



TELECOM REGULATORY AUTHORITY OF INDIA
REGIONAL OFFICE - BHOPAL

Operator Assisted / Self Drive Test Report for Feb'2026

LSA-UPE

**Lalitpur City, Jhansi Outer and
Jhansi-Lalitpur-MP Border NH44 Highway**

From 23/02/2026 to 25/02/2026

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1. Overview

The Operator Assisted Drive Test was carried out in Lalitpur and Jhansi City Outer Areas and NH 44 Highway from 23/02/2026 to 25/02/2026 & 9:00 AM to 8:00 PM. The drive test covered drive route of around 354 Kms in 3 days and 5 hotspot locations.

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

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

1.2 Quality of Service parameters measured:

(1) 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

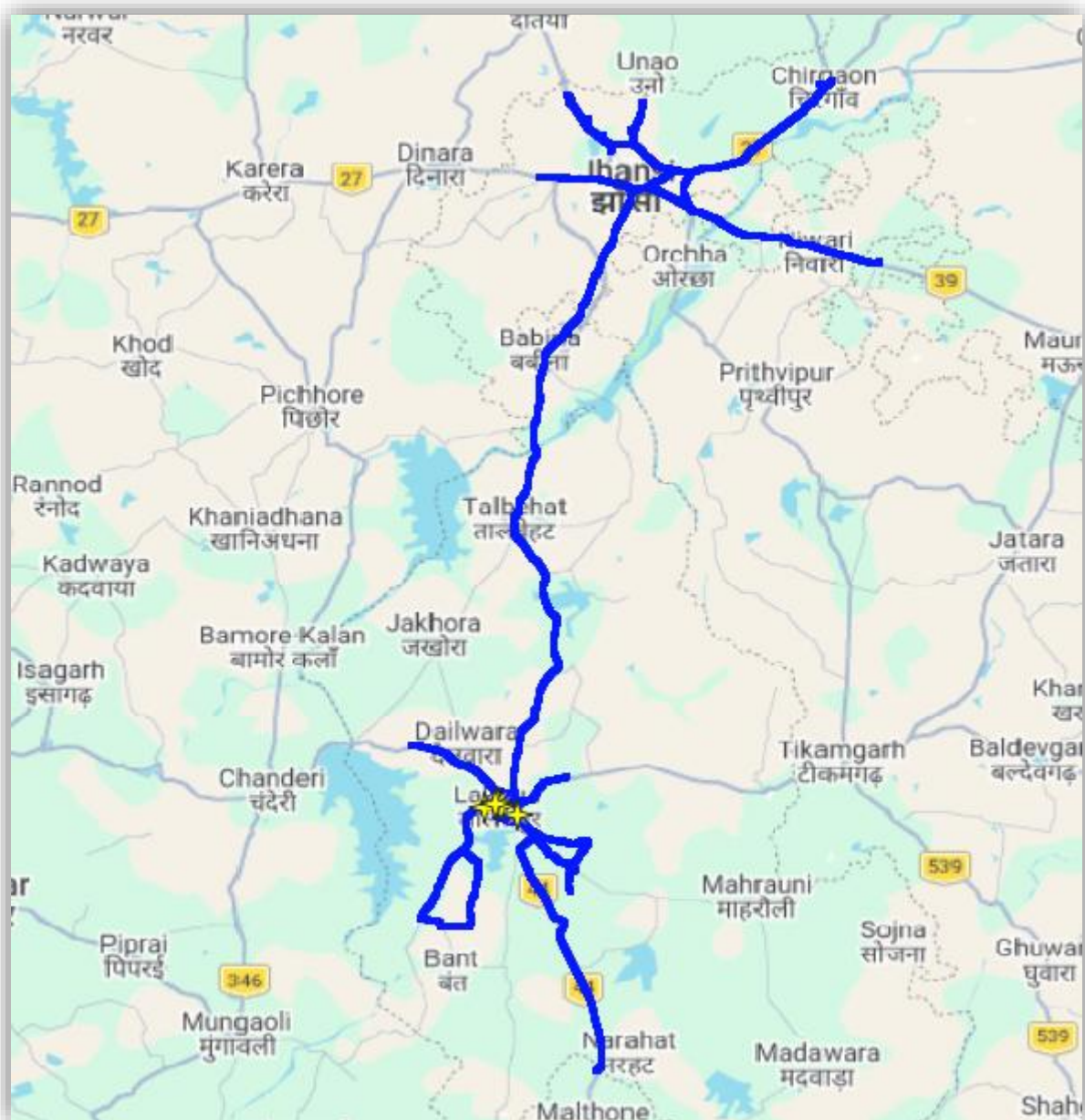
Drive Test Methodology adopted during the Drive test is attached as **Annexure-I**.

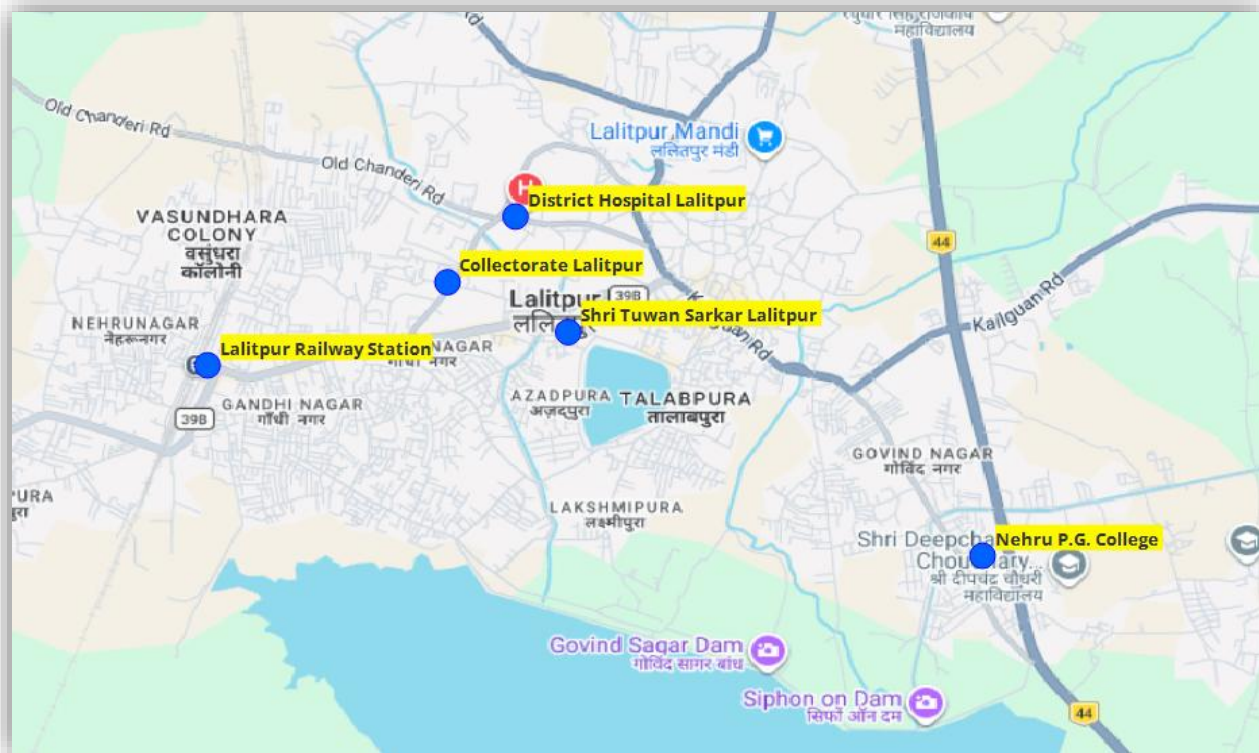
QoS Performance Analysis Uttar Pradesh East LSA

2. Executive Summary

This report covers the findings of the OADT undertaken in Uttar Pradesh License Service Area (LSA) during the month of Feb'2026 under the supervision of TRAI Regional Office (RO), Bhopal. Details of route/ area covered during the DT are as given below:

2.1 Route Map of Drive test & Hotspot locations:





2.2 Drive Test Area detail

Date	Duration AM to PM	Drive test route	Distance covered (in Kms)
23/02/2026	10AM to 07:38PM	City	115
24/02/2026	9:30AM to 08:10PM	Highway	134
25/02/2026	10:00AM to 6:45PM	City	105

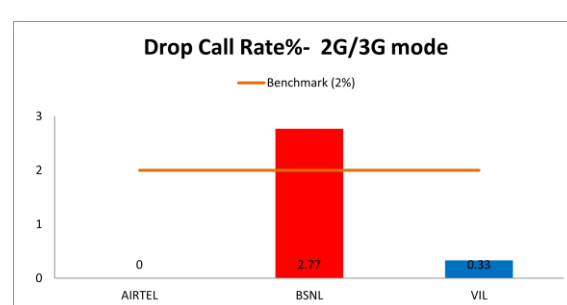
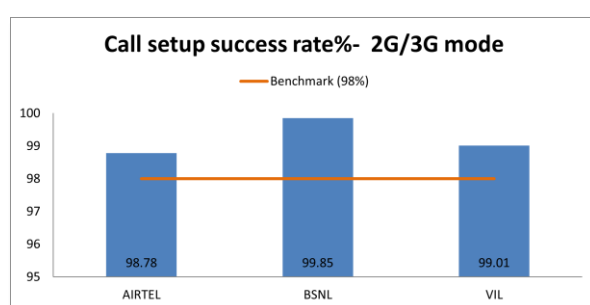
Date	Time	Hotspot Location	Latitude / Longitude
24/02/2026	05:00PM	Nehru P.G. College	24.678692/78.435671
24/02/2026	06:45PM	Shri Tuwan Sarkar Lalitpur	24.690117/78.414493
24/02/2026	08:10PM	Lalitpur Railway Station	24.688425/78.396058
25/02/2026	04:10PM	District Hospital Lalitpur	24.696024/78.411799
25/02/2026	06:45PM	Collectorate Lalitpur	24.692668/78.408321

2.3 Details of Drive Test Tools used:

TSP	Drive Test tool used
Airtel	TEMS
JIO	X-CAL
BSNL	4G-Azenqos Handy mobile set-4, 2G/3GVoice- TEMS Pocket-1
VI	TEMS 22.3.6/ 22.2 and AZENQOS

2.4 Key findings (Voice & Data)

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

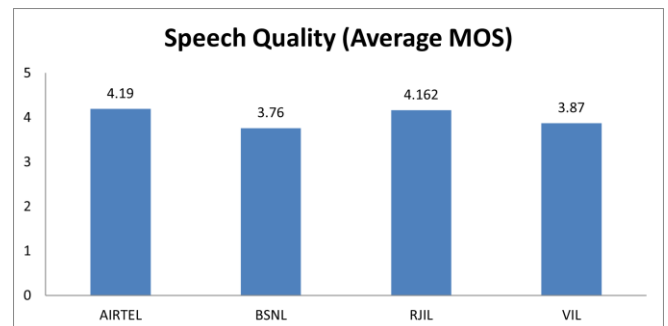
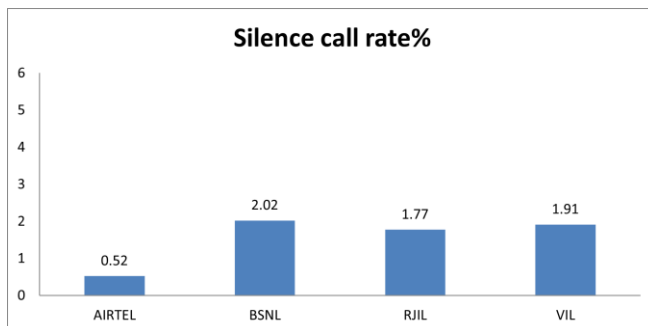
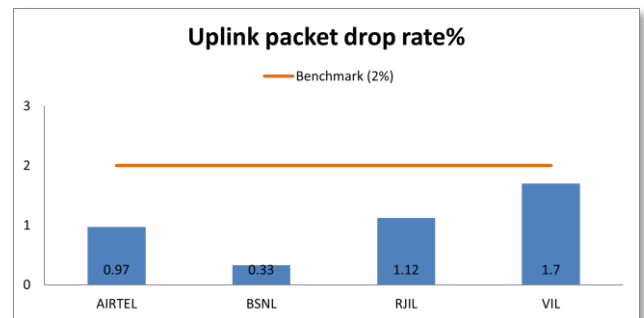
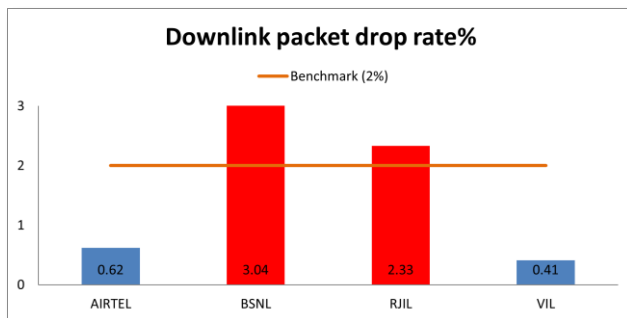
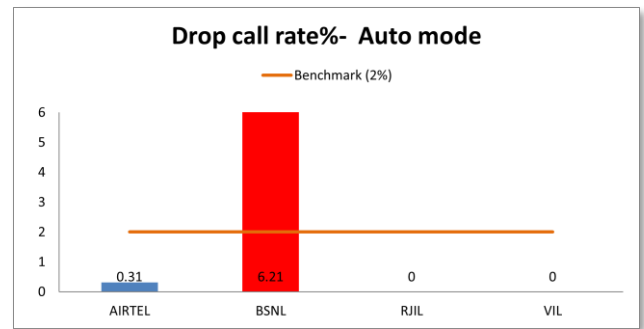
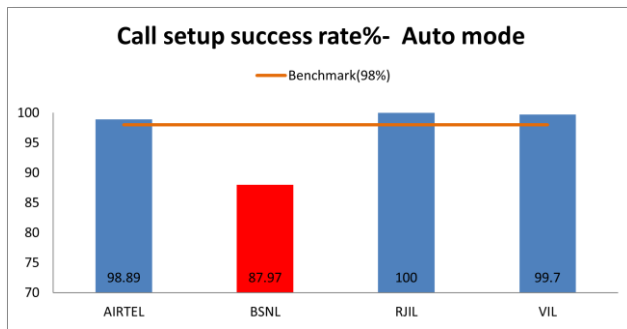


Parameter	Benchmark	AIRTEL	BSNL/MTNL	VIL
Call Attempts		313	437	304
Call Setup Success Rate (in %)	98%	98.78	98.85	99.01
Drop Call Rate (in %)	2%	0	2.77	0.33
Call Setup Time-Average (in Seconds)		2.9	4.2	3.14
Handover Success Rate (in %)		98.9	94.94	99.83

2.3.2 Number of Cell ids latched during drive test

Technology	AIRTEL	BSNL/MTNL	VIL
3G	NA	95	NA
2G	320	61	170

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

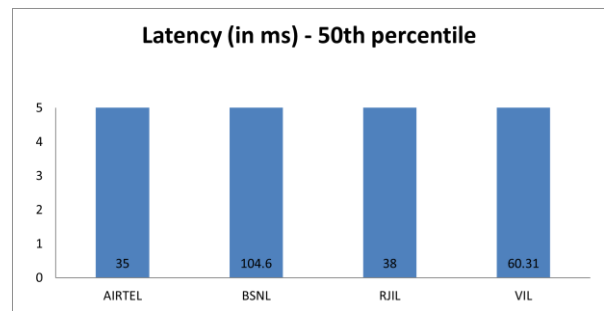
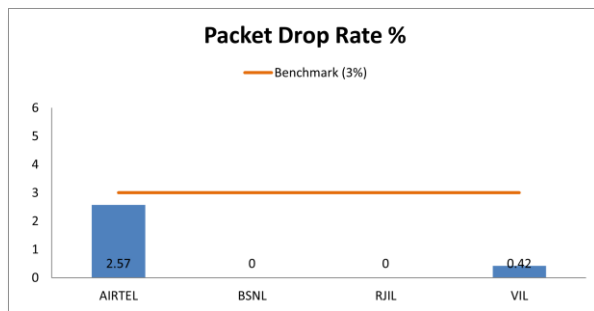
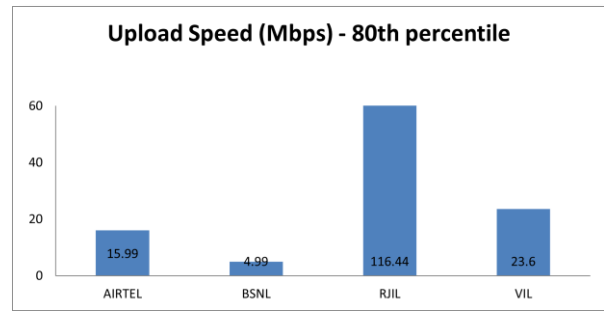
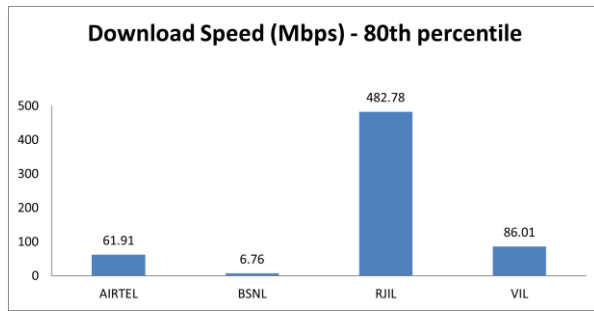


Parameter	AIRTEL	BSNL/MTNL	RJIL	VIL
Call Attempts	330	183	338	335
Call Setup Success Rate %	98.89	87.97	100	99.70
Drop Call Rate%	0.31	6.21	0.0	0.00
Call Setup Time-Average (Second)	1.11	4.2	1.45	0.61
Handover Success Rate %	99.99	99.69	99.85	100
Downlink Packet drop rate %	0.62	3.04	2.33	0.41
Uplink Packet drop rate %	0.97	0.33	1.12	1.70
Silence Call Rate %*	0.52	2.02	1.77	1.91
Speech Quality (Average MOS)	4.19	3.76	4.162	3.87

2.3.4 Number of Cell ids latched during drive test

Technology	AIRTEL	BSNL/MTNL	RJIL	VIL
5G	132		260	
4G	373	188	799	275
3G		33		NA
2G	320	67		48

2.3.5 Data performance in 5G/4G/3G/2G (Auto mode)



QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	20 th Percentile	7.8	0.80	24.25	24.59
	Average	38.9	4.64	256.94	55.75
	80th Percentile	61.91	6.76	482.78	86.01
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbits/s)	20 th Percentile	4.05	0	2.58	8.12
	Average	14.5	4.61	60.44	15.34
	80th Percentile	15.99	4.99	116.44	23.60
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50th Percentile	35	104.60	38	60.31
Jitter (in ms)	Average	18.91	2.91	21.1	0.08
Packet Drop Rate %		2.57	0	0.0	0.42
Web browsing delay (in sec)		2.7	3.38	1.58	2.43
Video Streaming performance for video		0.95	NA	0.64	1.62

2.3.6 TSP-wise Key Findings:

TSP	Important finding and benchmark not achieved.
Airtel	Voice 98.78% call setup success rate and 0.00% drop call rate have been observed in the lock mode (3G/2G) for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. 98.89% call setup success rate and 0.31% drop call rate have been observed in the auto-selection mode (5G/4G/3G/2G) for LSA. 98.77% call setup success rate and 0.82% drop call rate have been observed in the lock mode (3G/2G) for city drive. 99.21% call setup success rate and 0.39% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. 98.52% call setup success rate and 1.41% drop call rate have been observed in lock mode (3G/2G) for highway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. 98.66% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. Data - Airtel has average download speed of 38.90 Mbps and average upload speed of 14.5 Mbps for LSA. - Airtel has average download speed of 80.04 Mbps and average upload speed of 14.65 Mbps across measured routes for city drive.

