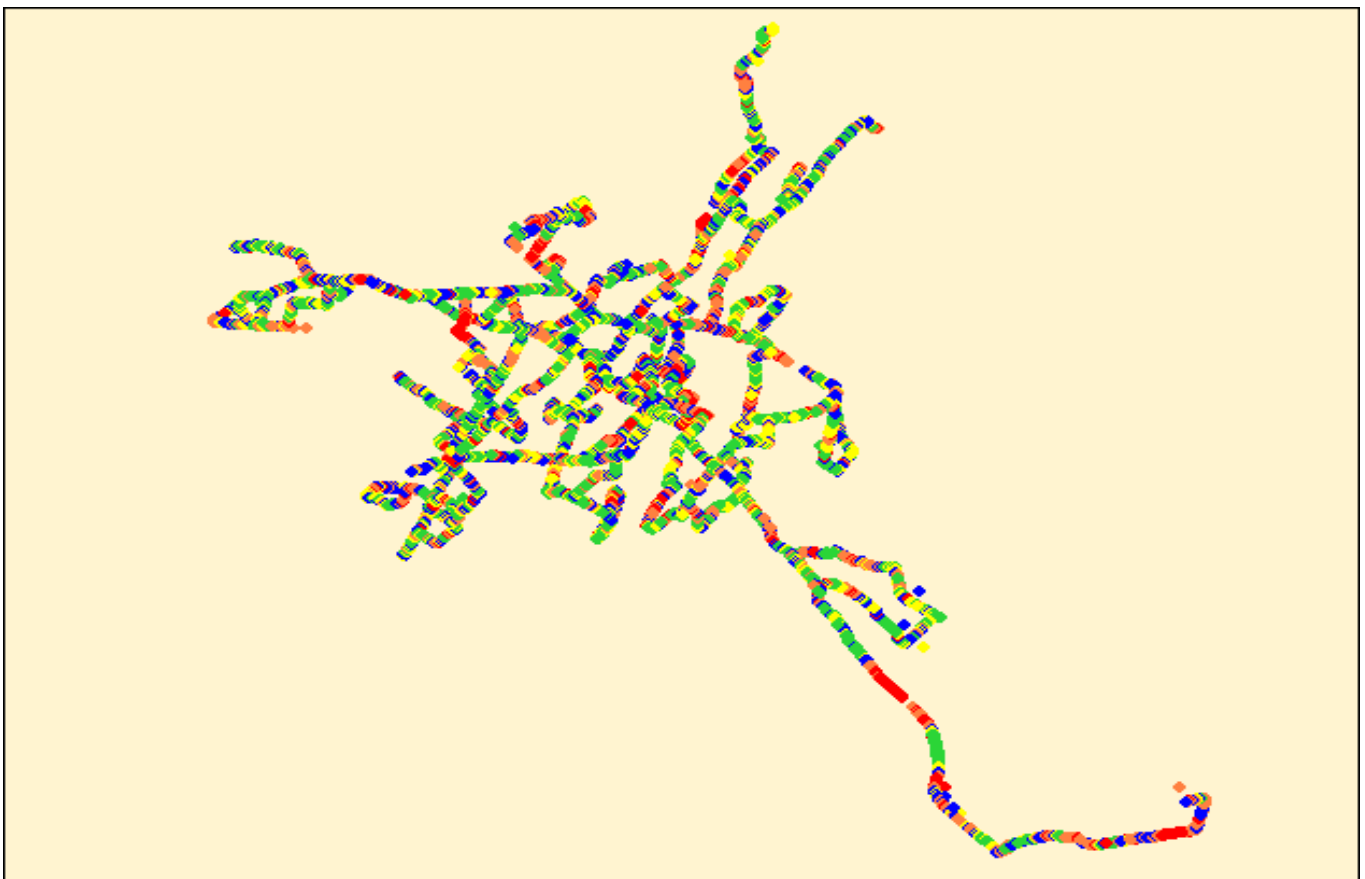
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	4868	13%	
(0, ≤ 5)	16717	47%	
(5, ≤ 10)	8137	23%	
(10, ≤ 15)	3739	11%	
(15, $\leq \text{Max}$)	2145	6%	
Total	35606		

