

REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICES
FOR
WEST ZONE
GUJARAT CIRCLE

Report Period: October 2011 – December 2011

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- 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.
- vii) Emergency Level-1 Live calling

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 Gujarat 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 Gujarat Circle in 4th¹ quarter (October2011 – 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 Gujarat circle (West 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	Nov 2011	2000-2100 Hrs
2	Airtel Ltd	Nov.2011	1900-2000 hrs
3	BSNL	Nov.2011	1900-2000 hrs
4	Reliance Communication	Nov.2011	2000-2100 Hrs
5	Tata Communications	Nov.2011	1900-2000 hrs
6	Vodafone	Nov,2011	1900-2000 hrs
7	Uninor	Nov.2011	1900-2000 hrs
8	Etisalat	Nov.2011	1900-2000 hrs
9	Idea	Nov.2011	1900-2000 hrs
10	Videocon	Nov.2011	1900-2000 hrs
CDMA operators			
11	MTS	Nov.2011	1900-2000 hrs
12	Reliance Communication	Nov.2011	2000-2100 Hrs
13	Tata Communications	Nov.2011	1900-2000 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

<u>3 days Live Data Audit</u>		Bench- mark	Airce l	Airtel	BSNL	Etisala t	Idea	Rco m GSM	Tata GSM	Unin or	Video con	Voda fone	Rcom CDM A	MTS	Tata CDMA
S/ N	Name of Parameter		GSM Operators										CDMA Operators		
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.05%	0.07%	0.45%	0.00%	0.03%	0.06%	0.01%	0.01%	0.03%	0.02%	0.06%	0.11%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.05%	0.09%	0.00%	0.00%	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%	98.50 %	99.35 %	98.05 %	99.80%	99.46 %	99.61 %	98.90 %	96.99 %	99.28 %	99.19 %	99.54 %	99.49%	98.93%
	b) SDCCH/PAGING congestion	<=1%	0.05%	0.02%	0.19%	0.01%	0.26%	0.01%	0.07%	0.13%	0.01%	0.25%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.70%	0.10%	1.96%	0.00%	0.13%	0.05%	0.40%	0.17%	0.03%	0.13%	0.10%	0.00%	0.01%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.76%	1.35%	1.87%	1.00%	1.17%	0.56%	1.23%	1.54%	0.54%	0.88%	0.38%	0.28%	0.56%
	b) Worst affected cells>3% TCH drop	<=3%	1.16%	1.88%	2.85%	1.59%	2.79%	0.07%	10.26 %	2.69%	0.59%	1.91%	0.04%	3.18%	0.56%
	c) Good voice quality	>=95%	97.92 %	97.15 %	NA	98.54%	95.86 %	98.87 %	98.36 %	96.60 %	98.73 %	97.37 %	98.72 %	99.00%	99.40%
4	No of POI having >=0.5% congestion	<0.5%	0	0	1	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%	98.00 %	100%	100%	99.40%	100%	98.78 %	100%	98.00 %	100%	100%	97.80 %	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	78.52 %	96.93 %	98.75 %	98.81%	99.47 %	66.95 %	99.42 %	98.04 %	97.40 %	98.94 %	97.63 %	100%	98.61%

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters except for Tata GSM and MTS not meeting "worst affected cells >3% TCH drop". BSNL is having congestion on one POI.

Customer care data is found to be satisfactory for all the operators except Aircel & Rcom GSM which do not meet the benchmark for calls answered by operator within 60 secs.

