REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE
WIRELINE BASIC SERVICE
&
BROADBAND SERVICE

FOR

SOUTH ZONE – KERALA CIRCLE

Report Period: October 2011 - December 2011

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I.   Objectives and Methodology

The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband services against the parameters notified by TRAI. The audit and assessment of Quality of Service is conducted for all the basic service providers, unified access service providers, cellular mobile service providers and ISPs (Internet Service Provider) for basic wireline, Cellular Mobile Telephone Services and broadband service. TCIL has undertaken the following audit works as per the Terms of Reference (TOR):

i)   Verification of the data submitted by the service providers to TRAI as part of QoS monitoring reports i.e. Quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnection (POI) Congestion Reports with reference to the records maintained by the service provider.

ii)   Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using live measurement for 3 days during the month in which the audit and assessment is carried out.

iii)   Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

iv)   Drive tests of the mobile networks both operators assisted and independent drive test (as and where required).

v)   Billing and call center's data verification.

vi)   Live testing of the efficiency of the call center / customer care help line.

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To fulfill the above mentioned Scope of Work audit was performed on different Systems, Facilities and Field data collection.

Systems audited:-
1. Network Switching Centre (NSS)
2. Base Station Subsystem(BSS)
3. Billing Applications
4. Customer Care applications

Facilities audited:-
1. Billing documents.
2. Customer Care records.

Field data collections carried out:-
1. RF network coverage including KPIs (Key Performance Index)
2. Inter Operator Call Assessment
3. Checking of Customer Billing/Refund Complaints (Random sample)
4. Customer Care efficiency
5. The live calling was made to assess the quality of services for Inter Operator Call Assessment, Customer Billing/Refund Complaints and Customer Care efficiency.

In order to carry out the above scope of work:-

- ✓ TCIL auditors visited all the NSS (Network Sub System) and BSS (Base-station Sub System) to check data for all the operators in their respective service area.

- ✓ All the NSS and BSS data for the relevant details were collected either directly from the centralized NOC or through a remote access to the NOC.

- ✓ The Radio parameters were audited/verified from the data collected from OMC-R (Operation and Maintenance Center – Radio, as part of BSS data).

- ✓ The Drive test was conducted in high, low and medium dense areas including highways, commercial complex and residential areas and special attention was paid for the areas for which TRAI has received complaints.

- ✓ The POI and other network related parameters were audited/verified from the data collected from the OMC-S (Operation and Maintenance Center – Switch as part of NSS data).

- ✓ The data related to Billing and Customer care was checked for the previous month and verified with the customers by calling them on random basis. The process of registration and handling of the complaints was also studied for the various operators. Call centre number were called for measuring the efficiency of the call centre.

- ✓ The inter operator call assessment test was carried out during the time period as is specified in the tender document. TCBH (Time Consistent Busy Hour) is taken after observation of the traffic consistently for 3 days prior to the audit activity.

- ✓ Data has been collected for busy hour of network in case of live assessment & month of audit for all service providers & verified that service providers are providing busy hour data only for QoS service. We found that TCBH hour is matching with network busy hour as provided by service providers for Keralat circle. But for parameters such as 'Worst affected cell exceeding 3% TCH drop' and 'BTSs accumulated down time' CBBH (Cell Bouncing Busy Hour) was taken instead of TCBH (Time Consistent Busy Hours) as per the TRAI new regulation 2009. This has resulted in high value for 'Cell exceeding 3% TCH drop' parameter for some of the service providers.

- ✓ For Basic Wireline Service, the Network parameter of the QoS TRAI regulations is observed / verified for the 3 days for nearly 5% of the telephone exchanges covering 10% of the SDCA in a Service area.

- ✓ For Broadband Services, Audit data were collected from the centralized NOC or through a remote access to the NOC. Network parameters were also checked from the centralized NOC with relevant details. MRTG, Cactii and Sandvine software were used for monitoring link utilization. Smoke Ping and Ping Test were used for monitoring Network Latency.

CHAPTER-2: EXECUTIVE SUMMARY

I.   Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile, Wireline & Broad Band Services in Kerala Circle in 4th quarter (October- December 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period April - June 2011.

Following are the various operators covered in Kerala for Cellular Mobile (Wireless) services QoS audit & assessment. The Month of audit & TCBH information is also given below:

S/N	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	November - 2011	1900-2000 hrs
2	Airtel Ltd	November - 2011	2000-2100 hrs
3	BSNL	November - 2011	2000-2100 hrs
4	Etisalat	November - 2011	1900-2000 hrs
5	Idea	November - 2011	2000-2100 hrs
6	Reliance Communication (GSM)	November - 2011	1900-2000 hrs
7	Tata Communications (GSM)	November - 2011	2000-2100 hrs
8	Uninor	November - 2011	2000-2100 hrs
9	Videocon	November - 2011	2000-2100 hrs
10	Vodafone	November - 2011	2000-2100 hrs
CDMA Operators			
11	MTS (CDMA)	November - 2011	1900-2000 hrs
12	Reliance Communication (CDMA)	November - 2011	1900-2000 hrs
13	Tata Communications (CDMA)	November - 2011	2000-2100 hrs

All the NSS and BSS systems were considered for audit and assessment for the TCBH hours of individual   operators.

II. Findings from Quality of Service Audit (Operator wise for each parameter)

(A) Cellular Mobile Telephone Services

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
3 days Live Data Audit								GSM Operators						CDMA Opearators	
1	**Network Availability**														
	a) BTS Accumulated Downtime	<=2%	0.02%	0.01%	0.39%	0.00%	0.01%	0.01%	0.00%	0.02%	0.03%	0.00%	0.01%	0.01%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.00%	0.02%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**														
	a) CSSR (Call Setup Success Rate)	>=95%	99.67%	99.02%	98.01%	100%	99.91%	99.90%	99.44%	99.29%	98.70%	98.73%	99.01%	99.58%	98.98%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.14%	0.39%	0.00%	0.14%	0.13%	0.02%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.21%	1.99%	0.00%	0.48%	0.02%	0.12%	0.03%	0.00%	0.79%	0.00%	0.07%	0.00%
3	**Connection maintenance (retainability)**														
	a) CDR	<=2%	0.63%	0.94%	0.53%	0.76%	0.97%	0.12%	0.94%	1.24%	0.92%	0.61%	1.13%	0.58%	0.50%
	b) Worst affected cells>3% TCH drop	<=3%	6.63%	8.66%	2.01%	4.09%	2.13%	0.06%	6.33%	13.28%	1.37%	2.24%	1.96%	0.25%	1.42%
	c) Good voice quality	>=95%	98.01%	96.86%	99.89%	98.16%	95.40%	99.27%	98.36%	97.81%	98.47%	97.24%	100%	98.54%	0.00%
4	**No of POI having congestion**	>=0.5%	0	0	0	0	0	0	0	0	0	0	0	0	0
5	**Response time to customers for assistance**														
	a) Accessibility of call centre/Customer Care	>=95%	76.00%	100%	100%	100%	92.40%	99.40%	100%	97.00%	99.80%	100%	99.20%	99.90%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	79.60%	96.70%	40.80%	100%	98.30%	87.90%	97.00%	98.10%	99.00%	97.40%	87.90%	95.00%	98.70%

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that AIRCEL, AIRTEL, ETISALAT, Tata GSM & UNINOR are not meeting the benchmark for the parameter "worst affected cells >3% TCH drop".

Customer care data is found to be satisfactory for most of the operators except for AIRCEL & IDEA in "Accessibility of call centre/Customer Care" and AIRCEL, BSNL, RCOM GSM & MTS for the parameter "calls answered by operators (voice-to-voice)".

One Month Data Audit														Rcom	TATA
S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
			GSM Operators										CDMA Operators		
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.24%	0.03%	0.55%	0.01%	0.05%	0.04%	0.01%	0.04%	0.10%	0.02%	0.01%	0.01%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	2.25%	0.16%	0.88%	0.00%	0.14%	0.00%	0.00%	0.30%	0.33%	0.00%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		2353	4475	4550	38	5095	2179	2016	1330	922	4146	704	1183	561
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		4039	1002	17895	2	1842	627	168	340	686	630	70	98	64
	e) No. of BTSs having accumulated downtime of >24 hours in a month		53	7	40	0	7	0	0	4	3	0	0	0	0
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.65%	98.88%	98.03%	99.71%	99.70%	99.92%	99.41%	99.27%	98.63%	98.53%	98.91%	99.56%	98.67%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.11%	0.36%	0.40%	0.36%	0.03%	0.04%	0.04%	0.00%	0.38%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.15%	1.96%	0.00%	0.57%	0.02%	0.14%	0.04%	0.00%	0.81%	0.00%	0.08%	0.00%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.64%	1.06%	0.54%	0.85%	0.90%	0.13%	1.00%	1.14%	0.98%	0.65%	1.14%	0.59%	0.70%
	b) Worst affected cells>3% TCH drop	<=3%	6.93%	9.44%	1.97%	3.22%	1.55%	0.08%	7.03%	13.06%	1.52%	2.50%	2.38%	0.28%	1.36%
	c) Good voice quality	>=95%	97.95%	96.74%	99.86%	98.44%	95.62%	99.30%	98.31%	97.53%	98.38%	97.19%	100.00%	98.55%	0.00%
4	No of POI having congestion	>=0.5%	0	0	0	0	0	0	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	<= 0.1%	0.29%	0.02%	0.10%	NA	0.02%	0.09%	0.00%	NA	NA	0.09%	NA	0.06%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.06%	0.04%	0.02%	0.00%	0.00%	0.03%	0.00%	0.00%	0.04%	0.04%	0.02%	0.02%	0.00%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	91%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance														

	a) Accessibility of call centre/Customer Care	>=95%	78.00%	98.97%	100%	98.53%	97.04%	99.41%	100%	96.31%	99.64%	95%	97.31%	99.76%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	90.49%	94.27%	49.50%	100%	91.13%	93.66%	97.21%	98.29%	96.25%	94.84%	90.35%	95.79%	83.63%
9	**Termination/closure of service**	<=7days	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	NA	100%	100%
10	**Time taken for refunds of deposits after closures.**	*100% within 60 days*	100%	100%	100%	NA	100%	100%	100%	NA	NA	98%	NA	100%	100%
NA: Not Applicable, NP: Data Not Provided															

From the month data assessment, it is found that all the operators are meeting the network parameters. Deviations are found under the parameter 1. "Worst affected BTSs due to downtime" with AIRCEL and 2. For the parameter 'Worst affected cells>3% TCH drop' AIRCEL, AIRTEL, ETISALAT, Tata GSM & UNINOR.

Performance related to customer care, data is found to be satisfactory for most of the operators. However deviations are found with AIRCEL in "Accessibility of call centre/Customer Care" and with BSNL & RCOM CDMA in "calls answered by operators (voice-to-voice)". AIRCEL is having low Billing/Metering Credibility in case of Post-Paid connections.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted at Kerala for all the operators. Route covered was about around 100-120Km depending on city areas within the speed limit of 30Km/hr. The cities covered were Palakkad, Thalassery and Trivendrum. In all the cities, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators		
1.1	Blocked Call Rate (<=3%)	Palakkad	0	0	0.62	0.65	0	0	1.27	2.78	0.68	0	0	0
		Thalassery	0.75	0.91	0	0	0.74	0	0.84	2.13	1.55	0	0	0
		Trivendrum	0.54	1.14	1.69	0	0	1.16	0	0.53	3.93	0.56	0	0
1.2	Dropped Call Rate (<=2%)	Palakkad	0.63	0	0	0	0	0	0	0.69	0.68	0	0	0
		Thalassery	0	0	0	0	1.47	0.78	0	0	2.33	0	0	0
		Trivendrum	1.08	0.57	0	0	0.54	0	0	0	0.56	0	0	0
1.3	Percentage of connections with good voice quality (=>95%)													
	(i) 0-4 (w/o frequency hopping)	Palakkad	0	0	0	0	0	0	0	0	0	99.76	97.64	98.13
		Thalassery	0	0	0	0	0	0	0	0	0	99.90	97.98	99.83
		Trivendrum	0	0	0	0	0	0	0	0	0	99.67	98.72	98.47
	(ii) 0-5 (with frequency hopping)	Palakkad	93.91	91.57	97.22	87.72	97.83	93.50	94.00	98.00	93.41	0	0	0
		Thalassery	95.33	96.19	98.10	84.37	97.26	97.30	96.33	97.00	96.00	0	0	0
		Trivendrum	94.51	93.82	94.33	91.89	98.14	97.30	93.00	99.00	96.10	0	0	0
1.4	Call Setup Success Rate (>=95%)	Palakkad	100	100	99.30	99	100	100	100	97.22	99.49	100	100	100
		Thalassery	99.25	99.09	100	100	99	100	99	97.87	98.33	100	100	100
		Trivendrum	99.46	99	98	100	100	98.71	100.00	99.47	96.07	99	100	100

Key observations as could be derived from the table are as under:
• Dropped Call Rate' benchmark is not met by Vodafone in **TRIVENDRUM**.
• Blocked Call Rate' benchmark is not met by Vodafone in **THALASSERY**.
• Good Voice Quality parameter is not met by
   Aircel, Airtel, Idea, Tata GSM, Uninor & Vodafone in **PALAKKAD**, Idea in **THALASSERY &** Aircel, Airtel, Bsnl, Idea & Uninor in **TRIVENDRUM**

Independent Drive Test

SN	Parameter	BSNL (Ernakulam)	IDEA (Wynad)	Rcom GSM (Wynad)	MTS (Kasargod)	Tata GSM (Ernakulam)	VIDEOCON (Malappuram)	Vodafone (Malappuram)
1.1	Blocked Call Rate (<=3%)	1.59	0	0	0	0	0	1.82
1.2	Dropped Call Rate (<=2%)	0.79	0	1.75	0	0	1.85	0
1.3	Percentage of connections with good voice quality (=>95%)							
	(i) 0-4 (w/o frequency hopping)				97.20			
	(ii) 0-5 (with frequency hopping)	95.50	86.57	97.81		97.43	99	95.28
1.4	Call Setup Success Rate (>=95%)	98.40	100	100	100	100	100	98.99

Key observations as could be derived from the table are as under:

• Good Voice Quality parameter is not met by Idea in **WYNAD**

All other Operators are meeting the benchmark

(B) Basic Telephone Service (Wire line) Providers

3 Days Live Data Audit

S/N	Name of Parameter	Bench mark	AIRTEL	BSNL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	<=5%	2.18%	0.69%	0.00%	0.00%
2	Call Completion Rate	>= 55% (CCR) & >=75% (ASR)	92.82%	67.76%	84.00%	97.50%
3	POI Congestion	<= 0.5%	0	0	0	0
4	**Response Time to the customer for assistance**					
a	Accessibility of Call Centre/Customer Care					
	within 40 seconds	>= 95%	100%	95.27%	98.00%	100%
B	% age of calls answered by operator(voice to voice):					
	within 60 seconds	>= 90%	89.46%	85.07%	97.00%	100%

From the 3 days live data audit, it was observed that all the four basic telephone service providers meet the benchmarks. However AIRTEL & BSNL are not meeting the bench mark of "% age of calls answered by operator (voice to voice) within 60 seconds" as mentioned above.

One Month Data Audit

S/N	Name of Parameter	Bench mark	AIRTEL	BSNL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	<=5%	1.87%	6.23%	0.42%	0.02%
2	Fault repair by next working day(Urban Area)					
a	By next working day	>90%	96.33%	80.72%	100%	100%
b	Within 3 days	100%	100%	87.33%	100%	100%
3	Fault repair by next working day(Rural & hilly Area)					
a	By next working day	>90%	NA	69.42%	NA	NA
b	Within 5 days	100%	NA	83.69%	NA	NA
4	Rent rebate					
a	Fault pending > 3 days & <7 days	Rebate for 7 days	0	31	0	0
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	0	148	0	0
c	Fault pending > 15 days	Rebate for one month	0	812	0	0
5	Mean time to Repair(MTTR)	<= 8 Hrs	3.5	19.13	2.3	4.76

6	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55%(CCR) & > 75%(ASR)	92.49%	73.24%	83.10%	98.16%
7	Metering and billing credibility(post paid)					
a	Disputed Bills over bills issued	< 0.1%	0.06%	0.01%	0.03%	0.00%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	100%	100%	100%	100%
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 weeks	100%	100%	100%	100%
9	POI Congestion	<= 0.5%	0	0	0	0
10	Response Time to customer for assistance					
a	Accessibility of Call centre within 40 sec.	>= 95%	100%	95.81%	98.00%	96.16%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	89.10%	77.89%	96.00%	94.53%
11	Customer care(promptness in attending to customers request					
a	Termination / Closures	<= 7 Days	100%	98.72%	100%	100%
b	Time taken refunds deposit after closures	100% within 60 days	100%	91.56%	100%	100%

From the Month data table, it can be observed that most of the operators are meeting the parameters. However, deviation is found with 1. AIRTEL in "% age of calls answered by operator (voice to voice) within 60 sec" and 2. With BSNL not meeting the benchmark for "fault repair", "MTTR", "% age of calls answered by operator(voice to voice) within 60 sec., "Termination/Closures" parameter & Time taken refunds deposit after closures.

(C) Broad Band Service (Wire line) Providers

3 Days live data Audit							
S/N	**Name of Parameter**	**Bench mark**	**AIRTEL**	**ASIANET**	**BSNL**	**RCOM**	**TCISL**
1	**Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)**						
	Within 60 seconds	>=60%	90.60%	NP	75.00%	96.00%	92.00%
	Within 90 seconds	>=80%	92.33%	NP	90.00%	97.00%	98.00%
2	**Bandwidth Utilization/ Throughput:**						
	i) POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	41.79%	72.00%	55.00%	22.64%	20.00%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	0.00%	74.00%	71.63%	NA	46.00%
	Broadband Connection Speed (download)	>=80%	100%	88.00%	87.60%	100%	94.33%
3	**Service Availability/Uptime (for all users)**						
	Service Availability / Uptime	>98%	100.00%	99.77%	100.00%	99.99%	96.00%
	Packet Loss	<=1%	0.00%	0.00%	0.01%	0.00%	0.00%
4	**Network Latency (for wired broadband access)**						
	Network Latency at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	<=120ms	73	32	62	NP	25
	Network Latency at ISP Gateway Node to International nearest NAP port abroad	<=350ms	276	225	76	97.2	267
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	<=800ms	NA	NA	760	NA	NA

From the 3 days live data audit, it was observed that all the four basic telephone service providers meet the benchmarks except for TCISL in Service availability.

