



# INDEPENDENT DRIVE TEST REPORT

*For*

## Hyderabad to Nagpur June 2018

### SOUTH ZONE

**Key Performance Indicators: All TSPs have fail to met the Drop Call Rate (DCR) benchmark of  $\leq 2\%$  except Jio Volte. All TSPs have met the Call Setup Success Rate (CSSR) of  $\geq 95\%$  except Airtel 2G ,BSNL 2G and Airtel 3G.**

The Independent Drive Test has been carried out by M/s PhiMetrics Technologies Pvt. Ltd. on behalf of TRAI in Hyderabad to Nagpur Train Route from 9:00 AM to 9:00 PM; 21<sup>st</sup> June 2018. The drive test covered an drive route of 575KMs over a period of 1day. Approximately 260 calls were made for each of the 8 networks: four 2G networks, three 3G networks and one LTE network covering 5 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 **21st June 2018** covering various locations in Hyderabad to Nagpur Train Route. The performance of **Airtel, BSNL, 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, all Setup Success Rate, Drop Call Rate and Block Call Rate.

**Date:** Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay and Latency

## Drive Test Details For Hyderabad to Nagpur Train Route:

Independent Drive test was conducted for a period of one day on 21st June 2018 in Hyderabad to Nagpur Train Route 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.

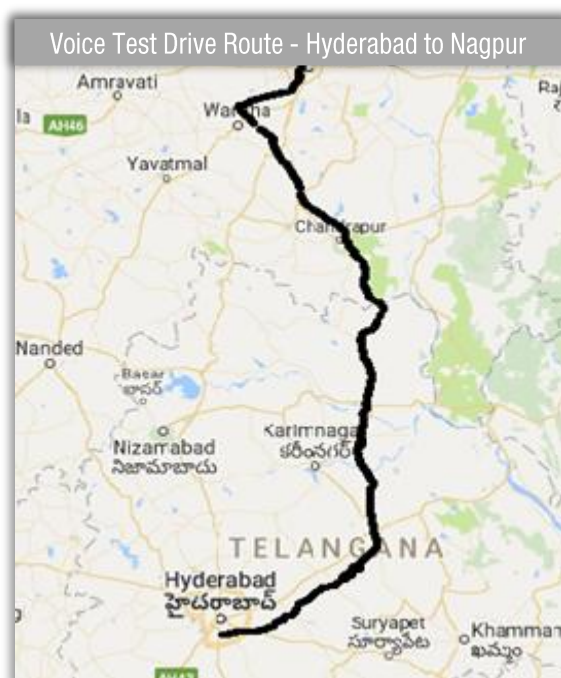
**Voice Tests:** The drive test covered a drive route of approximately 575KMs over a period of one day on 21st June 2018. Approximately 260 calls were made for each of the 8 networks: four 2G (Lock Mode) networks, three 3G (Dual mode) networks and one VoLTE network covering 5 unique TSPs.

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

\* For 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 are calculated from UE in Dual Mode (2G & 3G) includes samples and events of 2G.

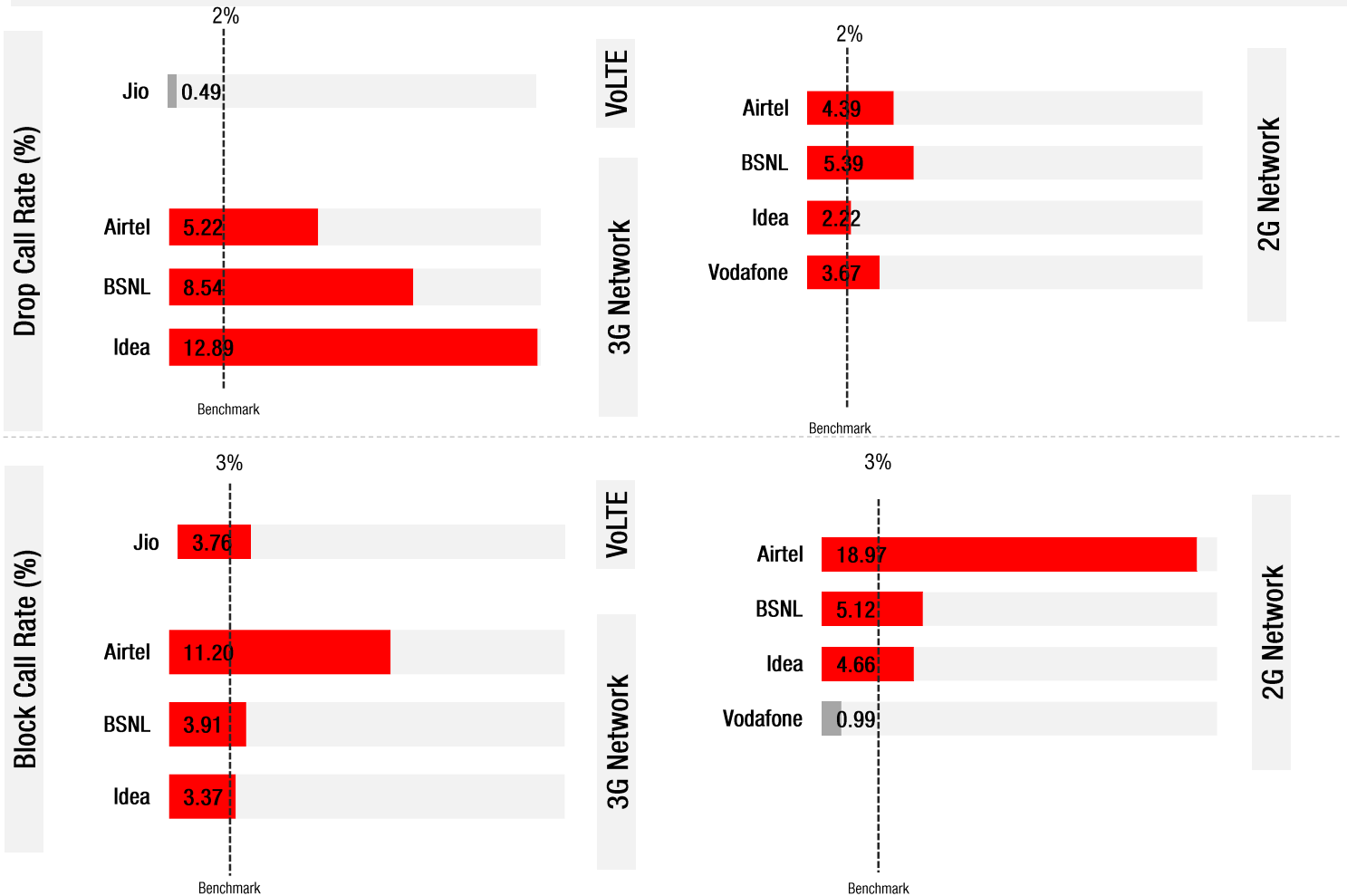
\* 4G KPI's which are calculated from the UE in Free Mode included samples and events of 2G & 3G.



