REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE

FOR

NORTH ZONE – HIMACHAL PRADESH CIRCLE

Report Period: Jan 2011 – March 2011

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II. Basic Telephone Service (Wireline) Providers

- Not conducted for this quarter

III. Broadband Service Providers

- Not conducted for this quarter

CHAPTER-1: INTRODUCTION

I. Background

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

In pursuance of above objective TRAI has issued from time to time a large number of regulations, orders and directives to deal with issues coming before it and provided the required direction to the evolution of Indian telecom market from a Government owned monopoly to a multi-operator multi service open competitive market.

The directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection and quality of service as well as governance of the Authority.

The purpose of laying down Quality of Service Parameters is to:

i) Create conditions for consumer satisfaction by making known the quality of service, which the service provider is required to provide, and the user has a right to expect.

ii) Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.

iii) Generally protect the interests of consumers of telecommunication services.

TRAI has been carrying out regular reviews of the status of quality of service of the networks of all operators. In continuation to these efforts, TRAI has selected through bidding process TCIL as the Audit Agency to audit and assess the Quality of Service rendered by the service providers' namely Basic (Wireline) Services, Cellular Mobile Telephone (Wireless) Services and Broadband Services. The Audit for various telecom circles within the Zones has been distributed across four quarterly periods.

The parameters that need to be measured for Basic and Cellular Mobile Services have been specified in the TRAI notification on Quality of Service of Basic (Wireline) and Cellular Mobile (wireless) Services, 2009. The parameters for Broadband Services have been specified in the TRAI notification for Quality of Services of Broadband Service Regulation, 2006.

II. 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.

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 Himachal Pradesh 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.

CHAPTER-2: EXECUTIVE SUMMARY

I. Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in Himachal Pradesh Circle in 1st quarter (January – March 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period July – September 2010.

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

Sl.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	Feb-2011	2100-2200 Hrs
2	Airtel Ltd	Feb-2011	1900-2000 Hrs
3	BSNL	Feb-2011	1900-2000 Hrs
4	STel	Feb-2011	2000-2100 Hrs
5	Idea	Feb-2011	1900-2000 Hrs
6	Reliance Communication (GSM)	Feb-2011	1900-2000 Hrs
7	Tata Communications (GSM)	ICR with Aircel	
8	Videocon	ICR with Aircel	
9	Vodafone	Feb-2011	1900-2000 Hrs
CDMA Operators			
10	Reliance Communication (CDMA)	Feb-2011	1900-2000 Hrs
11.	Tata Communications (CDMA)	Feb-2011	1900-2000 Hrs

Note: Tata GSM & Videocon are in ICR with Aircel.

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

(A) Cellular Mobile Telephone Services

3 days Live Data Audit		Bench-mark	Aircel	Airtel	BSNL	Stel	Idea	Room GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter		GSM Operators									CDMA Operators	
1	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	*>=95%*	97.81%	98.66%	98.82%	99.70%	99.19%	99.61%	ICR WITH AIRCEL	ICR WITH AIRCEL	99.76%	99.83%	99.91%
	b) SDCCH/PAGING congestion	*<=1%*	0.10%	0.14%	0.11%	0.00%	0.04%	0.29%			0.04%	0.00%	0.00%
	c) TCH congestion	*<=2%*	0.34%	0.39%	0.46%	0.00%	0.15%	0.10%			0.04%	0.05%	0.01%
2	**Connection maintenance (Retainability)**												
	a) CDR	*<=2%*	0.85%	1.01%	1.94%	0.74%	1.54%	0.33%			0.96%	0.75%	0.18%
	b) Worst affected cells>3% TCH drop	*<=5%*	12.83%	3.40%	4.49%	4.79%	13.93%	2.30%			3.14%	1.24%	0.41%
	c) Good voice quality	*>=95%*	95.06%	98.69%	95.61%	96.43%	96.69%	97.14%			97.76%	NA	NA
3	**No of POI having > 0.5% congestion**		0	0	0	0	0	0			0	0	0
4	**Response time to customers for assistance**												
	a) Accessibility of call centre/Customer Care	*>=95%*	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100%	100.00%	100.00%	100.00%	92%
	b) % call answered by operators(voice to voice) within 60 sec.	*>=90%*	95.00%	97.00%	95.00%	96.00%	95.00%	96.00%	90.00%	95.00%	50%	94%	85%

NA: Not Applicable, NR: Not Received

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters by and large, except for Idea & Aircel are not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 13.93% & 12.83% respectively.

Performance related to customer care data is not found to be satisfactory of Vodafone, Rcom-CDMA & Tata-CDMA especially for the parameter "calls answered by operators (voice-to-voice)". Tata-CDMA is having a below benchmark value for "accessibility of call centre" parameter too.

One Month Data Audit		Bench-mark	Aircel	Airtel	BSNL	STel	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter		GSM Operators									CDMA Operators	
(A)	**Network Service Quality Parameter**												
1	**Network Availability**												
	a) BTS Accumulated Downtime	*<=2%*	0.03%	0.03%	1.90%	0.25%	0.13%	0.26%	ICR WITH AIRCEL	ICR WITH AIRCEL	0.01%	0.23%	0.00%
	b) Worst affected BTSs due to downtime	*<=2%*	0.00%	0.00%	1.80%	0.19%	0.00%	1.54%			0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	*>=95%*	97.72%	97.72%	99.12%	98.30%	98.29%	99.56%			99.76%	99.82%	99.84%
	b) SDCCH/PAGING congestion	*<=1%*	0.27%	0.14%	0.80%	0.04%	0.35%	0.55%			0.03%	0.01%	0.01%
	c) TCH congestion	*<=2%*	0.27%	0.24%	1.90%	0.20%	1.06%	0.16%			0.04%	0.11%	0.01%
3	**Connection maintenance (Retainability)**												
	a) CDR	*<=2%*	0.95%	0.99%	1.95%	0.75%	1.65%	1.29%			1.06%	0.83%	0.18%
	b) Worst affected cells>3% TCH drop	*<=5%*	13.78%	3.38%	4.89%	4.84%	15.47%	2.83%			3.37%	1.33%	0.35%
	c) Good voice quality	*>=95%*	95.00%	98.65%	96.00%	96.42%	96.76%	96.45%			97.69%	NA	NA
4	**No of POI having > 0.5% congestion**		0	0	0	0	0	0			0	0	0
(B)	**Customer Service Quality Parameters**												
5	**Metering/billing credibility-Post paid**	*<= 0.1%*	0.00%	0.00%	0.05%	NA	0.00%	0.00%	0.03%	NA	0.00%	0.09%	0.00%
6	**Metering /billing credibility-Pre paid**	*<= 0.1%*	0.00%	0.00%	0.05%	0.03%	0.00%	0.09%	0.00%	0.70%	0.03%	0.10%	0.08%
7	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	100%	100%	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%	100%	100%	100%	100%	100%	100%	100%	100%
8	**Response time to customers for assistance**												
	a) Accessibility of call centre/Customer Care	*>=95%*	100%	98%	100%	86%	100%	NR	100.00%	98.00%	100.00%	100.00%	93.60%
	b) % call answered by operators(voice to voice) within 60 sec.	*>=90%*	91.00%	93.00%	95.18%	96.00%	23%	NR	84.70%	98.00%	91.05%	90.83%	NR
9	**Termination/closure of service**	*<=7days*	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%
10	**Time taken for refunds of deposits after closures.**	*100% within 60 days*	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%

NA: Not Applicable, NR: Not Received

From the month data assessment, it is found that all the operators are meeting the network parameters by and large, except for Idea & Aircel are not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 15.47% & 13.78% .

Performance related to customer care data is not found to be satisfactory for the operators like Idea & Tata GSM especially for the parameter "calls answered by operators (voice-to-voice)". A below benchmark performance is observed in case of STel (86%) and Tata CDMA (93.60%) for "accessibility of call centre" parameter respectively.

