EAST ZONE

TRAI AUDIT WIRELESS REPORT-KOLKATA CIRCLE- OND QUARTER, 2013

Prepared By -

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2   INTRODUCTION

2.1   ABOUT TRAI

TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in a manner and at a pace that will enable India to play a leading role in the emerging global information society. One of the main objectives of TRAI is to provide a fair and transparent policy environment which promotes a level playing field and facilitates fair competition.

In pursuance of above objective, TRAI has been issuing regulations, order and directives to deal with the issues or complaints raised by the operators as well as the consumers. These regulations, order and directives have helped the nurture the growth of multi operator multi service- an open competitive market from a government owned monopoly. Also, the directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection and quality of service as well as governance of the Authority.

TRAI initiated a regulation- The Standard of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service regulations, 2009 (7 of 2009) dated the March 20, 2009 and Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated the October 6, 2006 provide for benchmarks for the parameters on customer perception of service to be achieved by service provider.

In order to assess the above regulations TRAI has commissioned a third party agency to conduct the audit of the service providers and check the performance of the operators on the various benchmarks set by Telecom Regulatory Authority of India (TRAI).

2.2   OBJECTIVES

The primary objective of the Audit module is to-

- Audit and Assess the Quality of Services being rendered by Basic (Wireline), Cellular Mobile (Wireless), and Broadband service against the parameters notified by TRAI. (The parameters of Quality of Services (QoS) have been specified by in the respective regulations published by TRAI).

2.3   FRAMEWORK USED

```
                                    Audit Actvities

        PMR Reports                   Drive Test                   Live Calling

           Monthly PMR                  Operator Assisted            Billing Complaints

           3 Day Live                                                 Service Requests
           Data
                                        Independent                   Level 1 Service
           Customer
           Service                                                     Customer Care

                                                                      Inter Operator call
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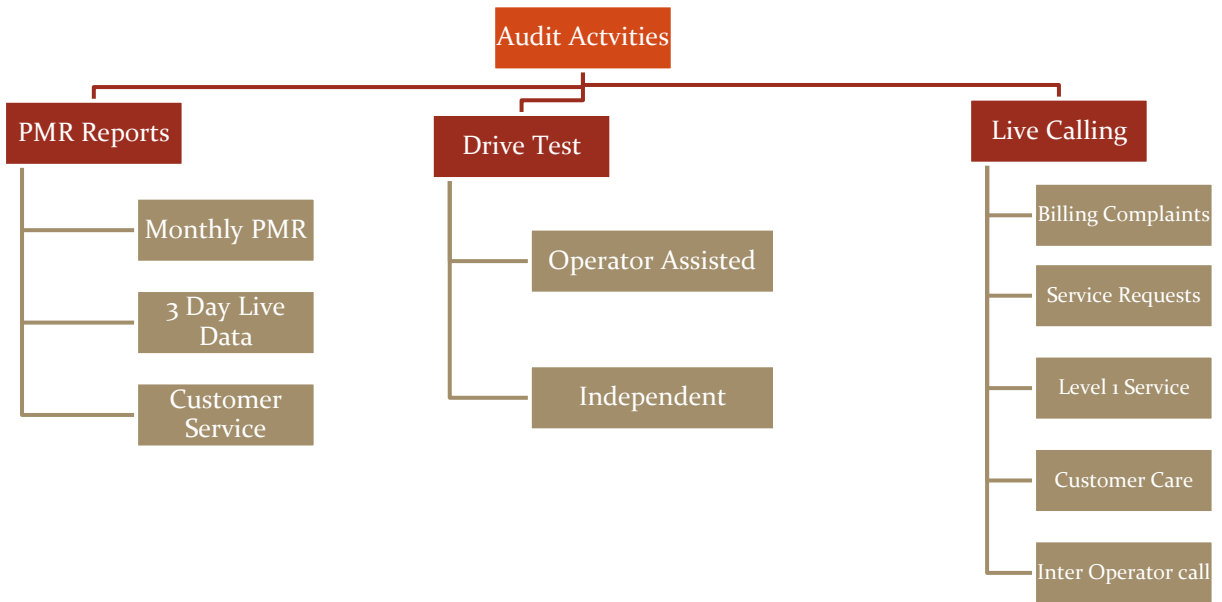
Let's discuss each of the activity in detail and the methodology adopted for each of the module-

2.3.1   PMR REPORTS

2.3.1.1   MONTHLY PMR

This involved calculation of the various Quality of Service parameters through monthly Performance Monitoring Reports (PMR's). The PMR reports were extracted and collected from operators every month. The performance of operators on various parameters was assessed against the benchmarks. Parameters include-

Network Availability

- BTS accumulated downtime
- Worst affected BTS due to downtime

Connection Establishment (Accessibility)

- Call Set Up success Rate (CSSR)

Network Congestion Parameters

- SDCCH/Paging Channel Congestion
- TCH Congestion
- Point of Interconnection

Connection Maintenance

- Call Drop rate
- Worst affected cells having more than 3% TCH drop

Voice Quality

- % Connections with good voice quality

Let's look at each of the parameter in detail and how the value is calculated-

Network Availability

- ⮑ The parameter of network availability would be measured from following sub-parameters

  - ⮩ BTSs Accumulated downtime (not available for service)

  - ⮩ Worst affected BTSs due to downtime

  BTSs accumulated downtime (not available for service) shall basically measure the downtime of the BTSs, including its transmission links/circuits during the period of a month, but excludes all planned service downtime for any maintenance or software upgradation.

  - ⮩ TRAI Benchmark –

    a. BTSs Accumulated downtime (not available for service) ≤ 2%

    b. Worst affected BTSs due to downtime ≤ 2%

Connection Establishment (Accessibility)

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- Definition: The ratio of calls established to total calls is known Call Set-Up Success Rate (CSSR).

- Call Established means the following events have happened in call setup:-

    - call attempt is made

    - the TCH is allocated

    - the call is routed to the outward path of the concerned MSC

- Computational Methodology: Calls Established / Total Call Attempts * 100

- TRAI Benchmark: > 95%

Network Congestion Parameters

- Definition: It means a call is not connected because there is no free channel to serve the call attempt. This parameter represents congestion in the network. It happens at three levels:

    - SDCCH Level: Stand-alone dedicated control channel

    - TCH Level: Traffic Channel

    - POI Level: Point of Interconnect

- Computational Methodology:

    - **SDCCH / TCH Congestion% = $[(A_1 \times C_1) + (A_2 \times C_2) +.......+ (A_n \times C_n)] / (A_1 + A_2 +...+ A_n)$**

        - Where:-A_1 = Number of attempts to establish SDCCH / TCH made on day 1

        - C_1 = Average SDCCH / TCH Congestion % on day 1

        - A_2 = Number of attempts to establish SDCCH / TCH made on day 2

        - C_2 = Average SDCCH / TCH Congestion % on day 2

        - A_n = Number of attempts to establish SDCCH / TCH made on day n

        - C_n = Average SDCCH / TCH Congestion % on day n

    - **POI Congestion% = $[(A_1 \times C_1) + (A_2 \times C_2) +.......+ (A_n \times C_n)] / (A_1 + A_2 +...+ A_n)$**

        - Where:-A_1 = POI traffic offered on all POIs (no. of calls) on day 1

        - C_1 = Average POI Congestion % on day 1

- A_2 = POI traffic offered on all POIs (no. of calls) on day 2

- C_2 = Average POI Congestion % on day 2

- A_n = POI traffic offered on all POIs (no. of calls) on day n

- C_n = Average POI Congestion % on day n

⊃ Benchmark:

  ↳ **SDCCH Congestion: < 1%**

  ↳ **TCH Congestion: < 2%**

  ↳ **POI Congestion: < 0.5%**

Connection Maintenance

⊃ The following parameter would be further sub-divided into Call drop rate and Worst affected cells

⊃ The dropped call rate is the ratio of successfully originated calls that were found to drop to the total number of successfully originated calls that were correctly released

  ↳ **Total calls dropped** = All calls ceasing unnaturally i.e. due to handover or due to radio loss

  ↳ **Total calls established** = All calls that have TCH allocation during busy hour

⊃ Computational Methodology: Total Calls Dropped / Total Calls Established x 100

⊃ TRAI Benchmark –

  ↳ Call drop rate ≤ 2%

  ↳ Worst affected cells having more than 3% TCH drop rate ≤ 5%

Voice Quality

⊃ Definition:

  ↳ for GSM service providers the calls having a value of 0 – 4 are considered to be of good quality (on a seven point scale)

  ↳ For CDMA the measure of voice quality is Frame Error Rate (FER). FER is the probability that a transmitted frame will be received incorrectly. Good voice quality of a call is considered when it FER value lies between 0 – 4 %

- ➲ Computational Methodology:

    - ↳ **% Connections with good voice quality** = (No. of voice samples with good voice quality / Total number of samples) x 100

- ➲ TRAI Benchmark: > 95%

2.3.1.2   3 DAY LIVE DATA

Network related parameters were evaluated for a period of 3 days in each month. 3 day live audit was conducted for 3 consecutive weekdays for each month. The data was extracted from eachoperator's server at the end of the 3[rd] day. The extracted data was analyzed to assess the various QoS parameters.

2.3.1.3   CUSTOMER SERVICE PARAMETERS

The Customer Service Quality Parameters include metering and billingcredibility (postpaid and prepaid), resolution of billing/charging complaints,period of applying credit/waiver/adjustment to customer's account,response time to the customer for assistance, termination/closure of serviceand time taken for refund of security deposit after closures. All the customer service parameters were calculated on the quarterly basis-

Let's look at each of the parameter one by one -

Metering and Billing Credibility

- ➲ Billing complaints includes any of the following complaints related to billing from the point of view of customer:

    - ↳ Local call charges billed as STD/ISD or vice-versa

    - ↳ Toll free numbers charged

    - ↳ Wrong roaming charges

    - ↳ Call made/received disputed

    - ↳ Wrongly charged extra for some service (SIM replacement charged twice, service not used but charged etc.)

↳ Cheque submitted on time but charged penalty for paying beyond due date (in case customer is not at fault i.e. all those that operator cannot prove that he/she is not lying)

↳ Payment made but not reflected (may be wrongly adjusted to another customer etc.)

