

Objective Assessment of Quality of Services for (QoS) for Cellular Mobile (Wireless) Service Providers

Bihar Circle

Report: April – May - June, 2012



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Preface

TRAI, the regulatory watch dog for the Quality of Service for the telecom services – Basic (Wireline), Cellular Mobile (Wireless) and Broadband has commissioned this study with the objective of measuring Quality of Services under the parameters as per the published notifications.

The Audit module would assess the Quality of Service of telecom operators Basic (Wireline), Cellular Mobile (Wireless) and Broadband services) by auditing the service level records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI.

The Audit module for various circles within the Zones, due the sheer scale of data collection, has been distributed across various quarterly periods. IMRB International Auditors carried out Audits across Orissa, Bihar & Jharkhand, West Bengal, North-East, Assam and Kolkata circles in the second quarter of 2012. **This report details the performance of various service providers in Bihar circle against Quality of Services benchmarks for various parameters laid down by TRAI in respective regulations for Cellular (Mobile) services.**

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1.0 Background

The Telecom Regulatory Authority of India (TRAI) has a critical mandate to protect the interest of telecom consumers in addition to various other functions bestowed upon it. As part of the license conditions to telecom operators, it has the power and authority to measure the Quality of Service provided by various govt. (BSNL & MTNL) and private telecom operators. The parameters that need to be measured for Basic (Wireline) and Cellular Mobile (Wireless) services have been specified in the TRAI notification on Quality of Services of Basic (Wireline) and Cellular Mobile (Wireless) services dated 20th March, 2009. The parameters for Broadband Service have been specified in the TRAI notification for Quality of Services of Broadband Service Regulation, 2006

Audit module: To assess the quality of service of telecom operators Basic (Wireline), Cellular Mobile (Wireless) and Broadband services by auditing the service level records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI

This report highlights the findings for the Audit module for Bihar circle that was covered in period of April - June 2012. The verification of records maintained by various operators of Cellular Mobile (Wireless) service was undertaken by the auditors of IMRB International during the period April - June 2012.



***This report
highlights the Audit
Module findings for
Bihar circle for
Cellular Mobile
services***

2.0 Objectives and Methodology

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). Following are the key activities undertaken by Auditors during the Audit process conducted at the operator’s premises



All Network related and Non network related parameters notified by TRAI in various regulations were Audited

- 1. Verification of the data submitted by service providers:** This involved verification of the quarterly Performance Monitoring Reports (PMR's) and monthly Point of Interconnect (POI) Congestion reports being submitted by various service providers. The raw data in the records maintained by service providers was audited to assess the book keeping methodology.
- 2. Live measurement for three days:** Network performance of service providers was assessed for three days in the month in which the Audit was carried out. Live figures from the server/ NMS software were recorded for various network related parameters.
- 3. Data verification for the month in which Audits were carried out:** Subsequent to the visits for Audit during the live measurement at various Exchanges/ISP Nodes/Exchanges, data for all the network and Non network related parameters was collected from various service providers for the complete month in which the Audit was carried out. Raw data/records pertaining to these were also verified on sample basis to check the veracity of data provided by the operators.
- 4. Drive tests:** Operator assisted drive test were conducted in three cities as per the norms stated in the tender.
- 5. Live calling:** Live testing was done on a sample basis to check efficiency of various parameters

- Any changes or discrepancies found in the methodology were reported to the service providers and changes were suggested by IMRB Auditors.
- PMR verification was done as per the new parameters being reported to TRAI by all operators.
- Live measurement and 1 month data collection was done as per the new regulations published by TRAI on 20th March, 2009.

3.0 Sampling methodology

3.1 Sampling for Cellular Mobile (Wireless) service providers

Data pertaining to 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centers (MSC's) of all the Cellular Mobile Service Providers or Unified Access Service Providers (UASP) was collected and verified in specified circles/service areas. Following are the various operators covered in Bihar circle

	Name of Operator	Audit Month
Operator 1	Idea	June, 2012
Operator 2	BSNL	June, 2012
Operator 3	Reliance CDMA	May, 2012
Operator 4	Videocon	May, 2012
Operator 5	MTS	May, 2012
Operator 6	Airtel	May, 2012
Operator 7	Uninor	May, 2012
Operator 8	Vodafone	June, 2012
Operator 9	Tata Tele – CDMA	June, 2012
Operator 10	Tata Tele – GSM	June, 2012
Operator 11	Aircel	May, 2012
Operator 12	Smart (Reliance GSM)	May, 2012

4.0 Audit methodology

4.1 Cellular Mobile Services

In a nutshell the following activities were done while auditing for various parameters for Cellular Mobile Services:

S.no	Parameter	AS REPORTED IN PMR	AS FOUND IN ACTUAL RECORDS AFTER VERIFICATION	AS FOUND IN VERIFICATION FOR THE MONTH OF AUDIT	AS FOUND IN 3 DAY LIVE MEASUREMENT DATA	LIVE CALLING	OPERATOR ASSISTED DRIVE TESTS	INDEPENDENT DRIVE TESTS
A	Network Performance							
A (i)	BTS accumulated down time	Yes	Yes	Yes				
A (ii)	Call setup success rate (within licensee own network)	Yes	Yes	Yes	Yes		Yes	Yes
A (iii)	Blocked Call Rate	Yes	Yes	Yes	Yes		Yes	Yes
A (iv)	Call Drop rate	Yes	Yes	Yes	Yes		Yes	Yes
A (v)	% Connections with good voice quality	Yes	Yes	Yes			Yes	Yes
A (vi)	Service Coverage	Yes	Yes	Yes			Yes	Yes
A (vii)	PoI Congestion	Yes	Yes	Yes				
B	Customer Helpline							
B (i)	Response time to the customer for assistance	Yes	Yes	Yes		Yes		
C	Billing Complaints							
C (i)	Billing complaints per 100 bills issued	Yes	Yes	Yes				
C (ii)	%age of billing complaints resolved within 4 weeks	Yes	Yes	Yes		Yes		
C (iii)	Period of all refunds/payments due to customers from date of resolution as in (ii) above	Yes	Yes	Yes		Yes		

5.0 Executive Summary

The objective assessment of Quality of Services (QoS) was carried out by IMRB International for all the Cellular mobile service providers during the period starting from April 2012 to June 2012 in Bihar circle. The executive summary encapsulates the key findings of the Audit

5.1 Service provider performance report based on one month data verification: Cellular Mobile Services

Name of Service Provider	Time Consistent Busy Hour (TCBH)	Network Availability					Connection Establishment (Accessibility)			Connection Maintenance (Retainability)				POI		Network Traffic Capacity and Utilization			
		Total no. of BTSs in the licensed service area	Sum of downtime of BTSs in a month i.e. total outage time of all BTSs in hours during a month	BTSs Accumulated downtime (not available for service) (%age)	No. of BTSs having accumulated downtime of >24 hours in a month	Worst affected BTSs due to downtime (%age)	Call Set-up Success Rate (within licensee's own network)	SDCCH/Paging Chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Total No. of cells exceeding 3% TCH drop (call drop)	Total no. of cells in the network	Worst affected cells having more than 3% TCH drop (call drop) rate (%age)	%age of connection with good voice quality	POI Congestion (No. of POIs not meeting the benchmark) Note :2)	Total number of working POI Service Area wise	Equipped Capacity of Network in respect of Traffic in erlang	Total traffic handled in TCBH in erlang	Total no. of customers served (as per VLR) on last day of the month
Benchmark				≤ 2%		≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%			≤ 3%	≥ 95%	≤ 0.5%				
Idea	20:00 to 21:00 hrs	5177	36007	0.93%	96	1.85%	97.95%	0.90%	1.82%	1.38%	427	15563	2.74%	95.31%	0	77	154128	154234	5600412
BSNL	19:00 to 20:00 hrs	3333	98259	3.96%	175	5.25%	88.79%	8.17%	3.87%	10.60%	373	9094	4.10%	96.00%	0	145	218600	142142	2372303
Reliance CDMA	19:00 to 20:00 hrs	1845	2532	0.18%	16	0.87%	98.97%	0.00%	0.70%	0.55%	21	5535	0.38%	99.59%	0	30	174000	98189	2493988
Videcon	19:00 to 20:00 hrs	52	143	0.37%	0	0.00%	99.22%	0.15%	0.05%	0.82%	0	160	0.00%	97.08%	0	10	10000	2	313
MTS	19:00 to 20:00 hrs	1390	10963	1.06%	4	0.29%	99.60%	0.00%	0.17%	0.83%	107	4265	2.51%	97.18%	0	50	65835	25639	619528
Airtel	20:00 to 21:00 hrs	7414	11235	0.20%	34	0.46%	99.18%	0.18%	0.40%	0.42%	300	21945	1.37%	99.14%	0	48	644593	533472	17591269
Uninor	20:00 to 21:00 hrs	2348	29782	1.70%	41	1.75%	97.98%	0.44%	1.37%	1.40%	165	7064	2.34%	95.86%	0	89	101574	87084	2022242
Vodafone	20:00 to 21:00 hrs	6876	32689	0.64%	132	1.92%	94.94%	1.39%	3.07%	1.69%	2598	20531	12.65%	96.74%	0	50	223652	194764	6092932
Tata Tele – CDMA	19:00 to 20:00 hrs	1030	260	0.03%	0	0.00%	98.60%	0.00%	0.26%	0.74%	39	3144	1.24%	99.75%	0	213	291879	48089	854145
Tata Tele - GSM	19:00 to 20:00 hrs	2132	109	0.01%	0	0.00%	98.75%	0.04%	0.15%	0.75%	104	6390	1.63%	97.82%	0	31	93999	37619	1595496
Aircel	20:00 to 21:00 hrs	3524	32096	1.22%	56	1.59%	98.22%	0.25%	1.27%	1.16%	422	10503	4.02%	95.63%	0	136	199160	62683	2441023
Smart (Reliance GSM)	19:00 to 20:00 hrs	3812	1808	0.06%	3	0.08%	98.82%	0.10%	0.10%	0.52%	2	11436	0.02%	98.50%	0	22	187000	120404	4859030

*Details pertaining to these are obtained through operator done drive tests. Results of the operator assisted drive tests are explained in detail in critical findings

** Methodology not in line with QoS

■ Figures provided on All India basis

■ Not meeting the benchmark

B'mark = TRAI Benchmark, DNA = Details not available, NA: Not Applicable

Critical findings: Cellular Mobile Services

The audit for cellular mobile service providers were conducted at their respective MSCs in the Bihar circle apart from Reliance Communication whose audit was conducted at their central NOC at Mumbai.

The audit involved a three stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. Finally basis the three day live measurement the auditors needed to find out the busy hour for the service provider and collect the hourly data for this busy hour for the month in which the audit was conducted.

Busy Hour of Various Service Providers

Service Provider	Reported Time Consistent Busy Hour	Network Busy Hour found in 3 day live measurement
Idea	20:00 to 21:00 hrs	20:00 to 21:00 hrs
BSNL	19:00 to 20:00 hrs	19:00 to 20:00 hrs
Reliance CDMA	19:00 to 20:00 hrs	19:00 to 20:00 hrs
Videocon	19:00 to 20:00 hrs	19:00 to 20:00 hrs
MTS	19:00 to 20:00 hrs	19:00 to 20:00 hrs
Airtel	20:00 to 21:00 hrs	20:00 to 21:00 hrs
Uninor	20:00 to 21:00 hrs	20:00 to 21:00 hrs
Vodafone	20:00 to 21:00 hrs	20:00 to 21:00 hrs
Tata Tele – CDMA	19:00 to 20:00 hrs	19:00 to 20:00 hrs
Tata Tele - GSM	19:00 to 20:00 hrs	19:00 to 20:00 hrs
Aircel	20:00 to 21:00 hrs	20:00 to 21:00 hrs
Smart (Reliance GSM)	19:00 to 20:00 hrs	19:00 to 20:00 hrs

The TCBH reported by all the service providers matched the network busy hour calculated by IMRB auditors for the Bihar circle.

BTs Accumulated Downtime:

In the Bihar circle, BSNL was not meeting the benchmark with a BTs accumulated downtime of 3.96%, rest all operators were meeting the benchmark.