	- Airtel has average download speed of 75.27 Mbps and average upload speed of 29.92 Mbps across measured routes at Hotspot Locations. - Airtel has average download speed of 73.27 Mbps and average upload speed of 16.14 Mbps across measured routes for highway drive.
BSNL	Voice 98.85% call setup success rate and 2.77% drop call rate have been observed in the lock mode (3G/2G) for LSA. 87.97% call setup success rate and 6.21% drop call rate have been observed in the auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not within the benchmark of 98.00% & 2.00% respectively. 99.08% call setup success rate and 0.92% drop call rate have been observed in the lock mode (3G/2G) for city drive. Performance is within the benchmark of 98.00% & 2.00% respectively. 93.17% call setup success rate and 4.62% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is not well within the benchmark of 98.00% & 2.00% respectively. 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. 98.18% call setup success rate and 8.33% drop call rate have been observed in lock mode (3G/2G) for highway drive. Performance is not within the benchmark of 98.00% & 2.00% respectively. 73.61% call setup success rate and 6.94% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not within the benchmark of 98.00% & 2.00% respectively. Data - BSNL has average download speed of 4.64 Mbps and average upload speed of 4.61 Mbps for LSA.

	• BSNL has average download speed of 4.64 Mbps and average upload speed of 4.99 Mbps across measured routes for city drive. • BSNL has average download speed of 4.64 Mbps and average upload speed of 4.99 Mbps across measured routes at Hotspot Locations. • BSNL has average download speed of 4.01 Mbps and average upload speed of 6.59 Mbps across measured routes for highway drive.
RJIL	Voice • 100.00% call setup success rate and 0.00% drop call rate have been observed in the auto-selection mode (5G/4G/3G/2G) for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. Data • RJIL has average download speed of 256.94 Mbps and average upload speed of 60.44 Mbps for LSA. • RJIL has average download speed of 321.8 Mbps and average upload speed of 81.4 Mbps across measured routes for city drive. • RJIL has average download speed of 344.01 Mbps and average upload speed of 26.8 Mbps across measured routes at Hotspot Locations. • RJIL has average download speed of 231.2 Mbps and average upload speed of 53.2 Mbps across measured routes for highway drive.

VIL	Voice • 99.01% call setup success rate and 0.33% drop call rate have been observed in the lock mode (3G/2G) for LSA. Performance is within the benchmark of 98.00% & 2.00% respectively. • 99.70% call setup success rate and 0.00% drop call rate have been observed in the auto-selection mode (5G/4G/3G/2G) for LSA. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 99.15% call setup success rate and 0.42% drop call rate have been observed in the lock mode (3G/2G) for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 99.51% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.00% drop call rate have been observed in lock mode (3G/2G) for highway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. Data • VIL has average download speed of 55.75 Mbps and average upload speed of 15.34 Mbps for LSA. • VIL has average download speed of 54.15 Mbps and average upload speed of 14.61 Mbps across measured routes for city drive. • VIL has average download speed of 43.66 Mbps and average upload speed of 16.88 Mbps across measured routes at Hotspot Locations.
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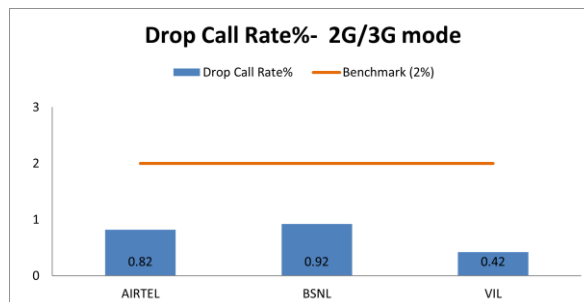
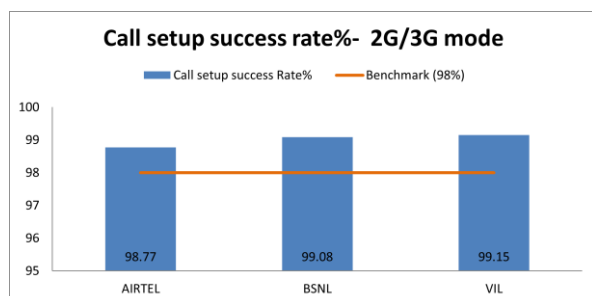
	• VIL has average download speed of 51.49 Mbps and average upload speed of 17.61 Mbps across measured routes for highway drive.
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Detailed QoS Performance Analysis

City – Lalitpur and Jhansi Outer

3.0 QoS Performance Analysis - Dynamic

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	220	220	N/A	220
No. of Call Attempts	245	327	N/A	237
No. of Call Established	242	324	N/A	235
Call setup success rate (CSSR) %	98.77	99.08	N/A	99.15
No. of Drop Call	2	3	N/A	01
Drop Call Rate %	0.82	0.92	N/A	0.42
Call Setup Time Average (Sec.)	2.96	3.2	N/A	3.15
No. of Handover Attempts	194.00	93	N/A	432
No. of Handover success	192.00	88	N/A	432
HOSR %	98.97	94.62	N/A	100
Total no of RLT Occurrence	26705.00	NA	N/A	0
No of RLT > 48	0.00	NA	N/A	0

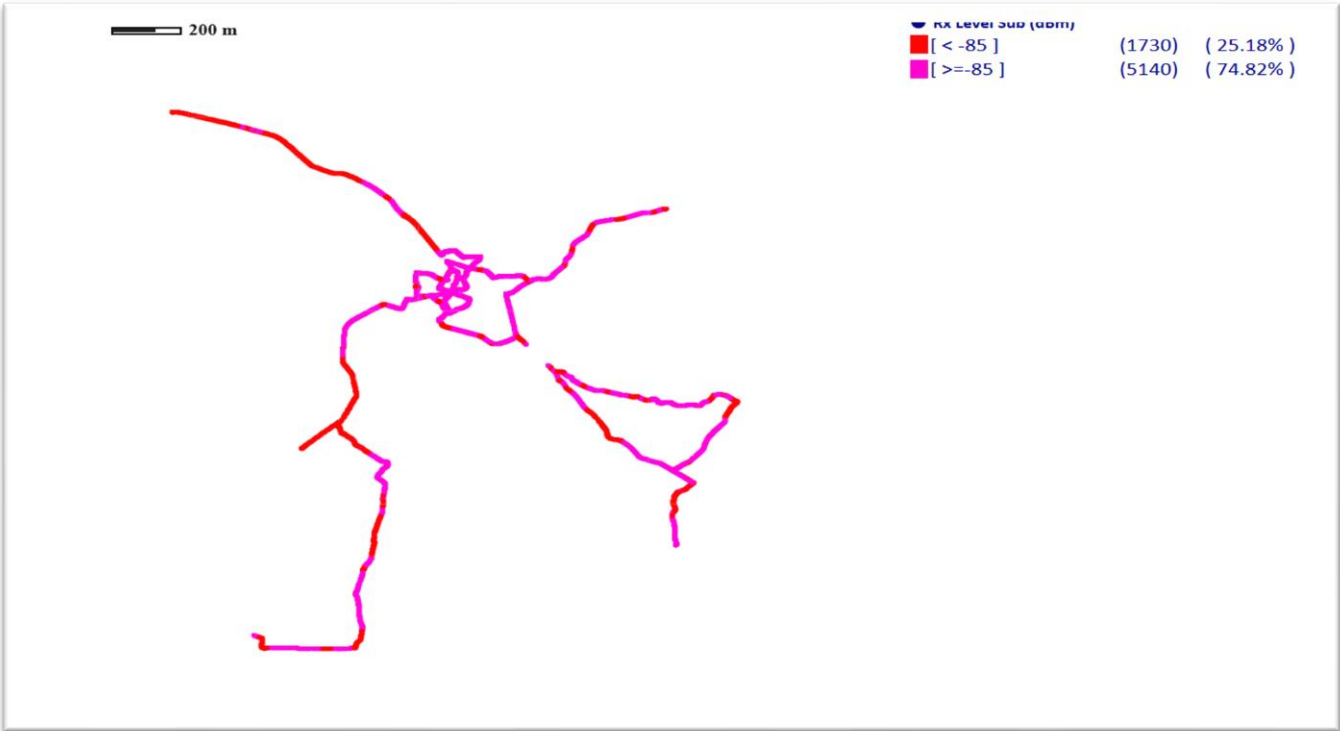
3.1.2 Number of Cell ids latched during drive test (3G/2G - Lock mode)

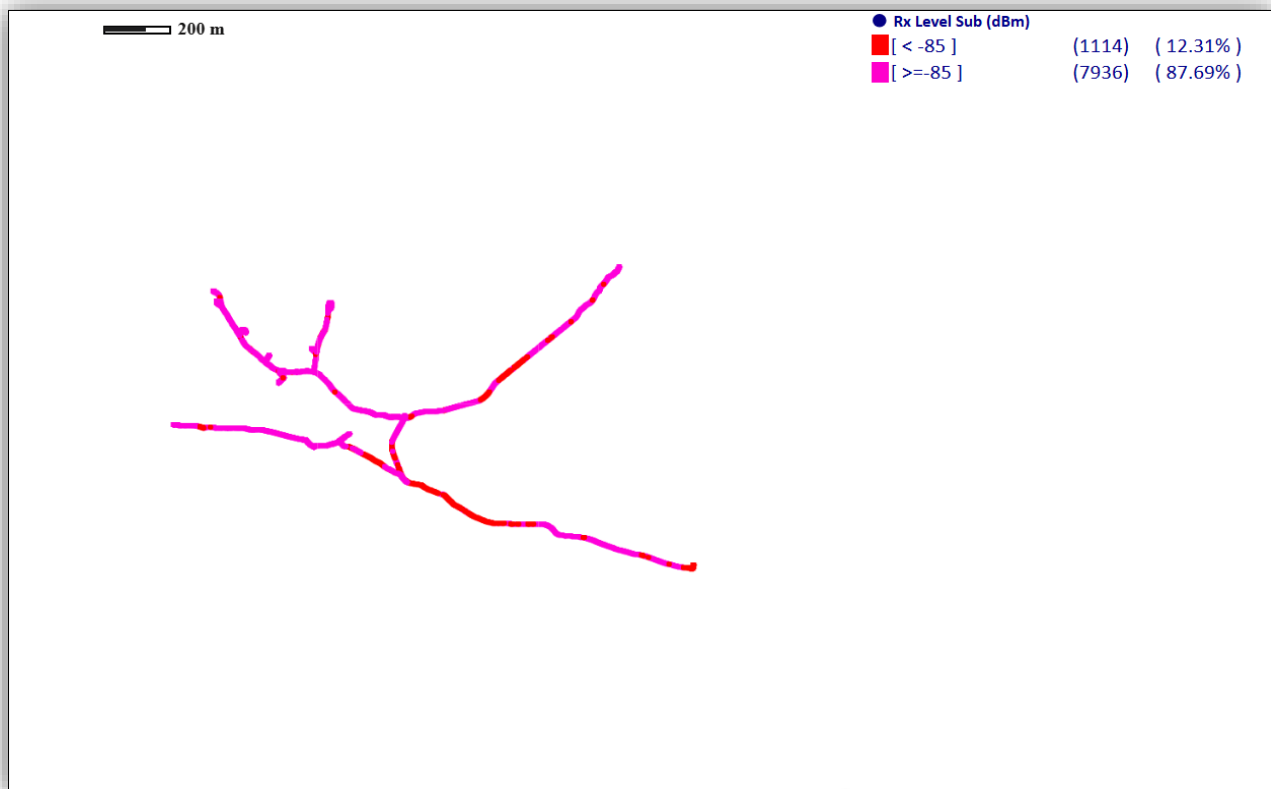
Number of unique Cell ids covered in Voice test				
Technology	AIRTEL	BSNL/MTNL	RJIL	VIL
3G	NA	NA		NA
2G	107	NA		120

3.1.3 Signal Strength Map (3G/2G - Lock mode)

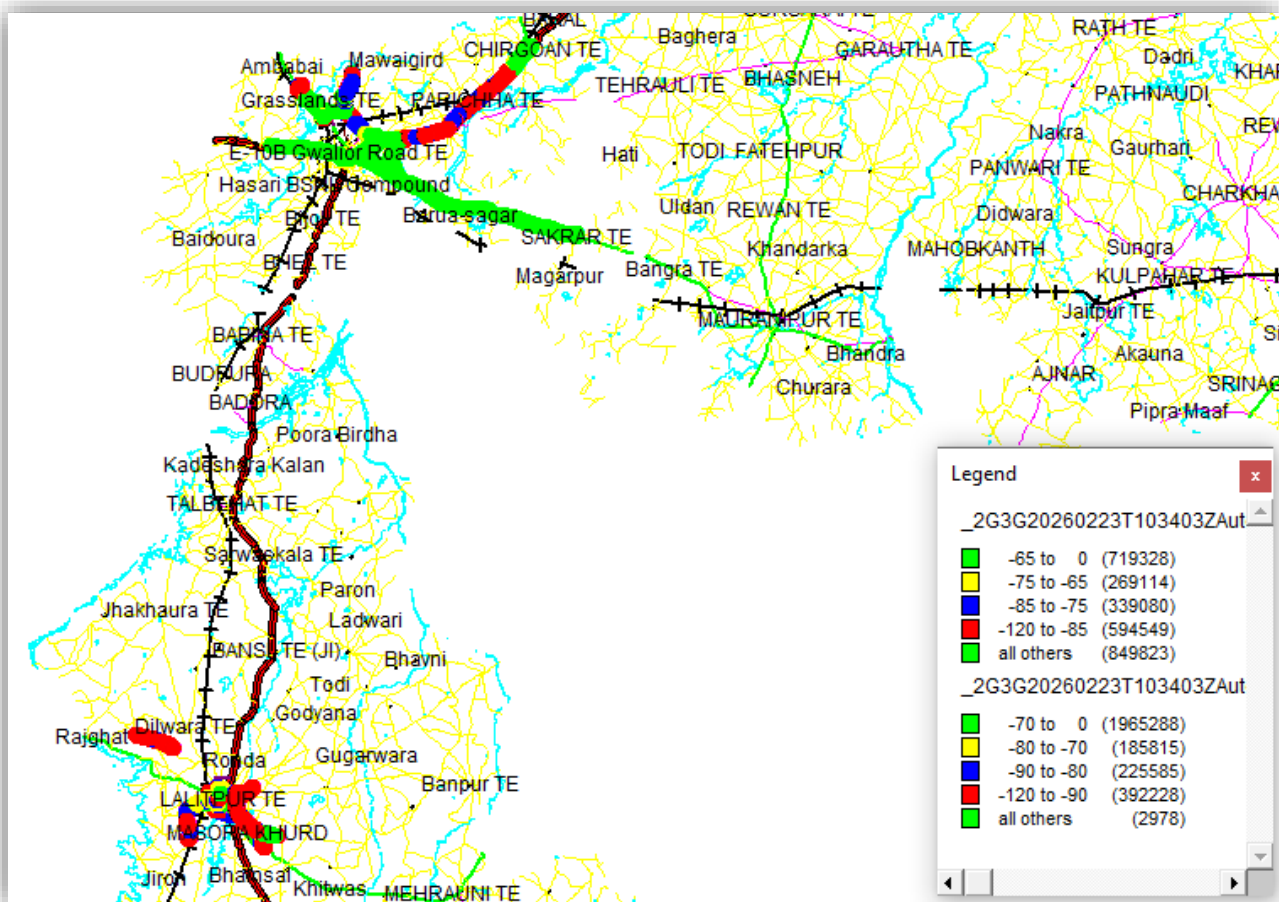
Parameter Name	Technology	Signal Strength (dBm)			
		Excellent	Good	Fair	Poor
Rx Level	GSM	0 to $\geq$ -65	<-65 to $\geq$ -75	<-75 to $\geq$ -85	<-85 to min
RSCP	WCDMA	0 to $\geq$ -70	<-70 to $\geq$ -80	<-80 to $\geq$ -90	<-90 to min
RSRP	LTE	0 to $\geq$ -80	<-80 to $\geq$ -95	<-95 to $\geq$ -110	<-110 to min
SS_RSRP	NR	0 to $\geq$ -80	<-80 to $\geq$ -95	<-95 to $\geq$ -110	<-110 to min

