



INDEPENDENT DRIVE TEST REPORT

For

Delhi to Dehradun Railway

JUNE

2019

NORTH ZONE

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

The Independent Drive Test has been carried out by M/s PhiMetrics Technologies Pvt. Ltd. on behalf of TRAI in Delhi to Dehradun Railway Route from 06:30 AM to 01:30 PM; 18th June 2019. The drive test covered an drive route of 290 KMs over a period of One day. Approximately 192 calls were made for each of the 10 networks: four 2G networks, four 3G networks and two LTE network covering 4 unique TSPs.

Overview

Voice Summary

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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 18th June 2019 covering various locations in **Delhi to Dehradun Railway** Route. The performance of **Airtel, BSNL, Vodafone Idea Ltd (VIL(Idea, Vodafone)) and Jio** were monitored across various technologies (2G, 3G, and 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.

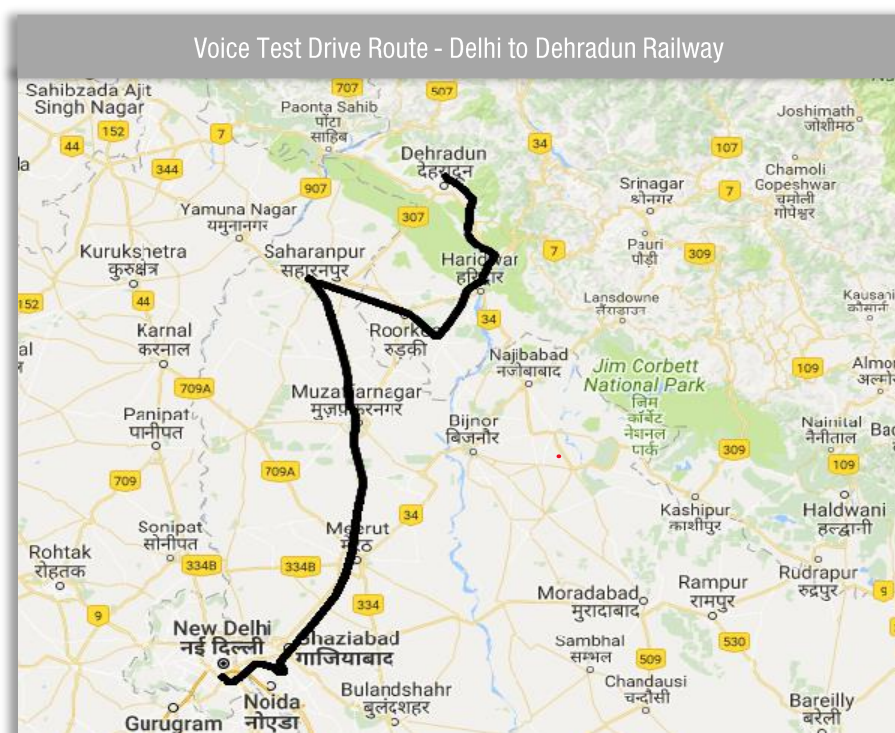
The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services in terms of **Voice: Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.**

Drive Test Details For Delhi to Dehradun Railway Route:

Independent Drive test was conducted for a period of One day from 18th June 2019 in Delhi to Dehradun Railway Route from 6:30 AM to 1:30 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 290 KMs over a period of One day from 18th June 2019. Approximately 192 calls were made for each of the 10 networks: four 2G (Lock Mode) networks, four 3G (Dual mode) networks and two VoLTE network covering 4 unique TSPs.

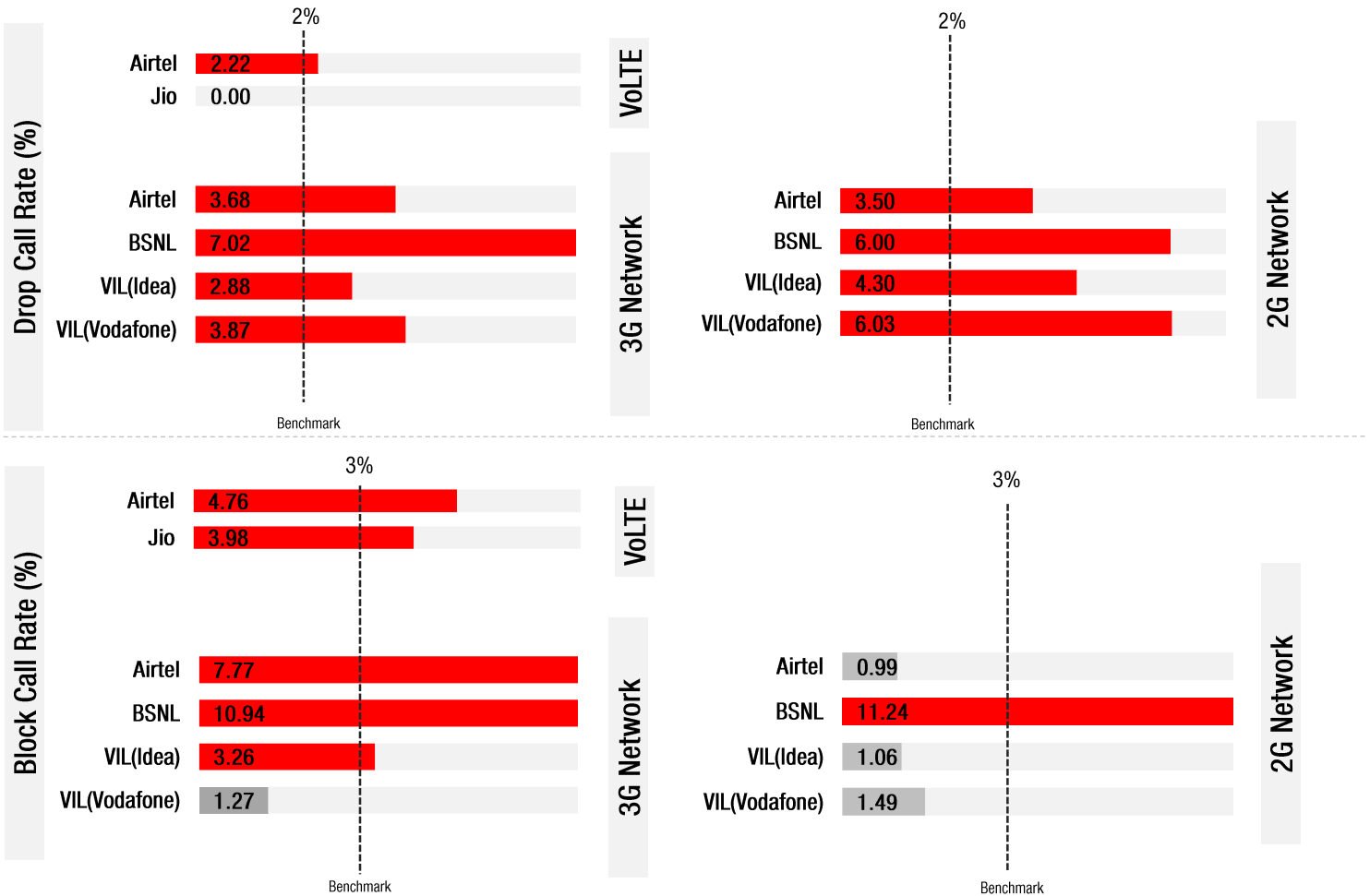
* In case of multiple call failure in similar geo location in given period of 60secs has been counted as one call failure



Voice Calls

Key Observations

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



- All TSPs have fail to met the 2% QOS benchmark of Drop Call Rate (DCR%) except Jio VoLTE.
- All TSPs have fail to met the 3% benchmark of Call Block Rate (CBR%) except Airtel 2G,VIL(Idea 2G), VIL(Vodafone 2G) & VIL(Vodafone).

*NA = Not Applicable Not meeting Benchmark

Voice Calls

Key Observations

Coverage

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

TSPs	2G			
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)
Coverage%	62.17%	55.67%	62.03%	65.10%

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

TSPs	3G				VoLTE	
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)	Airtel	Jio
Coverage %	72.13%	61.67%	73.43%	81.65%	67.34%	91.59%

c) Percentage of time spent on 3G network:

TSPs	3G			
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)
Time Spent on 3G%	49.21%	29.38%	71.05%	73.01%

d) Percentage of RLT \geq 48:

TSPs	2G			
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)
%RLT \geq 48	0.00%	61.95%	0.00%	0.00%

e) Average CST Second

TSPs	2G			
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)
CST(sec)	3.13	2.76	2.61	2.76

TSPs	3G				VOLTE	
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)	Airtel	Jio
CST(sec)	4.31	2.61	3.28	2.97	3.12	1.26

