INDEPENDENT DRIVE TEST REPORT

For

Aizwal

Oct 2017

EAST ZONE

Key Performance Indicators: All of the TSPs have failed to met the Drop Call Rate (DCR) benchmark of 2% except Jio while all TSPs have met the Call Setup Success Rate (CSSR) benchmark of 95% except Aircel 2G, BSNL 2G & Airtel 3G.

The Independent Drive Test has been carried out by M/s PhiMetrics Technologies Pvt. Ltd. on behalf of TRAI in Aizwal City & adjoining areas from 9:00 AM to 9:00 PM; 24th Oct to 26nd Oct 2017. The drive test covered an drive route of approximately 250 KMs and 4 hotspots over a period of 3 days. Approximately 460 calls were made for each of the 11 networks: five 2G networks, five 3G networks, and one LTE network covering 6 unique TSPs.

Overview | Voice Summary | Data Summary

Overview

Overview:

Telecom Regulatory Authority of India has been entrusted with the task of laying down the standards of quality of service to be provided by the service providers and ensuring its enforcement; and also TRAI is responsible for conducting the periodical audit of such services provided by the service providers so as to protect the interest of the consumers of telecommunications service

TRAI is regularly monitoring the performance of Telecom Service Providers (TSP) against the benchmarks for the various Quality of Service (QoS) parameters laid down by the Authority. TSPs submit Performance Monitoring Reports to TRAI every quarter. TRAI also undertakes audit and assessment of Quality of Service through independent agencies to verify the Quality of Service claimed. The Audit agencies conduct sample 'Drive tests' across various cities in the country as part of audit and assessment of the TSPs' performance.

In view of complaints on call drops and other network quality issues, on behalf of TRAI, an Independent Drive Test (IDT) was conducted by PhiMetrics Technologies Pvt. Ltd. from **24th Oct to 26th Oct 2017** covering various locations in Aizwal City & surrounding region. The performance of **Aircel, Airtel, BSNL, Idea, Vodafone and Jio** were monitored across various technologies (2G, 3G & 4G). The drive test route was defined on the basis of several factors that include - areas from where call drop complaints are commonly received; areas of heavy usage; residential areas away from arterial roads; office areas; areas where previous Drive tests showed network issues; etc.
The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services in terms of
Voice: Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.
Data: Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay and Latency.

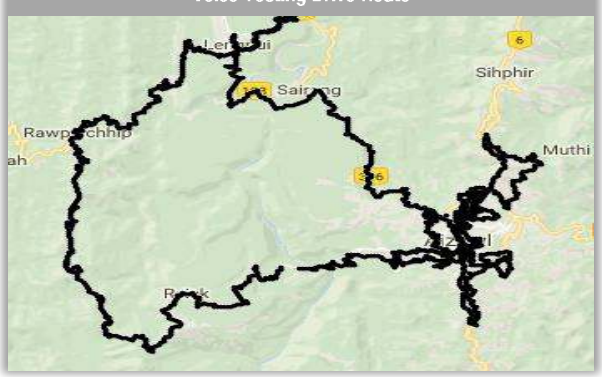
Drive Test Details for Aizwal:

Independent Drive test was conducted for a period of 2 days from 25th Oct to 26th Oct 2017 in Aizwal city & surrounding areas from 9:00 AM to 9:00 PM. Calls were made for 90 sec duration with wait time of 10 sec between calls in all technologies.
Voice Tests: The drive test covered a drive route of approximately 250 KMs over a period of 2 days from 25th to 26th Oct-17. Approximately 460 calls were made for each of the 11 networks: Five 2G networks, five 3G networks and one VoLTE network covering 6 unique TSPs.
* In case of multiple call failure in similar geo location in given period of 60sec has been counted as one call failure

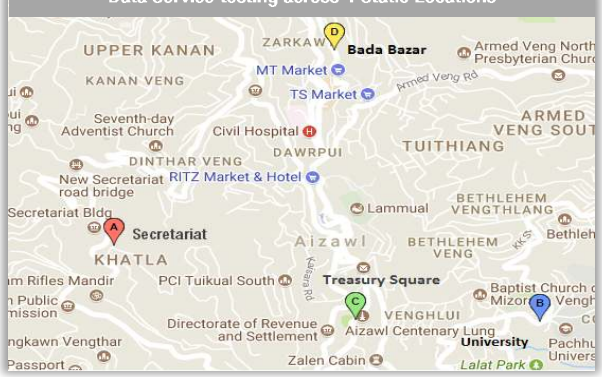
Data Tests: Data Tests were performed at static locations for 1 day on 24th Oct; Five 2G (Lock mode) networks, five 3G (Dual mode) networks and four 4G (Free mode) networks covering 6 unique TSPs were tested.
* Outlier values are discarded to calculate the below KPI's.
* For Voice and Data KPI's, 2G measurement is done with UE locked on 2G, 3G measurement is done with UE in Dual mode (2G & 3G) and 4G measurement is done with UE in Free Mode.
* 3G KPI's which is calculated from UE in Dual Mode (2G & 3G) includes samples and events of 2G.
* 4G KPI's which is calculated from the UE in Free Mode included samples and events of 2G & 3G.

Service	Specifications
Download	2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in, www.flipkart.com and PayTm
Video Streaming	120 sec clip
Latency	32 Bytes on www.google.com

Voice Testing Drive Route



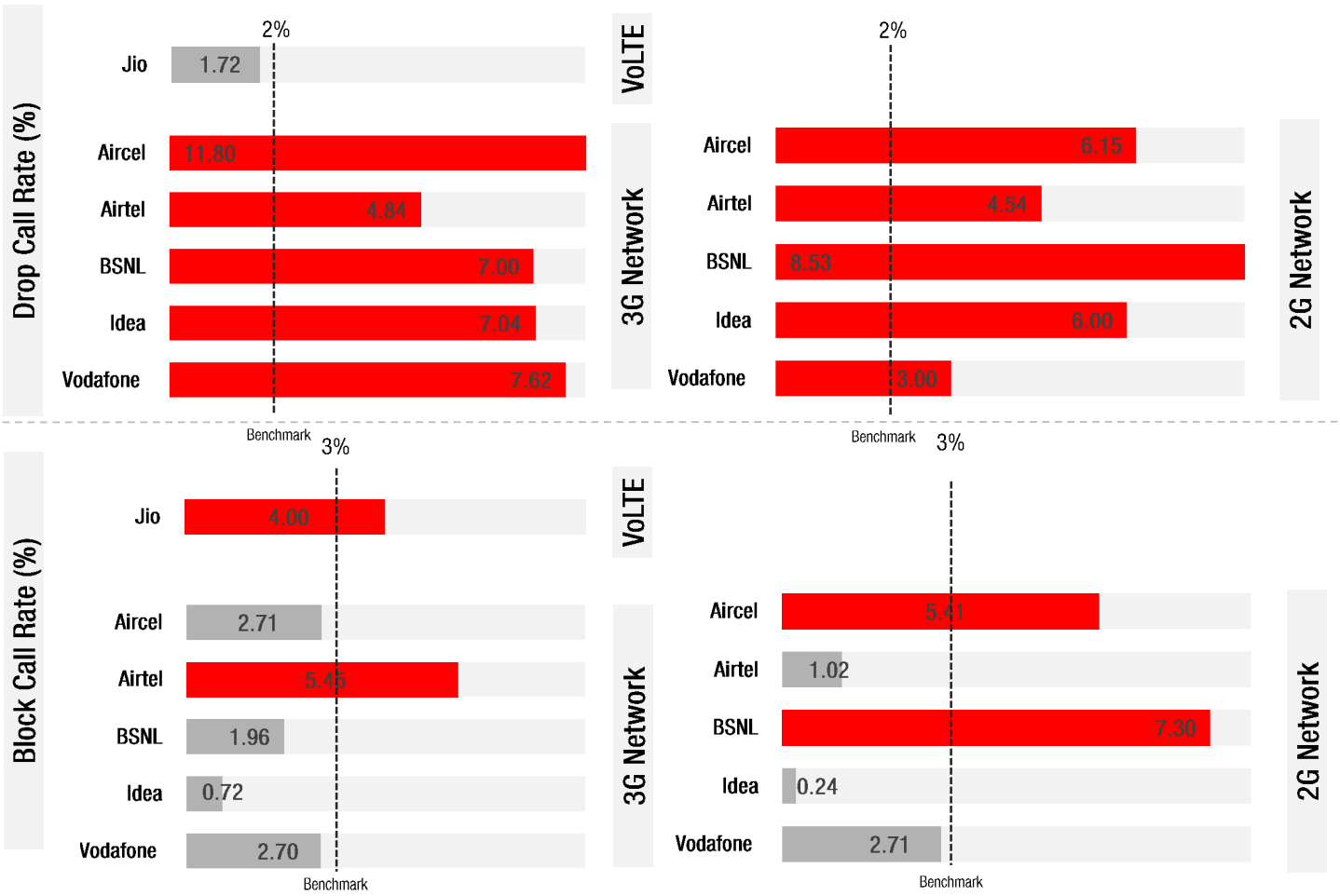
Data Service testing across 4 Static Locations



Voice Calls

Key Observations

QoS compliance of the TSPs in Aizwal for Voice across technologies 2G/3G/4G-VoLTE is given below:



KPI	2G Networks				
	Aircel	Airtel	BSNL	Idea	Vodafone*
SDCCH Congestion%	0.62%	0.20%	1.01%	0.24%	0.42%
TCH Congestion %	4.81%	0.82%	6.35%	0.00%	2.30%

KPI	3G				
	Aircel	Airtel	BSNL	Idea	Vodafone*
SDCCH Congestion%	0.21%	0.00%	0.20%	0.00%	0.22%
RRC Congestion%	0.42%	3.92%	0.59%	0.24%	0.90%
SDCCH & RRC Congestion%	0.63%	3.92%	0.78%	0.24%	1.12%
TCH Congestion %	2.10%	0.00%	0.59%	0.24%	0.68%
RAB Congestion %	0.00%	1.59%	0.59%	0.24%	0.91%
TCH & RAB Congestion %	2.10%	1.59%	1.19%	0.48%	1.59%

a) All TSPs have failed to met the 2% QOS benchmark of Drop Call Rate (DCR%) except Jio.
b) Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's except Aircel 2G, BSNL 2G, Airtel 3G & Jio.
c) Call failures due to major technical issue in Vodafone 2G & 3G are not included in results.

Not meeting Benchmark

Voice Calls

Key Observations

Coverage

a) Percentage of coverage samples for 2G ≥ -85 dBm and CDMA ≥ -90 dBm.

TSPs	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Coverage%	54.86%	61.88%	44.86%	42.64%	58.68%

b) Percentage of coverage samples for 2G ≥ -85 dBm, 3G ≥ -90 dBm & LTE ≥ -110 dBm.

TSPs	3G					VoLTE
	Aircel	Airtel	BSNL	Idea	Vodafone	Jio
Coverage%	53.53%	53.77%	59.84%	50.41%	64.73%	81.86%

c) Percentage of time spent on 3G network.

TSPs	3G				
	Aircel	Airtel	BSNL	Idea	Vodafone
% Time Spent on 3G	34.17%	78.11%	22.74%	31.72%	64.57%

d) Percentage of Radio Link Timeout (RLT) => 48

TSPs	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
% of RLT => 48	13.61%	0.00%	17.14%	0.00%	0.00%

During IDT all TSP's have RLT =<48 except Aircel & BSNL

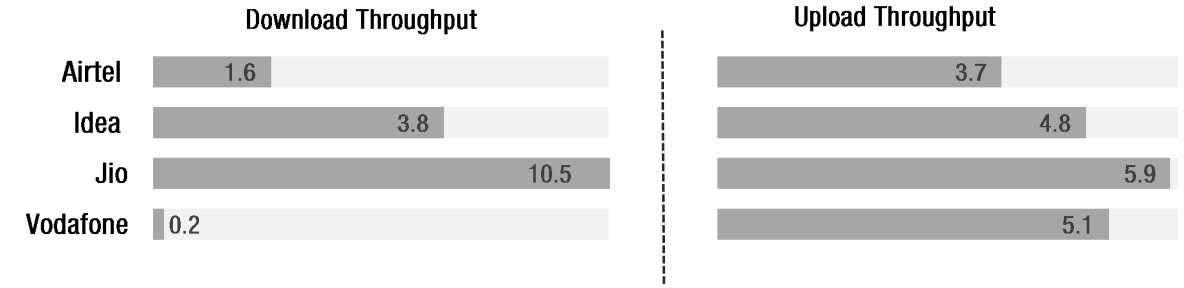
Data Services

Key Observations

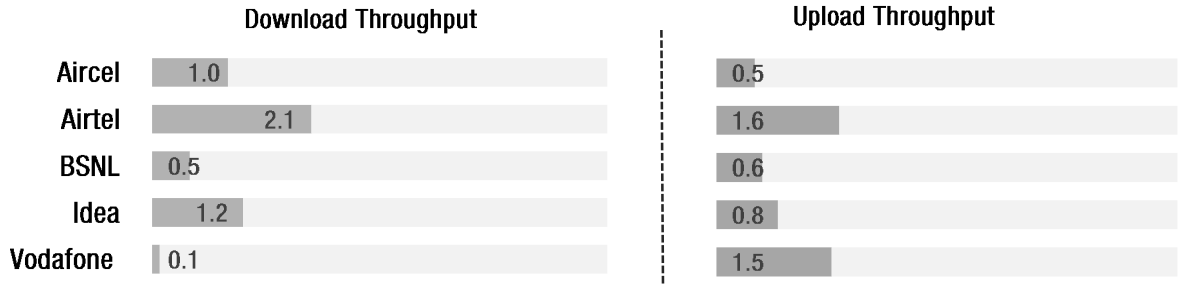
Data was tested at 4 locations viz Secretariat, University, Treasury Square and Bada Bajar. Following services were tested: Data Download/Upload, Latency (www.google.com), Video Streaming (YouTube) and Web browsing (Flipkart, Amazon, PayTm)

Data Download and Upload Performance (Mbps)

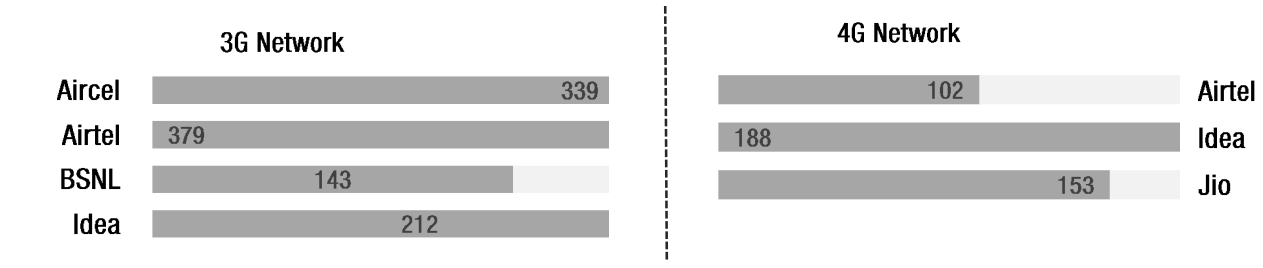
4G Network:



3G Network:



Latency (msec)



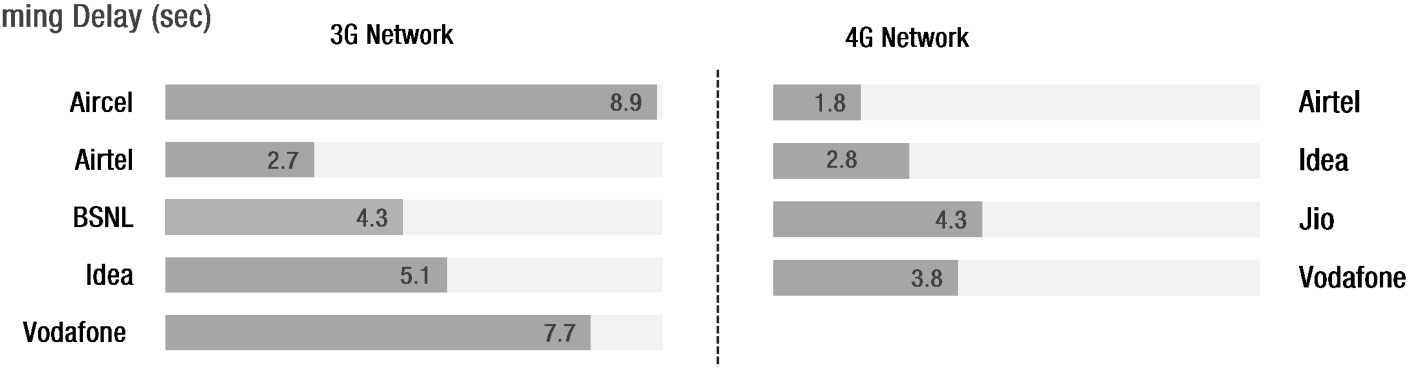
** Vodafone has disabled ping on its network*

Data Services

Key Observations

Video Streaming Performance (120 sec YouTube video sample sizes)

Streaming Delay (sec)

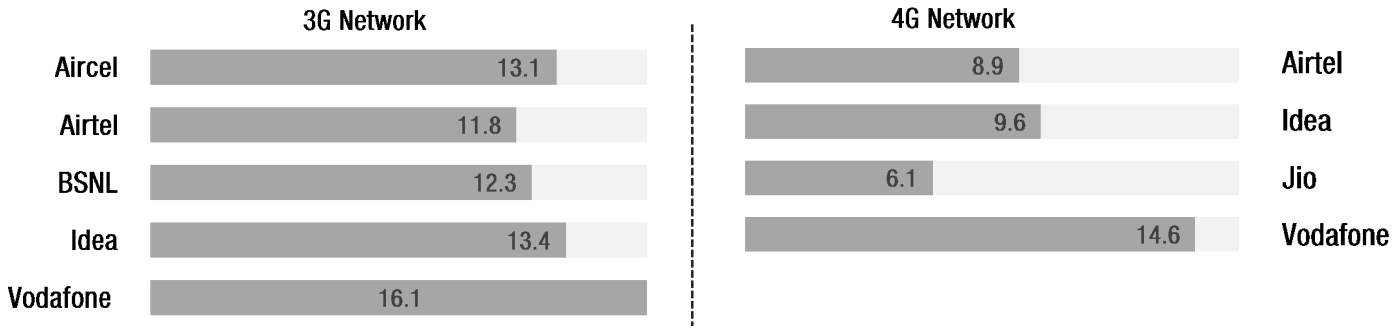


Streaming Delay further broken into 2 parameters which form the end-user perception to assess consistency on Video streaming.

