

Operator Assisted Drive Test Report

Aizawl City, Mizoram January 2023 (RO, Kolkata)

Key Performance Indicators (KPIs):

The following TSPs could not meet the KPIs benchmark as stated below—

AIRTEL- Rx Quality in 2G & 4G (SINR) network.

BSNL-Drop Call Rate in 2G & 4G network, Block Call Rate in 2G network, Hand over Success Rate (HOSR%) in 2G & 4G network and Rx Quality in 2G & 4G (SINR) network.

RJIO-Rx Quality (SINR) in 4G network.

VIL-Rx Quality in 4G (SINR) network.

The Operator Assisted Drive Test has been carried out by Regional Office, Kolkata with the help of Service Providers in Aizawl and surrounding areas including National Highway-108 on 31st January 2023 from 08.30 AM to 08.00 PM. The drive test covered drive route of 111 KMs (approx) over a period of 1 day. Approximately 190+ calls were made for each of the 8 networks: three 2G networks, one 3G network and four 4G network covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

Aizawl is the capital of the state of Mizoram in India. Aizawl was officially established on 25 February 1890. With a population of 293,416, it is the largest city in the state. It is also the centre of administration containing all the important government offices, state assembly house and civil secretariat. The population of Aizawl strongly reflects the different communities of the ethnic Mizo people.

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, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

Data: Download Throughputs and Data File Success Rate.

Voice Tests: Calls were made for 90 secs duration with wait time of 5 secs between calls in all technologies. Three 2G networks, One 3G network, Four 4G networks covering 4 unique TSPs were tested.

Data Tests: Dynamic Data Service Testing was performed along same route in all technologies. 500 KB file for 2G, 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, One 3G (Lock Mode) network, four 4G (Lock Mode) networks covering 4 unique TSPs were tested.

Service	Static Data Service Testing- Specifications
Download	2G (Locked) - 500KB, 3G (Locked) - 20 MB, 4G (Locked) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Locked) - 5 MB, 4G (Locked) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in, www.flipkart.com and PayTm
Video Steaming	130 secs Clip
Latency	32 Bytes on www.google.com

Technology/ TSP	AIRTEL	BSNL	RJIO	VODAFONE-IDEA
2G	YES	YES	NO	YES
3G	NO	No	NO	YES
4G	YES	YES	YES	YES
TOOL USED	TEMS	NIMO	X-CAL	TEMS

Overview

Voice & Dynamic Data Test Drive Route



DRIVE ROUTES OF AIZAWL

DAY-1—Lengpui Airport-Sihmui-Lungverh-Hunter-Chatlang-Aizwal Civil Hospital-Mizoram University-Helipad No. 1—Kendriya Vidyalaya, Mizoram University-Tanhril Road, Tuivamit-FCI, FSD Aizawl-Solomon Temple-Chawlhmun Venglai- Msi Dawr-Chawnpui Veng-Hotel Floria, Bara Bazar-Hotel Regency-Chandmari - Laipuitlang Rd, Chaltlang-LRM Hospital-Armed Veng Post Office-Bethlehem Vengthlang Taxi Stand-Pachhunga University College-I.T.I. Veng-Salem Veng-Kulikawn-Melthum Presbyrian Church-Tlangnuam Community Hall-B.N Hospital-Model Veng taxi stand -Tlawng Road-Lawipu Veng Rd-Maubawk Presbyterian Church-Mizoram Police Headquarters.

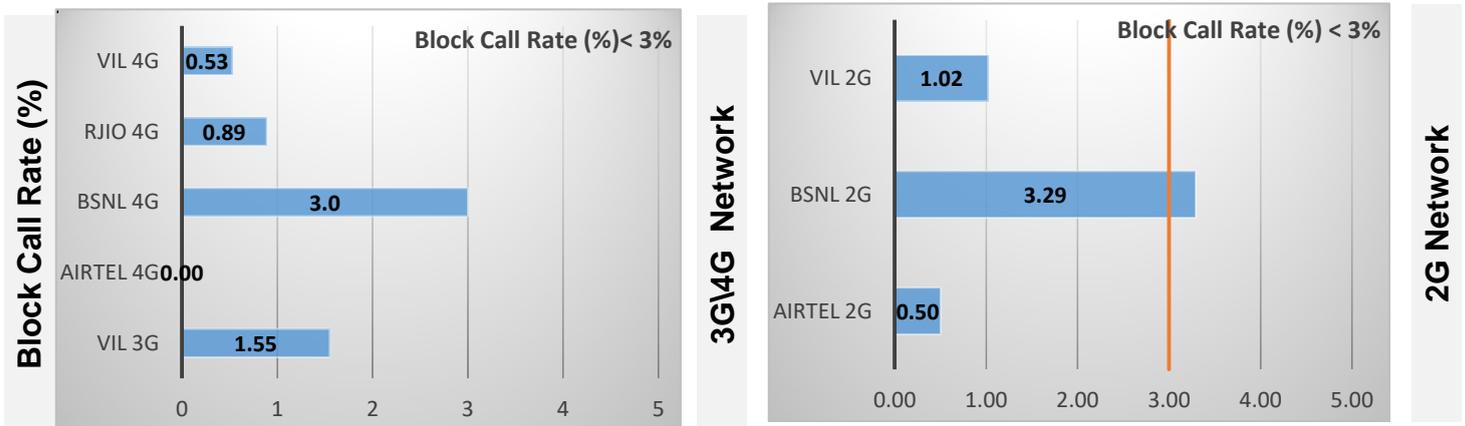
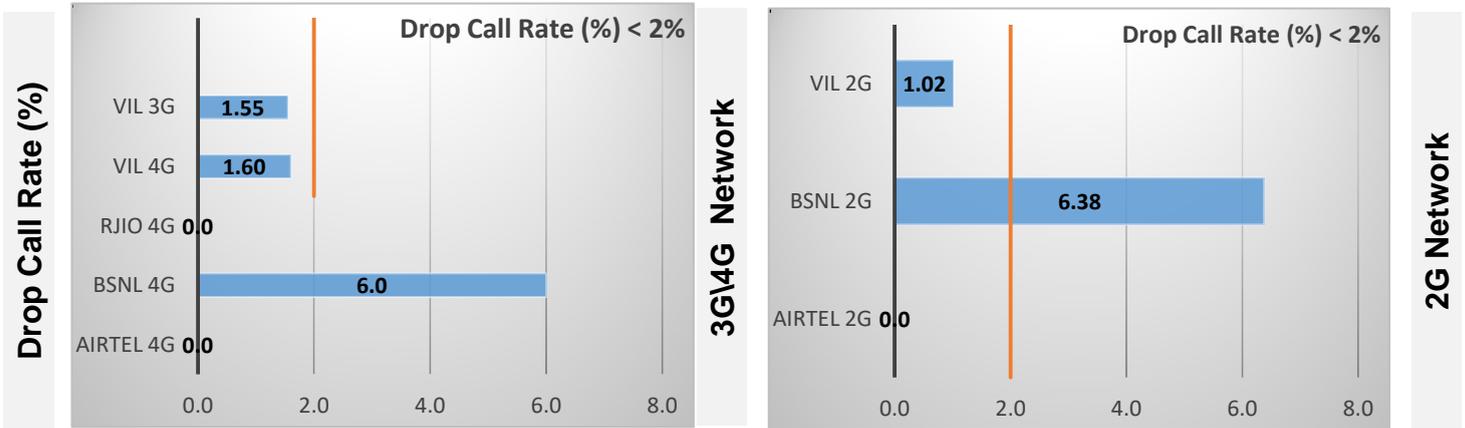
Data Service Test- Static Locations

Static Location
AIZAWL AIRPORT

Voice Calls

Key Observations

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



KPIs	2G			3G	4G-VoLTE			
	AIRTEL	BSNL	VIL	VIL	AIRTEL	BSNL	RJO	VIL
Drop Call Rate %	0.0	6.38	1.02	1.55	0.0	6.0	0.0	1.60
Block Call Rate %	0.50	3.29	1.02	1.55	0.0	3.0	0.89	0.53

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%) except BSNL 2G & 4G network
- b) All TSPs have met the 3% QOS benchmark of Block Call Rate (BCR%) except BSNL 2G network

Coverage

a) Percentage of coverage samples for 2G \geq -85 dBm.

TSPs	2G		
	AIRTEL	BSNL	VIL
Coverage %	92.20	82.21	96.97

b) Percentage of coverage samples for 3G \geq -90 dBm & LTE \geq -110 dBm.

TSPs	3G	4G			
	VIL	AIRTEL	BSNL	RJIO	VIL
Coverage %	94.37	94.86	41.0	79.67	86.33

Summary

City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	199	243	197
Blocked Call Rate (%)	0.50	3.29	1.02
CSSR% (Accessibility)	99.49	96.71	98.98
Drop Call Rate (%)	0.0	6.38	1.02
Mobility HOSR (%)	100	73.93	98.86
Rx Quality (%)	94.35	89.15	96.38

Voice Call	3G	4G			
	VIL 3G	AIRTEL 4G	BSNL 4G	RJIO 4G	VIL 4G
Call Attempt	194	202	245	112	187
Blocked Call Rate (%)	1.55	0.0	3.0	0.89	0.53
CSSR% (Accessibility)	98.45	100	96.0	99.11	98.40
Drop Call Rate (%)	1.55	0.0	6.0	0.0	1.60
Mobility HOSR (%)	100	99.69	74.0	97.93	100
Rx Quality (%)	95.67	84.68	79.0	81.97	84.58

Summary-Data Services Dynamic

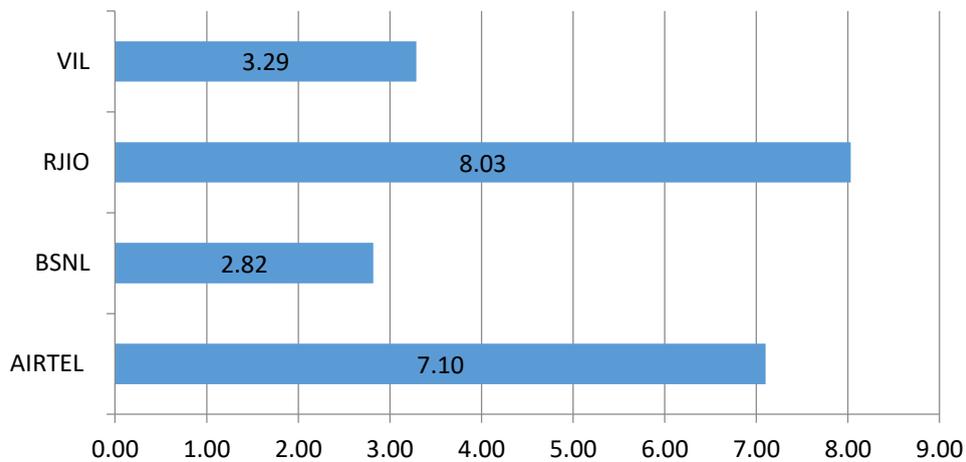
Key Observations

Dynamic Data was tested for 111 Kms. Download Throughput was tested.

