



INDEPENDENT DRIVE TEST REPORT

For

Palakkad to Trivandrum Railway

2019

June

SOUTH ZONE

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

The Independent Drive Test has been carried out by M/s PhiMetrics Technologies Pvt. Ltd. on behalf of TRAI in Palakkad to Trivandrum Railway Route from 09:00 AM to 06:00 PM; 26th June 2019. The drive test covered a drive route of 322 KMs over a period of 1 day. Approximately 212 calls were made for each of the 12 networks: five 2G networks, five 3G networks and two LTE network covering 5 unique TSPs.

Overview

Voice 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. on 26th June 2019 covering various locations in Palakkad to Trivandrum Railway Route. The performance of Airtel, BSNL, Tata, Vodafone Idea Limited (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; areas where previous Drive tests showed network issues; etc.

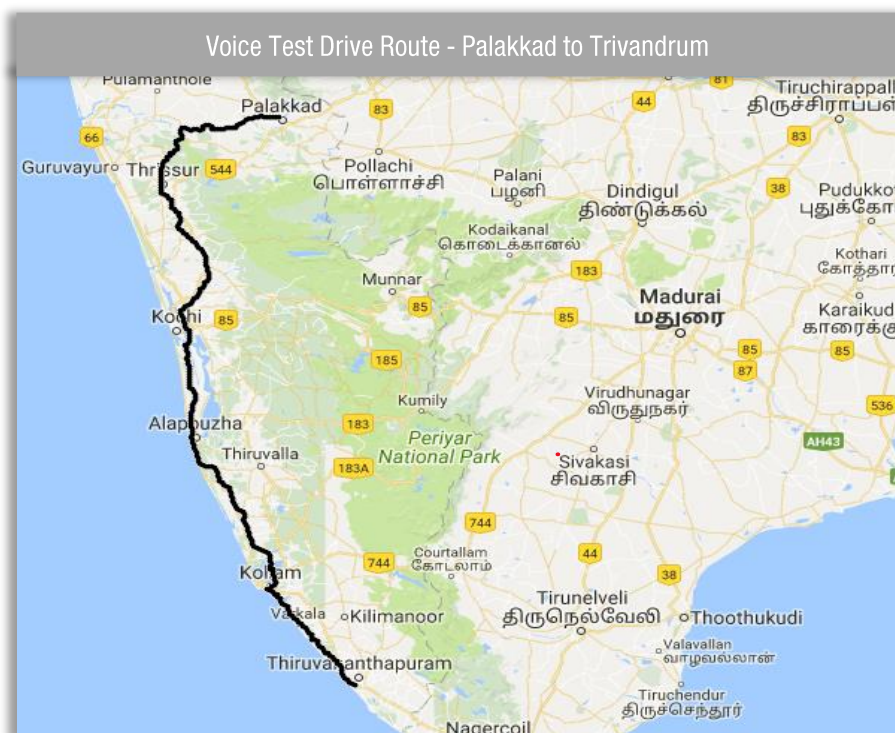
The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services in terms of Voice: Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

Drive Test Details For Palakkad to Trivandrum Railway Route:

Independent Drive test was conducted for a period of 1 day on 26th June 2019 in Palakkad to Trivandrum Railway Route from 09:00 AM to 6:00 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 322 KMs over a period of 1 day on 26th June 2019 . Approximately 212 calls were made for each of the 12 networks: five 2G (Lock Mode) networks, five 3G (Dual mode) networks and two VoLTE network covering 5 unique TSPs.

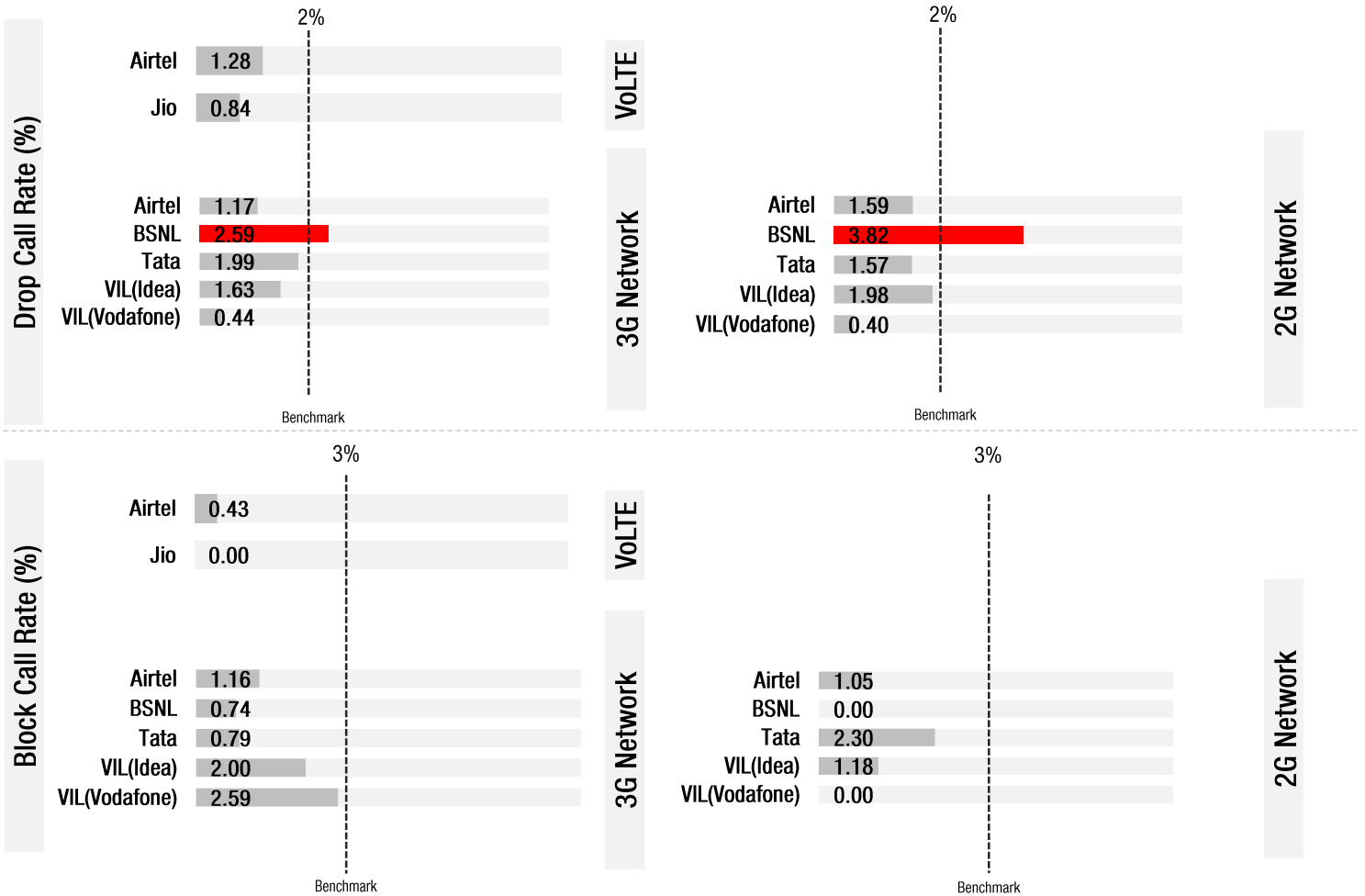
* In case of multiple call failure in similar geo location in given period of 60secs has been counted as one call failure



Voice Calls

Key Observations

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



KPI	2G Networks				
	Airtel	BSNL	Tata	Vodafone Idea Ltd	
				Idea	Vodafone
SDCCH Congestion(<=1%)	1.05%	0.00%	1.92%	0.79%	0.00%
TCH Congestion (<=2%)	0.00%	0.00%	0.38%	0.39%	0.00%

KPI	3G Networks				
	Airtel	BSNL	Tata	Vodafone Idea Ltd	
				Idea	Vodafone
CSFB Failure %	0.00%	NA	NA	0.00%	0.00%
SDCCH Congestion%	1.16%	0.37%	0.39%	0.00%	0.00%
RRC Congestion%	0.00%	0.37%	0.40%	1.20%	2.59%
SDCCH & RRC Congestion(<=1%)	1.16%	0.74%	0.79%	1.20%	2.59%
TCH Congestion %	0.00%	0.00%	0.00%	0.40%	0.00%
RAB Congestion %	0.00%	0.00%	0.00%	0.40%	0.00%
TCH & RAB Congestion (<=2%)	0.00%	0.00%	0.00%	0.80%	0.00%

- a) All TSPs have met the 2% QoS benchmark of Drop Call Rate (DCR%) except BSNL 2G & BSNL 3G.
- b) All TSPs have met the 2% QoS benchmark of Call Block Rate (CBR%).

*VIL= (Idea, 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	Tata	VIL	
				Idea	Vodafone
Coverage%	64.87%	70.71%	57.26%	74.24%	62.65%

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

TSPs	3G				VoLTE		
	Airtel	BSNL	Tata	VIL		Airtel	Jio
				Idea	Vodafone		
Coverage %	61.98%	67.76%	72.15%	64.67%	62.89%	58.19%	79.81%

c) Percentage of time spent on 3G network:

TSPs	3G				
	Airtel	BSNL	Tata	VIL	
				Idea	Vodafone
Time Spent on 3G%	49.31%	13.32%	59.97%	35.69%	65.47%

d) Percentage of RLT \geq 48:

TSPs	2G				
	Airtel	BSNL	Tata	VIL	
				Idea	Vodafone
%RLT \geq 48	0.00%	4.06%	0.00%	0.00%	0.00%

e) Average CST Second

TSPs	2G				
	Airtel	BSNL	Tata	VIL	
				Idea	Vodafone
(Sec.)	2.11	2.82	2.71	2.85	2.69

TSPs	3G				VoLTE		
	Airtel	BSNL	Tata	VIL		Airtel	Jio
				Idea	Vodafone		
(Sec.)	3.99	3.11	3.61	2.59	2.85	3.03	0.69