- Initial Start time
- Interruption time while playing the video.

Video Streaming	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Avg. Initial Start Time (sec)	5.7	2.1	4.3	5.1	4.9	1.8	2.2	2.9	2.9
Avg. Interruption Time (sec)	3.2	0.6	-	-	2.8	-	0.6	1.4	0.9

Web Page Download Time (sec)



Web browsing experience is the average time taken to fully load the websites tested.

Summary

City Level Summary

Voice Call	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Call Attempt	481	490	493	418	480
Blocked Call Rate (%)	5.4%	1.0%	7.3%	0.2%	2.7%
CSSR% (Accessibility)	94.6%	99.0%	92.7%	99.8%	97.3%
Drop Call Rate (%)	6.2%	4.5%	8.5%	6.0%	3.0%
Mobility HOSR (%)	86.2%	95.6%	86.7%	99.6%	98.8%
Rx Quality (%)	87.3%	88.3%	92.7%	93.8%	93.3%

Voice Call	3G					VoLTE
	Aircel	Airtel	BSNL	Idea	Vodafone	Jio
Call Attempt	479	459	510	415	445	425
Blocked Call Rate (%)	2.7%	5.4%	2.0%	0.7%	2.7%	4.0%
CSSR% (Accessibility)	97.3%	94.6%	98.0%	99.3%	97.3%	96.0%
Drop Call Rate (%)	11.8%	4.8%	7.0%	7.0%	7.6%	1.7%
Mobility HOSR (%)	96.8%	100.0%	93.0%	99.8%	99.9%	99.5%
Rx Quality (%)	80.4%	61.8%	93.1%	89.9%	81.5%	71.7%

Summary

City Level Summary

Data Services	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone *
Download Throughput (Kbps)	60.5	98.6	95.3	131.3	108.9
Upload Throughput (Kbps)	50.8	120.1	95.2	147.8	116.2
Web Browsing Delay (sec)	18.3	19.5	23.2	24.5	23.5
Latency (msec)	395	280	374	513	-

Data Services	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone*	Airtel	Idea	Jio	Vodafone*
Download Throughput (Mbps)	1.0	2.1	0.5	1.2	0.1	1.6	3.8	10.5	0.2
Upload Throughput (Mbps)	0.5	1.6	0.6	0.8	1.5	3.7	4.8	5.9	5.1
Web Browsing Delay (sec)	13.1	11.8	12.3	13.4	16.1	8.9	9.6	6.1	14.6
Video Streaming Delay (sec)	8.9	2.7	4.3	5.1	7.7	1.8	2.8	4.3	3.8
Latency (msec)	339	379	143	212	-	102	188	153	-

** Vodafone has disabled ping on its network*

Summary

City Level Summary(contd.)

Bada Bajar	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Download Throughput (kbps)	4.7	73.0	131.6	85.5	63.2
Upload Throughput (kbps)	13.8	155.1	95.8	130.3	88.2
Web Browsing Delay (sec)	6.9	12.7	18.0	18.8	17.0
Latency (msec)	404	238	345	593	-

Bada Bajar	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	0.2	0.1	0.1	0.2	0.1	0.8	1.6	3.6	0.1
Upload Throughput (Mbps)	0.4	0.2	0.6	0.2	1.1	2.3	2.6	4.7	2.2
Web Browsing Delay (sec)	16.6	17.4	13.5	13.2	10.2	10.2	11.5	7.0	11.5
Video Streaming Delay (sec)	13.4	Fail	5.1	8.6	16.6	Fail	2.1	9.8	1.8
Latency (msec)	340	456	127	228	-	119	234	163	-

Secretariat	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Download Throughput (kbps)	33.1	72.4	32.7	85.8	56.7
Upload Throughput (kbps)	51.7	88.9	51.1	136.9	106.4
Web Browsing Delay (sec)	23.3	18.8	31.3	17.7	24.4
Latency (msec)	454	380	396	516	-

Secretariat	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	1.8	3.7	0.6	1.9	0.2	2.6	1.3	14.0	0.1
Upload Throughput (Mbps)	0.6	1.5	0.2	0.9	1.1	3.0	4.3	7.3	5.1
Web Browsing Delay (sec)	10.8	9.6	12.0	12.4	18.6	8.6	11.2	5.1	17.9
Video Streaming Delay (sec)	14.2	2.0	6.7	1.7	2.8	1.6	5.3	2.9	2.0
Latency (msec)	321	329	197	210	-	92	173	138	-

Summary

City Level Summary(contd.)

Treasury Square	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Download Throughput (kbps)	62.6	154.0	111.6	162.5	142.2
Upload Throughput (kbps)	85.0	141.7	141.7	168.8	137.1
Web Browsing Delay (sec)	22.9	25.6	26.9	30.7	25.1
Latency (msec)	519	236	392	451	-

Treasury Square	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	0.8	1.5	0.3	0.2	0.1	1.6	1.7	4.7	0.1
Upload Throughput (Mbps)	0.7	2.0	0.4	0.3	1.4	4.1	3.8	3.9	5.9
Web Browsing Delay (sec)	13.0	11.6	13.2	17.1	14.2	8.6	9.0	6.9	15.6
Video Streaming Delay (sec)	1.5	3.9	3.7	7.3	4.4	1.8	2.6	2.6	9.2
Latency (msec)	388	424	127	203	-	101	176	171	-

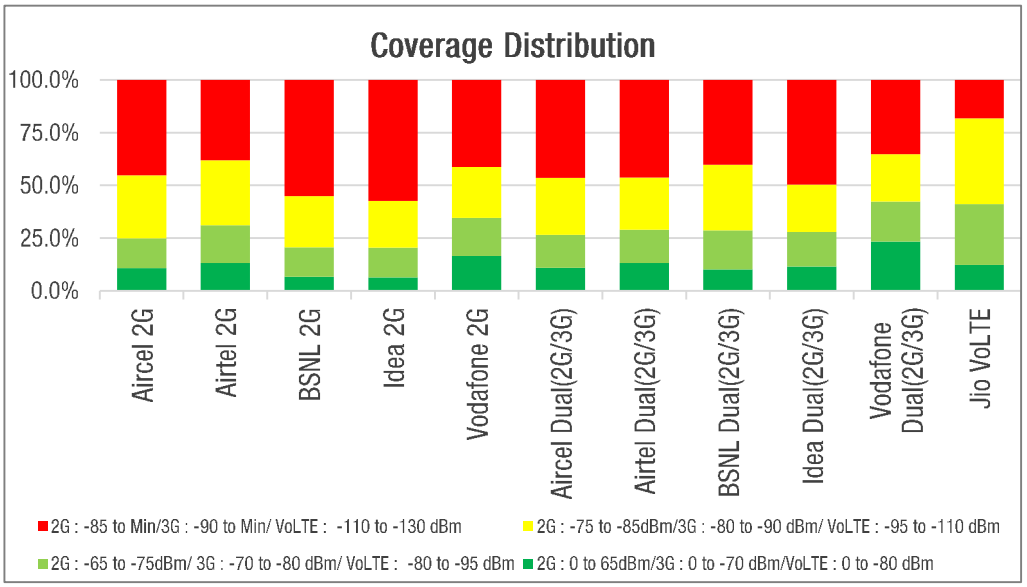
University	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Download Throughput (kbps)	123.1	132.0	105.1	191.3	156.1
Upload Throughput (kbps)	52.8	94.7	92.3	155.1	132.9
Web Browsing Delay (sec)	17.8	20.7	16.3	28.9	27.7
Latency (msec)	244	289	370	518	-

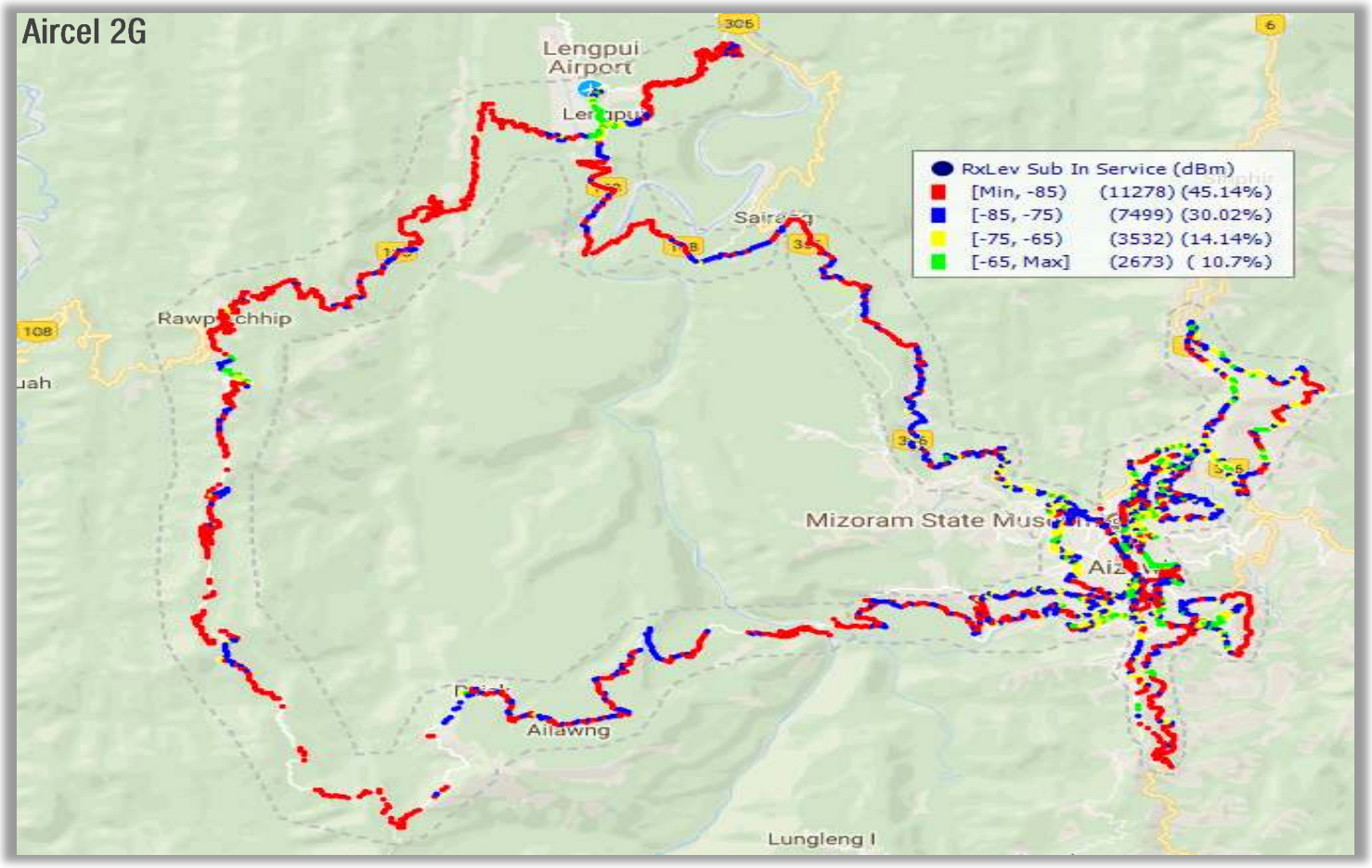
University	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	1.4	2.7	0.9	2.6	0.0	1.6	10.8	19.5	0.4
Upload Throughput (Mbps)	0.3	2.9	1.0	1.9	2.4	5.5	8.3	7.6	7.3
Web Browsing Delay (sec)	12.2	9.4	10.4	9.8	19.4	8.2	6.5	5.3	12.9
Video Streaming Delay (sec)	4.0	2.1	2.6	1.7	6.9	2.1	1.1	1.9	2.1
Latency (msec)	314	345	119	205	-	100	168	136	-