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	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%	0.07%	45.00%	0.00%	0.03%	0.06%	0.01%	0.01%	0.03%	0.02%	0.06%	0.11%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.05%	0.09%	0.00%	0.00%	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%	98.51%	99.20%	97.91%	99.85%	99.42%	99.61%	98.88%	97.10%	99.26%	99.73%	99.52%	99.38%	98.88%
	b) SDCCH/PAGING congestion	<=1%	0.05%	0.19%	0.14%	0.01%	0.27%	0.01%	0.10%	0.06%	0.02%	0.55%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.75%	0.18%	1.96%	0.00%	0.14%	0.07%	0.34%	0.13%	0.05%	0.24%	0.11%	0.00%	0.01%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.77%	1.45%	1.97%	1.00%	1.13%	0.55%	1.25%	1.47%	0.52%	0.98%	0.33%	0.32%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	1.16%	2.27%	2.73%	1.59%	2.73%	0.11%	5.53%	2.32%	0.44%	2.01%	0.10%	2.78%	0.52%
	c) Good voice quality	>=95%	97.96%	96.93%	NA	98.49%	95.74%	98.86%	98.34%	96.71%	98.75%	97.10%	98.73%	99.00%	98.50%
4	No of POI having >=0.5% congestion	<0.5%	0	0	1	0	0	0	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility- Post paid	<= 0.1%	0.16%	0.00%	0.00%	NA	0.04%	0.10%	0.00%	NA	NA	0.03%	0.06%	0.06%	0.00%
6	Metering /billing credibility- Pre paid	<= 0.1%	0.01%	0.00%	0.00%	0.00%	0.01%	0.10%	0.00%	0.17%	0.02%	0.01%	0.05%	0.00%	0.00%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
	a) 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%
8	Response time to customers for assistance														

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
S/N	Name of Parameter		GSM Operators										CDMA Operators		
	a) Accessibility of call centre/Customer Care	>=95%	83.50%	96.50%	100%	98.50%	99.28%	98.76%	99.50%	95.00%	97.30%	100%	97.80%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	50.62%	95.04%	98.75%	99.75%	98.30%	82.95%	92.50%	94.82%	96.23%	95.79%	94.67%	100%	92.87%
9	Termination/closure of service	<=7days	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	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 except Tata GSM for the parameter 'Worst affected cells>3% TCH drop'. BSNL is having congestion on one POI.

Performance related to "Response time to customer" parameters is found to be satisfactory for all the operators except for Aircel. Rcom GSM has low %age of calls answered by operator within 60 sec. Aircel has low billing credibility for post-paid connections & Uninor has same performance for pre-paid connections.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted in and around Ahmadabad, Surat and Jamnagar for all the operators. Route covered was about around 100-120Km and for all the operators the same route was followed. The speed limit of 30-35Km/hr was maintained throughout the Drive Test. Zones were selected for covering different density areas (High, Medium & Low dense areas). Aircel is on ICR with Tata GSM in Surat and Tata GSM is on ICR in Ahmadabad and Jamnagar.

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%)	Ahmadabad	0.00	0.00	0.90	0.71	0.00	ICR	0.00	0.00	0.00	0.00	0.00	0.00
		Surat	ICR	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jamnagar	0.00	0.00	1.30	1.16	0.00	ICR	0.00	0.00	0.00	0.00	0.00	0.00
1.2	Dropped Call Rate (<=2%)	Ahmadabad	0.00	0.00	0.90	0.00	0.00	NA	0.00	0.00	0.00	0.00	0.00	0.00
		Surat	ICR	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jamnagar	0.00	0.00	0.00	0.00	0.00	ICR	1.17	0.00	0.00	0.00	0.00	0.00
1.3	Percentage of connections with good voice quality (>=95%) (i) 0-4 (w/o frequency hopping)	Ahmadabad										99.31	98.30	99.84
		Surat										99.08	98.09	98.40
		Jamnagar										98.48	99.97	99.99
	(ii) 0-5 (with frequency hopping)	Ahmadabad	98.00	96.20	97.60	96.90	98.30	ICR	95.15	97.00	97.33			
		Surat	ICR	94.60	96.70	98.20	98.08	96.76	95.15	96.00	98.00			
		Jamnagar	98.00	96.70	94.34	98.60	98.88	ICR	98.83	98.00	98.33			
1.4	Call Setup Success Rate (>=95%)	Ahmadabad	100	100	99.10	99.30	100	ICR	100	100	100	100	100	100
		Surat	ICR	100	100	99.11	100	100	100	100	100	100	100	100
		Jamnagar	100	100	98.70	99.84	100	ICR	100	100	100	100	100	100