TSP – Airtel

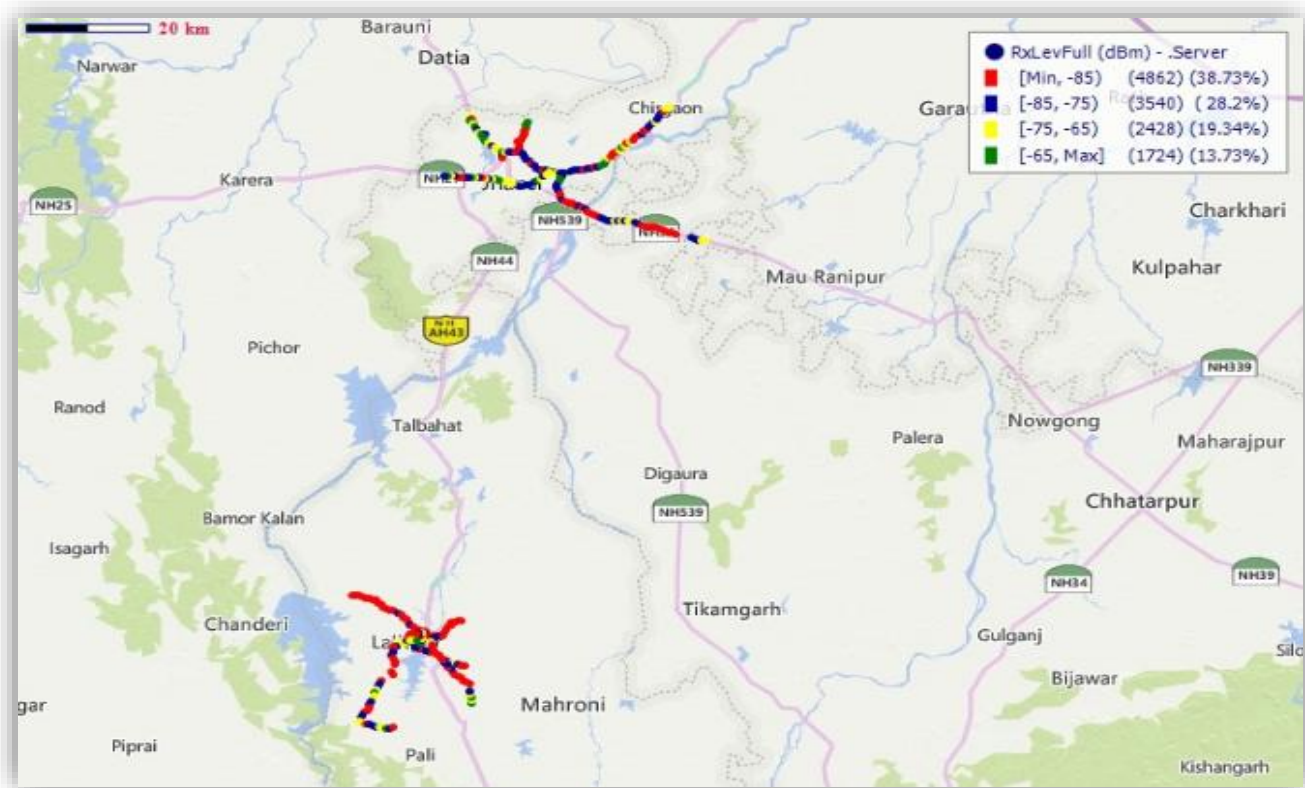




TSP - BSNL

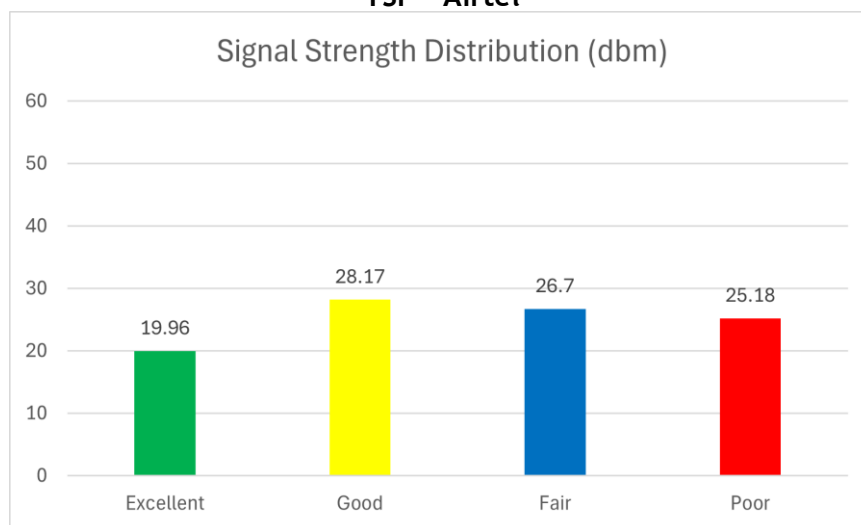


TSP – VIL

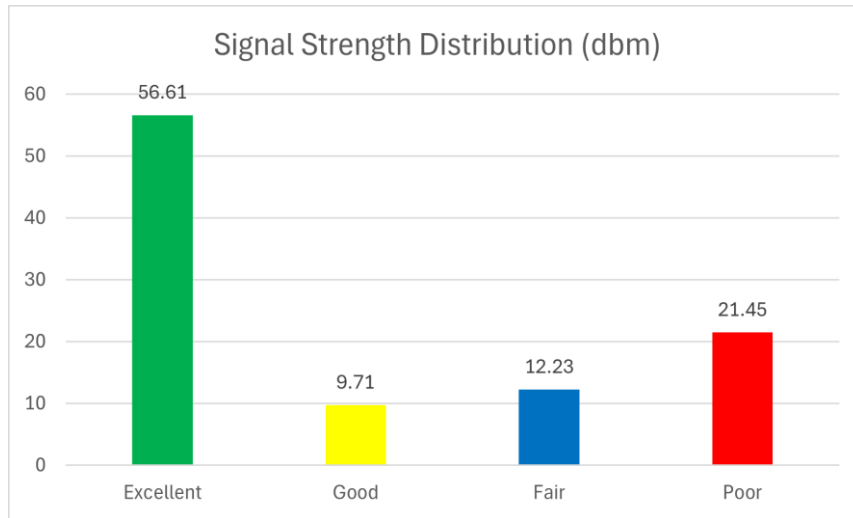


3.1.4 Signal Strength distribution: (3G/2G - Lock mode)

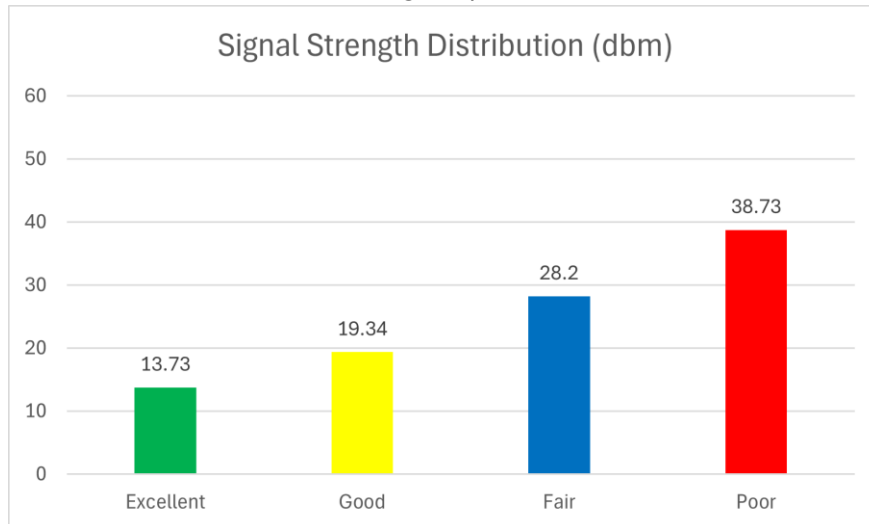
TSP - Airtel



TSP - BSNL



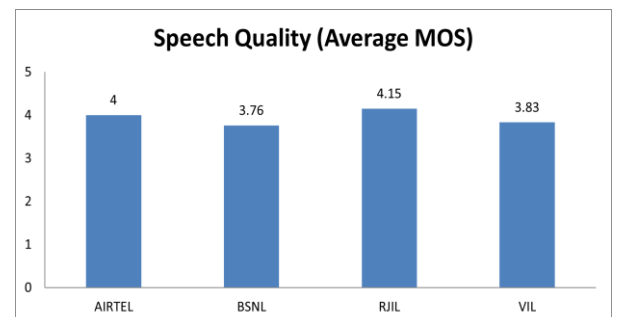
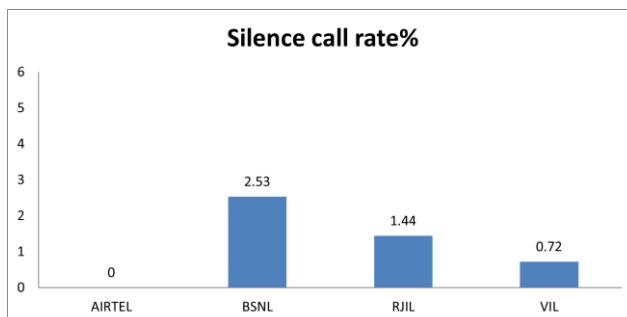
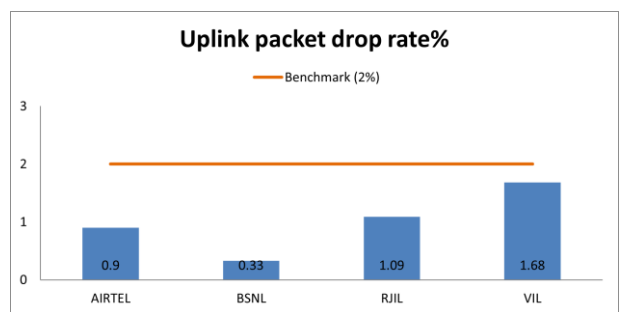
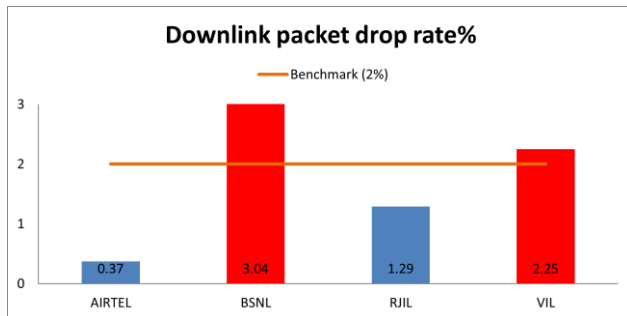
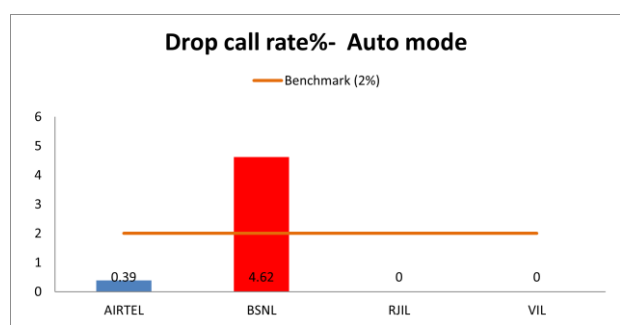
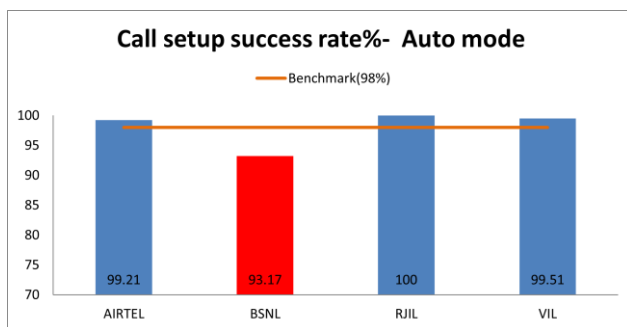
TSP - VIL



Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	1371	1569151	NA	1724	19.96	56.61	NA	13.73
[-65, ≥-75)	1935	269114	NA	2428	28.17	09.71	NA	19.34
[-75, ≥-85)	1834	339080	NA	3540	26.70	12.23	NA	28.2
[-85, ≥Min)	1730	594549	NA	4862	25.18	21.45	NA	38.73
Total	6870	2771894	NA	12554	100.01	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, $\geq$ -70]	NA	1968266	NA	NA	NA	71.00	NA	NA
[-70, $\geq$ -80)	NA	185815	NA	NA	NA	06.70	NA	NA
[-80, $\geq$ -90)	NA	225585	NA	NA	NA	08.14	NA	NA
[-90, $\geq$ Min)	NA	392228	NA	NA	NA	14.16	NA	NA
Total	NA	2771894	NA	NA	NA	100	NA	NA

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	220	220	220	220
No. of Call Attempts	255	111	277	208
No. of Call Established	253	108	277	207
Call setup success rate (CSSR) %	99.21	93.17	100	99.51
No. of Drop Call	1	5	0	0
Drop Call Rate %	0.39	4.62	0.0	0.00
Call Setup Time Average (Sec.)	1.08	3.6	1.24	0.59
No. of Handover Attempts	548.00	187	2353	1151
No. of Handover success	547.00	186	2350	1144
HOSR %	99.82	99.76	99.87	99.39
Packet Drop Rate (Downlink)	0.37	3.04	1.29	2.25
Packet Drop Rate (Uplink)	0.90	0.33	1.09	1.68
Number of silence call for > 2 sec.	0	NA	8	0
Silence Call Rate %	0.00	2.53	1.44	0.72
Number of MOS samples	1108	NA	2582	2112
Average MOS score	4.00	3.76	4.15	3.83

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

Number of unique cell ids covered in Voice test				
Technology	Service Provider			
	AIRTEL	BSNL/MTNL	RJIL	VIL
3G	NA	33	NA	NA
2G	210	67	NA	34
4G	273	14	516	210
5G	102	NA	214	NA

Table-6

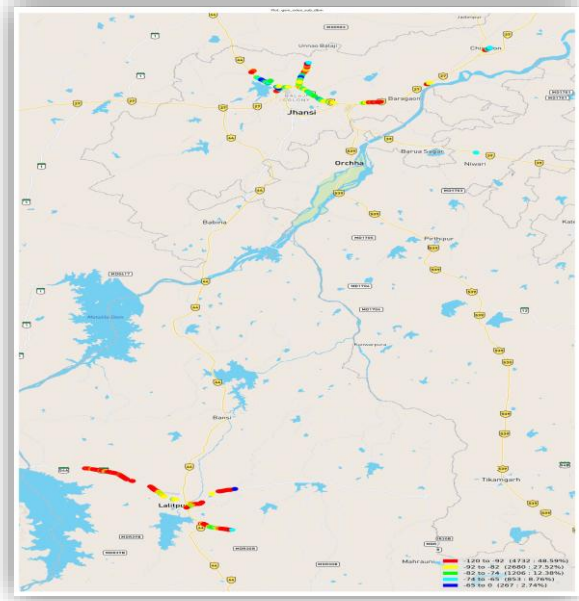
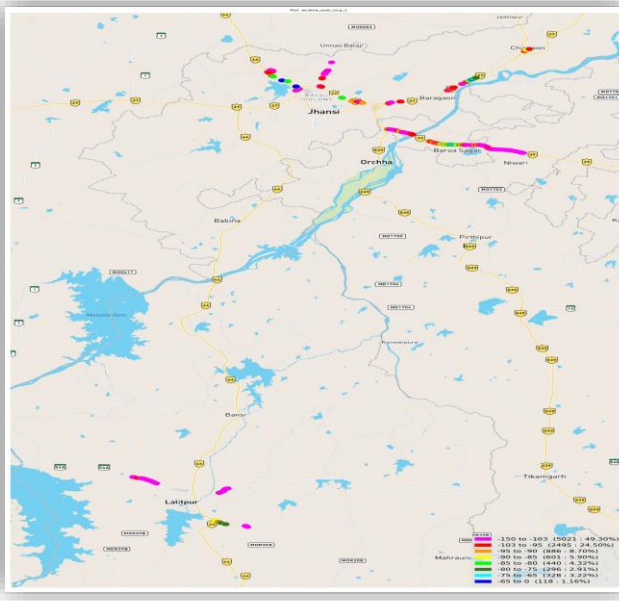
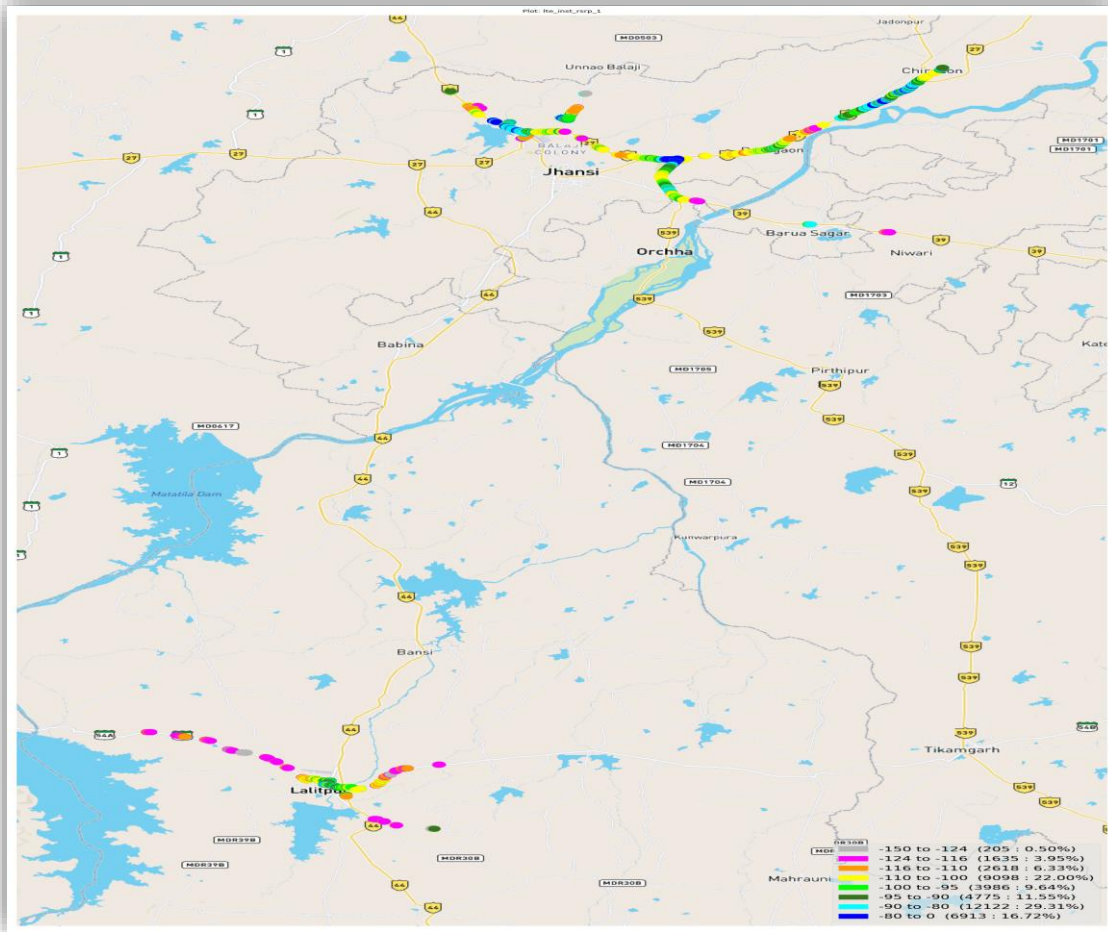
3.2.3 Signal Strength Map (5G/4G/3G/2G - Auto mode)

Parameter Name	Technology	Signal Strength (dBm)			
		Excellent	Good	Fair	Poor
Rx Level	GSM	0 to $\geq$ -65	<-65 to $\geq$ -75	<-75 to $\geq$ -85	<-85 to min
RSCP	WCDMA	0 to $\geq$ -70	<-70 to $\geq$ -80	<-80 to $\geq$ -90	<-90 to min
RSRP	LTE	0 to $\geq$ -80	<-80 to $\geq$ -95	<-95 to $\geq$ -110	<-110 to min
SS_RSRP	NR	0 to $\geq$ -80	<-80 to $\geq$ -95	<-95 to $\geq$ -110	<-110 to min

