Operator Assisted Drive Test Report

Chhindwara – Parasia Highway
12/06/2025
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 Chhindwara to Parasia Highway from 9:00 AM to 8:00 PM. The drive test covered drive route of around 29 KMs.

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

Key Performance Indicators:

KPI	Benchmark	Observations
Drop call rate %	≤2%	All TSPs achieved the benchmark except BSNL in 2G,3G and VoLTE
CSSR %	≥98 %	All TSPs achieved the benchmark except BSNL in 2G,3G and VoLTE
Mobility HOSR %	≥95%	All TSPs achieved the benchmark except BSNL in 2G,3G and VoLTE
Good RX Quality %	≥95%	All TSPs achieved the benchmark except BSNL in 2G,3G and Airtel 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, 4G & 5G). 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 **180-sec** duration with a wait time of **10 sec** between calls in all technologies.
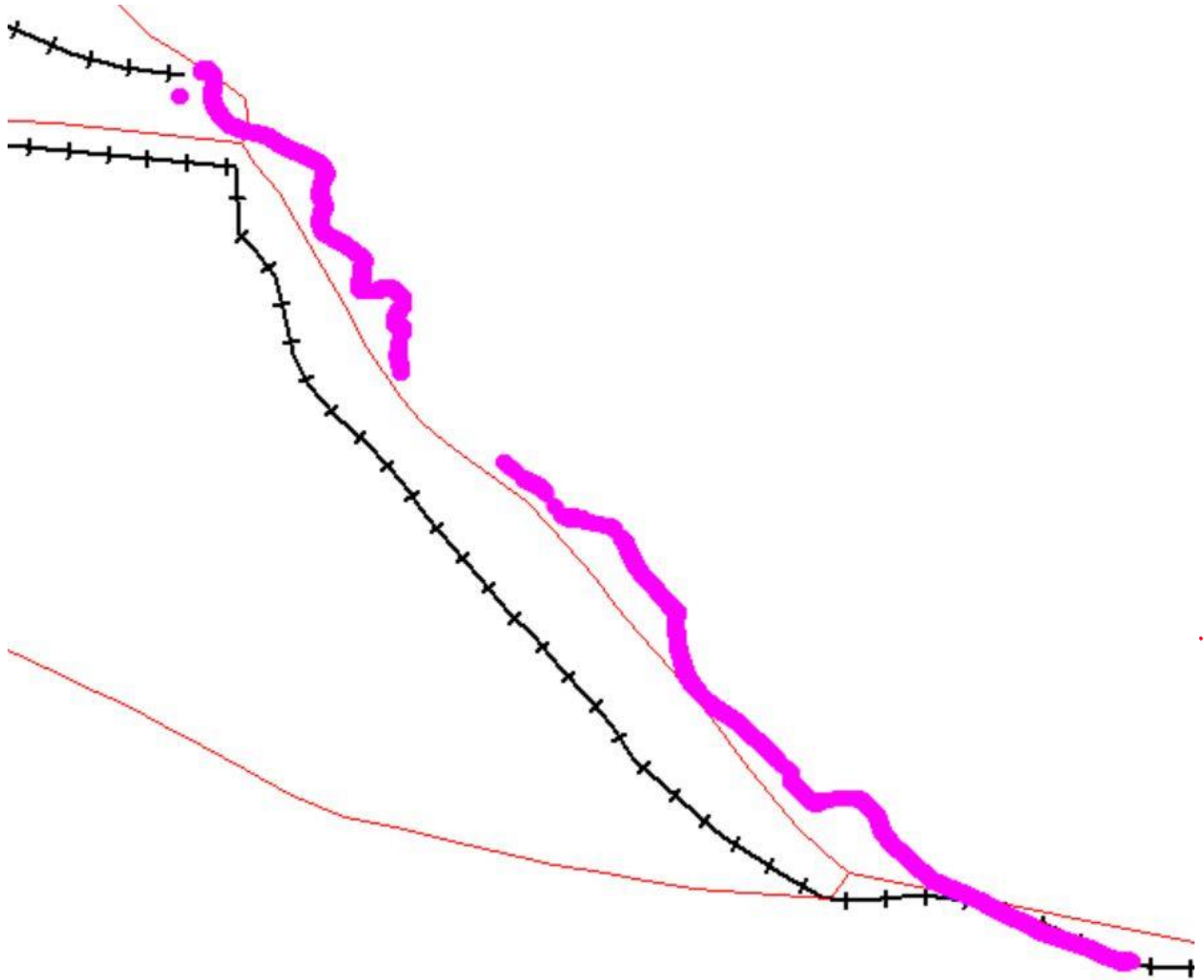
Data Tests:
Dynamic data – repeat data file download (to check throughput on the entire route)

i.   3G – measurement – UE in 3G   File Size- 20MB
ii. 4G – measurement – UE in LTE File Size- 40MB
iii. 5G – measurement – UE in 5G File Size- 200MB

Voice & Dynamic Data Test Drive Route

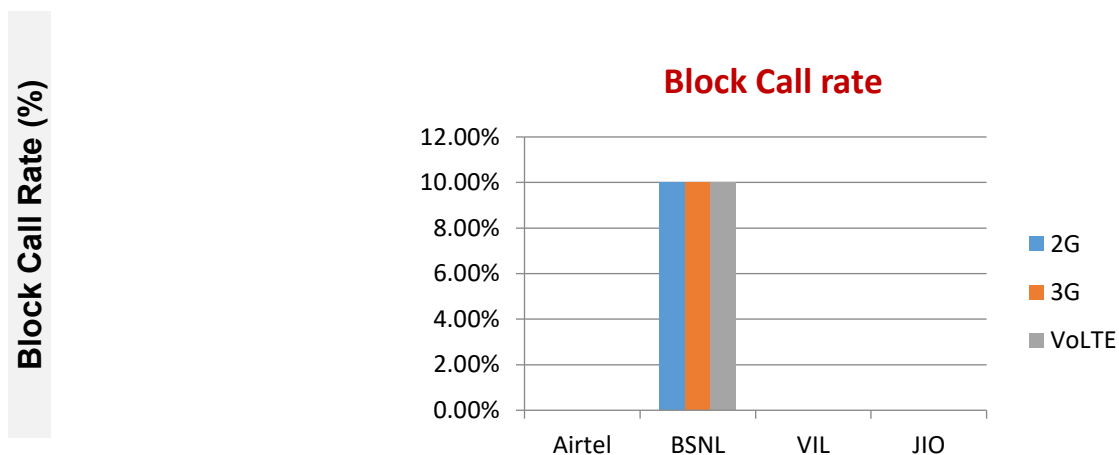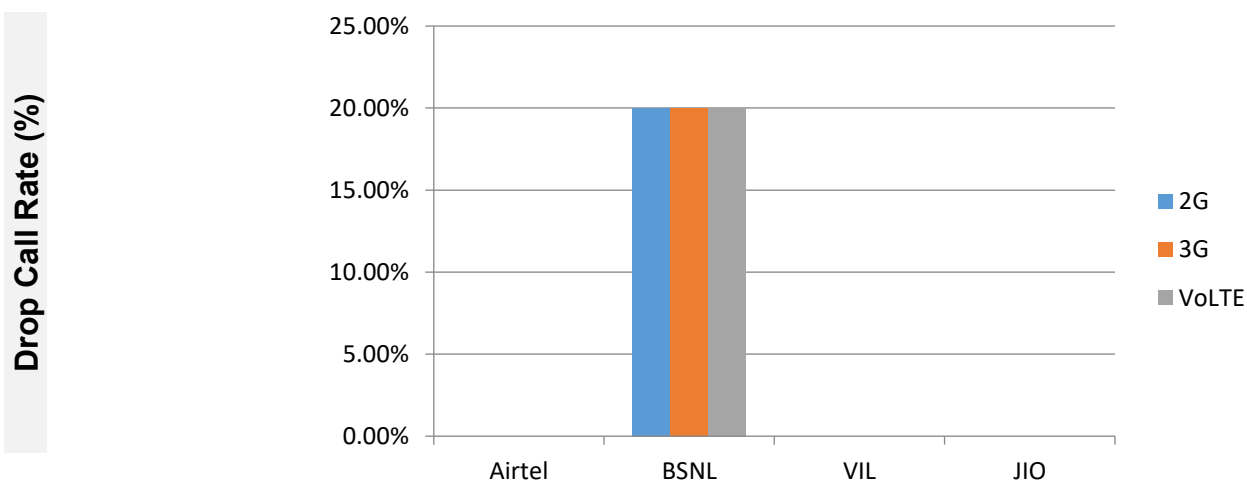| List of important area covered during the drive test |
|---|
| Chhindwara HW |
| Gangiwada locality |
| Gangiwada toll Plaza |
| Kosmi arera |
| Khircha doh ghat |
| Khircha doh city arera |
| |

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

Drop Call 2G

Block Call rate

KPIs	2G			3G	VoLTE			
	Airtel	BSNL	VIL	BSNL	Airtel	BSNL	RJIL	VIL
Drop Call Rate %	0	20	0	20	0	20	0	0
Block Call Rate %	0	10	0	10	0	10	0	0

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

Voice Calls

Coverage

a) Percentage of coverage samples for 2G **≥** -85 dBm.

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	51.37	53.22	72.09

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

TSPs	3G
	BSNL
Coverage %	50.35

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

TSPs	VoLTE			
	Airtel	BSNL	Jio	VIL
Coverage %	91.86	85.2	98.76	94.21

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

TSPs	3G	VoLTE			
	BSNL	Airtel	BSNL	JIO	VIL
Time Spent on 3G/4G %	13.11	100	75.75	100	100

Data Services Dynamic

Dynamic Data -Download Throughput was tested.

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

■ Avg Download Throughput 4G   ■ Avg Download Throughput 3G

Dynamic Data Avg. Download Throughput (Mbps)
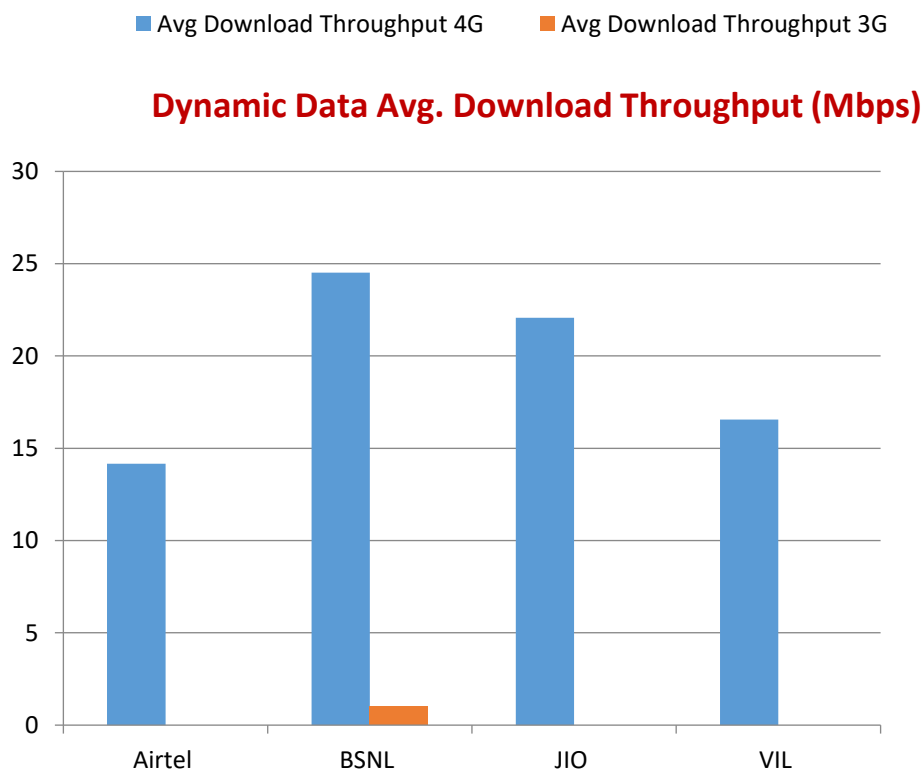
TSP	Airtel	BSNL	JIO	VIL
Average Download throughput- 3G In Mbps	-	1.0	-	-
Average Download throughput-LTE in Mbps	14.17	24.52	22.07	16.56

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Summary

TSP (For 2G)	Airtel	BSNL	VIL
Call attempts	17	11	16
Block call rate %	0	10	0
CSSR %	100	90	100
Drop call rate %	0	20	0
Mobility HOSR %	100	83.33	100
RX Quality %	95.98	93.82	98.36
Average CST Sec	3.15	0.75	2.4

TSP (For 3G)	BSNL
Call attempts	11
Block call rate %	10
CSSR %	90.9
Drop call rate %	20
Mobility HOSR %	75
RX Quality %	94.7
Average CST (Sec)	0.82

TSP (For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	18	11	12	17
Block call rate %	0	10	-	0
CSSR %	100	90.9	100	100
Drop call rate %	0	20	0	0
Mobility HOSR %	100	75	100	100
RX Quality %	88.34	97.12	99.17	97.6
Average CST(Sec)	1.19	2.17	1.39	0.55