# Voice Calls

## Key Observations

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



KPI	2G Networks			
	Airtel	BSNL	Idea	Vodafone
SDCCH Congestion% ( $\leq 1\%$ )	6.72%	3.54%	4.24%	0.99%
TCH Congestion % ( $\leq 2\%$ )	12.25%	1.58%	0.42%	0.00%

KPI	3G Networks		
	Airtel	BSNL	Idea
SDCCH Congestion%	0.77%	2.34%	1.01%
RRC Congestion%	3.09%	0.00%	1.35%
SDCCH & RRC Congestion% ( $\leq 1\%$ )	3.86%	2.34%	2.36%
TCH Congestion %	1.54%	0.39%	0.00%
RAB Congestion %	5.79%	1.18%	1.01%
TCH & RAB Congestion % ( $\leq 2\%$ )	7.34%	1.57%	1.01%

- 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 Call Block Rate (CBR%) benchmark of 3% except Vodafone 2G.

Not meeting Benchmark

# Voice Calls

## Key Observations

### Coverage

a) Percentage of coverage samples for 2G  $\geq$  -85 dBm and CDMA  $\geq$  -90 dBm.

TSPs	2G			
	Airtel	BSNL	Idea	Vodafone
Coverage%	35.26%	56.56%	62.74%	45.06%

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

TSPs	3G			VoLTE
	Airtel	BSNL	Idea	Jio
Coverage %	48.62%	51.25%	56.82%	87.87%

c) Percentage of time spent on 3G network:

TSPs	3G		
	Airtel	BSNL	Idea
Time Spent on 3G%	57.64%	32.47%	23.52%

d) ) Percentage of RLT spent on  $\geq$ 48:

TSPs	2G			
	Airtel	BSNL	Idea	Vodafone
%RLT $\geq$ 48%	0.00%	35.05%	0.00%	0.00%

# Summary

## City Level Summary

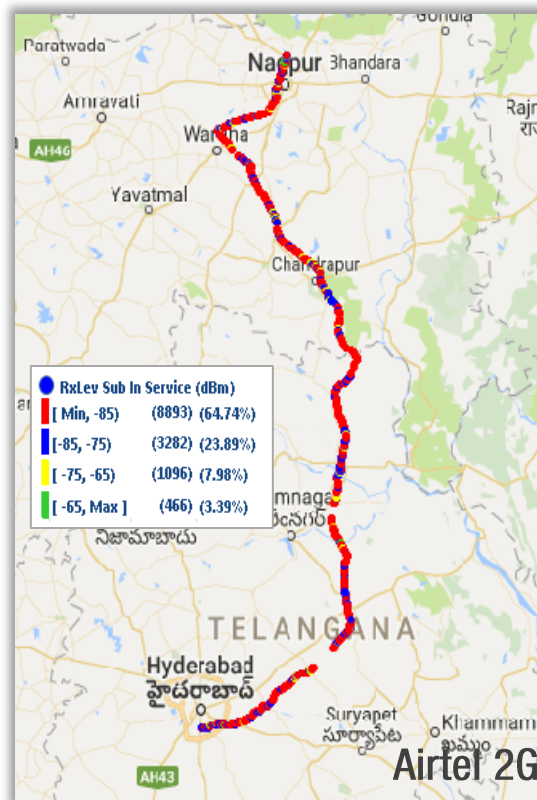
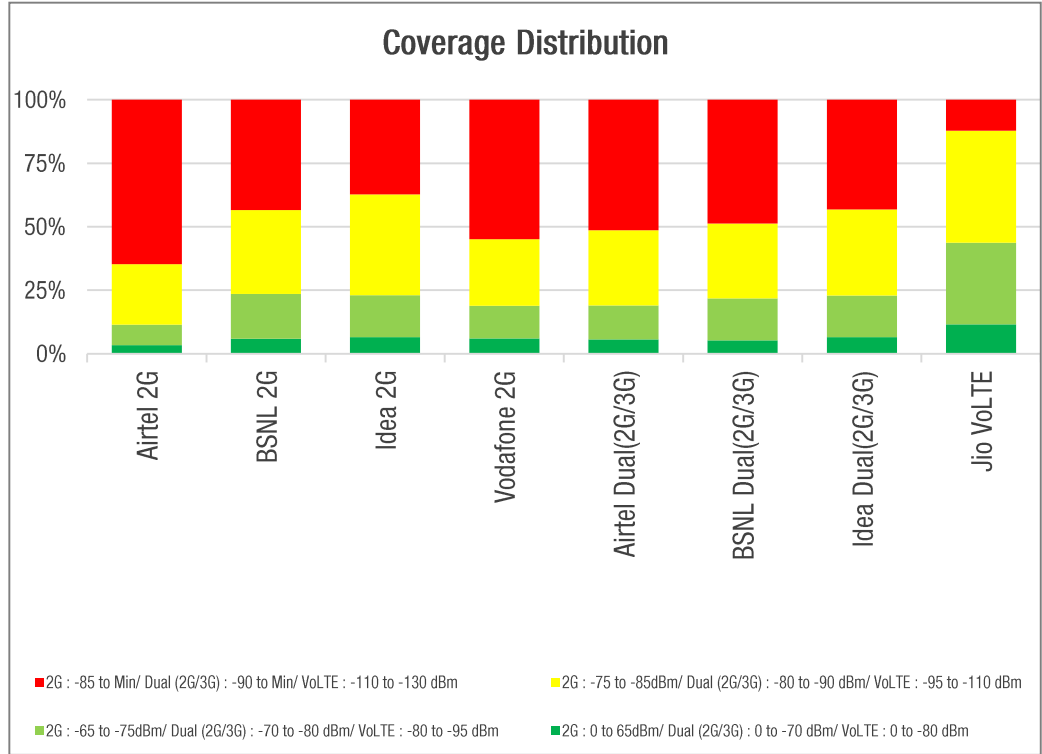
Voice Call	2G			
	Airtel	BSNL	Idea	Vodafone
Call Attempt	253	254	236	303
Blocked Call Rate ( $\leq 3\%$ )	18.97%	5.12%	4.66%	0.99%
CSSR% ( $\geq 95\%$ )	81.03%	94.88%	95.34%	99.01%
Drop Call Rate ( $\leq 2\%$ )	4.39%	5.39%	2.22%	3.67%
Mobility HOSR	96.80%	89.21%	98.19%	97.37%
Rx Quality ( $\geq 95\%$ )	91.50%	94.38%	92.29%	94.18%