One Month Data Audit

S/N	Name of Parameter	Benchmark	AIRTEL	ASIANET	BSNL	RCOM	TCISL
1	**Service Provisioning /Activation Time**						
	100% cases in 15 days (subject to technical feasibility)	<15 days	100%	100%	100%	100%	100%
	Fault Repair / Restoration Time						
	By next working day:	>90%	93.07%	90.00%	90.51%	100.00%	95.00%
	within 3 working days:	≥99%	100.00%	99.00%	99.46%	100.00%	99.00%
	Rebate:						
	Faults Pending for > 3 working days and < 7 working days:		0	0	0	0	93
	Faults Pending for > 7 working days and < 15 working days:		0	0	1	0	NA
	Faults Pending for > 15 working days:		0	0	9	0	NA
	Billing Performance						
	Billing complaints per 100 bills issued	<2%	0.04%	1.50%	0.24%	0.08%	0.35%
4	%age of Billing Complaints resolved	100%	100%	100%	100%	100%	NA
5	Time taken for refund of deposits after closure:	100%	100%	100%	100%	100%	NA
	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)						
6	Within 60 seconds	>=60%	91.30%	NP	77.00%	98.00%	90.99%
7	Within 90 seconds	>=80%	94.00%	NP	90.00%	98.00%	93.55%
	BW Utilization/ Throughput: (If on any link(s) / route BM utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of BW on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route BW utilization during peak hours (TCBH).	<=80%					
	i) POP to ISP Gateway Node [Intra-network] Link(s)	>=95%	36.19%	67.00%	54.00%	12.34%	23.00%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	>=90%	0.00%	67.00%	83.00%	NA	54.00%
9	Broadband Connection Speed	>=80%	96.48%	88.00%	93.80%	NP	93.20%
	Service Availability / Uptime (for all users)						
10	Service Availability / Uptime	>98%	99.99%	99.70%	99.98%	99.99%	98.00%
	Packet Loss	<=1%	0.00%	0.00%	0.01%	0.12%	0.00%
11	**Network Latency (for wired broadband access)**						
	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	<=120ms	73	35	62	85.2	25.76
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	<=350ms	276	230	77	90.2	265.96
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	<=800ms	NA	NA	760	NA	NA

From the month data audit, it was observed that all the four basic telephone service providers meet the benchmarks.

CHAPTER-3: Audit-PMR data verification results

I. Cellular Mobile Telephone Service

S/N	PMR / Name of Parameter	Bench-mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Vi-con	Vo-fone	MTS	Rcom CDMA	Tata CDMA
								GSM Operators							CDMA Operators	
(A)	**Network Service Quality Parameter**															
1	**Network Availability**															
	BTS Accumulated Downtime	<=2%	Reported	0.01%	0.04%	0.81%	0.00%	0.11%	0.00%	0.04%	0.21%	0.07%	0.02%	0.14%	0.00%	0.01%
			Verified	0.01%	0.04%	0.81%	0.01%	0.11%	0.00%	0.04%	0.21%	0.07%	0.02%	0.01%	0.00%	0.01%
	Worst affected BTSs due to downtime	<=2%	Reported	0.00%	0.12%	1.87%	0.00%	0.09%	0.00%	0.07%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
			Verified	0.00%	0.12%	1.87%	0.00%	0.09%	0.00%	0.07%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**															
	CSSR (Call Setup Success Rate)	>=95%	Reported	99%	99%	99%	100%	100%	100%	98%	99%	100%	98%	99%	100%	100%
			Verified	99%	99%	99%	100%	100%	100%	98%	99%	100%	98%	99%	100%	100%
	SDCCH/PAGING congestion	<=1%	Reported	0.03%	0.35%	0.32%	0.00%	0.30%	0.00%	0.12%	0.04%	0.02%	0.00%	0.00%	0.00%	0.00%
			Verified	0.03%	0.35%	0.32%	0.01%	0.30%	0.00%	0.12%	0.04%	0.02%	0.21%	0.00%	0.00%	0.00%
	TCH congestion	<=2%	Reported	0.04%	0.20%	1.45%	0.00%	0.59%	0.00%	0.13%	0.04%	0.24%	0.01%	0.00%	0.00%	0.00%
			Verified	0.04%	0.20%	1.45%	0.00%	0.59%	0.00%	0.13%	0.04%	0.24%	1.59%	0.00%	0.00%	0.00%
3	**Connection maintenance (retainability)**															
	CDR	<=2%	Reported	0.53%	1.11%	0.62%	0.64%	0.99%	0.00%	0.90%	1.16%	1.15%	0.01%	0.33%	0.00%	0.29%
			Verified	0.53%	1.11%	0.62%	1.36%	0.99%	0.00%	0.90%	1.16%	1.15%	0.59%	0.41%	0.00%	0.29%
	Worst affected cells>3% TCH drop	<=5%	Reported	0.02%	0.02%	1.96%	1.44%	1.74%	0.00%	2.25%	0.66%	1.04%	0.01%	0.69%	0.01%	0.73%
			Verified	2.43%	1.80%	2.19%	3.60%	1.74%	0.00%	2.25%	0.66%	1.04%	0.89%	0.30%	0.01%	0.73%
	Good voice quality	>=95%	Reported	98%	96%	100%	98%	96%	99%	98%	98%	98%	97%	100%	99%	99%
			Verified	98%	96%	100%	98%	96%	99%	98%	98%	98%	97%	100%	99%	99%

4															
			Reported	0.67	0	0	0	0	0	0	0	0	0	0	0	0
	POI congestion	>=0.5%	Verified	------	0	0	0	0	0	0	0	0	0	0	0	0
(B)	**Customer Service Quality Parameters**															
5			Reported	1.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Metering/billing credibility- Post paid	<= 0.1%	Verified	1.24%	0.02%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%
6			Reported	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%
	Metering /billing credibility- Pre paid	<= 0.1%	Verified	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.10%	0.02%	0.00%	0.01%
7		100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100%	100%	0.00%	100%	100%	100%	100%	100%
	Resolution of billing/ charging complaints		Verified	100%	100%	100%	100%	100%	100%	100%	0.00%	100%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	Reported	100%	100%	100%	0.00%	100%	100%	100%	0.00%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	0.00%	100%	100%	100%	0.00%	100%	100%	100%	100%	100%
8	**Response time to customers for assistance**															
	Accessibility of call centre/Customer Care	>=95%	Reported	100%	100%	100%	0	99%	100%	99%	99%	98%	100%	99%	100%	100%
			Verified	100%	100%	100%	98.88%	99%	100%	99%	99%	98%	100%	99%	100%	100%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	92%	82%	45%	100%	96%	78%	94%	99%	95%	53%	90%	81%	95%
			Verified	92%	82%	45%	100%	96%	78%	94%	99%	95%	53%	90%	81%	95%
9	**Termination/closure of service**															
	No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100%	100%	100%	0.00%	100%	100%	98%	0.00%	0.00%	100%	NA	100%	100%
			Verified	100%	100%	100%	0.00%	100%	100%	98%	0.00%	0.00%	100%	NA	100%	100%
10		100% within 60 days	Reported	100%	100%	100%	0.00%	100%	100%	100%	0.00%	0.00%	100%	NA	100%	100%
	Time taken for refunds of deposits after closures.		Verified	100%	100%	100%	0.00%	100%	100%	100%	0.00%	0.00%	100%	NA	100%	100%

The figures provided in PMR are found to be matching with the data obtained from the operators for verification in most of the cases.

II. Basic Telephone (Wireline) Service:

S/N	Parameters	Bench-marks	Audit	AIRTEL	BSNL	RCOM	TTSL
1	*Fault incidences*						
	(No. of faults/100 subscribers /month) BM <5%	**< 5%**	**Reported**	2.09%	6.32%	0.50%	0.32%
			Verified	2.09%	6.32%	0.50%	0.32%
2	*Faults Repair/Restoraion Time*						
	Fault repair by next working day(Urban Area) BM >90%	**>90%**	**Reported**	94.65%	72.79%	100%	95.45%
			Verified	94.65%	72.79%	100%	95.45%
	Within 3 days.BM 100%	**100%**	**Reported**	100%	88.65%	100%	100%
			Verified	100%	88.65%	100%	100%
	Within 5 days (Hilly & Rural Area) BM 100%	**100%**	**Reported**	NA	86.91%	NA	100%
			Verified	NA	86.91%	NA	100%
	Mean time to Repair(MTTR).BM <=8 hrs	**≤8 Hrs**	**Reported**	3.47	18.2	2.29	6.97
			Verified	3.47	18.2	2.29	6.97
3	*Rent Rebate*						
	Rent Rebate		**Reported**	NIL	NIL	NIL	NIL
			Verified	NIL	NIL	NIL	NIL
4	*Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)*						
	CCR & ASR. BM >55% & >75%	**> 55%(CCR) & > 75%(ASR)**	**Reported**	93.46%	72.65%	83.16%	98.92%
			Verified	93.46%	72.65%	83.16%	98.92%
5	*Metering & Billing Performance*						
	Metering & Billing Credibility-Post paid.BM 0.1%	**< 0.1%**	**Reported**	0.01%	0.02%	0.01%	0.07%
			Verified	0.01%	0.02%	0.01%	0.07%
	Metering & Billing Credibility-Pre paid BM 0.1%	**100%**	**Reported**	NA	NR	NR	NA
			Verified	NA	NR	NR	NA
	Resolution of billing charging/validity/Complaints within 4 weeks BM 100%	**100%**	**Reported**	100%	NR	100%	100%
			Verified	100%	NR	100%	100%
	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	**100%**	**Reported**	100%	NR	100%	NR
			Verified	100%	NR	100%	NR
6	*POI Congestion*						
	POI Congestion (%)	**≤ 0.5%**	**Reported**	0	NR	0	0
			Verified	0	NR	0	0
7	*Response Time to customer for assistance*						
	Accessibility of Call centre/customer Care within 40 seconds.BM >95%	**≥95%**	**Reported**	99.39%	98.03%	96.00%	98.24%
			Verified	99.39%	98.03%	96.00%	98.24%
	% age of calls answered by operator(voice to voice) within 60 seconds. BM >90%	**≥90%**	**Reported**	85.88%	96.51%	91.00%	94.47%
			Verified	85.88%	96.51%	91.00%	94.47%
8	*Customer care(promptness in attending to customers request*						
	Termination / Closures.BM <=7 days	**100%**	**Reported**	NR	99.64%	100%	NR
			Verified	NR	99.64%	100%	NR
	Time taken for refunds of deposit after closures. BM 100% with in 60 days.	**100%**	**Reported**	100%	100%	100%	NIL
			Verified	100%	100%	100%	NIL

NA – Not Applicable   **NR** – Data Not Received

The figures provided by all the operators match the figures obtained on verification.

III. Broadband Service

S/N	Parameters	Benchmarks	Audit Period	AIRTEL	ASIANET	BSNL	RCOM	TCISL
1	Service Provisioning/Activation Time							
1.2	%age of connections provided within 15 days of registration of demand	100%	Reported	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%
2	Faults Repair/Restoration Time							
2.1	% of faults repaired by next working day	>90%	Reported	93.62%	90.31%	93.10%	100%	97%
			Verified	93.62%	90.31%	93.10%	100%	97%
2.2	% of faults repaired within 3 working day	≥99%	Reported	96.42%	99.66%	99.70%	100%	99%
			Verified	100%	99.66%	99.70%	100%	99%
3	Rent Rebate							
3.1	Rent Rebate(nos)		Reported	0	NR	32	0	1819
			Verified	0	NR	32	0	1819
4	Billing Performance							
4.1	%age of bills disputed	<2%	Reported	0.00%	0.03%	0.30%	0.09%	0.00%
			Verified	0.00%	0.01%	0.30%	0.09%	0.00%
4.2	%age of complaints resolved within 4 weeks	100%	Reported	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	Reported	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%
5	Response Time to the Customer for assistance							
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	Reported	81.57%	NR	74.90%	85.00%	90.43%
			Verified	81.57%	NR	74.90%	85.00%	90.43%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	Reported	86.44%	NR	89.50%	89.00%	91.65%
			Verified	86.44%	NR	89.50%	89.00%	91.65%
6	Bandwidth utilization/throughput							
6.1	No. of Intra network links having Bandwidth utilisation >90% during peak hours (TCBH)		Reported	0	0	0	0	DNF
			Verified	0	0	0	0	DNF
6.2	No. of Upstream links for International connectivity		Reported	NA	0	3	0	0

No	Parameter	Benchmark						
	having BW utilisation >90% Peak Hrs.(TCBH)		Verified	NA	0	3	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	Reported	NA	77.56%	78.10%	53.42%	42.05%
			Verified	NA	77.56%	78.10%	53.42%	42.05%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	Reported	103.03%	DNF	87.10%	DNF	93.26%
			Verified	103.03%	DNF	87.10%	DNF	93.26%
7	**Service Availability/Uptime (for all users) in %age**							
7.1	Service availability /uptime (for all users) in %age	>98%	Reported	100%	99.00%	100%	99.69%	**97.00%**
			Verified	100%	99.00%	100%	99.69%	**97.00%**
8	**Packet loss**							
8.1	% of Packet loss	<1%	Reported	0%	C/DNF	0.04%	C/DNF	0.53%
			Verified	0%	C/DNF	0.04%	C/DNF	0.53%
9	**Network latency (for wired broadband access)**							
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	Reported	103	C/DNF	26.3	DNF	50.33
			Verified	103	C/DNF	26.3	DNF	50.33
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	Reported	326	C/DNF	233.7	DNF	249
			Verified	326	C/DNF	233.7	DNF	249
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 ms	Reported	NA	NA	0	NA	NA
			Verified	NA	NA	0	NA	NA

The figures provided by all the operators match the figures obtained on verification

CHAPTER-4: DETAILED FINDINGS & ANALYSIS

I. Cellular Mobile Telephone Service
(A) MSC Audit
(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
			GSM Operators										CDMA Operators		
A	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.02%	0.01%	0.39%	0.00%	0.01%	0.01%	0.00%	0.02%	0.03%	0.00%	0.01%	0.01%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.00%	0.02%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		2353	4475	4550	38	5095	2179	2016	1330	922	4146	704	1183	561
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		32	29	1264	0	50	12	7	18	18	14	3	8	0
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	0	1	0	1	0	0	0	0	0	0	0	0
1	Connection Establishment (Accessibility)														
	a) CSSR	>=95%	99.67%	99.02%	98.01%	100.00%	99.91%	99.90%	99.44%	99.29%	98.70%	98.73%	99.01%	99.58%	98.98%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.14%	0.39%	0.00%	0.14%	0.13%	0.02%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.21%	1.99%	0.00%	0.48%	0.02%	0.12%	0.03%	0.00%	0.79%	0.00%	0.07%	0.00%
2	Connection maintenance														
	a) CDR	<=2%	0.63%	0.94%	0.53%	0.76%	0.97%	0.12%	0.94%	1.24%	0.92%	0.61%	1.13%	0.58%	0.50%
	b) Cells having > 3% TCH drop	<=3%	6.63%	8.66%	2.01%	4.09%	2.13%	0.06%	6.33%	13.28%	1.37%	2.24%	1.96%	0.25%	1.42%
	c) Good voice quality	>=95%	98.01%	96.86%	99.89%	98.16%	95.40%	99.27%	98.36%	97.81%	98.47%	97.24%	100.00%	98.54%	NA
	d) No. of cells > 3% TCH drop		467	1,155	269	5	324	4	380	532	38	277	42	9	24
	e) Total no. of cells in the network		7,039	13,343	13,408	114	15,247	6,537	6,002	4,005	2,766	12,371	2,147	3,549	1,688

S/N	Name of Parameter	Benchm ark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
							GSM Operators							CDMA Operators	
3	No of POI having congestion	>=0.5 %	0	0	0	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	b) Total No. of call attempts on POI (Avg.)		217,859	1,809,695	1,492,302	89	1,814,428	56,206	457,557	106,586	28,520	2,144,019	176,581	269,271	394,277
	c) Total traffic served on POI (Erlang) (Avg.)		4,878	71,111	44,272	3	50,814	1,945	14,301	3,878	1,011	88,161	6,547	12,152	11,242
	d) Total No. of circuits on POI		12,552	134,835	66,730	2,417	118,168	6,850	27,768	10,186	3,323	148,731	15,668	38,132	43,036
	e) Total number of working POI Service Area wise		36	41	12	25	127	NP	18	38	25	36	55	NP	84
	f) Equipped Capacity of Network in respect of Traffic in erlang		62,231	172,308	233,256	844	222,827	50,000	91,778	32,146	18,476	165,476	19,000	142,000	116,185
	g) Total traffic handled in TCBH in erlang		15,368	99,023	130,084	4	199,164	NP	32,610	5,781	2,281	152,933	9,022	NP	29,534
(B)	Customer Service Quality Parameters														
4	Response time to customers for assistance														
	a) Accessibility of call centre	>=95%	76.00%	100%	100%	100%	92.38%	99.44%	100%	97.00%	100%	100%	99.18%	99.89%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	79.60%	96.71%	40.84%	100%	98.29%	87.87%	97.03%	98.08%	98.99%	97.39%	87.88%	95.00%	98.66 %
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		1,039	16,698	41,510	18	54,122	2,151	20,389	3,808	99.00	4,910	3,911	2,321	1,868
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		827	16,148	16,952	18	53,199	1,890	19,784	3,735	98.00	4,782	3,437	2,205	1,843

NA: Not Applicable, NP: Data Not Provided

Parameter wise Findings (Live Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in Kerala Service Area are as given below:-

➢ **BTS accumulated downtime (benchmark ≤2%):** All operators are meeting the benchmark with values lying between 0% and 0.39%.

➢ **Worst affected BTSs due to downtime (benchmark ≤ 2%):** All operators are meeting the benchmark with values lying between 0% and 0.02%.

➢ **Call setup success rate (benchmark ≥95%):** All operators are meeting the benchmark with values lying between 98.01% and 100%.

➢ **SDCCH/PAGING Channel congestion (benchmark ≤ 1%):** All operators are meeting the benchmark with values lying between 0% and 0.39%. MTS, Reliance CDMA & Tata CDMA have not provided data.
Note: CDMA operators have the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.

