



# INDEPENDENT DRIVE TEST REPORT

*For*

# Dibrugarh to Guwahati

## Rail Route

## Dec 2017

## EAST ZONE

**Key Performance Indicators: All of the TSPs have failed to meet the Drop Call Rate (DCR) benchmark of 2% except Jio VoLTE while 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 Dibrugarh to Guwahati Rail Route areas from 9:00 AM to 9:00 PM; 18th Dec 2017. The drive test covered an rail route of approximately 580 kms over a period of 1 days. Approximately 330 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

# 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 18<sup>th</sup> Dec 2017 covering Dibrugarh to Guwahati Rail Route. The performance of **Aircel, Airtel, BSNL, Idea, Vodafone and Jio** were monitored across various technologies (2G, 3G & 4G). 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 Dibrugarh to Guwahati Rail Route:

Independent Drive test was conducted for a period of 1 days on 18<sup>th</sup> Dec 2017 in Dibrugarh to Guwahati Rail Route. 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 580 KMs over a period of 1 days on 18<sup>th</sup> Dec-17. Approximately 330 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.
- For 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.

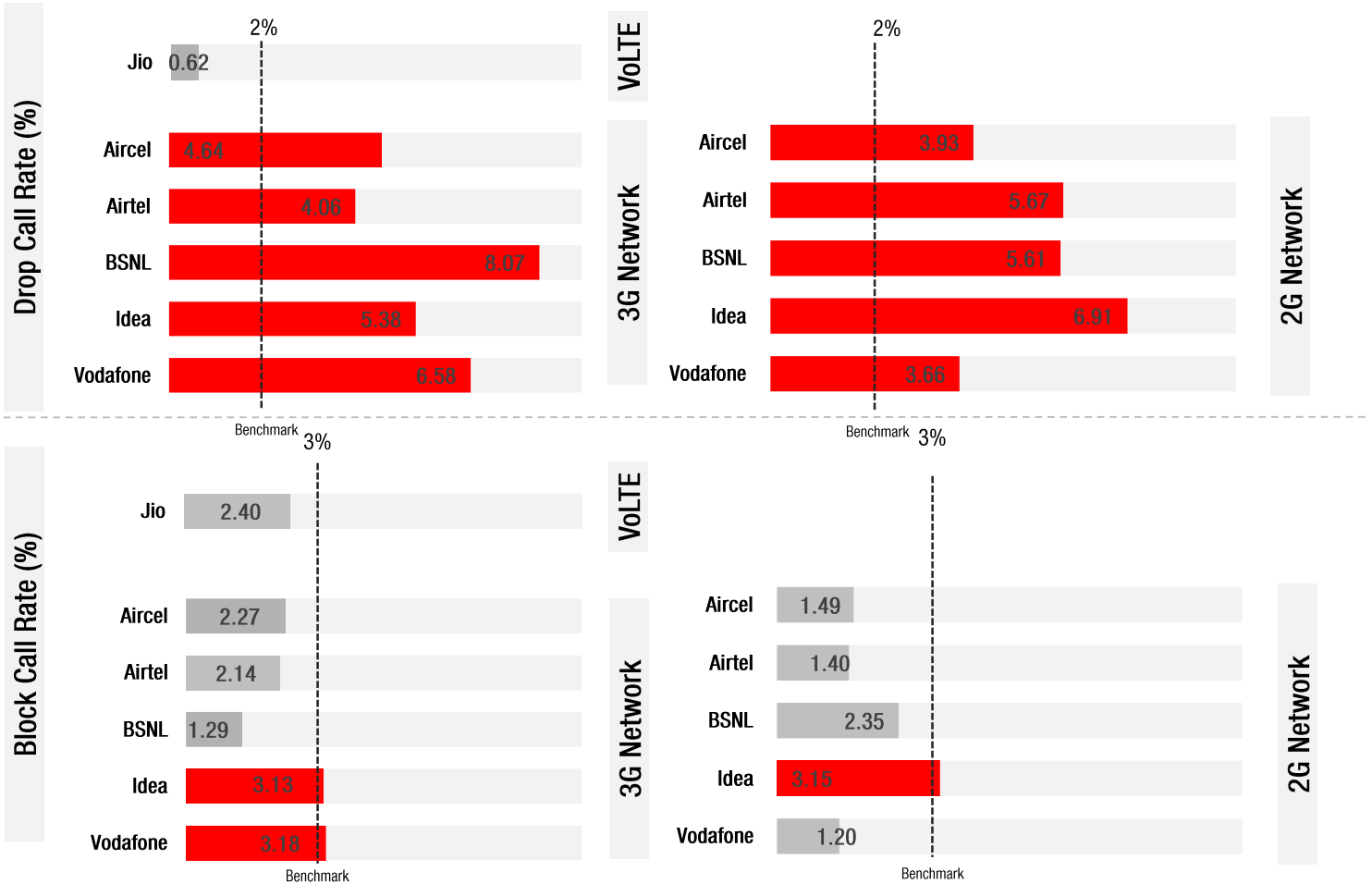
Voice Testing Drive Route



# Voice Calls

## Key Observations

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



KPI	2G Networks				
	Aircel	Airtel	BSNL	Idea	Vodafone*
SDCCH Congestion%	0.30%	0.00%	0.78%	1.57%	0.60%
TCH Congestion %	1.19%	1.40%	1.58%	1.60%	0.61%

KPI	3G Networks				
	Aircel	Airtel	BSNL	Idea	Vodafone*
SDCCH Congestion%	0.32%	0.00%	0.51%	0.35%	0.96%
RRC Congestion%	0.00%	1.83%	0.26%	0.35%	0.64%
SDCCH & RRC Congestion%	0.32%	1.83%	0.77%	0.69%	1.59%
TCH Congestion %	1.95%	0.31%	0.52%	1.40%	0.32%
RAB Congestion %	0.00%	0.00%	0.00%	1.05%	1.29%
TCH & RAB Congestion %	1.95%	0.31%	0.52%	2.45%	1.62%

- All TSPs have failed to meet the 2% QoS benchmark of Drop Call Rate (DCR%) except Jio VoLTE.
- Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's. excepts Idea 2G, Idea 3G & Vodafone 3G.

Not meeting Benchmark

# Voice Calls

## Key Observations

### Coverage

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

TSPs	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Coverage%	45.98%	43.19%	26.27%	34.18%	47.09%

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

TSPs	3G					VoLTE
	Aircel	Airtel	BSNL	Idea	Vodafone	Jio
Coverage%	41.55%	45.94%	33.51%	48.21%	55.69%	89.12%

c) Percentage of time spent on 3G network.

TSPs	3G				
	Aircel	Airtel	BSNL	Idea	Vodafone
% Time Spent on 3G	21.73%	83.83%	18.38%	64.59%	73.99%

# Summary

## Railway Route Summary

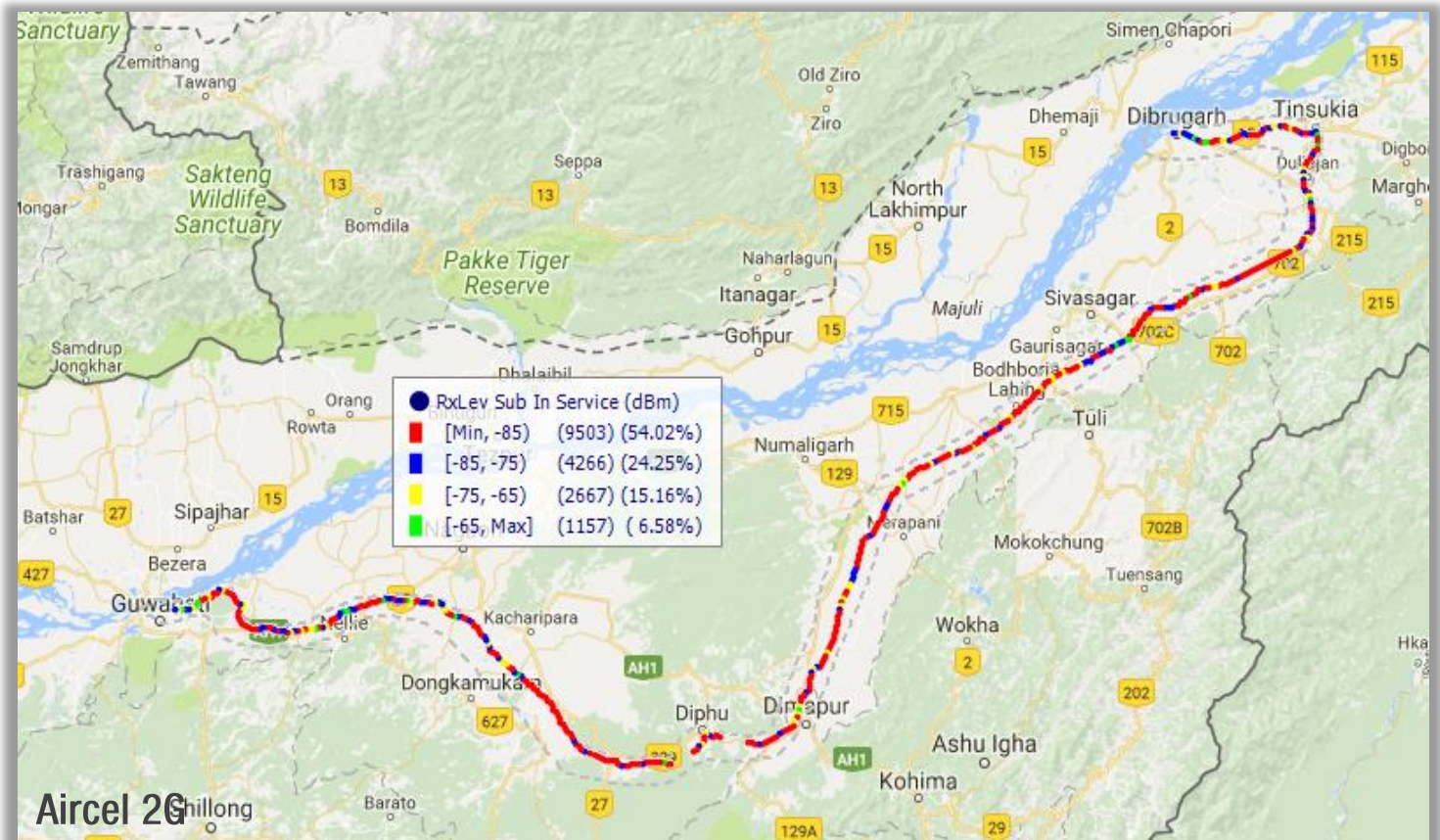
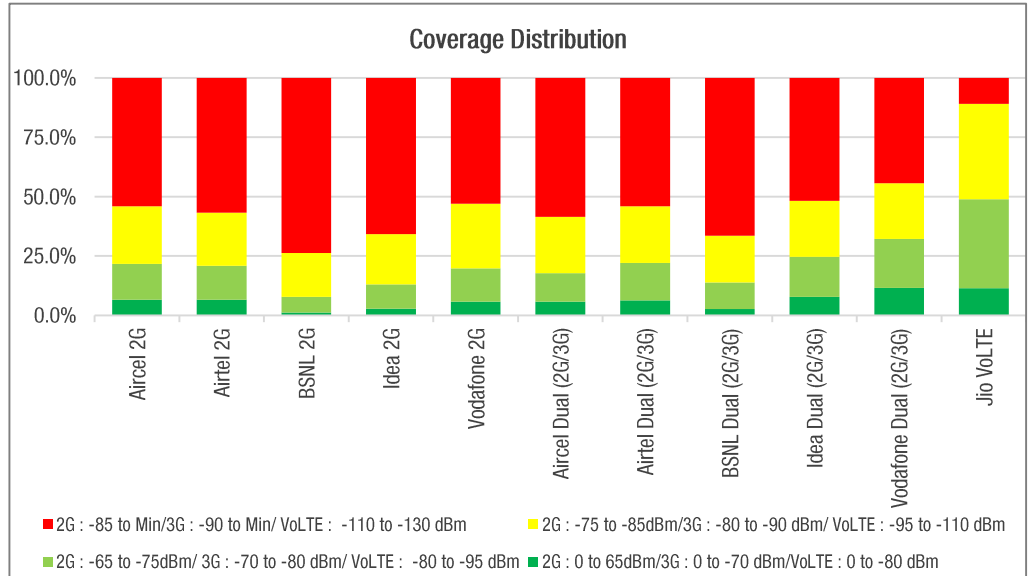
Voice Call	2G				
	Aircel	Airtel	BSNL	Idea	Vodafone
Call Attempt	336	358	383	254	332
Blocked Call Rate (%)	1.5%	1.4%	2.3%	3.1%	1.2%
CSSR% (Accessibility)	98.5%	98.6%	97.7%	96.9%	98.8%
Drop Call Rate (%)	3.9%	5.7%	5.6%	6.9%	3.7%
Mobility HOSR (%)	97.9%	99.4%	98.0%	100.0%	99.5%
Rx Quality (%)	91.62%	87.77%	86.31%	89.31%	92.73%

Voice Call	3G					VoLTE
	Aircel	Airtel	BSNL	Idea	Vodafone	Jio
Call Attempt	309	327	389	288	314	333
Blocked Call Rate (%)	2.3%	2.1%	1.3%	3.1%	3.2%	2.4%
CSSR% (Accessibility)	97.7%	97.9%	98.7%	96.9%	96.8%	97.6%
Drop Call Rate (%)	4.6%	4.1%	8.1%	5.4%	6.6%	0.6%
Mobility HOSR (%)	99.8%	100.0%	97.5%	100.0%	100.0%	99.3%
Rx Quality (%)	88.95%	82.16%	84.59%	89.59%	89.64%	90.30%