Voice Call	3G			VOLTE
	Airtel	BSNL	Idea	Jio
Call Attempt	259	256	297	213
Blocked Call Rate ( $\leq 3\%$ )	11.20%	3.91%	3.37%	3.76%
CSSR% ( $\geq 95\%$ )	88.80%	96.09%	96.63%	96.24%
Drop Call Rate ( $\leq 2\%$ )	5.22%	8.54%	12.89%	0.49%
Mobility HOSR	99.44%	95.68%	98.52%	97.81%
Rx Quality ( $\geq 95\%$ )	78.24%	91.81%	80.12%	71.72%

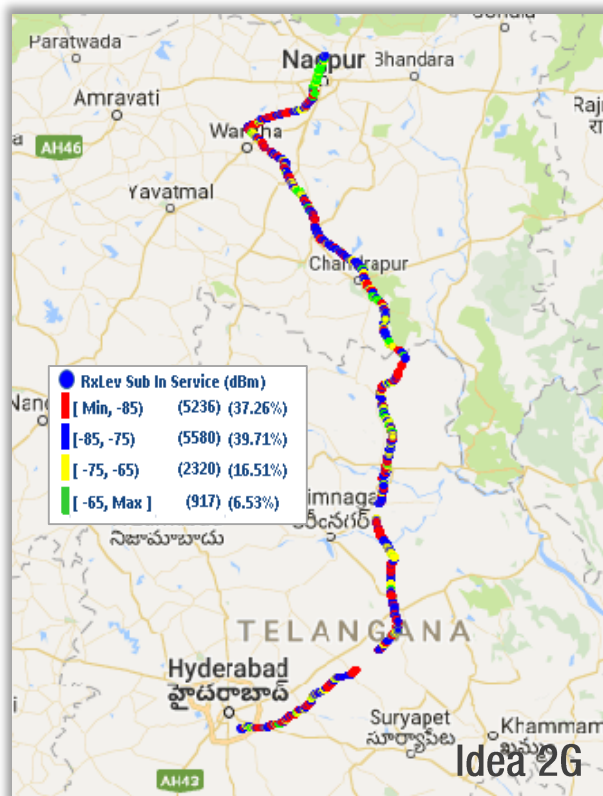
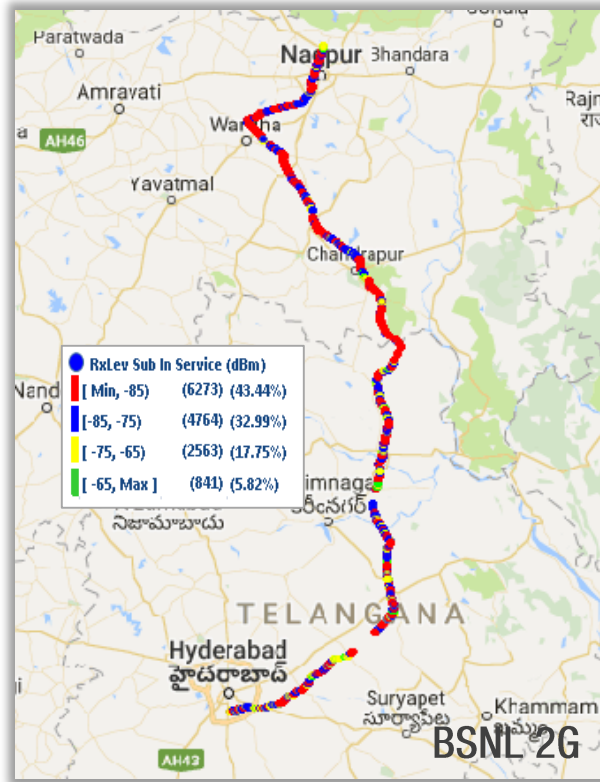
# I. Coverage Details