Independent Drive Test

SN	Parameter	Airtel (Bhuj)	Idea (Godhra)	Rcom GSM (Mehsana)	Tata GSM (Godhra)	Uninor (Daman)	Vi-Con (Daman)	V-fone (Dwarka)	Rcom CDMA (Mehsana)	Tata CDMA (Godhra)
1.1	Blocked Call Rate ($\leq 3\%$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.2	Dropped Call Rate ($\leq 2\%$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.3	Percentage of connections with good voice quality ($\geq 95\%$)									
	(i) 0-4 (w/o frequency hopping)								99.30	98.70
	(ii) 0-5 (with frequency hopping)	96.30	95.90	98.70	96.00	97.70	96.30	99.00		
1.4	Call Setup Success Rate ($\geq 95\%$)	100	100	100	100	100	100	100	100	100

CHAPTER-3: AUDIT-PMR VERIFICATION RESULTS

I. Cellular Mobile Telephone Service

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisa lat	Idea	Rcom GSM	Tata GSM	Unin or	Video con	Vode fone	Rcom CDMA	MTS	Tata CDMA
S/N	Name of Parameter															
(A)	Network Service Quality Parameter															
1	Network Availability															
	BTS Accumulated Downtime	<=2%	Reported	0.00%	0.14%	0.54%	0.05%	0.07%	0.00%	0.03%	0.02%	0.05%	0.03%	0.00%	0.17%	0.03%
			Verified	0.00%	0.14%	0.54%	0.05%	0.07%	0.00%	0.03%	0.02%	0.05%	0.03%	0.00%	0.17%	0.03%
	Worst affected BTSs due to downtime	<=2%	Reported	0.00%	0.63%	0.46%	0.00%	0.12%	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Verified			0.00%	0.63%	0.46%	0.00%	0.12%	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%
2	Connection Establishment (Accessibility)															
	CSSR (Call Setup Success Rate)	>=95%	Reported	99%	99%	98%	100%	99%	100%	96%	98%	99%	99%	100%	99%	96%
			Verified	99%	99%	98%	100%	99%	100%	96%	98%	99%	99%	100%	99%	96%
	SDCCH/PAGING congestion	<=1%	Reported	0.04%	0.09%	0.26%	0.02%	0.28%	0.00%	0.25%	0.02%	0.07%	0.00%	0.00%	0.00%	0.25%
			Verified	0.04%	0.09%	0.26%	0.02%	0.28%	0.00%	0.25%	0.02%	0.07%	0.00%	0.00%	0.00%	0.25%
	TCH congestion	<=2%	Reported	0.10%	0.21%	1.38%	0.00%	0.21%	0.00%	1.29%	0.06%	0.23%	0.00%	0.00%	0.00%	1.29%
Verified			0.10%	0.21%	1.38%	0.00%	0.21%	0.00%	1.29%	0.06%	0.23%	0.00%	0.00%	0.00%	1.29%	
3	Connection maintenance (retainability)															
	CDR	<=2%	Reported	0.40%	1.19%	1.58%	0.50%	0.88%	0.00%	1.06%	1.04%	0.68%	0.01%	0.00%	0.31%	1.06%
			Verified	0.40%	1.19%	1.58%	0.50%	0.88%	0.00%	1.06%	1.04%	0.68%	0.01%	0.00%	0.31%	1.06%
	Worst affected cells>3% TCH drop	<=5%	Reported	0.20%	0.01%	3.50%	3.14%	2.53%	0.00%	2.66%	4.39%	0.32%	0.02%	0.00%	1.23%	2.66%
			Verified	0.20%	0.01%	3.50%	3.14%	2.53%	0.00%	2.66%	4.39%	0.32%	0.02%	0.00%	1.23%	2.66%
	Good voice quality	>=95%	Reported	99%	97%	100%	98%	97%	98%	98%	97%	98%	97%	99%	100%	98%
Verified			99%	97%	100%	98%	97%	98%	98%	97%	98%	97%	99%	100%	98%	
4	No. of POI with >=0.5% congestion	<0.5%	Reported	0	0	0.01	0	1	0	0	0	0.33	0	0	0	0
			Verified	0	0	NP	0	1	0	0	0	NP	0	0	0	0
(B)	Customer Service Quality Parameters															
5	Metering/billing credibility-Post paid	<=0.1%	Reported	0.27%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Verified	0.27%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

