INDEPENDENT DRIVE TEST REPORT

For

Guwahati

Nov 2017

EAST ZONE

Key Performance Indicators: All of the TSPs have met the Drop Call Rate (DCR) benchmark of 2% & all TSPs have met the Call Setup Success Rate (CSSR) benchmark of 95%.

The Independent Drive Test has been carried out by M/s PhiMetrics Technologies Pvt. Ltd. on behalf of TRAI in Guwahati City & adjoining areas from 9:00 AM to 9:00 PM; 15th Nov to 21st Nov 2017 (Except Saturday & Sunday). The drive test covered an drive route of approximately 530 KMs and 6 hotspots over a period of 5 days. Approximately 905 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 **15th Nov to 21st Nov 2017 (Except Saturday & Sunday)** covering various locations in Guwahati City & surrounding region. The performance of **Aircel, Airtel, BSNL, Idea, Vodafone and Jio** were monitored across various technologies (2G, 3G, CDMA & 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 Guwahati:

Independent Drive test was conducted for a period of 5 days from 15th Nov to 21st Nov 2017 in Guwahati 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 530 KMs over a period of 4 days from 15th to 17th & 21st Nov. Approximately 905 calls were made for each of the 11 networks: Five 2G networks, five 3G networks and one VoLTE network covering 6 unique TSPs.

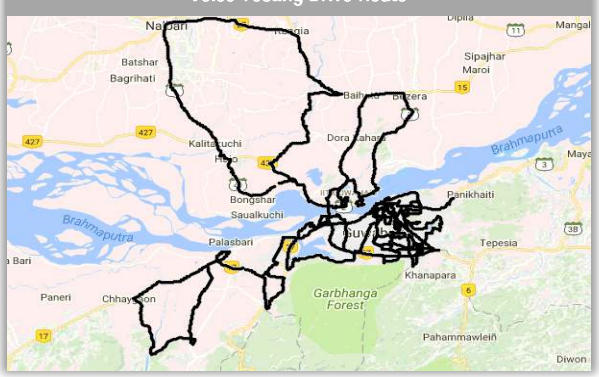
* In case of multiple call failure in similar geo location in given period of 60sec has been counted as one call failure

Data Tests: Data Tests were performed at static locations for 1 day on 20th Nov; Five 2G (Lock mode) networks, five 3G (Dual mode) networks, one CDMA 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

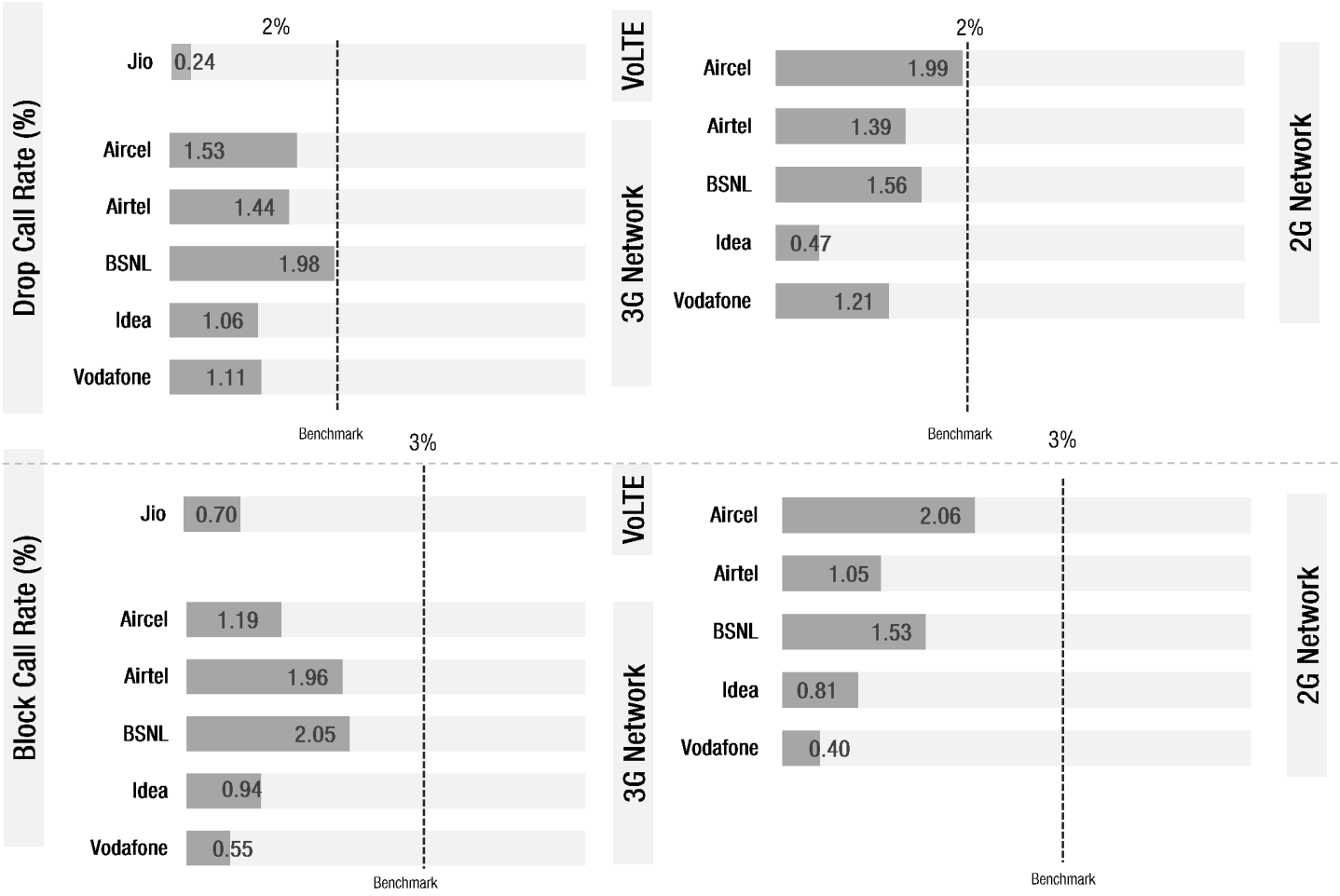


Data Service testing across 6 Static Locations

Voice Calls

Key Observations

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



KPI	2G Networks				
	Aircel	Airtel	BSNL	Idea	Vodafone
SDCCH Congestion%	0.31%	0.32%	0.35%	0.00%	0.30%
TCH Congestion %	1.75%	0.74%	1.18%	0.81%	0.10%

KPI	3G				
	Aircel	Airtel	BSNL	Idea	Vodafone
SDCCH Congestion%	0.11%	0.11%	0.22%	0.00%	0.00%
RRC Congestion%	0.11%	1.52%	0.00%	0.00%	0.00%
SDCCH & RRC Congestion%	0.22%	1.63%	0.22%	0.00%	0.00%
TCH Congestion %	0.76%	0.00%	1.51%	0.35%	0.00%
RAB Congestion %	0.22%	0.33%	0.32%	0.59%	0.55%
TCH & RAB Congestion %	0.98%	0.33%	1.84%	0.94%	0.55%

a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%) .
b) Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's.

Not meeting Benchmark

Voice Calls

Key Observations

Coverage

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

TSPs	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Coverage%	88.18%	78.09%	70.86%	71.95%	84.00%

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%	82.69%	77.08%	80.73%	82.88%	87.96%	94.97%

c) Percentage of time spent on 3G network.

TSPs	3G				
	Aircel	Airtel	BSNL	Idea	Vodafone
% Time Spent on 3G	59.99%	87.77%	19.81%	71.52%	91.54%

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

TSPs	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
% of Cells => 48	6.08%	0.00%	10.06%	0.00%	0.00%

During IDT all TSP's have RLT less than to 48 except Aircel & BSNL

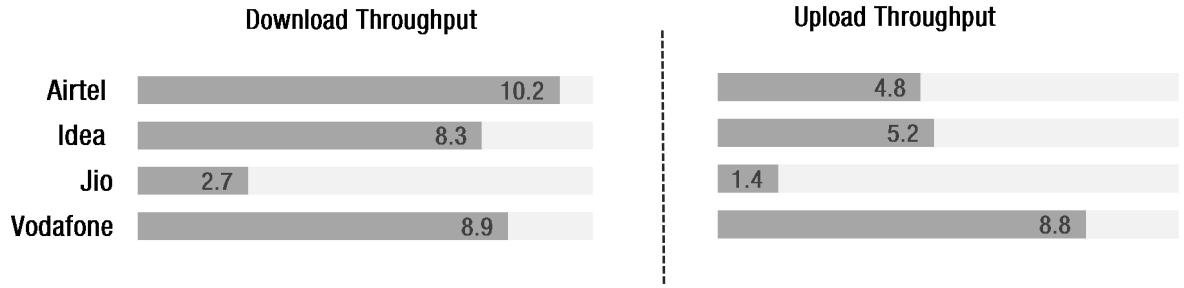
Data Services

Key Observations

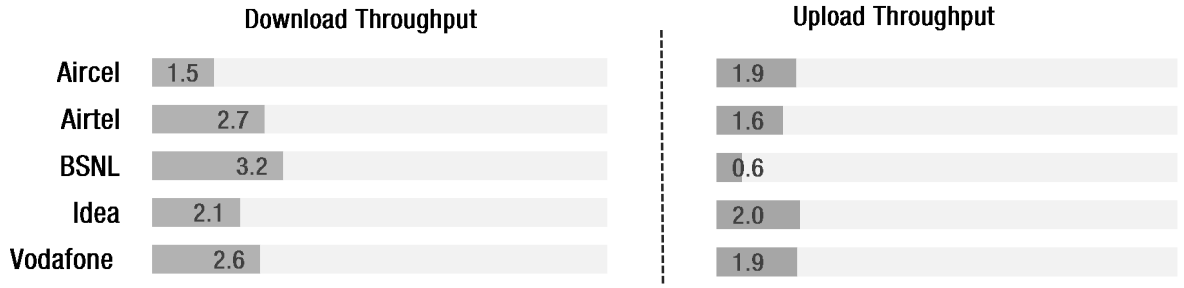
Data was tested at 6 locations viz Hotel Dynasty, Beltola, Ganeshguri, Chandmari, IIT and Paltan Bajar. Following services were tested: Data Download/Upload, Latency (www.google.com), Video Streaming (YouTube) and Web browsing (Flipkart, Amazon, PayTm)

Data Download and Upload Performance (Mbps)

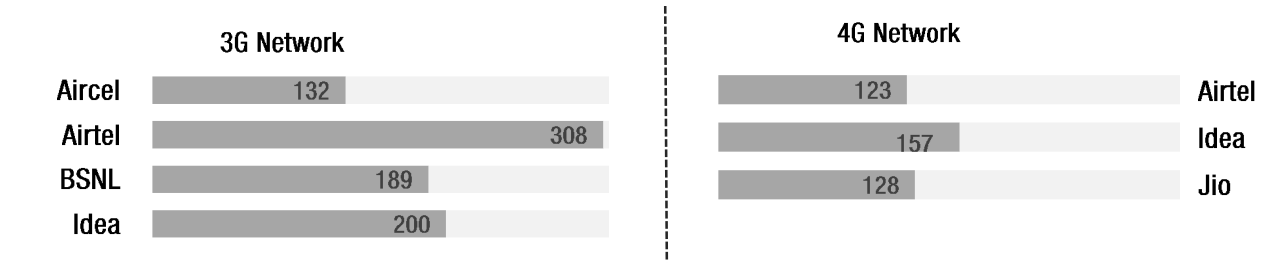
4G Network:



3G Network:



Latency (msec)



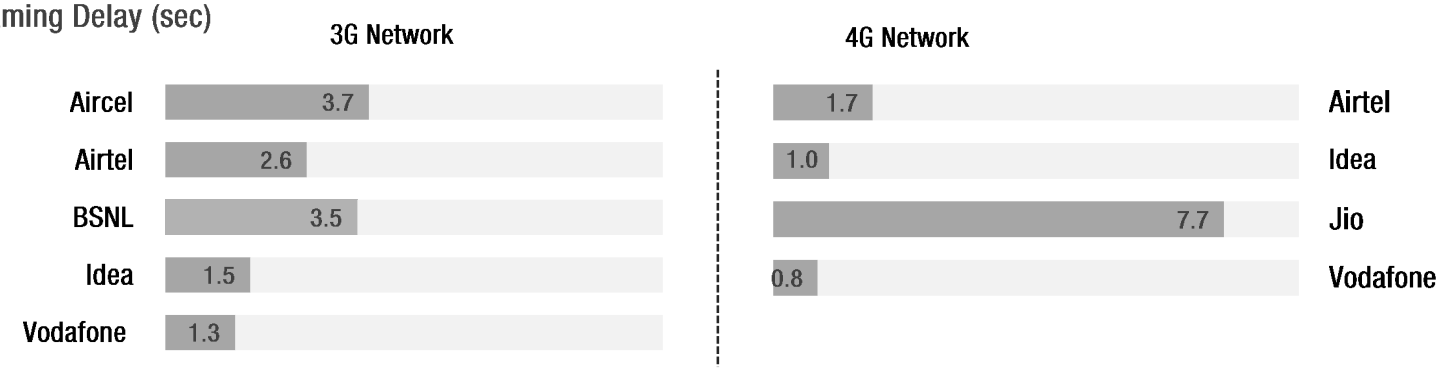
** Vodafone has disabled ping on its network*

Data Services

Key Observations

Video Streaming Performance (120 sec YouTube video sample sizes)

Streaming Delay (sec)

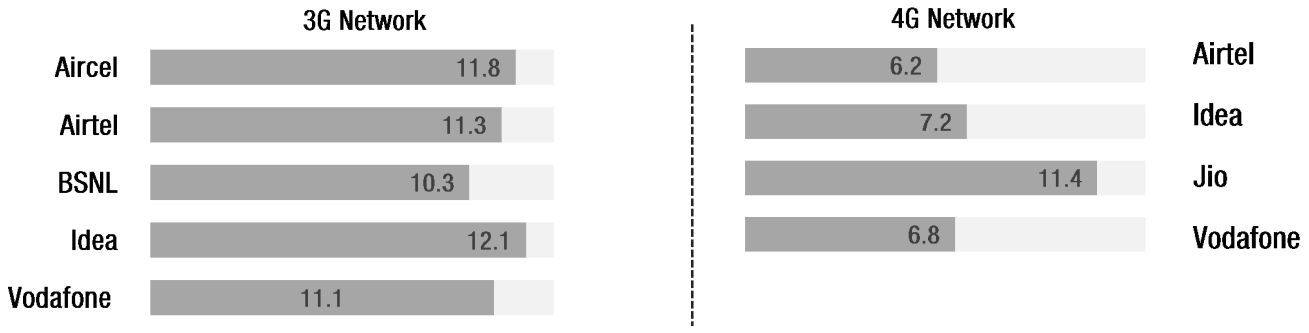


Streaming Delay further broken into 2 parameters which form the end-user perception to assess consistency on Video streaming.

- 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)	3.7	2.6	3.5	1.5	1.3	1.7	1.0	4.0	0.8
Avg. Interruption Time (sec)	-	-	-	-	-	-	-	3.8	-

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	973	948	848	865	997
Blocked Call Rate (%)	2.1%	1.1%	1.5%	0.8%	0.4%
CSSR% (Accessibility)	97.9%	98.9%	98.5%	99.2%	99.6%
Drop Call Rate (%)	2.0%	1.4%	1.6%	0.5%	1.2%
Mobility HOSR (%)	98.9%	99.3%	95.6%	99.2%	99.1%
Rx Quality (%)	97.75%	95.64%	97.59%	98.33%	93.67%

Voice Call	3G					VoLTE
	Aircel	Airtel	BSNL	Idea	Vodafone	Jio
Call Attempt	924	920	928	854	909	856
Blocked Call Rate (%)	1.2%	2.0%	2.0%	0.9%	0.6%	0.7%
CSSR% (Accessibility)	98.8%	98.0%	98.0%	99.1%	99.4%	99.3%
Drop Call Rate (%)	1.5%	1.4%	2.0%	1.1%	1.1%	0.2%
Mobility HOSR (%)	99.8%	100.0%	97.1%	99.9%	100.0%	99.5%
Rx Quality (%)	96.60%	82.90%	97.48%	94.34%	93.31%	89.02%

Summary

City Level Summary

Data Services	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone *	BSNL CDMA
Download Throughput (Kbps)	132.2	133.1	158.0	135.8	169.9	405.7
Upload Throughput (Kbps)	81.8	122.1	83.3	162.8	163.3	137.2
Web Browsing Delay (sec)	41.4	36.5	40.9	42.8	41.2	24.4
Latency (msec)	449	241	424	502	-	224

Data Services	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone*	Airtel	Idea	Jio	Vodafone*
Download Throughput (Mbps)	1.5	2.7	3.2	2.1	2.6	10.2	8.3	2.7	8.9
Upload Throughput (Mbps)	1.9	1.6	0.6	2.0	1.9	4.8	5.2	1.4	8.8
Web Browsing Delay (sec)	11.8	11.3	10.3	12.1	11.1	6.2	7.2	11.4	6.8
Video Streaming Delay (sec)	3.7	2.6	3.5	1.5	1.3	1.7	1.0	7.7	0.8
Latency (msec)	132	308	189	200	-	123	157	128	-

** Vodafone has disabled ping on its network*

Summary

City Level Summary(contd.)