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter except for BSNL with 88.79% and Vodafone slightly missing the benchmark with 94.94% respectively. During the audits the maximum CSSR was observed for MTS with 99.6% 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 except BSNL and Vodafone for SDCCH / Paging Channel Congestion and Traffic channel congestion were meeting the TRAI specified benchmarks on the congestion parameters. BSNL and Vodafone do not meet the TRAI specified benchmark with a SDCCH / Paging Channel Congestion of 8.17% and 1.39% and Traffic Channel congestion 3.87% and 3.07% respectively. 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. When the value of this parameter is less than 100%, it is counted as 0% congestion. There were no POIs with congestion more than the benchmark ($\leq 0.5\%$)

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 except for BSNL which had a high call drop rate of 10.6%.

Connections with good voice quality:

All the operators are measuring this parameter via their periodic drive tests. However, for some operators these parameters can be obtained at their switch as well. During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines.

Customer Care / Helpline Assessment

For the accessibility of customer care aspect all the service providers meet the TRAI benchmark.

Billing performance

All the operators were found to be meeting the benchmark of $\leq 0.1\%$ complaints registered per 100 bills issued and the benchmark of 100% billing complaints being resolved within 4 weeks. In all cases where customers were due for refund, all the service providers were meeting the TRAI benchmark of 100% with 1 week.

Inter operator calls assessment

Inter operator call Assessment To↓ From→	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Idea	NA	100%	100%	88%	95%	94%	95%	95%	97%	99%	99%	96%
BSNL	100%	NA	98%	97%	92%	92%	99%	98%	100%	100%	99%	97%
Reliance CDMA	100%	100%	NA	90%	94%	90%	90%	99%	96%	99%	98%	75%
Videocon	100%	NA	100%	NA	98%	94%	63%	99%	99%	100%	100%	95%
MTS	100%	99%	100%	94%	NA	93%	100%	100%	93%	97%	100%	100%
Airtel	100%	99%	99%	95%	95%	NA	92%	100%	100%	97%	100%	99%
Uninor	100%	97%	99%	79%	91%	89%	NA	100%	95%	95%	100%	100%
Vodafone	100%	100%	100%	97%	93%	84%	98%	NA	97%	99%	98%	91%
Tata Tele - CDMA	99%	96%	95%	96%	100%	98%	99%	99%	NA	99%	100%	97%
Tata Tele - GSM	100%	99%	89%	91%	100%	96%	99%	100%	99%	NA	97%	95%
Aircel	100%	99%	98%	99%	94%	88%	99%	100%	97%	100%	NA	96%
Smart (Reliance GSM)	99%	95%	87%	90%	98%	98%	98%	98%	100%	98%	99%	NA



The maximum problem faced by the calling operator to other operators

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. Uninor faced difficulty in connecting to a Videocon number with only 63% of calls getting connected. Further, Reliance GSM also found it difficult to connect with RCOM CDMA as only 75% of calls got connected.

Operator	Date	Location
Idea	5 th June, 2012	Patna
BSNL	5 th June, 2012	Patna
Reliance CDMA	16 th May, 2012	Patna
Videocon	17 th May, 2012	Patna
MTS	17 th May, 2012	Patna
Airtel	22 nd May, 2012	Patna
Uninor	22 nd May, 2012	Patna
Vodafone	6 th June, 2012	Patna
Tata Tele – CDMA	4 th June, 2012	Patna
Tata Tele – GSM	4 th June, 2012	Patna
Aircel	28 th May, 2012	Patna
Smart (Reliance GSM)	29 th May, 2012	Patna

Results of Operator assisted Drive test

The drive test was conducted simultaneously for all the operators present in the Bihar circle. There was in total of three drive tests conducted in the circle. These tests were conducted in the cities of Siwan, Patna, & Ranchi. IMRB auditors were present in vehicles of every operator. A sample of 15 – 30 test calls were made along each of the routes. The holding period for all test calls was between 120 seconds to 180 seconds. The drive test vehicle across all routes plied at a speed of less than 20 km per hour. Taking into consideration the route that was taken for the drive test; most of the major areas Bihar telecom circles were covered.

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 dms for in-vehile and > -95 dbm outdoor routes.

The drive tests in the Bihar circle were conducted in the cities of Siwan, Patna, & Ranchi was conducted along the following route:

	Type of location	Siwan	Patna	Ranchi
Outdoor	Periphery of the city	Babunia mode, Station, Renuwal bypass, D.P.R. College, Gopalganj Mode, J P Chowk, Hospital Mode	Gandhi Maidan to Saguna More via Kurji and Danapur	Namkum, Kantatoli, Kakar, Bootymore, Bariyatu, Rajbhawan, Premsons motors
	Congested area	Hasanpura Stand, Vishal Mega, Mouleshri Chowk, Reg Kachari, J.P Chowk, Malbia Chowk	Gai Ghat to Gandhi Maidan Via Mahendru	Kantatoli, Bahu Bazar, Sujata Chowk, Firayalal chowk, Sahid chowk, Kuchery, Ratu Road, Metro Gali
	Across the city	Babunia Mode, Station, Ander Mode, D.A.Medical College	Saguna More to Agam Kuan by pass more via IT crossing and Rajendra Nagar	Kuchery, Jail Road, Firayalal Chowk, Lalpur, Kokar Chowk
Indoor	Office complex	Railway Station	Maurya Lok Complex	Hari Om Tower - Vodafone customer care office
	Shopping complex	Hotel Prakash (Canara Bank)	P&M Mall(Patliputra)	Sanik Market

The tables given below gives a glimpse of the results of the operator assisted drive test:

Drive Test – Siwan

	B'mark	Idea		BSNL		Reliance CDMA		MTS		Airtel		Uninor		Vodafone		Tata Tele - CDMA		Aircel		Smart (Reliance GSM)	
		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%	98.03%	96.58%	95.01%	91.86%	99.76%	99.20%	100.00%	99.50%	97.58%	96.77%	97.80%	96.25%	98.87%	97.71%	99.94%	99.92%	97.97%	97.88%	97.48%	96.07%
CSSR	≥ 95%	100.00%	100.00%	83.33%	94.67%	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%	99.47%
%age Blocked calls		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%	0.70%	0.00%	0.00%	0.00%	1.33%	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%	98.86%	93.57%	100.00%	100.00%	100.00%	100.00%	100%	100.00%	100%	100.00%	100.00%	100.00%	100.00%	100%	100.00%	100.00%	100.00%	99.77%

Drive Test – Patna

	B'mark	Idea		BSNL		Reliance CDMA		MTS		Airtel		Uninor		Vodafone		Tata Tele - CDMA		Aircel		Smart (Reliance GSM)	
		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%	98.75%	96.74%	97.44%	96.03%	97.18%	95.92%	99.90%	99.25%	97.60%	96.52%	96.53%	95.08%	98.67%	96.61%	100.00%	98.91%	97.45%	95.68%	99.03%	95.65%
CSSR	≥ 95%	100.00%	100.00%	98.36%	92.26%	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%	98.77%
%age Blocked calls		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%	1.67%	0.70%	0.00%	0.63%	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%	100.00%	98.59%	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%

Drive Test – Ranchi

	B'mark	Idea		BSNL		Reliance CDMA		MTS		Airtel		Uninor		Vodafone		Tata Tele - CDMA		Aircel		Smart (Reliance GSM)	
		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%	97.46%	97.10%	96.06%	92.82%	100.00%	99.30%	99.91%	98.54%	98.11%	98.91%	98.43%	96.00%	98.65%	97.35%	99.99%	99.87%	99.11%	98.46%	95.52%	94.74%
CSSR	≥ 95%	100.00%	100.00%	100.00%	99.34%	100.00%	100.00%	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%	98.79%
%age Blocked calls		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%	0.67%	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%	1.23%
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%	99.64%

Not meeting the benchmark

Following were the areas where the signal strength was found to be inadequate for the operators:

ALL SERVICE PROVIDERS

Conclusions:

Drive test was conducted by IMRB with the help of service providers to measure this parameter. Following are the findings of the drive tests.

1. BSNL did not meet few of the drive test benchmarks across all three cities
2. Reliance GSM did not meet the voice quality benchmark by a slender margin in Outdoor area in Ranchi

Summary of Live Measurement Results – Cellular Mobile Services

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%
Idea	1.05%	0.04%	97.93%	0.82%	1.90%	1.33%	2.77%	95.74%
BSNL	1.93%	1.47%	88.23%	9.02%	3.82%	10.50%	4.01%	97.33%
Reliance CDMA	0.46%	0.00%	96.73%	0.00%	0.02%	0.06%	0.02%	99.80%
Videocon	0.53%	0.00%	98.89%	0.33%	0.00%	0.00%	0.00%	98.34%
MTS	1.33%	0.14%	99.53%	0.00%	0.02%	0.71%	2.41%	98.20%
Airtel	0.24%	0.00%	97.22%	0.86%	0.87%	0.94%	1.39%	99.54%
Uninor	1.01%	0.00%	97.91%	0.44%	1.37%	1.55%	2.46%	95.67%
Vodafone	0.63%	0.00%	94.98%	1.69%	2.69%	2.02%	13.97%	96.67%
Tata Tele - CDMA	0.05%	0.00%	99.10%	0.00%	0.03%	0.56%	0.64%	99.76%
Tata Tele - GSM	0.02%	0.00%	99.37%	0.13%	0.44%	0.82%	0.00%	97.66%
Aircel	0.53%	0.14%	99.16%	0.29%	0.50%	1.08%	2.53%	96.69%
Smart (Reliance GSM)	0.09%	0.00%	98.08%	0.07%	0.08%	0.51%	0.01%	DNP

DNP: Data not provided

■ Not meeting the benchmark

* Based on operator assisted drive tests conducted by IMRB

During the three day live measurement, all operators except BSNL and Vodafone were found to be meeting the TRAI benchmark on all the parameters. Further, both BSNL and Vodafone were found to be defaulting on all of Connection establishment and most of connection maintenance benchmarks

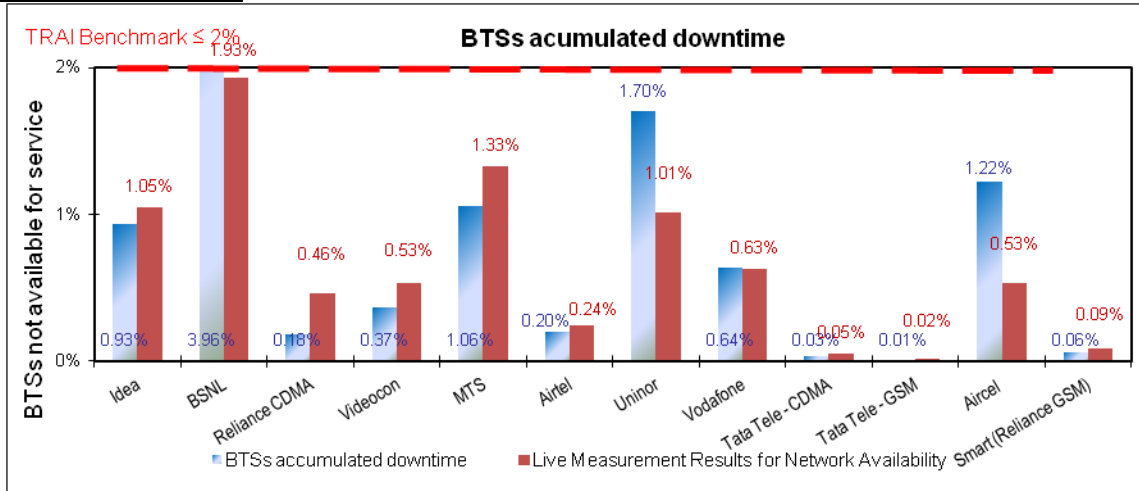
Summary of Live Calling Results – Cellular Mobile Services

Name of Service Provider	Metering and Billing	Response time to customer for assistance	
	%age complaints resolved within 4 weeks	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 60 seconds
Benchmark	100%	≥ 95%	≥ 90%
Idea	66.00%	100.00%	96.00%
BSNL	64.50%	100.00%	100.00%
Reliance CDMA	52.00%	100.00%	90.00%
Videocon	NA	100.00%	84.00%
MTS	NA	100.00%	80.00%
Airtel	67.00%	86.00%	80.00%
Uninor	56.00%	100.00%	59.00%
Vodafone	98.00%	100.00%	89.00%
Tata Tele - CDMA	77.00%	100.00%	100.00%
Tata Tele - GSM	NA	100.00%	NA
Aircel	98.00%	100.00%	87.00%
Smart (Reliance GSM)	52.00%	100.00%	94.00%