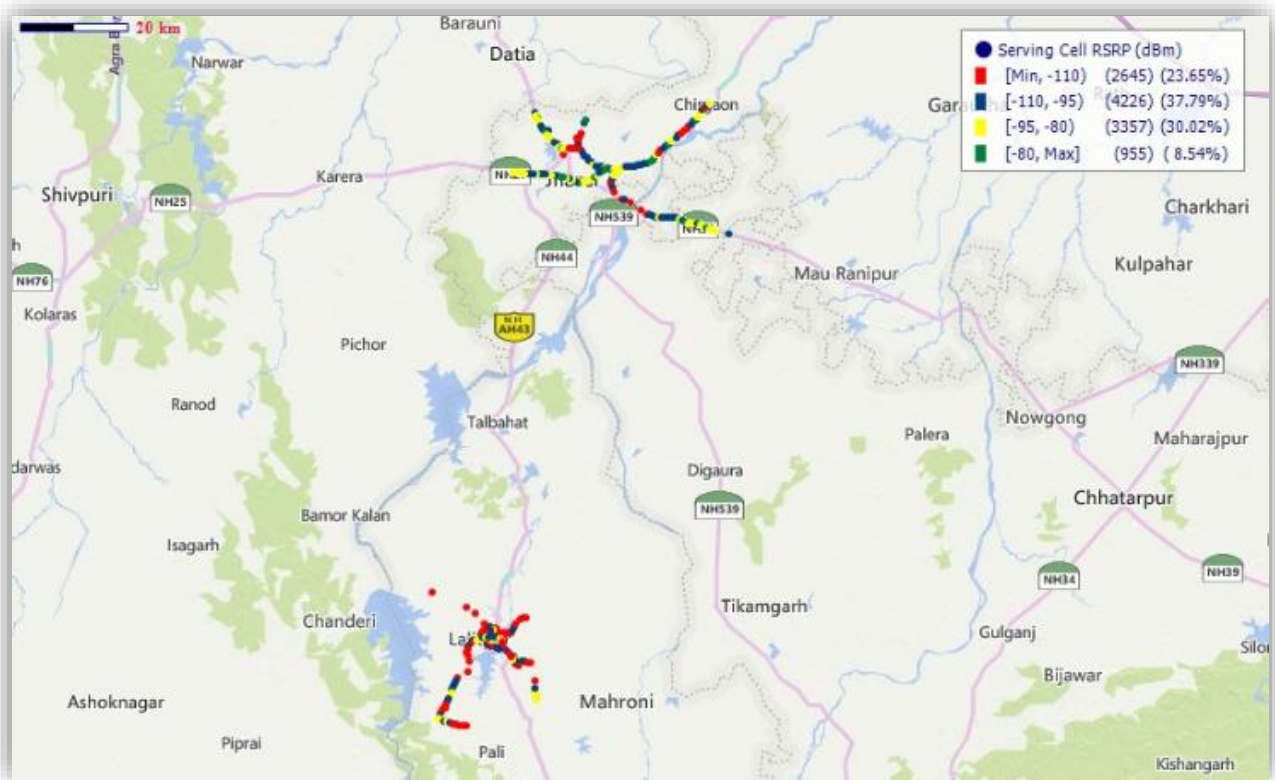
TSP - Airtel



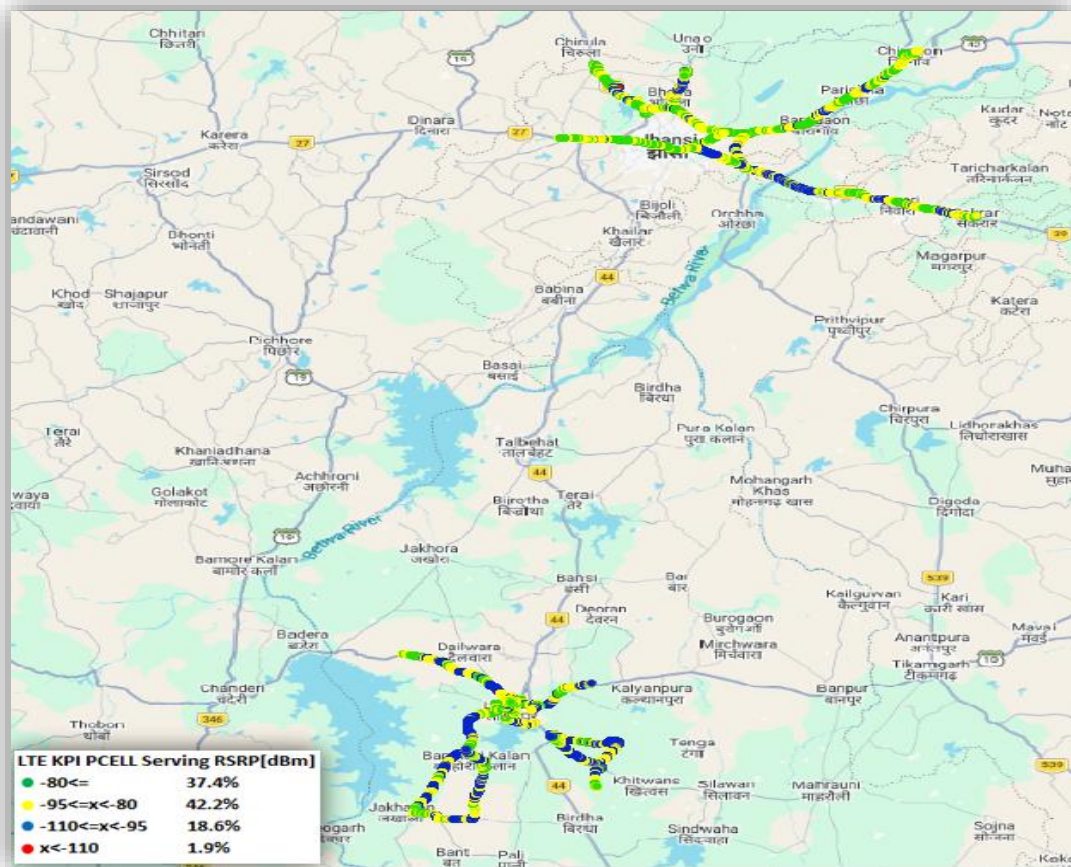
TSP – BSNL



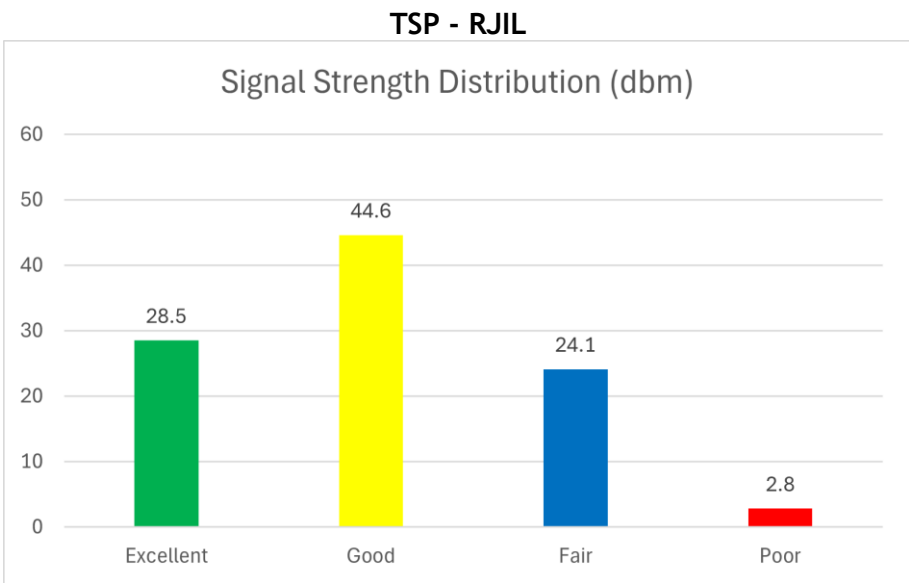
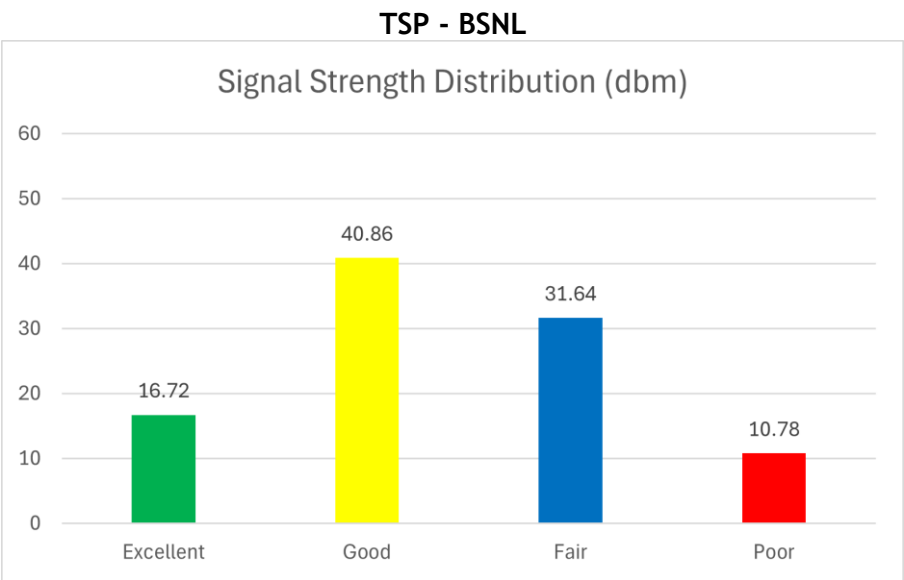
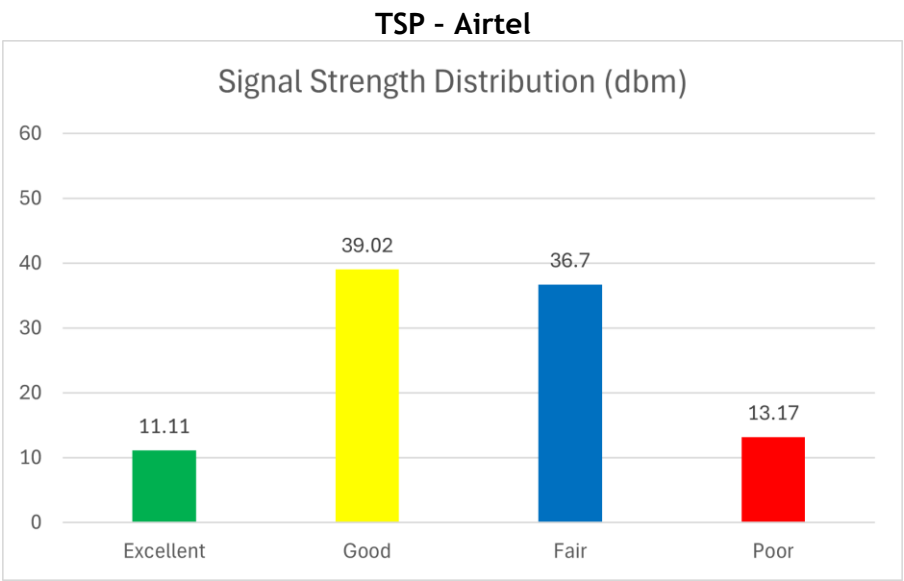
TSP - VIL



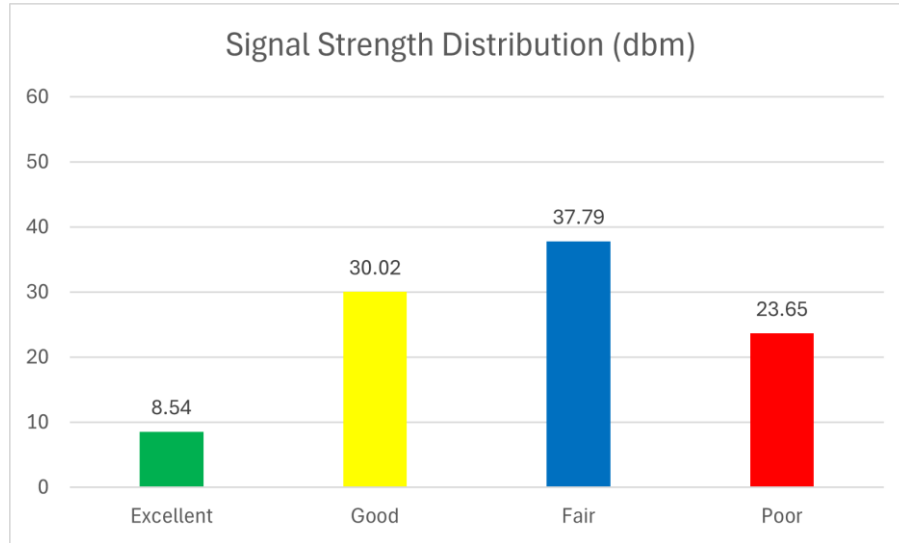
TSP - RJIL



3.2.4 Signal Strength distribution: (5G/4G/3G/2G - Auto mode)



TSP - VIL



Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	267	NA	NA	NA	2.74	NA	NA
[-65, ≥-75)	NA	991	NA	NA	NA	10.18	NA	NA
[-75, ≥-85)	NA	1675	NA	NA	NA	17.20	NA	NA
[-85, ≥Min)	NA	6805	NA	NA	NA	69.88	NA	NA
Total	NA	9738	NA	NA	NA	100.00	NA	NA

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	233	NA	NA	NA	2.29	NA	NA
[-70, ≥-80)	NA	509	NA	NA	NA	5.00	NA	NA
[-80, ≥-90)	NA	1041	NA	NA	NA	10.22	NA	NA
[-90, ≥Min)	NA	8402	NA	NA	NA	82.49	NA	NA
Total	NA	10185	NA	NA	NA	100.00	NA	NA

Rx Level -4G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	813.00	6913	4950	955	11.11	16.72	28.5	8.54
[-80, ≥-95]	2856	16897	7749	3357	39.02	40.86	44.6	30.02
[-95, ≥-110]	2686	13084	4179	4226	36.70	31.64	24.1	37.79
[-110, ≥Min]	964	4458	485	2645	13.17	10.78	2.8	23.65
Total	7319	41352	17363	11183	100.00	100.00	100.0	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	15	NA	6389	NA	16.85	NA	49.2	NA
[-80, ≥-95]	35	NA	5057	NA	39.33	NA	38.9	NA
[-95, ≥-110]	37	NA	1452	NA	41.57	NA	11.2	NA
[-110, ≥Min]	2	NA	87	NA	2.25	NA	0.7	NA
Total	89	NA	12985	NA	100.00	NA	100.0	NA

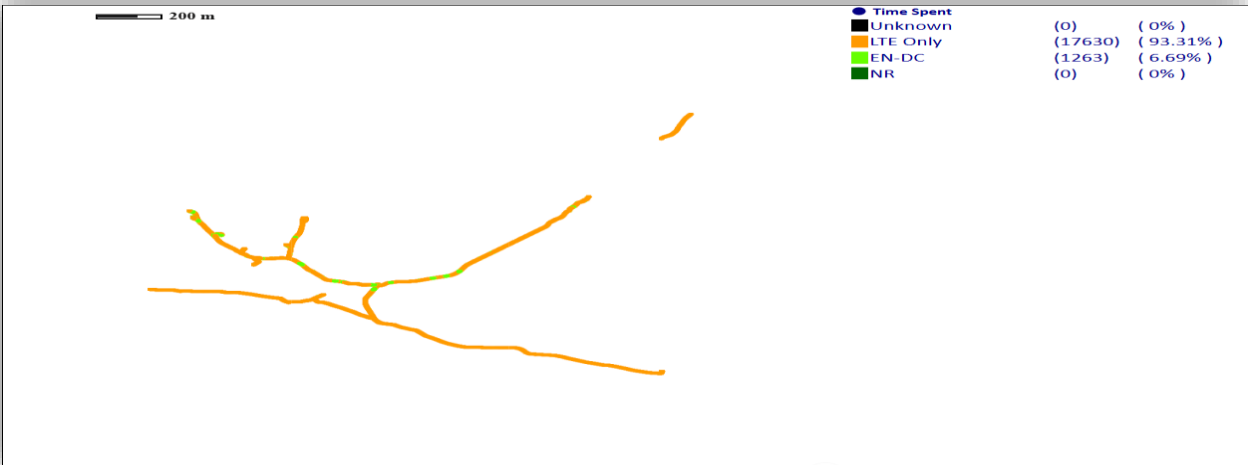
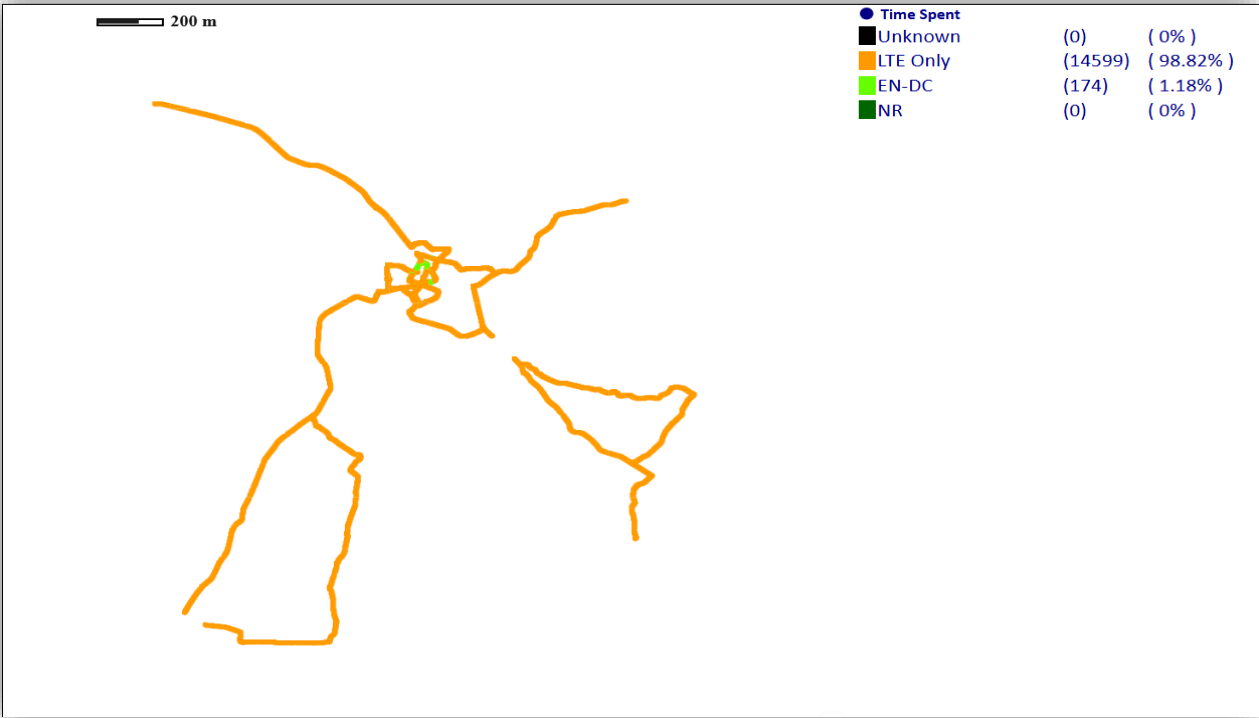
3.3 Data Service performance in 5G/4G/3G/2G (Auto mode) - Dynamic

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	80.04	4.64	321.8	54.15
	80th Percentile	128.77	6.76	519.5	89.29
	20th Percentile	15.64	0.8088	48.3	18.16
Upload speed (Mbps/s)	Average	14.65	4.99	81.4	14.61
	80th Percentile	24.48	4.61	154.1	22.05
	20th Percentile	3.31	0	4.3	8.31
Latency (ms)	Average	78.80	104.60	38.2	70.48
	50th Percentile	26.50	156	39	57.93
Jitter (ms)	Average	13.83	2.91	19.8	0.11

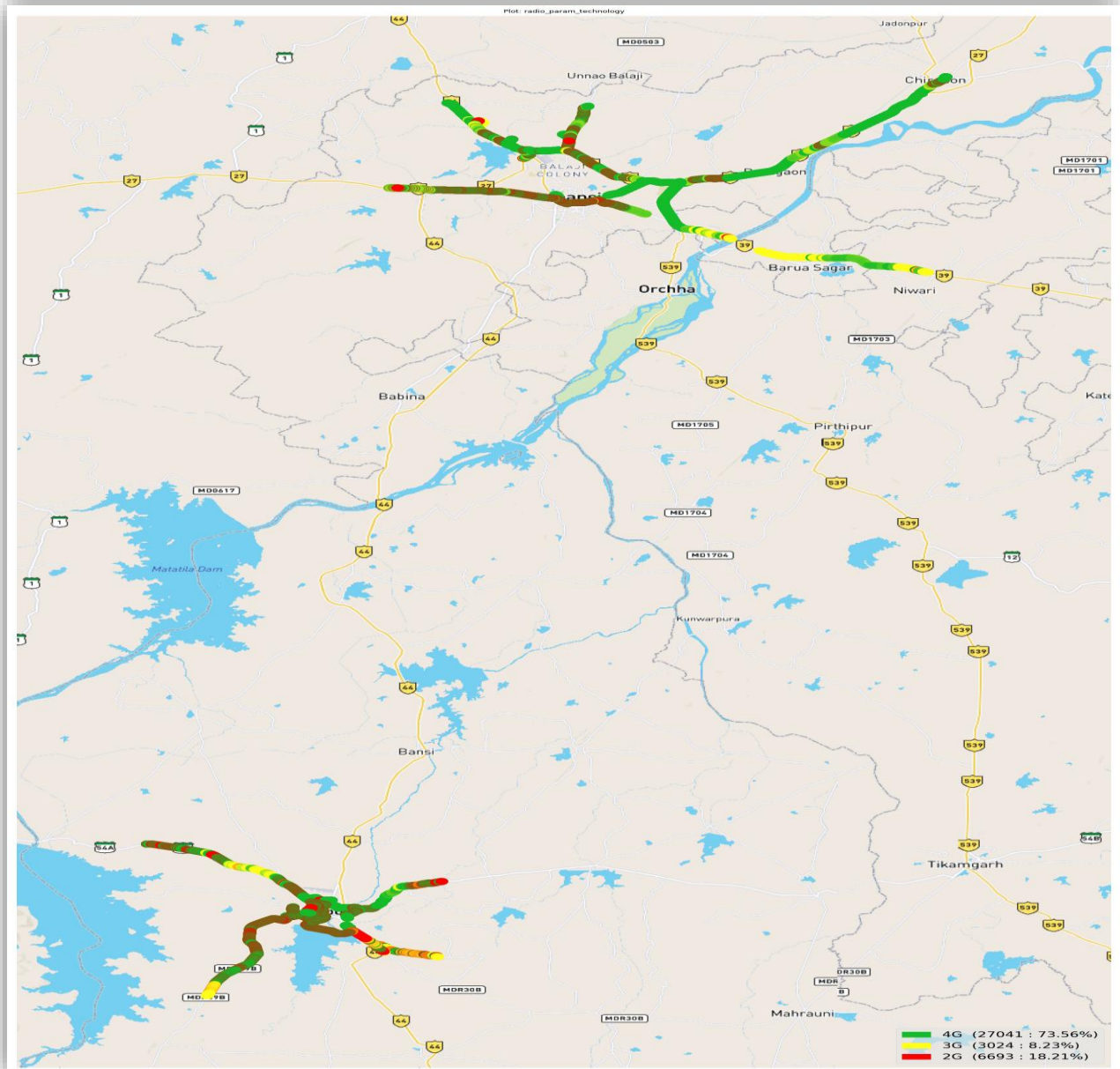
3.4 Time Spent (Technology-wise)