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

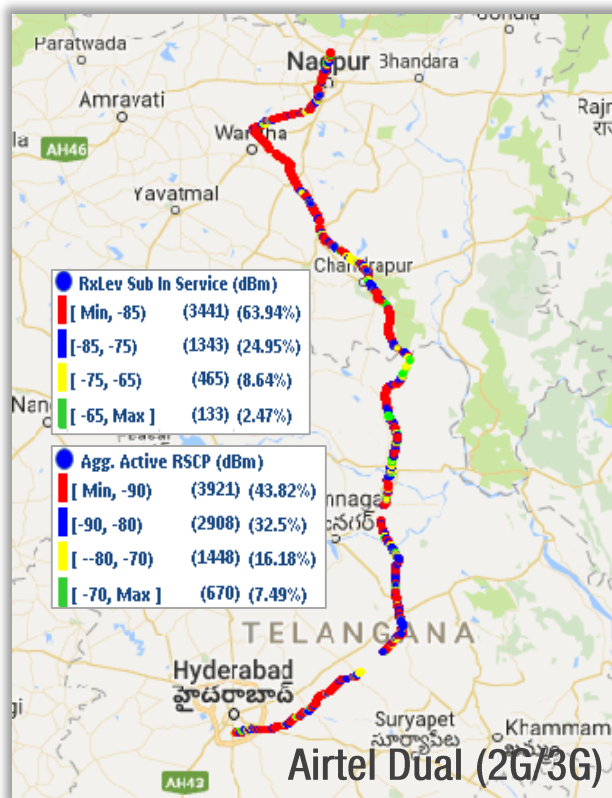
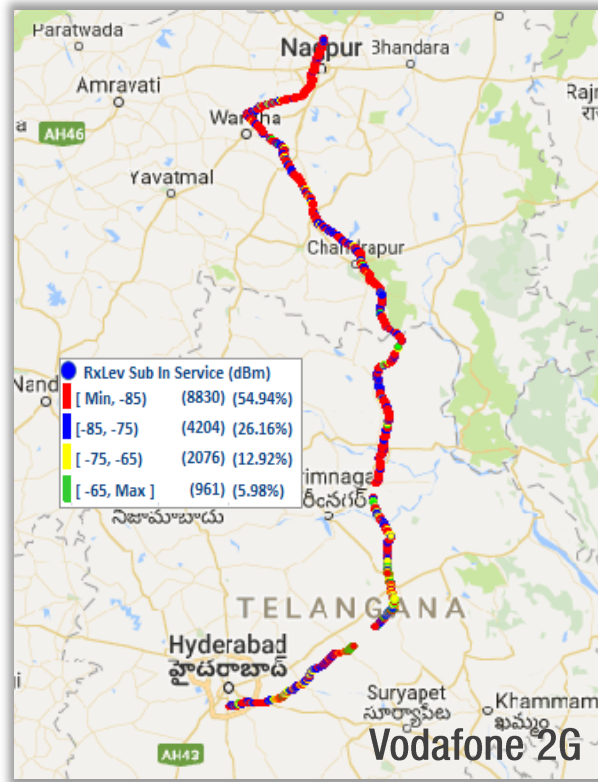
TSP	Coverage Rate
Airtel 2G	35.26%
BSNL 2G	56.56%
Idea 2G	62.74%
Vodafone 2G	45.06%
Airtel Dual(2G/3G)	48.62%
BSNL Dual(2G/3G)	51.25%
Idea Dual(2G/3G)	56.82%
Jio VoLTE	87.87%



# I. Coverage Details (contd.)

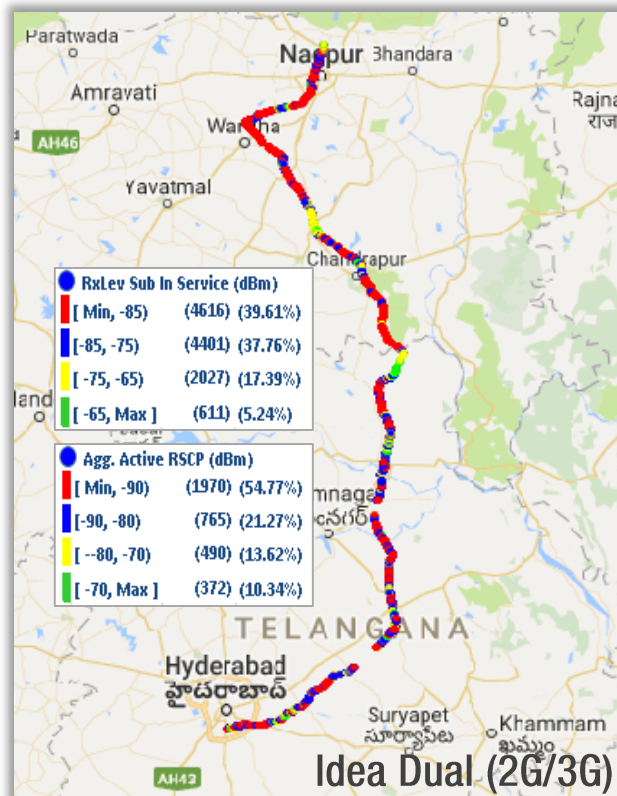
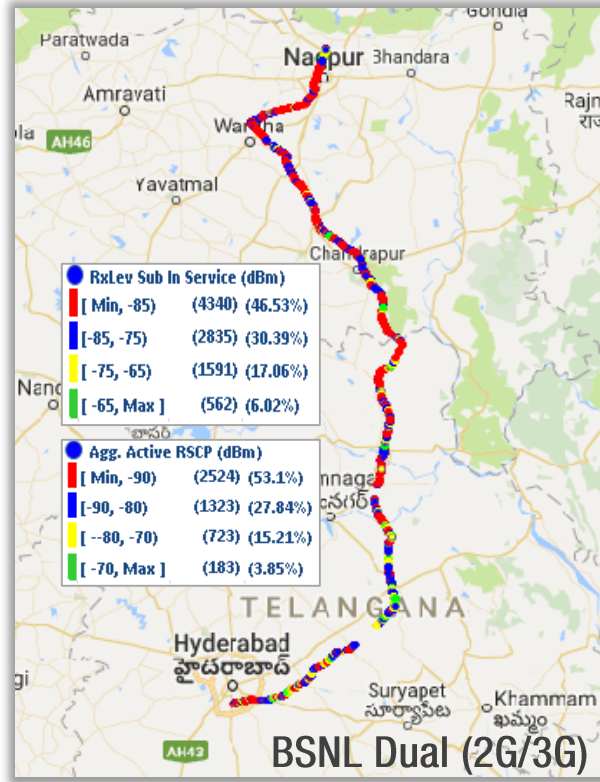