➢ **TCH congestion (benchmark ≤ 2%):** All operators are meeting the benchmark with values lying between 0.0% and 1.99%.
➢ **Call drop rate (benchmark ≤ 2%):** All operators are meeting the benchmark with values lying between 0.12% and 1.24%.

➢ **Cell exceeding 3% TCH drop (benchmark ≤ 3%):** Aircel, Airtel, Etisalat, Tata (GSM) & Uninor are not meeting the benchmark 3%. Other operators are satisfying the benchmark with value in between 0.06% and 2.24%.

➢ **Connections with good voice quality (benchmark ≥95%):** CDMA service providers have declared that the parameter is not system generated. GSM operators are meeting the benchmark with values lying between 95.40% and 99.89%.

➢ **Number of POI having ≥0.5% POI congestion:** All the operators meeting the benchmark.

➢ **%age of call answered by operator (electronically) (benchmark >95%):** All the operators are meeting the benchmark with values lying between 97% and 100% except Aircel & Idea.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%):** Aircel, BSNL, Reliance GSM & MTS are not meeting the benchmark value of 90%.

(2) One Month Audit Data Report & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
			GSM Operators										CDMA Operators		
(A)	**Network Service Quality Parameter**														
1	**Network Availability**														
	a) BTS Accumulated Downtime	*<=2%*	0.24%	0.03%	0.55%	0.01%	0.05%	0.04%	0.01%	0.04%	0.10%	0.02%	0.01%	0.01%	0.02%
	b) Worst affected BTSs due to downtime	*<=2%*	2.25%	0.16%	0.88%	0.00%	0.14%	0.00%	0.00%	0.30%	0.33%	0.00%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		2,353	4,475	4,550	38	5,095	2,179	2,016	1,330	922	4,146	704	1,183	561
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		4,039	1,002	17,895	2	1,842	627	168	340	686	630	70	98	64
	e) No. of BTSs having accumulated downtime of >24 hours in a month		53	7	40	0	7	0	0	4	3	0	0	0	0
2	**Connection Establishment (Accessibility)**														
	a) CSSR (Call Setup Success Rate)	*>=95%*	99.65%	98.88%	98.03%	99.71%	99.70%	99.92%	99.41%	99.27%	98.63%	98.53%	98.91%	99.56%	98.67%
	b) SDCCH/PAGING congestion	*<=1%*	0.01%	0.11%	0.36%	0.40%	0.36%	0.03%	0.04%	0.04%	0.00%	0.38%	0.00%	0.00%	0.00%
	c) TCH congestion	*<=2%*	0.00%	0.15%	1.96%	0.00%	0.57%	0.02%	0.14%	0.04%	0.00%	0.81%	0.00%	0.08%	0.00%
3	**Connection maintenance (retainability)**														
	a) CDR	*<=2%*	0.64%	1.06%	0.54%	0.85%	0.90%	0.13%	1.00%	1.14%	0.98%	0.65%	1.14%	0.59%	0.70%
	b) Worst affected cells>3% TCH drop	*<=3%*	6.93%	9.44%	1.97%	3.22%	1.55%	0.08%	7.03%	13.06%	1.52%	2.50%	2.38%	0.28%	1.36%
	c) Good voice quality	*>=95%*	97.95%	96.74%	99.86%	98.44%	95.62%	99.30%	98.31%	97.53%	98.38%	97.19%	100.00%	98.55%	NA
	d) Total No. of cells exceeding 3% TCH drop (call drop)		488	1,260	264	4	237	5	422	523	42	309	51	10	23
	e) Total no. of cells in the network		7,039	13,343	13,408	114	15,247	6,537	6,002	4,005	2,766	12,371	2,147	3,549	1,688

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
			GSM Operators										CDMA Operators		
4	No of POI having congestion	>=0.5%	0	0	0	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	b) Total No. of call attempts on POI (Avg.)		206,236	1,690,436	1,391,445	82	1,973,877	54,610	451,334	108,686	27,558	1,908,560	170,278	226,978	500,955
	c) Total traffic served on POI (Erlang) (Avg.)		4,572	69,438	42,850	3	56,714	1,868	14,018	3,880	973	86,801	6,347	10,613	13,782
	d) Total No. of circuits on POI		12,552	135,431	66,730	2,417	116,147	6,823	27,768	10,186	3,334	148,731	15,672	35,084	43,036
	e) Total number of working POI Service Area wise		36	41	12	25	127	NP	18	38	25	36	55	NP	84
5	Network Data														
	a) Equipped Capacity of Network Erlang		62,231	172,308	233,256	844	222,827	50,000	91,778	32,146	18,476	165,476	19,000	142,000	116,185
	b) Total traffic in TCBH in erlang (Avg.)		14,246	97,205	124,848	4	192,494	34,858	31,958	5,276	2,195	147,596	8,672	45,691	30,382
	c) Total no. of customers served (as per VLR) on last day of the month		636,113	2,937,957	4,335,096	541	6,790,942	959,378	1,073,515	223,737	61,796	4,696,742	304,136	1,438,198	286,748
(B)	Customer Service Quality Parameters														
6	Metering/billing credibility-Post paid	<= 0.1%	0.29%	0.02%	0.10%	NA	0.02%	0.09%	0.00%	NA	NA	0.09%	NA	0.06%	0.00%
	a) No. of bills issued during the period		9,812	134,446	171,031	NA	237,095	11,049	73,099	NA	NA	177,345	NA	173,999	73,099
	b) No. of bills disputed including billing complaints during the period		28	23	171	NA	36	10	0	NA	NA	159	NA	109	0
7	Metering /billing credibility-Pre paid	<= 0.1%	0.06%	0.04%	0.02%	0.00%	0.00%	0.03%	0.00%	0.00%	0.04%	0.04%	0.02%	0.02%	0.00%
	a) No. of charging / credit / validity complaints during the quarter		1,402	1,725	1,433	0	46	552	1	25	103	2,258	108	341	1

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
							GSM Operators							CDMA Operators	
	b) Total no. of pre-paid customers at the end of the quarter		2,510,284	4,421,500	6,098,243	9,146	6,983,413	1,799,384	318,895	653,436	245,975	5,588,533	588,304	2,206,011	318,895
8	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	91%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
	a) No. of billing/(post paid) and charging, credit/validity (pre paid) complaints resolved within 4 weeks during the quarter		1,430	1,748	1,604	NA	82	562	216	25	103	2,417	108	450	216
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		1,430	5,934	1,604	NA	82	562	216	25	103	2,417	108	450	216
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		60	1,748	1,456	NA	72	134	0	25	7	2,408	10	135	1
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		1,370	4,186	148	NA	10	428	327	0	96	9	98	315	215
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
9	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	>=95%	78.00%	98.97%	100%	98.53%	97.04%	99.41%	100%	96.31%	99.64%	95%	97.31%	99.76%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	90.49%	94.27%	49.50%	100%	91.13%	93.66%	97.21%	98.29%	96.25%	94.84%	90.35%	95.79%	83.63%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		820	18,300	38,055	53	54,256	2,161	20,718	3,620	80	4,691	3,981	2,328	2,377

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
			GSM Operators										CDMA Operators		
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		742	17,252	18,836	53	49,446	2,024	20,139	3,558	77	4,449	3,597	2,230	1,988
10	Termination/closure of service	<=7days	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	NA	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		242	627	2,591	NA	1,467	94	122	NA	NA	673	NA	751	889
	b) No. of requests for Termination / Closure of service complied within 7 days during the quarter		242	627	2,591	NA	1,467	94	122	NA	NA	673	NA	751	889
11	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	NA	100%	100%	100%	NA	NA	98%	NA	100%	100%
NA: Not Applicable, NP: Data Not Provided															

Parameter-wise Findings (Month Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in Kerala Service Area are as given below:-
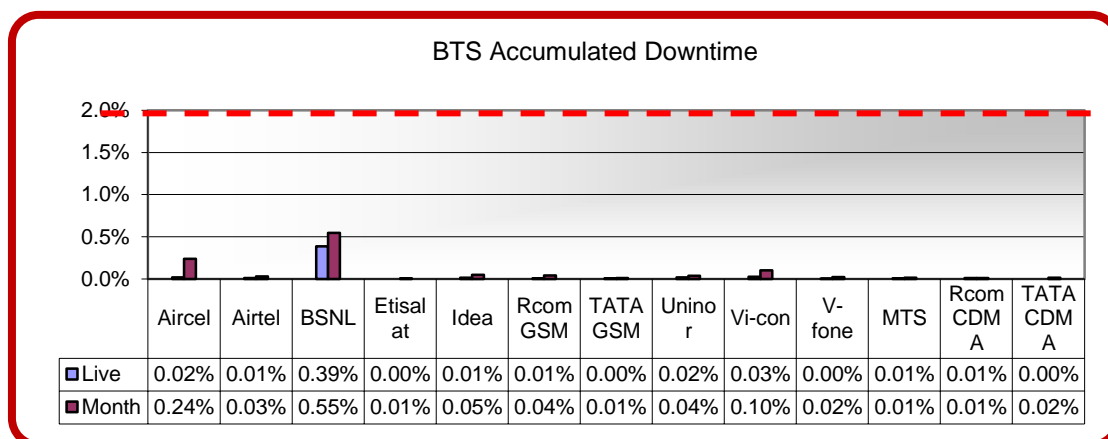
- ➢ **BTS accumulated downtime (benchmark ≤2%):** All operators are meeting the benchmark with values lying between 0.01% and 0.55%.
- ➢ **Worst affected BTSs due to downtime (benchmark ≤ 2%):** Aircel is not meeting the benchmark. Other operators are meeting the benchmark with values lying between 0% and 0.88%.

- ➢ **Call setup success rate (benchmark ≥95%):** All operators are meeting the benchmark with values lying between 98.03% and 99.92%.
- ➢ **SDCCH/PAGING Channel congestion (benchmark ≤ 1%):** All operators are meeting the benchmark with values lying between 0.01% and 0.40%. MTS, Reliance CDMA & Tata CDMA have not provided the data.
  Note: CDMA operators have the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- ➢ **TCH congestion (benchmark ≤ 2%):** All operators are meeting the benchmark with values lying between 0% and 1.96%.
- ➢ **Call drop rate (benchmark ≤ 2%):** All operators are meeting the benchmark with values lying between 0.13% and 1.14%.
- ➢ **Cell exceeding 3% TCH drop (benchmark ≤ 3%):** Aircel, Airtel, Etisalat, TATA GSM & Uninor are not meeting the benchmark. Others are meeting with value in between 0.08% & 2.5%.
- ➢ **Connections with good voice quality (benchmark ≥95%):** CDMA service providers have declared that the parameter is not system generated. GSM operators are meeting the benchmark with values lying between 95.62% and 99.86%.

- ➢ **Number of POI having ≥0.5% POI congestion:** All the operators meeting the benchmark.

- ➢ **%age of call answered by operator (electronically) (benchmark >95%):** All operators are meeting the benchmark with values lying between 95% and 100% except Aircel (78%).
- ➢ **%age of call answered by operator (Voice to voice) (benchmark >90%):** BSNL & Tata CDMA are not meeting the benchmark.

- ➢ **Metering and billing credibility-Post paid (benchmark ≤ 0.1%):** Except Aircel all other operators are meeting the benchmark.
- ➢ **Metering and billing credibility-Pre paid (benchmark ≤ 0.1%):** All the operators are meeting the benchmark.

- ➢ **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All the operators are meeting the benchmark. Except BSNL.
- ➢ **Termination/Closure of service (Benchmark ≤ 7 days):** All the operators are meeting the benchmark.
- ➢ **Time taken for refunds of deposits after closures (benchmark 100% within ≤60 days):** All the operators are meeting the benchmark. Except Vodafone.

(3) Sample Coverage

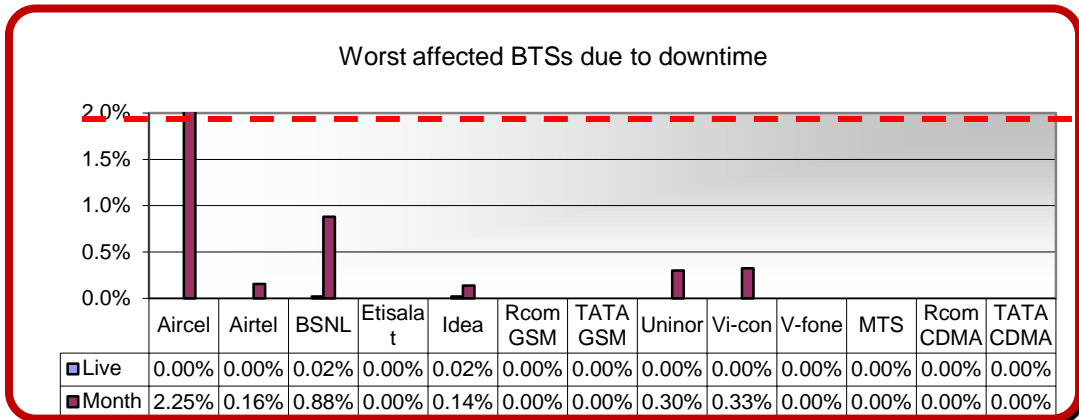*Switches/BSC/BTS details of operators:*

S/N	Name of Service Provider	No. of MSC/ GMSC	No. of BSC	No. of BTS
	GSM Operators			
1	Aircel Ltd	3	15	2353
2	Airtel Ltd	11	42	4475
3	BSNL	20	65	4550
4	Etisalat	3	1	38
5	Idea	12	72	5095
6	Reliance Communication (GSM)	3	10	2179
7	Tata Communications (GSM)	3	15	2016
8	Uninor	2	18	1330
9	Videocon	1	6	922
10	Vodafone	8	64	4146
	CDMA Operators			
11	MTS (CDMA)	1	2	704
12	Reliance Communication (CDMA)	7	2	1183
13	Tata Communications (CDMA)	4	6	561

(4) Performance (Graphical Representation)

Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services
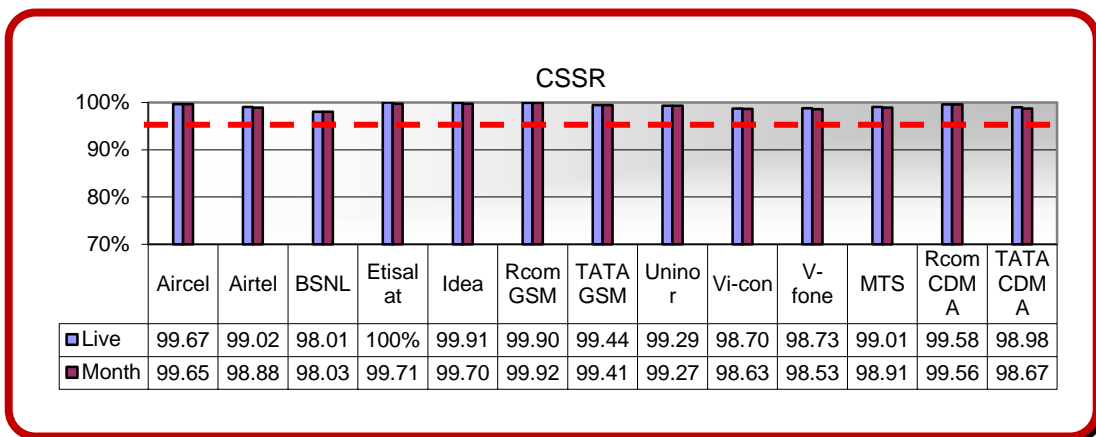
A)   NETWORK PERFORMANCE

BTS Accumulated Downtime: All operators are meeting the TRAI benchmarks (<= 2 %) for both one month data and 3 days live data taken in the month of audit.
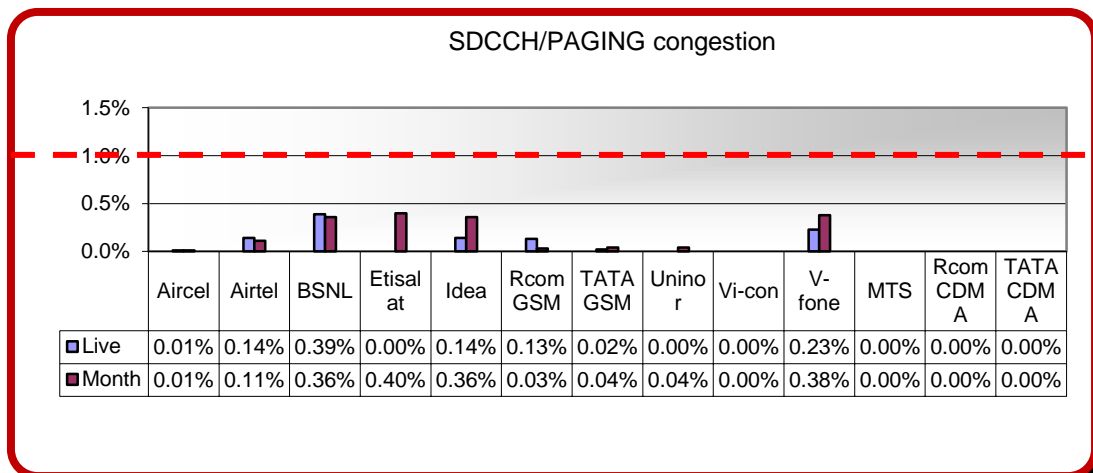

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	0.02%	0.01%	0.39%	0.00%	0.01%	0.01%	0.00%	0.02%	0.03%	0.00%	0.01%	0.01%	0.00%
Month	0.24%	0.03%	0.55%	0.01%	0.05%	0.04%	0.01%	0.04%	0.10%	0.02%	0.01%	0.01%	0.02%

Worst affected BTSs due to downtime: All operators are meeting the TRAI benchmarks (<= 2 %) for both one month data and 3 days live data taken in the month of audit

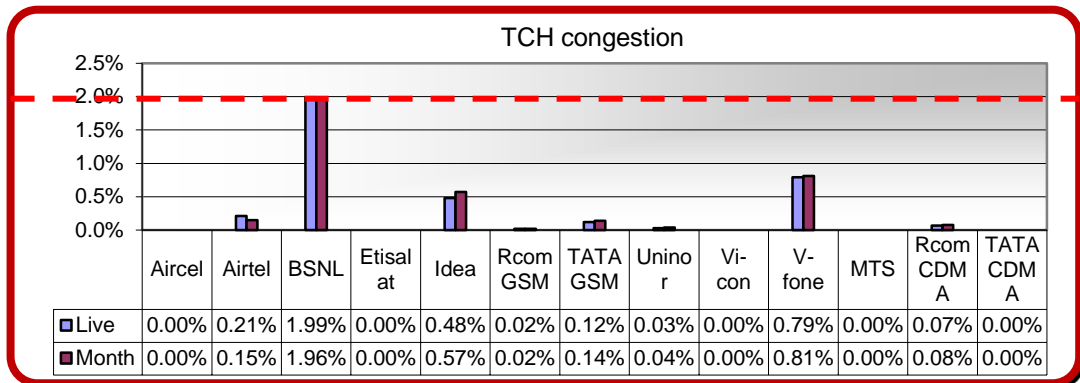**Worst affected BTSs due to downtime**

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	0.00%	0.00%	0.02%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Month	2.25%	0.16%	0.88%	0.00%	0.14%	0.00%	0.00%	0.30%	0.33%	0.00%	0.00%	0.00%	0.00%

Call setup success rate: All operators are meeting the TRAI benchmarks (≥95 %) for both one month data and 3 days live data taken in the month of audit.