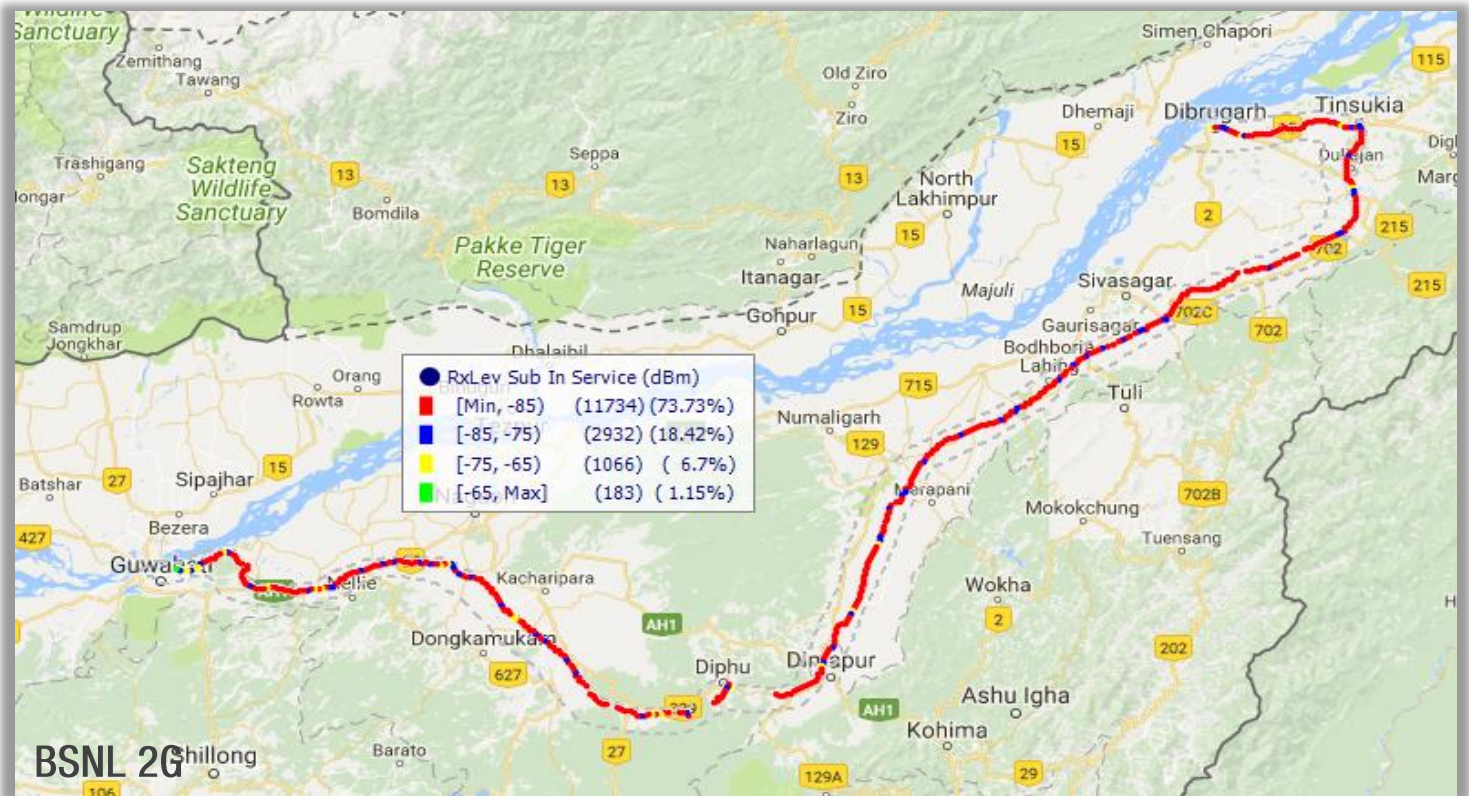
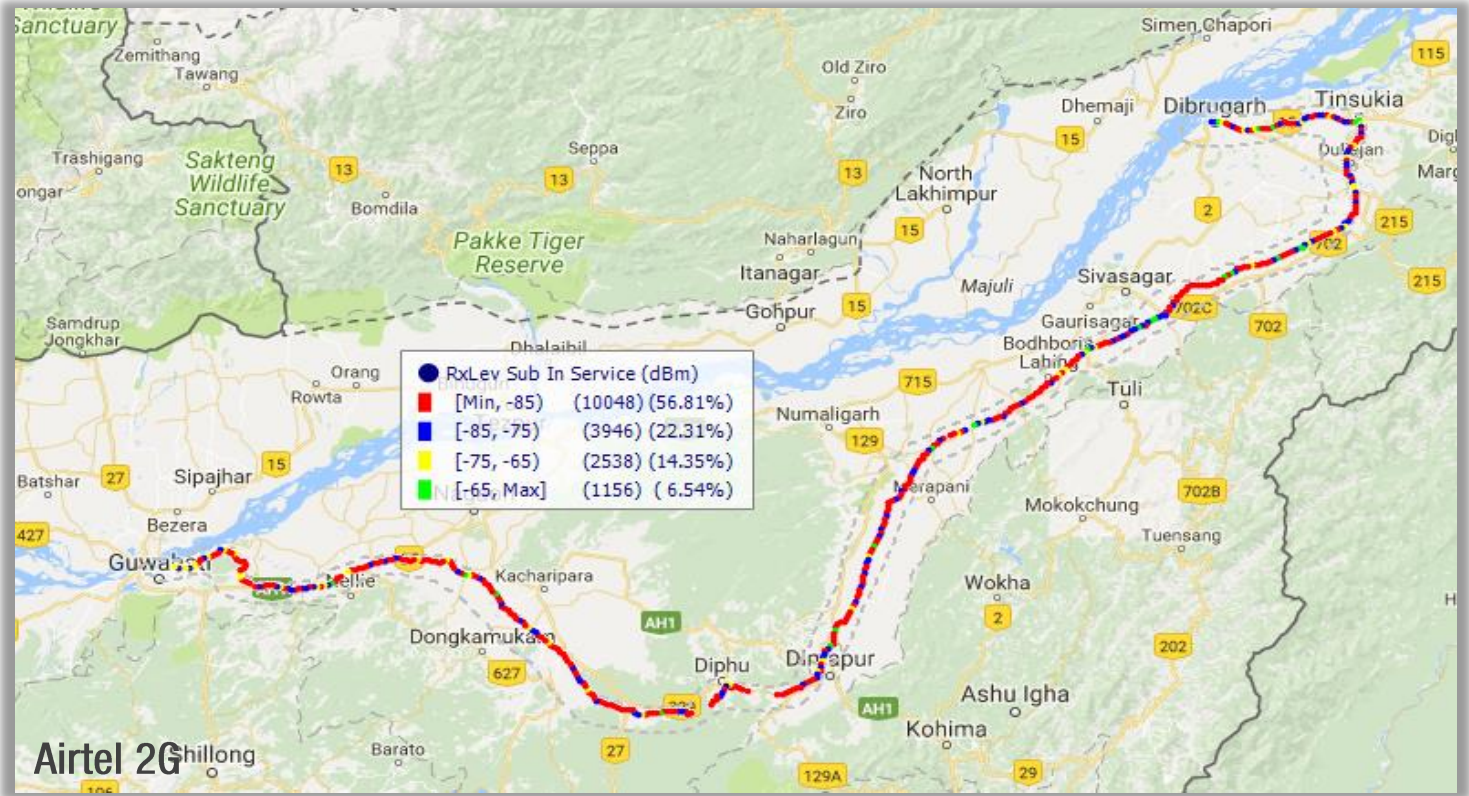
# I. Coverage Details

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  $\geq -85$ , RSCP is  $\geq -90$  dBm & RSRP  $\geq -110$ dBm. The details are as follows.

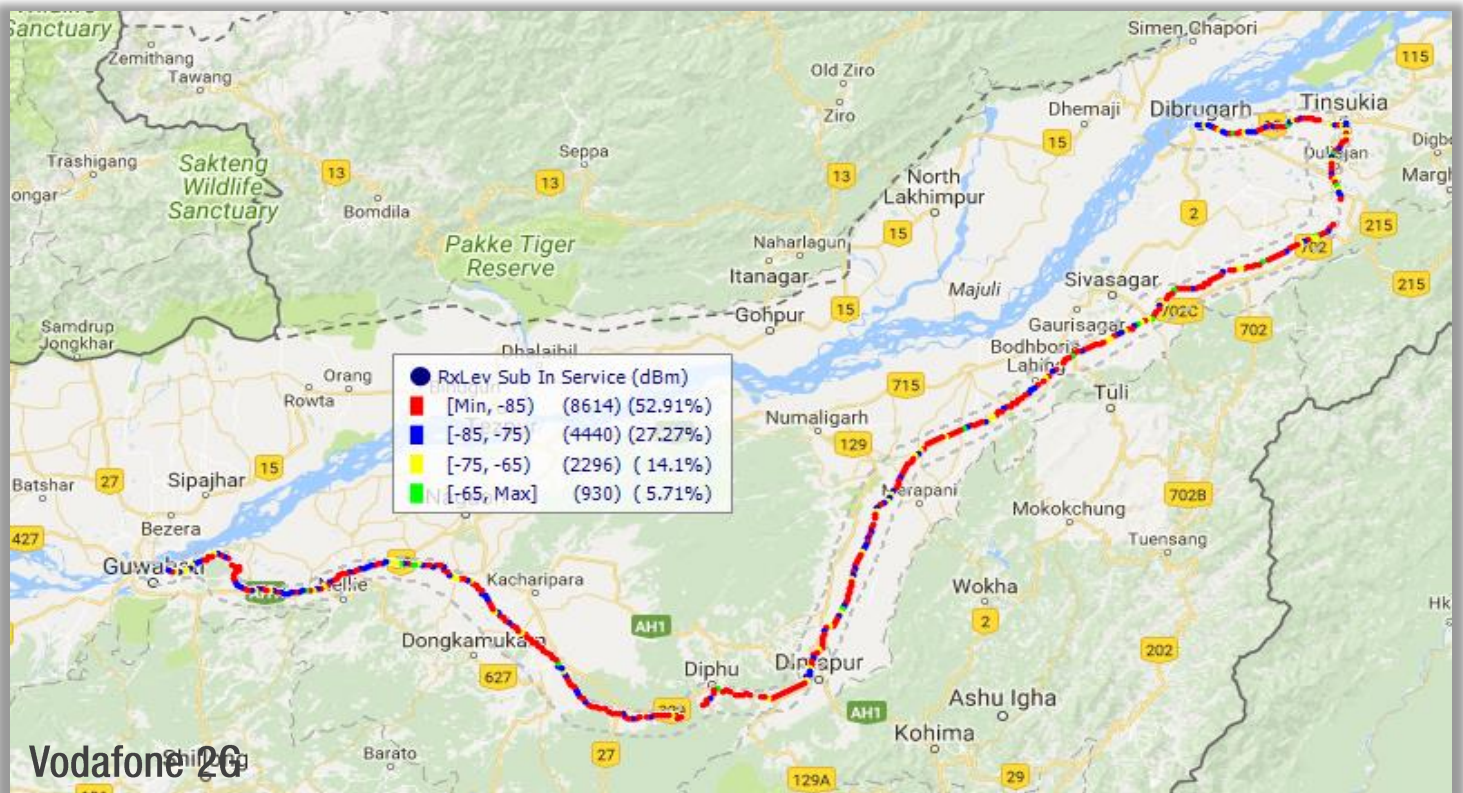
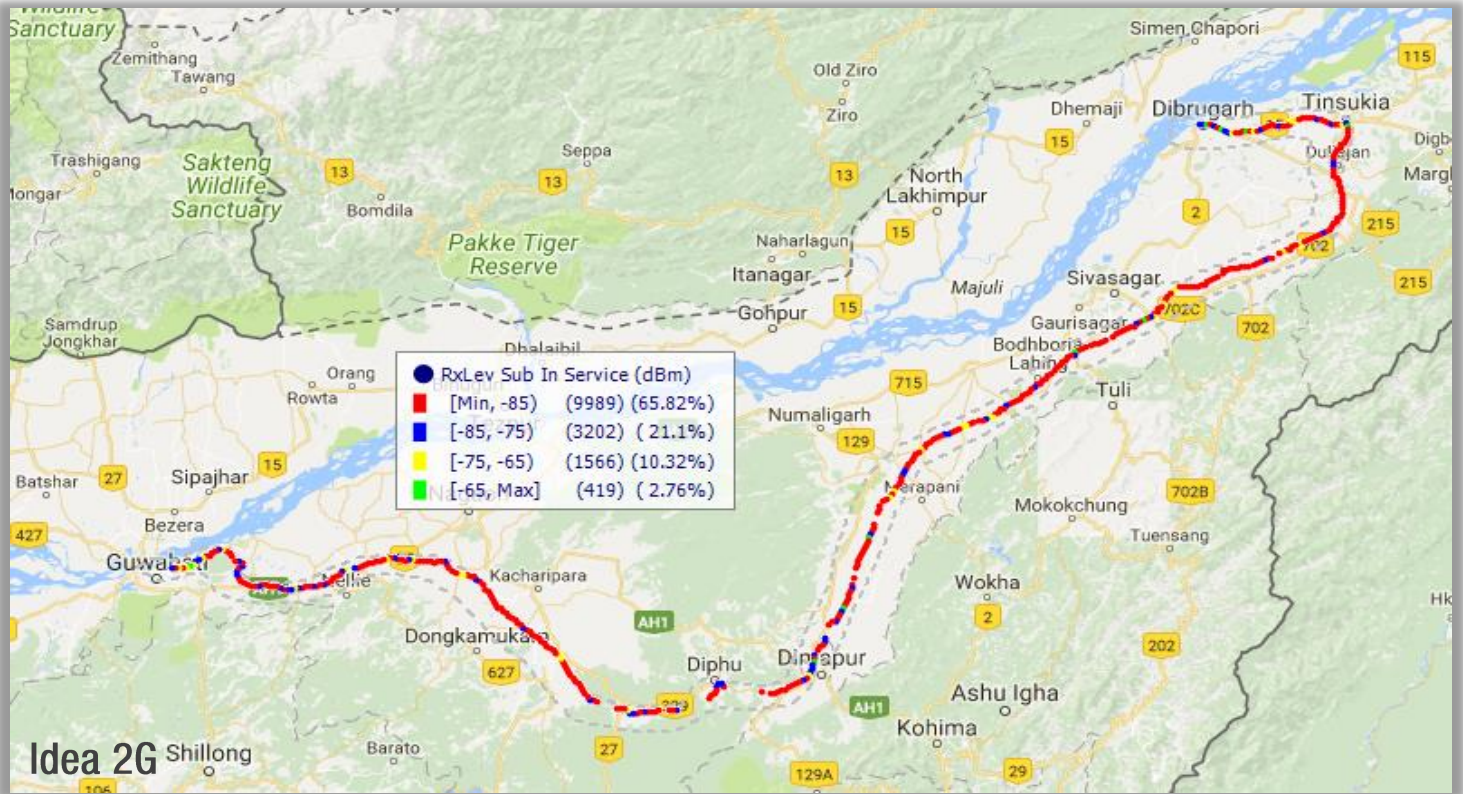
TSP	Coverage Rate
Aircel 2G	45.98%
Airtel 2G	43.19%
BSNL 2G	26.27%
Idea 2G	34.18%
Vodafone 2G	47.09%
Aircel Dual (2G/3G)	41.55%
Airtel Dual (2G/3G)	45.94%
BSNL Dual (2G/3G)	33.51%
Idea Dual (2G/3G)	48.21%
Vodafone Dual (2G/3G)	55.69%
Jio VoLTE	89.12%