Quality Details

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	97.47%



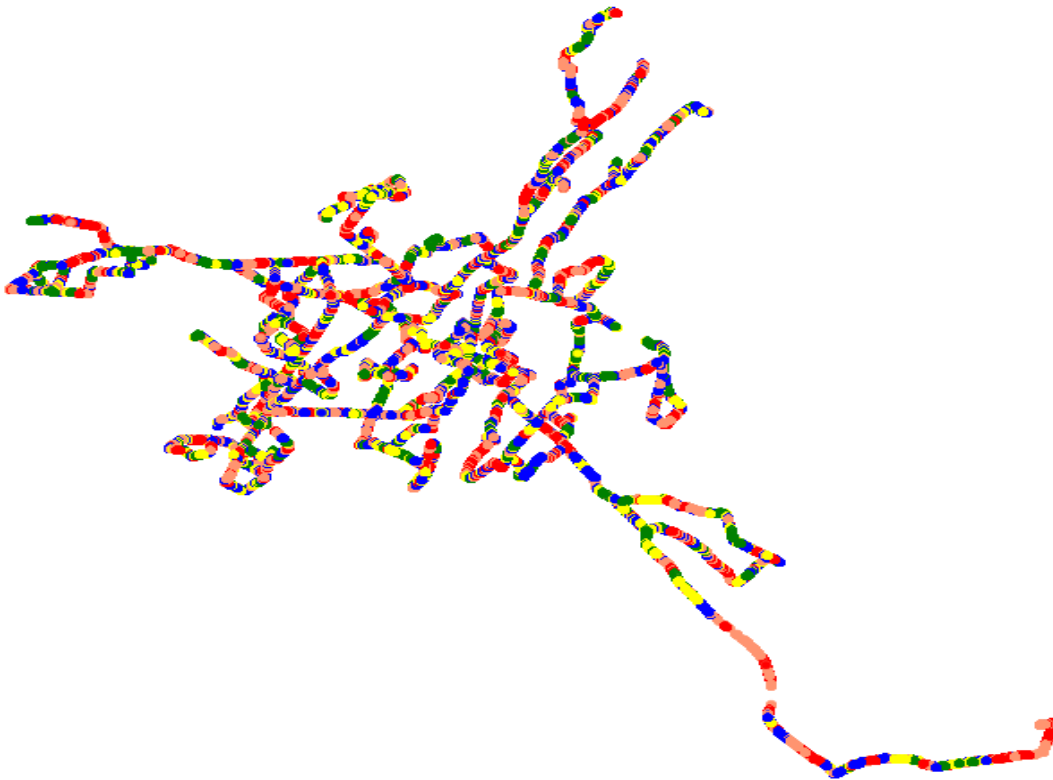
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	1559	2.53%	Red
(0, ≤ 5)	10786	17.50%	Orange
(5, ≤ 10)	13711	22.24%	Blue
(10, ≤ 15)	14402	23.37%	Yellow
(15, $\leq \text{Max}$)	21179	34.36%	Green
Total	61637		

Quality Details

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- VIL

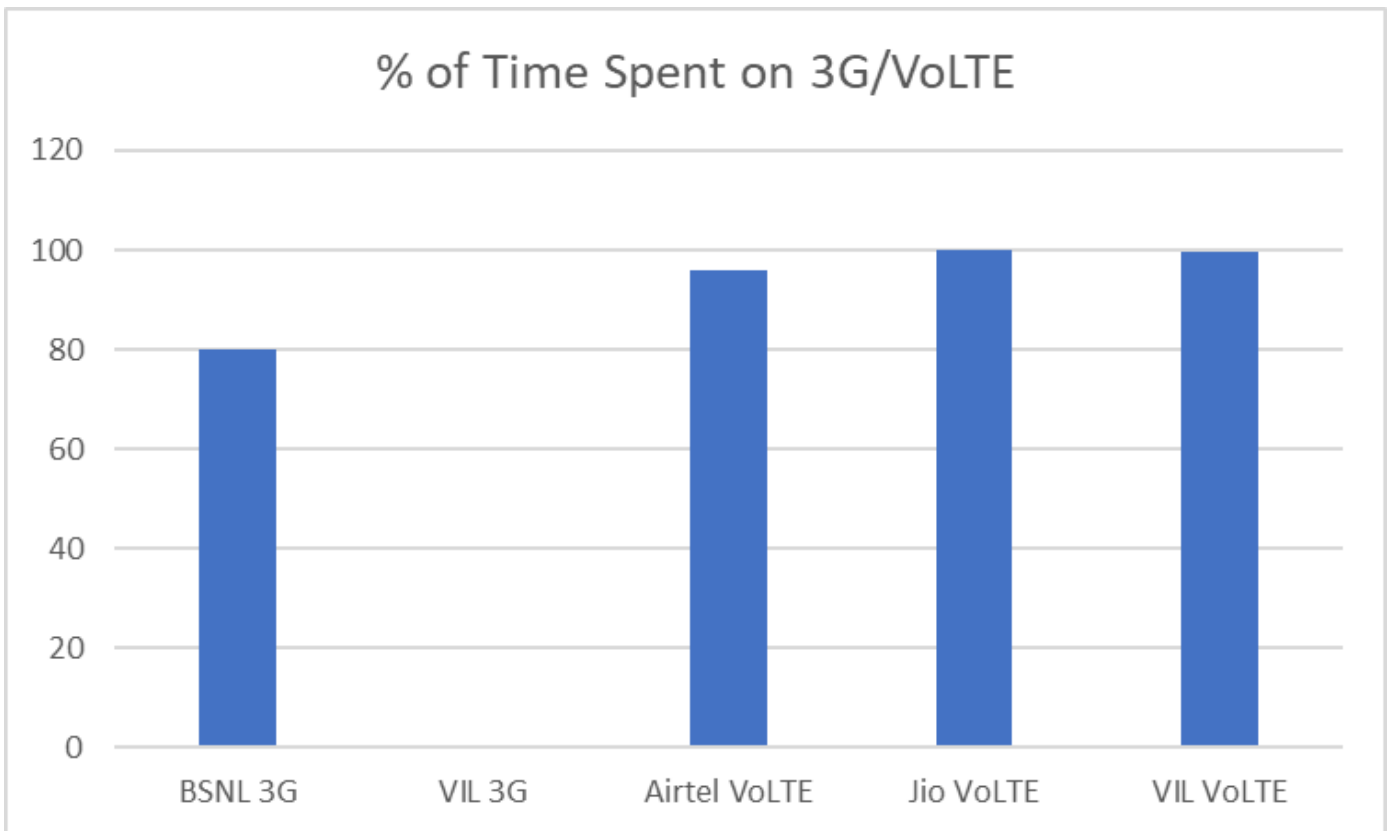
Technology	Rx Quality %
VoLTE	84.5



Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	3305	11	Red
(0, ≤ 5)	7616	27	Orange
(5, ≤ 10)	8282	29	Blue
(10, ≤ 15)	5350	19	Yellow
(15, $\leq \text{Max}$)	4010	14	Green
Total	28563	100	