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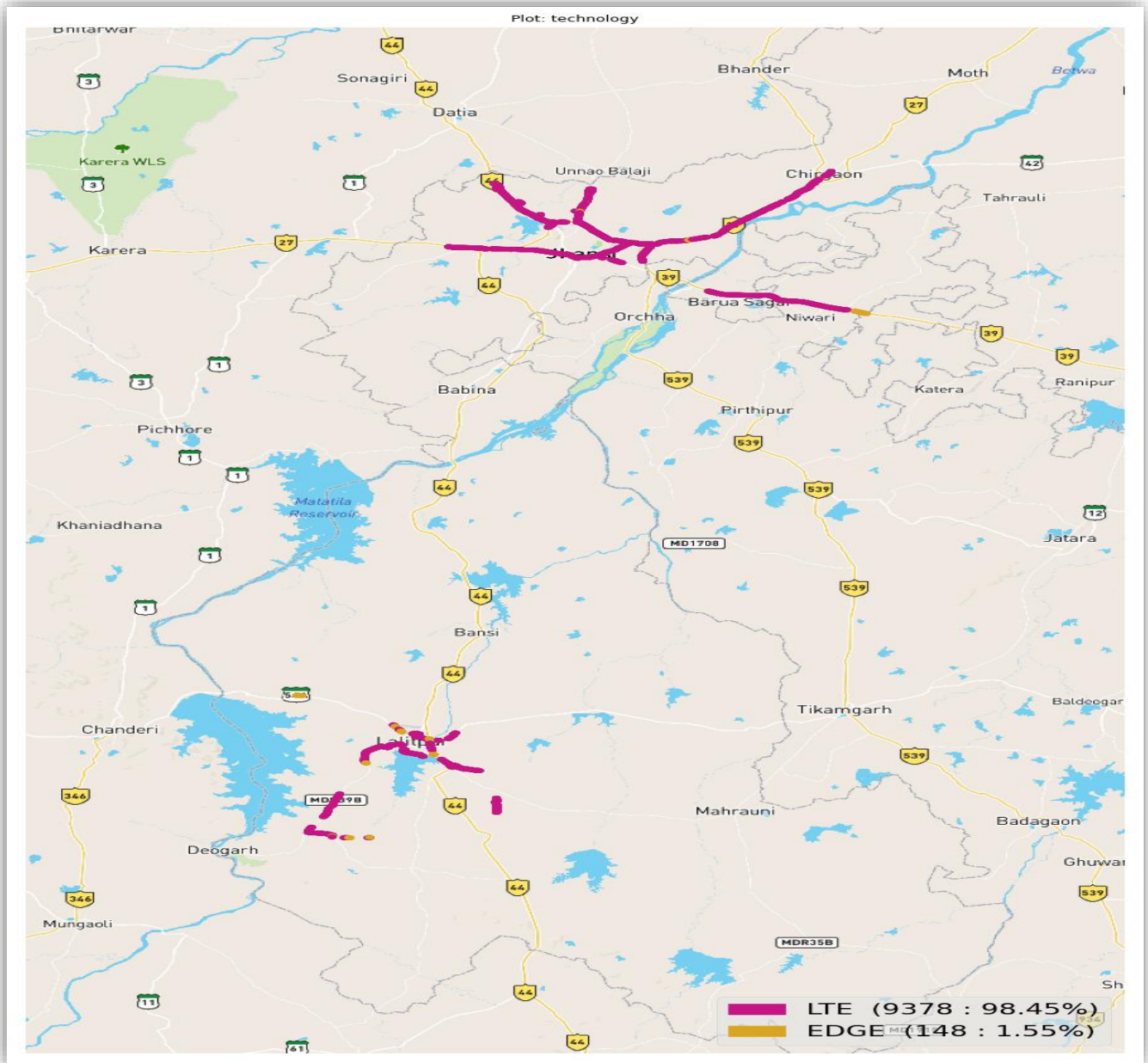
TSP - Airtel



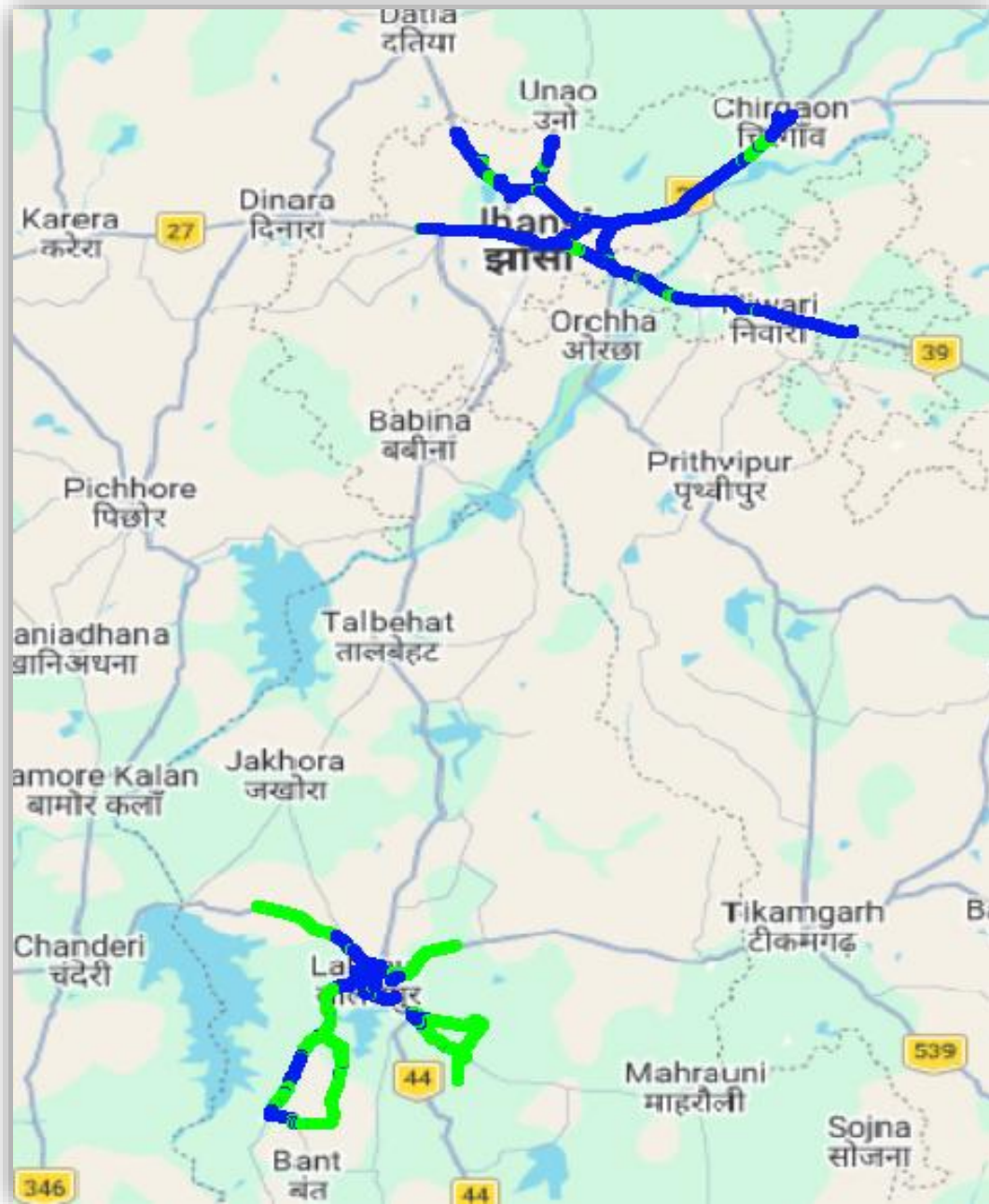
TSP - BSNL



TSP – VIL

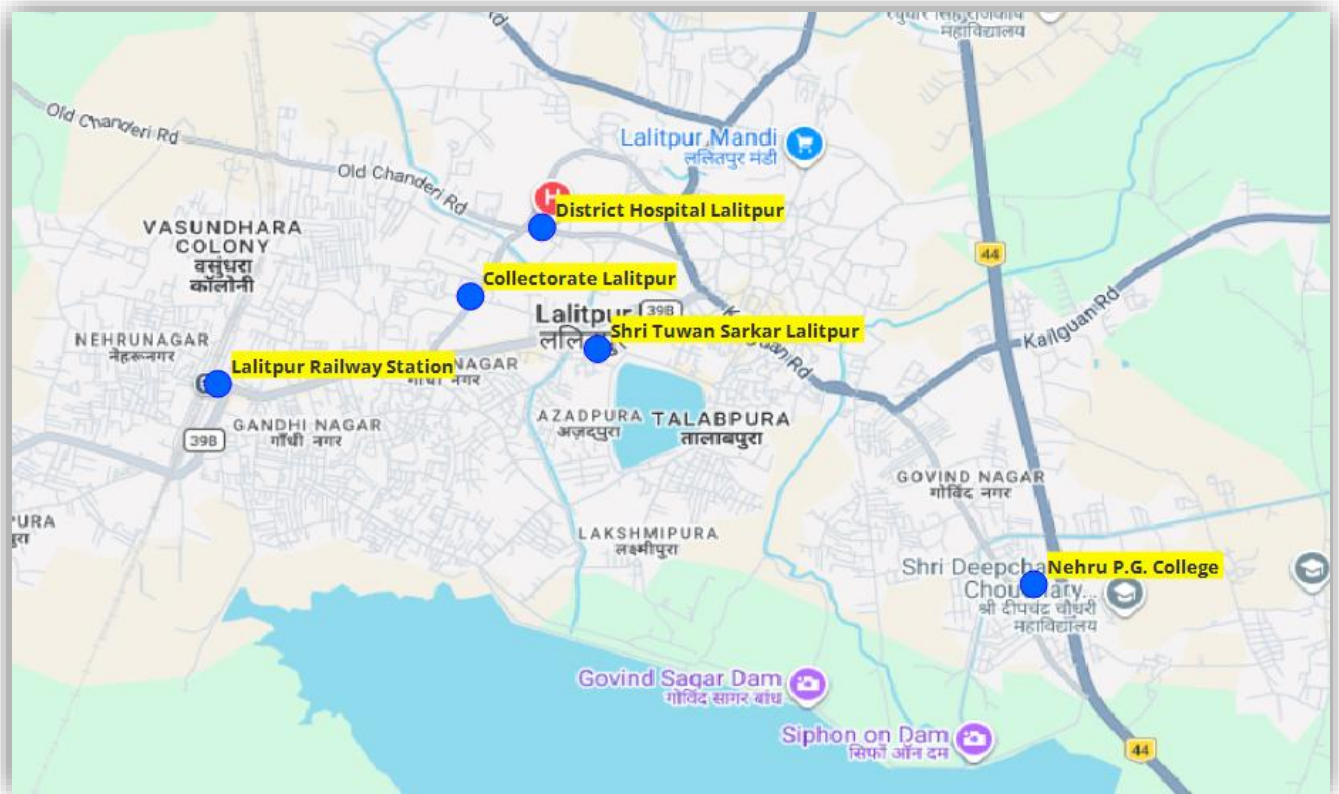


TSP – RJIL



4.0 QoS Performance Analysis - Static

4.1 Hot spot Locations



Hotspot Name	Latitude & Longitude	Date of Measurement	Time of Measurement
Nehru P.G. College	24.678692/78.435671	24/02/2026	05:00PM
Shri Tuwan Sarkar Lalitpur	24.690117/78.414493	24/02/2026	06:45PM
Lalitpur Railway Station	24.688425/78.396058	24/02/2026	08:10PM
District Hospital Lalitpur	24.696024/78.411799	25/02/2026	04:10PM
Collectorate Lalitpur	24.692668/78.408321	25/02/2026	06:45PM

Table-12

4.2 Voice Service Performance (5G/ 4G/ 3G/ 2G - Auto mode) – Over all

Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	50	50	50	65
No of Call Established	50	50	50	65
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0.0	0.00
Call Setup Time Average (Sec.)	0.8	2.68	1.102	0.62

4.3 Data Service Performance (5G/ 4G/ 3G/ 2G - Auto mode) – Over all

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	20 th Percentile	36.75	0.81	253.4	23.05
	Average	75.27	4.64	344.01	43.66
	80 th Percentile	102.76	6.76	402.7	72
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbits/s)	20 th Percentile	3.43	0	17.6	11.11
	Average	29.92	4.99	26.8	16.88
	80 th Percentile	69.86	4.61	29.7	26.98
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50 th Percentile	29.50	89	31.82	30.75
Jitter (in ms)	Average	16.23	2	12.78	0.35
Packet Drop Rate %		3.13	0	0.0	0.02
Web browsing delay (in sec)		6.40	3.06	1.58	2.43
Video Streaming performance for video		1.27	NA	0.64	1.62

4.4 Voice Service Performance (5G/ 4G/ 3G/ 2G - Auto mode) at each Hotspot location

Name of Hotspot Location	1. Shri Tuwan Sarkar Lalitpur			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	10	10	10	16
No of Call Established	10	10	10	16
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0.0	0.00
Call Setup Time Average (Sec.)	2.0	2.009	1.12	0.56
Total no of RLT Occurrence	NA	NA	NA	0
No of RLT > 48	NA	NA	NA	0

Name of Hotspot Location	2. Nehru P.G. College			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	10	10	10	12
No of Call Established	10	10	10	12
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0.0	0.00
Call Setup Time Average (Sec.)	2.0	3.483	1.10	0.56
Total no of RLT Occurrence	NA	NA	NA	0
No of RLT > 48	NA	NA	NA	0

Name of Hotspot Location	3. Lalitpur Station			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	10	10	10	13
No of Call Established	10	10	10	13
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0.0	0.00
Call Setup Time Average (Sec.)	2.0	3.856	1.01	0.56
Total no of RLT Occurrence	NA	NA	NA	0
No of RLT > 48	NA	NA	NA	0

Name of Hotspot Location	4. District Hospital Lalitpur			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	10	10	10	12
No of Call Established	10	10	10	12
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0.0	0.00
Call Setup Time Average (Sec.)	2.0	2.132	1.12	0.64
Total no of RLT Occurrence	NA	NA	NA	0
No of RLT > 48	NA	NA	NA	0

Name of Hotspot Location	5. Collectorate Lalitpur			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	10	10	10	12
No of Call Established	10	10	10	12
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0.0	0.00
Call Setup Time Average (Sec.)	2.0	2.313	1.16	0.62
Total no of RLT Occurrence	NA	NA	NA	0
No of RLT > 48	NA	NA	NA	0

4.5 Data Service Performance (5G/4G/3G/2G - auto mode) at each Hotspot location:

Name of Hotspot Location		1. Shri Tuwan Sarkar Lalitpur			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	49.86	4.729	203.9	87.41
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbps/s)	Average	4.32	4.611	43.02	28.65
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50th Percentile	36	131	32	30.50
Jitter (in ms)	Average	0.39	2.07	12.3	0.35
Packet Drop Rate %		0.33	0	0.0	0.00
Web browsing delay (in sec)		2.01	8.15	1.8	1.92
Video Streaming performance for video		0.89	NA	0.6	1.47

Name of Hotspot Location		2. Nehru P.G. College			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	76.45	4.505	489.6	20.71
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbps/s)	Average	25.42	2.493	32.4	13.94
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50th Percentile	42.35	79	31.4	30.75
Jitter (in ms)	Average	9.44	1.3	11.4	0.85
Packet Drop Rate %		0.8	0	0.0	0.00
Web browsing delay (in sec)		1.02	8.339	1.4	2.04
Video Streaming performance for video		1.11	NA	0.5	1.76

Name of Hotspot Location		3. Lalitpur Station			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	82.96	5.955	246.7	26.32
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbps/s)	Average	29.98	3.302	18.4	11.55
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50th Percentile	45.48	81	32.2	39.75
Jitter (in ms)	Average	6.75	2.69	13.9	0.74
Packet Drop Rate %		0.93	0	0.0	0.00
Web browsing delay (in sec)		2.59	8.05	1.6	2.25
Video Streaming performance for video		0.97	NA	0.71	1.81

Name of Hotspot Location		4. District Hospital Lalitpur			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	54.99	3.283	198.4	51.89
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbps/s)	Average	21.98	3.318	16.8	12.99
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50th Percentile	35	117	32	30.52
Jitter (in ms)	Average	2.3	2.71	14.3	0.87
Packet Drop Rate %		0.92	0	0.0	0.00
Web browsing delay (in sec)		2.75	8.57	1.7	2.05
Video Streaming performance for video		1.61	NA	0.78	1.56

Name of Hotspot Location		5. Collectorate Lalitpur			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	28.84	5.06	579.3	31.99
Download Session Setup Success Rate %		100	100	100	100
Upload speed (Mbps/s)	Average	30.69	2.484	23.5	17.03
Upload Session Setup Success Rate %		100	100	100	100
Latency (in ms)	50th Percentile	36	113	31.5	37.64
Jitter (in ms)	Average	2.69	1.89	12.5	0.79
Packet Drop Rate %		1.3	0	0.0	0.1
Web browsing delay (in sec)		3.65	8.16	1.4	3.89
Video Streaming performance for video		0.67	NA	0.62	1.53

4.6 Signal Strength distribution at Static location – Over all

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	NA	NA	NA	NA	NA	NA	NA
[-65, ≥-75)	NA	NA	NA	NA	NA	NA	NA	NA
[-75, ≥-85)	NA	NA	NA	NA	NA	NA	NA	NA
[-85, ≥Min)	NA	NA	NA	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA	NA	NA	NA

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	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	NA	NA

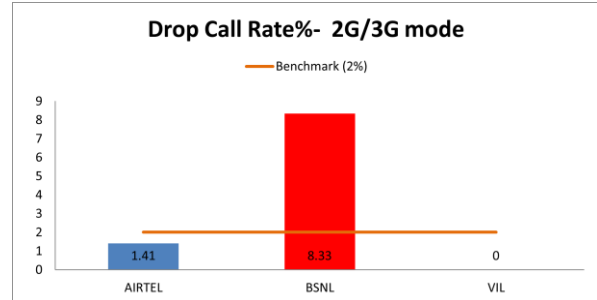
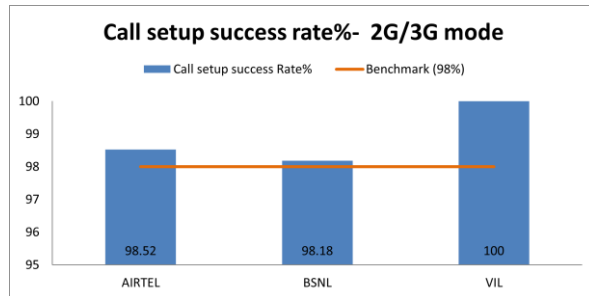
Rx Level -4G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	446.00	2741	436	149	41.72	16.07	59.4	4.38
[-80, ≥-95]	623.00	10816	296	1337	58.28	63.41	40.3	39.35
[-95, ≥-110]	0.00	3490	2	1810	0.00	20.46	0.3	53.27
[-110, ≥Min]	0.00	10	0	102	0.00	0.06	0.0	3
Total	1069.00	17057	734	3398	100.00	100	100.0	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	52	NA	3043	NA	69.33	NA	64.1	NA
[-80, ≥-95]	0	NA	1012	NA	0.00	NA	21.3	NA
[-95, ≥-110]	23	NA	689	NA	30.67	NA	14.5	NA
[-110, ≥Min]	0	NA	0	NA	0.00	NA	0.0	NA
Total	75	NA	4744	NA	100.00	NA	100.0	NA

Highway (Jhansi-Lalitpur-MP Border NH44)

5.0 QoS Performance Analysis - Dynamic

5.1 Voice Service Performance (3G/2G Lock mode) - Dynamic

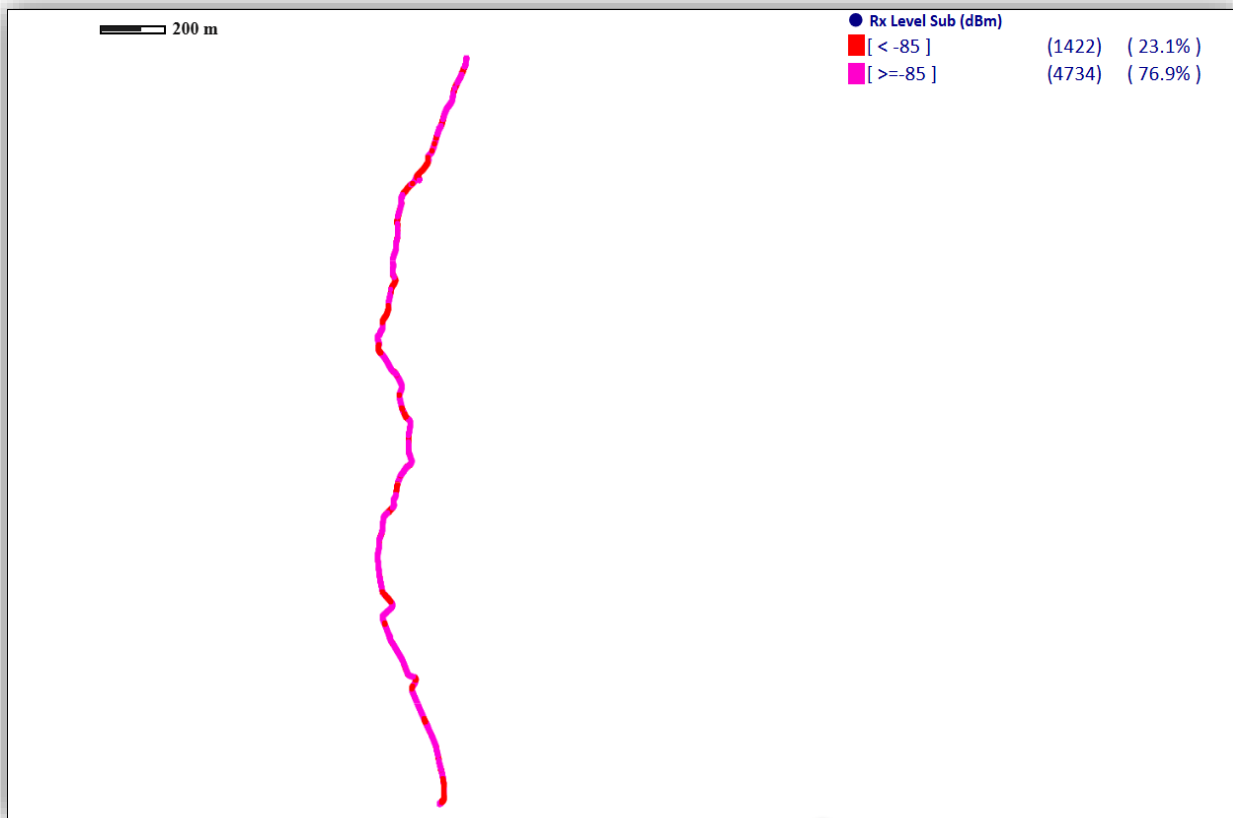


Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	134	134	N/A	134
No. of Call Attempts	68	110	N/A	67
No. of Call Established	67	108	N/A	67
Call setup success rate (CSSR) %	98.52	98.18	N/A	100
No. of Drop Call	1	9	N/A	0
Drop Call Rate %	1.41	8.33	N/A	0.00
Call Setup Time Average (Sec.)	2.98	3.69	N/A	3.11
No. of Handover Attempts	204.00	9	N/A	161
No. of Handover success	202.00	6	N/A	160
HOSR %	99.02	67.66	N/A	99.37
Total no of RLT Occurrence	24219.00	NA	N/A	0
No of RLT > 48	0.00	NA	N/A	0