Summary

City Level Summary

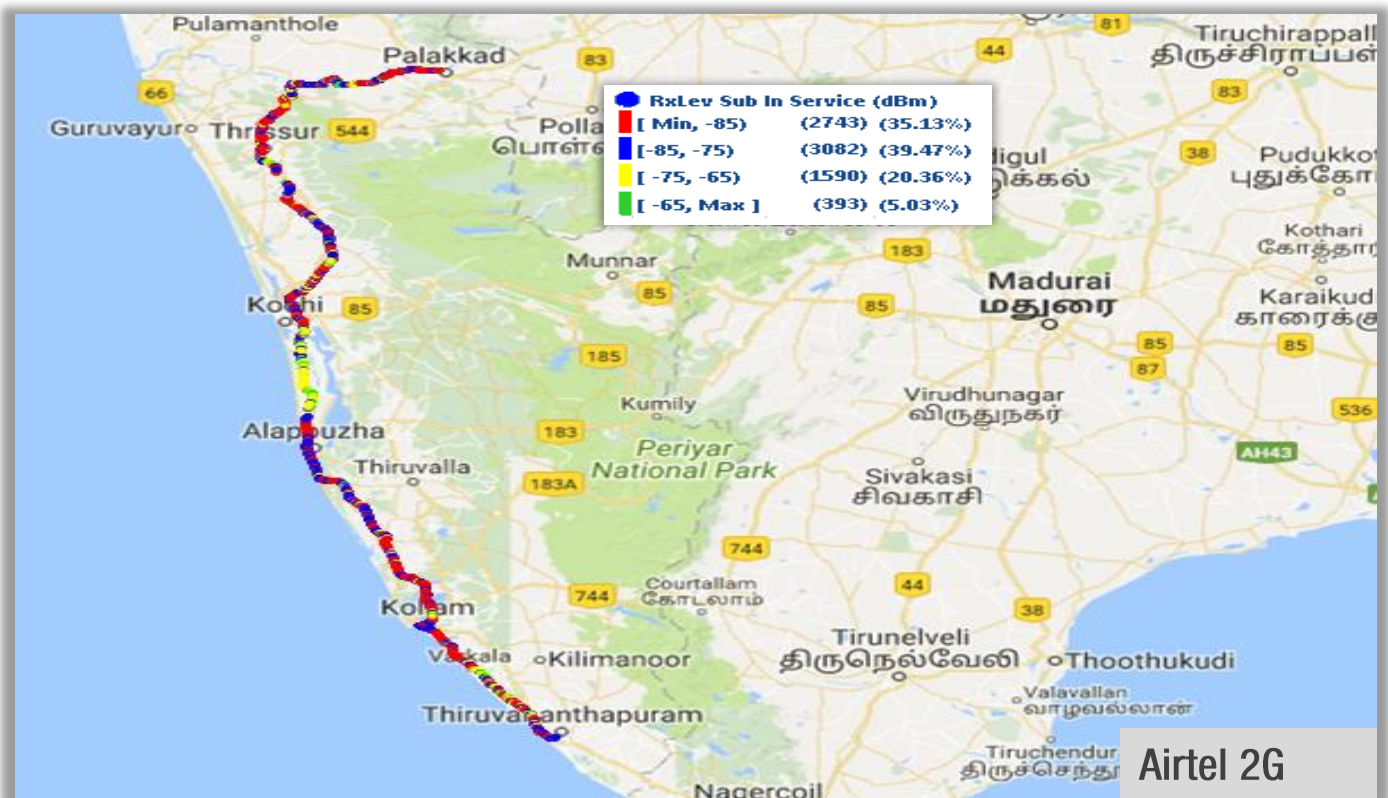
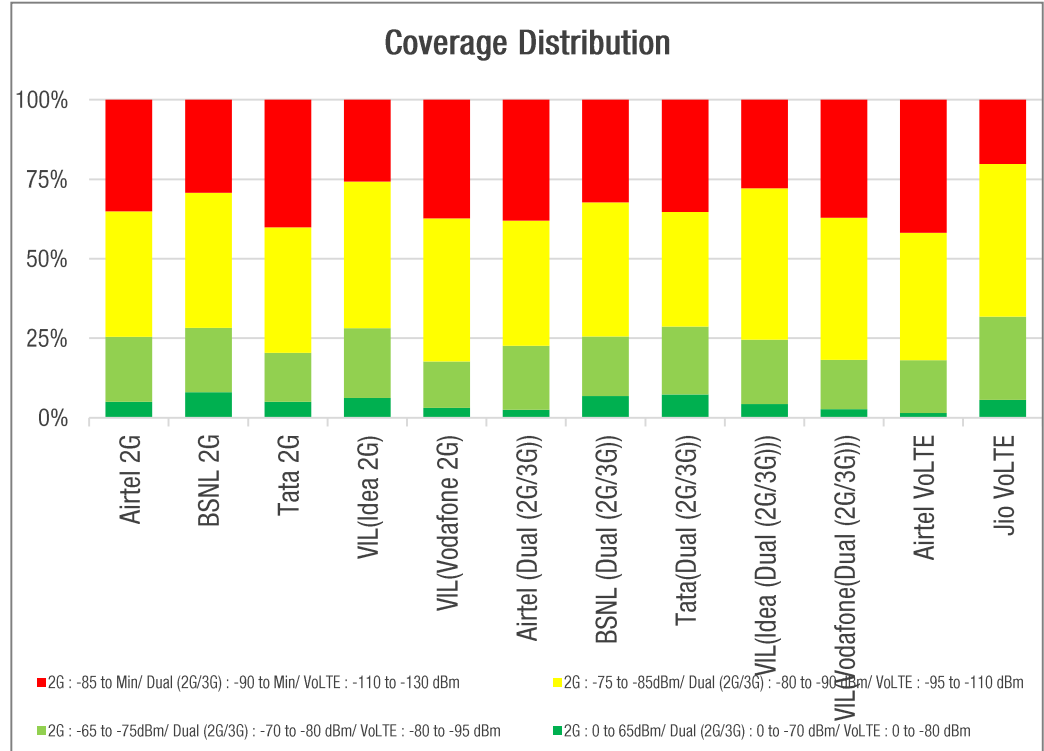
Voice Call	2G				
	Airtel	BSNL	Tata	VIL	
				Idea	Vodafone
Call Attempt	191	262	261	255	253
Blocked Call Rate (%)	1.05%	0.00%	2.30%	1.18%	0.00%
CSSR% (Accessibility)	98.95%	100.00%	97.70%	98.82%	100.00%
Drop Call Rate (%)	1.59%	3.82%	1.57%	1.98%	0.40%
Mobility HOSR (%)	99.09%	98.16%	99.33%	97.50%	98.78%
Rx Quality (%)	94.08%	98.16%	91.43%	94.42%	96.61%

Voice Call	3G					VoLTE	
	Airtel	BSNL	Tata	VIL		Airtel	Jio
				Idea	Vodafone		
Call Attempt	259	272	253	250	232	235	238
Blocked Call Rate (%)	1.16%	0.74%	0.79%	2.00%	2.59%	0.43%	0.00%
CSSR% (Accessibility)	98.84%	99.26%	99.21%	98.00%	97.41%	99.57%	100.00%
Drop Call Rate (%)	1.17%	2.59%	1.99%	1.63%	0.44%	1.28%	0.84%
Mobility HOSR (%)	99.62%	99.03%	99.85%	99.92%	99.92%	99.83%	99.26%
Rx Quality (%)	91.41%	93.83%	94.76%	90.96%	89.74%	78.16%	81.06%

I. Coverage Details

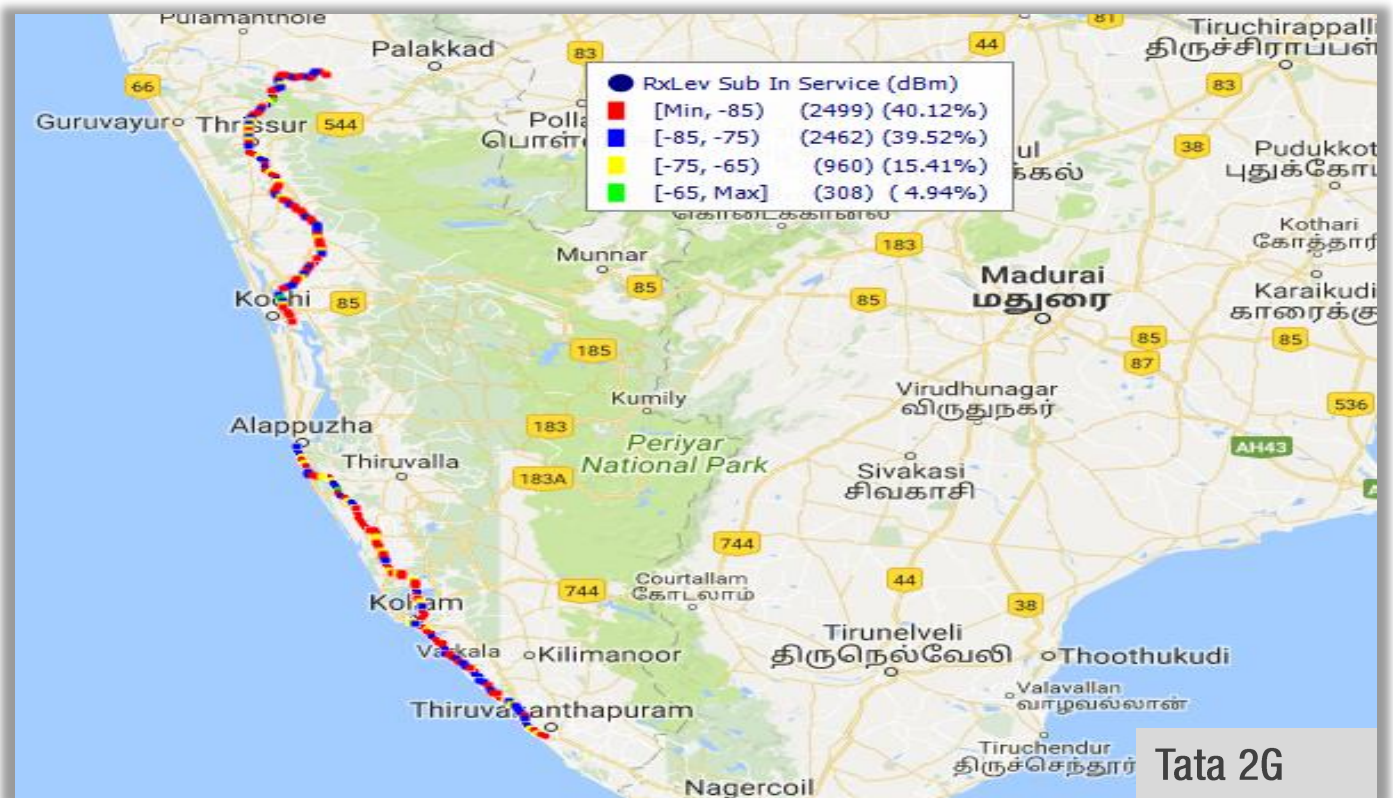
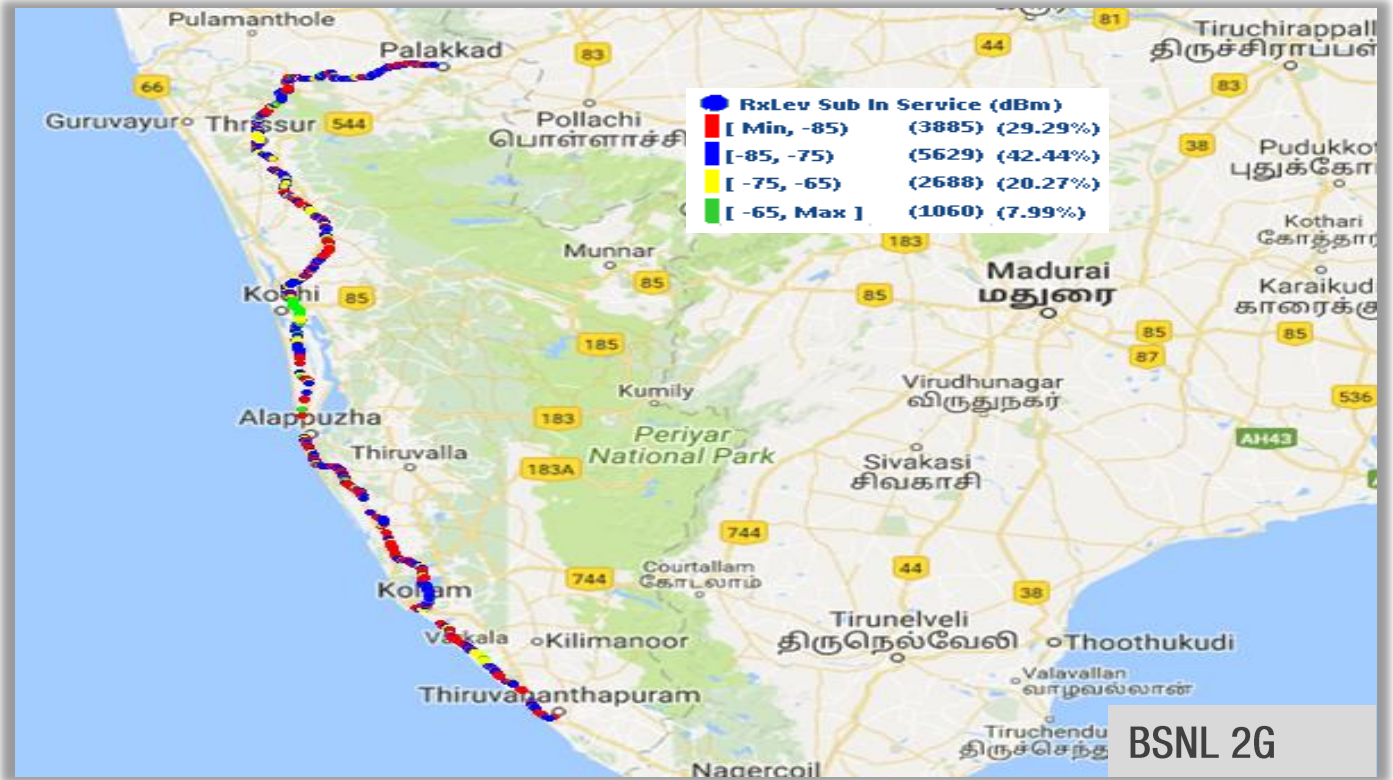
RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call/data session. The Coverage rate of an TSP is calculated on the basis of % of samples in which the Rx level ≥ -85 dBm, RSCP is ≥ -90 dBm & RSRP ≥ -110 dBm. The details are as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

TSP	Coverage Rate
Airtel 2G	64.87%
BSNL 2G	70.71%
Tata 2G	59.88%
VIL(Idea 2G)	74.24%
VIL(Vodafone 2G)	62.65%
Airtel Dual (2G/3G)	61.98%
BSNL Dual (2G/3G)	67.76%
Tata Dual (2G/3G)	64.67%
VIL(Idea Dual (2G/3G))	72.15%
VIL(Vodafone Dual (2G/3G))	62.89%
Airtel (VoLTE)	58.19%
Jio (VoLTE)	79.81%