Beltola	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone	BSNL CDMA
Download Throughput (kbps)	154.1	37.5	208.5	173.2	180.1	Fail
Upload Throughput (kbps)	50.9	69.0	136.9	169.4	164.9	Fail
Web Browsing Delay (sec)	43.7	19.7	39.3	42.3	41.1	Fail
Latency (msec)	457	223	599	497	-	Fail

Beltola	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	1.2	3.2	6.0	1.8	2.0	14.3	17.7	0.3	9.2
Upload Throughput (Mbps)	1.7	2.0	2.1	1.5	2.8	3.4	7.4	3.4	7.8
Web Browsing Delay (sec)	13.7	10.6	9.0	12.2	10.6	7.2	6.3	12.3	6.8
Video Streaming Delay (sec)	2.9	1.9	2.4	1.3	1.5	1.8	0.8	Fail	0.8
Latency (msec)	115	311	221	187	-	112	157	113	-

Chandmari	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone	BSNL CDMA
Download Throughput (kbps)	102.2	169.3	154.2	137.2	125.4	Fail
Upload Throughput (kbps)	86.0	132.9	86.6	159.7	174.8	Fail
Web Browsing Delay (sec)	49.7	47.1	40.9	46.8	43.7	24.5
Latency (msec)	483	195	434	436	-	Fail

Chandmari	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	0.4	2.5	3.2	1.9	2.9	7.0	4.4	3.2	9.3
Upload Throughput (Mbps)	1.6	1.4	0.1	1.3	1.3	2.2	5.9	2.2	10.9
Web Browsing Delay (sec)	14.3	12.3	9.8	13.7	10.7	5.6	6.8	8.7	6.3
Video Streaming Delay (sec)	5.1	2.5	3.3	1.9	1.3	1.6	1.0	2.1	0.7
Latency (msec)	277	385	149	187	-	112	146	96	-

Summary

City Level Summary(contd.)

Ganeshguri	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone	BSNL CDMA
Download Throughput (kbps)	171.8	92.4	147.9	168.6	165.8	Fail
Upload Throughput (kbps)	85.7	94.0	68.4	212.4	146.9	Fail
Web Browsing Delay (sec)	40.9	37.2	45.0	42.7	41.6	26.6
Latency (msec)	431	297	211	529	-	448

Ganeshguri	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	0.9	1.4	1.1	1.7	2.5	8.1	11.7	0.7	2.6
Upload Throughput (Mbps)	1.7	1.4	0.2	1.2	1.9	7.3	7.5	0.9	6.4
Web Browsing Delay (sec)	12.3	12.3	9.6	11.4	12.8	5.7	6.0	13.1	9.1
Video Streaming Delay (sec)	3.0	3.2	2.7	2.0	1.4	1.4	0.9	18.4	0.8
Latency (msec)	107	252	212	210	-	119	163	153	-

Hotel Dynasty	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone	BSNL CDMA
Download Throughput (kbps)	113.5	189.6	181.0	152.9	176.6	611.3
Upload Throughput (kbps)	94.0	155.1	105.6	151.8	194.9	138.9
Web Browsing Delay (sec)	32.6	38.6	38.8	44.2	39.6	25.9
Latency (msec)	483	215	385	438	-	187

Hotel Dynasty	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	5.6	4.6	6.0	4.9	5.0	15.6	10.3	7.3	7.9
Upload Throughput (Mbps)	2.0	1.9	0.7	2.4	1.1	6.1	3.9	1.6	7.4
Web Browsing Delay (sec)	9.4	9.3	8.2	9.6	8.7	4.9	6.5	7.2	6.5
Video Streaming Delay (sec)	5.3	1.7	3.2	1.1	1.0	1.9	0.8	1.6	0.7
Latency (msec)	106	287	143	189	-	106	149	107	-

Summary

City Level Summary(contd.)

IIT	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone	BSNL CDMA
Download Throughput (kbps)	130.6	138.0	95.7	141.9	202.3	263.4
Upload Throughput (kbps)	64.0	185.8	31.6	156.0	159.6	135.7
Web Browsing Delay (sec)	34.4	35.3	47.1	47.0	39.2	22.6
Latency (msec)	420	214	578	589	-	180

IIT	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	0.5	2.9	0.2	0.5	0.8	1.9	3.0	3.8	7.1
Upload Throughput (Mbps)	1.7	1.9	0.4	3.1	2.2	6.1	3.7	0.5	8.4
Web Browsing Delay (sec)	12.7	10.8	14.3	13.7	13.5	8.5	9.4	10.3	6.4
Video Streaming Delay (sec)	2.3	3.2	6.5	1.4	1.3	1.8	1.2	2.8	0.8
Latency (msec)	107	358	267	209	-	188	181	112	-

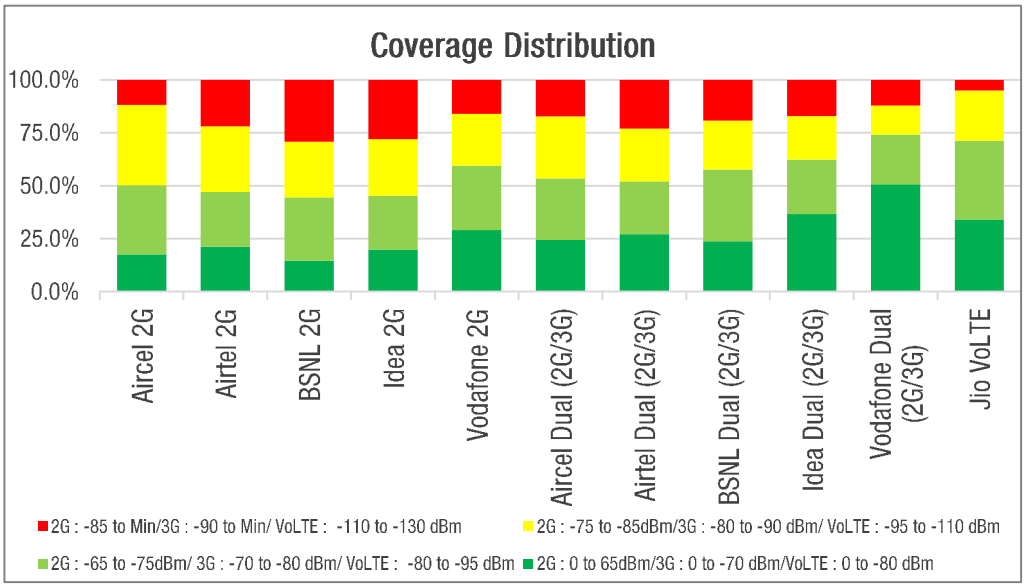
Paltan Bajar	2G					CDMA
	Aircel	Airtel	BSNL	Idea	Vodafone	BSNL CDMA
Download Throughput (kbps)	121.0	126.5	160.8	41.2	169.3	342.4
Upload Throughput (kbps)	110.4	95.5	70.7	110.0	138.9	136.6
Web Browsing Delay (sec)	46.9	38.5	34.7	32.0	42.7	22.4
Latency (msec)	419	300	321	525	-	156

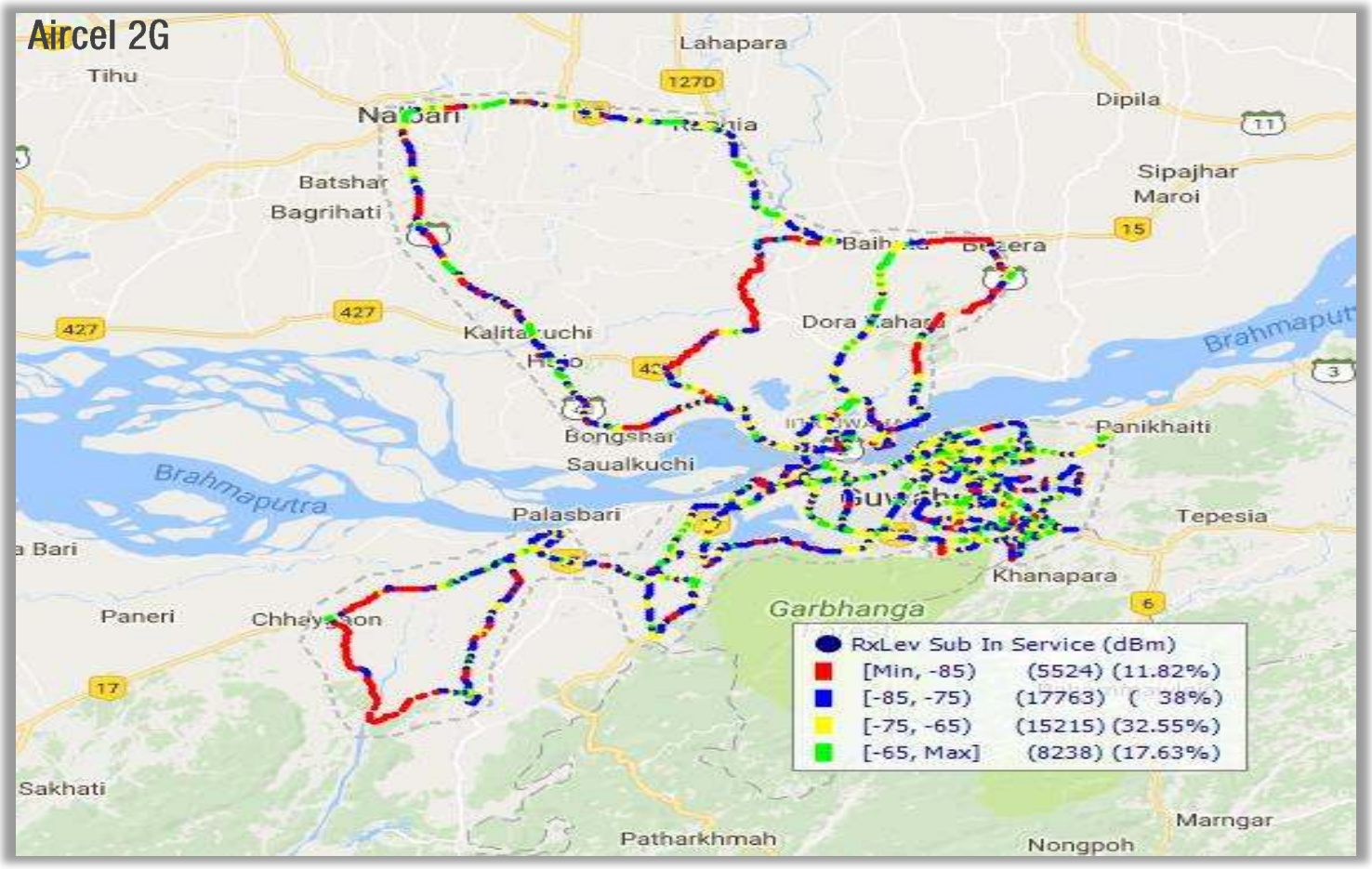
Paltan Bajar	3G					4G			
	Aircel	Airtel	BSNL	Idea	Vodafone	Airtel	Idea	Jio	Vodafone
Download Throughput (Mbps)	0.4	1.3	2.5	2.0	2.6	13.4	2.9	0.6	17.4
Upload Throughput (Mbps)	2.7	0.9	0.1	2.6	2.2	3.8	2.4	0.1	11.9
Web Browsing Delay (sec)	8.6	12.6	10.7	12.2	10.2	5.6	8.2	16.9	5.8
Video Streaming Delay (sec)	3.5	2.9	2.7	1.5	1.2	1.7	1.0	22.0	0.7
Latency (msec)	107	280	147	224	-	97	148	183	-

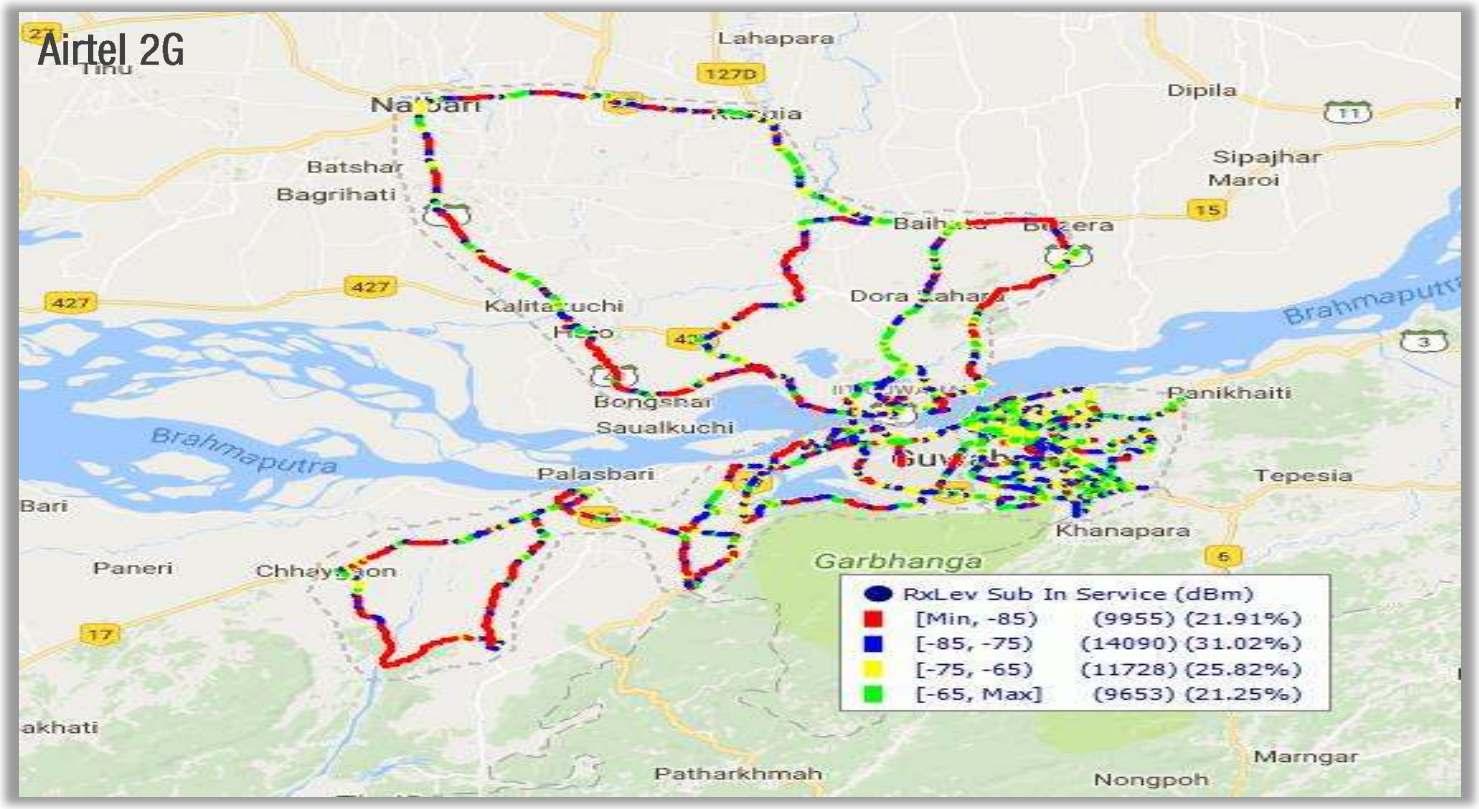
I. Coverage Details

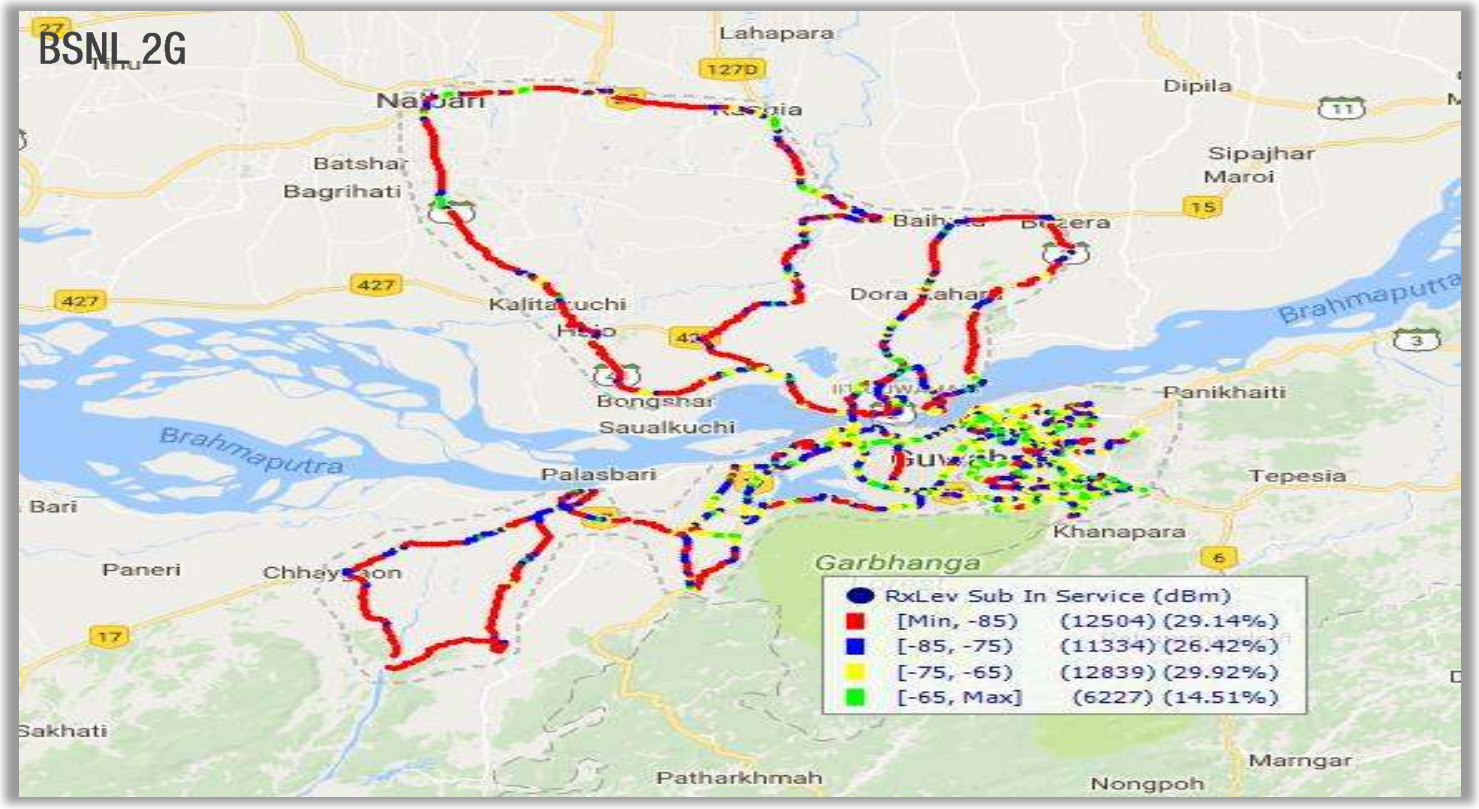
RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call/data session. The Coverage rate of an TSP is calculated on the basis of % of samples in which the Rx level ≥ -85, RSCP is ≥ -90 dBm & RSRP ≥ -110dBm. The details are as follows.