# I. Coverage Details (contd.)

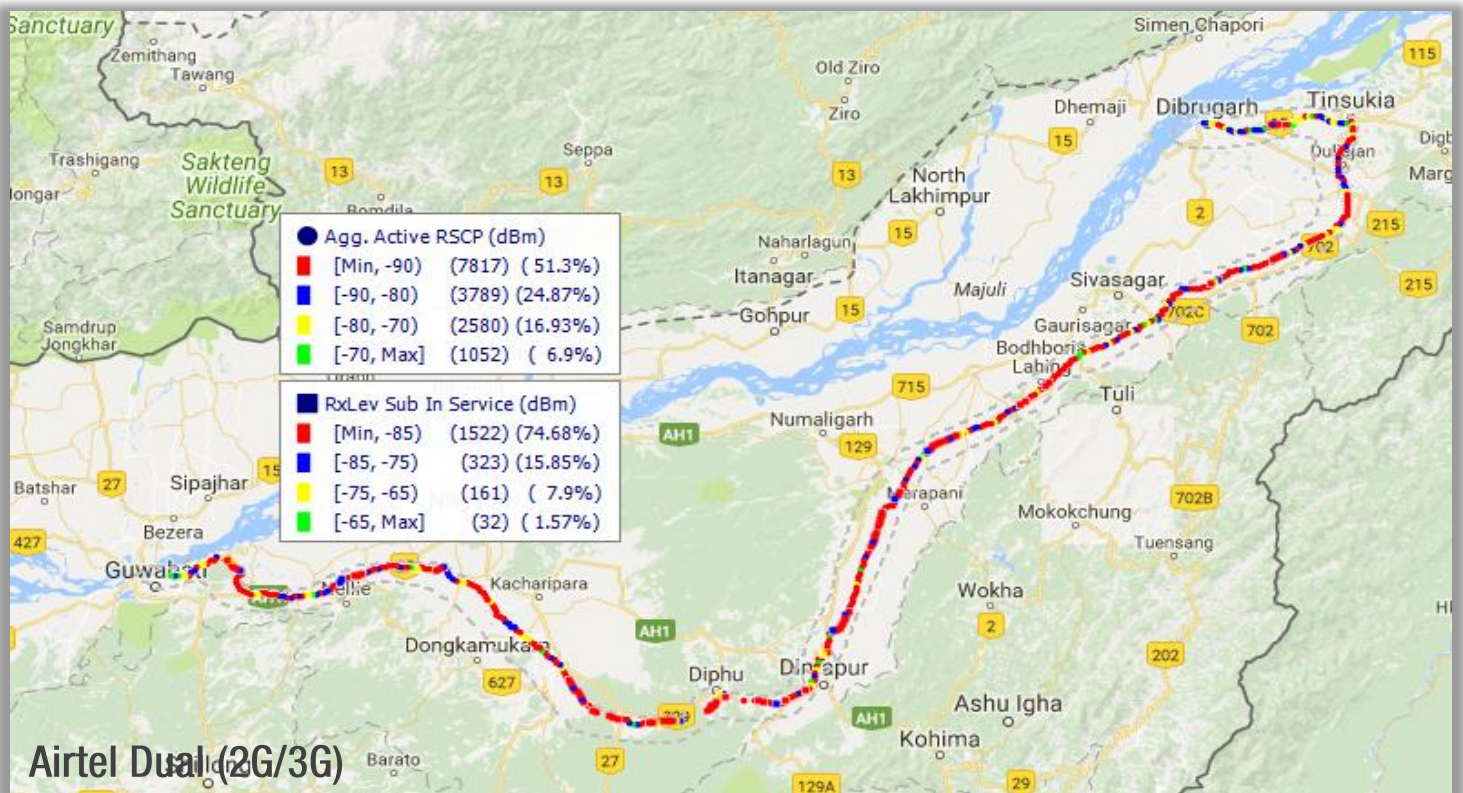
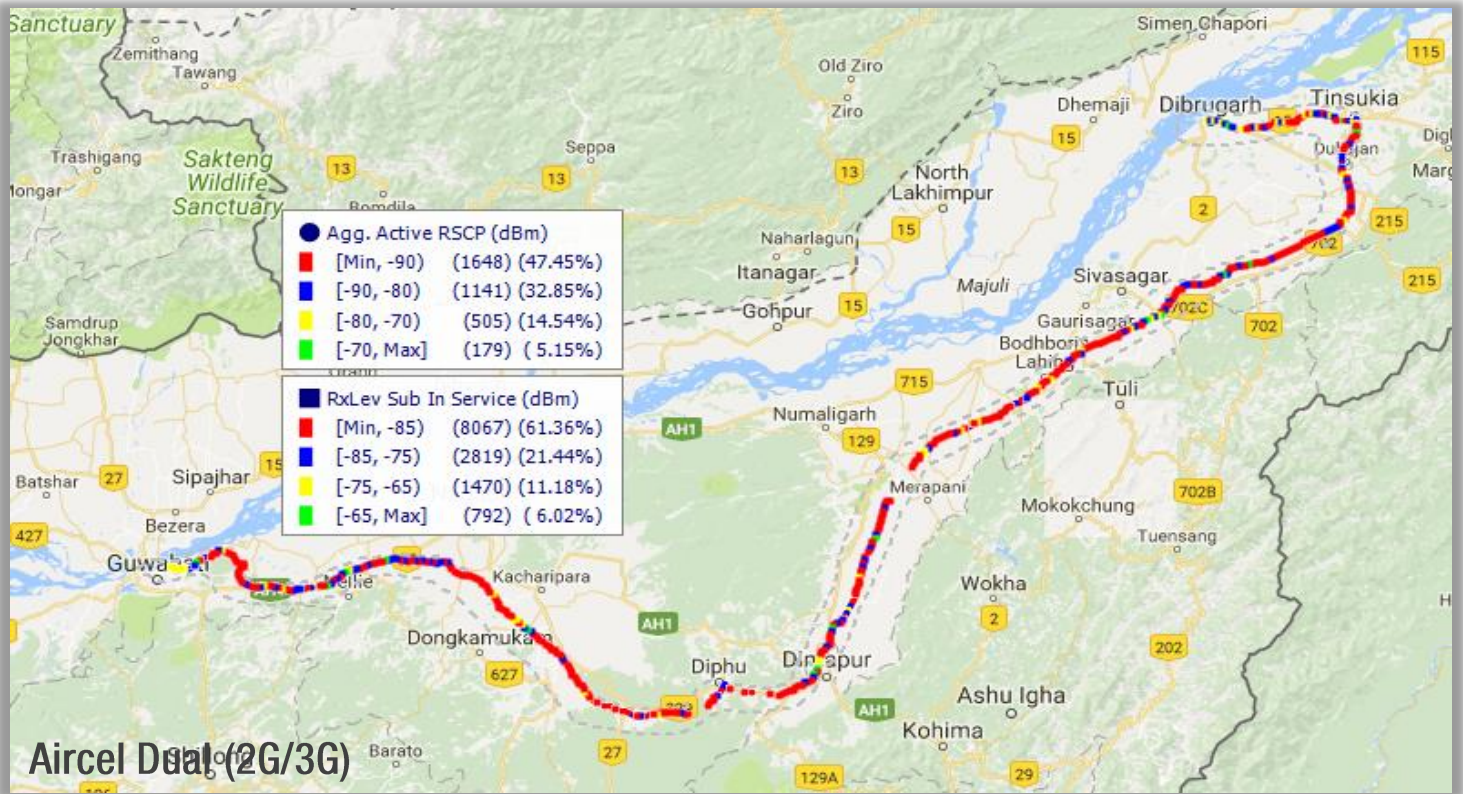


# I. Coverage Details (contd.)

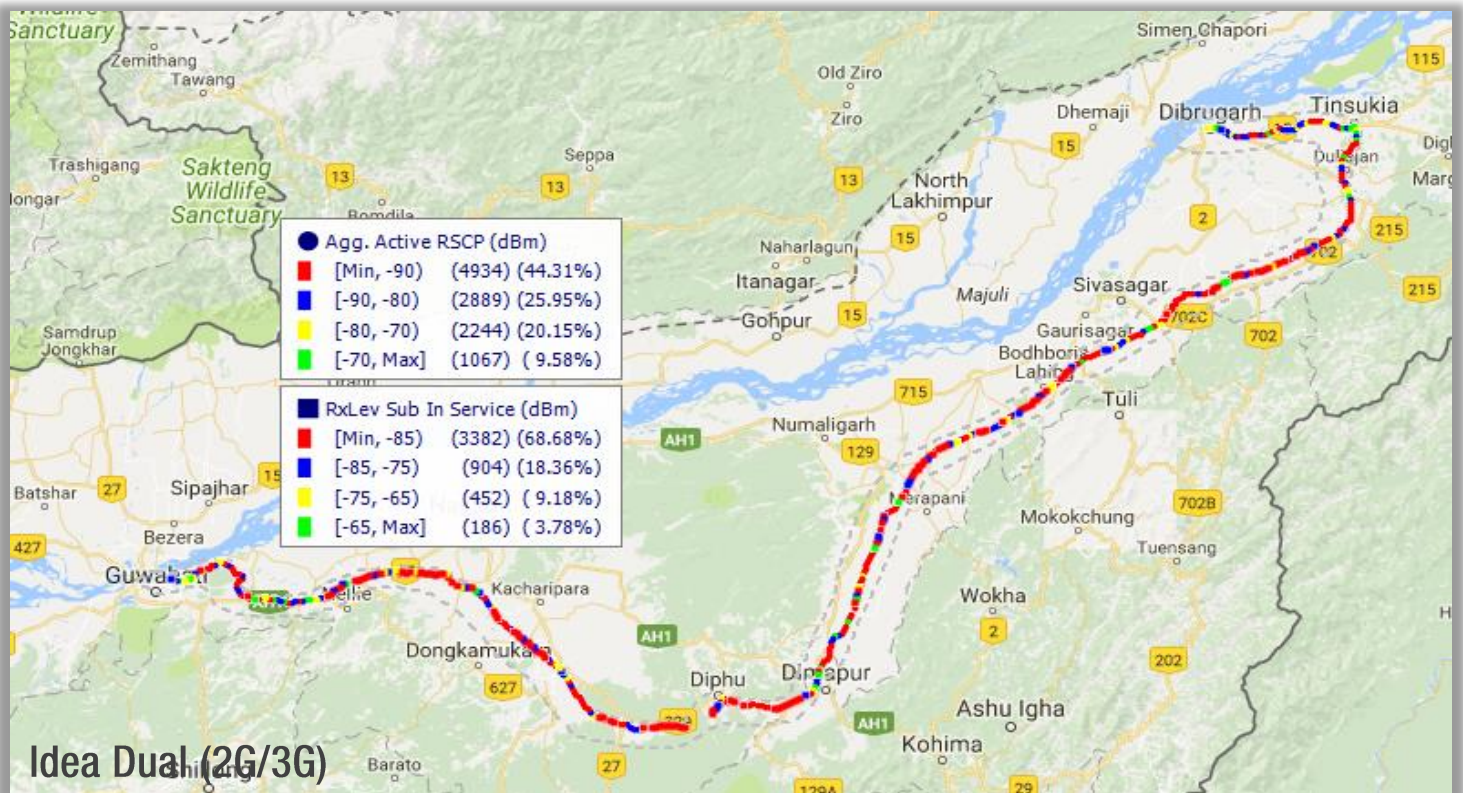
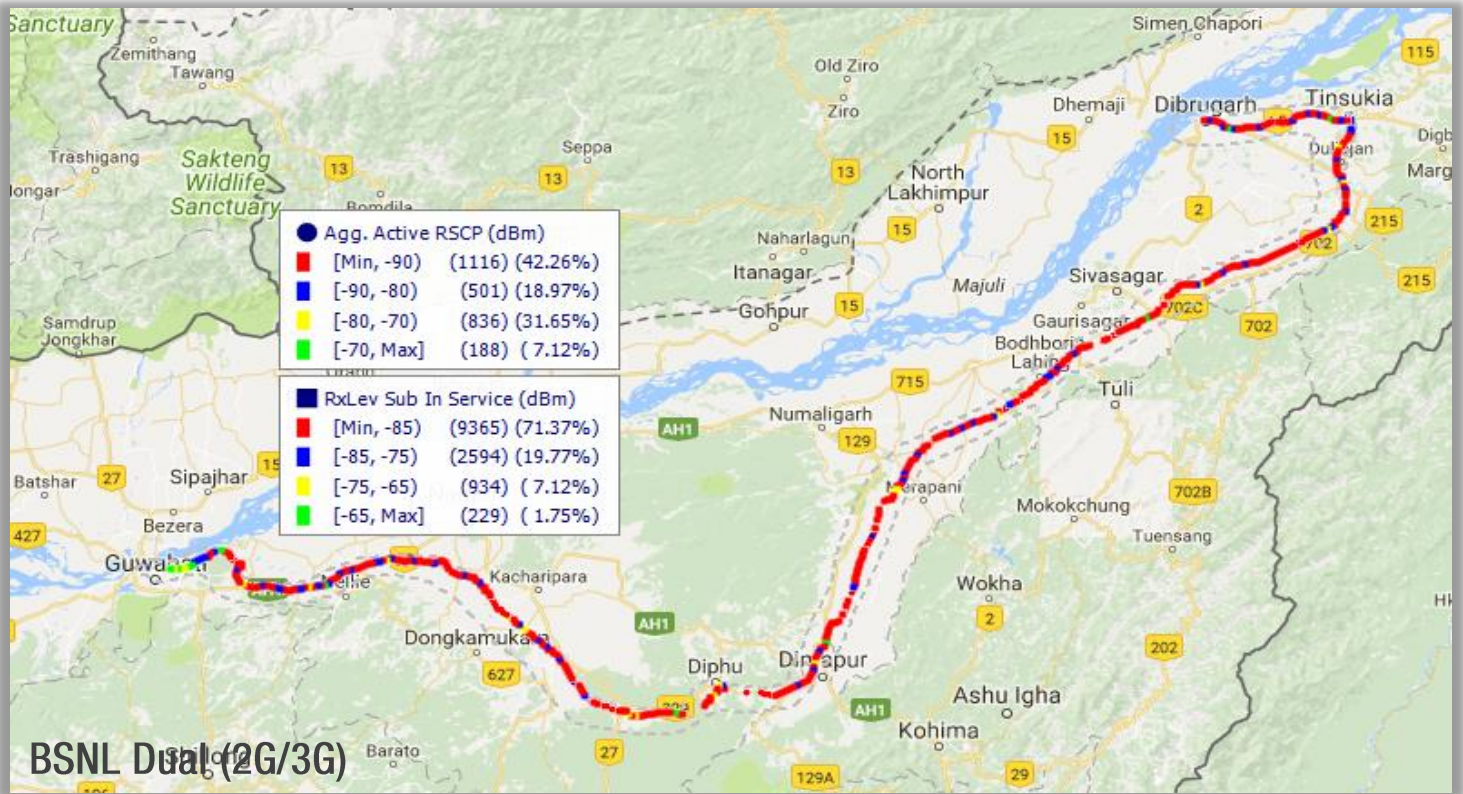