Summary

City Level Summary

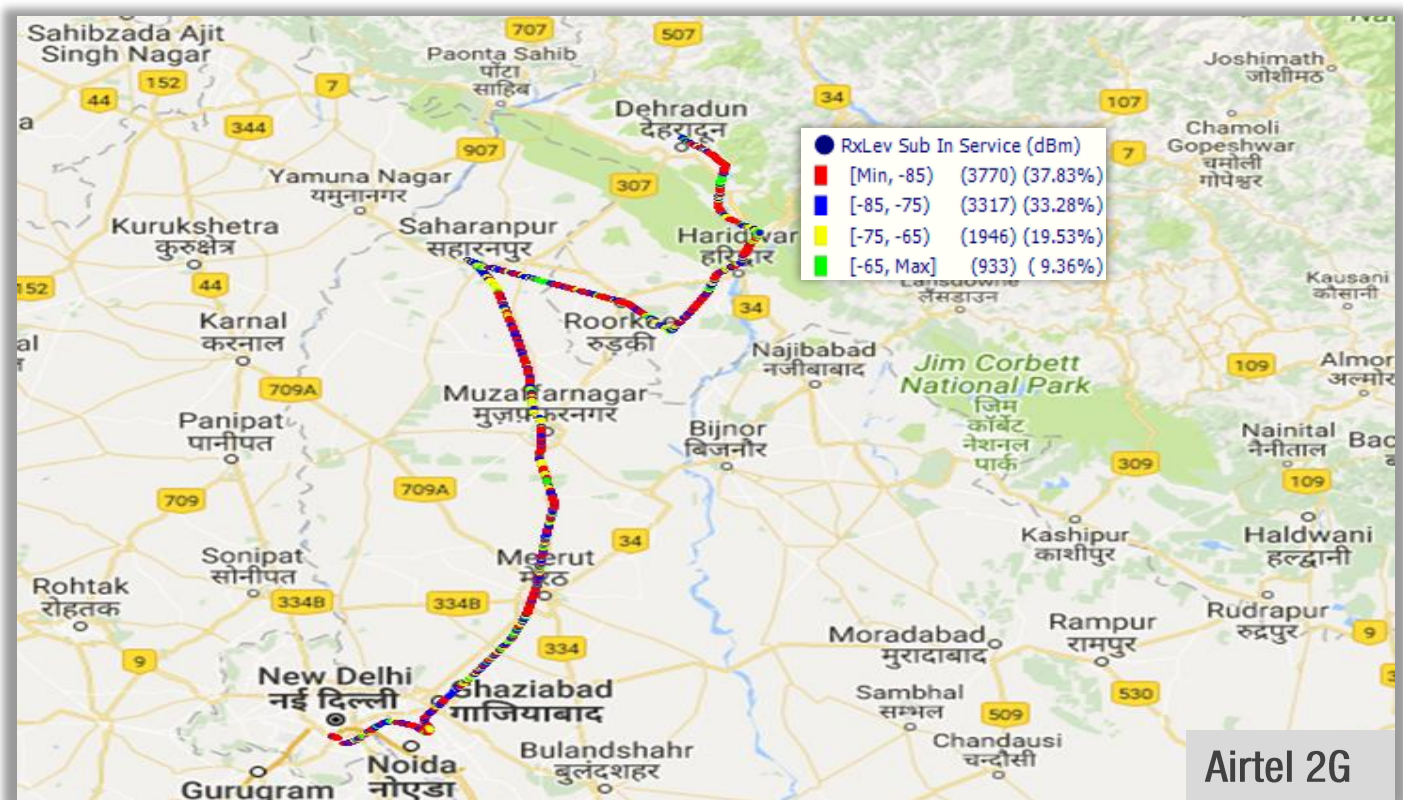
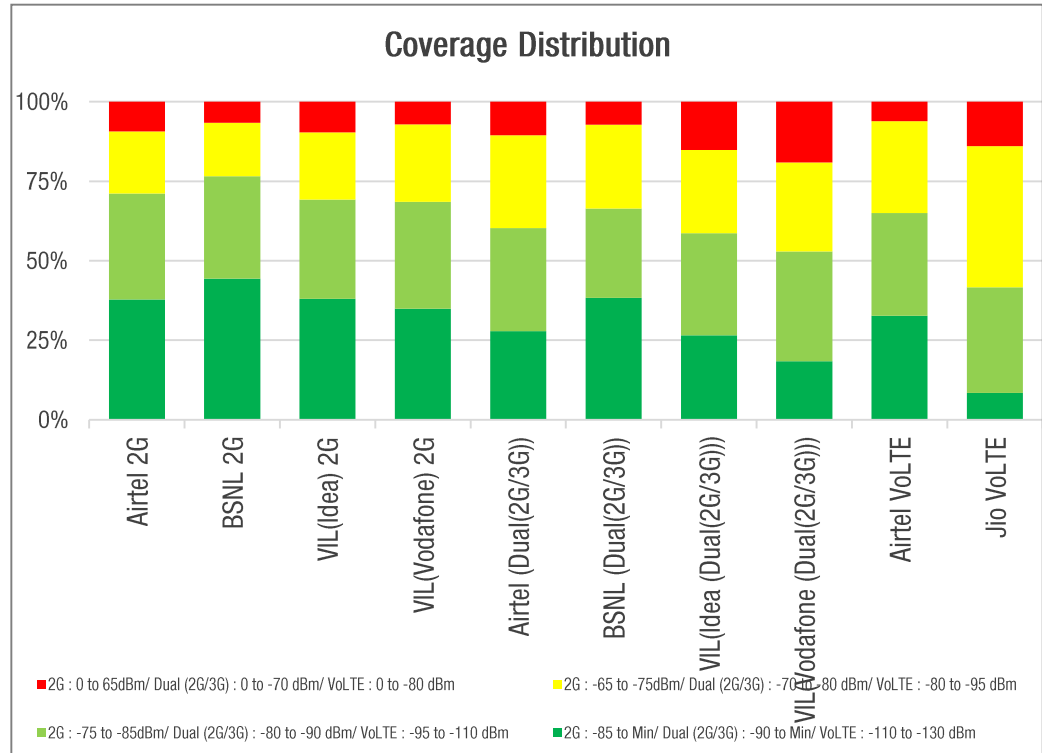
Voice Call	2G			
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)
Call Attempt	202	169	188	202
Blocked Call Rate (%)	0.99%	11.24%	1.06%	1.49%
CSSR% (Accessibility)	99.01%	88.76%	98.94%	98.51%
Drop Call Rate (%)	3.50%	6.00%	4.30%	6.03%
Mobility HOSR (%)	97.25%	95.93%	97.25%	96.04%
Rx Quality (%)	91.00%	90.24%	92.26%	89.24%

Voice Call	3G				VoLTE	
	Airtel	BSNL	VIL(Idea)	VIL(Vodafone)	Airtel	Jio
Call Attempt	206	192	215	157	189	201
Blocked Call Rate (%)	7.77%	10.94%	3.26%	1.27%	4.76%	3.98%
CSSR% (Accessibility)	92.23%	89.06%	96.74%	98.73%	95.24%	96.02%
Drop Call Rate (%)	3.68%	7.02%	2.88%	3.87%	2.22%	0.00%
Mobility HOSR (%)	99.69%	97.51%	99.54%	99.51%	99.27%	99.12%
Rx Quality (%)	89.39%	92.65%	86.17%	88.74%	75.45%	75.08%

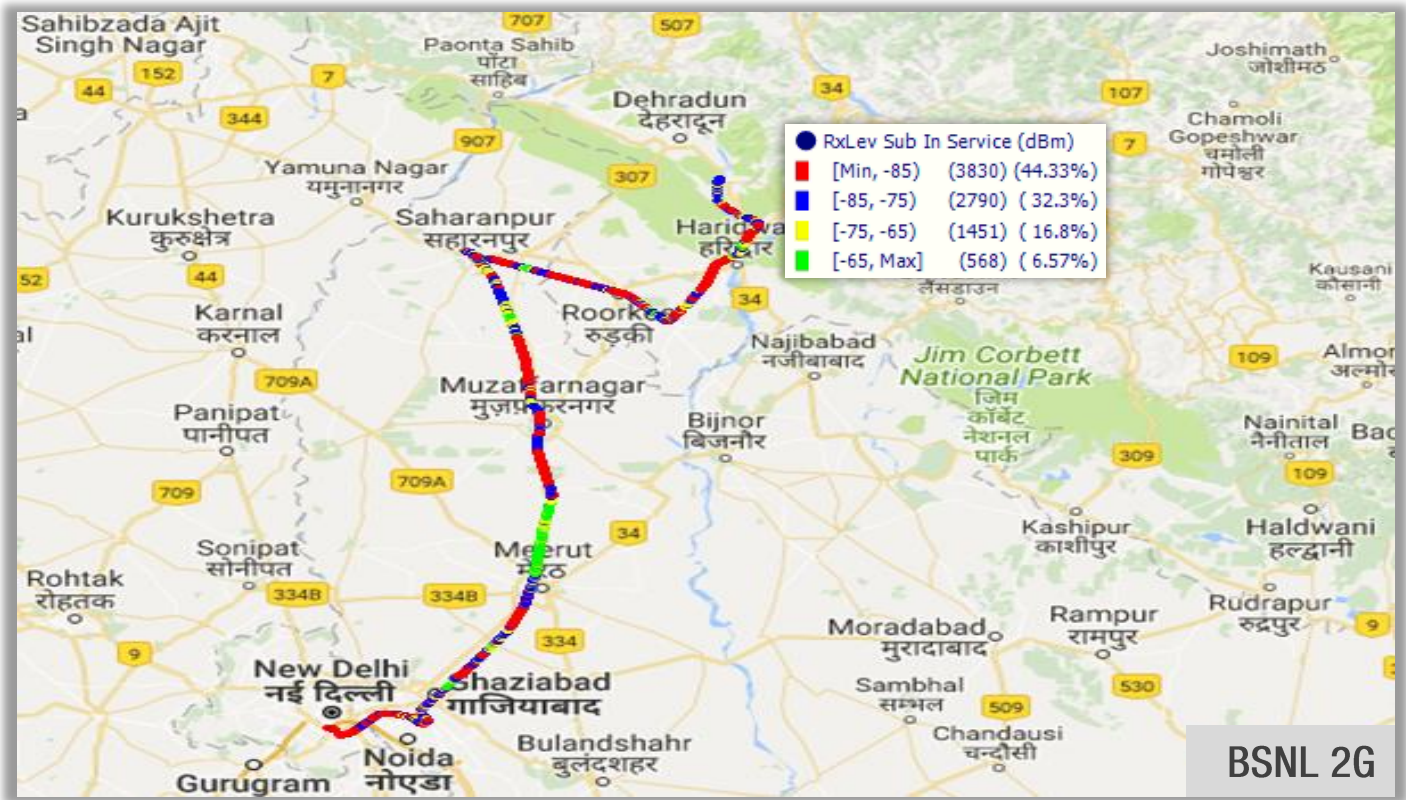
I. Coverage Details

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 dBm, RSCP is ≥ -90 dBm & RSRP ≥ -110 dBm. The details are as follows.