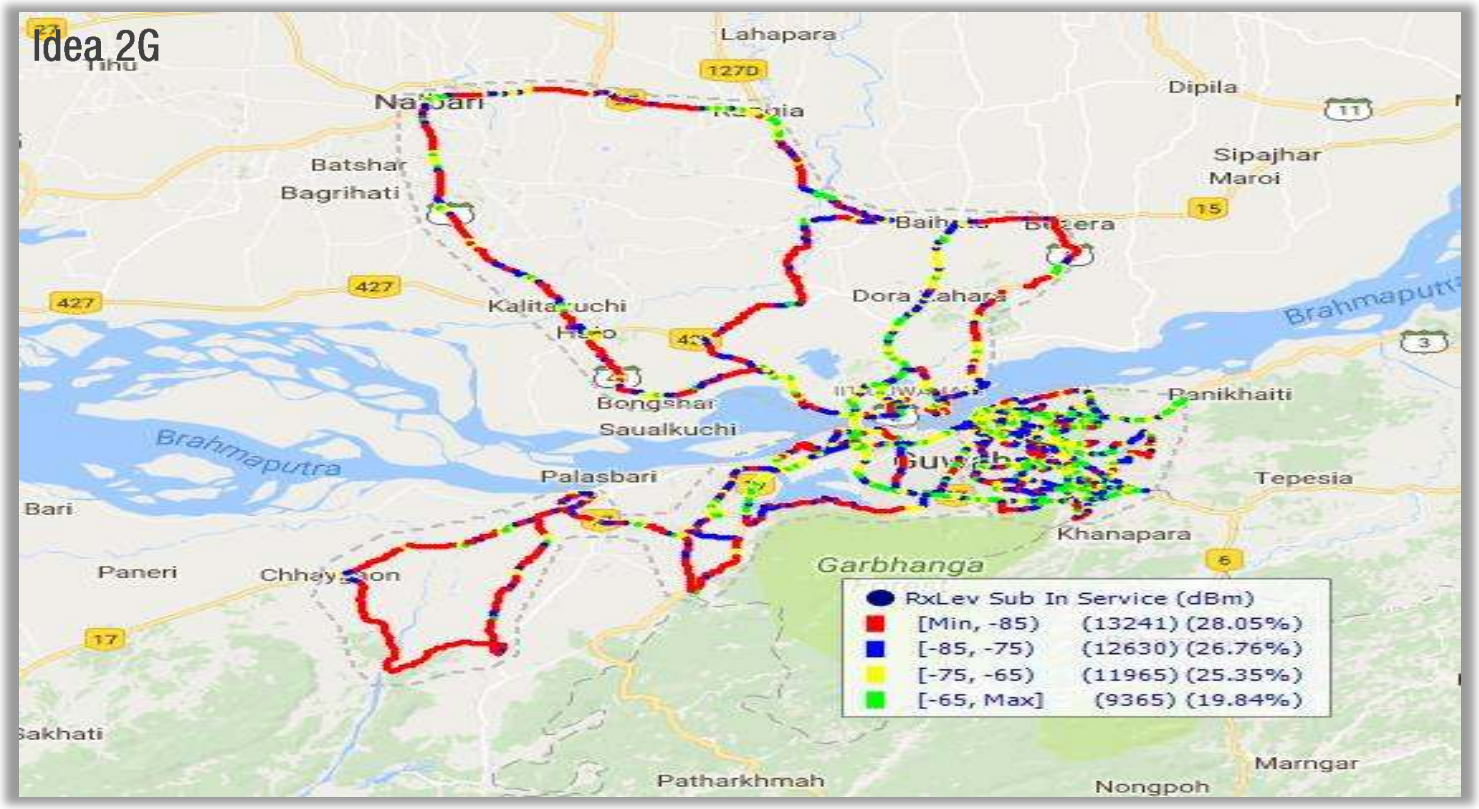
TSP	Coverage Rate
Aircel 2G	88.18%
Airtel 2G	78.09%
BSNL 2G	70.86%
Idea 2G	71.95%
Vodafone 2G	84.00%
Aircel Dual (2G/3G)	82.69%
Airtel Dual (2G/3G)	77.08%
BSNL Dual (2G/3G)	80.73%
Idea Dual (2G/3G)	82.88%
Vodafone Dual (2G/3G)	87.96%
Jio VoLTE	94.97%

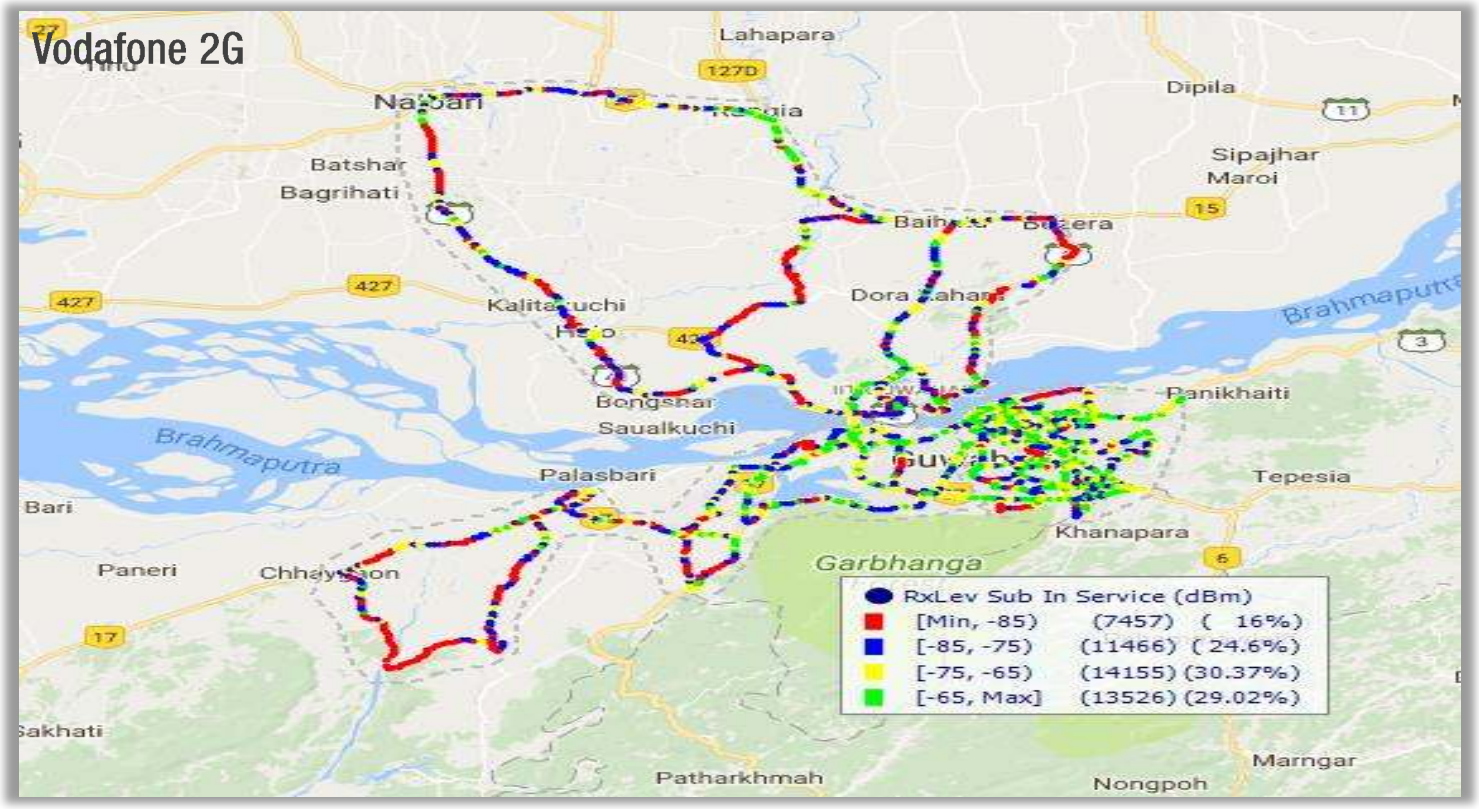


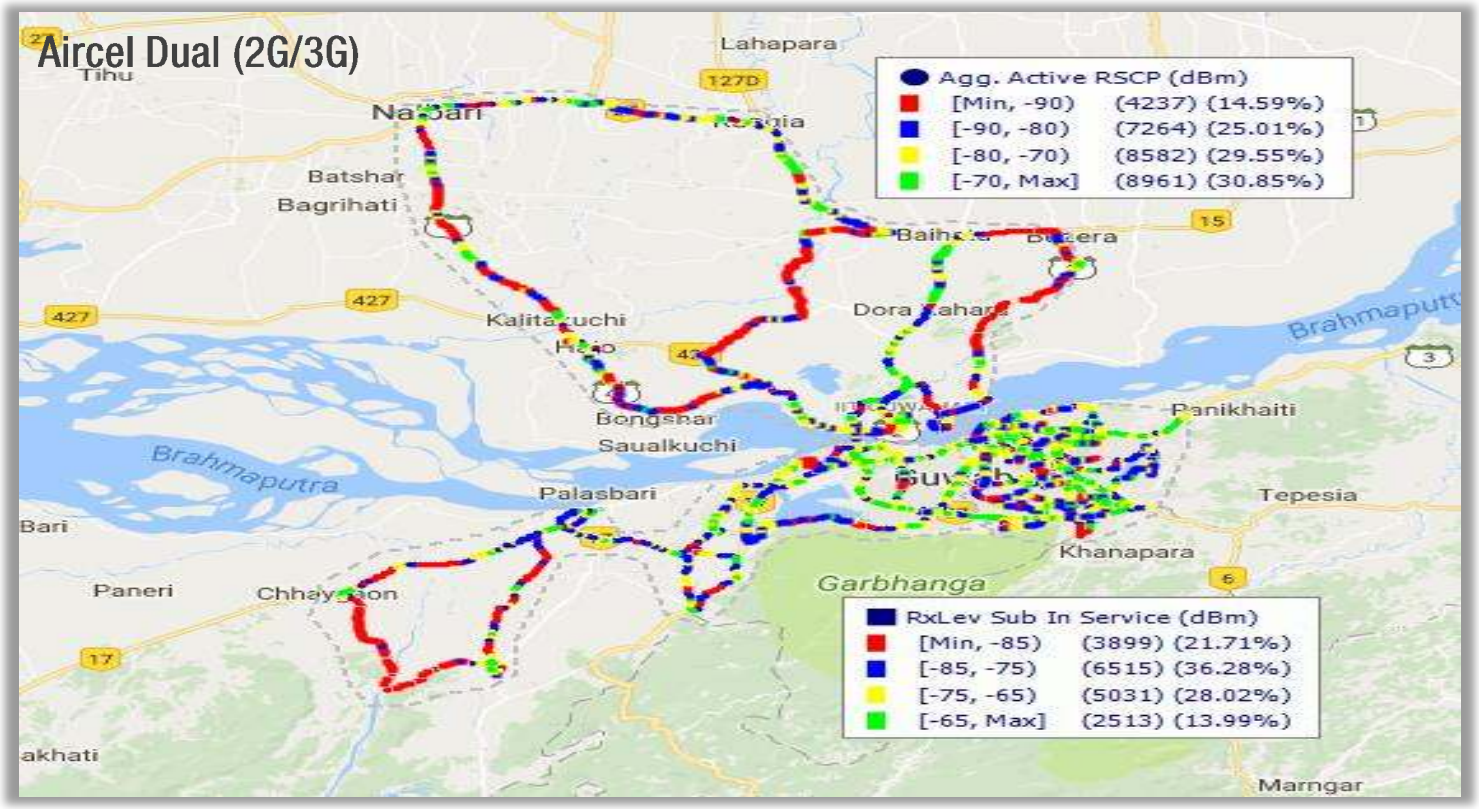


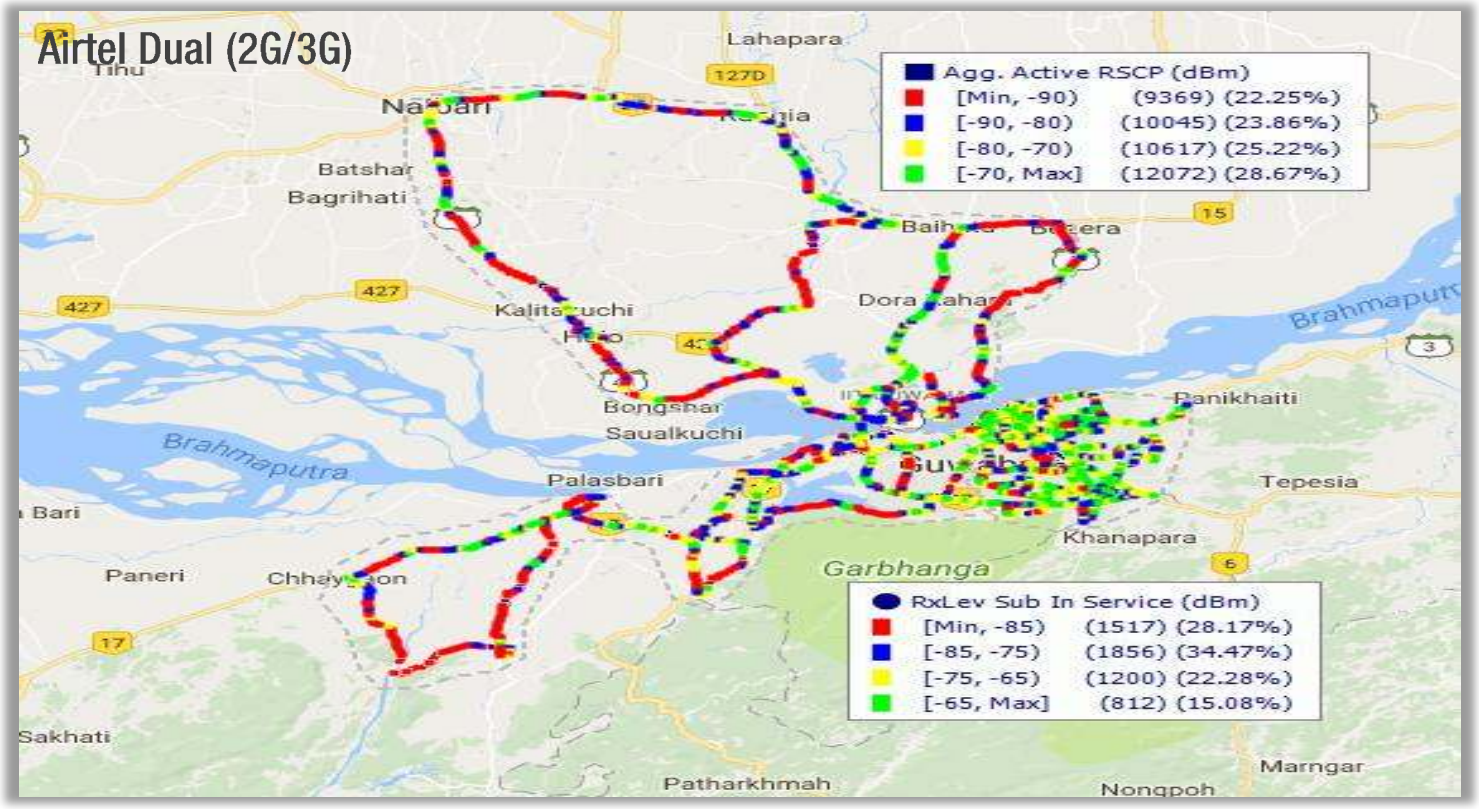

Airtel 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalitacuchi
Dora Gahara
Brahmaputra
Bongshar
Saualkuchi
Panikhaiti
Palasbari
Tepesia
Khanapara
Garbhanga
Paneri
Patharkhmah
Nongpoh
Marngar
RxLev Sub In Service (dBm)
[Min, -85) (9955) (21.91%)
[-85, -75) (14090) (31.02%)
[-75, -65) (11728) (25.82%)
[-65, Max] (9653) (21.25%)