6.0 Detailed findings – Includes comparison between Live calling/Live measurements and One month data collection

6.1 Graphical/Tabular Representations for Cellular Mobile Services

BTSS Accumulated Downtime



One month

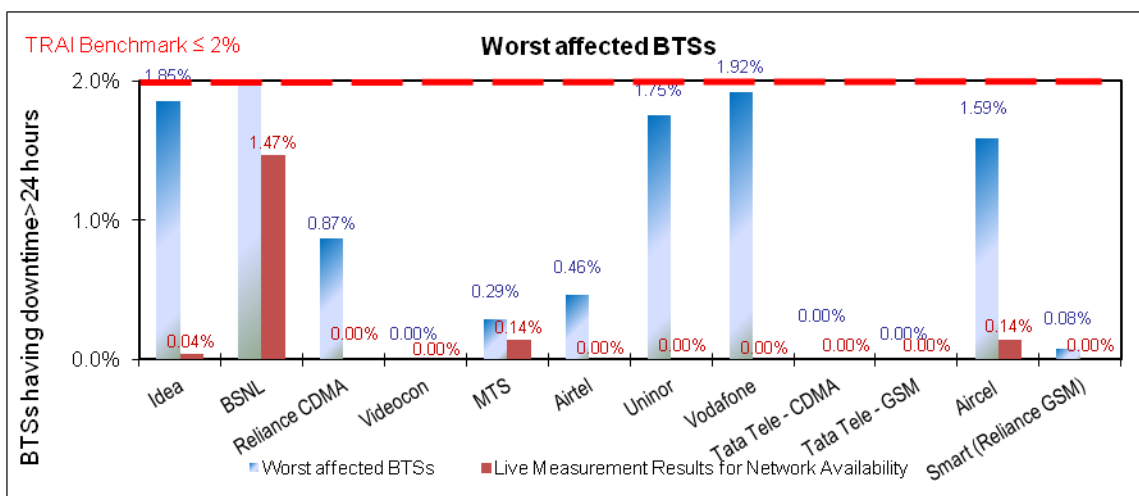
Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Vodafone, Tata Tele - CDMA, Tata Tele - GSM, Aircel, Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL

Live measurement

All the operators meet the benchmark

Worst Affected BTSS



One month

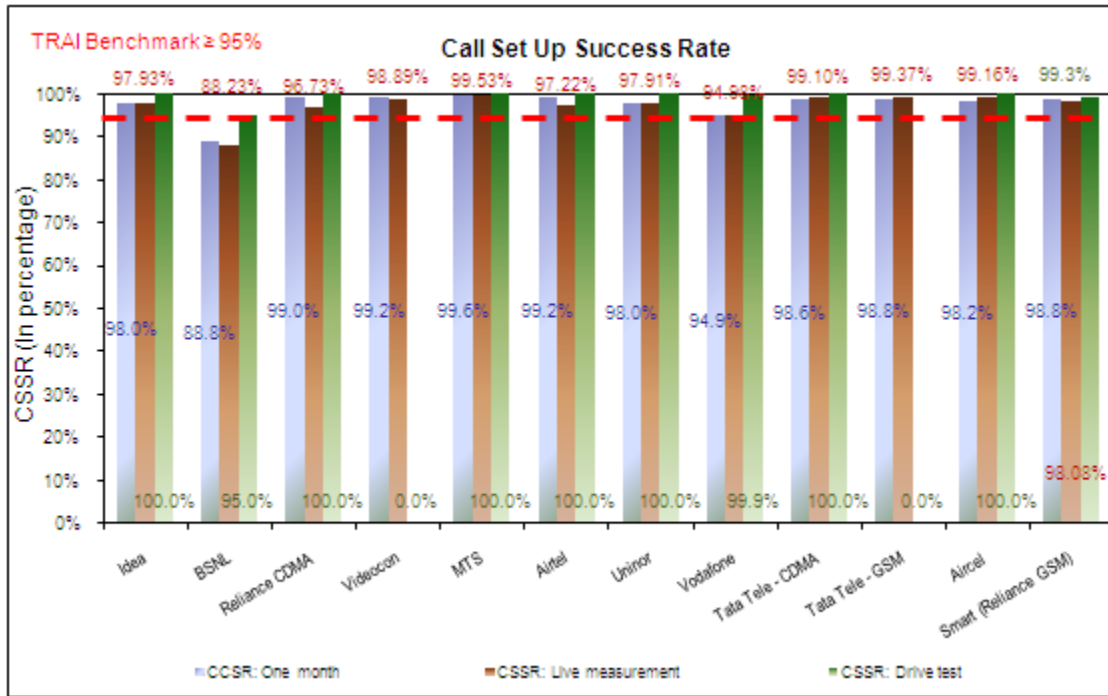
Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Vodafone, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL

Live measurement

All the operators meet the benchmark

Call Set-up Success Rate (CSSR)



One month

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL, Vodafone

Live measurement

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

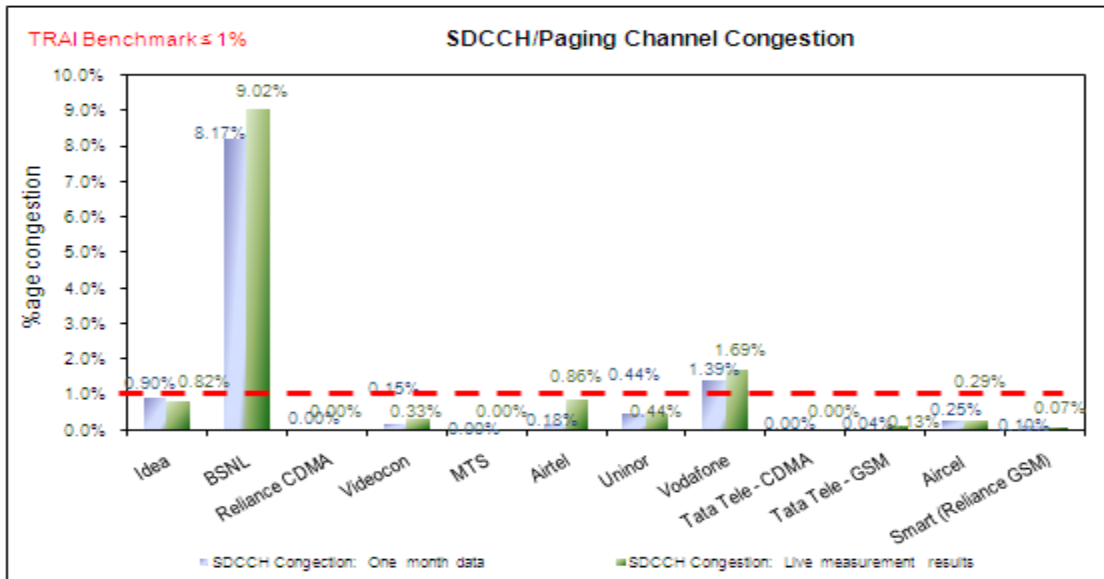
Operator(s) not meeting the benchmark: BSNL, Vodafone

Drive test

Operator(s) meeting benchmark: Idea, Reliance CDMA, MTS, Airtel, Uninor, Vodafone, Tata Tele - CDMA, Aircel, Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL

SDCCH / Paging Channel Congestion



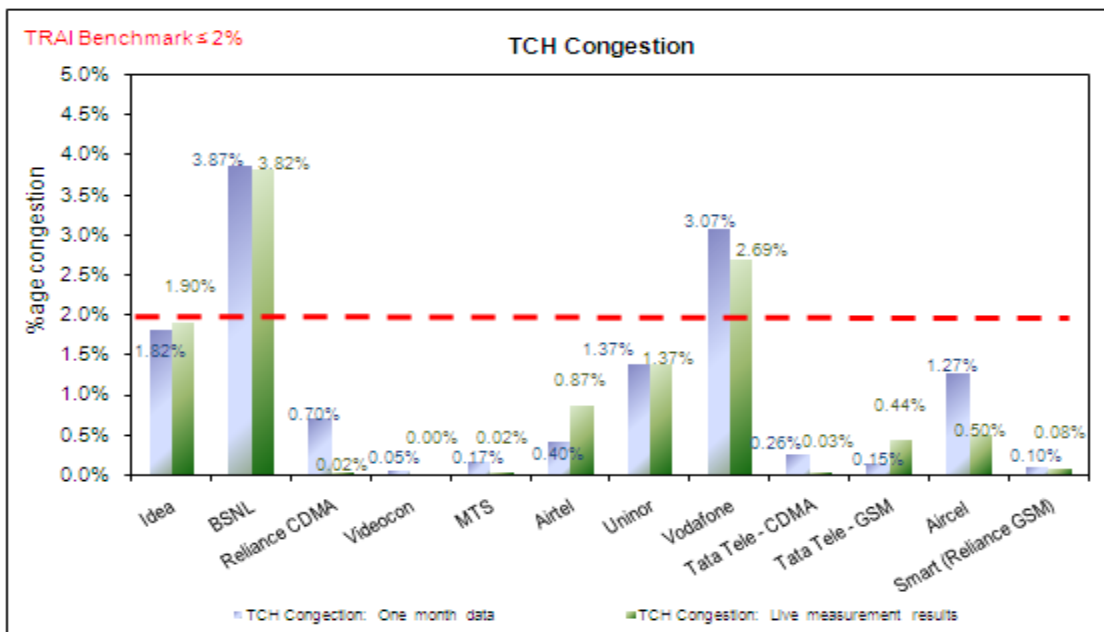
One month

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)
 Operator(s) not meeting the benchmark: BSNL, Vodafone

Live measurement

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)
 Operator(s) not meeting the benchmark: BSNL, Vodafone

TCH Congestion



One month

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

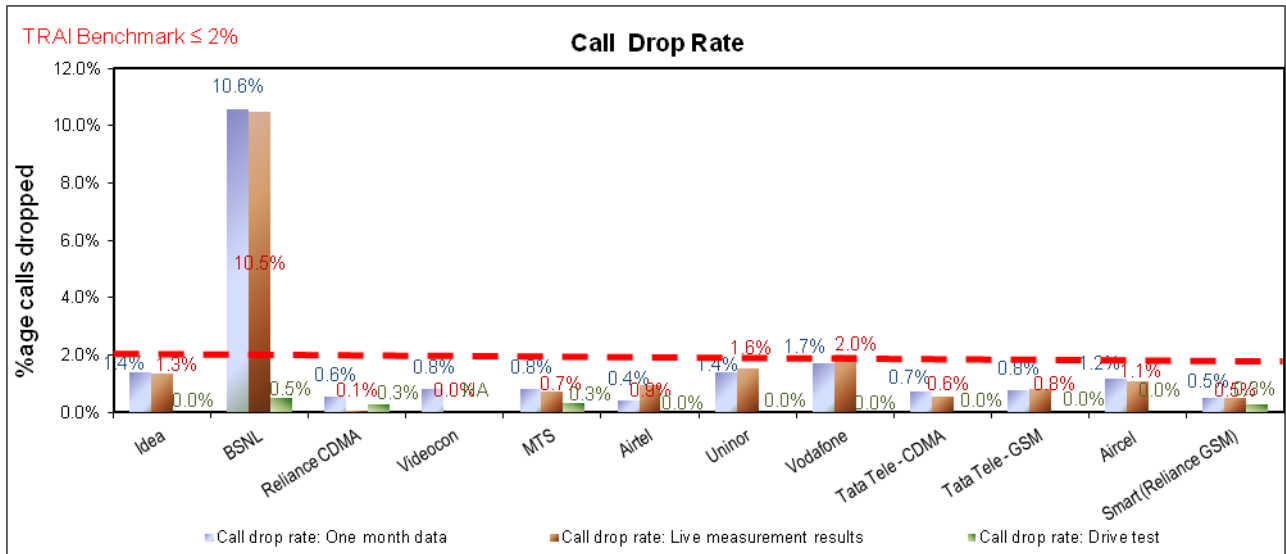
Operator(s) not meeting the benchmark: BSNL, Vodafone

