



**TELECOM REGULATORY AUTHORITY OF INDIA
REGIONAL OFFICE - BHOPAL**

**Operator Assisted / Self Drive Test
Report for Aug'2025
LSA-MP**

**Panna & Chhatarpur City and Nearby Area
From 19/08/2025 to 21/08/2025**

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1. Overview

The Operator Assisted Drive Test carried out in Panna, Khajuraho, Chhatarpur City and nearby areas and Highway Drive from Panna to Chhatarpur from date 19/08/2025 to 21/08/2025 & 9:00 AM to 8:00 PM. The drive test covered drive route of around 300 KMs in 3 days and 07 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	1800
2	Bharti Airtel Ltd.	4G	850/1800/2100/2300
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	850,1800,2300
8	Reliance JIO Infocomm Ltd.	5G	700,3500
9	Vodafone Idea Ltd.	2G	900
10	Vodafone Idea Ltd.	3G	N/A
11	Vodafone Idea Ltd.	4G	1800/2300/2500

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:

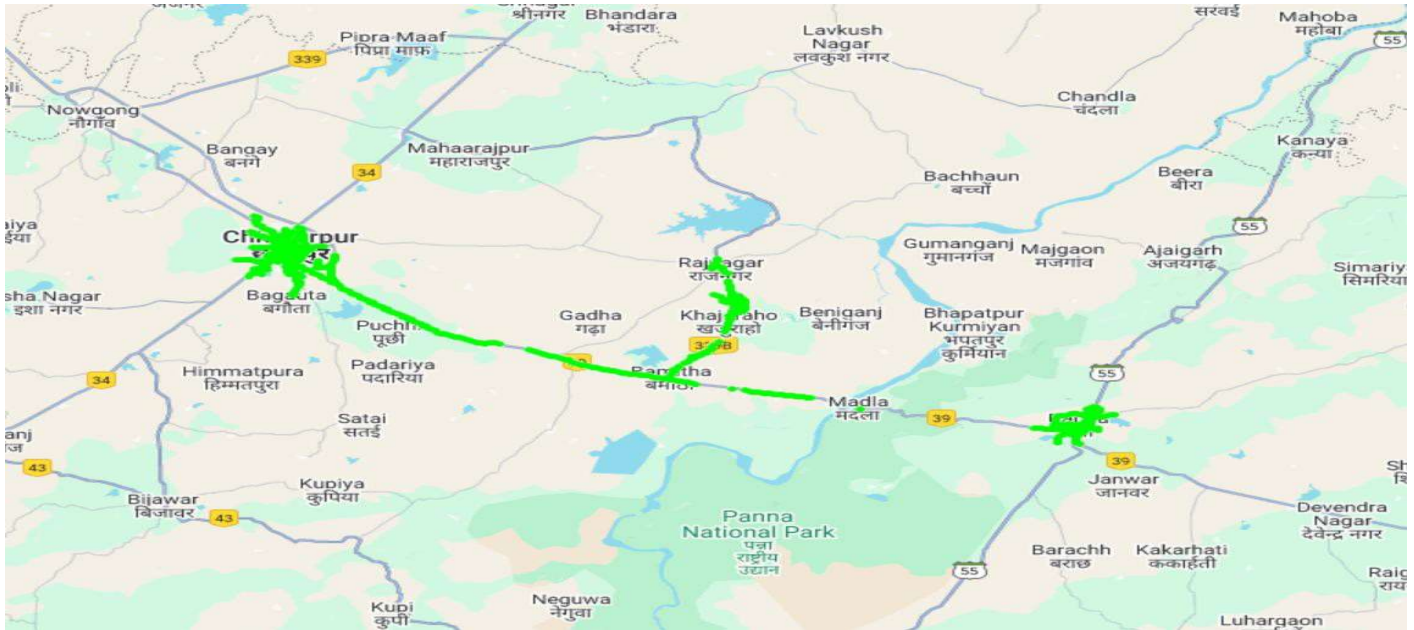
Dynamic	Static (Hotspot Location)
Data speed (DL / UL both)	Data speed (DL/UL both)
Latency	Latency
Jitter	Jitter
	Session Setup Success Rate (DL/UL)
	Packet Drop rate
	Web browsing delay
	Video Streaming performance

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

2. Executive Summary

This report covers the findings of the OADT undertaken in Madhya Pradesh License Service Area (LSA) during the month of Aug'2025 under the supervision of **TRAJ Regional Office (RO), Bhopal**. Details of route/ area covered during the DT is as given below:

2.1 Route Map of Drive test & Hotspot locations:



2.2 Drive Test Area detail

Date	Duration	Drive test route	Distance covered (in Kms)
19-08-2025	9:30am to 6:30pm	Panna	70km
20-08-2025	9:00am to 7:00pm	Highway	75km
20-08-2025	1:00am to 4:00pm	Khajuraho	35km
21-08-2025	9:30am to 6:30pm	Chhatrapur	100km

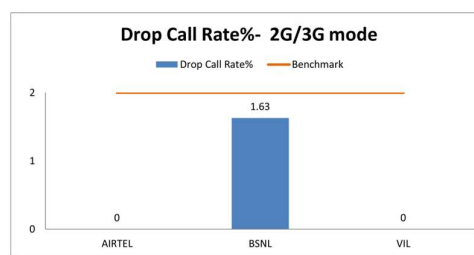
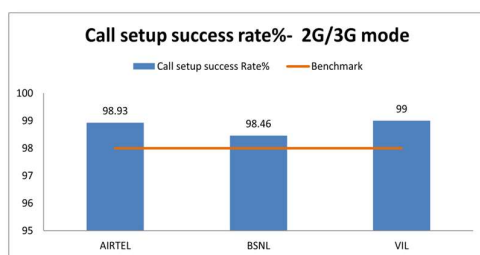
Date	Time	Hotspot Location	Latitude / Longitude
19/08/2025	5:00 pm	Hospital Chauk _panna	24.711967, 80.181786
19/08/2025	5:40 pm	Bus Stand _panna	24.716810, 80.186778
20/08/2025	02:00 pm	Bus Stand _Khajuraho	24.847218, 79.925037
20/08/2025	3:47 pm	Railway station Khajuraho	24.795217, 79.889584
20/08/2025	5:00 pm	Railway station Chhatrapur	24.878432, 79.615348
20/08/2025	6:15 pm	Gov hospital Chhatrapur	24.906674, 79.584498
20/08/2025	7:00 pm	Bus stand _Chhatrapur	24.921643, 79.583883

2.3 Details of Drive Test Tools used:

TSP	Drive Test tool used
Airtel	Tems Investigation
JIO	XCAL
BSNL	TEMS Kit and TEMS Pocket
VI	TEMS INVESTIGATION

2.4 Key findings (Voice & Data)

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

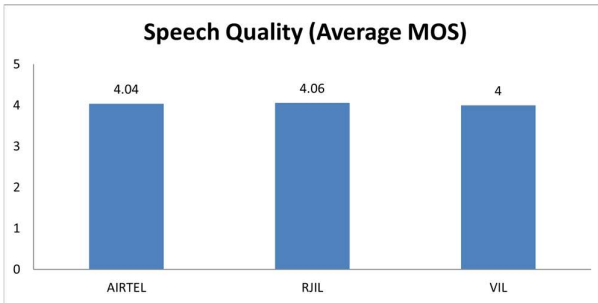
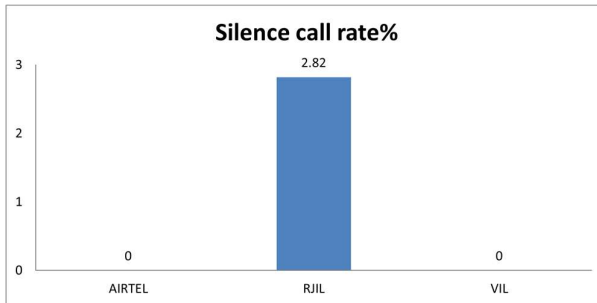
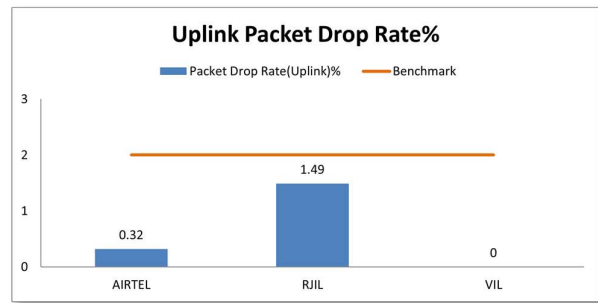
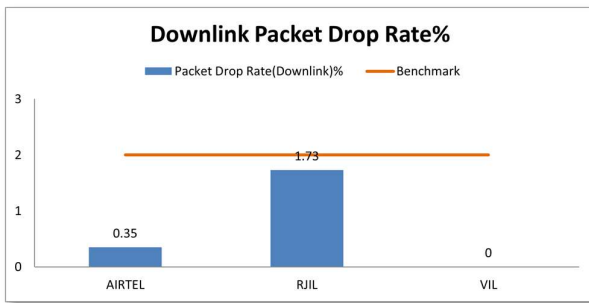
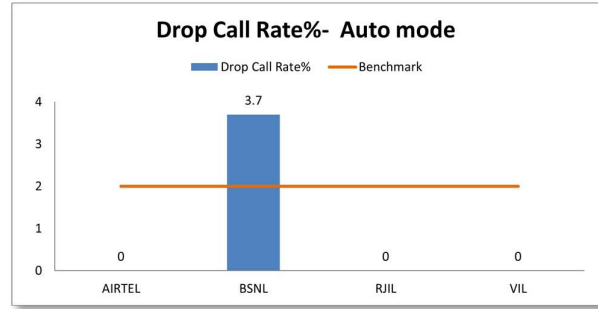
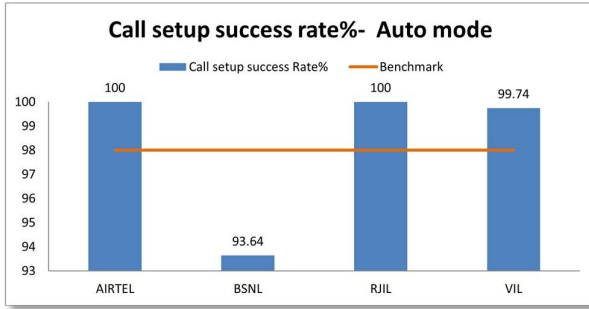


Parameter	Benchmark	AIRTEL	BSNL /MTNL	VIL
Call Attempts		466	590	401
Call Setup Success Rate (in %)	98%	98.93	98.46	99.00%
Drop Call Rate (in %)	2%	0	1.63	0%
Call Setup Time-Average (in Seconds)		3.41	2.25	2.6
Handover Success Rate (in %)		99.8	96.5	99.79%

2.4.2 Number of Cell ids latched during drive test

Technology	AIRTEL	BSNL/MTNL	VIL
3G	NA	128	NA
2G	283	138	188

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



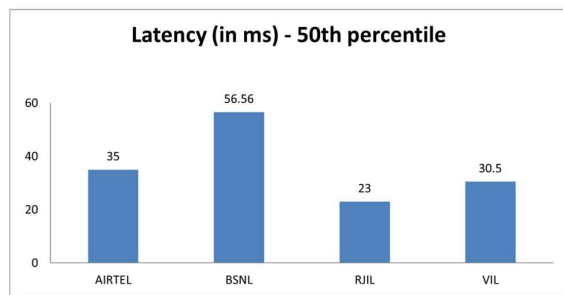
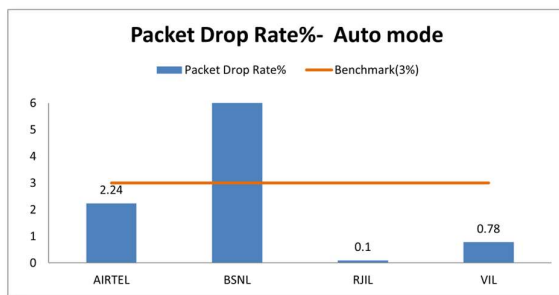
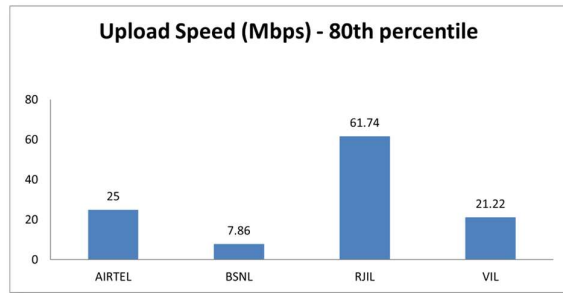
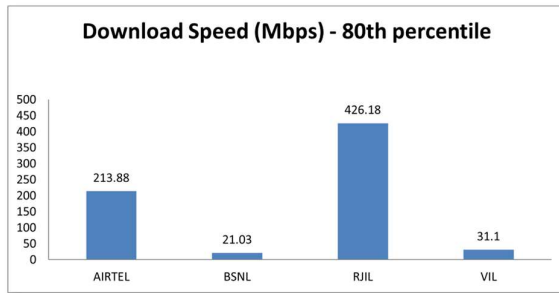
Parameter	AIRTEL	BSNL/MTNL	RJIL	VIL
Call Attempts	481	502	447	388
Call Setup Success Rate %	100	93.64	100	99.74
Drop Call Rate%	0	3.7	0	0
Call Setup Time-Average (Second)	1.24	2.4	0.9	1.47
Handover Success Rate %	99.71	85.47	99.56	100
Downlink Packet drop rate %	0.35	NA	1.73	0
Uplink Packet drop rate %	0.32	NA	1.49	0
Silence Call Rate %*	0	NA	2.82	0
Speech Quality (Average MOS)	4.04	NA	4.06	4.0

1.1.1 Number of Cell ids latched during drive test

Technology	AIRTEL	BSNL/MTNL	RJIL	VIL
5G	NA		153	
4G	512	124	676	369

3G		114		NA
2G	283	123		188

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



QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	16.18	5	15	15
	Average	120.31	15.56	246.93	20.57
	80th Percentile	213.88	21.03	426.18	31.1
Download Session Setup Success Rate %		100	54.00	100	100
Upload speed (Mbps/s)	Typical	5.82	3	7	8
	Average	14.23	3.92	32.78	12.28
	80th Percentile	25.0	7.86	61.74	21.22
Upload Session Setup Success Rate %		100	60.75	125	100
Latency (in ms)	50th Percentile	35.0	56.56	23	30.5
Jitter (in ms)	Average	11.55	0.62	24.8	6.8
Packet Drop Rate %		2.24	60.37	0.1	0.78%
Web browsing delay (in sec)		1.57	6.00	3.04	4.36
Video Streaming performance for video		1.44	3.96	0.45	1.06

1.1.3 TSP-wise Key Findings:

TSP	Important finding and benchmark not achieved.
Airtel	Voice • 98.93% call setup success rate and 0.00% drop call rate have been observed in 3G/2G network mode for LSA. • 100 % call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. • 99.22%, 98.34%, 100% call setup success rate and 0.00%, 0.00%, 0.00% drop call rate have been observed in auto-selection mode (3G/2G Lock Mode) for Panna city, Chhatarpur City, Khajuraho 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 Panna city, Chhatarpur city, Khajuraho 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 in Panna Chhatarpur and Khajuraho. 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 3G/2G network mode for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. • 100.0% 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 not meeting the benchmark of 98.00% & 2.00% respectively. Data • Airtel has 120.31 Mbps average download speed & 14.23 Mbps average upload speed for LSA. • Airtel has 118.32 Mbps, 145.31 Mbps, 111.57 Mbps average download speed & 17.90, 19.23, 13.16 Mbps average upload speed across the measured routes for Panna city, Chhatarpur City and Khajuraho City drive respectively. • Airtel has 155.09 Mbps, 89.52 Mbps, 46.14 Mbps average download speed & 21.97 Mbps, 11.28 Mbps, 8.48 Mbps average upload speed across hotspot locations for auto-selection mode (5G/4G/3G/2G) in Panna City, Chhatarpur City and Khajuraho City respectively.

	Airtel has 19.36 Mbps average download speed & 6.02 Mbps average upload speed across the measured routes for highway drive.
BSNL	Voice 98.46% call setup success rate and 1.63% drop call rate have been observed in 3G/2G network mode for LSA. 93.64 % call setup success rate and 3.70% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. 98.46%, 98.07%, 98.06% call setup success rate and 1.56%, 1.75%, 1.30% drop call rate have been observed in auto-selection mode (3G/2G Lock Mode) for Panna city, Chhatarpur City, Khajuraho City drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. 98.4%, 98.2% 98.5% call setup success rate and 1.58%, 1.76%, 1.42% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Panna city, Chhatarpur city, Khajuraho city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. 95.00%, 100%, 100% call setup success rate and 0.00%, 0.00%, 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for all hotspot locations in Panna Chhatarpur and Khajuraho. Performance is not meeting the benchmark of 98.00% for CSSR at Panna. 98.07% call setup success rate and 1.9% drop call rate have been observed in 3G/2G network mode for highway drive. Performance is meeting the benchmark of 98.00% & 2.00% respectively. 79.45% call setup success rate and 10.03% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for highway drive. Performance is not meeting the benchmark of 98.00% & 2.00% respectively. Data - BSNL has 15.56 Mbps average download speed & 3.92 Mbps average upload speed for LSA. - BSNL has 14.76 Mbps, 33.03 Mbps, 10.65 Mbps average download speed & 4.73, 4.85, 4.21 Mbps average upload speed across the measured routes for Panna city, Chhatarpur City and Khajuraho City drive respectively. - BSNL has 3.81 Mbps average download speed & 1.91 Mbps average upload speed across the measured routes for highway drive.