Technology Details

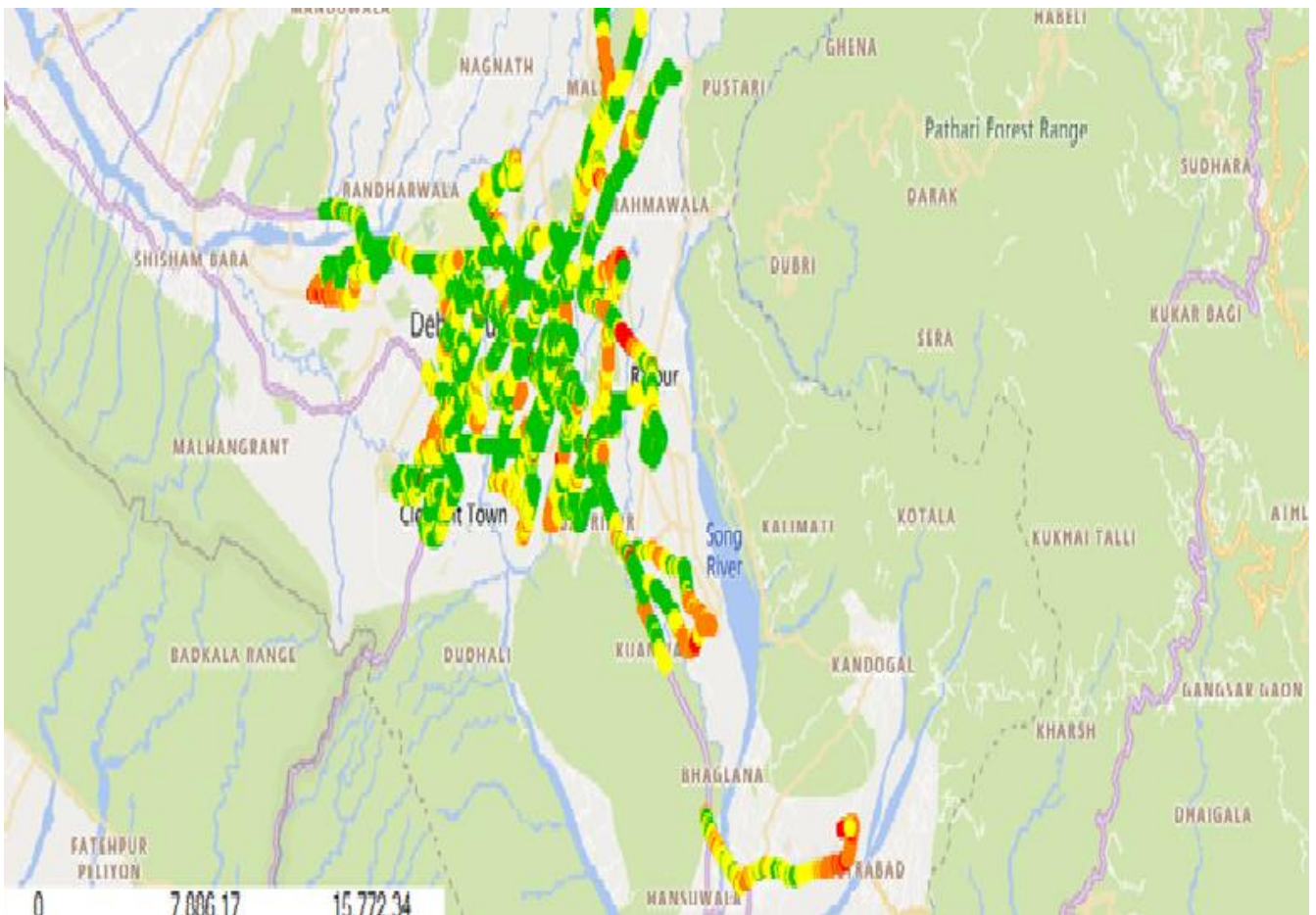
TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	80
VIL 3G	NA
Airtel VoLTE	95.92
Jio VoLTE	100
VIL VoLTE	99.61