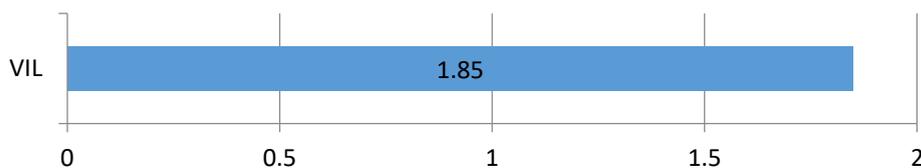
Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

4G/3G Network:

4G-Dynamic Download Average Throughput (Mbps)



3G-Dynamic Download Average Throughput (Mbps)



Summary-Data Services Static

City Level Summary-

Data Services Static at Aizawl Airport	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	98.0	135.69	104.84
Upload Throughput (kbps)	62.0	9.50	57.37
Web Browsing Delay (sec)	0.0	10.02	1.35
Latency (msec)	188	302.5	278

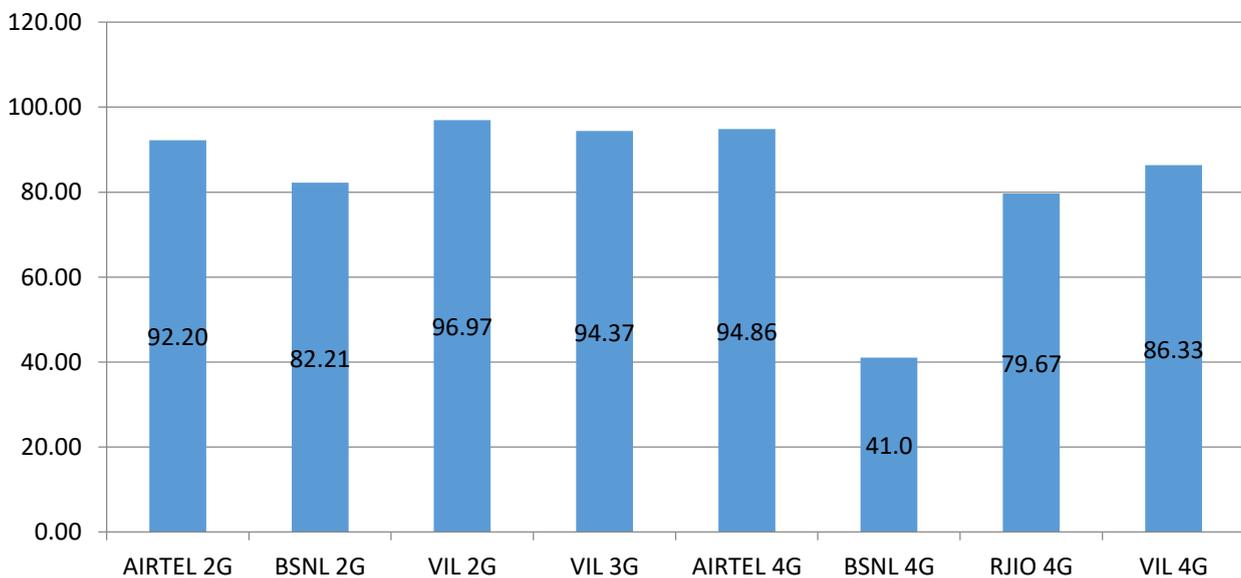
Data Services Static at Aizawl Airport	3G/4G				
	VIL 3G	AIRTEL 4G	BSNL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	3.01	14.80	7.09	21.89	18.04
Upload Throughput in Mbps	1.05	6.20	0.14	20.15	8.57
Video streaming delay (secs)	1.62	0.0	0.75	0.0	0.62
Web Browsing Delay (secs)	1.21	0.0	0.60	1.67	0.29
Latency (msec)	139	72	11	46	92

I. Coverage Details

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

TSP	Coverage Rate %
AIRTEL 2G	92.20
BSNL 2G	82.21
VIL 2G	96.97
VIL 3G	94.37
AIRTEL 4G	94.86
BSNL 4G	41.0
RJIO 4G	79.67
VIL 4G	86.33

Coverage Rate %

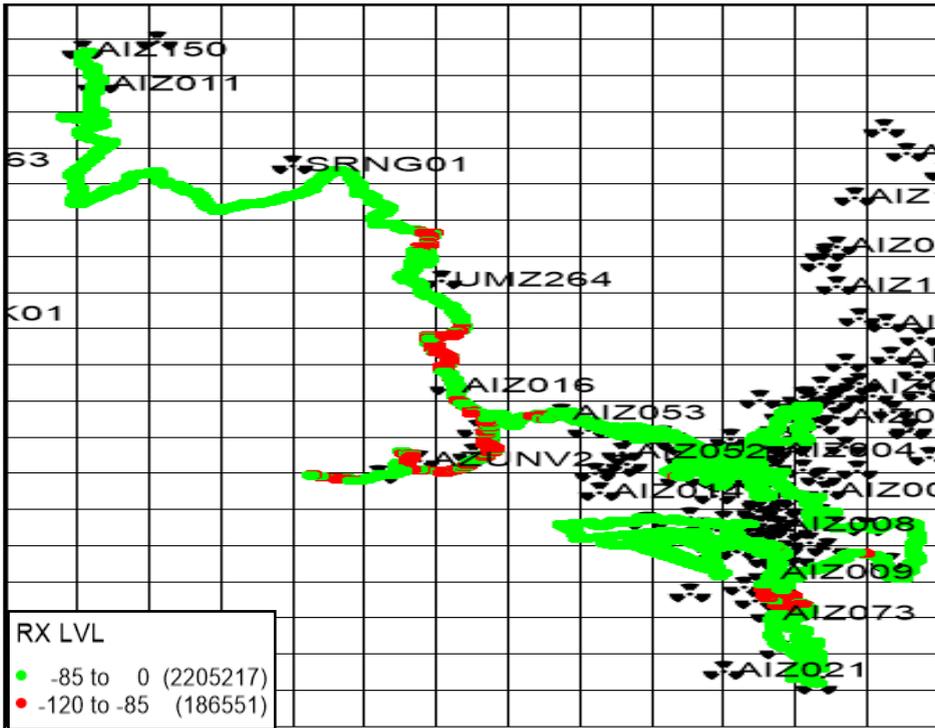


I. Coverage Details

AIRTEL

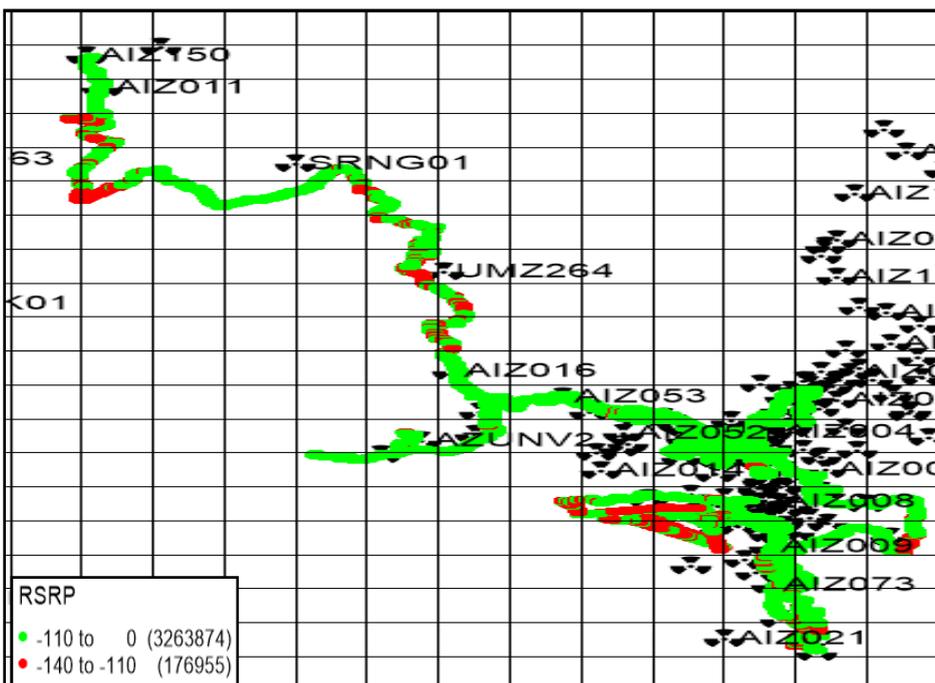
Technology	Coverage Rate %
2G	92.20
4G	94.86

2G



Overall RxLevel	Sample %
[Max >=-75]	8.80
[-75 >=-85)	83.39
[-85 >=-95)	6.59
[-95 >=Min)	1.20
Total	100%

4G



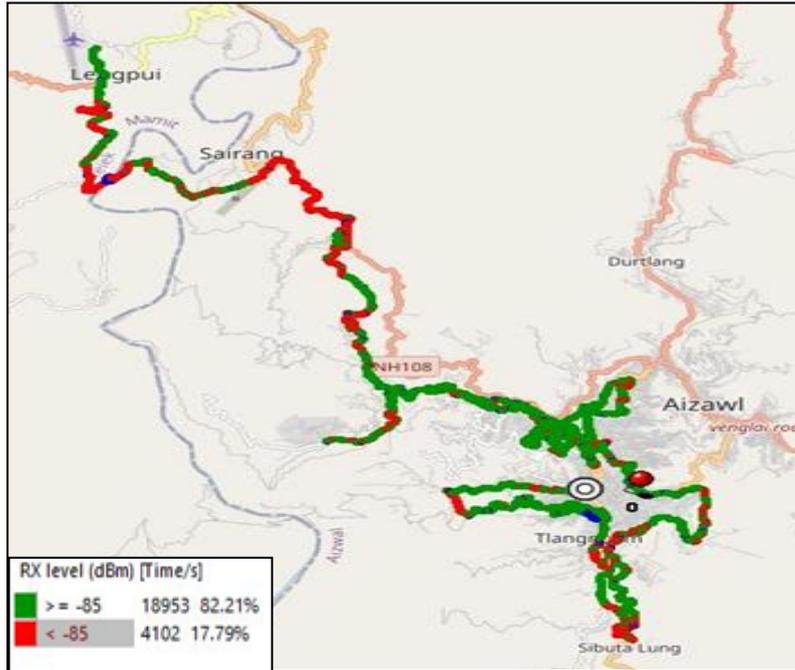
Overall RSRP	Sample %
[Max >=-80]	27.29
[-80 >=-90)	29.25
[-90 >=-110)	38.30
[-110 >=Min)	5.14
Total	100

I. Coverage Details

BSNL

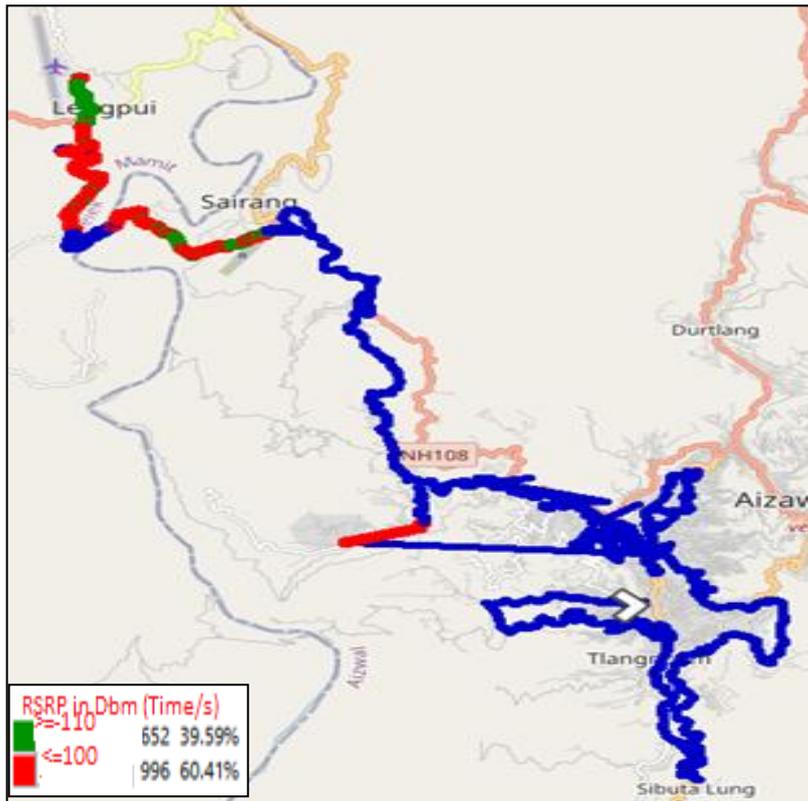
Technology	Coverage Rate %
2G	82.21
4G	41.0