# I. Coverage Details (contd.)

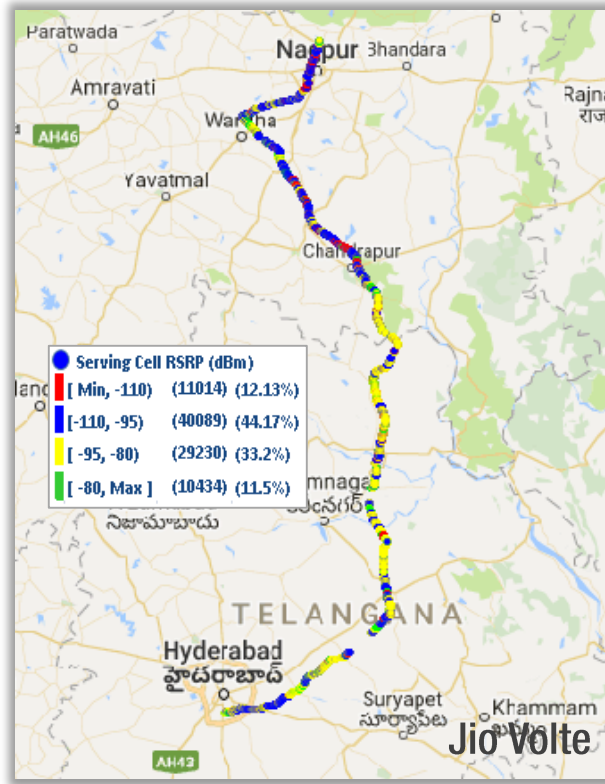




# I. Coverage Details (contd.)



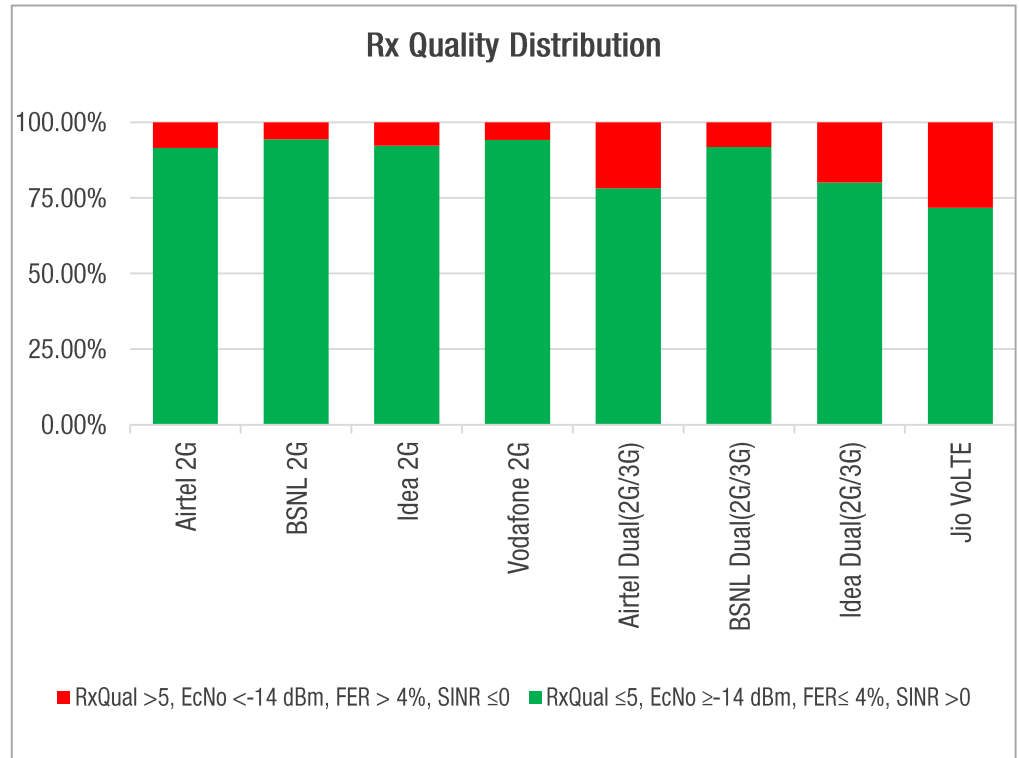
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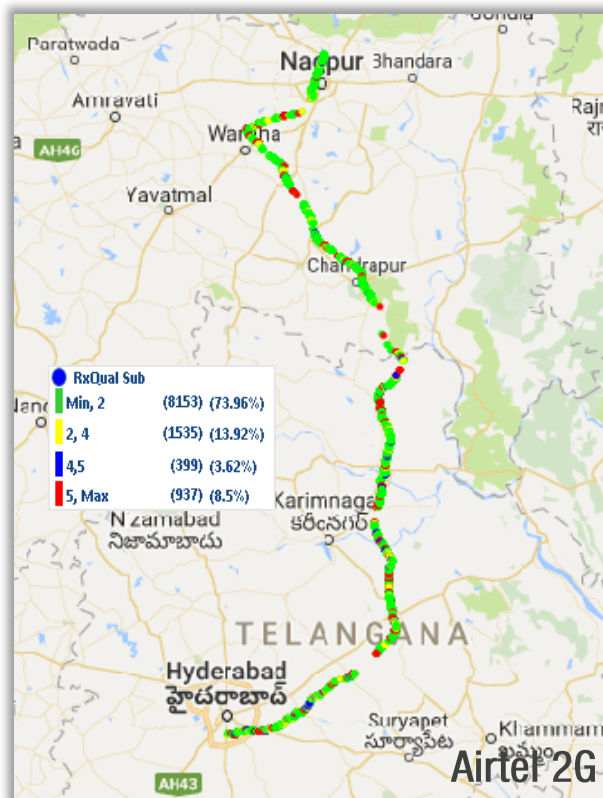
## II. Quality Details