BSNL 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalitacuchi
Dora Gahara
Brahmaputra
Bongshar
Saualkuchi
Panikhaiti
Palasbari
Tepesia
Khanapara
Garbhanga
Paneri
Patharkhmah
Nongpoh
Marngar
RxLev Sub In Service (dBm)
[Min, -85) (12504) (29.14%)
[-85, -75) (11334) (26.42%)
[-75, -65) (12839) (29.92%)
[-65, Max] (6227) (14.51%)

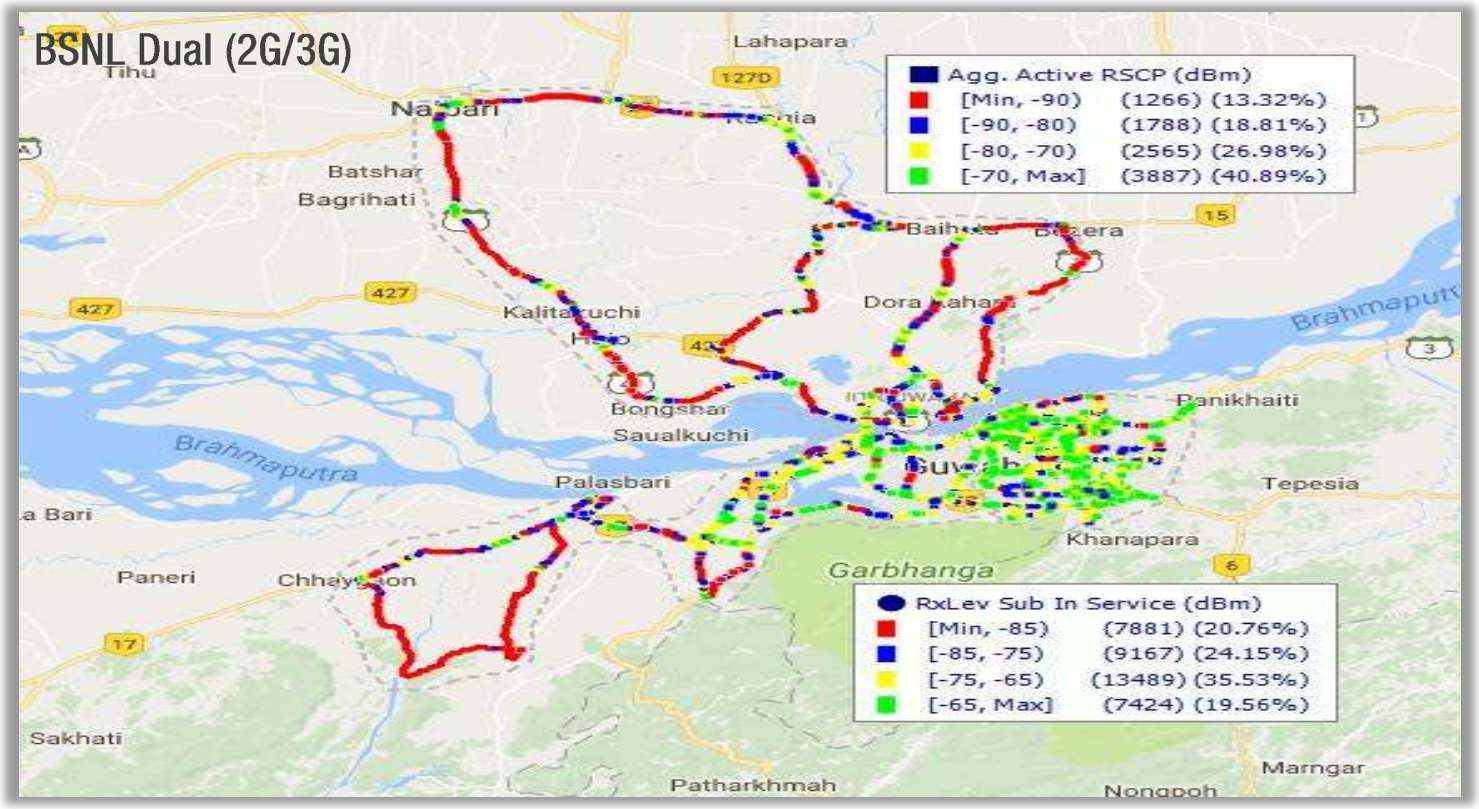

Idea 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalitachuchi
Dora Pahar
Brahmaputra
Bongshar
Saulkuchi
Panikhaiti
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhanga
Patharkhmah
Nongpoh
Marngar
RxLev Sub In Service (dBm)
[Min, -85) (13241) (28.05%)
[-85, -75) (12630) (26.76%)
[-75, -65) (11965) (25.35%)
[-65, Max] (9365) (19.84%)


Vodafone 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalitachuchi
Brahmaputra
Bongshar
Saulkuchi
Panikhaiti
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhanga
Patharkhmah
Nongpoh
Marngar
RxLev Sub In Service (dBm)
[Min, -85) (7457) (16%)
[-85, -75) (11466) (24.6%)
[-75, -65) (14155) (30.37%)
[-65, Max] (13526) (29.02%)

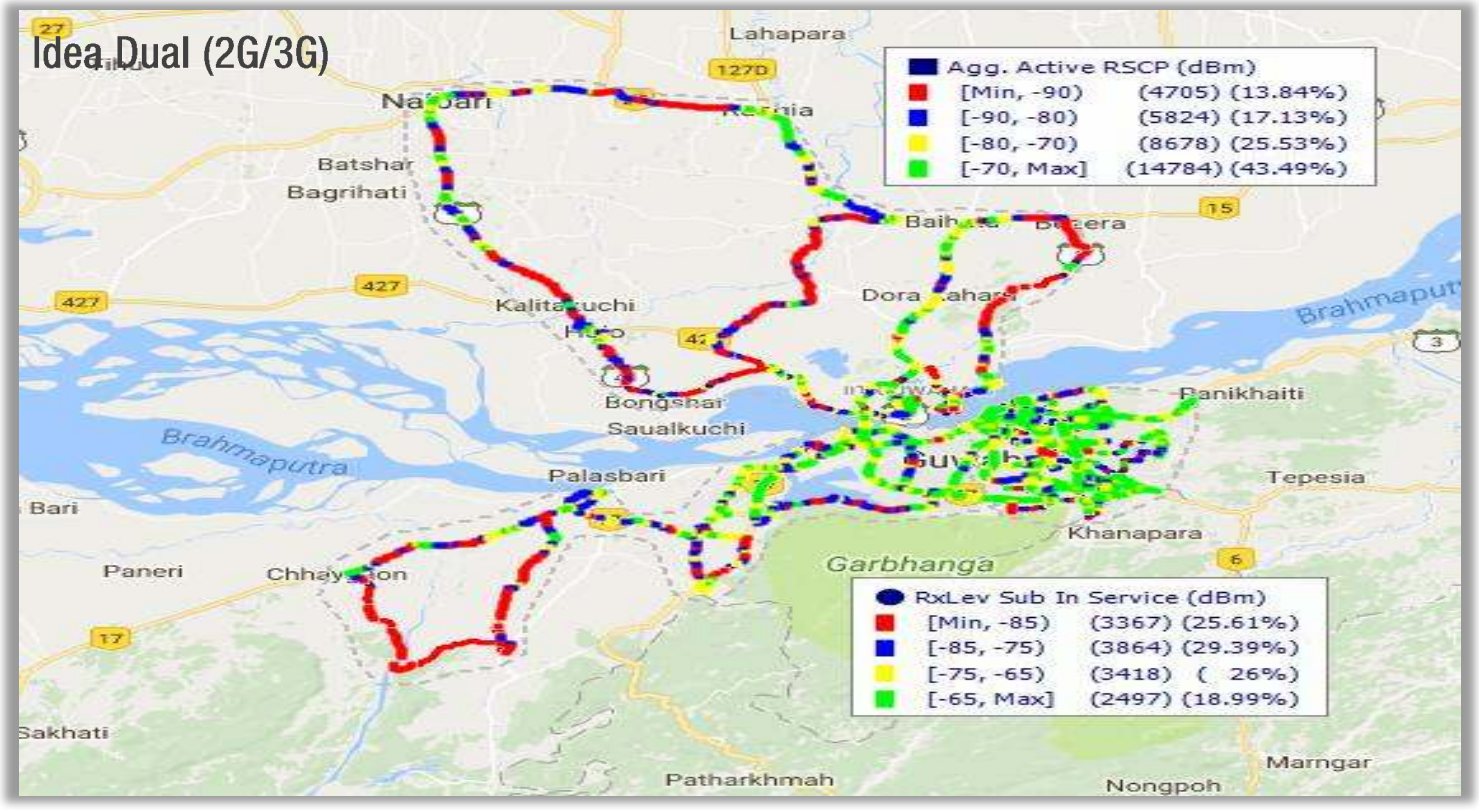

Aircel Dual (2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (4237) (14.59%)
[-90, -80) (7264) (25.01%)
[-80, -70) (8582) (29.55%)
[-70, Max] (8961) (30.85%)
RxLev Sub In Service (dBm)
[Min, -85) (3899) (21.71%)
[-85, -75) (6515) (36.28%)
[-75, -65) (5031) (28.02%)
[-65, Max] (2513) (13.99%)
Lahapara
Batshar
Bagrihati
Kalitakuchi
Bongshar
Saulkuchi
Palasbari
Panikhaiti
Tepesia
Khanapara
Garbhanga
Brahmaputra
Paneri
Marngar

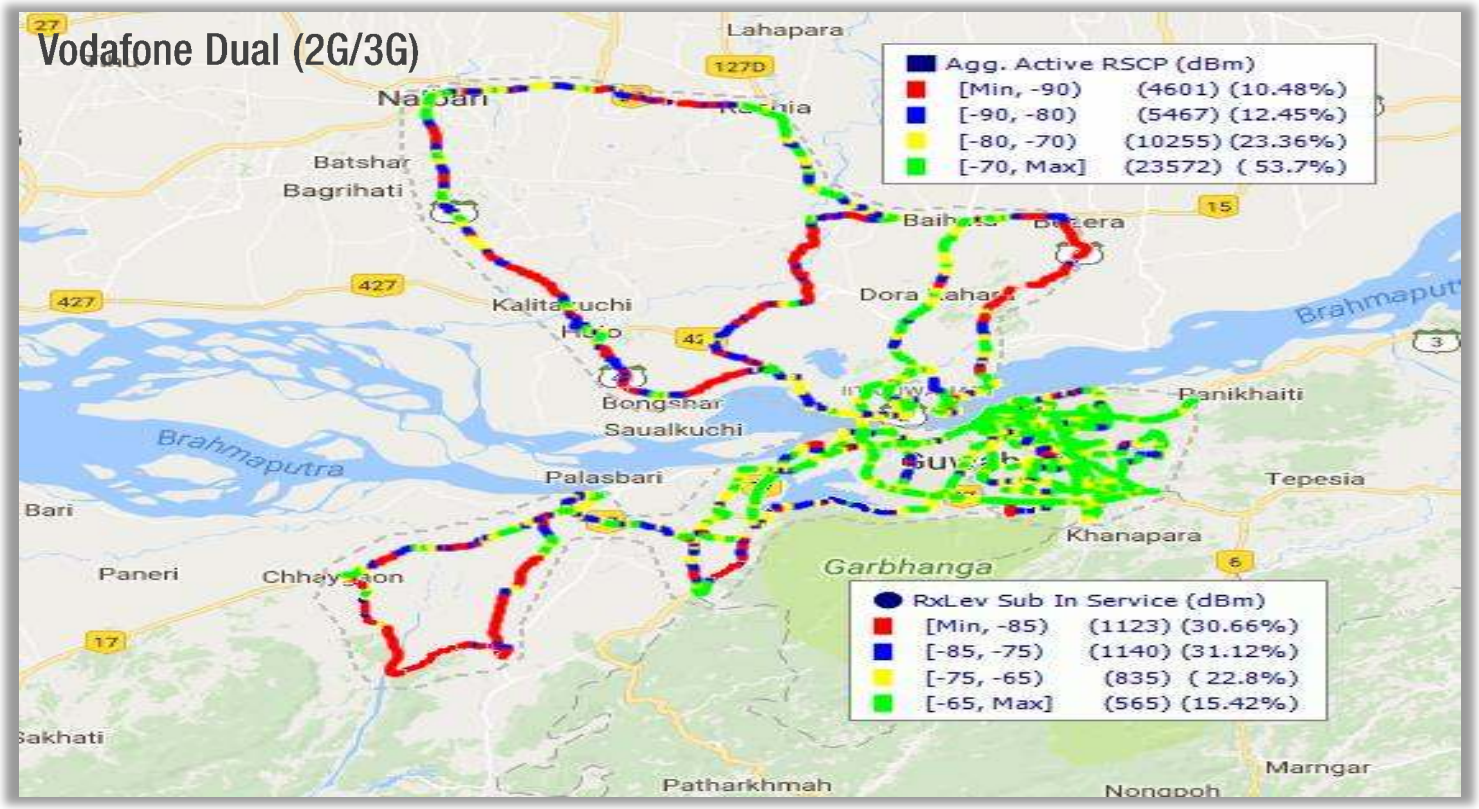

Airtel Dual (2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (9369) (22.25%)
[-90, -80) (10045) (23.86%)
[-80, -70) (10617) (25.22%)
[-70, Max] (12072) (28.67%)
RxLev Sub In Service (dBm)
[Min, -85) (1517) (28.17%)
[-85, -75) (1856) (34.47%)
[-75, -65) (1200) (22.28%)
[-65, Max] (812) (15.08%)
Lahapara
Batshar
Bagrihati
Kalitakuchi
Bongshar
Saulkuchi
Palasbari
Panikhaiti
Tepesia
Khanapara
Garbhanga
Brahmaputra
Paneri
Sakhati
Patharkhmah
Nongpoh
Marngar

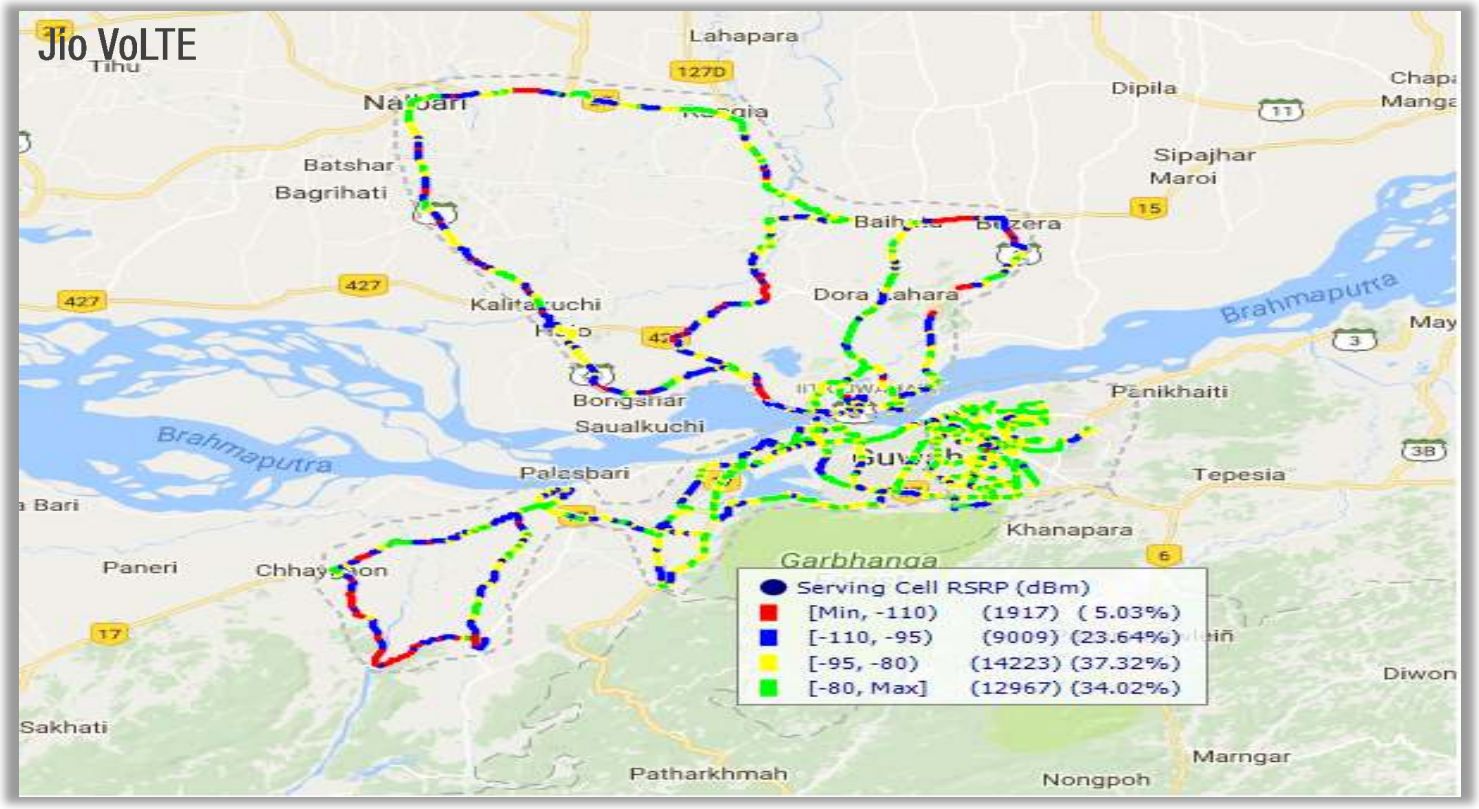
BSNL Dual (2G/3G)