2G



Overall RxLevel	Sample %
[Max >=-75]	58.3
[-75 >=-85)	23.91
[-85 >=-95)	11.98
[-95 >=Min)	5.81
Total	100%

4G

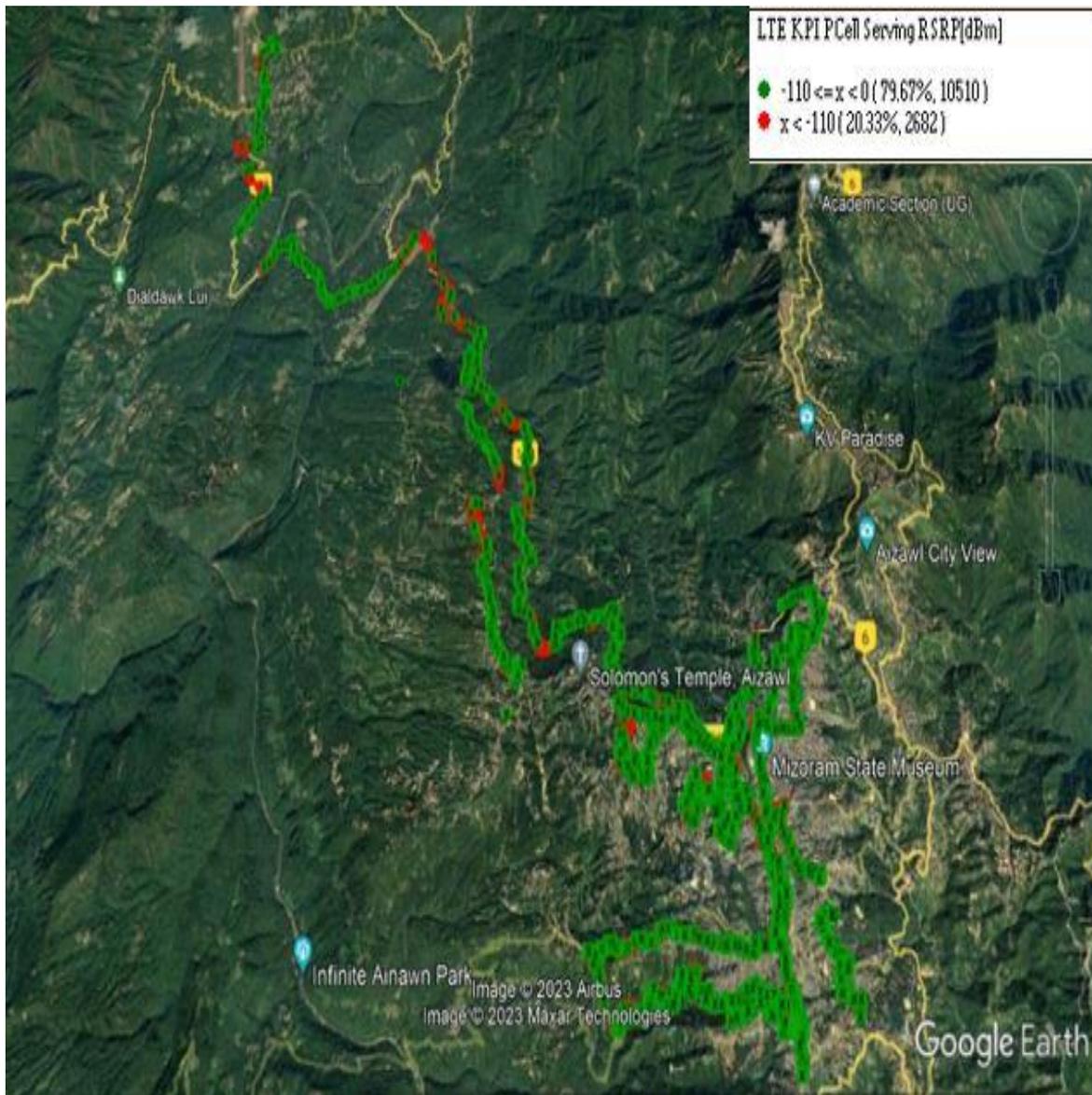


I. Coverage Details

RJIO

Technology	Coverage Rate %
4G	79.67

4G



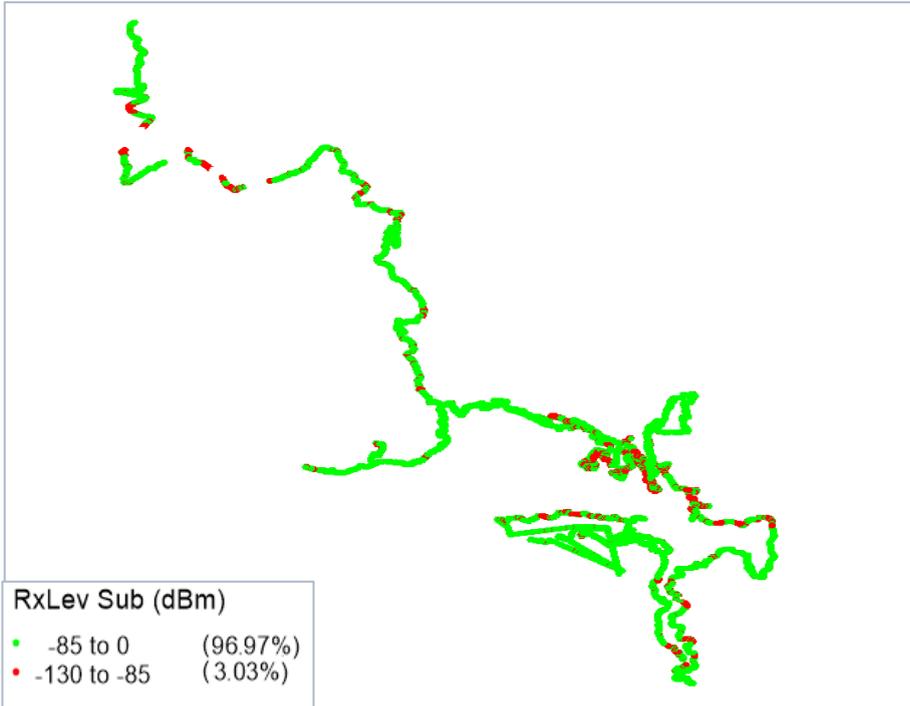
Overall RSRP	Sample %
[Max >=-80]	6.15
[-80 >=-90]	25.83
[-90 >=-110]	47.7
[-110 >=Min]	20.33
Total	100%

I. Coverage Details

VIL

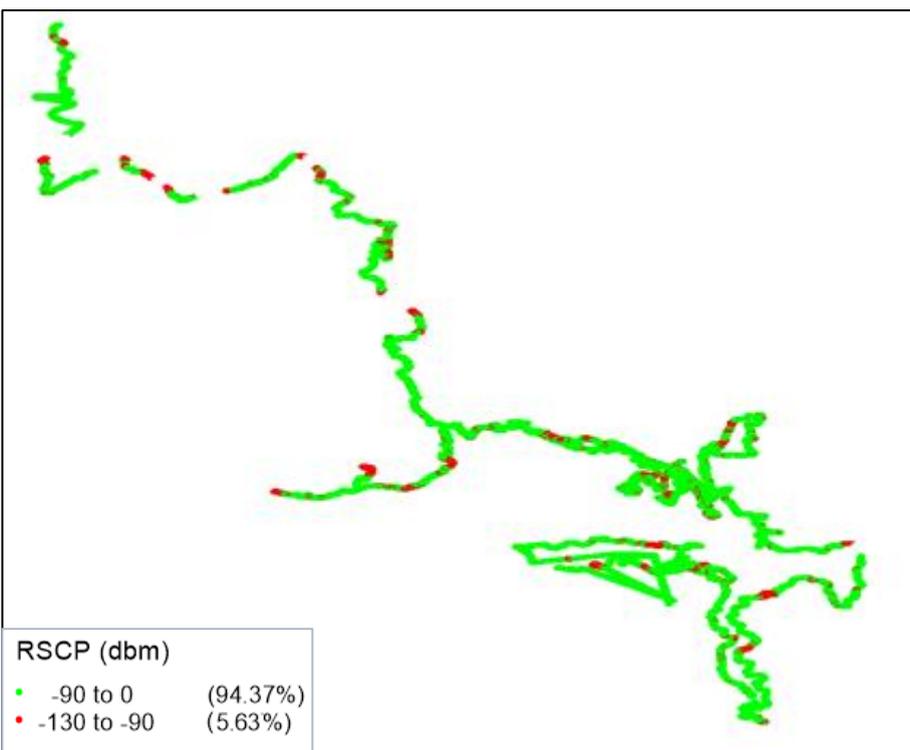
Technology	Coverage Rate %
2G	96.97
3G	94.37

2G



Overall RxLevel	Sample %
[Max >=-75]	26.68
[-75 >=-85)	38.46
[-85 >=-95)	31.83
[-95 >=Min)	3.03
Total	100%

3G



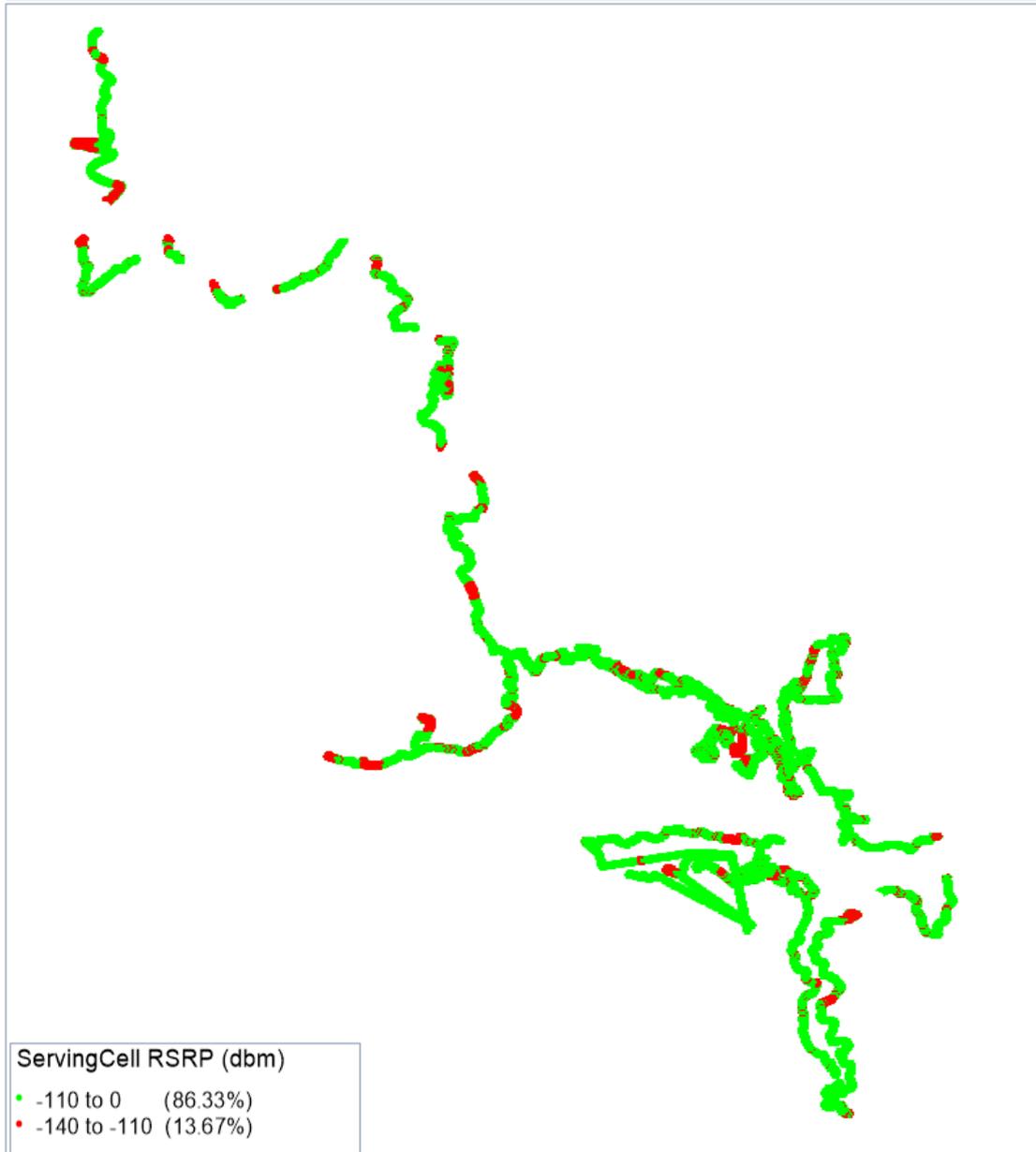
Overall RSCP	Sample %
[Max >=-70]	24.95
[-70 >=-80)	32.85
[-80 >=-90)	36.57
[-90 >=Min)	5.63
Total	100%