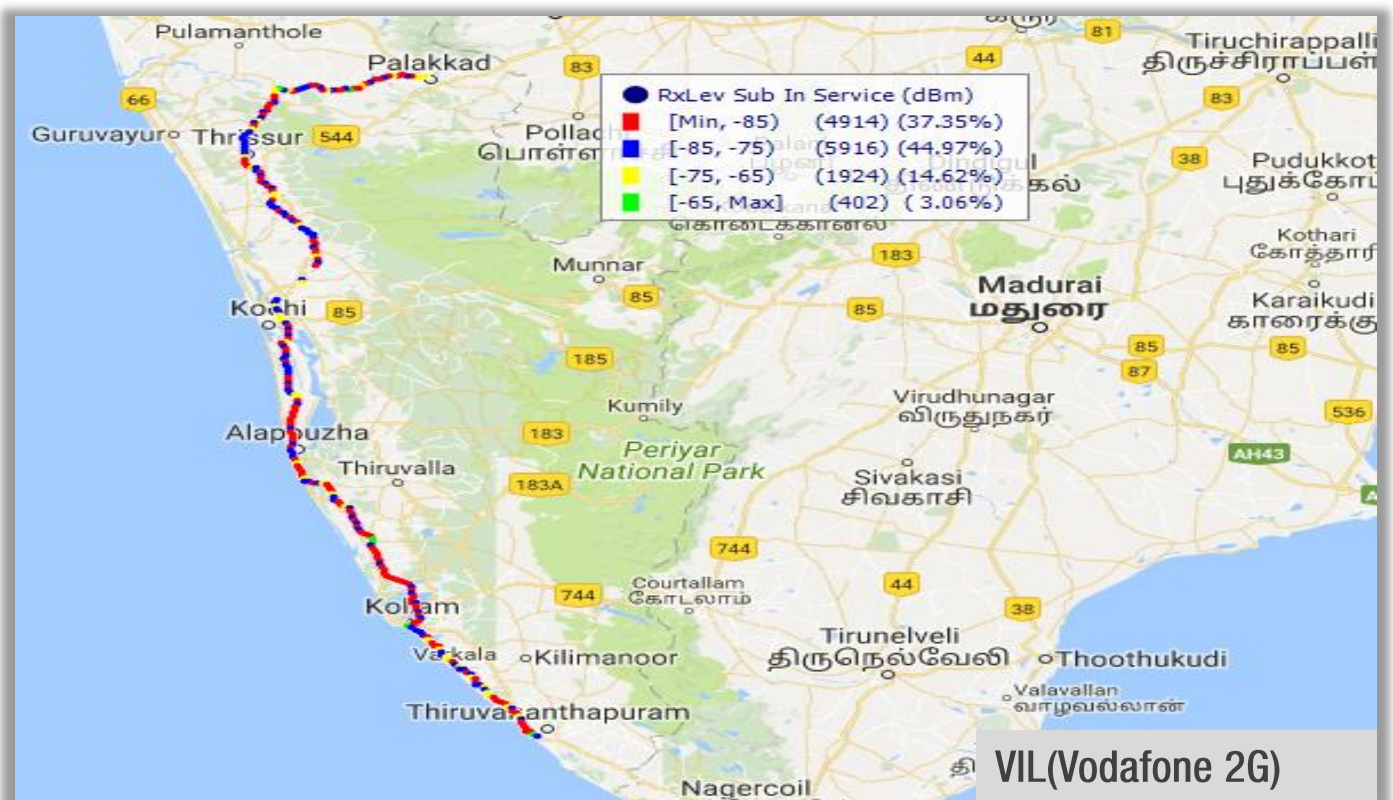
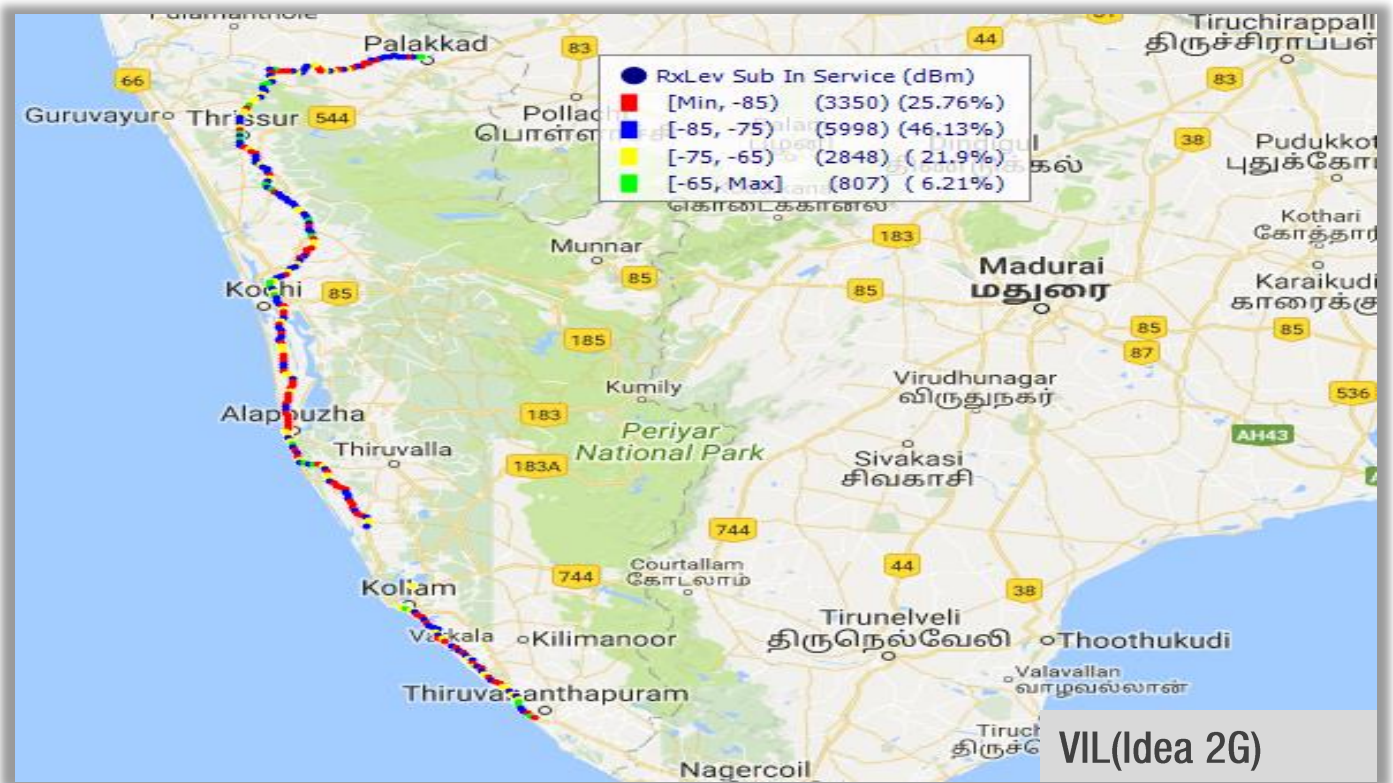


Airtel 2G

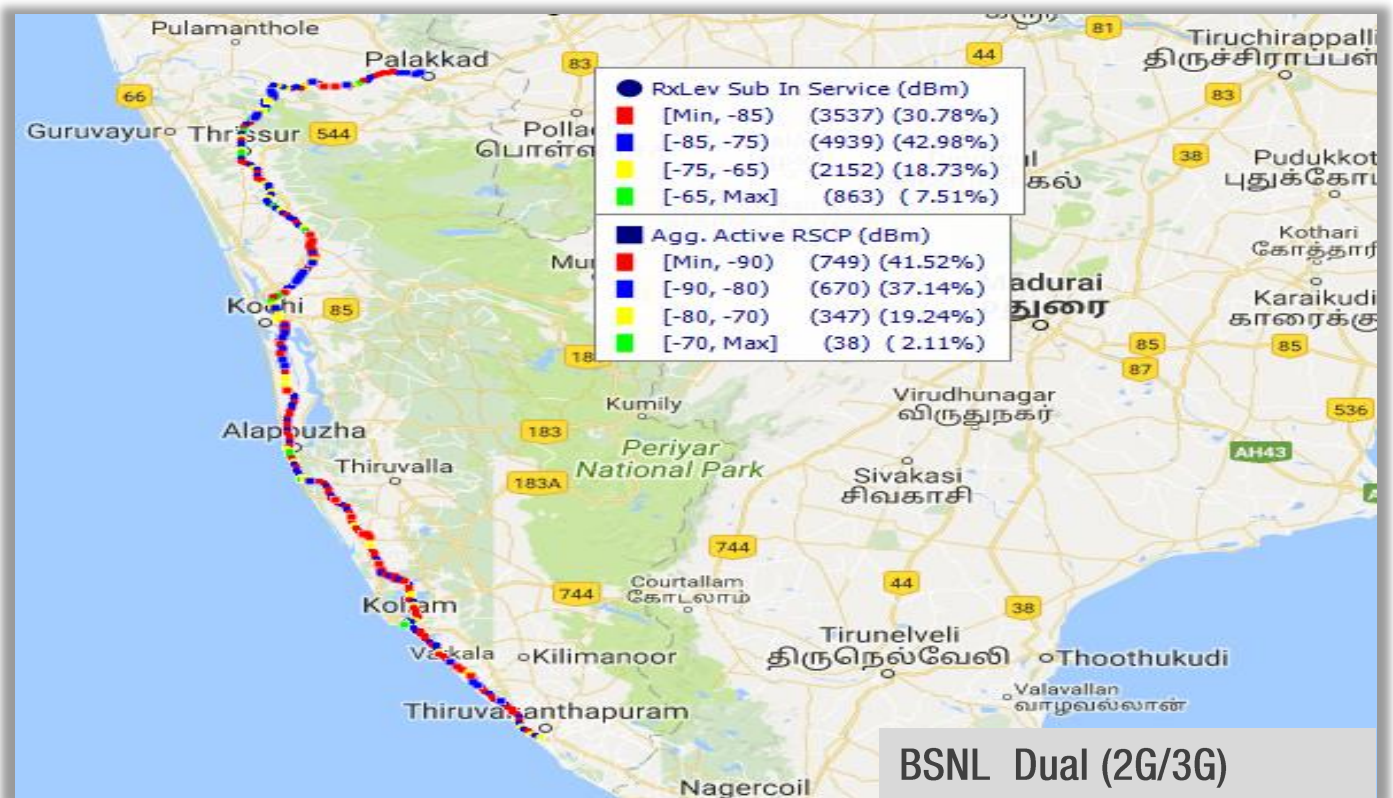
I. Coverage Details (contd.)