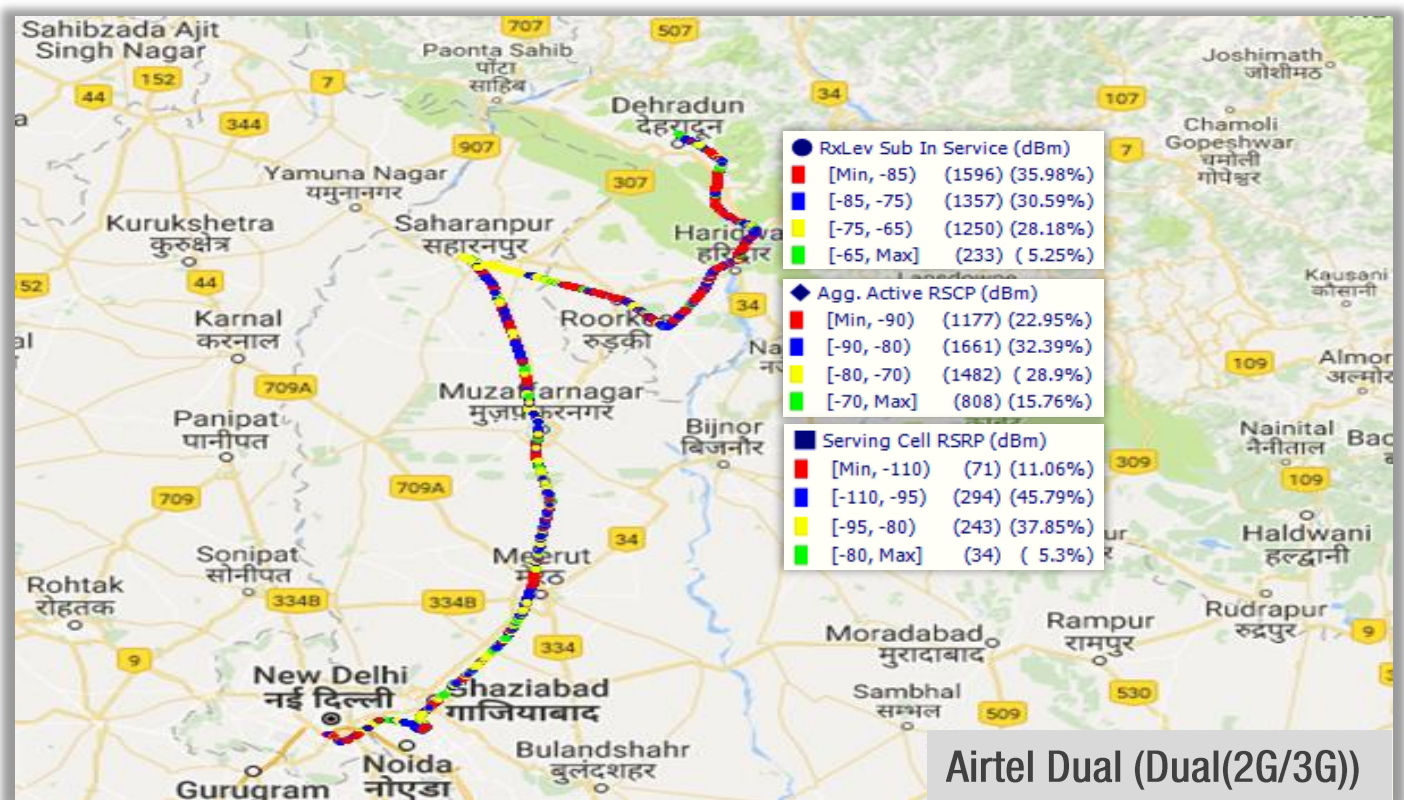
TSP	Coverage Rate
Airtel 2G	62.17%
BSNL 2G	55.67%
VIL(Idea) 2G	62.03%
VIL(Vodafone) 2G	65.10%
Airtel (Dual(2G/3G))	72.13%
BSNL (Dual(2G/3G))	61.67%
VIL(Idea (Dual(2G/3G)))	73.43%
VIL(Vodafone(Dual(2G/3G)))	81.65%
Airtel VoLTE	67.34%
Jio VoLTE	91.59%



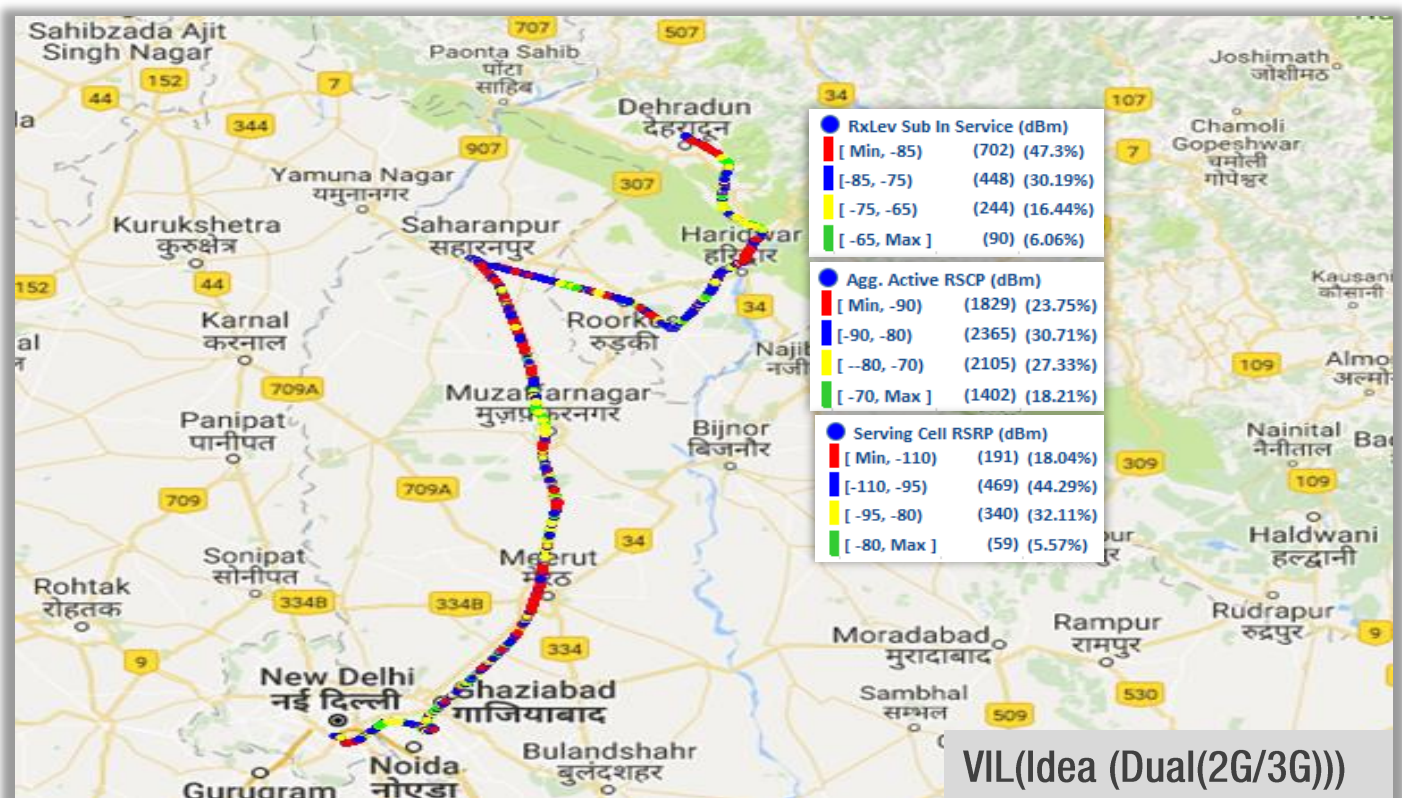
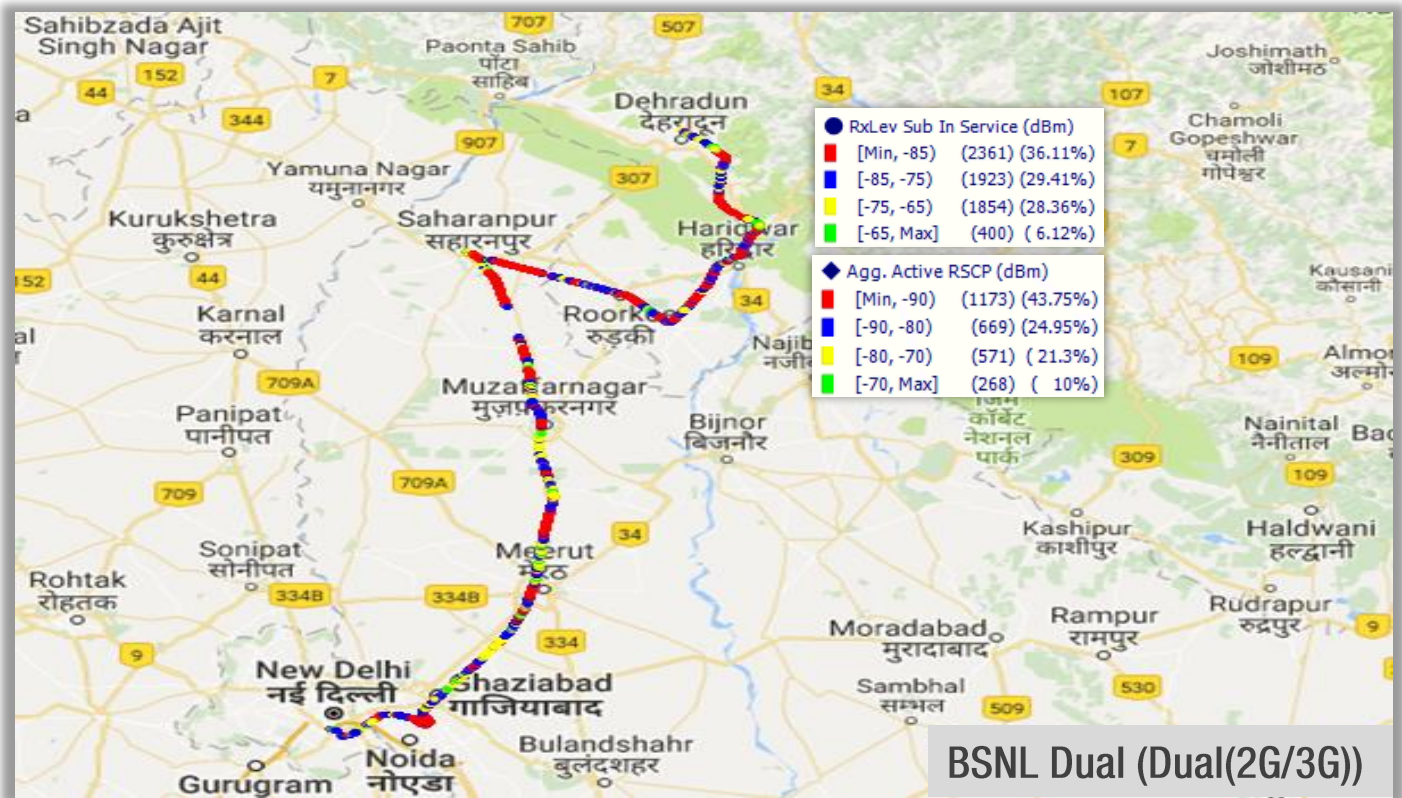
II. Coverage Details (contd.)