CSSR

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	99.67	99.02	98.01	100%	99.91	99.90	99.44	99.29	98.70	98.73	99.01	99.58	98.98
Month	99.65	98.88	98.03	99.71	99.70	99.92	99.41	99.27	98.63	98.53	98.91	99.56	98.67

Blocked call rate:

SDCCH congestion: All operators are meeting the TRAI benchmarks (≤ 1 %) for both one month data and 3 days live data taken in the month of audit. CDMA operators MTS, Reliance & Tata have not provided the data.

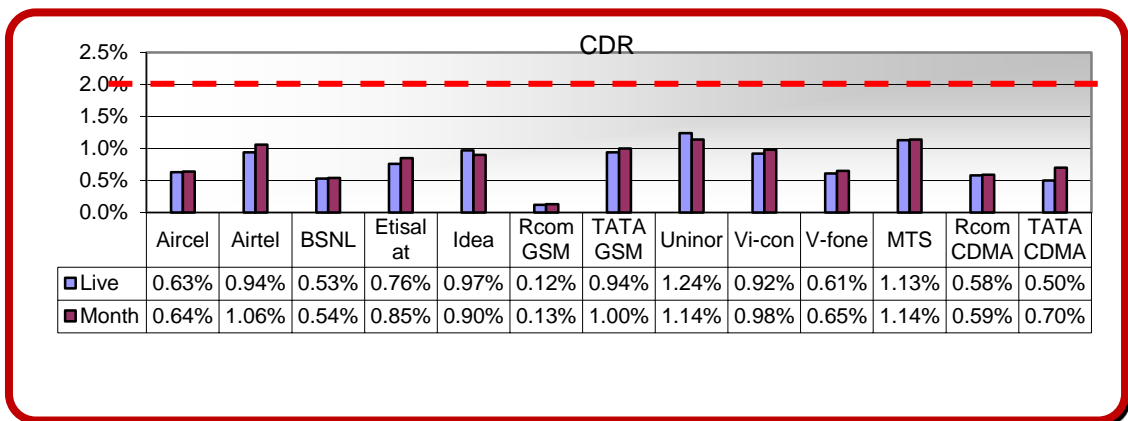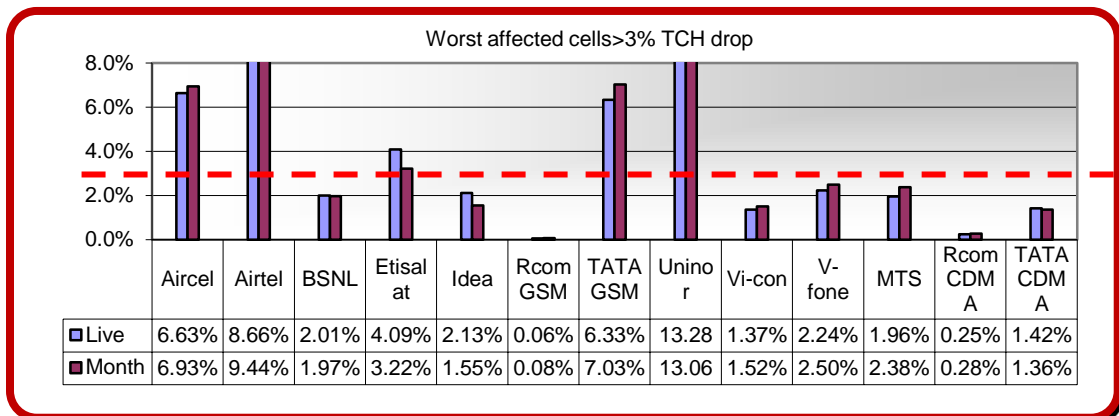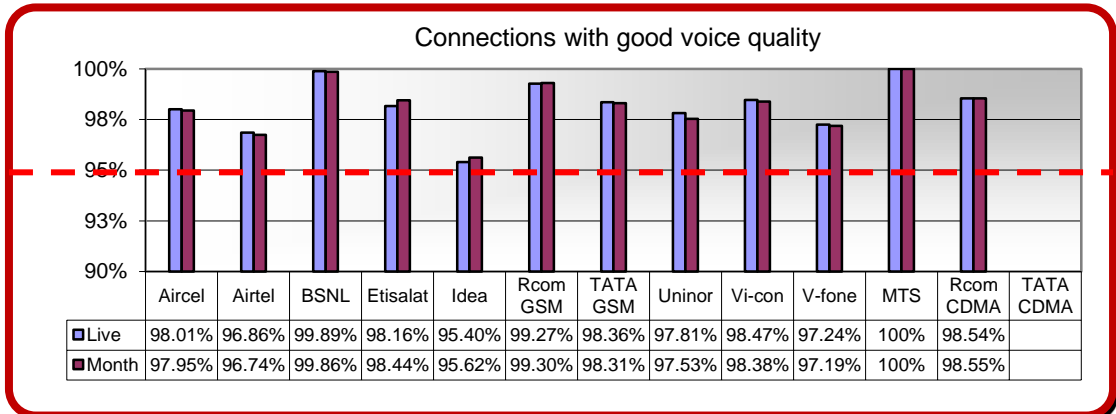**SDCCH/PAGING congestion**

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	0.01%	0.14%	0.39%	0.00%	0.14%	0.13%	0.02%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%
Month	0.01%	0.11%	0.36%	0.40%	0.36%	0.03%	0.04%	0.04%	0.00%	0.38%	0.00%	0.00%	0.00%

TCH congestion: All operators are meeting the TRAI benchmarks (≤ 2%) for both one month data and 3 days live data taken in the month of audit.

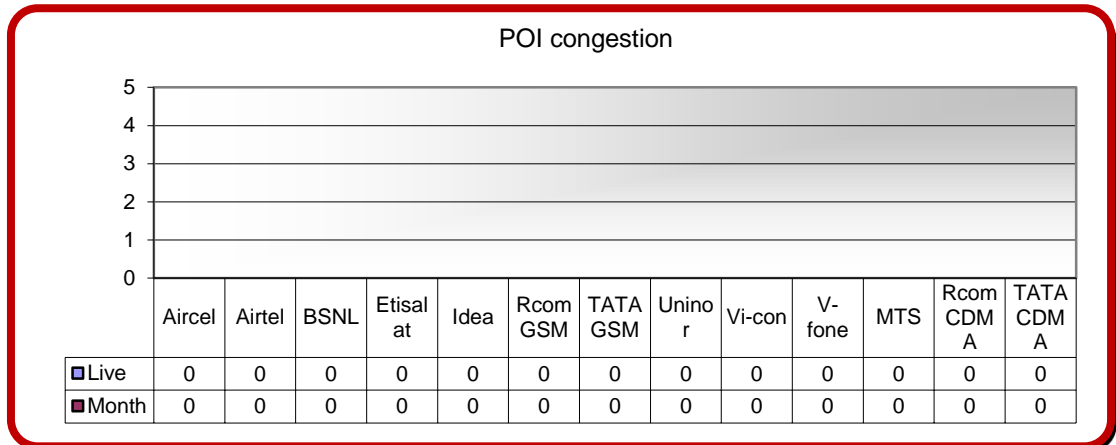| TCH congestion	Aircel	Airtel	BSNL	Etisal at	Idea	Rcom GSM	TATA GSM	Unino r	Vi-con	V-fone	MTS	Rcom CDM A	TATA CDM A
Live	0.00%	0.21%	1.99%	0.00%	0.48%	0.02%	0.12%	0.03%	0.00%	0.79%	0.00%	0.07%	0.00%
Month	0.00%	0.15%	1.96%	0.00%	0.57%	0.02%	0.14%	0.04%	0.00%	0.81%	0.00%	0.08%	0.00%

Connection Maintainability (Retainability):

Call drop rate: All operators are meeting the TRAI benchmarks (≤2%) for both one month data and 3 days live data taken in the month of audit.

CDR	Aircel	Airtel	BSNL	Etisal at	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	0.63%	0.94%	0.53%	0.76%	0.97%	0.12%	0.94%	1.24%	0.92%	0.61%	1.13%	0.58%	0.50%
Month	0.64%	1.06%	0.54%	0.85%	0.90%	0.13%	1.00%	1.14%	0.98%	0.65%	1.14%	0.59%	0.70%

Worst affected Cell exceeding 3% TCH Drop: For live audit Aircel Airtel, Etisalat, Tata GSM & Uninor for both live and month data are found not meeting the benchmark of ≤3%. Other operators are meeting the benchmark for both cases.

Worst affected cells>3% TCH drop	Aircel	Airtel	BSNL	Etisal at	Idea	Rcom GSM	TATA GSM	Unino r	Vi-con	V-fone	MTS	Rcom CDM A	TATA CDM A
Live	6.63%	8.66%	2.01%	4.09%	2.13%	0.06%	6.33%	13.28	1.37%	2.24%	1.96%	0.25%	1.42%
Month	6.93%	9.44%	1.97%	3.22%	1.55%	0.08%	7.03%	13.06	1.52%	2.50%	2.38%	0.28%	1.36%

Percentage of connections with good voice quality: All operators are meeting the TRAI benchmarks (≥ 95%) for both one month data and 3 days live data taken in the month of audit.
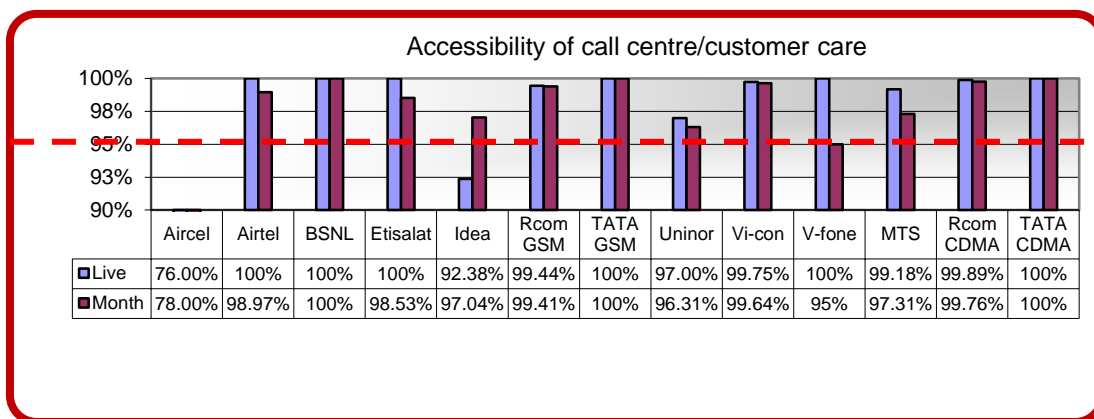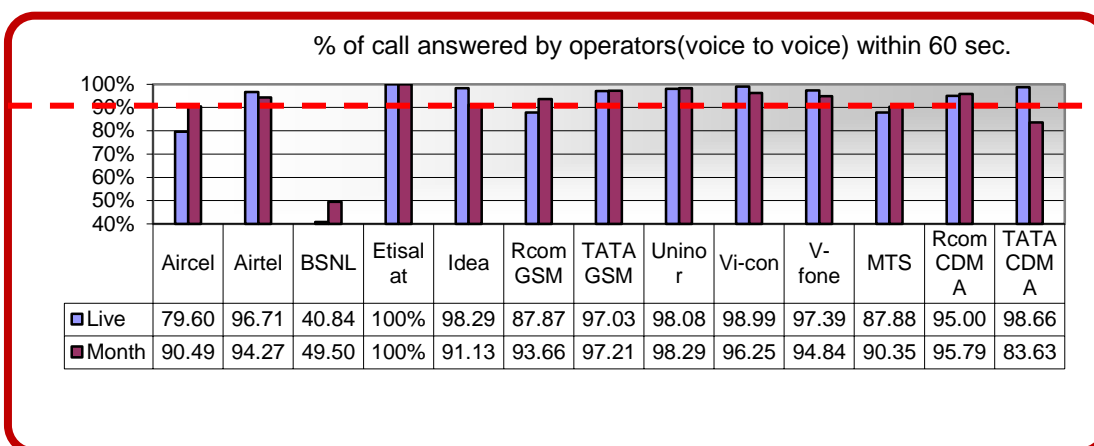
	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Connections with good voice quality													
Live	98.01%	96.86%	99.89%	98.16%	95.40%	99.27%	98.36%	97.81%	98.47%	97.24%	100%	98.54%	
Month	97.95%	96.74%	99.86%	98.44%	95.62%	99.30%	98.31%	97.53%	98.38%	97.19%	100%	98.55%	

POI Congestion: All operators are meeting the TRAI benchmark (>=0.5%) for both one month data and 3 days live data taken in the month of audit.

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
POI congestion													
Live	0	0	0	0	0	0	0	0	0	0	0	0	0
Month	0	0	0	0	0	0	0	0	0	0	0	0	0

B) **CUSTOMER SERVICE QUALITY PARAMETERS**

Response time to the customer for assistance:

Percentage of call answered (Electronically): Idea for live audit & Aircel for live and month audit are not meeting the benchmark. Other operators are meeting the TRAI benchmark (≥95%) for both one month data and 3 days live data taken in the month of audit.

Accessibility of call centre/customer care

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	76.00%	100%	100%	100%	92.38%	99.44%	100%	97.00%	99.75%	100%	99.18%	99.89%	100%
Month	78.00%	98.97%	100%	98.53%	97.04%	99.41%	100%	96.31%	99.64%	95%	97.31%	99.76%	100%

Percentage of call answered by operators (Voice to voice) within 60 sec: Aircel, Rcom GSM & MTS for live audit and BSNL for both live and month audit are not meeting the required benchmark against this parameter.

% of call answered by operators(voice to voice) within 60 sec.

	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	TATA CDMA
Live	79.60	96.71	40.84	100%	98.29	87.87	97.03	98.08	98.99	97.39	87.88	95.00	98.66
Month	90.49	94.27	49.50	100%	91.13	93.66	97.21	98.29	96.25	94.84	90.35	95.79	83.63

(5) Critical Analysis

The above comparative study between live data & month data shows similar trends & consistency in both the cases. However, inconsistency in live & month data was found for the parameter Worst affected BTSs due to downtime with Aircel, "Worst affected cells>3% TCH drop" with Aircel, Airtel, Etisalat, TATA GSM & Uninor. Customer care parameter are satisfactory with all the operators except with Aircel , BSNL, Rcom GSM & MTS in Percentage of call answered by operators (Voice to voice) within 60 sec.

(B) Redressal

1. Sample coverage

A sample of billing complaints was taken for each operator and calls were made for assessing the resolution of billing/charging complaints within 4 weeks as claimed by the respective operators.

2. Performance based on live calling for billing complaints

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Tata GSM	Uninor	Video con	Vodaf one	MTS	Tata CDMA
Total No. of Calls Attempted	15	120	15	NA	25	NA	25	5	122	5	NA
Total No. of calls Answered	15	105	15	NA	25	NA	22	5	100	5	NA
Cases resolved with 4 weeks	15	105	15	NA	25	NA	22	5	100	5	NA
%age of cases resolved	100 %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: During the verification in some cases we could not get answer from subscriber; however those whom we contacted have confirmed their complaint and subsequently solved by the operator. Rcom GSM and CDMA did not provide data for verification.

3. Live Calling to Call Centre

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
Call Centre No.	121	121	2502	121	198	*333	121	121	121	111	198	*333	121
Total No. of Calls Attempted	200	200	200	100	200	200	200	100	100	200	100	200	200
Total No. of calls connected to IVR	200	200	200	100	200	200	200	100	100	200	100	200	200
Calls got connected to agent within 60 Sec	200	200	200	100	200	200	200	100	100	200	100	200	200
%age of calls got answered	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
NOTE: Calls were made from the Operators place. All the calls were connected within 60 seconds. 200 calls total made i.e. 100 each for Prepaid and Post paid except Etisalat, Uninor, Videocon & MTS who have only Prepaid services.													

4. Level 1 Live Calling

Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	Emergency Services
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Police
101	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Fire service
108	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Emergency Ambulance
139	5	5	5	5	5	5	5	5	5	5	5	5	5	5	Railway Enquiry

5. Critical Analysis

Random numbers were selected from the operators' database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. It was found that the operators had made refunds in 100% cases as claimed by their records. Rcom has not provided the data for verification.

Calls were made from Operators office at Cochin for Call Centre test calls. 200 calls total made i.e. 100 each for Prepaid and Post paid except Etisalat, Uninor, Videocon & MTS as these operators are having prepaid services only. Call centre calls were successfully connected within the 60 seconds time for all the operators.

All the level 1 calls were also made from Cochin and were found to land in the neighboring area as per requirement.

(C) Inter operator call assessment

(1)   Sample coverage

A sample of 2x50 test calls per Service Providers with in the licensed service area (Kerala Circle) were made between 1100 to 1400 hrs and between 1600 to 1900 hrs.

(2)   Performance based on live Calling

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
Aircel	-	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	98%	-	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	97%	-	100%	98%	98%	100%	100%	99%	100%	100%	100%	100%
Etisalat	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	98%	100%
Idea	100%	99%	100%	100%	-	100%	97%	100%	100%	100%	100%	100%	100%
Reliance (GSM)	100%	100%	100%	100%	98%	-	100%	100%	100%	100%	100%	100%	100%
Tata (GSM)	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Uninor	100%	98%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%
Videocon	100%	97%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
Vodafone	100%	100%	100%	100%	100%	99%	100%	100%	100%	-	100%	100%	100%
MTS	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Reliance (CDMA)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%
Tata (CDMA)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-

(3)   Critical Analysis

In the inter-operator call assessment test, calls were made from one operator to other operators so as to check congestion on both the operators' network. In such cases, the radio part, switch part & the POI in-between the operators are involved and hence if any congestion is found in the network, it may be due to any of these parts. The result shows that there is not much congestion on the operator networks.