PMR	Bench-mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	MTS	Tata CDMA	
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.08%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	
			Verified	0.08%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	
			Verified	100%	100%	100%	100%	100%	100%	100%	NA	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%	100%	100%	100%	0%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	NA	100%	100%	100%	NA	100%	100%	100%	100%	100%
8	Response time to customers for assistance	>=95%	Reported	100%	100%	99%	100%	99%	100%	99%	98%	97%	100%	100%	97%	99%
			Verified	100%	100%	99%	100%	99%	100%	99%	98%	97%	100%	100%	97%	99%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	47%	91%	91%	100%	83%	88%	90%	90%	92%	93%	92%	96%	90%
			Verified	47%	91%	91%	100%	83%	88%	90%	90%	92%	93%	92%	96%	90%
9	Termination/closure of service	<=7days	Reported	100%	100%	100%	0%	100%	100%	100%	0%	0%	100%	100%	NA	100%
			Verified	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	NA	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	100%	0%	100%	100%	100%	0%	0%	100%	100%	NA	100%
			Verified	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	NA	100%

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

II. Basic Service (Wire Line) Service - *Not conducted for this quarter*

III. Broadband Service - *Not conducted for this quarter*

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	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators										CDMA Operators		
A	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.05%	0.07%	0.45%	0.00%	0.03%	0.06%	0.01%	0.01%	0.03%	0.02%	0.06%	0.11%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.05%	0.09%	0.00%	0.00%	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		891	6365	4331	21	5485	3051	2148	2288	1747	7050	1712	503	835
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		33.47	321	1411	0	106	135	11.02	24.18	36.6	107.5	75	39.15	0
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	3	4	0	0	0	0	0	0	0	0	0	0
1	Connection Establishment (Accessibility)														
	a) CSSR	>=95%	98.50%	99.35%	98.05%	99.80%	99.46%	99.61%	98.90%	96.99%	99.28%	99.19%	99.54%	99.49%	98.93%
	b) SDCCH/PAGING congestion	<=1%	0.05%	0.02%	0.19%	0.01%	0.26%	0.01%	0.07%	0.13%	0.01%	0.25%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.70%	0.10%	1.96%	0.00%	0.13%	0.05%	0.40%	0.17%	0.03%	0.13%	0.10%	0.00%	0.01%
2	Connection maintenance														
	a) CDR	<=2%	0.76%	1.35%	1.87%	1.00%	1.17%	0.56%	1.23%	1.54%	0.54%	0.88%	0.38%	0.28%	0.56%
	b) Cells having > 3% TCH drop	<=3%	1.16%	1.88%	2.85%	1.59%	2.79%	0.07%	10.26%	2.69%	0.59%	1.91%	0.04%	3.18%	0.56%

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators										CDMA Operators		
	c) Good voice quality	>=95%	97.92%	97.15%	NA	98.54%	95.86%	98.87%	98.36%	96.60%	98.73%	97.37%	98.72%	99.00%	99.40%
	d) No. of cells > 3% TCH drop		31	360	357	1	456	6	661	183	31	406	2	48	14
	e) Total no. of cells in the network		2,672	19,116	12,548	63	16,330	9,153	6,441	6,814	5,238	21,203	5,136	1,509	2,505
3	No of POI having >=0.5% congestion	<0.5%	0	0	1	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark				TataGSM										
	b) Total No. of call attempts on POI (Avg.)		174,238	2,992,646	526,119	1,945	2,547,412	333,365	22,674	13,604	3,945	27,183	409,016	8,257	3,625
	c) Total traffic served on POI (Erlang) (Avg.)		3,870	107,075	20,531	65	57,784	11,275	811	339	92	421	12,666	285	83
	d) Total No. of circuits on POI		10,386	198,368	40,091	3,246	114,048	59,681	29,030	46,402	11,437	231,328	34,541	4,308	42,345
	e) Total number of working POI Service Area wise		40	250	50	21	150	103	22	58	43	128	72	47	170
	f) Equipped Capacity of Network in respect of Traffic in erlang		33,118	249,124	150,000	530	223,398	144,000	102,085	58,660	74,958	479,849	200,000	21,000	231,486
	g) Total traffic handled in TCBH in erlang		5,272	107,074	13,596	10	57,784	NP	17,852	19,661	3,897	53,971	NP	852	15,154
(B)	Customer Service Quality Parameters														
4	Response time to customers for assistance														
	a) Accessibility of call centre	>=95%	98.00%	100.00%	100.00%	99.40%	100.00%	98.78%	100.00%	98.00%	100.00%	100.00%	97.80%	100.00%	100.00%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	78.52%	96.93%	98.75%	98.81%	99.47%	66.95%	99.42%	98.04%	97.40%	98.94%	97.63%	100.00%	98.61%