Technology Details

TSP- BSNL

Technology	% of Time Spent on
3G	80
VoLTE	NA



TSP- VIL

Technology	% of Time Spent on
3G	NA
VoLTE	99.61

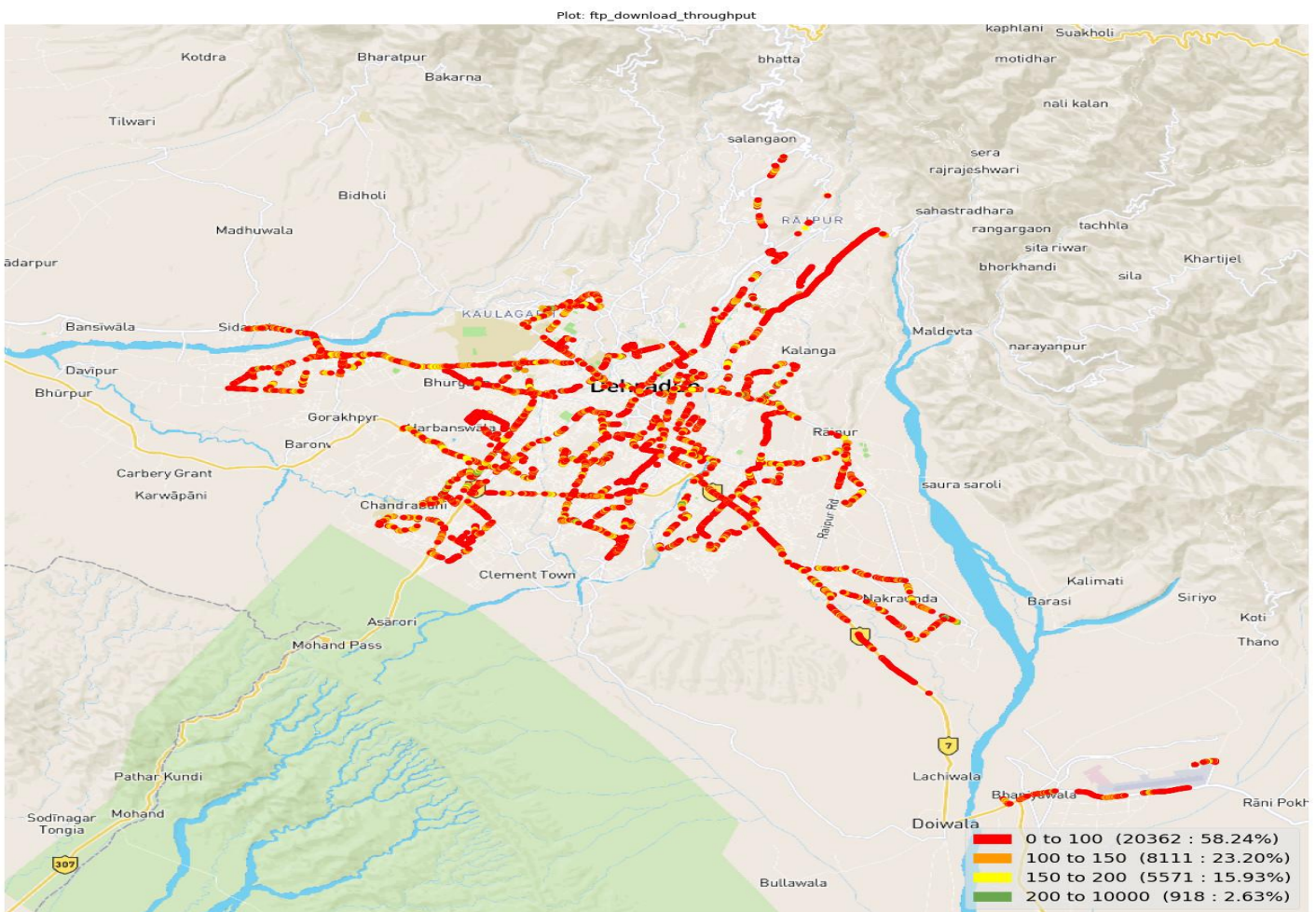


Dynamic Data Test

TSP- Airtel

Data Statistics - Dynamic data testing - 340 Kms

Data KPIs - Overall	2G
Download Throughput (Kbps)	79.29



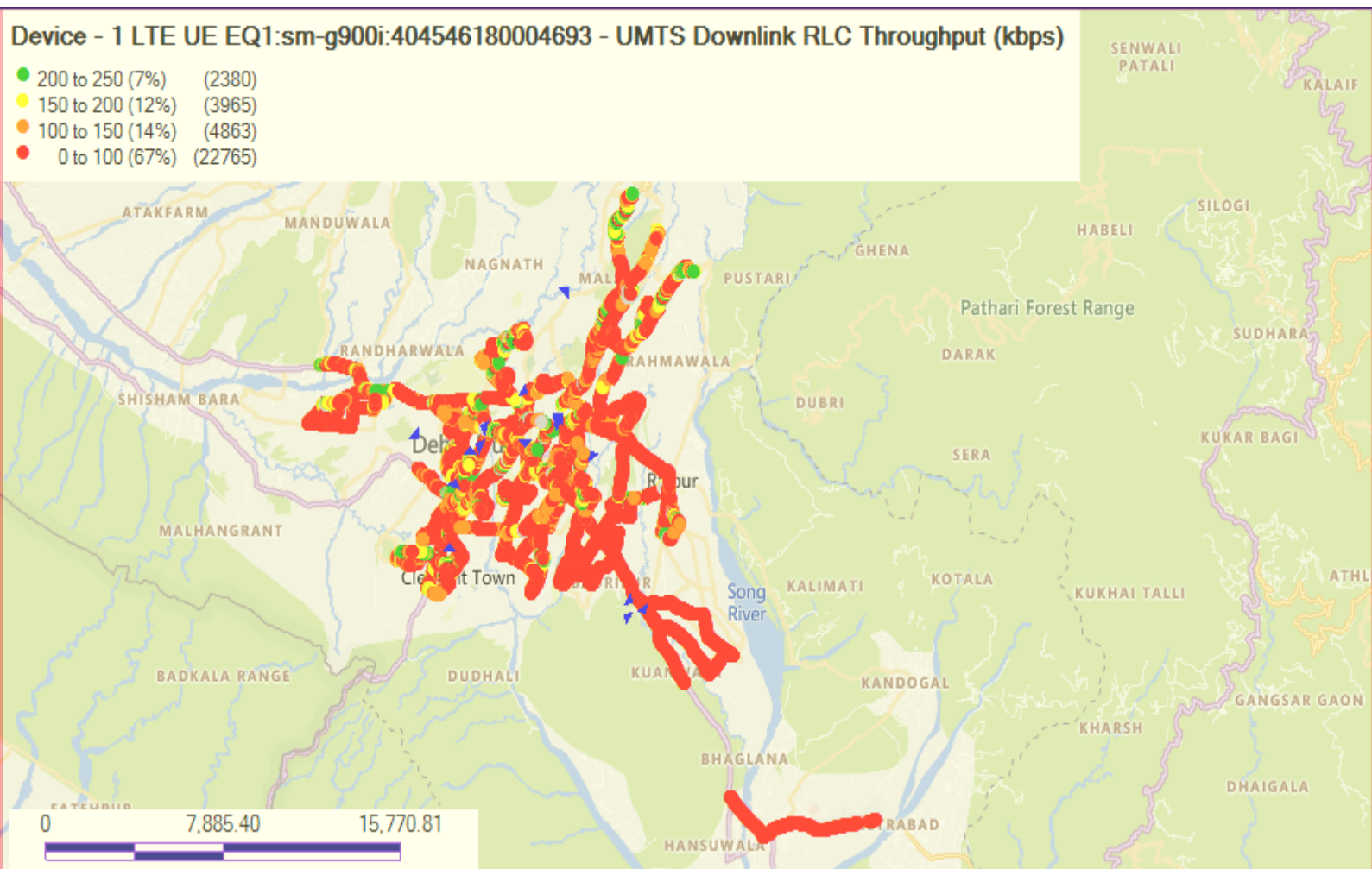
DL throughput	No of Sample	%	Legends
< 100 Kbps	20362	58.2	
100-150Kbps	8111	23.2	
150-200Kbps	5571	15.9	
>200Kbps	918	2.6	