Idea Dual (2G/3G)




Vodafone Dual (2G/3G)
Agg. Active RSCP (dBm)
[Min, -90) (4601) (10.48%)
[-90, -80) (5467) (12.45%)
[-80, -70) (10255) (23.36%)
[-70, Max] (23572) (53.7%)
RxLev Sub In Service (dBm)
[Min, -85) (1123) (30.66%)
[-85, -75) (1140) (31.12%)
[-75, -65) (835) (22.8%)
[-65, Max] (565) (15.42%)
Lahapara
Batshar
Bagrihati
Kalitakuchi
Bongshar
Saualkuchi
Palasbari
Brahmaputra
Panikhaiti
Tepesia
Khanapara
Garbhanga
Paneri
Bari
Sakhati
Patharkhmah
Nongpoh
Marngar

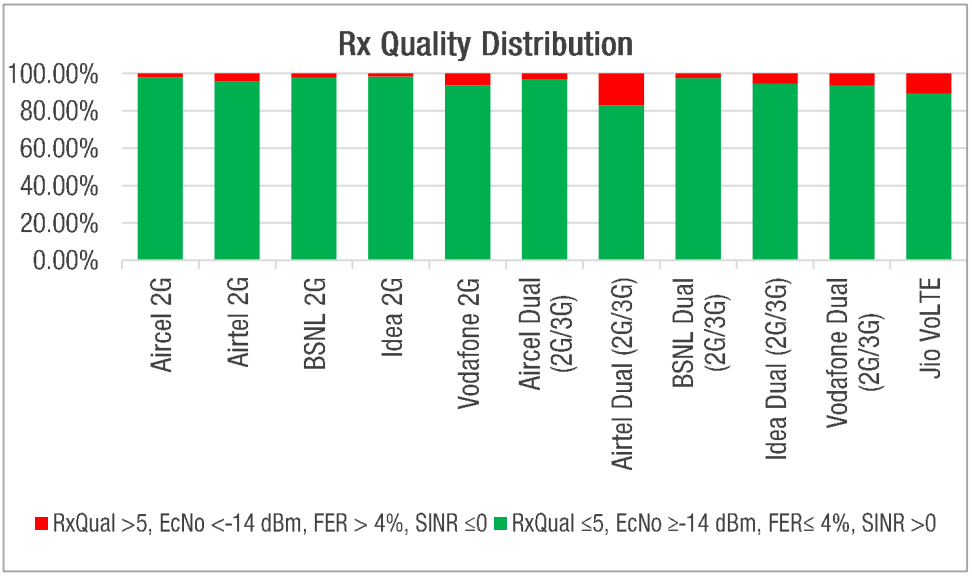

Jio VoLTE
Serving Cell RSRP (dBm)
[Min, -110) (1917) (5.03%)
[-110, -95) (9009) (23.64%)
[-95, -80) (14223) (37.32%)
[-80, Max] (12967) (34.02%)
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalitakuchi
Bongshar
Saualkuchi
Palasbari
Brahmaputra
Panikhaiti
Tepesia
Khanapara
Garbhanga
Paneri
Sakhati
Patharkhmah
Nongpoh
Marngar
Diwon

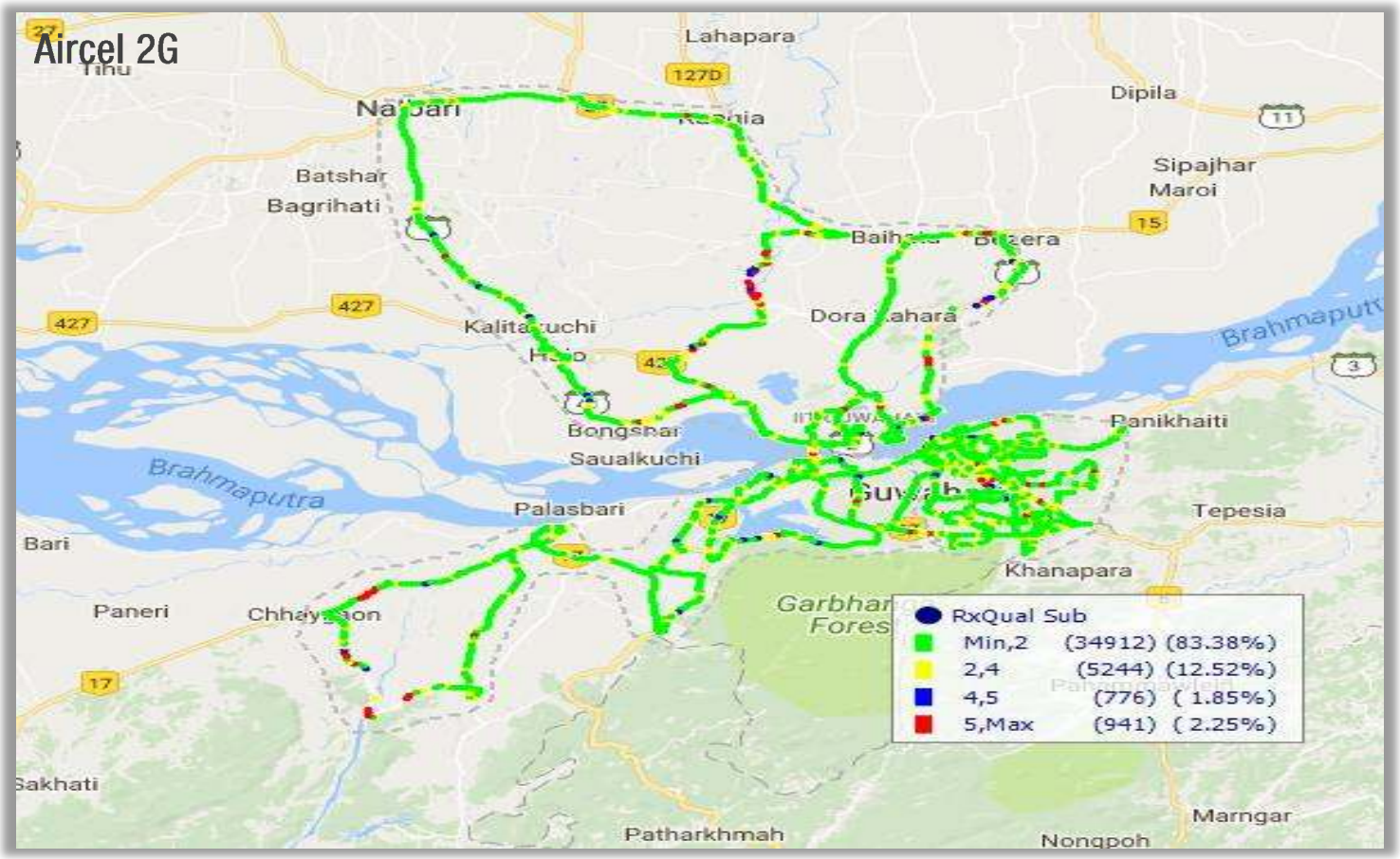
II. Quality Details

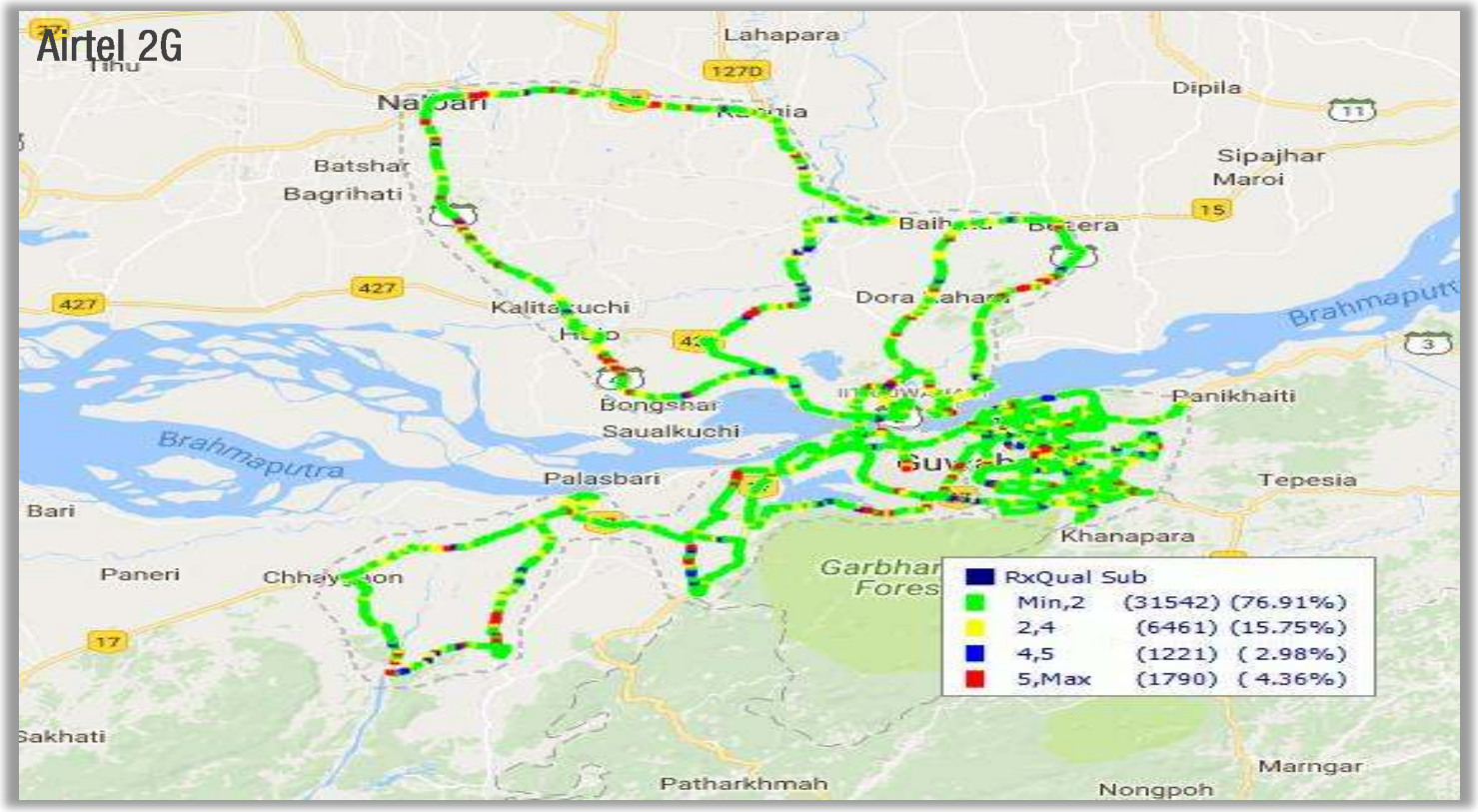
For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -14 dBm for 3G TSPs, FER <=4% for CDMA TSPs and SINR >0 in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be ≥ 95%.

TSP	Rx Quality
Aircel 2G	97.75%
Airtel 2G	95.64%
BSNL 2G	97.59%
Idea 2G	98.33%
Vodafone 2G	93.67%
Aircel Dual (2G/3G)	96.60%
Airtel Dual (2G/3G)	82.90%
BSNL Dual (2G/3G)	97.48%
Idea Dual (2G/3G)	94.34%
Vodafone Dual (2G/3G)	93.31%
Jio VoLTE	89.02%