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  $\geq 95\%$ .

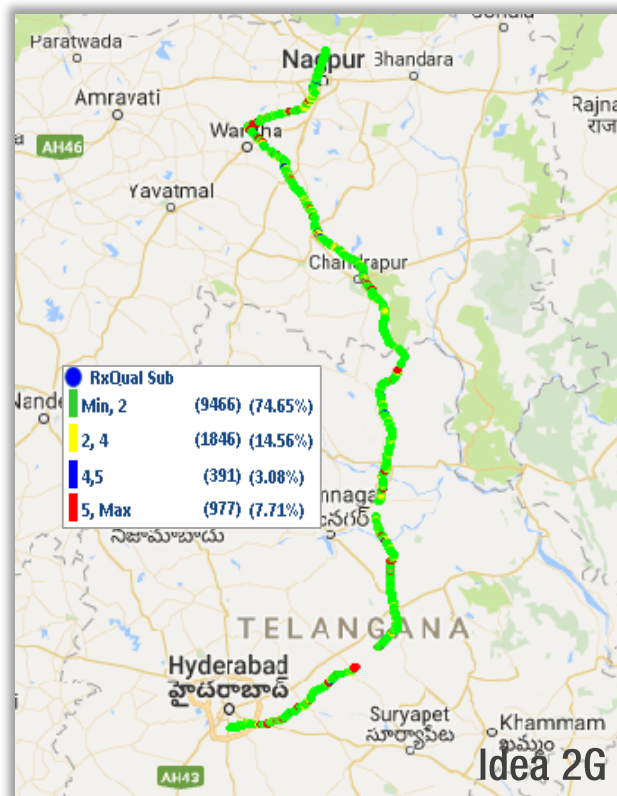
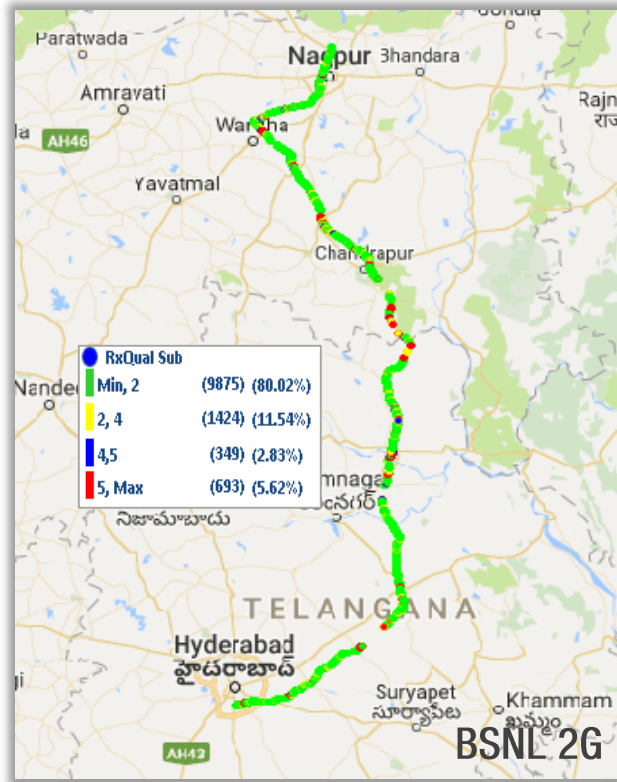
TSP	Rx Quality
Airtel 2G	91.50%
BSNL 2G	94.38%
Idea 2G	92.29%
Vodafone 2G	94.18%
Airtel Dual(2G/3G)	78.24%
BSNL Dual(2G/3G)	91.81%
Idea Dual(2G/3G)	80.12%
Jio VoLTE	71.72%