➲ Computational Methodology:

↳ **Billing complaints per 100 bills issued** = Total billing complaints** received during the relevant quarter / Total bills generated* during the relevant quarter

↳ *Operator to include all types of bills generated for customers. This would include printed bills, online bills and any other forms of bills generated

↳ **Billing complaints here shall include only dispute related issues (including those that may arise because of a lack of awareness at the subscribers' end). It does not include any provisional issues (such as delayed dispatch of billing statements, etc.) in which the operator has opened a ticket internally.

➲ TRAI Benchmark: < 0.1%

➲ Audit Procedure:

↳ Audit of billing complaint details for the complaints received during the quarter and used for arriving at the benchmark reported to TRAI would be conducted

Resolution of billing/charging complaints

➲ Computational Methodology:

↳ **%age of billing complaints resolved within 4 weeks**=(Complaints resolved*** in 4 weeks from date of receipt / Total billing complaints** received during the period 2008) x 100

↳ **Billing complaints here shall include only dispute related issues (including those that may arise because of a lack of awareness at the subscribers' end). It does not include any provisional issues (such as delayed dispatch of billing statements, etc.) in which the operator has opened a ticket internally.

↳ *** Date of resolution in this case would refer to the date when a communication has taken place from the operator's end to inform the complainant about the final resolution of the issue / dispute.

➲ TRAI Benchmark: 100% within 4 weeks

➲ Audit Procedure:

↳ Audit of ratio of billing complaints resolved to total complaints received during the quarter used for reporting the benchmark to TRAI would be conducted. At the same time we would also conduct random live backchecks of complaints.

Period of refunds / payments due to customers

➲ Computational Methodology:

↳ **Period of all refunds = Maximum value of 'Time taken to refund'**

↳ Where:-Time taken to refund = Date of refund – date of lodging complaint.

➲ TRAI Benchmark:

↳ Termination/Closure of Service: <=7 days

↳ Time taken for refund for deposit after closures: 100% within 60 days

➲ Audit Procedure:

↳ Audit of refund details and complaints (only those resulting in refunds) resolution details used for arriving at the figures reported to TRAI to be conducted.

↳ Operator to provide details of:-

‣ Dates of lodging of all billing complaints resolved in favour of customer and resulting in requirement of a refund by the operator

‣ Dates of refund pertaining to all billing complaints received during the relevant quarter

↳ Also random live checks of all subscribers entitled for refund would be conducted

2.3.2 DRIVE TEST

A total of 9 cities were selected and audited in each quarter, 3 cities each month. Cities were selected on the basis of population. In each licensed service area drive test in three cities, having high population, medium population and low population. The methodology adopted for the drive test-

↳ The drive test covered selected cities and adjoining towns/rural areas where the service provider has commenced service, including congested areas and indoor sites.

- The drive test covered the routes including expressways,major and secondary roads/streets, Commercial, residentialareas/Commercials estates to check the in-building networkperformance.
- The drive test of each mobile network was conductedbetween 10 am and 8 pm on weekdays.
- The Vehicle used in the drive tests was equipped withthe test tool that automatically generates calls on the mobile telephonenetworks.
- The speed of the vehicle was kept at around 30-50km/hour (around 30 km/hr in case of geographically small cities)
- The holding period of each test call was 120 seconds.
- A test call was generated 10 seconds after the previous testcall is completed.
- Height of the antenna was kept uniform in case of all serviceproviders.

The parameters which were captured during the drive test include-

- Coverage-Signal strength
- Voice quality
- Call setup success rate
- Blocked calls
- Call drop rate

2.3.3 LIVE CALLING

2.3.3.1 BILLING COMPLAINTS

All the complaints booked weretreated as the total population for selection of samples. From the population a sample of 100 calls was taken. Telephonic Interviews were done with 100 subscribers per service provider for each service in a licensed service area

TRAI benchmark-

% of complaints resolved in 4 weeks – 100%

Metering and billing credibility–Post Paid- Not more than 0.1% of bills issued should be disputed over a billing cycle

Metering and billing credibility –- Prepaid - Not more than 1 complaint per 1000 customers i.e. 0.1% complaints for metering, charging, credit, and validity

Resolution of billing/ charging complaints - 100% within 4 weeks

2.3.3.2 SERVICE COMPLAINTS REQUESTS

"Service request" means a request made to a service provider by its consumer pertaining to his account, and includes-

- A request for change of tariff plan;
- A request for activation or deactivation of a value added service or a supplementary service or a special pack;
- A request for activation of any service available on the service provider's network;
- A request for shift or closure or termination of service or for billing details;

All the complaints other than billing were covered. A total of 100 calls per service provider for each service in licensed service area were done by the IMRB auditors.

2.3.3.3 LEVEL 1 SERVICE

Level 1 Services include services such as police, fire, ambulance (Emergency services) Test calls were made from all the levels working in a particular SDCA visited. Total sample size (150 per license service area per service per quarter) was equally distributed among the different SDCAs visited, and the distribution among the active levels would be in proportion to the capacity of each level in that SDCA.

2.3.3.4 CUSTOMER CARE

Overall sample size is 2*50 calls per service provider per circle at different points of time, to be evenly distributed across the selected exchanges – 50 calls between 10:00 HRS to 13:00 HRS and 50 calls between 15:00 HRS to 17:00 HRS.

The time taken to answer the call through IVR and Customer Care is recorded by the audit agency.

TRAI Benchmark- Response time to the customer for assistance:
(a) Accessibility of call center/customer care/IVR>= 95%
(b) % age of calls answered by the operator (voice to voice): within 60 seconds = 90%

2.3.3.5 INTER OPERATOR CALL ASSESEMENT

A total of 100 calls per service provider to all the other service providers in a licensed service area were done for the purpose of audit.

2.4 OPERATORS COVERED

Operator	Number of Subscriber as per VLR
Aircel(DWL)	1934850
Airtel	3631782
BSNL	751553

Idea	1219195
MTS	637824
Reliance CDMA	1120195
Reliance GSM	2605334
TATA CDMA	113085
TATA GSM	1797962
Vodafone	4241588

Not Meeting the benchmark

3 EXECUTIVE SUMMARY

3.1 PMR DATA – 3 MONTHS- CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	BTSs Accumulated downtime (not available for service)	Worst affected BTSs due to downtime	Call Set-up Success Rate (within licensee's own network)	SDCCH/ Paging Chl. Congestion	TCH Congestion	Call Drop Rate (%age)	Worst affected cells having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel(DWL)	0.45%	1.97%	97.37%	0.41%	0.36%	0.75%	0.73%	97.46%
Airtel	0.03%	0.03%	99.65%	0.05%	0.04%	0.76%	0.17%	97.66%
BSNL	1.20%	1.96%	98.29%	0.20%	0.26%	1.67%	2.88%	99.52%
Idea	0.44%	0.63%	99.58%	0.06%	0.06%	0.34%	0.32%	97.80%
MTS	0.18%	0.00%	99.72%	0.00%	0.04%	0.53%	0.97%	99.53%
Reliance CDMA	2.05%	0.07%	99.33%	0.00%	0.01%	0.07%	0.41%	99.75%
Reliance GSM	0.10%	0.28%	99.34%	0.01%	0.00%	0.42%	0.06%	98.39%
TATA CDMA	0.10%	0.00%	98.74%	0.00%	0.09%	1.11%	1.89%	98.18%
TATA GSM	0.01%	0.00%	98.63%	0.03%	0.05%	0.79%	1.49%	98.26%
Vodafone	0.03%	0.07%	99.57%	0.05%	0.43%	0.84%	2.53%	97.59%

Values highlighted in green color represent the best performance in that category for the following operator.

BTSs Accumulated Downtime:

In the Kolkata circle, Reliance CDMA does not meet the benchmark on the aspect of BTS Accumulated downtime. Rest of the operators is meeting the benchmark comfortably.

Worst Affected BTSs Due to Downtime:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter. During the audits the maximum CSSR was observed for MTS with 99.72% of their calls getting completed. All the operators

were found to be calculating the parameter as per the norm specified by TRAI. CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made.

Network Congestion parameters:

SDCCH / Paging Channel Congestion, TCH and POI are part of the network congestion parameters. All the operators are meeting the TRAI specified benchmarks on the congestion parameters. Aircel however was performing the worst with a SDCCH congestion of 0.41% and TCH congestion of 0.36%..The calculation methodology of these parameters was found to be in complete accordance with what has been specified by TRAI. Both RCOM CDMA and Tata Teleservices measure paging channel utilization. Almost all the operators had 0% POI.

Call Drop Rate:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. The call drop rate was measured as the ratio of total calls dropped to the total number of call attempts for all operators. Also, all of service providers were found to be meeting the TRAI specified benchmark. The highest call drop was for BSNL with 1.67% followed by TATA CDMA with benchmark of 1.11%.

Worst Affected Cells Having More than 3% TCH Drop:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark however in terms of voice quality Airtel and Aircel have relatively lower voice quality as compare to rest of the operators.

3.2 3 DAY DATA - CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	BTSs Accumulated downtime (not available for service)	Worst affected BTSs due to downtime	Call Set-up Success Rate (within licensee's own network)	SDCCH/ Paging Chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Worst affected cells having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel(DWL)	0.43%	0.14%	97.43%	0.48%	0.29%	0.76%	2.09%	97.49%
Airtel	0.02%	0.00%	99.64%	0.05%	0.03%	0.80%	0.84%	98.18%
BSNL	1.50%	0.11%	98.71%	0.02%	0.01%	1.24%	1.15%	99.05%
Idea	0.66%	0.43%	99.79%	0.05%	0.01%	0.28%	0.02%	98.54%
MTS	0.11%	0.00%	99.75%	0.00%	0.04%	0.55%	1.06%	99.04%
Reliance CDMA	0.14%	0.00%	99.27%	0.00%	0.01%	0.06%	1.12%	99.77%
Reliance GSM	0.16%	0.00%	99.44%	0.01%	0.00%	0.38%	0.00%	98.55%
TATA CDMA	0.13%	0.00%	99.39%	0.00%	0.31%	1.56%	5.79%	99.73%
TATA GSM	0.01%	0.00%	98.55%	0.06%	0.05%	0.78%	6.91%	98.50%
Vodafone	0.03%	0.00%	99.61%	0.07%	0.39%	0.80%	0.00%	97.78%

Values highlighted in green color represent the best performance in that category for the following operator.