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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 ≥ -85 dBm, RSCP is ≥ -90 dBm & RSRP ≥ -110dBm. The details are as follows.
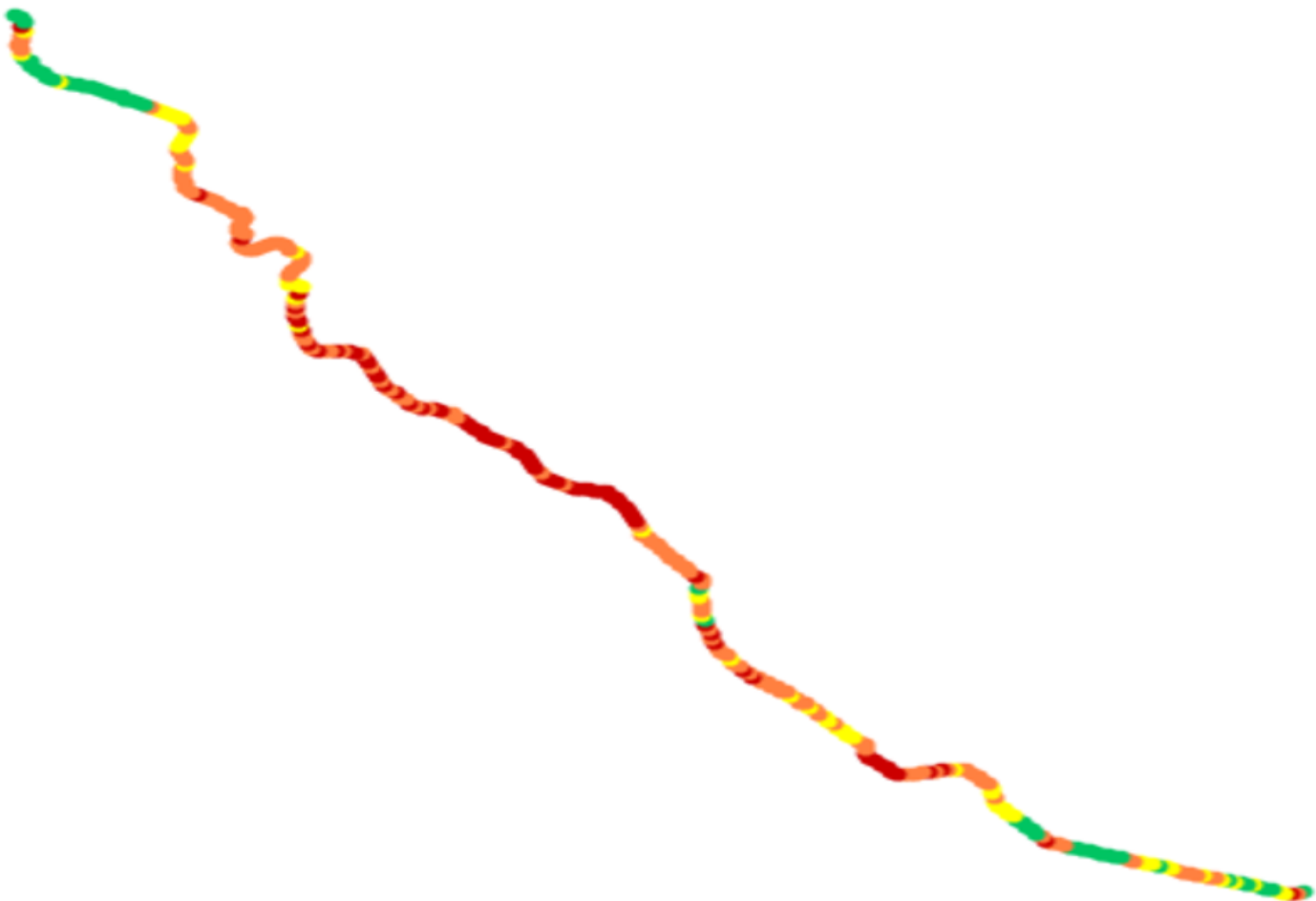
TSP	Coverage Rate %
Airtel 2G	51.37
BSNl 2G	53.22
VIL 2G	72.9
BSNL 3G	50.35
Airtel VoLTE	91.86
BSNL VoLTE	85.2
Jio VoLTE	98.76
VIL VoLTE	94.21

Coverage Rate %
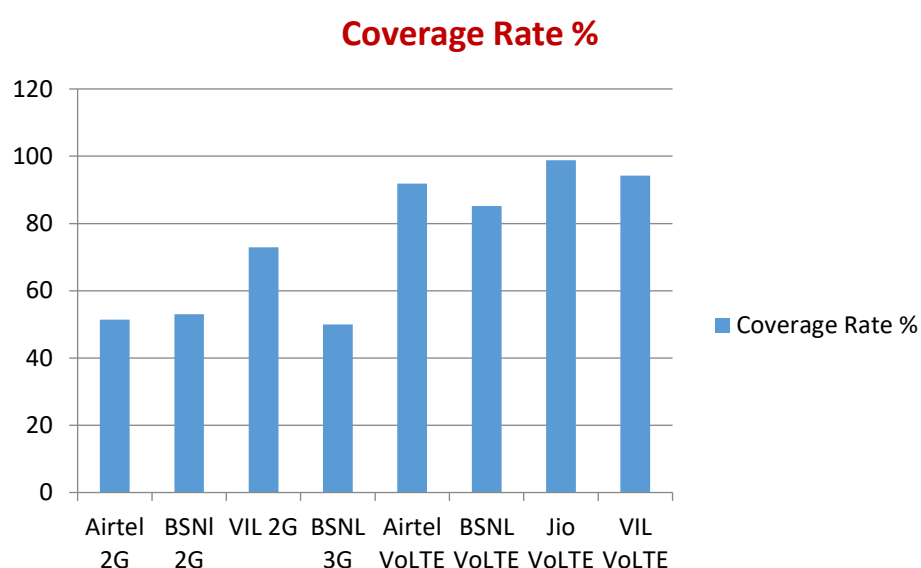
TSP-Airtel

Technology	Coverage %
2G	51.37

2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	**2305**	**34.33**	🟩
[-75, >=-85)	**1144**	**17.04**	🟨
[-85, >=-95)	**1835**	**27.33**	🟧
[-95, >=Min)	**1430**	**21.3**	🟥
Total			

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TSP-BSNL

Technology	Coverage %
2G	53.22

Legend

2G_HW_CHW_2_Parasiya RxLevSu
- ● -75 to 0 (30777)
- ● -85 to -75 (24731)
- ● -95 to -85 (22826)
- ● -120 to -95 (25979)
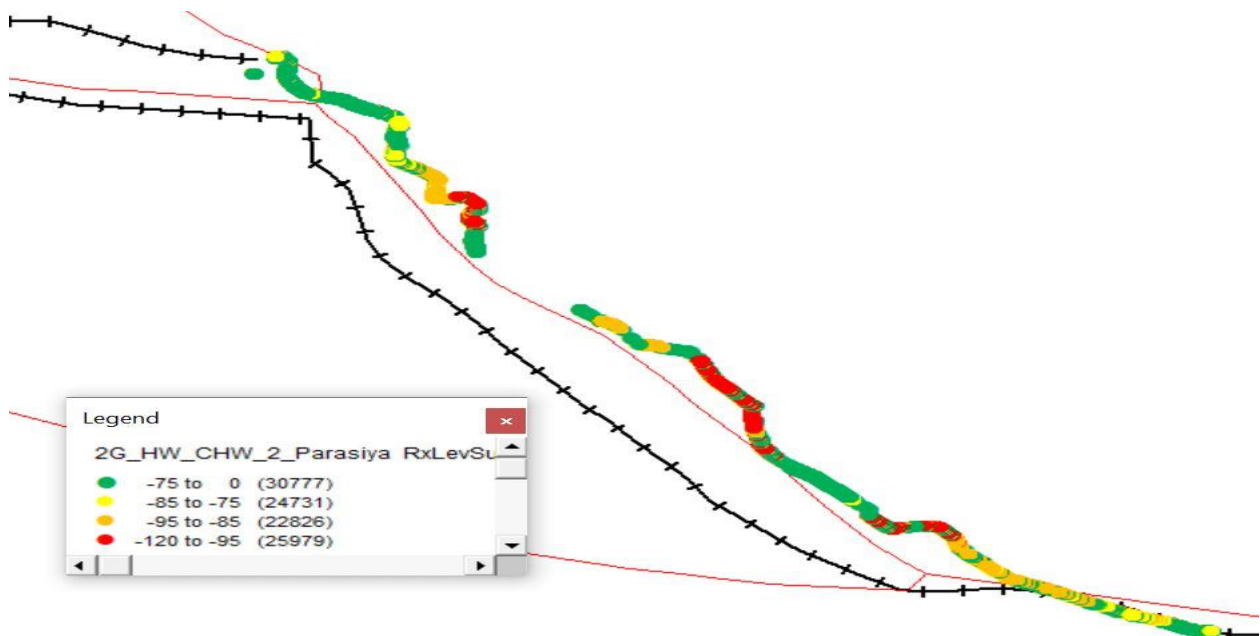
2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	**30777**	**29.51**	
[-75, >=-85)	**24731**	**23.71**	
[-85, >=-95)	**22826**	**21.88**	
[-95, >=Min)	**25979**	**24.90**	
Total	**104313**	**100**	

TSP-VIL

Technology	Coverage %
2G	72.09

RxLev Full

●	-75 to 0 (775)
●	-85 to -75 (444)
●	-95 to -85 (441)
●	-110 to -95 (31)
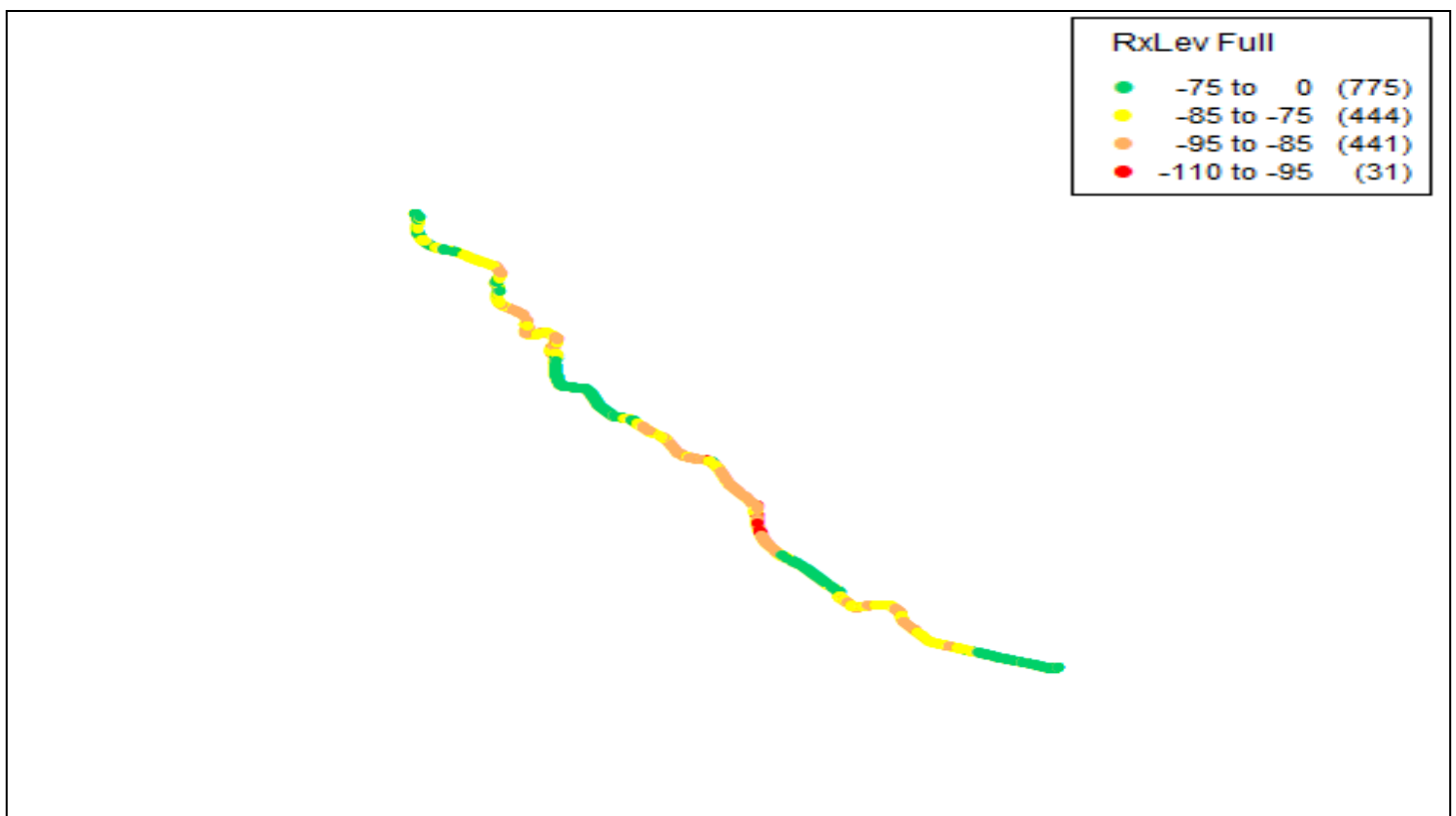
2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	775	45.83	
[-75, >=-85)	444	26.26	
[-85, >=-95)	441	26.08	
[-95, >=Min)	31	1.83	
Total	1691	100	

TSP- BSNL.

Technology	Coverage %
3G	50.35
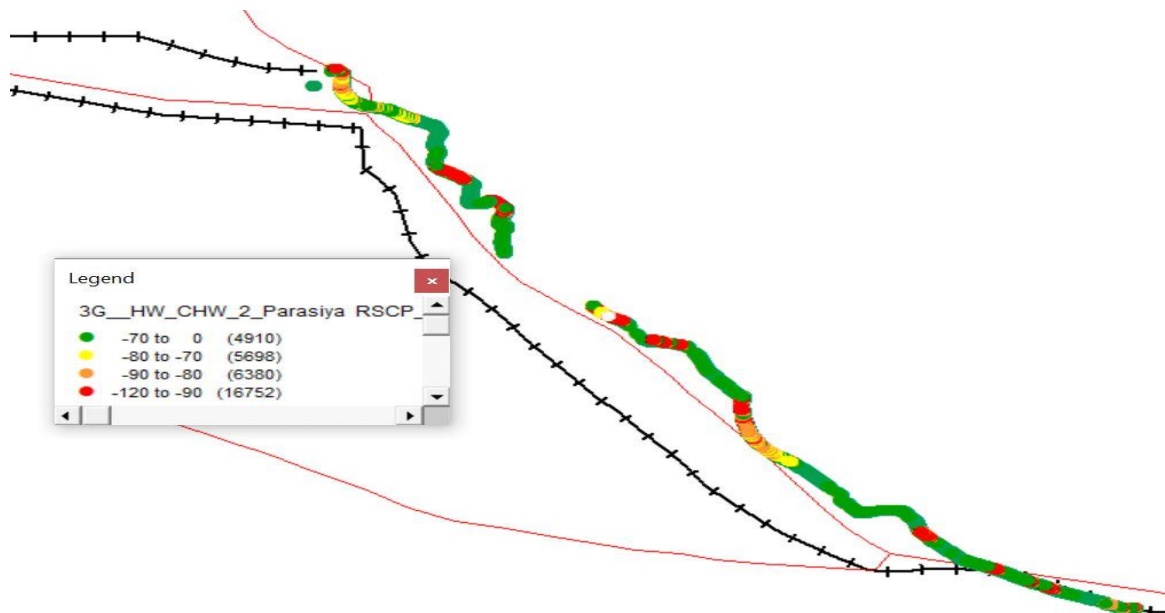
3G			
Overall RSCP	**# Samples**	**% PDF**	**Legends**
[Max, >=-70]	4910	14.55	
[-70, >=-80)	5698	16.89	
[-80, >=-90)	6380	18.91	
[-90, >=Min)	16752	49.65	
Total	33740	**100**	