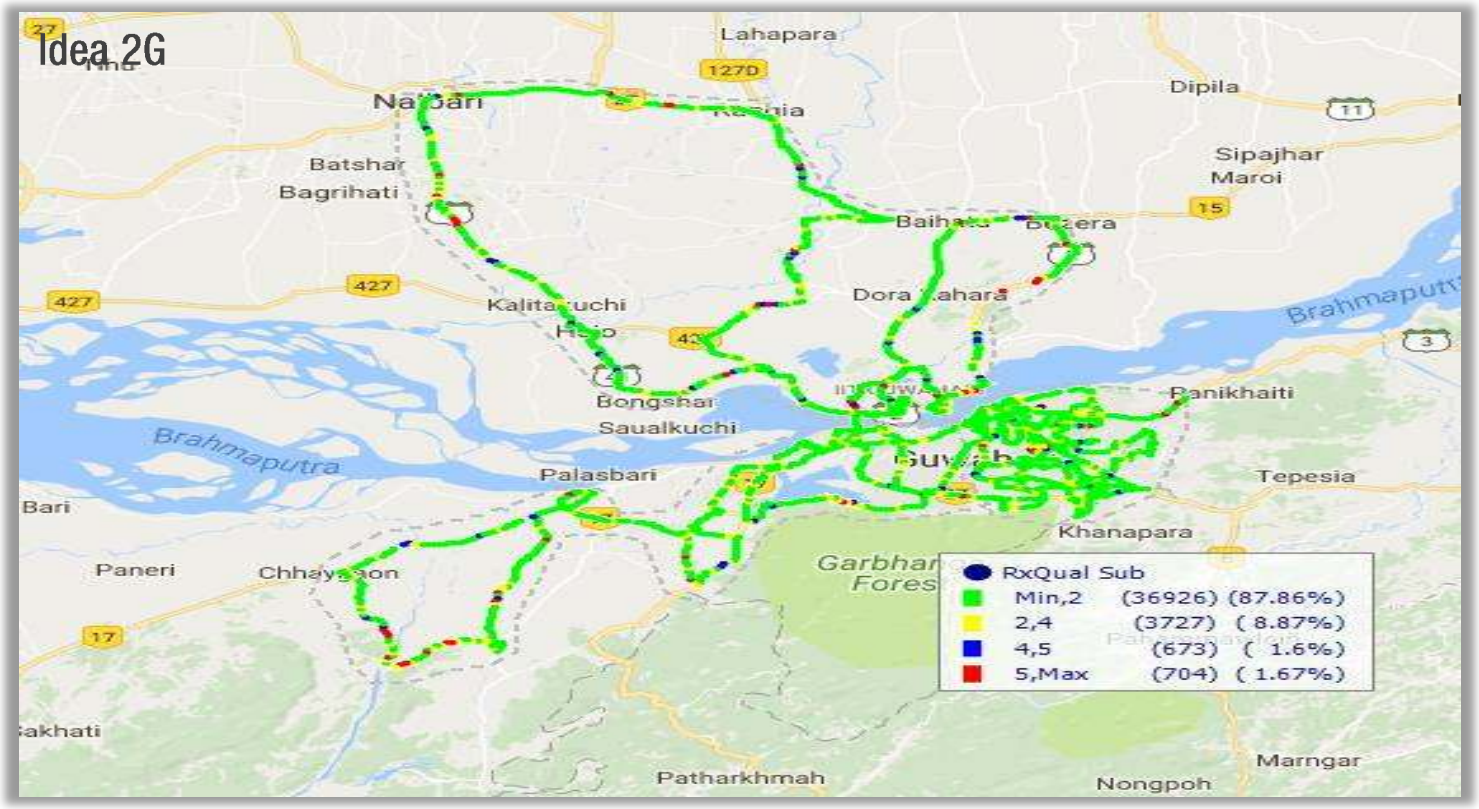
TSPs not meeting the benchmark

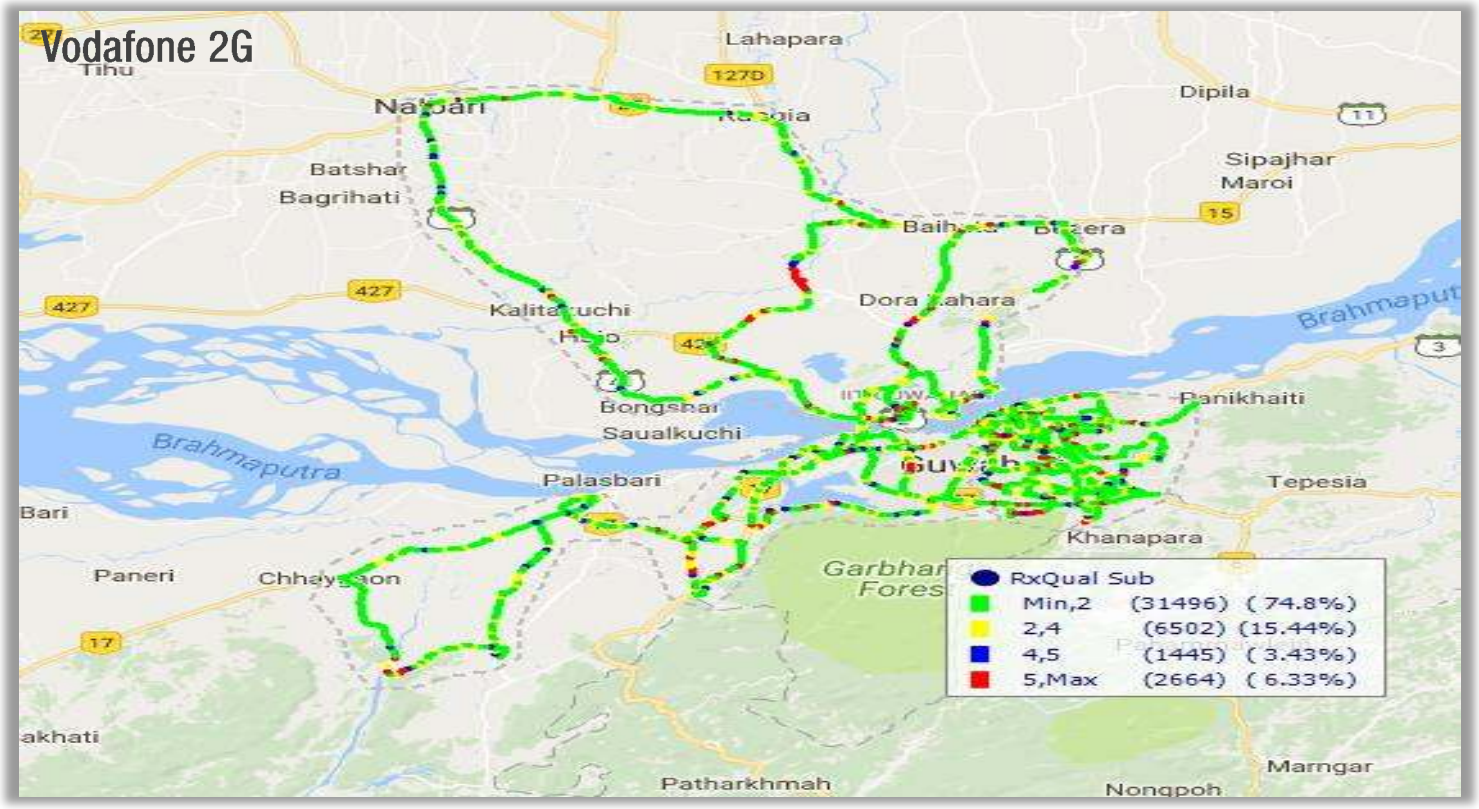




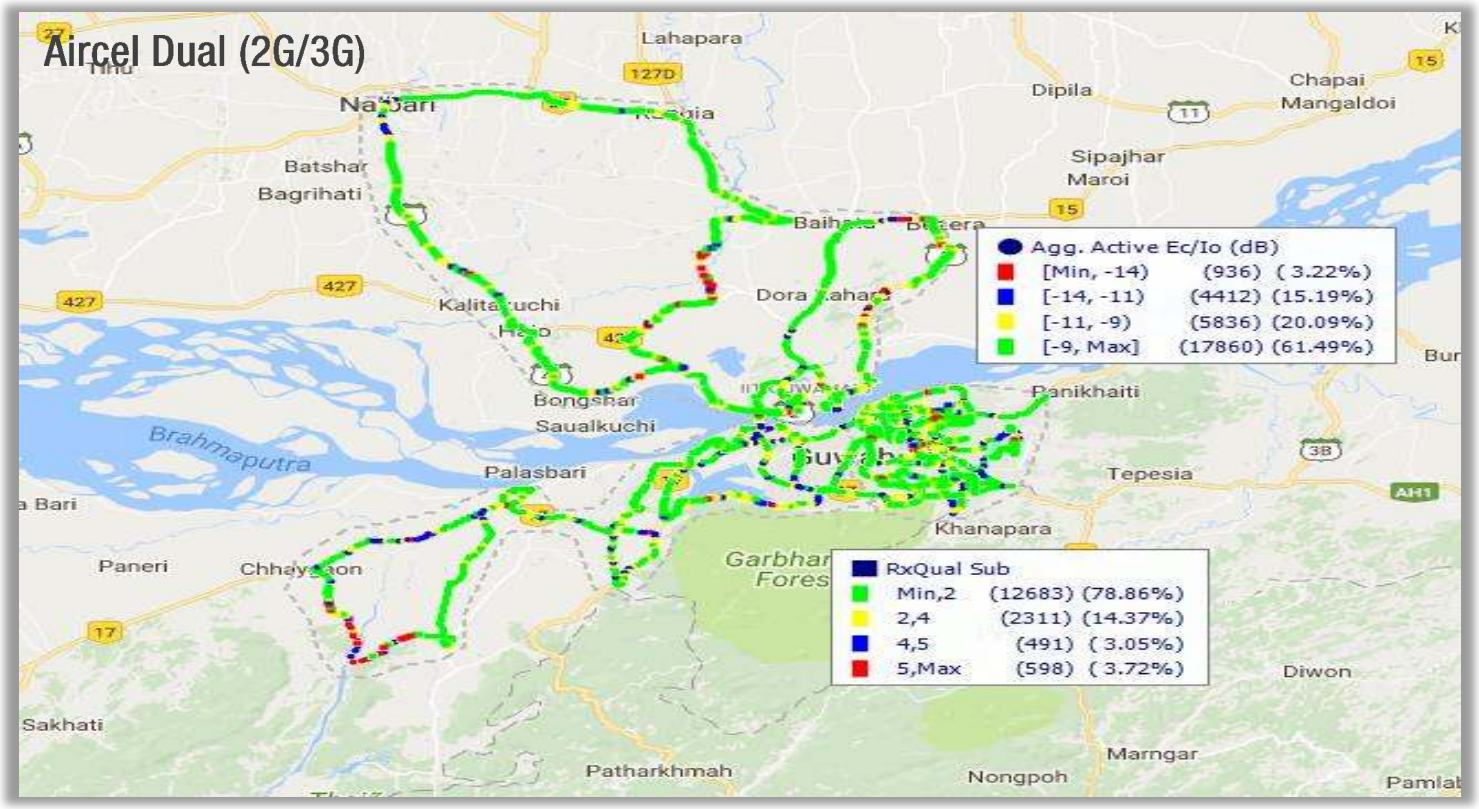

Airtel 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalita
Dora
Brahmaputra
Bongshar
Saulkuchi
Panikhaiti
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhar
Fores
RxQual Sub
Min,2 (31542) (76.91%)
2,4 (6461) (15.75%)
4,5 (1221) (2.98%)
5,Max (1790) (4.36%)
Patharkhmah
Nongpoh
Marngar

BSNL 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Kalita
Dora
Brahmaputra
Bongshar
Saulkuchi
Panikhaiti
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbha
Fore
RxQual Sub
Min,2 (34036) (88.34%)
2,4 (2990) (7.76%)
4,5 (574) (1.49%)
5,Max (927) (2.41%)
Patharkhmah
Nongpoh
Marngar

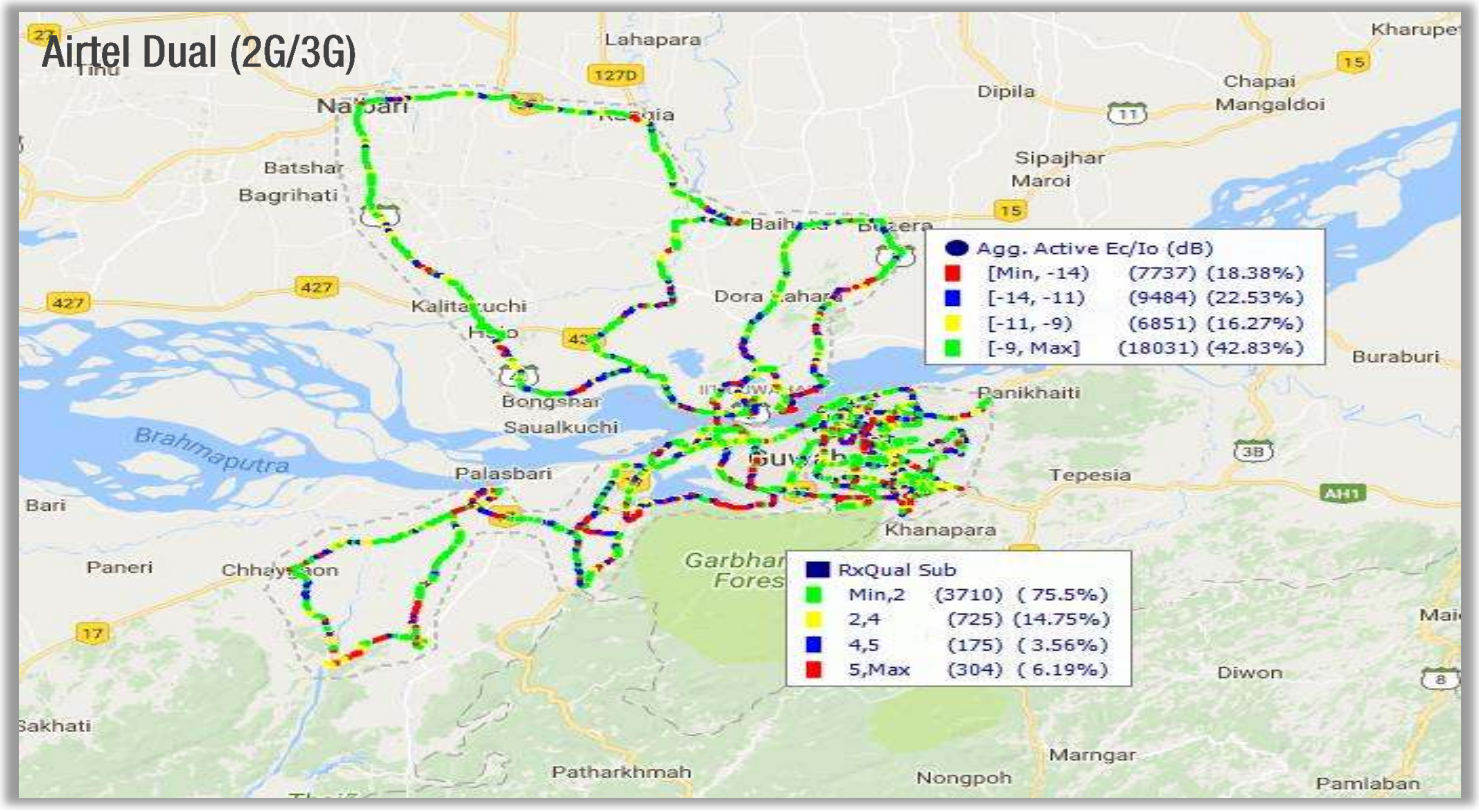

Idea 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Dora Kahara
Kalitakuchi
Bongshar
Saualkuchi
Panikhaiti
Brahmaputra
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhar
Fores
Patharkhmah
Nongpoh
Marngar
RxQual Sub
Min,2 (36926) (87.86%)
2,4 (3727) (8.87%)
4,5 (673) (1.6%)
5,Max (704) (1.67%)

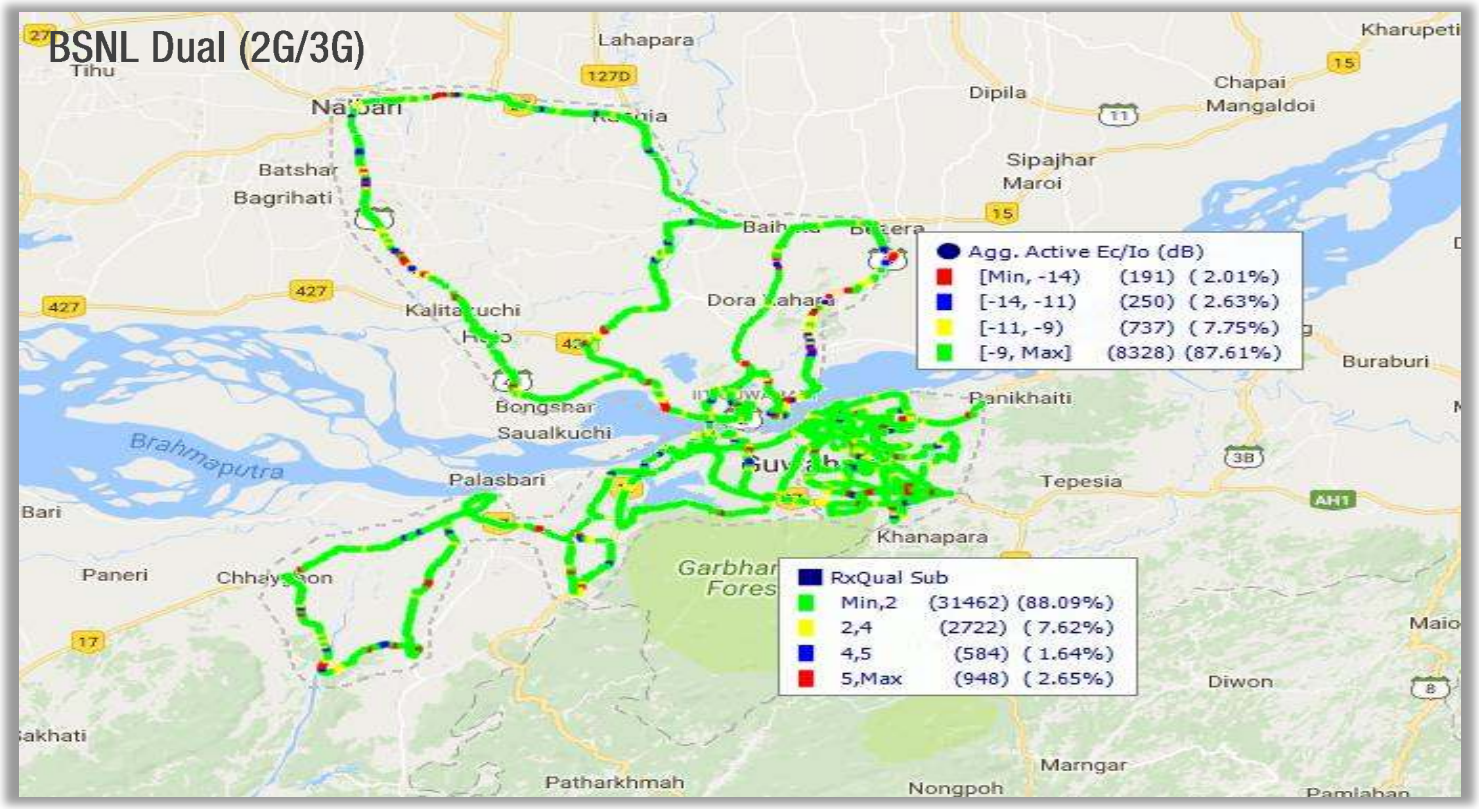

Vodafone 2G
Lahapara
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Dora Kahara
Kalitakuchi
Bongshar
Saualkuchi
Panikhaiti
Brahmaputra
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhar
Fores
Patharkhmah
Nongpoh
Marngar
RxQual Sub
Min,2 (31496) (74.8%)
2,4 (6502) (15.44%)
4,5 (1445) (3.43%)
5,Max (2664) (6.33%)