BTSs Accumulated Downtime:

In the Kolkata circle, Reliance CDMA does not meet the benchmark on the aspect of BTS Accumulated downtime. Rest of the operators is meeting the benchmark comfortably.

Worst Affected BTSs Due to Downtime:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter. During the audits the maximum CSSR was observed for Vodafone with 99.75% of their calls getting completed. All the operators were found to be calculating the parameter as per the norm specified by TRAI. CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made.

Network Congestion parameters:

SDCCH / Paging Channel Congestion, TCH and POI are part of the network congestion parameters. All the operators are meeting the TRAI specified benchmarks on the congestion parameters. The calculation methodology of these parameters was found to be in complete accordance with what has been specified by TRAI. Both RCOM CDMA and Tata Teleservices measure paging channel utilization. Almost all the operators had 0% POI.

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Call Drop Rate:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. The call drop rate was measured as the ratio of total calls dropped to the total number of call attempts for all operators. Also, all of service providers were found to be meeting the TRAI specified benchmark.

Worst Affected Cells Having More than 3% TCH Drop:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter except TATA CDMA & TATA GSM.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark however in terms of voice quality Airtel and Aircel have relatively lower voice quality as compare to rest of the operators.

3.3 LIVE CALLING DATA - CONSOLIDATED

Name of Service Provider	Metering and Billing	Service Requests	Level 1 Service	Response time to customer for assistance	
	%age complaints resolved within 4 weeks (As per consumer)	Complaint /Request attended to Satisfaction	Call answered in 60 seconds	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 60 seconds
Benchmark	100%		≥ 95%	≥ 95%	≥ 90%
Aircel(DWL)	52.17%	79.00%	100.00%	100.00%	100.00%
Airtel	87.00%	86.00%	100.00%	100.00%	100.00%
BSNL	76.00%	83.00%	100.00%	100.00%	100.00%
Idea	97.00%	81.00%	100.00%	100.00%	100.00%
MTS	59.00%	74.00%	100.00%	100.00%	100.00%
Reliance CDMA	79.00%	61.00%	100.00%	100.00%	100.00%
Reliance GSM	100.00%	69.00%	100.00%	100.00%	100.00%
TATA CDMA	75.00%	86.00%	100.00%	100.00%	100.00%
TATA GSM	77.19%	71.00%	100.00%	100.00%	100.00%
Vodafone	96.00%	89.00%	100.00%	100.00%	100.00%

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Complaints Resolved within 4 weeks

As per the audited records, all the operators resolve the complaints within 4 weeks of registration of complaints. However as per the consumers except for Reliance GSM all the other operators are not meeting the benchmarks.

Customer Care / Helpline Assessment

For the accessibility of customer care aspect all the service providers meet the TRAI benchmark wherein 100% of the calls were answered through IVR.

3.4   INTER OPERATOR CALL ASSESSMENT - CONSOLIDATED

Inter operator call Assessment To↓ From→	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Aircel(DWL)	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%
Idea	98%	76%	98%	NA	100%	100%	99%	100%	100%	100%
MTS	100%	100%	NA	100%	NA	100%	100%	100%	100%	100%
Reliance CDMA	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%
Reliance GSM	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%
TATA CDMA	100%	100%	100%	100%	100%	96%	94%	NA	100%	99%
TATA GSM	100%	100%	100%	100%	99%	100%	100%	100%	NA	100%
Vodafone	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA

	Maximum Problem faced by the calling operator to other operator

In the inter-operator call assessment, calls were made from the test SIMs of service provider whose audit was being conducted to all the other service providers. Almost all operators were comfortably able to connect with each other except Airtel, BSNL, Reliance CDMA and Reliance GSM which faced problems in connecting to Idea and TATA CDMA.

4   DETAILED FINDINGS - DRIVE TEST DATA

The drive test was conducted simultaneously for all the operators present in the Kolkata circle. There was in total of seven drive tests conducted in the circle in the month of October, November and December, 2013. IMRB auditors were present in vehicles of every operator. The holding period for all test calls was 120 seconds.

For measuring voice quality RxQual samples for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. RxQual greater than 5 meant that the sample was not of appropriate voice quality and for CDMA operators FERs of more than 4 were considered bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in Dbm with strength > -75dbm for indoor, -85 dbs for in-vehicle and > -95 dbm outdoor routes.

The Drive Test were conducted in below cities-

October-

October	
City Name	Kolkata City
Date of Drive Test	25th October

Route Details-

Type of location	Kolkata City

Periphery of the city	MEHER ALI ROAD SCIENCE CITY
Congested area	BRABOURNE RD- PARK STREET
Across the city	SOUTH CITY MALL
Office complex	STEPHEN HOUSE
Shopping complex	SOUTH CITY MALL

November -

November	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	Barasat	Baruipur	Chandannagar
Date of Drive Test	12-11-2013	13-11-2013	19-11-2013

Route Details-

Type of location	Barasat	Baruipur	Chandannagar

Periphery of the city	Nilgunje Road-Colony More	Kamalgazi More	Kapasdanga to Delhi Road to sankarhati toBhadreshwar more along Delhi Road.
Congested area	MadhyamgramChowmatha	Dhalie Bridge	Around GT Road and Rly station at chandannagar
Across the city	Colony more to Borojagulia	Baruipur to Amtala	Bhadreshwar to Kapasdanga across GT Road.
Office complex	Big Bazar	Bigbazar	Fooding Zone Shopping Mall
Shopping complex	Barasat Court	Barauipur Court	Bhadreshwar Municipality

December -

December	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	HOWRAH	BARRACKPUR	RISHRA
Date of Drive Test	10-12-2013	17-12-2013	18-12-2013

Route Details-

Type of location	HOWRAH	BARRACKPUR	RISHRA

Periphery of the city	SALAP	MOHANPUR	GLASS INDIA LIMITED
Congested area	SANPUR	CHAKRABORT	GT ROAD
Across the city	KADMTALA	BABBERIA	MOTOR BRANCH
Office complex	HORAH COURT	BARRACKPUR COURT	RISHRA MUNICIPALITY
Shopping complex	AVANI MALL	JAYANTHI COMPLEX	SAMSUNG ELECTRONICS

4.1.1.1 KOLKATA CITY-OCTOBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	94.90%	88.01%	98.79%	95.57%	99.75%	99.90%	96.91%	93.91%	98.44%	97.66%	99.99%	99.36%	97.22%	94.48%	96.92%	95.89%	96.99%	94.57%	99.65%	96.70%
CSSR	≥ 95%	100.00%	99.37%	100.00%	100.00%	100.00%	100.00%	98.44%	96.97%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.37%	100.00%	99.36%
%age Blocked calls		0.00%	0.63%	0.00%	0.00%	0.00%	0.00%	1.57%	3.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	63.00%	0.00%	0.64%
Call drop rate	≤ 2%	3.13%	3.21%	0.00%	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00%	98.52%	100.00%	100.00%	100.00%	100.00%	100.00%	98.90%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.22%	100.00%	100.00%

Key Insights-October

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Kolkata City

Voice quality: All the operators meet the benchmark set by TRAI except Aircel, Idea, Reliance GSM and TATA GSM were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Aircel is not meeting the benchmark in both indoor and outdoor areas where as Idea, Reliance GSM and TATA GSM in outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark except Aircel and Idea.

4.1.1.2 BARASAT-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
	0.56	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	97.80%	92.43%	98.27%	96.16%	98.20%	99.30%	93.26%	92.32%	99.04%	96.31%	99.97%	98.97%	98.37%	98.20%	96.44%	96.19%	98.87%	96.66%	98.45%	98.23%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.35%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.03%	100.00%	100.00%

4.1.1.3 BURUIPUR-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	97.65%	96.27%	99.51%	96.82%	99.75%	99.66%	94.83%	94.59%	99.03%	97.44%	100.00%	91.59%	98.39%	97.82%	99.07%	96.84%	99.20%	97.97%	97.75%	98.17%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.88%	99.35%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.13%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00%	100.00%	100.00%	99.56%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

4.1.1.4 CHANDANNAGAR-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	99.50%	96.17%	98.85%	97.62%	98.98%	99.09%	86.14%	95.04%	93.84%	96.32%	98.87%	97.62%	97.54%	93.81%	97.02%	95.51%	99.42%	97.53%	98.65%	97.93%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Key Insights - November

Barasat

Voice quality: All the operators meet the benchmark set by TRAI except Aircel and Idea were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas where as Aircel in outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark.

Buruipur

Voice quality: All the operators meet the benchmark set by TRAI except Idea and Reliance CDMA were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas where as Reliance CDMA and MTS in outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark.

Chandannagar

Voice quality: All the operators meet the benchmark set by TRAI except Idea, MTS and Reliance GSM were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.MTS is not meeting the benchmark in indoor areas where as Idea in indoor Areas and Reliance GSM in outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark.

4.1.1.5 HOWRAH-DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	94.80%	94.33%	99.28%	96.39%	98.65%	99.30%	91.13%	92.74%	98.83%	97.30%	99.87%	99.70%	95.43%	95.91%	99.78%	96.29%	97.57%	95.48%	98.83%	97.57%
CSSR	≥ 95%	93.35%	100.00%	100.00%	100.00%	100.00%	100.00%	92.19%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.44%	97.61%	100.00%	100.00%
%age Blocked calls		6.65%	0.00%	0.00%	0.00%	0.00%	0.00%	7.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.52%	2.39%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.56%	1.23%	0.00%	0.00%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.24%	100.00%	100.00%

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4.1.1.6   BARRACKPUR-DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	99.65%	88.86%	99.33%	96.27%	92.04%	99.13%	91.89%	90.36%	99.72%	96.88%	97.58%	98.23%	97.00%	93.79%	99.62%	97.17%	98.80%	97.54%	97.19%	97.84%
CSSR	≥ 95%	100.00%	99.34%	100.00%	100.00%	100.00%	100.00%	100.00%	99.36%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.49%	98.81%	100.00%	100.00%
%age Blocked calls		0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.52%	1.19%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	1.28%	0.00%	0.00%	3.33%	0.00%	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00%	99.39%	100.00%	100.00%	99.33%	100.00%	100.00%	99.64%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

4.1.1.7   RISHRA-DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	99.00%	92.17%	98.18%	96.62%	99.65%	98.37%	92.43%	93.22%	98.82%	95.40%	100.00%	99.73%	98.40%	96.96%	99.60%	94.66%	98.62%	97.26%	97.83%	97.50%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.38%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.62%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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Key Insights-December

Howrah

**Voice quality:** All the operators meet the benchmark set by TRAI except Aircel and Idea were not able to meet the benchmark on voice quality in both indoor and outdoor areas. The benchmark for voice quality is 95%.