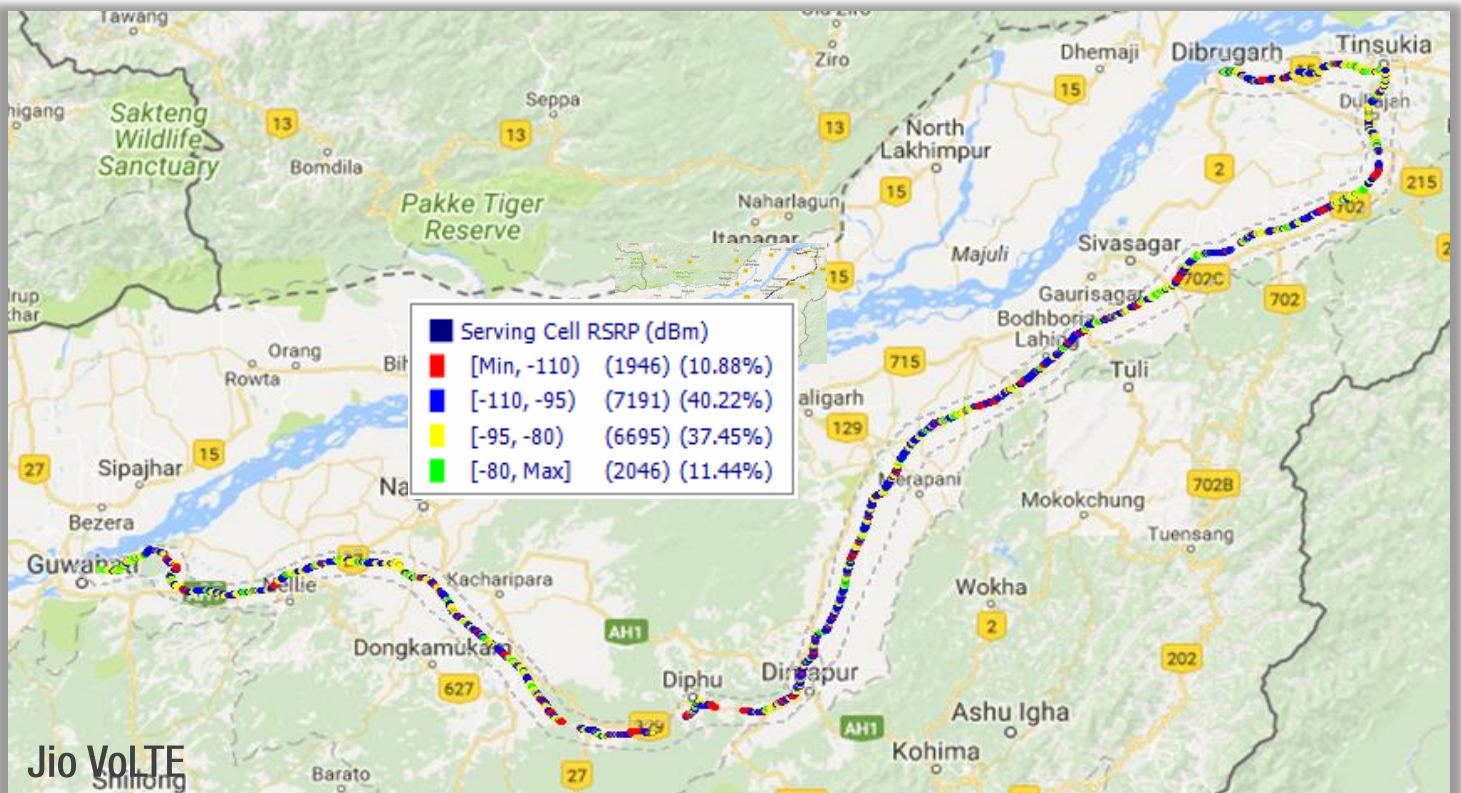
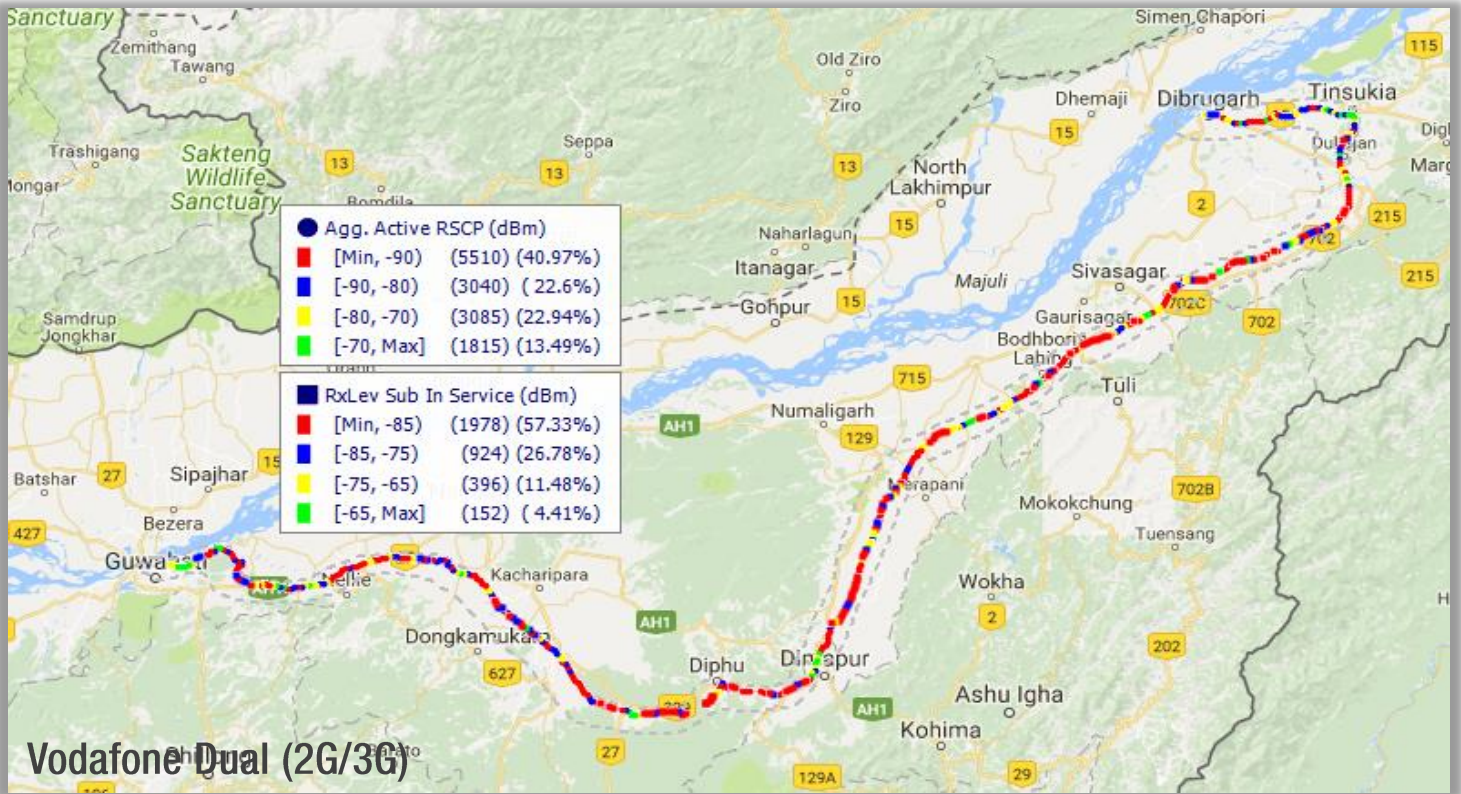
# I. Coverage Details (contd.)



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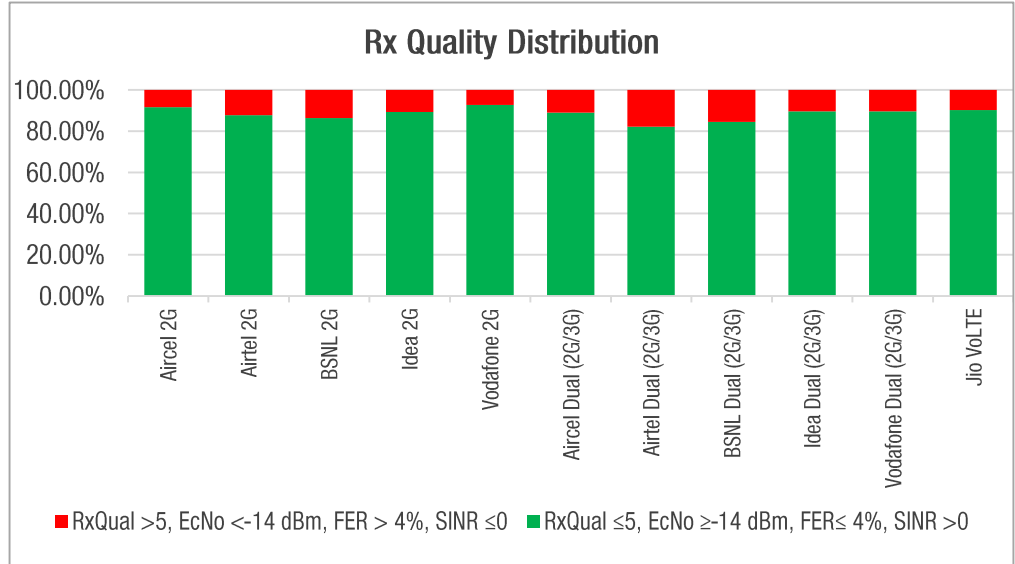
# I. Coverage Details (contd.)