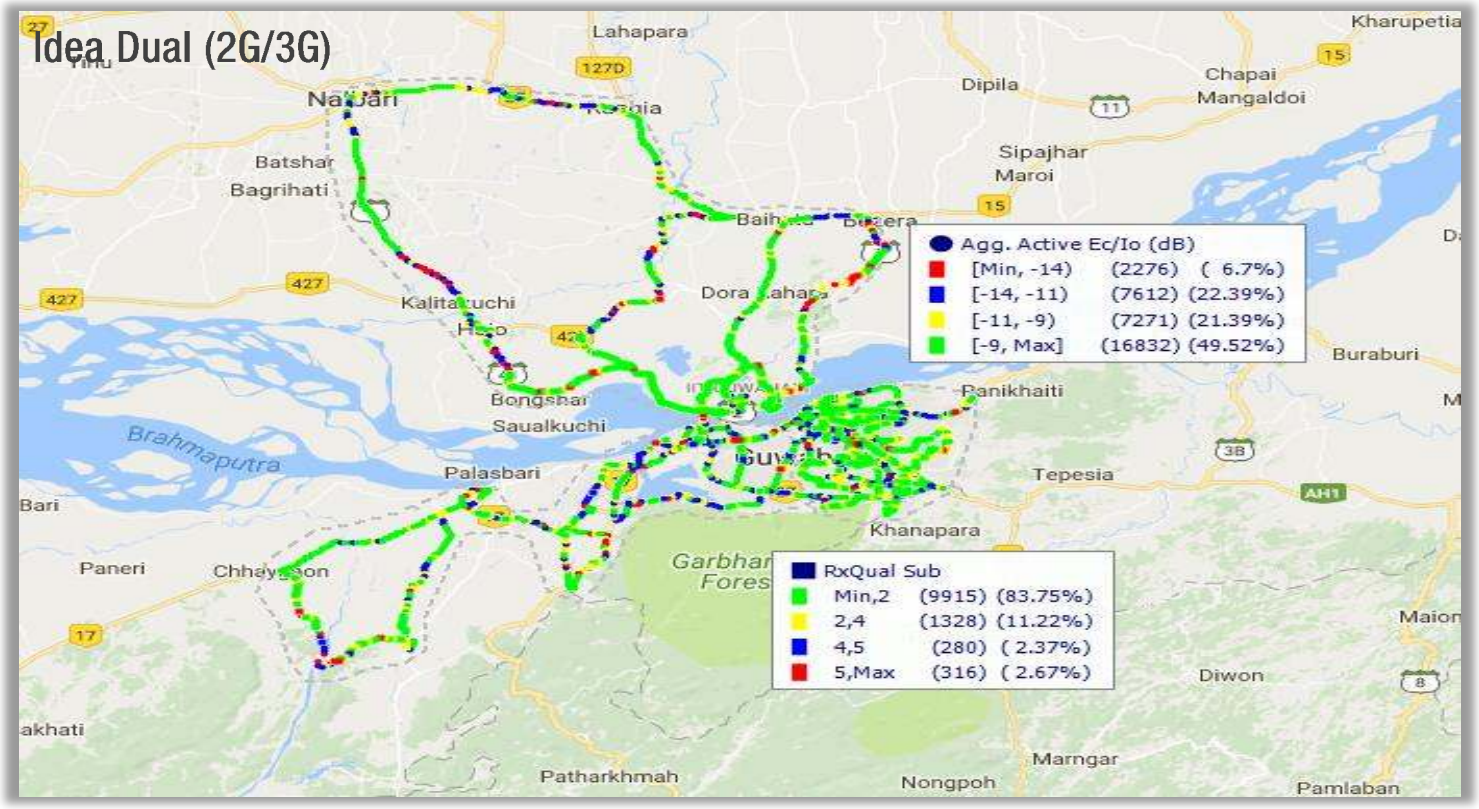
Aircel Dual (2G/3G)

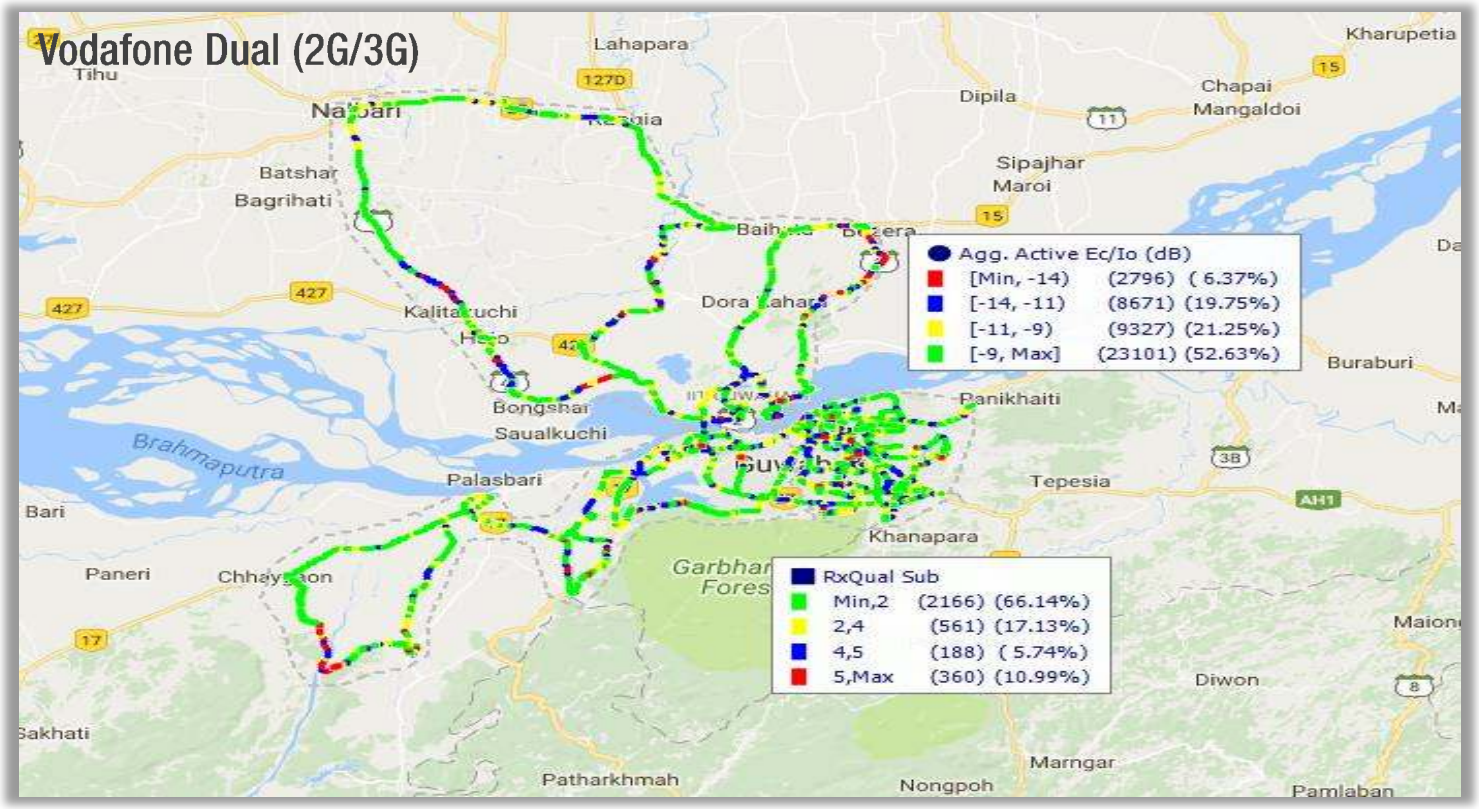


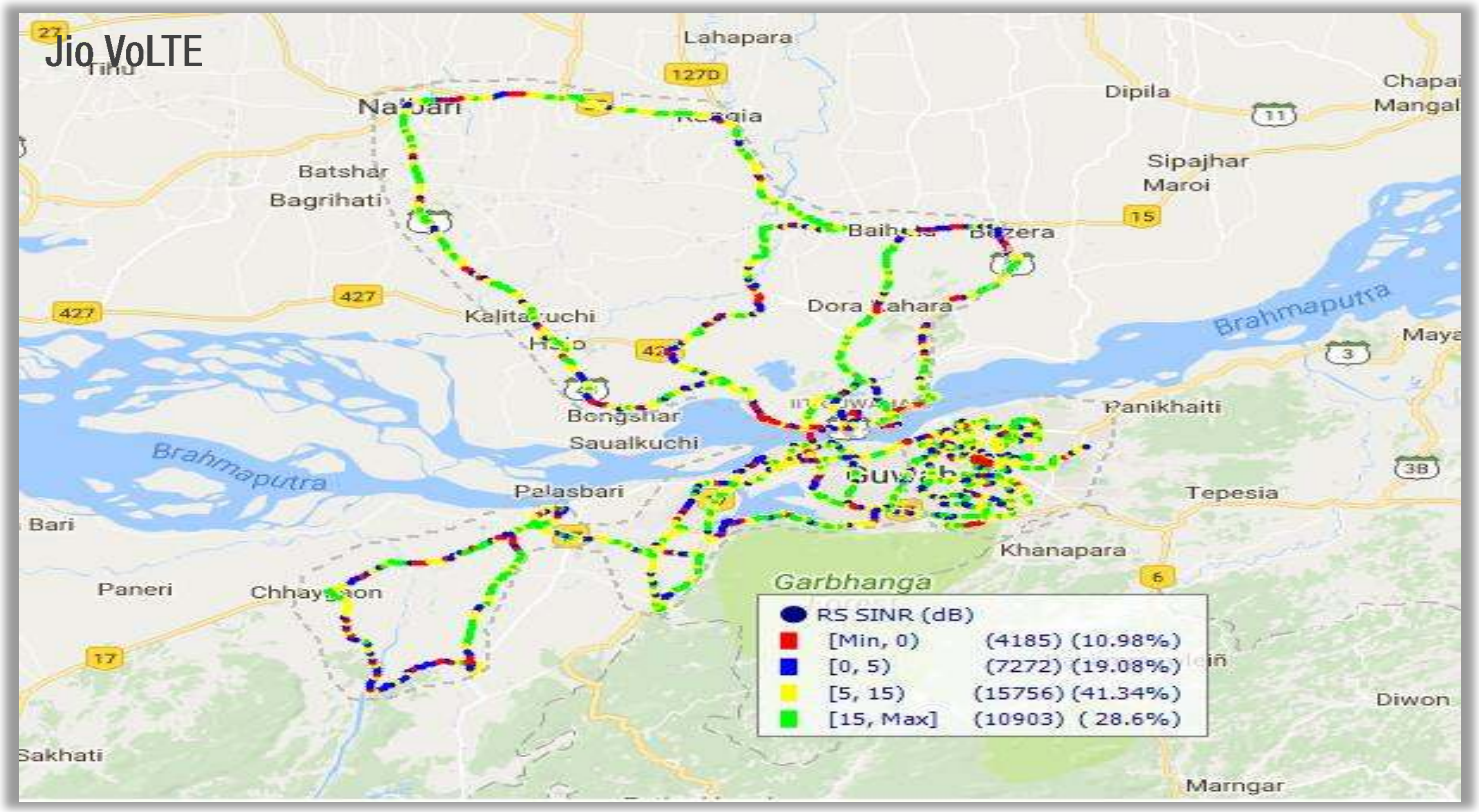
Airtel Dual (2G/3G)




BSNL Dual (2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (191) (2.01%)
[-14, -11) (250) (2.63%)
[-11, -9) (737) (7.75%)
[-9, Max] (8328) (87.61%)
RxQual Sub
Min,2 (31462) (88.09%)
2,4 (2722) (7.62%)
4,5 (584) (1.64%)
5,Max (948) (2.65%)
Lahapara
Kharupeti
Dipila
Chapai Mangaldoi
Sipajhar Maroi
Batshar Bagrihati
Kalitachuchi
Bongshar Saualkuchi
Brahmaputra
Palasbari
Panikhaiti
Buraburi
Tepesia
Khanapara
Paneri
Diwon
Patharkhmah
Nongpoh
Marngar

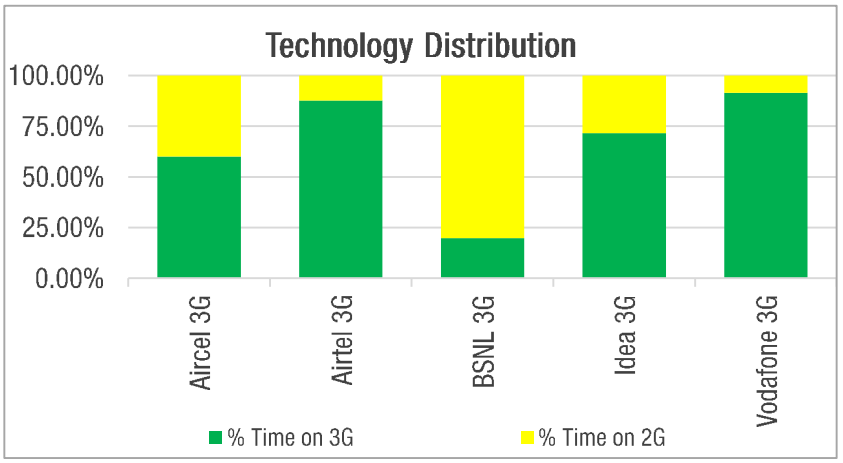

Idea Dual (2G/3G)
Agg. Active Ec/Io (dB)
[Min, -14) (2276) (6.7%)
[-14, -11) (7612) (22.39%)
[-11, -9) (7271) (21.39%)
[-9, Max] (16832) (49.52%)
RxQual Sub
Min,2 (9915) (83.75%)
2,4 (1328) (11.22%)
4,5 (280) (2.37%)
5,Max (316) (2.67%)
Lahapara
Kharupetia
Dipila
Chapai Mangaldoi
Sipajhar Maroi
Batshar Bagrihati
Kalitachuchi
Bongshar Saualkuchi
Brahmaputra
Palasbari
Panikhaiti
Buraburi
Tepesia
Khanapara
Paneri
Diwon
Patharkhmah
Nongpoh
Marngar
Pamlaban

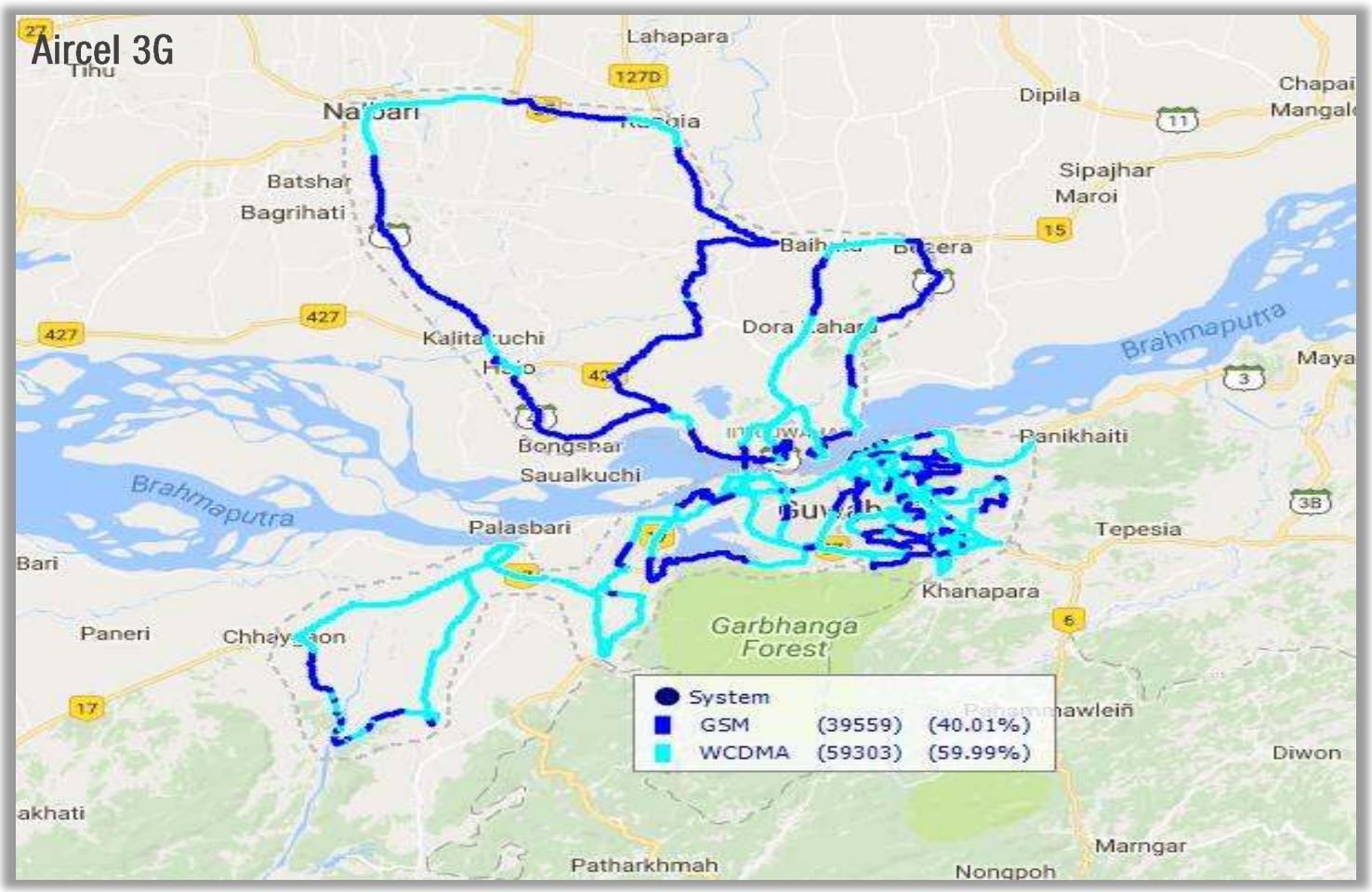

Vodafone Dual (2G/3G)
Lahapara
Kharupetia
Tihu
Dipila
Chapai Mangaldoi
Batshar
Bagrihati
Sipajhar Maroi
Dora Tahara
Buraburi
Panikhaiti
Bongshar
Saualkuchi
Brahmaputra
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhanga
Diwon
Sakhati
Patharkhmah
Nongpoh
Marngar
Pamlaban
Agg. Active Ec/Io (dB)
[Min, -14) (2796) (6.37%)
[-14, -11) (8671) (19.75%)
[-11, -9) (9327) (21.25%)
[-9, Max] (23101) (52.63%)
RxQual Sub
Min,2 (2166) (66.14%)
2,4 (561) (17.13%)
4,5 (188) (5.74%)
5,Max (360) (10.99%)