[-90, >=-110)	6647
[-110, >=Min)	1427

TSP-Airtel

Technology	Coverage %
VoLTE	91.86
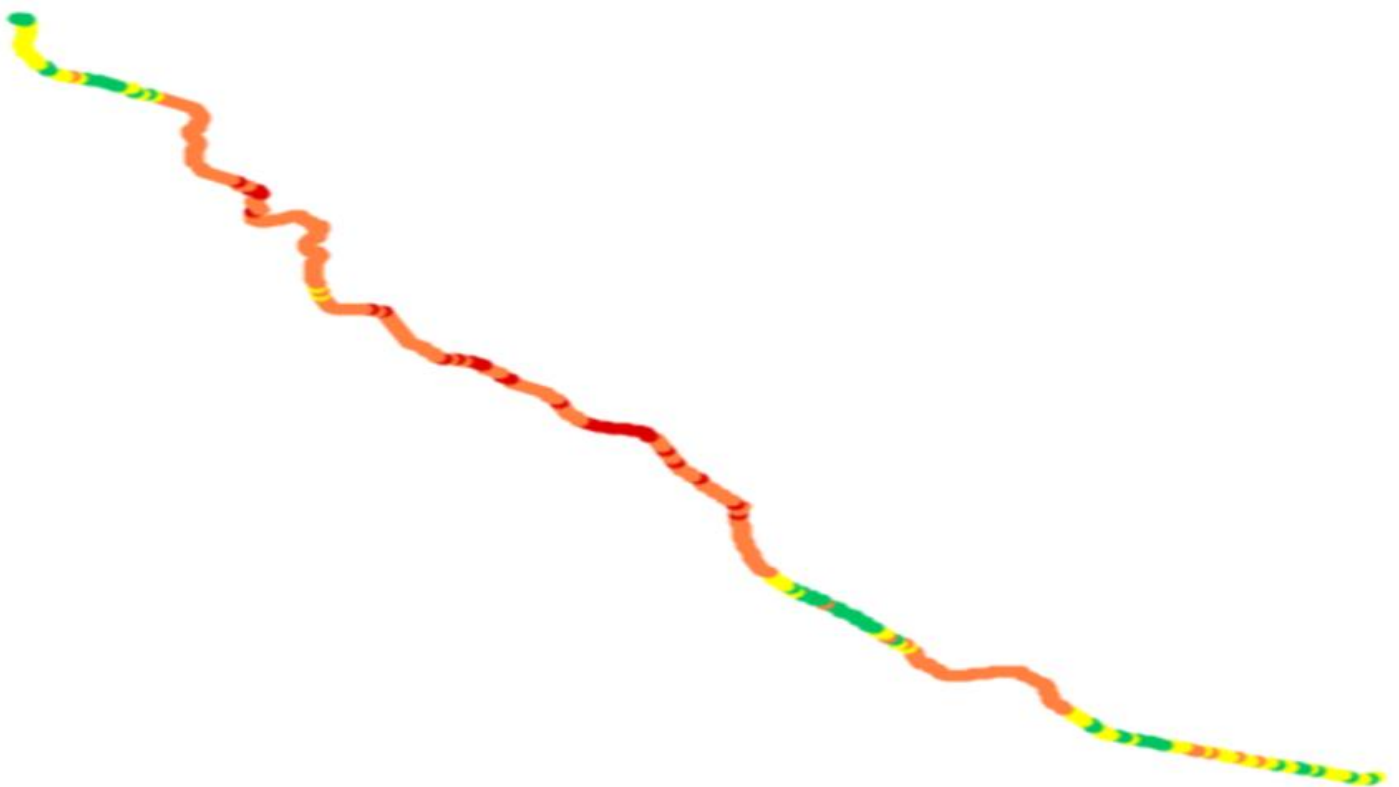
VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	**3694**	**21.07**	
[-80, >=-90)	**5768**	**32.89**	
[-90, >=-110)	**6647**	**37.9**	
[-110, >=Min)	**1427**	**8.14**	
Total			

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TSP-BSNL

Technology	Coverage %
VoLTE	85.2

RSRP-4G_Trai

Serving Cell RSRP (dBm)
- [Min, -110)   (300) (23.96%)
- [-110, -90)   (749) (59.82%)
- [-90, -80)   (138) (11.02%)
- [-80, Max]   (65) (5.19%)
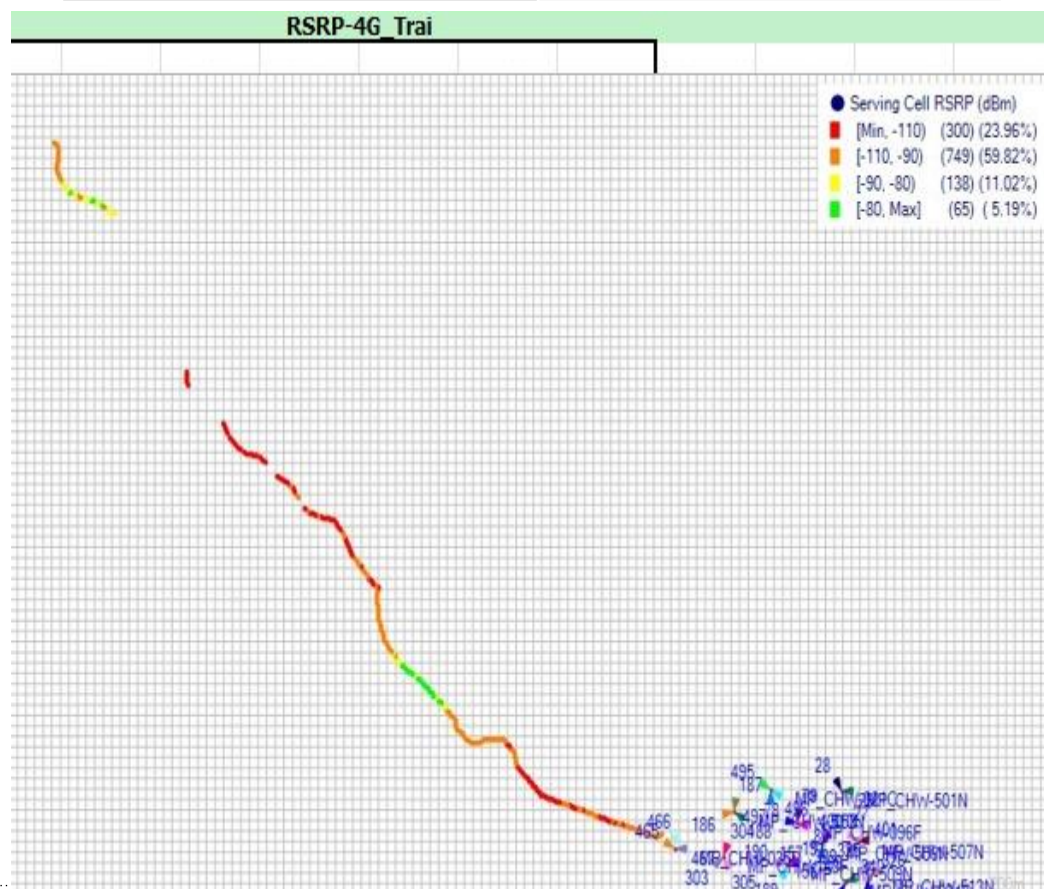
VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	75	6.65	
[-80, >=-90)	91	8.07	
[-90, >=-110)	795	70.48	
[-110, >=Min)	167	14.8	
Total	1128		

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TSP-RJIO

Technology	Coverage %
VoLTE	98.76%
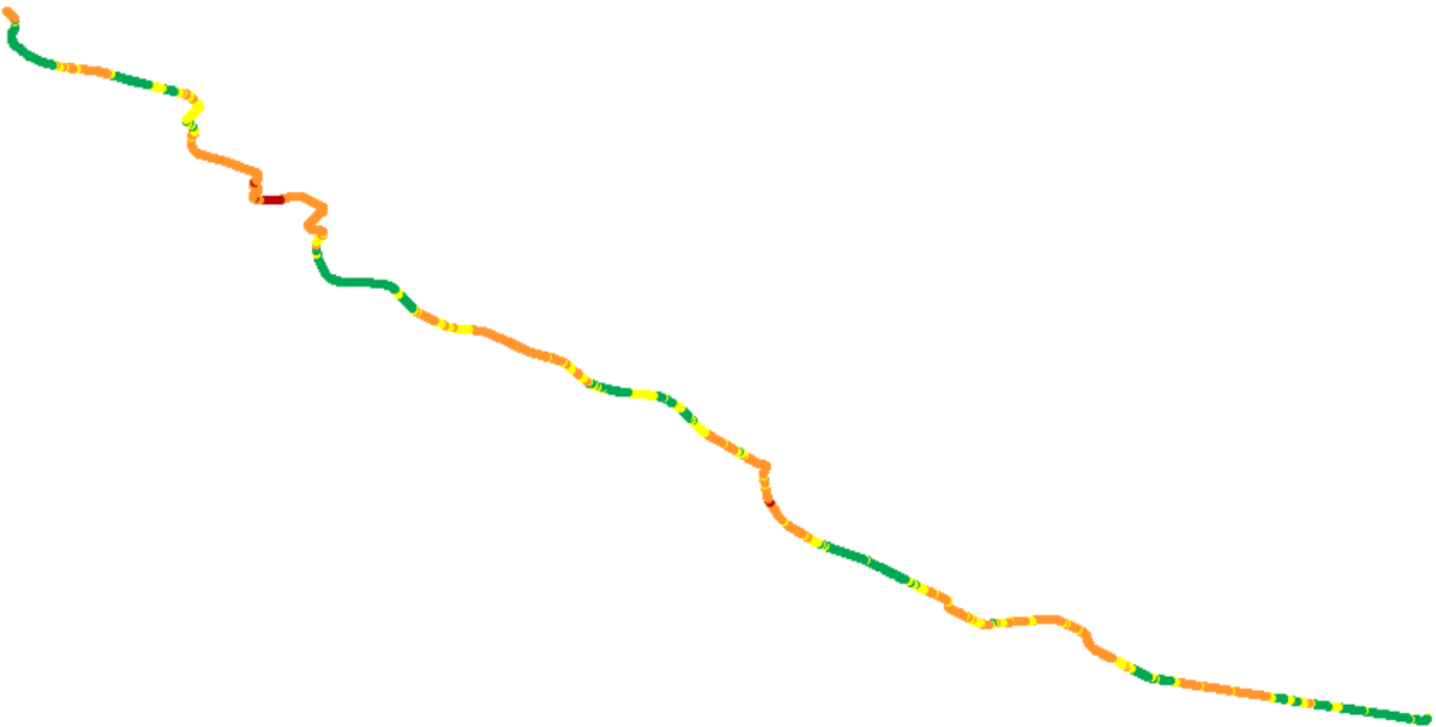
VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	615	28.35%	
[-80, >=-90)	457	21.07%	
[-90, >=-110)	1070	49.33%	
[-110, >=Min)	27	1.24%	
Total	2169		

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TSP-VIL

Technology	Coverage %
VoLTE	94.21

RSRP Volte plote
- ● -80 to 0 (538)
- ● -90 to -80 (294)
- ● -110 to -90 (697)
- ● -140 to -110 (94)
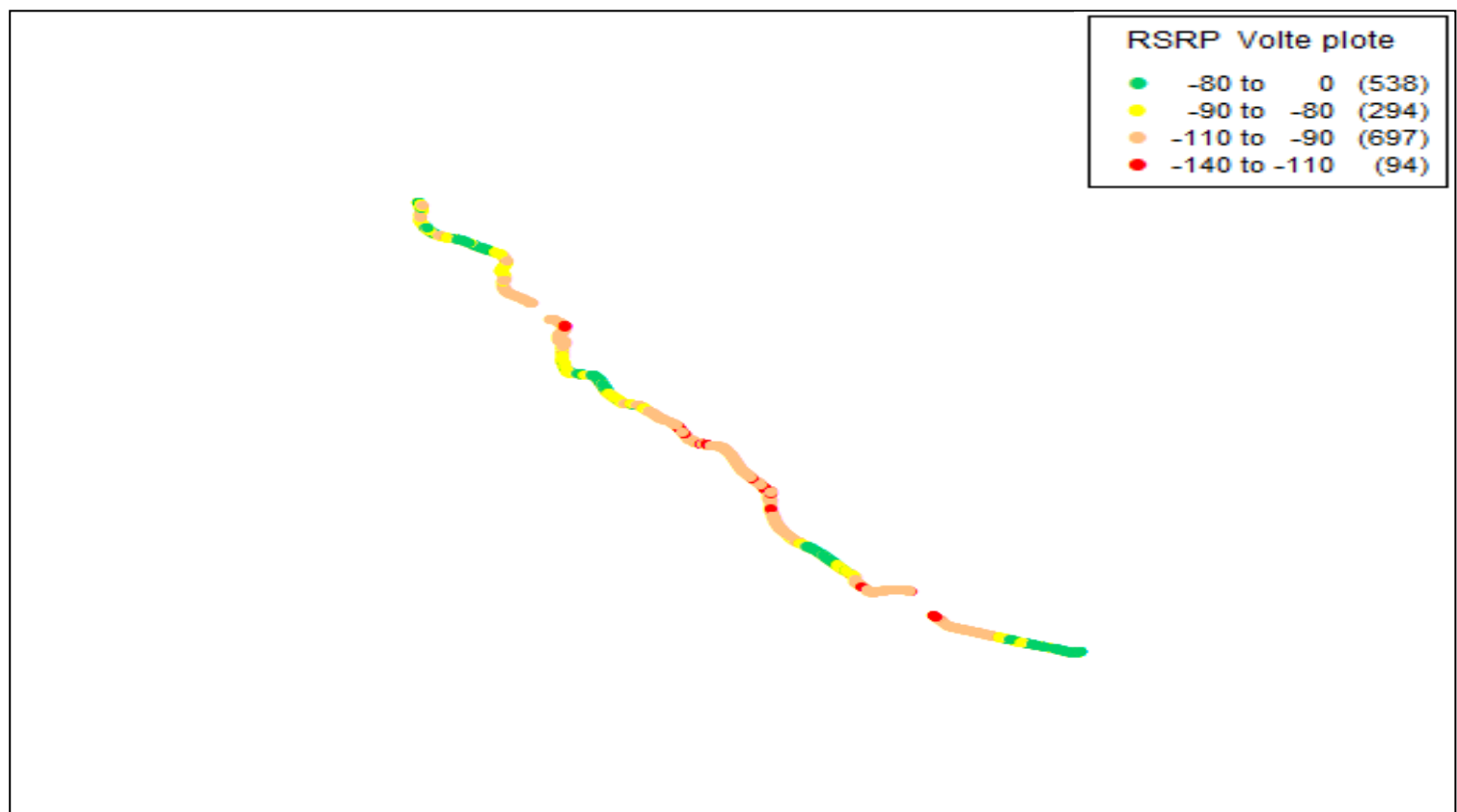
VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	538	33.15	
[-80, >=-90)	294	18.12	
[-90, >=-110)	697	42.94	
[-110, >=Min)	24	5.79	
Total	1493	100	

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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 ≥ 95%.