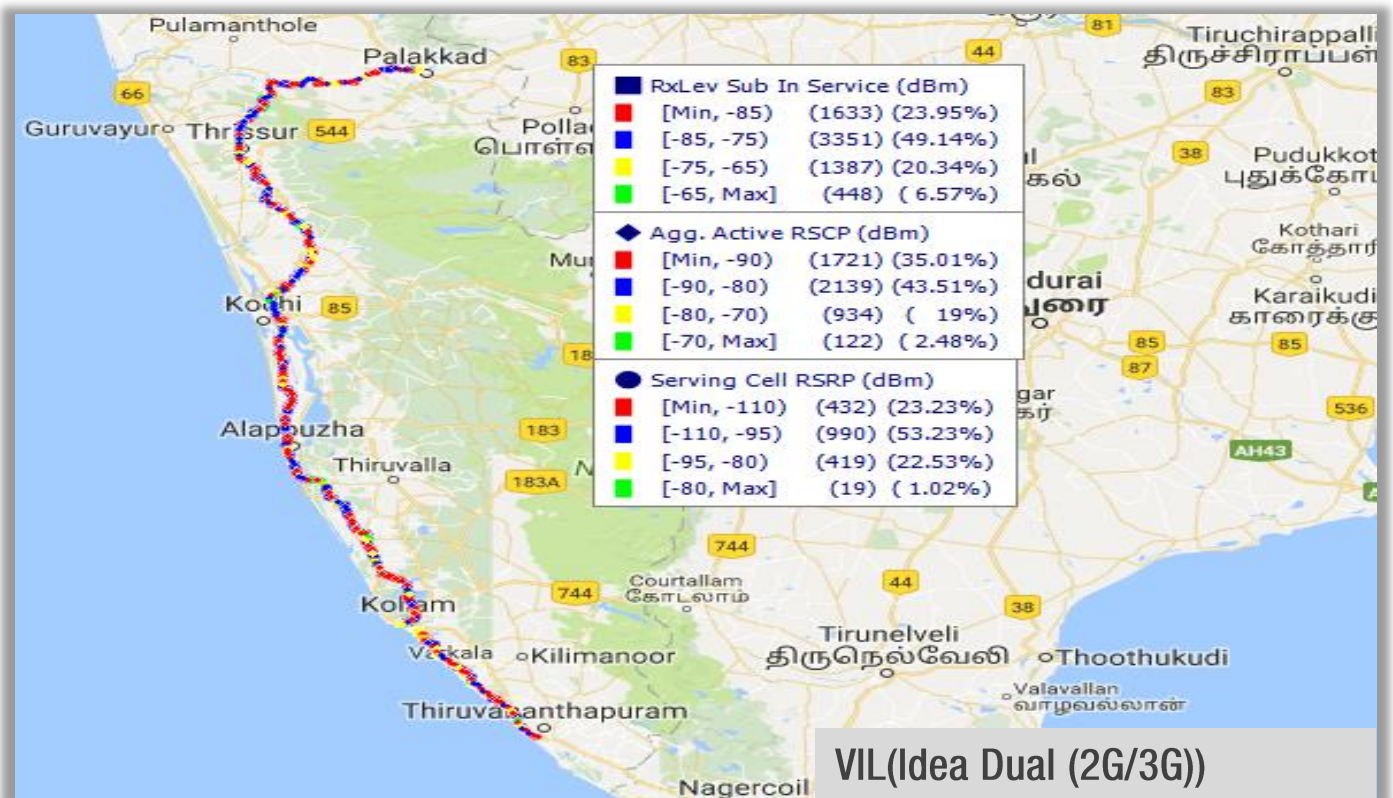
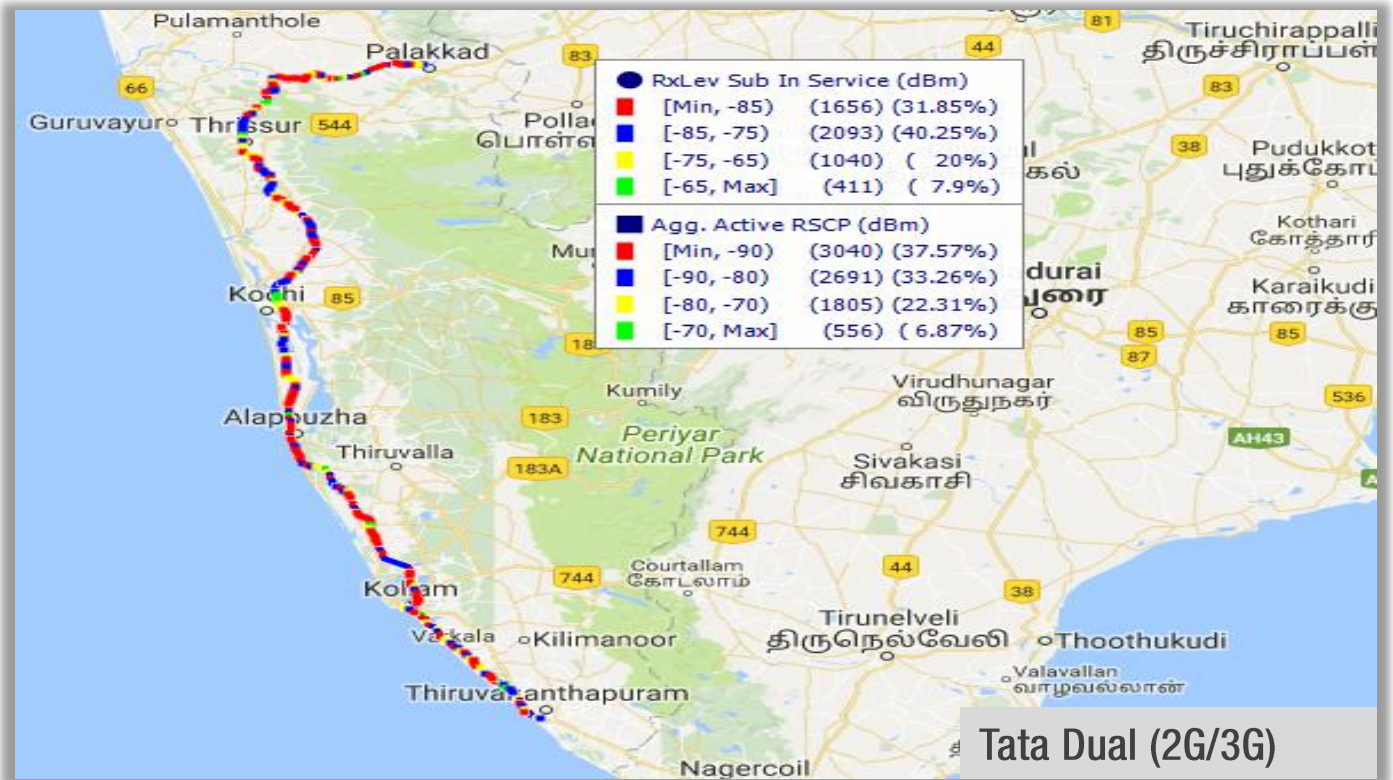
I. Coverage Details (contd.)



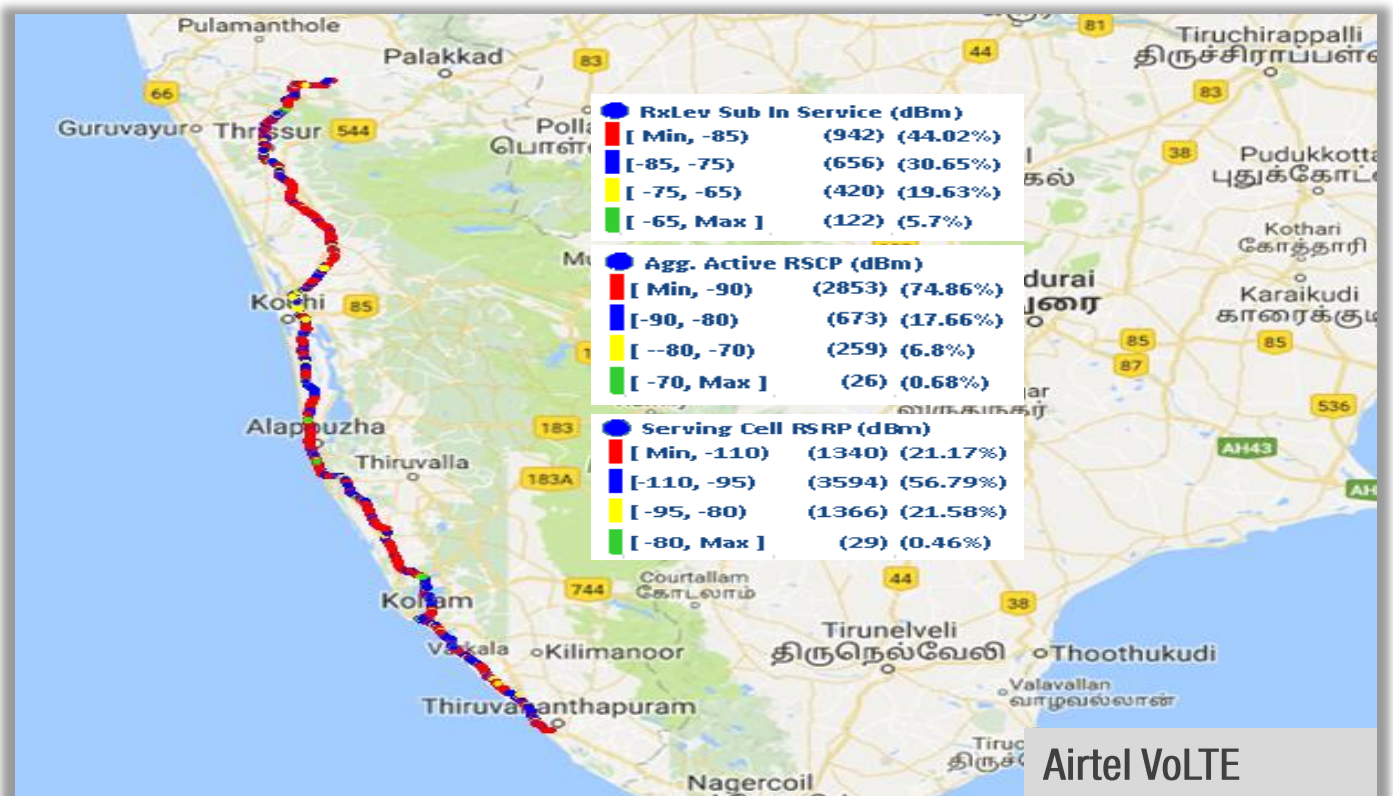
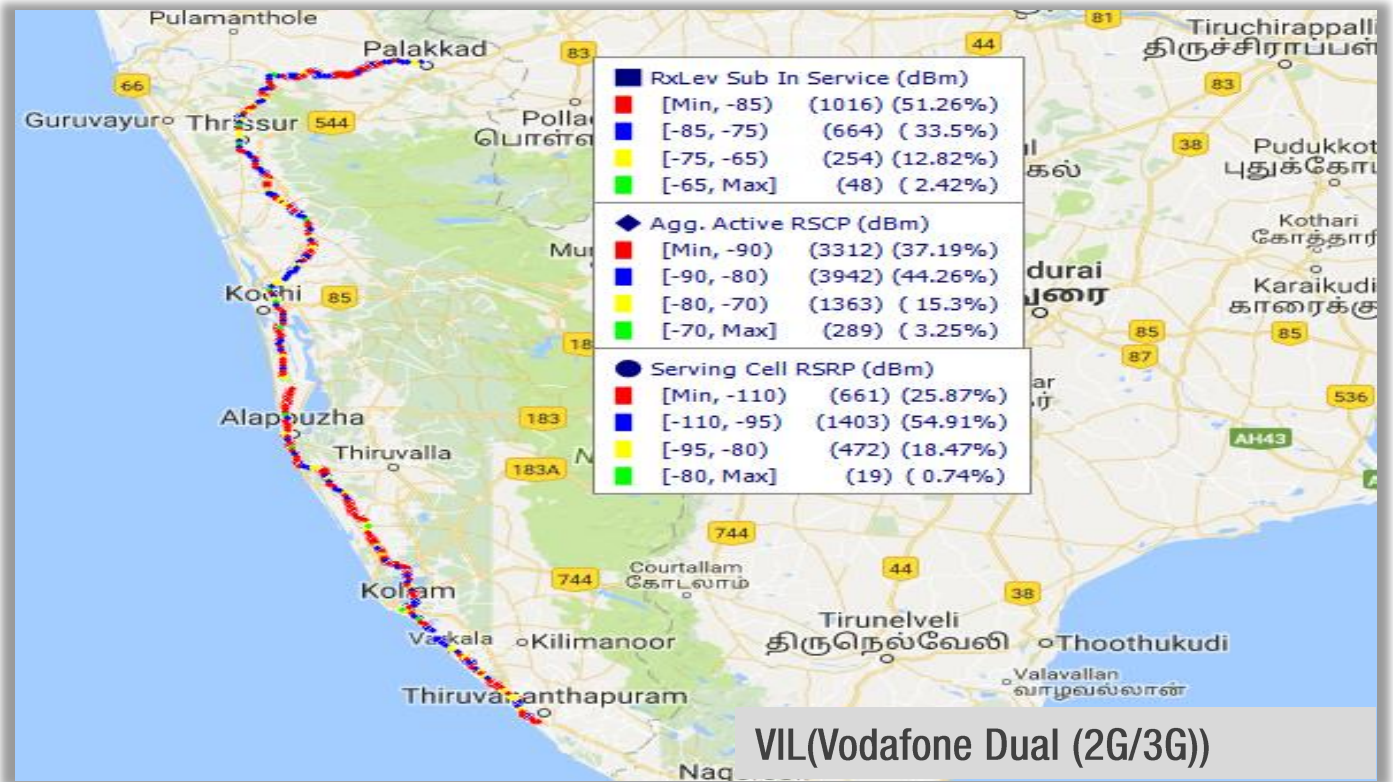
I. Coverage Details (contd.)



I. Coverage Details (contd.)



I. Coverage Details (contd.)



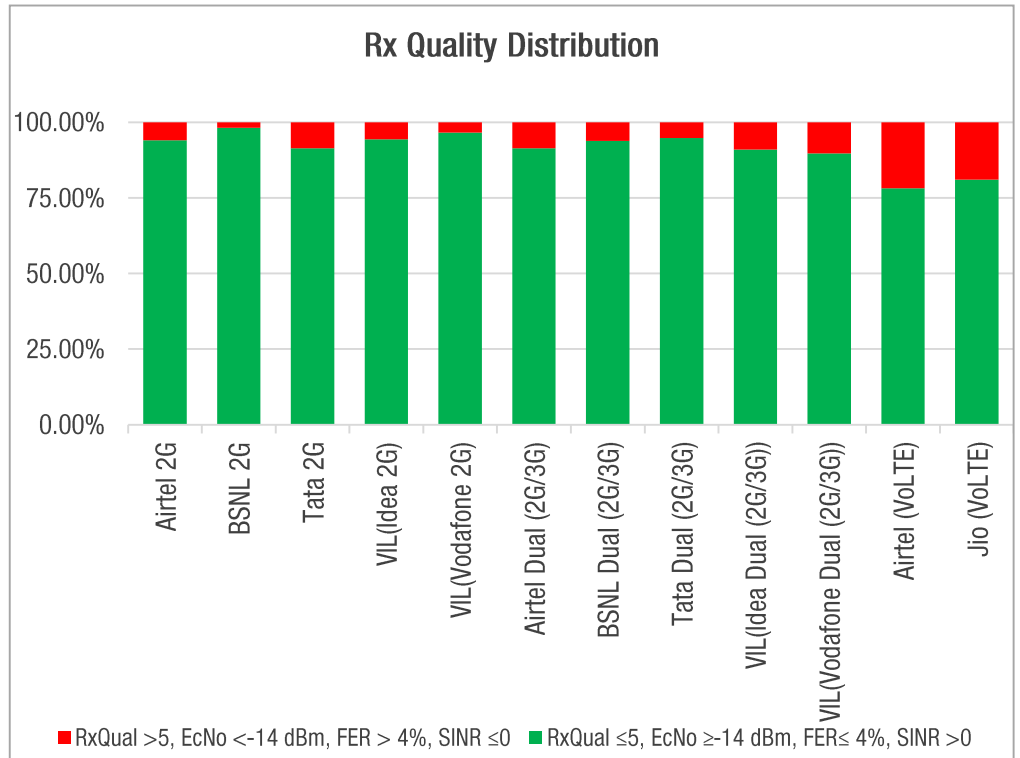
I. Coverage Details (contd.)