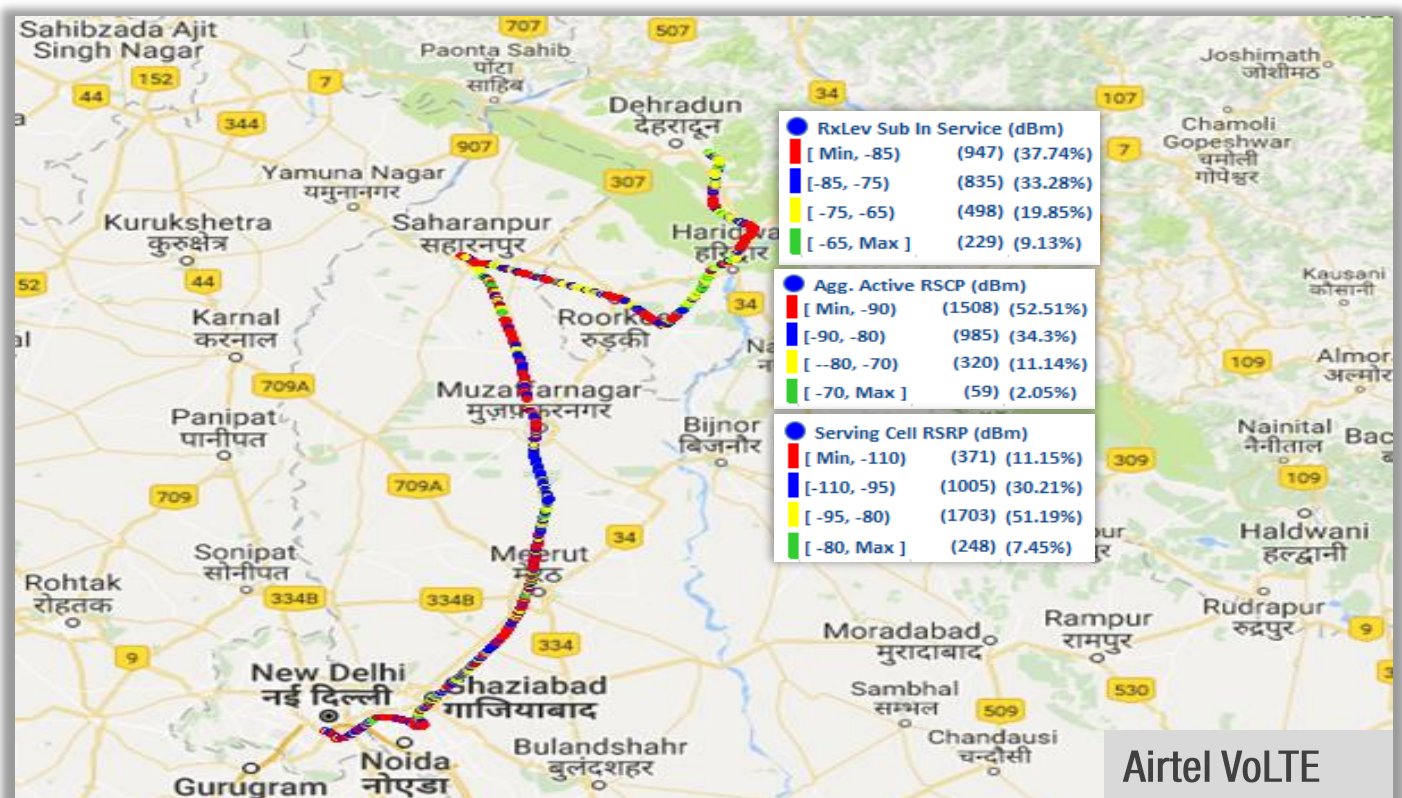
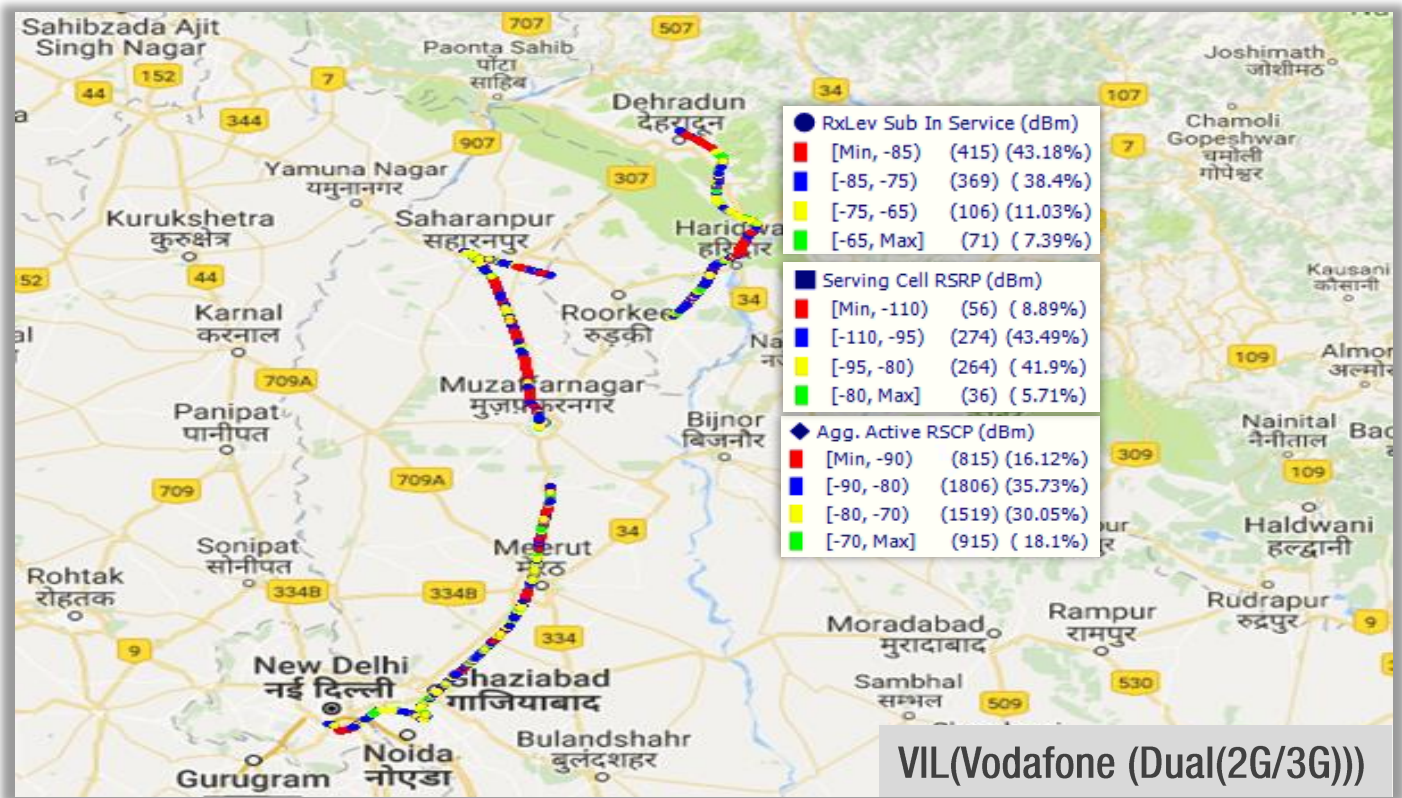
III. Coverage Details (contd.)



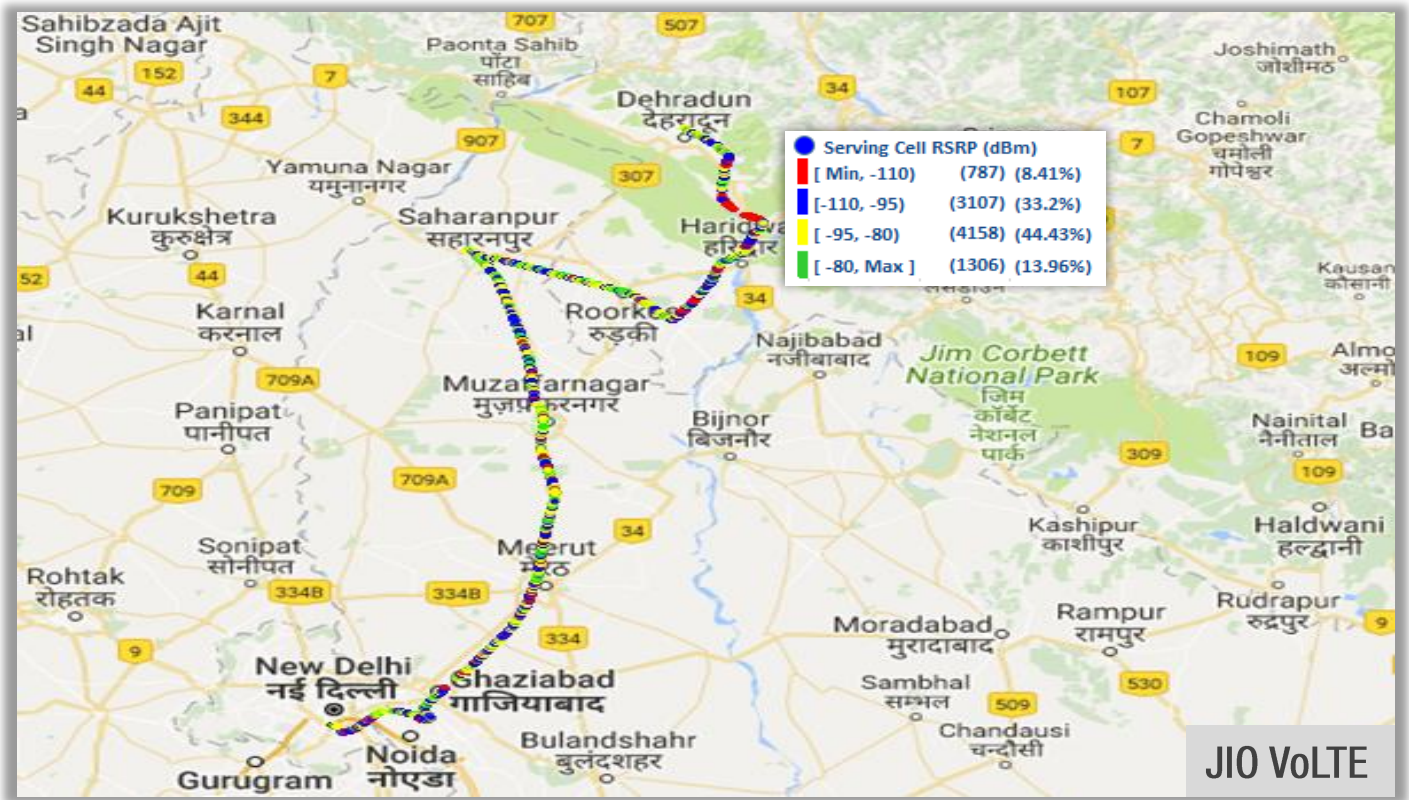
IV. Coverage Details (contd.)