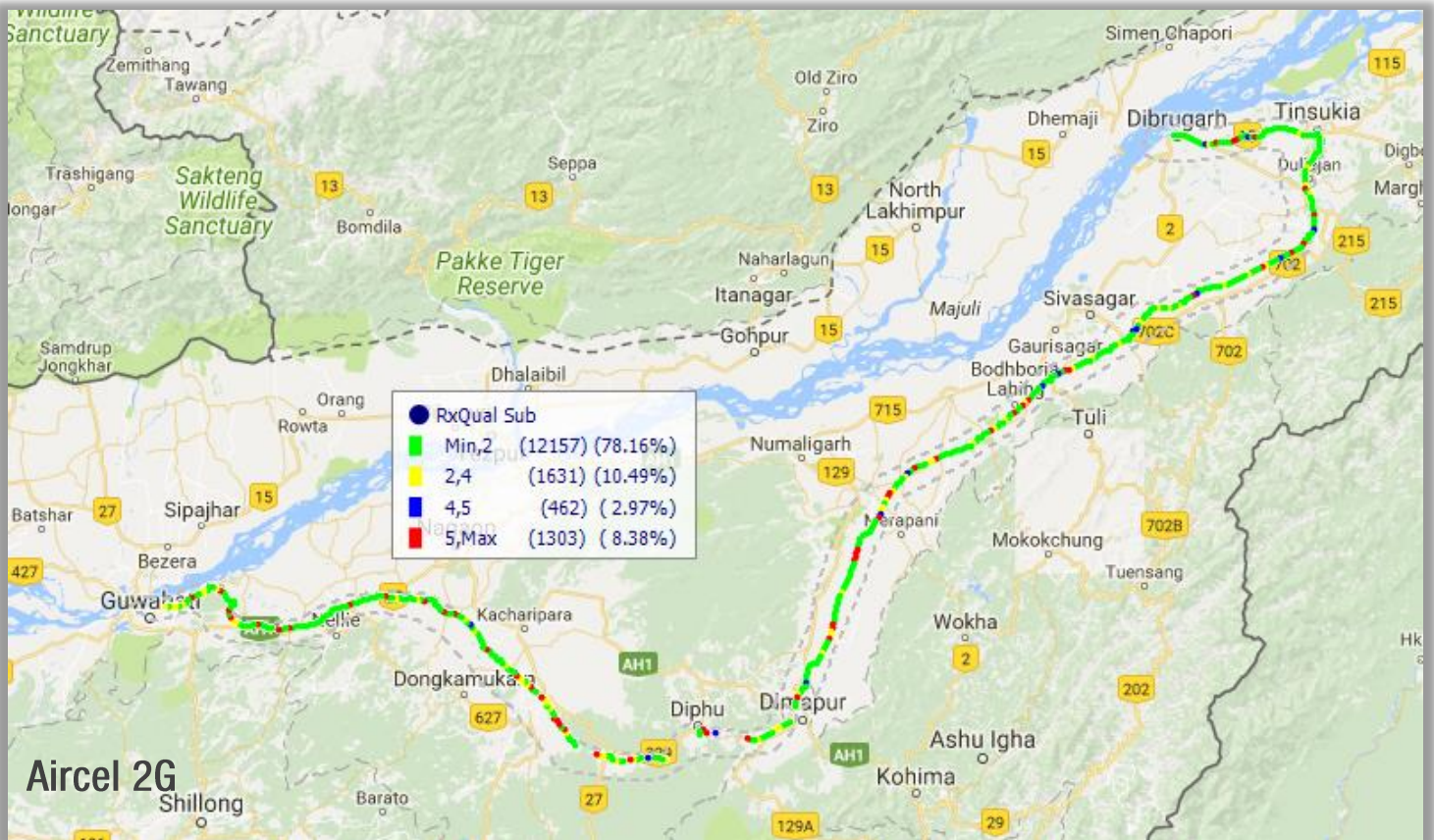
## II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual  $\leq 5$  for GSM TSPs, EcNo  $\geq -14$  dBm for 3G TSPs, FER  $\leq 4\%$  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  $\geq 95\%$ .

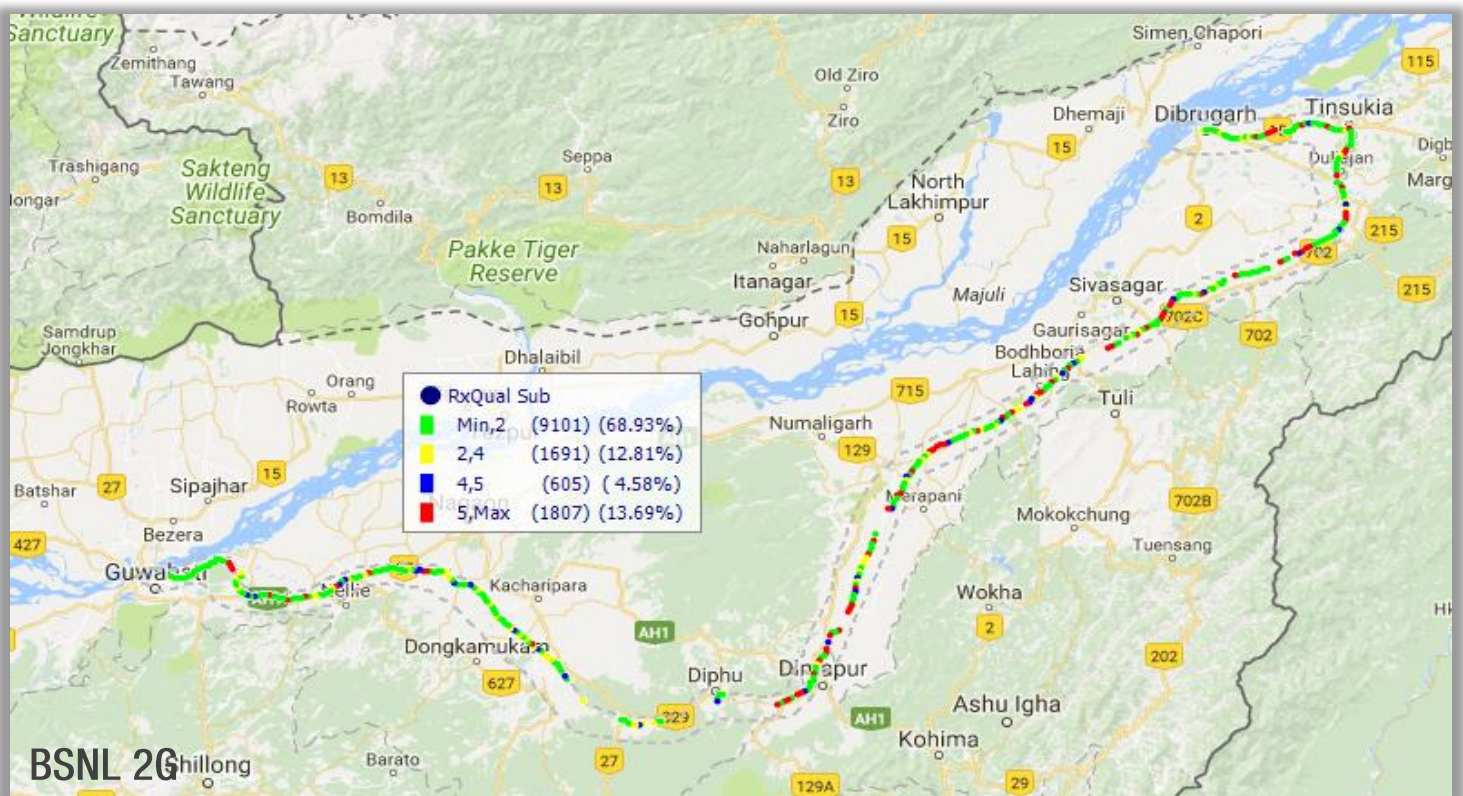
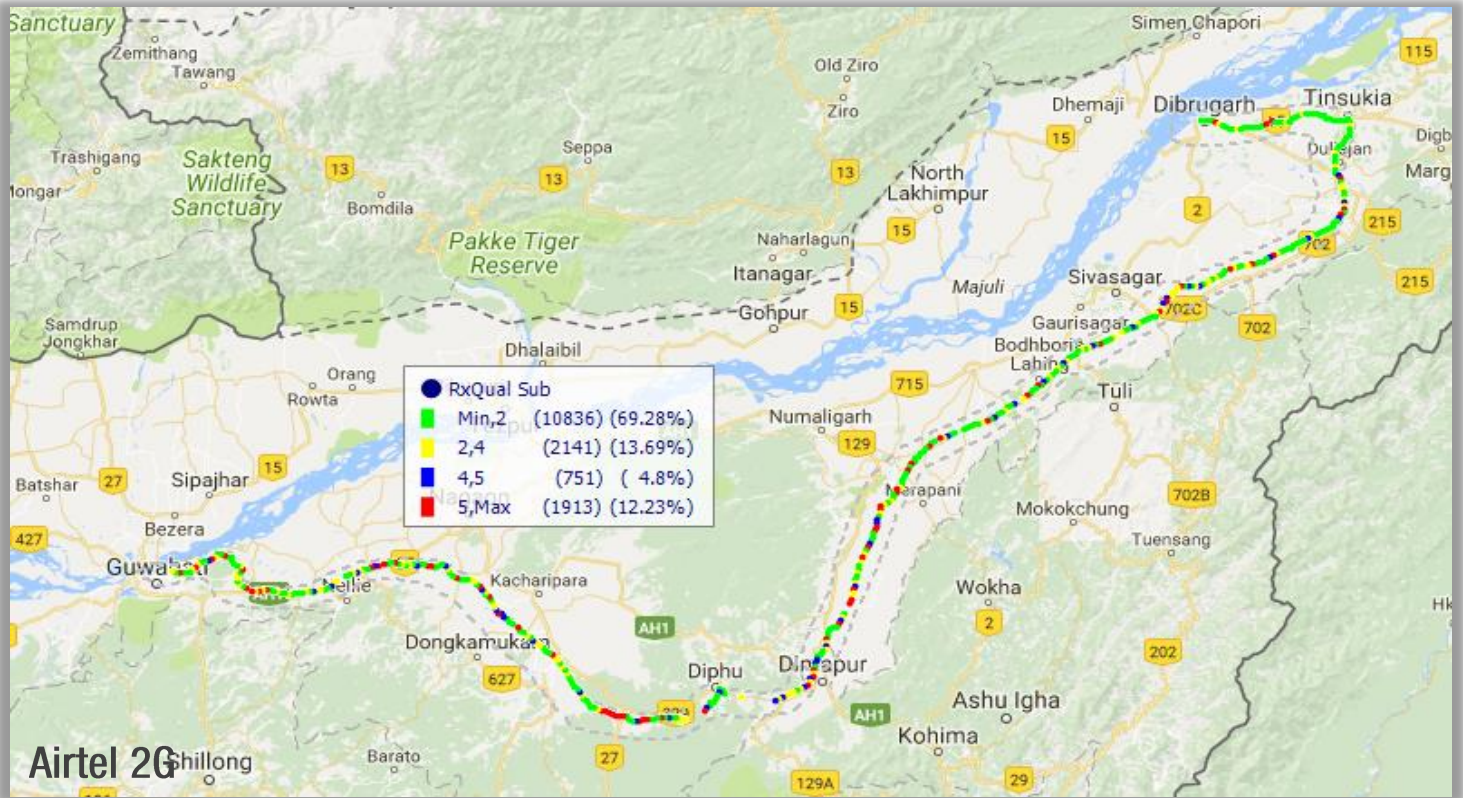
TSP	Rx Quality
Aircel 2G	91.62%
Airtel 2G	87.77%
BSNL 2G	86.31%
Idea 2G	89.31%
Vodafone 2G	92.73%
Aircel Dual (2G/3G)	88.95%
Airtel Dual (2G/3G)	82.16%
BSNL Dual (2G/3G)	84.59%
Idea Dual (2G/3G)	89.59%
Vodafone Dual (2G/3G)	89.64%
Jio VoLTE	90.30%