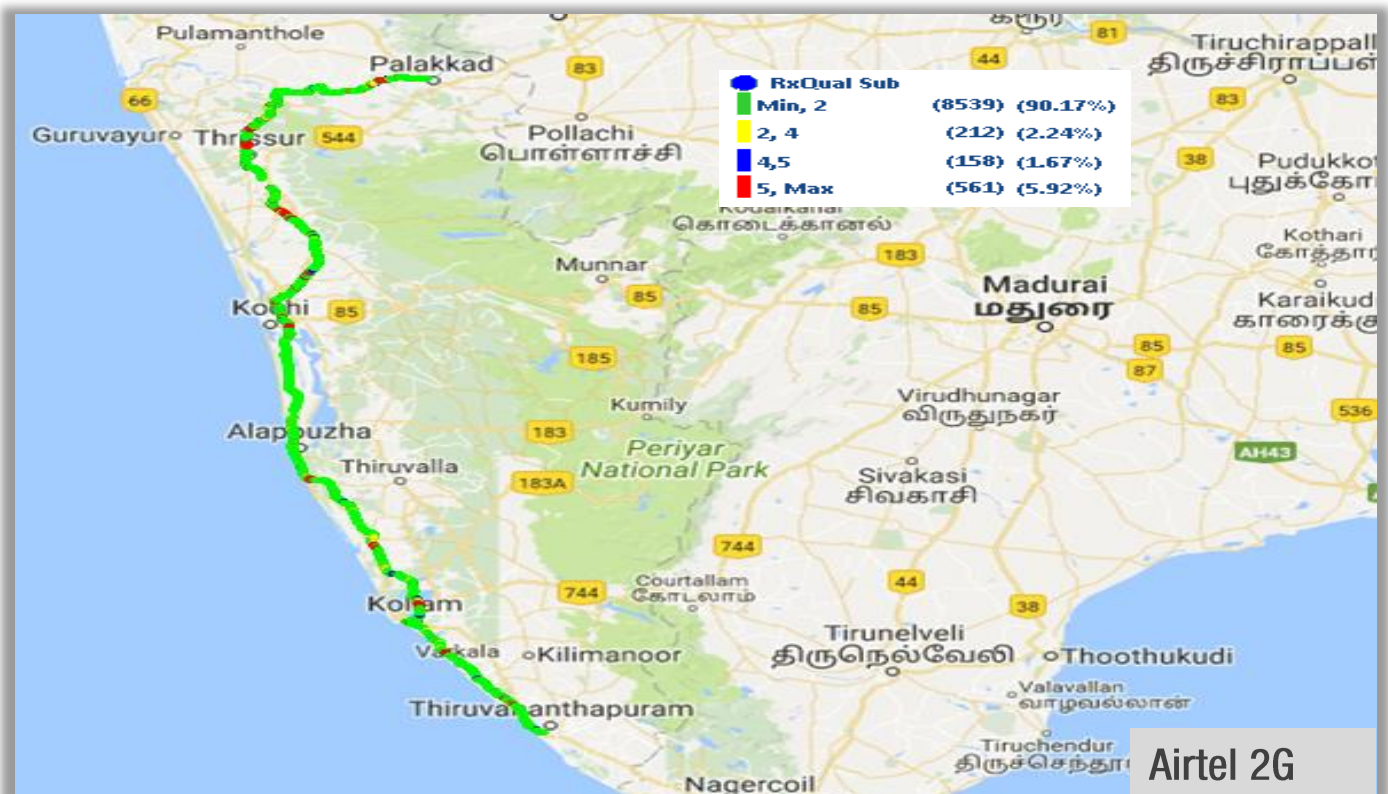
II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -14 dBm for 3G TSP sand 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 $\geq 95\%$.

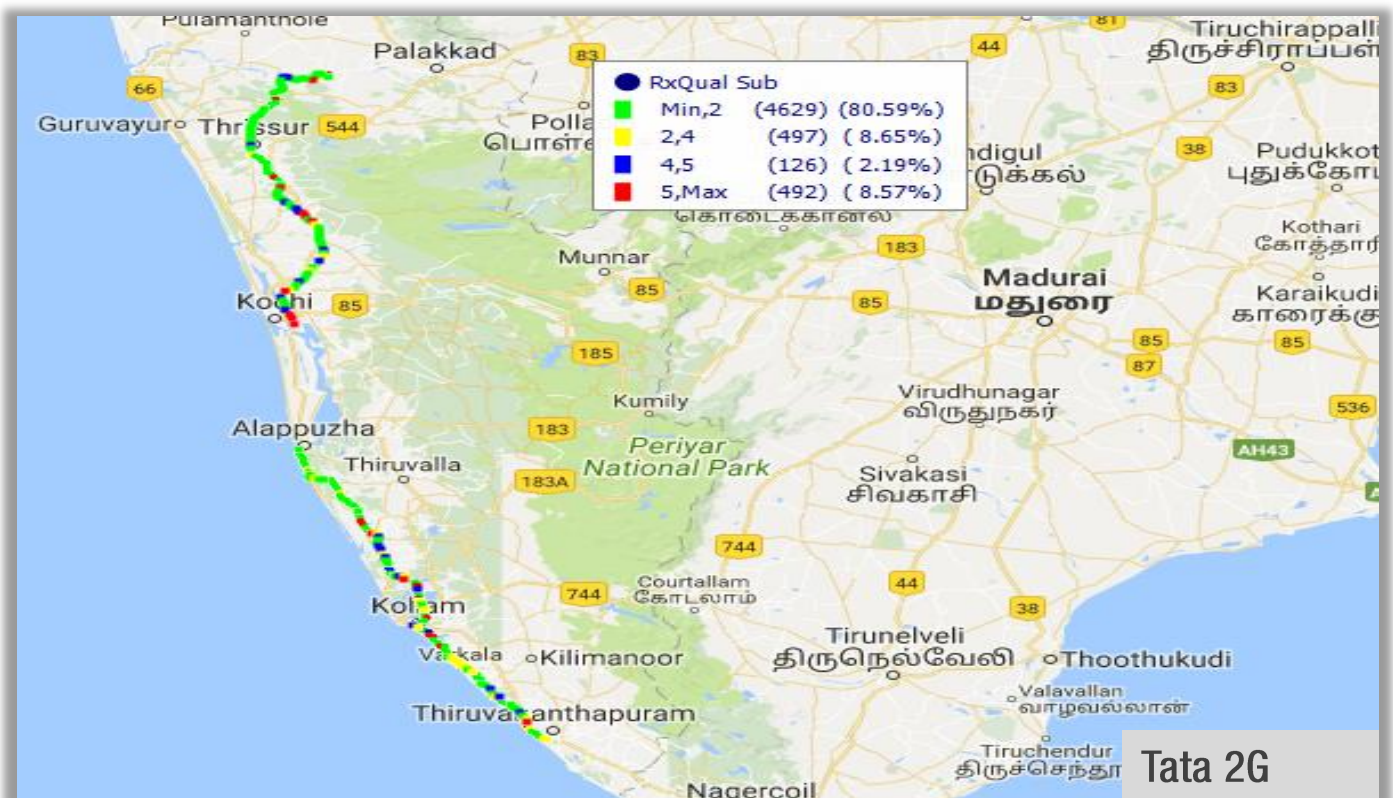
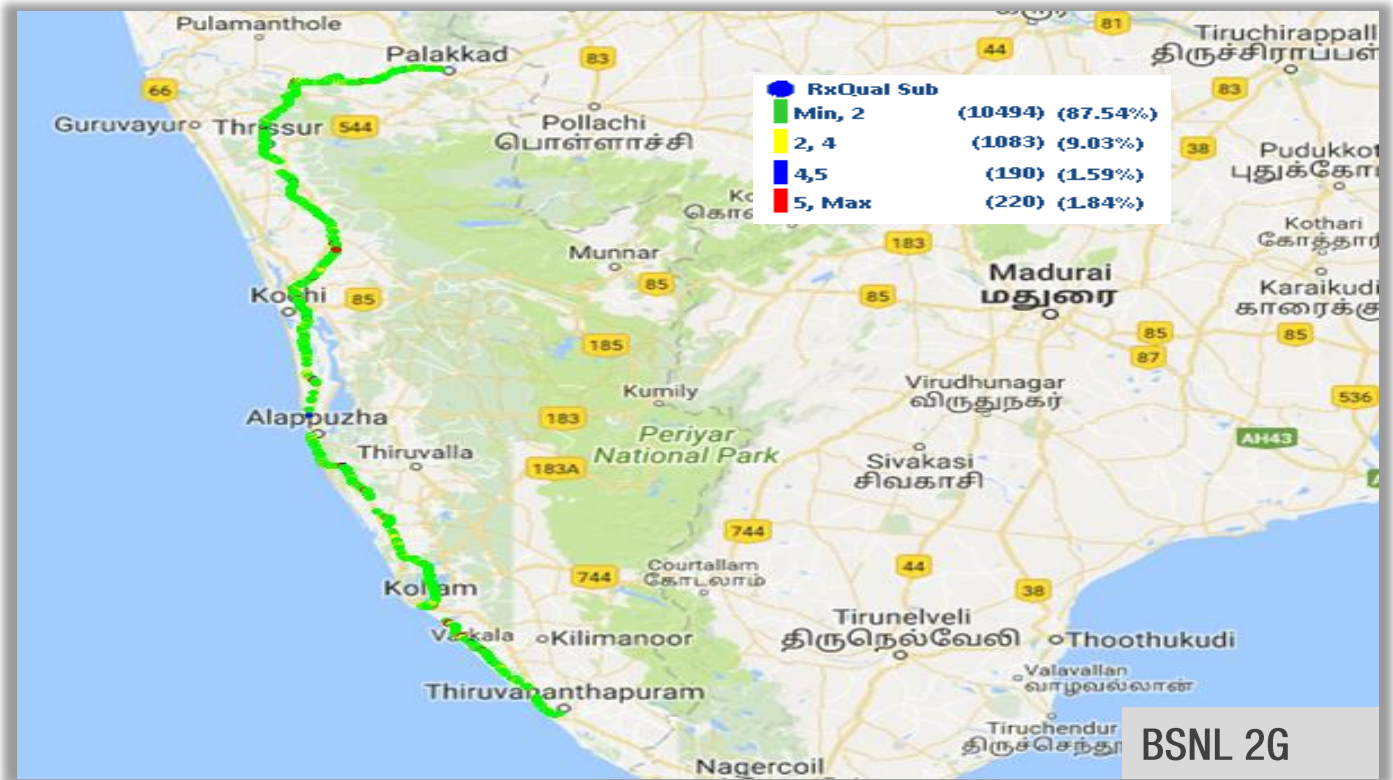
TSP	Rx Quality
Airtel 2G	94.08%
BSNL 2G	98.16%
Tata 2G	91.43%
VIL(Idea 2G)	94.42%
VIL(Vodafone 2G)	96.61%
Airtel Dual (2G/3G)	91.41%
BSNL Dual (2G/3G)	93.83%
Tata Dual (2G/3G)	94.76%
VIL(Idea Dual (2G/3G))	90.96%
VIL(Vodafone Dual (2G/3G))	89.74%
Airtel (VoLTE)	78.16%
Jio (VoLTE)	81.06%