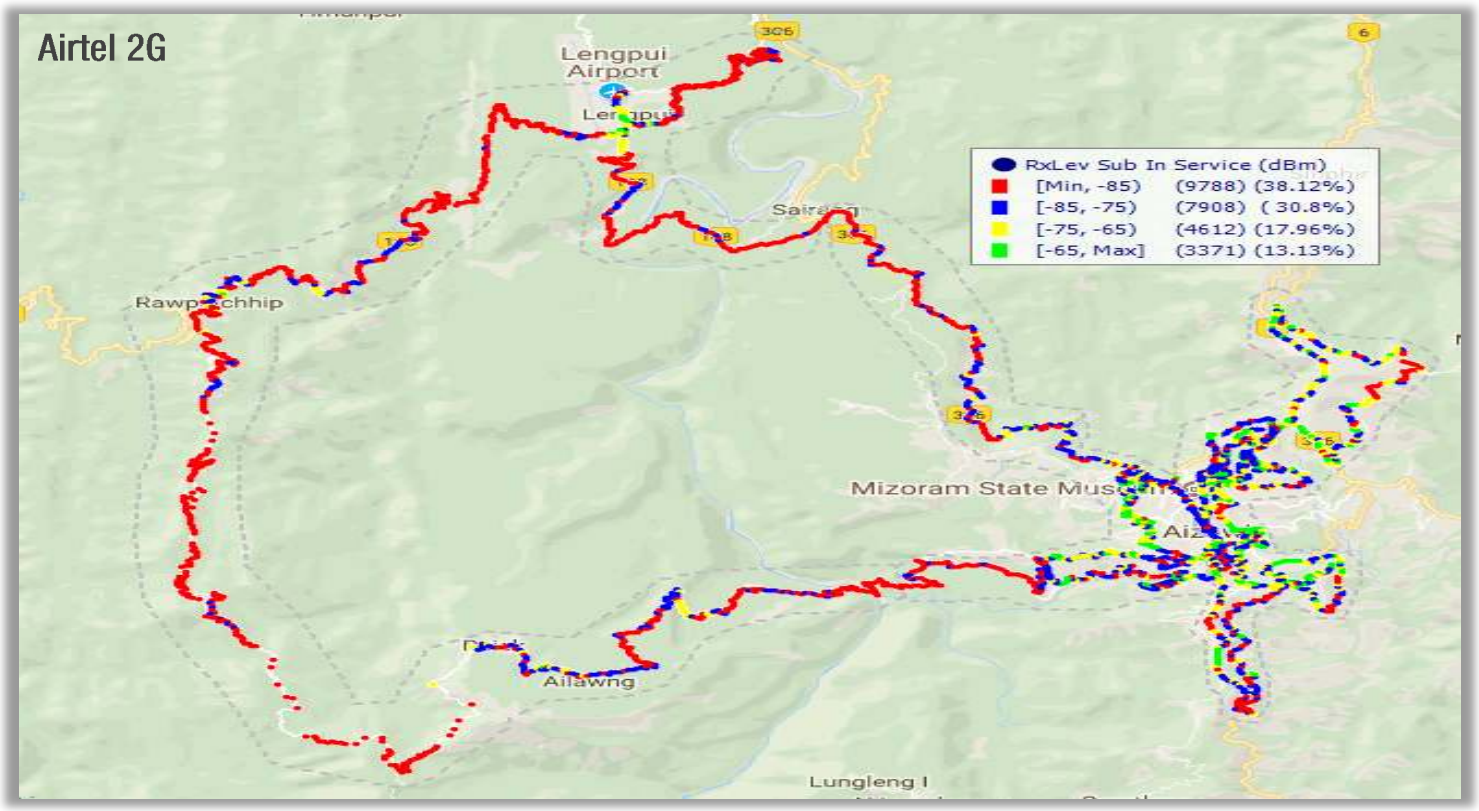
I. Coverage Details

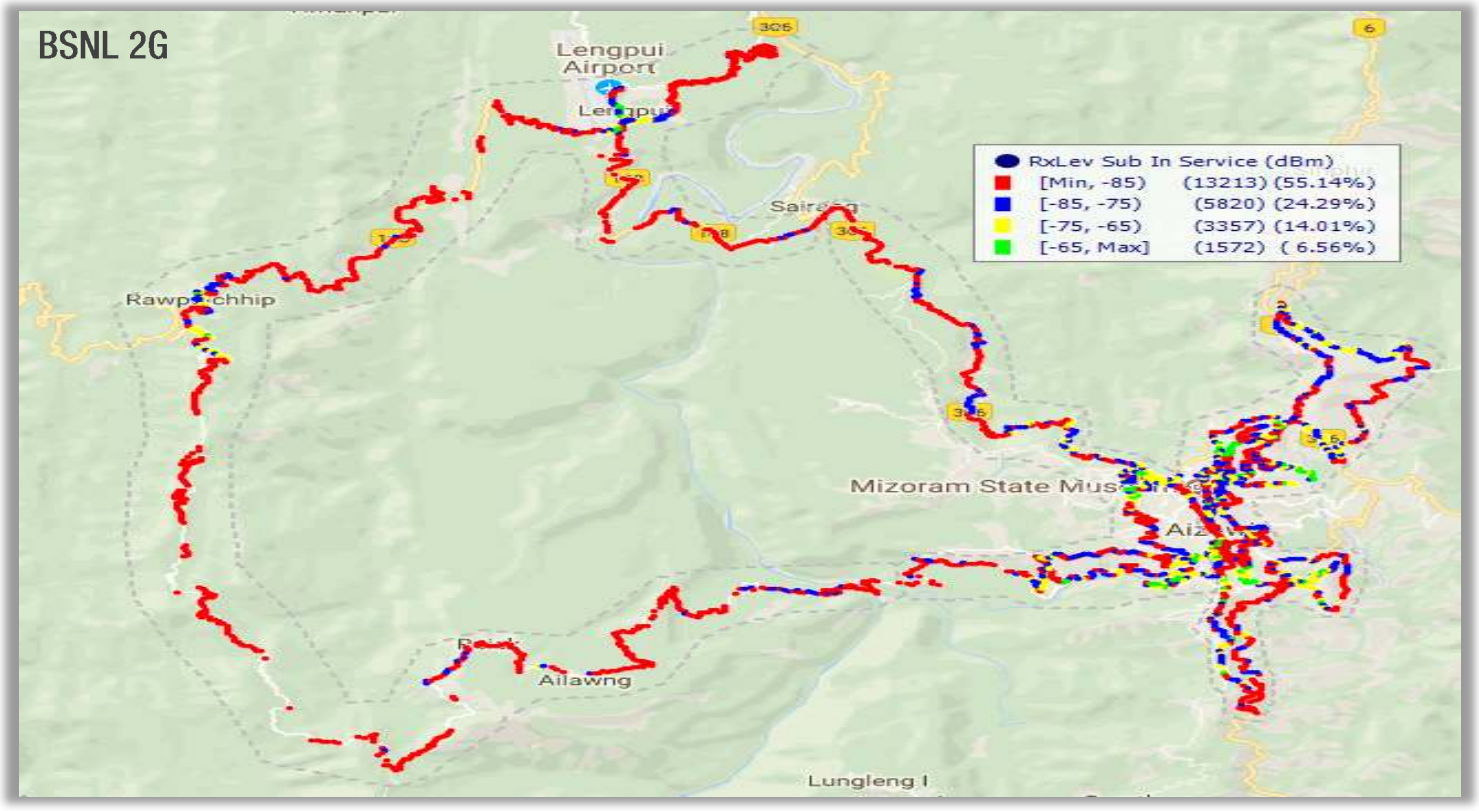
RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call/data session. The Coverage rate of an TSP is calculated on the basis of % of samples in which the Rx level ≥ -85, RSCP is ≥ -90 dBm & RSRP ≥ -110dBm. The details are as follows.

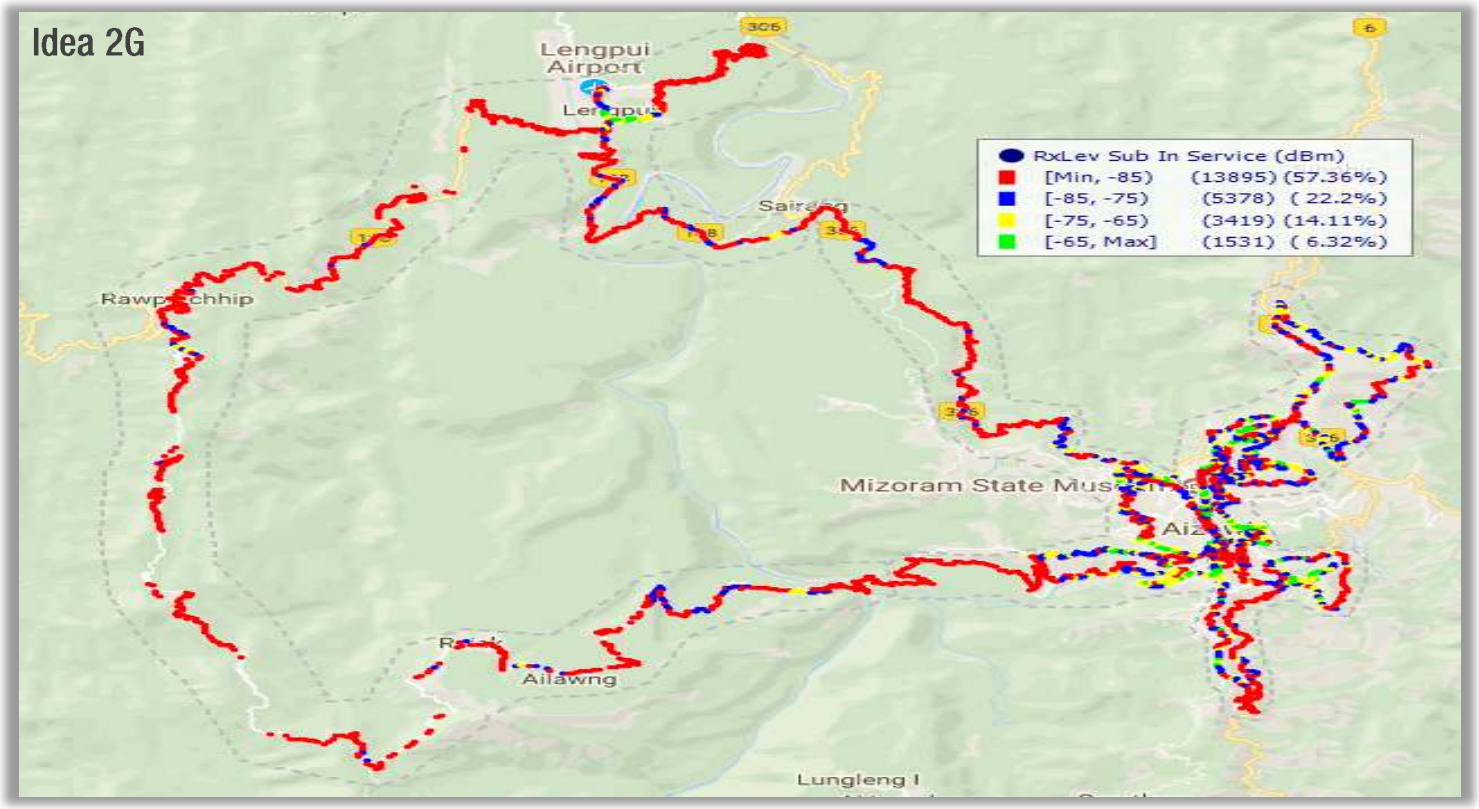
TSP	Coverage Rate
Aircel 2G	54.86%
Airtel 2G	61.88%
BSNL 2G	44.86%
Idea 2G	42.64%
Vodafone 2G	58.68%
Aircel Dual(2G/3G)	53.53%
Airtel Dual(2G/3G)	53.77%
BSNL Dual(2G/3G)	59.84%
Idea Dual(2G/3G)	50.41%
Vodafone Dual(2G/3G)	64.73%
Jio VoLTE	81.86%

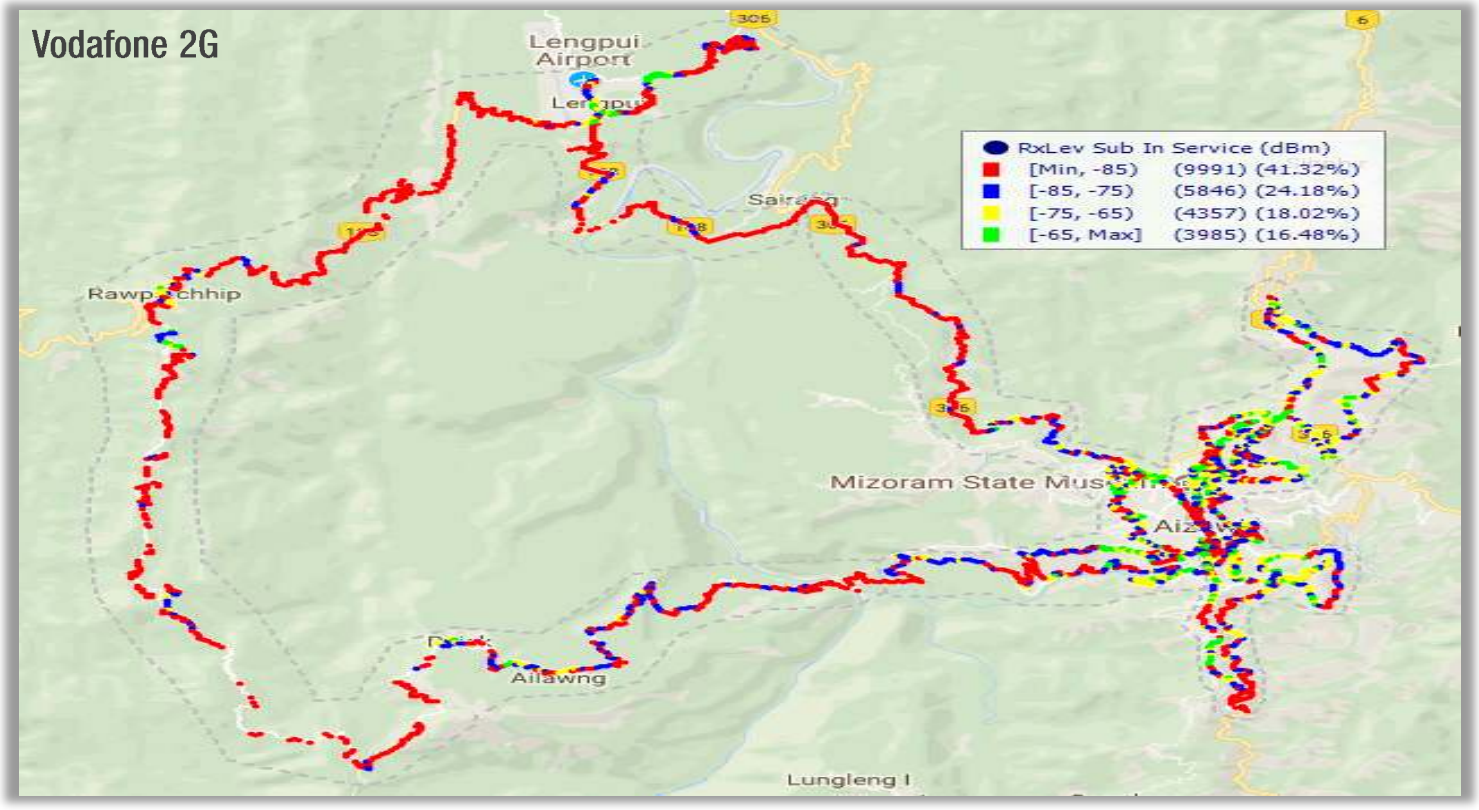


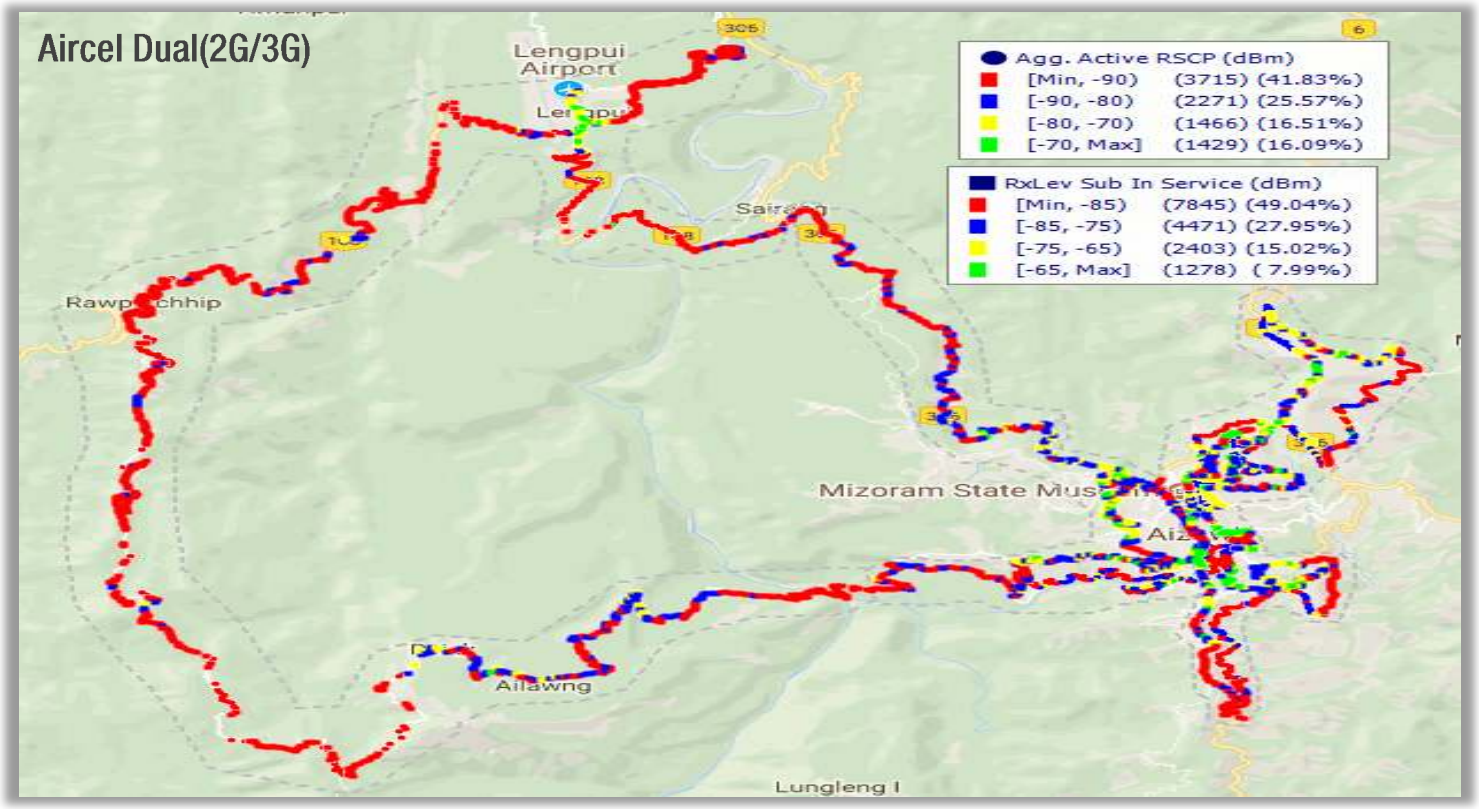


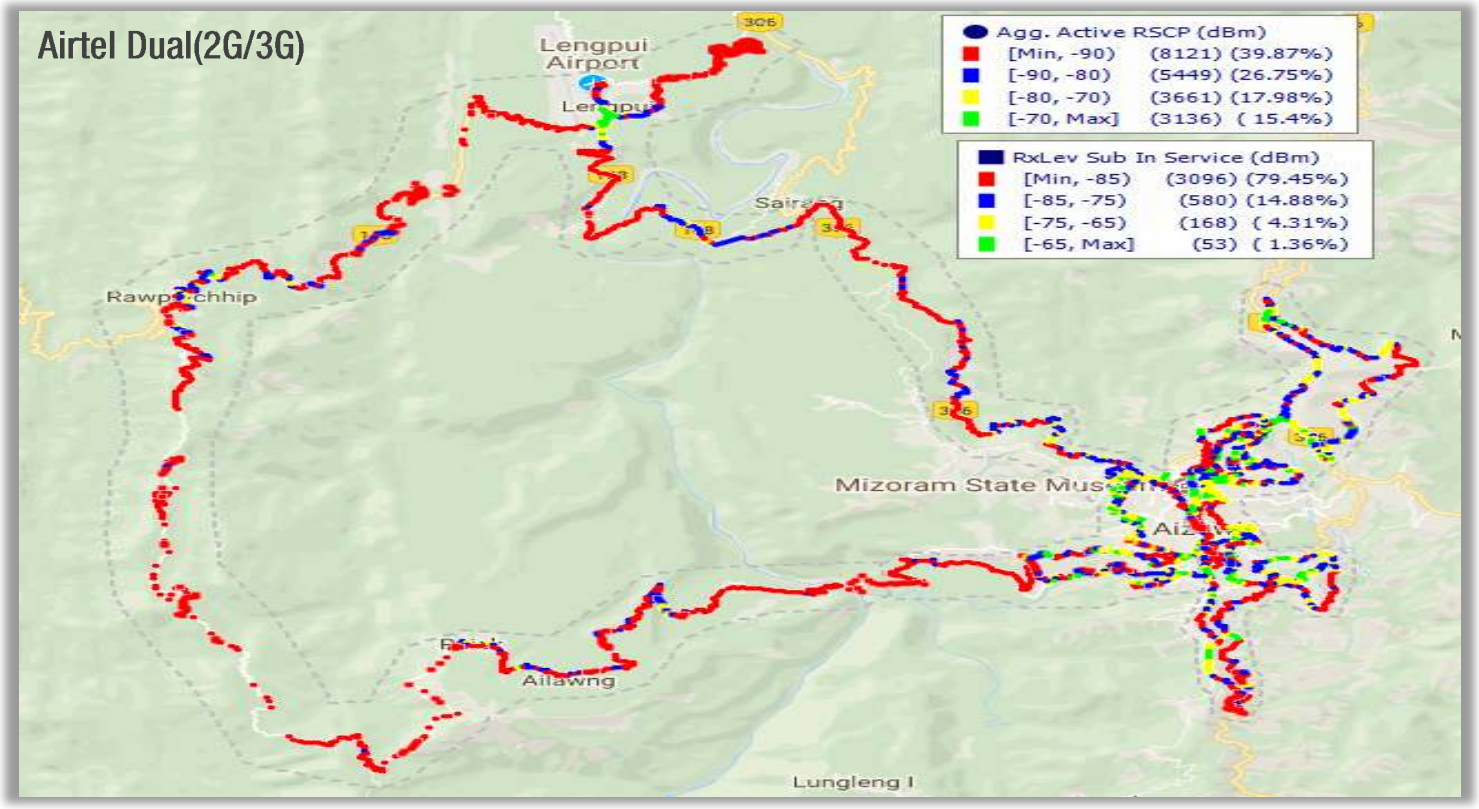

Airtel 2G
Lengpui Airport
RxLev Sub In Service (dBm)
[Min, -85) (9788) (38.12%)
[-85, -75) (7908) (30.8%)
[-75, -65) (4612) (17.96%)
[-65, Max] (3371) (13.13%)
Mizoram State
Ailawng
Lungleng I