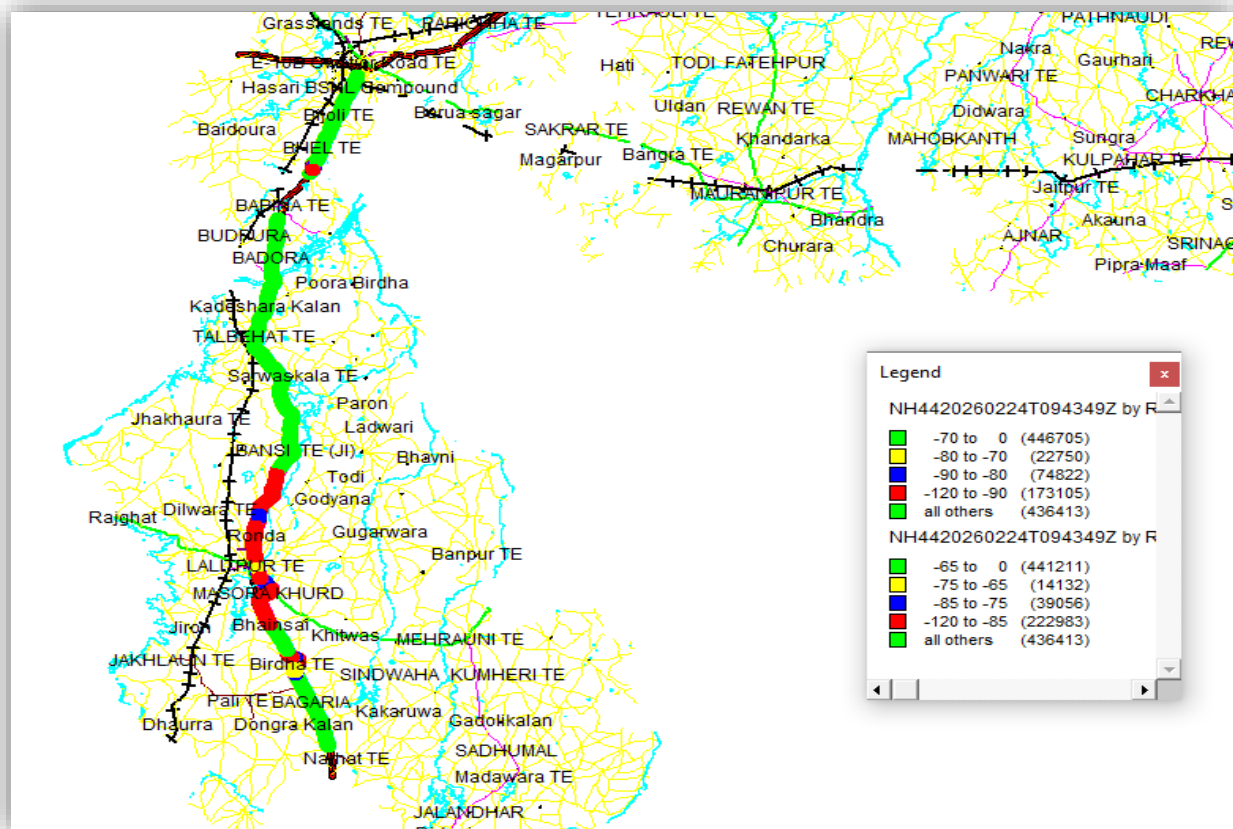
5.1.1 Signal Strength Map (3G/2G - Lock mode)

Parameter Name	Technology	Signal Strength (dBm)			
		Excellent	Good	Fair	Poor
Rx Level	GSM	0 to ≥ -65	<-65 to ≥ -75	<-75 to ≥ -85	<-85 to min
RSCP	WCDMA	0 to ≥ -70	<-70 to ≥ -80	<-80 to ≥ -90	<-90 to min
RSRP	LTE	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min
SS_RSRP	NR	0 to ≥ -80	<-80 to ≥ -95	<-95 to ≥ -110	<-110 to min

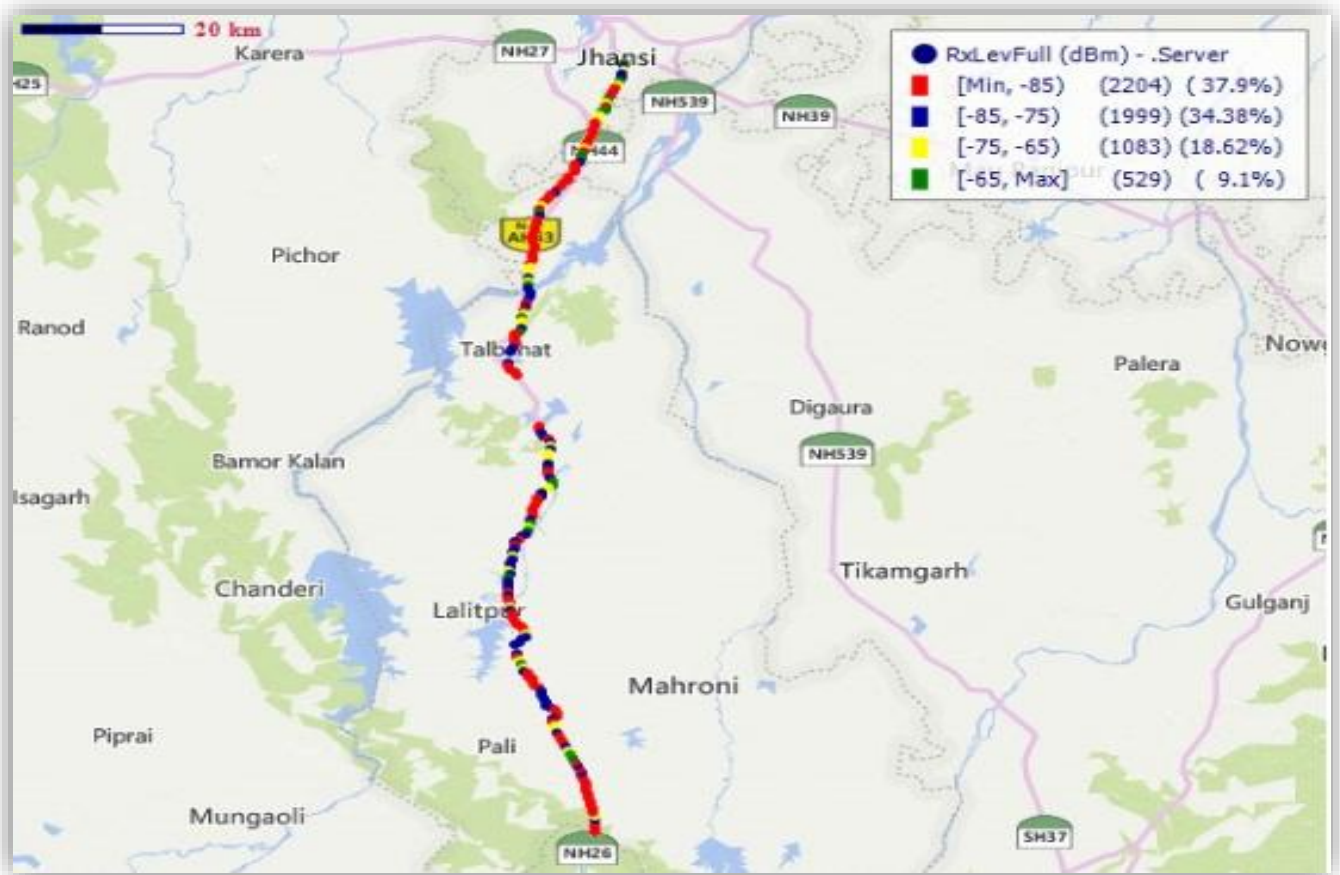
TSP – Airtel



TSP - BSNL

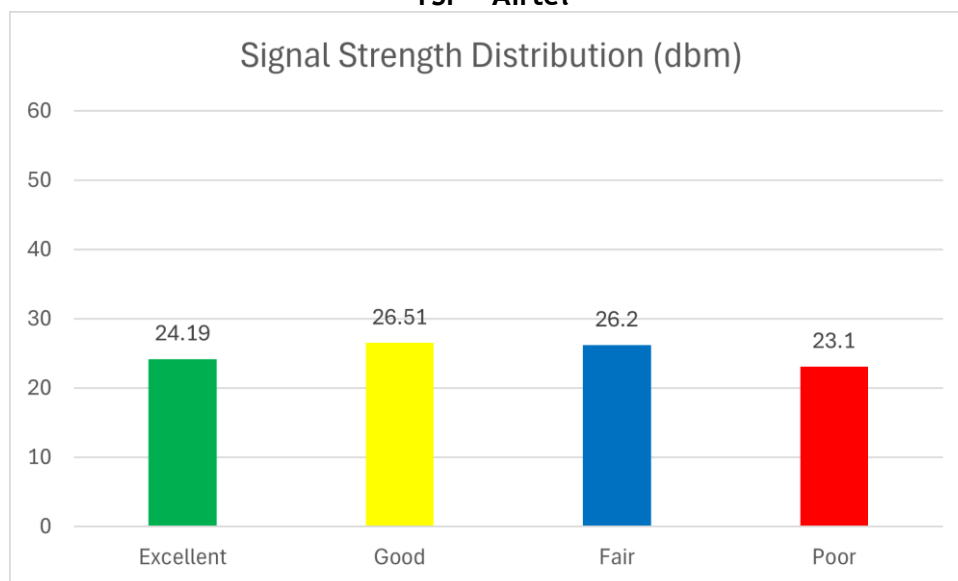


TSP – VIL

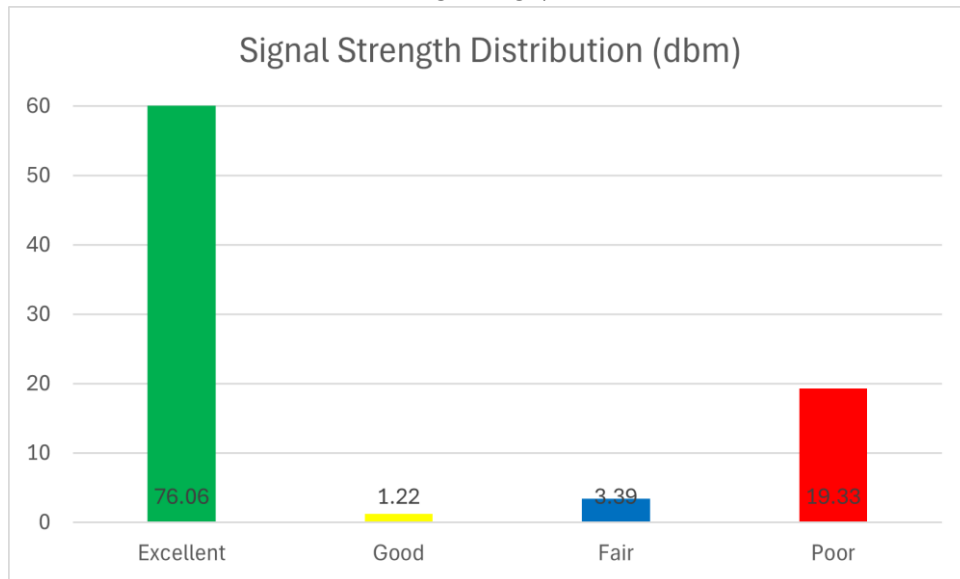


5.1.2 Signal Strength distribution: (3G/2G - Lock mode)

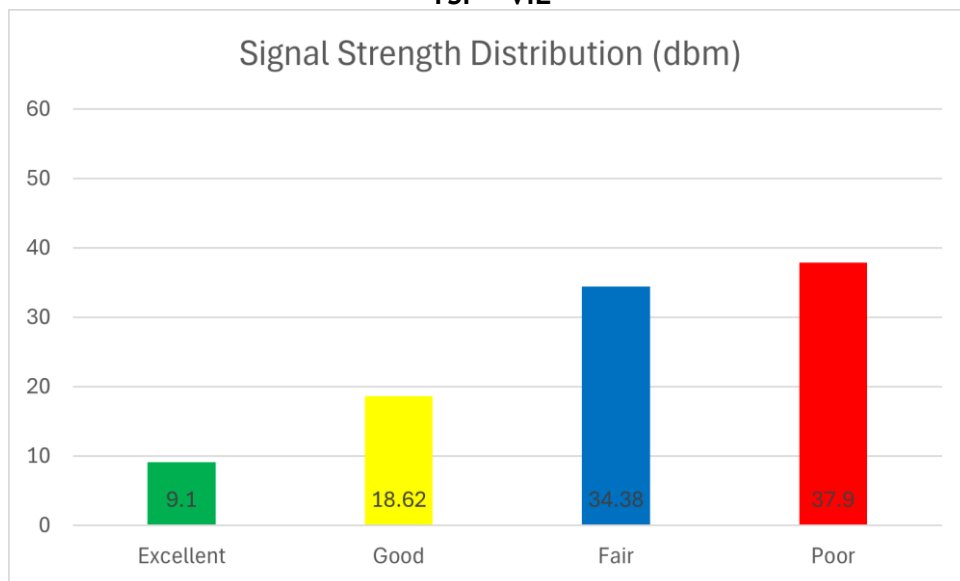
TSP - Airtel



TSP - BSNL



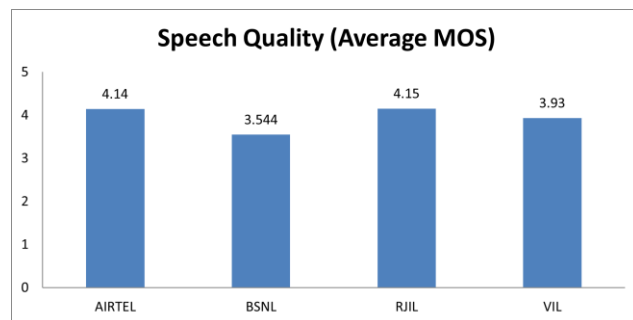
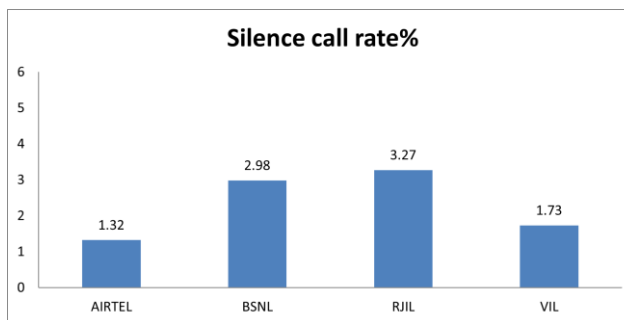
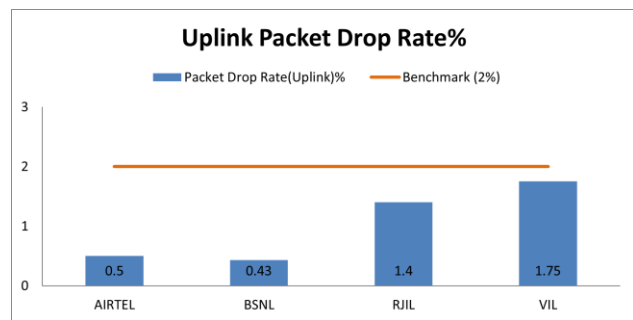
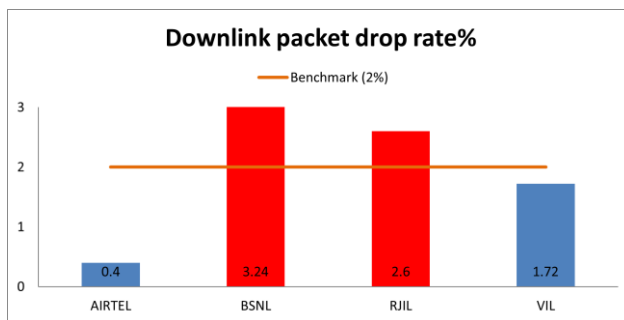
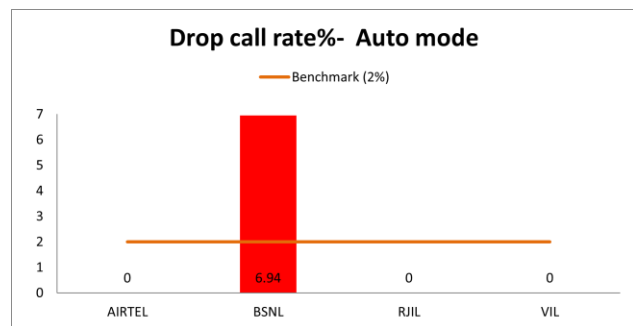
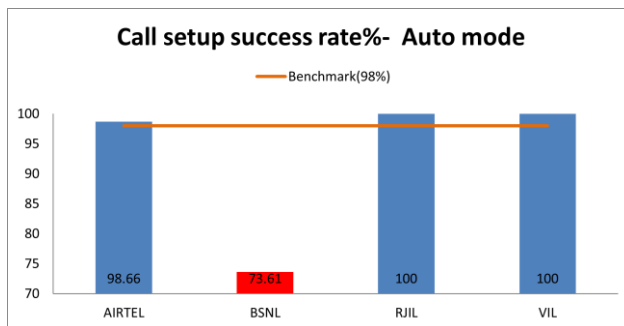
TSP - VIL



Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	1489	877624	NA	529	24.19	76.06	NA	9.1
[-65, ≥-75]	1632	14132	NA	1083	26.51	01.22	NA	18.62
[-75, ≥-85]	1613	39056	NA	1999	26.20	03.39	NA	34.38
[-85, ≥Min]	1422	222983	NA	2204	23.10	19.33	NA	37.9
Total	6156	1153795	NA	5815	100.00	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	883118	NA	NA	NA	76.54	NA	NA
[-70, ≥-80)	NA	22750	NA	NA	NA	01.97	NA	NA
[-80, ≥-90)	NA	74822	NA	NA	NA	06.48	NA	NA
[-90, ≥Min)	NA	173105	NA	NA	NA	15.01	NA	NA
Total	NA	1153795	NA	NA	NA	100	NA	NA