Operator-Assisted Drive Test

SN	Parameter	City Name	Airtel	BSNL	Idea	Rcom GSM	Aircel	Stel	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators							CDMA Operators	
1.1	Blocked Call Rate (<=3%)	Shimla	0%	1.50%	2.20%	0%	1.73%	0%	3.84%	0%	0%
		Mandi	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Kullu	0%	0%	0%	0%	0%	0%	0%	0%	0%
1.2	Dropped Call Rate (<=2%)	Shimla	0%	1.50%	0%	0%	0%	0%	0%	0%	0%
		Mandi	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Kullu	0%	0%	0%	0%	0%	0%	0%	0%	0%
1.3	Percentage of connections with good voice quality (=>95%)										
	(i) 0-4 (w/o frequency hopping)	Shimla								99%	98.94%
		Mandi								100%	99.47%
		Kullu								100%	99.67%
	(ii) 0-5 (with frequency hopping)	Shimla	95%	95.53%	94.70%	95.70%	95.31%	97.60%	96.40%		
		Mandi	97.10%	95.50%	98.70%	97.80%	94.71%	99.40%	99.70%		
		Kullu	95.70%	95.56%	94.80%	98.20%	95.40%	99.70%	98.50%		
1.4	Call Setup Success Rate (>=95%)	Shimla	99.11%	99%	100%	100%	98.27%	100%	96%	100%	100%
		Mandi	98.03%	100%	100%	100%	100%	100%	100%	100%	100%
		Kullu	100%	100%	100%	100%	100%	100%	100%	100%	100%

Independent Drive Test

SN	Parameter	City Name	Airtel	BSNL	Idea	Rcom GSM	Aircel	Stel	Vodafone
			GSM Operators						
1.1	Blocked Call Rate (<=3%)	Shimla	0%	3.37%	0%	0%	1.73%	0%	1.73%
		Mandi	0%	0%	0%	0%	0%	0%	0%
		Kullu	0%	0%	0%	0%	0%	0%	0%
1.2	Dropped Call Rate (<=2%)	Shimla	0%	0%	0%	0%	0%	0%	0%
		Mandi	0%	0%	0%	0%	0%	0%	0%
		Kullu	0%	0%	0%	0%	0%	0%	0%
1.3	Percentage of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)								
	(ii) 0-5 (with frequency hopping)	Shimla	96.20%	95.46%	96%	96.30%	95.31%	97.20%	97.20%
		Mandi	97%	95.50%	95.20%	98.70%	94.71%	98.60%	99.50%
		Kullu	96%	96%	95.20%	98.50%	95.40%	99.00%	98.20%
1.4	Call Setup Success Rate (>=95%)	Shimla	98.10%	95.51%	100%	100%	98.27%	100%	100%
		Mandi	100.00%	100%	100%	100%	100%	100%	100%
		Kullu	100.00%	100%	100%	100%	100%	100%	100%

CHAPTER-3: AUDIT-PMR VERIFICATION

I. Cellular Mobile Telephone Service

PMR		Bench-mark	Audit	Aircel	Airtel	BSNL	STel	Idea	Rcom GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators	
(A)	**Network Service Quality Parameter**												
1	**Network Availability**												
	BTS Accumulated Downtime	*<=2%*	Reported	0.21%	0.07%	1.94%	0.93%	0.01%	0.18%	1.24%	0.01%	0.30%	0.00%
			Verified	0.21%	0.07%	1.94%	0.93%	0.01%	0.18%	1.24%	0.01%	0.30%	0.00%
	Worst affected BTSs due to downtime	*<=2%*	Reported	0.09%	0.06%	1.90%	2.07%	0.00%	0.96%	0%	0%	0.37%	0.00%
			Verified	0.09%	0.06%	1.90%	2.07%	0.00%	0.96%	0%	0%	0.37%	0.00%
2	**Connection Establishment (Accessibility)**												
	CSSR (Call Setup Success Rate)	*>=95%*	Reported	97.54%	99.07%	95.30%	97.47%	98.81%	98.37%	98.19%	99.62%	99.83%	99.43%
			Verified	97.54%	99.07%	95.30%	97.47%	98.81%	98.37%	98.19%	99.62%	99.83%	99.43%
	SDCCH/PAGING congestion	*<=1%*	Reported	0.43%	0.12%	0.80%	0.19%	0.03%	0.46%	0.25%	0.04%	0%	0%
			Verified	0.43%	0.12%	0.80%	0.19%	0.03%	0.46%	0.25%	0.04%	0%	0%
	TCH congestion	*<=2%*	Reported	0.49%	0.20%	1.80%	0.14%	0.12%	0.57%	0.00%	0.16%	0.19%	0.11%
			Verified	0.49%	0.20%	1.80%	0.14%	0.12%	0.57%	0.00%	0.16%	0.19%	0.11%
3	**Connection maintenance (Retainability)**												
	CDR	*<=2%*	Reported	0.51%	1.00%	1.90%	0.75%	0.83%	1.04%	1.06%	1.63%	0.84%	0.32%
			Verified	0.51%	1.00%	1.90%	0.75%	0.83%	1.04%	1.06%	1.63%	0.84%	0.32%
	Worst affected cells>3% TCH drop	*<=5%*	Reported	1.29%	3.69%	4.88%	5.70%	7.97%	2.39%	0.00%	1.14%	1.39%	0.74%
			Verified	1.29%	3.69%	4.88%	5.70%	7.97%	2.39%	0.00%	1.14%	1.39%	0.74%
	Good voice quality	*>=95%*	Reported	96.55%	98.55%	95.60%	96.42%	98.12%	96.22%	98.94%	97.26%	98.95%	99.54%
			Verified	96.55%	98.55%	95.60%	96.42%	98.12%	96.22%	98.94%	97.26%	98.95%	99.54%
4	**No of POI having > 0.5% congestion**		Reported	0	0	4	0	0	0	0	0	0	0
			Verified	0	0	4	0	0	0	0	0	0	0
(B)	**Customer Service Quality Parameters**												
5	**Metering/billing credibility-Post paid**	*<= 0.1%*	Reported	0.04%	0.01%	0.10%	NA	0.28%	0.08%	NA	0.03%	0.12%	0.09%
			Verified	0.04%	0.01%	0.10%	NA	0.28%	0.08%	NA	0.03%	0.12%	0.09%
6	**Metering /billing credibility-Pre paid**	*<= 0.1%*	Reported	0.12%	0%	0.10%	0%	0%	0.03%	0%	0%	0.04%	0.05%
			Verified	0.12%	0%	0.10%	0%	0%	0.03%	0%	0%	0.04%	0.05%
7	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	Reported	100%	100%	99%	NA	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	99%	NA	100%	100%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	*<=1 week*	Reported	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%

PMR		Bench-mark	Audit	Aircel	Airtel	BSNL	Stel	Idea	Rcom GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators	
8	**Response time to customers for assistance**												
	Accessibility of call centre/Customer Care	*>=95%*	Reported	100%	100%	100%	99%	99%	80%	99%	100%	98%	100%
			Verified	100%	100%	100%	99%	99%	80%	99%	100%	98%	100%
	% call answered by operators(voice to voice) within 60 sec.	*>=90%*	Reported	84.82%	90.50%	91%	99.43%	93.20%	90.60%	100%	97.99%	93.64%	96%
			Verified	84.82%	90.50%	91%	99.43%	93.20%	90.60%	100%	97.99%	93.64%	96%
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%	NA	97%	100%	NA	100%	100%	100%
			Verified	100%	100%	100%	NA	97%	100%	NA	100%	100%	100%
10	**Time taken for refunds of deposits after closures.**	*100% within 60 days*	Reported	100%	100%	100%	NA	100%	100%	NA	100%	94%	100%
			Verified	100%	100%	100%	NA	100%	100%	NA	100%	94%	100%

Critical Analysis (PMR Verification):

a. The figures proved by all the operators match the figures obtained on verification.
b. Idea & STel are not meeting the benchmark for the parameter "Worst affected cells>3% TCH drop" with high margins. And only STel in BTS due to downtime parameter with a value of 2.07% respectively.
c. In case of POI congestion, BSNL is not meeting the benchmark with high margins.
d. Idea is not meeting the benchmark for "Metering/Billing Credibility-Post-paid", while Aircel is not meeting the benchmark for "Metering/Billing Credibility-Prepaid".".
e. Accessibility of Customer Care Centre is very poor (80%) by Rcom GSM in HP.
f. "% call answered by operators(voice to voice) within 60 sec." benchmark is not met by Aircel & Idea only,
g. Idea is not meeting the benchmark in Termination & Closure Parameter". Rcom-CDMA is not meeting the 60 days' benchmark for "Refund of deposits after closure of connection".