JIO	Voice • 100.00 % call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is meeting the benchmark of 98.00% & 2.00% respectively. • 100.0%, 100% 100.0% call setup success rate and 0.00%, 0.00%, 0% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Panna city, Chhatarpur city, Khajuraho 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 highway drive. Performance is meeting the benchmark of 98.00% & 2.00% respectively. Data • RJIL has 246.93 Mbps average download speed & 32.78 Mbps average upload speed for LSA. • RJIL has 246.93 Mbps, 280.59 Mbps, 100.66 Mbps average download speed & 32.78, 33.46, 25.93 Mbps average upload speed across the measured routes for Panna city, Chhatarpur City and Khajuraho City drive respectively. • RJIL has 115.46 Mbps average download speed & 15.22 Mbps average upload speed across the measured routes for highway drive.
VI	Voice • 99.46% call setup success rate and 0.00% drop call rate have been observed in 3G/2G network mode for LSA. • 99.74 % call setup success rate and 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for LSA. Performance is meeting the benchmark of 98.00% & 2.00% respectively. • 100.00%, 98.11%, 100.00% call setup success rate and 0.00%, 0.00%, 0.00% drop call rate have been observed in auto-selection mode (3G/2G Lock Mode) for Panna city, Chhatarpur City, Khajuraho City drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.0%, 100.0% 98.27% call setup success rate and 0.00%, 0.00%, 0.00% drop call rate have been observed in auto-selection mode (5G/4G/3G/2G) for Panna city, Chhatarpur city, Khajuraho city drive. Performance is well within the benchmark of 98.00% & 2.00% respectively. • 100.00% call setup success rate and 0.0% drop call rate have been observed in 3G/2G network mode for highway drive. Performance is meeting 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)

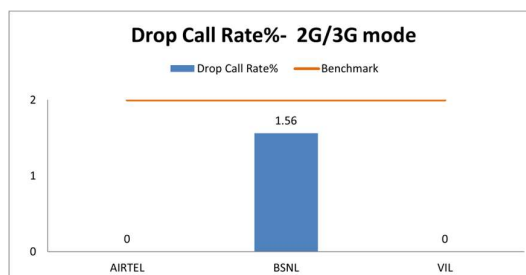
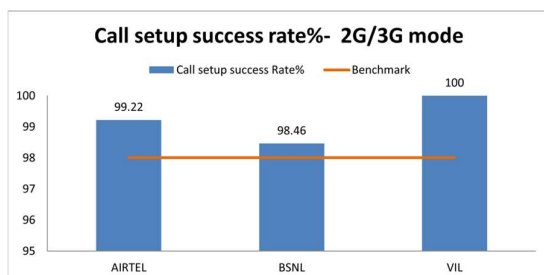
	for highway drive. Performance is meeting the benchmark of 98.00% & 2.00% respectively. Data • VIL has 20.57 Mbps average download speed & 12.28 Mbps average upload speed for LSA. • VIL has 33.55 Mbps, 41.52 Mbps, 34.17 Mbps average download speed & 27.65, 10.99, 15.24 Mbps average upload speed across the measured routes for Panna city, Chhatarpur City and Khajuraho City drive respectively. • VIL has 21.76 Mbps average download speed & 17.33 Mbps average upload speed across the measured routes for highway drive.
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Detailed QoS Performance Analysis

City - Panna

QoS Performance Analysis - Dynamic

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	70	70	70	70
No. of Call Attempts	129	130	N/A	98
No. of Call Established	128	128	N/A	98
Call setup success rate (CSSR) %	99.22	98.46	N/A	100
No. of Drop Call	0	02	N/A	0
Drop Call Rate %	0	1.56	N/A	0
Call Setup Time Average (Sec.)	3.55	2.51	N/A	2.7
No. of Handover Attempts	171	121	N/A	96
No. of Handover success	171	118	N/A	94
HOSR %	100	97.52	N/A	97.91
Total no of RLT Occurrence	24497	14	N/A	20696
No of RLT > 48	0	0	N/A	0

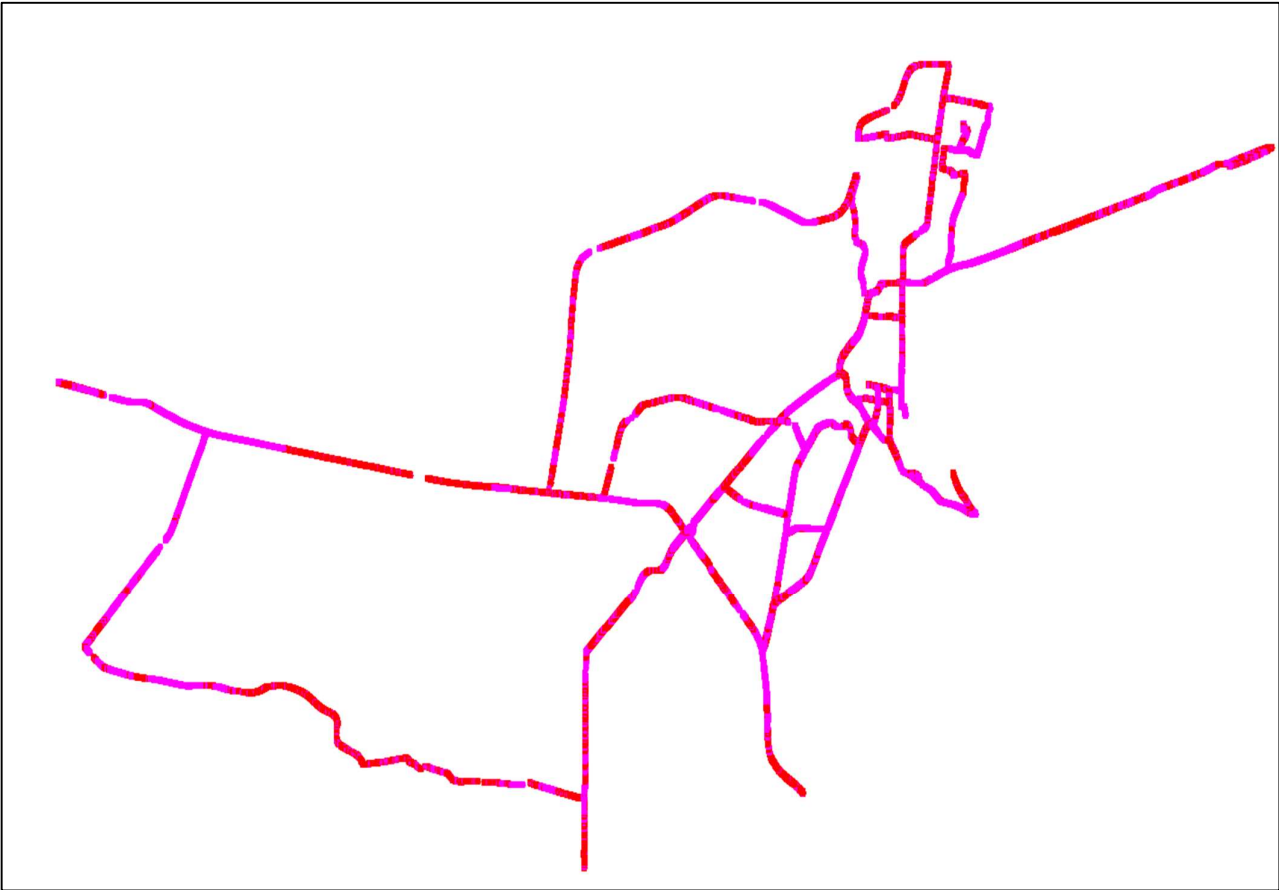
Number of Cell ids latched during drive test (3G/2G - Lock mode)

Number of unique Cell ids covered in Voice test				
Technology	AIRTEL	BSNL/MTNL	RJIL	VIL
3G	NA	21		NA
2G	50	24		40

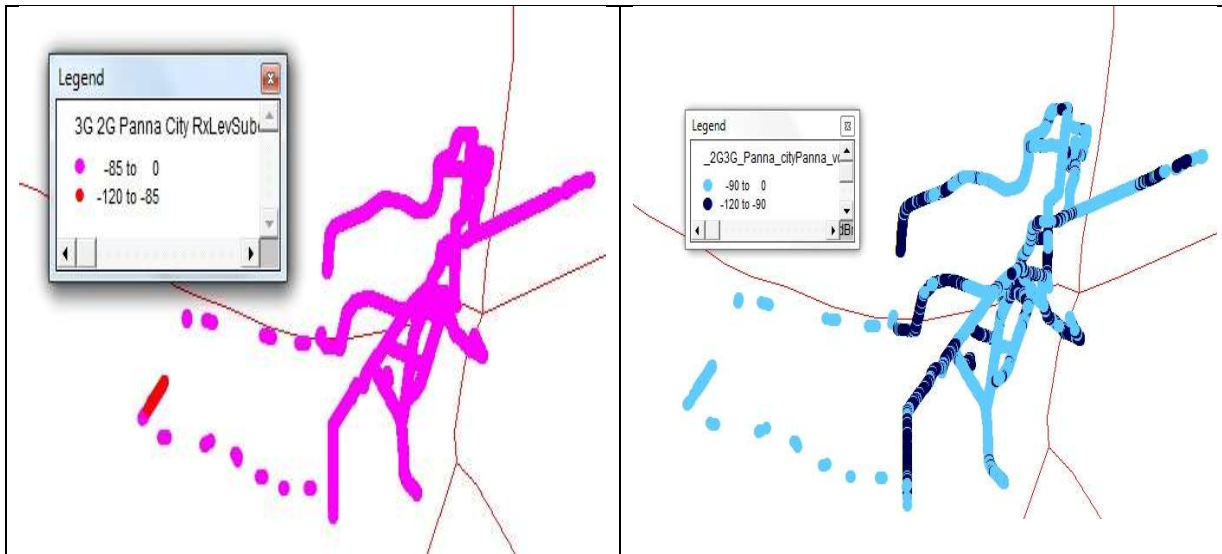
Signal Strength Map: (3G/2G - Lock mode)

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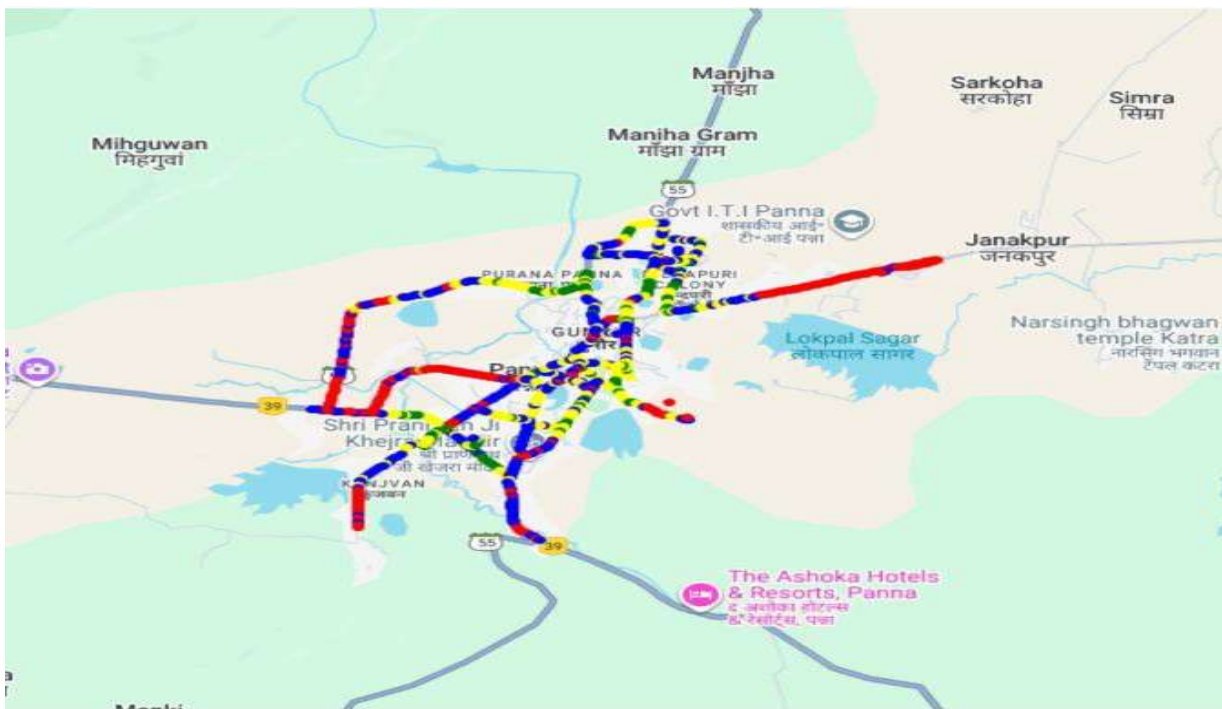
Signal Strength Map (3G/2G - Lock mode) TSP- Airtel



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



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

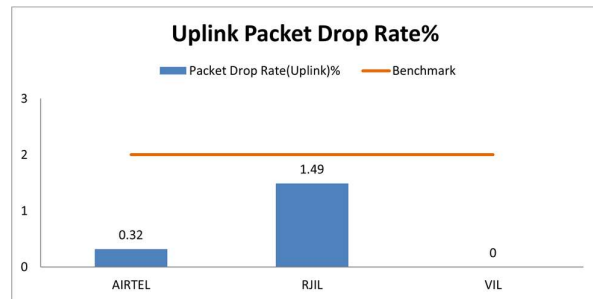
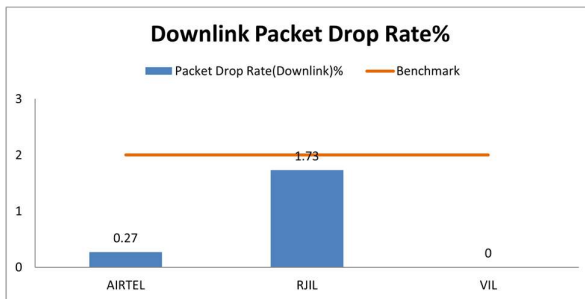
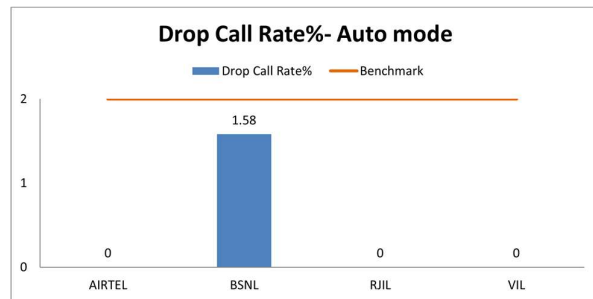
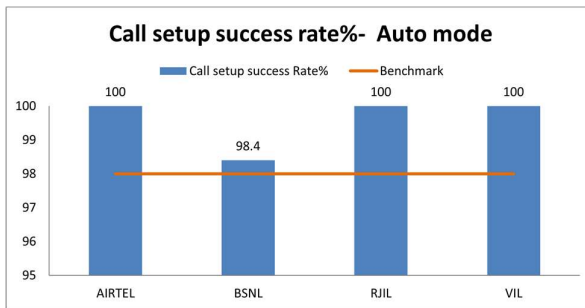


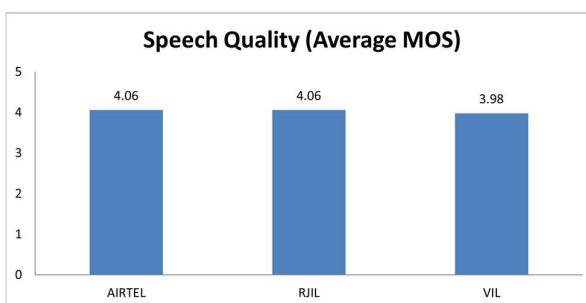
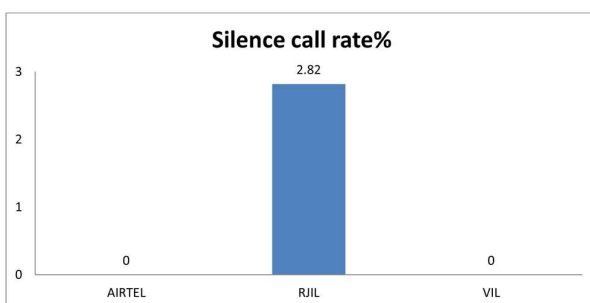
Signal Strength distribution: (3G/2G - Lock mode)

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	302134	652162	NA	580	14.36	75.26	NA	10.13
[-65, ≥-75]	351683	91461	NA	1940	16.71	10.55	NA	33.87
[-75, ≥-85]	625648	82138	NA	2175	29.74	9.48	NA	37.98
[-85, ≥Min)	824584	40826	NA	1032	39.19	4.71	NA	18.02
Total	2104049	866587	NA	5727	100	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	714122	NA	NA	NA	78.27	NA	NA
[-70, ≥-80]	NA	87960	NA	NA	NA	9.64	NA	NA
[-80, ≥-90]	NA	48989	NA	NA	NA	5.37	NA	NA
[-90, ≥Min)	NA	61361	NA	NA	NA	6.72	NA	NA
Total	NA	912432	NA	NA	NA	100	NA	NA

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





Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	70	70	70	70
No. of Call Attempts	135	128	136	98
No. of Call Established	135	126	136	98
Call setup success rate (CSSR) %	100	98.4	100	100
No. of Drop Call	0	2	0	0
Drop Call Rate %	0	1.58	0	0%
Call Setup Time Average (Sec.)	1.27	1.80	0.9	0.68
No. of Handover Attempts	376	188	1357	577
No. of Handover success	375	186	1351	577
HOSR %	99.73	98.92	99.56	100
Packet Drop Rate (Downlink)	0.27	NA	1.73	0
Packet Drop Rate (Uplink)	0.32	NA	1.49	0
Number of silence call for > 4 sec.	0	NA	7	0
Silence Call Rate %	0	NA	2.82	0
Number of MOS samples	791	NA	1719	520
Average MOS score	4.06	NA	4.06	3.98

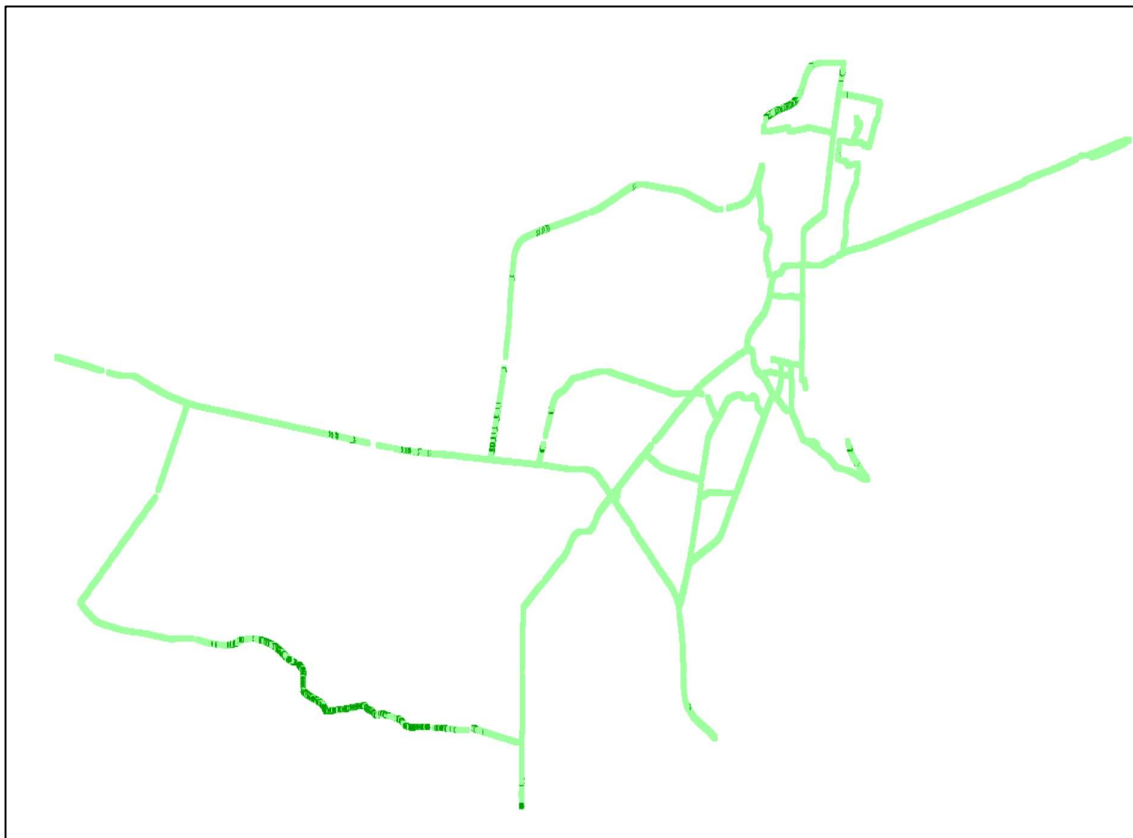
Number of Cell ids latched during drive test 5G/4G/3G/2G - Auto mode)