Live measurement

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL, Vodafone

Call Drop Rate



One month

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Vodafone, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL

Live measurement

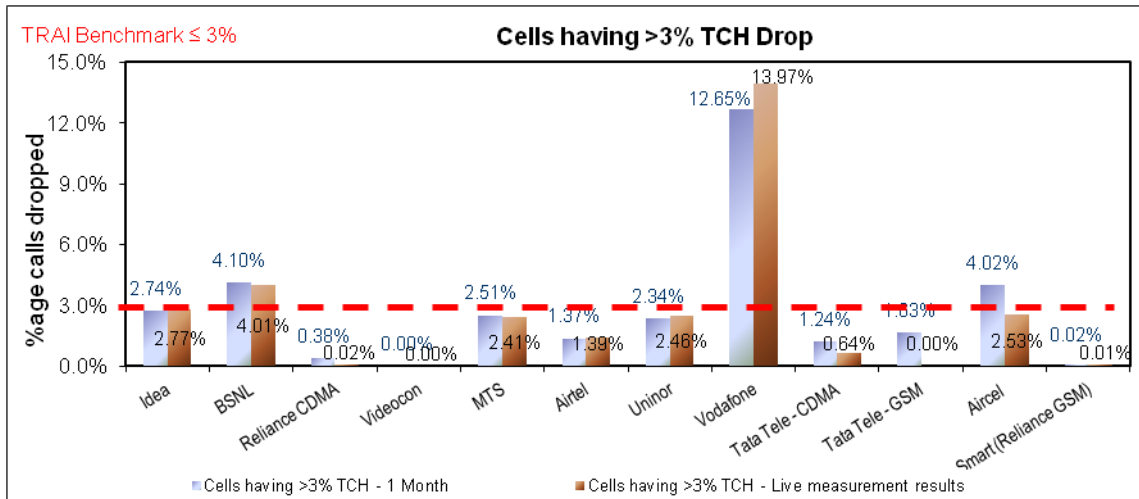
Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel , Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL, Vodafone

Drive test

All the operators meet the benchmark

Cells with more than 3% TCH Drop Rate



One month

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Smart (Reliance GSM)

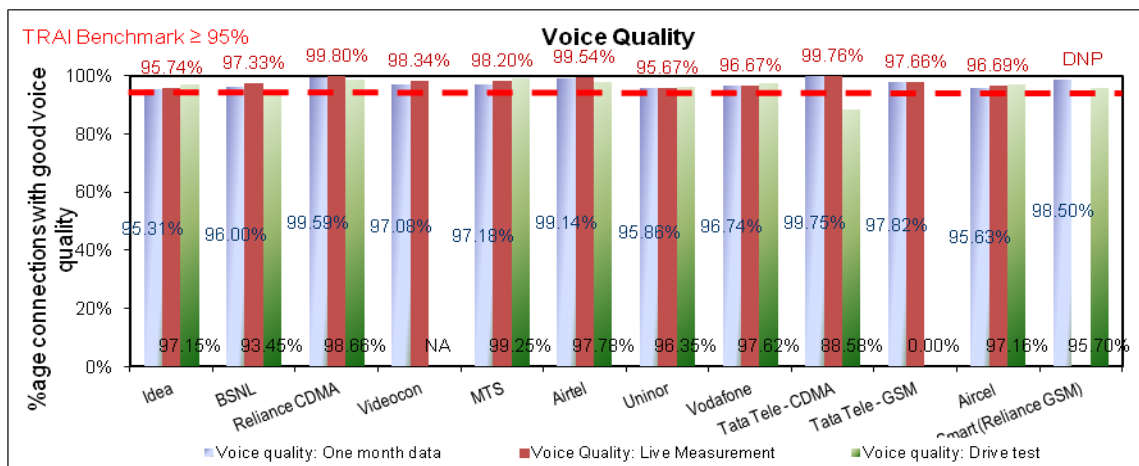
Operator(s) not meeting the benchmark: BSNL, Vodafone, Aircel

Live measurement

Operator(s) meeting benchmark: Idea, Reliance CDMA, Videocon, MTS, Airtel, Uninor, Tata Tele - CDMA, Tata Tele - GSM, Aircel, Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL, Vodafone

Voice quality



One month

All the operators meet the benchmark

Live measurement

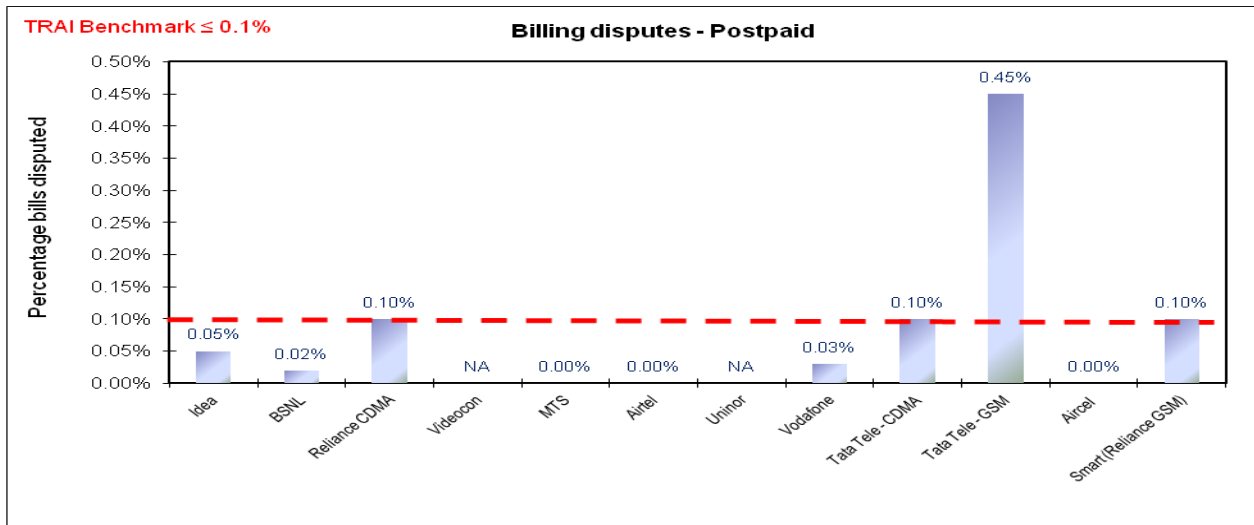
All the operators meet the benchmark

Drive test

Operator(s) meeting benchmark: Idea, Reliance CDMA, MTS, Airtel, Uninor, Vodafone, Aircel, Smart (Reliance GSM)

Operator(s) not meeting the benchmark: BSNL, Tata Tele - CDMA

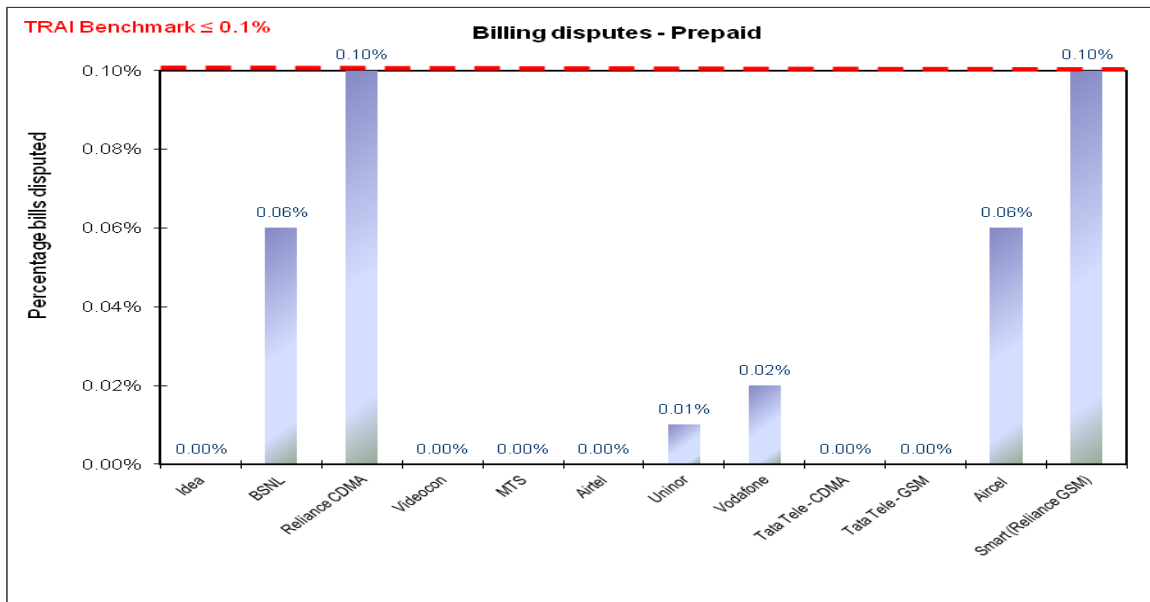
Billing Disputes - Postpaid



Operator(s) meeting benchmark: Idea, BSNL, Reliance CDMA, MTS, Airtel, Vodafone, Tata Tele - CDMA, Aircel, Smart (Reliance GSM)

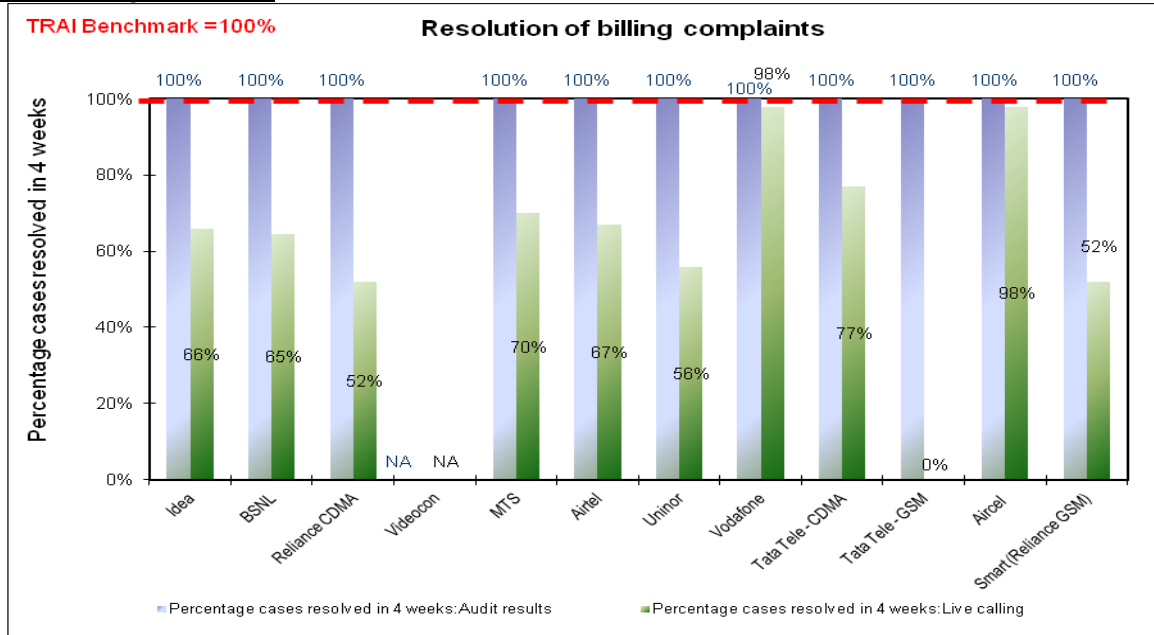
Operator(s) not meeting the benchmark: Tata Tele - GSM