CSSR: All the networks comfortably clear the benchmark except Idea.

Call drop rate: All the networks comfortably clear the benchmark.

Barrackpur

Voice quality: All the operators meet the benchmark set by TRAI except Aircel, BSNL, Idea and Reliance GSM were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas where as Aircel, BSNL and Reliance GSM in outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark except BSNL.

Rishra

Voice quality: All the operators meet the benchmark set by TRAI except Aircel, Idea and TATA CDMA were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas where as Aircel and TATA CDMA in outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

**Call drop rate:** All the networks comfortably clear the benchmark.

5 DETAILED FINDINGS - COMPARISON BETWEEN PMR DATA, 3 DAY LVE DATA AND LIVE CALLING DATA

5.1 BTS ACCUMULATED DOWNTIME
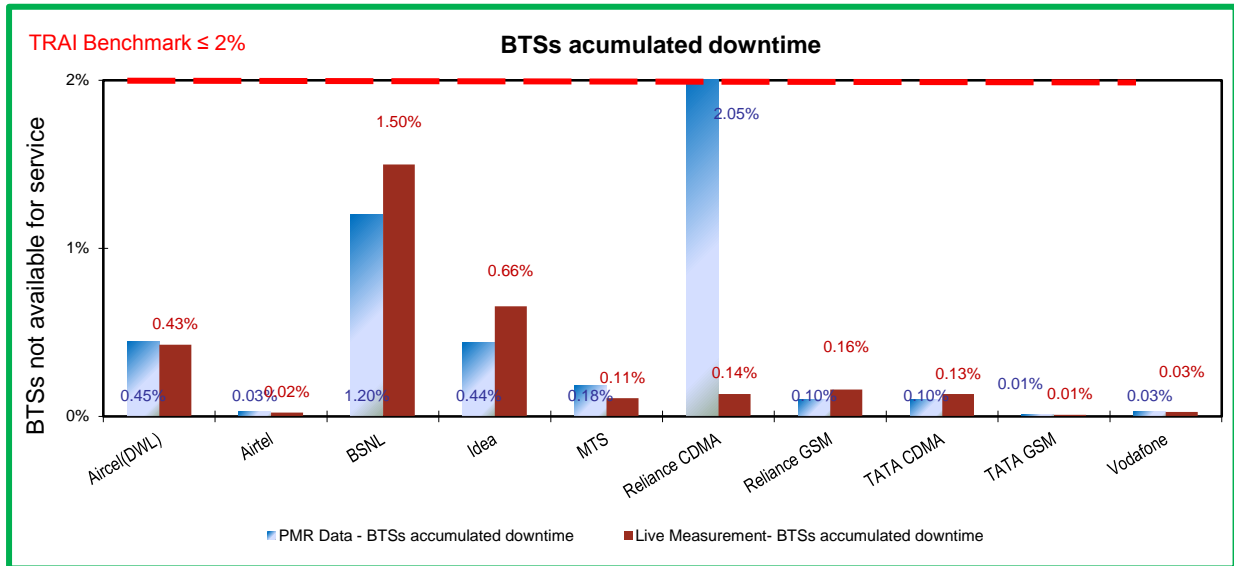
The result of the PMR data and live measurement isalmost similar except for Reliance CDMA where there is considerable difference on aspect of BTS Accumulated Downtime. Reliance CDMA does not meet the benchmark on aspect of BTS Accumulated downtime.

5.2 WORST AFFECTED BTS DUE TO DOWNTIME
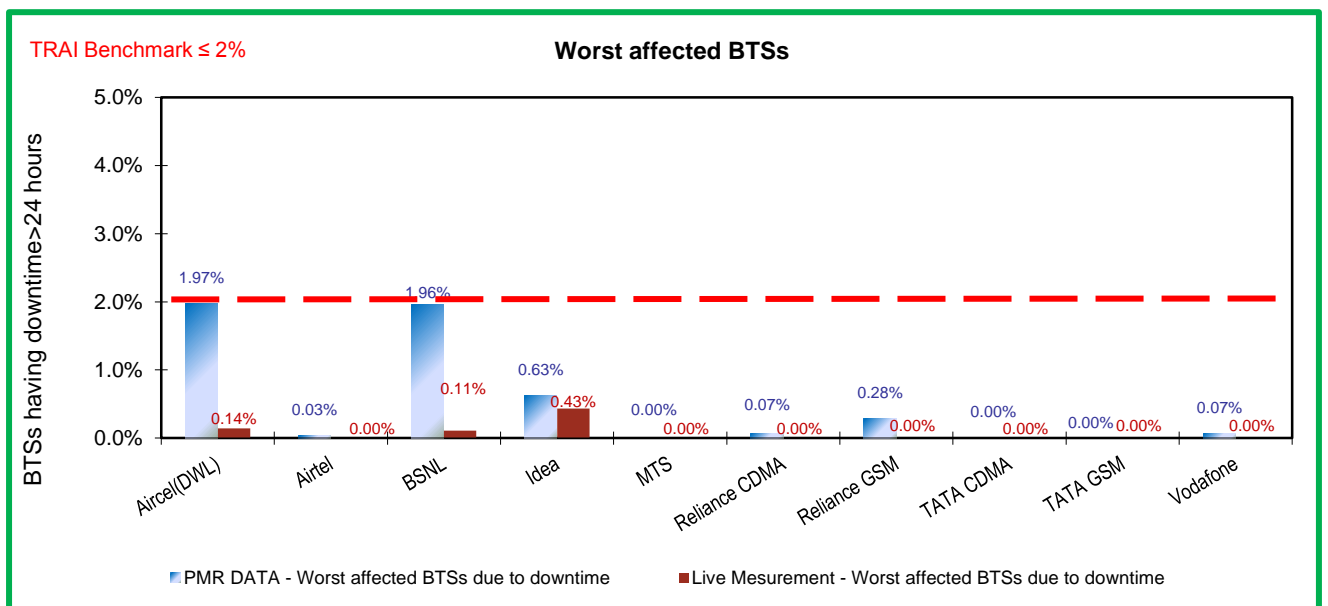
All the operators meet the benchmark, Aircel and BSNL have the maximum worst affected BTS due to downtime.

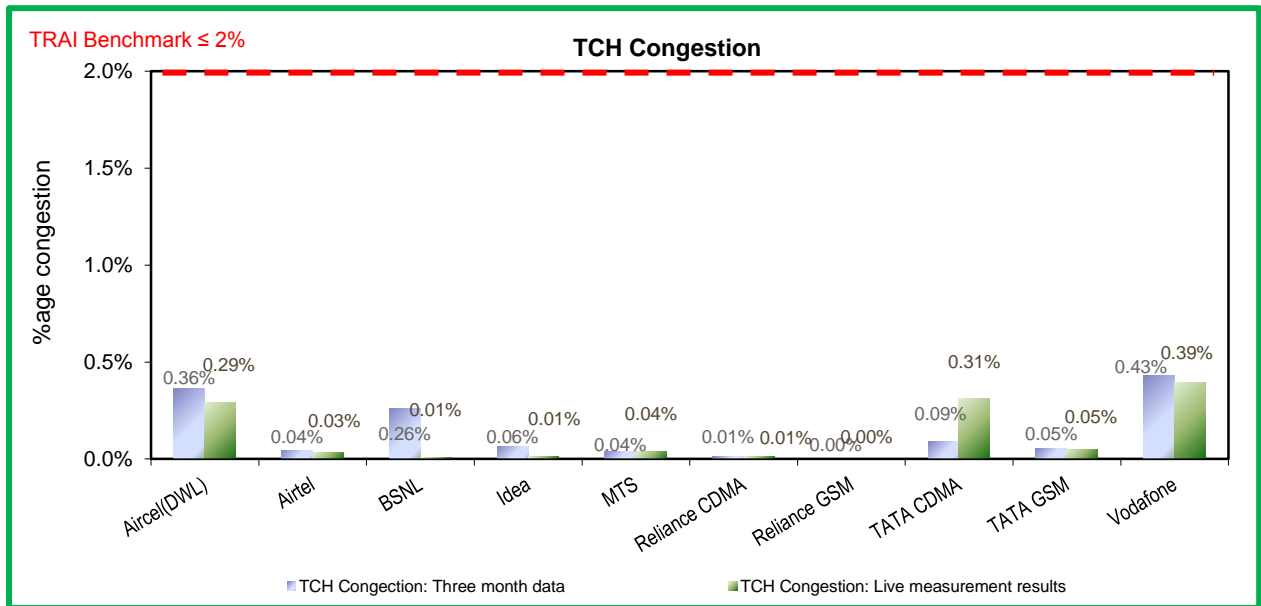## 5.3   CALL SET UP SUCCESS RATE
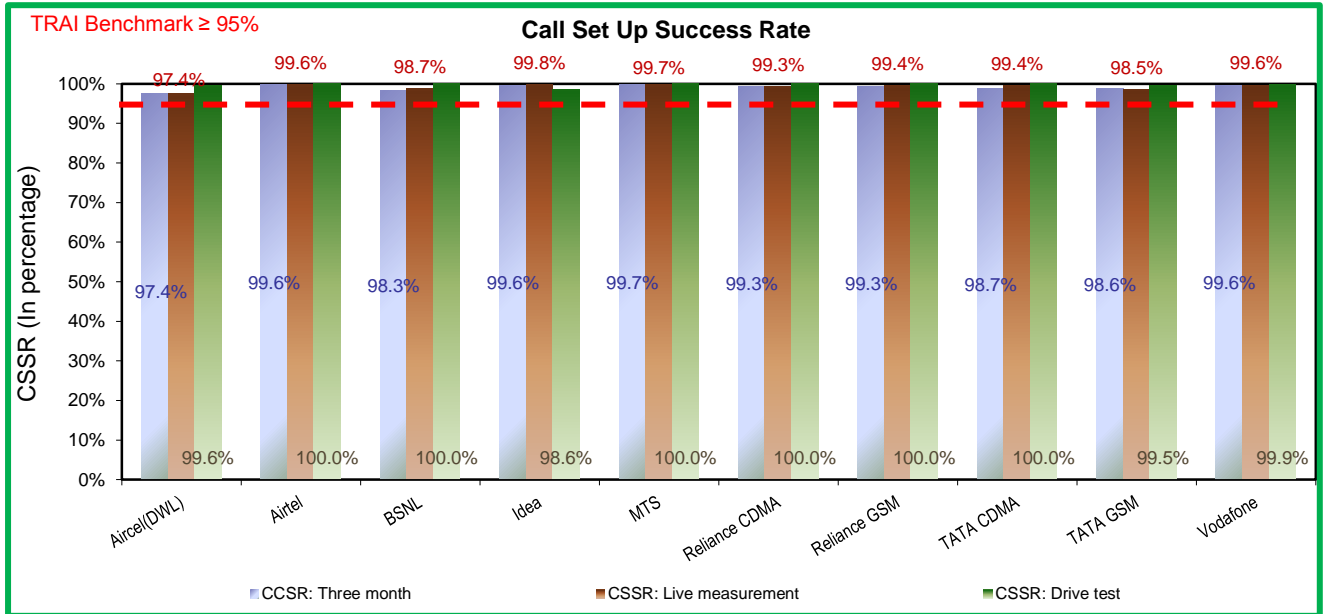
All the operators are meeting the benchmark across Monthly PMR, Live measurement and Drive Test. There is no significant difference for CSSR found from three modes of measuring the CSSR.