Number of unique cell ids covered in Voice test				
Technology	Service Provider			
	AIRTEL	BSNL/MTNL	RJIL	VIL
3G	NA	21	NA	NA
2G	NA	24	NA	40
4G	81	24	141	61
5G	NA	NA	24	NA

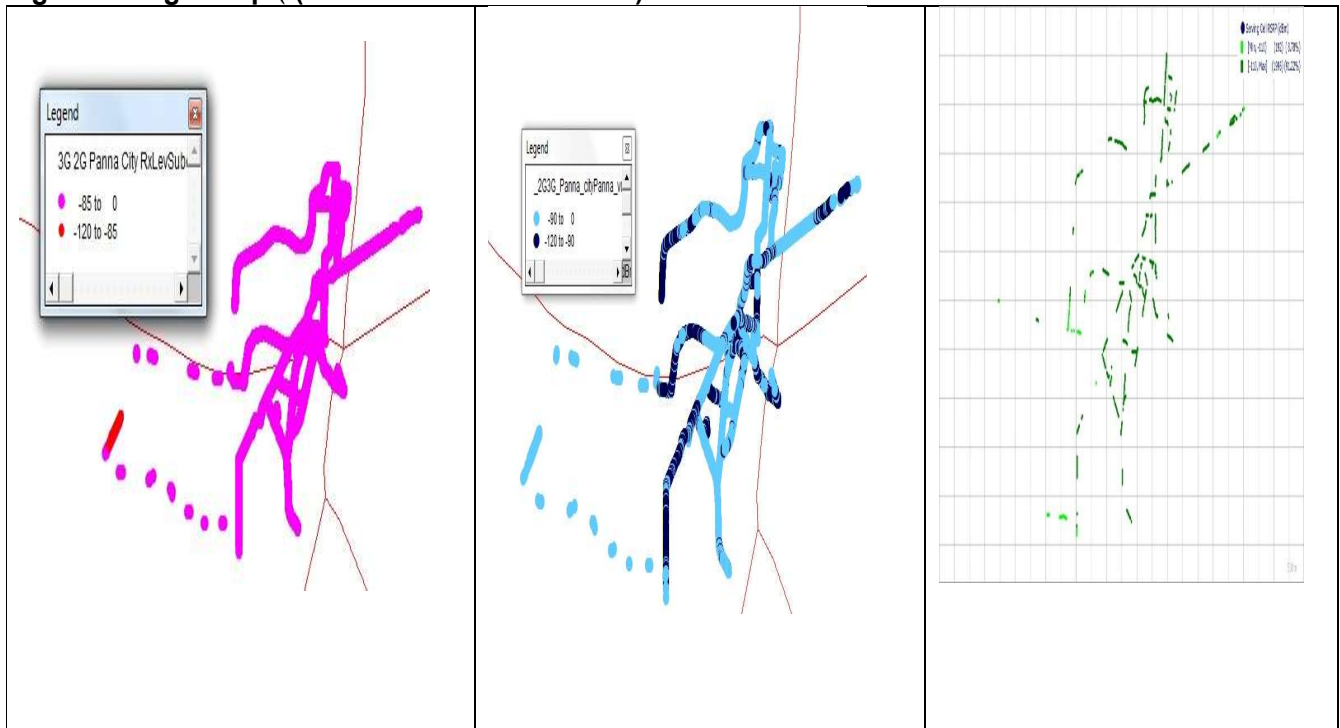
Signal Strength Map	Map Legend- 2G- Pink (Rx Level $\geq$ -85 dBm), 3G- Sky blue (RSCP Level $\geq$ -90 dBm)	Red (Rx Level $<$ -85 dBm) Dark Blue (RSCP Level $<$ -90 dBm)
	Map Legend- 4G- Light Green (RSRP Level $\geq$ -110 dBm), 5G- Light Yellow (RSRP Level $\geq$ -110 dBm),	Dark Green (RSRP Level $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

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

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



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



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



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



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

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	652162	NA	580	NA	75.26	NA	10.13
[-65, ≥-75]	NA	91461	NA	1940	NA	10.55	NA	33.87
[-75, ≥-85]	NA	82138	NA	2175	NA	9.48	NA	37.98
[-85, ≥Min)	NA	40826	NA	1032	NA	4.71	NA	18.02
Total	NA	866587	NA	5727	NA	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	714122	NA	NA	NA	78.27	NA	NA
[-70, ≥-80]	NA	87960	NA	NA	NA	9.64	NA	NA
[-80, ≥-90]	NA	48989	NA	NA	NA	5.37	NA	NA
[-90, ≥Min)	NA	61361	NA	NA	NA	6.72	NA	NA
Total	NA	912432	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]	1793694	203	773	486	35.50	9.28	13.58	8.02
[-80, ≥-95]	2058591	504	2046	3156	40.74	23.03	35.95	52.09
[-95, ≥-110]	1118662	1289	2587	2061	22.14	58.91	45.46	34.02
[-110, ≥Min]	82371	192	285	356	1.63	8.78	5.01	5.88
Total	5053318	2188	NA	6059	100	100	NA	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	NA	NA	2696	NA	NA	NA	30.91	NA
[-80, ≥-95]	NA	NA	4759	NA	NA	NA	54.56	NA
[-95, ≥-110]	NA	NA	1211	NA	NA	NA	13.88	NA
[-110, ≥Min]	NA	NA	57	NA	NA	NA	0.65	NA
Total	NA	NA	NA	NA	NA	NA	NA	NA

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

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	118.32	14.76	246.93	33.55
	80th Percentile	237.3	26.22	426.18	50.3
	20th Percentile	17.91	12.63	14.63	19.22
Upload speed (Mbps/s)	Average	17.90	4.73	32.78	27.65
	80th Percentile	30.02	10.27	61.74	39.43
	20th Percentile	6.03	6.24	1.99	16.77
Latency (ms)	Average	43.86	48.24	28	33.55
	50th Percentile	36.0	50.64	47	27.5
Jitter (ms)	Average	15.51	0.53	24.8	12.22

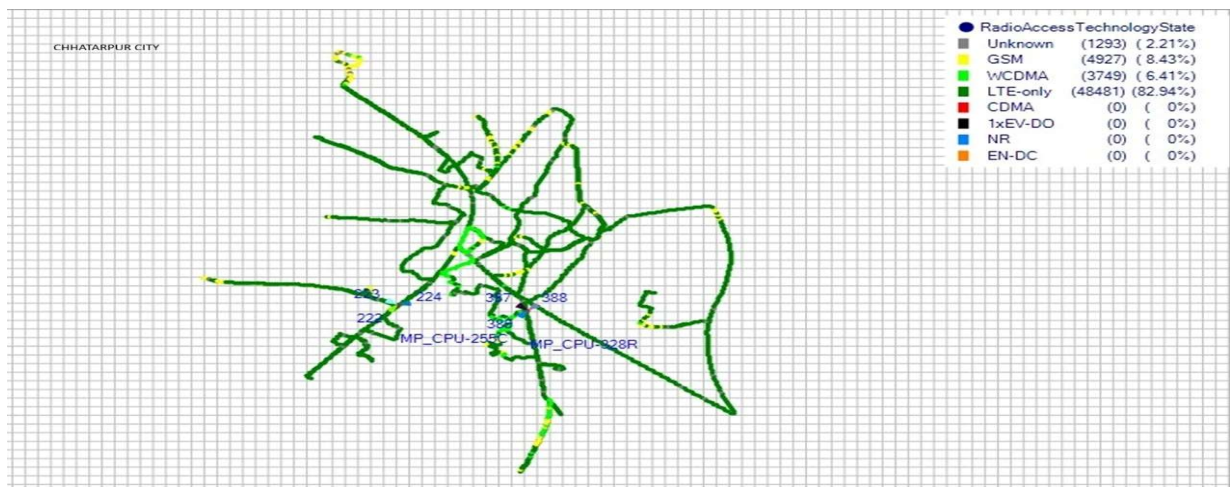
Time Spent (Technology-wise)

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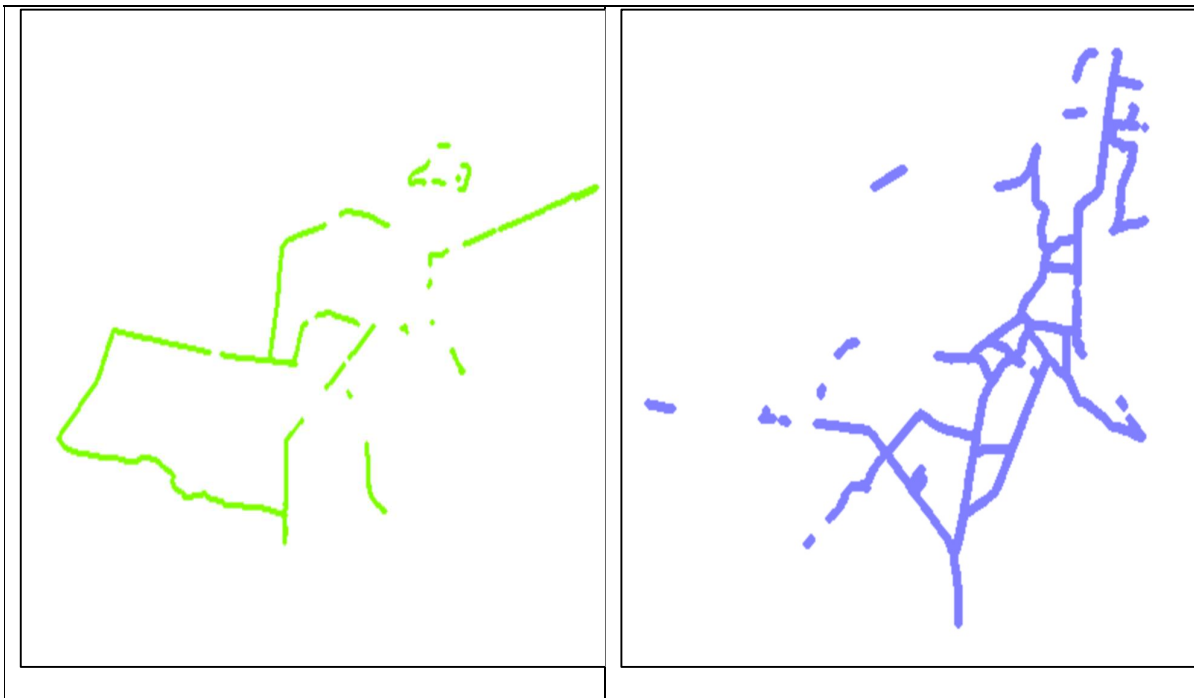
TSP - Airtel



TSP – BSNL



TSP - RJIL



TSP - VIL



QoS Performance Analysis - Static

Hot spot Locations



Hotspot Name	Latitude & Longitude	Date of Measurement	Time of Measurement
Hospital Chauk	24.711967, 80.181786	19/08/2025	5:00 pm
Bus Stand	24.716810, 80.186778	19/08/2025	5:40 pm

Table-12

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

Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	11	21	20	20
No of Call Established	11	20	20	20
Call setup success rate (CSSR) %	100	95	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.12	1.63	0.9	0.67

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

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	16.18	5	15	15
	Average	155.09	13.93	520.42	27.38

	80th Percentile	300.7	16.67	744.95	45.02
Download Session Setup Success Rate %		100	57.28	100	100
Upload speed (Mbps/s)	Typical	5.82	3	7	8
	Average	21.97	9.41	91.29	39.47
	80th Percentile	31.5	13.36	148.85	44.47
Upload Session Setup Success Rate %		100	58.5	100.00	100
Latency (in ms)	50th Percentile	33	35.82	21	28.5
Jitter (in ms)	Average	3.64	0.485	5.04	6.1
Packet Drop Rate %		1.42	50.5	0.1	0.32
Web browsing delay (in sec)		1.32	4	3.06	4.3
Video Streaming performance for video		1.07	1.7	.045	0.98

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

Name of Hotspot Location	Hospital chouk			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	5	11	5	10
No of Call Established	5	11	5	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.16	1.28	0.9	2.432
Total no of RLT Occurrence	NA	0	NA	2648
No of RLT > 48	NA	0	NA	NA

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

Name of Hotspot Location		Hospital chouk			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	6.36	30.60	NA	5.45
	Average	156.64	17.08	435.61	18.11
	80th Percentile	312.1	20.52	495.16	26.99
Download Session Setup Success Rate %		100	68	100	NA
Upload speed (Mbps/s)	Typical	24.08	20.80	NA	35.66
	Average	26.22	10.70	39.31	40.78
	80th Percentile	34.6	16.48	45.87	44.47

Upload Session Setup Success Rate %		100	60	100	NA
Latency (in ms)	50th Percentile	34.00	32.41	19	59
Jitter (in ms)	Average	3.11	0.46	4.47	5.69
Packet Drop Rate %		0.52	48.6	0.1	0.22
Web browsing delay (in sec)		1.31	6	3.04	4.37
Video Streaming performance for video		1.09	1.21	0.32	0.97

19

3.04

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	1925	NA	27	NA	14.08	NA	1.8
[-65, ≥-75]	NA	10044	NA	823	NA	73.55	NA	54.87
[-75, ≥-85]	NA	1391	NA	638	NA	10.18	NA	42.53
[-85, ≥Min)	NA	299	NA	12	NA	1.93	NA	0.8
Total	NA	13659	NA	1500	NA	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	2450	NA	NA	NA	17.89	NA	NA
[-70, ≥-80]	NA	6431.50	NA	NA	NA	46.95	NA	NA
[-80, ≥-90]	NA	4403	NA	NA	NA	32.14	NA	NA
[-90, ≥Min)	NA	414	NA	NA	NA	3.03	NA	NA
Total	NA	13699	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]	87279	11654.50	NA	147	30.70	83.84	NA	10.85
[-80, ≥-95]	197002	1637	NA	1206	69.30	11.77	NA	89
[-95, ≥-110]	0	229.50	NA	2	0	1.65	NA	0.15
[-110, ≥Min]	0	381.00	NA	0	0	2.74	NA	0
Total	284281	13902.00	NA	1355	100	100	NA	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL

[Max, ≥-80]	62528	NA	29	NA	14.50	NA	2.59	NA
[-80, ≥-95]	368808	NA	1063	NA	85.50	NA	94.91	NA
[-95, ≥-110]	0	NA	28	NA	0	NA	2.50	NA
[-110, ≥Min]	0	NA	29	NA	0	NA	2.59	NA
Total	431336	NA	1063	NA	100	NA	94.91	NA

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

Name of Hotspot Location	Bus Stand			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	6	10	10	10
No of Call Established	6	9	10	10
Call setup success rate (CSSR) %	100	90	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.08	1.98	0.89	2.39
Total no of RLT Occurrence	NA	0	NA	2400
No of RLT > 48	NA	0	NA	0

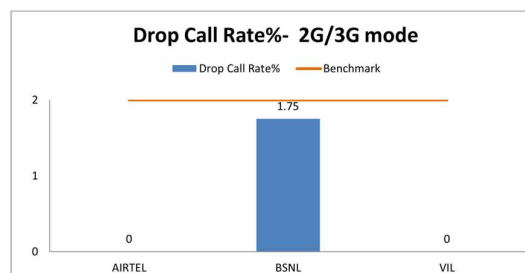
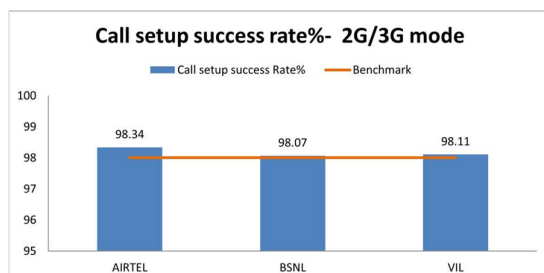
Data Service Performance (5G/4G/3G/2G - auto mode) at each Hotspot location:

Name of Hotspot Location		Bus Stand			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	4.66	19.98	628.24	5.29
	Average	153.11	10.79	825.42	36.65
	80th Percentile	286.2	12.82	100	72.77
Download Session Setup Success Rate %		100	52	52	100
Upload speed (Mbps/s)	Typical	10.28	16.14	143.28	29.01
	Average	17.07	8.12	155.10	38.15
	80th Percentile	23.6	10.24	100	43.62
Upload Session Setup Success Rate %		100	55	55	100
Latency (in ms)	50th Percentile	32	39.24	5.57	28.5
Jitter (in ms)	Average	4.06	0.51	0.1	6.01
Packet Drop Rate %		2.96	52.4	52.4	0.43
Web browsing delay (in sec)		1.32	4	4	4.34
Video Streaming performance for video		1.05	2.22	2.22	1.01

City - Chhatarpur

QoS Performance Analysis - Dynamic

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	100	100	100	100
No. of Call Attempts	241	231	N/A	212
No. of Call Established	237	228	N/A	208
Call setup success rate (CSSR) %	98.34	98.7	N/A	98.11
No. of Drop Call	0	04	N/A	0
Drop Call Rate %	0	1.75	N/A	0
Call Setup Time Average (Sec.)	3.40	2.15	N/A	2.55
No. of Handover Attempts	223	156	N/A	780
No. of Handover success	222	151	N/A	780
HOSR %	99.69	96.7	N/A	100
Total no of RLT Occurrence	46422	35	N/A	82201
No of RLT > 48	0	0	N/A	0