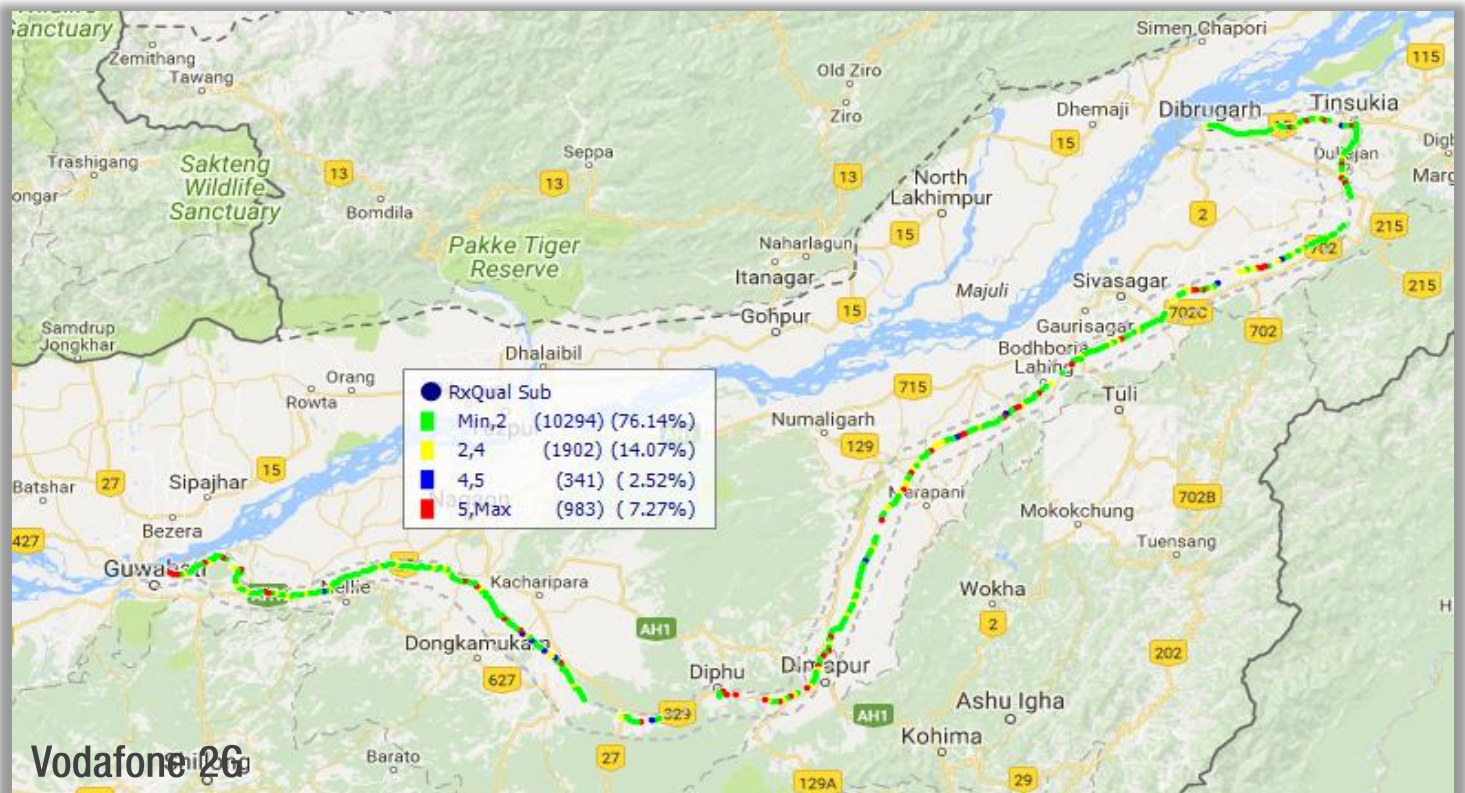
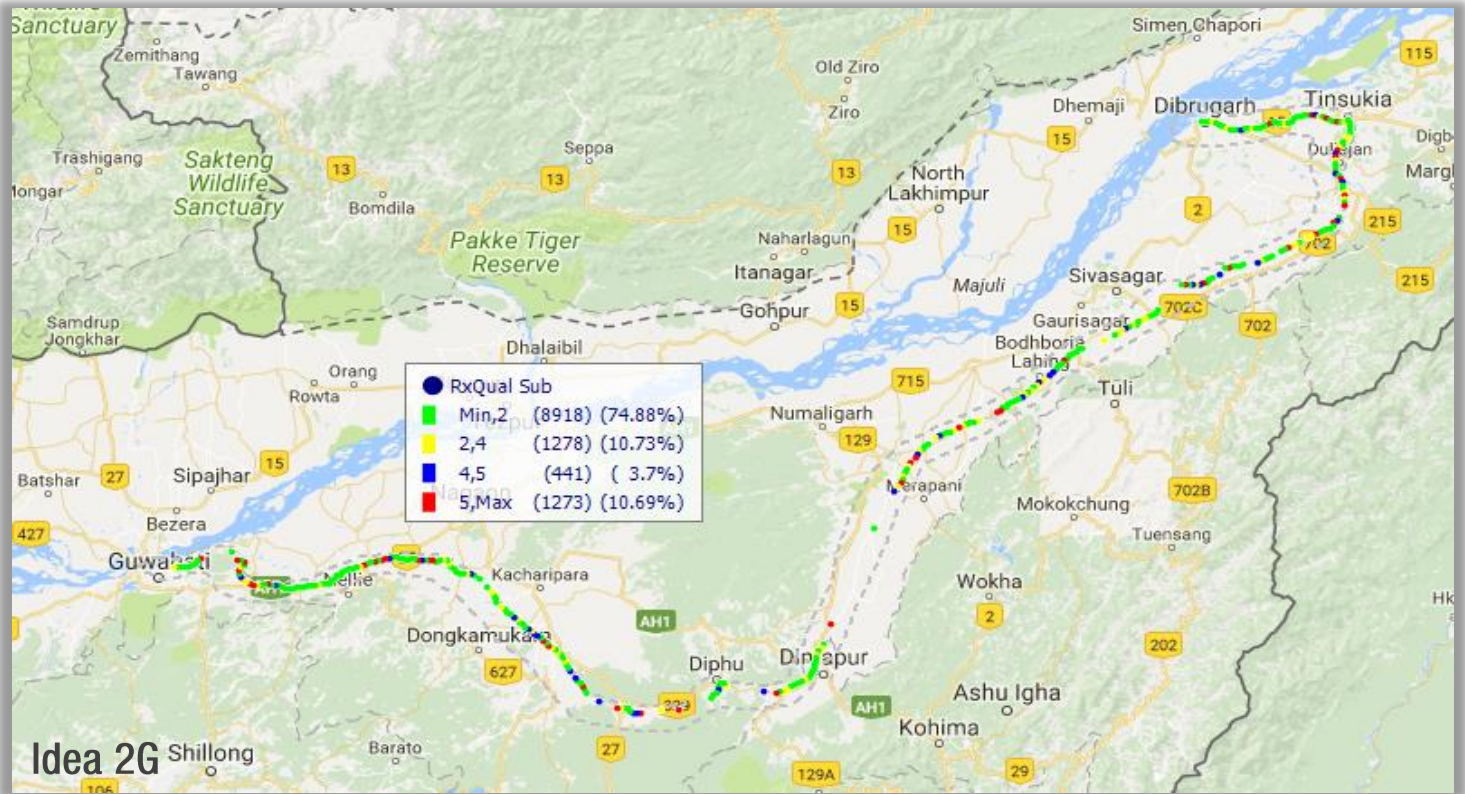
— TSPs not meeting the benchmark



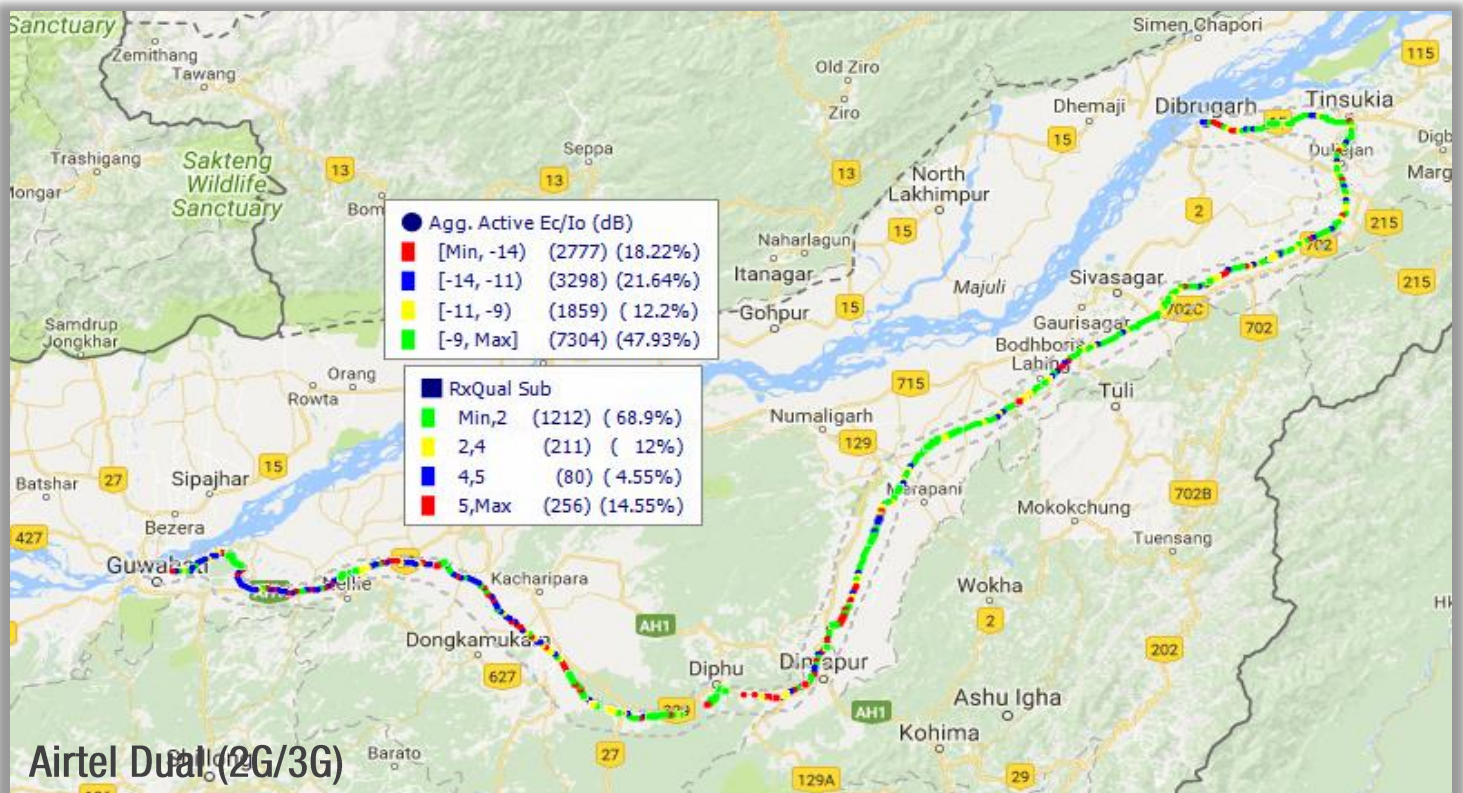
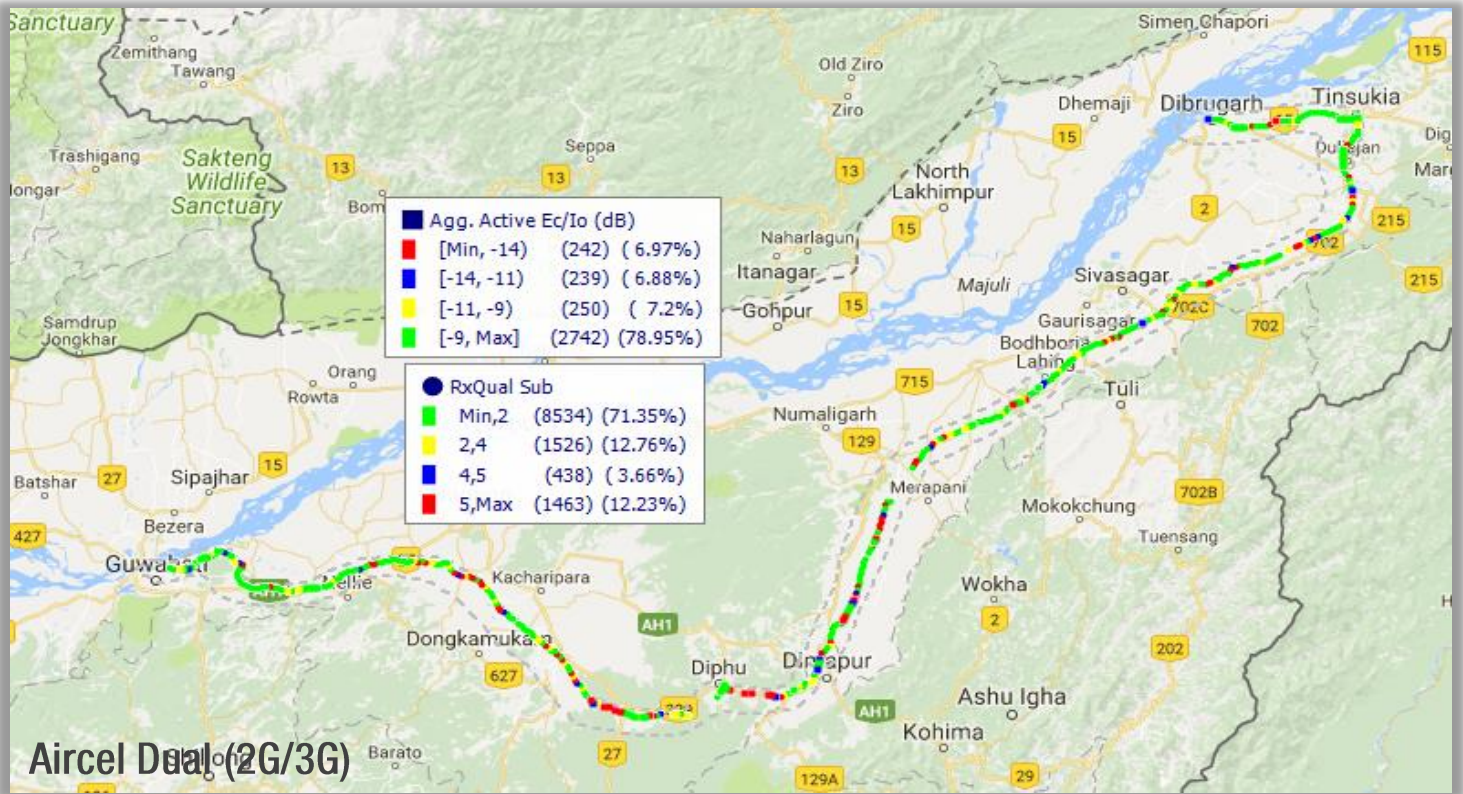
## II. Quality Details (contd.)