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	Stel	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators	
A	**Network Service Quality Parameter**												
1	**Connection Establishment (Accessibility)**												
	a) CSSR	*>=95%*	97.81%	98.66%	98.82%	99.70%	99.19%	99.61%	ICR with Aircel	ICR with Aircel	99.76%	99.83%	99.91%
	b) SDCCH/PAGING congestion	*<=1%*	0.10%	0.14%	0.11%	0.00%	0.04%	0.29%			0.04%	0.00%	0.00%
	c) TCH congestion	*<=2%*	0.34%	0.39%	0.46%	0.00%	0.15%	0.10%			0.04%	0.05%	0.01%
2	**Connection maintenance**												
	a) CDR	*<=2%*	0.85%	1.01%	1.94%	0.74%	1.54%	0.33%			0.96%	0.75%	0.18%
	b) Cells having > 3% TCH drop	*<=5%*	12.83%	3.40%	4.49%	4.79%	13.93%	2.30%			3.14%	1.24%	0.41%
	c) Good voice quality	*>=95%*	95.06%	98.69%	95.61%	96.43%	96.69%	97.14%			97.76%	NA	NA
	d) No. of cells > 3% TCH drop		230	108	121.4	75.33	205	38			62.33	6	2
	e) Total no. of cells in the network		1793	3198	2704	1574	1442	1563			1987	456	564
3	**No of POI having > 0.5% congestion**		0	0	0	0	0	0			0	0	0
	a) Name of POI not meeting the benchmark												
	b) Total No. of circuits on POI		9621	19385	9927	9621	11645	2433			10204	2433	8081
	c) Avg No. of call attempts on POI		406704	323286	8469	406704	594794	19834			189479	909	250511
	d) Avg traffic served on POI (Erlang)		10687	8548	285	10687	5486	909			5262	19834	4706
	e) Total number of working POI Service Area wise		29	28	22	29	31	9			38	9	62
	f) Equipped Capacity of Network in respect of Traffic in erlang		11774	63654	42000	11774	13372	39180			14525	39180	9600
	g) Total traffic handled in TCBH in erlang		5692	49744	29591	5692	9554	10858			8521	10858	2210

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Stel	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators	
(B)	**Customer Service Quality Parameters**												
4	**Response time to customers for assistance**												
	a) Accessibility of call centre	*>=95%*	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	92%
	b) % of call answered by operators(voice to voice) within 60 sec	*>=90%*	95%	97%	95%	96%	95%	96%	95%	95%	50%	94%	85%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		100	100	100	100	100	100	100	100	100	100	92
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		95	97	95	96	95	96	95	95	50	94	85

NA: Not Applicable, NR: Not Received

Parameter-wise Findings (Live Data Assessment):

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

- **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 97.81% and 99.91%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.57%.
  Note: CDMA operators have provided 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 0.79%.
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.33% and 1.94%.
- **Cell exceeding 3% TCH drop (benchmark <= 5%):** Except for Idea & Aircel with a value of 13.93% & 12.83% respectively, rest of the operators are satisfying the benchmark with value in between 0.41% and 4.79%.
- **Connections with good voice quality (benchmark >= 95%):** CDMA service providers have declared that the parameter is not system generated. Rest of the GSM operators are meeting the benchmark with values lying between 95.06% and 98.69%.
- **POI Congestion (benchmark <= 0.5%):** All the operators are meeting the benchmark with value of 0%. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark >95):** All operators are meeting the benchmark except Tata CDMA with a value of 92%.
- **%age of call answered by operator (Voice to voice) (benchmark >90%): %):** All operators are meeting the benchmark except Vodafone (50%) & Tata CDMA (85%) respectively.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	STel	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators	
(A)	**Network Service Quality Parameter**												
1	**Network Availability**												
	a) BTS Accumulated Downtime	*<=2%*	0.03%	0.03%	1.90%	0.25%	0.13%	0.26%	ICR with Aircel	ICR with Aircel	0.01%	0.23%	0.00%
	b) Worst affected BTSs due to downtime	*<=2%*	0.00%	0.00%	1.80%	0.19%	0.00%	1.54%			0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		602	1,114	945	525	497	521			661	456	188
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		139	244	12,346	870	481	981			71	718	0
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	0	17	1	0	8			0	0	0
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	*>=95%*	97.72%	97.72%	99.12%	98.30%	98.29%	99.56%			99.76%	99.82%	99.84%
	b) SDCCH/PAGING congestion	*<=1%*	0.27%	0.14%	0.80%	0.04%	0.35%	0.55%			0.03%	0.01%	0.01%
	c) TCH congestion	*<=2%*	0.27%	0.24%	1.90%	0.20%	1.06%	0.16%			0.04%	0.11%	0.01%
3	**Connection maintenance (Retainability)**												
	a) CDR	*<=2%*	0.95%	0.99%	1.95%	0.75%	1.65%	1.29%			1.06%	0.83%	0.18%
	b) Worst affected cells>3% TCH drop	*<=5%*	13.78%	3.38%	4.89%	4.84%	15.47%	2.83%			3.37%	1.33%	0.35%
	c) Good voice quality	*>=95%*	95.00%	98.65%	96.00%	96.42%	96.76%	96.45%			97.69%	NR	NR
	d) Total No. of cells exceeding 3% TCH drop (call drop)		247.1	108.3	132.15	76	228	45			67.03	6.06	2
	e) Total no. of cells in the network		1793	3198	2704	1574	1442	1563			1987	456	564
4	**No of POI having > 0.5% congestion**		0	0	0	0	0	0			0	0	0
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL			NIL	NIL	NIL
	b) Total No. of call attempts on POI (Avg.)		2322698	314761	220119	3930714	5327026	1053			175916	1053	2322698
	c) Total traffic served on POI (Erlang) (Avg.)		43189	8453	7278	102661	5549	18929			4352	18929	43189
	d) Total No. of circuits on POI		8081	19385	9927	9621	11645	2433			10204	2433	8081
	e) Total number of working POI Service Area wise		62	28	22	29	31	9			38	9	62
	f) Capacity of POI		6817	18037	8934	9063	10867	2134			8897	2134	6817
5	**Network Data**												
	a) Equipped Capacity of Network Erlang		32626	63654	42000	32626	13372	29200			14525	39180	9600
	b) Total traffic in TCBH in erlang (Avg.)		11506	49744	29591	11506	9554	19989			8521	10858	2210
	c) Total no. of customers served (as per VLR) on last day of the month		62176	1482141	931929	62176	310350	NR			254172	NR	62176