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	68		NA
2G	158	66		103

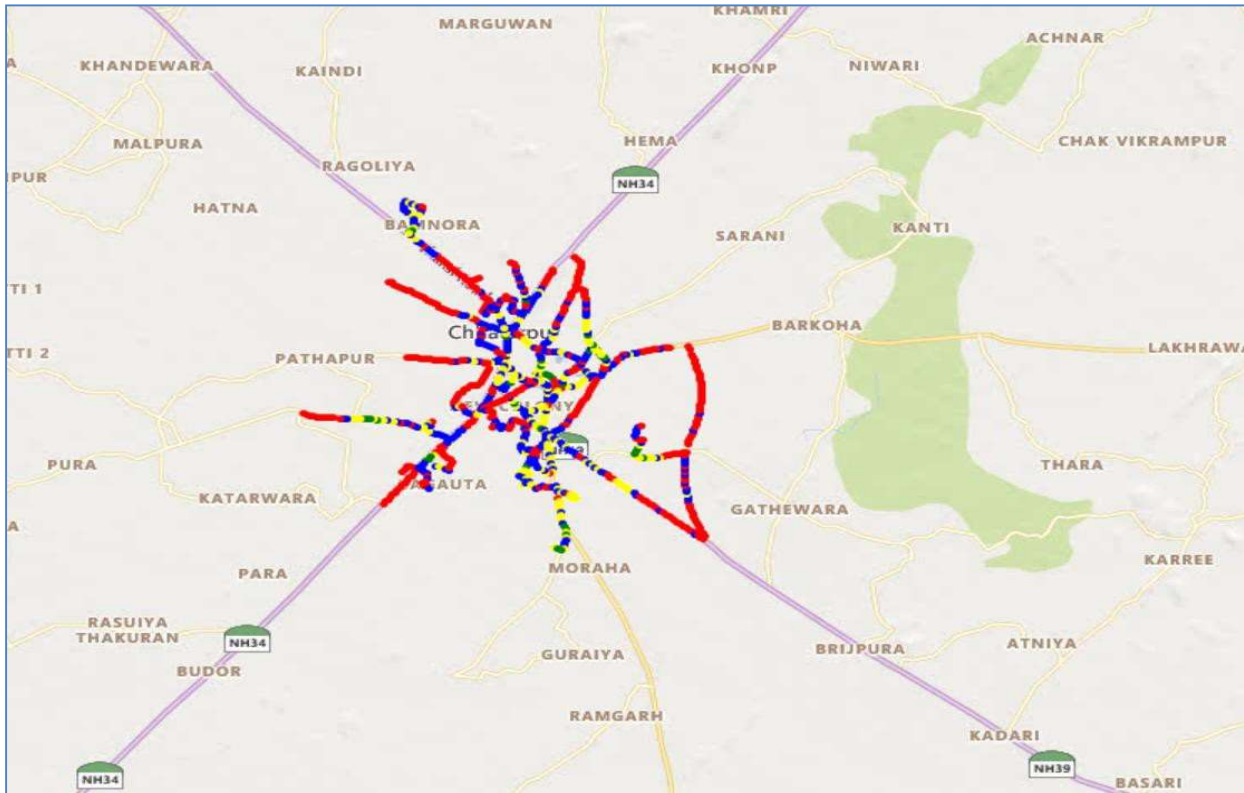
Signal Strength Map: (3G/2G - Lock mode)

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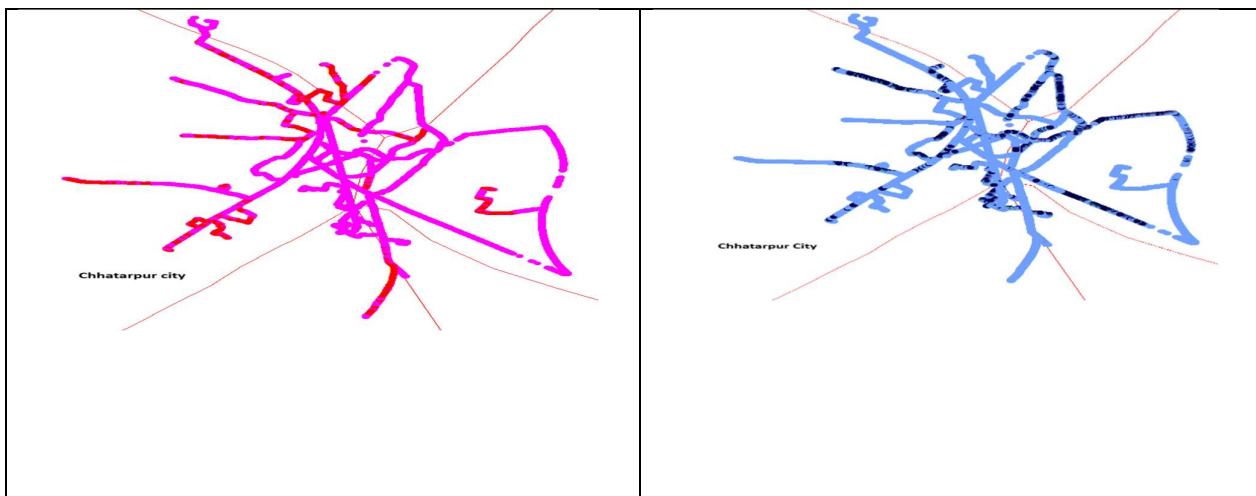
Signal Strength Map ((3G/2G - Lock mode) TSP- Airtel



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



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

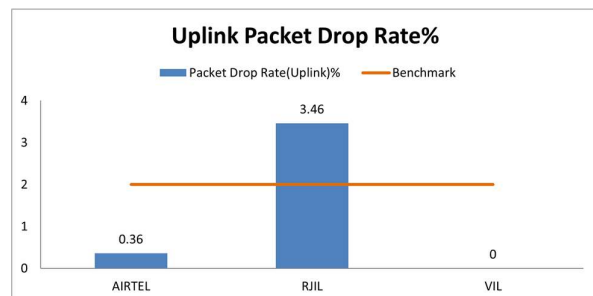
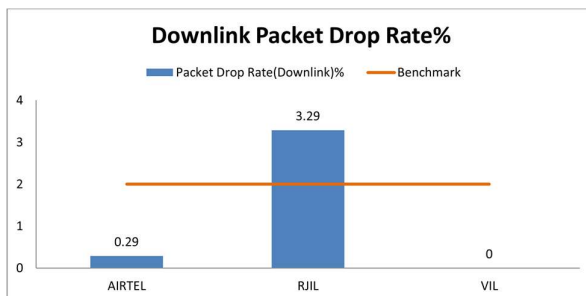
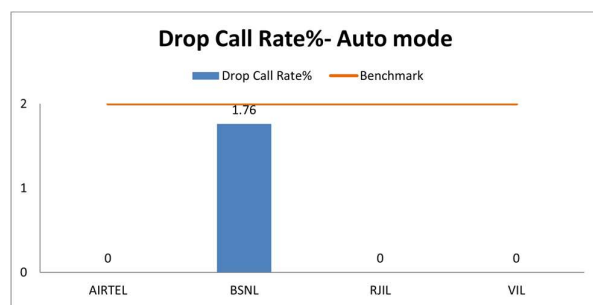
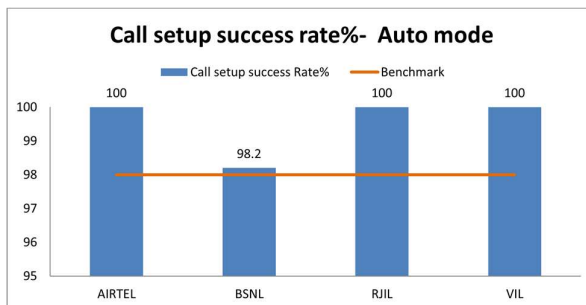


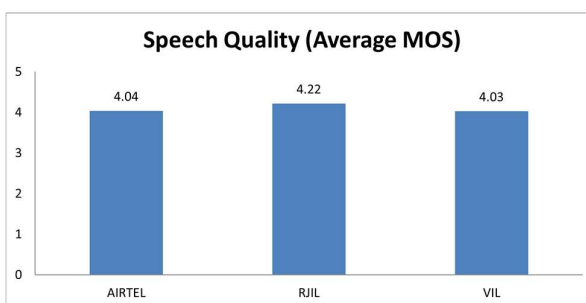
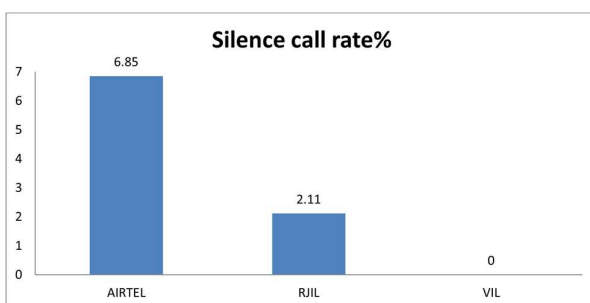
Signal Strength distribution: (3G/2G - Lock mode)

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	508461	856099	NA	562	12.55	70.42	NA	5.11
[-65, ≥-75]	770215	42335	NA	2930	19.01	3.48	NA	26.64
[-75, ≥-85]	1334409	256775	NA	4029	32.94	21.12	NA	36.63
[-85, ≥Min)	1437850	60440	NA	3477	35.49	4.97	NA	31.61
Total	4050935	1215649	NA	10998	100	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	1281551	NA	NA	NA	53.58	NA	NA
[-70, ≥-80]	NA	879370	NA	NA	NA	36.76	NA	NA
[-80, ≥-90]	NA	113110	NA	NA	NA	4.73	NA	NA
[-90, ≥Min)	NA	117851	NA	NA	NA	4.93	NA	NA
Total	NA	2391882	NA	NA	NA	100	NA	NA

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





Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	100	100	100	100
No. of Call Attempts	248	230	220	217
No. of Call Established	248	226	220	217
Call setup success rate (CSSR) %	100	98.2	100	100
No. of Drop Call	0	3	0	0
Drop Call Rate %	0	1.76	0	0%
Call Setup Time Average (Sec.)	1.26	2.55	1.24	0.73
No. of Handover Attempts	715	263	2397	780
No. of Handover success	714	258	2387	780
HOSR %	99.86	98.09	99.58	100
Packet Drop Rate (Downlink)	0.29	NA	3.29	0
Packet Drop Rate (Uplink)	0.36	NA	3.46	0
Number of silence call for > 4 sec.	0	NA	10	0
Silence Call Rate %	0	NA	2.11	0
Number of MOS samples	1455	NA	2232	1103
Average MOS score	4.04	NA	4.22	4.03

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	54	NA	NA
2G	NA	57	NA	103
4G	277	57	291	209
5G	NA	NA	101	NA

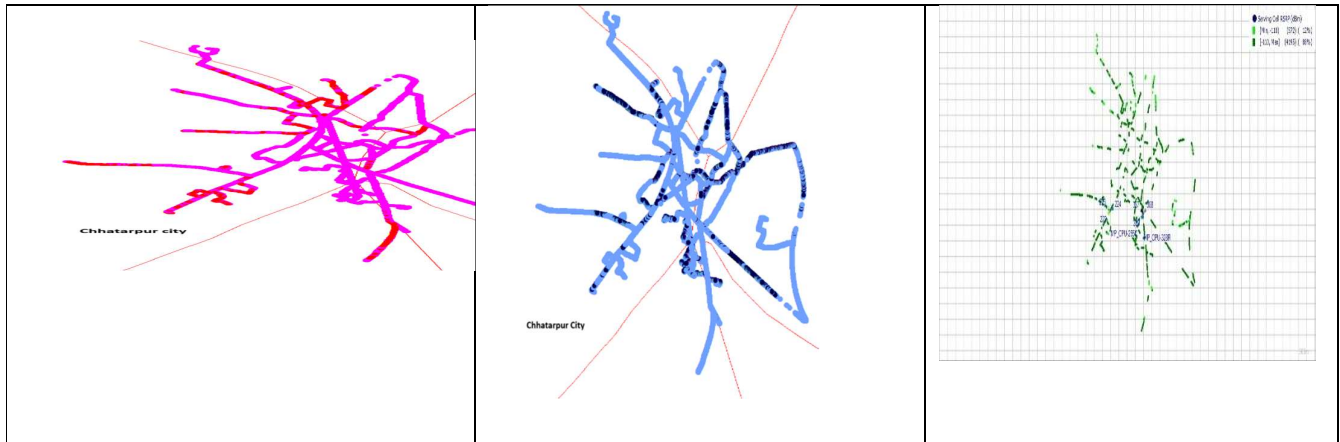
Signal Strength Map: (5G/4G/3G/2G - Auto mode)

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)

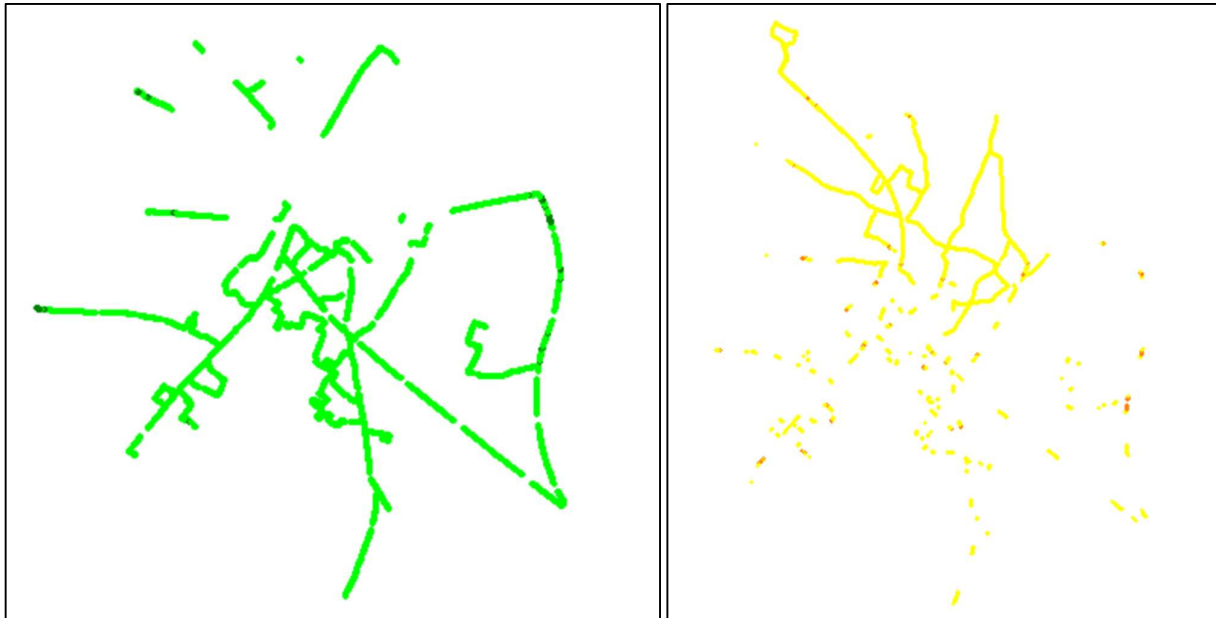
Signal Strength Map ((5G/4G/3G/2G - Auto mode) TSP- Airtel



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



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



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



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

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	856099	NA	562	NA	70.42	NA	5.11
[-65, ≥-75]	NA	42335	NA	2930	NA	3.48	NA	26.64
[-75, ≥-85]	NA	256775	NA	4029	NA	21.12	NA	36.63
[-85, ≥Min)	NA	60440	NA	3477	NA	4.97	NA	31.61
Total	NA	1215649	NA	10998	NA	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	1281551	NA	NA	NA	53.58	NA	NA
[-70, ≥-80]	NA	879370	NA	NA	NA	36.76	NA	NA
[-80, ≥-90]	NA	113110	NA	NA	NA	4.73	NA	NA
[-90, ≥Min)	NA	117851	NA	NA	NA	4.93	NA	NA
Total	NA	2391882	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]	1937116	485	6818	2521	19.92	10.17	48.05	16.41
[-80, ≥-95]	6634961	972	5839	8267	68.24	20.39	41.15	53.81
[-95, ≥-110]	1120169	2738	1396	4081	11.52	57.44	9.84	26.56
[-110, ≥Min]	31205	572	135	495	0.32	12.0	0.95	3.22
Total	9723451	4767	14188	15364	100	100	100	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	NA	NA	3104	NA	NA	NA	29.78	NA
[-80, ≥-95]	NA	NA	5162	NA	NA	NA	49.53	NA
[-95, ≥-110]	NA	NA	1944	NA	NA	NA	18.65	NA
[-110, ≥Min]	NA	NA	213	NA	NA	NA	2.04	NA
Total	NA	NA	10423	NA	NA	NA	100	NA

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

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	145.31	33.03	280.59	41.52
	80th Percentile	228.5	18.81	447.17	60.2
	20th Percentile	49.48	16.86	59.40	17.62
Upload speed (Mbps/s)	Average	19.23	4.85	33.46	10.99
	80th Percentile	29.0	10.25	59.11	21.72
	20th Percentile	8.36	6.47	2.64	2.11
Latency (ms)	Average	62	38.56	27	39.87
	50th Percentile	31	46.04	24	29.76
Jitter (ms)	Average	9.78	0.59	18.19	13.42

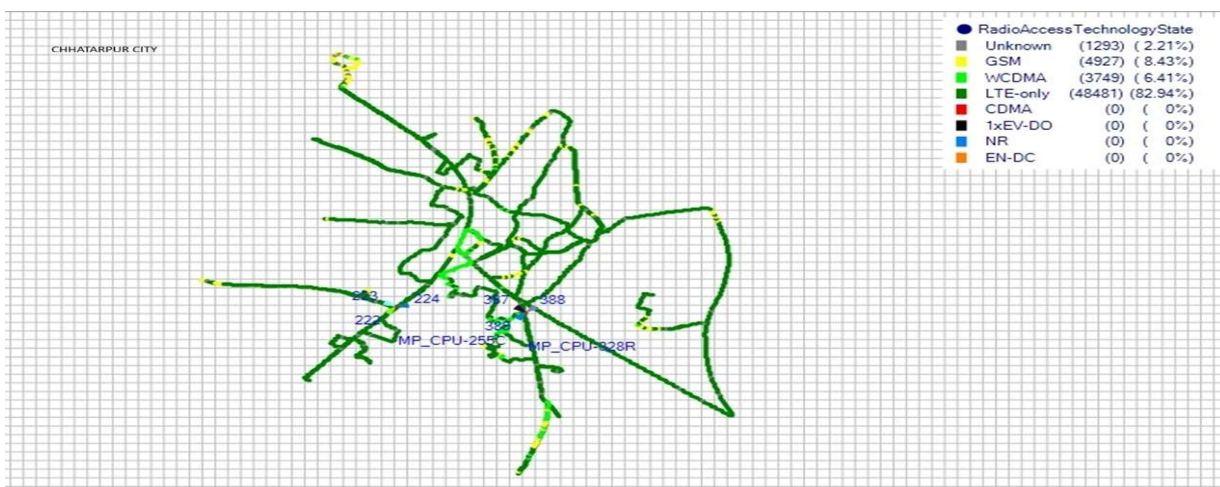
Time Spent (Technology-wise)

