



Operator Assisted Drive Test (OADT) For

Idukki

10th to 12th Mar 2026

TRAI RO, Bengaluru

Self-Drive Test by TSP



Drive Test Report
for
Feb Month 2026 Year
Idukki & Nearby Area
10 Mar to 12 Mar 2026
by
TRAI RO ,Bengaluru

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1. Overview

The Operator Assisted Drive Test carried out in Idduki and nearby areas from date 10/03/26 to 12/03/26 From 10:00 AM to 7:00 PM. The drive test covered drive route of around 436 KMs in 3 days and 6 hotspot locations.

1.1 Telecom Service Providers(TSPs),Technologies and frequency bands captured during Drive Test are as below:

Sl. No.	Name of TSP	Technology	Frequency Bands (In MHz)
1	Bharti Airtel Ltd.	2G	1800
2	Bharti Airtel Ltd.	4G	850 , 1800 , 2100 , 2300
3	Bharti Airtel Ltd.	5G	3500
4	BSNL	2G	900
5	BSNL	3G	2100
6	BSNL	4G	2100,700 ,2500
7	Reliance JIO Infocomm Ltd.	4G	850 ,1800 ,2300
8	Reliance JIO Infocomm Ltd.	5G	700 ,3500
9	Vodafone Idea Ltd.	2G	900
10	Vodafone Idea Ltd.	3G	NA
11	Vodafone Idea Ltd.	4G	900 ,1800 , 2100,2300 ,2500

(1) Quality of Service parameters measured:

Voice Service:

Dynamic	Static (Hotspot Location)
Call setup time	Call setup time
Call setup success rate (CSSR)	Call setup success rate (CSSR)
Dropped Call rate	Dropped Call rate
Call Silence Rate	
Handover Success Rate (HOSR)	
Packet Drop Rate (Uplink & Downlink)	
Mean Opinion Score (MOS)	
Signal Strength	

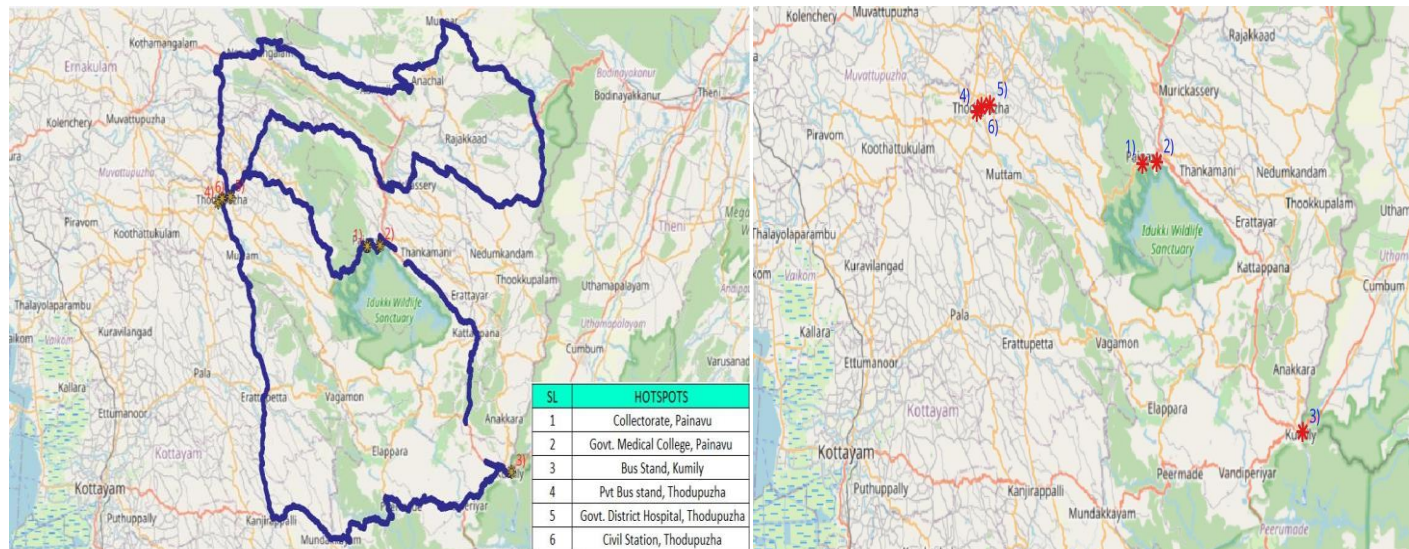
(2) Data Service:

Dynamic	Static (Hotspot Location)
Data speed (DL / UL both)	Data speed (DL/UL both)
Latency	Latency
Jitter	Jitter
	Session Setup Success Rate (DL/UL)
	Packet Drop rate
	Web browsing delay
	Video Streaming performance

2. Executive Summary

This report covers the findings of the OADT undertaken in Idukki, Kerala License Service Area (LSA) during the month of Mar (2026) under the supervision of TRAI Regional Office (RO), Bengaluru. Details of route/ area covered during the OADT is as given below:

2.1 Route Map of Drive test & Hotspot locations:



2.2 Drive Test Area detail

Date	Duration 10 AM to 9 PM	Drive test route	Distance covered (in Kms)
10-03-2026	10:04 AM - 08:47 PM	Thodupuzha- Painav- Kattapanana-Kumily- Kuttikanam-Kanjirappally- Erattupetta-Thodupuzha	211
11-03-2026	09:06 AM - 06:09 PM	Thodupuzha- Vannapuram- Udumbanchola-Pooppara- Pallivasal- Paingottor- Thodupuzha	225

Date	Time	Hotspot Location	Latitude / Longitude
10-03-2026	12:37 PM	COLLECTRATE IDUKKI	9.84796/76.9419
10-03-2026	01:56 PM	Govt. MEDICAL COLLEGE HOSPITAL IDUKKI	9.84983/76.9627
10-03-2026	05:08 PM	KUMILY BUS STAND	9.60928/77.1699
11-03-2026	06:54 PM	PRIVATE BUS STAND THODUPUZHA	9.89301/76.7088
12-03-2026	10:22 AM	DISTRICT HOSPITAL THODUPUZHA	9.90031/76.7262
12-03-2026	11:32 AM	CIVIL STATION THODUPUZHA	9.8983/76.7139

2.3 Details of Drive Test Tools used:

Airtel - TEMS Investigation & TEMS Pocket

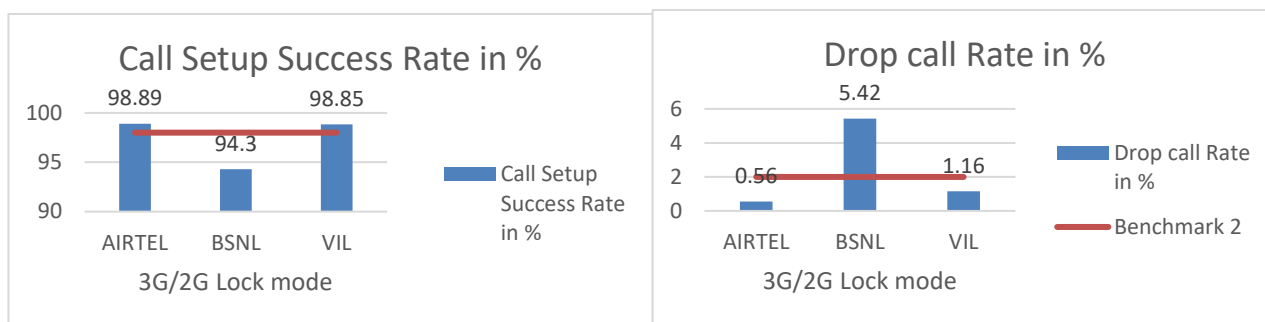
BSNL – Azenqos Drive Tool with Handsets

JIO – XCAL.

VIL – TEMS Investigation & Azenqos

2.4 Key findings(Voice & Data)

2.4.1 Voice Service performance in 3G/2G mode only

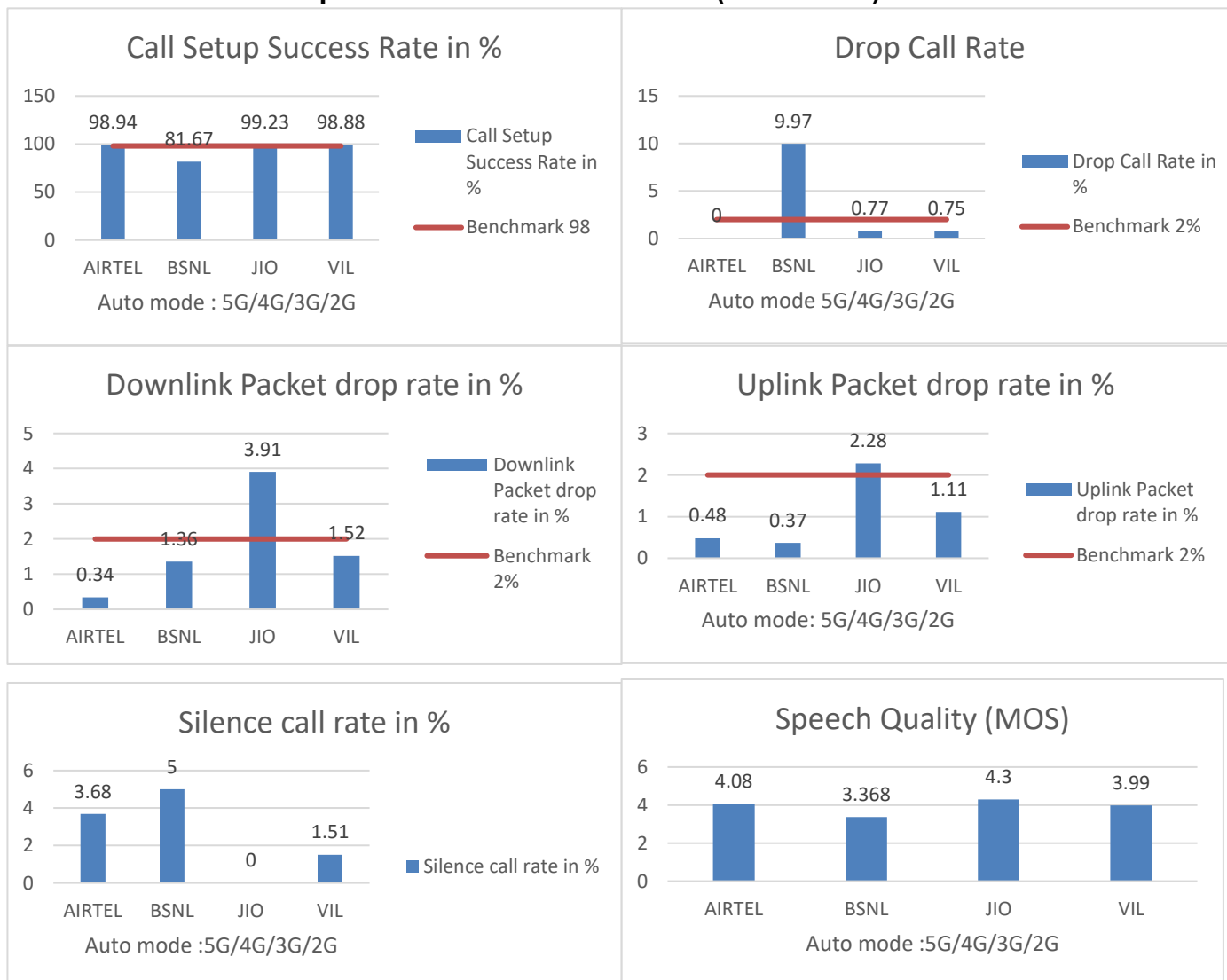


Parameter	Benchmark	AIRTEL	BSNL	VIL
Call Attempts		180	369	262
Call Setup Success Rate(in%)	$\geq 98.0\%$	98.89%	94.3	98.85
Drop Call Rate(in%)	$\leq 2\%$	0.56	5.42	1.16
Call Setup Time-Average(in Seconds)		3.69	5.4	3.32
Handover Success Rate(in %)	$\geq 95\%$	99.49%	97.72	98.2