Dynamic Data Test

TSP- BSNL

Data Statistics - Dynamic data testing -340 Kms

Data KPIs - Overall	2G
Download Throughput (Kbps)	87.28



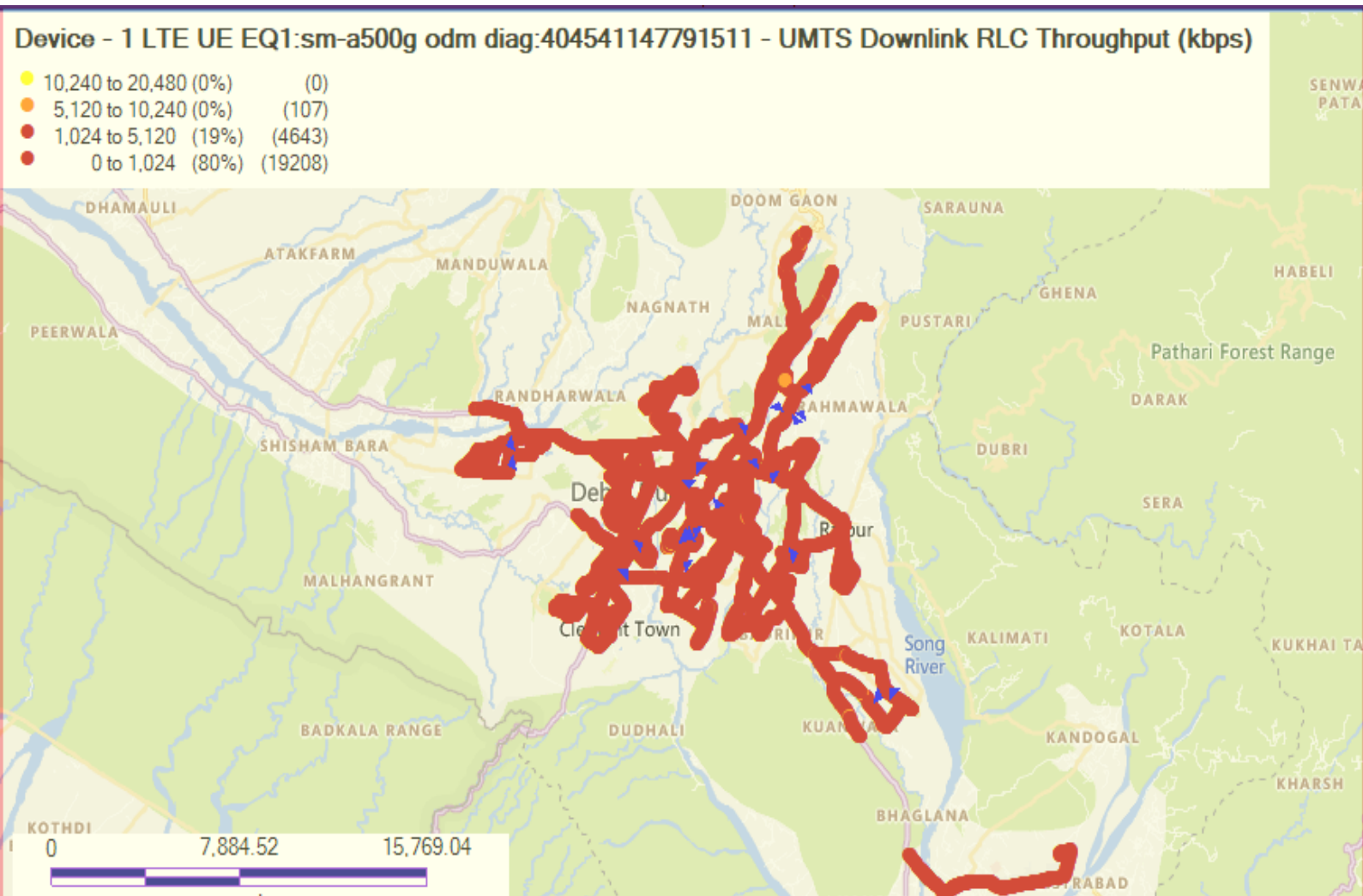
DL throughput	No of Sample	%	Legends
< 100 Kbps	22765	67	
100-150Kbps	4863	14	
150-200Kbps	3965	12	
>200Kbps	2380	7	