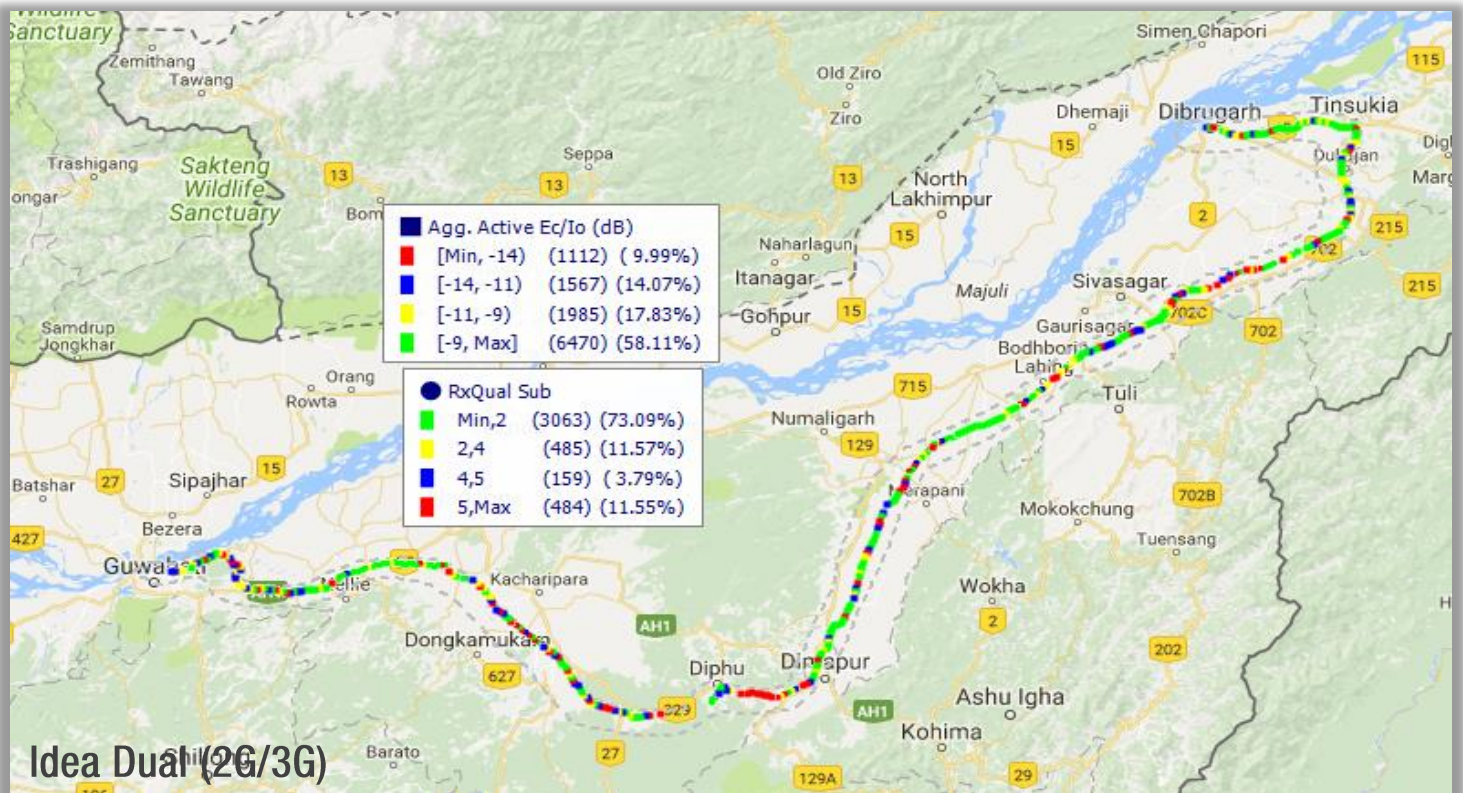
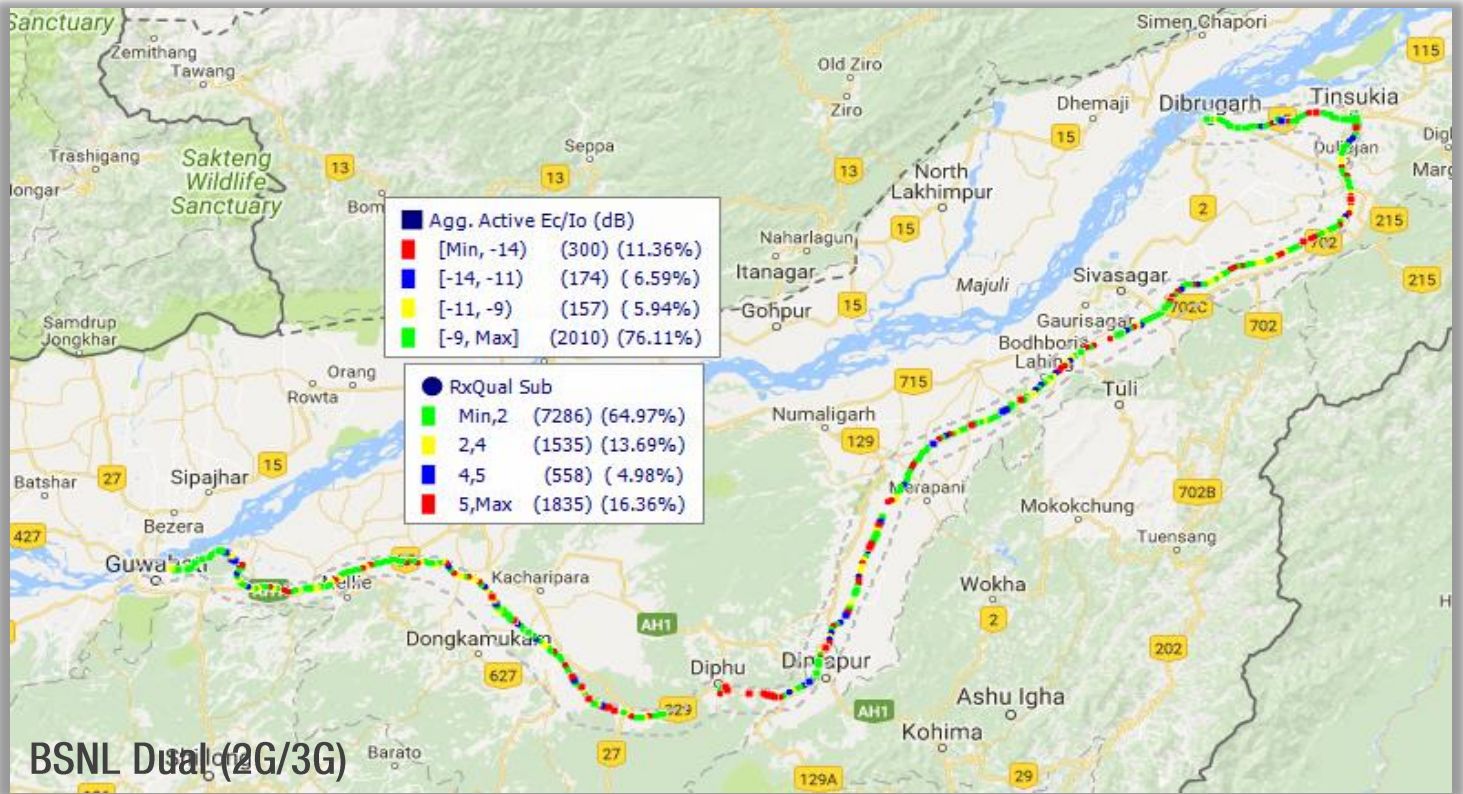
## II. Quality Details (contd.)



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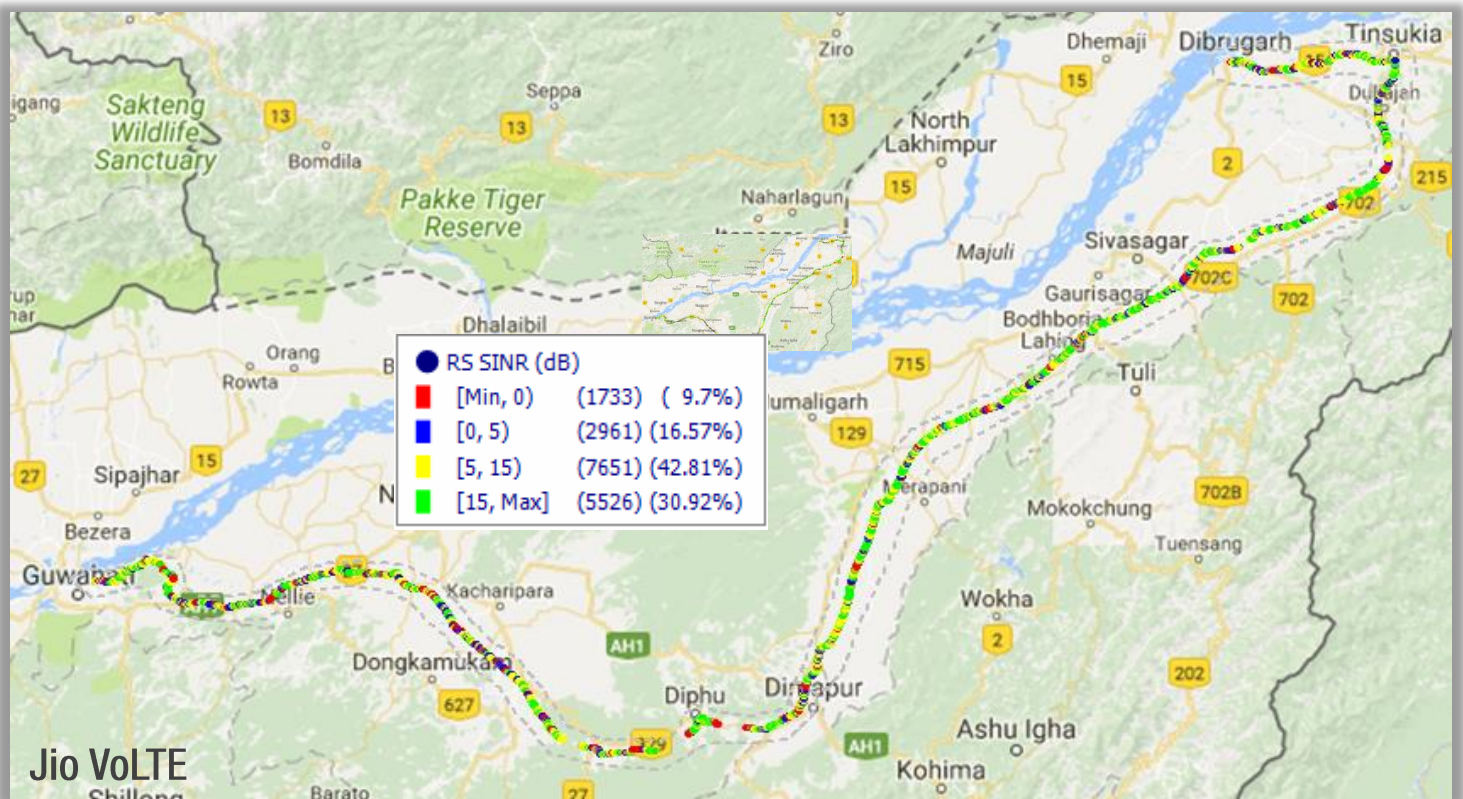
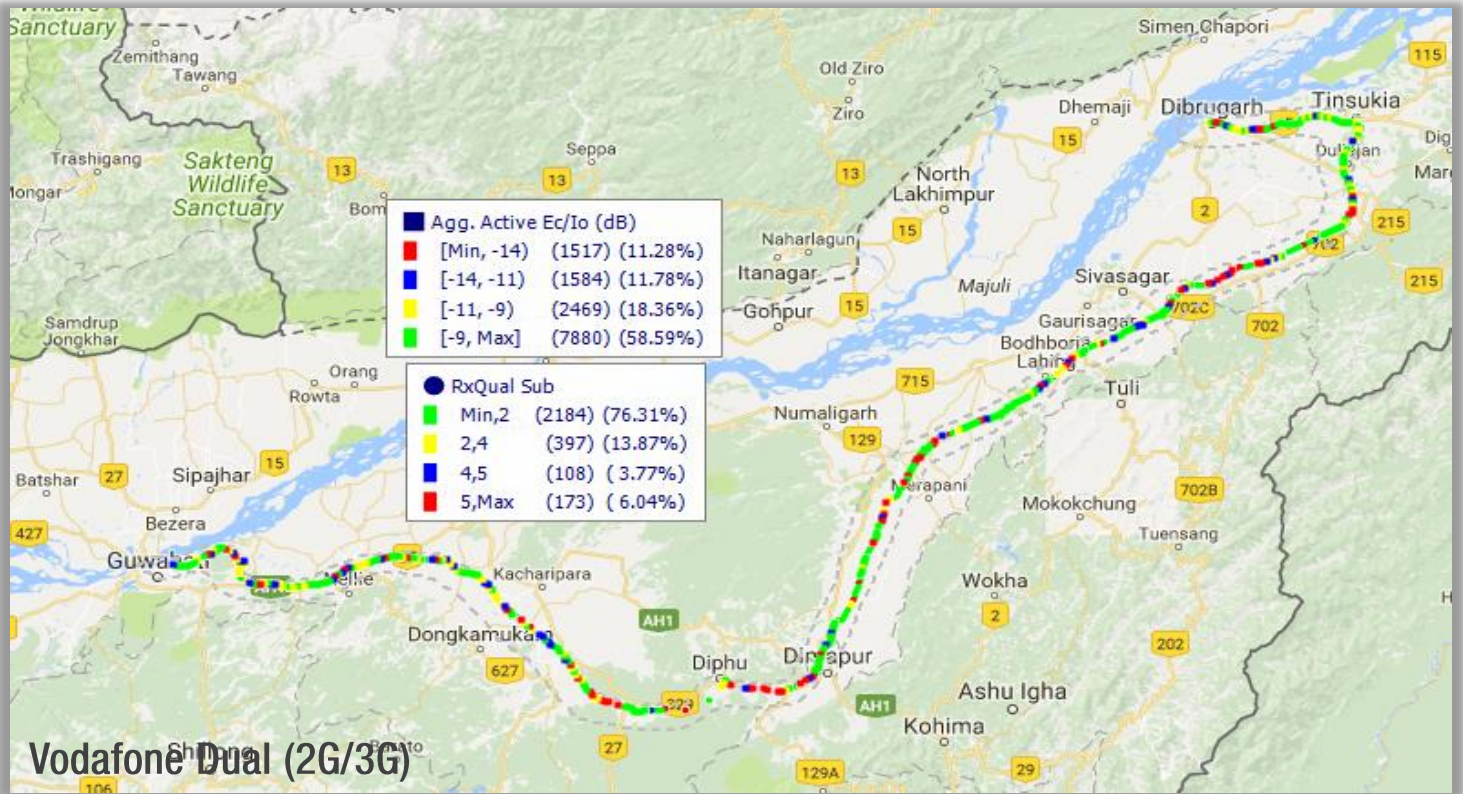