2.4.2 Number of Cell ids latched during drive test (3G/2G)

Technology	AIRTEL	BSNL	VIL
3G	NA	42	NA
2G	314	273	448

2.4.3 Voice Service performance in 5G/4G/3G/2G (Auto mode)

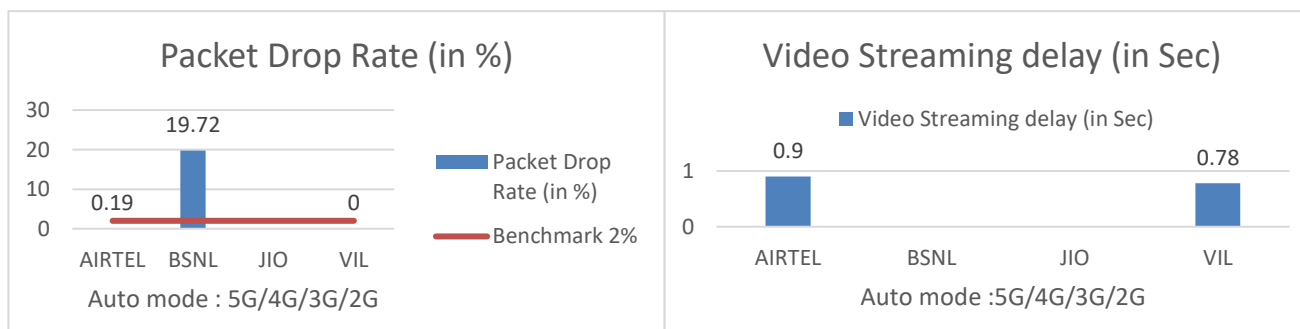
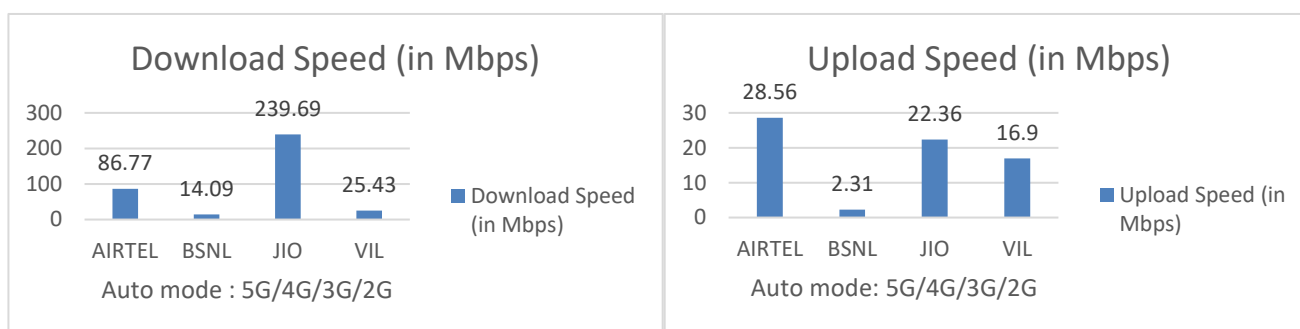


Parameter	AIRTEL	BSNL	RJIL	VIL
Call Attempts	189	431	389	269
Call Setup Success Rate%	98.94	81.67	99.23	98.88
Drop Call Rate%	0	9.97	0.77	0.75
Call Setup Time-Average(Second)	1.17	1.5	1.58	0.88
Handover Success Rate%	99.82	96.51	97.76	99.11
Downlink Packet drop rate %	0.34%	1.36	3.91	1.52
Uplink Packet drop rate%	0.48%	0.37	2.28	1.11
Silence Call Rate%*	3.68%	5	0	1.51
Speech Quality (AverageMOS)	4.08	3.37	4.3	3.99

2.4.4 Number of Cell ids latched during drive test (Automode)

Technology	AIRTEL	BSNL	RJIL	VIL
5G	92	-	541	-
4G	657	314	459	749
3G	-	25	-	-
2G	0	215	-	142

2.4.5 Data performance in 5G/4G/3G/2G(Automode)

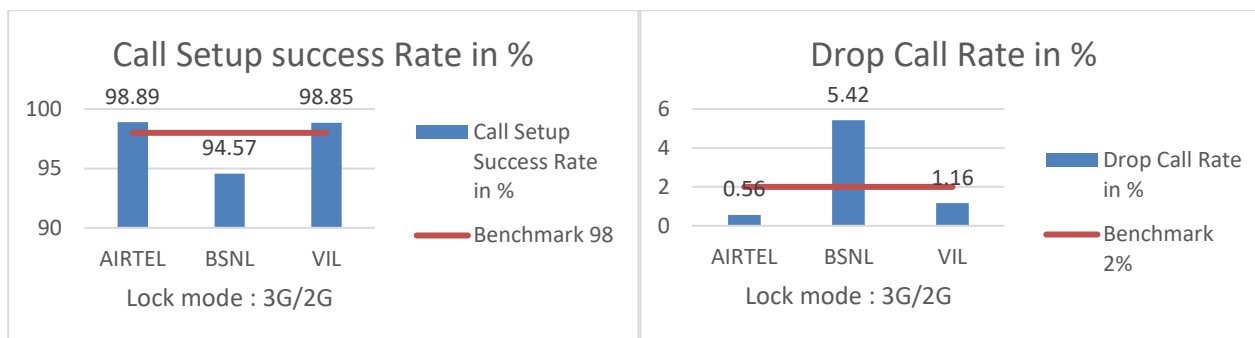


QoS Parameters		AIRTEL	BSNL	RJIL	VIL
Download speed (Mbits/s)	Typical	49.95	0.622	8.61	19.33
	Average	86.77	14.0918	239.69	25.43
	80thPercentile	138.38	24.697	482.82	28.98
Download Session Setup Success Rate%		100	97.08	-	100
Upload speed (Mbits/s)	Typical	24.14	0.0848	1.22	14.81
	Average	28.56	2.3139	22.36	16.9
	80thPercentile	32.35	4.2397	39.13	20.02
Upload Session Setup Success Rate%		100	96.7272	-	100
Latency(in ms)	50thPercentile	22.58	36.185	34	74.15
Jitter(in ms)	Average	5.52	46.571	12.48	0.91
Packet Drop Rate%		0.19	19.72	-	0
Web browsing delay(in sec)		1.68	NA	-	1.95
Video Streaming performance for video		0.9	NA	-	0.78

Detailed QoS Performance Analysis

3. Performance Analysis-Dynamic

3.1 Voice Service Performance(3G/2GLockmode)-Dynamic



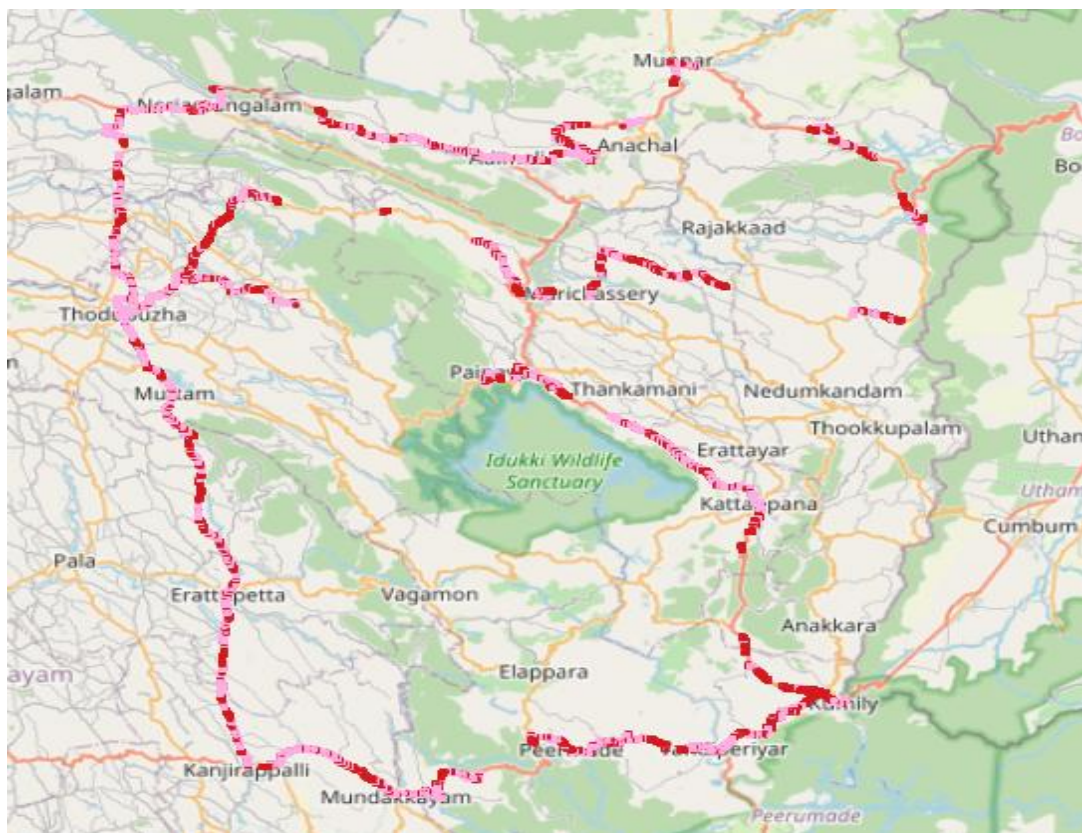
Parameters	Airtel	BSNL	RJIL	VIL
Total Distance covered(in Kms)	436	435.18	NA	436
No .of Call Attempts	180	369	NA	262
No. of Call Established	178	349	NA	259
Call setup success rate(CSSR)%	98.89	94.57	NA	98.85
No. of Drop Call	1	20	NA	3
Drop Call Rate%	0.56	5.42	NA	1.16
Call Setup Time Average(Sec.)	3.69	5.4	NA	3.32
No. of Handover Attempts	390	440	NA	891
No .of Handover success	388	10	NA	875
HOSR%	99.49	97.73	NA	98.2
Total no of RLT Occurrence	58806	16	NA	89153
No of RLT>48	0	30076	NA	0

3.1.1 Number of Cell ids latched during drive test (3G/2G-Lockmode)

Number of unique Cell ids covered in Voice test				
Technology	AIRTEL	BSNL	RJIL	VIL
3G	NA	42	NA	NA
2G	314	273	NA	448

3.1.2 Signal Strength Map:(3G/2G-Lockmode) Airtel

Signal Strength Map (for each TSP)	Map Legend: 2G- Pink (Rx Level $\geq$ -85 dBm), 3G- Sky blue (RSCP Level $\geq$ -90 dBm) Red (Rx Level $<$-85 dBm) Dark Blue (RSCP Level $<$ -90 dBm)
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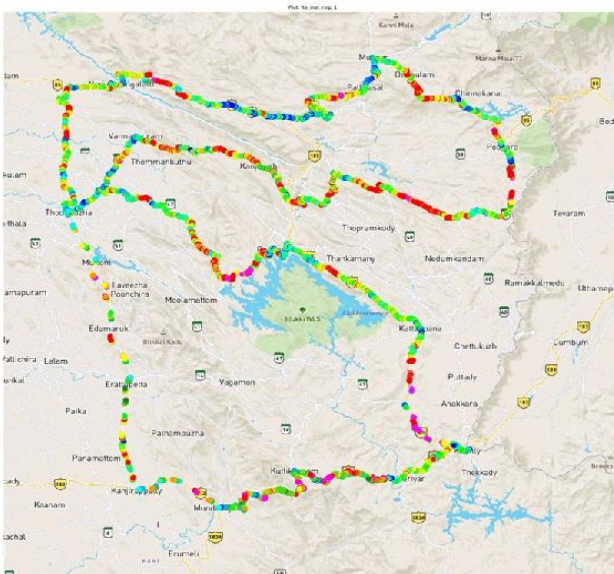
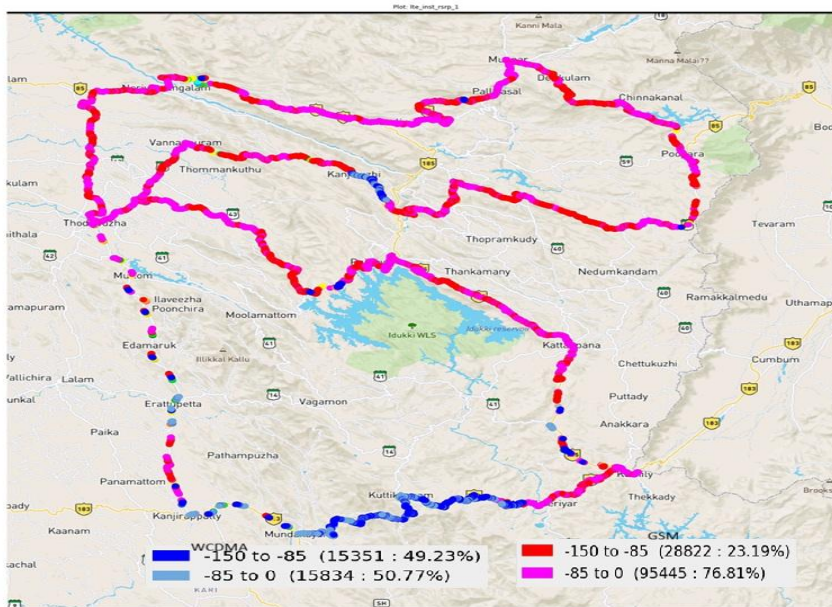
Signal Strength Map:(3G/2G-Lockmode) BSNL

Signal Strength Map (for each TSP)

Map Legend:

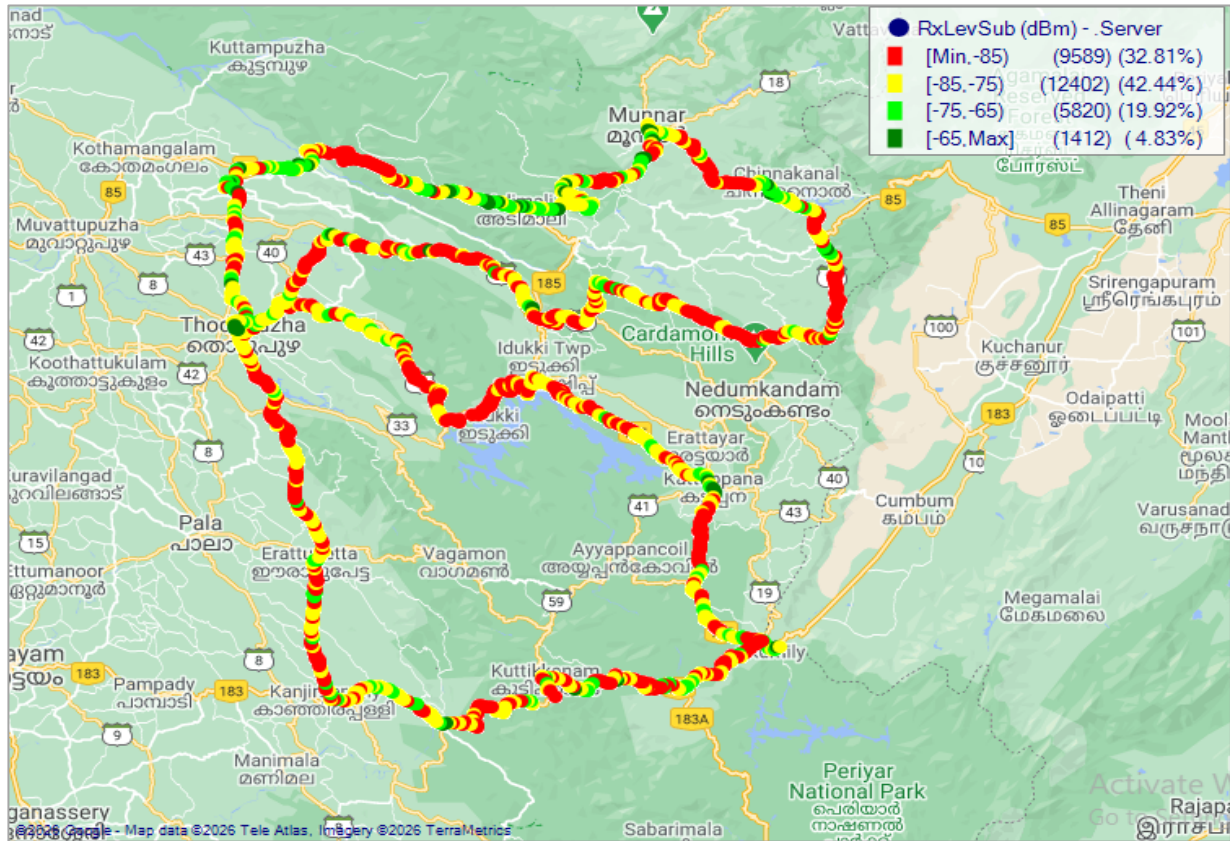
2G- **Pink** (Rx Level ≥ -85 dBm),
3G- **Sky blue** (RSCP Level ≥ -90 dBm)

Red (Rx Level < -85 dBm)
Dark Blue (RSCP Level < -90 dBm)



Signal Strength Map:(3G/2G-Lockmode) VIL

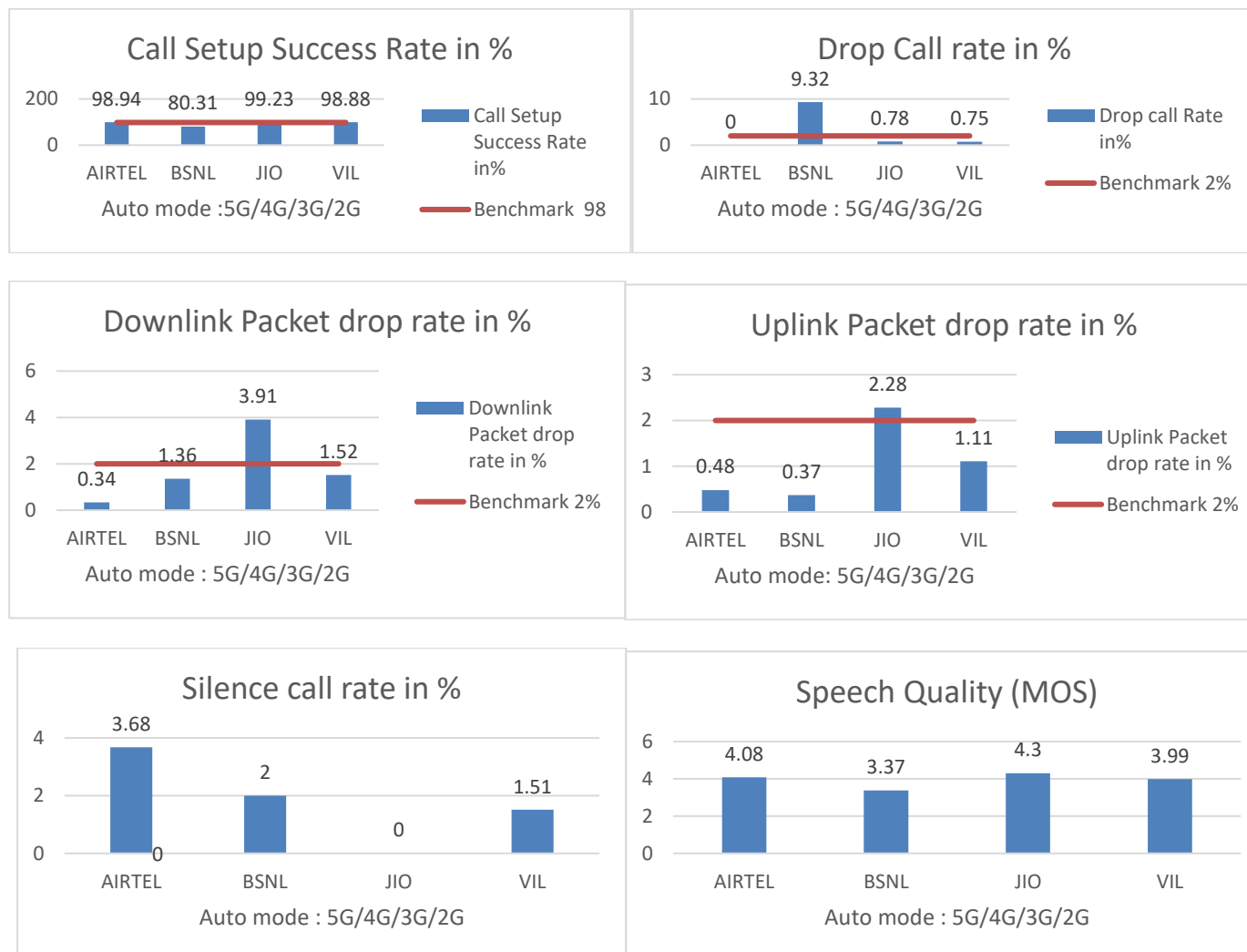
Signal Strength Map (for each TSP)	Map Legend:
2G- Pink (Rx Level ≥ -85 dBm),	Red (Rx Level < -85 dBm)
3G- Sky blue (RSCP Level ≥ -90 dBm)	Dark Blue (RSCP Level < -90 dBm)



3.1.3 Signal Strength Distribution:(3G/2G-Lockmode)

RxLevel-2G								
Overall Rx Level	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-65]	745	24171	NA	1412	4.55	20.09	NA	4.83
[-65,≥-75)	2783	35686	NA	5820	17	29.66	NA	19.92
[-75,≥-85)	7868	33417	NA	12402	48.08	27.77	NA	42.44
[-85,≥Min)	4970	27061	NA	9589	30.37	22.49	NA	32.81
Total	16366	120335	NA	29223	100%	100	NA	100
RxLevel-3G								
Overall RSCP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-70]	NA	1836	NA	NA	NA	9.06	NA	NA
[-70,≥-80)	NA	4943	NA	NA	NA	24.38	NA	NA
[-80,≥-90)	NA	7180	NA	NA	NA	35.41	NA	NA
[-90,≥Min)	NA	6316	NA	NA	NA	31.15	NA	NA
Total	NA	20275	NA	NA	NA	100	NA	NA

3.2 Voice Service Performance in 5G/4G/3G/2G(Automode)-Dynamic



3.2 Voice Service Performance in 5G/4G/3G/2G(Automode)-Dynamic

Parameters	Airtel	BSNL	RJIL	VIL
Total Distance covered(in Kms)	436	447.34	465	436
No. of Call Attempts	189	772	389	269
No. of Call Established	187	620	386	266
Call setup success rate(CSSR)%	98.94	80.31	99.23	98.88
No. of Drop Call	0	72	3	2
Drop Call Rate%	0	9.32	0.78	0.75
Call Setup Time Average(Sec.)	1.17	2.2	1.58	0.88
No. of Handover Attempts	1141	1074	3220	1579
No. of Handover success	1139	1062	3148	1565
HOSR%	99.82	98.88	97.76	99.11
Packet Drop Rate (Downlink)	0.34%	1.36	3.91	1.52
Packet Drop Rate (Uplink)	0.48%	0.37	2.28	1.11
Number of silence call for>2sec.	6	22	0	4
Silence Call Rate%	3.68	2	0	1.51
Number of MOS samples	2235	3845	7282	3169
Average MOS score	4.08	3.368	4.3	3.99

3.2.1 Number of Cell ids latched during drive test 5G/4G/3G/2G-Automode)

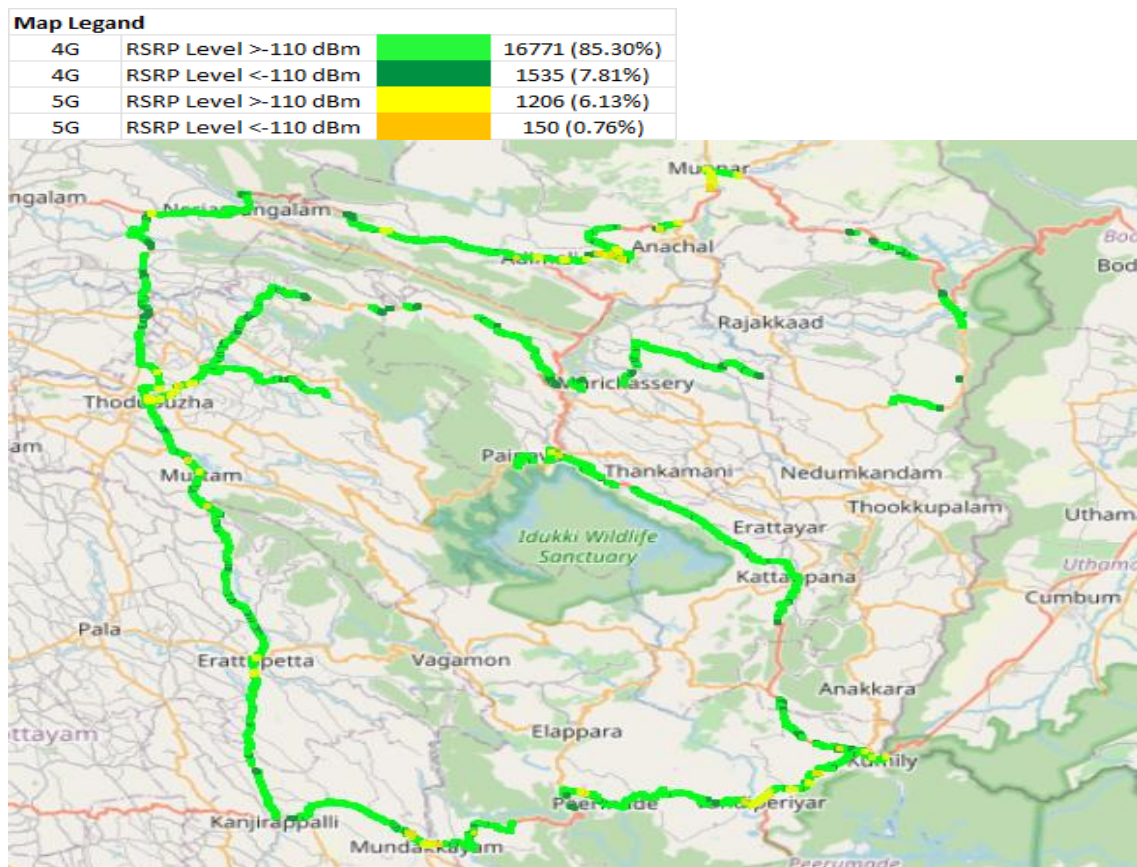
Number of unique cell ids covered in Voice test				
Technology	Service Provider			
	AIRTEL	BSNL	RJIL	VIL
3G	NA	138	-	NA
2G	0	167	-	142
4G	657	259	459	749
5G	92	NA	541	0

3.2.2 Signal Strength Map:(5G/4G/3G/2G-Automode)

Signal Strength Map	Map Legend- 2G- Pink (Rx Level ≥ -85 dBm), 3G- Sky blue (RSCP Level ≥ -90 dBm)	Red (Rx Level < -85 dBm) Dark Blue (RSCP Level < -90 dBm)
	Map Legend- 4G- Light Green (RSRP Level ≥ -110 dBm), 5G- Light Yellow (RSRP Level ≥ -110 dBm),	Dark Green (RSRP Level < -110 dBm) Dark Yellow (RSRP Level < -110 dBm)