I. Coverage Details

VIL

Technology	Coverage Rate %
4G	86.33

4G



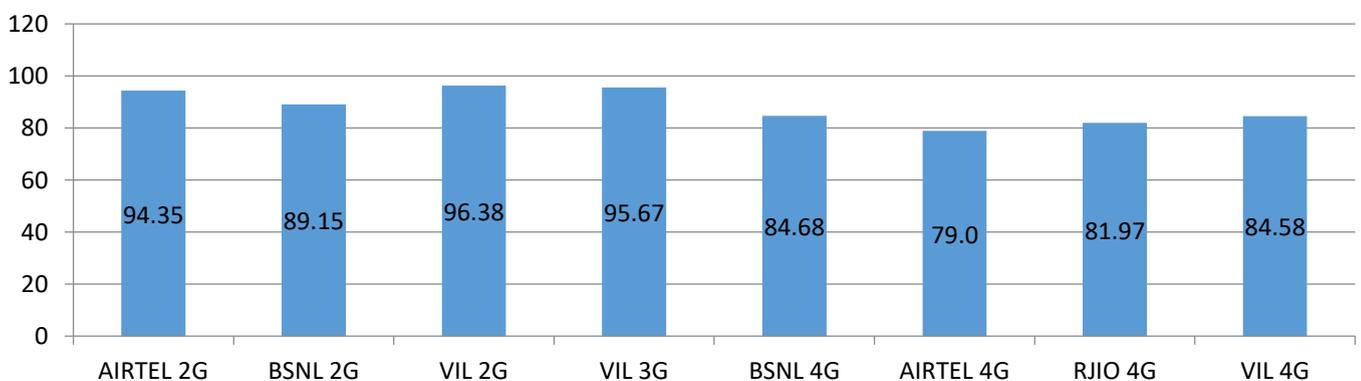
Overall RSRP	Sample %
[Max >=-80]	25.61
[-80 >=-90)	27.4
[-90 >=-110)	33.32
[-110 >=Min)	13.67
Total	100%

II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Quality ≤ 5 for GSM, $E_c/N_0 \geq -14$ dBm for 3G 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 $\geq 95\%$.

TSP	Rx Quality %
AIRTEL 2G	94.35
BSNL 2G	89.15
VIL 2G	96.38
VIL 3G	95.67
AIRTEL 4G	84.68
BSNL 4G	79.0
RJIO 4G	81.97
VIL 4G	84.58

Rx Quality %

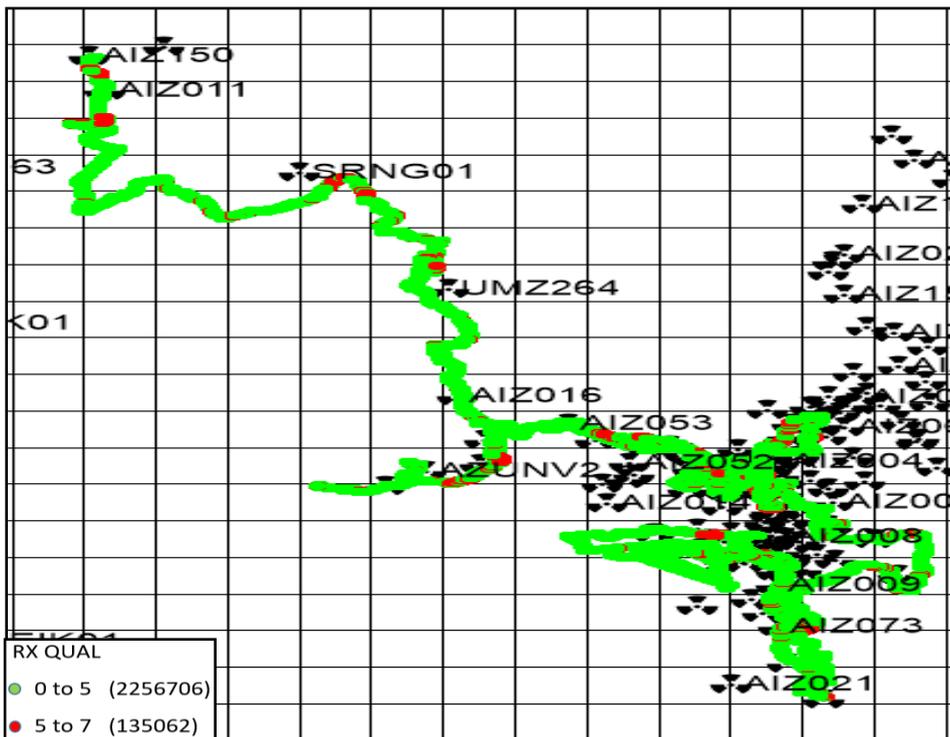


II. Quality Details

AIRTEL

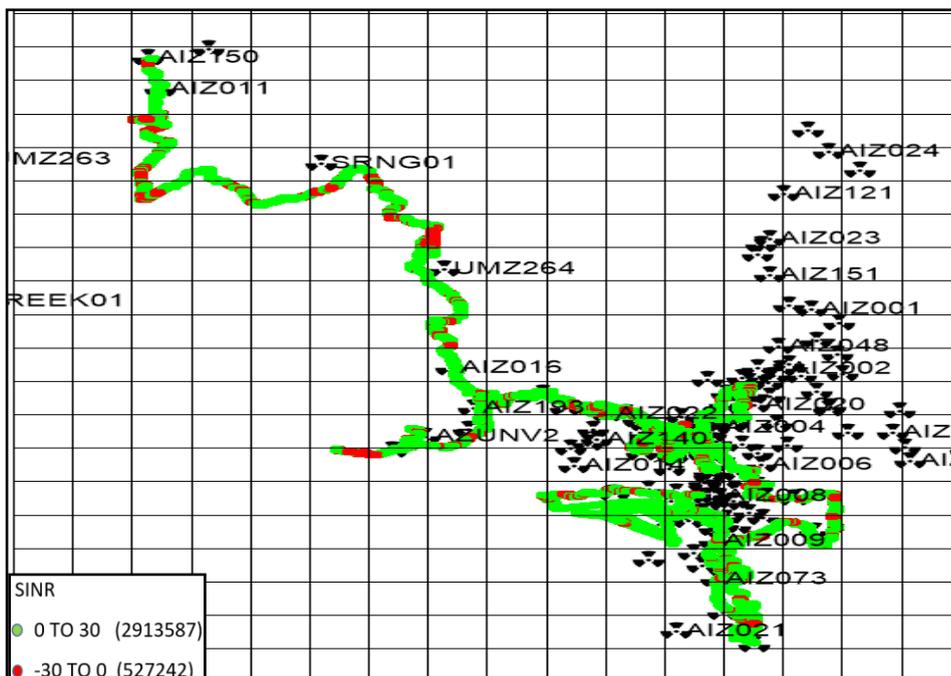
Technology	Rx Quality %
2G	94.35
4G	84.68

2G



Overall Rx Quality	Sample %
(Min <=2)	86.35
(2 <=3)	2.72
(3 <=4)	2.68
(4 <=5)	2.58
(5 <=Max)	5.64
Total	100%

4G



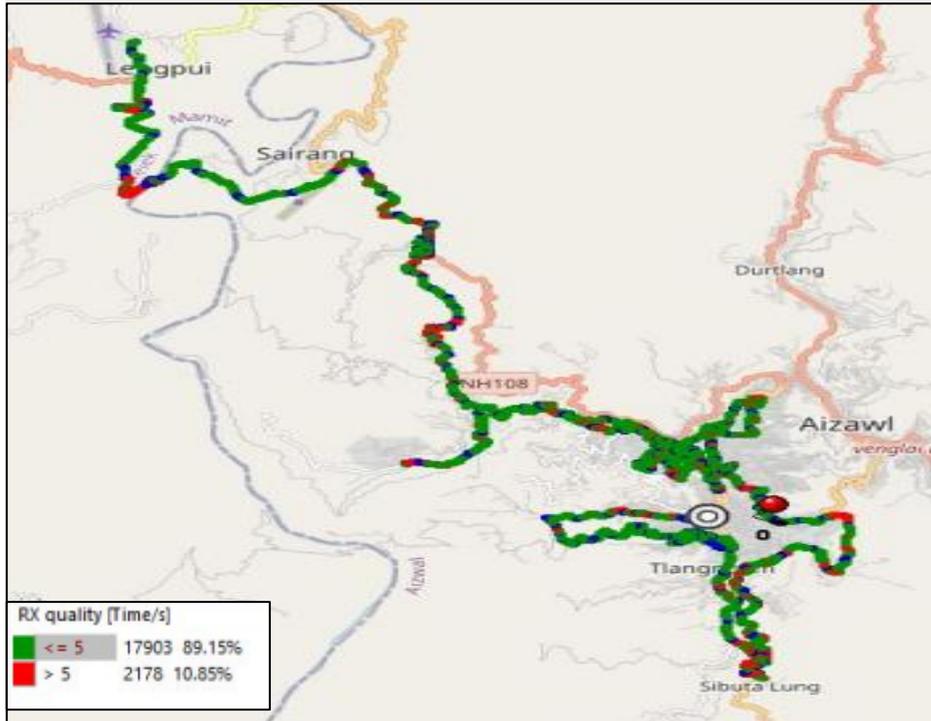
Overall SINR	Sample %
(Min <=0)	15.32
(0 <=5)	33.10
(5 <=10)	28.78
(10 <=15)	8.97
(15 <=Max)	13.81
Total	100

II. Quality Details

BSNL

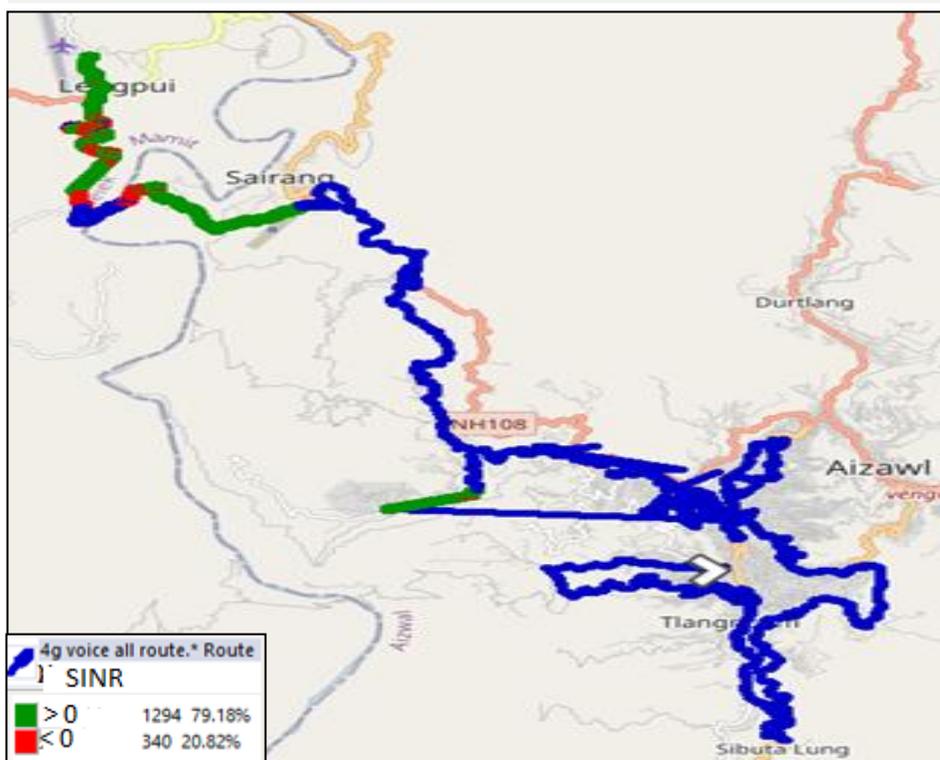
Technology	Rx Quality %
2G	89.15
4G	79.0