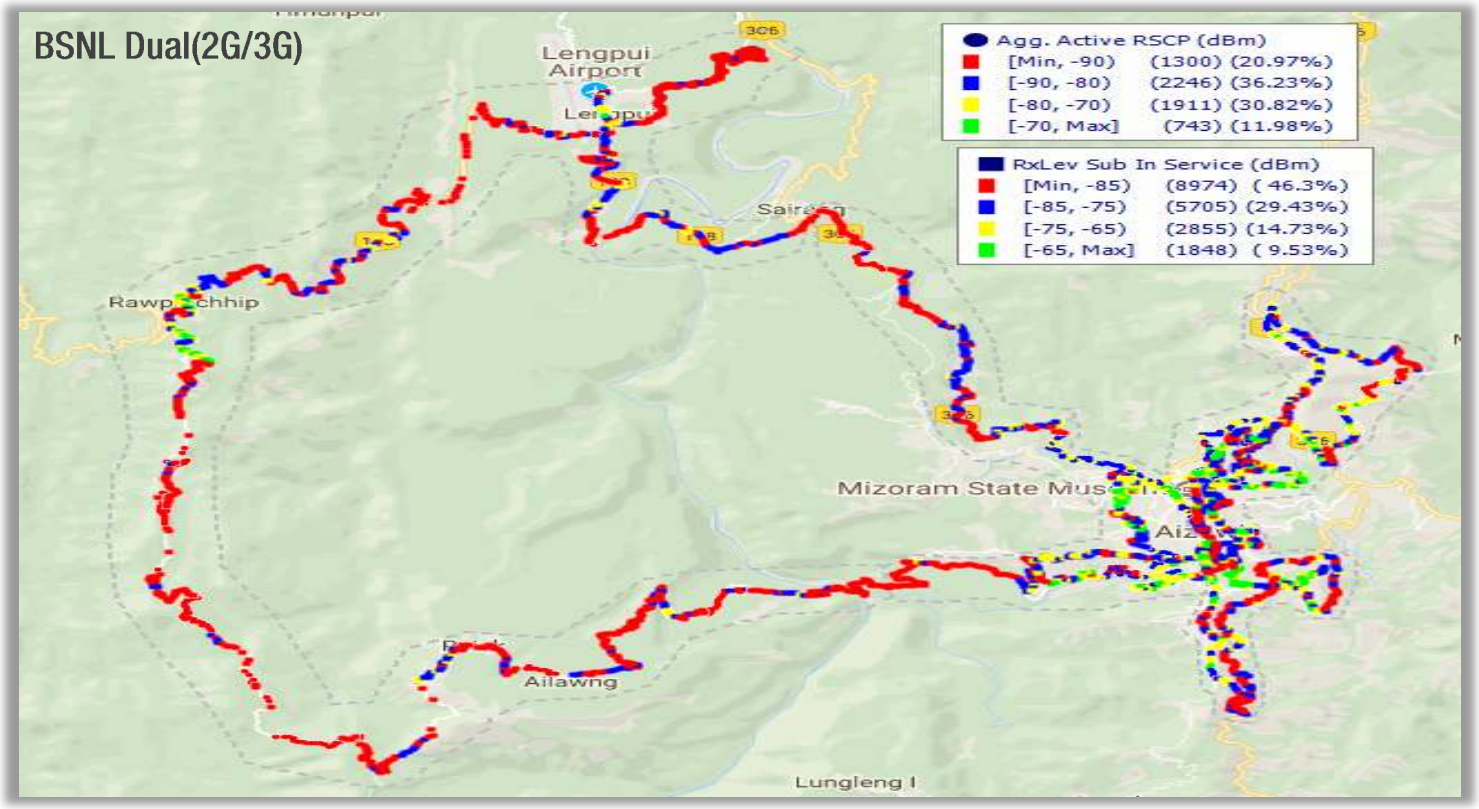

BSNL 2G
Lengpui Airport
RxLev Sub In Service (dBm)
[Min, -85) (13213) (55.14%)
[-85, -75) (5820) (24.29%)
[-75, -65) (3357) (14.01%)
[-65, Max] (1572) (6.56%)
Mizoram State
Ailawng
Lungleng I

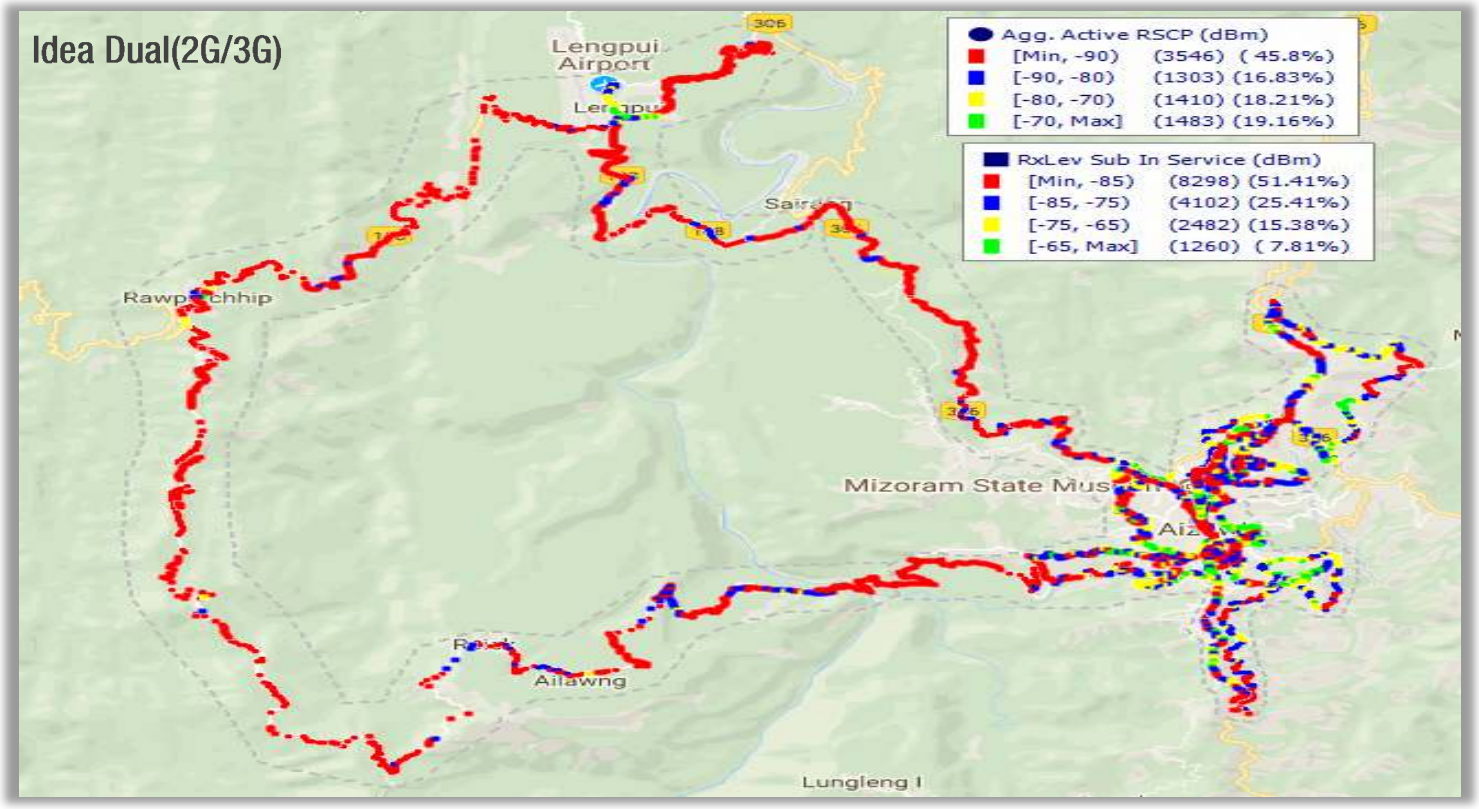

Idea 2G
Lengpui Airport
Sairang
Rawpuichhip
Mizoram State Mus
Aizawl
Ailawng
Lungleng I
RxLev Sub In Service (dBm)
[Min, -85) (13895) (57.36%)
[-85, -75) (5378) (22.2%)
[-75, -65) (3419) (14.11%)
[-65, Max] (1531) (6.32%)

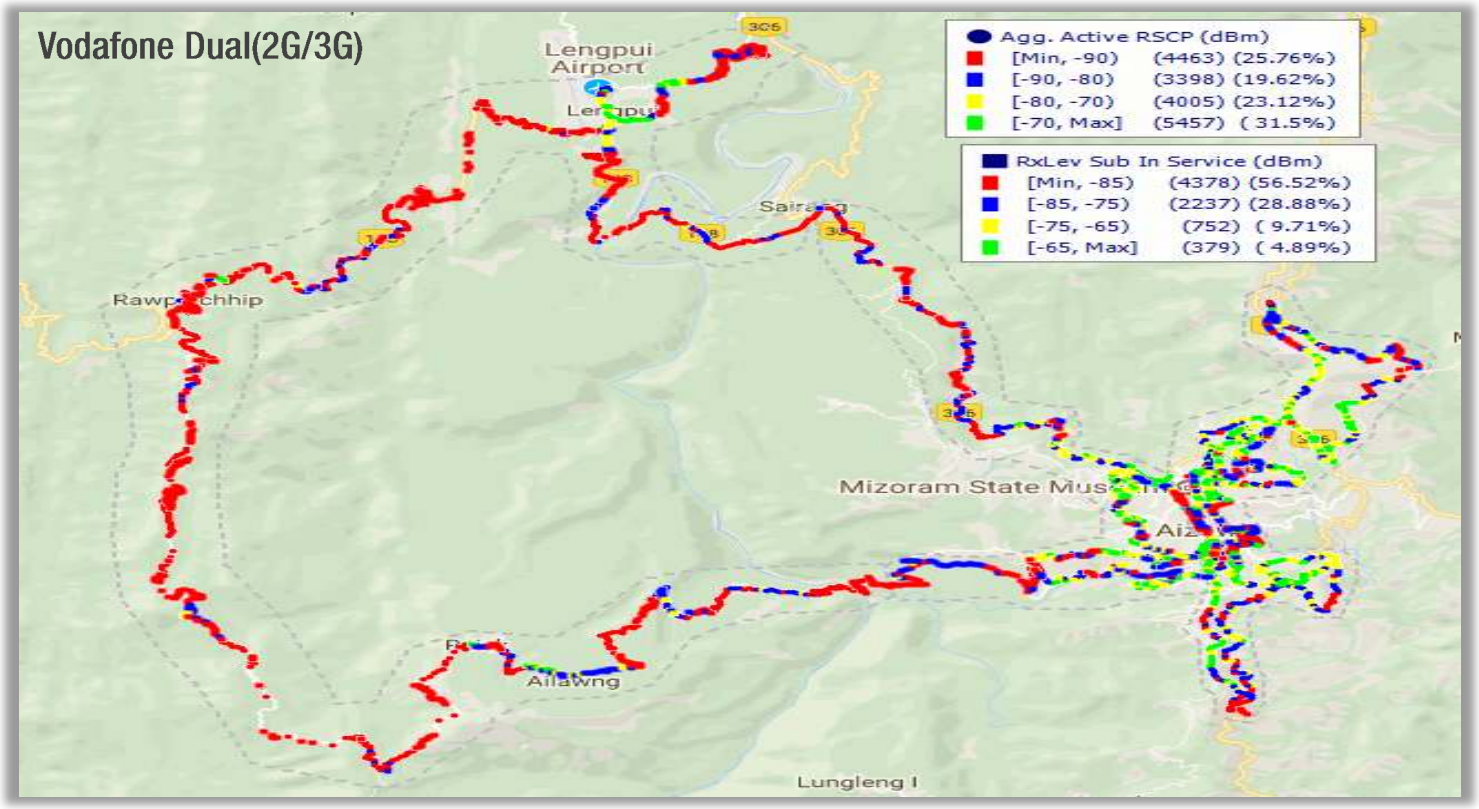

Vodafone 2G
Lengpui Airport
Sairang
Rawpuichhip
Mizoram State Mus
Aizawl
Ailawng
Lungleng I
RxLev Sub In Service (dBm)
[Min, -85) (9991) (41.32%)
[-85, -75) (5846) (24.18%)
[-75, -65) (4357) (18.02%)
[-65, Max] (3985) (16.48%)

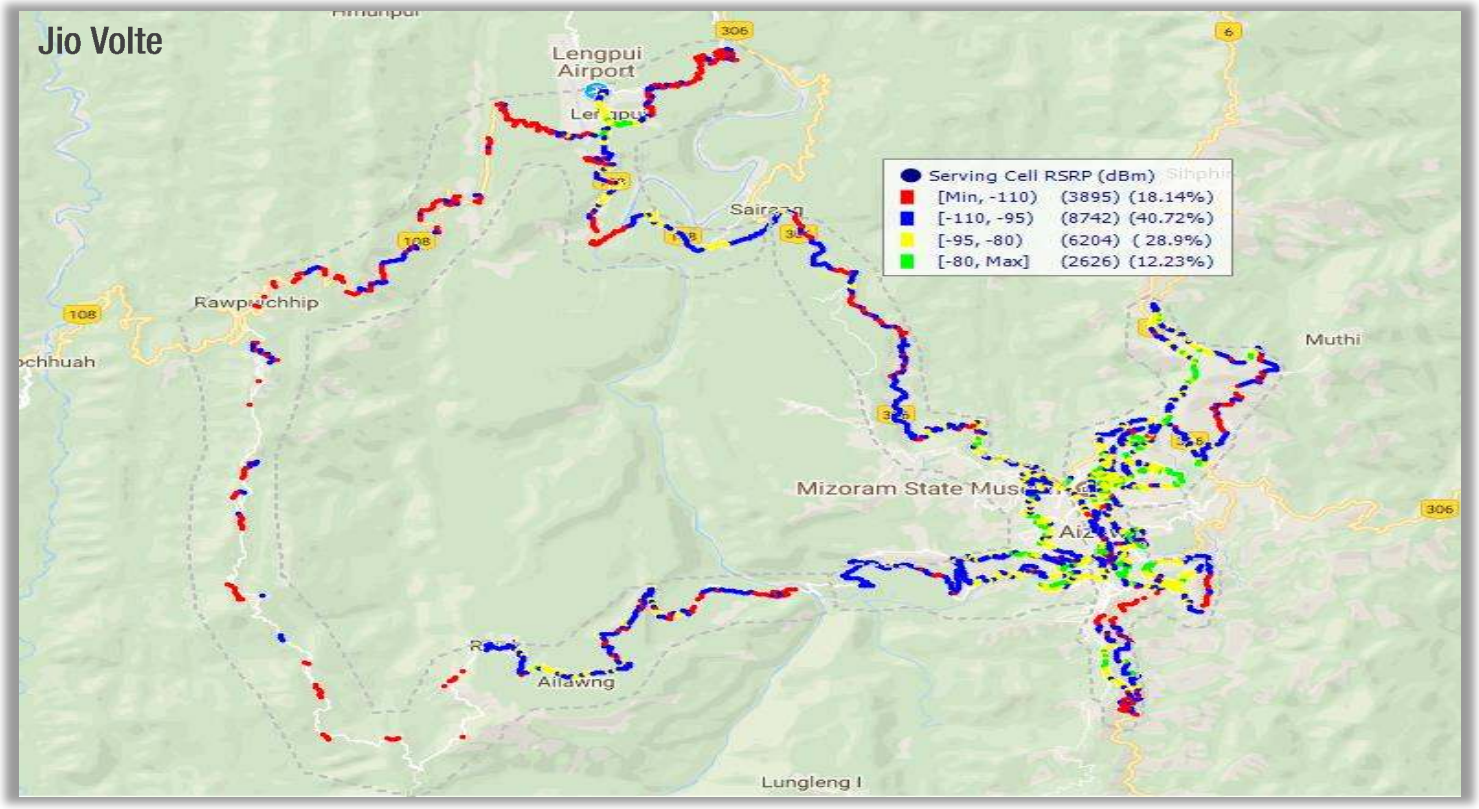

Aircel Dual(2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (3715) (41.83%)
[-90, -80) (2271) (25.57%)
[-80, -70) (1466) (16.51%)
[-70, Max] (1429) (16.09%)
RxLev Sub In Service (dBm)
[Min, -85) (7845) (49.04%)
[-85, -75) (4471) (27.95%)
[-75, -65) (2403) (15.02%)
[-65, Max] (1278) (7.99%)
Lengpui Airport
Mizoram State
Ailawng
Lungleng I