TSP	Rx Quality %
Airtel 2G	95.98
BSNl 2G	93.82
VIL 2G	98.36
BSNL 3G	94.7
Airtel VoLTE	88.34
BSNL VoLTE	97.12
Jio VoLTE	99.17
VIL VoLTE	97.6
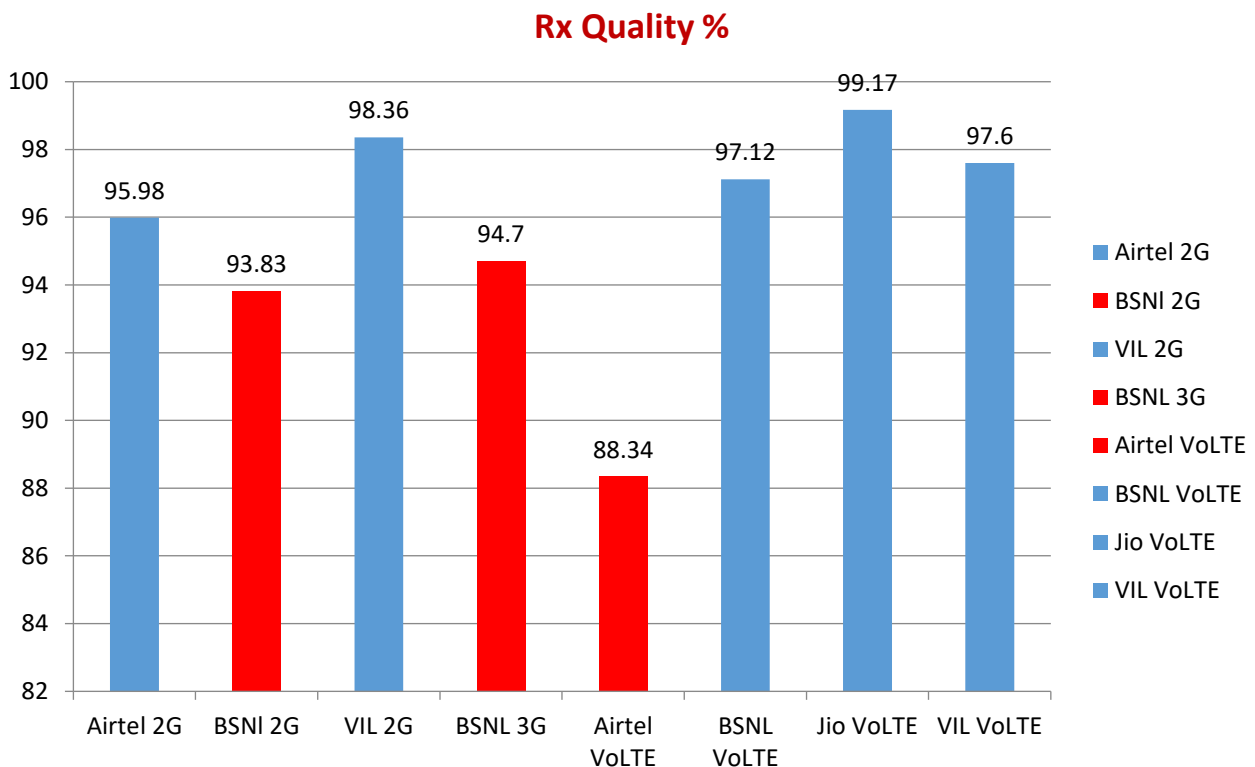
Rx Quality %

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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 ≥ 95%.
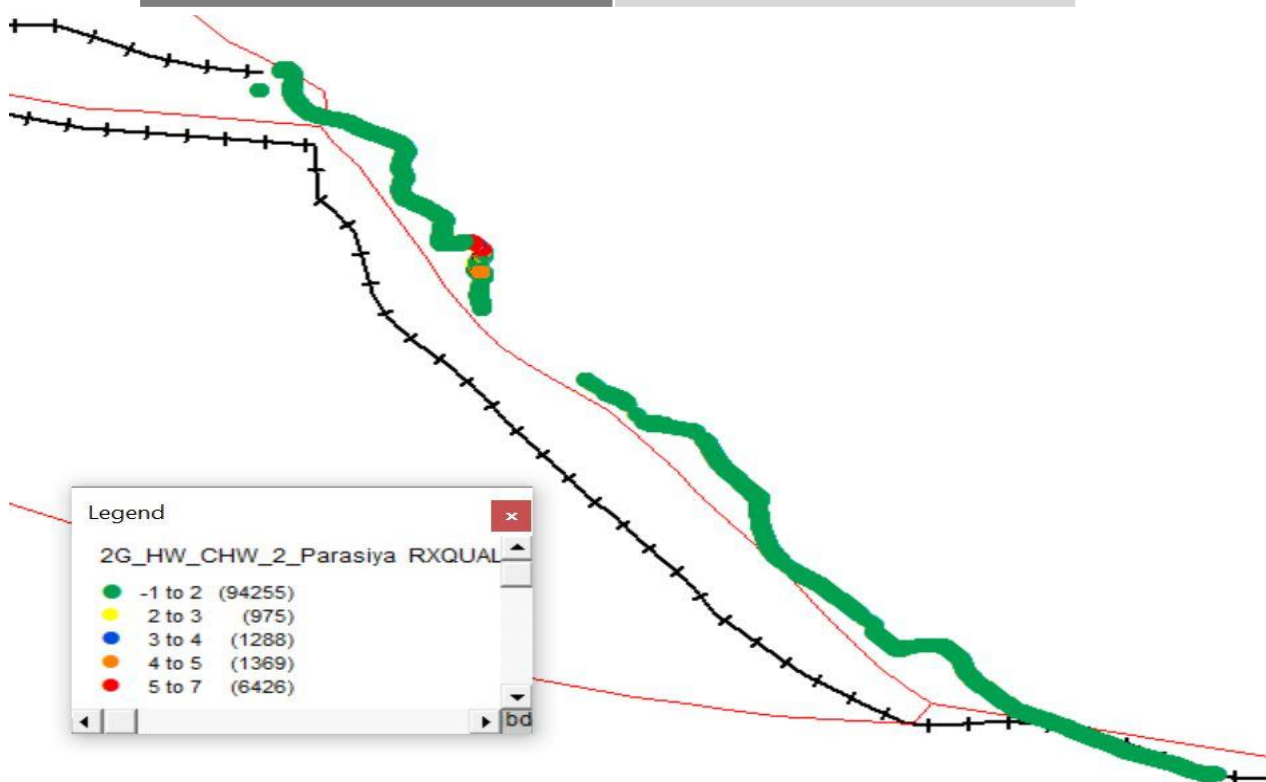
TSP-Airtel

Technology	Rx Quality %
2G	95.97
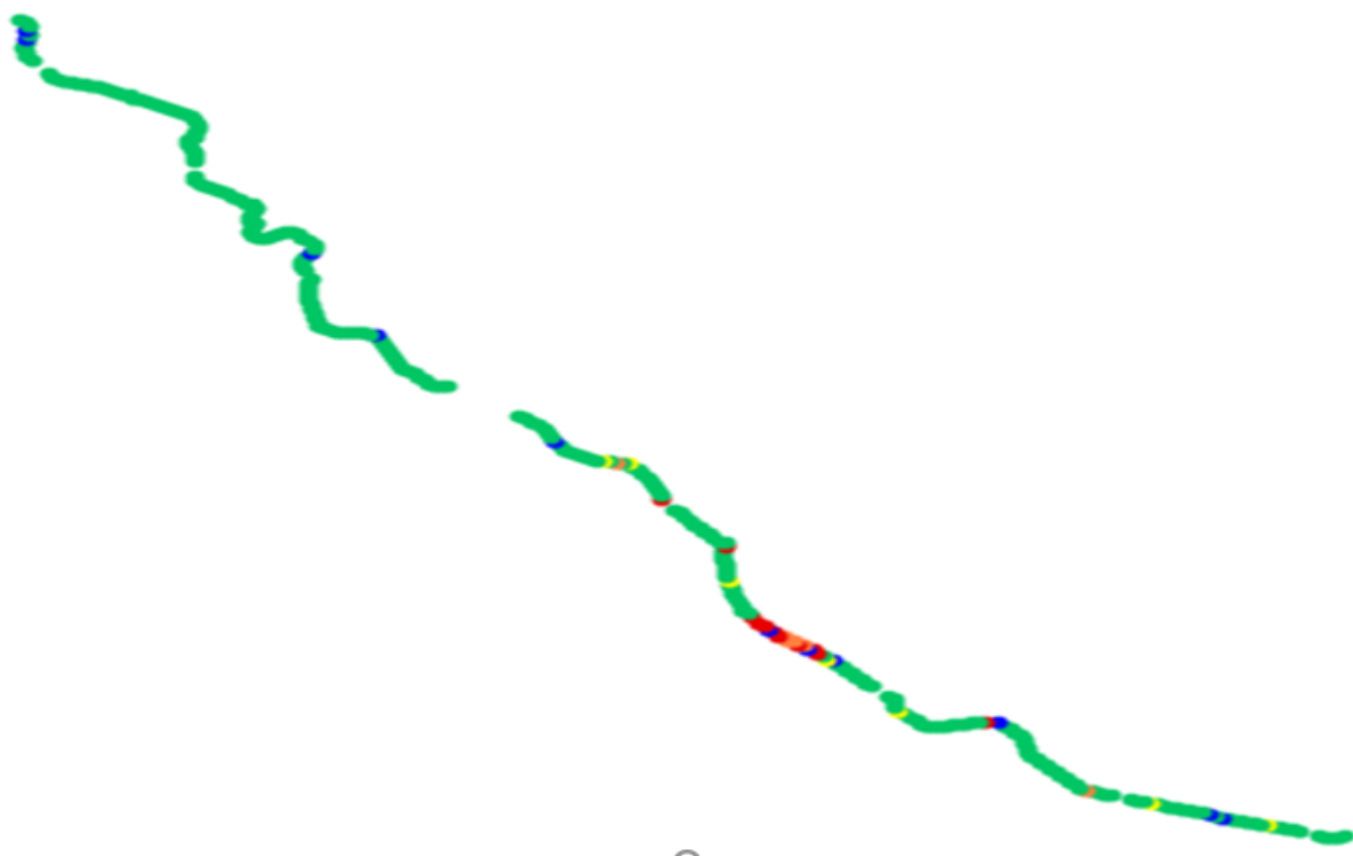
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	4204	83.73	
(2, <=3)	216	4.3	
(3 , <=4)	213	4.24	
(4 , <=5)	186	3.7	
(5 , <=Max)	202	4.03	
Total			

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 ≥ 95%.

TSP-…BSNL

| Technology	Rx Quality %
2G	93.82

Legend

2G_HW_CHW_2_Parasiya RXQUAL
- -1 to 2 (94255)
- 2 to 3 (975)
- 3 to 4 (1288)
- 4 to 5 (1369)
- 5 to 7 (6426)

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	94255	90.36	
(2, <=3)	975	0.93	
(3 , <=4)	1288	1.23	
(4 , <=5)	1369	1.3	
(5 , <=Max)	6426	6.18	
Total	104313	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 ≥ 95%.
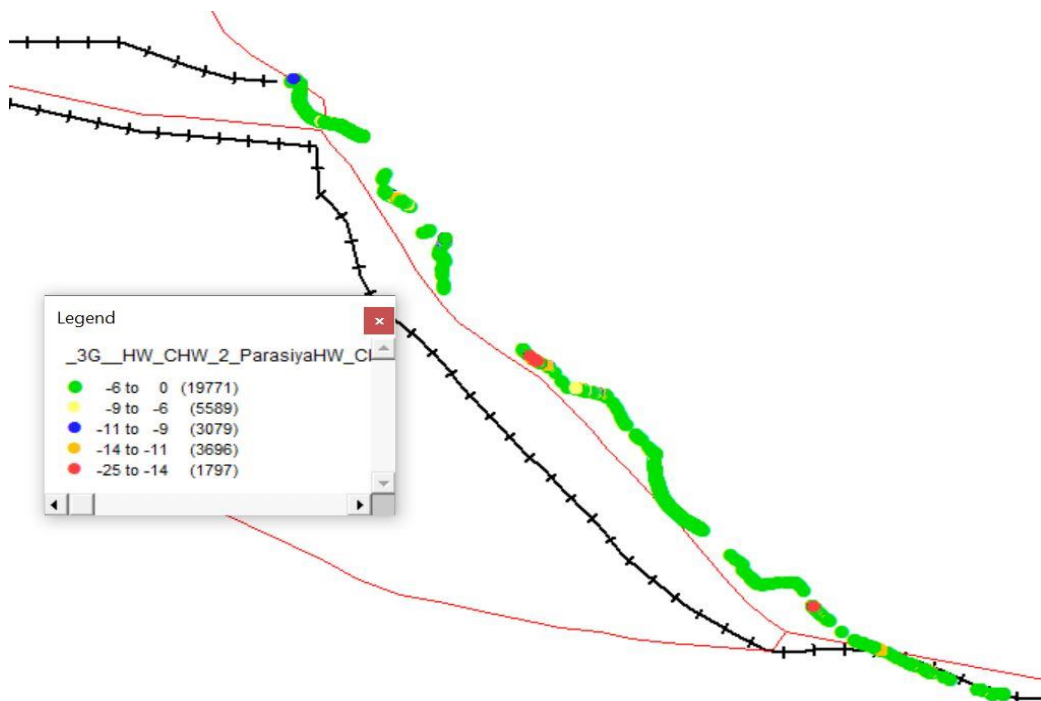
TSP-VIL