V. Coverage Details (contd.)

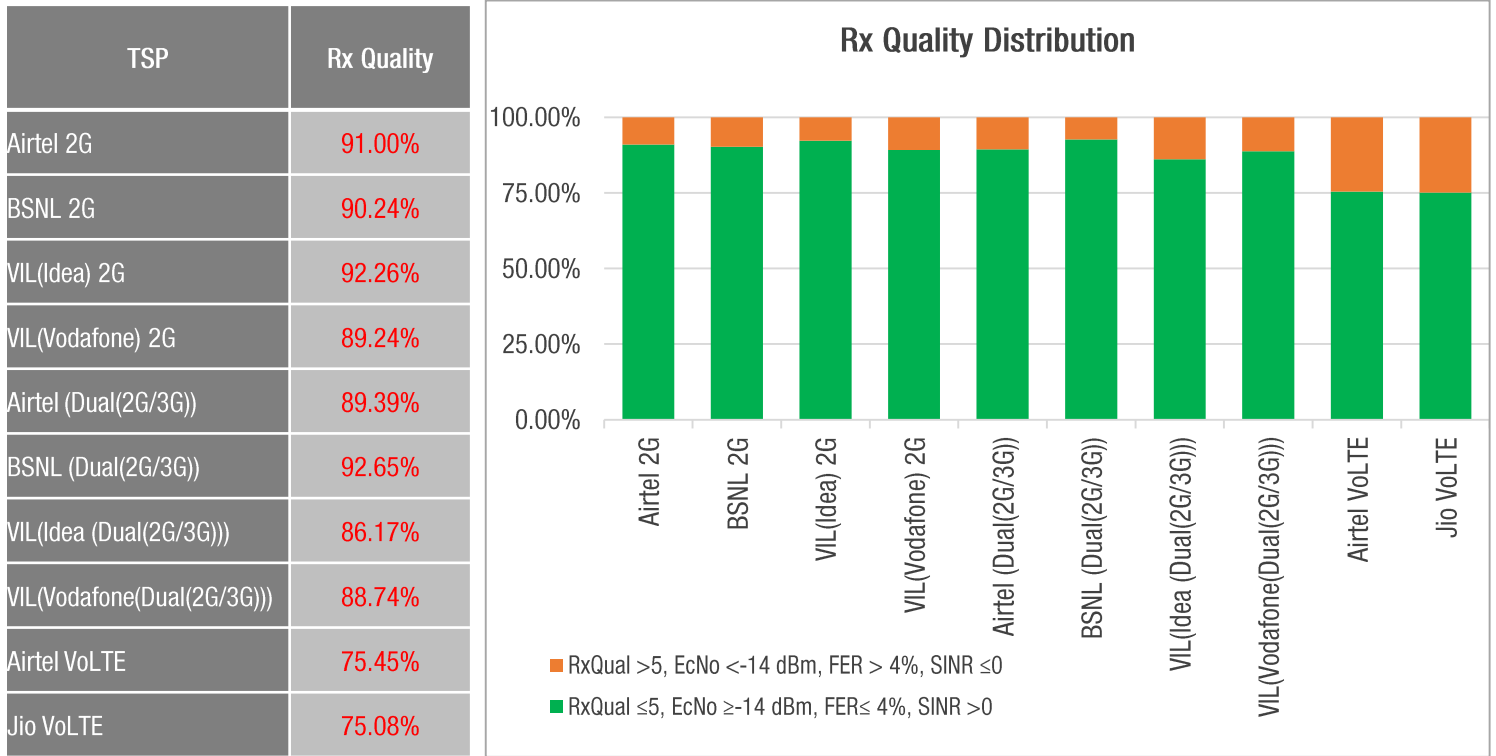


V. Coverage Details (contd.)

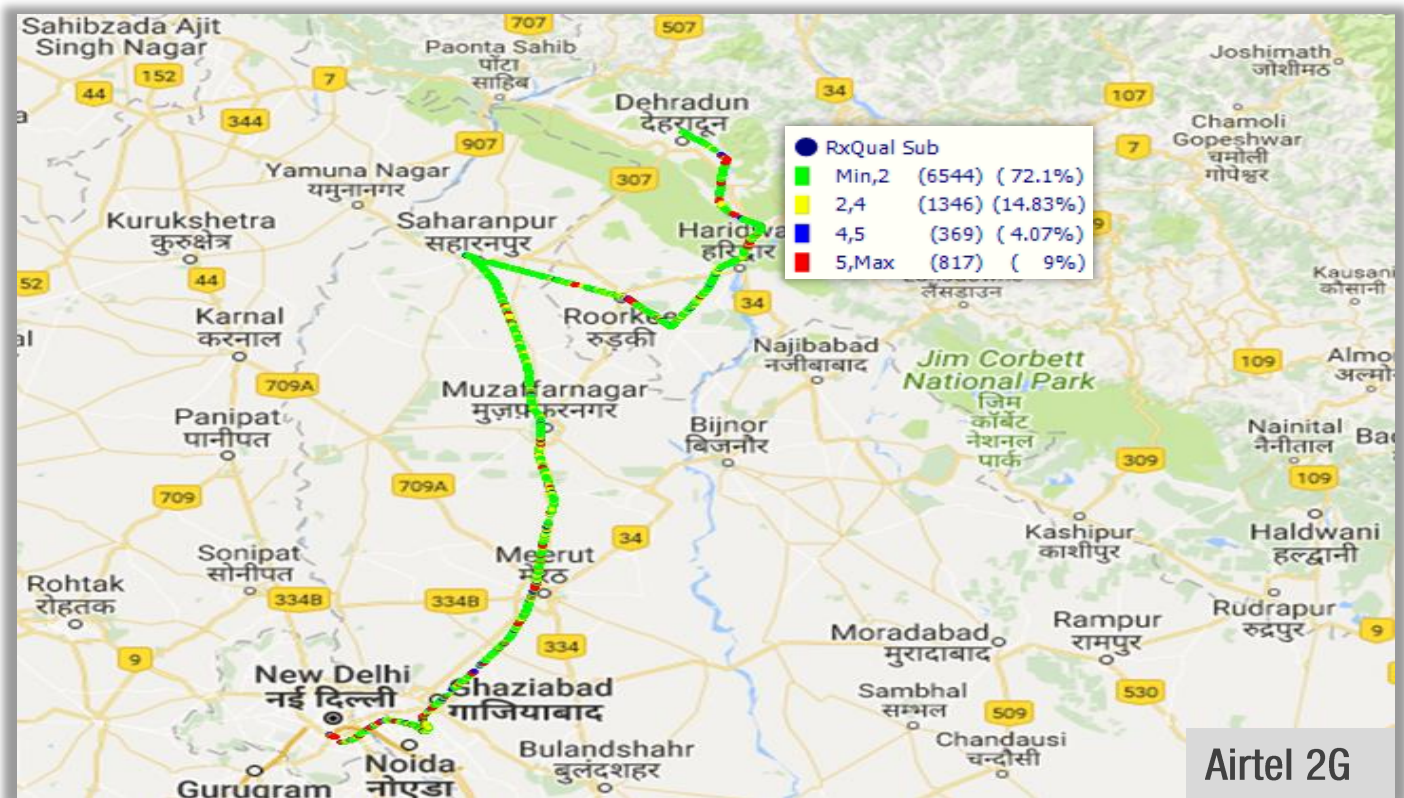


II. Quality Details

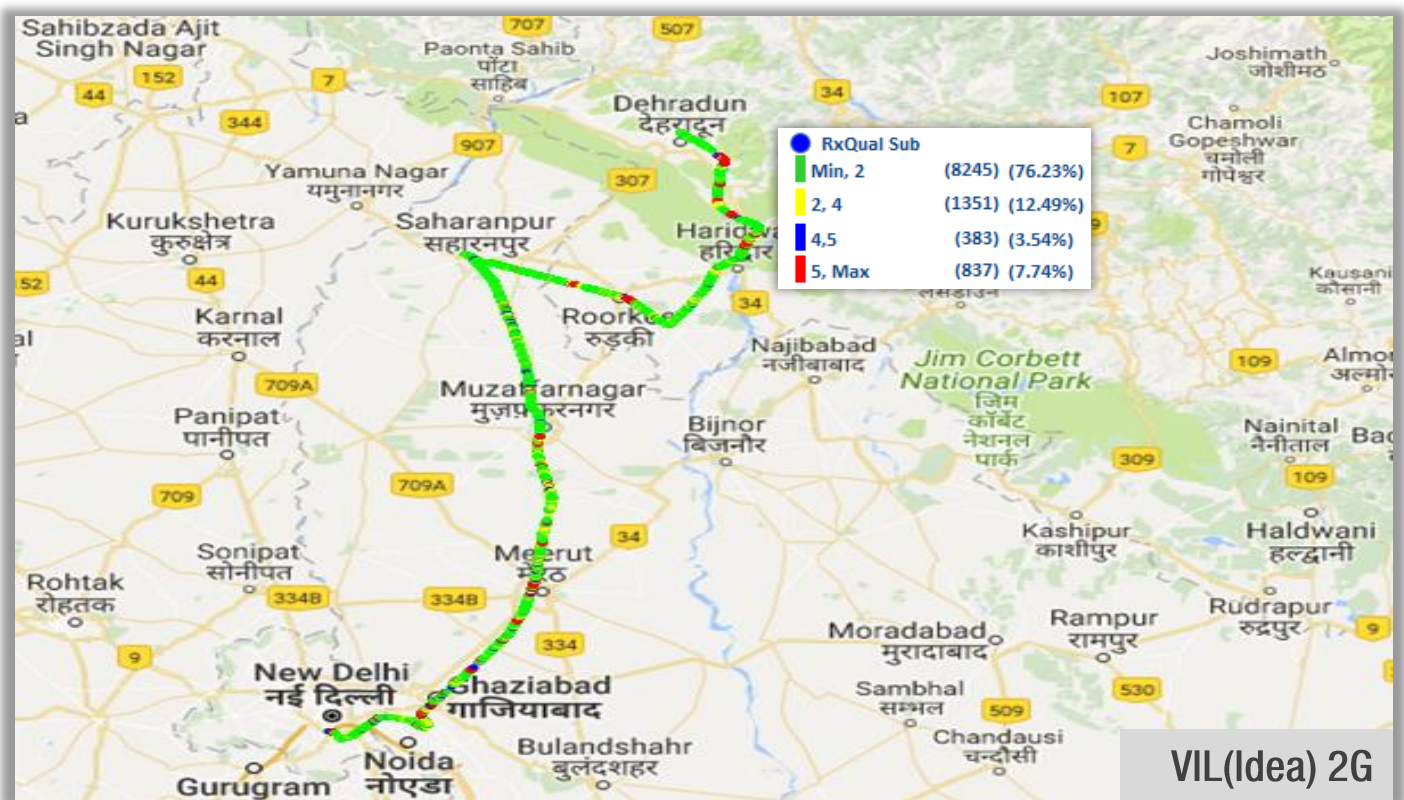
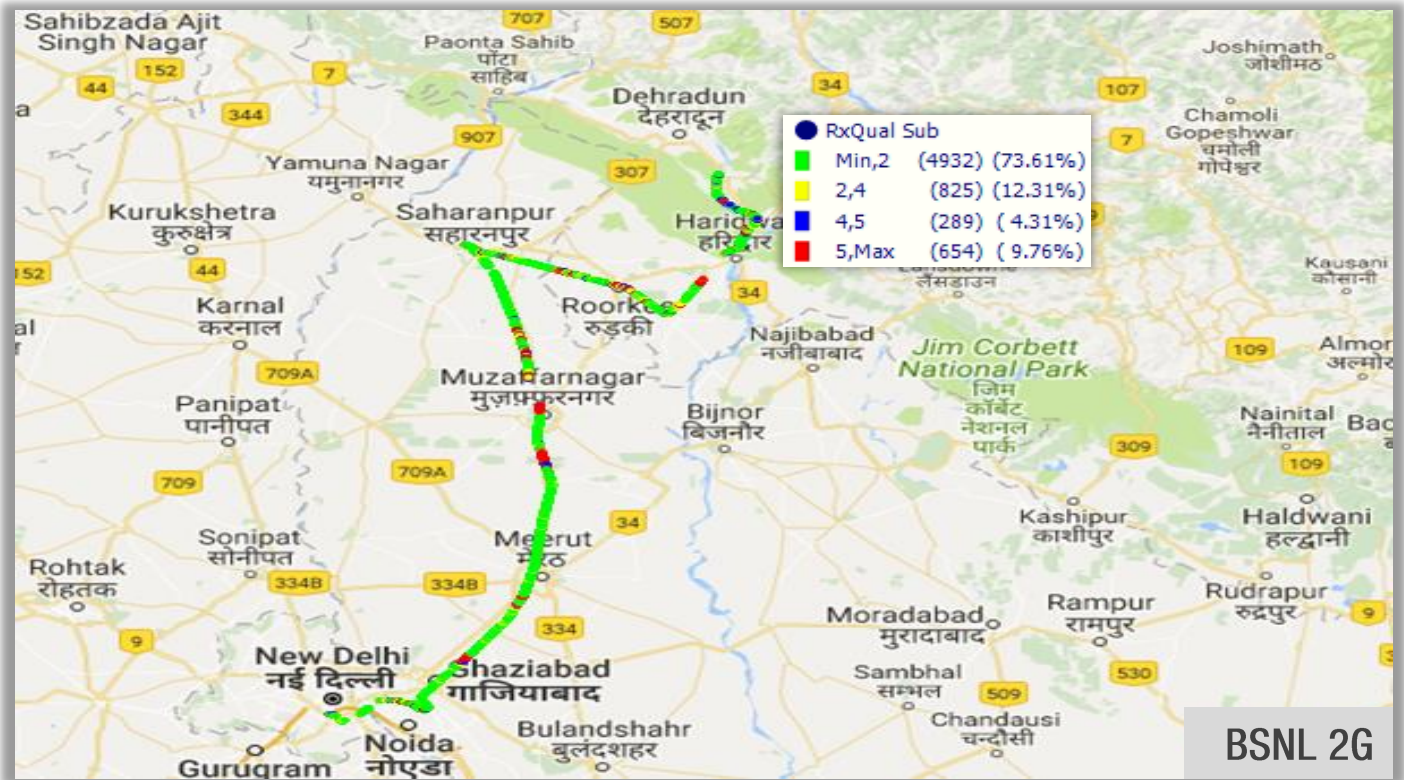