(D) Drive test of the mobile network of service providers

1. Sample Coverage

The Operator Assisted Drive Test was conducted at Kerala for all the operators. Route covered was about around 100-120Km depending on city areas within the speed limit of 30Km/hr.

Drive Test Locations

Palakkad

HIGH DENSE:	Sbi Jn, Bigbazaar, Ksrtc, Melamuri, Vennakara, Ln Puram, Manapullikavu And Fort
MEDIUM DENSE:	Olavakkod, Cto, Victoriacollge, Kallapully, Chandranagar And Medical College
LOW DENSE:	Erattyal, Pallatheri, Elapully, Mankurissi, Anchammile, Kallekad

Thalassery

HIGH DENSE:	Koduvally Bridge, Thalassery Busstand, Town Hal Jn, Punool-Mahe-Saidarpally-Bsnl Circle-Tly Rly.Station, Chirakkara-Eranjoly And Jagannatha Temple Gate
MEDIUM DENSE:	Nadal Railway Gate, Edakkad-Koduvally Bridge, Eranjoly Bridge, Kolassery Road And Mc Villa Road.
LOW DENSE:	Maakootam To Paral-Paral Juction, Igch Hospital Jn, Koppalam Road, Champad, Kadirur And Ponniam

Trivendrum

HIGH DENSE:	Museum Jn, Pmg-Kd Puram-Ulloor-Pongumoodu, Medical College Campus-Rcc-Medical College Jn, Kannamoola-Law College Jn, Panavila-Thampanoor, Mettukada-Womens College, Jagathi, Karamana, Kaimanam, Chavadimukku, And Vazhuthacaud-Vellayambalam Jn.
MEDIUM DENSE:	Ambalamukku, Muttada-Marapalam, Kowdiyar Ttc, Db Jn, Nanthankode-Museum Jn, Attukal, Manacaud, Kamaleswaram, Pachalloor Andvazhamuttam Jn
LOW DENSE:	Vazhamuttam Jn, Kovalam Beach, International Airport, Chackai, All Saints Collge, Infosys, Kazhakuttam, Karyavattom, Pangappara And Chavadimukku

2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	RCOM GSM	TATA GSM	Uninor	Vi-con	V-fone	MTS	RCOM CDMA	TATA CDMA
			GSM Operators									CDMA Operators		
1.1	Call Attempts	Palakkad	159	166	161	155	173	130	158	144	146	154	173	107
		Thalassery	134	110	122	117	136	129	119	94	129	132	131	117
		Trivendrum	185	175	178	185	184	172	170	189	178	179	183	161
1.2	Blocked Call Rate (<=3%)	Palakkad	0	0	0.62	0.65	0	0	1.27	2.78	0.68	0	0	0
		Thalassery	0.75	0.91	0	0	0.74	0	0.84	2.13	1.55	0	0	0
		Trivendrum	0.54	1.14	1.69	0	0	1.16	0	0.53	3.93	0.56	0	0
1.3	Dropped Call Rate (<=2%)	Palakkad	0.63	0	0	0	0	0	0	0.69	0.68	0	0	0
		Thalassery	0	0	0	0	1.47	0.78	0	0	2.33	0	0	0
		Trivendrum	1.08	0.57	0	0	0.54	0	0	0	0.56	0	0	0
1.4	Percentage of connections with good voice quality (=>95%)													
	(i) 0-4 (w/o frequency hopping)	Palakkad										99.76	97.64	98.13
		Thalassery										99.90	97.98	99.83
		Trivendrum										99.67	98.72	98.47
	(ii) 0-5 (with frequency hopping)	Palakkad	93.91	91.57	97.22	87.72	97.83	93.50	94.00	98.00	93.41			
		Thalassery	95.33	96.19	98.10	84.37	97.26	97.30	96.33	97.00	96.00			
		Trivendrum	94.51	93.82	94.33	91.89	98.14	97.30	93.00	99.00	96.10			
1,5	Service Coverage													
	In door (>= -75dBm)	Palakkad	73.67	61.90	81.20	58.67	46.33	70.13	25.63	22.00	63.16	52.11	54.33	89.27
		Thalassery	44.92	52.87	77.83	57.25	43.67	50.00	16.25	16.00	43.00	63.00	30.00	68.90
		Trivendrum	47.60	72.44	83.90	71.50	56.05	82.67	28.81	41.00	57.70	80.79	61.12	98.23
	In-vehicle (>= -85dBm)	Palakkad	95.22	95.65	97.63	97.99	79.75	92.03	75.40	71.00	94.92	77.73	91.00	98.67
		Thalassery	83.60	89.25	96.13	95.40	78.00	77.00	65.78	55.00	87.00	88.95	69.33	96.00
		Trivendrum	85.60	97.34	98.21	98.14	90.19	97.67	82.19	87.00	86.30	96.23	94.19	100
	Out door- in city (>= -95dBm)	Palakkad	99.71	99.86	99.96	99.98	97.33	98.94	97.43	94.00	100	98.15	100	100
		Thalassery	97.51	99.07	100	99.79	92	96.72	96.07	81.00	99.00	99.83	97	100
		Trivendrum	97.89	99.90	99.98	99.95	99.05	100	99.11	99	98.80	99.80	100	100
1.6	Call Setup Success Rate (>=95%)	Palakkad	100	100	99.30	99.41	100	100	99.10	97.22	99.49	100	100	100
		Thalassery	99.25	99.09	100	100	99.38	100	98.60	97.87	98.33	100	100	100
		Trivendrum	99.46	98.86	98.00	100	100	98.71	100	99.47	96.07	99.33	100	100

Graphical Representation

Coverage level PALAKKAD	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
In door (>= -75dBm)	73.67	61.90	81.20	58.67	46.33	70.13	25.63	22.00	63.16	52.11	54.33	89.27
In-vehicle (>= -85dBm)	95.22	95.65	97.63	97.99	79.75	92.03	75.40	71.00	94.92	77.73	91.00	98.67
Out door- in city (>= -95dBm)	99.71	99.86	99.96	99.98	97.33	98.94	97.43	94.00	100	98.15	100	100

Coverage level THALASSERY	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
In door (>= -75dBm)	44.92	52.87	77.83	57.25	43.67	50.00	16.25	16.00	43.00	63.00	30.00	68.90
In-vehicle (>= -85dBm)	83.60	89.25	96.13	95.40	78.00	77.00	65.78	55.00	87.00	88.95	69.33	96.00
Out door- in city (>= -95dBm)	97.51	99.07	100	99.79	92	96.72	96.07	81.00	99.00	99.83	97	100

Coverage level TRIVENDRUM	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
In door (>= -75dBm)	47.60	72.44	83.90	71.50	56.05	82.67	28.81	41.00	57.70	80.79	61.12	98.23
In-vehicle (>= -85dBm)	85.60	97.34	98.21	98.14	90.19	97.67	82.19	87.00	86.30	96.23	94.19	100
Out door- in city (>= -95dBm)	97.89	99.90	99.98	99.95	99.05	100	99.11	99	98.80	99.80	100	100

(3) Critical Analysis

The Drive test performances of operators are satisfactory. Deviations noticed are as under.

- Dropped Call Rate' benchmark is not met by Vodafone in TRIVENDRUM.
- Blocked Call Rate' benchmark is not met by Vodafone in THALASSERY.
- Good Voice Quality parameter is not met by Aircel, Airtel, Idea, Tata GSM, Uninor & Vodafone in PALAKKAD; Idea in THALASSERY; Aircel, Airtel, Bsnl, Idea & Uninor in TRIVENDRUM

(E) Independent Drive Test

The Independent Drive Test was conducted in Kerala in four cities namely Ernakulam, Kasargod, Malappuram and Wynad. The service providers' city wise radio coverage with call testing was performed individually through drive test activity on different days. Route covered was about around 95 kms for BSNL & TATA GSM in Ernakulum, 60 Kms for MTS in Kasargod, 41 Kms for Videocon & Vodafone in Malappuram and 78 Kms for IDEA & RCOM GSM in Wynad, depending on city areas within the speed limit of 30Km/hr. The drive was conducted within the municipality area of each city / town.

(1) Sample Coverage

Ernakulum - PANAMPILLY NAGAR, MG RD, KSRTC, KALOOR, THAMMANAM, PALARIVATTOM, EDAPALLY, KADAVANTARA, MATTANCHERY, THOPPUMPADY, MARINE DRIVE,HIGH COURT, PALARIVATTOM, VYTILLA, KUNDANOOR AND WELLIGTON ISLAND.

Kasargod - KASARGOD, THALANGARA, CHOWKEY, VIDYANAGAR, KSRTC, RAILWAY STATION AND MARKET.

Malappuram - KSRTC, UPHILL, CIVILSTATION BUSSTAND, MANJERIROAD, KOTTAPADI, POLICESTATION, PRIVATEBUSTAND, PERINTHALMANNARD, MUNDUPARAMBHA, CALICUT-MANJERIBYPASS, MELMURY, POOKKOTTURROAD, MBHOSPITAL, NOORADIPALAM,

Wynad - MANANTHAVADI TOWN, VINCENTGIRI, BUSSTAND, BATHERI, KYNATTY, KALPETTA TOWN, KANIYARAM, MANANTHAVADI TOWN, VINCENTGIRI, BATHERI, MOOLANKAVU, KOYILERI, MEENANGADI, KRISHNAGIRI AND KOLAGAPPARA.

2) Performance (for the respective cities)

SN	Parameter	BSNL (Ernakulam)	IDEA (Wynad)	Rcom GSM (Wynad)	MTS (Kasargod)	Tata GSM (Ernakulam)	VIDEOCON (Malappuram)	Vodafone (Malappuram)
1.1	Call Attempts	126	107	114	67	127	54	55
1.2	Blocked Call Rate (<=3%)	1.59	0	0	0	0	0	1.82
1.3	Dropped Call Rate (<=2%)	0.79	0	1.75	0	0	1.85	0
1.4	Percentage of connections with good voice quality (=>95%)							
	(i) 0-4 (w/o frequency hopping)				97.2			
	(ii) 0-5 (with frequency hopping)	95.5	86.57	97.81		97.43	99	95.28
1.5	Service Coverage							
	In door (>= -75dBm)	90.3	55.12	31.39	77.2	93.04	37	47.06
	In-vehicle (>= -85dBm)	99.3	94.39	63.51	98.7	97.79	71	89.56
	Outdoor- in city (>= -95dBm)	100	100	85	100	100	94	99.11
1.6	Call Setup Success Rate (>=95%)	98.4	100	100	100	100	100	98.99

Graphical Representation

	BSNL (Ernakulam)	IDEA (Wynad)	Rcom GSM (Wynad)	MTS (Kasargod)	Tata GSM (Ernakulam)	VIDEOCON (Malappuram)	Vodafone (Malappuram)
In door (>= -75dBm)	90.3	55.12	31.39	77.2	93.04	37	47.06
In-vehicle (>= -85dBm)	99.3	94.39	63.51	98.7	97.79	71	89.56
Out door- in city (>= -95dBm)	100	100	85	100	100	94	99.11
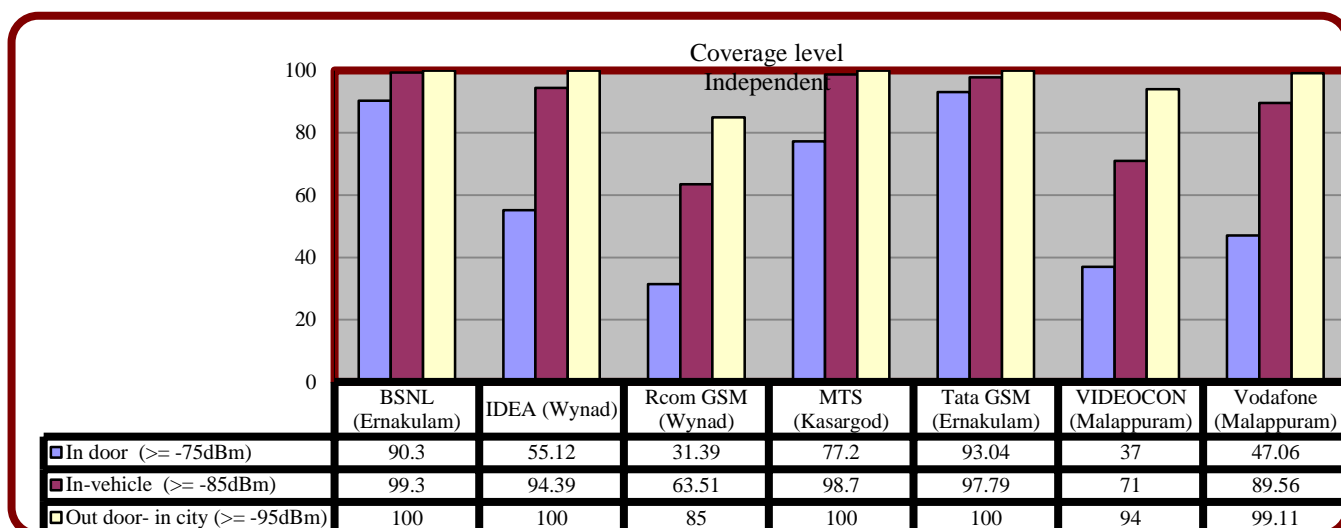
The Independent Drive test performances of operators are satisfactory. Deviation noticed is as under.

- Good Voice Quality parameter is not met by Idea in WYNAD.
- Extremely low indoor coverage was observed in case of Rcom GSM in Wynad and Videocon in Malappuram.

(F) Compliance report (Status of service providers with respect to the QoS)

From live, month, PMR and Drive Tests (both Operator Assisted and Independent) findings, it can be concluded that on an average, performance of the operators in the service area (Kerala) is satisfactory for **Network Parameters**. However, Aircel did not meet the bench mark in "Worst affected BTSs due to downtime" for the month data, Aircel, Airtel, Etisalat, Tata GSM & Uninor did not meet the required benchmark in "worst affected cells >3% TCH drop" for both live and month data. These figures are much higher than the normal benchmark.

Under **Customer Service Quality** Parameter "Accessibility of call centre/Customer Care" is found that many operators have improved their performances except Aircel and Idea. In "operator answered calls (voice-to-voice) within 60 seconds" parameter it is found that the benchmark of >=90% is not met by Aircel, BSNL, MTS & Rcom GSM / CDMA.

Regarding **Metering/Billing Credibility parameter**, only in Pre-Paid connections values of Aircel do not meet the benchmark. In case of Post-paid connections all operators are meeting the required benchmark.

During **Drive Tests (Operator Assisted)** it is noticed that most of the parameters were found to be in order in all the three cities for all the Operators. The Drive test performances of operators are satisfactory. Deviations noticed in Dropped Call Rate' benchmark with Vodafone in TRIVENDRUM, in Blocked Call Rate' with Vodafone in THALASSERY and in Good Voice Quality Aircel, Airtel, Idea, Tata GSM, Uninor & Vodafone in PALAKKAD, Idea in THALASSERY and Aircel, Airtel, BSNL, Idea & Uninor in TRIVENDRUM. In case of **Independent Drive Test** all operators' performances are as per TRAI benchmark except Idea for the benchmark of Good Voice Quality in Wynad.

II. Basic Telephone Service (Wire line) Provider
(A) Exchange Audit
(1) 3 days live data & One Month Audit Comparative Table

S/N	Name of Parameter	Bench mark	Audit	AIRTEL	BSNL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	< 5%	Live	2.18%	0.69%	0.00%	0.00%
			Month	1.87%	6.23%	0.42%	0.02%
2	Fault repair by next working day(Urban Area)		Month				
a	By next working day	>90%	Month	96.33%	80.72%	100%	100%
b	Within 3 days	100%	Month	100%	87.33%	100%	100%
3	Fault repair by next working day(Rural & hilly Area)		Month				
a	By next working day	>90%	Month	NA	69.42%	NA	NA
b	Within 5 days	100%	Month	NA	83.69%	NA	NA
4	Rent rebate		Month				
a	Fault pending > 3 days & <7 days	Rebate for 7 days	Month	0	31	0	0
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Month	0	148	0	0
c	Fault pending > 15 days	Rebate for one month	Month	0	812	0	0
5	Mean time to Repair(MTTR)	<= 8 Hrs	Month	3.5	19.13	2.3	4.76
6	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55%(CCR) & > 75%(ASR)	Live	92.82%	67.76%	84.00%	97.50%
			Month	92.49%	73.24%	83.10%	98.16%
7	Metering and billing credibility(post paid)		Month				
a	Disputed Bills over bills issued	< 0.1%	Month	0.06%	0.01%	0.03%	0.00%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	Month	100%	100%	100%	100%
a	Period of refunds after resolution of complaints within 1 week	Within 1 week	Month	100%	100%	100%	100%
9	POI Congestion	<= 0.5%	Live	0	0	0	0
			Month	0	0	0	0
10	Response Time to customer for assistance		Month				
a	Accessibility of Call centre within 40 sec.	>= 95%	Live	100%	95.27%	98.00%	100%
			Month	100%	95.81%	98.00%	96.16%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	Live	89.46%	85.07%	97.00%	100.00%
			Month	89.10%	77.89%	96.00%	94.53%
11	Customer care(promptness in attending to customers request		Month				
a	Termination / Closures	<= 7 Days	Month	100%	98.72%	100%	100%
b	Time taken refunds deposit after closures	100% within 60 days	Month	100%	91.56%	100%	100%

(2) Performance (Graphical representation)

Fault incidences (No of faults/100 subscribers/month (<= 5%): All the three operators are meeting the benchmarks of 5%.