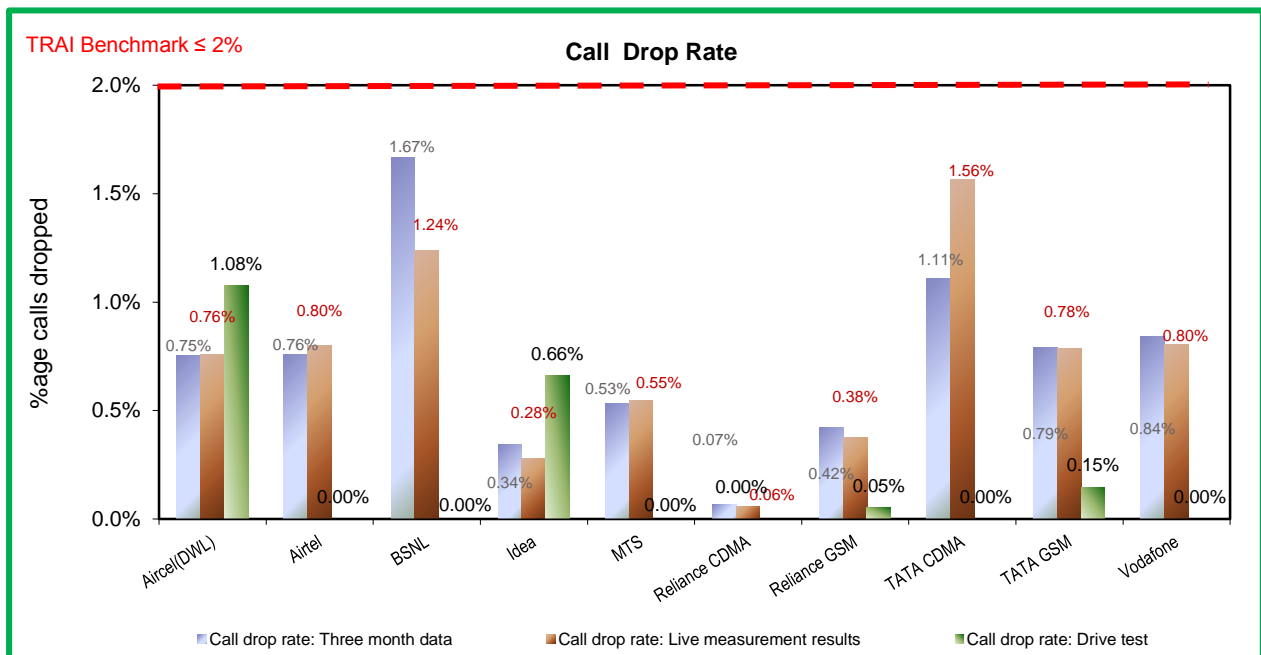
5.4   SDCCH/PAGING CHANNEL CONGESTION
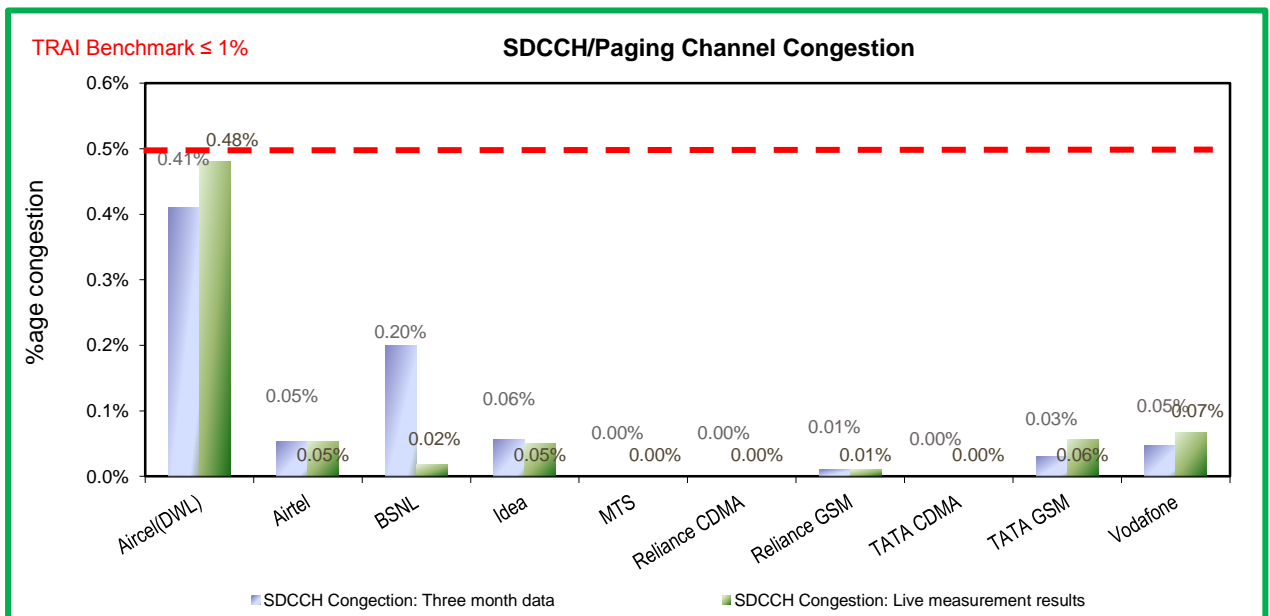
All the operators meet the benchmark.

5.5 TCH CONGESTION

All the operator meets the benchmark. No Significant difference observed in PMR reports and three day live data collection.
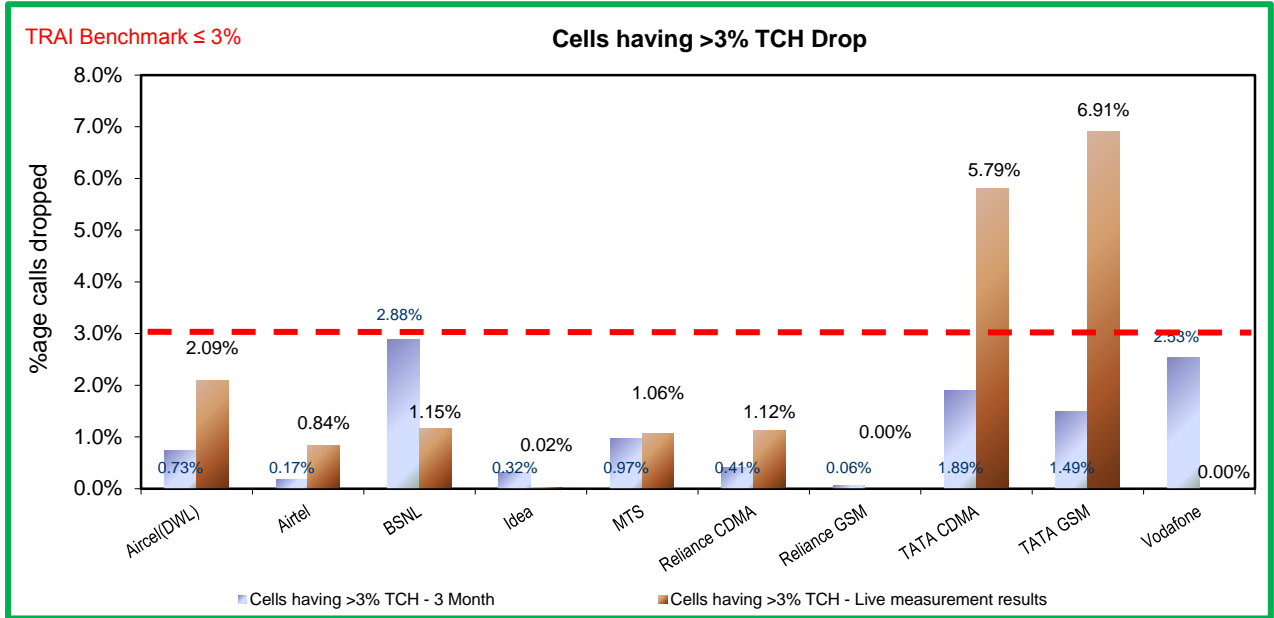
5.6 CALL DROP RATE

All the operators meet the benchmark. There is no significant difference across the benchmark monthly PMR, Live measurement results and Drive test except for BSNL where the call drop rate is very low in the drive test.

5.7 CELLS HAVING GREATER THAN 3% TCH DROP

Tata CDMA and Tata GSM have not met the benchmark for cells having more than 3% TCH drop. There is a considerable difference in Three month and Live data for TATA CDMA and TATA GSM.