Technology	Rx Quality %
2G	98.36

RxQual Full
- 5 to 7   (24)
- 4 to 5   (44)
- 3 to 4   (76)
- 2 to 3   (211)
- 0 to 2   (1117)
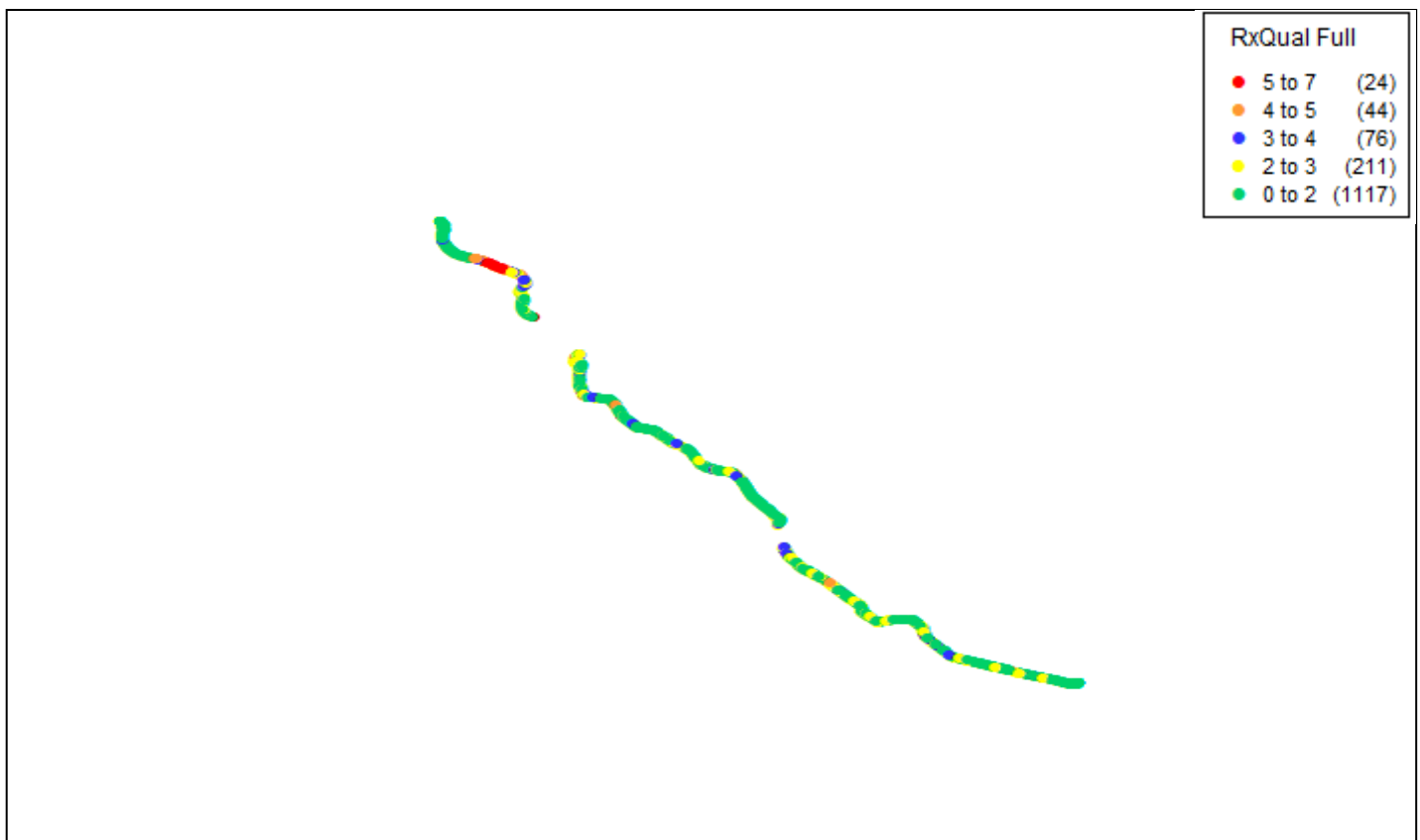
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1117	75.88	
(2, <=3)	211	14.34	
(3 , <=4)	76	5.16	
(4 , <=5)	44	2.98	
(5 , <=Max)	24	1.64	
Total	1472	100	

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 ≥ 95%.

TSP-…BSNL.

| Technology	Rx Quality %
3G	94.70

Legend

_3G__HW_CHW_2_ParasiyaHW_Cl

●	-6 to	0	(19771)
●	-9 to	-6	(5589)
●	-11 to	-9	(3079)
●	-14 to	-11	(3696)
●	-25 to	-14	(1797)

Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	19771	58.27	
(-6, <=-9)	5589	16.47	
(-9, <=-11)	3079	9.07	
(-11, <=-14)	3696	10.89	
(-14, <= Min)	1797	5.30	
Total	33932	**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 ≥ 95%.
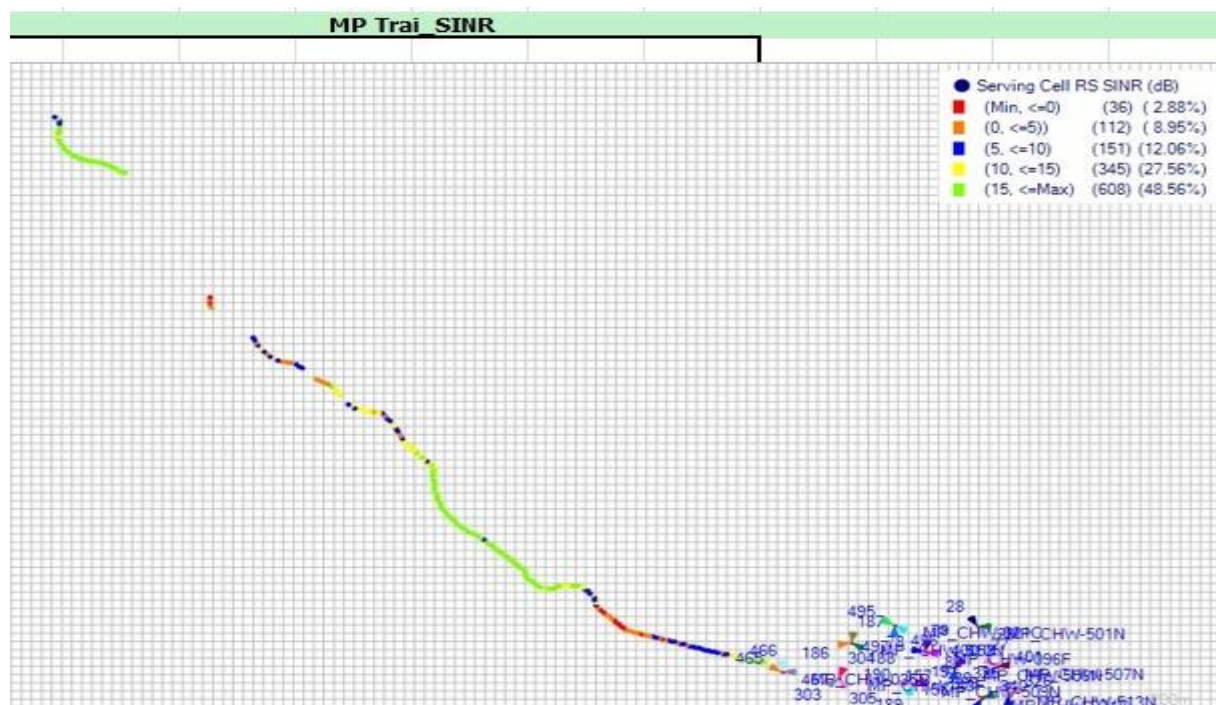
TSP-Airtel

Technology	Rx Quality %
VoLTE	88.34
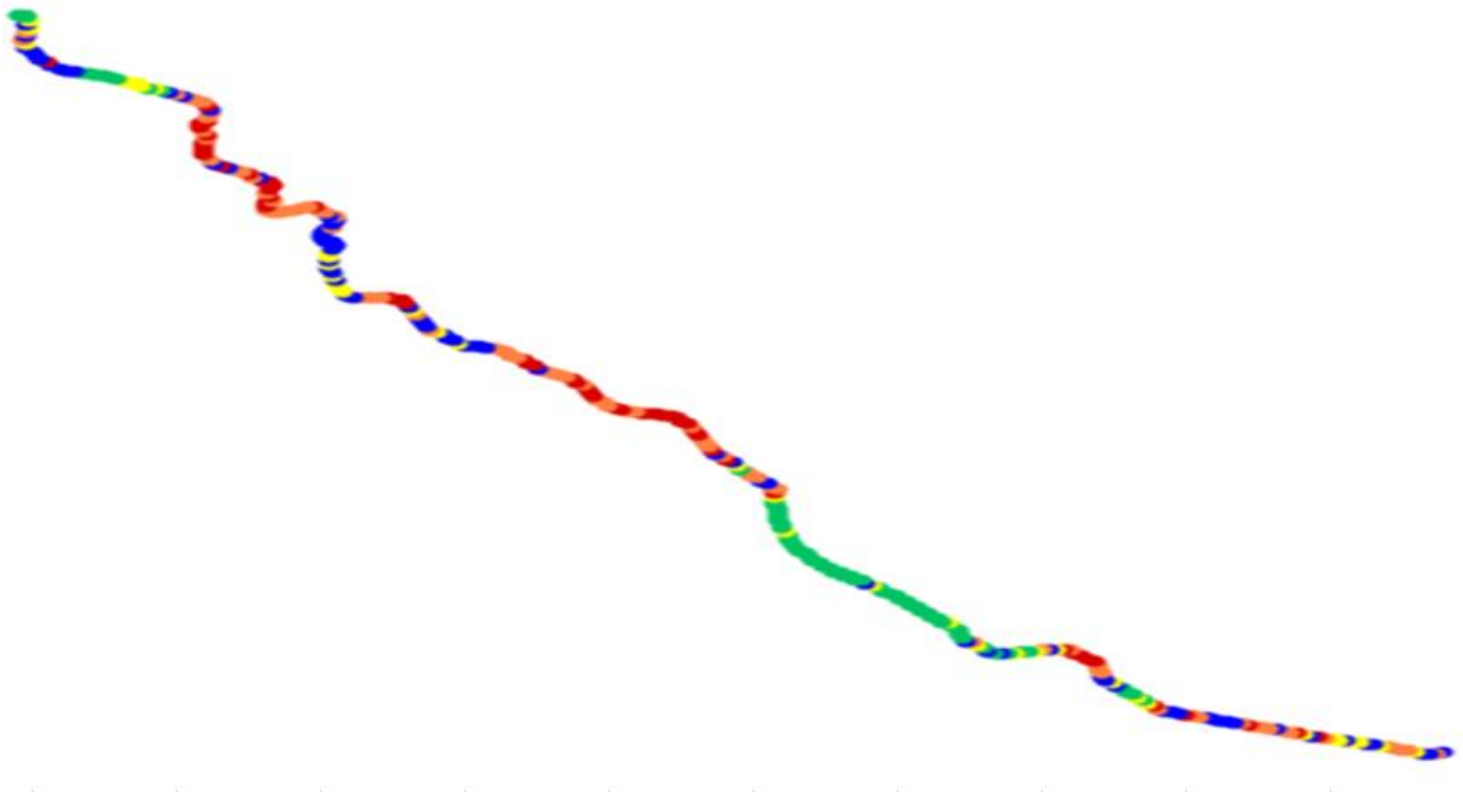
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	2040	11.66	🟥
(0, <=5)	5125	29.29	🟧
(5, <=10)	4571	26.12	🟦
(10, <=15)	1655	9.46	🟨
(15, <=Max)	4107	23.47	🟩
Total			

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 ≥ 95%.

TSP-……BSNL.

Technology	Rx Quality %
VoLTE	97.12

MP Trai_SINR

Serving Cell RS SINR (dB)
- (Min, <=0)   (36) (2.88%)
- (0, <=5))   (112) (8.95%)
- (5, <=10)   (151) (12.06%)
- (10, <=15)   (345) (27.56%)
- (15, <=Max)   (608) (48.56%)

Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	36	2.88	
(0, <=5)	112	8.94	
(5, <=10)	151	12.06	
(10, <=15)	345	27.56	
(15, <=Max)	608	48.56	
Total	1252		

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 ≥ 95%.

TSP-RJIO.