Airtel Dual(2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (8121) (39.87%)
[-90, -80) (5449) (26.75%)
[-80, -70) (3661) (17.98%)
[-70, Max] (3136) (15.4%)
RxLev Sub In Service (dBm)
[Min, -85) (3096) (79.45%)
[-85, -75) (580) (14.88%)
[-75, -65) (168) (4.31%)
[-65, Max] (53) (1.36%)
Lengpui Airport
Mizoram State
Ailawng
Lungleng I


BSNL Dual(2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (1300) (20.97%)
[-90, -80) (2246) (36.23%)
[-80, -70) (1911) (30.82%)
[-70, Max] (743) (11.98%)
RxLev Sub In Service (dBm)
[Min, -85) (8974) (46.3%)
[-85, -75) (5705) (29.43%)
[-75, -65) (2855) (14.73%)
[-65, Max] (1848) (9.53%)
Lengpui Airport
Ailawng
Lungleng I


Idea Dual(2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (3546) (45.8%)
[-90, -80) (1303) (16.83%)
[-80, -70) (1410) (18.21%)
[-70, Max] (1483) (19.16%)
RxLev Sub In Service (dBm)
[Min, -85) (8298) (51.41%)
[-85, -75) (4102) (25.41%)
[-75, -65) (2482) (15.38%)
[-65, Max] (1260) (7.81%)
Lengpui Airport
Ailawng
Lungleng I


Vodafone Dual(2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (4463) (25.76%)
[-90, -80) (3398) (19.62%)
[-80, -70) (4005) (23.12%)
[-70, Max] (5457) (31.5%)
RxLev Sub In Service (dBm)
[Min, -85) (4378) (56.52%)
[-85, -75) (2237) (28.88%)
[-75, -65) (752) (9.71%)
[-65, Max] (379) (4.89%)
Lengpui Airport
Ailawng
Lungleng I

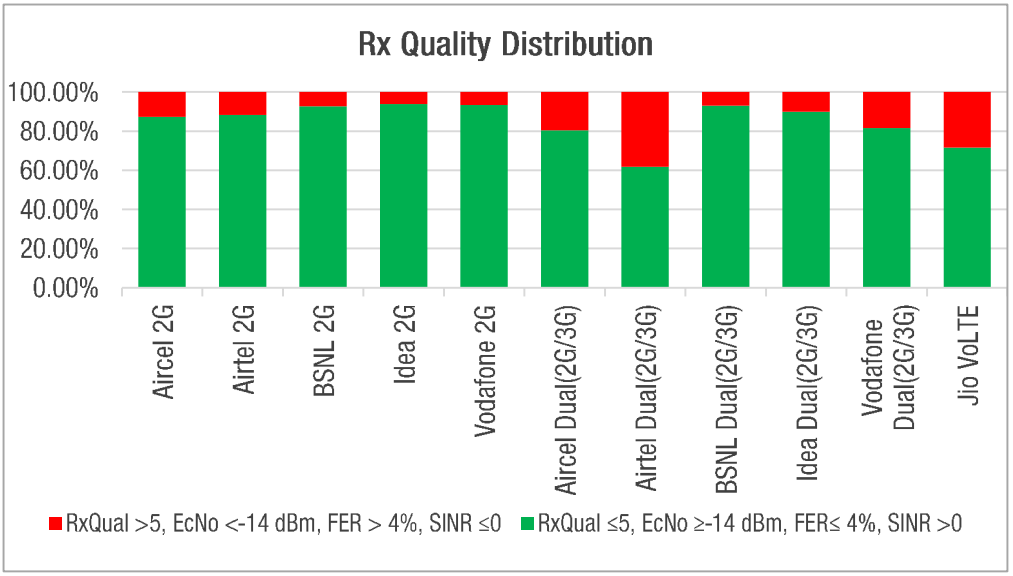

Jio Volte
Serving Cell RSRP (dBm)
[Min, -110) (3895) (18.14%)
[-110, -95) (8742) (40.72%)
[-95, -80) (6204) (28.9%)
[-80, Max] (2626) (12.23%)
Lengpui Airport
Muthi
Ailawng
Lungleng I

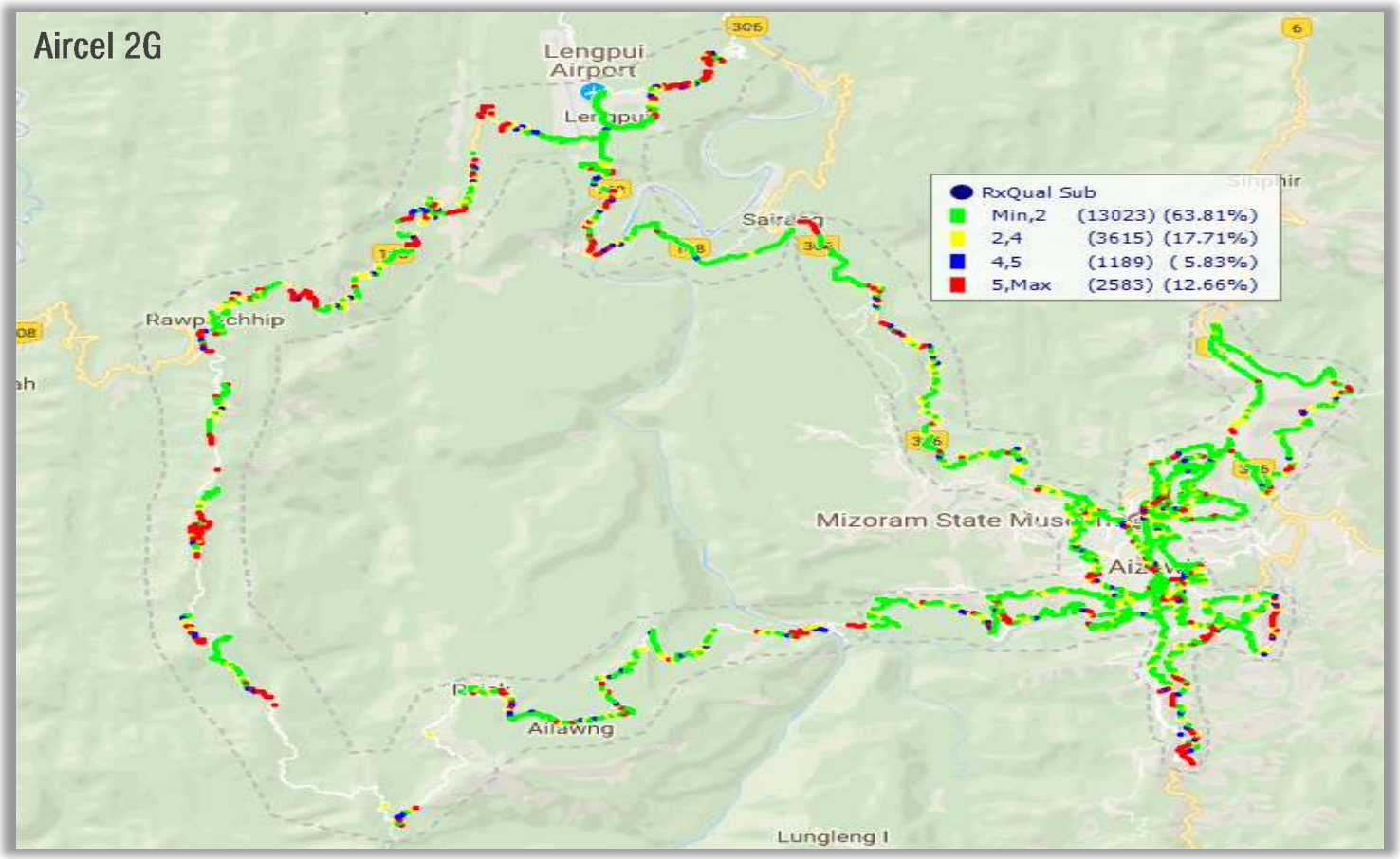
II. Quality Details

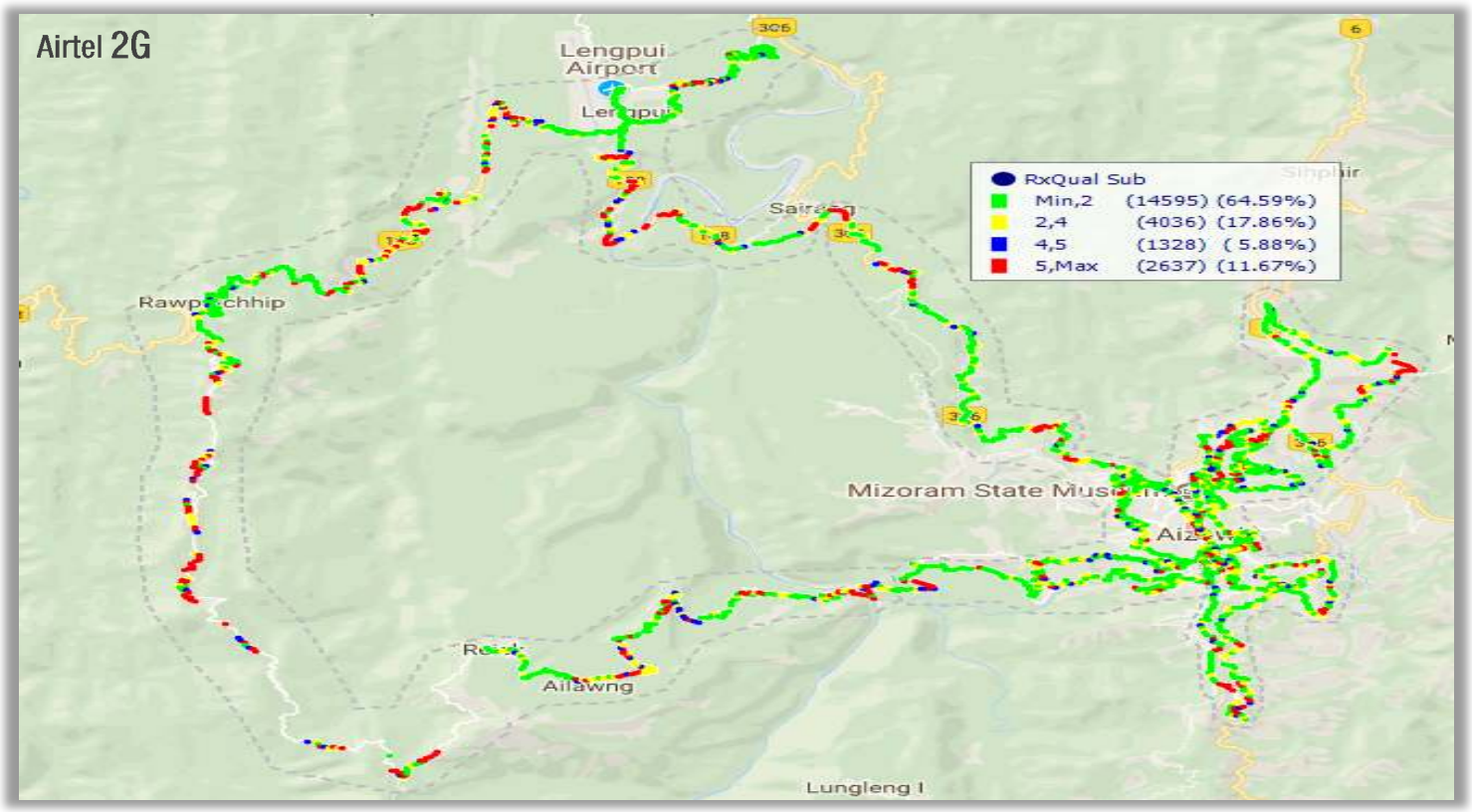
For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -14 dBm for 3G TSPs, FER <=4% for CDMA TSPs and SINR >0 in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be ≥ 95%.

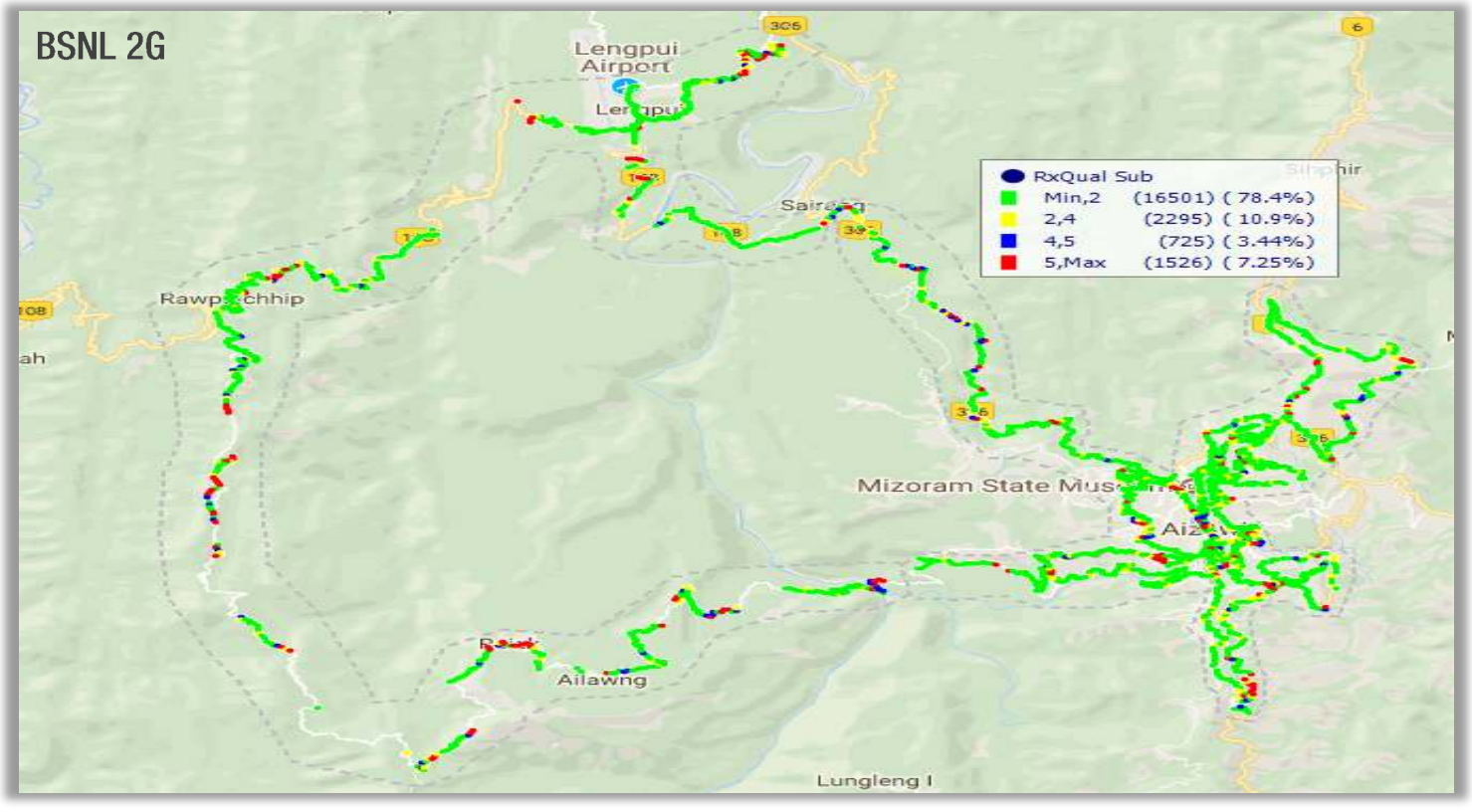
TSP	Rx Quality
Aircel 2G	87.34%
Airtel 2G	88.33%
BSNL 2G	92.75%
Idea 2G	93.80%
Vodafone 2G	93.34%
Aircel Dual(2G/3G)	80.36%
Airtel Dual(2G/3G)	61.80%
BSNL Dual(2G/3G)	93.10%
Idea Dual(2G/3G)	89.90%
Vodafone Dual(2G/3G)	81.51%
Jio VoLTE	71.66%