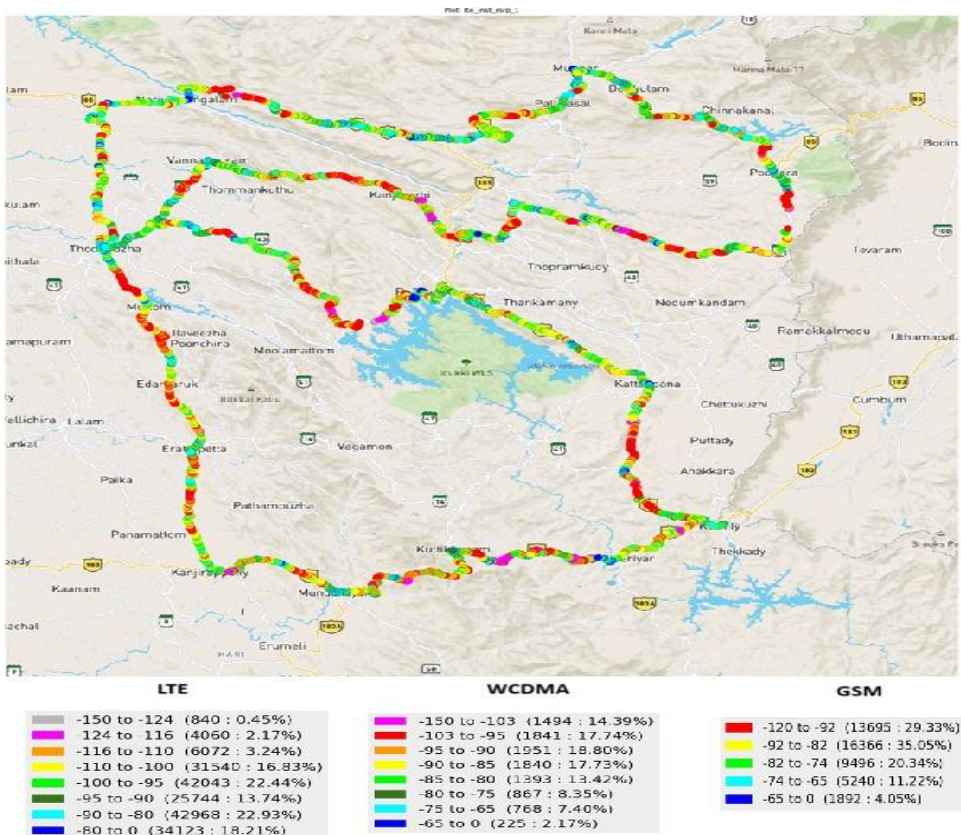
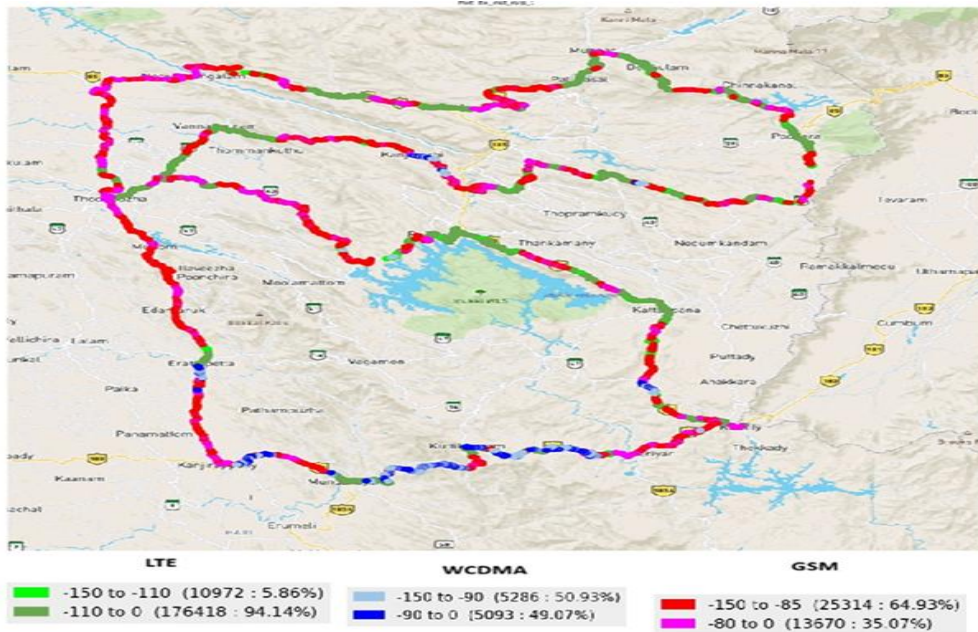
Technology	Parameter	Range	Colour
2G	Rx Level	≥ -85 dBm	
		< -85 dBm	
3G	RSCP	≥ -90 dBm	
		< -90 dBm	
4G	RSRP	≥ -110 dBm	
		< -110 dBm	
5G	RSRP	≥ -110 dBm	
		< -110 dBm	

Signal Strength Map - Airtel :(5G/4G/3G/2G-Automode)



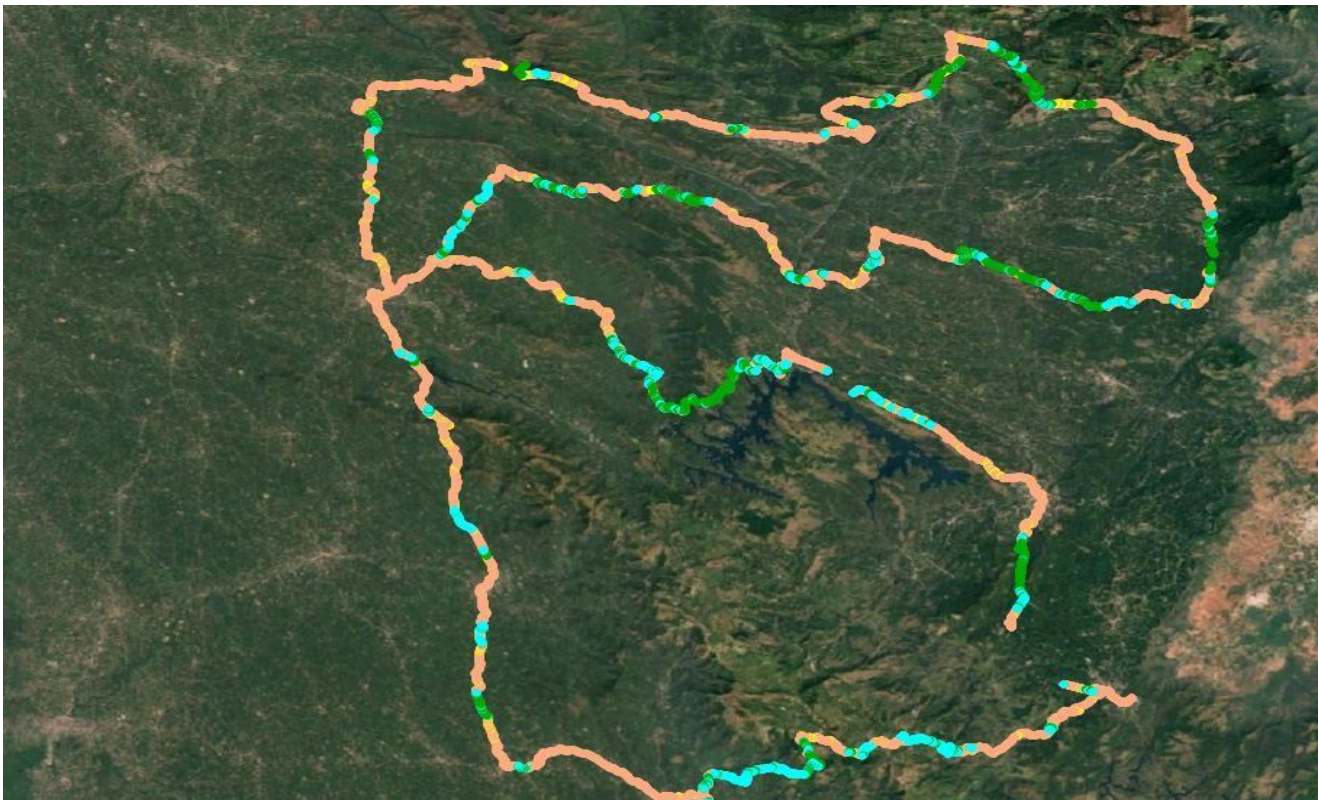
Signal Strength Map - BSNL : (5G/4G/3G/2G-Automode)

SignalStrength Map	MapLegend- 2G- Pink (RxLevel $\geq$ -85dBm), 3G- Skyblue (RSCPLLevel $\geq$ -90dBm)	Red (RxLevel $<$ -85dBm) DarkBlue (RSCPLLevel $<$ -90dBm)
	MapLegend- 4G- Light Green (RSRPLLevel $\geq$ -110 dBm), DarkGreen (RSRPLLevel $<$ -110 dBm) 5G- Light Yellow (RSRP Level $\geq$ -110 dBm), DarkYellow (RSRPLevel $<$ -110dBm)	



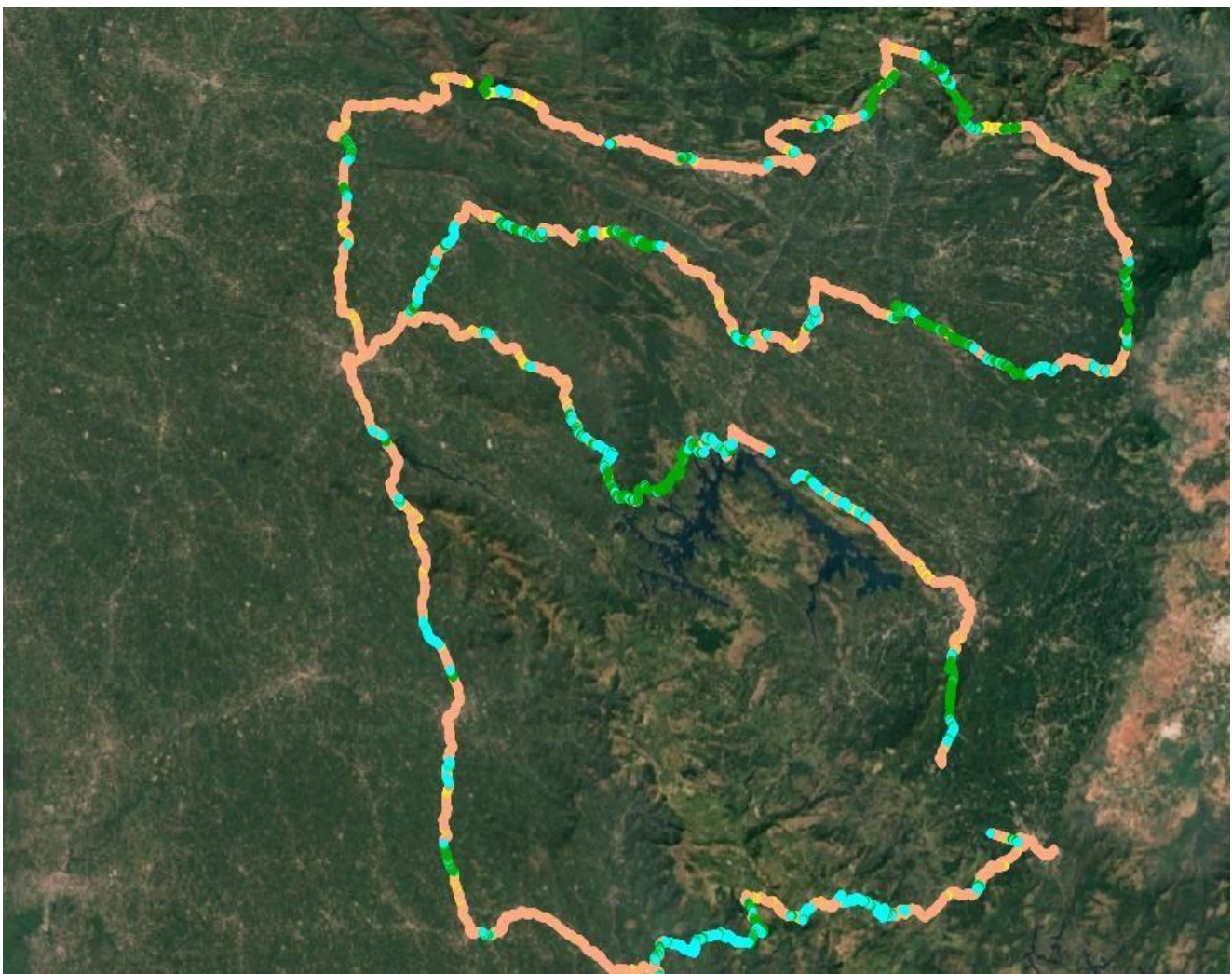
Signal Strength Map: JIO (5G/4G/3G/2G-Automode)

Signal Strength Map	Map Legend-	
	2G- Pink (Rx Level $\geq$ -85 dBm), 3G- Sky blue (RSCP Level $\geq$ -90 dBm)	Red (Rx Level $<$ -85 dBm) Dark Blue (RSCP Level $<$ -90 dBm)
	Map Legend-	
	4G- Light Green (RSRP Level $\geq$ -110 dBm), 5G- Light Yellow (RSRP Level $\geq$ -110 dBm),	Dark Green (RSRP Level $<$ -110 dBm) Dark Yellow (RSRP Level $<$ -110 dBm)