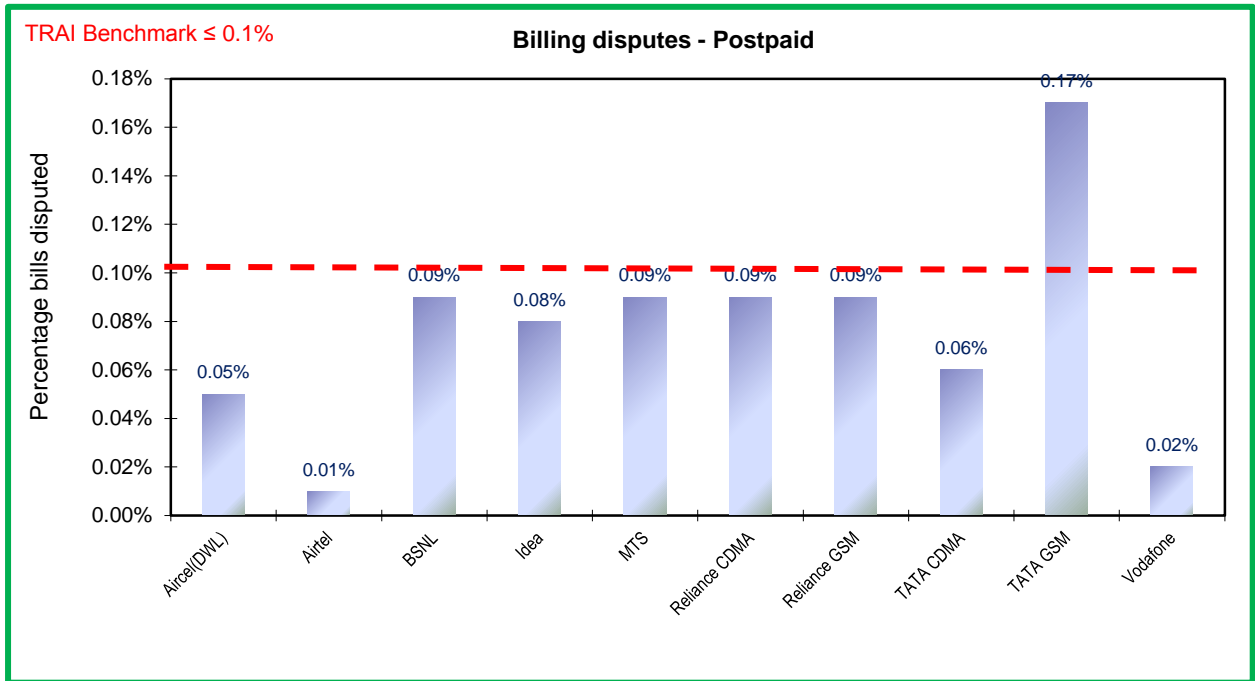
5.8 VOICE QUALITY
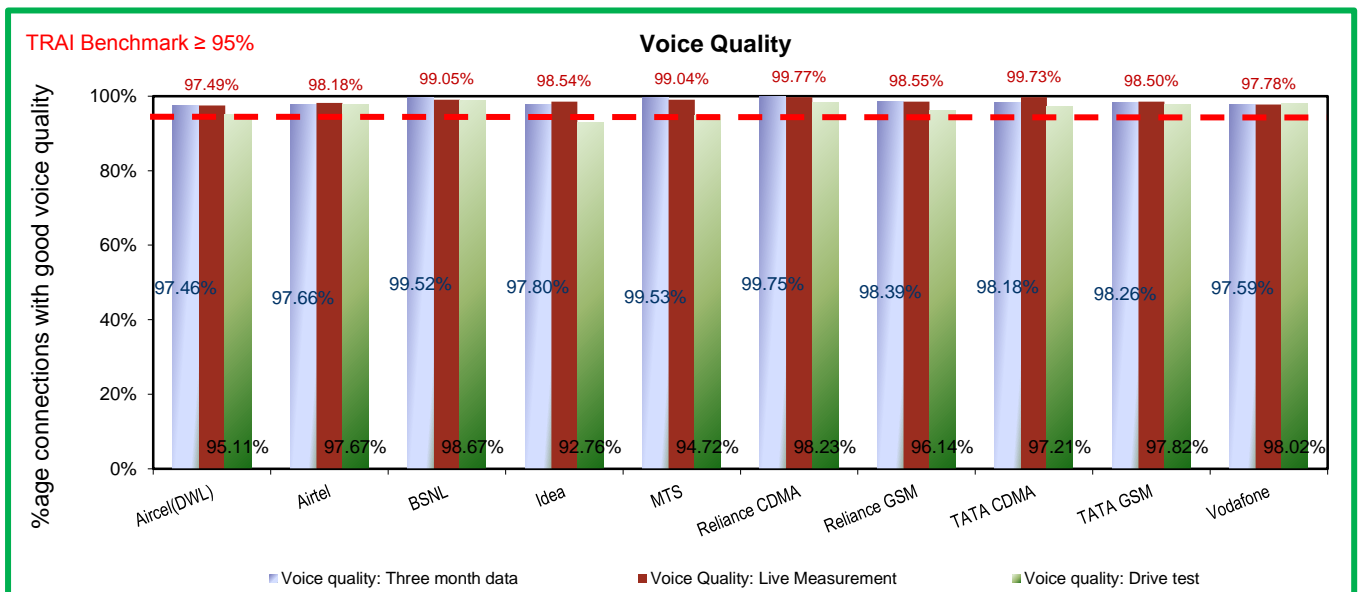
All the operators are meeting the benchmark.

6   DETAILED FINDINGS – NON NETWORK PARAMETERS

6.1   BILLING DISPUTES-POSTPAID

TATA GSM is not meeting the benchmark on the aspects of billing disputes –postpaid.

6.2   RESOLUTION OF BILLING COMPLAINTS
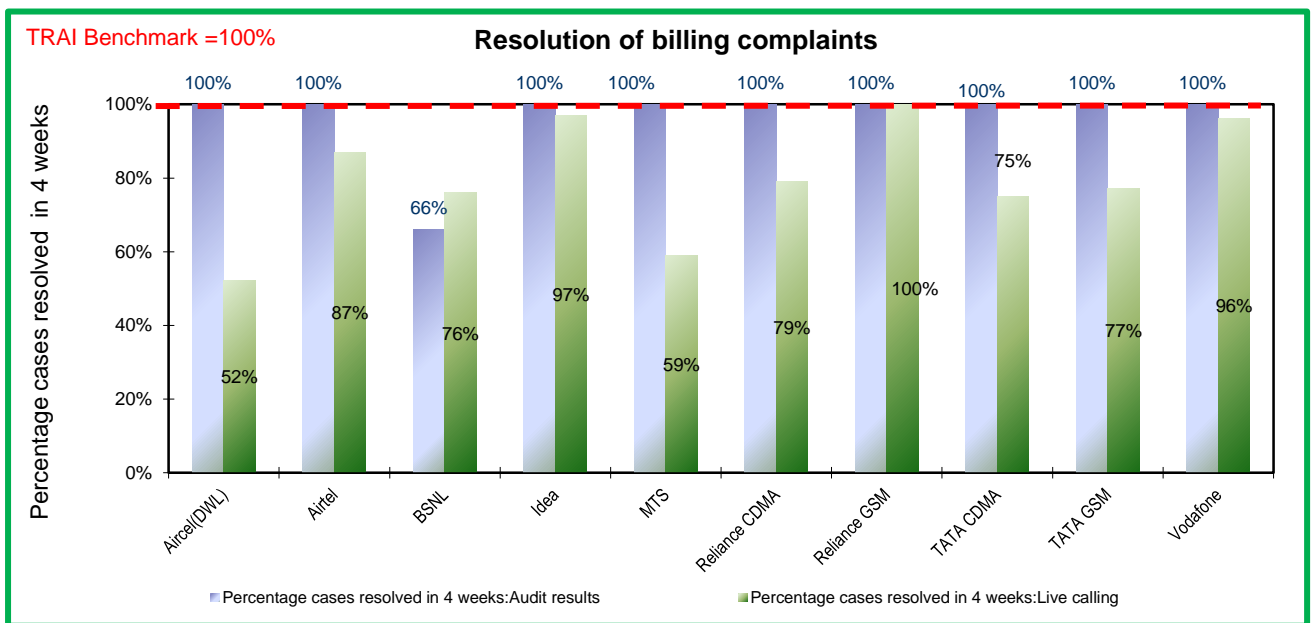
As per the operators all the complaints were resolved in 4 weeks' time however as per customers none of the operators are meeting the benchmark.

6.3 PERIOD OF APPLYING CREDIT/WAVIER
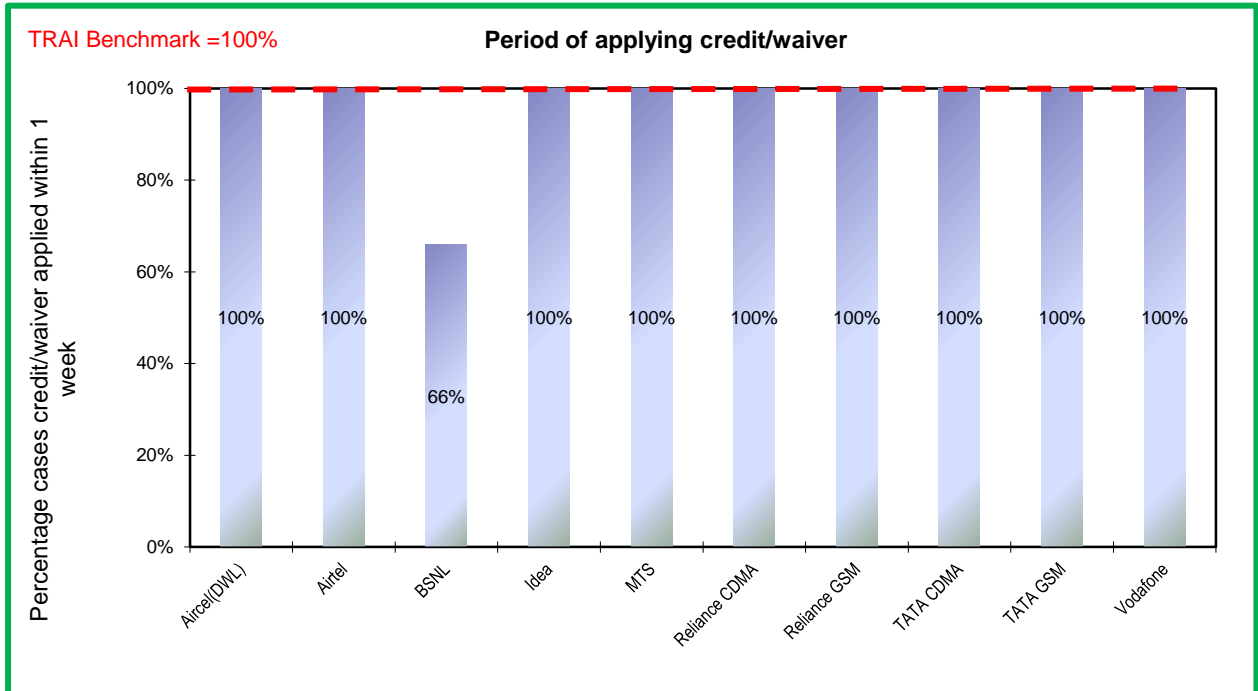
As per the operators meet the benchmark except for BSNL.