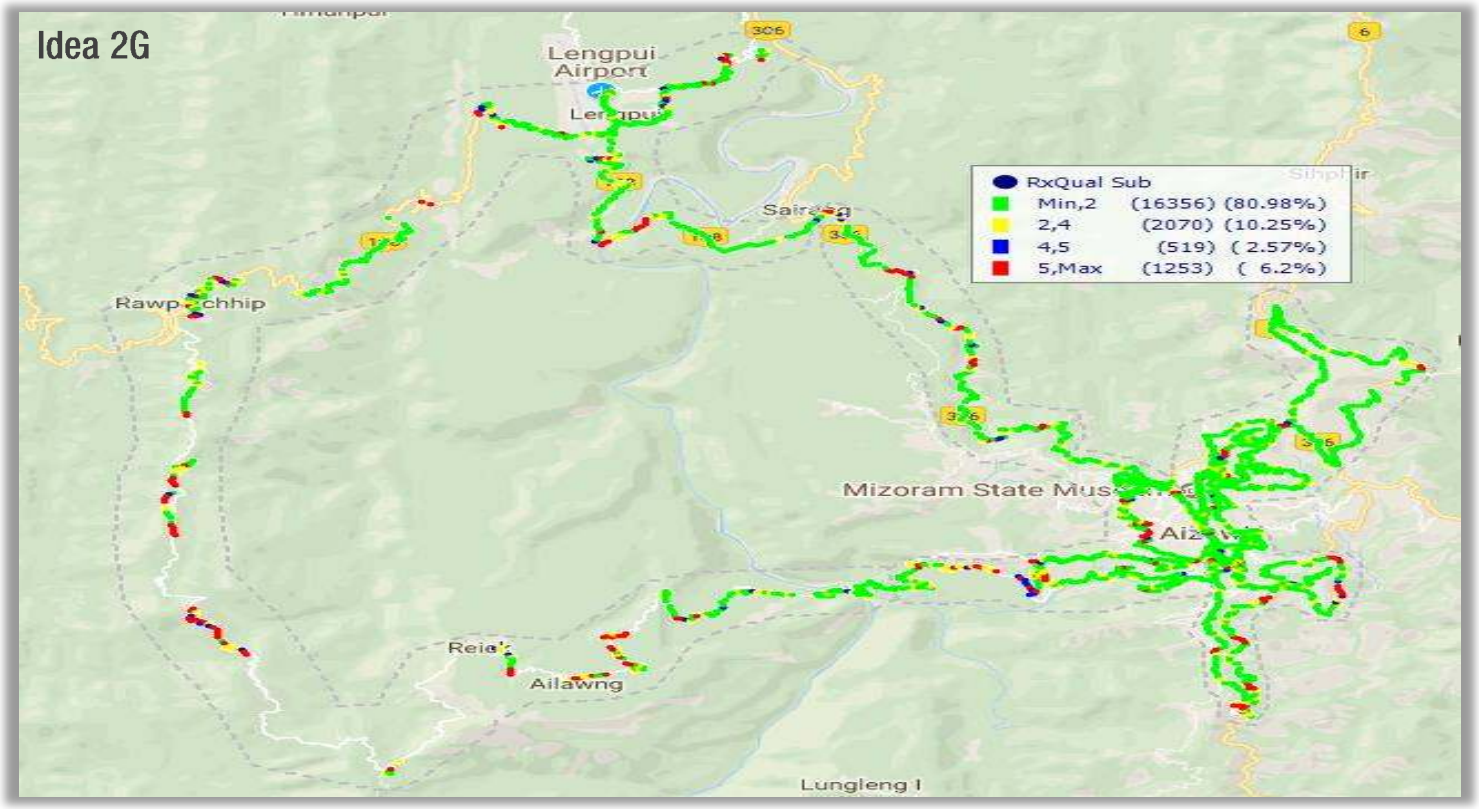
TSPs not meeting the benchmark

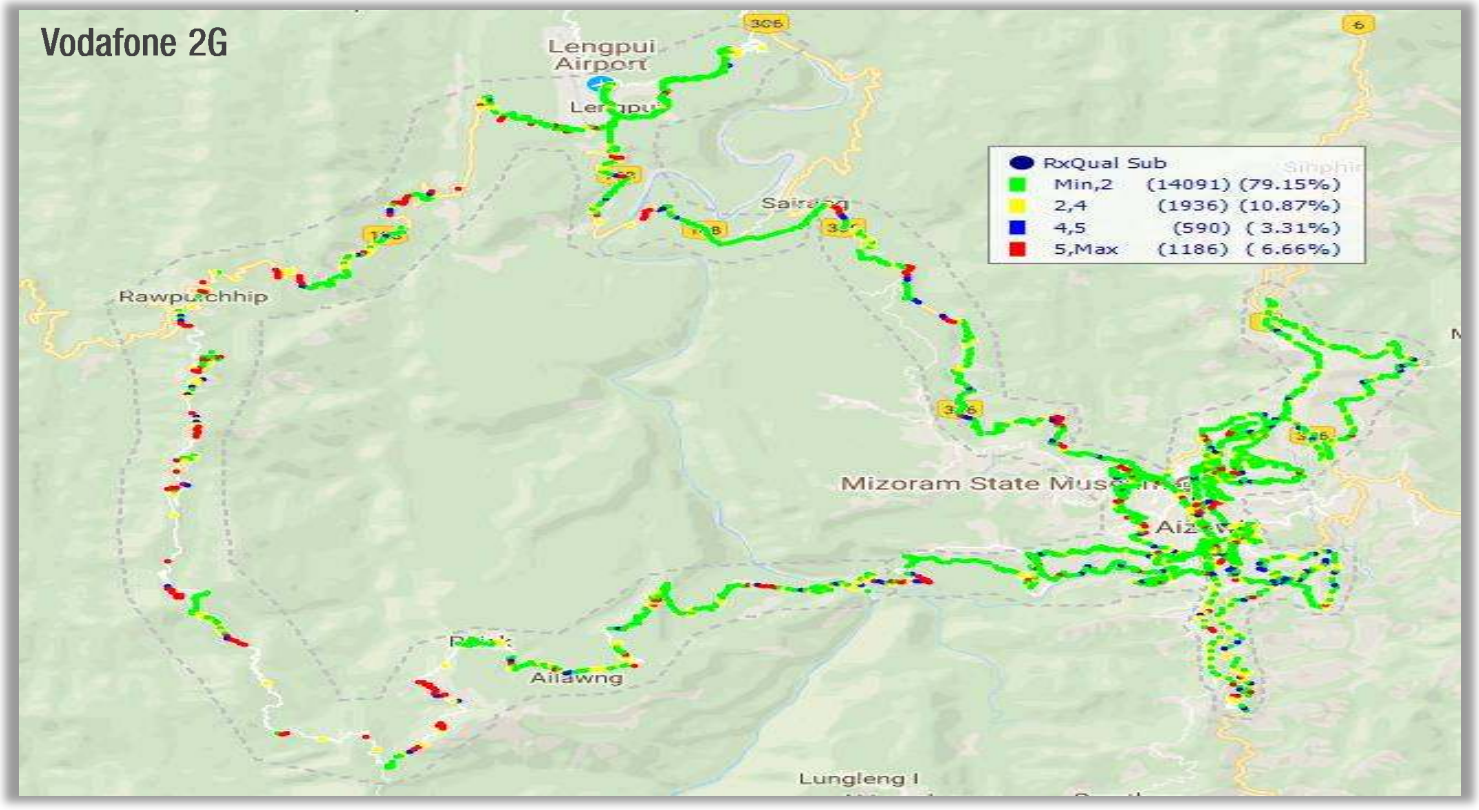


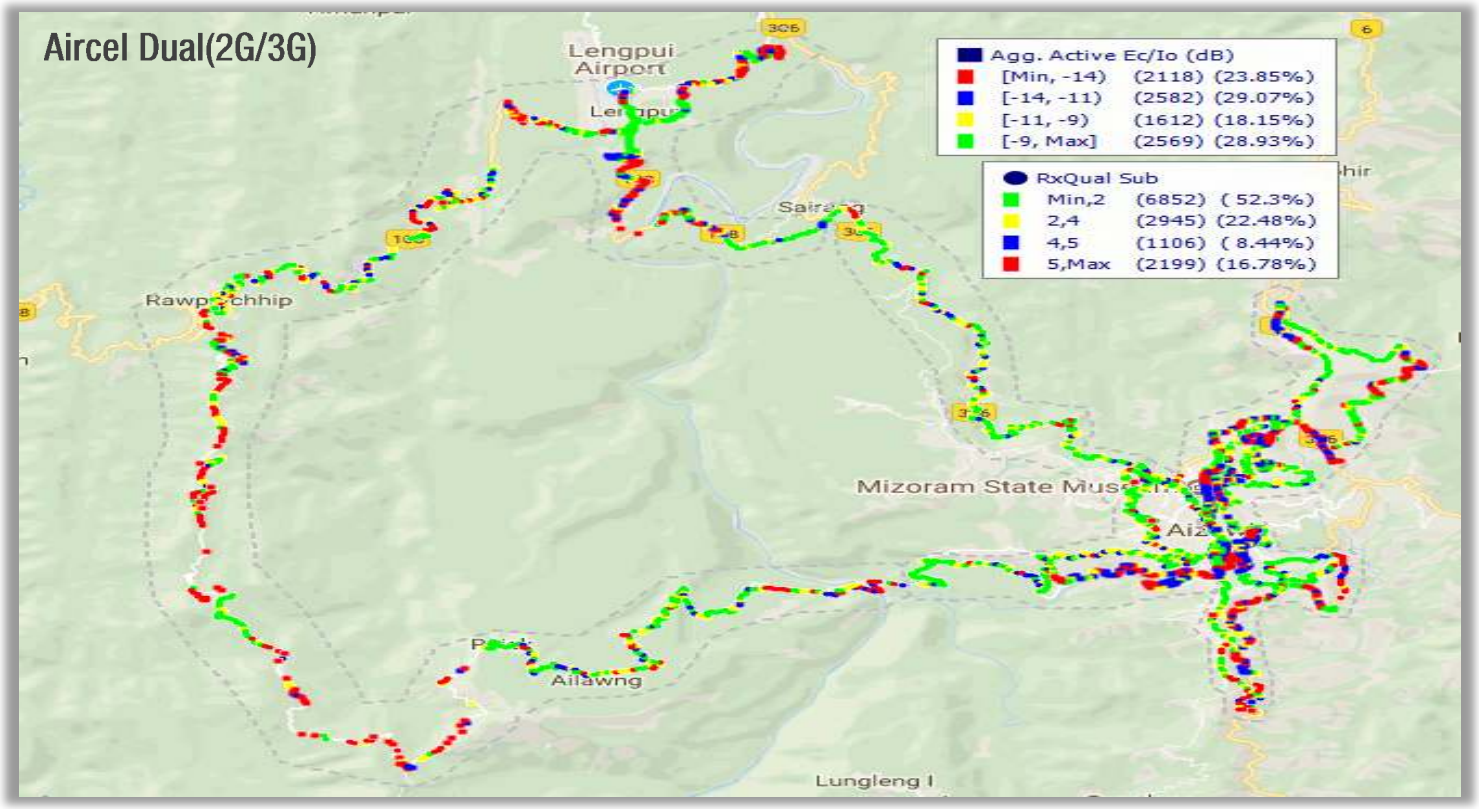


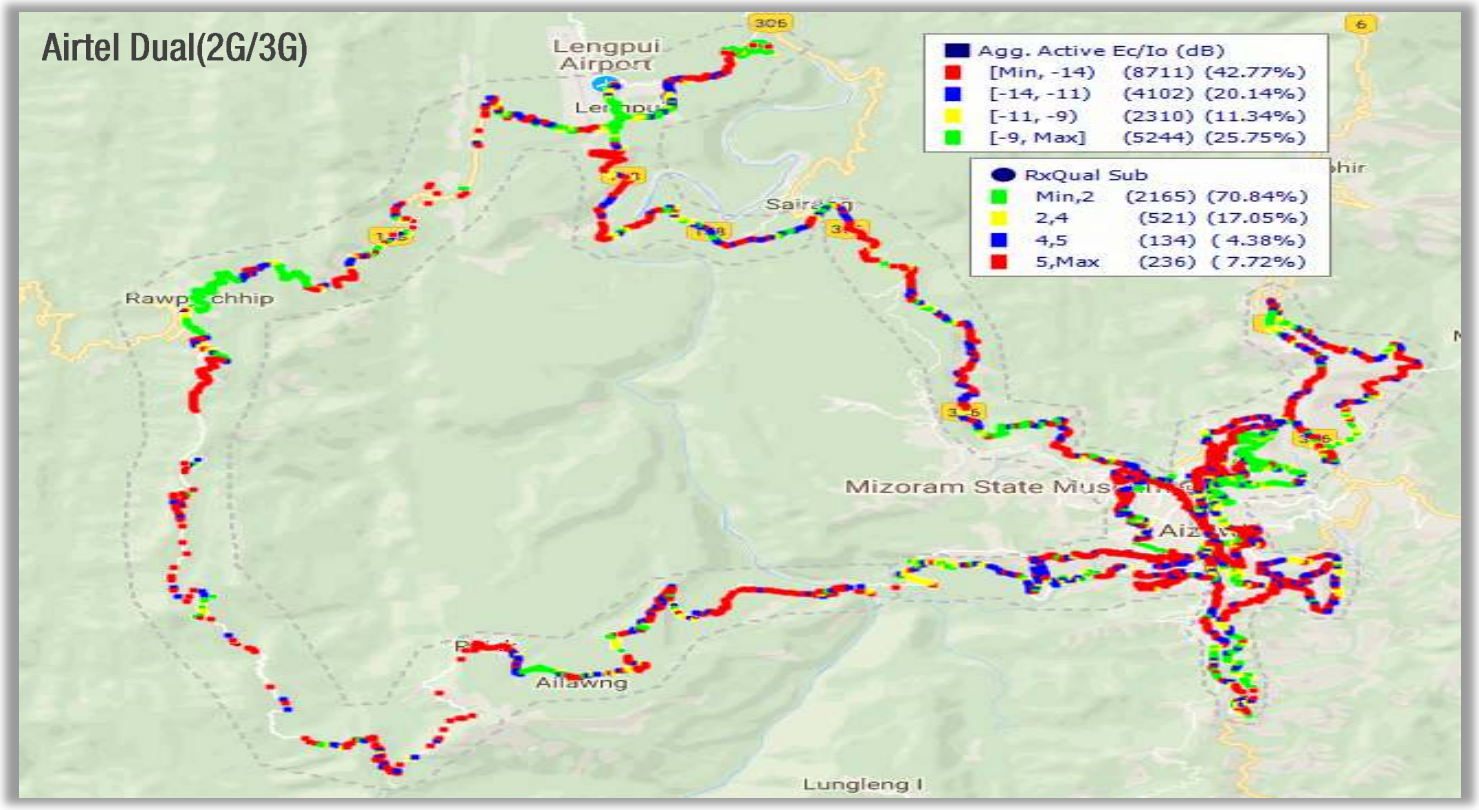

Airtel 2G
Lengpui Airport
RxQual Sub
Min,2 (14595) (64.59%)
2,4 (4036) (17.86%)
4,5 (1328) (5.88%)
5,Max (2637) (11.67%)
Mizoram State
Ailawng
Lungleng I

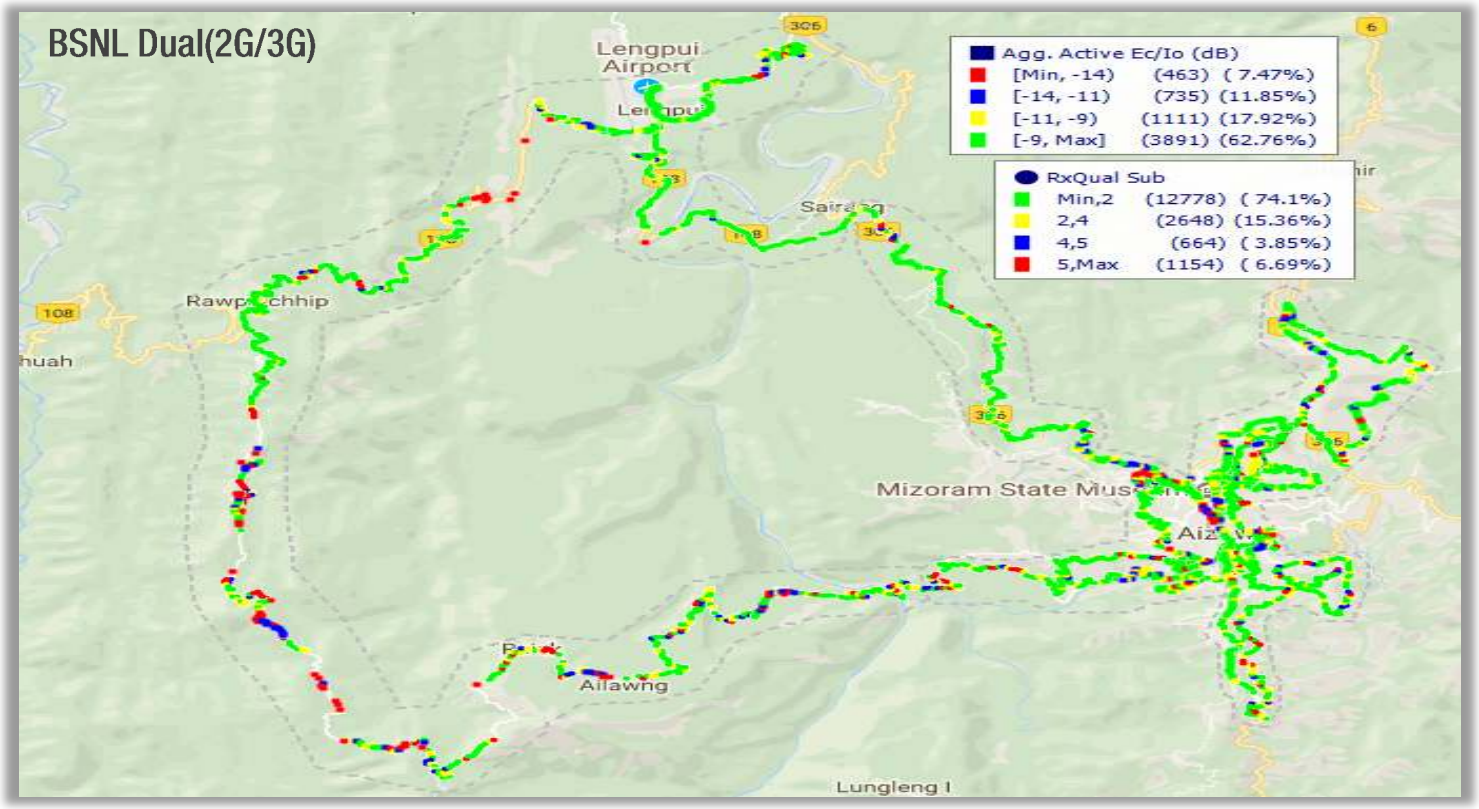

BSNL 2G
Lengpui Airport
RxQual Sub
Min,2 (16501) (78.4%)
2,4 (2295) (10.9%)
4,5 (725) (3.44%)
5,Max (1526) (7.25%)
Mizoram State
Ailawng
Lungleng I