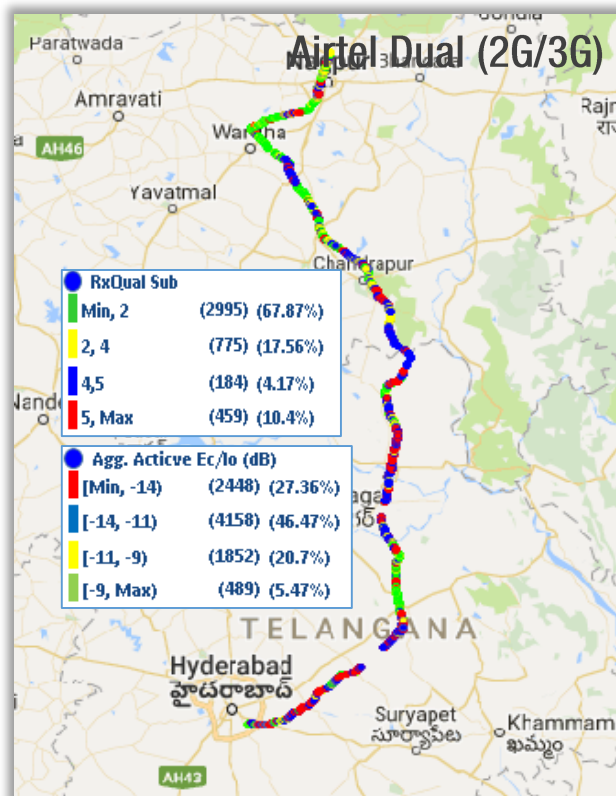
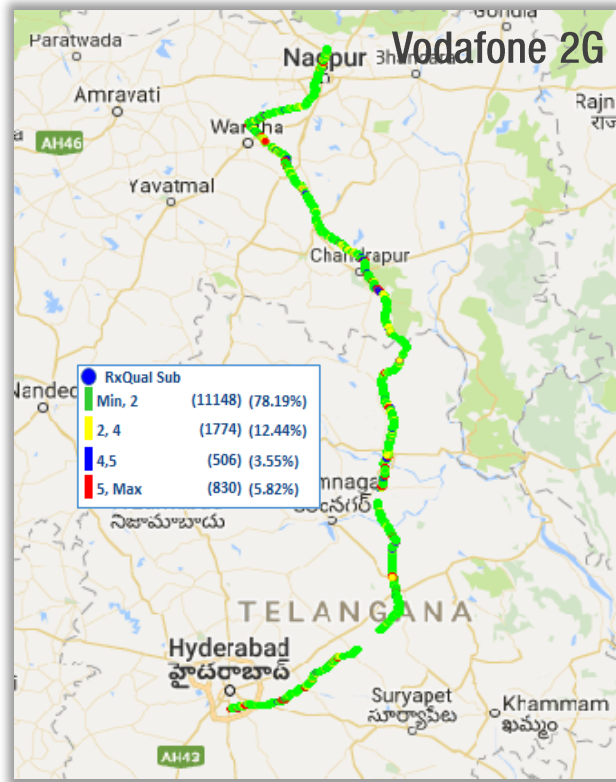
— TSPs not meeting the Benchmark



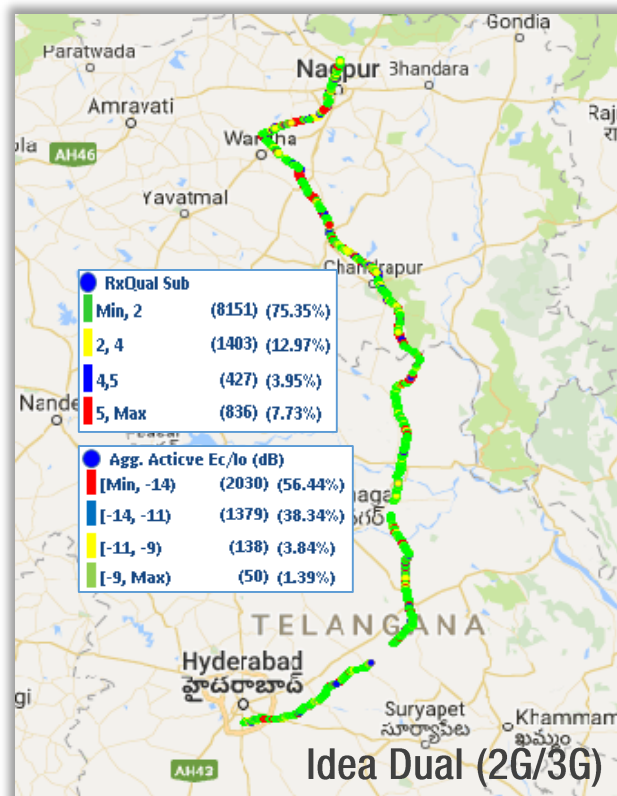
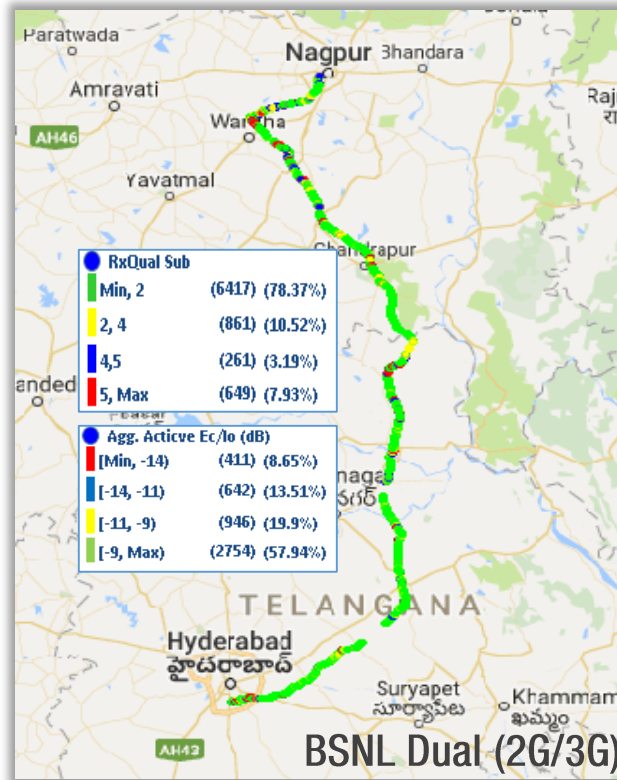
## II. Quality Details (contd.)