Technology	Rx Quality %
VoLTE	99.17%
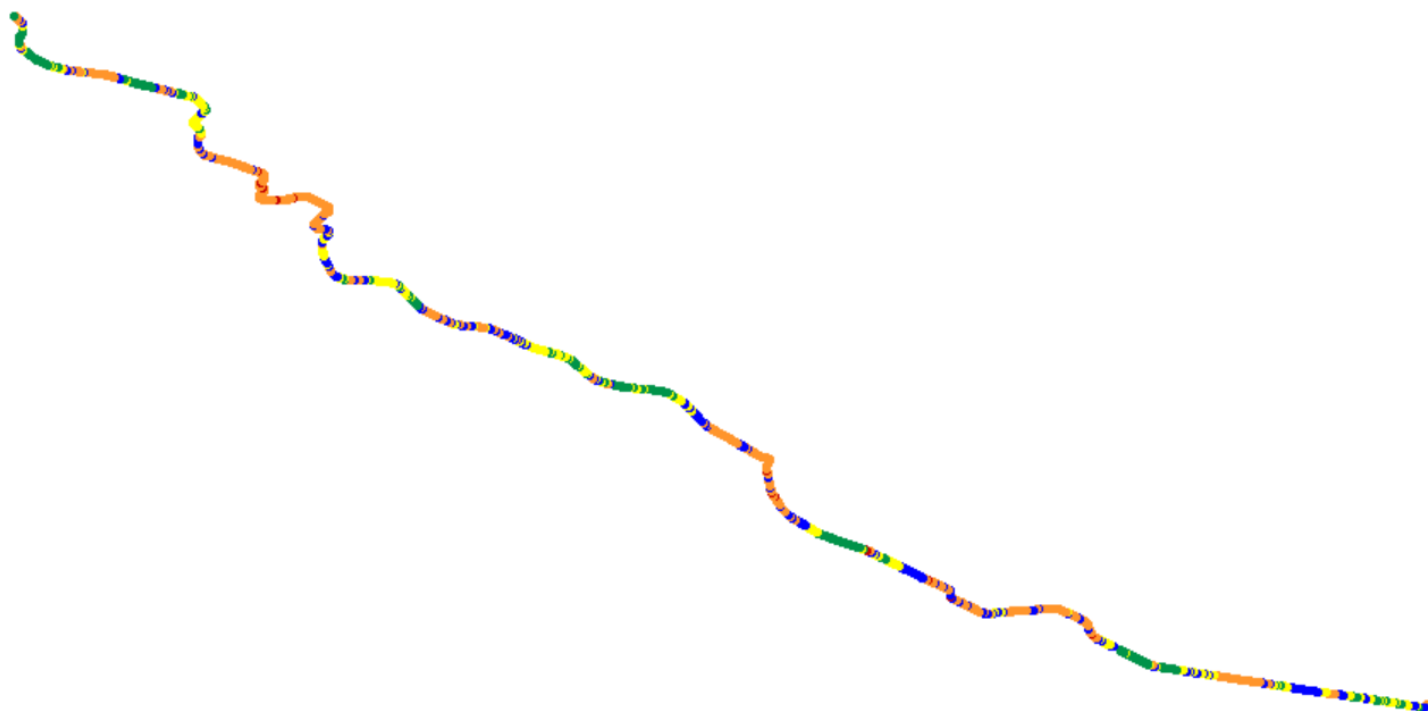
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	18	0.83%	
(0, <=5)	719	33.15%	
(5, <=10)	587	27.06%	
(10, <=15)	411	18.95%	
(15, <=Max)	434	20.01%	
Total	2169		

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 ≥ 95%.
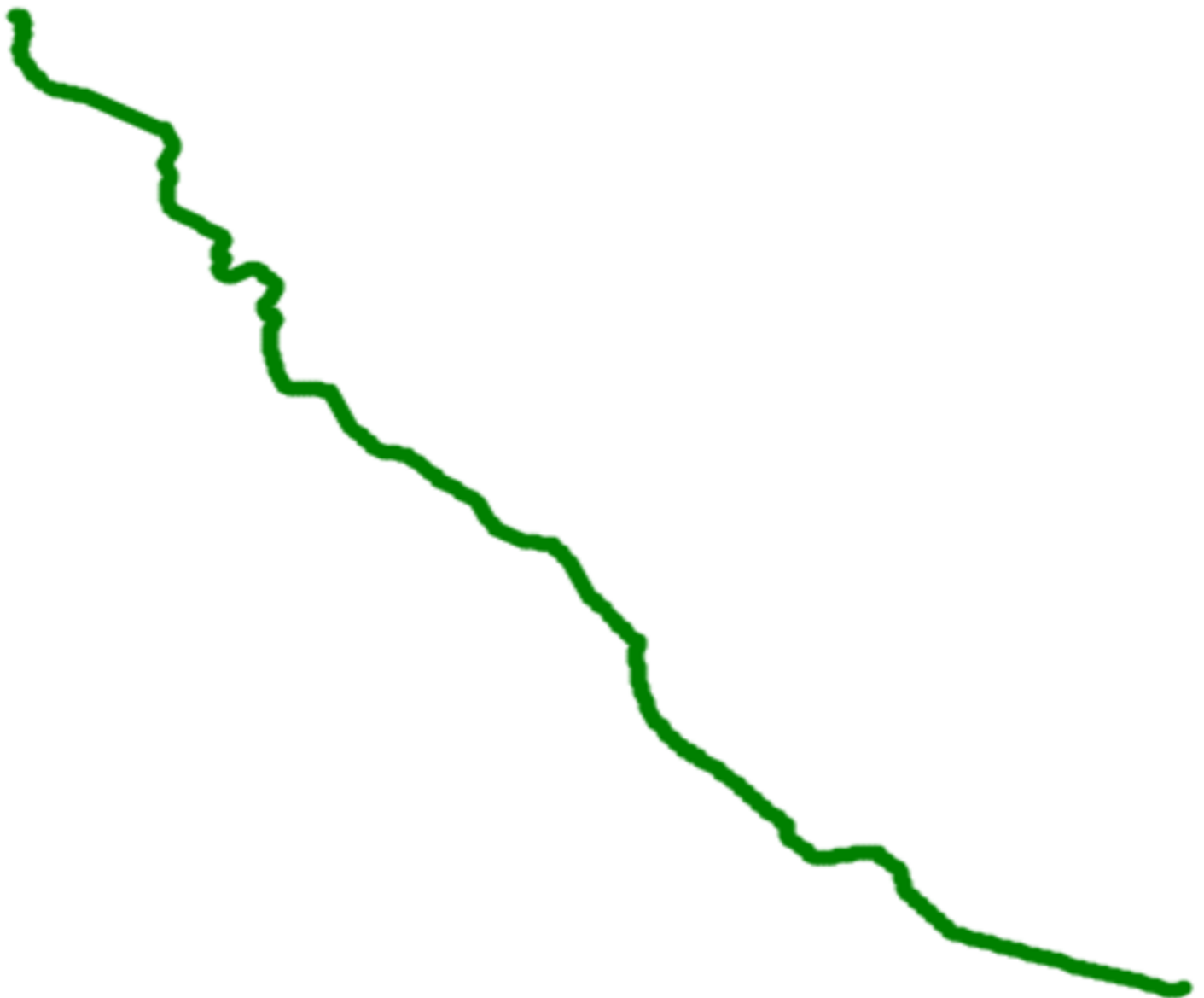
TSP-VIL

Technology	Rx Quality %
VoLTE	97.6

Volte SINR plot
- 15 to 32 (791)
- 10 to 15 (256)
- 5 to 10 (335)
- 0 to 5 (202)
- -32 to 0 (39)
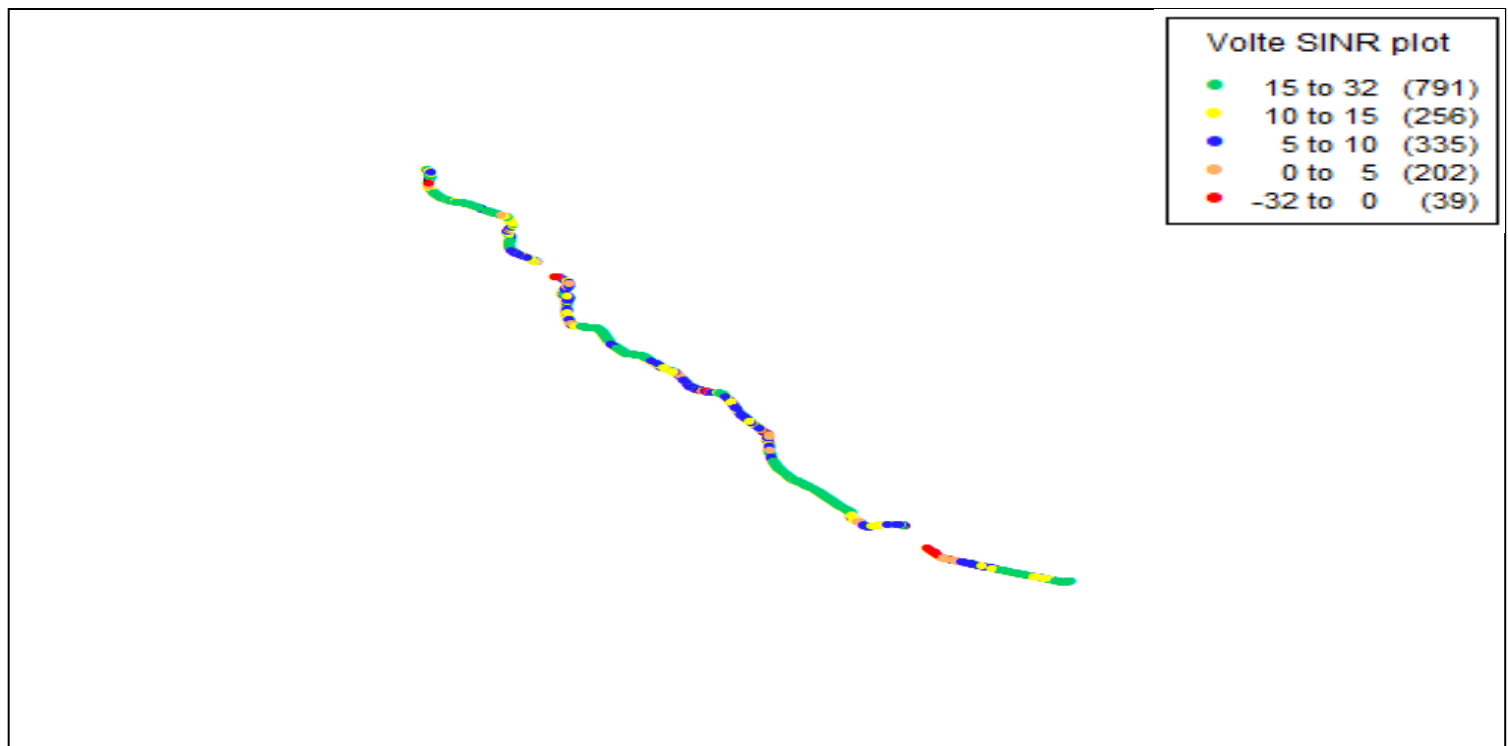
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	39	2.4	
(0, <=5)	202	12.45	
(5, <=10)	335	20.65	
(10, <=15)	256	15.77	
(15, <=Max)	791	48.73	
Total	1623	100	

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	13.11
Airtel VoLTE	100
BSNL VoLTE	75.75
Jio VoLTE	100
VIL VoLTE	100

TSP-Airtel

Technology	% of Time Spent on
VoLTE	100
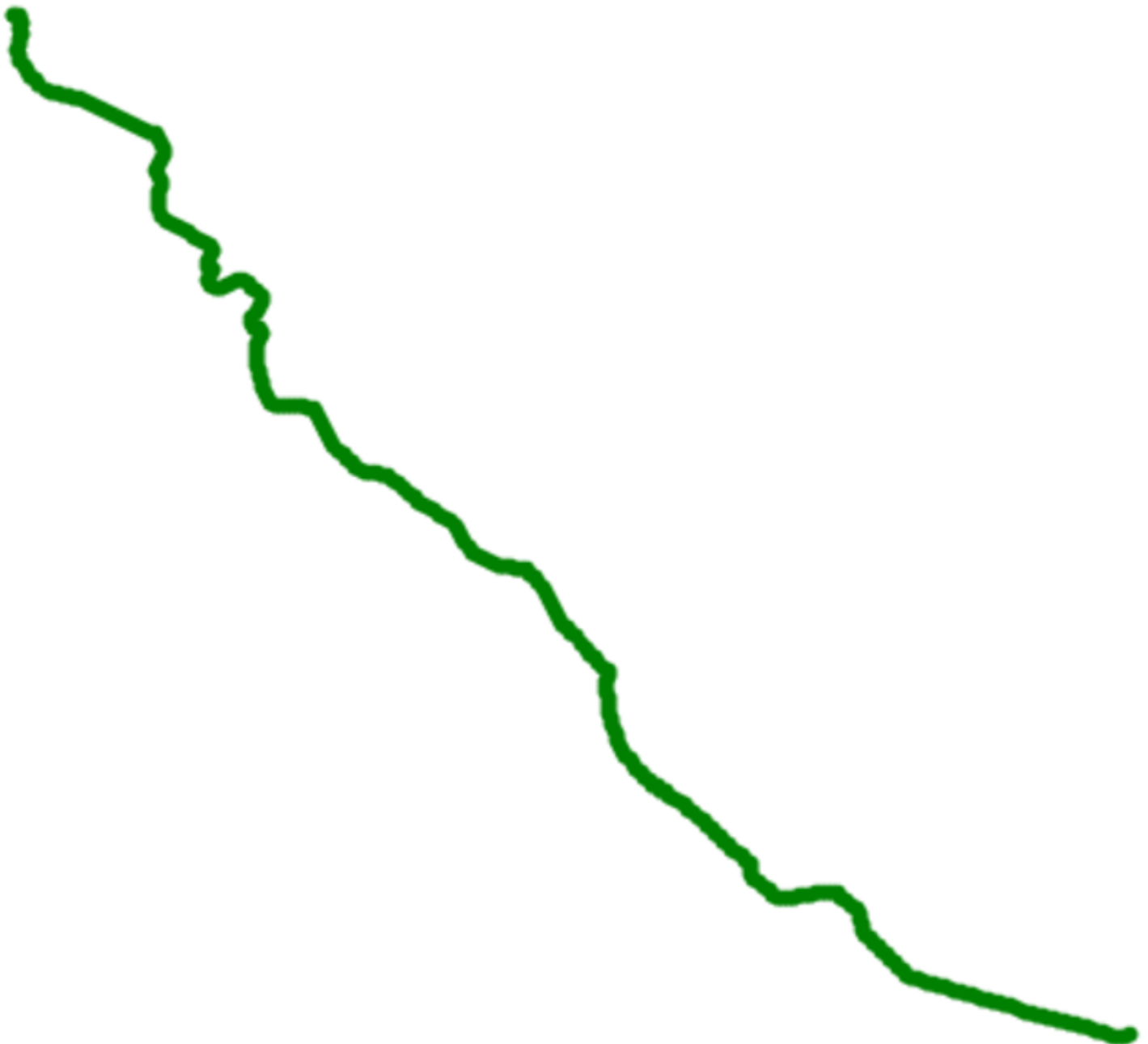
TSP- BSNL