## II. Quality Details (contd.)



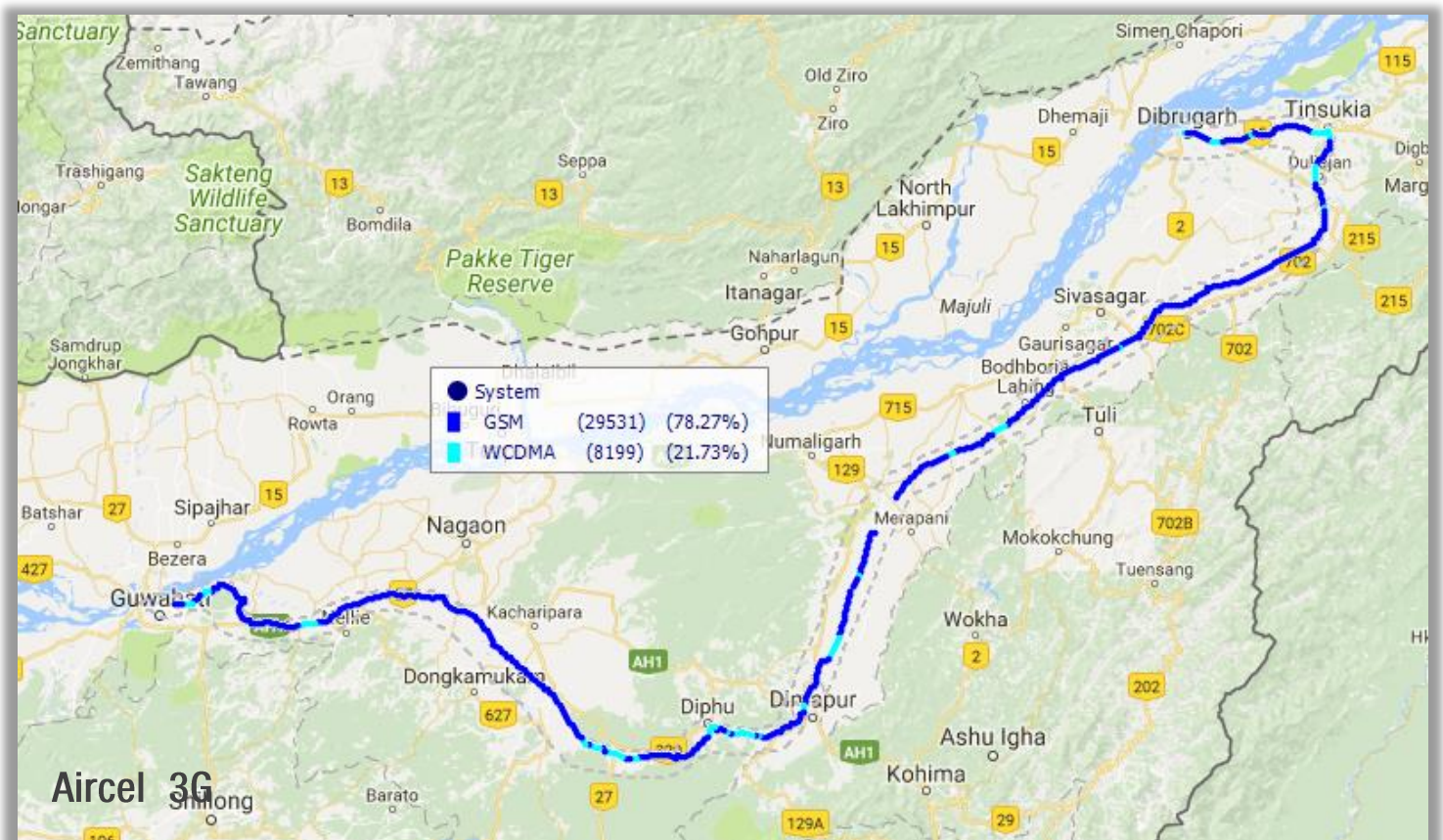
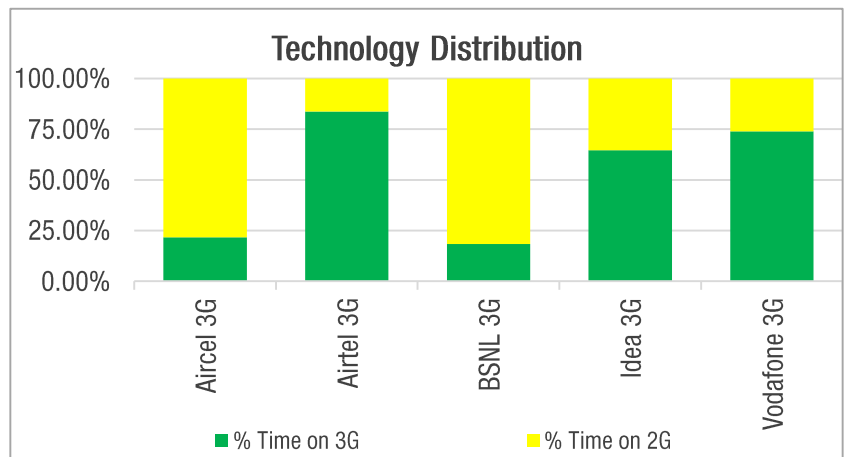


## II. Quality Details (contd.)

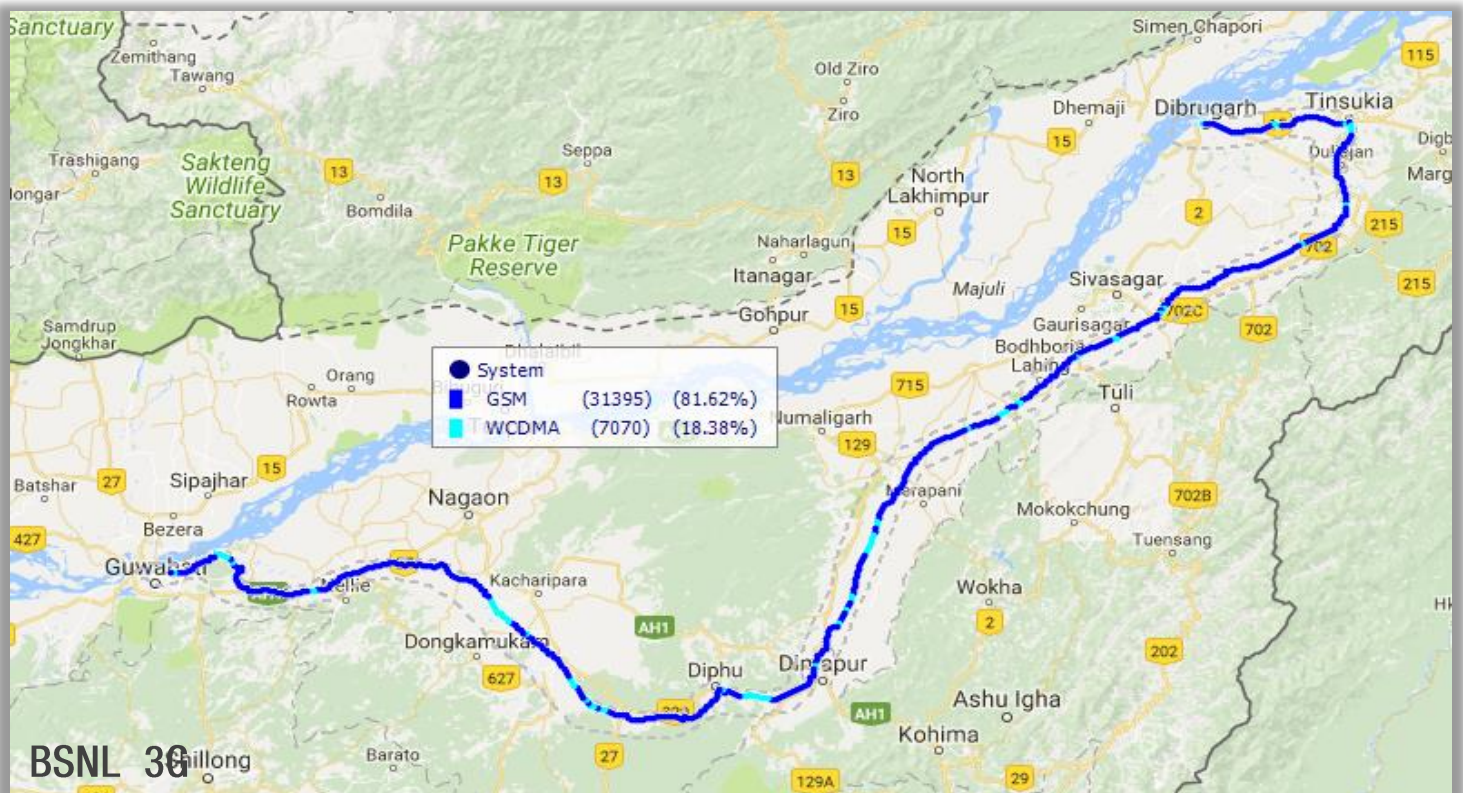
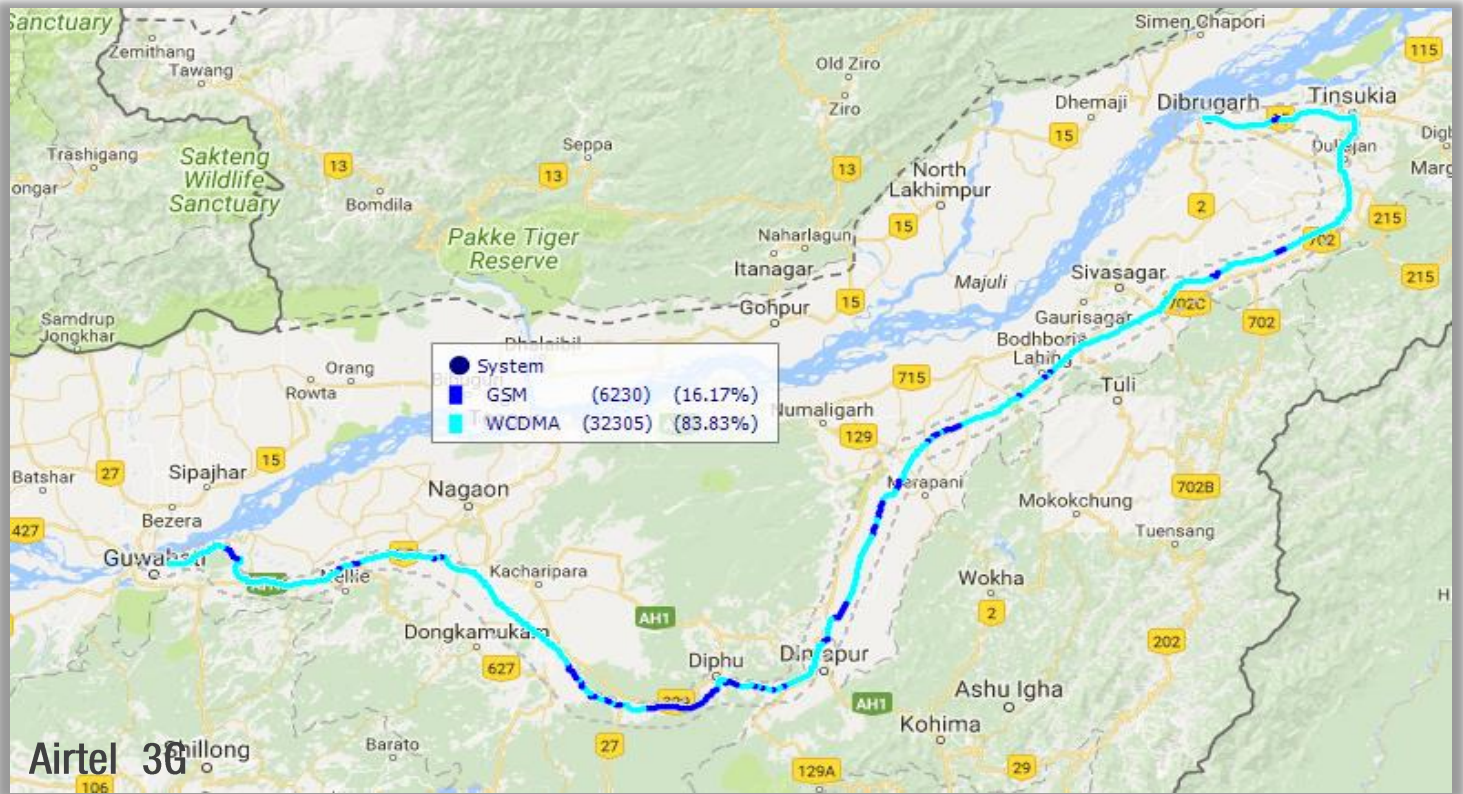


### III. Technology Details

TSP	% Time on 3G
Aircel 3G	21.73%
Airtel 3G	83.83%
BSNL 3G	18.38%
Idea 3G	64.59%
Vodafone 3G	73.99%



### III. Technology Details(contd.)



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