Fault Incedences

	AIRTEL	BSNL	RCOM	TTSL
Month	1.87%	6.23%	0.42%	0.02%
Live	2.18%	0.69%	0.00%	0.00%
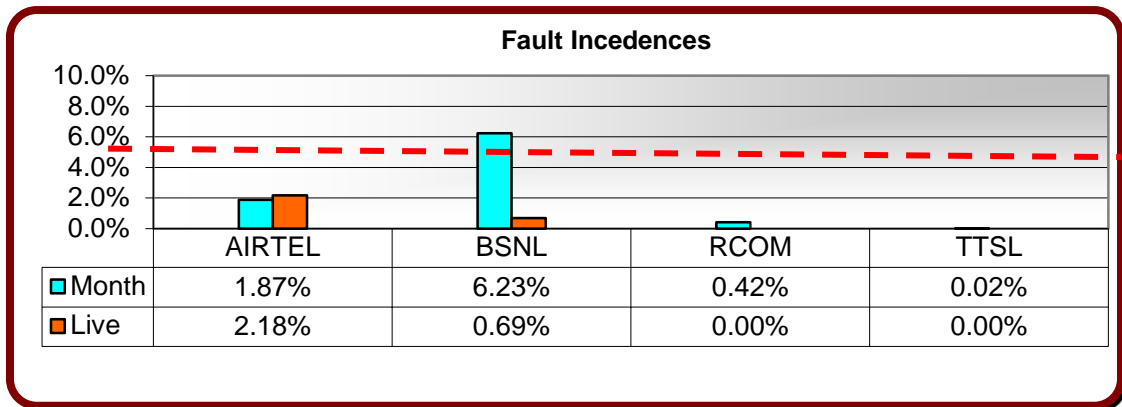
Fault Repair (Urban Area):
- **By next working day** (>90%): All the operators comply with the TRAI benchmark of 90% except BSNL
- **Within 3 days (100%):** All the operators comply with the TRAI benchmark of 100% except BSNL.

Fault Repair Urban Area

	AIRTEL	BSNL	RCOM	TTSL
By next working day	96.33%	80.72%	100%	100%
Within 3 days	100%	87.33%	100%	100%
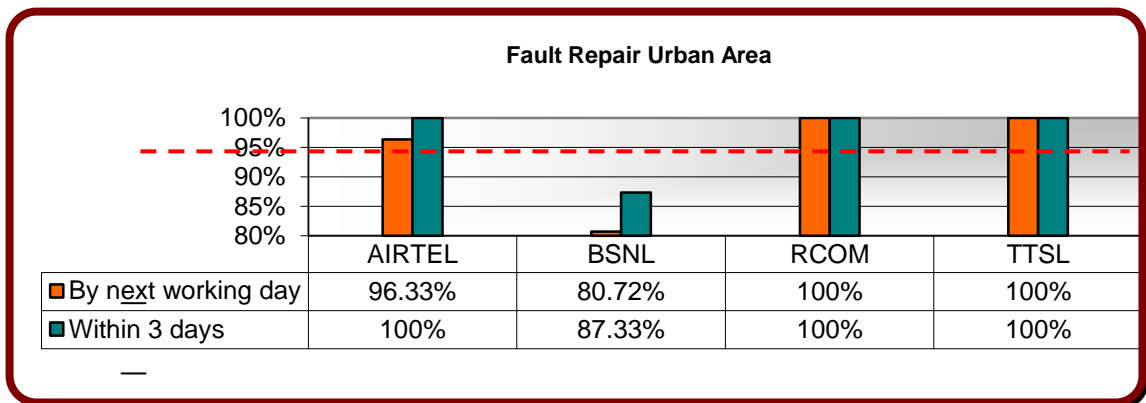
Fault Repair (Rural & Hilly Area): This parameter is applicable only for BSNL.
- **By next working day (>90%):** BSNL is not meeting the benchmark.
- **Within 5 days (100%):** BSNL is not meeting the benchmark.

Fault Repair Rural & Hilly Area

	AIRTEL	BSNL	RCOM	TTSL
By next working day	0.00%	69.42%	0.00%	0.00%
Within 5 days	0.00%	83.69%	0.00%	0.00%
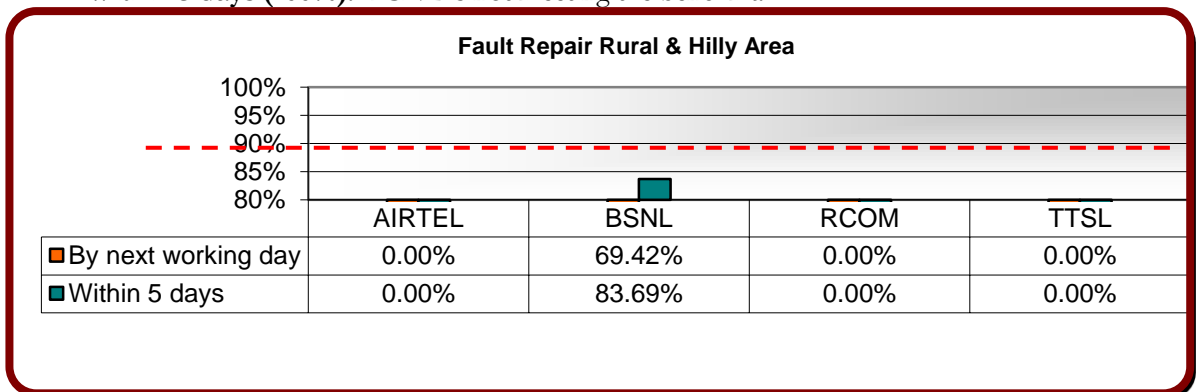
Mean Time to Repair (MTTR) (<= 8 Hrs): Except BSNL all the other operators comply with the TRAI benchmark.

	AIRTEL	BSNL	RCOM	TTSL
Mean time to Repair(MTTR)	3.5	19.13	2.3	4.76
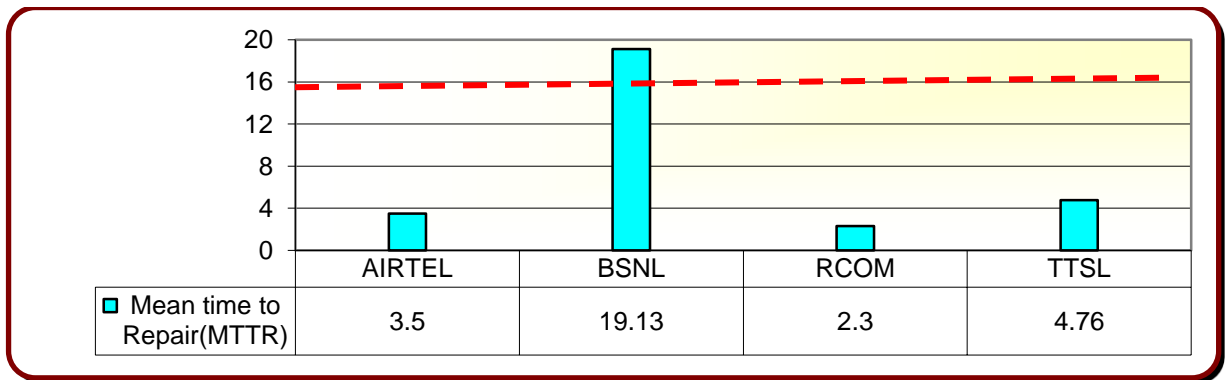
Metering and Billing Credibility (< 0.1%): Disputed Bills over Bills issued: - All the operators comply with the TRAI standard.

	AIRTEL	BSNL	RCOM	TTSL
Disputed Bills over bills issued	0.06%	0.01%	0.03%	0.00%
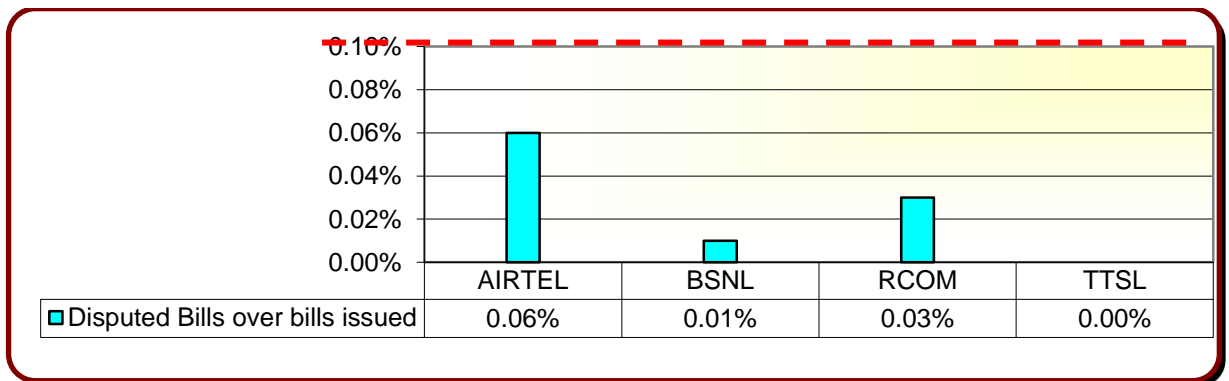
Call Completion Rate (>55%) & Answer to Seizure (>75%): The performance based on live measurement as well as One-Month Data is above the respective benchmarks for all the operators. Here, except Rcom, all the operators measure CCR while Rcom measures ASR.
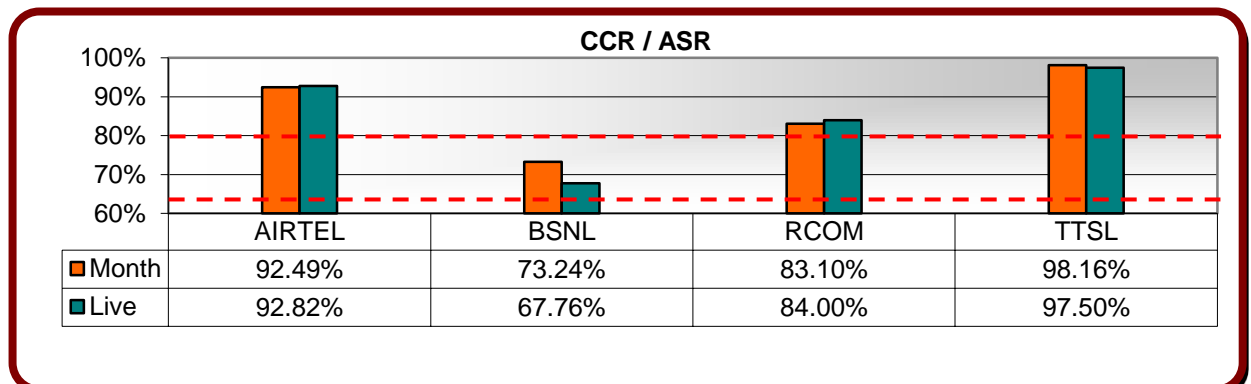
CCR / ASR

	AIRTEL	BSNL	RCOM	TTSL
Month	92.49%	73.24%	83.10%	98.16%
Live	92.82%	67.76%	84.00%	97.50%

Response time to the customer for assistance:

i) **Accessibility of Call Centre / Customer Care 40 sec (> 95 %.):** All the operators meet the benchmark for both live and month data.

Accessibility of Call Centre / Customer Care 40 sec

	AIRTEL	BSNL	RCOM	TTSL
Month	100%	95.81%	98.00%	96.16%
Live	100%	95.27%	98.00%	100%
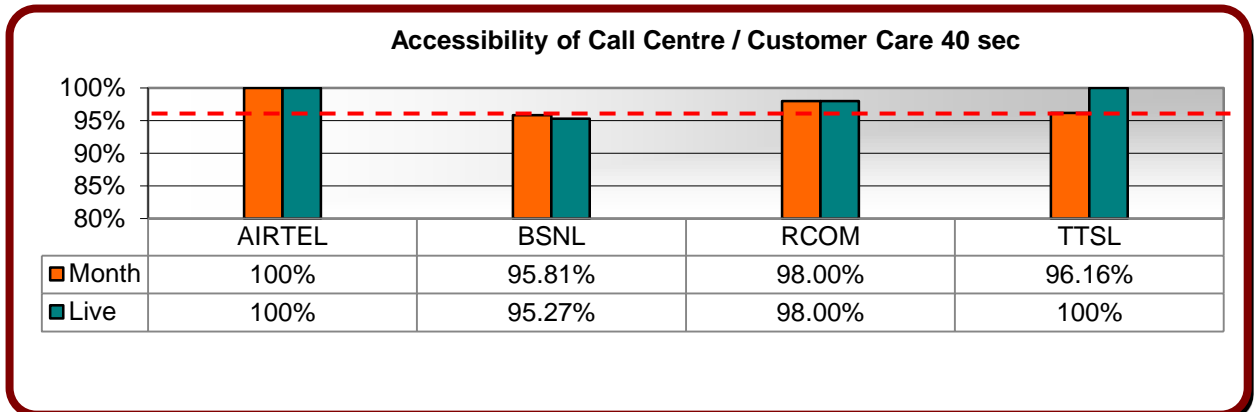
ii) **Calls Answered by operator within 60 seconds (>90%) (Voice to Voice):** Airtel and BSNL are not meeting the benchmark.

Calls Answered by operator (voice to voice) within 60 seconds

	AIRTEL	BSNL	RCOM	TTSL
Month	89.10%	77.89%	96.00%	94.53%
Live	89.46%	85.07%	97.00%	100.00%
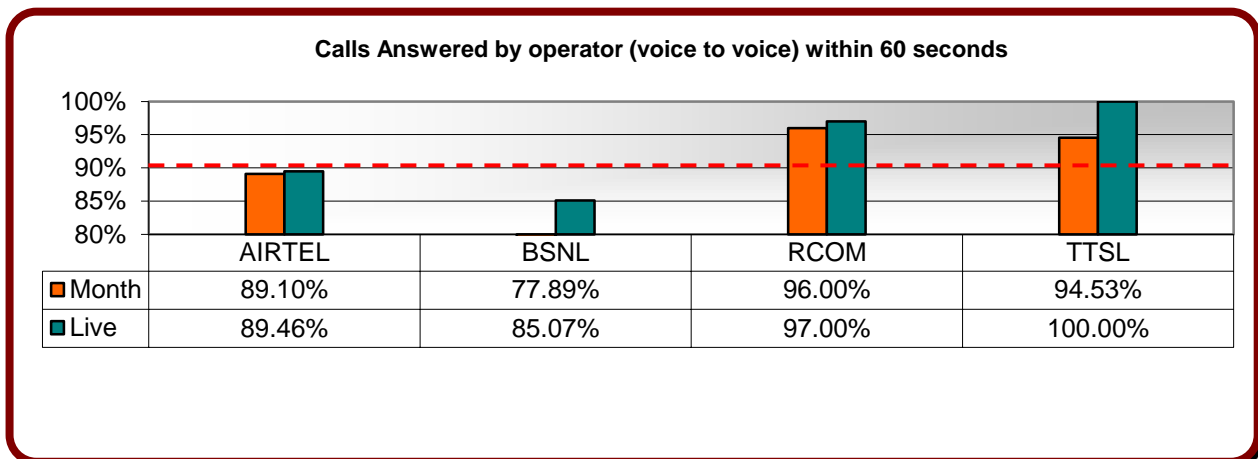
POI Congestion   (< 0.5%): The performance based on Live measurement as well as One-Month Data are similar for all the operators and meeting the benchmark. No POI is having congestion for all the four operators.

POI congestion

	AIRTEL	BSNL	RCOM	TTSL
Month	0	0	0	0
Live	0	0	0	0
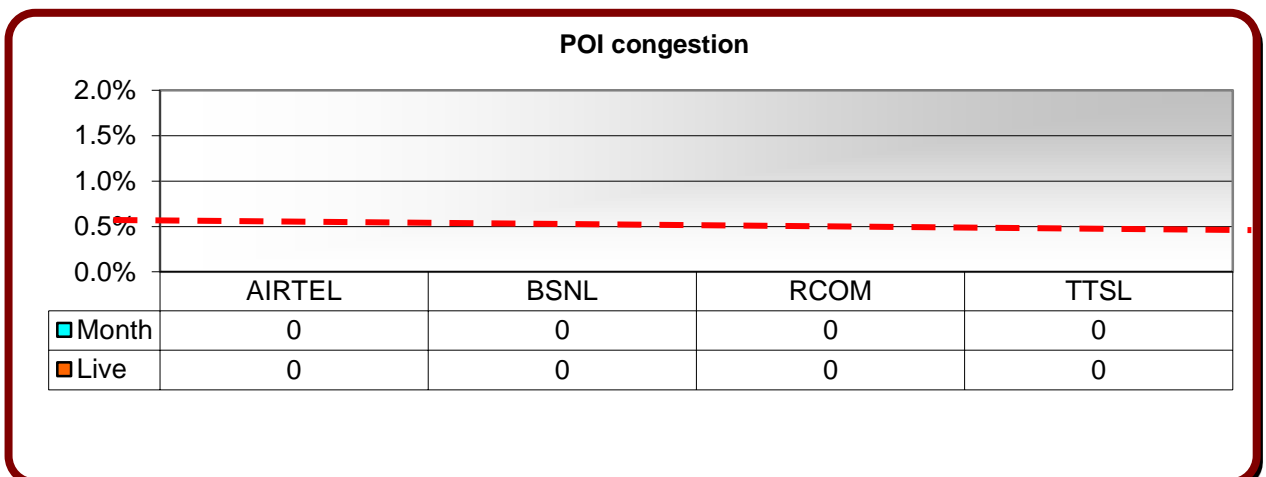
3. Customer Care & Grievances Redressal

S.N.	Parameters	BSNL	Airtel	TTSL	Rcom
1	Total no of complaints received in the call centre (Tech+ Non Tech)	5069	4726	3	238
2	Total no of complaints redressed by the call centre within the specified time limit	5061	4726	3	238
3	**Nodal Officer**				
3.1	Total no of complaints received by the nodal officers	289	28	NA	0
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	6	0.59	NA	0
3.3	Total no of complaints redressed within the specified time limit	NP	NP	NA	0
4	**Appellate Authority**				
4.1	Total no of appeals received by the appellate authority	0	2	NA	0
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	0	7	NA	0

Note: NP- Not Provided, NA- Not Applicable.

It is found that there are many instances where customers directly approach to Nodal Officer without approaching to Call Center for redressal. Similarly there are many instances where customers directly approach to Appellate Authority without approaching to Nodal Officer for their grievances redressal.

4. Live Calling to Call Center

Calling Operator	Airtel	BSNL	Rcom GSM	Tata GSM
Call Centre No.	121	1500	30337777	18002661515
Total No. of Calls Attempted	100	100	100	100
Total No. of calls connected to IVR	100	100	100	100
Calls got connected to agent within 60 Sec	100	100	100	100
%age of calls got answered	100%	100%	100%	100%
NOTE: Calls were made from the Operators office at Ernakulam. All the calls were connected within 60 seconds.				