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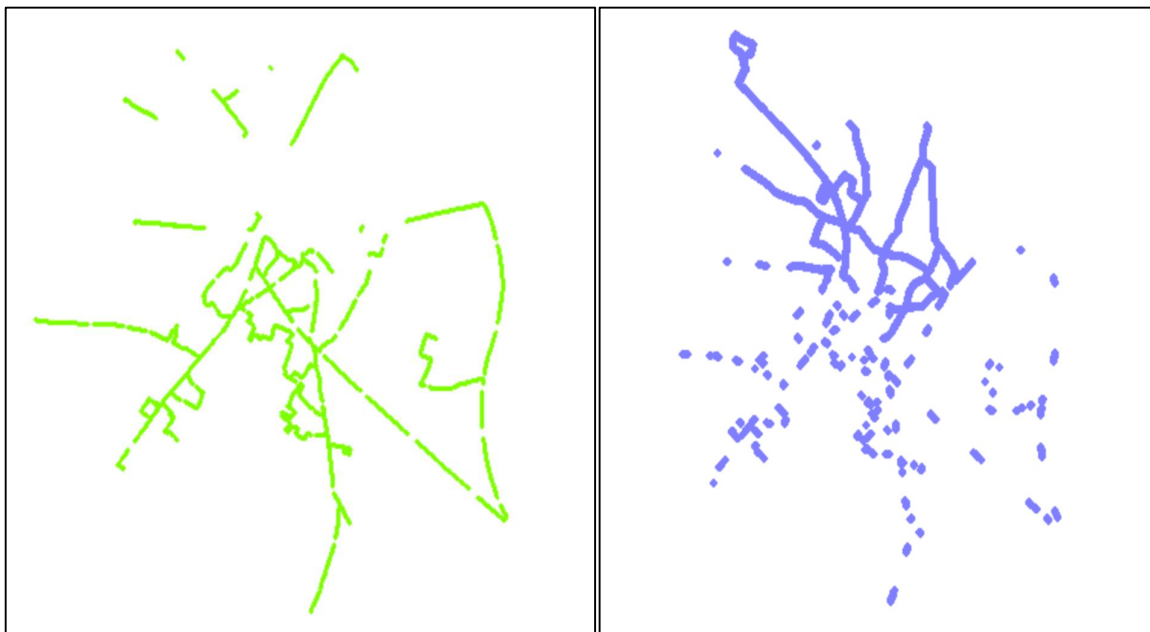
TSP -Airtel



TSP - BSNL



TSP - RJIL

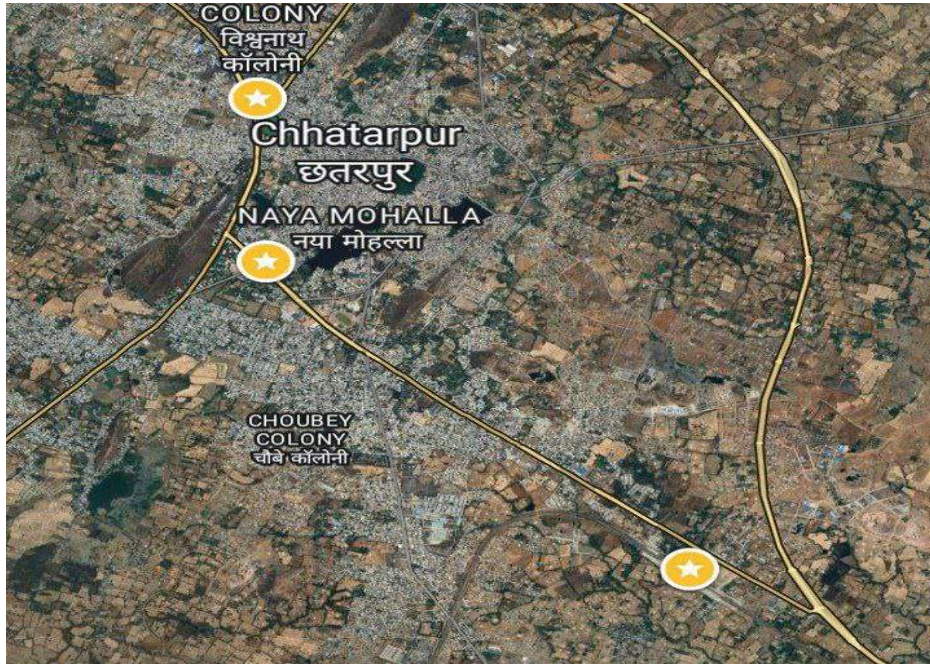


TSP - VIL



QoS Performance Analysis - Static

Hot spot Locations



Hotspot Name	Latitude & Longitude	Date of Measurement	Time of Measurement
Railway station	24.878432, 79.615348	20/08/25	5:00 pm
Gov hospital	24.906674, 79.584498	20/08/25	6:15 pm
Bus stand	24.921643, 79.583883	20/08/25	7:00 pm

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

Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	23	30	28	30
No of Call Established	23	30	28	30
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.25	1.57	0.88	2.42

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

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	Typical	16.18	5	15	15
	Average	89.52	22.01	292.49	18.80
	80th Percentile	167.0	26.49	449.57	25.92

Download Session Setup Success Rate %		100	64.00	100	100
Upload speed (Mbps/s)	Typical	5.82	3	7	8
	Average	11.28	11.38	57.54	9.10
	80th Percentile	18.5	12.86	85.05	24.92
Upload Session Setup Success Rate %		100	62.33	100	100
Latency (in ms)	50th Percentile	49.00	36.25	28	32
Jitter (in ms)	Average	14.05	0.51	7.56	34.32
Packet Drop Rate %		1.28	37.60	121.6	0.60
Web browsing delay (in sec)		1.92	6.00	3.40	4.40
Video Streaming performance for video		1.34	2.13	0.31	1.11

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

Name of Hotspot Location	Railway station			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	8	10	9	10
No of Call Established	8	10	9	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.25	1.25	0.92	2.43
Total no of RLT Occurrence	NA	0	NA	2045
No of RLT > 48	NA	0	NA	0

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

Name of Hotspot Location		Railway station			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	4.15	54.59	NA	3.84
	Average	47.52	41.16	483.27	9.87
	80th Percentile	82.64	48.36	617.04	17.06
Download Session Setup Success Rate %		100	72	100	100
Upload speed (Mbps/s)	Typical	4.32	14.88	NA	0.82
	Average	6.04	11.68	85.64	1.60
	80th Percentile	7.93	14.12	103.88	2.09
Upload Session Setup Success Rate %		100	58	100	100

Latency (in ms)	50th Percentile	51	39.42	22	NA
Jitter (in ms)	Average	13.97	0.51	6.74	NA
Packet Drop Rate %		1.48	38.2	0	NA
Web browsing delay (in sec)		1.59	3	3.13	4.74
Video Streaming performance for video		1.60	1.2	0.31	1.46

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	5476	NA	305	NA	13.64%	NA	17.96
[-65, ≥-75]	NA	29995	NA	470	NA	74.71%	NA	27.68
[-75, ≥-85]	NA	3910	NA	742	NA	9.74%	NA	43.7
[-85, ≥Min)	NA	769	NA	181	NA	1.92%	NA	10.66
Total	NA	40150	NA	1698	NA	100.00%	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	7290	NA	NA	NA	18.01%	NA	NA
[-70, ≥-80]	NA	19040	NA	NA	NA	47.04%	NA	NA
[-80, ≥-90]	NA	12943	NA	NA	NA	31.98%	NA	NA
[-90, ≥Min)	NA	1204	NA	NA	NA	2.97%	NA	NA
Total	NA	40477	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]	79171	34600	723	560	28.60	84.37%	99.59	32.96
[-80, ≥-95]	10509	4651	3	1	3.80	11.34%	0.41	0.06
[-95, ≥-110]	187144	645	NA	1044	67.60	1.57%	NA	61.45
[-110, ≥Min]	0	1113	NA	94	0	2.71%	NA	5.53
Total	276824	41009	726	1699	100	100.00%	100	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	232590	NA	3	NA	98.29	NA	1.99	NA

[-80, ≥-95]	0	NA	148	NA	0	NA	98.01	NA
[-95, ≥-110]	2332	NA	NA	NA	0.99	NA	NA	NA
[-110, ≥Min]	1704	NA	NA	NA	0.72	NA	NA	NA
Total	236626	NA	151	NA	100	NA	100	NA

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

Name of Hotspot Location	Gov Hospital			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	7	10	9	10
No of Call Established	7	10	9	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.31	1.52	0.88	2.40
Total no of RLT Occurrence	NA	0	NA	2001
No of RLT > 48	NA	0	NA	0

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

Name of Hotspot Location		Gov Hospital			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	9.86	30.60	NA	5.71
	Average	19.14	17.08	268.25	22.96
	80th Percentile	26.53	20.68	365.8	42.96
Download Session Setup Success Rate %		100	66	100	100
Upload speed (Mbps/s)	Typical	9.36	20.80		4.26
	Average	13.84	10.70	38.15	15.30
	80th Percentile	7.93	12.02	45.21	26.38
Upload Session Setup Success Rate %		100	68	100	100
Latency (in ms)	50th Percentile	51	30.84	23	31
Jitter (in ms)	Average	16.61	0.54	6.67	32.26
Packet Drop Rate %		0.1	38.4	0	0.61
Web browsing delay (in sec)		2.75	4	3.6	4.27
Video Streaming performance for video		1.24	1.18	0.29	0.98

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

Name of Hotspot Location	Bus Stand			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	8	10	10	10
No of Call Established	8	9	10	10
Call setup success rate (CSSR) %	100	90	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.19	1.95	0.87	2.53
Total no of RLT Occurrence	NA	0	NA	2017
No of RLT > 48	NA	0	NA	0

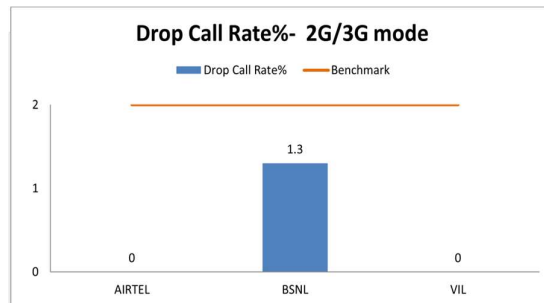
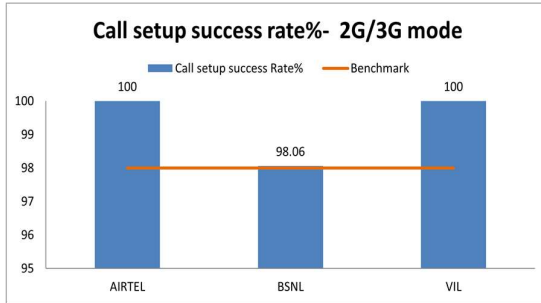
Data Service Performance (5G/4G/3G/2G - auto mode) at each Hotspot location:

Name of Hotspot Location		Bus Stand			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	Typical	62.58	17.0		5.72
	Average	133.22	7.78	135.43	19.41
	80th Percentile	193.30	10.43	188.25	29.07
Download Session Setup Success Rate %		100	54	100	100
Upload speed (Mbits/s)	Typical	6.45	25.31		3.73
	Average	16.49	11.77	48.84	4.21
	80th Percentile	22.5	12.43	62.98	4.44
Upload Session Setup Success Rate %		100	61	100	100
Latency (in ms)	50th Percentile	45.00	38.5	22	31
Jitter (in ms)	Average	9.97	0.48	9.19	32.19
Packet Drop Rate %		2.74	36.2	0.2	0.58
Web browsing delay (in sec)		1.44	11	3.21	4.20
Video Streaming performance for video		1.20	4.01	0.66	0.89

City – Khajuraho

QoS Performance Analysis - Dynamic

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	35	35	35	35
No. of Call Attempts	66	73	N/A	58
No. of Call Established	66	72	N/A	58
Call setup success rate (CSSR) %	100	98.6	N/A	100
No. of Drop Call	0	01	N/A	0
Drop Call Rate %	0	1.3	N/A	0
Call Setup Time Average (Sec.)	3.40	2.10	N/A	2.46
No. of Handover Attempts	72	35	N/A	66
No. of Handover success	72	34	N/A	66
HOSR %	100	97	N/A	100
Total no of RLT Occurrence	12561	9	N/A	11282
No of RLT > 48	0	0	N/A	0

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	18		NA
2G	37	21		27

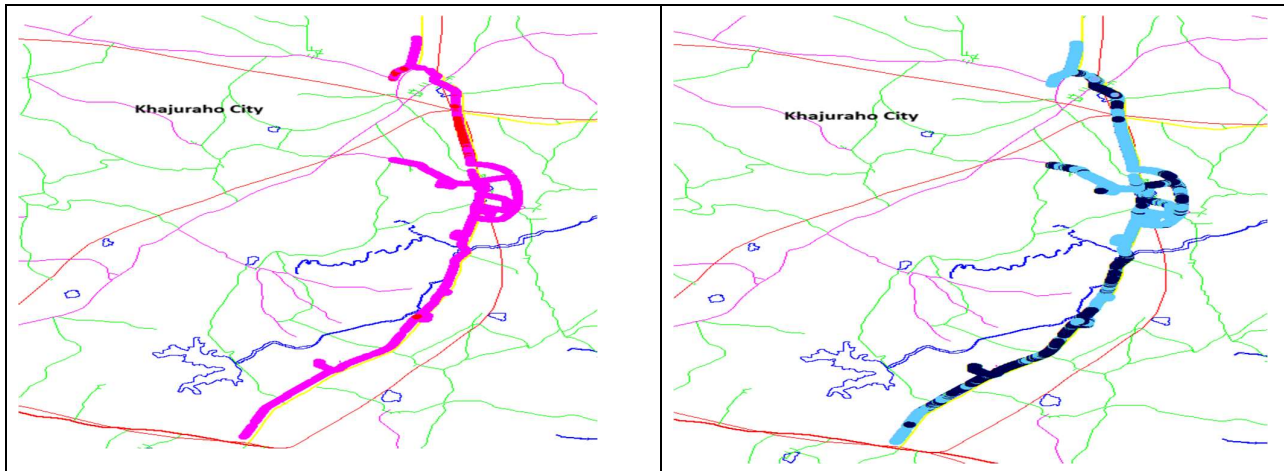
Signal Strength Map: (3G/2G - Lock mode)

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 - Lock mode) TSP- Airtel



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



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

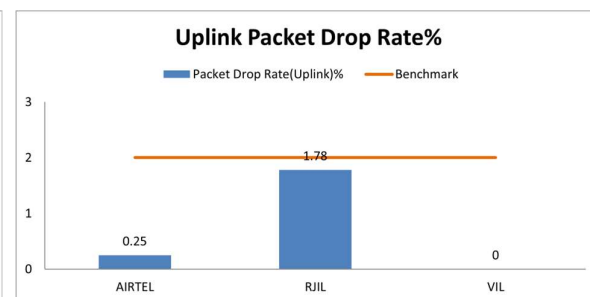
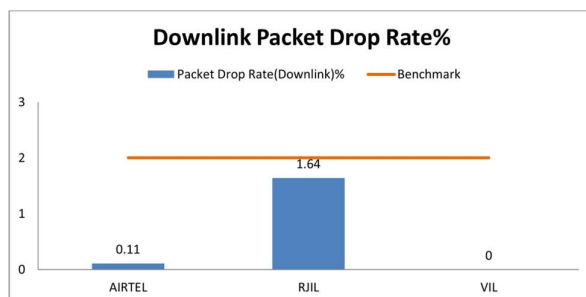
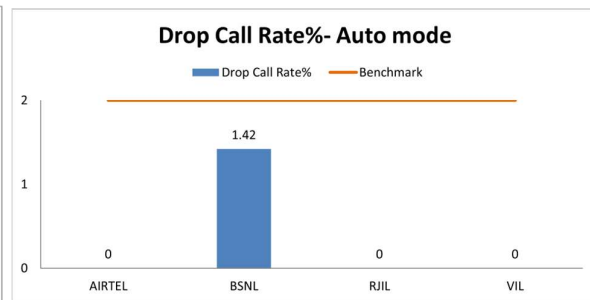
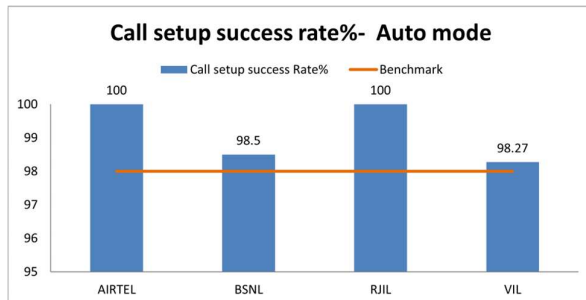


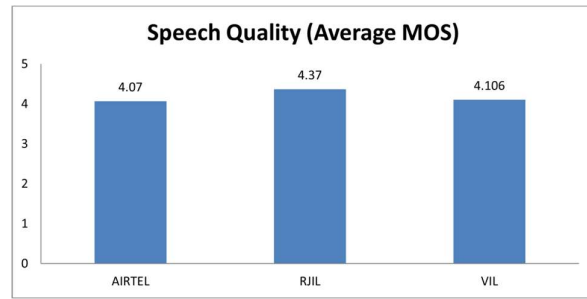
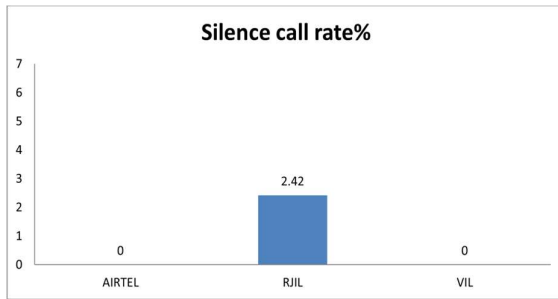
Signal Strength distribution: (3G/2G - Lock mode)

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	108226	398760	NA	NA	9.79	75.26	NA	7.96
[-65, ≥-75]	154231	35721	NA	NA	13.95	10.55	NA	27.75
[-75, ≥-85]	299904	21835	NA	NA	27.12	9.48	NA	25.36
[-85, ≥Min]	543453	26645	NA	NA	49.15	4.71	NA	38.93
Total	1105814	482961	NA	NA	100	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	163371	NA	NA	NA	78.27	NA	NA
[-70, ≥-80]	NA	114122	NA	NA	NA	9.64	NA	NA
[-80, ≥-90]	NA	159484	NA	NA	NA	5.37	NA	NA
[-90, ≥Min]	NA	21552	NA	NA	NA	6.72	NA	NA
Total	NA	458529	NA	NA	NA	100	NA	NA

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





Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	35	35	35	35
No. of Call Attempts	68	71	62	58
No. of Call Established	68	70	62	57
Call setup success rate (CSSR) %	100	98.5	100	98.27
No. of Drop Call	0	1	0	0
Drop Call Rate %	0	1.42	0	0%
Call Setup Time Average (Sec.)	1.23	2.54	0.81	2.88
No. of Handover Attempts	140	96	402	66
No. of Handover success	140	93	401	66
HOSR %	100	96.87	99.75	100
Packet Drop Rate (Downlink)	0.11	NA	1.64	0
Packet Drop Rate (Uplink)	0.25	NA	1.78	0
Number of silence call for > 4 sec.	0	NA	3	0
Silence Call Rate %	0	NA	2.42	0
Number of MOS samples	381	NA	498	253
Average MOS score	4.07	NA	4.37	4.106