Complaints - Prepaid



All the operators meet the benchmark

Resolution of billing complaints



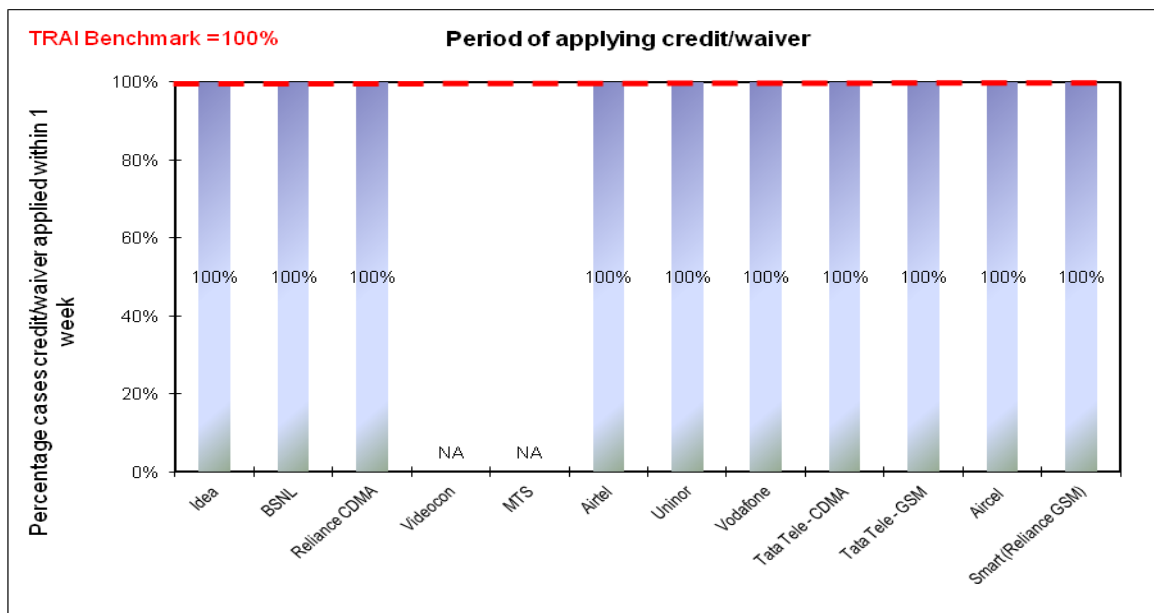
One month

All the operators meet the benchmark

Live calling

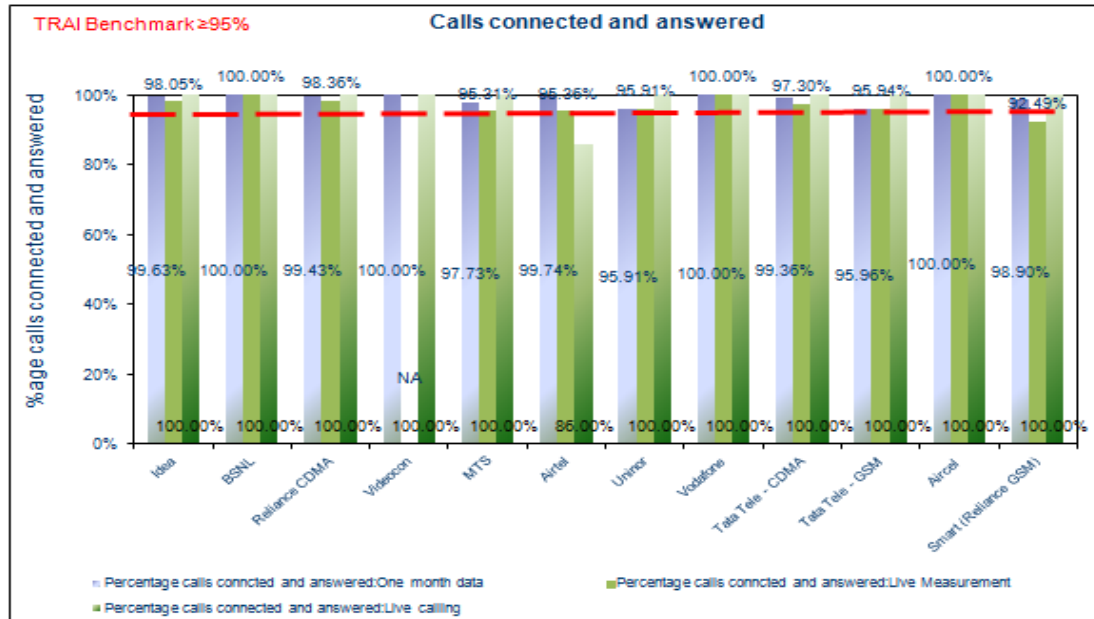
None of the operator meets the benchmark

Period of applying credit / waiver



All the operators meet the benchmark

Customer Care / Helpline: Calls answered



One month

All the operators meet the benchmark

Live measurement

Operator(s) meeting benchmark: Idea, BSNL, Reliance CDMA, MTS, Airtel, Uninor, Vodafone, Tata Tele - CDMA, Tata Tele - GSM, Aircel

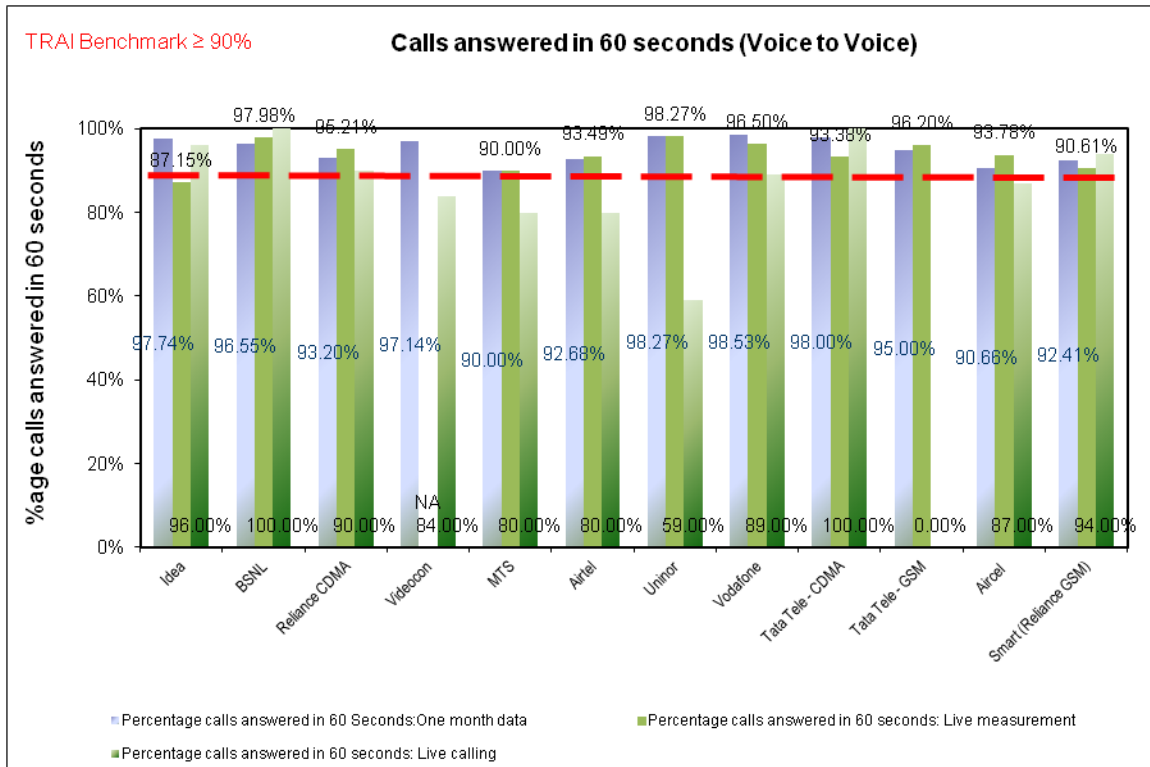
Operator(s) not meeting the benchmark: Smart (Reliance GSM)

Live calling

Operator(s) meeting benchmark: Idea, BSNL, Reliance CDMA, Videocon, MTS, Uninor, Vodafone, Tata Tele - CDMA, Tata Tele - GSM, Aircel, Smart (Reliance GSM)

Operator(s) not meeting the benchmark: Airtel

Customer Care / Helpline: Calls answered voice to voice



One month

All the operators meet the benchmark

Live measurement

Operator(s) meeting benchmark: BSNL, Reliance CDMA, MTS, Airtel, Uninor, Vodafone, Tata Tele - CDMA, Tata Tele - GSM, Aircel, Smart (Reliance GSM)

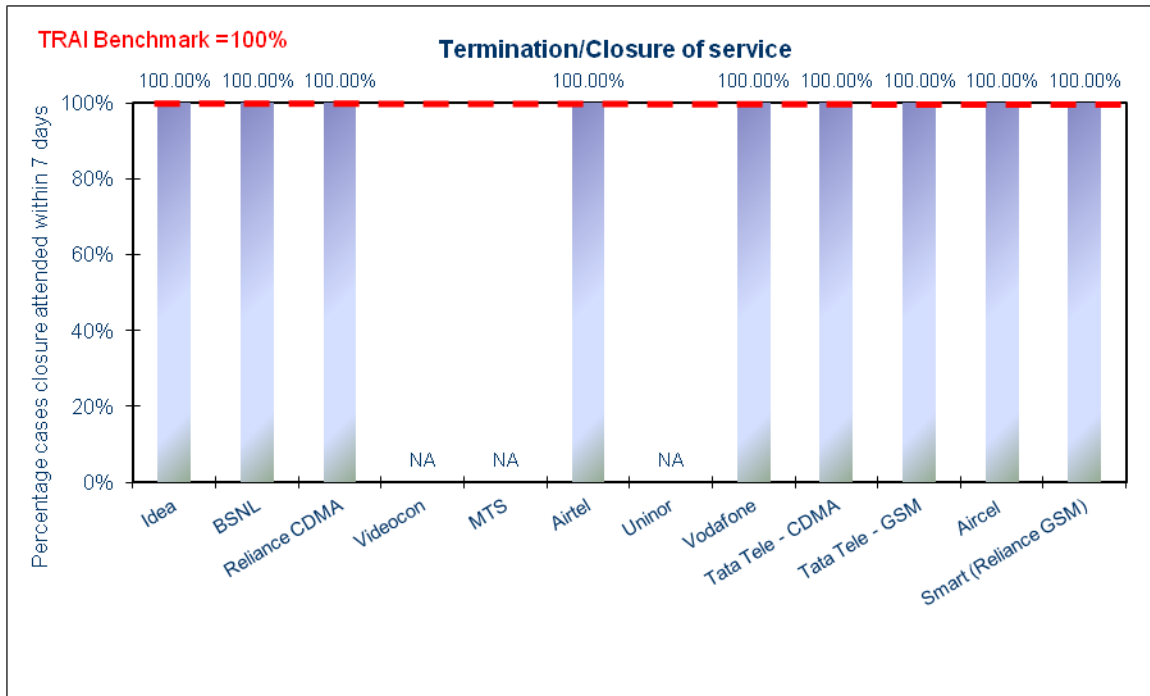
Operator(s) not meeting the benchmark: Idea

Live calling

Operator(s) meeting benchmark: Idea, BSNL, Reliance CDMA, Tata Tele - CDMA, Smart (Reliance GSM)