5.2 Voice Service Performance in 5G/4G/3G/2G (Auto mode) - Dynamic

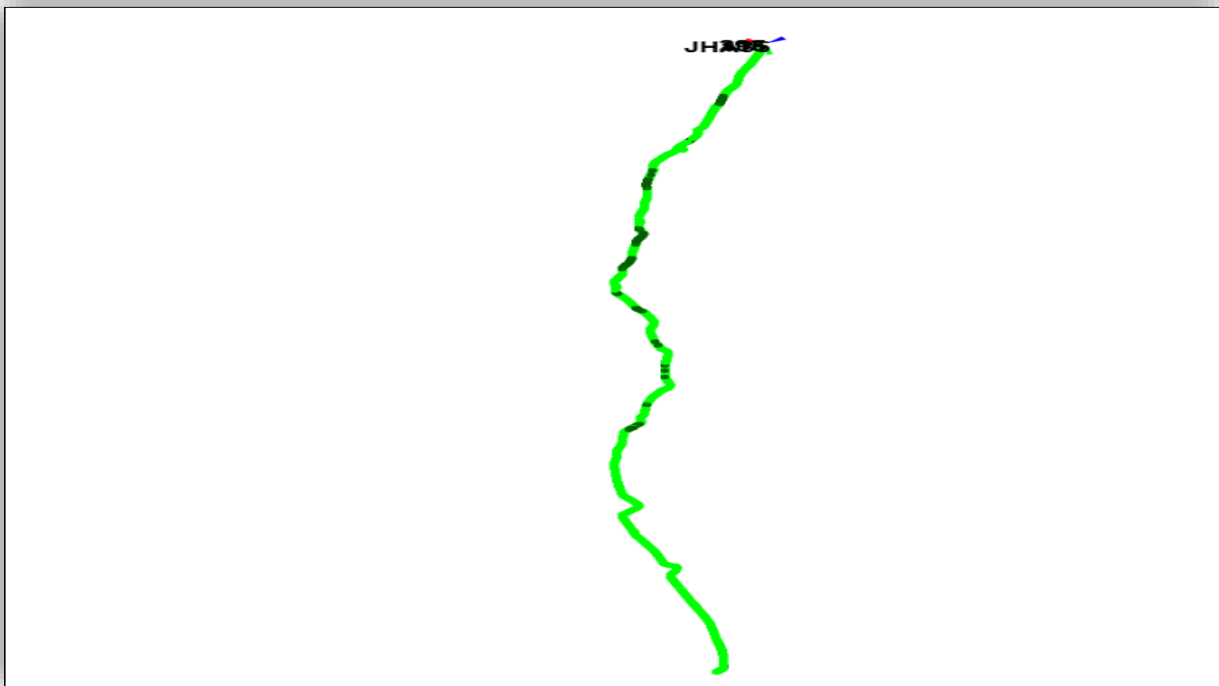


Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	134	134	134	134
No. of Call Attempts	75	72	61	62
No. of Call Established	74	53	61	62
Call setup success rate (CSSR) %	98.66	73.61	100	100
No. of Drop Call	0	5	0	0
Drop Call Rate %	0	6.94	0.0	0.00
Call Setup Time Average (Sec.)	1.08	10.27	1.31	0.66
No. of Handover Attempts	110	145	990	326
No. of Handover success	109	145	988	325
HOSR %	99.75	100	99.79	99.69
Packet Drop Rate (Downlink)	0.4	3.24	2.6	1.72
Packet Drop Rate (Uplink)	0.5	0.43	1.4	1.75
Number of silence call for > 2 sec.	16	NA	4	0
Silence Call Rate %	1.32	2.98	3.27	1.73
Number of MOS samples	1170	NA	1166	1362
Average MOS score	4.14	3.544	4.15	3.93
RTP Jitter (4G & 5G) in ms	NA	6.01	6.20	8.11

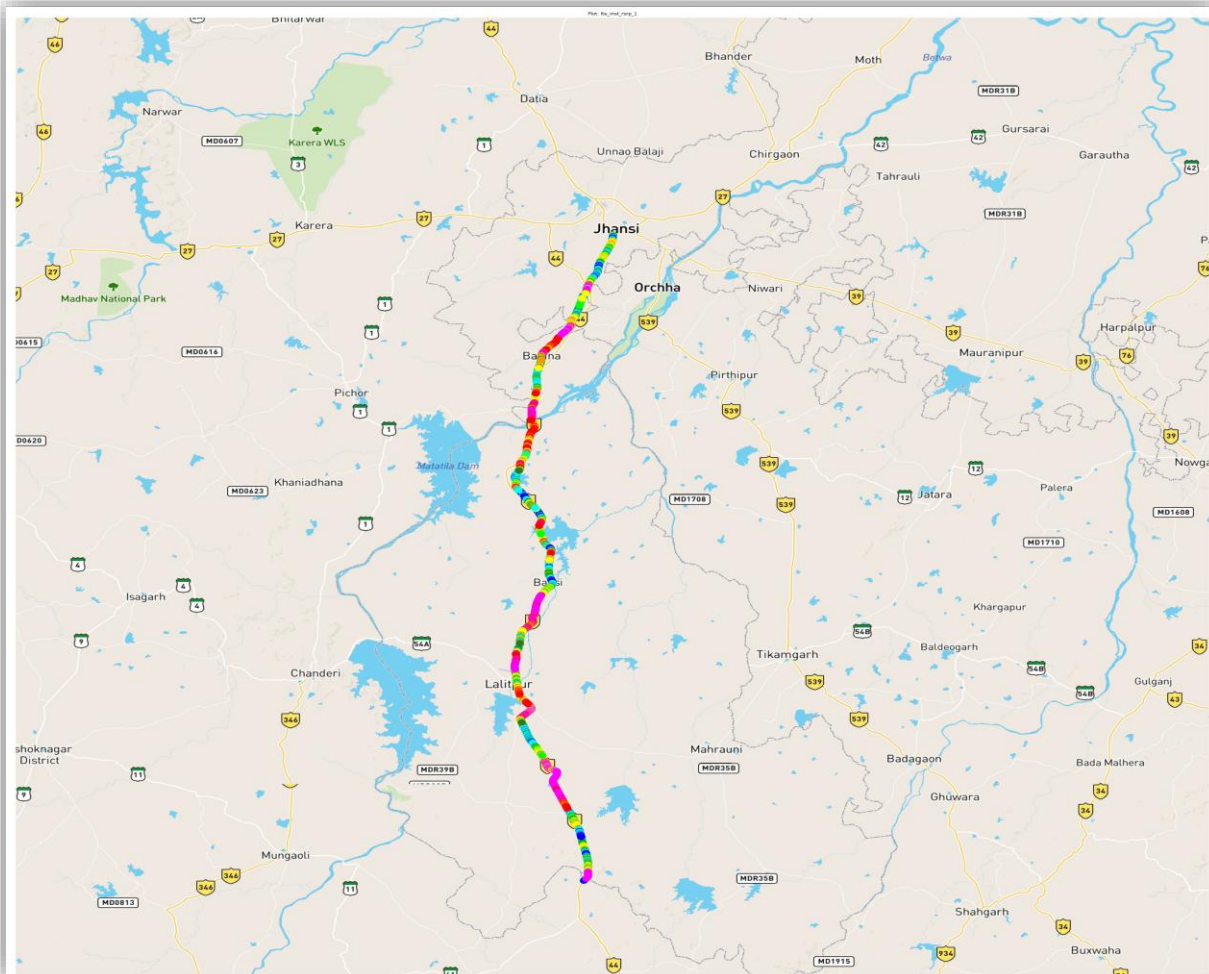
5.2.1 Signal Strength Map ((5G/4G/3G/2G - Auto mode)

Parameter Name	Technology	Signal Strength (dBm)			
		Excellent	Good	Fair	Poor
Rx Level	GSM	0 to $\geq$ -65	<-65 to $\geq$ -75	<-75 to $\geq$ -85	<-85 to min
RSCP	WCDMA	0 to $\geq$ -70	<-70 to $\geq$ -80	<-80 to $\geq$ -90	<-90 to min
RSRP	LTE	0 to $\geq$ -80	<-80 to $\geq$ -95	<-95 to $\geq$ -110	<-110 to min
SS_RSRP	NR	0 to $\geq$ -80	<-80 to $\geq$ -95	<-95 to $\geq$ -110	<-110 to min

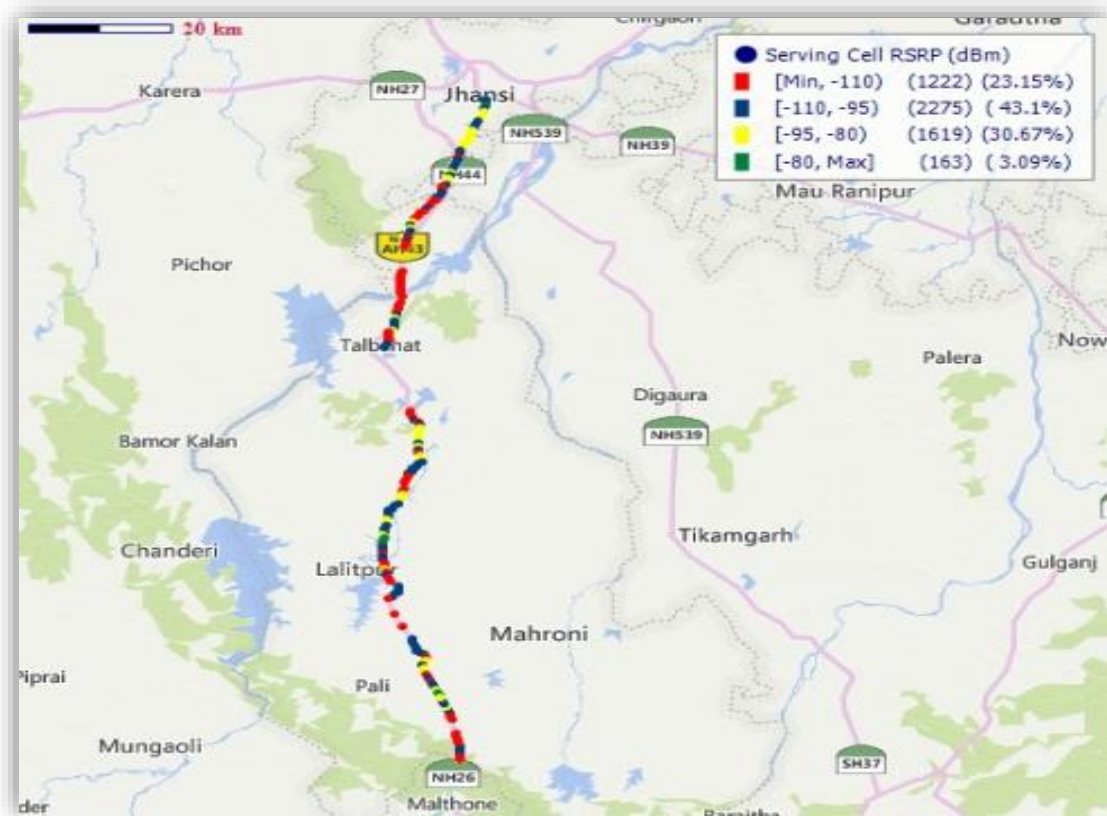
TSP - Airtel



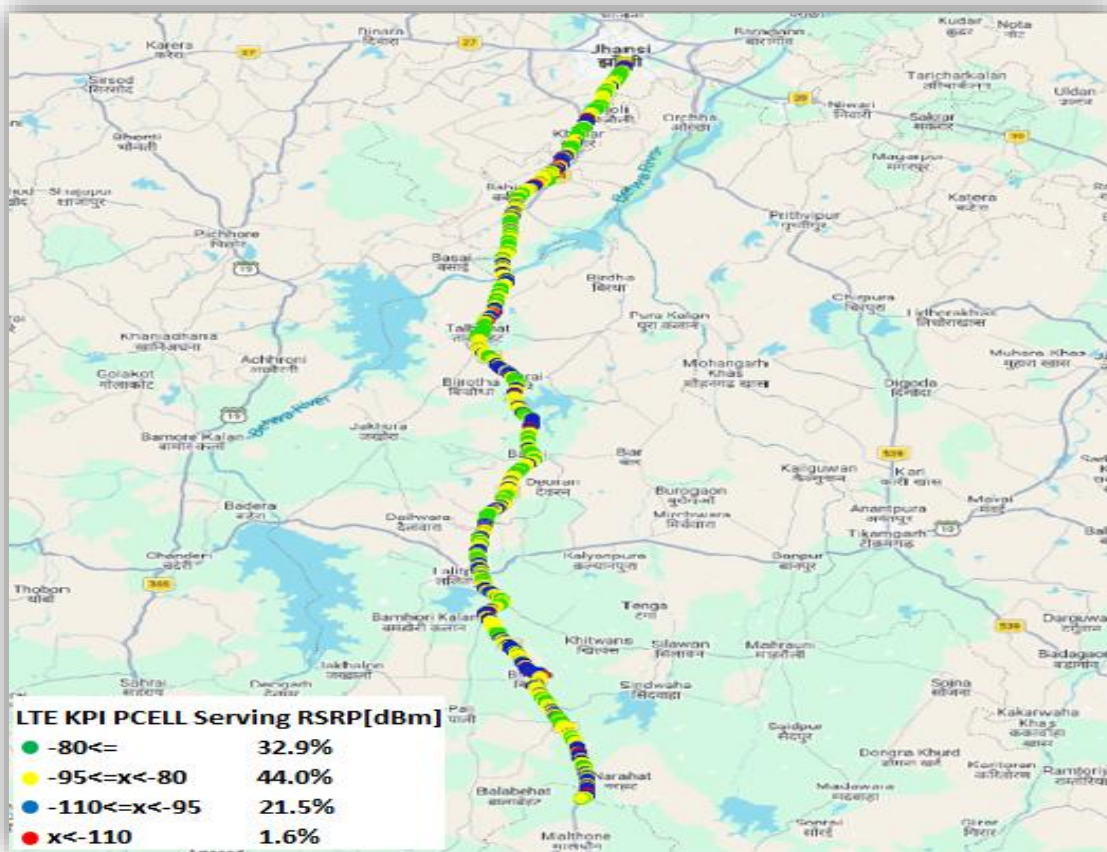
TSP - BSNL



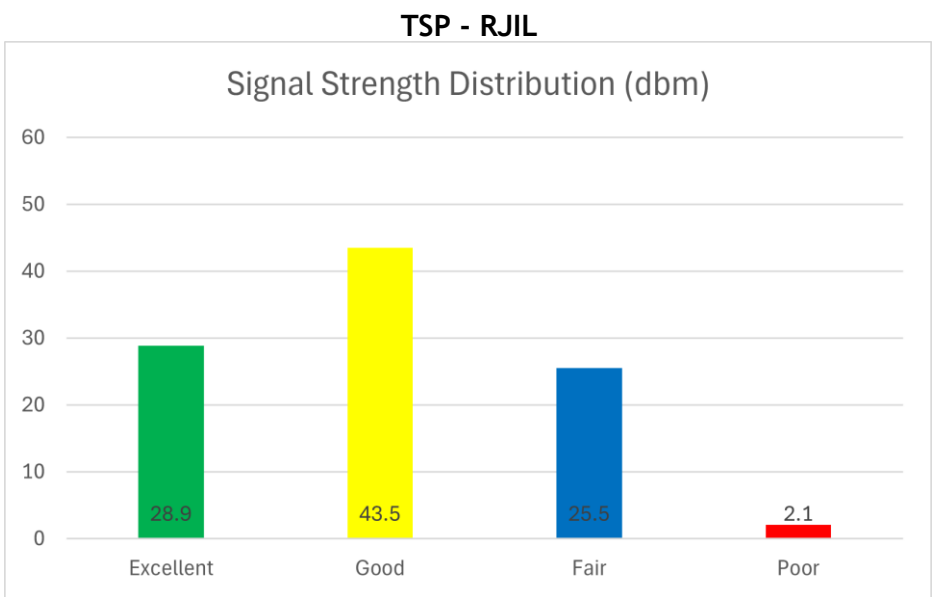
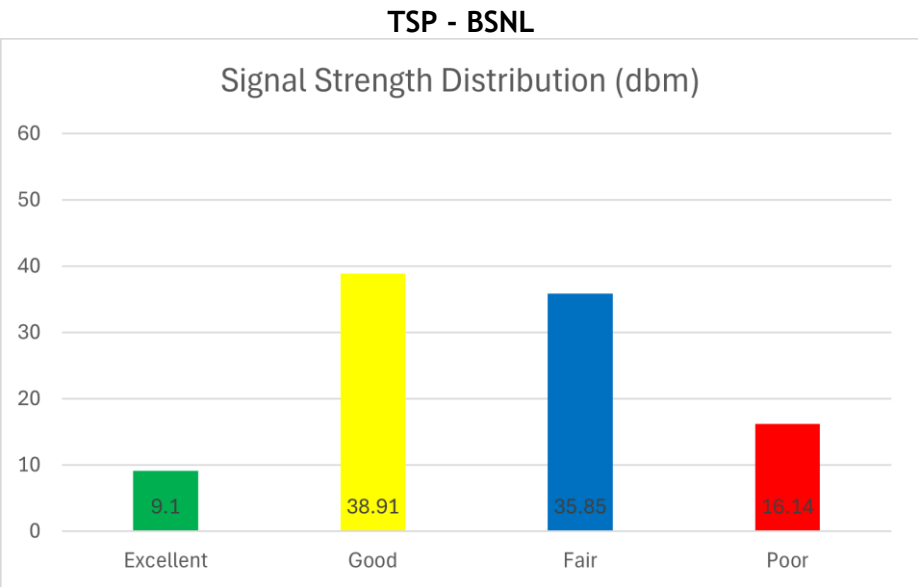
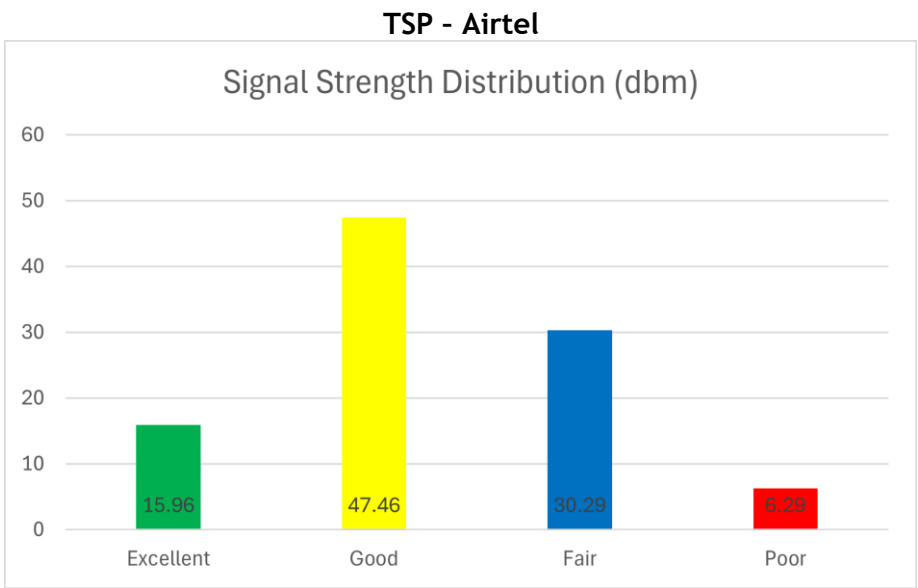
TSP – VIL



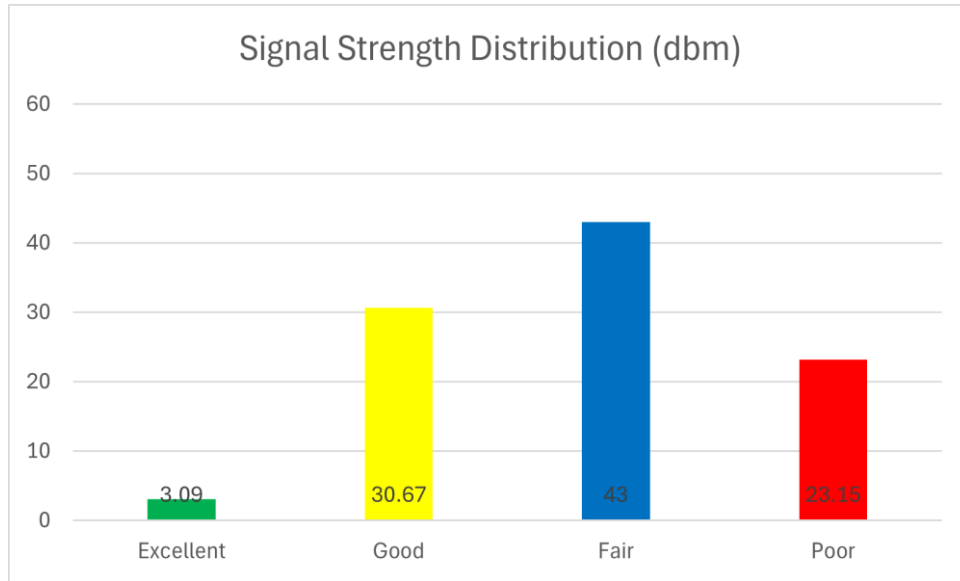
TSP - RJIL



5.2.2 Signal Strength distribution: (5G/4G/3G/2G - Auto mode)



TSP - VIL



Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	125	NA	NA	NA	03.81	NA	NA
[-65, ≥-75)	NA	378	NA	NA	NA	11.53	NA	NA
[-75, ≥-85)	NA	635	NA	NA	NA	19.37	NA	NA
[-85, ≥Min)	NA	2141	NA	NA	NA	65.29	NA	NA
Total	NA	3279	NA	NA	NA	100	NA	NA