Dynamic Data Test

TSP-BSNL

Data Statistics - Dynamic data testing - 340 Kms

Data KPIs - Overall	3G
Download Throughput (Mbps)	1.46Mbps



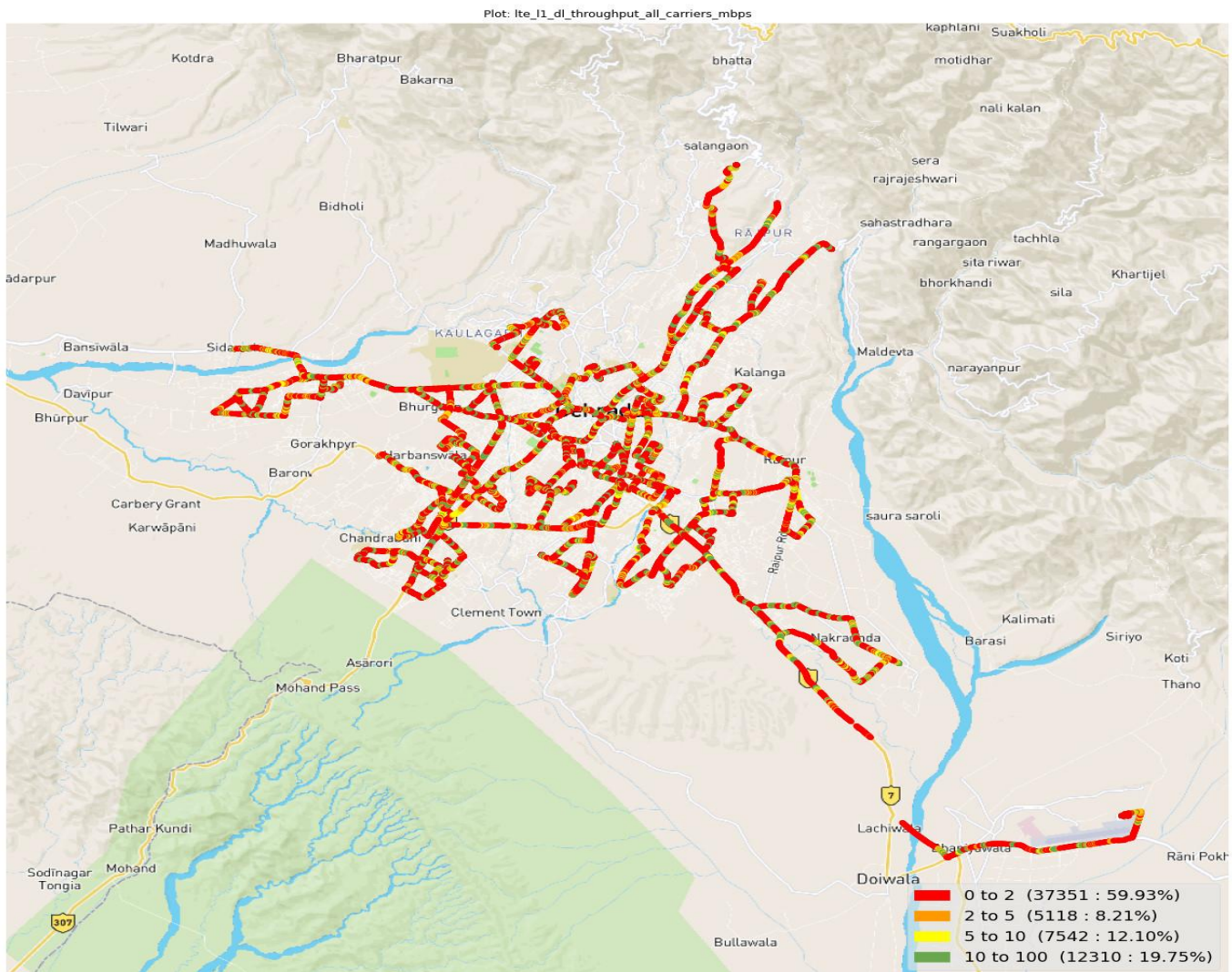
DL throughput	No of Sample	%	Legends
< 1 Mbps	19208	80	
1-5 Mbps	4643	19	
5-10 Mbps	107	1	
>10Mbps	0	0	