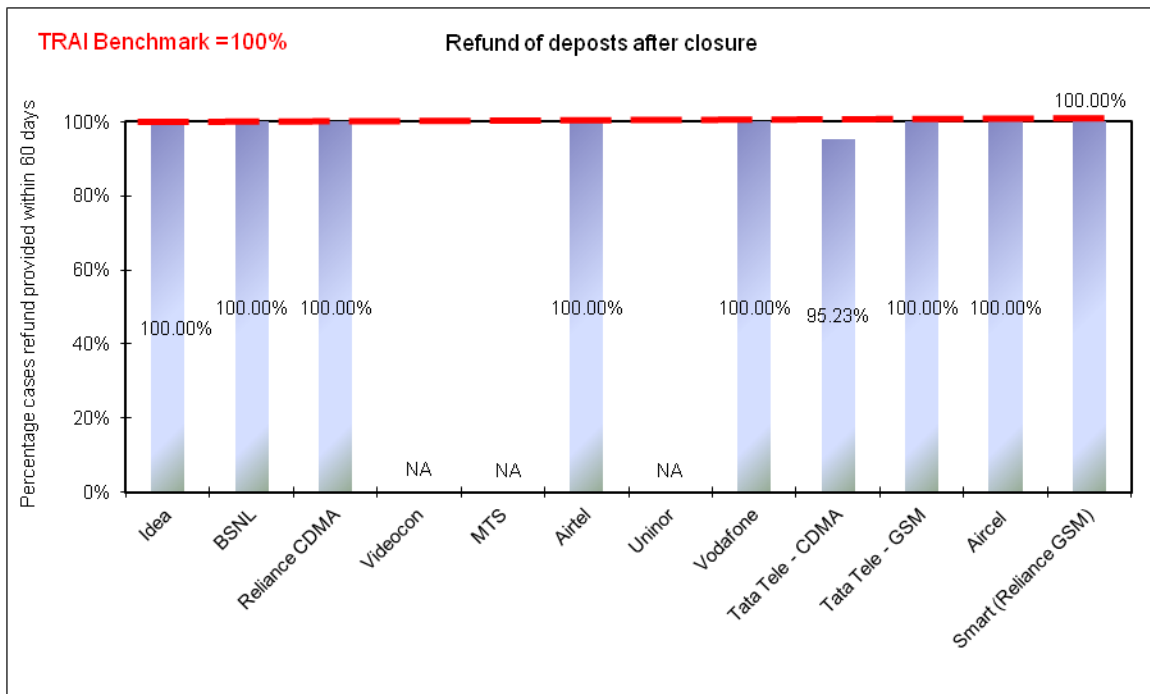
Operator(s) not meeting the benchmark: Videocon, MTS, Airtel, Uninor, Vodafone, Aircel

Termination / Closure of service



All the operators meet the benchmark

Refund of deposits



Operator(s) meeting benchmark: Idea, BSNL, Reliance CDMA, Airtel, Vodafone, Tata Tele - GSM, Aircel, Smart (Reliance GSM)

Operator(s) not meeting the benchmark: Tata Tele - CDMA

Inter operator calls assessment

Inter operator call Assessment To↓ From→	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Idea	NA	100%	100%	88%	95%	94%	95%	95%	97%	99%	99%	96%
BSNL	100%	NA	98%	97%	92%	92%	99%	98%	100%	100%	99%	97%
Reliance CDMA	100%	100%	NA	90%	94%	90%	90%	99%	96%	99%	98%	75%
Videocon	100%	NA	100%	NA	98%	94%	63%	99%	99%	100%	100%	95%
MTS	100%	99%	100%	94%	NA	93%	100%	100%	93%	97%	100%	100%
Airtel	100%	99%	99%	95%	95%	NA	92%	100%	100%	97%	100%	99%
Uninor	100%	97%	99%	79%	91%	89%	NA	100%	95%	95%	100%	100%
Vodafone	100%	100%	100%	97%	93%	84%	98%	NA	97%	99%	98%	91%
Tata Tele - CDMA	99%	96%	95%	96%	100%	98%	99%	99%	NA	99%	100%	97%
Tata Tele - GSM	100%	99%	89%	91%	100%	96%	99%	100%	99%	NA	97%	95%
Aircel	100%	99%	98%	99%	94%	88%	99%	100%	97%	100%	NA	96%
Smart (Reliance GSM)	99%	95%	87%	90%	98%	98%	98%	98%	100%	98%	99%	NA

 The maximum problem faced by the calling operator to other operators

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. Uninor faced difficulty in connecting to a Videocon number with only 63% of calls getting connected. Further, Reliance GSM also found it difficult to connect with RCOM CDMA as only 75% of calls got connected.

7.0 Compliance reports: Results of Verification of PMR

7.1 Cellular Mobile services

Name of Service Provider	Network Availability					Connection Establishment			Connection Maintenance (Retainability)				POI	Network Traffic Capacity				
	Total no. of BTSs in the licensed service area	Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month	BTSs Accumulated downtime (not available for service) (%age)	No. of BTSs having accumulated downtime of >24 hours in a month	Worst affected BTSs due to downtime (%age)	Call Set-up Success Rate (within licensee's own network)	SDCCH/Paging chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Total No. of cells exceeding 3% TCH drop (call drop)	Total no. of cells in the network	Worst affected cells having more than 3% TCH drop (call drop) rate (%age)	%age connection with good voice quality	Point of Interconnection (POI) Congestion	Equipped Capacity of Network in respect of Traffic in erlang	Total traffic handled in TCHB in erlang	Total no. of customer serves (as per VLR) on last day of the month	
Benchmark			≤ 2%		≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%			≤ 3%	≥ 95%					
Idea	PMR	4769	41963.80586	1.20%	89	1.88%	97.79%	0.63%	1.76%	1.64%	383	14274	2.69%	95.31%	0	140672	117570.0	4766930
	IMRB	4769	41963.33333	1.20%	89	1.88%	97.79%	0.63%	1.76%	1.64%	383	14274	2.69%	95.31%	0	140671	117569.3	4766930
BSNL	PMR	3329	59633	0.64%	152	1.70%	97.67%	0.36%	0.82%	1.37%	420	9897	4.35%	97.00%	0	262600	145995.3	2199023
	IMRB	3329	59633	0.64%	152	1.70%	97.67%	0.36%	0.82%	1.37%	420	9897	4.35%	97.00%	0	262600	145995.3	2199023
Reliance CDMA	PMR	1262	7202	0.78%	25	1.28%	98.30%	0.00%	1.56%	1.32%	58	3785	1.52%	97.25%	0	242667	87507.4	DNP
	IMRB	1262	7202	0.78%	25	1.28%	98.30%	0.00%	1.56%	1.32%	58	3785	1.52%	97.25%	0	242667	87507.4	DNP
Videocon	PMR	39	233	0.92%	0	0.00%	99.41%	0.41%	0.03%	1.09%	0	119	0.00%	98.21%	0	10000	5.1	1365
	IMRB	39	233	0.92%	0	0.00%	99.41%	0.41%	0.03%	1.09%	0	119	0.00%	98.21%	0	10000	5.1	1365
MTS	PMR	1348	12350	1.24%	13	0.93%	99.58%	0.00%	0.44%	0.89%	106	4070	2.60%	98.74%	0	60711	19796.8	543713
	IMRB	1348	12350	1.23%	13	0.93%	99.58%	0.00%	0.42%	0.89%	106	4070	2.59%	98.73%	0	60711	19797.0	543713
Airtel	PMR	7229	6809	0.13%	49	0.68%	98.55%	0.45%	0.75%	0.79%	381	21418	1.78%	98.99%	0	610091	392712.0	15705442
	IMRB	7229	6809	0.13%	49	0.68%	98.55%	0.45%	0.75%	0.79%	381	21418	1.78%	98.99%	0	610091	392712.0	15705442
Uninor	PMR	2293	24434	1.45%	30	1.32%	97.78%	0.42%	1.45%	1.63%	215	6877	3.12%	96.60%	1	88874	76817.3	1710175
	IMRB	2293	24434	1.45%	30	1.32%	97.78%	0.42%	1.45%	1.63%	215	6877	3.12%	96.60%	0	88874	76817.0	1710175
Vodafone	PMR	6442	34317	0.73%	319	4.99%	93.92%	1.46%	3.83%	1.91%	2437	19231	12.71%	96.34%	0	204237	159123.6	5375075
	IMRB	6442	34317	0.73%	319	4.99%	94.05%	1.43%	3.73%	1.91%	2430	19231	12.67%	96.35%	0	204237	158844.7	5381592
Tata Tele - CDMA	PMR	1030	958	0.13%	3	0.26%	98.75%	0.00%	0.49%	0.83%	45	3144	1.43%	99.37%	0	290915	50137.0	894696
	IMRB	1030	958	0.13%	3	0.26%	98.75%	0.00%	0.48%	0.82%	45	3144	1.43%	99.37%	0	290915	50137.0	894696
Tata Tele - GSM	PMR	2042	221	0.01%	0	0.00%	97.61%	0.10%	0.41%	1.06%	285	6119	4.66%	97.42%	0	94663	31041.6	1325764
	IMRB	2042	221	0.01%	0	0.00%	97.61%	0.10%	0.41%	1.06%	285	6119	4.66%	97.42%	0	94663	31041.6	1325764

Quality of Service – Audit module report for “Bihar” Circle for Cellular Mobile Services


Aircel	PMR	3450	43929	1.73%	164	4.77%	97.77%	0.12%	0.76%	1.45%	497	10259	4.85%	95.72%	0	199508	49346.7	2116477
	IMRB	3450	43929	1.73%	164	4.77%	97.77%	0.12%	0.76%	1.45%	497	10259	4.85%	95.72%	0	199508	49346.0	2116477
Smart (Reliance GSM)	PMR	2467	2657	0.14%	24	0.98%	97.74%	0.61%	0.93%	0.78%	196	7401	2.63%	98.04%	0	161000	106447.0	#DIV/0!
	IMRB	2467	2657	0.14%	24	0.98%	97.74%	0.61%	0.93%	0.78%	196	7401	2.63%	98.04%	0	161000	106447.0	#DIV/0!

Name of Service Provider		Metering and Billing											Response time to the customer for assistance			Termination/ closure of service					
		Metering and billing credibility - post paid	No. of bills issued during the period	No. of bills disputed including billing complaints during the period	Metering and billing credibility - pre paid	No. of charging / credit / validity complaints during the quarter	Total no. of pre-paid customers at the end of the quarter	Resolution of billing/charging complaints	credit / validity (pre-paid) complaints resolved within 4 weeks during the quarter	Total no. of billing (post-paid) and charging, credit / validity (pre-paid) complaints received during the quarter	and charging, credit / validity complaints (pre paid) resolved in favor	No. of complaints disposed on account of not considered as valid complaints during the quarter	adjustment to customer's account from the date of resolution of complaints	Accessibility of call centre/ customer care	Total no. of call attempts to call centre / customer care nos. during TCBH (Note)	No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Note)	Percentage of calls answered by the operators (voice to voice) within 60 seconds	%age request for Termination / Clouse of service complied within 7 days	Total No. of request for termination / Closure of service received during the quarter	No. of requests for termination / Closure of service complied within 7 days during the quarter	Time taken for refund of deposits after closure
Benchmark		< 0.1%			< 0.1%		100% within 4 weeks				100% Within 1 week	> 95%			> 90%	100% within 7 days			100% within 60 days		
Idea	PMR	0.03%	21,780	6	0.01%	1385	15785687	100.00%	1391	1391	225	1166	100.00%	97.00%	23,77,002	23,13,522	99.00%	100.00%	481	131	100.00%
	IMRB	0.03%	21780	6	0.00%	225	15792228	100.00%	1391	1391	225	1166	100.00%	97.00%	2397567	2333856	97.34%	100.00%	350	350	100.00%
BSNL	PMR	0.03%	155081	66	0.11%	4135	5508619	100.00%	4215	4215	4203	12	100.00%	100.00%	4288892	4046560	97.00%	100.00%	1293	1293	100.00%
	IMRB	0.03%	155081	66	0.11%	4135	5508619	100.00%	4215	4215	4203	12	100.00%	100.00%	4288892	4046560	97.00%	100.00%	1293	1293	100.00%
Reliance CDMA	PMR	0.10%	196677	193	0.10%	3504	3516373	100.00%	10706	10706	10256	450	100.00%	99.00%	5633232	5564214	95.00%	100.00%	196677	196677	100.00%
	IMRB	0.10%	196677	193	0.10%	3504.333	3516373	100.00%	10706	10706	10256	450	100.00%	99.00%	5633232	5564214	95.00%	100.00%	196677	196677	100.00%
Videocon	PMR	NA	NA	NA	0.00%	0	20515	100.00%	0	0	0	0	100.00%	98.95%	287	284	98.45%	NA	NA	NA	NA
	IMRB	NA	NA	NA	0.00%	0	20515	100.00%	0	0	0	0	100.00%	98.95%	287	284	98.45%	NA	NA	NA	NA
MTS	PMR	0.00%	0	0	0.05%	716	1534689	100.00%	716	716	676	40	100.00%	100.00%	121317	110207	90.00%	100.00%	0	0	0.00%
	IMRB	0.00%	0	0	0.00%	716	1534689	100.00%	716	716	676	40	100.00%	100.00%	121317	110207	90.00%	100.00%	0	0	0.00%
Airtel	PMR	0.01%	80130	7	0.00%	4	62151476	100.00%	11	9118	11	9107	100.00%	98.00%	9389741	9229445	95.00%	100.00%	301	301	100.00%
	IMRB	0.01%	80130	7	0.00%	4	62151476	100.00%	11	9118	11	9107	100.00%	98.00%	9389741	9229445	95.00%	100.00%	301	301	100.00%
Uninor	PMR	NA	NA	NA	0.00%	383	3426728	100.00%	383	383	NA	NA	NA	96.00%	3142112	3023588	98.00%	NA	NA	NA	NA