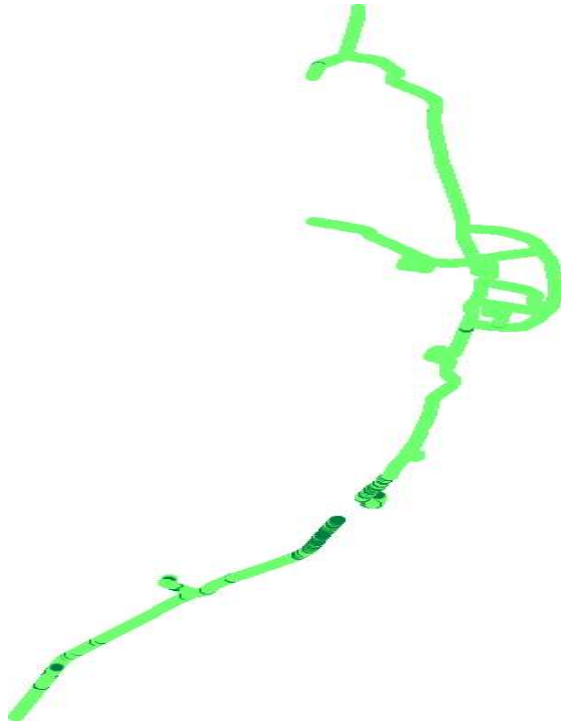
Number of Cell ids latched during drive test 5G/4G/3G/2G - Auto mode)

Number of unique cell ids covered in Voice test				
Technology	Service Provider			
	AIRTEL	BSNL/MTNL	RJIL	VIL
3G	NA	21	NA	NA
2G	NA	18	NA	27
4G	66	19	90	52
5G	NA	NA	18	NA

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

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), Dark Green (RSRP Level < -110 dBm) 5G- Light Yellow (RSRP Level ≥ -110 dBm), Dark Yellow (RSRP Level < -110 dBm)	

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



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



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



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



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

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	398760	NA	NA	NA	82.57	NA	7.96
[-65, ≥-75]	NA	35721	NA	NA	NA	7.40	NA	27.75
[-75, ≥-85]	NA	21835	NA	NA	NA	4.52	NA	25.36
[-85, ≥Min]	NA	26645	NA	NA	NA	5.52	NA	38.93
Total	NA	482961	NA	NA	NA	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	163371	NA	NA	NA	35.63	NA	NA
[-70, ≥-80]	NA	114122	NA	NA	NA	24.89	NA	NA
[-80, ≥-90]	NA	159484	NA	NA	NA	34.78	NA	NA
[-90, ≥Min]	NA	21552	NA	NA	NA	4.70	NA	NA
Total	NA	458529	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]	913118	146	NA	NA	35.52	12.19	26.15	11.89
[-80, ≥-95]	902035	176	NA	NA	35.09	14.69	42.67	42.72
[-95, ≥-110]	658354	675	NA	NA	25.61	56.34	28.51	37.14
[-110, ≥Min]	97287	201	NA	NA	3.78	16.78	2.68	8.26
Total	2570794	1198	NA	NA	100	100	100	100

Rx Level -5G								
Overall RSRP	o of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	NA	NA	NA	NA	NA	NA	16.09	NA
[-80, ≥-95]	NA	NA	NA	NA	NA	NA	34.66	NA
[-95, ≥-110]	NA	NA	NA	NA	NA	NA	44.61	NA
[-110, ≥Min]	NA	NA	NA	NA	NA	NA	4.64	NA
Total	NA	NA	NA	NA	NA	NA	100	NA

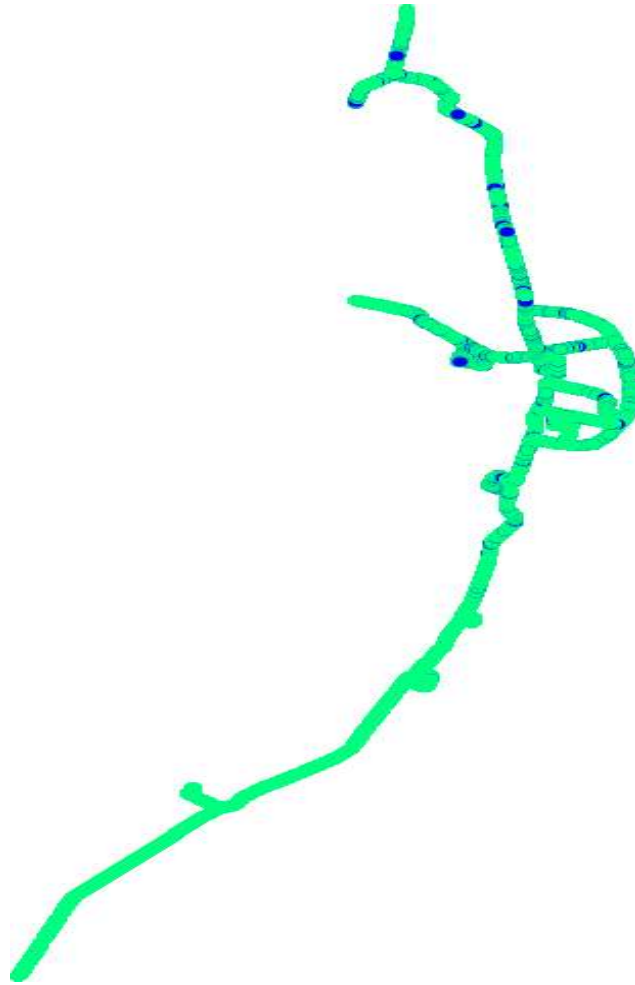
Data Service performance in 5G/4G/3G/2G (Auto mode) - Dynamic

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Average	111.57	10.65	100.66	34.17
	80th Percentile	190.6	22.64	152.69	56.12
	20th Percentile	20.78	14.34	2.79	13.09
Upload speed (Mbps/s)	Average	13.16	4.21	25.93	15.24
	80th Percentile	19.5	8.29	39.01	26.69
	20th Percentile	4.43	5.72	3.2	2.96
Latency (ms)	Average	44	54.26	52.23	33.5
	50th Percentile	88	59.41	23	31
Jitter (ms)	Average	12.34	0.49	16.51	9.5

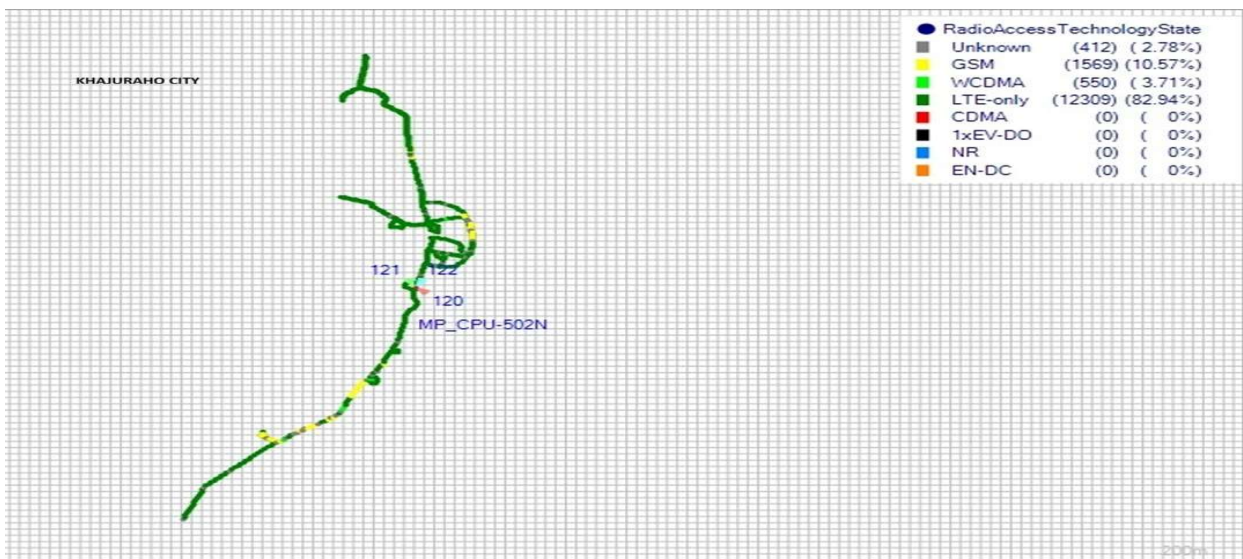
Time Spent (Technology-wise)

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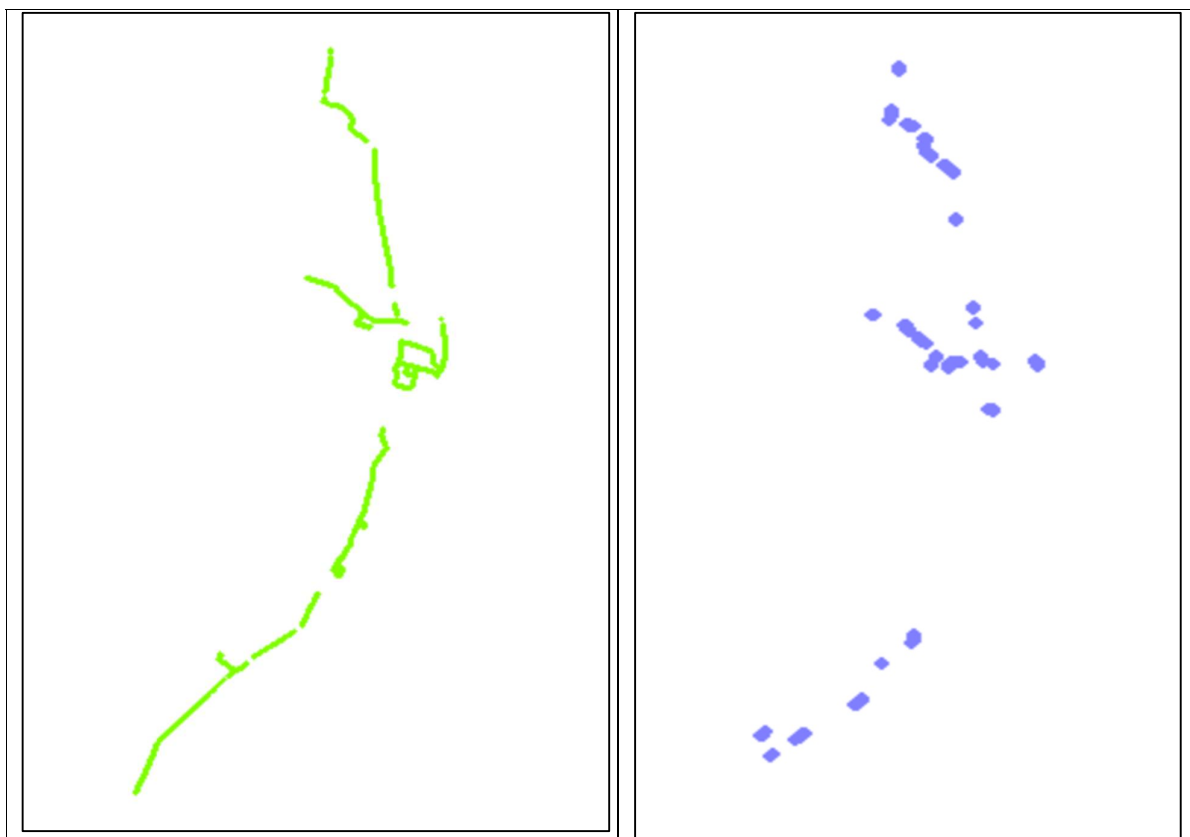
TSP - Airtel



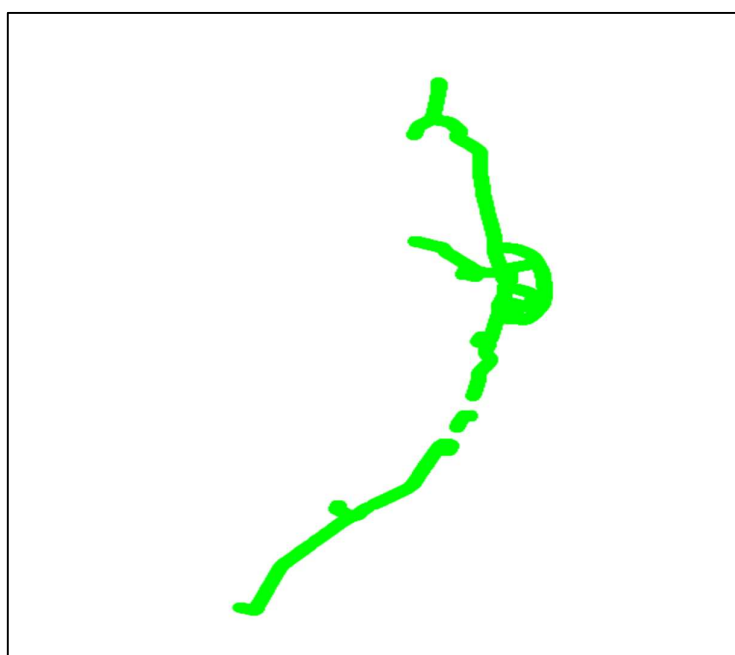
TSP - BSNL



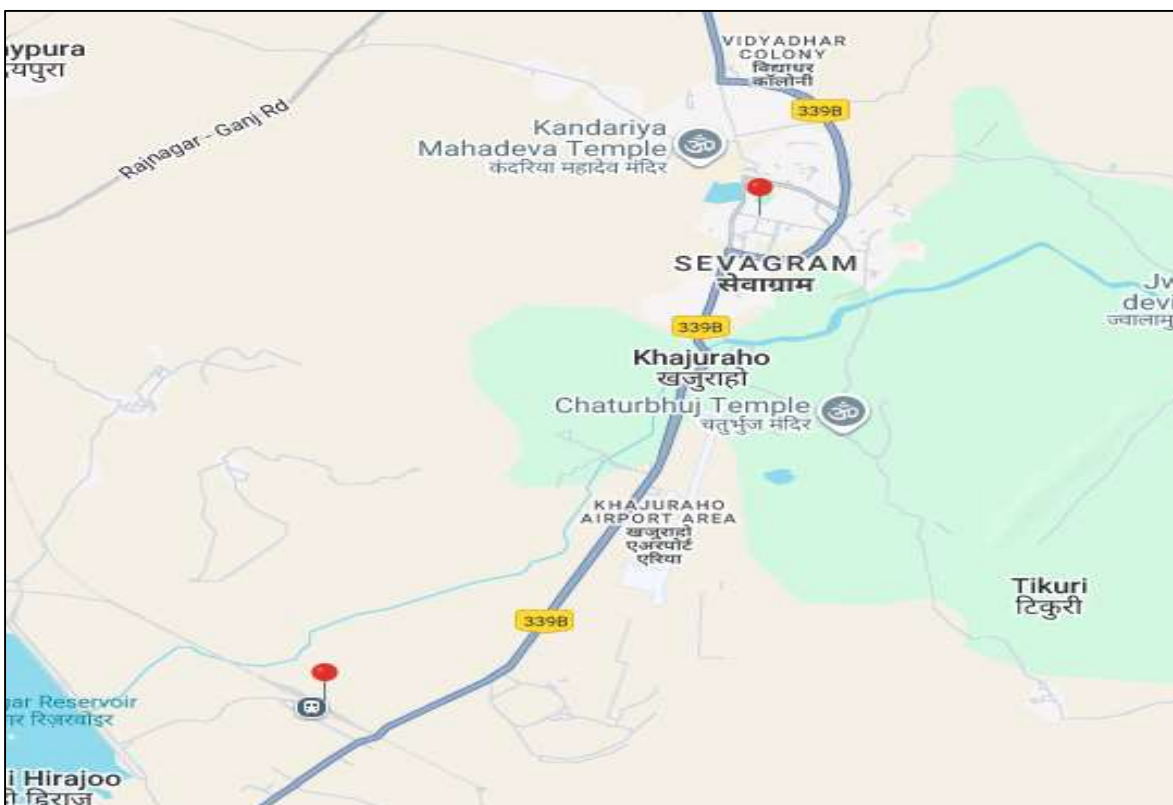
TSP - RJIL



TSP - VIL



QoS Performance Analysis - Static



Hotspot Locations

Hotspot Name	Latitude & Longitude	Date of Measurement	Time of Measurement
Bus Stand	24.847218, 79.925037	20.08.2025	02:00 PM
Railway Station	24.795217, 79.889584	20.08.2025	03:47 PM

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

Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	14	21	18	20
No of Call Established	14	21	18	20
Call setup success rate (CSSR) %	100	100	100	100%
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0%
Call Setup Time Average (Sec.)	1.26	1.36	0.89	2.50

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

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	Typical	16.18	5	15	15
	Average	46.14	13.36	184.23	15.55
	80th Percentile	91.1	15.47	316.7	22.43
Download Session Setup Success Rate %		100	62	100	100
Upload speed (Mbits/s)	Typical	5.82	3	7	8
	Average	8.48	6.95	39.97	15.09
	80th Percentile	17.1	12.36	83.55	29.17
Upload Session Setup Success Rate %		100	58	100	100
Latency (in ms)	50th Percentile	44	36.24	26	32
Jitter (in ms)	Average	17.73	0.45	17.3	7.5
Packet Drop Rate %		1.56	50.3	0.2	1.42
Web browsing delay (in sec)		1.31	5.5	3.19	4.39
Video Streaming performance for video		1.96	3.28	0.44	1.1

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

Name of Hotspot Location	Bus Stand			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	7	11	9	10
No of Call Established	7	11	9	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.25	1.41	0.87	2.5
Total no of RLT Occurrence	NA	0	NA	2017
No of RLT > 48	NA	0	NA	0

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

Name of Hotspot Location		Bus Stand			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	Typical	17.95	30.91	NA	5.62
	Average	110.24	18.51	68.98	17.14
	80th Percentile	196.61	20.42	96.24	21.69
Download Session Setup Success Rate %		100	68	100	100
Upload speed (Mbits/s)	Typical	12.94	24.32		3.94
	Average	16.68	11.20	0.13	4.98
	80th Percentile	21.58	18.28	0.14	5.41
Upload Session Setup Success Rate %		100	60	100	100
Latency (in ms)	50th Percentile	42	36.24	28	31.5
Jitter (in ms)	Average	22.19	0.42	21.19	8.09
Packet Drop Rate %		1.04	48.2	0.1	2.10
Web browsing delay (in sec)		1.44	6	3.67	4.28
Video Streaming performance for video		1.18	1.21	0.44	1.05

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

Name of Hotspot Location	Railway Station			
Parameters	Airtel	BSNL/MTNL	RJIL	VIL
No of Call Attempts	7	10	9	10
No of Call Established	7	10	9	10
Call setup success rate (CSSR) %	100	100	100	100
No. of Drop Call	0	0	0	0
Drop Call Rate %	0	0	0	0
Call Setup Time Average (Sec.)	1.26	1.32	0.91	2.47
Total no of RLT Occurrence	NA	0	NA	1990
No of RLT > 48	NA	0	NA	0