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Stel	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators	
(B)	**Customer Service Quality Parameters**												
6	**Metering/billing credibility-Post paid**	*<= 0.1%*	0.00%	0.00%	0.05%	NA	0.00%	0.00%	0.00%	NA	0.00%	0.09%	0.00%
	a) No. of bills issued during the period		2552	32270	56231	NA	268	2127	10,149	NA	1022	7820	7440
	b) No. of bills disputed including billing complaints during the period		0	42	27	NA	0	0	0	NA	0	7	0
7	**Metering /billing credibility-Pre paid**	*<= 0.1%*	0.00%	0.01%	0.00%	0.03%	0.00%	0.09%	0.08%	0.70%	0.03%	0.10%	0.08%
	a) No. of charging / credit / validity complaints during the quarter		124	4017	4763	134	17	17	89	46	9	33	30
	b) Total no. of pre-paid customers at the end of the quarter		7,10,455	19,58,933	15,41,013	4,22,760	4,79,780	10,82,912	1,09,700	65,825	2,92,608	3,29,456	37,949
8	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	100%	100%	100%	100.0%	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		124	4059	4790	134	343	97	89	46	9	40-	30
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		124	4059	4790	134	343	97	89	46	9	40	30
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		124	198	27	0	295	9	78	19	9	22	30
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		0	3861	4763	0	48	88	11	27	0	18	4
	e) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	*<=1 week*	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9	**Response time to customers for assistance**												
	a) Accessibility of call centre/Customer Care	*>=95%*	100%	98%	100%	86%	99.08%	NR	100%	98%	100%	100%	93%
	b) % call answered by operators(voice to voice) within 60 sec.	*>=90%*	91%	93.00%	95.18%	96%	23%	NR	84.70%	98.00%	91.05%	90.83%	NR
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		4,63,210	7,74,167	2,817	62,441	15,447	NR	25,350	40,101	8,485	27,807	NR
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		4,21,521	7,20,671	2,682	60,019	15,447	NR	21,457	39,298	7,726	25,258	NR

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Stel	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators	
10	**Termination/closure of service**	*<=7days*	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		46	243	866	NA	784	23	NR	NA	22	38	150
	b) No. of requests for Termination / Closure of service complied within 7 days during the quarter		46	243	866	NA	784	23	NR	NA	22	38	150
11	**Time taken for refunds of deposits after closures.**	*100% within 60 days*	100%	100%	100%	NA	100%	100%	NR	NA	100%	100%	100%

NA: Not Applicable, NR: Not Received

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark with values lying between 0% and 1.90%.
- **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0% and 1.80%., respectively
- **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 97.72% and 99.84%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0.00% and 0.55%.
  Note: CDMA operators have provided 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 0.01% and 1.90%.
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.18% and 1.95%.
- **Cell exceeding 3% TCH drop (benchmark <= 5%):** Except for Idea & Aircel with a value of 15.47% & 13.78% . All the operators are satisfying the benchmark with value in between 0.35% and 4.89%.
- **Connections with good voice quality (benchmark >= 95%):** CDMA service providers have declared that the parameter is not system generated. Rest of the GSM operators are meeting the benchmark with values lying between 95.00% and 98.65%.
- **POI Congestion (benchmark <= 0.5%):** All the operators are meeting the benchmark with value of 0%. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark >95):** Except for STel. All operators are meeting the benchmark.
- **%age of call answered by operator (Voice to voice) (benchmark >90%):** Except for Idea, Tata Gsm. All operators are meeting the benchmark.
- **Metering and billing credibility-Post paid (benchmark <= 0.1%):** All other operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** All the operators are meeting the benchmark with values lying between 0% and 0.09%., except Videocon with a value of 0.70% respectively.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark <= 7 days):** All operators have satisfied the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):** All operators have satisfied the benchmark respectively.

(1) Sample Coverage

Switches/BSC/BTS details of operators:

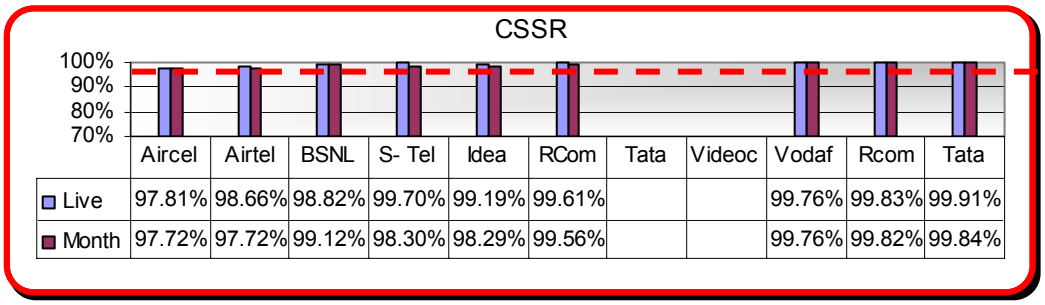
Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	1	7	602
2	Airtel Ltd	5	13	1114
3	BSNL	3	14	945
4	STel	1	4	525
5	Idea			
6	Reliance Communication (GSM)	2	12	741
7	Tata Communications (GSM)	1	ICR with Aircel	
8	Videocon	1		
9	Vodafone	1	8	
CDMA Operators				
10	Reliance Communication (CDMA)	1	0	461
11	Tata Communications (CDMA)	1	1	187

(2) Performance (Graphical Representation)

Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services

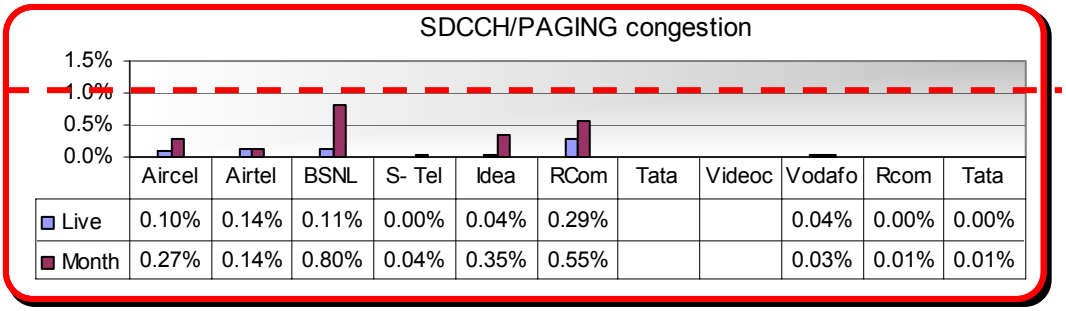
A) NETWORK PERFORMANCE

I. **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.



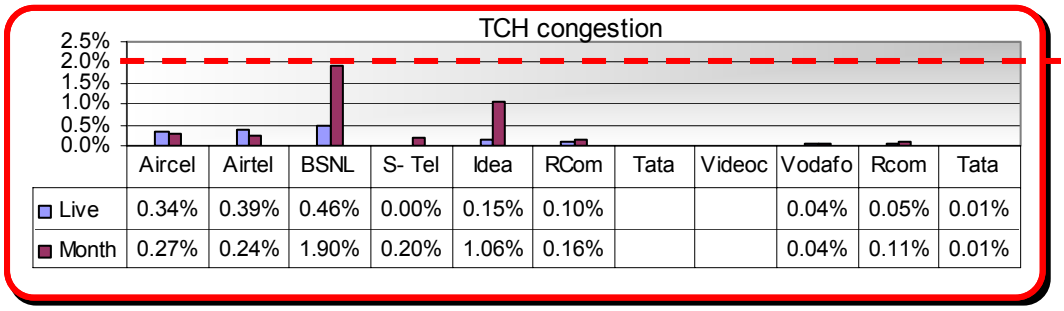
II. Blocked call rate:

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.



	Aircel	Airtel	BSNL	S- Tel	Idea	RCom	Tata	Videoc	Vodafo	Rcom	Tata
Live	0.10%	0.14%	0.11%	0.00%	0.04%	0.29%			0.04%	0.00%	0.00%
Month	0.27%	0.14%	0.80%	0.04%	0.35%	0.55%			0.03%	0.01%	0.01%

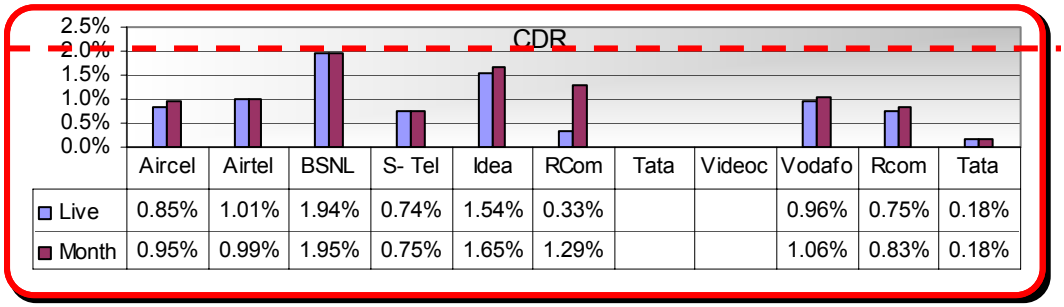
TCH congestion (%): All operators are meeting the TRAI benchmarks (<= 2%) for both one month data and 3 days live data taken in the month of audit.