For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -14 dBm for 3G TSP and SINR > 0 in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be $\geq 95\%$.



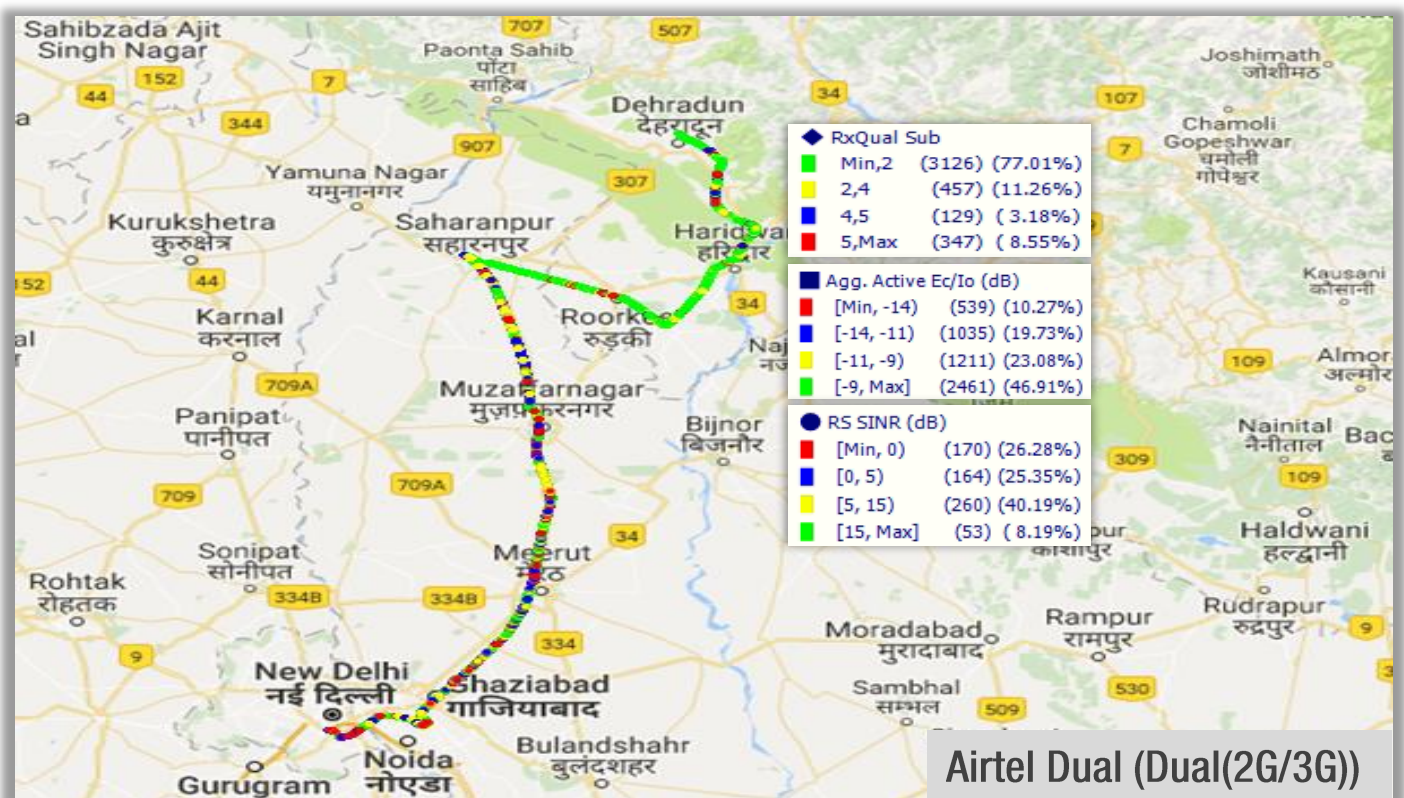
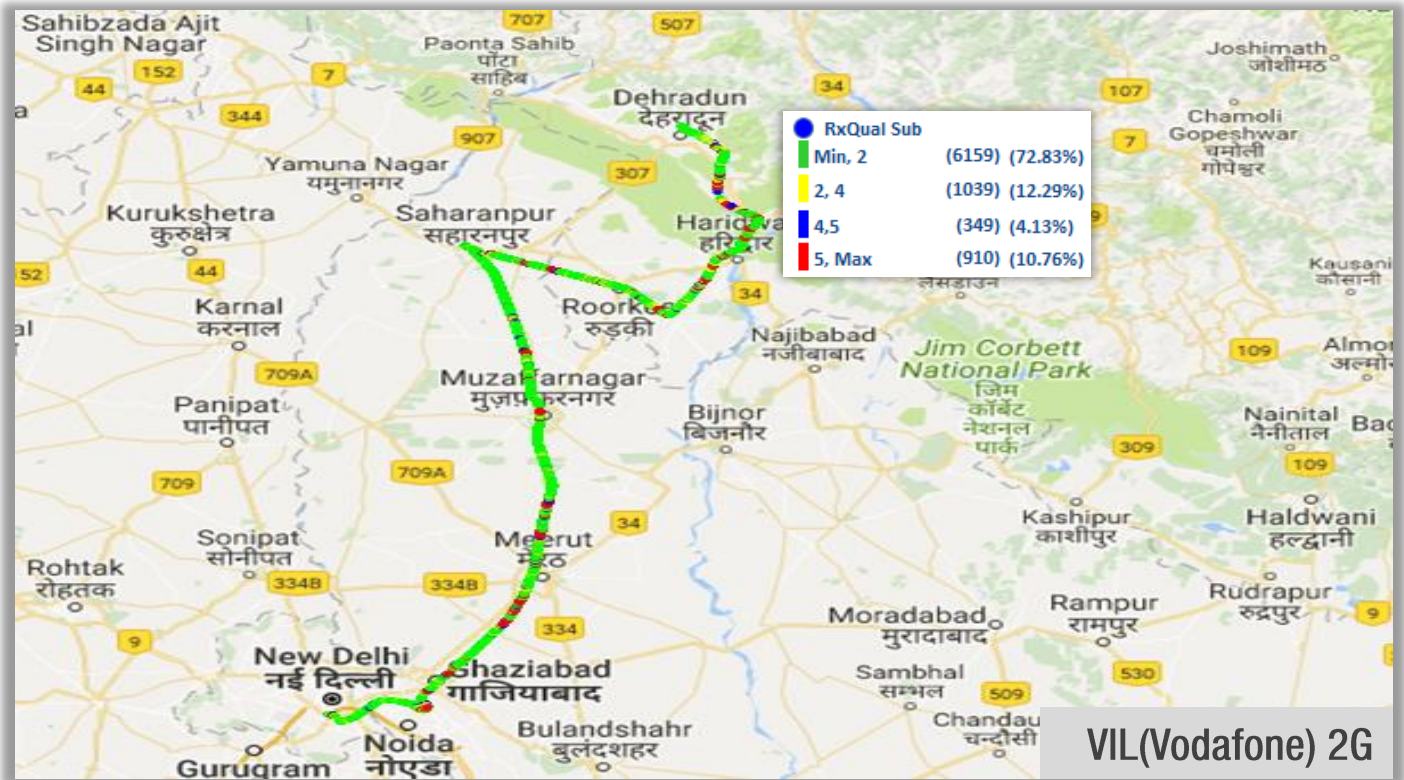
— TSPs not meeting the Benchmark