Signal Strength Map: VIL (5G/4G/3G/2G-Automode)

Signal Strength Map	Map Legend- 2G- Pink (Rx Level $\geq$ -85 dBm), Red (Rx Level $<$ -85 dBm) 3G- Sky blue (RSCP Level $\geq$ -90 dBm) Dark Blue (RSCP Level $<$ -90 dBm)
	Map Legend- 4G- Light Green (RSRP Level $\geq$ -110 dBm), Dark Green (RSRP Level $<$ -110 dBm) 5G- Light Yellow (RSRP Level $\geq$ -110 dBm), Dark Yellow (RSRP Level $<$ -110 dBm)



3.2.3 Signal Strength distribution:(5G/4G/3G/2G-Automode)

RxLevel-2G								
Overall Rx Level	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-65]	NA	1892	NA	2	NA	4.05	NA	0.1
[-65,≥-75)	NA	6165	NA	29	NA	13.2	NA	1.45
[-75,≥-85)	NA	13318	NA	183	NA	28.52	NA	9.12
[-85, ≥Min)	NA	25314	NA	1792	NA	54.22	NA	89.33
Total	NA	46689	NA	2006	NA	100	NA	100

RxLevel-3G								
Overall RSCP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-70]	NA	512	NA	NA	NA	4.93	NA	NA
[-70,≥-80)	NA	1348	NA	NA	NA	12.99	NA	NA
[-80,≥-90)	NA	3233	NA	NA	NA	31.15	NA	NA
[-90, ≥Min)	NA	5286	NA	NA	NA	50.93	NA	NA
Total	NA	10379	NA	NA	NA	100	NA	NA

RxLevel-4G								
Overall RSRP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-80]	963	34123	171	760	5.26	18.21	1.34	2.83
[-80,≥-95]	6745	68712	1295	7604	36.85	36.67	10.14	28.32
[-95,≥-110]	9063	73583	4759	12708	49.51	39.27	37.25	47.33
[-110,≥Min]	1535	10972	6551	5778	8.39	5.86	51.27	21.52
Total	18306	187390	12776	26850	100%	100	100	100

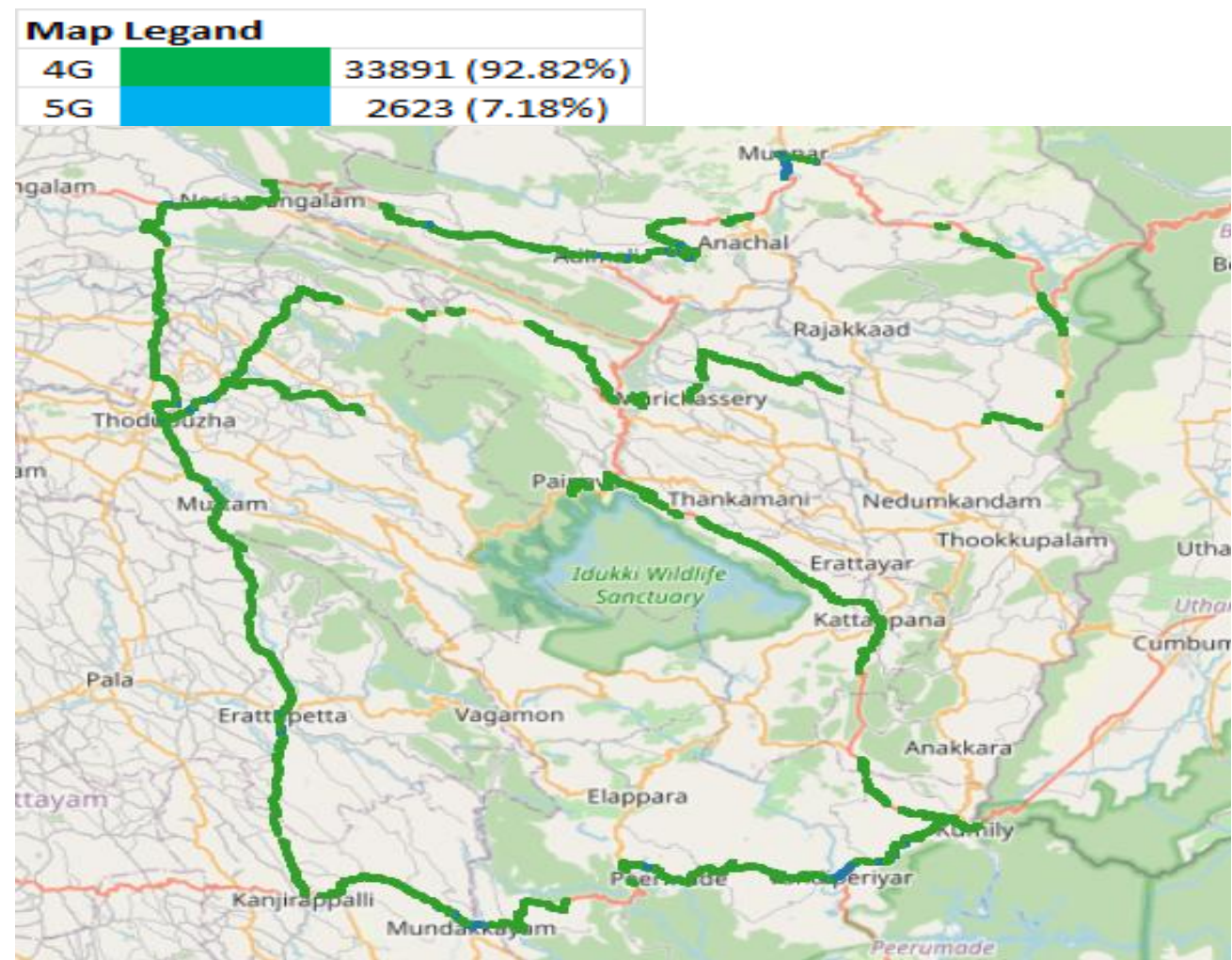
RxLevel-5G								
Overall RSRP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-80]	424	NA	7439	NA	31.27%	NA	16.58	NA
[-80,≥-95]	291	NA	16492	NA	21.46%	NA	36.76	NA
[-95,≥-110]	491	NA	17726	NA	36.21%	NA	39.51	NA
[-110,≥Min]	150	NA	3209	NA	11.06%	NA	7.15	NA
Total	1356		44866		100%		100	

3.3 Data Service performance in 5G/4G/3G/2G(Automode)-Dynamic

QoS Parameters		AIRTEL	BSNL	RJIL	VIL
Download speed (M bits/s)	Average	18.3	6.94	239.69	18.16
	80thPercentile	50.31	12.15	482.82	24.68
	20thPercentile	64.16	0.01	8.61	3.48
Upload speed (M bits/s)	Average	3.44	2.19	22.36	8.22
	80thPercentile	13.26	3.43	39.13	15.01
	20thPercentile	19.99	0.05	1.22	0.76
Latency (ms)	Average	40	178.04	37	316
	50thPercentile	24	358.16	34	87
Jitter(ms)	Average	7.36	110.87	12.48	0.93

3.4 Time Spent(Technology-wise) Airtel

Time Spent Map (for each TSP)	Map Legend: 2G – Red 3G – Yellow 4G – Green 5G - Blue
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Time Spent(Technology-wise) BSNL

Time Spent Map (for each TSP)

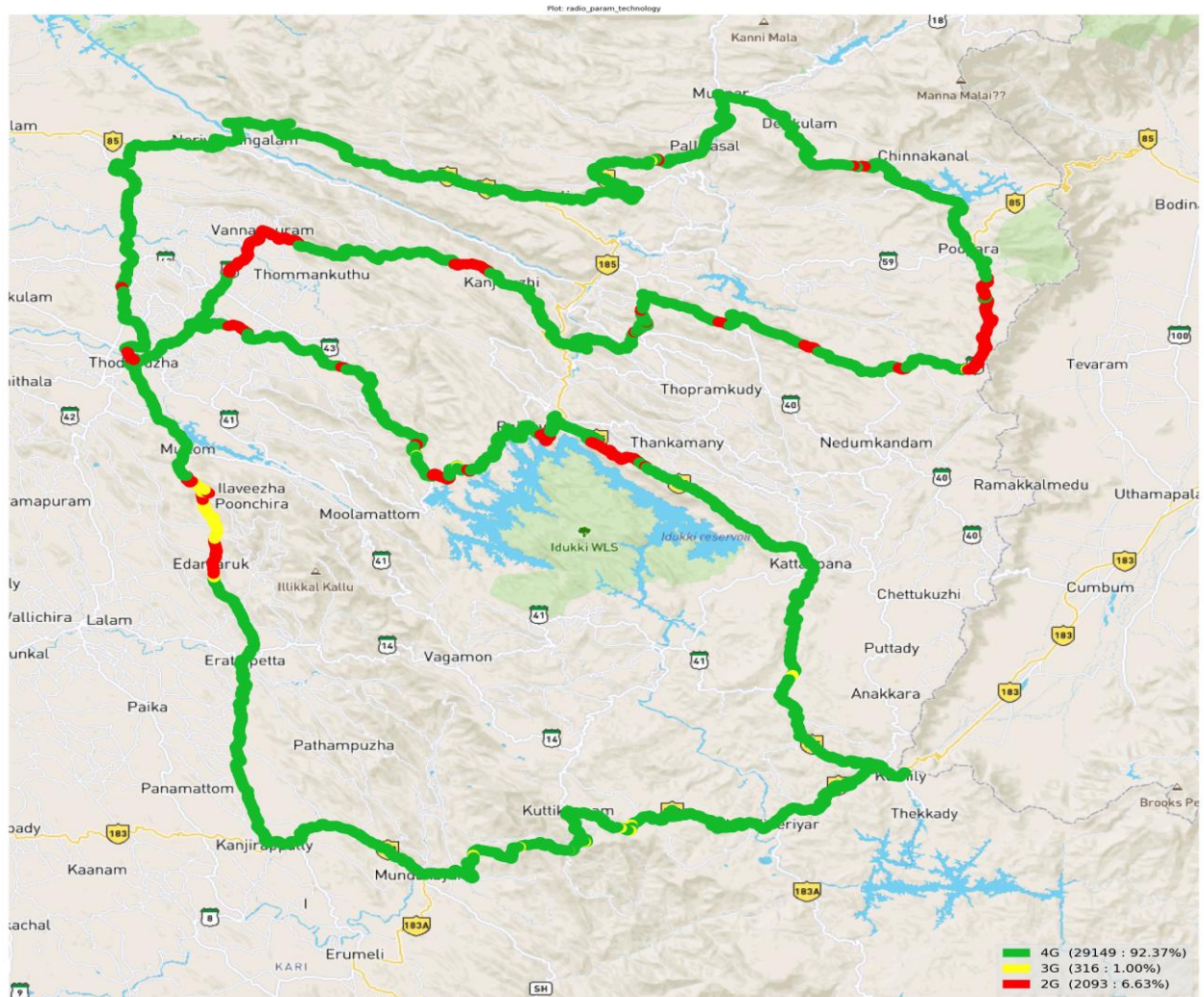
Map Legend:

2G – Red

4G – Green

3G – Yellow

5G - Blue

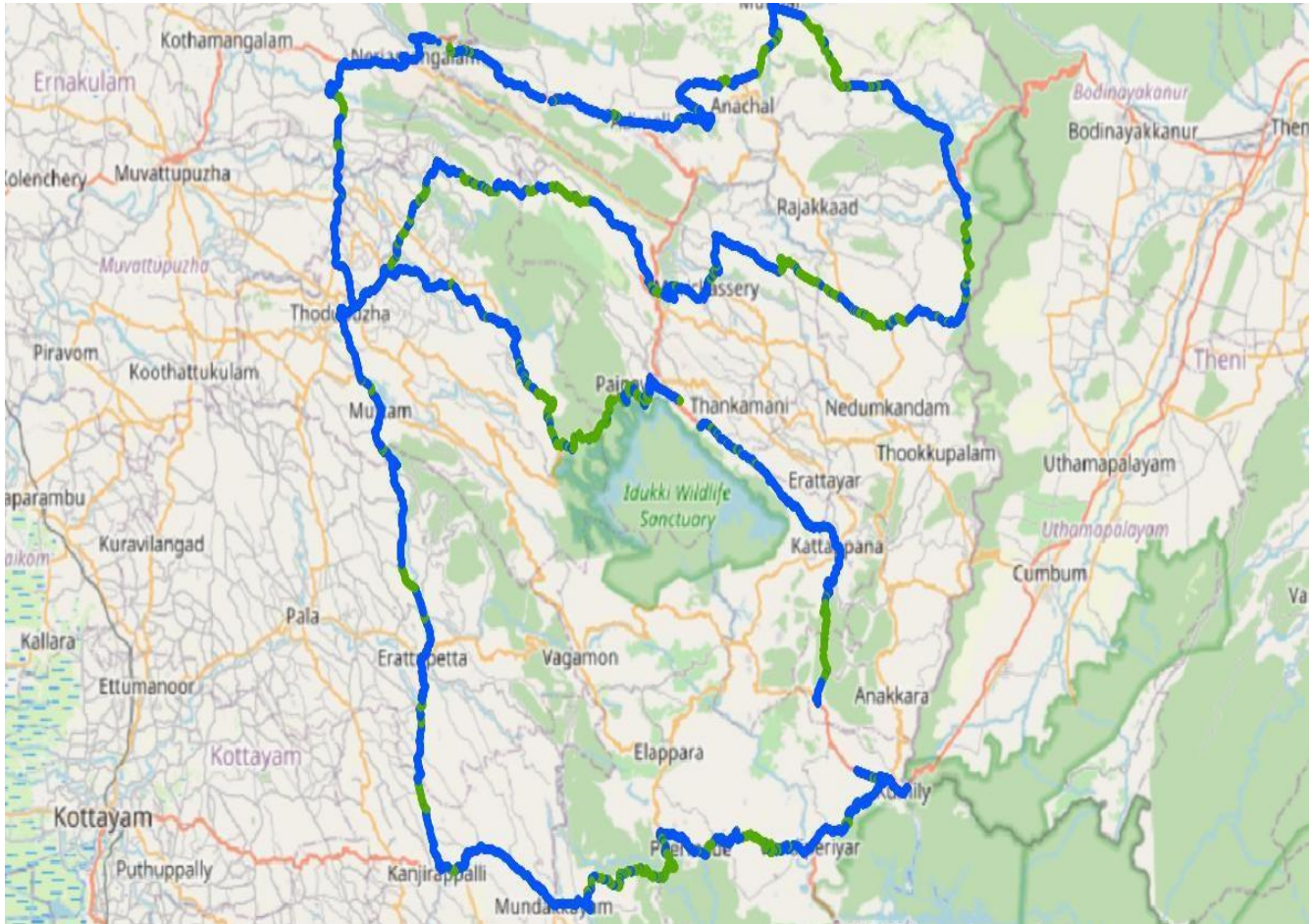


Time Spent(Technology-wise) JIO

Time Spent Map (RJIL)