	Aircel	Airtel	BSNL	S- Tel	Idea	RCom	Tata	Videoc	Vodafo	Rcom	Tata
Live	0.34%	0.39%	0.46%	0.00%	0.15%	0.10%			0.04%	0.05%	0.01%
Month	0.27%	0.24%	1.90%	0.20%	1.06%	0.16%			0.04%	0.11%	0.01%

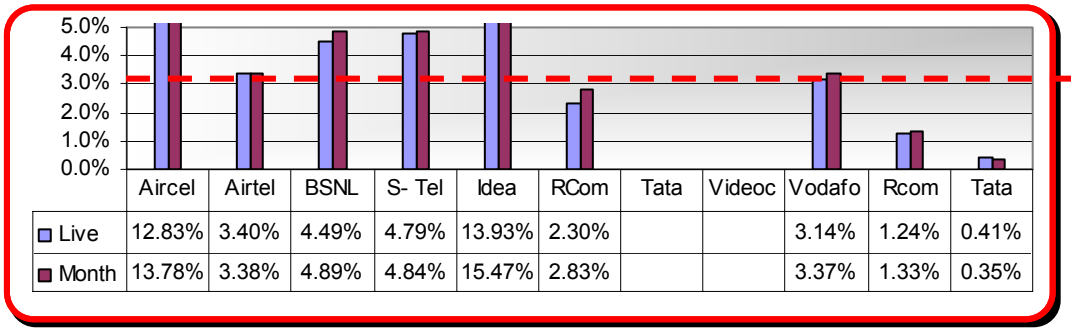
III. Connection Maintainability (Retainability):

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.



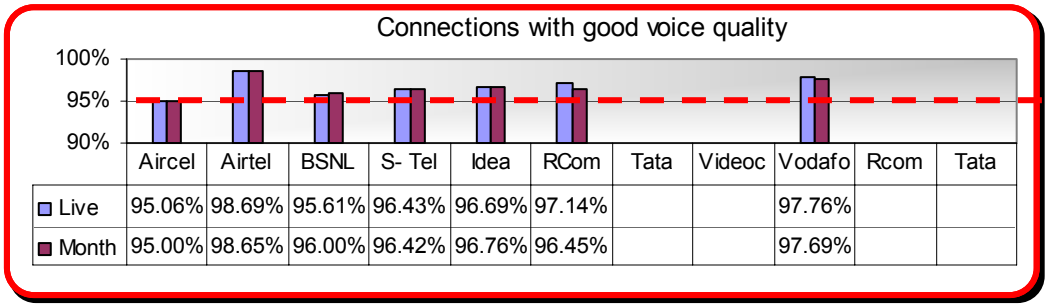
	Aircel	Airtel	BSNL	S- Tel	Idea	RCom	Tata	Videoc	Vodafo	Rcom	Tata
Live	0.85%	1.01%	1.94%	0.74%	1.54%	0.33%			0.96%	0.75%	0.18%
Month	0.95%	0.99%	1.95%	0.75%	1.65%	1.29%			1.06%	0.83%	0.18%

Worst affected Cell exceeding 3% TCH Drop: For both live and month data, Idea with a value of 13.93% and 15.47% & Aircel with a value 12.83% and 13.78%, in Month is found not meeting the benchmark of <=5%. Rests of the operators are meeting the benchmark for both cases. Tata and Videocon are in ICR with Aircel.



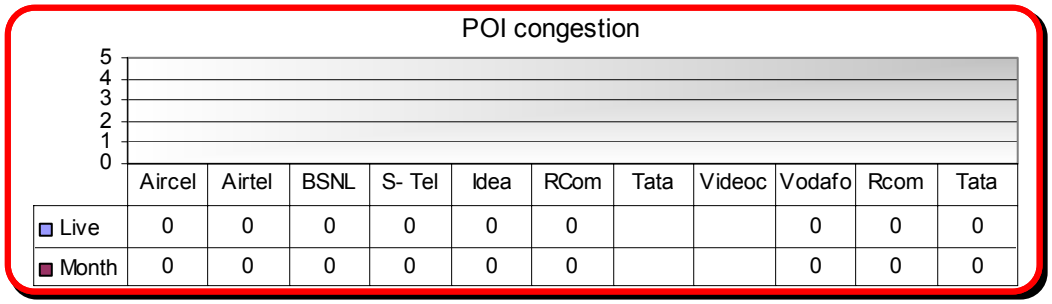
	Aircel	Airtel	BSNL	S- Tel	Idea	RCom	Tata	Videoc	Vodafo	Rcom	Tata
Live	12.83%	3.40%	4.49%	4.79%	13.93%	2.30%			3.14%	1.24%	0.41%
Month	13.78%	3.38%	4.89%	4.84%	15.47%	2.83%			3.37%	1.33%	0.35%

Percentage of connections with good voice quality (benchmark >= 95%): 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	S- Tel	Idea	RCom	Tata	Videoc	Vodafo	Rcom	Tata
Live	95.06%	98.69%	95.61%	96.43%	96.69%	97.14%			97.76%		
Month	95.00%	98.65%	96.00%	96.42%	96.76%	96.45%			97.69%		

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

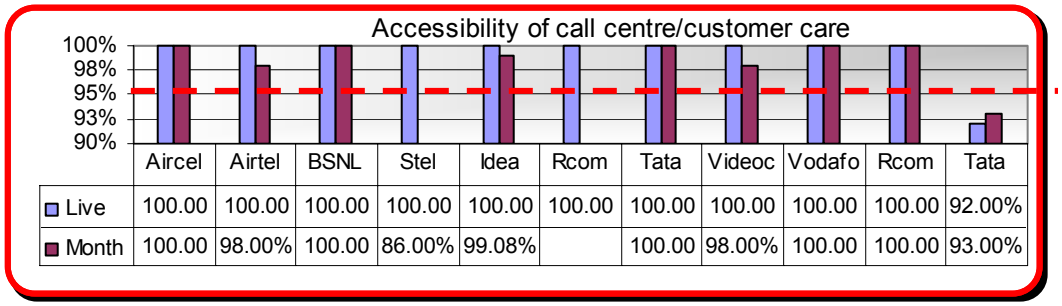


	Aircel	Airtel	BSNL	S- Tel	Idea	RCom	Tata	Videoc	Vodafo	Rcom	Tata
Live	0	0	0	0	0	0			0	0	0
Month	0	0	0	0	0	0			0	0	0

B) CUSTOMER SERVICE QUALITY PARAMETERS

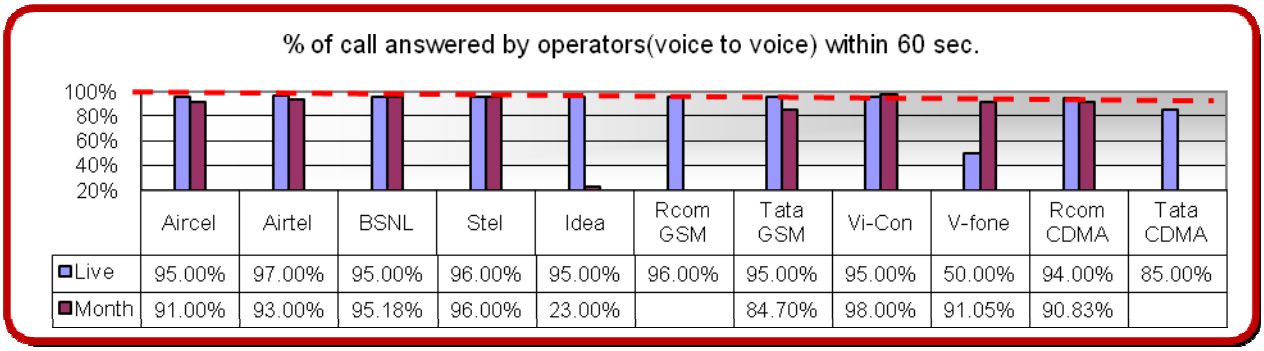
(A) Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks (>= 95%) for both one month data and 3 days live data taken in the month of audit except for Tata CDMA in live data audit (92.00%), STel in month data audit (86%) .