6.4 CALL CENTRE PERFORMANCE-IVR
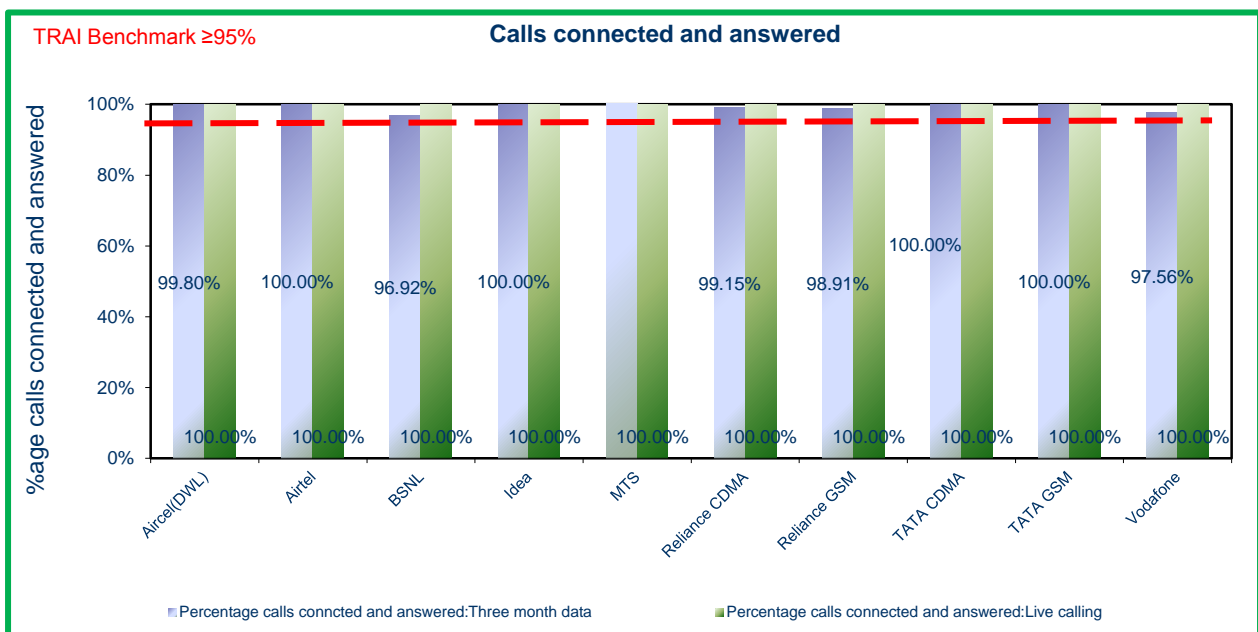
All the operators meet the benchmark. IVR has 100% connectivity across operators.

6.5 CALL CENTRE PERFORMANCE-VOICE TO VOICE
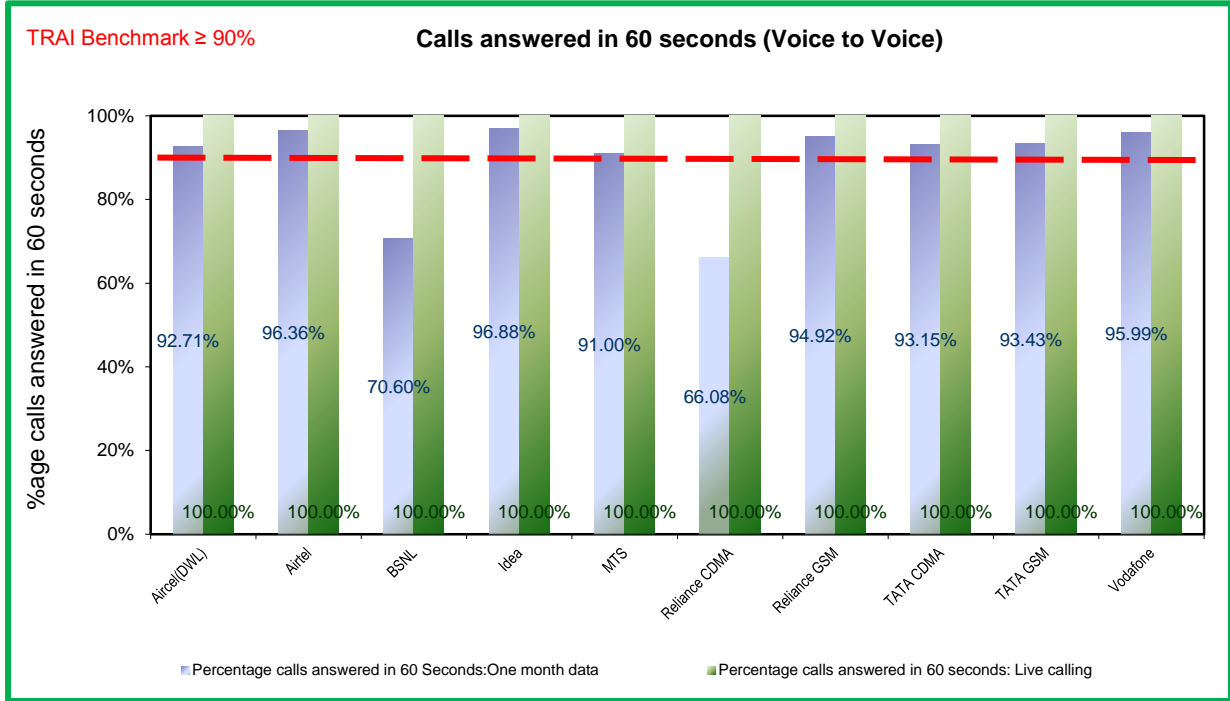
BSNL and Reliance CDMA are not meeting the benchmark on the aspect of call answered in 60 seconds.

6.6 TERMINATION/CLOSURE OF SERVICE
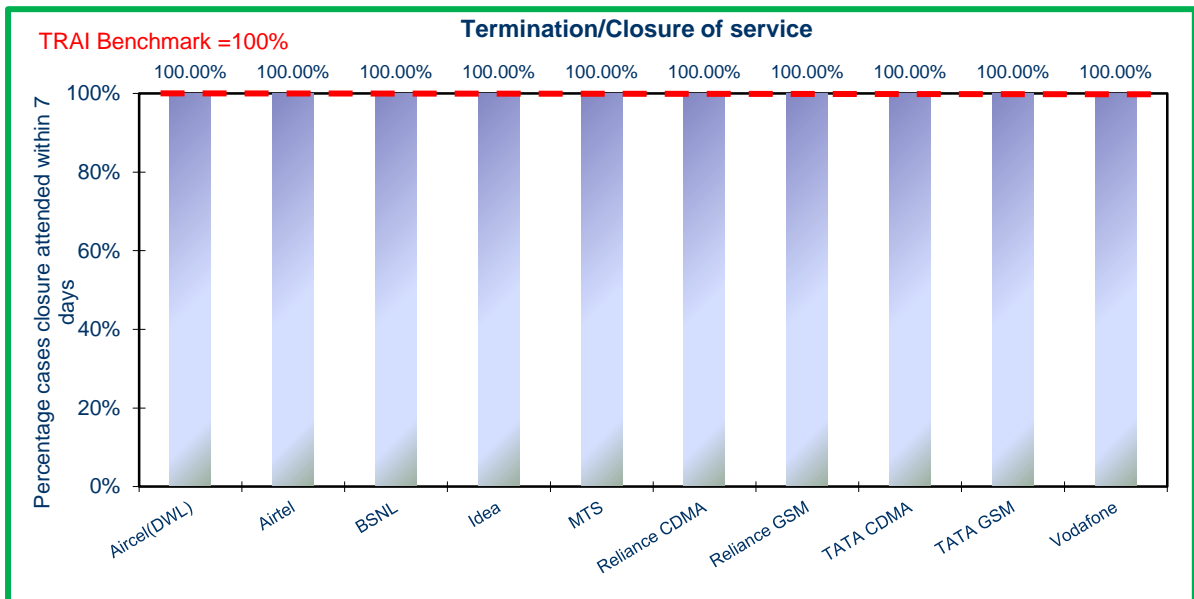
All the operators meet the benchmark on the aspect of closure of services in 7 days

6.7   REFUND OF DEPOSITS AFTER CLOSURE
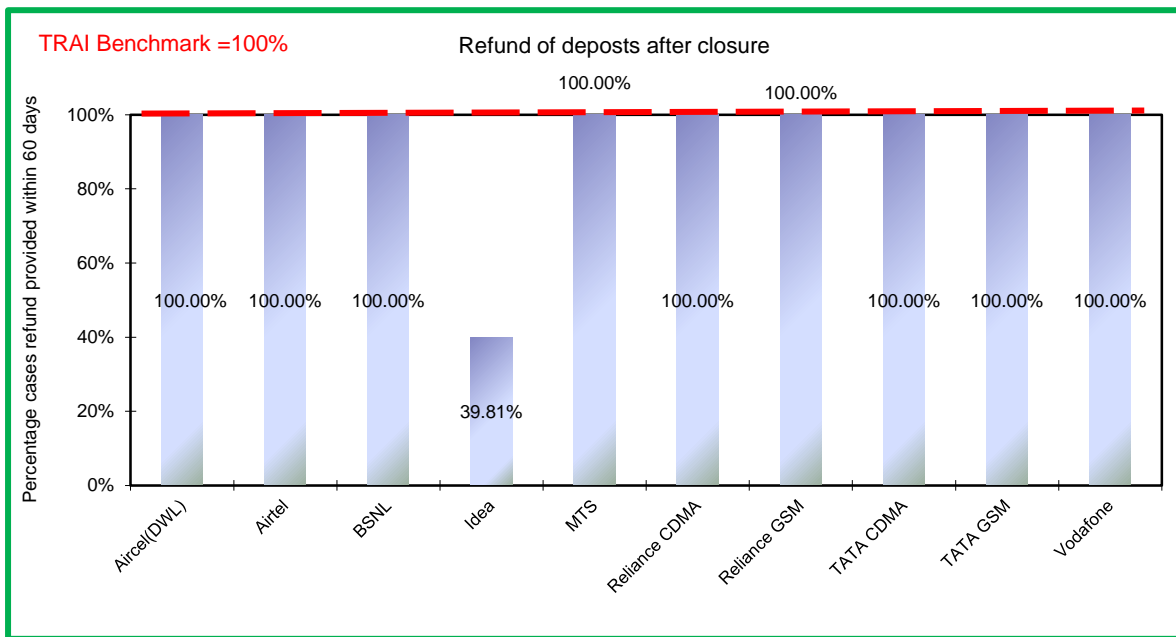
Idea being the only operator which does not meet the benchmark for refund of deposits within 60 days post closure of service.