Technology	% of Time Spent on
3G+2G	13.11+10.93
VoLTE	75.75
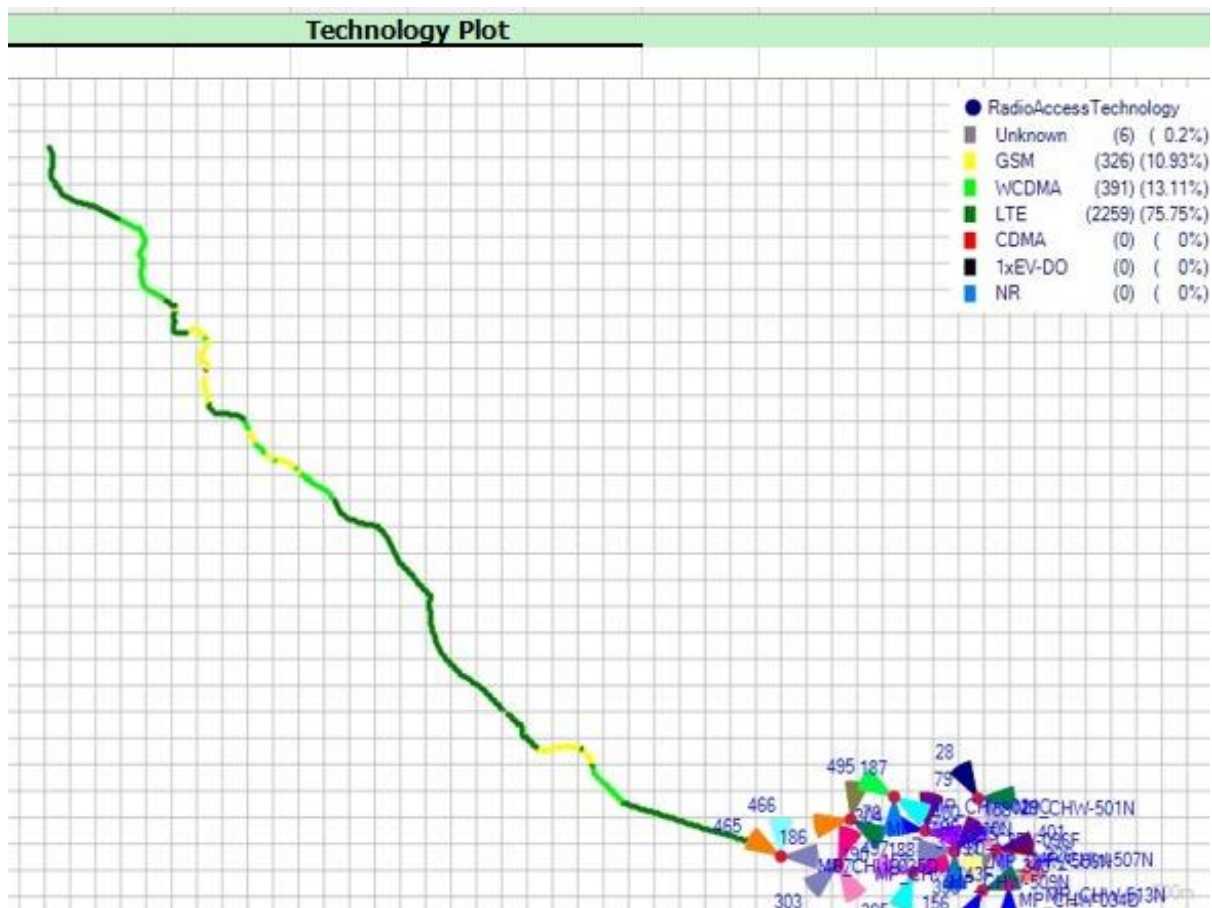
TSP-RJIO

Technology	% of Time Spent on
VoLTE	100%
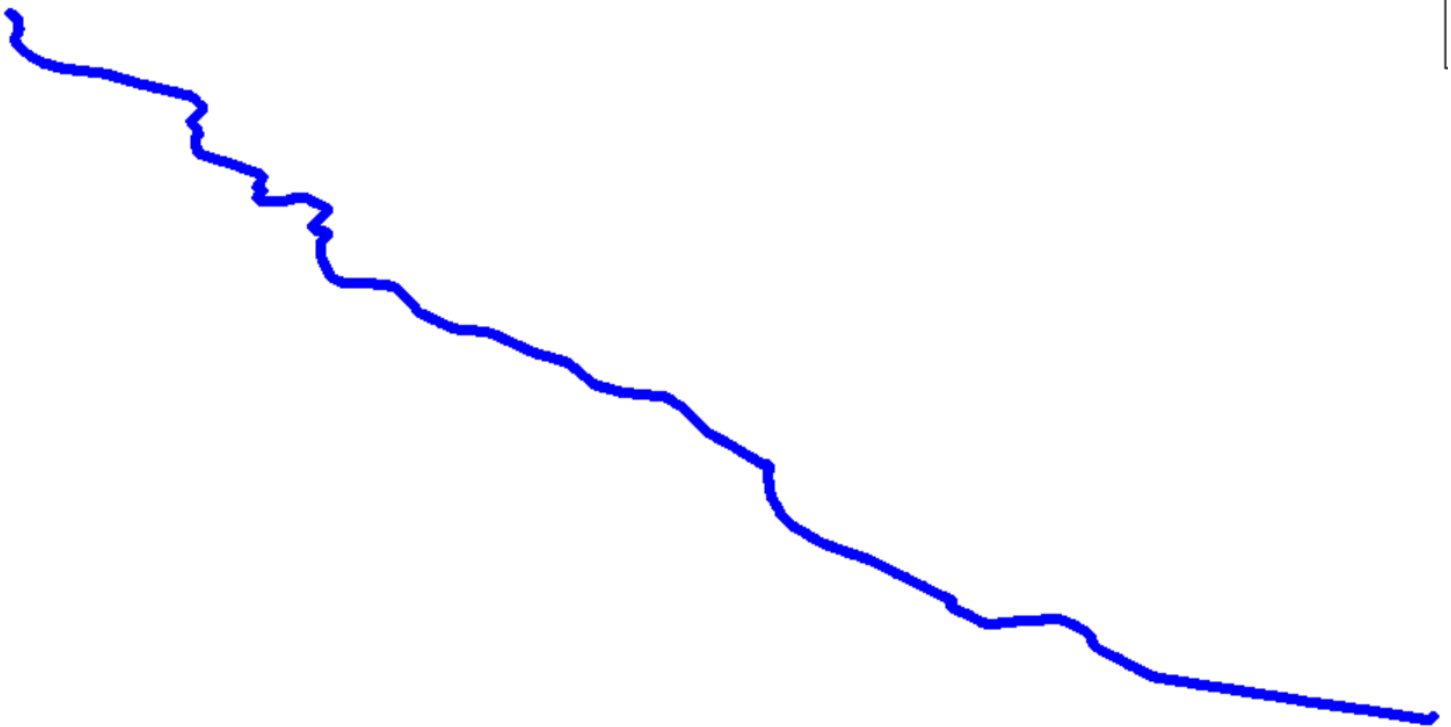
TSP-VIL.

Technology	% of Time Spent on
VoLTE	100
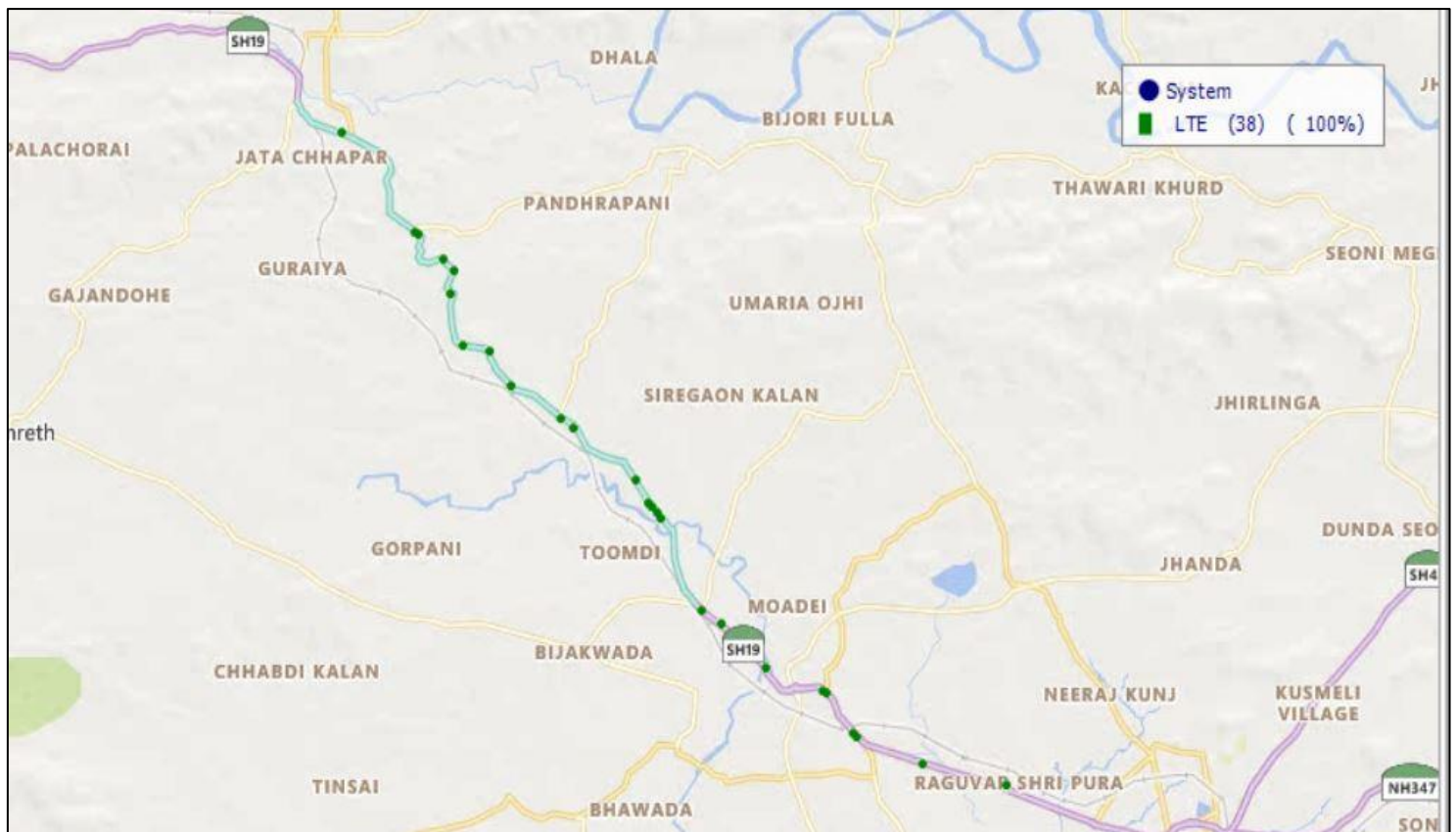
TSP- BSNL

Data Statistics - Dynamic data testing

Data KPIs - Overall	3G
Download Throughput (Mbps)	**1.00**

Legend

3G_THROUGHPUT_HW_CHW_2_ParasiyaHW

- 0 to 1,000 (36653)
- 1,000 to 5,000 (1797)
- 5,000 to 10,000 (0)
- 10,000 to 50,000 (0)
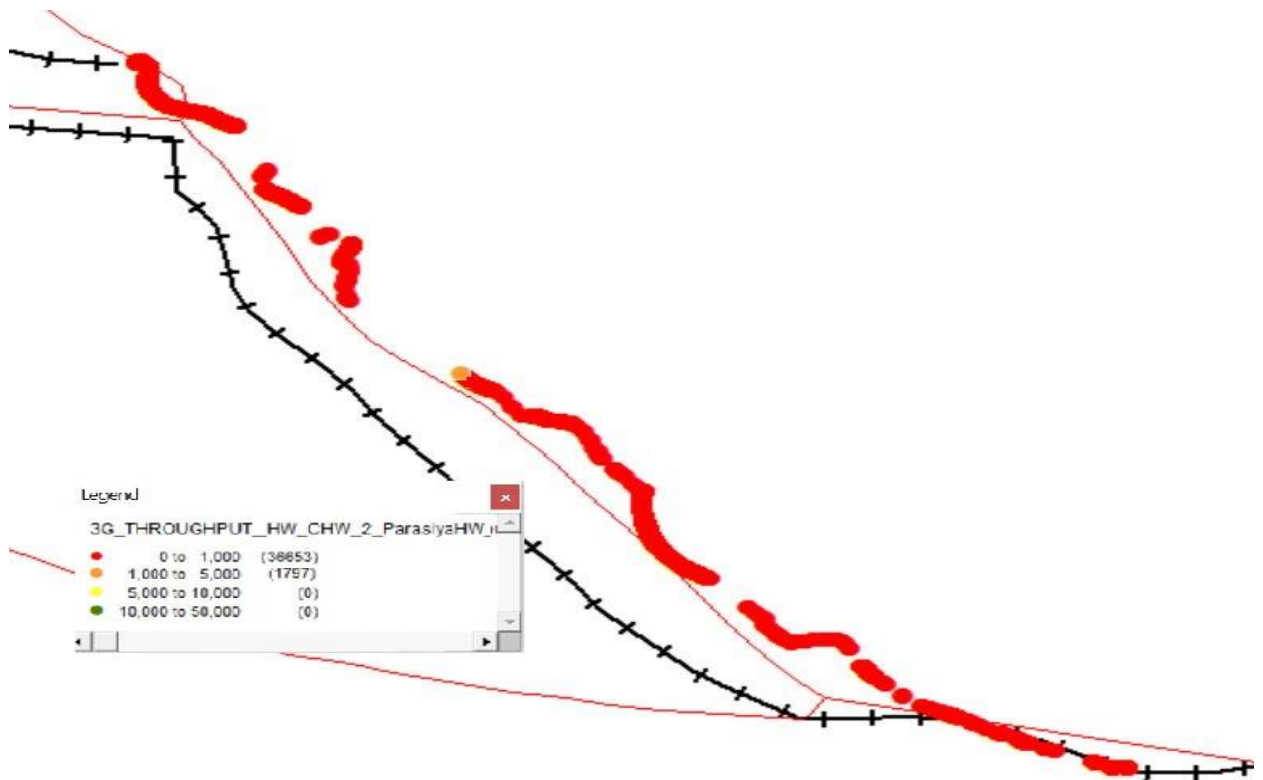
DL throughput	No of Sample	%	Legends
< 1 Mbps	36653	95.32	
1-5 Mbps	1797	4.67	
5-10 Mbps	0	0	
>10Mbps	0	0	