	Aircel	Airtel	BSNL	Stel	Idea	Rcom	Tata	Videoc	Vodafo	Rcom	Tata
Live	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	92.00%
Month	100.00	98.00%	100.00	86.00%	99.08%		100.00	98.00%	100.00	100.00	93.00%

Percentage of call answered by operators (Voice to voice) within 60 sec: For Live data, all operators are meeting the benchmark except Vodafone (50%) & Tata CDMA (85%). For month data, only Idea & Tata GSM are not meeting the benchmark. Data has not been provided by Tata-CDMA & Rcom CDMA, for month data audit.



	Aircel	Airtel	BSNL	Stel	Idea	Rcom GSM	Tata GSM	Vi-Con	V-fone	Rcom CDMA	Tata CDMA
Live	95.00%	97.00%	95.00%	96.00%	95.00%	96.00%	95.00%	95.00%	50.00%	94.00%	85.00%
Month	91.00%	93.00%	95.18%	96.00%	23.00%		84.70%	98.00%	91.05%	90.83%	

(3) Critical Analysis

The above comparative study between live data & month data shows similar trends in both the cases. However, inconsistency in live & month data was found for parameters like "worst affected cells >3% TCH drop" in Idea, Tata GSM & Videocon, as far as "accessibility of call centre" Live and Month data (Tata CDMA & STel) and "%age of calls answered by operator" in live and Month is Vodafone & Tata CDMA and Idea and Tata GSM respectively.

(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 (live calling for billing complaints)

Calling Operator	Aircel	Airtel	BSNL	STel	Idea	Reliance (GSM)	Tata (GSM)	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)
Total No. of calls	60	50	25	70	17	16	75	40	9	30	20
Cases resolved with 4 weeks	60	50	25	70	17	16	75	40	9	30	20
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Live calling to Call center:

Fifty nos. of calls were made at Shimla in each half and below given no. of calls got connected to the call center within 60 Sec.

	OPERATORS NAME										
	Aircel	Airtel	BSNL	STel	Idea	Rcom	Tata	Videocon	Vodafone	Rcom	Tata
	GSM									CDMA	
1ST HALF (10AM TO 01 PM)	46	45	48	34	45	32	46	45	46	47	**41**
2ND HALF (04PM TO 07 PM)	40	39	41	45	12	40	33	41	35	38	**36**
In % age	86.00	84.00	89.00	79.00	57.00	72.00	79.00	86.00	81.00	85.00	77.00

(4) Level 1 Calling: Level 1 calling such as calling at emergency no. (Police, Fire, Hospital), Railway enquiry system etc were made so as to check the service of such short codes. In Shimla it was found to be non functional except Railway Enquiry calls.

(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.

(C) Inter operator call assessment

(1) Sample coverage

A sample of 2x50 test calls per Service Providers with in the licensed service area (HP Circle) were made between 1100 to 1400 hrs and between 1600 to 1900 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL	STel	Idea	Reliance (GSM)	Tata (GSM)	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)
Aircel	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	100%	-	100%	100%	98%	100%	99%	100%	100%	100%
Idea	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Reliance (GSM)	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%
Tata (GSM)	98%	96%	100%	100%	100%	97%	-	100%	100%	100%	100%
Videocon	100%	96%	97%	100%	100%	98%	100%	-	98%	100%	99%
Vodafone	99%	100%	100%	100%	100%	100%	100%	100%	-	96%	100%
Reliance (CDMA)	100%	100%	100%	100%	100%	100%	100%	98%	100%	-	100%
Tata (CDMA)	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 Himachal Pradesh for all the operators. Route covered was about around 80-100Km depending on city areas within the speed limit of 30Km/hr.

Drive Test Locations

SHIMLA

LOW DENSE:	vikas nagar, malyana, dhalli,tauland.
MEDIUM DENSE:	New Shimla,khalini, lakkar bazar
HIGH DENSE:	Sinjauli, bus stand, area, kasumpti.
:	Sec-34, sec-17, Gurudwara, Sec-35, Fire works office.

MANDI

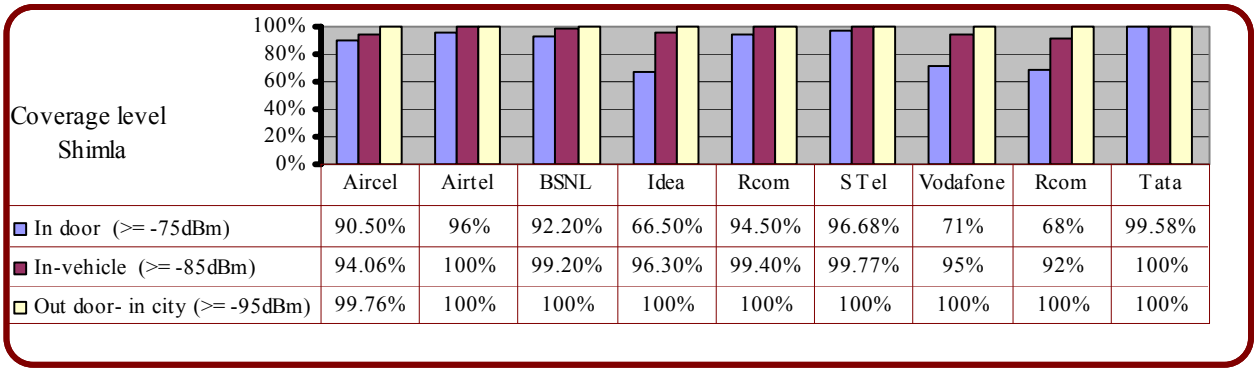
LOW DENSE:	Beuli road, Ram nagar.
MEDIUM DENSE:	Jwar nagar , bus stand.
HIGH DENSE:	Indra market, bhootnath bazar

KULLU

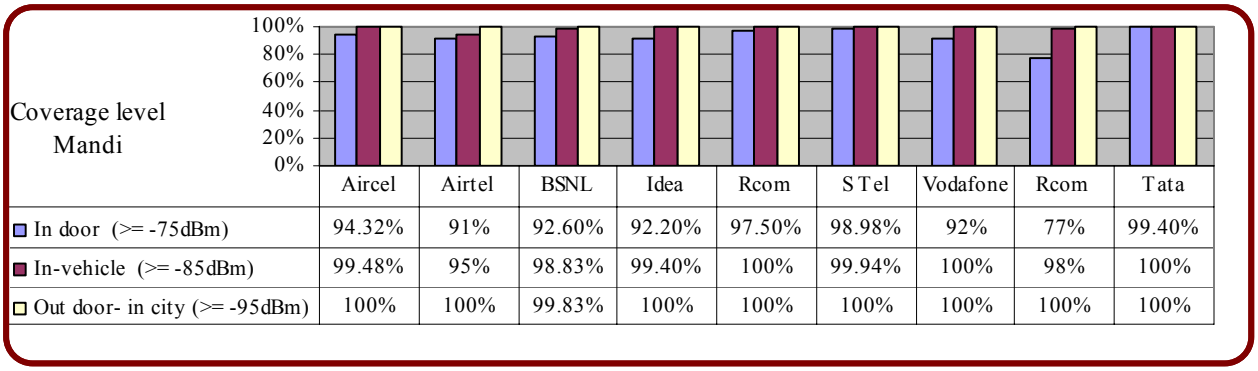
LOW DENSE:	Shashtri nagar , ramshila market.
MEDIUM DENSE:	Sultanpur, Sarvari market
HIGH DENSE:	Dhalpur market , Akhara bazar.