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

Name of Hotspot Location		Railway Station			
QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbps/s)	Typical	2.18	25.05	NA	4.38
	Average	4.10	8.21	298.71	13.25
	80th Percentile	5.42	10.52	340.16	22.27
Download Session Setup Success Rate %		100	56	100	100
Upload speed (Mbps/s)	Typical	1.62	13.90		25.38
	Average	2.25	2.71	76.55	29.25
	80th Percentile	2.89	6.45	92.44	31.81
Upload Session Setup Success Rate %		100	56	100	100
Latency (in ms)	50th Percentile	46	36.25	23	32
Jitter (in ms)	Average	10.93	0.48	5.06	6.90
Packet Drop Rate %		2.32	52.4	0.1	0.48
Web browsing delay (in sec)		1.18	5	3.52	4.51
Video Streaming performance for video		2.74	5.36	0.31	1.15

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	3952	NA	0	NA	14.40%	NA	0
[-65, ≥-75)	NA	20067	NA	42	NA	73.13%	NA	2.71
[-75, ≥-85)	NA	2795	NA	454	NA	10.19%	NA	29.31
[-85, ≥Min)	NA	627	NA	1053	NA	2.28%	NA	67.98
Total	NA	27441	NA	1549	NA	100	NA	100

Rx Level -3G								
Overall RSCP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	4931	NA	NA	NA	18.02%	NA	NA
[-70, ≥-80)	NA	12826	NA	NA	NA	46.87%	NA	NA
[-80, ≥-90)	NA	8740	NA	NA	NA	31.94%	NA	NA
[-90, ≥Min)	NA	866	NA	NA	NA	3.16%	NA	NA
Total	NA	27363	NA	NA	NA	100	NA	NA

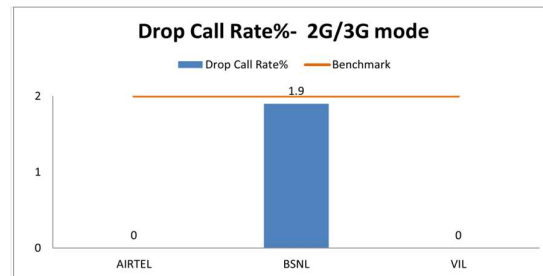
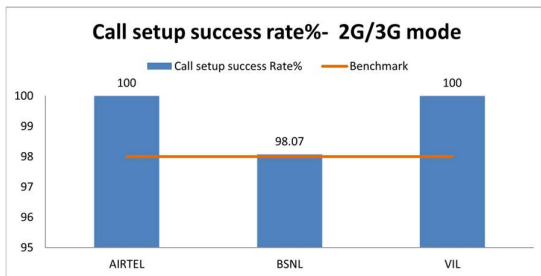
Rx Level -4G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	59061	23312	697	0	24.18	83.77%	95.48	0
[-80, ≥-95]	0	3289	33	26	0	11.82%	4.52	2.28
[-95, ≥-110]	175740	465	NA	1112	71.96	1.67%	NA	97.46
[-110, ≥Min]	9413	763	NA	3	3.85	2.74%	NA	0.26
Total	244214	27829	730	1141	100	100	100	100

Rx Level -5G								
Overall RSRP	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	NA	NA	42	NA	NA	NA	29.79	NA
[-80, ≥-95]	NA	NA	98	NA	NA	NA	69.50	NA
[-95, ≥-110]	NA	NA	1	NA	NA	NA	0.71	NA
[-110, ≥Min]	NA	NA	NA	NA	NA	NA	NA	NA
Total	NA	NA	141	NA	NA	NA	100	NA

Highway

QoS Performance Analysis - Dynamic

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	75	75	75	75
No. of Call Attempts	30	156	N/A	33
No. of Call Established	30	153	N/A	33
Call setup success rate (CSSR) %	100	98.07	N/A	100
No. of Drop Call	0	03	N/A	0
Drop Call Rate %	0	1.9	N/A	0
Call Setup Time Average (Sec.)	3.31	2.23	N/A	2.77
No. of Handover Attempts	46	78	N/A	22
No. of Handover success	46	74	N/A	22
HOSR %	100	94.8	N/A	100
Total no of RLT Occurrence	9622	42	N/A	8337
No of RLT > 48	0	0	N/A	0

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	21		NA
2G	38	27		18

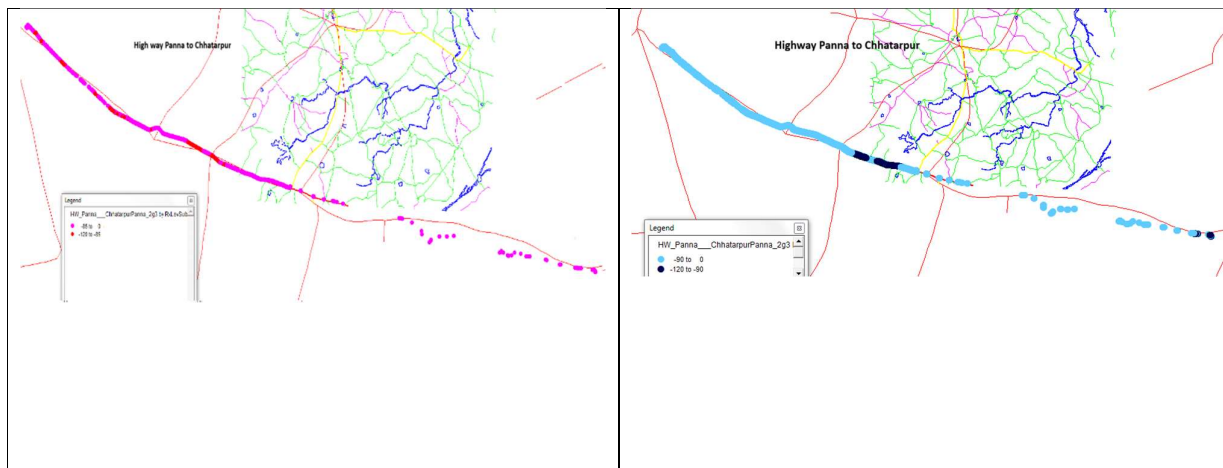
Signal Strength Map: (3G/2G - Lock mode)

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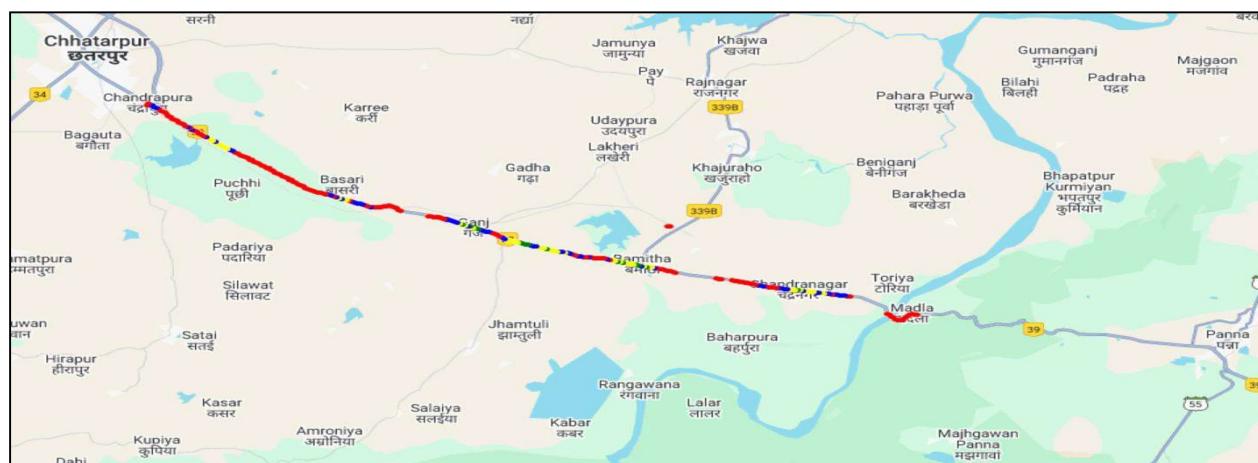
Signal Strength Map ((3G/2G - Lock mode) TSP- Airtel



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



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

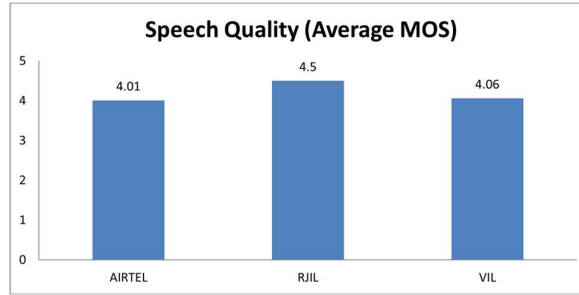
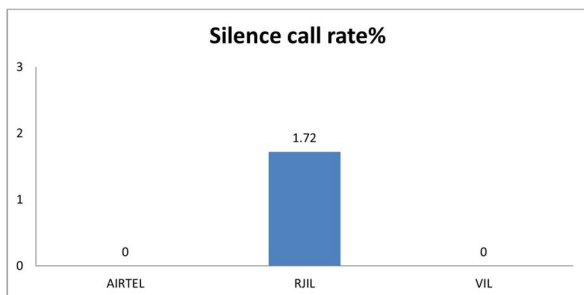
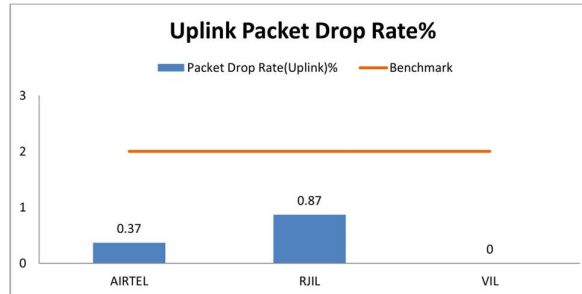
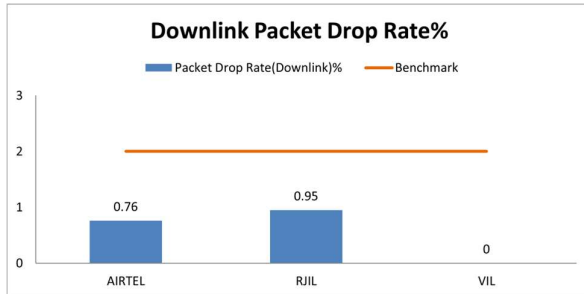
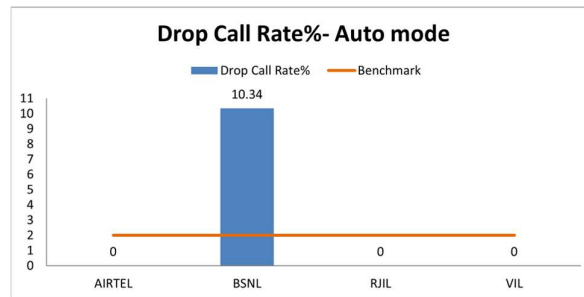
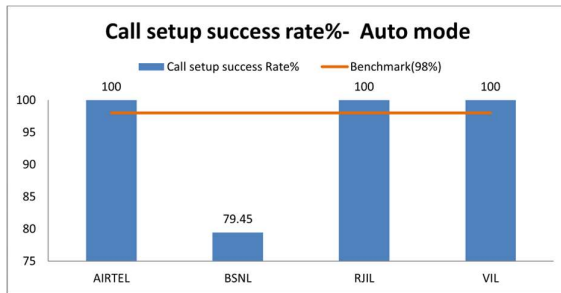


Signal Strength distribution: (3G/2G - Lock mode)

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	61596	88384	NA	107	6.65	56.70	NA	4.89
[-65, ≥-75]	67900	15972	NA	279	7.33	10.25	NA	12.75
[-75, ≥-85]	228894	17826	NA	310	24.71	11.43	NA	14.16
[-85, ≥Min]	567848	33709	NA	1493	61.31	21.62	NA	68.2
Total	926238	155891	NA	2189	100	100	NA	100

Rx Level -3G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	89208	NA	NA	NA	57.24	NA	NA
[-70, ≥-80)	NA	35791	NA	NA	NA	22.96	NA	NA
[-80, ≥-90)	NA	9107	NA	NA	NA	5.84	NA	NA
[-90, ≥Min)	NA	21754	NA	NA	NA	13.96	NA	NA
Total	NA	155860	NA	NA	NA	100	NA	NA

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



Parameters	Airtel	BSNL/MTNL	RJIL	VIL
Total Distance covered (in Kms)	75km	75 km	75 km	75 km
No. of Call Attempts	30	73	29	15
No. of Call Established	30	58	29	15
Call setup success rate (CSSR) %	100	79.45	100	100
No. of Drop Call	0	6	0	0
Drop Call Rate %	0	10.34	0	0
Call Setup Time Average (Sec.)	1.22	2.9	0.91	1.6
No. of Handover Attempts	161	128	NA	180
No. of Handover success	159	62	NA	180
HOSR %	98.76	48	99.8	100
Packet Drop Rate (Downlink)	0.76	NA	0.95	0
Packet Drop Rate (Uplink)	0.37	NA	0.87	0
Number of silence call for > 4 sec.	0	NA	0	0
Silence Call Rate %	0	NA	1.72	0
Number of MOS samples	426	NA	353	159
Average MOS score	4.01	NA	4.5	4.06

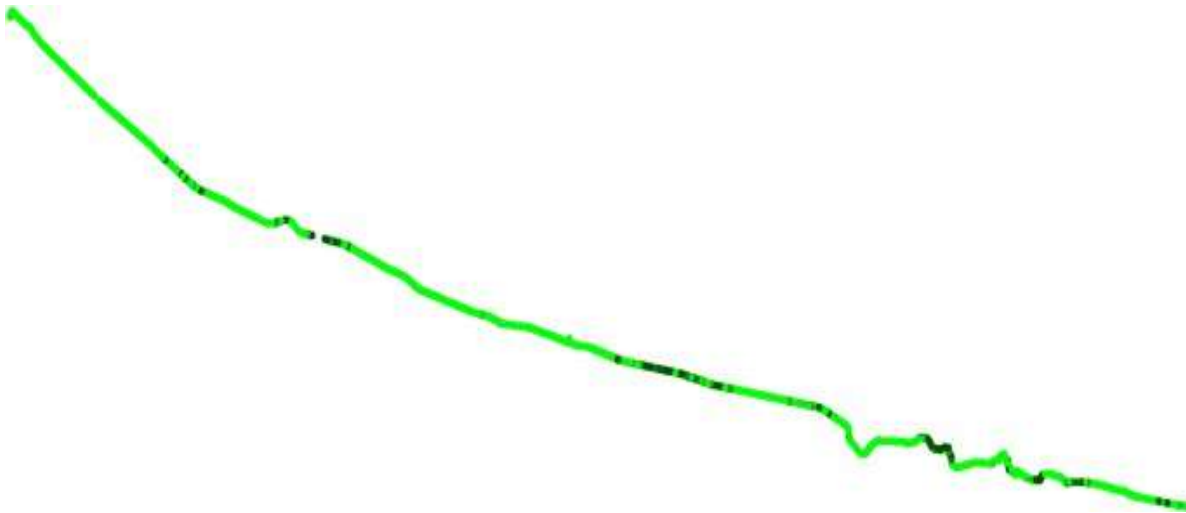
Number of Cell ids latched during drive test 5G/4G/3G/2G - Auto mode)

Number of unique cell ids covered in Voice test				
Technology	Service Provider			
	AIRTEL	BSNL/MTNL	RJIL	VIL
3G	NA	18	NA	NA
2G	NA	24	NA	18
4G	88	24	154	47
5G	NA	NA	10	NA

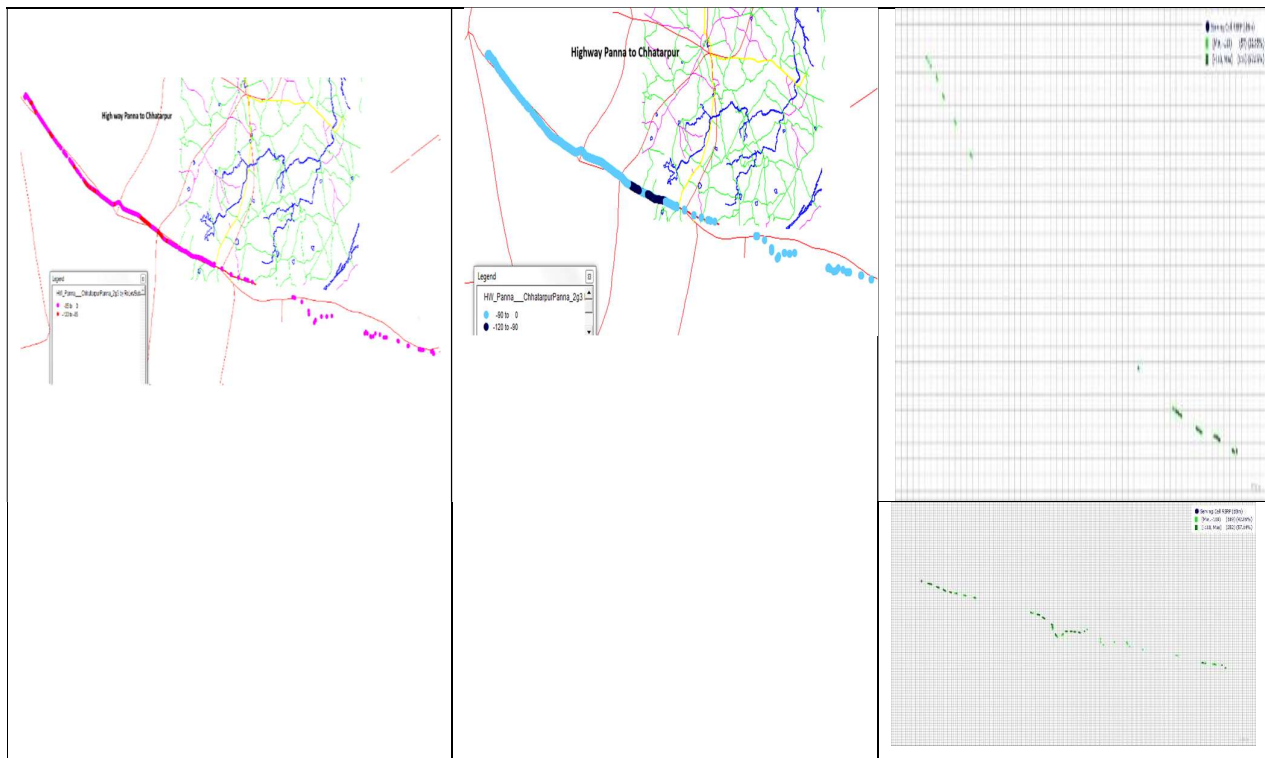
Signal Strength Map	Map Legend- 2G- Pink (Rx Level $\geq$ -85 dBm), 3G- Sky blue (RSCP Level $\geq$ -90 dBm)	Red (Rx Level < -85 dBm) Dark Blue (RSCP Level < -90 dBm)
	Map Legend- 4G- Light Green (RSRP Level $\geq$ -110 dBm), Yellow (RSRP Level $\geq$ -110 dBm),	Dark Green (RSRP Level < -110 dBm) 5G-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