6.8   BILLING COMPLAINTS - PREPAID
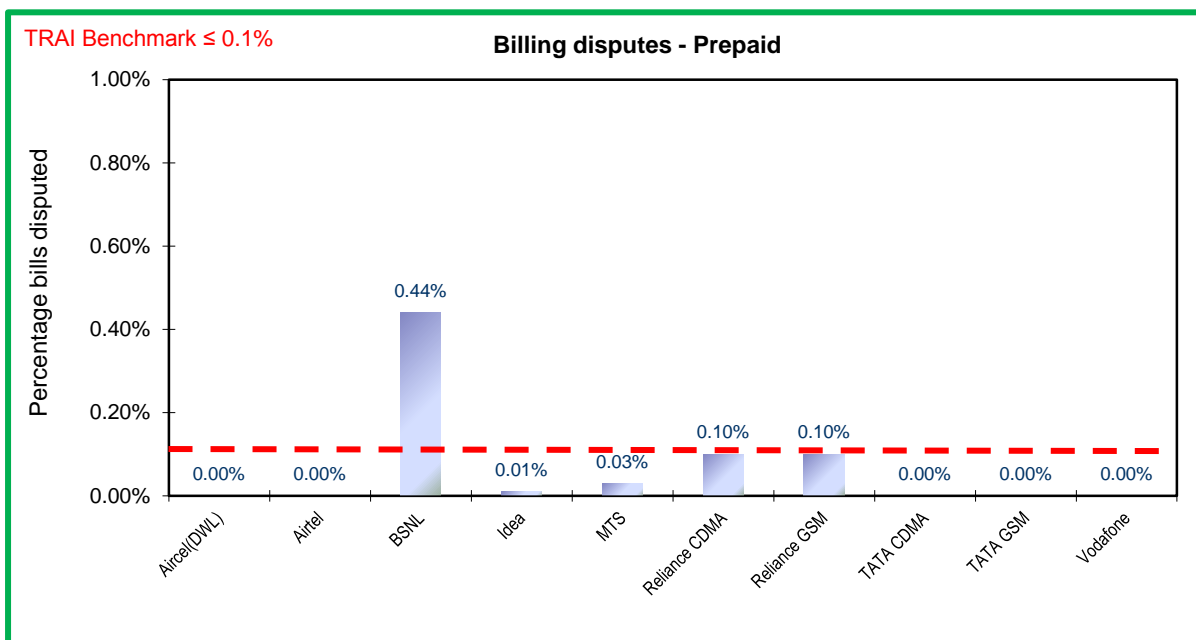
BSNL, Reliance and Vodafone are not meeting the benchmark on the aspect of billing disputes complaints for metering, charging, credit and validity.

7 ANNEXURE

7.1 BILLING

Billing Performance	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Billing diputes - Postpaid											
Total bills generated during the period		16666	377776	308549	40106	45176	182334	97199	369614	82000	2378160
Total number of bills disputed		8	51	284	32	42	173	91	238	140	424
Percentage bills disputed	≤ 0.1%	0.05%	0.01%	0.09%	0.08%	0.09%	0.09%	0.09%	0.06%	0.17%	0.02%
Billing diputes - Prepaid											
Number of complaints related to charging, credit & validity		1	87	9470	268	234	2212	50	20	69	2927
Total number of prepaid customers in that period		2454817	3399175	2141414	2450212	748628	2220827	51569.2	1277555	7847488	2927
Percentage of complaints	≤ 0.1%	0.00%	0.00%	0.44%	0.01%	0.03%	0.10%	0.10%	0.00%	0.00%	0.00%
Resolution of billing complaints											
Total number of billing/charging complaints		9	138	9754	300	276	2385	5183	258	209	NA
Total complaints considered invalid		2496	3582	8041	1827	62	42	0	243	204	NA
Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1		9	138	1129	300	276	2343	5183	258	209	NA
Percentage complaints resolved within 4 weeks of date of receipt	100%	100%	100%	66%	100%	100%	100%	100%	100%	100%	100%
Period of applying credit / waiver											

Total number of complaints where credit/waiver is required		25	138	1713	300	214	2343	5183	15	5	2204
Percentage cases in which credit/waiver was received within 1 week	100%	100%	100%	66%	100%	100%	100%	100%	100%	100%	100%

Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls made		23	100	100	100	100	100	100	20	57	100
Number of cases resolved in 4 weeks		12	87	76	97	59	79	100	15	44	96
Percentage cases resolved in four weeks	100%	52%	87%	76%	97%	59%	79%	100%	75%	77%	96%

Live calling for level 1 services

Level 1 services		Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total no. of calls made		150	150	150	150	150	150	150	150	150	150
Calls answered in 60 sec		150	150	150	150	150	150	150	150	150	150
Percentage call answered		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Live calling results for resolution of service requests

Resolution of service requests	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls made		100	100	100	100	100	100	100	100	100	100
Number of cases resolved to satisfaction		79	86	83	81	74	61	69	86	71	89

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Percentage cases resolved in four weeks		79%	86%	83%	81%	74%	61%	69%	86%	71%	89%

7.2   CUSTOMER CARE

8. Customer Care

Audit results for customer care (IVR and voice-to-Voice)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of call attempts to customer care for assistance		5927685	327520	1290500	3467648	79129	1951260	5200280	149839	1024697	170974
Number of calls getting connected and answered (electronically)		5915593	327520	1250816	3467648	293288	1934635	5143694	149839	1024697	166795
Percentage calls getting connected and answered	≥ 95%	99.80%	100.00%	96.92%	100.00%	370.65%	99.15%	98.91%	100.00%	100.00%	97.56%
Number of calls getting transferred to the operator (voice to voice)		1629951	863487	971253	1425856	NA	16625	56586	147819	1006149	NA
Number of calls answered by operator (voice to voice) within 60 seconds		1511139	832025	685686	1381369	NA	10985	53709	137688	940022	NA

Percentage calls answered within 60 seconds (V2V)	≥ 90%	92.71%	96.36%	70.60%	96.88%	91.00%	66.08%	94.92%	93.15%	93.43%	95.99%

Live calling results for customer care (IVR)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of call attempts to customer care for assistance		100	100	100	100	100	100	100	100	100	100
Number of calls getting connected and answered (electronically)		100	100	100	100	100	100	100	100	100	100
Percentage calls getting connected and answered	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls received		100	100	100	100	100	100	100	100	100	100
Total Number of calls getting connected and answered		100	100	100	100	100	100	100	100	100	100
Percentage calls getting connected and answered	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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7.3 TERMINATION/CLOSURE OF SERVICE

Audit results for termination / closure of service

Termination	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of closure request		161	1816	4642	1500	1174	1299	3207	4102	854	15745
Number of requests attended within 7 days		161	1816	4642	1500	1174	1299	3207	4102	854	15745
Percentage cases in which termination done within 7 days	100%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

7.4 REFUND

10. Time taken for refund of deposits after closure

Audit results for refund of deposits

Refund	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of cases requiring refund of deposits		68	262	101	211	NA	1299	3207	72	196	49
Total number of cases where refund was made within 60 days		68	262	101	84	NA	1299	3207	72	196	49

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Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	100.00%	39.81%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

7.5   ADDITIONAL NETWORK RELATED PARAMETRS

11. Additional Network Related parameters											
Audit Results for Total Traffic Handled in Erlang											
Traffic in Erlang		Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Eqipped capacity of the network		77526	119435.53	112000	49097	50400	56000	88000	19532	87769.262	124312
Total taffic handled in erlang during TCBH		64247	83365.37	54483	28586	20164	33178.72	44391.99	4023	40972.497	101219

Total number of customers as per VLR											
		Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total no. of customers served (as per VLR)		1934850	3631782	751553	1219195	637824	1120195	2605334	113085	1797962	4241588

Audit Results for POI Congestion

POI congestion	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of working POIs		40.0	31.0	95.0	78.0	44.3	12.0	21.0	66.3	43.7	40.0
No. of POIs not meeting benchmark		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Capacity of all POIs (A) - in erlangs		46013.3	76035.8	577990.5	48347.0	30569.7	8122.0	10439.0	34904.6	25870.7	1882228.3

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	Benchmark										
Traffic served for all POIs (B)- in erlangs		27108.1	36739.3	13664.3	19567.3	10857.0	4530.3	5651.0	13274.2	9536.7	851350.3
POI congestion	≤ 0.5%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Live Measurement Results for POI Congestion

POI congestion	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of working POIs		40.0	31.0	100.0	77.3	44.3	#DIV/0!	21.0	41.0	43.3	40.0
No. of POIs not meeting benchmark		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Capacity of all POIs (A) - in erlangs		44559.8	228445.7	538919.0	48949.0	31667.5	8122.0	10439.0	19385.1	25726.0	288644.0
Traffic served for all POIs (B)- in erlangs		25267.4	108839.2	12760.7	20369.0	10680.0	5111.7	5541.7	7257.6	11277.5	136509.0
POI congestion	≤ 0.5%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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