5. Performance based on Live calling for Fault Repair

Calling Operator	Airtel	BSNL	Rcom	TATA
Total No. of Calls Attempted	40	50	NA	3
Total No. of calls Answered	34	47	NA	2
Cases resolved within 3 days	34	47	NA	2
%age of complain resolved	100%	100%	NA	100%

Note: For Tata only three number of faults reported in November 2011. For other operators sample cases have been verified and found in order. During the verification in some cases we could not get answer from subscriber, however those whom we contacted have confirmed their complaint and subsequently solved by the operator. Rcom has not provided data for verification.

6. Performance based on Live calling for Billing Complaints

Calling Operator	Airtel	BSNL	Tata GSM
Total No. of Calls Attempted	10	35	NA
Total No. of calls Answered	10	32	NA
Cases resolved with 4 weeks	10	32	0
%age of cases resolved	100%	100%	100%
Note: During the verification in some cases we could not get answer from subscriber; however those whom we contacted have confirmed their complaint and subsequently solved by the operator.			

7. Level 1 Live Calling

Emergency no.	Calls attempted	PALAKKAD				ERNAKULAM				TRIVENDRUM				Name of Emergency Service
		AIRTEL	BSNL	RCOM	TATA	AIRTEL	BSNL	RCOM	TATA	AIRTEL	BSNL	RCOM	TATA	
100	1	NA	1	1	NA	1	1	1	1	1	1	1	1	Police
101	1	NA	1	1	NA	1	1	1	1	1	1	1	1	Fire service
108	1	NA	1	1	NA	1	1	1	1	1	1	1	1	Emergency Ambulance
139	5	NA	5	5	NA	5	5	5	5	5	5	5	5	Railway Enquiry

All the level 1 calls were found to land in the neighboring area as per requirement.

8. Critical Analysis

The parameter wise key takeouts for the Basic (Wireline) Service providers for the Rajasthan Circle are as under:-

Fault incidence: BSNL is not meeting the benchmark. Other operators are meeting the benchmarks of 5%.

Fault Repair (Urban Area): It is found that all the operators are meeting the benchmarks of >=90% set by TRAI for faults repair by the next working day and 100% for repair within 3 days except BSNL.

Fault Repair (Rural & Hilly Area): BSNL is deviating from the benchmarks in faults repaired with 5 days (100%) in Rural & hilly area with a value of 83.69%. Other operators have no services in these areas.

Rent Rebate: No rent rebate cases are observed for Airtel, Tata & Rcom. BSNL has given rent rebate for 7 days, 15 days & one month in a large number of cases (total amount paid is Rs. 1049/-, Rs. 19646/- and Rs. 133986/- respectively).

Mean Time to Repair (MTTR): Except BSNL (19.13%) all other operators are meeting the benchmark of <8hrs fixed by TRAI during one month audit.

Call Completion Rate (CCR)/ Answer to Seizure (ASR): All the service providers are found to be meeting TRAI benchmark of >55% for Call Completion Rate (CCR). Rcom measures ASR and meets the specified benchmark of 75%.

Metering and billing credibility: All the operators are meeting the benchmark of less than 0.1% billing complaints over the total number of bills issued.

% of Billing complaints Resolved Within 4 Weeks: As per the findings for one-month data audit all the four have resolved 100% of complaints within 4 weeks.

Period of all refunds/Payments from the date of resolution within 1 Week: As per the findings BSNL is not meeting this benchmark while other three operators have solved within the stipulated time.

POI Congestion: No POI congestion for all the operators..

Response Time to Customer for Assistance:

   i)   Accessibility of Call Centre/ Customer care within 40 seconds (Electronically): All the operators are meeting the benchmarks of >=95%.

   ii) % of Call answered by operators within 60 seconds (Voice to Voice): Airtel and BSNL are not meeting this benchmark of >= 90% fixed by TRAI.

Customer care (Promptness of attending customer request):

   i.   Termination / Closure: - BSNL is not meeting the benchmark. BSNL has closed 7870 cases out of 7972 cases within the stipulated time of 1 week.

   ii. Time taken for refund of deposits after closure: All the operators are providing the refund to the customers within the benchmark (100% within 60 days time limit). However BSNL could execute 7276 cases out of 7972 cases (91.56%).

(B) Compliance Report (Status of service providers with respect to the QoS)

It can be seen from the table and graphical method that in both the cases i.e. of live performance and month data verification there is consistency in the parameters except in fault incident cases with BSNL. Also for each parameter trend's can be analyzed comparing both type of data. This may help out the operators in making decision in view of their network performance so as to give customer satisfaction to its highest level, thus helping out TRAI to achieve its goal.

AIRTEL:

Airtel's performance in Network parameters overall is good when we go through the results for both live and month. They are not having any rent rebate cases at all. CCR ratio is 92.49% for the month which is very good. POI congestion is "0". Accessibility to call centers Bench mark is also met for both live and month data. However, Airtel has deviations in the "% age of calls answered by operator (voice to voice) within 60 sec." i.e. 89.10% for month data. 48041 number of wireline connections Airtel is having at the end of November 2011.

BSNL

BSNL is having the maximum number of wire line connections in Kerala 3086596 numbers. Their performances are good overall .However, they are not meeting the BM in case of fault repair by next working day, within 3 days for Urban is and within 5 days in Rural /Hilly areas are. Similarly "Mean Time to Repair", "Termination /closures within 7 days "and "Time taken refunds deposit after closures" benchmark is not being met.

Tata

TATA is having the minimum number of wireline connections in Kerala (12199 connections). Their network performance overall is very good. No POI congestion in the network. In Fault repair by next working day and within 3 days also is 100%.

Rcom

Rcom's performance in Network parameters overall is very good when we go through the results for both live and month." Mean time to Repair" parameter values achieved (2.3%) is the lowest among all the operators though they are having wirline connections 55389. They are not having any rent rebate cases at all.

III. Broadband Service Providers

(A) POP Audit
(1) 3 days live data & One Month Audit Comparative Table

S/N	Parameters	B-marks	Audit	AIRTEL	ASIANET	BSNL	RCOM	TCISL
	100% cases in 15 days (subject to technical feasibility)	<15 days	Month	100%	100%	100%	100%	100%
	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/day.		NA	NA	NA	NA	NA
2	Faults Repair/Restoraion Time							
	By next working day	>90%	Month	93.07%	90%	90.51%	100.00%	95.00%
	within 3 working day	≥99%		100%	99%	99.46%	100.00%	99.00%
2.1	Rebate							
	Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		Month	0	0	0	0	93
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)			0	0	1	0	NA
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)			0	0	9	0	NA
3	Billing Performance							
	Billing complaints per 100 bills issued	<2%	Month	0.04%	1.50%	0.24%	0%	0.35%
	%age of complaints resolved within 4 weeks	100%		100%	100%	100%	100%	NA
	Time taken for refund of deposits after closure (within 60 days)	100%		100%	100%	100%	100%	NA
4	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)							
	within 60 sec	>60%	Live	90.60%	NP	75%	96%	92.00%
			Month	91.30%	NP	77%	98%	90.99%
	within 90 sec	>80%	Live	92.33%	NP	90%	97%	98.00%
			Month	94.00%	NP	90%	98%	93.55%
5	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).							
5.1	POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	Live	41.79%	72%	55.00%	22.64%	20%
			Month	36.19%	67%	54.00%	12.34%	23%
S/N	Parameters	B-marks	Audit	AIRTEL	ASIANET	BSNL	RCOM	TCISL
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	Live	0%	74%	71.63%	NA	46%
			Month	0%	67%	83.00%	NA	54%
5.3	Broadband Connection Speed	> 80%	Live	100%	88.00%	87.60%	100%	94.33%

	(download) - from ISP Node to User		**Month**	96.48%	88.00%	93.75%	NP	93.19%
6	*Service Availability/Uptime (for all users)*							
6.1	Service Availability (%)	**>98%**	*Live*	100%	99.77%	100%	99.99%	96%
6.2			**Month**	99.99%	99.70%	99.98%	99.99%	98%
7	*Packet loss*							
	% of Packet loss	**<1%**	*Live*	0.00%	0%	0.01%	0.00%	0%
			Month	0.00%	0%	0.01%	0.12%	0%
8	*Network latency (for wired broadband access)*							
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	**<120 ms**	*Live*	73	32	62	NP	25.00
			Month	73	35	62	85.2	25.76
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	**<350 ms**	*Live*	276	225	76	97.2	267.00
			Month	276	230	77	90.2	265.96
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)** See note below	**<800 ms**	*Live*	NA	NA	760	NA	NA
			Month	NA	NA	760	NA	NA

NA – Not Applicable, **NP** – Not Provided.

Note:
1. For S No- 4 The remark from Asianet is :"The call center is decentralized and our software does not capture the speed of response. The data has not been provided in the PMR report also."
2. For S No- 8.3 Only BSNL is having satellite connectivity.
3. Rcom has declared that the live network latency for can not be fetched due to security reasons.
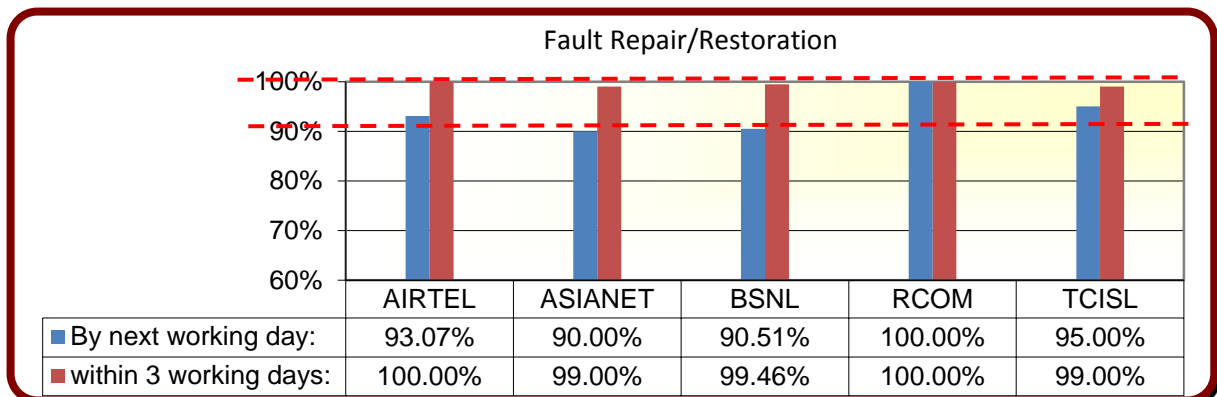
2) Performance (Graphical representation)

Service provisioning/activation Time (100% in 15 days)
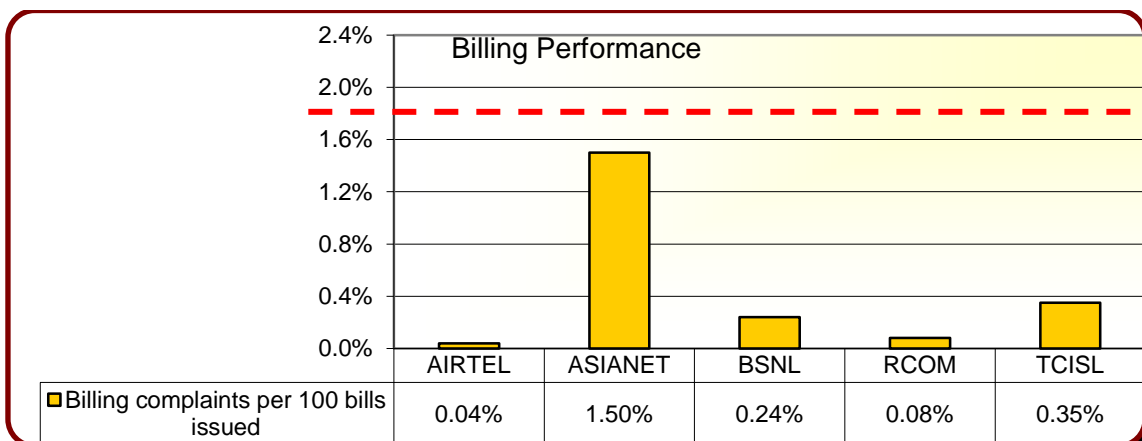All the operators are meeting the benchmark.
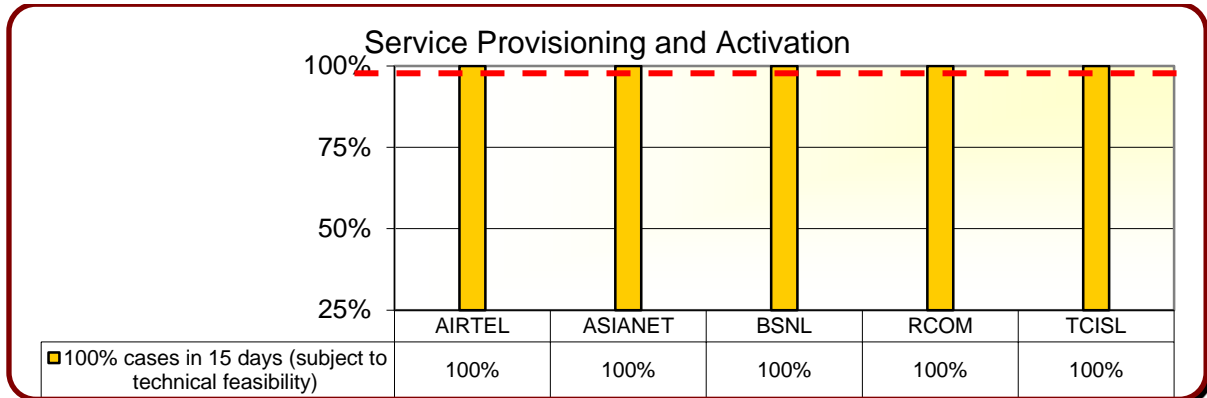
Service Provisioning and Activation	AIRTEL	ASIANET	BSNL	RCOM	TCISL
□ 100% cases in 15 days (subject to technical feasibility)	100%	100%	100%	100%	100%

Fault Repair / Restoration Time:
- o By next working day (>90%): All the operators are complying with the TRAI benchmark of 90%.
- o Within 3 working days (>99%): All the operators are complying with the TRAI benchmark.
- o Rebate: All the operators are giving rebate to the eligible customers.

Fault Repair/Restoration	AIRTEL	ASIANET	BSNL	RCOM	TCISL
■ By next working day:	93.07%	90.00%	90.51%	100.00%	95.00%
■ within 3 working days:	100.00%	99.00%	99.46%	100.00%	99.00%

Billing Performance: (Benchmark <2%)
All the operators are complying with the TRAI standards.

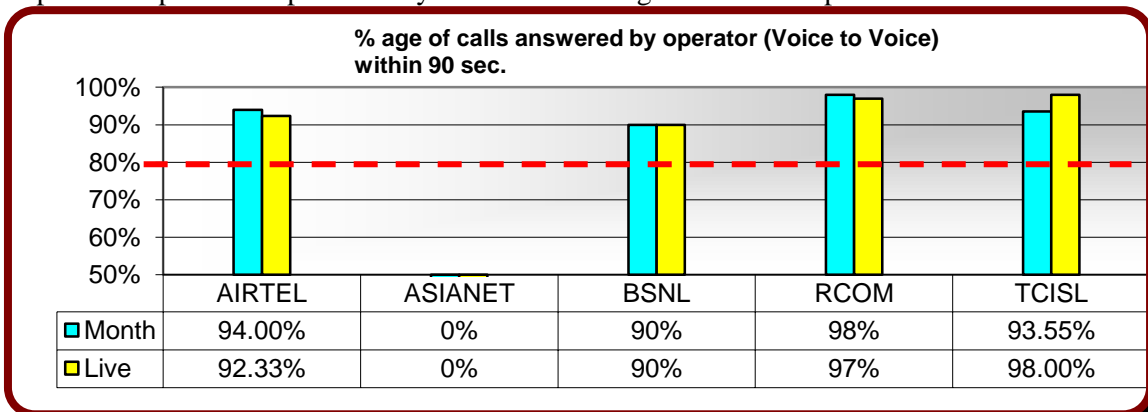| Billing Performance	AIRTEL	ASIANET	BSNL	RCOM	TCISL
□ Billing complaints per 100 bills issued	0.04%	1.50%	0.24%	0.08%	0.35%

Response time to the customer for assistance: % age of calls answered by operator (Voice to Voice)

- **Within 60 seconds (>60%):** All the operators are meeting the benchmark in both live and one month data verification. Asianet is has not submitted this information as their software does not capture the speed of response. They are not submitting in the PMR report also.
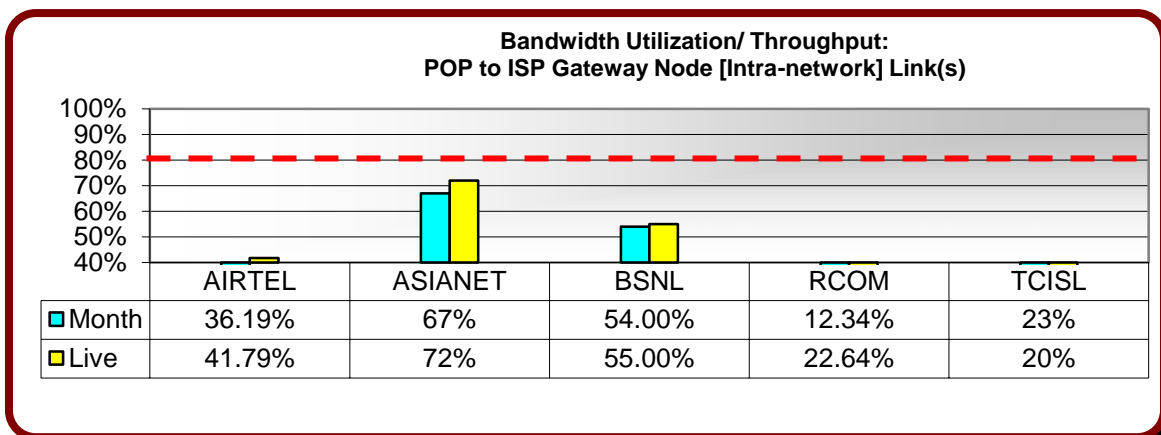
% age of calls answered by operator (Voice to Voice) within 60 sec.