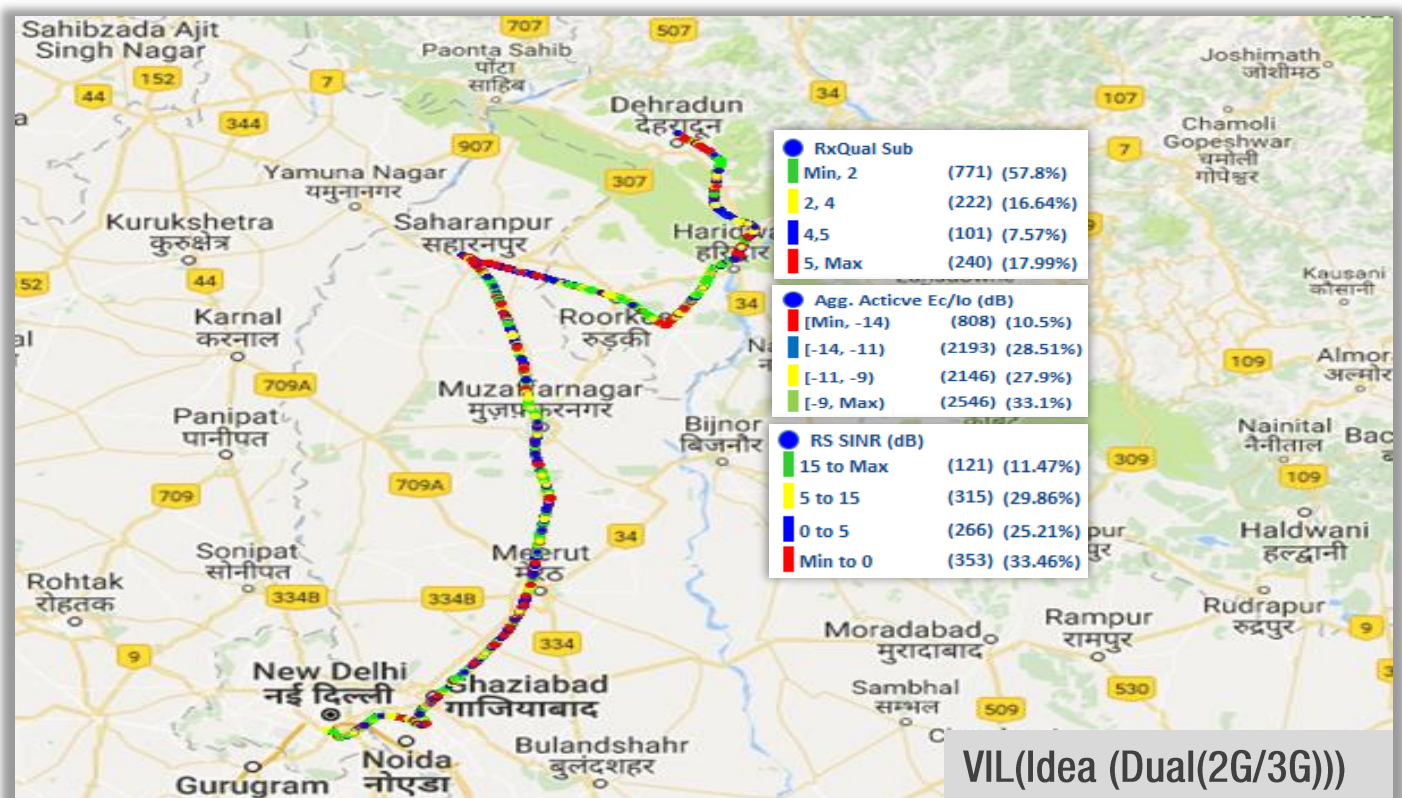
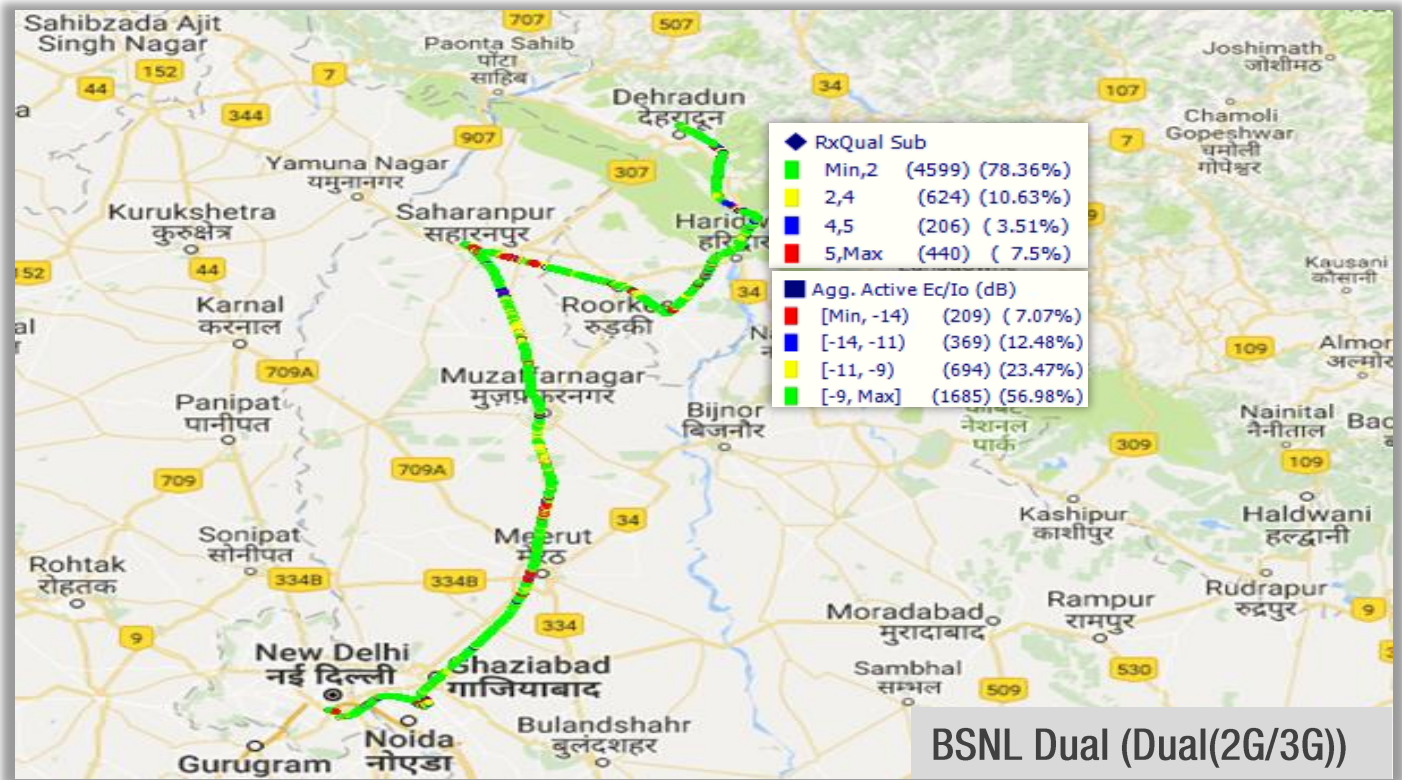
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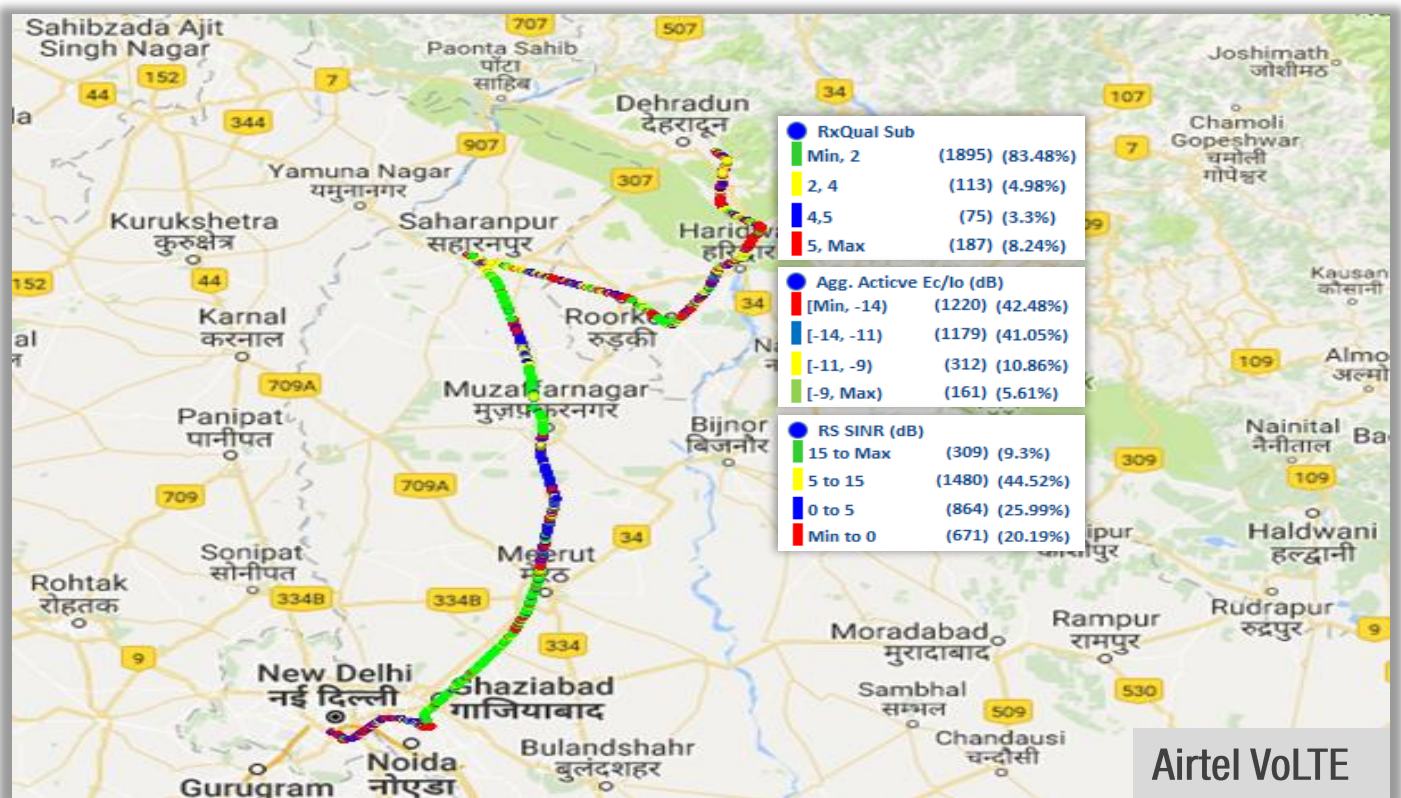
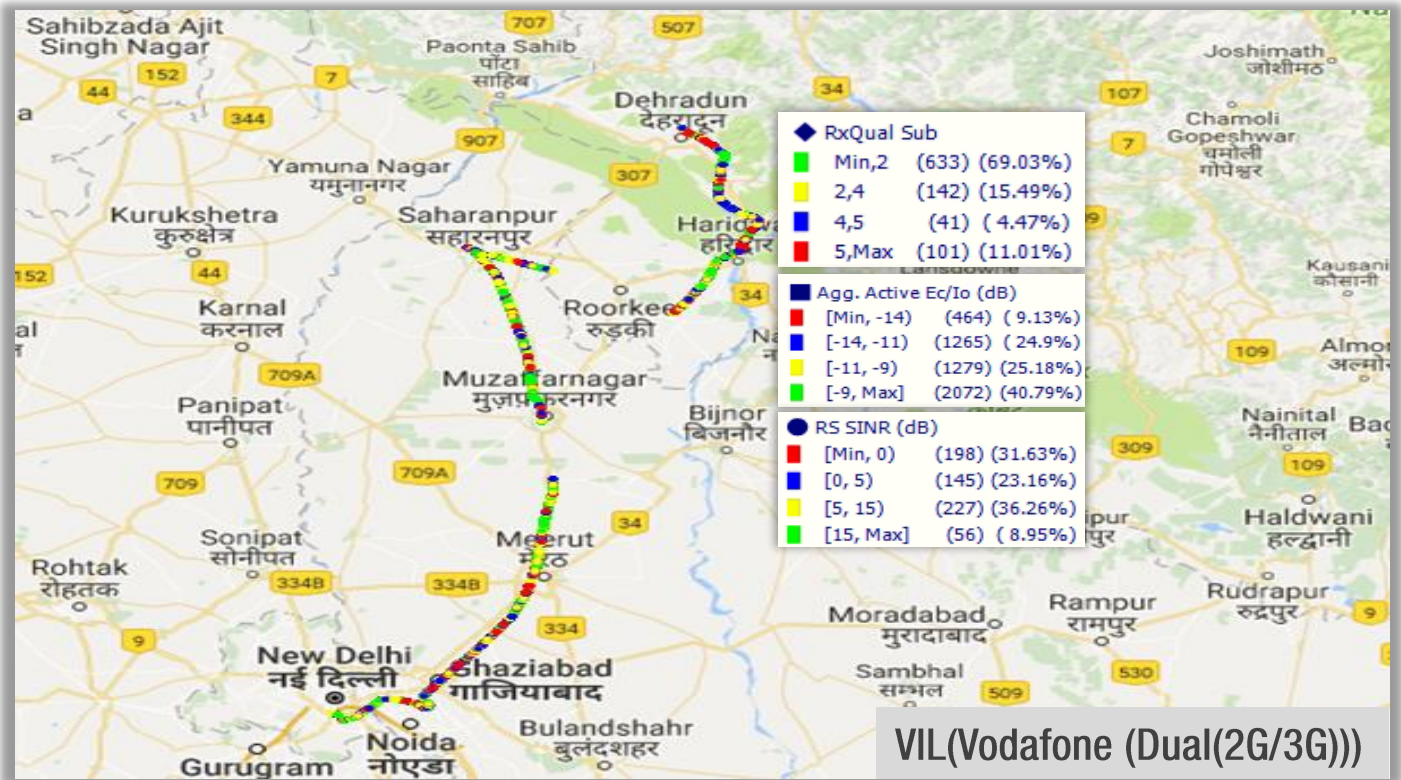
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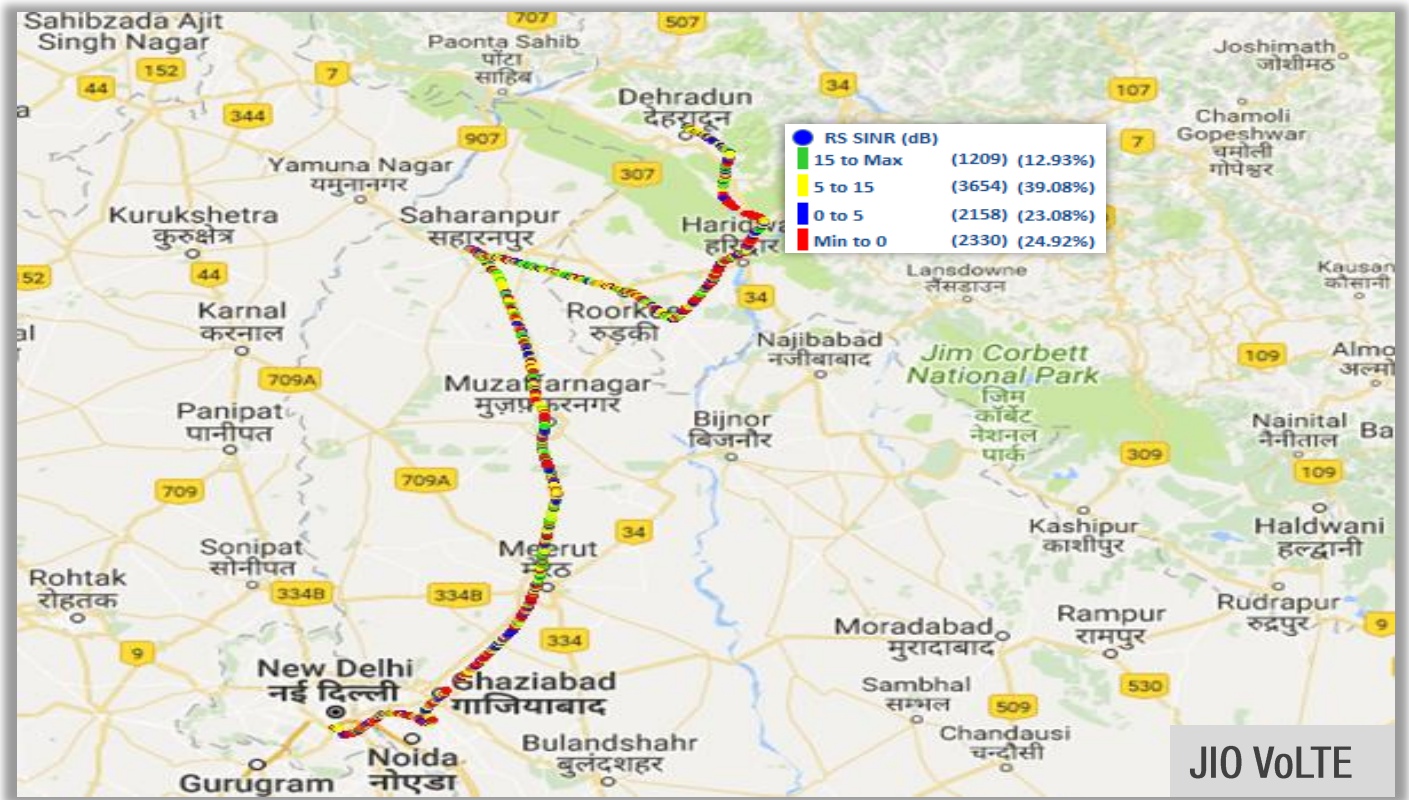
II. Quality Details (contd.)