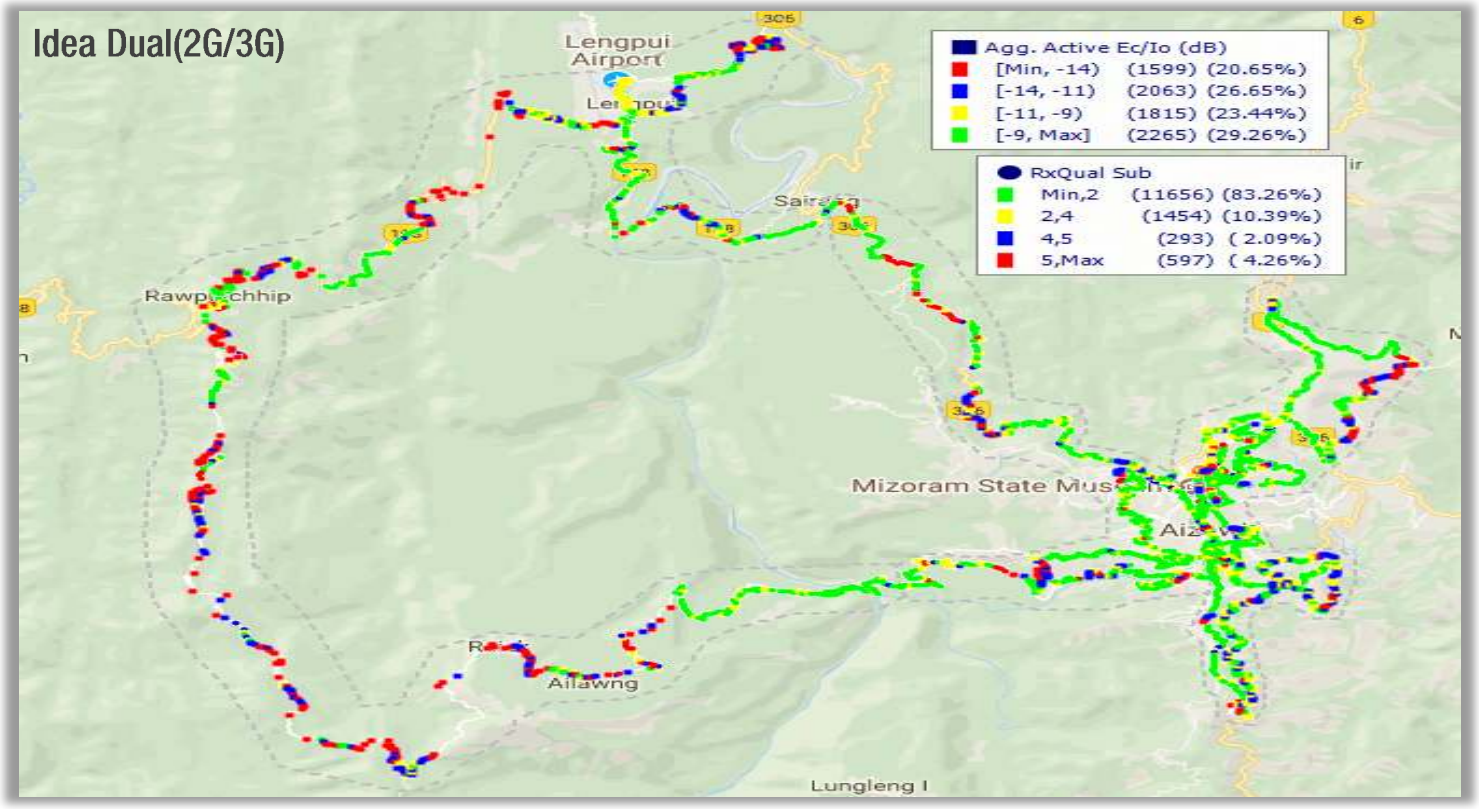

Idea 2G
Lengpui Airport
Sairang
Rawpuichhip
Mizoram State Mus
Aizawl
Ailawng
Lungleng I
RxQual Sub
Min,2 (16356) (80.98%)
2,4 (2070) (10.25%)
4,5 (519) (2.57%)
5,Max (1253) (6.2%)

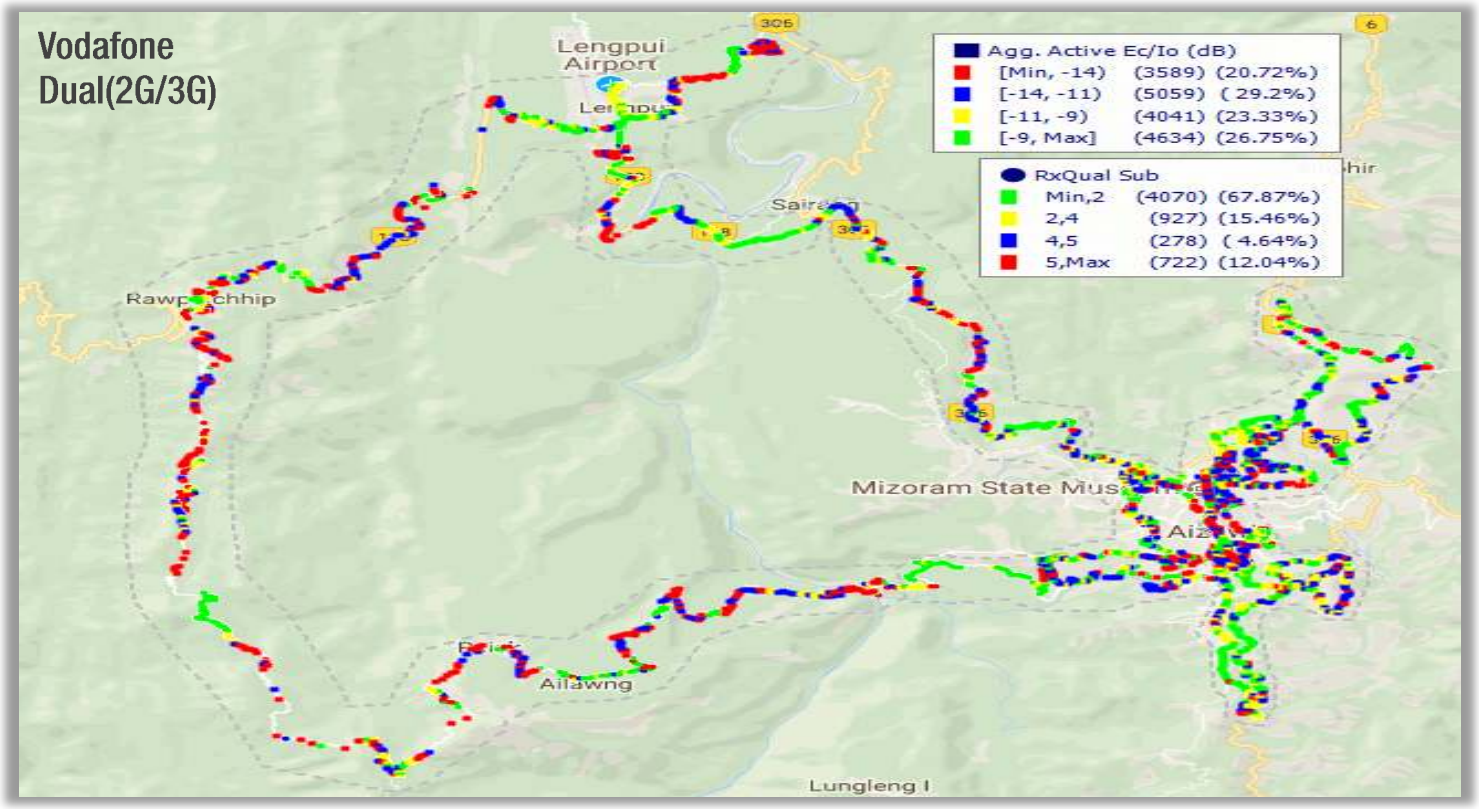

Vodafone 2G
Lengpui Airport
Sairang
Rawpuichhip
Mizoram State Mus
Aizawl
Ailawng
Lungleng I
RxQual Sub
Min,2 (14091) (79.15%)
2,4 (1936) (10.87%)
4,5 (590) (3.31%)
5,Max (1186) (6.66%)

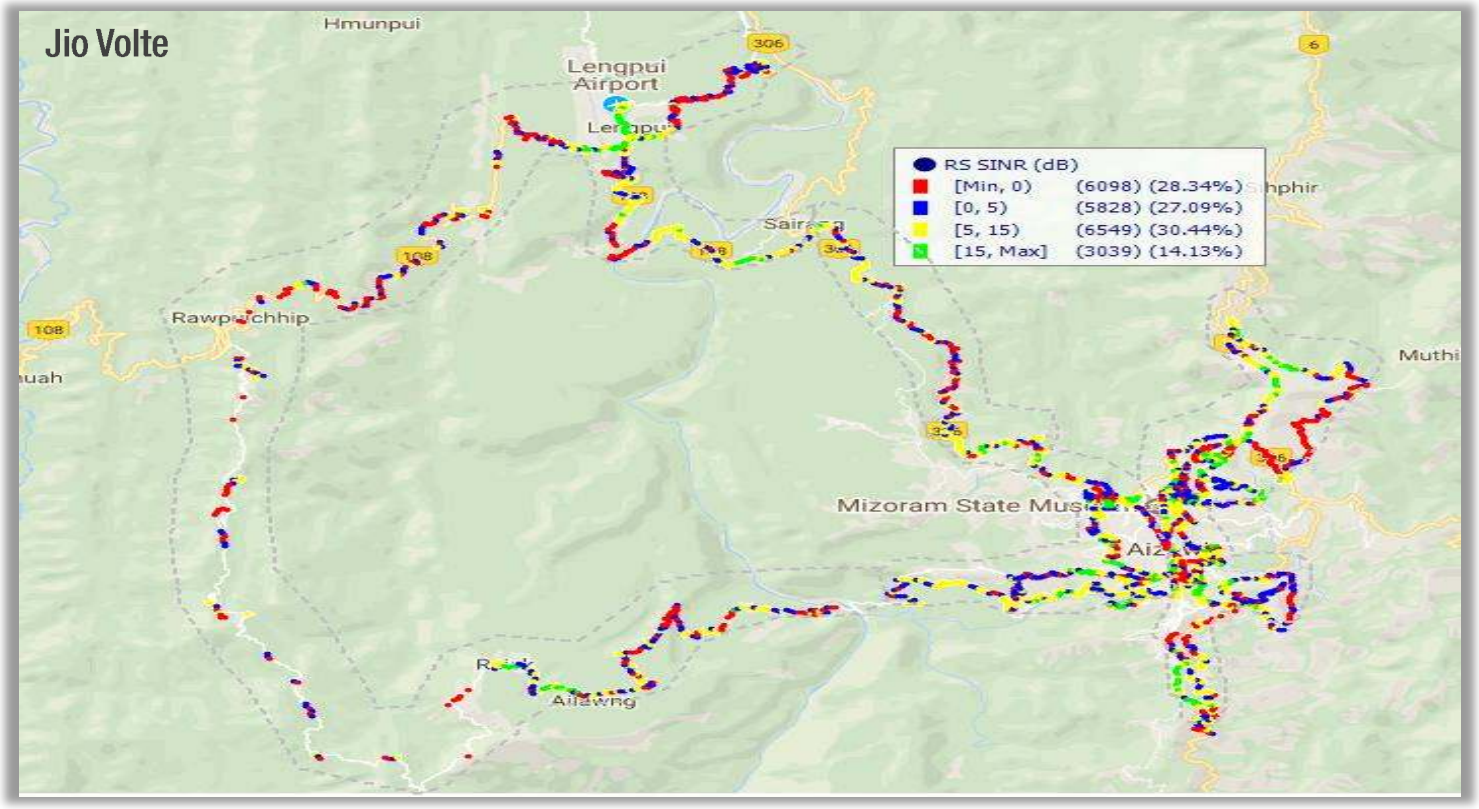

Aircel Dual(2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (2118) (23.85%)
[-14, -11) (2582) (29.07%)
[-11, -9) (1612) (18.15%)
[-9, Max] (2569) (28.93%)
RxQual Sub
Min,2 (6852) (52.3%)
2,4 (2945) (22.48%)
4,5 (1106) (8.44%)
5,Max (2199) (16.78%)
Lengpui Airport
Mizoram State
Ailawng
Lungleng I


Airtel Dual(2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (8711) (42.77%)
[-14, -11) (4102) (20.14%)
[-11, -9) (2310) (11.34%)
[-9, Max] (5244) (25.75%)
RxQual Sub
Min,2 (2165) (70.84%)
2,4 (521) (17.05%)
4,5 (134) (4.38%)
5,Max (236) (7.72%)
Lengpui Airport
Mizoram State
Ailawng
Lungleng I


BSNL Dual(2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (463) (7.47%)
[-14, -11) (735) (11.85%)
[-11, -9) (1111) (17.92%)
[-9, Max] (3891) (62.76%)
RxQual Sub
Min,2 (12778) (74.1%)
2,4 (2648) (15.36%)
4,5 (664) (3.85%)
5,Max (1154) (6.69%)
Lengpui Airport
Ailawng
Lungleng I

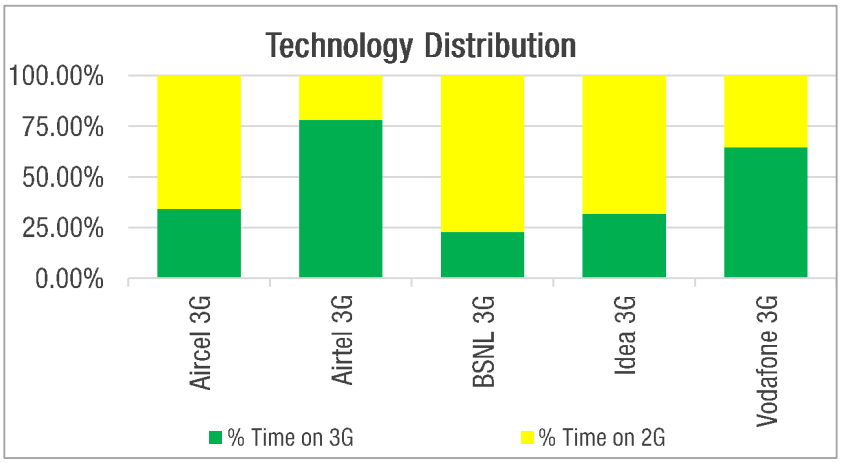

Idea Dual(2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (1599) (20.65%)
[-14, -11) (2063) (26.65%)
[-11, -9) (1815) (23.44%)
[-9, Max] (2265) (29.26%)
RxQual Sub
Min,2 (11656) (83.26%)
2,4 (1454) (10.39%)
4,5 (293) (2.09%)
5,Max (597) (4.26%)
Lengpui Airport
Ailawng
Lungleng I

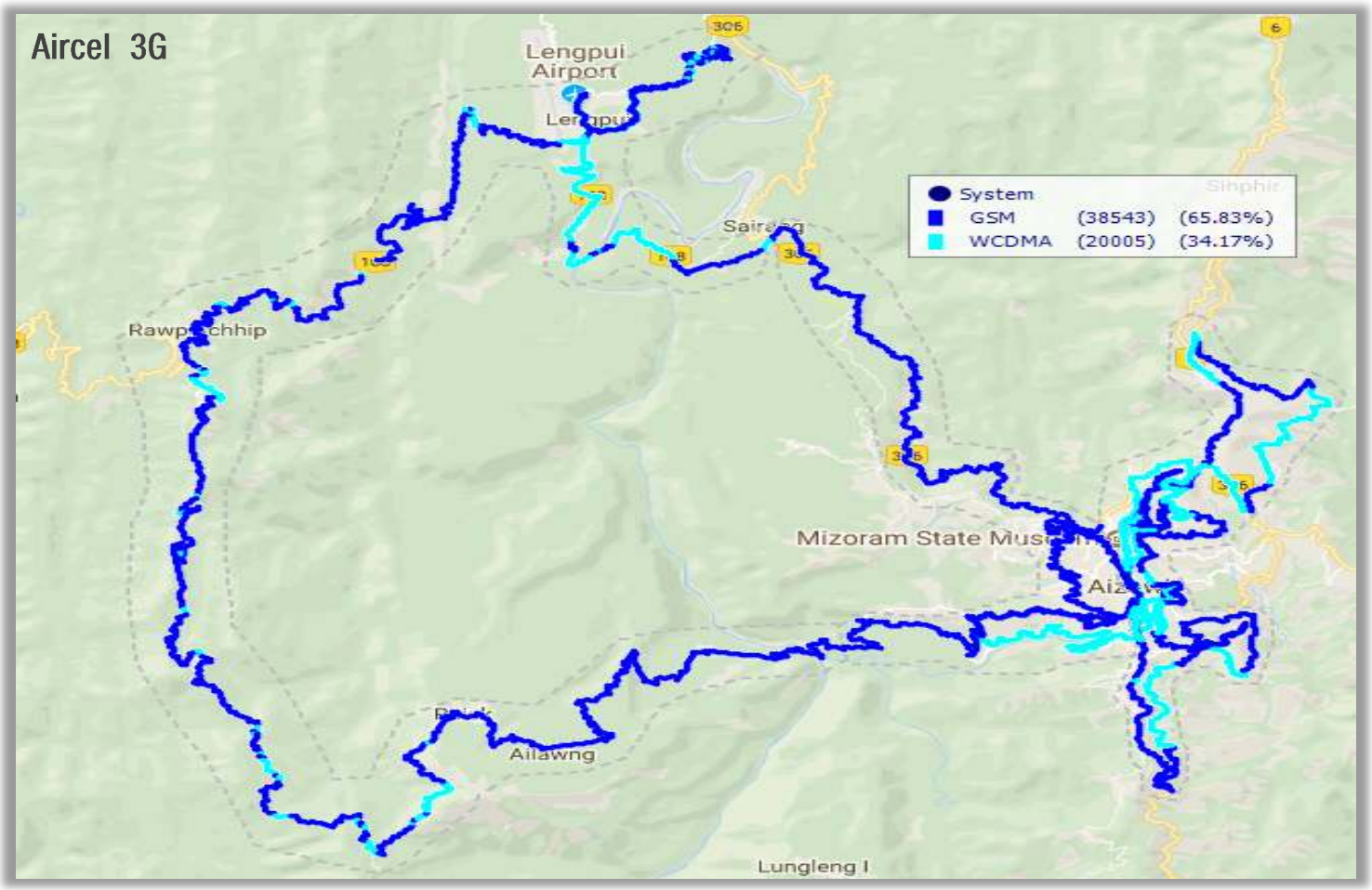

Vodafone
Dual(2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (3589) (20.72%)
[-14, -11) (5059) (29.2%)
[-11, -9) (4041) (23.33%)
[-9, Max] (4634) (26.75%)
RxQual Sub
Min,2 (4070) (67.87%)
2,4 (927) (15.46%)
4,5 (278) (4.64%)
5,Max (722) (12.04%)
Lengpui Airport
Ailawng
Lungleng I