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

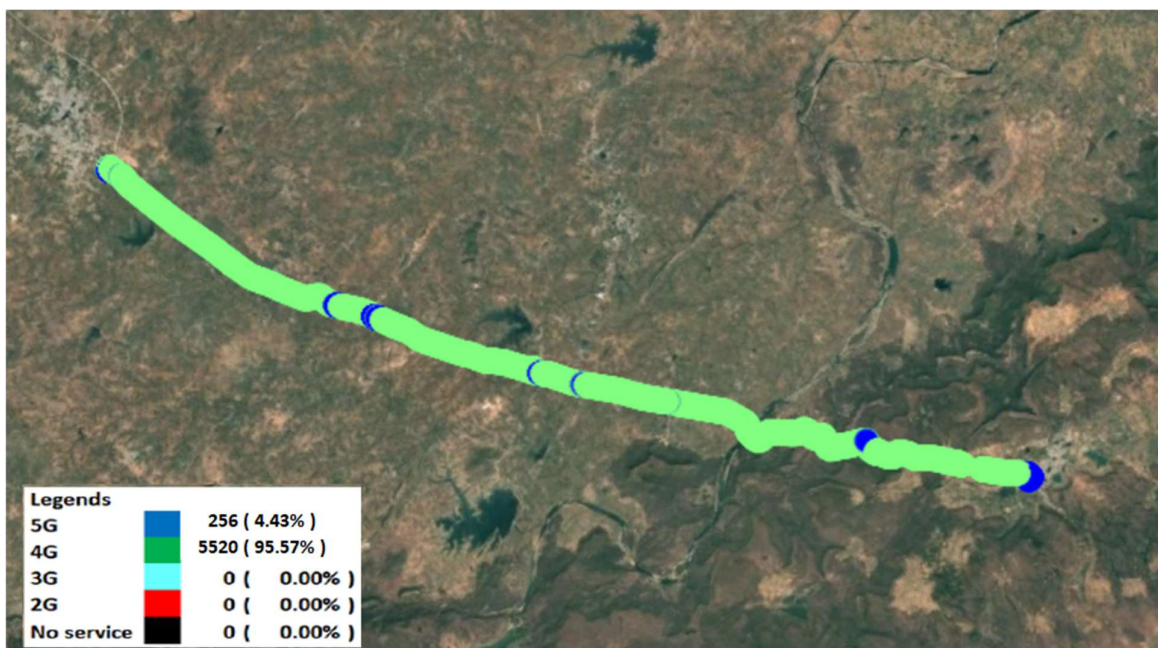
Signal Strength Map ((5G/4G/3G/2G - Auto mode) TSP- Airtel

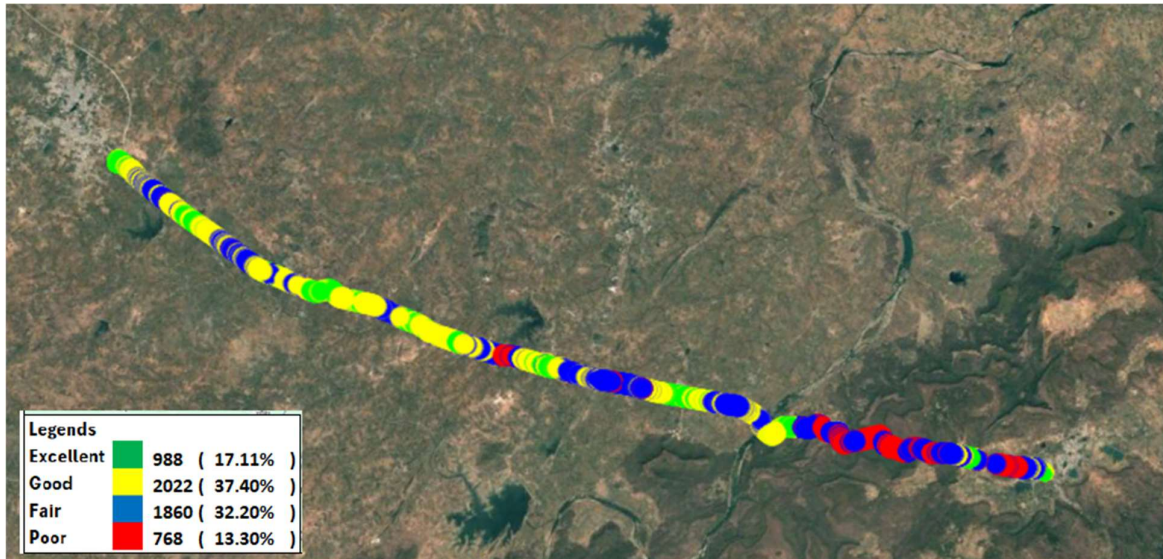


Signal Strength Map ((5G/4G/3G/2G - Auto mode) TSP- BSNL

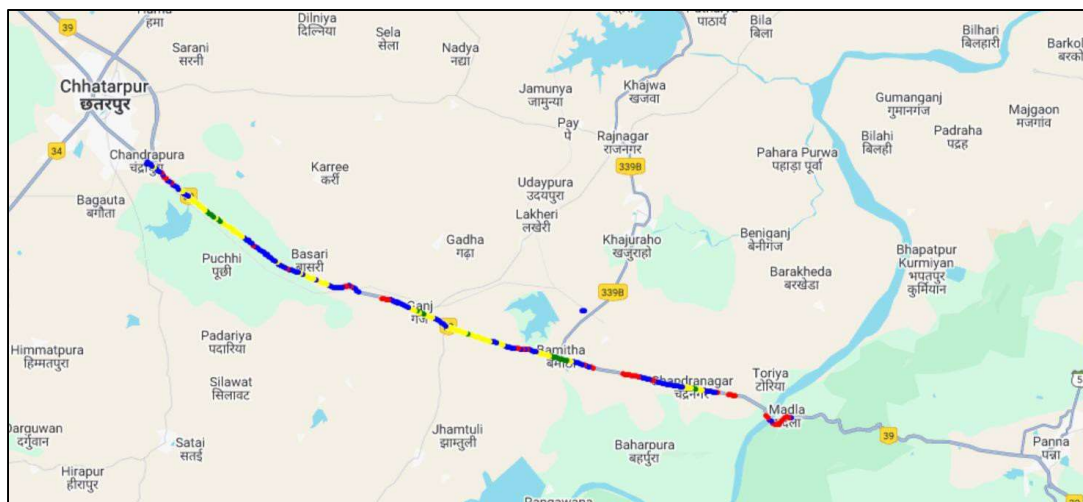


Signal Strength Map ((5G/4G/3G/2G - Auto mode) TSP- RJIL





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



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

Rx Level -2G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-65]	NA	88384	NA	NA	NA	56.70	NA	4.89
[-65, ≥-75]	NA	15972	NA	NA	NA	10.25	NA	12.75
[-75, ≥-85]	NA	17826	NA	NA	NA	11.43	NA	14.16
[-85, ≥Min]	NA	33709	NA	NA	NA	21.62	NA	68.2
Total	NA	155891	NA	NA	NA	100	NA	100

Rx Level -3G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-70]	NA	89208	NA	NA	NA	57.24	NA	NA
[-70, ≥-80]	NA	35791	NA	NA	NA	22.96	NA	NA
[-80, ≥-90]	NA	9107	NA	NA	NA	5.84	NA	NA
[-90, ≥Min]	NA	21754	NA	NA	NA	13.96	NA	NA
Total	NA	155860	NA	NA	NA	100	NA	NA

Rx Level -4G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	641493	34	NA	NA	31.68	5.55	NA	5.59
[-80, ≥-95]	494861	101	NA	NA	24.44	16.45	NA	20.13
[-95, ≥-110]	676067	233	NA	NA	33.38	37.94	NA	57.34
[-110, ≥Min]	212781	246	NA	NA	10.51	40.06	NA	16.95
Total	2025202	614	NA	NA	100	100	NA	100

Rx Level -5G								
Overall Rx Level	No of Sample				Sample %			
	Airtel	BSNL	RJIL	VIL	Airtel	BSNL/MTNL	RJIL	VIL
[Max, ≥-80]	NA	NA	NA	NA	NA	NA	NA	NA
[-80, ≥-95]	NA	NA	NA	NA	NA	NA	NA	NA
[-95, ≥-110]	NA	NA	NA	NA	NA	NA	NA	NA
[-110, ≥Min]	NA	NA	NA	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA	NA	NA	NA

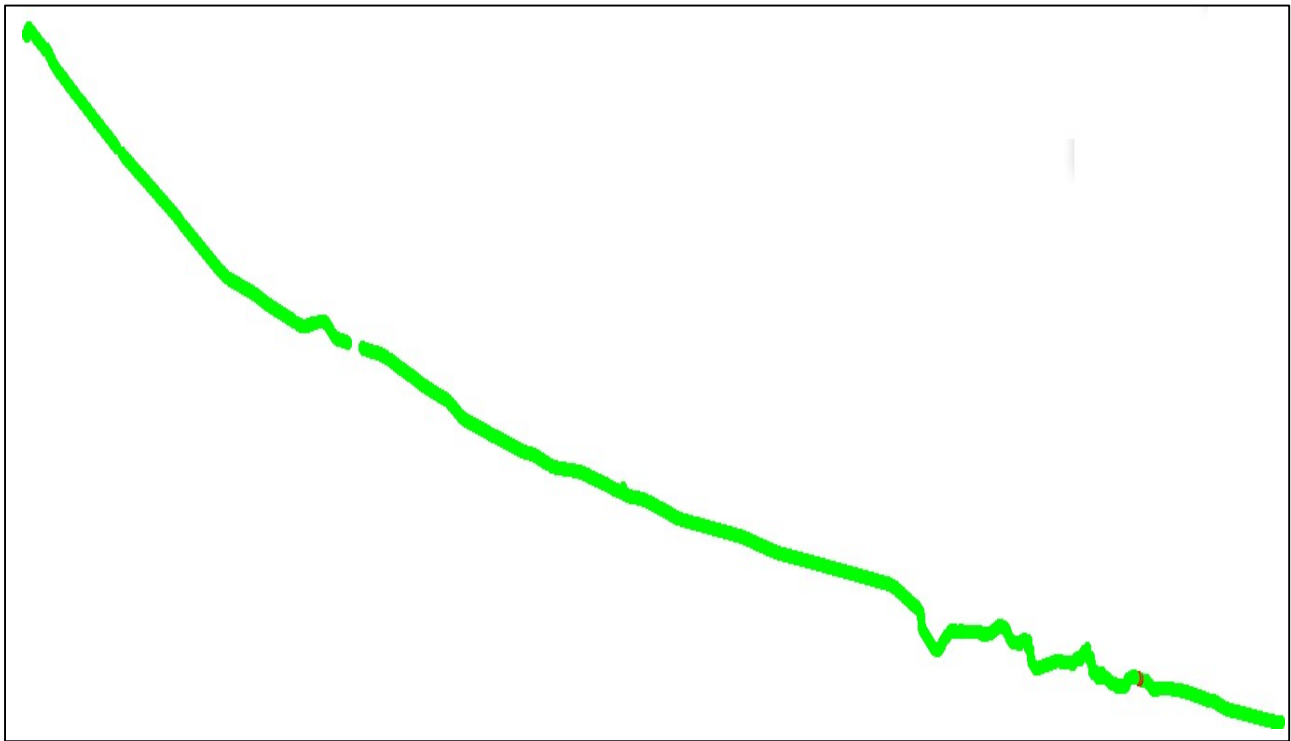
Data Service performance in 5G/4G/3G/2G (Auto mode) - Dynamic

QoS Parameters		AIRTEL	BSNL/MTNL	RJIL	VIL
Download speed (Mbits/s)	Average	19.36	3.81	115.46	21.76
	80th Percentile	28.8	16.45	238.43	30.22
	20th Percentile	4.73	4.64	10.42	3.66
Upload speed (Mbits/s)	Average	6.02	1.91	15.22	17.33
	80th Percentile	11.2	2.64	25.84	26.8
	20th Percentile	1.25	1.94	2.80	2.36
Latency (ms)	Average	46.95	74.32	NA	33.5
	50th Percentile	45	69.79	29	31
Jitter (ms)	Average	9.89	0.86	NA	10.15

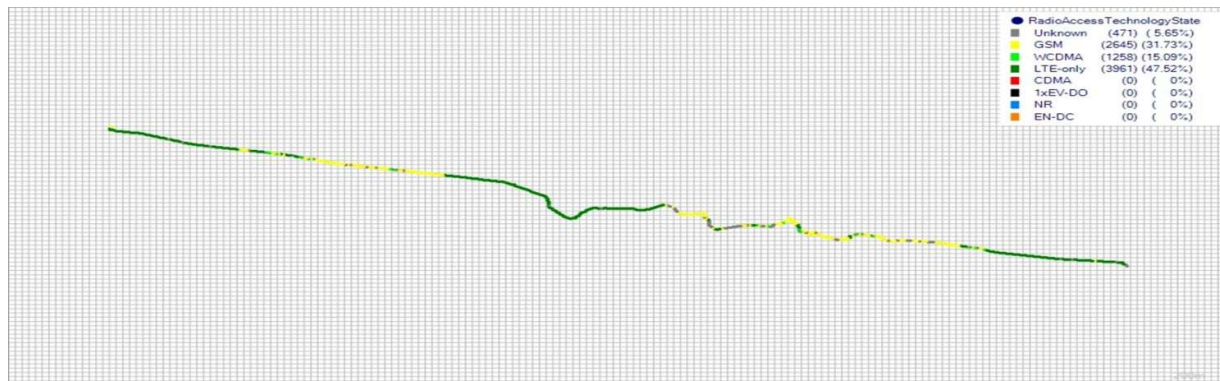
Time Spent (Technology-wise)

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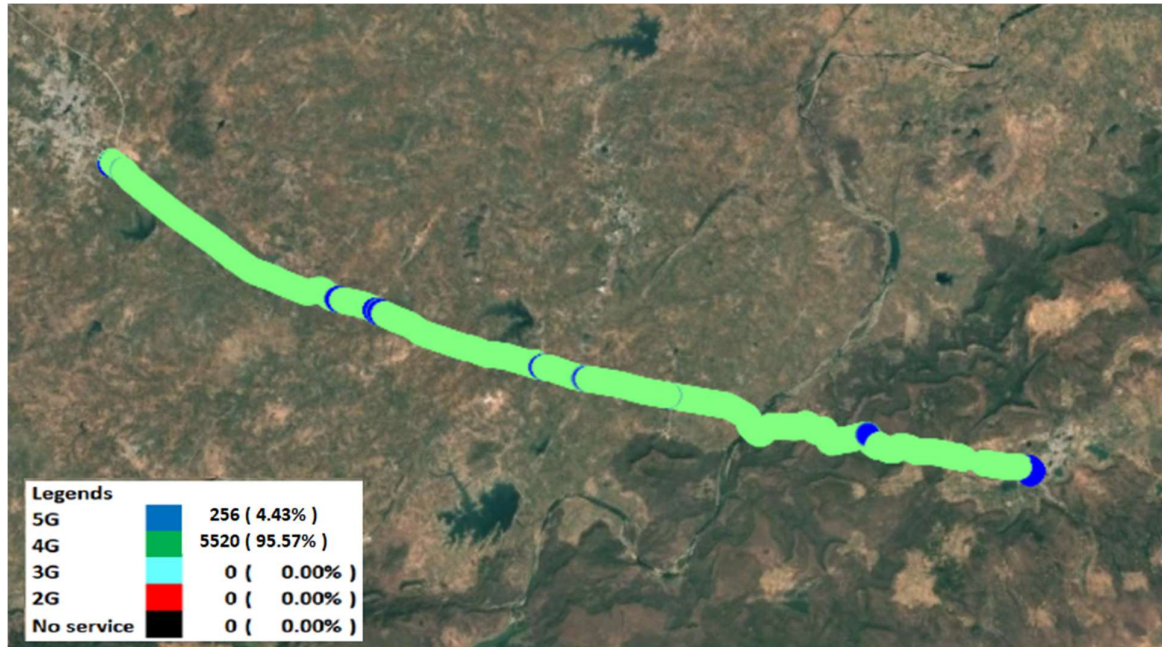
TSP - Airtel



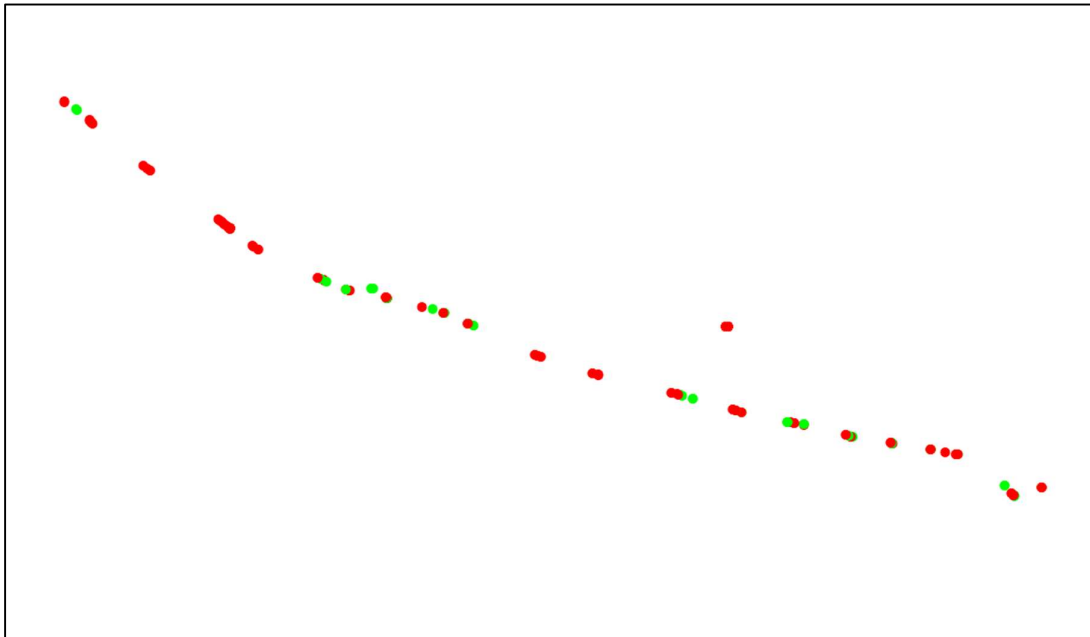
TSP - BSNL



TSP – RJIL



TSP – VIL



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
		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																															

(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