Quality of Service – Audit module report for “Bihar” Circle for Cellular Mobile Services

	IMRB	NA	NA	NA	0.00%	515	4204457	100.00%	515	515	NA	NA	NA	97.00%	709188	689188	98.00%	NA	NA	NA	NA
Vodafone	PMR	0.05%	29474	14	0.07%	11858	5699570	100.00%	11872	11872	8144	3728	100.00%	100.00%	539201	497966	98.00%	100.00%	682	682	100.00%
	IMRB	0.05%	29474	14	0.07%	11858	5699570	100.00%	11872	11872	8144	3728	100.00%	100.00%	539201	497966	98.00%	100.00%	682	682	100.00%
Tata Tele - CDMA	PMR	0.00%	188707	752	1.00%	7788	1513708	100.00%	8540	8540	192	8348	100.00%	9900.00%	396524	393787	9900.00%	10000.00%	2624	2624	10000.00%
	IMRB	0.13%	133639	182	0.14%	7788	5416508	100.00%	7970	7970	198	7772	100.00%	99.30%	396524	100	98.00%	100.00%	1190	1190	100.00%
Tata Tele - GSM	PMR	0.03%	15729	70	0.00%	15055	3681995	100.00%	15125	15125	5	15120	100.00%	96.00%	1549915	1482751	96.00%	100.00%	248	248	100.00%
	IMRB	0.45%	16625	74	0.00%	0	2905782	100.00%	74	74	16	15113	100.00%	95.96%	16195684	15541202	95.00%	100.00%	146	146	100.00%
Aircel	PMR	0.00%	7624	0	0.10%	5091	5011614	100.00%	5091	5091	2860	2231	100.00%	100.00%	364331	325206	91.93%	100.00%	47	47	100.00%
	IMRB	0.00%	7624	0	0.10%	5091	5341434	100.00%	5091	5091	2680	2231	100.00%	100.00%	391327	332288	88.00%	100.00%	47	47	100.00%
Smart (Reliance GSM)	PMR	0.09%	27180	24	0.10%	5690	5863198	100.00%	17095	17095	17092	3	100.00%	99.00%	14016146	14211225	89.00%	100.00%	91	91	100.00%
	IMRB	0.09%	27180	24	0.10%	5690	5863198	100.00%	17095	17095	17092	3	100.00%	99.00%	14016146	14211225	89.00%	100.00%	91	91	100.00%

 Figures do not match with those reported in PMR

 Figures verified on all India basis

B'mark = TRAI Benchmark, DNA = Details not available

 Not meeting benchmark

8.0 Conclusions

8.1 Cellular Mobile services

1. Majorly figures reported by all the operators on almost all parameters completely match the figures obtained on verification except for the parameter for Total no. of pre-paid customers at the end of the quarter which is not matched by Tata GSM & CDMA, Aircel
2. Further, Vodafone seems to be performing very poorly with it not meeting benchmarks on may parameters such as Worst affected BTSs due to downtime, Call Set-up Success Rate, SDCCH, & TCH congestion

9.0 Annexure - I

9.1 Service provider performance report based on one month data

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)			Metering and Billing				Response time to customer for assistance		Termination / closure of service	
	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	Metering and billing credibility (Postpaid)	Metering and billing credibility (Prepaid)	%age complaints resolved within 4 weeks	Period of applying credit/waiver less than 1 week	Accessibility of call centre/ customer care	Percentage of calls answered by operators within 60 sec	%age requests for Termination complied within 7 days	Refund of deposits after closure within 60 days
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.1%	≤ 0.1%	100%	100%	≥ 95%	≥ 90%	100%	100%
Idea	0.93%	1.85%	97.95%	0.90%	1.82%	1.38%	2.74%	95.31%	0.05%	0.00%	100.00%	100.00%	99.63%	97.74%	100.00%	100.00%
BSNL	3.96%	5.25%	88.79%	8.17%	3.87%	10.60%	4.10%	96.00%	0.02%	0.06%	100.00%	100.00%	100.00%	96.55%	100.00%	100.00%
Reliance CDMA	0.18%	0.87%	98.97%	0.00%	0.70%	0.55%	0.38%	99.59%	0.10%	0.10%	100.00%	100.00%	99.43%	93.20%	100.00%	100.00%
Videocon	0.37%	0.00%	99.22%	0.15%	0.05%	0.82%	0.00%	97.08%	NA	0.00%	NA	NA	100.00%	97.14%	NA	NA
MTS	1.06%	0.29%	99.60%	0.00%	0.17%	0.83%	2.51%	97.18%	0.00%	0.00%	100.00%	NA	97.73%	90.00%	NA	NA
Airtel	0.20%	0.46%	99.18%	0.18%	0.40%	0.42%	1.37%	99.14%	0.00%	0.00%	100.00%	100.00%	99.74%	92.68%	100.00%	100.00%
Uninor	1.70%	1.75%	97.98%	0.44%	1.37%	1.40%	2.34%	95.86%	NA	0.01%	100.00%	100.00%	95.91%	98.27%	NA	NA
Vodafone	0.64%	1.92%	94.94%	1.39%	3.07%	1.69%	12.65%	96.74%	0.03%	0.02%	100.00%	100.00%	100.00%	98.53%	100.00%	100.00%
Tata Tele - CDMA	0.03%	0.00%	98.60%	0.00%	0.26%	0.74%	1.24%	99.75%	0.10%	0.00%	100.00%	100.00%	99.36%	98.00%	100.00%	95.23%
Tata Tele - GSM	0.01%	0.00%	98.75%	0.04%	0.15%	0.75%	1.63%	97.82%	0.45%	0.00%	100.00%	100.00%	95.96%	95.00%	100.00%	100.00%
Aircel	1.22%	1.59%	98.22%	0.25%	1.27%	1.16%	4.02%	95.63%	0.00%	0.06%	100.00%	100.00%	100.00%	90.66%	100.00%	100.00%
Smart (Reliance GSM)	0.06%	0.08%	98.82%	0.10%	0.10%	0.52%	0.02%	98.50%	0.10%	0.10%	100.00%	100.00%	98.90%	92.41%	100.00%	100.00%

9.2 Monthly Point of Interconnection (POI) Congestion Report

Name of the Service Provider	Name of POI not meeting the benchmark	Total No. of circuits on POI	Total No. of call attempts on POI	Total traffic served on POI (Erlang)	% of Congestion POI	Action already taken/ action plan for meeting the benchmark
Idea	0	0	0	0	0	0
BSNL	0	0	0	0	0	0
BSNL (Bihar)	0	0	0	0	0	0
Reliance CDMA	0	0	0	0	0	0
Videocon	0	0	0	0	0	0
MTS	0	0	0	0	0	0
Airtel	0	0	0	0	0	0
Uninor	0	0	0	0	0	0
Vodafone	0	0	0	0	0	0
Tata Tele - CDMA	0	0	0	0	0	0
Tata Tele - GSM	0	0	0	0	0	0
Aircel	0	0	0	0	0	0
Smart (Reliance GSM)	0	0	0	0	0	0

9.3 Parameter wise performance reports for Cellular Mobile services

1. Network Availability

Audit Results for Network Availability

	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Number of BTSs in the licensed service area		5177	3333	1845	52	1390	7414	2348	6876	1030	2132	3524	3812
Sum of downtime of BTSs in a month (in hours)		36007	98259	2532	143	10963	11235	29782	32689	260	109	32096	1808
BTSs accumulated downtime (not available for service)	≤ 2%	0.93%	3.96%	0.18%	0.37%	1.06%	0.20%	1.70%	0.64%	0.03%	0.01%	1.22%	0.06%
Number of BTSs having accumulated downtime >24 hours		96	175	16	0	4	34	41	132	0	0	56	3
Worst affected BTSs due to downtime	≤ 2%	1.85%	5.25%	0.87%	0.00%	0.29%	0.46%	1.75%	1.92%	0.00%	0.00%	1.59%	0.08%

	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Number of BTSs in the licensed service area		5237	3331	1845	52	1391	7339	2381	6927	1030	2135	3515	3812
Sum of downtime of BTSs in a month (in hours)		3945.9	4627	606	20	1336	1284	1726	3123	40.13	28.45	1334	236
BTSs accumulated downtime (not available for service)	≤ 2%	1.05%	1.93%	0.46%	0.53%	1.33%	0.24%	1.01%	0.63%	0.05%	0.02%	0.53%	0.09%
Number of BTSs having accumulated downtime >24 hours		2	49	0	0	2	0	0	0	0	0	5	0
Worst affected BTSs due to downtime	≤ 2%	0.04%	1.47%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%

2. Connection Establishment (Accessibility)

Audit Results for CSSR, SDCCH and TCH congestion

CSSR	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
CSSR	≥ 95%	97.95%	88.79%	98.97%	99.22%	99.60%	99.18%	97.98%	94.94%	98.60%	98.75%	98.22%	98.82%

SDCCH congestion	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
SDCCH/Paging channel congestion	≤ 1%	0.90%	8.17%	0.00%	0.15%	0.00%	0.18%	0.44%	1.39%	0.00%	0.04%	0.25%	0.10%

TCH congestion	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
TCH congestion	≤ 2%	1.82%	3.87%	0.70%	0.05%	0.17%	0.40%	1.37%	3.07%	0.26%	0.15%	1.27%	0.10%

Live measurement results for CSSR, SDCCH and TCH congestion

CSSR	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
CSSR	≥ 95%	97.93%	88.23%	96.73%	98.89%	99.53%	97.22%	97.91%	94.98%	99.10%	99.37%	99.16%	98.08%

SDCCH congestion	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
SDCCH/Paging channel congestion	≤ 1%	0.82%	9.02%	0.00%	0.33%	0.00%	0.86%	0.44%	1.69%	0.00%	0.13%	0.29%	0.07%

TCH congestion	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
TCH congestion	≤ 2%	1.90%	3.82%	0.02%	0.00%	0.02%	0.87%	1.37%	2.69%	0.03%	0.44%	0.50%	0.08%

Drive test results for CSSR (Average of three drive tests) and blocked calls

CSSR	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of call attempts		630	637	688	NA	630	631	649	672	630	NA	630	726
Total number of successful calls established		630	605	688	NA	630	631	649	671	630	NA	630	721
CSSR	≥ 95%	100.00%	94.98%	100.00%	NA	100.00%	100.00%	100.00%	99.85%	100.00%	NA	100.00%	99.31%

Blocked calls	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
%age blocked calls		0.00%	5.02%	0.00%	NA	0.00%	0.00%	0.00%	0.15%	0.00%	NA	0.00%	0.69%

3. Connection Maintenance (Retainability)

Audit Results for Call drop rate and for number of cells having more than 3% TCH

Call drop rate	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of calls established		164987051	2076473	34764404	4985	32240817	798221257	96424015	DNP	85435925	44787893	127751049	136994217
Total number of calls dropped		2275833	220039	466117	41	267598	3377505	1348244	DNP	631655	333889	1479494	716207
Call drop rate	≤ 2%	1.38%	10.60%	0.55%	0.82%	0.83%	0.42%	1.40%	1.69%	0.74%	0.75%	1.16%	0.52%

Cells having more than 3% TCH	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of cells in the network		15563	9094	5535	160	4265	21945	7064	20531	3144	6390	10503	11436
Total number of cells having more than 3% TCH		427	373	21	0	107	300	165	2598	39	104	422	2
Worst affected cells having more than 3% TCH	≤ 3%	2.74%	4.10%	0.38%	0.00%	2.51%	1.37%	2.34%	12.65%	1.24%	1.63%	4.02%	0.02%

Live measurement results for Call drop rate and for number of cells having more than 3% TCH