Map Legend:
4G – Green

5G - Blue



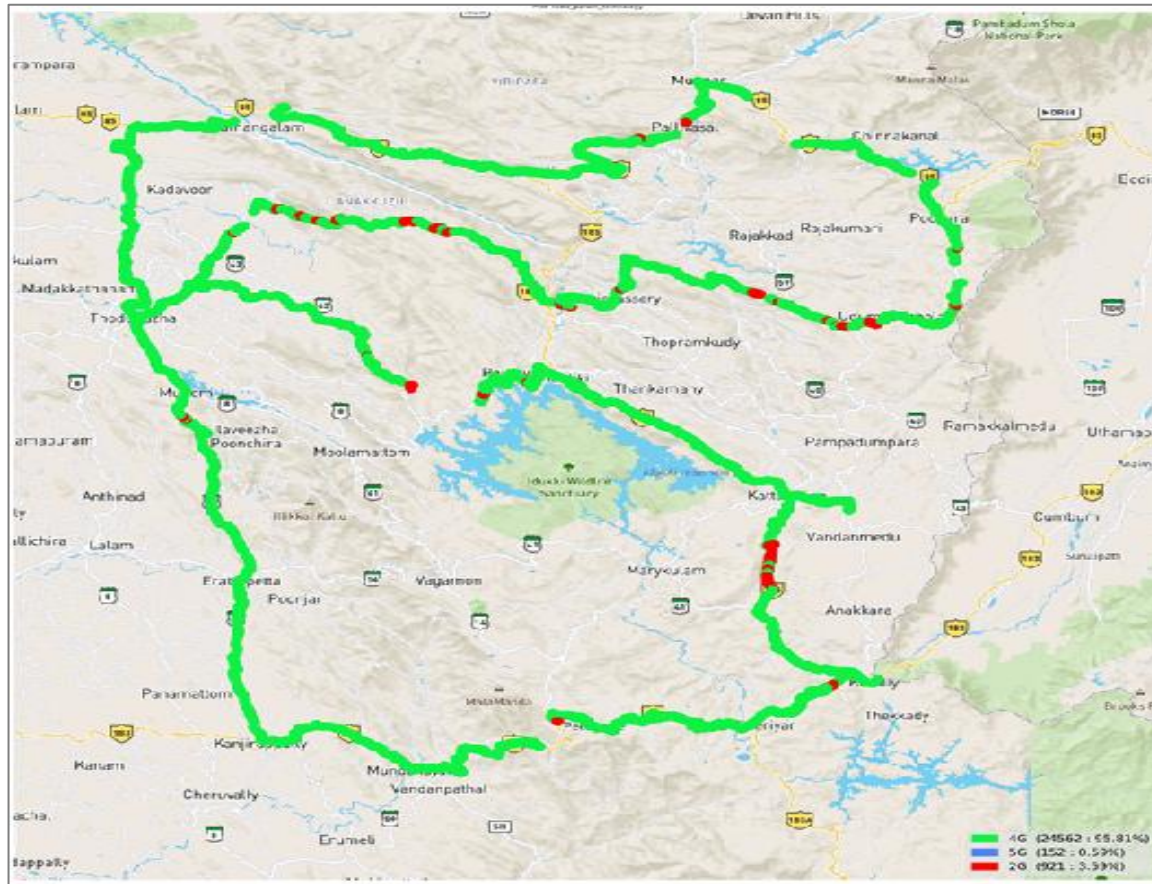
Time Spent(Technology-wise) VIL

Time Spent Map (for each TSP)

Map Legend:

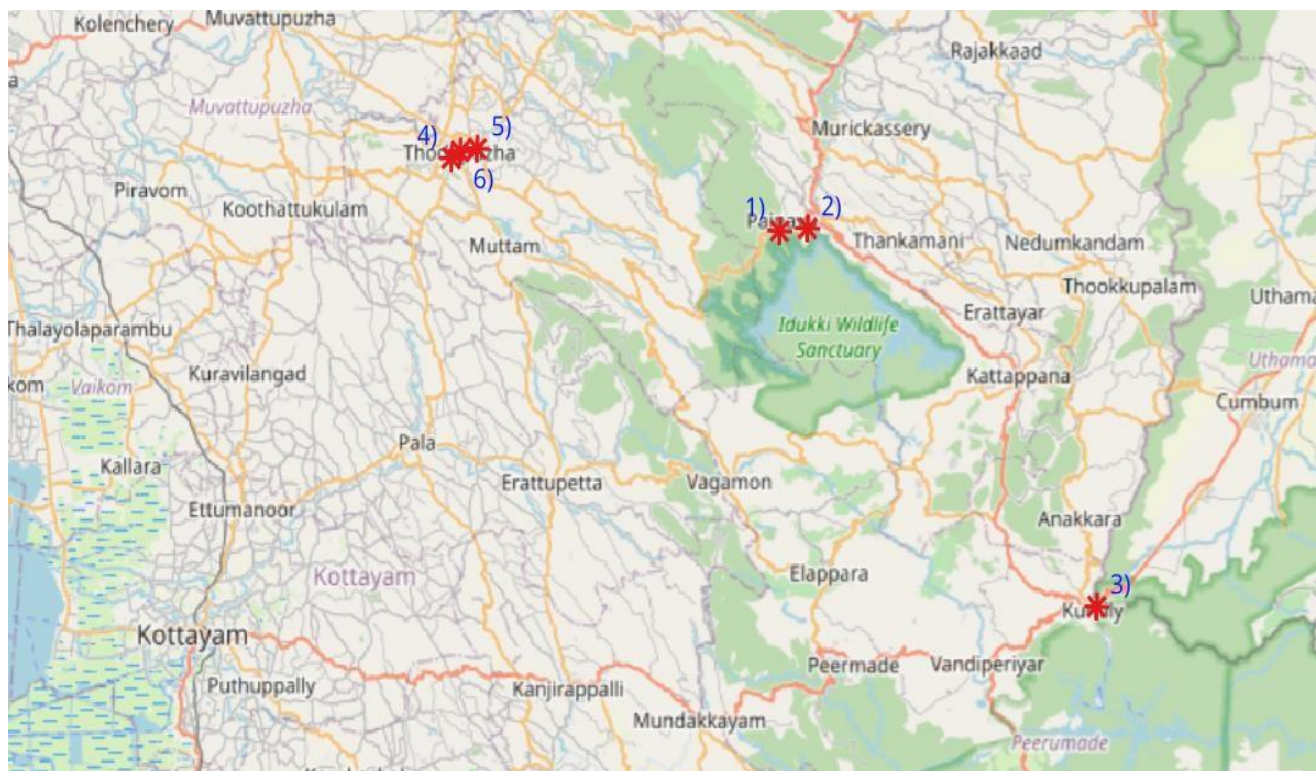
2G - Red
Green
5G - Blue

3G - Yellow 4G -



QoS Performance Analysis-Static

4.1 Hotspot Locations



Date	Time	Hotspot Location	Latitude / Longitude
10-03-2026	12:37 PM	COLLECTRATE IDUKKI	9.84796/76.9419
10-03-2026	01:56 PM	Govt. MEDICAL COLLEGE HOSPITAL IDUKKI	9.84983/76.9627
10-03-2026	05:08 PM	KUMILY BUS STAND	9.60928/77.1699
11-03-2026	06:54 PM	PRIVATE BUS STAND THODUPUZHA	9.89301/76.7088
12-03-2026	10:22 AM	DISTRICT HOSPITAL THODUPUZHA	9.90031/76.7262
12-03-2026	11:32 AM	CIVIL STATION THODUPUZHA	9.8983/76.7139

4.2 Voice Service Performance(5G/4G/3G/2G-Automode)–Overall

Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	60	60	30	30	60
No of Call Established	60	60	30	30	60
Call setup success rate(CSSR)%	100	100	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0	0	0	0	0
Call Setup Time Average(.)	1.31	1.2	1.11	1.11	0.56

4.3 Data Service Performance(5G/4G/3G/2G-Automode)–Overall

QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	49.95	10.85	31.81	176.52	19.33
	Average	86.77	13.4	35.09	315.03	25.43
	80thPercentile	138.38	13.08	38.36	444.47	28.98
Download Session Setup Success Rate%		100	100	100	91.67	100
Upload speed (M bits/s)	Typical	24.14	2.52	6.77	35.48	14.81
	Average	28.56	2.74	8.19	52.23	16.9
	80thPercentile	32.35	3.39	9.66	72.52	20.02
Upload Session Setup Success Rate%		100	100	100	91.67	100
Latency(in ms)	50thPercentile	22.58	181.61	38.33	39.38	74.15
Jitter(in ms)	Average	3.78	117.06	17.07	17.27	0.91
Packet Drop Rate%		0.19	2.40%	0	0	0
Web browsing delay(in)		1.68	10.73	-	9.16	1.95
Video Streaming performance for video		0.9	103.76	-	0.35	0.78

Voice Service Performance (5G/4G/3G/2G-Automode) at Collectorate Idukki.

Name of Hotspot Location 1	Collectorate Idukki				
Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	10	10	5	5	10
No of Call Established	10	10	5	5	10
Call setup success rate(CSSR)%	100	100	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0	0	0	0	0
Call Setup Time Average(.)	1.39	1.2	1.12	1.03	0.51
Total no of RLT Occurrence	-	-	-	-	-
No of RLT>48	-	-	-	-	-

Data Service Performance (5G/4G/3G/2G-auto mode) at Collectorate Idukki.

Name of Hotspot Location 1		Collectorate Idukki				
QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	18.24	11.39	42.38	304.84	9.61
	Average	21.43	20.83	46.13	444.64	10.19
	80thPercentile	21.75	26.46	50.69	572.44	10.9
Download Session Setup Success Rate%		100	100	100	100	100
Upload speed (M bits/s)	Typical	8.66	1.144	3.74	50.8	16.29
	Average	12.17	3.48	4.21	60.99	16.57
	80thPercentile	16.13	6.38	5.5	71.55	17.41
Upload Session Setup Success Rate%		100	100	100	100	100
Latency(in ms)	50thPercentile	25	22.45	44	40	68.89
Jitter(in ms)	Average	7.88	20.45	12.2	7.63	0.87
Packet Drop Rate%		0	0.44	0	0	0
Web browsing delay(in)		1.99	3.635	-	9.27	1.88
Video Streaming performance for video		1.14	86.68	-	0.28	0.74

Voice Service Performance (5G/4G/3G/2G-Automode) at Medical College Idukki

Name of Hotspot Location 2	Medical College Idukki				
Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	10	10	5	5	10
No of Call Established	10	9	5	5	10
Call setup success rate(CSSR)%	100%	100	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0%	0	0	0	0
Call Setup Time Average(sec.)	1.29	1.99	1.09	1.33	0.61
Total no of RLT Occurrence	-	-	-	-	-
No of RLT>48	-	-	-	-	-

Data Service Performance (5G/4G/3G/2G-auto mode) at Medical College Idukki

Name of Hotspot Location 2		Medical College Idukki				
QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	22.63	4.33	21.3	2.21	7.35
	Average	85.59	6.9	22.98	68.23	8.41
	80thPercentile	142.65	7.91	24.54	114.03	9.01
Download Session Setup Success Rate%		100	100	100	50	100
Upload speed (M bits/s)	Typical	9.04	0.14	3.21	1.96	8.61
	Average	12.28	0.361	4.87	20.36	14.77
	80thPercentile	16.67	0.56	6.19	46.28	23.75
Upload Session Setup Success Rate%		100	80	100	50	100
Latency(in ms)	50thPercentile	24	24.7	42	43	79
Jitter(in ms)	Average	4.1	17.44	24.4	22.41	0.86
Packet Drop Rate%		1	9.68	0	0	0
Web browsing delay(in)		1.5	6.7	-	8.88	1.99
Video Streaming performance for video		0.84	129.79	-	0.34	0.69