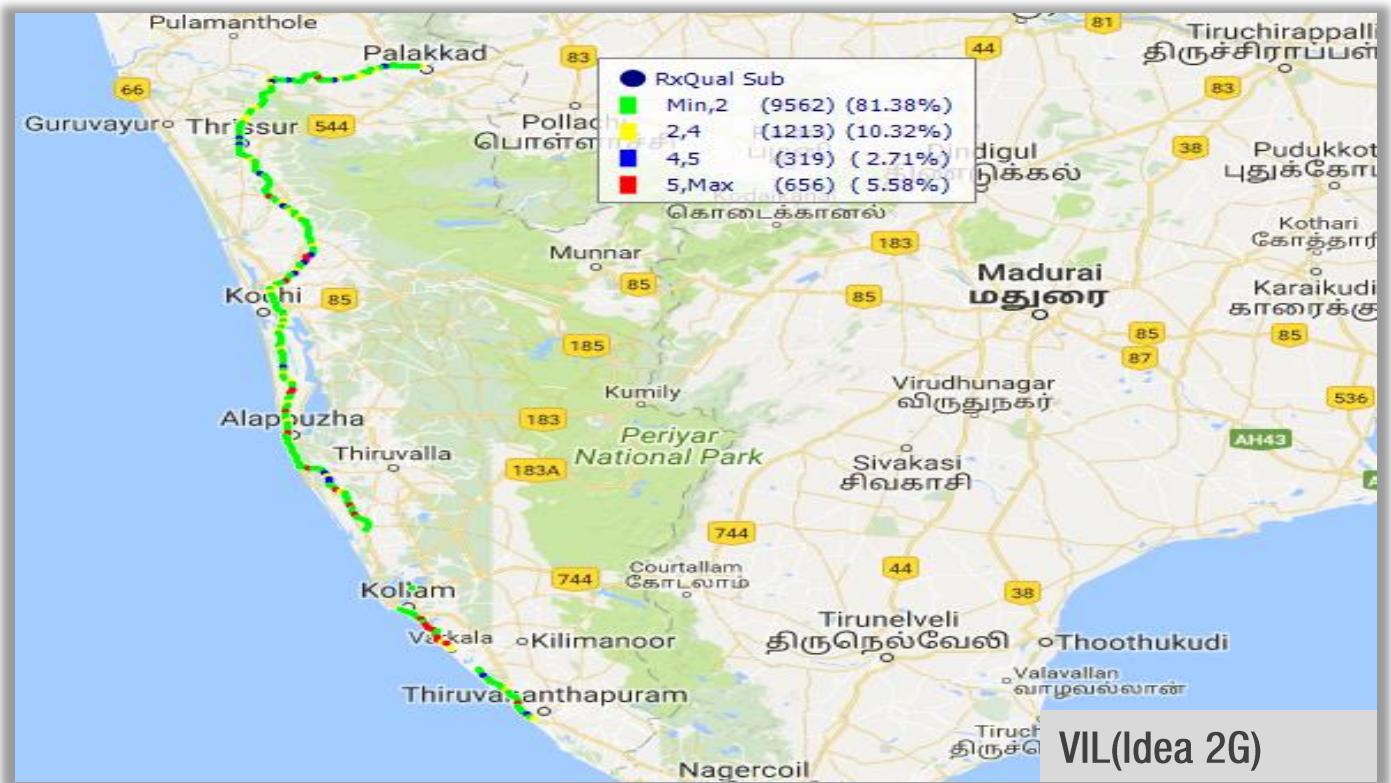
— TSPs not meeting the Benchmark



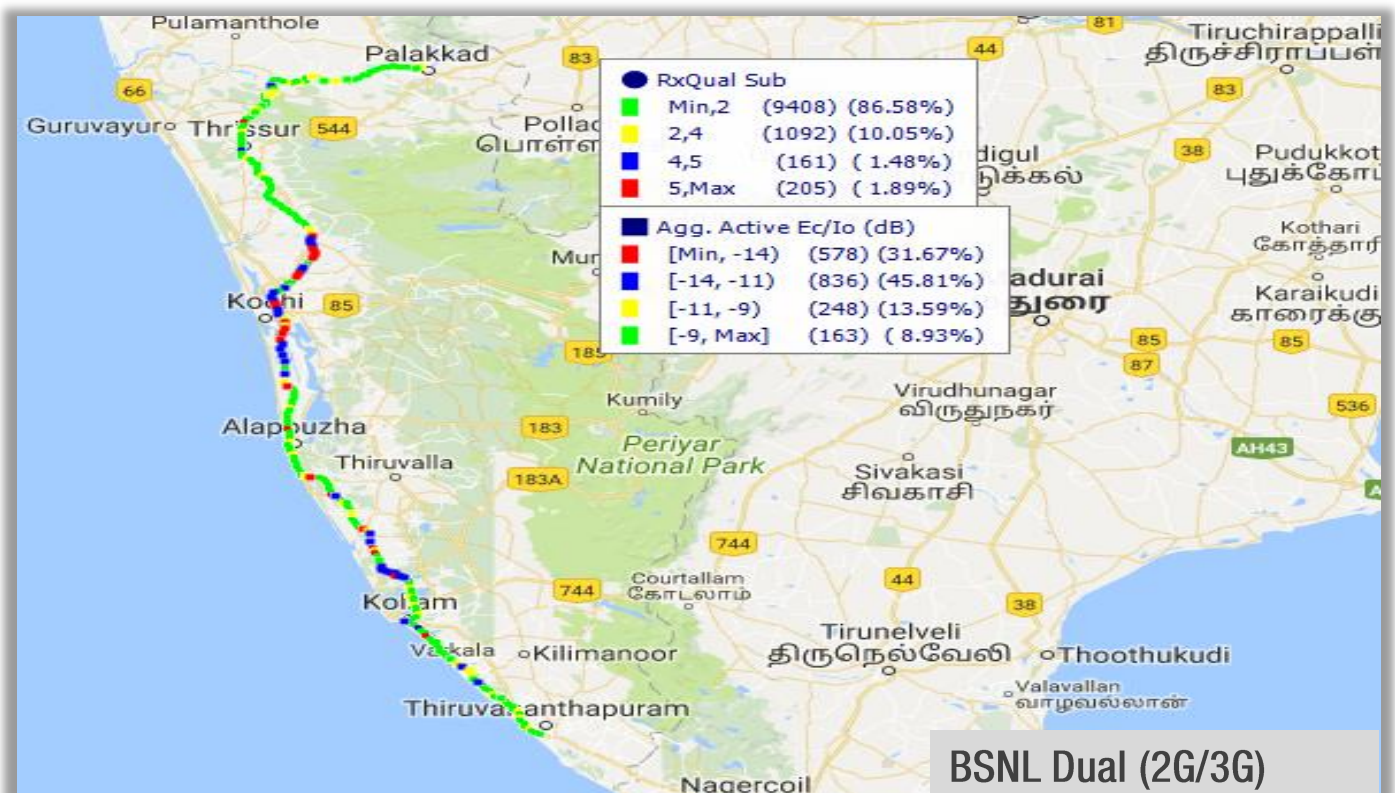
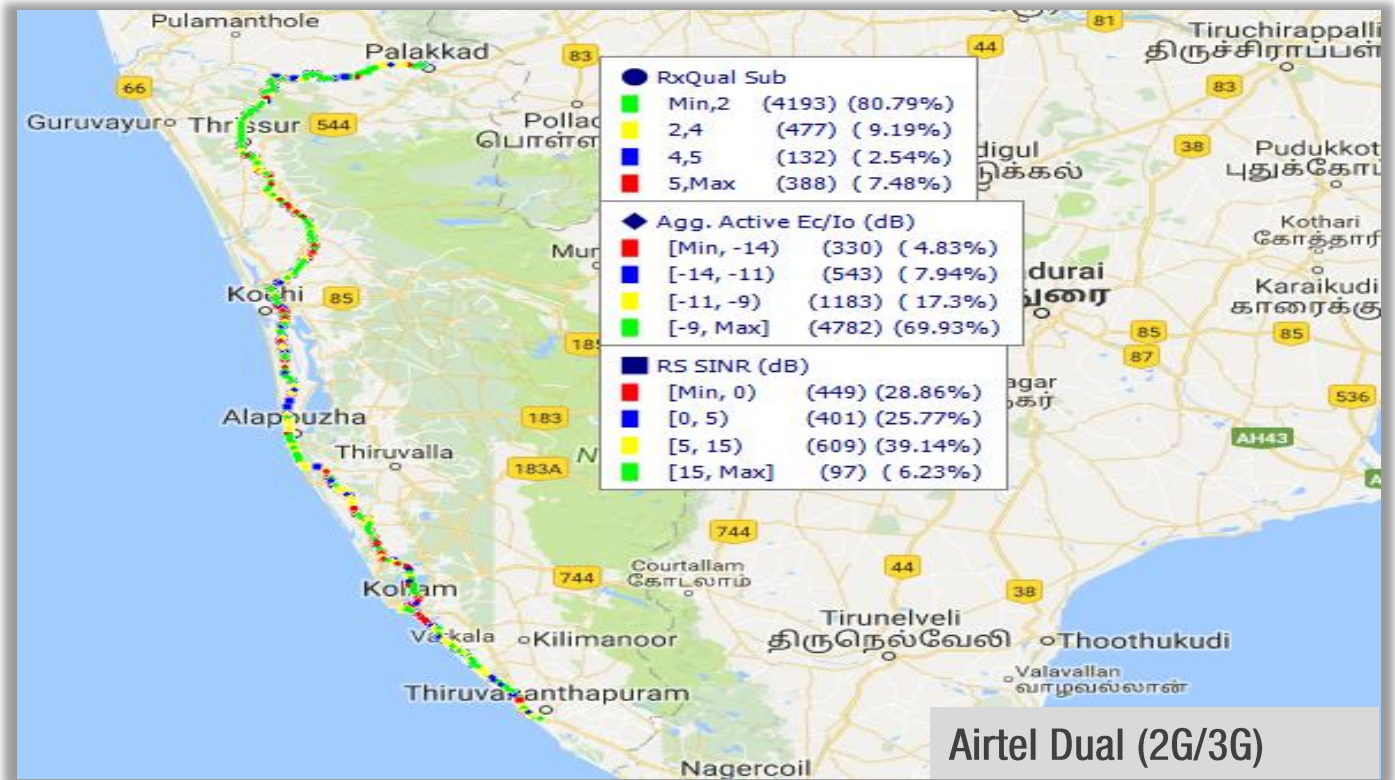
II. Quality Details (contd.)



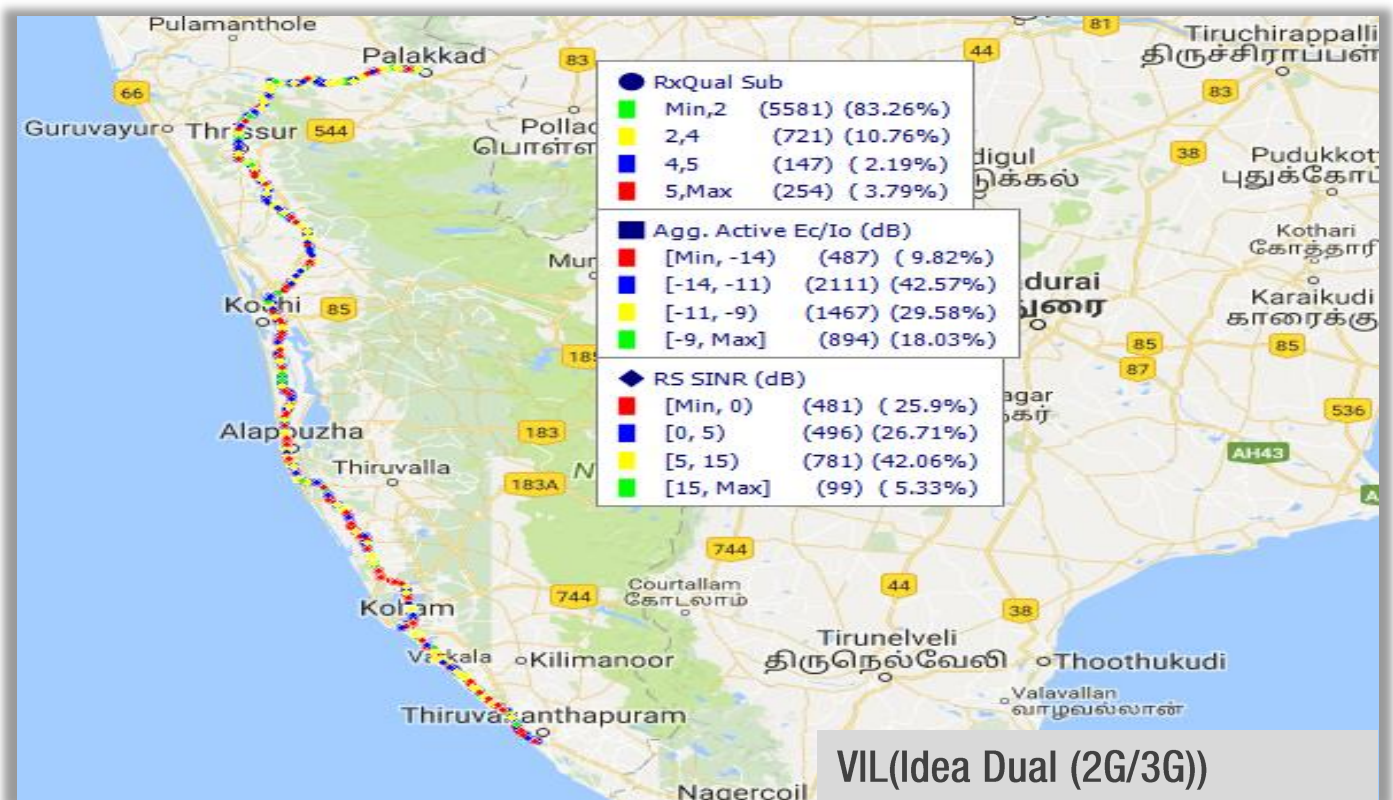
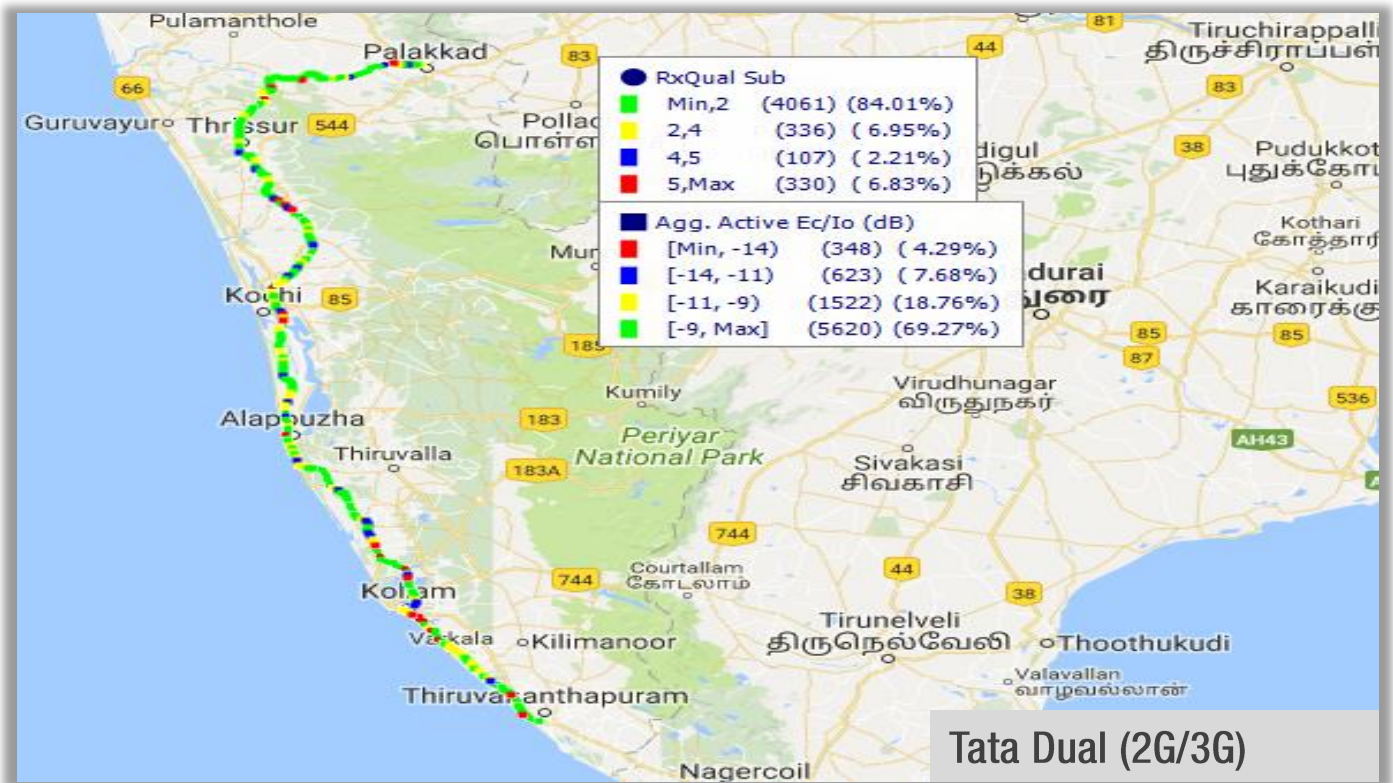
II. Quality Details (contd.)