Call drop rate	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of calls established		18851165	1964008	97927974	253	30307469	26306908	9469655	DNP	5696245	4011342	47392031	155840444
Total number of calls dropped		251117	206148	56862	0	214173	245970	146779	DNP	32059	32852	511564	790128
Call drop rate	≤ 2%	1.33%	10.50%	0.06%	0.00%	0.71%	0.94%	1.55%	2.02%	0.56%	0.82%	1.08%	0.51%

Cells having more than 3% TCH	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)

Total number of cells in the network		15744	9138	5535	160	4268	21962	7168	20756	3144	0	10186	11436
Total number of cells having more than 3% TCH		436	366	1	0	103	306	176	2899	20	6378	258	1
Worst affected cells having more than 3% TCH	≤ 3%	2.77%	4.01%	0.02%	0.00%	2.41%	1.39%	2.46%	13.97%	0.64%	0.00%	2.53%	0.01%

Drive test results for Call drop rate (Average of three drive tests)

Call drop rate	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of calls established		630	605	688	NA	630	631	649	671	630	NA	630	720
Total number of calls dropped		0	3	2	NA	2	0	0	0	0	NA	0	2
Call drop rate	≤ 2%	0.00%	0.50%	0.29%	NA	0.32%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.28%

4. Voice quality

Audit & Live measurement Results for Voice quality

Voice quality	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of sample calls		26990984415	150	303508331	313969	71	108585000436	14944268744	DNP	3636	9884546778	10321859708	6727749320
Total number of calls with good voice quality		25725547400	144	302252726	304804	69	107647457474	14325576005	DNP	3627	9668614378	9870467702	6626786145
%age calls with good voice quality	≥ 95%	95.31%	96.00%	99.59%	97.08%	97.18%	99.14%	95.86%	96.74%	99.75%	97.82%	95.63%	98.50%

Voice quality	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of sample calls		3310115689	150	302352449	36794	111	3835060401	1411344417	DNP	10394	1496811222	3574163928	DNP
Total number of calls with good voice quality		3168949185	146	301744171	36183	109	3817578478	1350295391	DNP	10369	1461791536	3455852206	DNP
%age calls with good voice quality	≥ 95%	95.74%	97.33%	99.80%	98.34%	98.20%	99.54%	95.67%	96.67%	99.76%	97.66%	96.69%	DNP

Drive test results for Voice quality (Average of three drive tests)

Voice quality	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of sample calls		1049163	817091	55818	NA	27811	1349369	1193449	1103507	101225	NA	1356530	797677
Total number of calls with good voice quality		1019314	763571	55068	NA	27602	1319416	1149877	1077192	89667	NA	1318063	763414
%age calls with good voice quality	≥ 95%	97.15%	93.45%	98.66%	NA	99.25%	97.78%	96.35%	97.62%	88.58%	NA	97.16%	95.70%

5. POI Congestion

Audit Results for POI Congestion

POI congestion	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of working POIs		79	144	30	11	50	48	86	50	227	31	136	22
No. of POIs not meeting benchmark		0	0	0	0	0	0	2	0	0	0	0	0
Total Capacity of all POIs (A) - in erlangs		166708.87	64000	1413677.9	18.0	28378	638010	53081	161642	82452	36459.12	66745	1449183.186
Traffic served for all POIs (B)- in erlangs		96142.9	48002	679888.8	1.5	15710	329975	36992	101421	35086	21853.88	41625	984439.6015

POI congestion	≤ 0.5%	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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Live measurement results for POI congestion

POI congestion	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of working POIs		77	145	30	10	50	48	89	50	213	31	136	22
No. of POIs not meeting benchmark		0	0	0	0	0	0	0	0	0	0	0	0
Total Capacity of all POIs (A) - in erlangs		166793.2	64000	106845.6	17.87	28378	624721	54950	164068.58	82452	38226.71	76671	143982.2243
Traffic served for all POIs (B)- in erlangs		93505.63	45853	53385.8	1.45	15710	330550	37293	107636.82	36816	25059.51	41538	102945.72
POI congestion	≤ 0.5%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

6. Inter Operator Call Assessment

Inter operator call Assessment To↓ From→	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Idea	NA	100%	100%	88%	95%	94%	95%	95%	97%	99%	99%	96%
BSNL	100%	NA	98%	97%	92%	92%	99%	98%	100%	100%	99%	97%
Reliance CDMA	100%	100%	NA	90%	94%	90%	90%	99%	96%	99%	98%	75%
Videocon	100%	NA	100%	NA	98%	94%	63%	99%	99%	100%	100%	95%
MTS	100%	99%	100%	94%	NA	93%	100%	100%	93%	97%	100%	100%
Airtel	100%	99%	99%	95%	95%	NA	92%	100%	100%	97%	100%	99%
Uninor	100%	97%	99%	79%	91%	89%	NA	100%	95%	95%	100%	100%
Vodafone	100%	100%	100%	97%	93%	84%	98%	NA	97%	99%	98%	91%
Tata Tele - CDMA	99%	96%	95%	96%	100%	98%	99%	99%	NA	99%	100%	97%
Tata Tele - GSM	100%	99%	89%	91%	100%	96%	99%	100%	99%	NA	97%	95%
Aircel	100%	99%	98%	99%	94%	88%	99%	100%	97%	100%	NA	96%
Smart (Reliance GSM)	99%	95%	87%	90%	98%	98%	98%	98%	100%	98%	99%	NA

 The maximum problem faced by the calling operator to other operators

7. Metering and Billing credibility

Audit Results for Billing performance

Billing Performance	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Billing disputes - Postpaid													
Total bills generated during the period		9123	54165	64417	NA	113	30406	NA	11964	188364	16625	3791	14028
Total number of bills disputed		5	5	64	NA	0	0	NA	3	182	74	0	14
Percentage bills disputed	≤ 0.1%	0.05%	0.02%	0.10%	NA	0.00%	0.00%	NA	0.03%	0.10%	0.45%	0.00%	0.10%
Billing disputes - Prepaid													
Number of complaints related to charging, credit & validity		43	937	3518	0	45	40	641	1442	191	0	3211	6005
Total number of prepaid customers in that period		5739425	1620916	3518731	0	1636192	21986852	4885287	6075413	4912473	2905782	5358373	6005815
Percentage of complaints	≤ 0.1%	0.00%	0.06%	0.10%	0.00%	0.00%	0.00%	0.01%	0.02%	0.00%	0.00%	0.06%	0.10%
Resolution of billing complaints													
Total number of billing/charging complaints		48	942	3582	0	45	7915	641	2596	373	74	3211	6019
Total complaints considered invalid		213	0	59	NA	8	7875	641	1003	0	0	1528	2
Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1		256	942	3582	NA	45	7915	641	2596	373	74	3211	6019
Percentage complaints resolved within 4 weeks of date of receipt	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%
Period of applying credit / waiver													
Total number of complaints where credit/waiver is required		43	942	3523	NA	0	40	641	594	373	74	1683	6017
Percentage cases in which credit/waiver was received within 1 week	100%	100%	100%	100%	NA	NA	100%	100%	100%	100%	100%	100%	100%

Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total Number of calls made		100	200	100	NA	100	100	100	100	100	NA	100	100
Number of cases resolved in 4 weeks		66	129	52	NA	70	67	56	98	77	NA	98	52
Percentage cases resolved in four weeks	100%	66%	65%	52%	NA	70%	67%	56%	98%	77%	NA	98%	52%

8. Customer Care

Audit results for customer care

Customer Care Assessment	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of call attempts to customer care for assistance		1152814	2746203	3088416	233	731651	3649800	176517	6005254	3786354	16195684	4607636	8454588
Number of calls getting connected and answered (electronically)		1148495	2746203	3070704	233	715053	3640242	169301	6005254	3762051	15541202	4607636	8361855
Percentage calls getting connected and answered	≥ 95%	99.63%	100.00%	99.43%	100.00%	97.73%	99.74%	95.91%	100.00%	99.36%	95.96%	100.00%	98.90%
Number of calls getting transferred to the operator (voice)		2757530	1203172	514616	105	731651	5322134	128143	137644	1291490	3829191	1812721	1887471

to voice)													
Number of calls answered by operator (voice to voice) within 60 seconds		2695221	1161711	479626	102	658495	4932532	125926	135620	1265660	3637731	1643367	1744194
Percentage calls answered within 60 seconds (V2V)	≥ 90%	97.74%	96.55%	93.20%	97.14%	90.00%	92.68%	98.27%	98.53%	98.00%	95.00%	90.66%	92.41%

Live measurement results for customer care

Customer Care Assessment	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of call attempts to customer care for assistance		202869	264376	313298	0	90509	1919672	176517	614757	171665	540169	162971	979329
Number of calls getting connected and answered (electronically)		198918	264376	308160	0	86262	1830599	169301	614757	167034	518243	162971	905768
Percentage calls getting connected and answered	≥ 95%	98.05%	100.00%	98.36%	NA	95.31%	95.36%	95.91%	100.00%	97.30%	95.94%	100.00%	92.49%
Number of calls getting transferred to the operator (voice to voice)		294002	123554	33014	0	90509	179239	128143	274473	32517	114626	64211	199247
Number of calls answered by operator (voice to voice) within 60 seconds		256215	121056	31431	0	81459	167578	125926	264878	30363	110274	60217	180538
Percentage calls answered within 60 seconds (V2V)	≥ 90%	87.15%	97.98%	95.21%	NA	90.00%	93.49%	98.27%	96.50%	93.38%	96.20%	93.78%	90.61%

Live calling results for customer care

Customer Care Assessment	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total Number of calls received		100	200	100	100	100	100	100	100	100	100	100	100
Total Number of calls getting connected and answered		100	200	100	100	100	86	100	100	100	100	100	100
Percentage calls getting connected and answered	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	86.00%	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	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total Number of calls received		100	200	100	100	100	100	100	100	100	100	100	100
Total Number of calls answered within 60 seconds		96	200	90	84	80	80	59	89	100	100	87	94
Percentage calls answered within 60 seconds	≥ 90%	96.00%	100.00%	90.00%	84.00%	80.00%	80.00%	59.00%	89.00%	100.00%	100.00%	87.00%	94.00%

Name of operator	Customer Care number
Aircel	121
Idea	12345
Airtel	121
Uninor	121
Videocon	121
BSNL	121
MTS	155
Vodafone	121
Tata Indicom	121
Tata Docomo	121
Reliance GSM	*333
Reliance CDMA	*333

9. Termination / closure of service

Audit results for termination / closure of service

Termination	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of closure request		120	169	69	NA	NA	218	NA	146	760	146	34	15
Number of requests attended within 7 days		120	169	69	NA	NA	218	NA	146	760	146	34	15
Percentage cases in which termination done within 7 days	100%	100.00%	100.00%	100.00%	NA	NA	100.00%	NA	100.00%	100.00%	100.00%	100.00%	100.00%

Audit results for refund of deposits

Refund	Benchmark	Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total number of cases requiring refund of deposits		16	21	211	NA	NA	21	NA	42	1006	71	0	106
Total number of cases where refund was made within 60 days		16	21	211	NA	NA	21	NA	42	958	71	0	106
Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	100.00%	NA	NA	100.00%	NA	100.00%	95.23%	100.00%	100.00%	100.00%

11. Additional Network Related parameters

Audit Results for Total Traffic Handled in Erlang

Traffic in Erlang		Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Equipped capacity of the network		154128.31	218600	174000	10000	65835	644593	101574	223652	291879	93999	199160	187000
Total traffic handled in erlang during TCBH		154233.73	142142	98189	1.51	25639	533472	87084	194764	48089	37619	62683	120404

Total number of customers as per VLR													
		Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total no. of customers served (as per VLR)		5600412	2372303	2493988	313	619528	17591269	2022242	6092932	854145	1595496	2441023	4859030

Level 1 services													
		Idea	BSNL	Reliance CDMA	Videocon	MTS	Airtel	Uninor	Vodafone	Tata Tele - CDMA	Tata Tele - GSM	Aircel	Smart (Reliance GSM)
Total no. of calls made		150	300	150	150	150	150	150	150	150	150	150	150
Calls answered in 60 sec		69	275	108	107	78	0	52	66	148	65	117	17
Calls answered after 60 sec		81	25	42	43	72	150	98	84	2	85	33	133

A total of 150 calls were made including 50 each at these numbers respectively:

- 108
- 101
- 102