Voice Service Performance (5G/4G/3G/2G-Automode) at KUMILY Bus Stand

Name of Hotspot Location 3	KUMILY BUS STAND				
Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	10	10	5	5	10
No of Call Established	10	9	5	5	10
Call setup success rate(CSSR)%	100	90	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0%	0	0	0	0
Call Setup Time Average(.)	1.33	0.91	1.18	1.11	0.55
Total no of RLT Occurrence	-	-	-		-
No of RLT>48	-	-	-		-

Data Service Performance (5G/4G/3G/2G-auto mode) at KUMILY Bus Stand

Name of Hotspot Location 3		KUMILY BUS STAND				
QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	16.86	5.71	26.8	162.88	20
	Average	91.17	23.51	32.11	304.81	24.06
	80thPercentile	253.21	35.37	35.59	497.09	26.82
Download Session Setup Success Rate%		100	100	100	100	100
Upload speed (Mbits/s)	Typical	37.56	0.63	9.05	15.74	22.62
	Average	39.13	8.48	13.15	31.66	23.98
	80thPercentile	40.88	13.53	17.03	54.22	25.33
Upload Session Setup Success Rate%		100	100	100	100	100
Latency(in ms)	50thPercentile	18	19.7	41	42	74.59
Jitter(in ms)	Average	4.55	7.95	8	12.41	0.93
Packet Drop Rate%		0.14	0.26	0	0	0
Web browsing delay(in)		1.57	8.938	-	10.15	2.08
Video Streaming performance for video		0.94	90.7	-	0.36	0.97

Voice Service Performance (5G/4G/3G/2G-Automode) at Thodupuzha Bus stand

Name of Hotspot Location 4	Thodupuzha Muncipal Bus Stand				
Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	10	10	5	5	10
No of Call Established	10	10	5	5	10
Call setup success rate(CSSR)%	100%	100	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0%	0	0	0	0
Call Setup Time Average(.)	1.31	0.95	1.09	1.13	0.55
Total no of RLT Occurrence	-	-	-	-	-
No of RLT>48	-	--	-	-	-

Data Service Performance (5G/4G/3G/2G-auto mode) at Thodupuzha Bus stand

Name of Hotspot Location 4		Thodupuzha Muncipal Bus Stand				
QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	72.84	14.23	39.6	305.93	46.96
	Average	84.78	16.77	42.57	481.25	51.79
	80thPercentile	100.66	19.27	46.57	634.68	56.67
Download Session Setup Success Rate%		100	100	100	100	100
Upload speed (Mbits/s)	Typical	24.38	0.5	7.26	53.64	13.06
	Average	31.85	1.04	7.54	79.4	13.8
	80thPercentile	36.23	1.33	7.9	112.23	14.6
Upload Session Setup Success Rate%		100	100	100	100	100
Latency(in ms)	50thPercentile	27	26.55	36	35	61.13
Jitter(in ms)	Average	4.85	9.61	17.8	11.24	0.92
Packet Drop Rate%		0	0.64	0	0	0
Web browsing delay(in)		2.15	4.47	-	8.83	1.48
Video Streaming performance for video		0.93	137.71	-	0.34	0.8

Voice Service Performance (5G/4G/3G/2G-Automode) at Dist Hospital Thodupuzha

Name of Hotspot Location 5	Dist Hospital Thodupuzha				
Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	10	10	5	5	10
No of Call Established	10	10	5	5	10
Call setup success rate(CSSR)%	100	100	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0	0	0	0	0
Call Setup Time Average(.)	1.29	0.87	1.1	1.01	0.54
Total no of RLT Occurrence	-	-	-	-	-
No of RLT>48	-	-	-	-	-

Data Service Performance (5G/4G/3G/2G-auto mode) at Dist Hospital Thodupuzha

Name of Hotspot Location 5		Dist Hospital Thodupuzha				
QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	81.28	2.49	35.66	137.37	18.45
	Average	138.2	3.88	39.76	262.6	32.18
	80thPercentile	199.24	4.77	43.98	364.39	41.98
Download Session Setup Success Rate%		100	100	100	100	100
Upload speed (M bits/s)	Typical	34.23	3.17	11.31	50.65	22.78
	Average	39.48	3.86	12.37	67.91	25.43
	80thPercentile	43.73	4.35	13.79	85.85	30.55
Upload Session Setup Success Rate%		100	100	100	100	100
Latency(in ms)	50thPercentile	19.5	18.55	37	37	77.38
Jitter(in ms)	Average	4.42	11.74	29.4	9.18	0.92
Packet Drop Rate%		0	3.94	0	0	0
Web browsing delay(in)		1.44	5.18	-	9.21	2.28
Video Streaming performance for video		0.75	69.69	-	0.39	0.71

Voice Service Performance (5G/4G/3G/2G-Automode) at Civil Station Thodupuzha

Name of Hotspot Location 6	Civil Station Thodupuzha				
Parameters	Airtel	BSNL	RJIL4G	RJIL5G	VIL
No of Call Attempts	10	10	5	5	10
No of Call Established	10	10	5	5	10
Call setup success rate(CSSR)%	100	100	100	100	100
No. of Drop Call	0	0	0	0	0
Drop Call Rate%	0	0	0	0	0
Call Setup Time Average(.)	1.26	1.1	1.12	1.06	0.59
Total no of RLT Occurrence	-	-	-	-	-
No of RLT>48	-	-	-	-	-

Data Service Performance (5G/4G/3G/2G-auto mode) at Civil Station Thodupuzha

Name of Hotspot Location 6		Civil Station Thodupuzha				
QoS Parameters		AIRTEL	BSNL	RJIL4G	RJIL5G	VIL
Download speed(M bits/s)	Typical	87.87	0.14	25.11	145.89	13.64
	Average	99.48	8.54	27.01	328.67	25.93
	80thPercentile	112.82	21	28.77	484.18	28.53
Download Session Setup Success Rate%		100	100	100	100	100
Upload speed (Mbits/s)	Typical	30.97	0.11	6.07	40.08	5.5
	Average	36.46	5.31	6.97	53.07	6.87
	80thPercentile	40.47	10.4	7.56	64.99	8.46
Upload Session Setup Success Rate%		100	100	100	100	100
Latency(In ms)	50thPercentile	22	17.5	30	34	83.95
Jitter(in ms)	Average	7.35	45.32	10.6	40.74	0.94
Packet Drop Rate%		0	0.04	0	0	0
Web browsing delay(in)		1.44	2.79	-	8.62	2.01
Video Streaming performance for video		0.85	107.77	-	0.36	0.75

4.3 Signal Strength distribution at Static location–Overall

RxLevel-2G								
Overall Rx Level	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-65]	NA	837	NA	NA	NA	100	NA	NA
[-65,≥-75)	NA	0	NA	NA	NA	0	NA	NA
[-75,≥-85)	NA	0	NA	NA	NA	0	NA	NA
[-85, ≥Min)	NA	0	NA	NA	NA	0	NA	NA
Total	NA	837	NA		NA	100	NA	
RxLevel-3G								
Overall RSCP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-70]	NA	NA	NA	NA	NA	NA	NA	NA
[-70,≥-80)	NA	NA	NA	NA	NA	NA	NA	NA
[-80,≥-90)	NA	NA	NA	NA	NA	NA	NA	NA
[-90, ≥Min)	NA	NA	NA	NA	NA	NA	NA	NA
Total	NA		NA	NA	NA		NA	NA
RxLevel-4G								
Overall RSRP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-80]	194	29089	1023	1634	10.74	41.51	56.93	14.09
[-80,≥-95]	1398	29424	561	9925	77.41	41.98	31.22	85.63
[-95,≥-110]	214	11569	213	32	11.85	16.51	11.85	0.28
[-110, ≥Min]	0	1	0	0	0	0	0	0
Total	1806	70083	1797	11591	100	100	100	100
RxLevel-5G								
Overall RSRP	No of Sample				Sample%			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL	RJIL	VIL
[Max,≥-80]	232	NA	1083	NA	15.69	NA	53.14	NA
[-80,≥-95]	471	NA	447	NA	31.85	NA	21.93	NA
[-95,≥-110]	722	NA	403	NA	48.82	NA	19.73	NA
[-110, ≥Min]	54	NA	104	NA	3.65	NA	5.2	NA
Total	1479		2037		100%		100	

4 Improvement plan for short coming observed during Drive Test



Sr.					Observation (No coverage / Poor coverage / Poor Signal Quality/ Call drops / Call Setup failure, and Hand Over failure/ Block/ Down Link Packet Drop/ Up	Improvement Plan (Optimization/Radiation of New Site/upgradation of existing site/upgradation of backhaul etc.)	
	Name of TSP	Route / Location	Name of Area & LSA	Lat. & Long.	Link Packet Drop/ speed less than 2Mb locations/)		Time Line/ Remarks
1	Airtel	Thodupuzha	Thodupuzha-Thodupuzha	9.8996268, 76.7155531		Soft optimization	
					Block		Closed
2	Airtel	Chithirapuram	Chithirapuram-Devikulam	10.0413,77.0390		Physical optimization	Closed
					Block		
3	Airtel	Venmony	Venmony-Idukki	9.9731,76.864		Physical Optimization	Closed
					Block		
4	Airtel	Kumily	Kumily-Idukki	9.6041,77.1418		Physical Optimization	Closed
					Drop		
5	Airtel	Valara	Valara-Adimaly	10.05661,76.821	No coverage	Forest/Non- populated area	NA
6	Airtel	Devikulam	Devikulam-Munnar	10.0133,77.192	No coverage	Non -populated area	NA
7	Airtel	Chathurangapara	Chathurangapara-Udumbanchola	9.913213°,77.216	No coverage	Forest Area	NA
8	Airtel	Painavu	Painavu-Idukki	9.8359,76.9268	NO coverage	Forest Area	NA
9	BSNL	Kurumpadam at Karimannur-Udumbannur road	Idukki Kerala LSA	9.91564428/76.80105895	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
10	BSNL	Moolekkadu in Peringassery-Uppukunnu Road	Idukki Kerala LSA	9.85056005/76.87016496	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
11	BSNL	Near Uppukunnu Viewpoint	Idukki Kerala LSA	9.83532416/76.87919862	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
12	BSNL	Near Valiyamavu in Thodupuzha-Puliyannmala road	Idukki Kerala LSA	9.81686758/76.89653823	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	Forest area no house holds	
13	BSNL	Near Narakakkanam in NH185	Idukki Kerala LSA	9.82902851/77.00248606	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
14	BSNL	Near Double cutting in NH185	Idukki Kerala LSA	9.82817548/77.01248958	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
15	BSNL	Kaithavana in NH185	Idukki Kerala LSA	9.70057462/77.10320813	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
16	BSNL	Near Sasthanada in NH185	Idukki Kerala LSA	9.64781603/77.10714261	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
17	BSNL	Near Vellaramkunnu in NH185	Idukki Kerala LSA	9.63428575/77.10850119	Poor 2G/3G coverage & Drop Call in 2G-3G lock mode	4G Coverage available	
18	BSNL	Near Peerumade in NH183	Idukki Kerala LSA	9.57894234/77.01891191	Hilly Terrain less populated, low coverage	4G Coverage available	
19	BSNL	Near Police camp in NH183	Idukki Kerala LSA	9.57211831/76.97544628	Hilly Terrain less populated, low coverage	4G Coverage available	
20	BSNL	Near Valanjanganam in NH183	Idukki Kerala LSA	9.56030093/76.98081384	Hilly Terrain less populated, low coverage	4G Coverage available	
21	BSNL	Near Amalagiri in NH183	Idukki Kerala LSA	9.55651255/76.94046519	Hilly Terrain less populated, low coverage	4G Coverage available	