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Stel	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators							CDMA Operators	
1.1	Call Attempts	SHIMLA	57	52	67	46	55	50	52	47	55
		MANDI	46	51	52	58	50	47	51	50	52
		KULLU	52	50	45	54	50	50	56	53	56
1.2	Blocked Call Rate (<=3%)	SHIMLA	0%	0%	1.50%	2.20%	0%	0%	3.84%	0%	0%
		MANDI	0%	0%	0%	0%	0%	0%	0%	0%	0%
		KULLU	0%	0%	0%	0%	0%	0%	0%	0%	0%
1.3	Dropped Call Rate (<=2%)	SHIMLA	0%	0%	1.50%	0%	0%	0%	0%	0%	0%
		MANDI	0%	0%	0%	0%	0%	0%	0%	0%	0%
		KULLU	0%	0%	0%	0%	0%	0%	0%	0%	0%
1.4	Percentage of connections with good voice quality (=>95%)										
	(i) 0-4 (w/o frequency hopping)	SHIMLA								99%	98.94%
		MANDI								100%	99.47%
		KULLU								100%	99.67%
	(ii) 0-5 (with frequency hopping)	SHIMLA	96.02%	95%	95.53%	94.70%	95.70%	97.60%	96.40%		
		MANDI	100%	97.10%	95.50%	98.70%	97.80%	99.40%	99.70%		
		KULLU	100%	95.70%	95.56%	94.80%	98.20%	99.70%	98.50%		
1,5	Service Coverage										
	In door (>= -75dBm)	SHIMLA	90.50%	96%	92.20%	66.50%	94.50%	96.68%	71%	68%	99.58%
		MANDI	94.32%	91%	92.60%	92.20%	97.50%	98.98%	92%	77%	99.40%
		KULLU	94.92%	99%	85%	89.60%	88.80%	98.34%	83%	71%	100%
	In-vehicle (>= -85dBm)	SHIMLA	94.06%	100%	99.20%	96.30%	99.40%	99.77%	95%	92%	100%
		MANDI	99.48%	95%	98.83%	99.40%	100%	99.94%	100%	98%	100%
		KULLU	99.46%	100%	99.70%	99.70%	99.60%	100.00%	99%	99%	100%
	Outdoor- in city (>= -95dBm)	SHIMLA	99.76%	100%	100%	100%	100%	100%	100%	100%	100%
		MANDI	100%	100%	99.83%	100%	100%	100%	100%	100%	100%
		KULLU	100%	100%	100%	100%	100%	100%	100%	100%	100%
1.6	Call Setup Success Rate (>=95%)	SHIMLA	100%	99.11%	99%	100%	100%	100%	98%	100%	100%
		MANDI	100%	98.03%	100%	100%	100%	100%	100%	100%	100%
		KULLU	100%	100%	100%	100%	100%	100%	100%	100%	100%

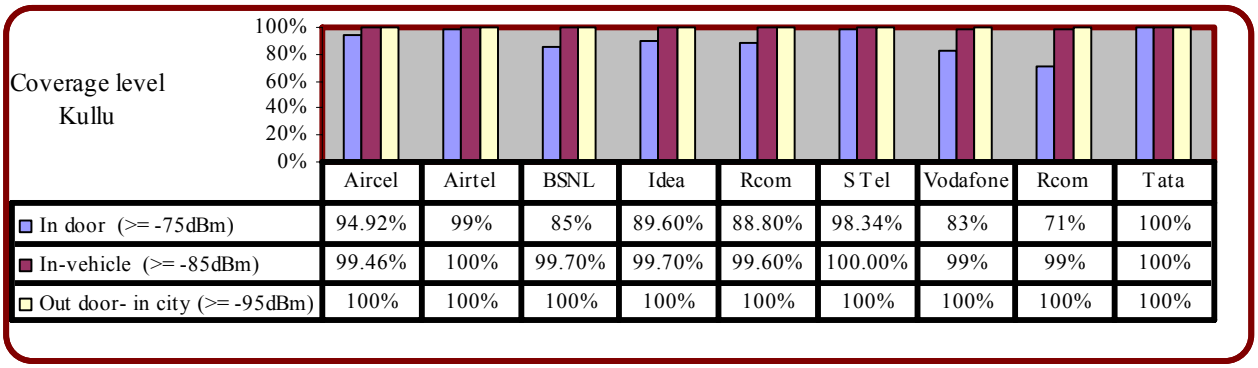
Graphical Representation



	Aircel	Airtel	BSNL	Idea	Rcom	S Tel	Vodafone	Rcom	Tata
In door (>= -75dBm)	90.50%	96%	92.20%	66.50%	94.50%	96.68%	71%	68%	99.58%
In-vehicle (>= -85dBm)	94.06%	100%	99.20%	96.30%	99.40%	99.77%	95%	92%	100%
Out door- in city (>= -95dBm)	99.76%	100%	100%	100%	100%	100%	100%	100%	100%



	Aircel	Airtel	BSNL	Idea	Rcom	S Tel	Vodafone	Rcom	Tata
In door (>= -75dBm)	94.32%	91%	92.60%	92.20%	97.50%	98.98%	92%	77%	99.40%
In-vehicle (>= -85dBm)	99.48%	95%	98.83%	99.40%	100%	99.94%	100%	98%	100%
Out door- in city (>= -95dBm)	100%	100%	99.83%	100%	100%	100%	100%	100%	100%



	Aircel	Airtel	BSNL	Idea	Rcom	S Tel	Vodafone	Rcom	Tata
In door (>= -75dBm)	94.92%	99%	85%	89.60%	88.80%	98.34%	83%	71%	100%
In-vehicle (>= -85dBm)	99.46%	100%	99.70%	99.70%	99.60%	100.00%	99%	99%	100%
Out door- in city (>= -95dBm)	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Critical Analysis

The drive test data was found to be satisfactory for all the parameters of all the operators.

(E) Independent Drive Test

(1) Sample Coverage

The Independent Drive Test was conducted at HP operators assisted drive test was over for respective operators. Route cover was about around 80-100Km depending on city areas within the speed limit of 30Km/hr.

Drive Test Locations

SHIMLA

LOW DENSE:	vikas nagar, malyana, dhalli,tauland.
MEDIUM DENSE:	New Shimla,khalini, lakkar bazar
HIGH DENSE:	Sinjauli, bus stand, area, kasumpti.

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MANDI

LOW DENSE:	Beuli road, Ram nagar.
MEDIUM DENSE:	Jwar nagar , bus stand.
HIGH DENSE:	Indra market, bhootnath bazar

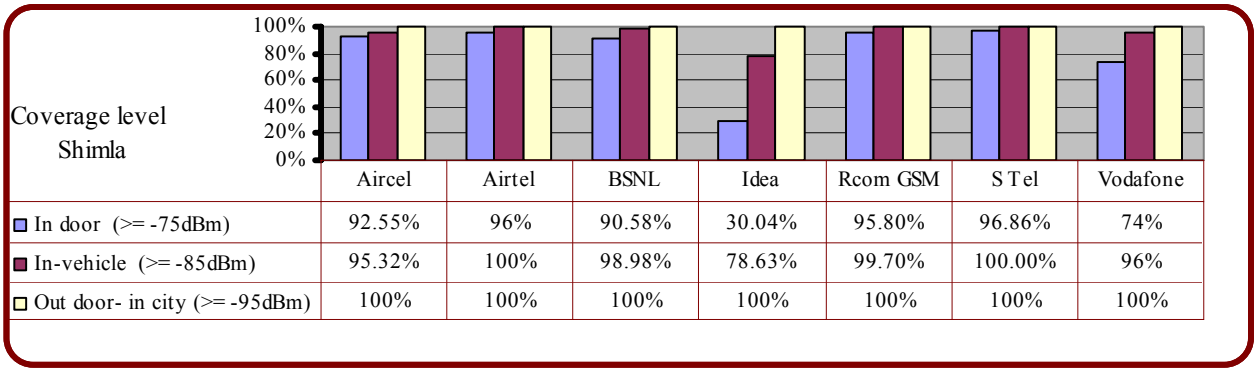
KULLU

LOW DENSE:	Shashtri nagar , ramshila market.
MEDIUM DENSE:	Sultanpur, Sarvari market
HIGH DENSE:	Dhalpur market , Akhara bazar.