2G



Overall Rx Quality	Sample %
(Min <=2)	77.72
(2 <=3)	3.10
(3 <=4)	3.63
(4 <=5)	4.76
(5 <=Max)	10.85
Total	100%

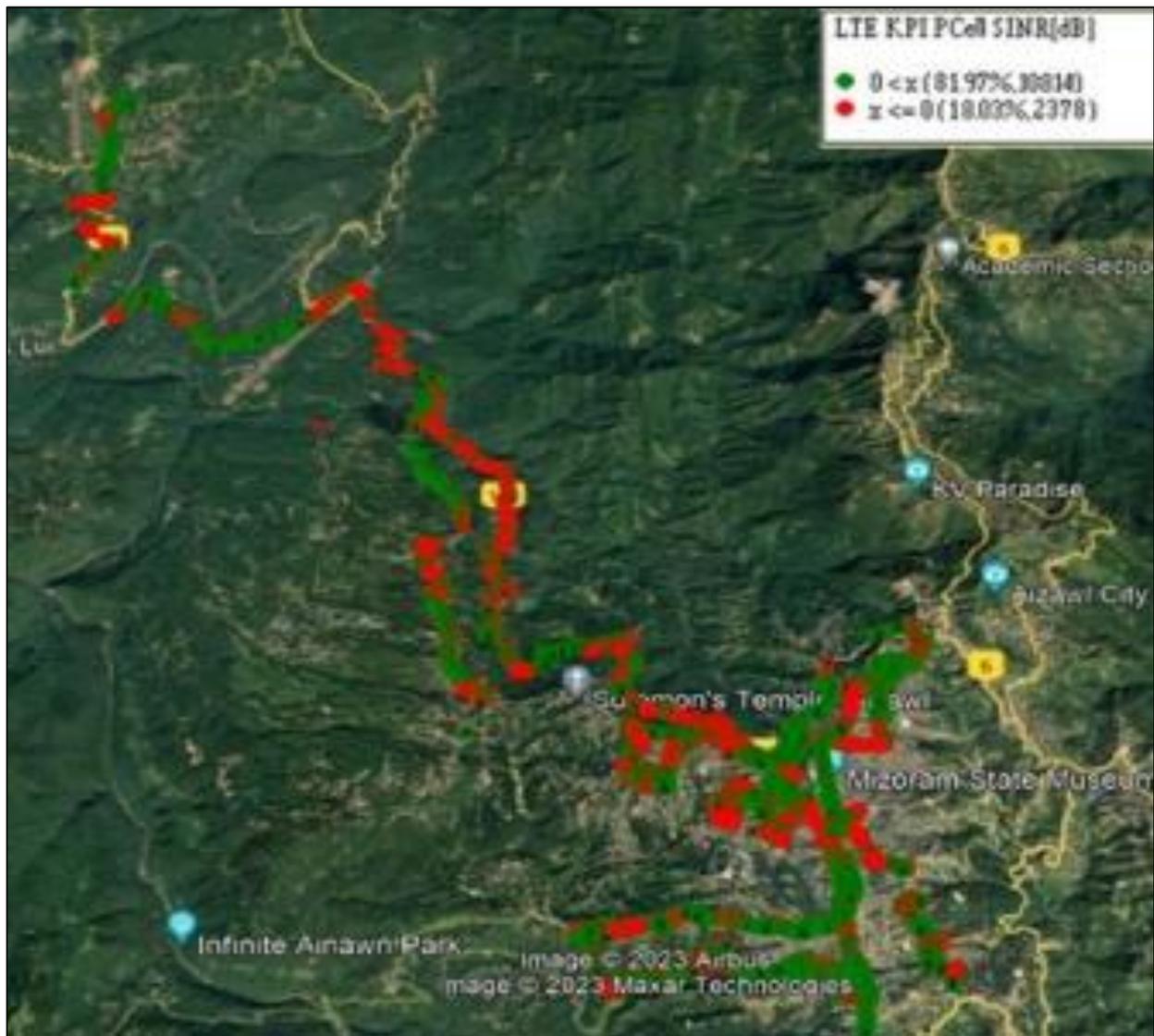
4G



II. Quality Details

RJIO

Technology	Rx Quality %
4G	81.97
4G	

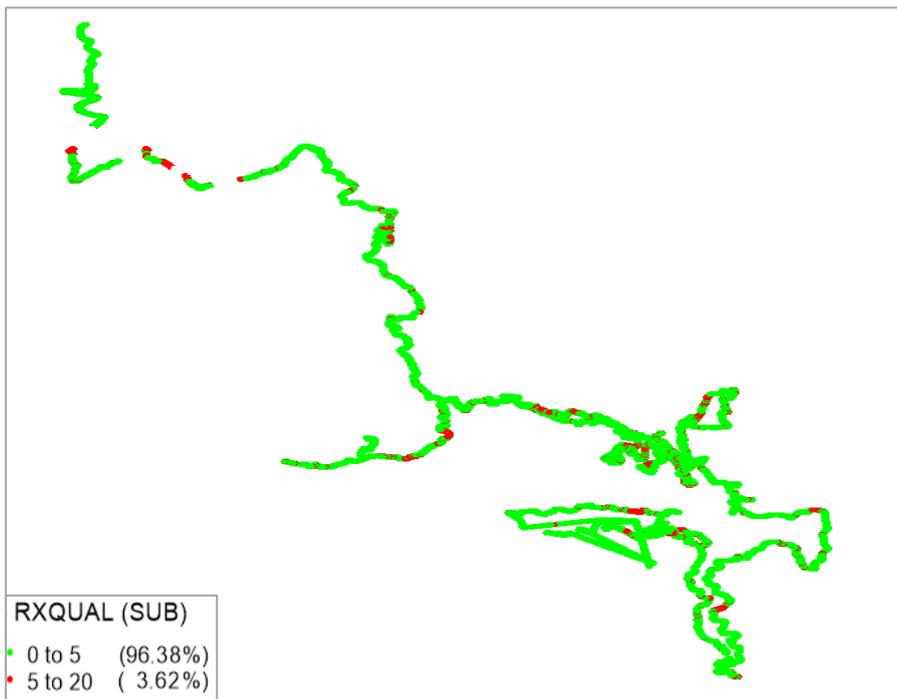


Overall SINR	Sample %
(Min <=0)	18.03
(0 <=5)	27.02
(5 <=10)	22.25
(10 <=15)	16.4
(15 <=Max)	16.30
Total	100%

II. Quality Details

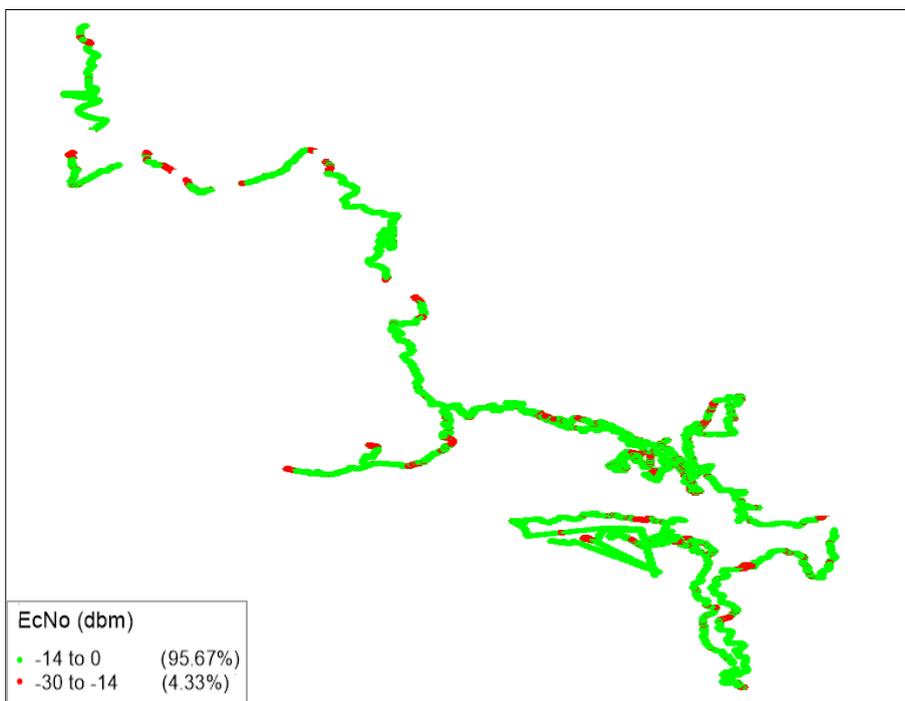
VIL

Technology	Rx Quality %
2G	96.38
3G	95.67
2G	



Overall Rx Quality	Sample %
(Min <=2)	18.90
(2 <=3)	22.45
(3 <=4)	29.26
(4 <=5)	25.77
(5 <=Max)	3.62
Total	100%

3G



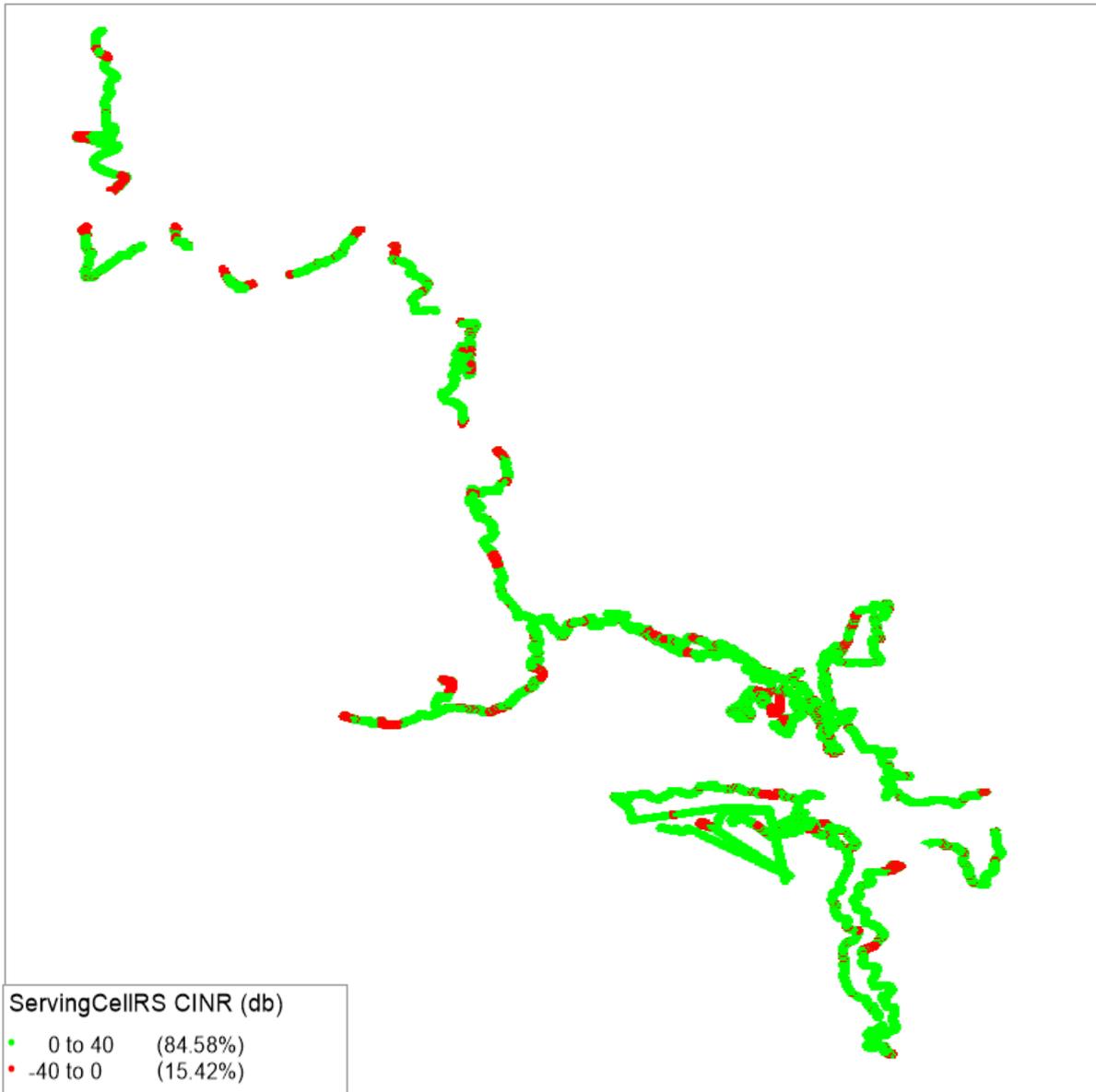
Overall EcNo	Sample %
(Max <=-6)	21.46
(-6 <=-9)	23.67
(-9 <=-11)	26.44
(-11 <=-14)	24.1
(-14 <= Min)	4.33
Total	100%