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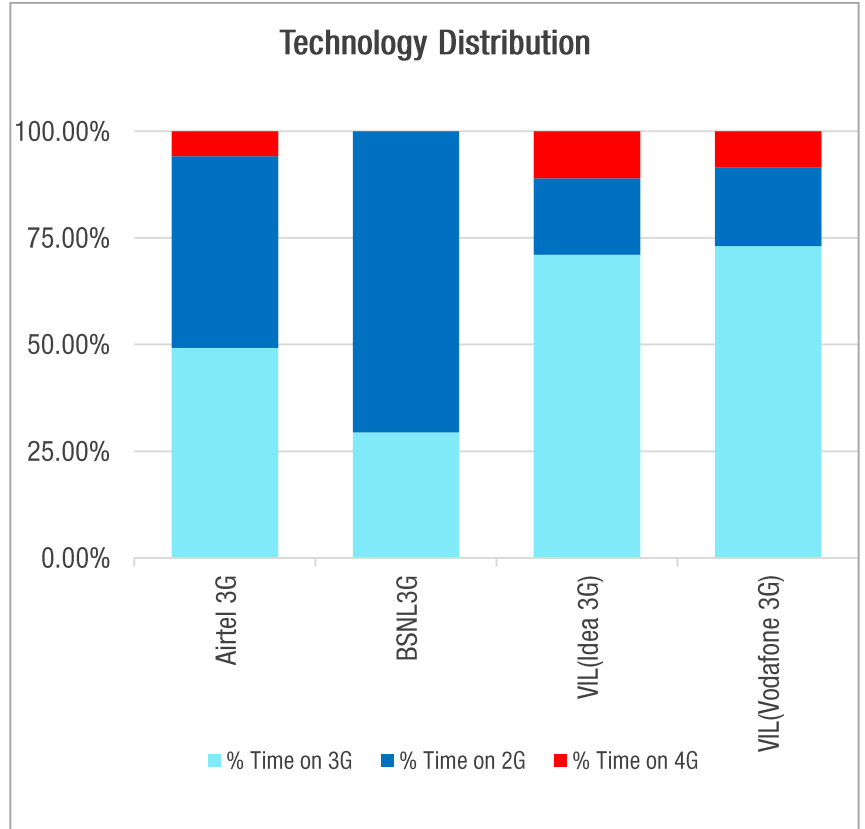


II. Quality Details (contd.)



III. Technology Details

TSP	% Time on 3G
Airtel 3G	49.21%
BSNL3G	29.38%
VIL(Idea 3G)	71.05%
VIL(Vodafone 3G)	73.01%



III. Technology Details_(contd.)



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