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators									CDMA Operators			
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		10,856	167,938	5,664	673	200,428	21,018	50,287	10,097	1,539	125,264	10,551	1,985	185,264
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		8,524	162,777	5,593	665	199,369	14,072	49,993	9,899	1,499	123,935	10,301	1,985	182,694

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 Gujarat Service Area are as given below:-

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.00% and 0.45%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 0.09%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 96.99% and 99.8%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0.0% and 0.26%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% to 1.96%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.28% and 1.87%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** All the operators are meeting the benchmark except Tata GSM and MTS.
- **Connections with good voice quality (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 95.86% and 99.4%. BSNL has declared that this parameter is not system generated.
- **POI Congestion (benchmark $\leq 0.5\%$):** BSNL is having 1 POI with congestion. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage, 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 in the range of 97.8% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for Aircel & Rcom GSM, all other operators are meeting the benchmark with values lying between 96.93% and 100%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators										CDMA Operators		
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.03%	0.07%	0.55%	0.15%	0.03%	0.08%	0.01%	0.01%	0.06%	0.03%	0.08%	0.09%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.06%	1.62%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		891	6,365	4,331	21	5,485	3,051	2,148	2,288	1,747	7,050	1,712	503	835
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		190.63	3,218	17,233	22	1,330	1,772	196.80	143	760.05	1,426	1,030	331	4
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	4	70	0	0	2	0	0	0	1	0	0	0
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	98.51%	99.20%	97.91%	99.85%	99.42%	99.61%	98.88%	97.10%	99.26%	99.73%	99.52%	99.38%	98.88%
	b) SDCCH/PAGING congestion	<=1%	0.05%	0.19%	0.14%	0.01%	0.27%	0.01%	0.10%	0.06%	0.02%	0.55%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.75%	0.18%	1.96%	0.00%	0.14%	0.07%	0.34%	0.13%	0.05%	0.24%	0.11%	0.00%	0.01%

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators										CDMA Operators		
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.77%	1.45%	1.97%	1.00%	1.13%	0.55%	1.25%	1.47%	0.52%	0.98%	0.33%	0.32%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	1.16%	2.27%	2.73%	1.59%	2.73%	0.11%	5.53%	2.32%	0.44%	2.01%	0.10%	2.78%	0.52%
	c) Good voice quality	>=95%	97.96%	96.93%	NA	98.49%	95.74%	98.86%	98.34%	96.71%	98.75%	97.10%	98.73%	99.00%	98.50%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		31	434	343	1	446	10	356	158	23	427	5	42	13
	e) Total no. of cells in the network		2,672	19,116	12,548	63	16,330	9,153	6,441	6,814	5,238	21,203	5,136	1,509	2,505
4	No of POI having >=0.5% congestion	<0.5%	0	0	1	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark				TataGsm										
	b) Total No. of call attempts on POI (Avg.)		163,318	2,920,505	269,769	1,933	2,540,685	332,035	25,014	13,348	4,788	27,645	394,115	7,574	3,510
	c) Total traffic served on POI (Erlang) (Avg.)		131	12,286	662	66	385	0	851	331	110	400	4,998	164	84
	d) Total No. of circuits on POI		10,386	198,368	40,091	3,246	114,048	59,898	29,030	46,402	11,437	231,328	34,704	4,308	42,345
	e) Total number of working POI Service Area wise		40	250	50	21	150	103	22	58	43	128	72	47	170
5	Network Data														
	a) Equipped Capacity of Network Erlang		33,118	249,124	150,000	530	223,398	144,000	102,085	58,660	74,958	479,849	200,000	21,000	231,486
	b) Total traffic in TCBH in erlang (Avg.)		5,272	107,074	13,596	10	57,784	NP	17,852	19,661	3,897	53,971	NP	852	15,154