II. Quality Details

VIL

Technology	Rx Quality %
4G	84.58

4G



Overall SINR	Sample %
(Min <=0)	15.96
(0 <=5)	18.56
(5 <=10)	9.49
(10 <=15)	40.57
(15 <=Max)	15.42
Total	100

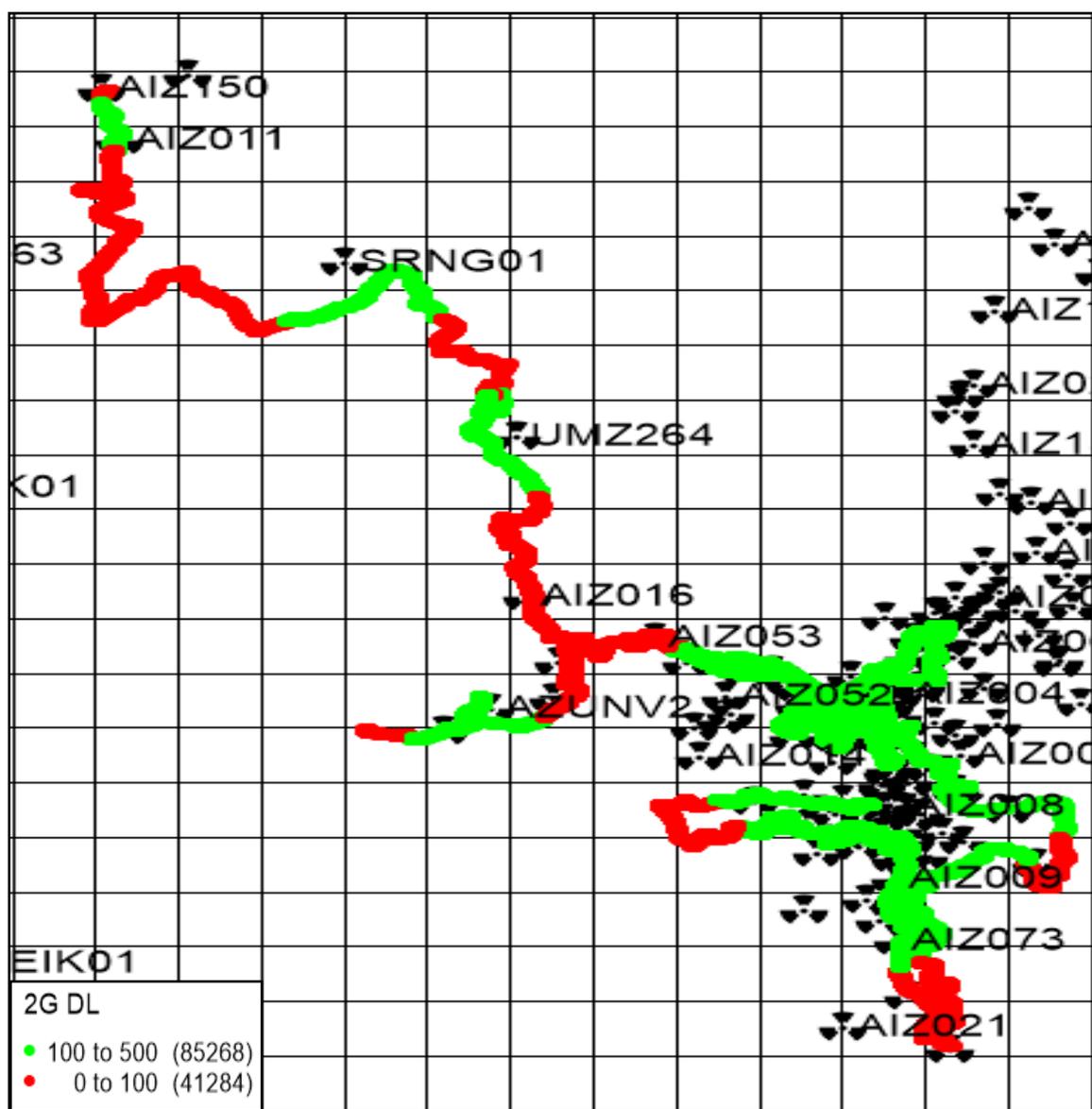
IV. Dynamic Data Test- 2G DL Details

AIRTEL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	68.0

2G



AVG. DOWNLOAD SPEED (Kbps)	68.0
% FILE TRANSFER COMPLETE	65.98
DL throughput	Sample %
0 to 50 Kbps	30.88
50 to 100 Kbps	1.73
100 to 200 Kbps	67.37
200 to 300 Kbps	0
>300 Kbps	0
Total	100%

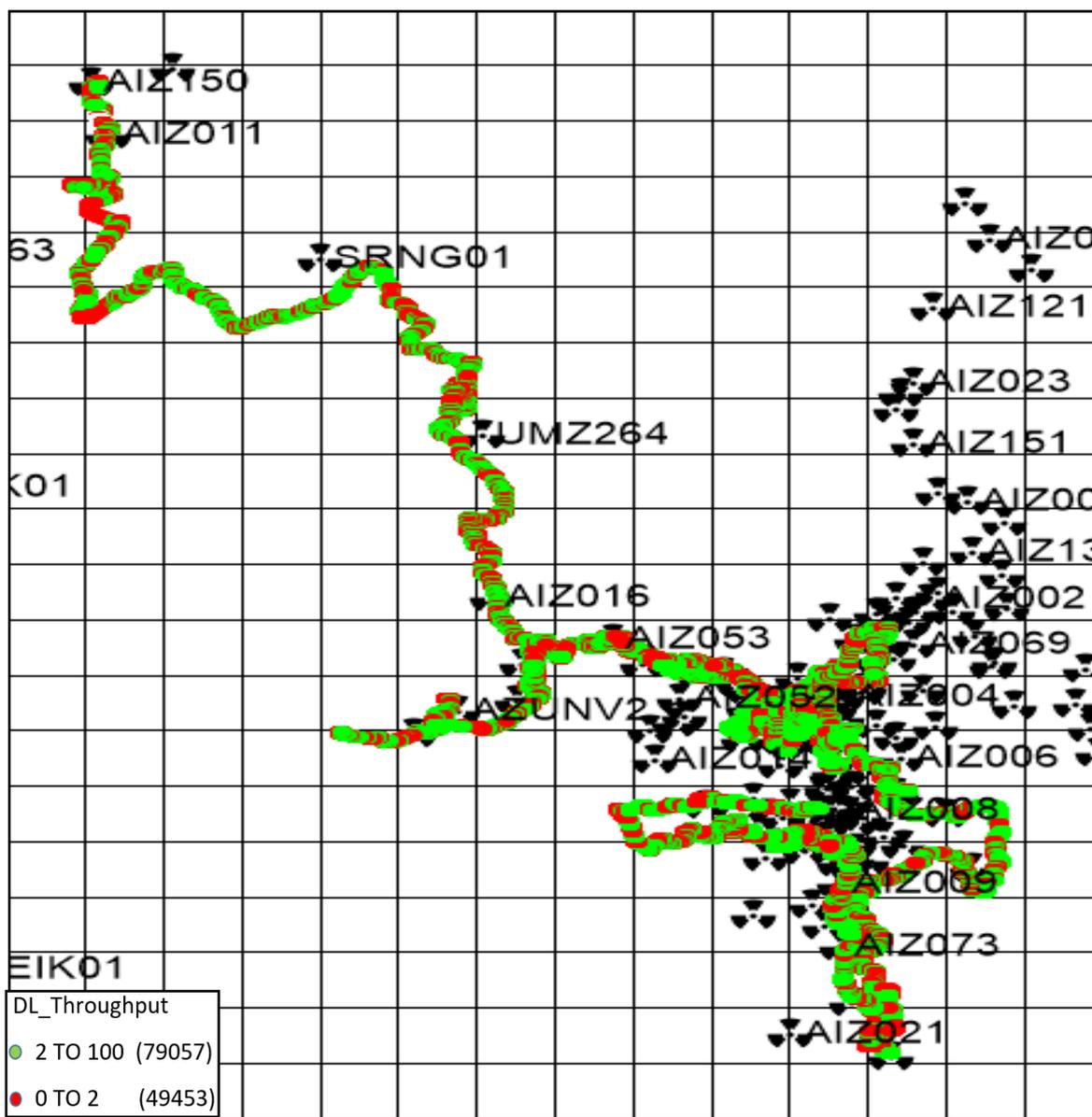
IV. Dynamic Data Test- 4G DL Details

AIRTEL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	7.10

4G



AVG. DOWNLOAD SPEED (Mbps)	7.10
% FILE TRANSFER COMPLETE	78%
DL throughput	Sample %
0 to 1 Mbps	32.02
1 to 2 Mbps	6.45
2 to 5 Mbps	17.67
5 to 10 Mbps	22.63
>10 Mbps	21.20
Total	100%