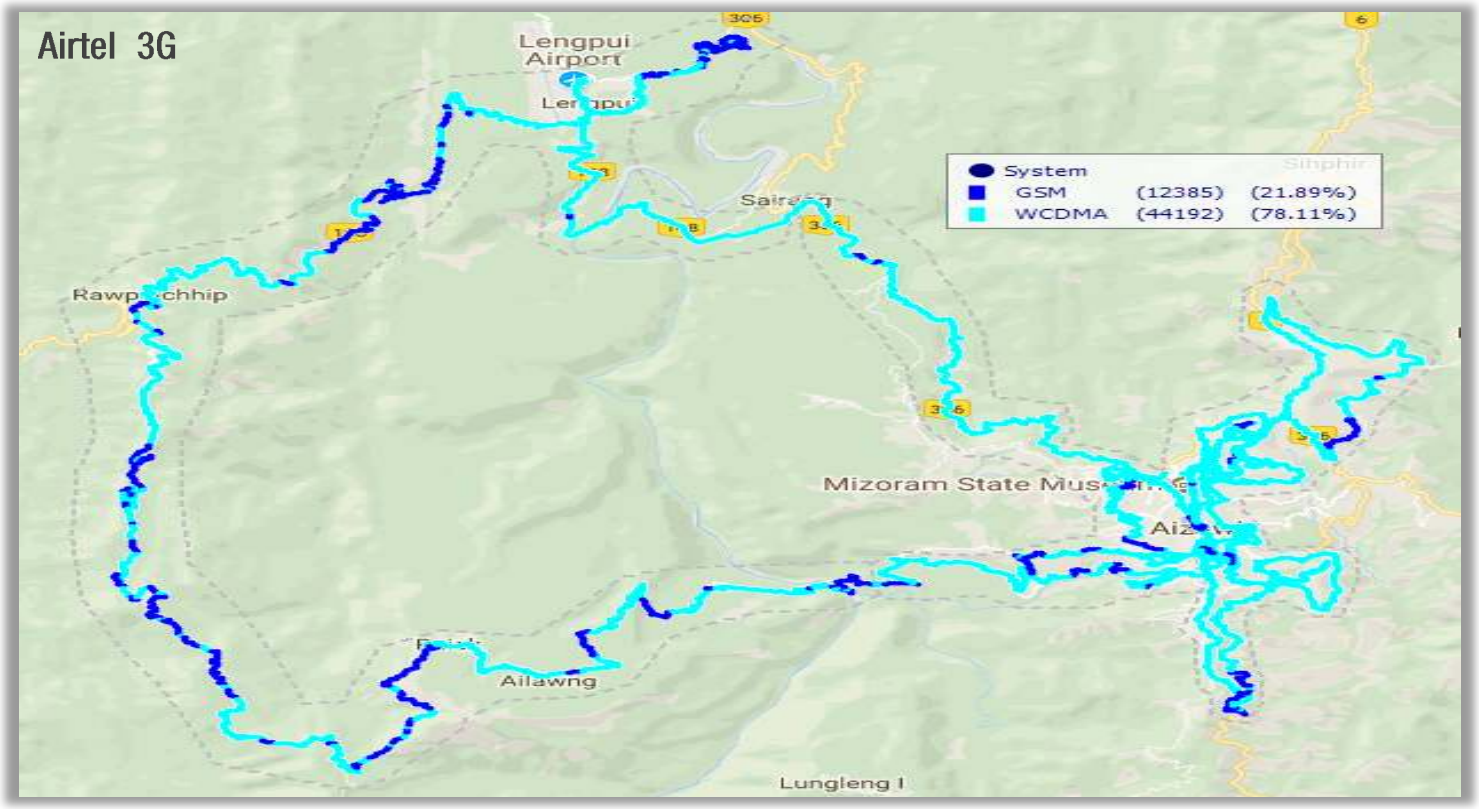

Jio Volte
Hmunpui
Lengpui Airport
RS SINR (dB)
[Min, 0) (6098) (28.34%)
[0, 5) (5828) (27.09%)
[5, 15) (6549) (30.44%)
[15, Max] (3039) (14.13%)
Ailawng

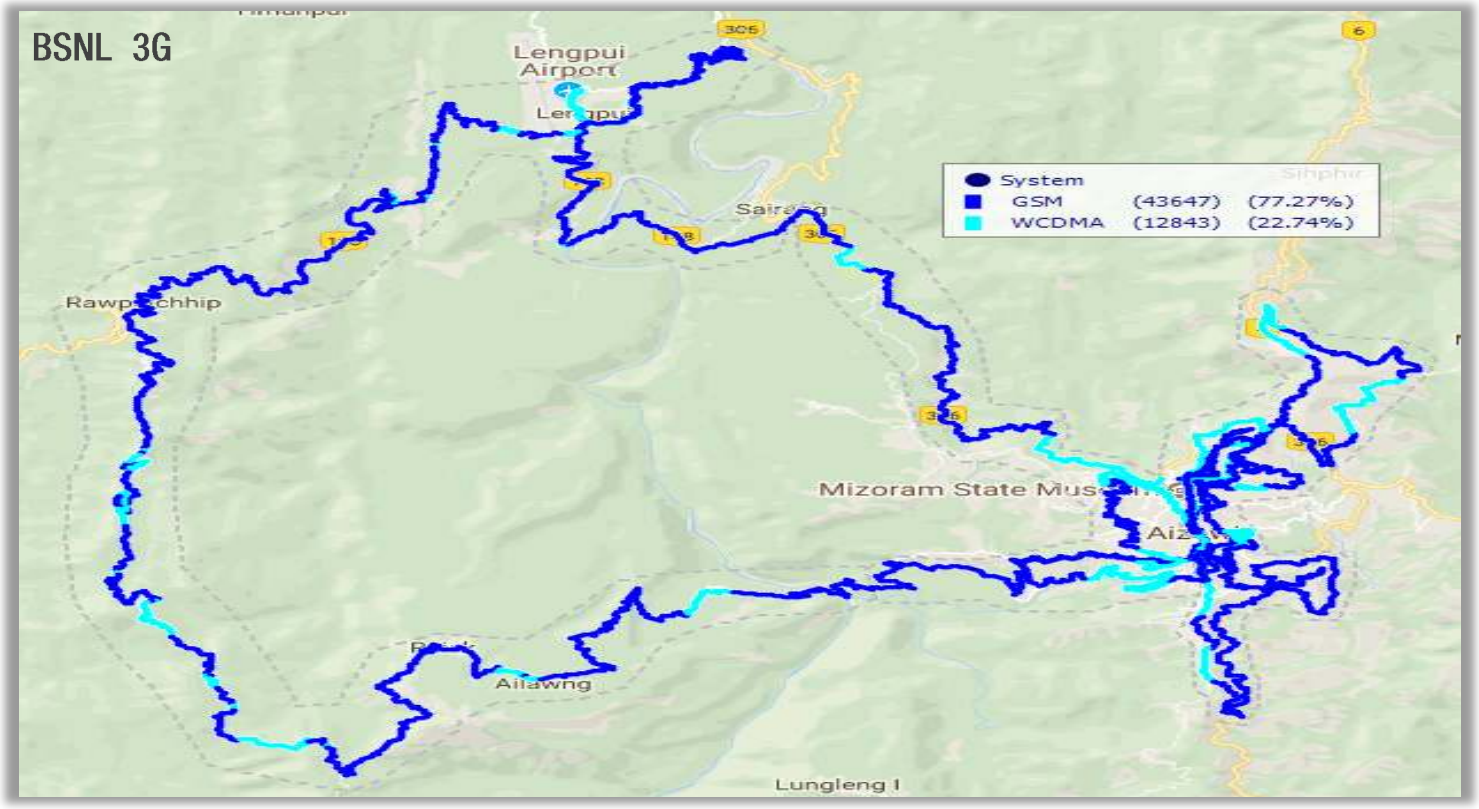
III. Technology Details

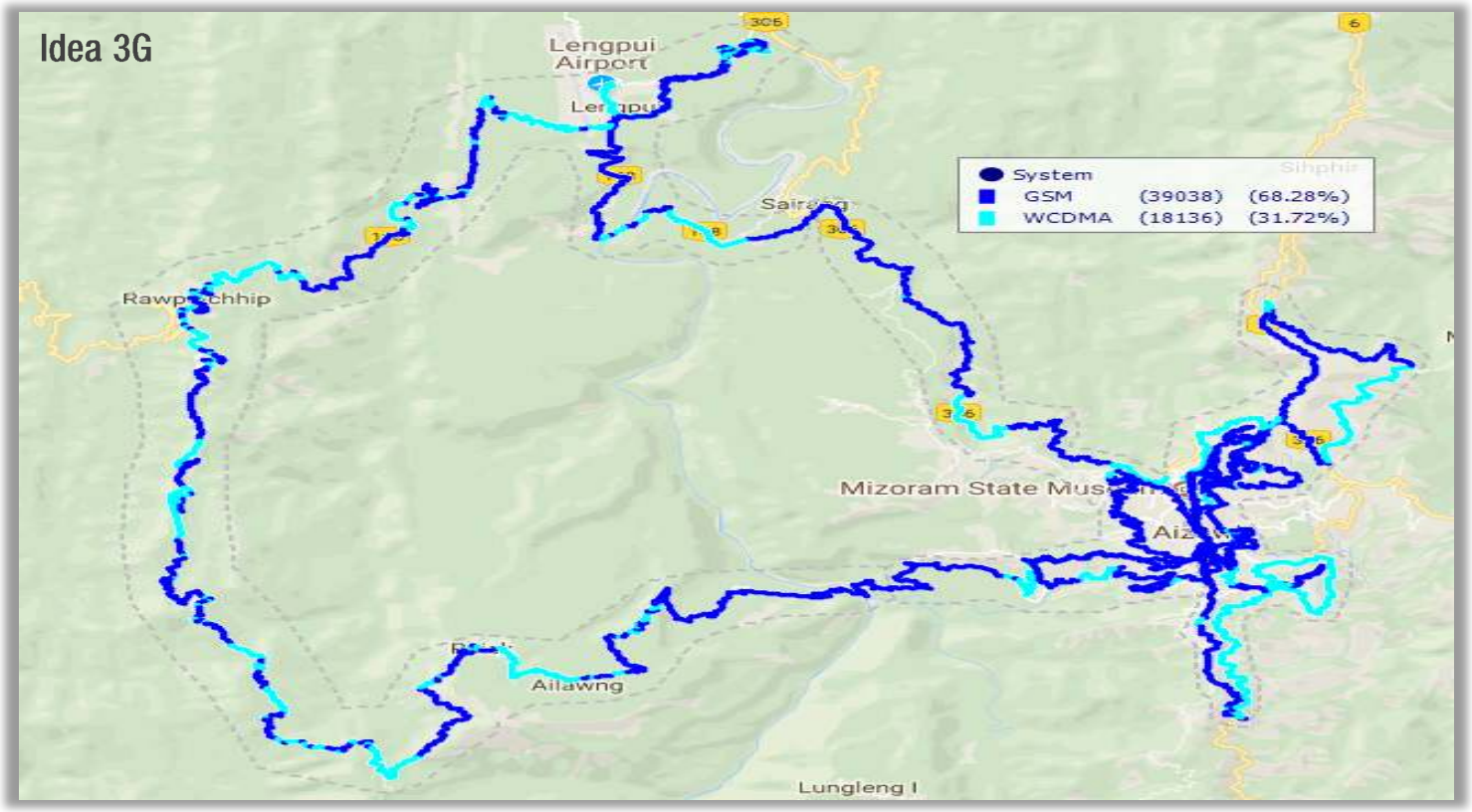
TSP	% Time on 3G
Aircel 3G	34.17%
Airtel 3G	78.11%
BSNL 3G	22.74%
Idea 3G	31.72%
Vodafone 3G	64.57%

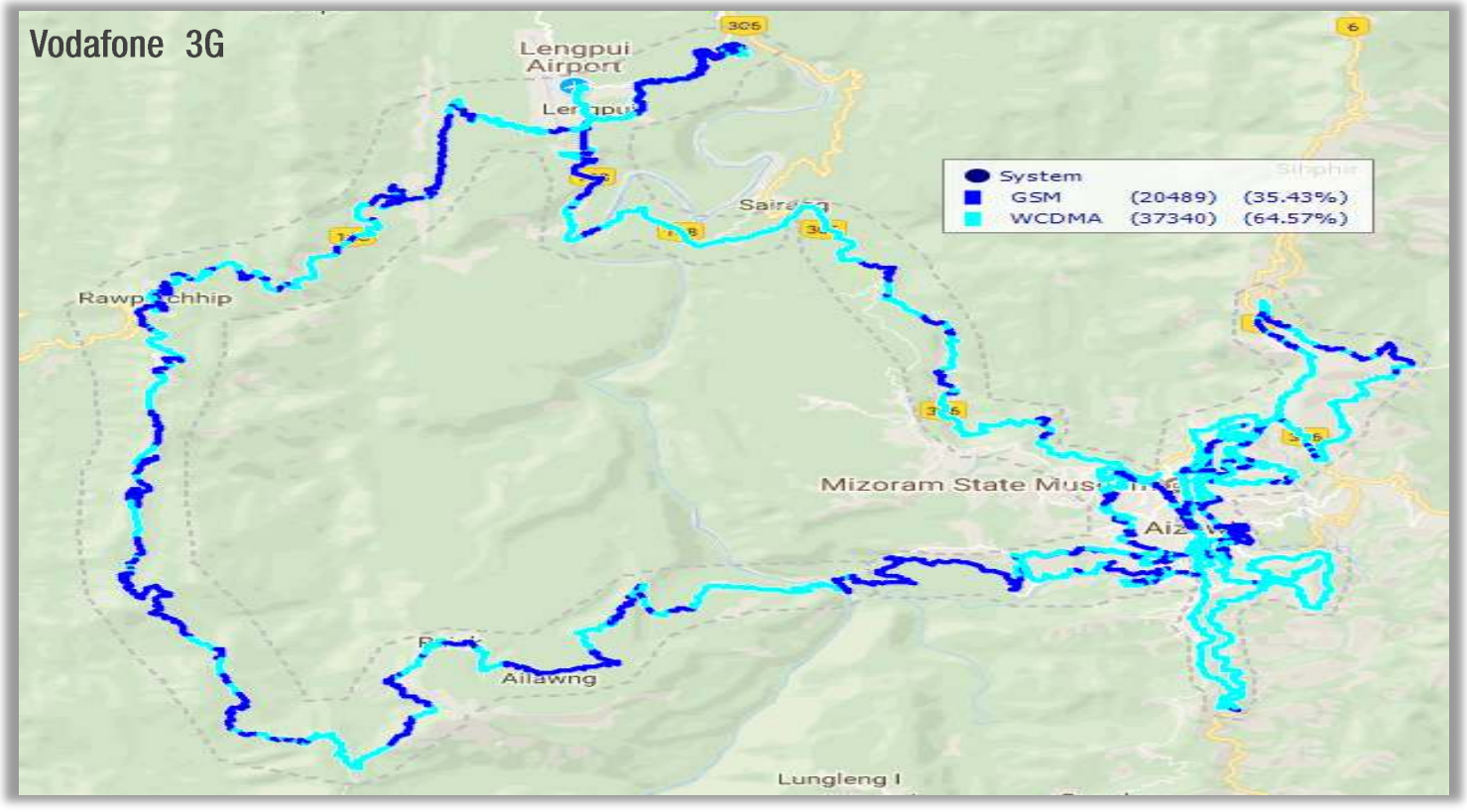





Airtel 3G
Lengpui Airport
System
GSM (12385) (21.89%)
WCDMA (44192) (78.11%)
Mizoram State
Ailawng
Lungleng I


BSNL 3G
Lengpui Airport
System
GSM (43647) (77.27%)
WCDMA (12843) (22.74%)
Mizoram State
Ailawng
Lungleng I


Idea 3G
Lengpui Airport
System
GSM (39038) (68.28%)
WCDMA (18136) (31.72%)
Rawpuichhip
Mizoram State Mus
Ailawng
Lungleng I


Vodafone 3G
Lengpui Airport
System
GSM (20489) (35.43%)
WCDMA (37340) (64.57%)
Rawpuichhip
Mizoram State Mus
Ailawng
Lungleng I