Jio VoLTE
Lahapara
Dipila
Batshar
Bagrihati
Sipajhar Maroi
Dora Tahara
Brahmaputra
Bongshar
Saualkuchi
Panikhaiti
Palasbari
Tepesia
Bari
Khanapara
Paneri
Garbhanga
Diwon
Sakhati
Marngar
RS SINR (dB)
[Min, 0) (4185) (10.98%)
[0, 5) (7272) (19.08%)
[5, 15) (15756) (41.34%)
[15, Max] (10903) (28.6%)

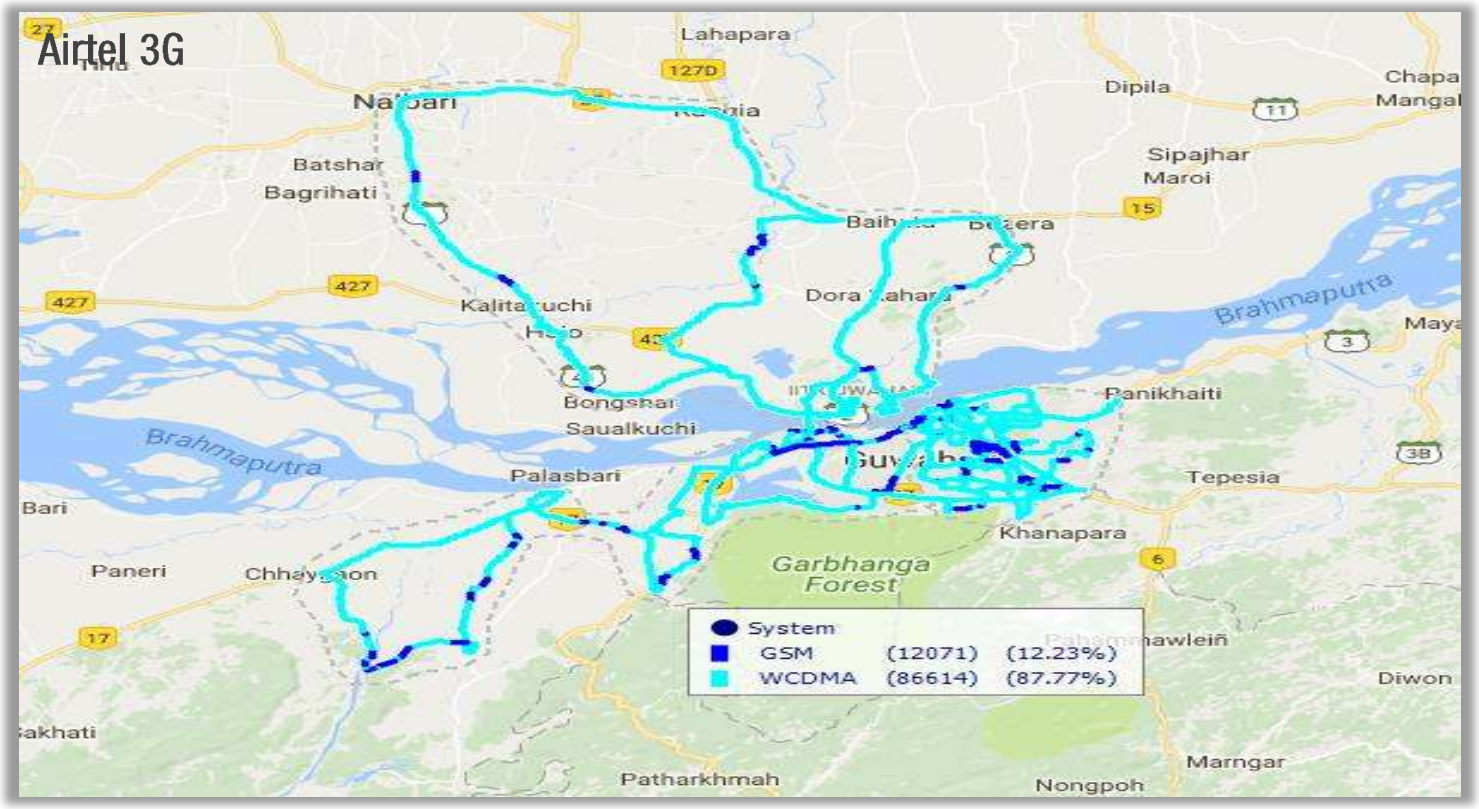
III. Technology Details

TSP	% Time on 3G
Aircel 3G	59.99%
Airtel 3G	87.77%
BSNL 3G	19.81%
Idea 3G	71.52%
Vodafone 3G	91.54%

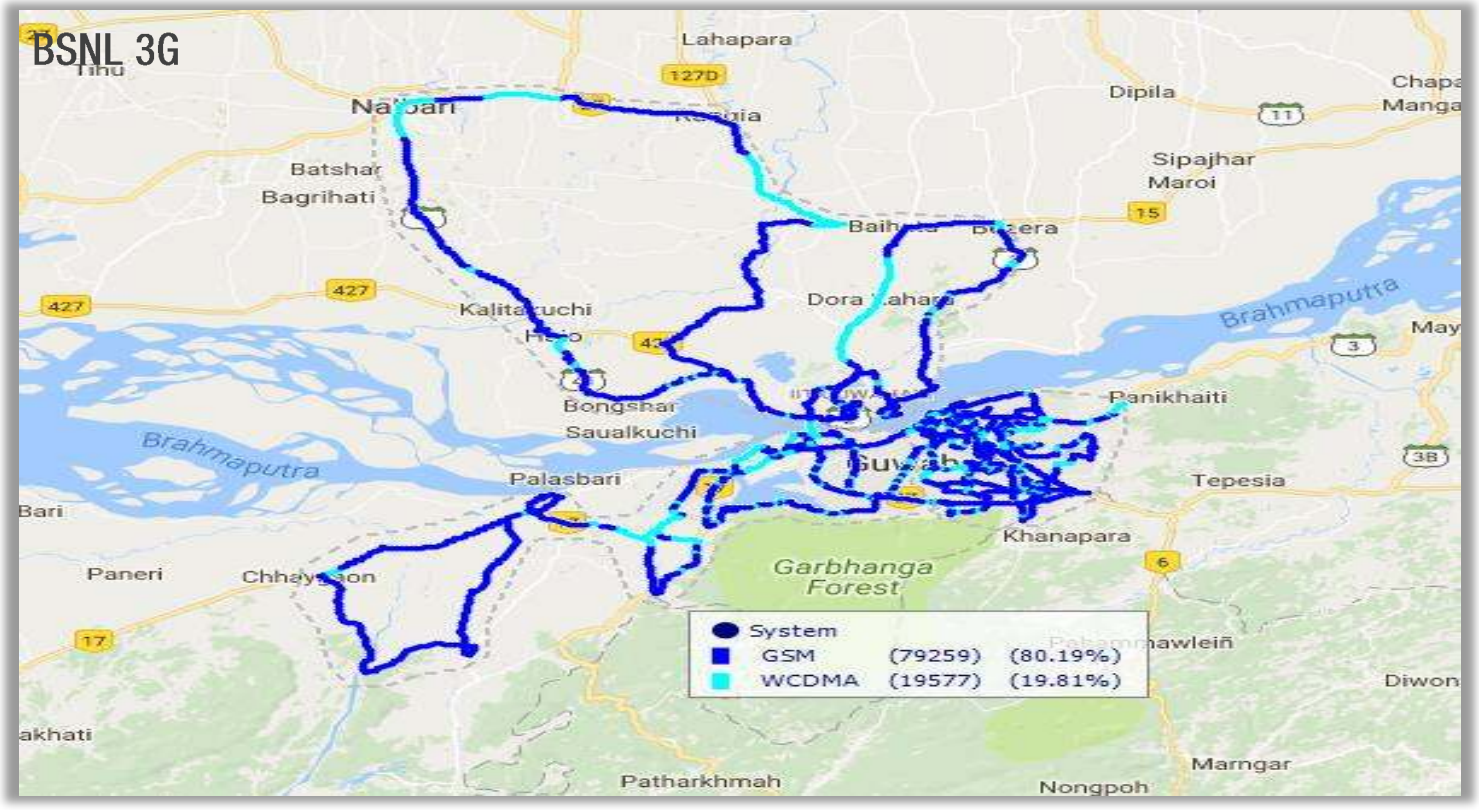


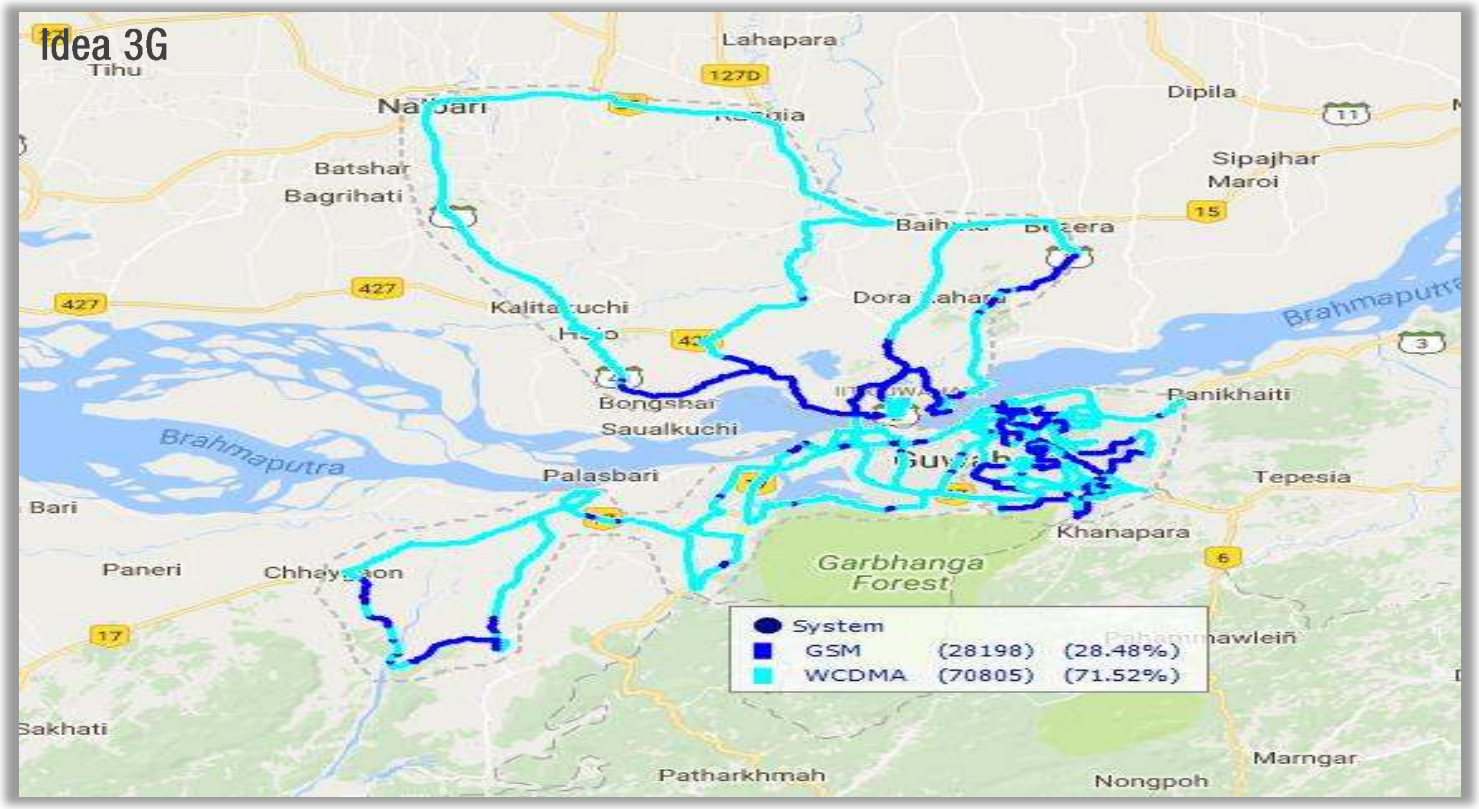


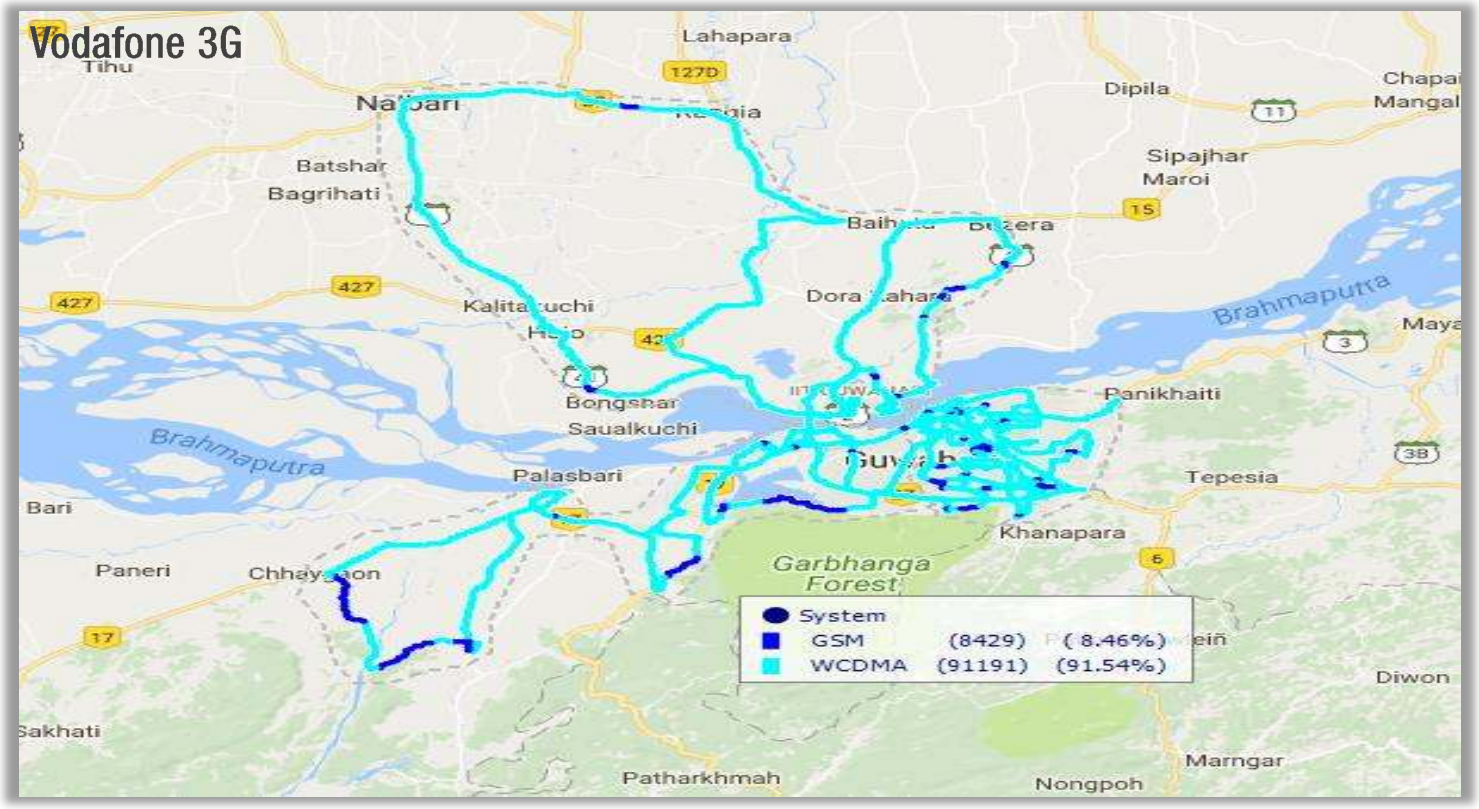
Airtel 3G



BSNL 3G




Idea 3G
Lahapara
Tihu
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Brahmaputra
Bongshar
Saulkuchi
Palasbari
Panikhaiti
Tepesia
Khanapara
Garbhanga
Forest
Bari
Paneri
Sakhati
Patharkhmah
Nongpoh
Marngar
System
GSM (28198) (28.48%)
WCDMA (70805) (71.52%)


Vodafone 3G
Lahapara
Tihu
Dipila
Sipajhar
Maroi
Batshar
Bagrihati
Brahmaputra
Bongshar
Saulkuchi
Palasbari
Panikhaiti
Tepesia
Khanapara
Garbhanga
Forest
Bari
Paneri
Sakhati
Patharkhmah
Nongpoh
Marngar
Diwon
System
GSM (8429) (8.46%)
WCDMA (91191) (91.54%)