22	BSNL	Near Kanjiram kavala in Erattupetta Muttom Road	Idukki Kerala LSA	9.8085441/76.75543679	Hilly Terrain less populated, low coverage	4G Coverage available, some orientation changes planned	1 month
23	BSNL	Oonnukal-Paingottoor Road	Idukki Kerala LSA	10.05596761/76.82352179	Hilly Terrain less populated, low coverage	4G Coverage available	
24	BSNL	Near Cheeyapara water falls in Aluva-Munnar Road	Idukki Kerala LSA	10.04949246/76.71374974	Hilly Terrain less populated, low coverage	4G Coverage available	
25	BSNL	Oonnukal-Paingottoor Road	Idukki Kerala LSA	10.03191824/76.70571824	Hilly Terrain less populated, low coverage	4G Coverage available	
26	BSNL	Near Akshaya centre, Thodupuzha	Idukki Kerala LSA	9.89951518/76.71549548	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
27	BSNL	Thodupuzha-Muthalakodam Road	Idukki Kerala LSA	9.91012546/76.73160967	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
28	BSNL	Sabarimala-Kodaikanal road in SH 44	Idukki Kerala LSA	9.98928825/76.79330198	Hilly Terrain less populated, low coverage	Antenna orientation and tilt adjusted in Kaloor TDP site	1 month
29	BSNL	Sabarimala-Kodaikanal road in SH 44	Idukki Kerala LSA	9.97242139/76.83318489	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
30	BSNL	Sabarimala-Kodaikanal Road in SH 44	Idukki Kerala LSA	9.97541601/76.88629384	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
31	BSNL	Alappuzha-Madurai Road in SH 40	Idukki Kerala LSA	9.92354906/77.01320056	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
32	BSNL	Vengalloor-Para Road	Idukki Kerala LSA	9.92979521/77.07408856	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
33	BSNL	Near Alazar Arts college	Idukki Kerala LSA	9.91796082/77.09342895	6 meters Mast site.	New 12 Mtrs Mast constructed. New Equipment will install shortly	3months
34	BSNL	Near Puthuchira Bus stop	Idukki Kerala LSA	9.91533227,77.10034183	Hilly Terrain less populated, low coverage	Antenna orientation and tilt adjusted in Vadakummuri site	1month
35	BSNL	Sabarimala-Kodaikanal road in SH 44	Idukki Kerala LSA	9.99515615,77.19924035	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
36	BSNL	Thodupuzha-oonukkal road	Idukki Kerala LSA	10.04497812,77.11134358	Hilly Terrain less populated, low coverage	Antenna orientation and tilt adjustments done	
37	BSNL	Kochi-Dhanushkodi road in NH 85	Idukki Kerala LSA	10.06213571,77.06032141	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
38	BSNL	Kochi-Dhanushkodi road in NH 85	Idukki Kerala LSA	10.05525635,77.05241479	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
39	BSNL	Kochi-Dhanushkodi road in NH 85	Idukki Kerala LSA	10.04790947,77.0511366	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
40	BSNL	Kochi-Dhanushkodi road in NH 85	Idukki Kerala LSA	10.04093026,77.02395318	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
41	BSNL	Sabarimala-Kodaikanal Road in SH 44	Idukki Kerala LSA	10.01220638,76.97391823	Hilly Terrain less populated, low coverage	Antenna orientation and tilt adjustments	1 month
42	BSNL	Sabarimala-Kodaikanal Road in SH 44	Idukki Kerala LSA	10.01425113,76.95502301	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months

43	BSNL	Kochi-Dhanushkodi road in NH 85	Idukki Kerala LSA	10.06058445,76.80057565	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
44	BSNL	Near Oonukkal Post office	Idukki Kerala LSA	10.04967863,76.71523273	Hilly Terrain less populated, low coverage	No coverage area	
45	BSNL	Near Lifeline Hospital SH 44	Idukki Kerala LSA	10.00243113,76.71062074	Old IMS congestion (Nokia)	New Tejas IMS is under testing.	2 months
46	JIO	Malankara	Idukki	9.855 ,76.7325	The location is located >1.7 km from the nearest serving sites. Due to challenging geographical conditions and terrain shadowing, the area is experiencing weak coverage.	Optimization	Optimization done, No improvement observed. With present resources ,further coverage improvement is not possible
47	JIO	Melukavu	Idukki	9.8059 ,76.7588	Location is > 0.59 KM away from nearest sites. Due to terrain block, Jio coverage is weak here. With present resources coverage cannot be improved	No Solution	Hill blockage
48	JIO	Pandiyamavu	Idukki	9.7955 ,76.7557	The location is located >0.98 km from the nearest serving sites. Due to terrain blocking, Jio coverage is weak in this area. Site serving this area is > 1.5 KM away.	Optimization	Optimization done, No improvement observed. With present resources ,further coverage improvement is not possible
49	JIO	Kalathukadavu	Idukki	9.713 ,76.7805	The location lies beyond 0.97 km from the nearest serving site. Due to terrain blocking, Jio coverage is weak in this area. Neighbouring sites are > 1.5 Km from here.	Optimization	Optimization done, No improvement observed. With present resources ,further coverage improvement is not possible
50	JIO	Kappadu-Kalaketty	Idukki	9.606 ,76.777	Site serving this area is COW site with less AGL. Due to this reason, coverage is weak along highway.	Optimization	Optimization done & coverage improvement observed.

51	JIO	Kodikuthi	Idukki	9.5523 ,76.91588	Coverage is very weak due to hill block. No scope for improvement by optimizing near by sites which are > 1 Km from here.	No Solution	Hill blockage
62	JIO	Murinjapuzha-Kuttikkanam route	Idukki	9.5711 ,76.9756	This location is 0.65 Km away from kuttikkanam site. Coverage from this site is completely blocked by hills. This route comes under forest category	No Solution	Hill block & forest area
53	JIO	Kuttikkanam town	Idukki	9.5811 ,76.9749	This location is 0.5 Km away from kuttikkanam site. Coverage is weak due to hill block.	Optimization	Optimization done, No improvement observed. With present resources ,further coverage improvement is not possible
54	JIO	Kallar	Idukki	9.5709 ,77.0001	This location is 1.2 Km away from nearest site. Coverage is weak due to hill block.	No Solution	Hill block
55	JIO	Pattumala-Vandiperiyar route	Idukki	9.572 ,77.065	This location is 1 Km away from nearest site. Coverage is weak due to hill block.	No Solution	Hill block
56	JIO	Chottuppara	Idukki	9.588 ,77.121	This location is > 1.35 Km away from nearest site. Due to high distance from site & terrain block ,jio Coverage is weak.	No Solution	Hill block
57	JIO	Kadamakuzhi	Idukki	9.7066 ,77.1025	Jio coverage is very weak due to high inter site distance (6KM) New site required to improve coverage	New Site	Currently we don't have any approved scope of new site roll out here.
58	JIO	Double cutting	Idukki	9.8277 ,77.0127	Jio coverage is very weak due to high inter site distance (3.2 KM) New site required to	New Site	Currently we don't have any approved scope of new site roll out here.

					improve coverage		
59	JIO	Painavu-Uppukunnu	Idukki	9.8225 ,76.9027	Jio coverage is nil in this route. Forest area	No Solution	Hill block & forest area
60	JIO	Vandamattom	Idukki	9.9307 ,76.7562	This location is 0.6 Km away from nearest site. Due to terrain blockage,jio coverage is weak.	No Solution	Hill block & forest area
61	JIO	Vannapuram-Kallippara	Idukki	9.977 ,76.8213	Jio coverage is very weak due to high inter site distance (6.5 KM) New site required to improve coverage	New Site	Currently we don't have any approved scope of new site roll out here.
62	JIO	Venmony-Pazhayarikandam	Idukki	9.9723 ,76.893	Jio coverage is very weak due to high inter site distance (5.5 KM) & terrain block. New site required to improve coverage	New Site	Currently we don't have any approved scope of new site roll out here.
63	JIO	Panikkankudy-Kallippara	Idukki	9.9185 ,77.095	Jio coverage is very weak due to high inter site distance (7.5 KM) & terrain block. New site required to improve coverage	New Site	Currently we don't have any approved scope of new site roll out here.
64	JIO	Kallippara-Udubanchola	Idukki	9.895 ,77.1419	Jio coverage is very weak due to high inter site distance (4.5 KM) & terrain block. New site required to improve coverage	No Solution	Hill block & forest area
65	JIO	Chathurangapara-Shathanpara	Idukki	9.9338 ,77.2177	Jio coverage is very weak due to high inter site distance (7.5 KM) & terrain block. New site required to improve coverage	New Site	Currently we don't have any approved scope of new site roll out here.

66	JIO	Gap Road munnar	Idukki	10.036 ,77.1216	Jio coverage is very weak due to high inter site distance (6.5 KM) & terrain block. Location falls under kannan devan tea plantation area,where site acuisition is very difficult.	No Solution	Kannan Devan tea plantation area
67	JIO	Pallivasal	Idukki	10.055 ,77.0527	Jio coverage is very weak due to high inter site distance (6 KM) & terrain block. Location falls under kannan devan tea plantation area,where site acuisition is very difficult.	New Site	Currently we don't have any approved scope of new site roll out here.
68	JIO	Neriamangalam highway	Idukki	10.0587 ,76.8013	Jio coverage is very weak due to high inter site distance (7 KM) ,forest area & terrain block.	No Solution	Forest area
69	VIL	district drive test / IDUKKI	Kerala	9.80402 & 76.75464	Dropped Call/Fair coverage	Optimization done at melukavu and Ellumpuram sites . Coverage Improved and drop call issue resolved.	Optimization completed
70	VIL	district drive test / IDUKKI	Kerala	10.07861 & 77.06283	Dropped Call/Fair coverage	Optimization done at Munnar town and munnar hill sites . Coverage Improved and drop call issue resolved.	Optimization completed
71	VIL	district drive test / IDUKKI	Kerala	9.95827 & 76.70959	Dropped Call/ Poor coverage	Optimization done at Ezhaloor site . Coverage Improved and drop call issue resolved.	Optimization completed
72	VIL	district drive test / IDUKKI	Kerala	10.053292 & 76.829929	Poor Coverage	Optimization done at Valarakuthu site . Coverage Improved and issue resolved	Optimization completed
73	VIL	district drive test / IDUKKI	Kerala	9.849756 & 76.936714	Poor Coverage	Optimization done at Idukki headquarters site . Coverage Improved and issue resolved improvement	Optimization completed
74	VIL	district drive test / IDUKKI	Kerala	9.915594 & 76.801008	Poor Coverage	Optimization done at Idukki karimannoor HS site . Coverage Improved and issue resolved improvement	Optimization completed
75	VIL	district drive test / IDUKKI	Kerala	9.796188 & 76.756152	Poor Coverage	Optimization done at Idukki melukavu2 site . Coverage Improved and issue resolved improvement	Optimization completed

5 Compliance Report for short comings observed during Drive Test Airtel

Annexure-I

Drive Test Methodology adopted during the Drive test:

(1) VoiceTests:

Sl.No.	QoS Parameter	Measurement Criteria and methodology
1	Call setup time	Time taken from call initiate to call alerting/ringing.
2	Call setup success rate	CSSR=(Total Call Established/Total Call Attempt)*100 Call Setup attempt time: 30 sec. Call duration(City/Highway):90/180sec. Wait/ Guard Time: 15sec.
3	Dropped Call rate(DCR)	Call Drop Rate=(Total Call Drop/Total Call Established)*100
4	Call Silence Rate (Muting)	Silence call rate=(count of silence/Total calls established)*100 Continuous RTP gap ≥ 2 sec
5	Handover Success Rate	Handover Success Rate = Count of successful handovers (All Technology Handover combined) / Total count of Handover Attempt (All Technology Handover combined) *100 Handover types which are considered- 2G Inter & Intra cell, 3G Soft & IRAT, 4G Inter & Intra frequency & SRVCC, 5G Inter & Intra frequency & 5G to 4G handovers.
6	Packet Drop Rate(DL& UL)for Packet Switched Network (4G & 5G)	Number of RTP (Real-time Transport Protocol) Packets lost divided by total RTP packet received (against each source SSRC and sequence number) at call originating handset. This KPI will be calculated from MOS call for packet call only (VoNR/VoLTE)
7	Mean Opinion Score (MOS) Performance(in5G/4G/3G/2G:Auto mode)	Voice quality in mobile networks is measured with algorithms based on ITU-T P.863 (POLQA) Excellent: MOS ≥ 4 and < 5 , Good :MOS ≥ 3 and < 4 , Fair: MOS ≥ 2 and < 3 ,Poor :MOS ≥ 1 and < 2

(2) Data Tests:

Sl. No.	QoS Parameter	Measurement Criteria and methodology
1	Data speed in M bits/s (DL/UL both)	DownloadSpeed=Totalbytes transferred during download/Total time for transfer Speed = Total bytes transferred during upload / Total time for transfer. Download: File Size: 500 MB for 120 sec, 30 Sec Timeout Upload: File size: 250 MB for 120 sec, 30 Sec Timeout (Multithread3-TCPConnection at a time for both DL&UL)
2	Latency(in ms)	Latency is the time taken by a packet to reach the receiving endpoint after being transmitted from the sending point in broadband service. Test with Packet of size of 512 Bytes - 1000 count on TSP's Test server using UDP packets (TWAMP)
3	Jitter(in ms)	Test with Packet of size of 512/256 Bytes - 1000 count on TSP's own Test server using UDP (TWAMP) & RTP packets separately
4	Session Setup Success Rate(in %)(DL/UL)	(Total DL or UL session established (successfully connected to server)/ Total DL or UL session attempt) x100
5	Packet drop rate (in %)	No. of packets lost out of total packet transferred during the testing. - Packet loss rate=(Total packet lost/Total packet sent)x100 - Packet delay(RTT)>90ms considered as packet loss and included in Packet drop rate. - The measurements should include all major types of packets i.e., TCP, UDP and RTP in their representative ratio. The 90th percentile value of the packet drop measurements shall be considered the Packet drop rate.
6	Web browsing delay(in seconds)	Time taken to open the web pages successfully is considered as web browsing delay/ web page download time. LSA-wise 3 popular websites to be taken
7	Video Streaming performance (in seconds)	TRAI Prescribed Video of 20 Sec with 25 sec Timeout & without caching https://www.youtube.com/watch?v=rH2RjvI0DFs