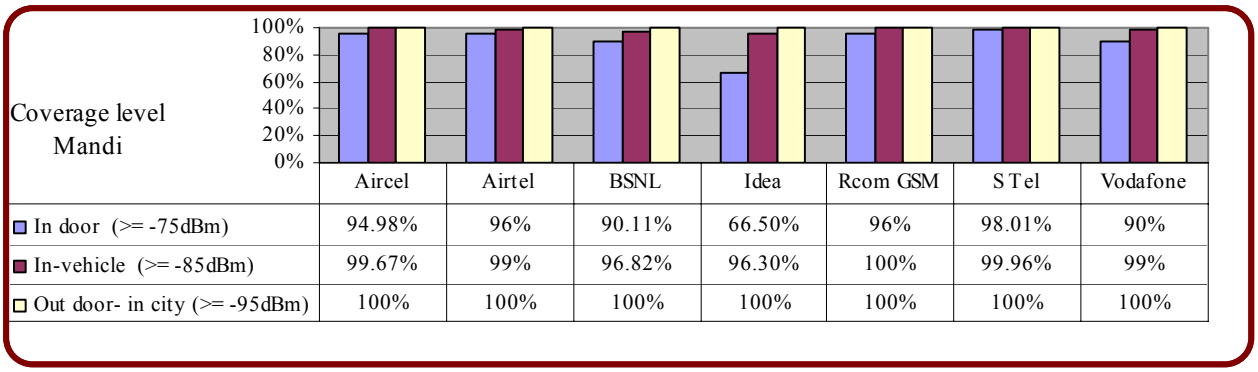
2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Stel	Vodafone
			GSM Operators						
1.1	Call Attempts	SHIMLA	58	56	56	44	52	50	52
		MANDI	47	50	57	47	50	48	53
		KULLU	53	50	49	59	51	52	54
1.2	Blocked Call Rate (<=3%)	SHIMLA	1.73%	0%	3.37%	0%	0%	0%	0%
		MANDI	0%	0%	0%	0%	0%	0%	0%
		KULLU	0%	0%	0%	0%	0%	0%	0%
1.3	Dropped Call Rate (<=2%)	SHIMLA	0%	0%	0%	0%	0%	0%	0%
		MANDI	0%	0%	0%	0%	0%	0%	0%
		KULLU	0%	0%	0%	0%	0%	0%	0%
1.4	Percentage of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)								
	(ii) 0-5 (with frequency hopping)	SHIMLA	95.31%	96.20%	95.46%	96%	96.30%	97.20%	97.20%
		MANDI	94.71%	97%	95.50%	95.20%	98.70%	98.60%	99.50%
		KULLU	95.40%	96%	96%	95.20%	98.50%	99.00%	98.20%
1.5	Service Coverage								
	In door (>= -75dBm)	SHIMLA	92.55%	96%	90.58%	30.04%	95.80%	96.86%	74%
		MANDI	94.98%	96%	90.11%	66.50%	96%	98.01%	90%
		KULLU	94.97%	98%	86.91%	82.17%	94.20%	98.35%	80%
	In-vehicle (>= -85dBm)	SHIMLA	95.32%	100%	98.98%	78.63%	99.70%	100.00%	96%
		MANDI	99.67%	99%	96.82%	96.30%	100%	99.96%	99%
		KULLU	99.32%	100%	99.97%	99.44%	99.90%	100%	97%
	Out door- in city (>= -95dBm)	SHIMLA	100%	100%	100%	100%	100%	100%	100%
		MANDI	100%	100%	100%	100%	100%	100%	100%
		KULLU	100%	100%	100%	100%	100%	100%	100%
1.6	Call Setup Success Rate (>=95%)	SHIMLA	98.27%	98.10%	95.51%	100%	100%	100%	100%
		MANDI	100%	100.00%	100%	100%	100%	100%	100%
		KULLU	100%	100.00%	100%	100%	100%	100%	100%

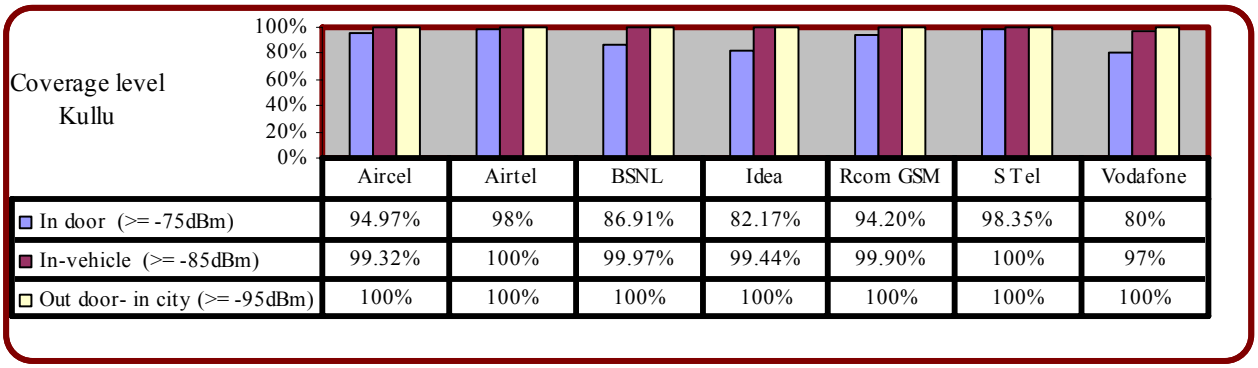
Graphical Representation



	Aircel	Airtel	BSNL	Idea	Rcom GSM	S Tel	Vodafone
In door (>= -75dBm)	92.55%	96%	90.58%	30.04%	95.80%	96.86%	74%
In-vehicle (>= -85dBm)	95.32%	100%	98.98%	78.63%	99.70%	100.00%	96%
Out door- in city (>= -95dBm)	100%	100%	100%	100%	100%	100%	100%



	Aircel	Airtel	BSNL	Idea	Rcom GSM	S Tel	Vodafone
In door (>= -75dBm)	94.98%	96%	90.11%	66.50%	96%	98.01%	90%
In-vehicle (>= -85dBm)	99.67%	99%	96.82%	96.30%	100%	99.96%	99%
Out door- in city (>= -95dBm)	100%	100%	100%	100%	100%	100%	100%



	Aircel	Airtel	BSNL	Idea	Rcom GSM	S Tel	Vodafone
In door (>= -75dBm)	94.97%	98%	86.91%	82.17%	94.20%	98.35%	80%
In-vehicle (>= -85dBm)	99.32%	100%	99.97%	99.44%	99.90%	100%	97%
Out door- in city (>= -95dBm)	100%	100%	100%	100%	100%	100%	100%

(3) Critical Analysis

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

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- BSNL is deviating the benchmarks for Blocked call rate in Shimla (3.37%).
- .Good Voice quality parameter is not met by Aircel (94.71%) in Mandi only.
- Tata GSM & Videocon is having ICR agreement with Aircel.

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

From live, month, PMR and Drive Tests findings, it can be concluded that on an average, performance of the operators in the service area (Himachal Pradesh) is by and large satisfactory for **Network Parameters**. However, the benchmark of <=5% for "worst affected cells >3% TCH drop" is not met by Aircel & Idea (for month & live data) respectively .

Under **Customer Service Quality Parameter** "operator answered calls (voice-to-voice) within 60 seconds" parameter it is found that most of the operators are fulfilling TRAI benchmark except Vodafone & Tata CDMA of >=90%. Apart from this, the "accessibility of call centre" parameter benchmark is not met by Tata CDMA in Live and STel in Month audit data..

Regarding **Metering/Billing Credibility** issues, All operators are meeting the benchmarks.

During **Drive Tests**, high Blocked Call Rates were found in case of Vodafone & BSNL in Shimla only for both Dependent & Independent Drive test.

III. Basic Telephone Service (Wireline) Providers

……..Audit not done for this quarter

IV. Broadband Service Providers

……..Audit not done for this quarter