Dynamic Data Test

TSP- Airtel

Data Statistics - Dynamic data testing - 340 Kms

Data KPIs - Overall	LTE
Download Throughput (Mbps)	9.065

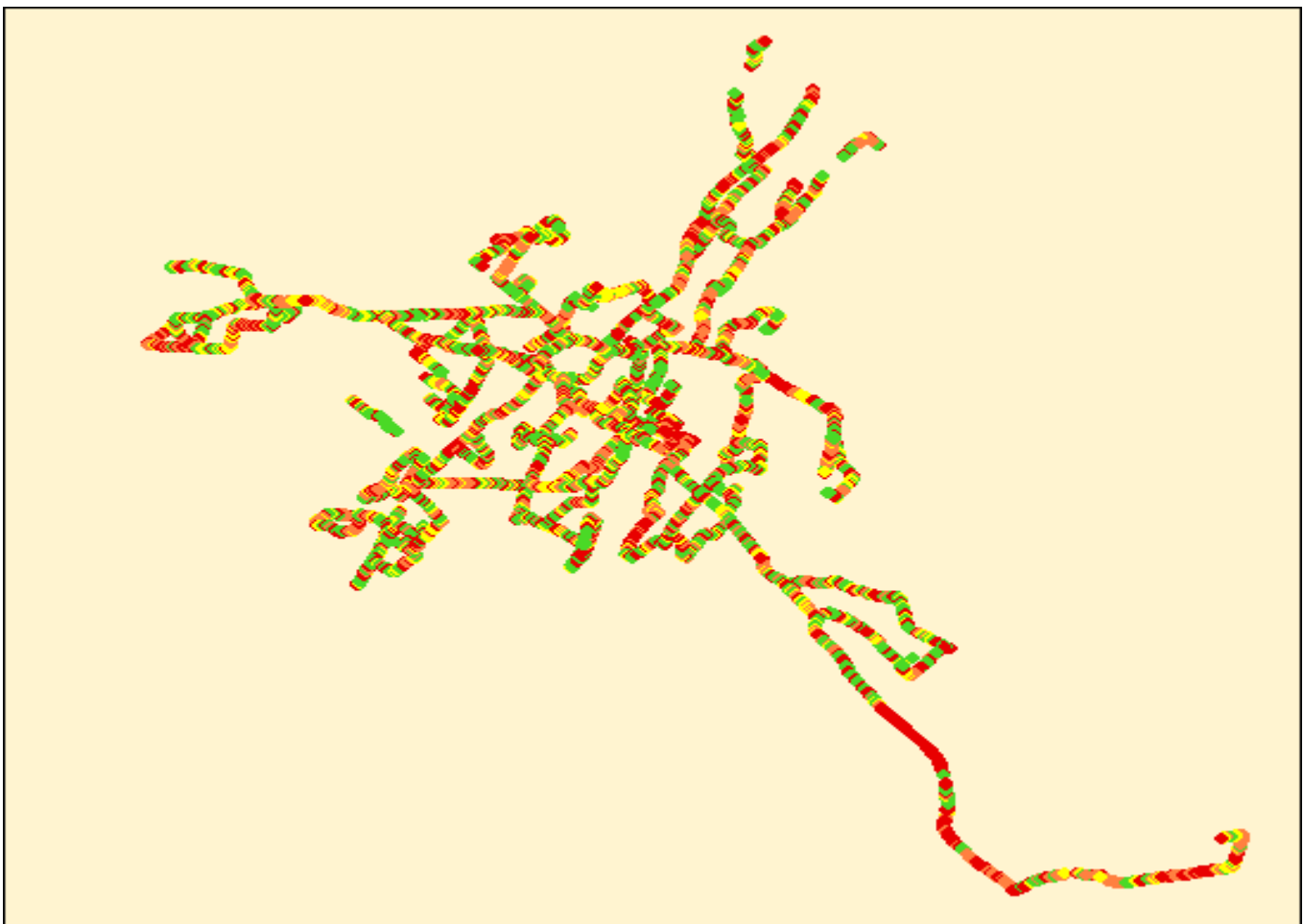


DL throughput	No of Sample	%	Legends
< 2Mbps	37351	59.9	
2-5 Mbps	5118	8.2	
5-10 Mbps	7542	12.1	
>10Mbps	12310	19.8	