TSP-Airtel

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	**14.17**
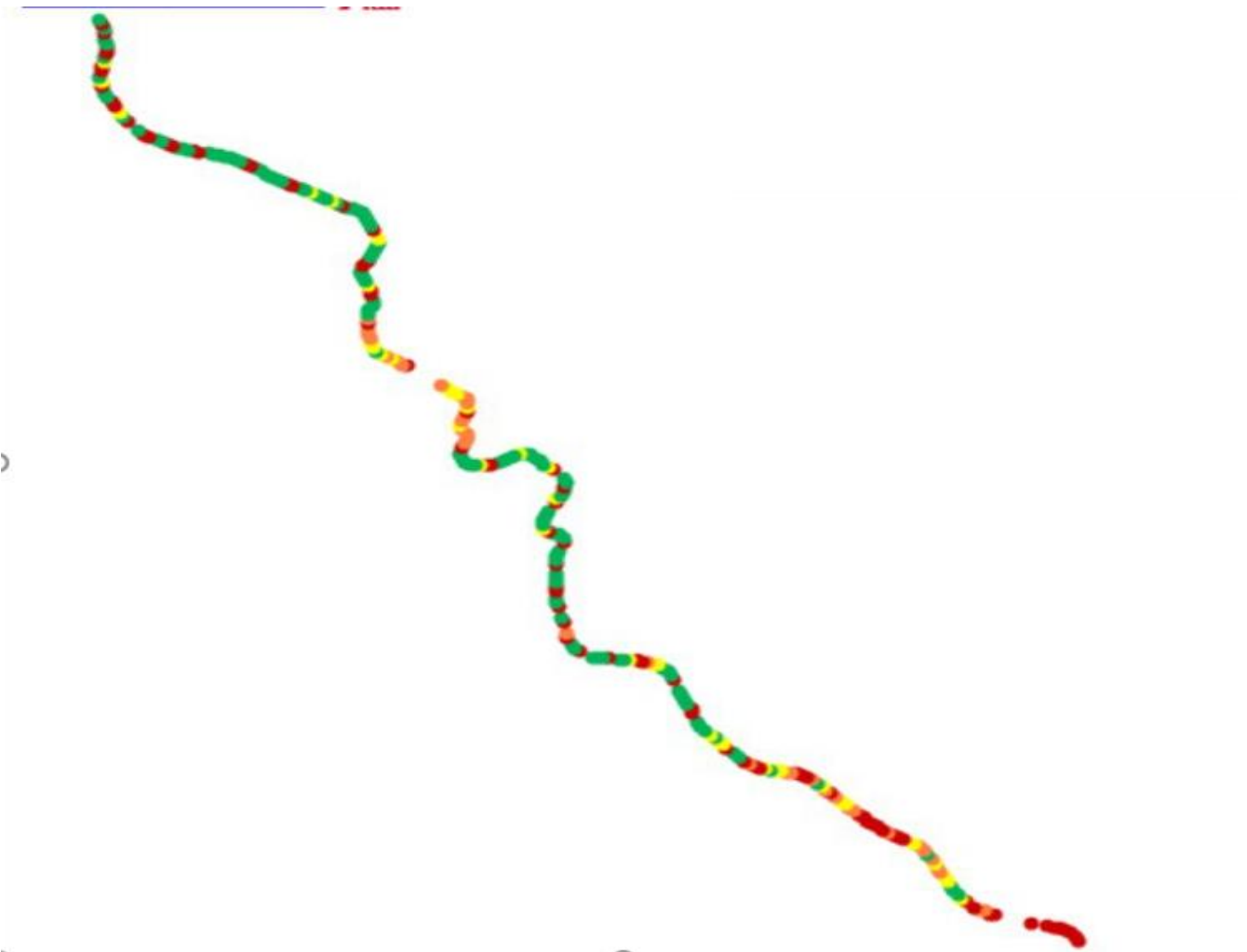
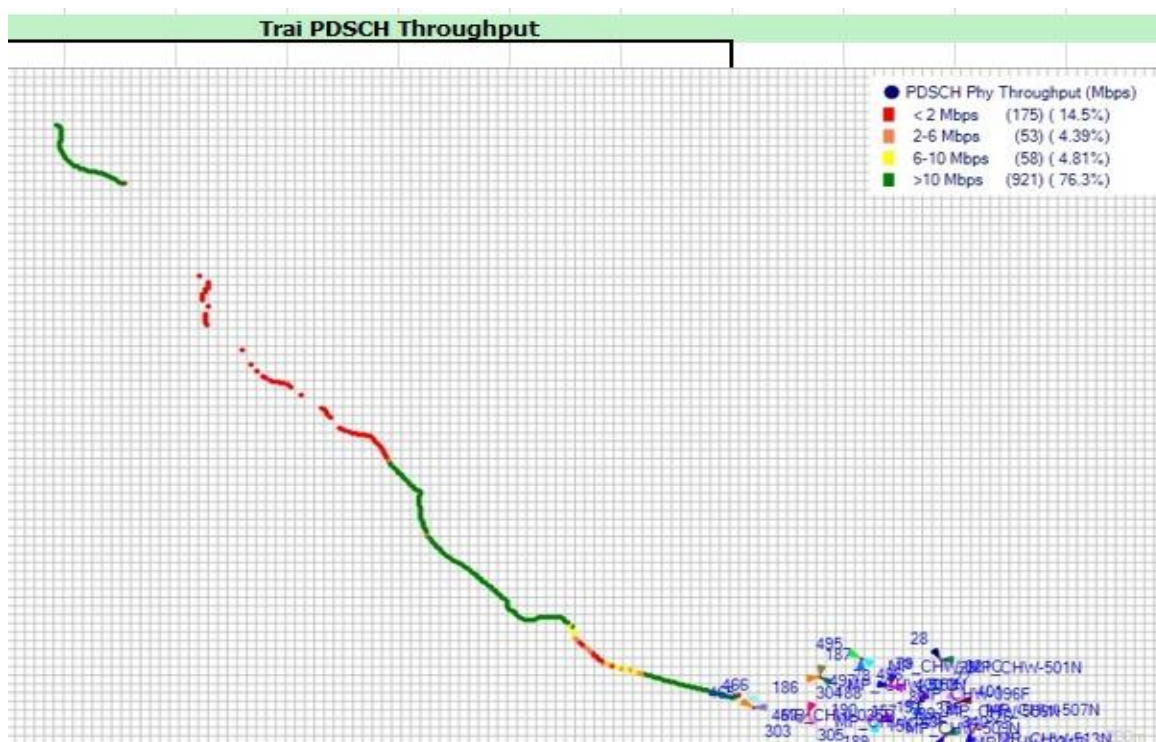| DL throughput	No of Sample	%	Legends
< 2Mbps	297	25.67	
2-5 Mbps	218	18.84	
5-10 Mbps	179	15.47	
>10Mbps	463	40.02	

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Dynamic Data Test

TSP-BSNL.

Data Statistics - Dynamic data testing

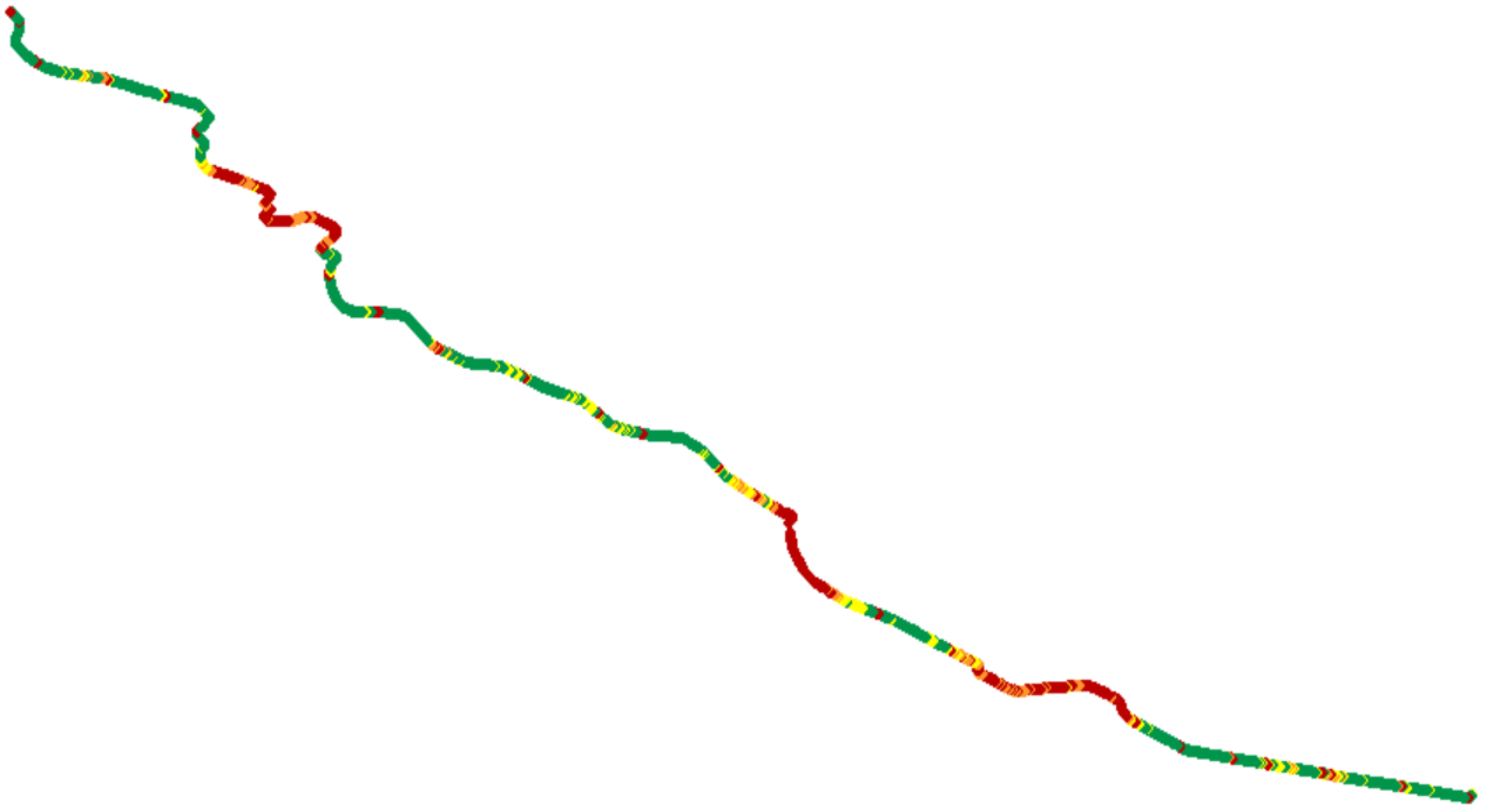| Data KPIs - Overall	LTE
Download Throughput (Mbps)	24.52

DL throughput	No of Sample	%	Legends
< 2Mbps	175	14.5	
2-5 Mbps	53	4.39	
5-10 Mbps	58	4.81	
>10Mbps	921	76.3	

Dynamic Data Test Details

TSP-RJIO

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	**22.07**

DL throughput	No of Sample	%	Legends
< 2Mbps	502	18.43%	
2-5 Mbps	203	7.45%	
5-10 Mbps	249	9.14%	
>10Mbps	1770	64.98%	

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TSP-VIL.

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	**16.56**

Dat throughput plot
- 10,000 to 100,000 (938)
- 5,000 to 10,000 (358)
- 1,000 to 5,000 (173)
- 0 to 1,000 (166)
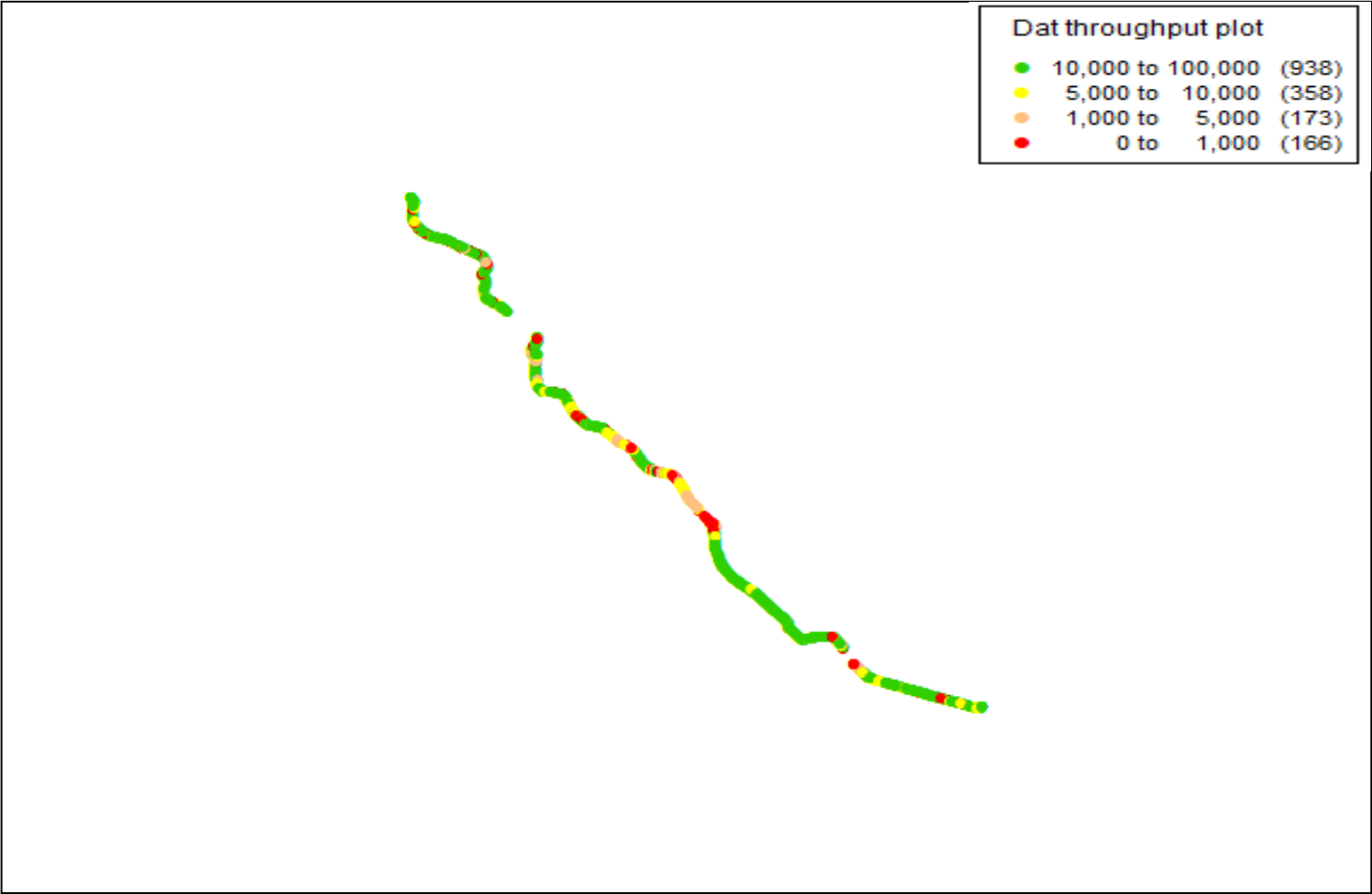
DL throughput	No of Sample	%	Legends
< 1 Mbps	166	10.15	
1-5 Mbps	173	10.58	
5-10 Mbps	358	21.89	
>10Mbps	938	57.37	

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