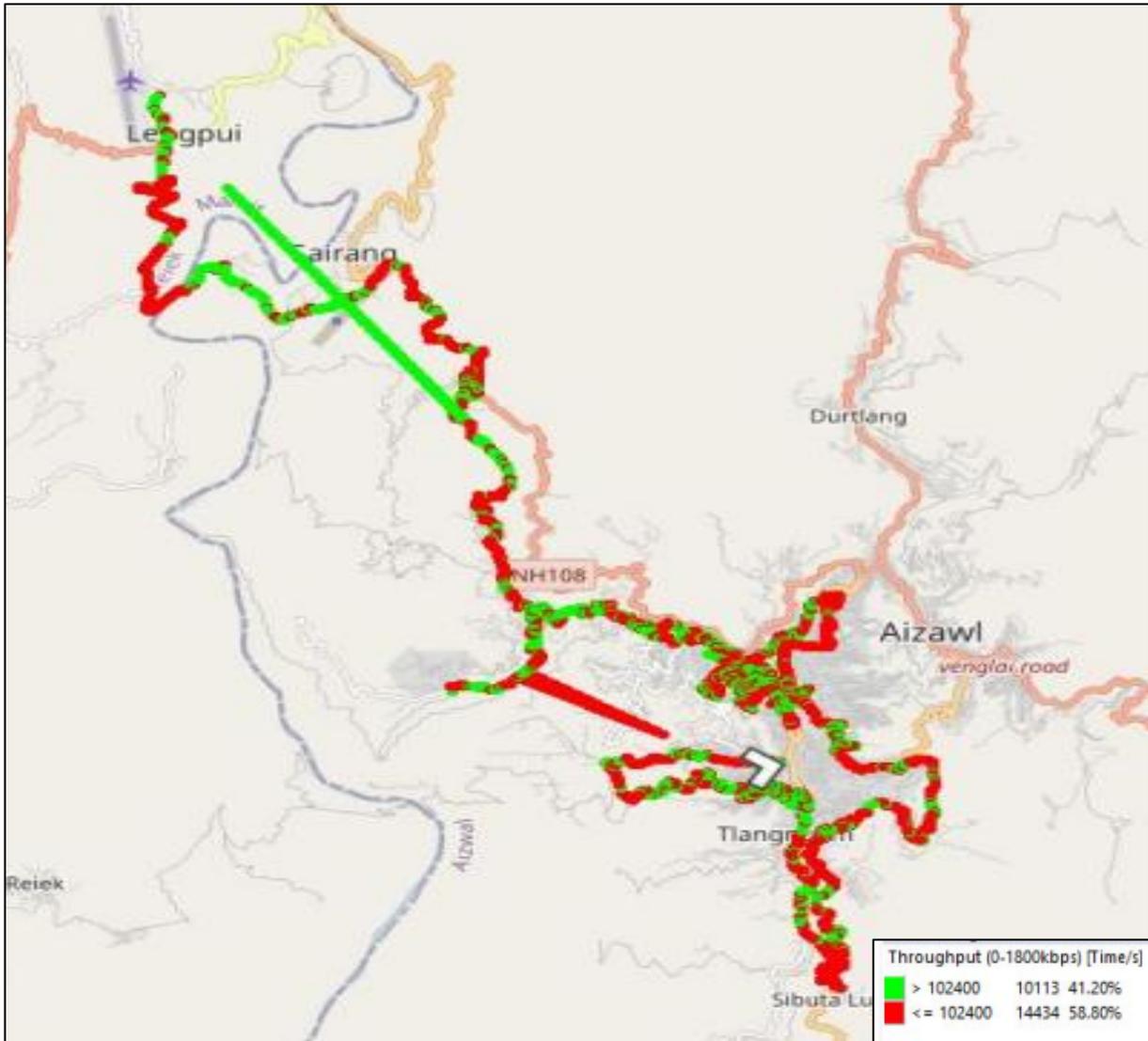
IV. Dynamic Data Test- 2G DL Details

BSNL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	84.20

2G



AVG. DOWNLOAD SPEED (Kbps)	84.20
% FILE TRANSFER COMPLETE	64%
DL throughput	Sample %
0 to 50 Kbps	47.98
50 to 100 Kbps	11.49
100 to 200 Kbps	27.38
200 to 300 Kbps	13.09
>300 Kbps	0.06
Total	100%

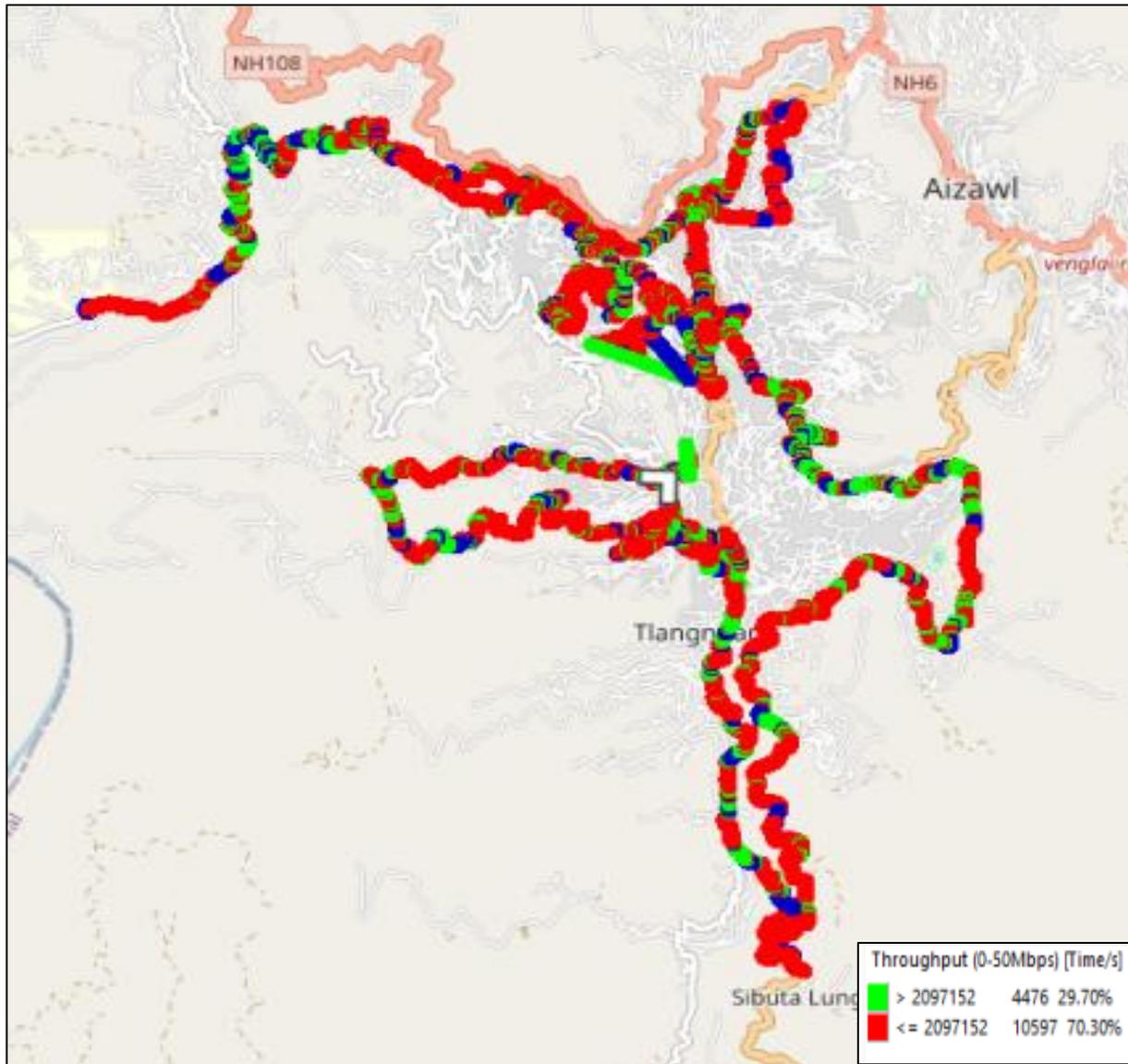
IV. Dynamic Data Test- 4G DL Details

BSNL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	2.82

4G



AVG. DOWNLOAD SPEED (Mbps)	2.82
% FILE TRANSFER COMPLETE	49%
DL throughput	Sample %
0 to 1 Mbps	56.15
1 to 2 Mbps	14.15
2 to 5 Mbps	17.89
5 to 10 Mbps	9.06
>10 Mbps	2.75
Total	100%

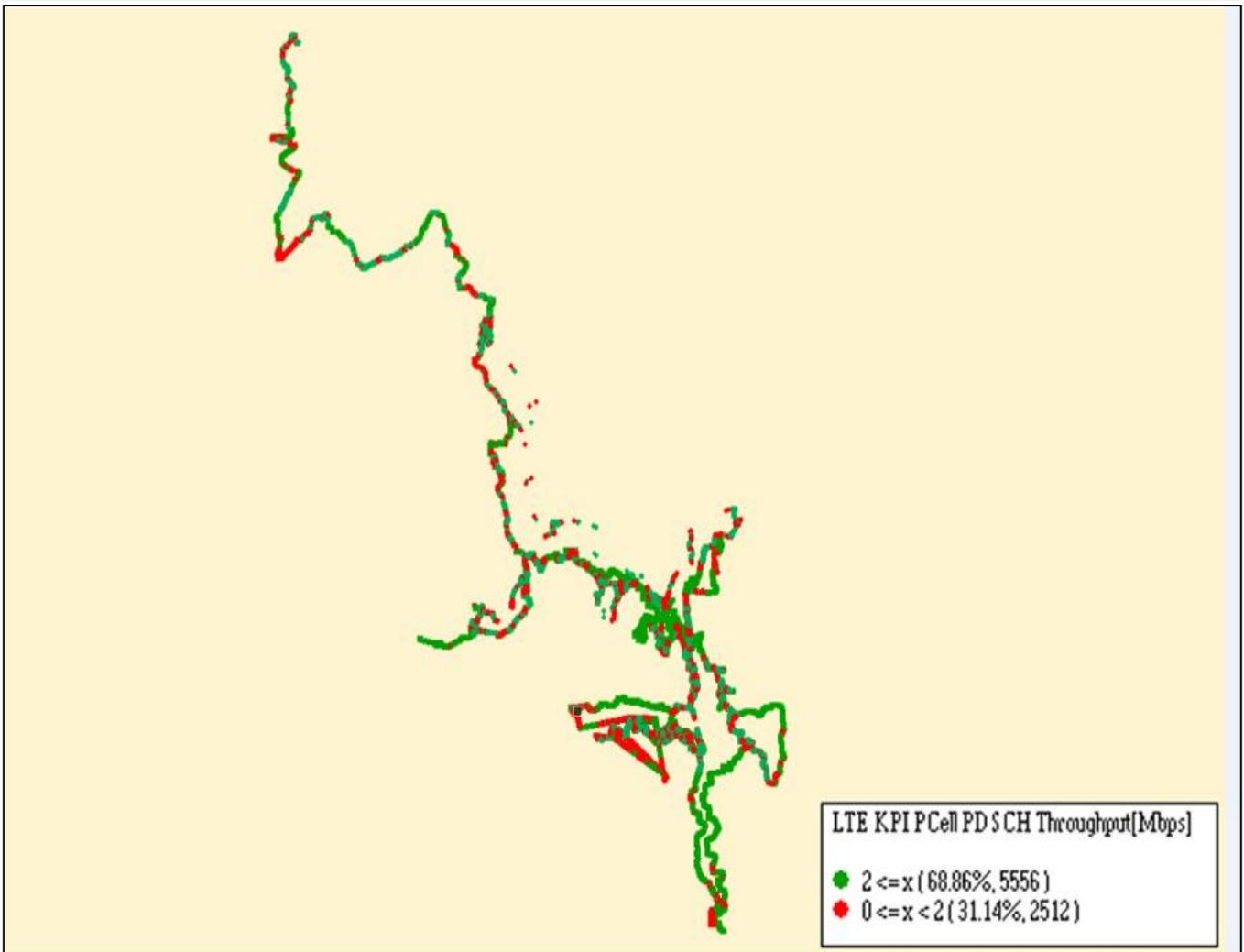
IV. Dynamic Data Test- 4G DL Details

RJIO

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	8.03

4G



AVG. DOWNLOAD SPEED (Mbps)	8.03
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 1 Mbps	27.11
1 to 2 Mbps	4.03
2 to 5 Mbps	16.63
5 to 10 Mbps	22.55
>10 Mbps	29.69
Total	100%