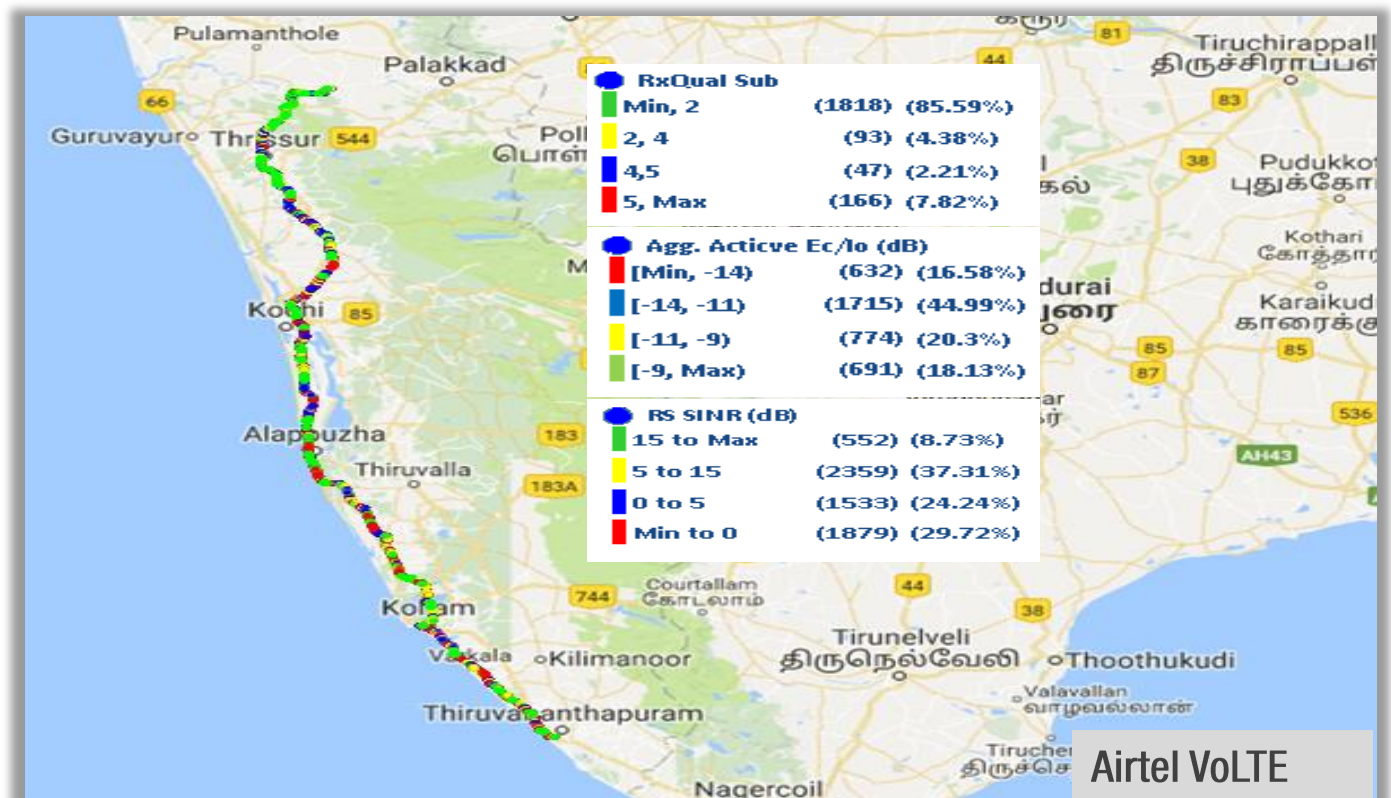
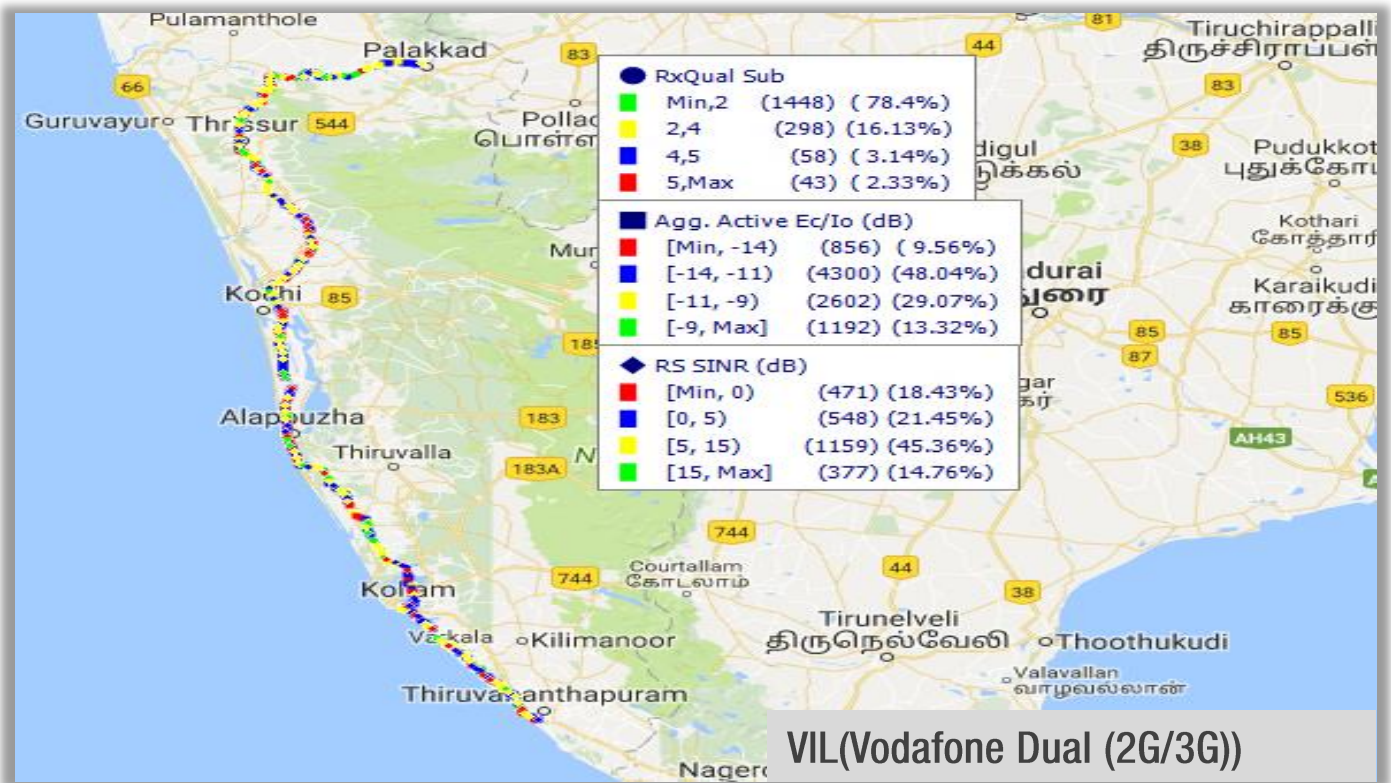
II. Quality Details (contd.)



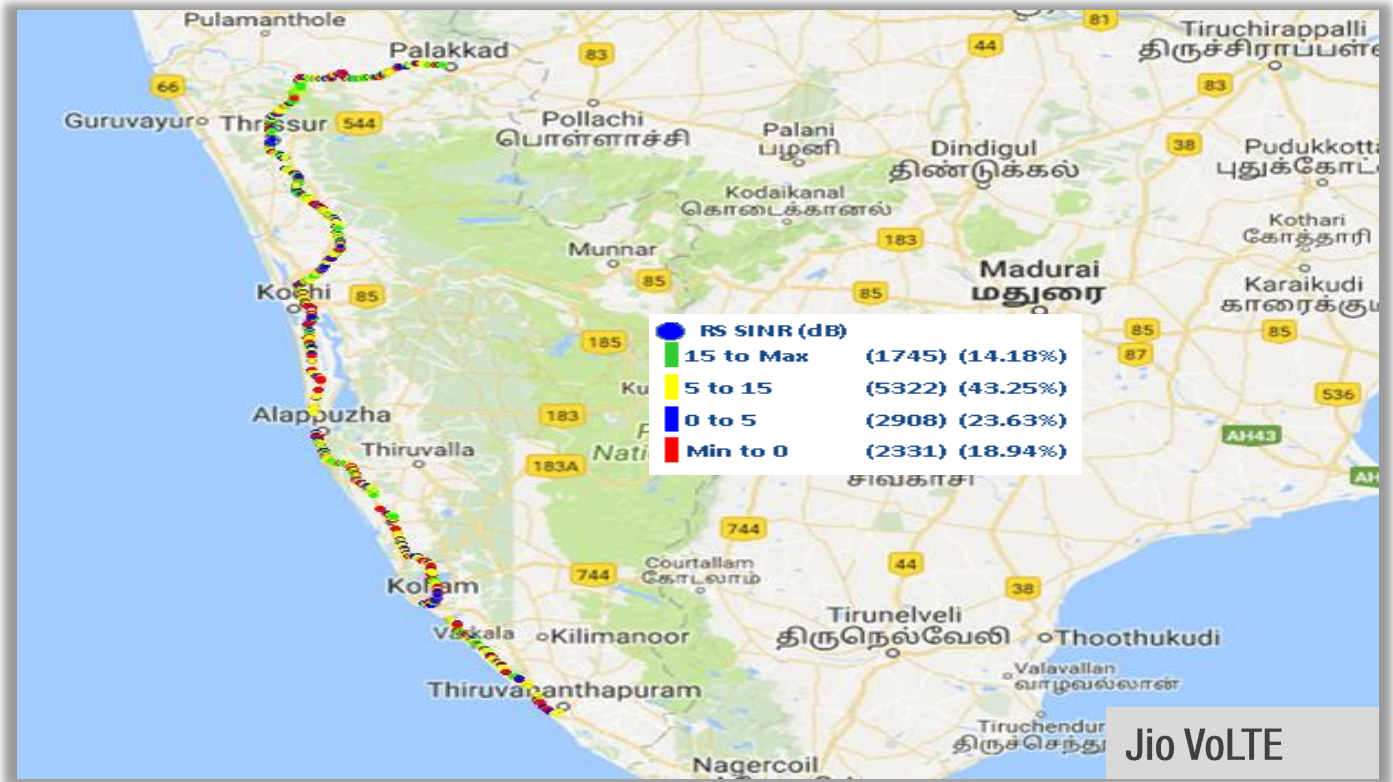
II. Quality Details (contd.)