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	91.30%	0%	77%	98%	90.99%
Live	90.60%	0%	75%	96%	92.00%

- **Within 90 seconds (>80%):** All the operators are meeting the benchmark in both live and one month data verification. Asianet is has not submitted this information as their software does not capture the speed of response. They are not submitting in the PMR report also.

% age of calls answered by operator (Voice to Voice) within 90 sec.

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	94.00%	0%	90%	98%	93.55%
Live	92.33%	0%	90%	97%	98.00%

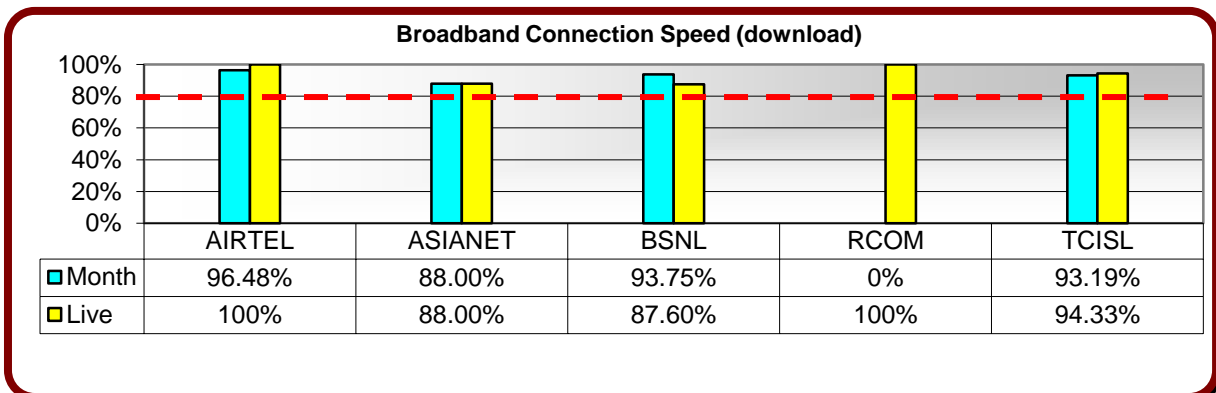**Bandwidth Utilization/ Throughput:**

- **POP to ISP Gateway Node [Intra-network] Link(s): (Benchmark <80%):** All the operators are meeting the benchmarks in both live and one-month data verification.
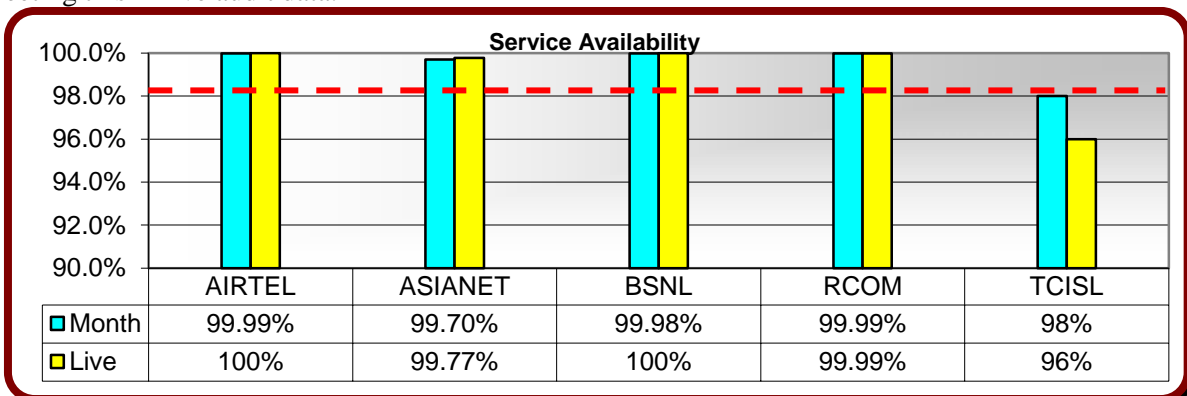
**Bandwidth Utilization/ Throughput:
POP to ISP Gateway Node [Intra-network] Link(s)**

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	36.19%	67%	54.00%	12.34%	23%
Live	41.79%	72%	55.00%	22.64%	20%

ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: (Benchmark <80%): All the operators are meeting the benchmarks in both live and one-month data verification. For Rcom, ISP gateway is in MUMBAI, DELHI, CHENNAI, and CALCUTTA. Hence No Upstream Link for Kerala Circle

Bandwidth Utilization/ Throughput:
ISP Gateway Node to IGSP / NIXI Node upstream Link(s)
for International connectivity

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	0%	67%	83.00%	0%	54%
Live	0%	74%	71.63%	0%	46%
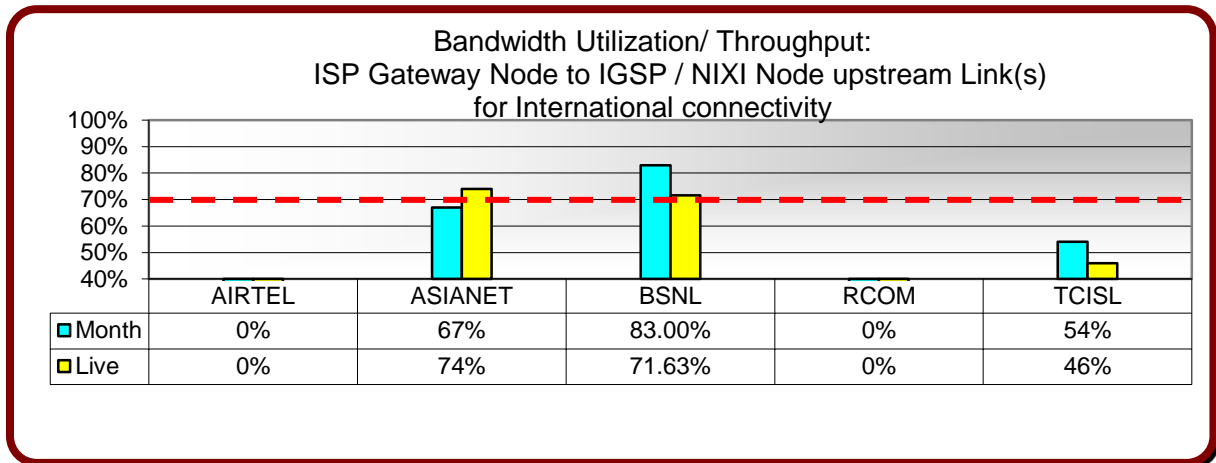
Broadband Connection Speed (download) (>80%): All the operators are meeting the TRAI benchmark of greater than 80% connection speed in both live and one-month data verification. Rcom has not submitted the data for month data.

Broadband Connection Speed (download)

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	96.48%	88.00%	93.75%	0%	93.19%
Live	100%	88.00%	87.60%	100%	94.33%

Service Availability / Uptime (for all users better than 98%): All the operators are meeting the TRAI benchmark of greater than 98% during one-month data verification. However, TCISL is not meeting this in live audit data.
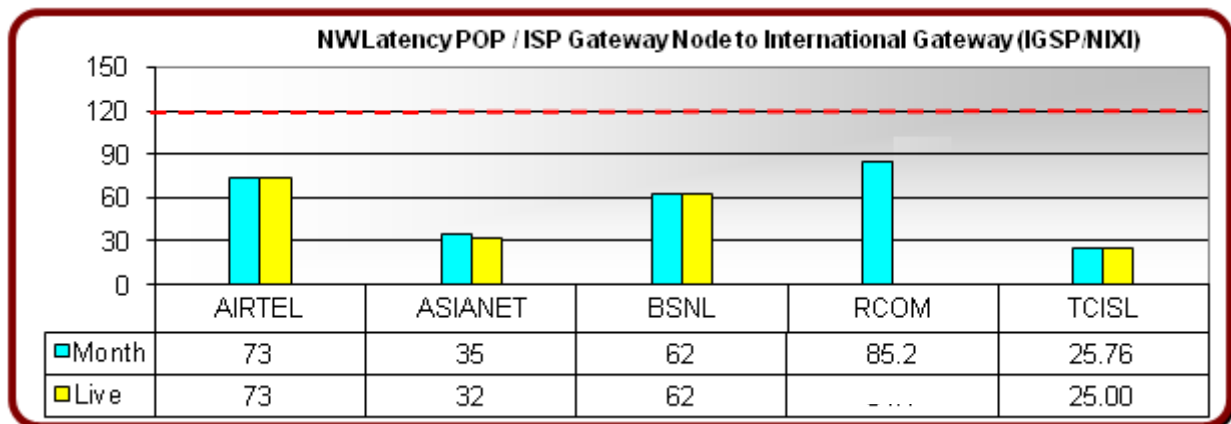
Service Availability

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	99.99%	99.70%	99.98%	99.99%	98%
Live	100%	99.77%	100%	99.99%	96%

Packet Loss (Should be less than 1%): All operators are meeting the benchmark in both live and one-month data verification
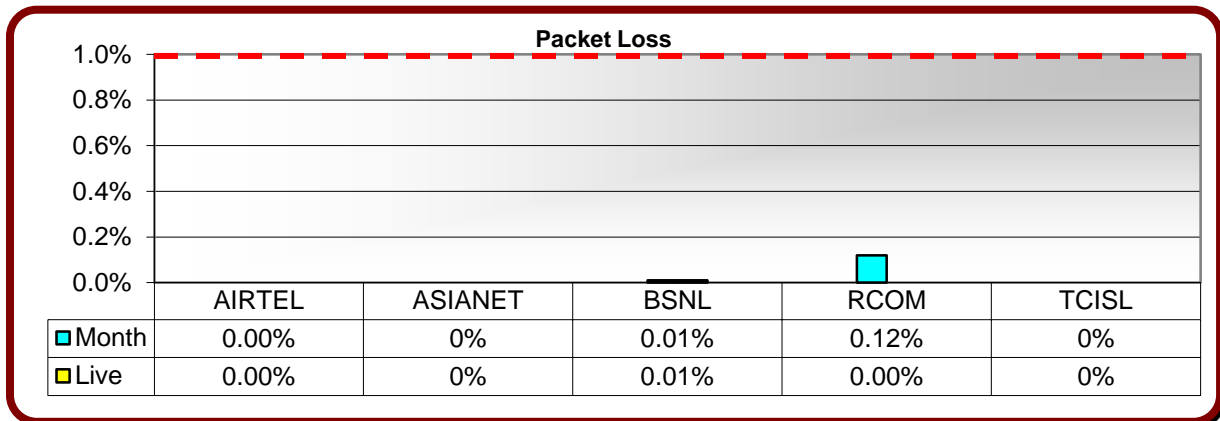
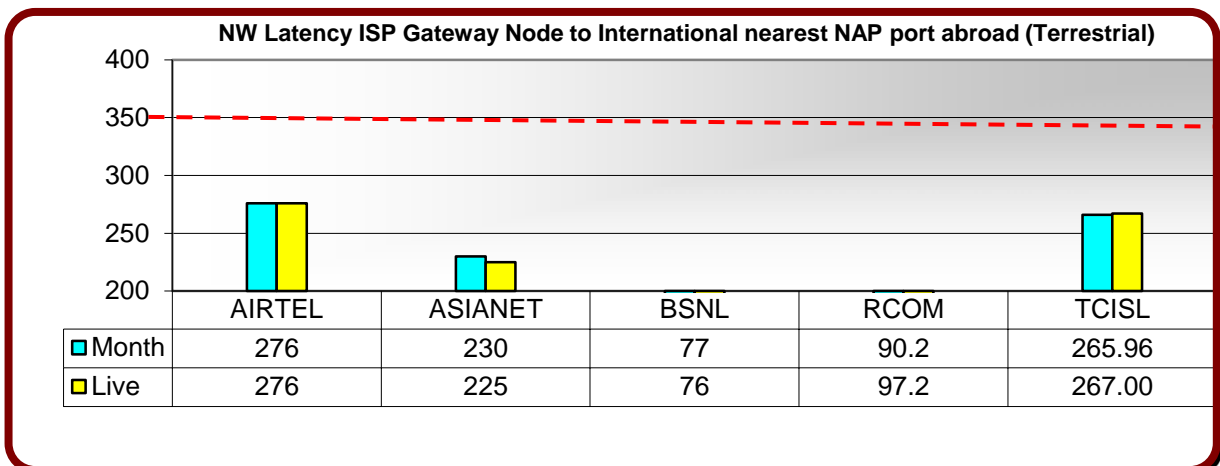|	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	0.00%	0%	0.01%	0.12%	0%
Live	0.00%	0%	0.01%	0.00%	0%

Network Latency:
User reference point at POP/ISP gateway node to international gateway (IGSP/NIXI) <120 ms: All operators are meeting the benchmark in both live and one-month data verification
.

NWLatency POP / ISP Gateway Node to International Gateway (IGSP/NIXI)

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	73	35	62	85.2	25.76
Live	73	32	62	- ...	25.00

User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <350 ms: All operators are meeting the benchmark in both live and one-month data verification

NW Latency ISP Gateway Node to International nearest NAP port abroad (Terrestrial)

	AIRTEL	ASIANET	BSNL	RCOM	TCISL
Month	276	230	77	90.2	265.96
Live	276	225	76	97.2	267.00

- **User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) <850 ms:** The Satellite link does not exist with any of the operator, except BSNL and it is meeting this benchmark.

3) Customer Care & Grievances Redressal

Call centre	AIRTEL	BSNL	RCOM	TCISL
Total complaints received in Call centre	4726	6713	201	3496
Total complaints received by nodal officers	28	NP	0	78
% age of complaints received by Nodal officer with respect to total complaints at call centre	0.59%	NP	0%	2.23%
Total appeals received by appellate authority	2	NP	0	0
Percentage of appeal received with reference to total no of complaints received by the nodal officers	7%	NP	0%	0%

It is found that there are many instances where customers directly approach to Nodal Officer without approaching to Call Center for redressal. Similarly there are many instances where customers directly approach to Appellate Authority without approaching to Nodal Officer for their grievances redressal.

4) Live Calling to Call Centre

Calling Operator	Airtel	Asianet	BSNL	Rcom GSM	Tata GSM
Call Centre No.	121	04712575222 04842342554	1500	30337777	18002661515
Total No. of Calls Attempted	100	100	100	100	100
Total No. of calls connected to IVR	100	100	100	100	100
Calls got connected to agent within 60 Sec	100	100	100	100	100
%age of calls got answered	100	100	100	100	100
NOTE: 1. Calls were made from the Operators office at Ernakulam. Since all the calls were connected within 60 seconds 90 seconds duration checking was not necessary. 100 calls total made. 2. Except for ASIANET, for all other four BB service provider the call centre test calls are common for Wireline and Broadband					

5) Performance based on live calling for new connections

Calling Operator	Airtel	Asianet	BSNL	Rcom	Tata
Total No. of Calls Attempted	40	40	40	35	34
Total No. of calls Answered	32	37	31	27	30
Connection provided within 15 days	32	37	31	27	30
%age of successful connection	100%	100%	100%	100%	100%

Note: During the verification in some cases we could not get answer from subscriber, however those whom we contacted have confirmed their connection installed within the stipulated time of 15 days. Rcom has not provided data for verification.

6) Performance based on live calling for Fault Repair

Calling Operator	Airtel	Asianet	BSNL	Rcom	Tata
Total No. of Calls Attempted	35	40	40	NA	31
Total No. of calls Answered	29	32	35	NA	28
Cases resolved within 3 days	29	32	35	NA	28
%age of complain resolved	100%	100%	100%	NA	100%

7) Performance based on live calling for Billing Complaints

Calling Operator	Airtel	Asianet	BSNL	RCcom	TTSL
Total No. of Calls Attempted	10	110	65	NA	NA
Total No. of calls Answered	10	100	60	NA	NA
Cases resolved with 4 weeks	10	100	60	NA	NA
%age of cases resolved	100%	100%	100%	NA	NA

8) Critical Analysis

The key conclusions (Parameter wise) emerging out from the Audit exercise of Broadband service providers are mentioned below

Service provisioning/Activation time: All the operators are performing well and meeting the benchmarks for service.

Fault Repair/Restoration time & Rebate: All the operators are meeting this benchmark.

Billing performance: All the operators are meeting the benchmark of less than 2% for billing complaints and also the benchmark of "100% cases 4 weeks" for billing complaint resolution for on-month data verifications and providing the refund of deposits after closure as per the benchmark of "100% cases within 60 days".

Customer Care/Helpline Assessment: All the operators are meeting the benchmark for the parameters response time to the customer for assistance (Voice to Voice) within 60 and 90 seconds in both live and one-month data verifications. However, Asianet has not submitted this information as their software does not capture the speed of response. They are not submitting in the PMR report also.

Bandwidth Utilization:

- **POP to ISP Gateway Node (intra-network) links:** All the operators are meeting all the benchmark during measurements of both live & one-month data Verification.
- **ISP Gateway Node to IGSP/ NIXI Node upstream links for International connectivity:** All the operators are meeting the benchmark during measurements of both live & one-month data Verification.
- **Broadband Connection speed:** All the operators are meeting the benchmark during measurements of both live & one-month data verification except Rcom which has not provided the data for month audit.

Service Availability/Uptime: All the operators are meeting the TRAI benchmark of greater than 98% during one-month data verification except Tata which is not meeting in live audit data.

Packet Loss: All the operators are meeting the TRAI benchmark of less than 1% during measurements of both live and one-month data verification.

Network Latency:

- **User reference point at POP/ISP gateway node to international gateway (IGSP/NIXI) <120 ms:** All the operators are meeting the benchmark in both live and one-month data verification.
- **User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <350 ms:** All the operators are meeting the benchmark in both live and one-month data verification.
- **User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <850 ms:** The Satellite link data provided by BSNL only. It is not applicable to other operators.

(B) Compliance report (Status of service providers with respect to the QoS)

Airtel: Meets all the QOS parameters

BSNL: Meets all the QOS parameters

Asianet: Meets all the QOS parameters.

Rcom: Meets all the QOS parameters. BW Utilization (ISP GW-NAP/NIXI Node) is not applicable since its ISP gateway is in Mumbai, Delhi, Kolkata & Chennai and there is Direct Upstream Link for Kerala Circle. Similarly, Rcom has NIXI gateway in Mumbai, Delhi, Kolkata & Chennai and NAP gateway in Mumbai & Chennai. Since there is no direct Upstream Link for Kerala Circle, Latency has been taken from nearest Gateway to POP (Chennai).

TCISL: Meets all the QOS parameters except having low service availability during live audit.