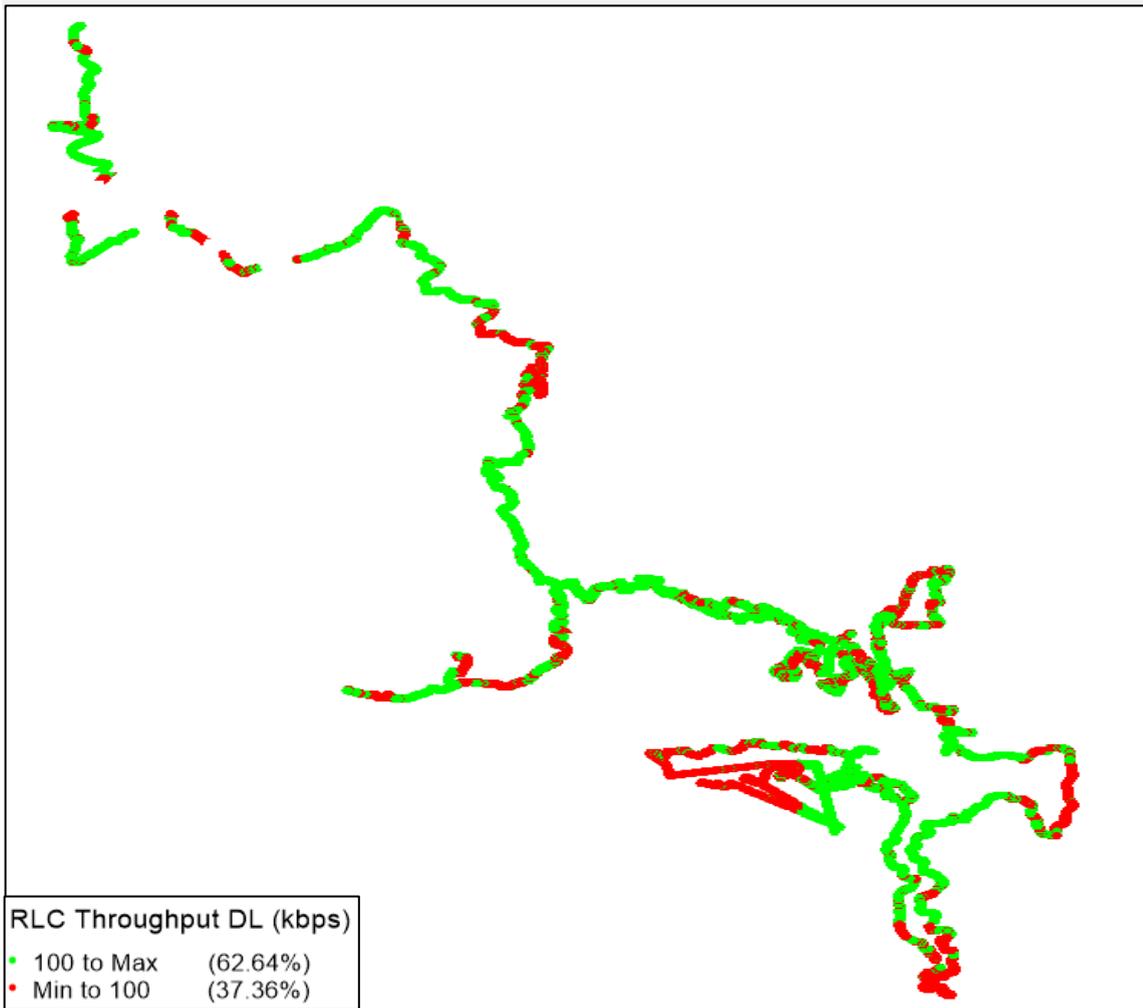
IV. Dynamic Data Test-2G DL Details

VIL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	67.48

2G



AVG. DOWNLOAD SPEED (Kbps)	67.48
% FILE TRANSFER COMPLETE	95.08
DL throughput	Sample %
0 to 50 Kbps	25.57
50 to 100 Kbps	11.79
100 to 200 Kbps	25.29
200 to 300 Kbps	21.13
>300 Kbps	16.22
Total	100%

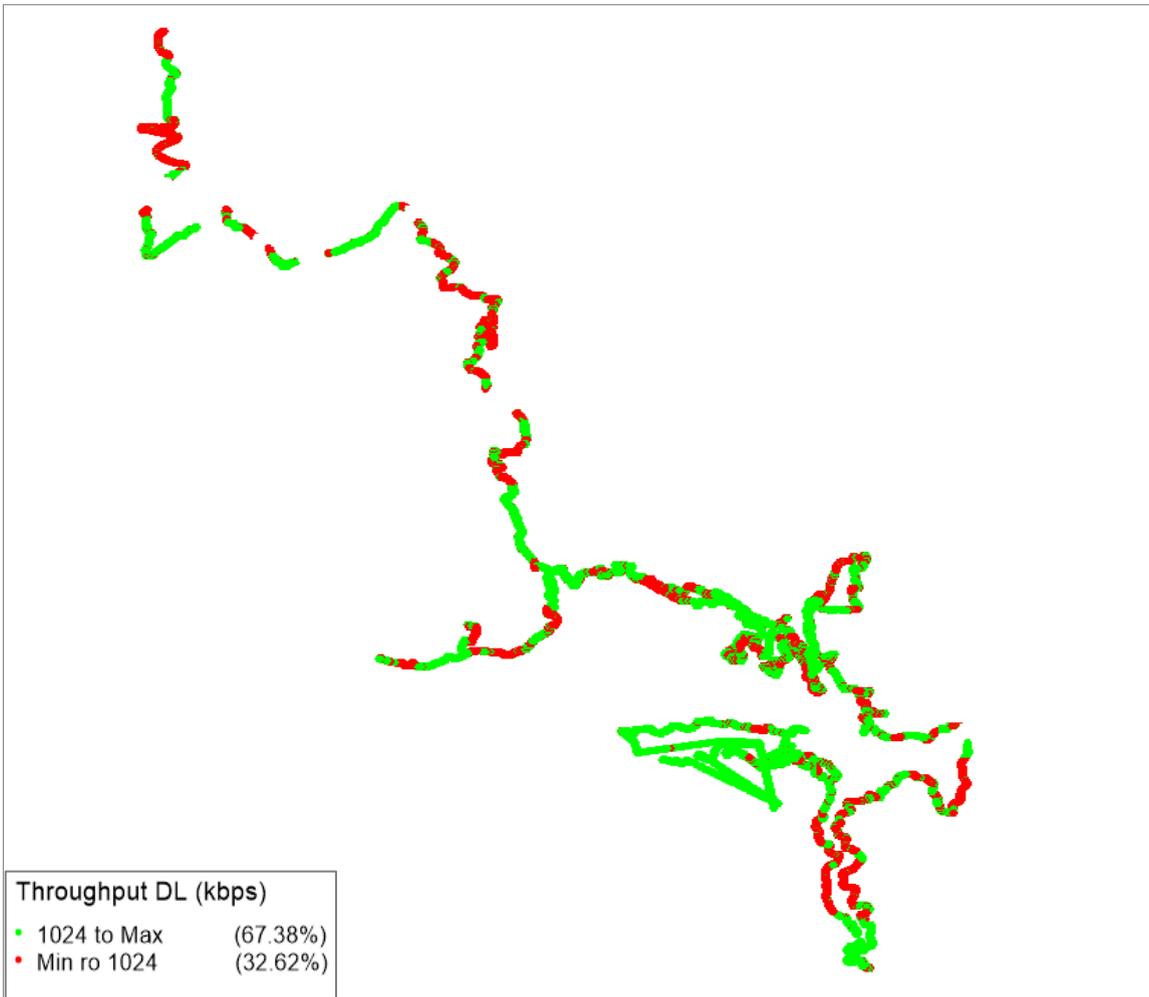
IV. Dynamic Data Test-3G DL Details

VIL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	3G
Average Download Throughput (Kbps)	1.85

3G



AVG. DOWNLOAD SPEED (Mbps)	1.85
% FILE TRANSFER COMPLETE	86.09
DL throughput	Sample %
0 to 0.5 Mbps	19.45
0.5 to 1 Mbps	13.17
1 to 2 Mbps	28.87
2 to 5 Mbps	25.74
>5 Mbps	12.77
Total	100

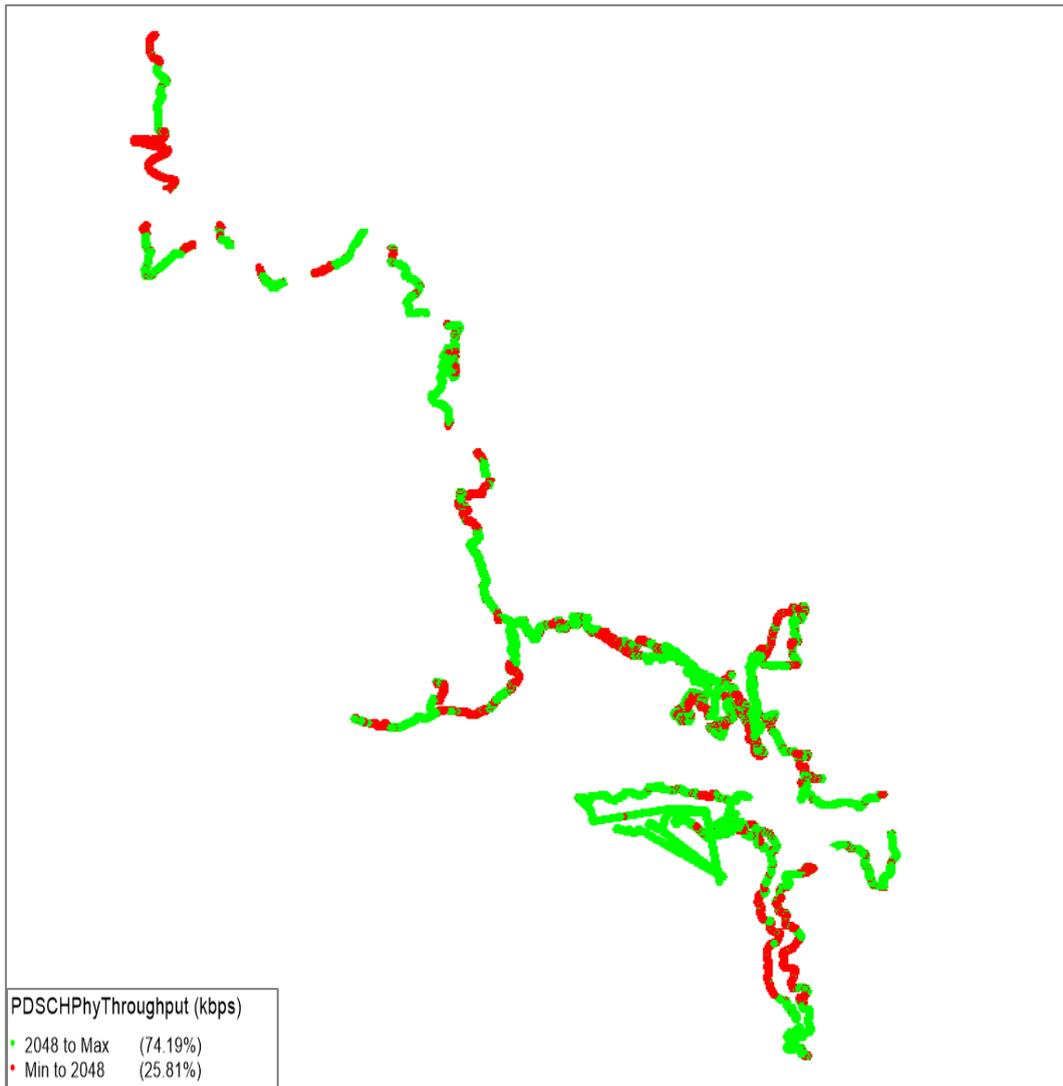
IV. Dynamic Data Test- 4G DL Details

VIL

Dynamic Data Testing Complete 111 Kms

Data KPIs - Overall	4G
Average Download Throughput (Kbps)	3.29

4G



AVG. DOWNLOAD SPEED (Mbps)	3.29
% FILE TRANSFER COMPLETE	98.76
DL throughput	Sample %
0 to 1 Mbps	15.42
1 to 2 Mbps	10.39
2 to 5 Mbps	29.75
5 to 10 Mbps	25.37
>10 Mbps	19.07
Total	100