II. Quality Details (contd.)

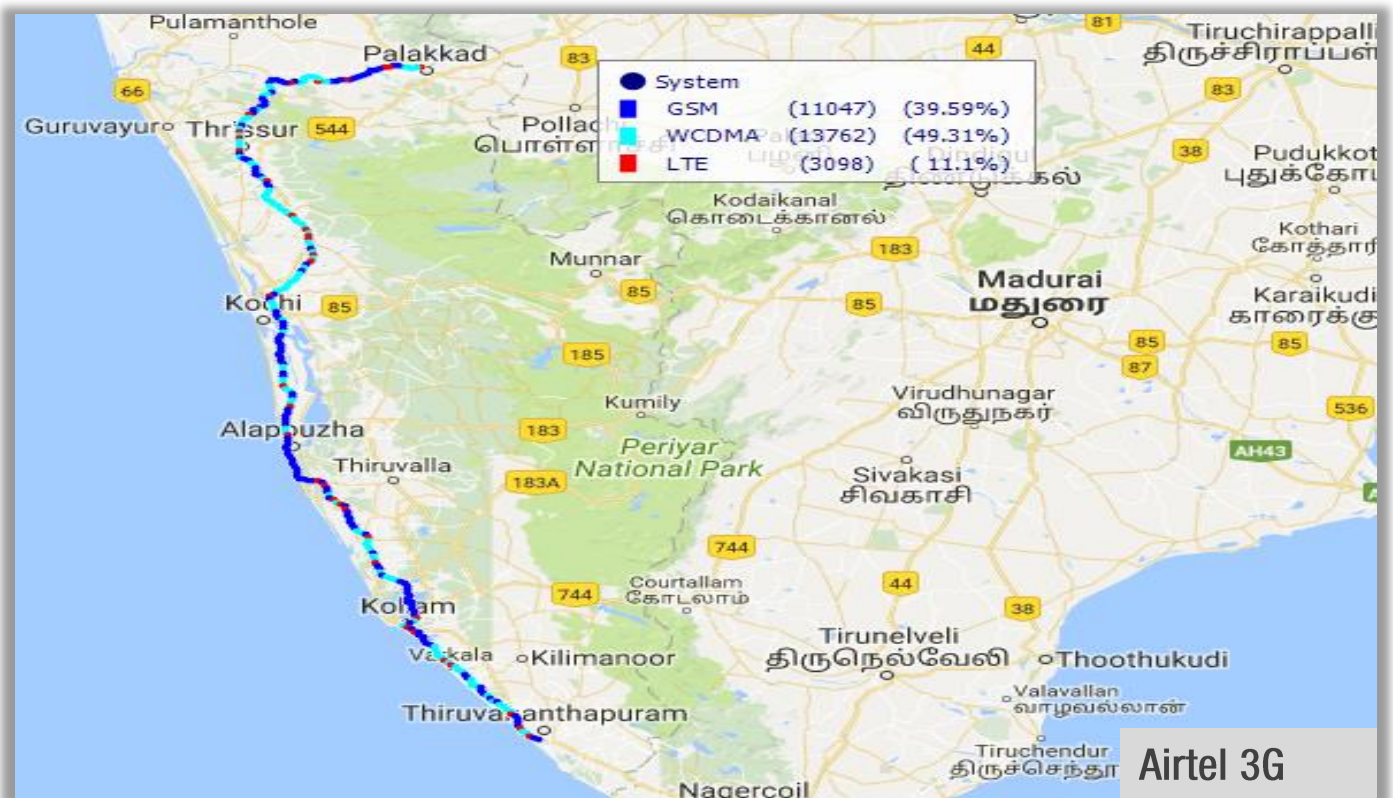
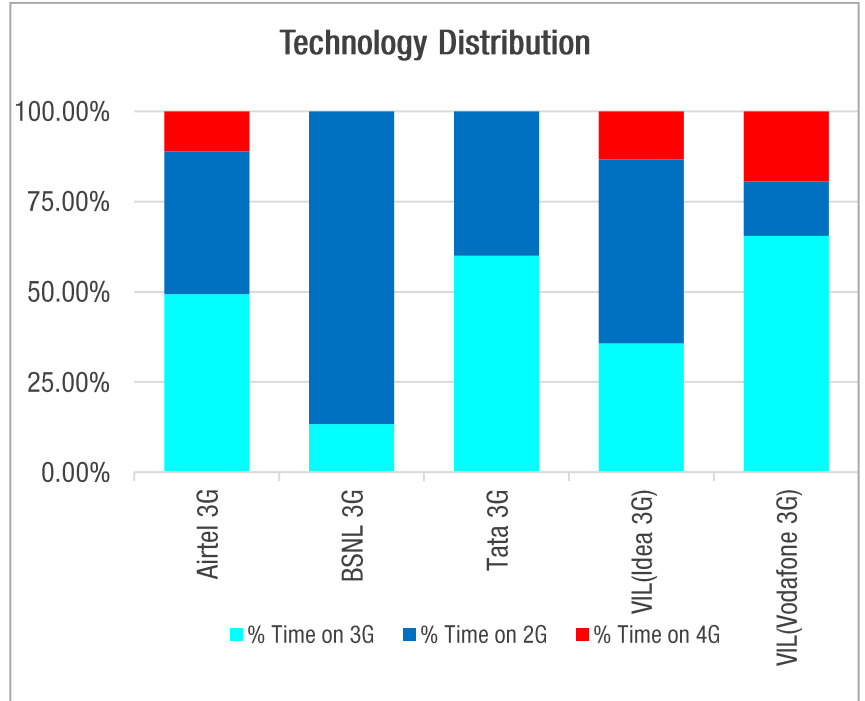


II. Quality Details (contd.)

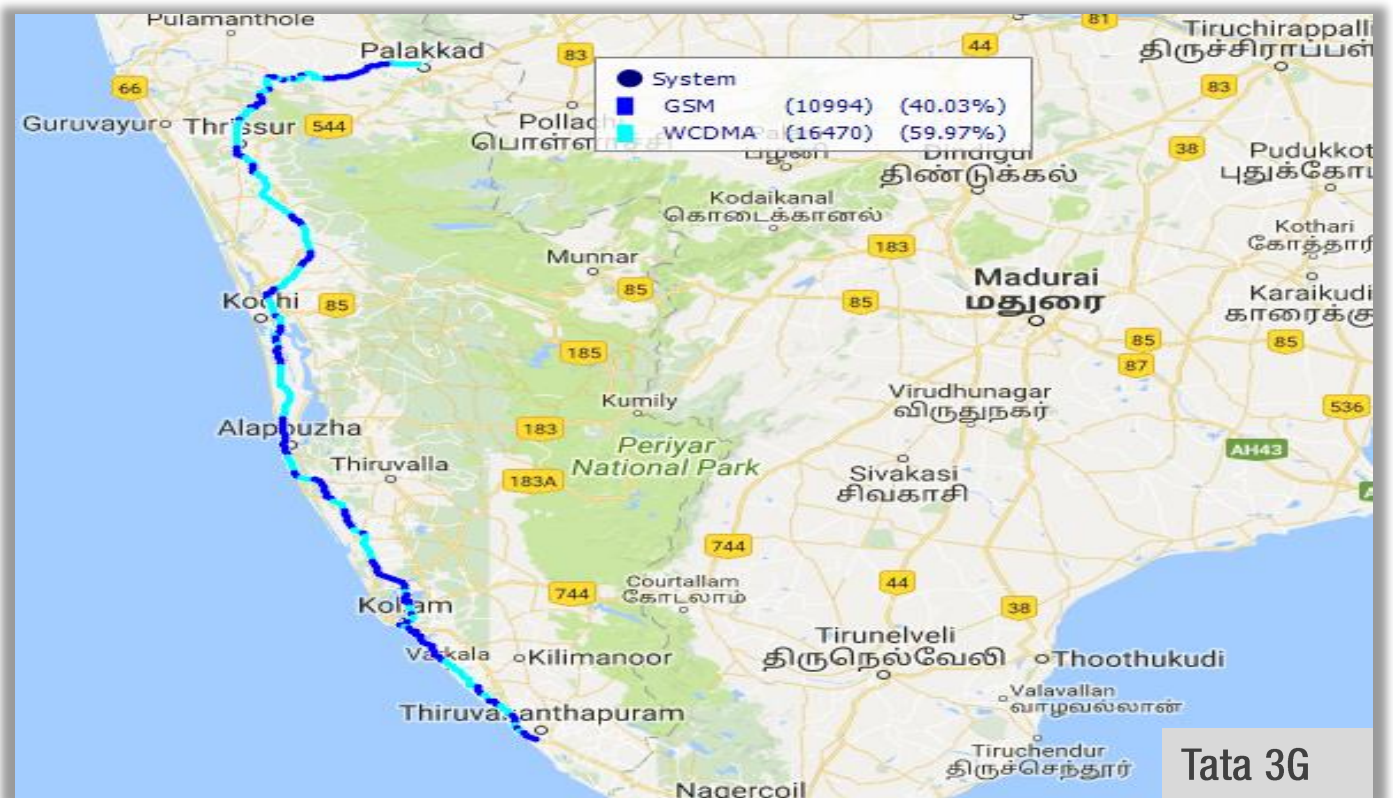
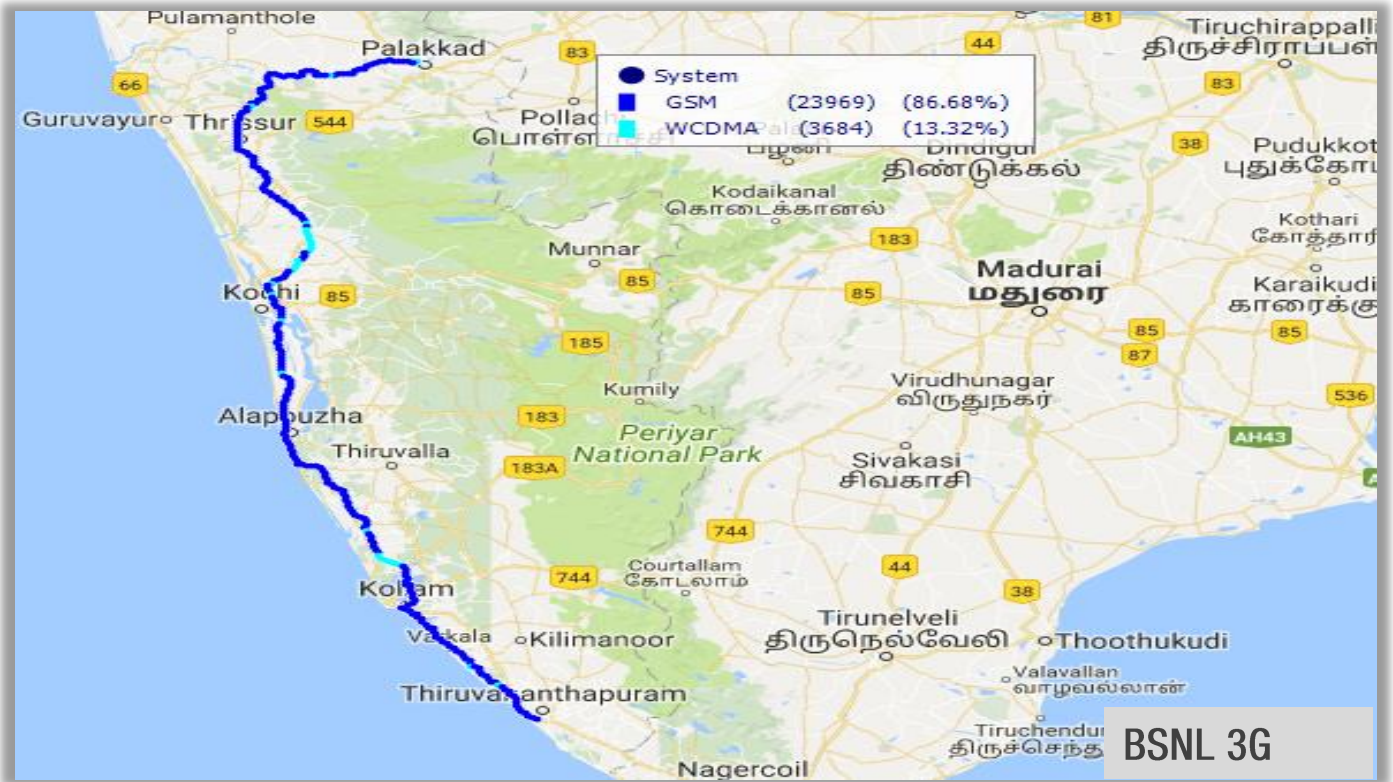


III. Technology Details

TSP	% Time on 3G
Airtel 3G	49.31%
BSNL3G	13.32%
Tata 3G	59.97%
VIL(Idea 3G)	35.69%
VIL(Vodafone 3G)	65.47%



III. Technology Details(contd.)



III. Technology Details(contd.)