TSP- JIO

Data Statistics - Dynamic data testing - 340 Kms

Data KPIs - Overall	LTE
Download Throughput (Mbps)	13.57

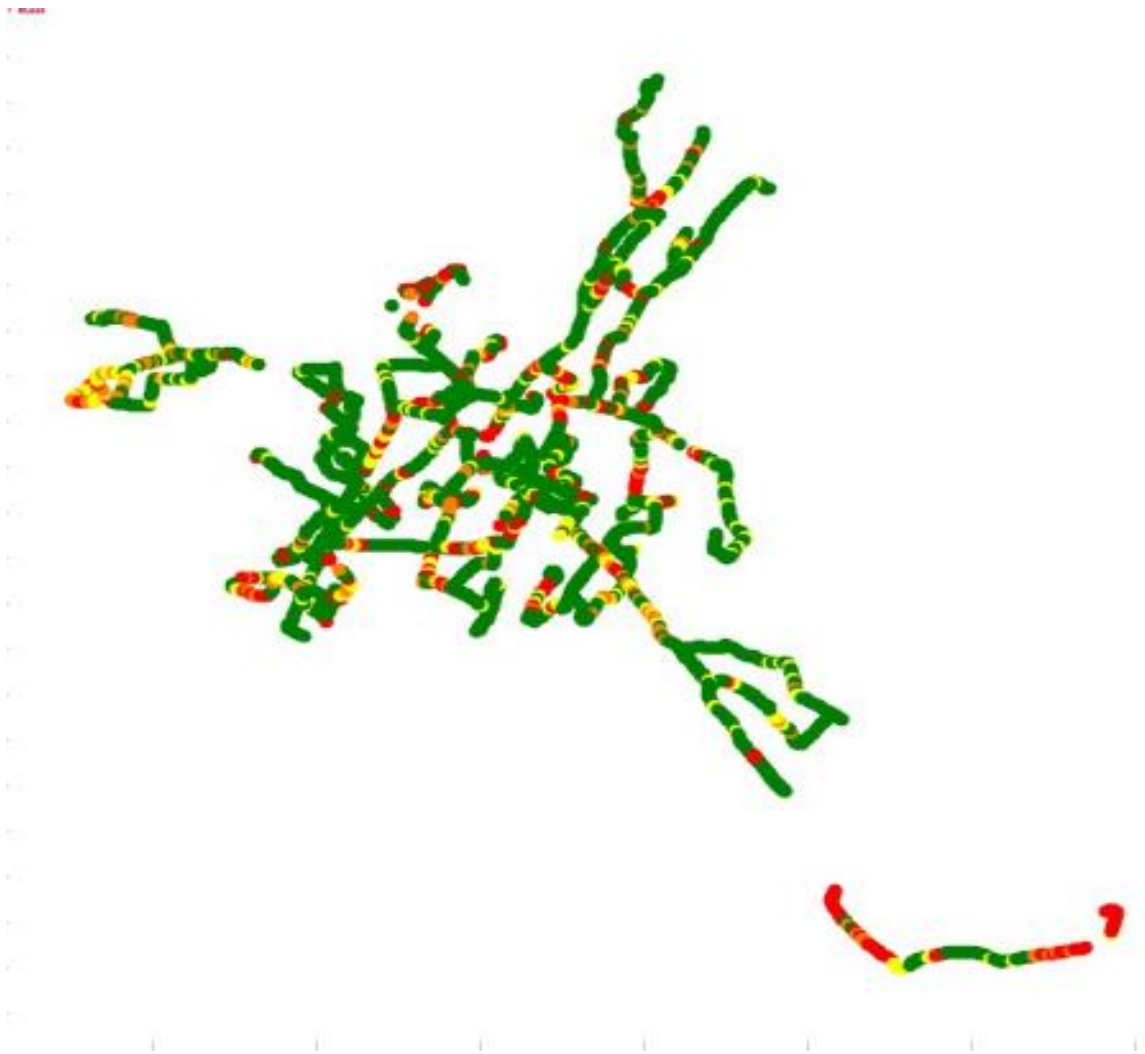


DL throughput	No of Sample	%	Legends
< 2Mbps	12755	24.44	Red
2-5 Mbps	11371	21.78	Orange
5-10 Mbps	10072	19.30	Yellow
>10Mbps	18001	34.49	Green

TSP- VIL

Data Statistics - Dynamic data testing - 340Kms

Data KPIs - Overall	LTE
Download Throughput (Mbps)	20



DL throughput	No of Sample	%	Legends
< 2Mbps	3132	12	Red
2-5 Mbps	1949	8	Orange
5-10 Mbps	2925	11	Yellow
>10Mbps	17600	69	Green

Data testing on hotspots using traимyspeed app

Hotspot		Airtel	BSNL	JIO	VIL
1. Uttarakhand Technical university	2G download in Mbps	0.18	0.24	NA	0.11
	2G upload in Mbps	0.11	0.15	NA	0.13
	3G download in Mbps	NA	10.31	NA	NA
	3G upload in Mbps	NA	1.89	NA	NA
	4G download in Mbps	21.05	NA	17.68	23.4
	4G upload in Mbps	27.34	NA	9.43	12.6
2. ISBT	2G download in Mbps	0.10	0.13	NA	0.24
	2G upload in Mbps	0.08	0.17	NA	0.14
	3G download in Mbps	NA	2.31	NA	NA
	3G upload in Mbps	NA	1.83	NA	NA
	4G download in Mbps	21.38	NA	24.04	21.2
	4G upload in Mbps	24.22	NA	20.42	10.7

Data testing on hotspots using traимyspeed app

Hotspot		Airtel	BSNL	JIO	VIL
3. Railway station	2G download in Mbps	0.15	0.17	NA	0.18
	2G upload in Mbps	0.24	0.18	NA	0.6
	3G download in Mbps	NA	1.54	NA	NA
	3G upload in Mbps	NA	1.82	NA	NA
	4G download in Mbps	15.25	NA	22.67	25.5
	4G upload in Mbps	13.70	NA	5.67	13.8
4. Clock Tower	2G download in Mbps	0.15	0.22	NA	0.34
	2G upload in Mbps	0.24	0.23	NA	0.13
	3G download in Mbps	NA	1.69	NA	NA
	3G upload in Mbps	NA	1.79	NA	NA
	4G download in Mbps	31.47	NA	48.35	27.4
	4G upload in Mbps	6.76	NA	7.81	12.6

Data testing on hotspots using traимyspeed app

Hotspot		Airtel	BSNL	JIO	VIL
5. Vidhan Sabha	2G download in Mbps	0.12	0.22	NA	0.21
	2G upload in Mbps	0.09	0.06	NA	0.14
	3G download in Mbps	NA	1.92	NA	NA
	3G upload in Mbps	NA	1.08	NA	NA
	4G download in Mbps	49.49	NA	28.43	19.8
	4G upload in Mbps	2.60	NA	43.08	9.4
6. Airport	2G download in Mbps	0.09	0.12	NA	0.1
	2G upload in Mbps	0.12	0.11	NA	0.3
	3G download in Mbps	NA	4.00	NA	NA
	3G upload in Mbps	NA	1.29	NA	NA
	4G download in Mbps	26.63	NA	19.42	3.8
	4G upload in Mbps	20.78	NA	3.93	1.3