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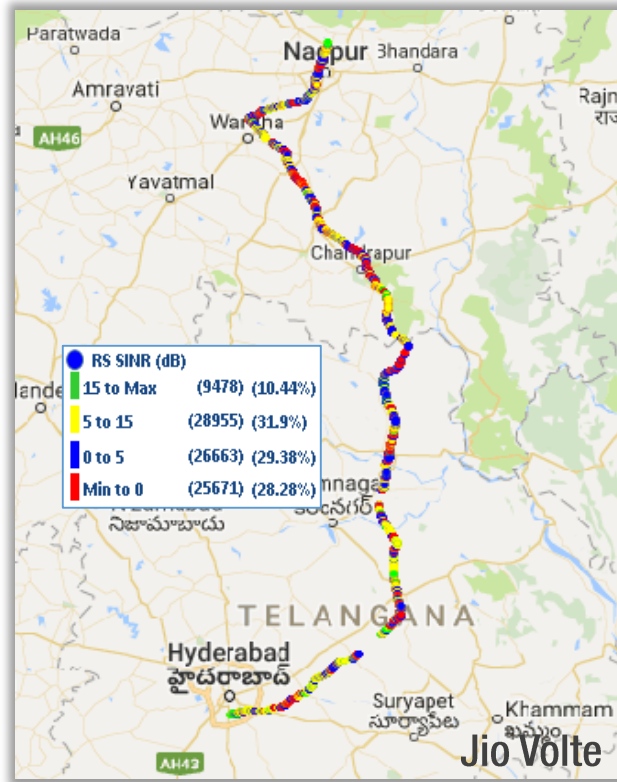


## II. Quality Details (contd.)



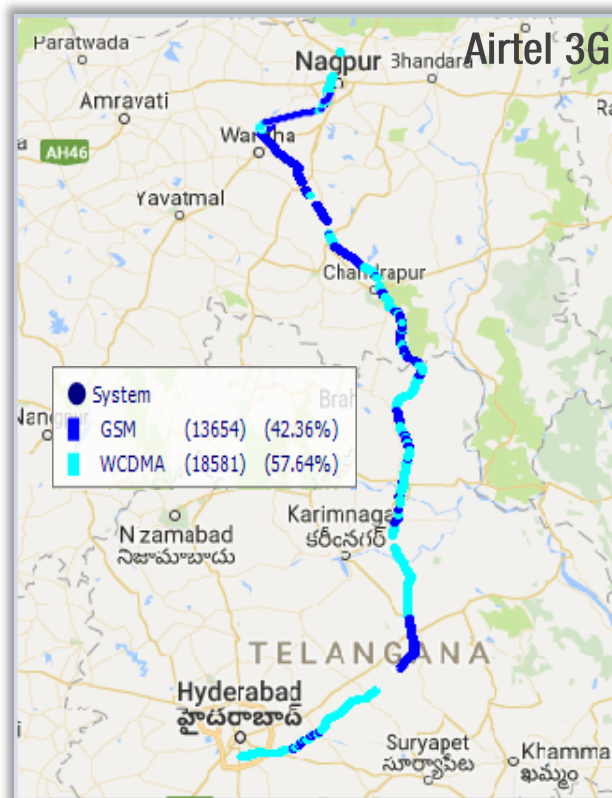
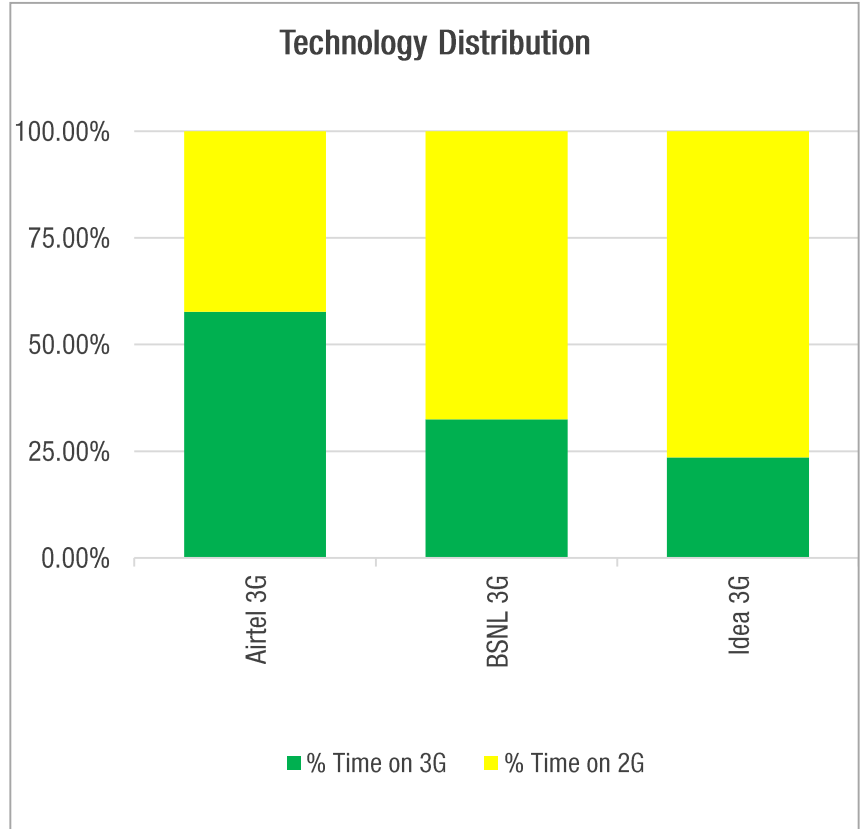


## II. Quality Details (contd.)



### III. Technology Details

TSP	% Time on 3G
Airtel 3G	57.64%
BSNL3G	32.47%
Idea 3G	23.52%





### III. Technology Details<sub>(contd.)</sub>