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	331	NA	NA	NA	04.59	NA	NA
[-70, ≥-80)	NA	440	NA	NA	NA	06.10	NA	NA
[-80, ≥-90)	NA	982	NA	NA	NA	13.61	NA	NA
[-90, ≥Min)	NA	5461	NA	NA	NA	75.70	NA	NA
Total	NA	7214	NA	NA	NA	100	NA	NA

Rx Level -4G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	1020.00	2153	2586	163	15.96	09.10	28.9%	3.09
[-80, ≥-95]	3033.00	9203	3899	1619	47.46	38.91	43.5%	30.67
[-95, ≥-110]	1936.00	8480	2280	2275	30.29	35.85	25.5%	43
[-110, ≥Min]	402.00	3819	191	1222	6.29	16.14	2.1%	23.15
Total	6391.00	23655	8956	5279	100.00	100	100.0%	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	NA	NA	1350	NA	NA	NA	44.9	NA
[-80, ≥-95]	NA	NA	1359	NA	NA	NA	45.2	NA
[-95, ≥-110]	NA	NA	290	NA	NA	NA	9.7	NA
[-110, ≥Min]	NA	NA	6	NA	NA	NA	0.2	NA
Total	NA	NA	3005	NA	NA	NA	100.0	NA

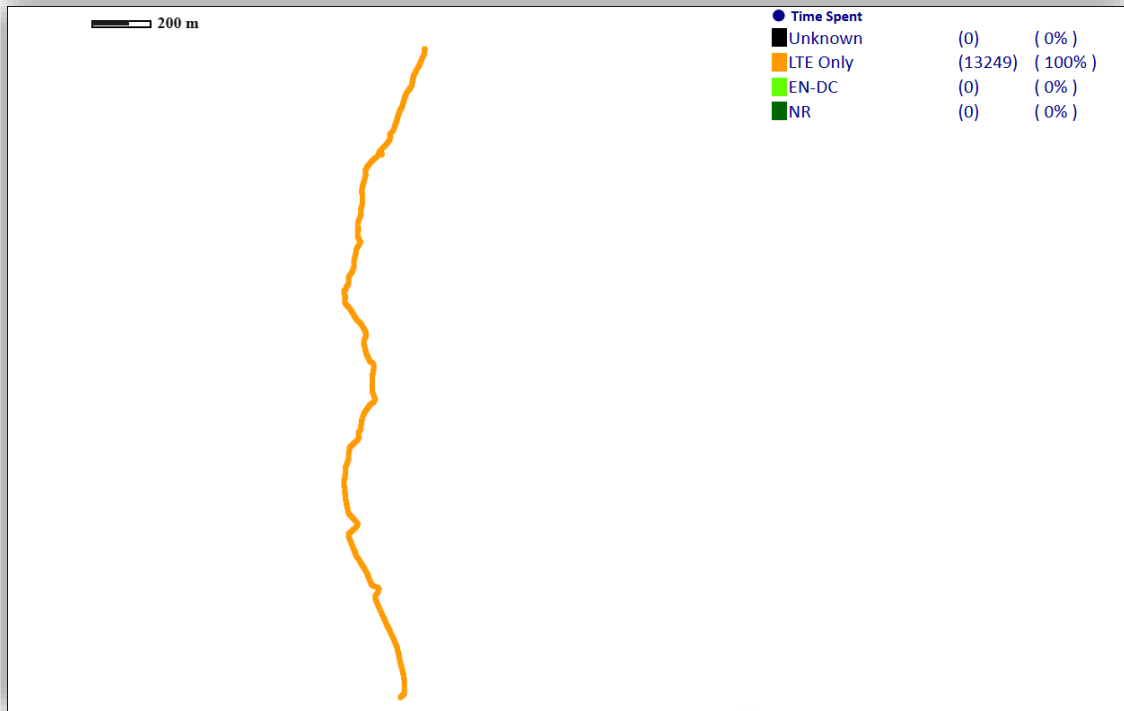
5.3 Data Service performance in 5G/4G/3G/2G (Auto mode) - Dynamic

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	73.27	4.01	231.2	51.49
	80th Percentile	115.38	4.80	439.5	73.63
	20th Percentile	23.41	0	21.6	25.81
Upload speed (Mbps/s)	Average	16.14	6.59	53.2	17.61
	80th Percentile	23.45	1.77	109.2	26.47
	20th Percentile	4.63	0	2.4	8.61
Latency (ms)	Average	NA	186.22	38.9	62.33
	50th Percentile	49.00	105	39	64.91
Jitter (ms)	Average	24.29	3.87	18.8	0.75

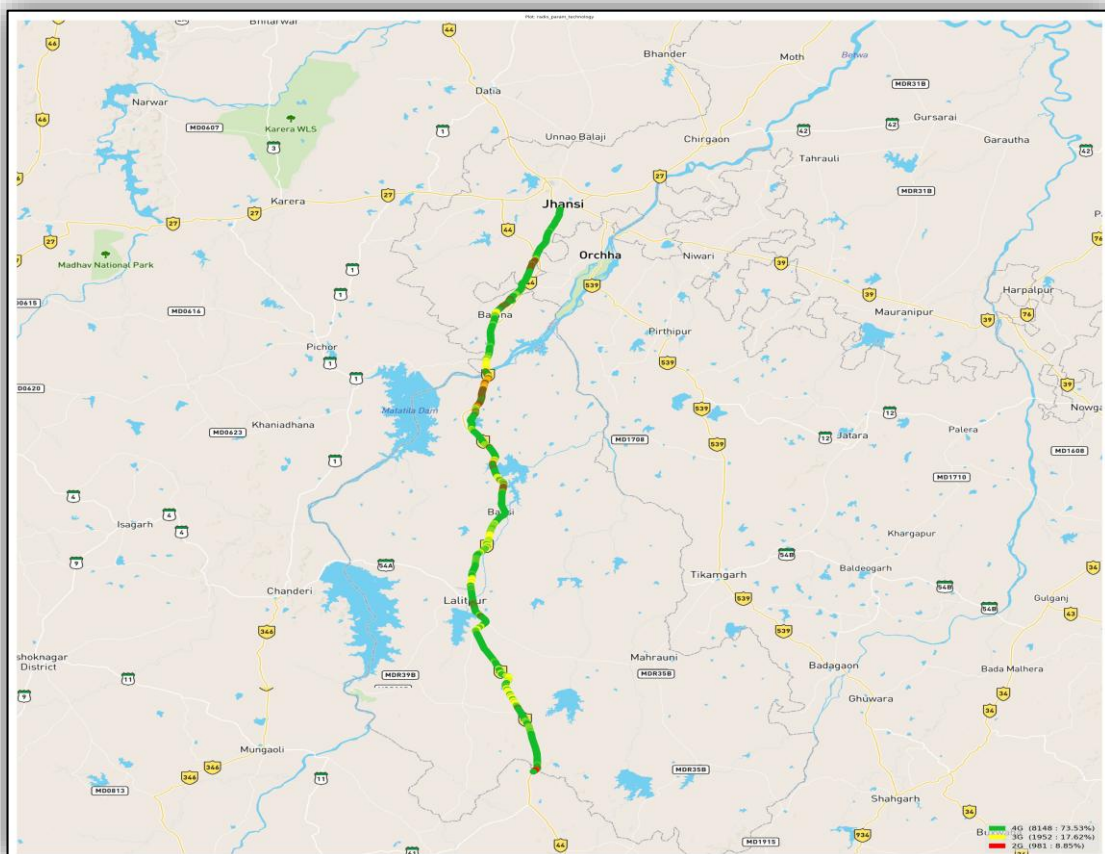
5.4 Time Spent (Technology-wise)

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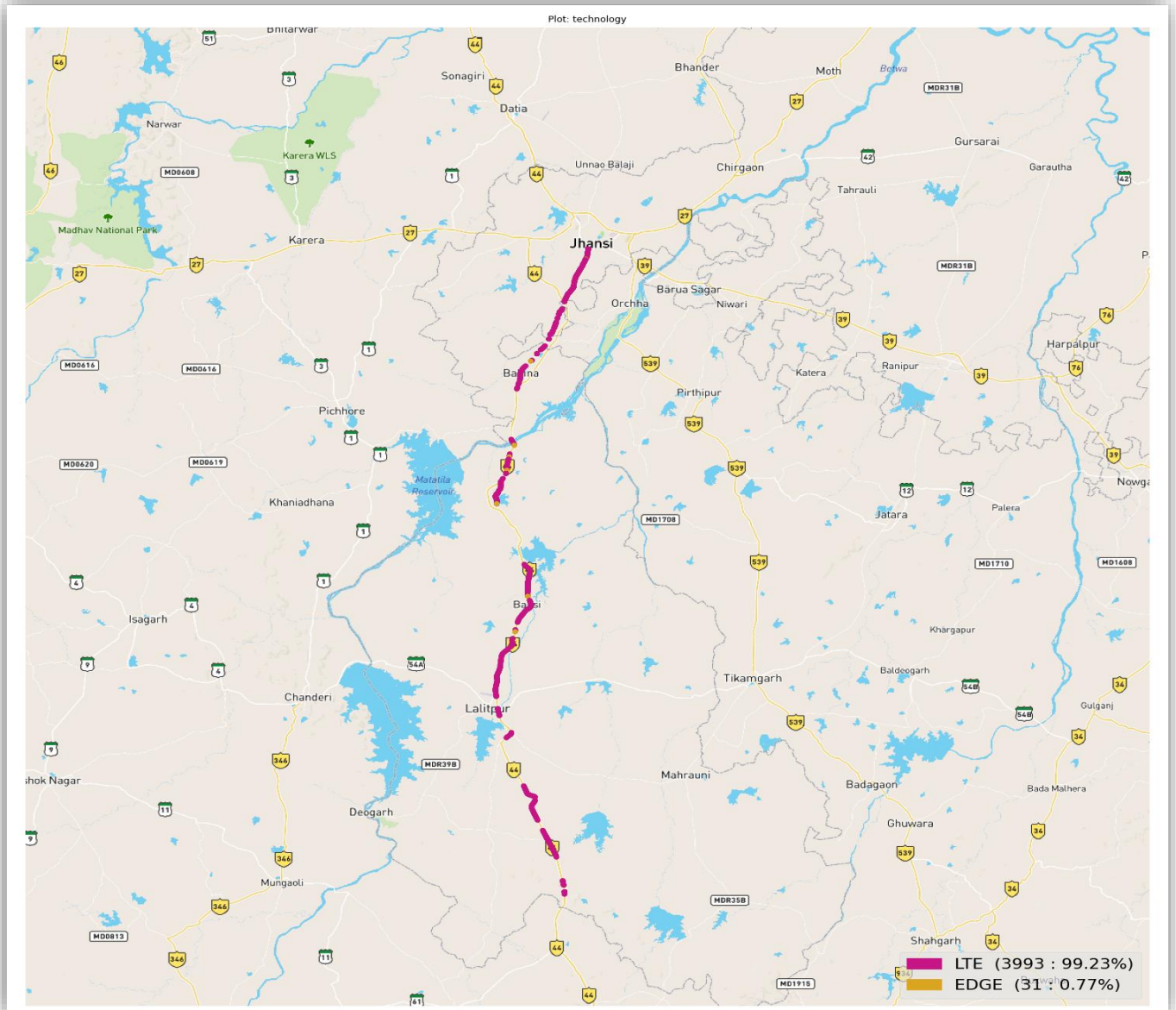
TSP - Airtel



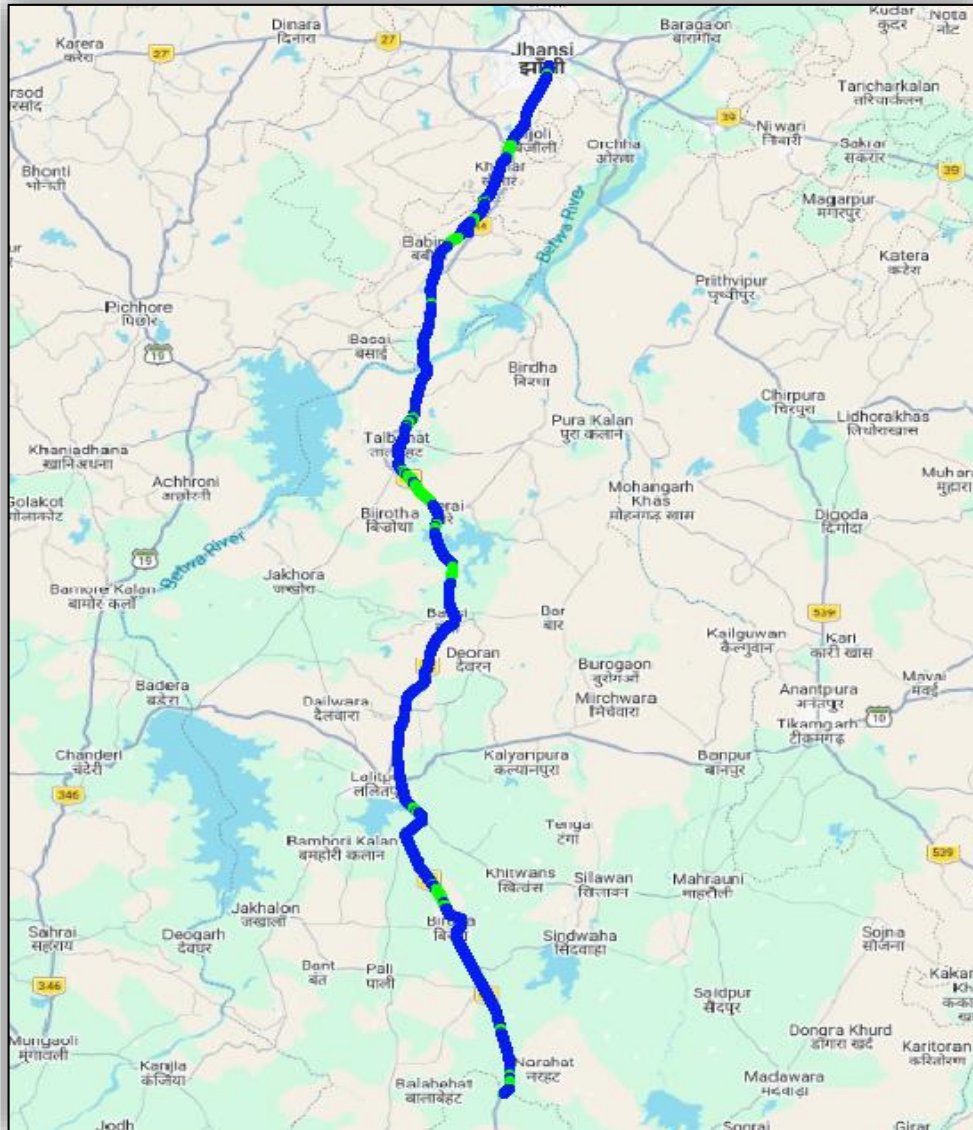
TSP - BSNL



TSP – VIL



TSP - RJIL



6.0 Data testing on hotspots using trainmyspeed app

Hotspot		Airtel	BSNL	JIO	VIL
1. Shri Tuwan Sarkar Lalitpur	3G download in Mbps	NA	NA	NA	NA
	3G upload in Mbps	NA	NA	NA	NA
	4G download in Mbps	27.49	20.26	72.47	99.07
	4G upload in Mbps	5.49	06.67	6.0	13.31
	5G download in Mbps	167.94	NA	214.59	NA
	5G upload in Mbps	16.64	NA	20.28	NA
2. Nehru P.G. College	3G download in Mbps	NA	NA	NA	NA
	3G upload in Mbps	NA	NA	NA	NA
	4G download in Mbps	59.42	16.02	80.26	15.55
	4G upload in Mbps	5.43	7.73	7.78	7.21
	5G download in Mbps	156.95	NA	400.58	NA
	5G upload in Mbps	13.55	NA	25.3	NA

3. Lalitpur Station	3G download in Mbps	NA	NA	NA	NA
	3G upload in Mbps	NA	NA	NA	NA
	4G download in Mbps	27.73	3.89	7.01	137.86
	4G upload in Mbps	5.04	4.44	2.14	23.33
	5G download in Mbps	207.14	NA	232.97	NA
	5G upload in Mbps	25.71	NA	16.05	NA
4. District Hospital Lalitpur	3G download in Mbps	NA	NA	NA	NA
	3G upload in Mbps	NA	NA	NA	NA
	4G download in Mbps	36.05	44.88	63.74	44.49
	4G upload in Mbps	9.16	7.09	4.87	14.00
	5G download in Mbps	190.56	NA	156.39	NA
	5G upload in Mbps	19.76	NA	11.83	NA
5. Collectorate Lalitpur	3G download in Mbps	NA	NA	NA	NA
	3G upload in Mbps	NA	NA	NA	NA
	4G download in Mbps	25.56	11.75	86.71	46.16

	4G upload in Mbps	5.49	4.00	5.41	24.4
	5G download in Mbps	187.87	NA	544.06	NA
	5G upload in Mbps	25.45	NA	16.53	NA

Annexure-I

Drive Test Methodology adopted during the Drive test:

(1) Voice Tests:

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): 90/180 sec. 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 (in 5G/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																																		
8	Signal Strength (Signal strength is the signal power level received by the wireless user)	<table><tr><th rowspan="2">Parameter Name</th><th rowspan="2">Technology</th><th colspan="4">Signal Strength (dBm)</th></tr><tr><th>Excellent</th><th>Good</th><th>Fair</th><th>Poor</th></tr><tr><td>RxLevel</td><td>GSM</td><td>0 to ≥ -65</td><td><-65 to ≥-75</td><td><-75 to ≥-85</td><td><-85 to min</td></tr><tr><td>RSCP</td><td>WCDMA</td><td>0 to ≥ -70</td><td><-70 to ≥-80</td><td><-80 to ≥-90</td><td><-90 to min</td></tr><tr><td>RSRP</td><td>LTE</td><td>0 to ≥ -80</td><td><-80 to ≥-95</td><td><-95 to ≥-110</td><td><-110 to min</td></tr><tr><td>SS_RSRP</td><td>NR</td><td>0 to ≥ -80</td><td><-80 to ≥-95</td><td><-95 to ≥-110</td><td><-110 to min</td></tr></table>	Parameter Name	Technology	Signal Strength (dBm)				Excellent	Good	Fair	Poor	RxLevel	GSM	0 to ≥ -65	<-65 to ≥-75	<-75 to ≥-85	<-85 to min	RSCP	WCDMA	0 to ≥ -70	<-70 to ≥-80	<-80 to ≥-90	<-90 to min	RSRP	LTE	0 to ≥ -80	<-80 to ≥-95	<-95 to ≥-110	<-110 to min	SS_RSRP	NR	0 to ≥ -80	<-80 to ≥-95	<-95 to ≥-110	<-110 to min
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SS_RSRP	NR	0 to ≥ -80	<-80 to ≥-95	<-95 to ≥-110	<-110 to min																															

(2) **Data Tests:**

Sl. No.	QoS Parameter	Measurement Criteria and methodology
1	Data speed in Mbits/s (DL/UL both)	Download Speed = Total bytes transferred during download / Total time for transfer Upload 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 (Multithread 3- TCP Connection at a time for both DL & UL)
2	Latency (in ms)	Latency is the time taken by a packet to reach the receiving end point 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) >90 ms considered as packet loss and included in Packet drop rate. • The measurement 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 page 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