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators										CDMA Operators		
	c) Total no. of customers served (as per VLR) on last day of the month		435,057	5,739,526	2,378,457	4,372	6,772,958	3,381,031	1,440,185	1,723,739	534,061	13,234,438	1,799,304	39,681	631,883
(B)	Customer Service Quality Parameters														
6	Metering/billing credibility-Post paid	$\leq 0.1\%$	0.16%	0.00%	0.00%	NA	0.04%	0.10%	0.00%	NA	NA	0.03%	0.06%	0.07%	0.00%
	a) No. of bills issued during the period		3,177	314,634	78,486	NA	315,208	32,989	18,396	NA	NA	1,018,834	281,178	3,064	165,412
	b) No. of bills disputed including billing complaints during the period		5	2	1	NA	112	32	0	NA	NA	294	155	2	0
7	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.01%	0.00%	0.00%	0.00%	0.01%	0.10%	0.00%	0.17%	0.02%	0.01%	0.05%	0.00%	0.00%
	a) No. of charging / credit / validity complaints during the quarter		44	42	158	0	734	5,299	51	4,903	173	877	1,407	0	1
	b) Total no. of pre-paid customers at the end of the quarter		805,759	6,398,629	3,711,195	28,567	7,123,671	5,323,567	2,870,133	2,806,237	1,089,755	14,402,996	2,601,819	96,434	1,112,516
8	Resolution of billing/ charging complaints	<i>100% within 4 weeks</i>	100%	100%	100%	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		49	833	1,782	0	846	5,355	10,378	4,903	173	3,085	2,823	2	2,747

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators										CDMA Operators		
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		49	833	1,782	0	846	5,355	10,378	4,903	173	3,085	2,823	2	2,747
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		18	44	159	0	846	5,331	51	4,663	173	1,171	1,562	2	1
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		31	789	1,623	0	0	24	10,327	240	0	1,914	1,261	0	2,746
	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%	83.50%	96.50%	100.00%	98.50%	99.28%	98.76%	99.50%	95.00%	97.30%	100.00%	97.80%	100.00%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	50.62%	95.04%	98.75%	99.75%	98.30%	82.95%	92.50%	94.82%	96.23%	95.79%	94.67%	100.00%	92.87%

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Video con	Voda fone	Rcom CDMA	MTS	Tata CDMA
			GSM Operators									CDMA Operators			
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		14,888	211,774	6,063	794	272,180	19,673	45,251	14,749	1,579	313,654	11,095	2,288	194,734
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		7,536	201,280	5,987	792	267,566	16,319	41,857	13,984	1,519	300,463	10,503	2,288	180,840
10	Termination/closure of service	<i><=7days</i>	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		75	2,951	1,923	NA	1,798	292	10,439	NA	NA	4,149	1,570	7	2,747
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		75	2,951	1,923	NA	1,798	292	10,439	NA	NA	4,149	1,570	7	2,747
11	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	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 Gujarat Service Area are as given below:-

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 0.55%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.62%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 97.10% and 99.85%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 0.55 %.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.96%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.32 % and 1.97%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** All the operators are meeting the benchmark except Tata GSM.
- **Connections with good voice quality (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 95.74% and 99%. BSNL has declared that this KPI is not system generated.
- **POI Congestion (benchmark $\leq 0.5\%$):** BSNL is having 1 POI each with more than 0.5% congestion. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage, 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, except Aircel, are meeting the benchmark in the range of 95% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for Aircel & Rcom GSM, all other operators are meeting the benchmark with values lying between 92.5% and 100%.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** Aircel is not meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** Except for Uninor, all operators are meeting the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark. Etisalat had no complaints during the month of audit and therefore, this parameter is not applicable to it.
- **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.

(3) Sample Coverage

Switches/BSC/BTS details of operators:

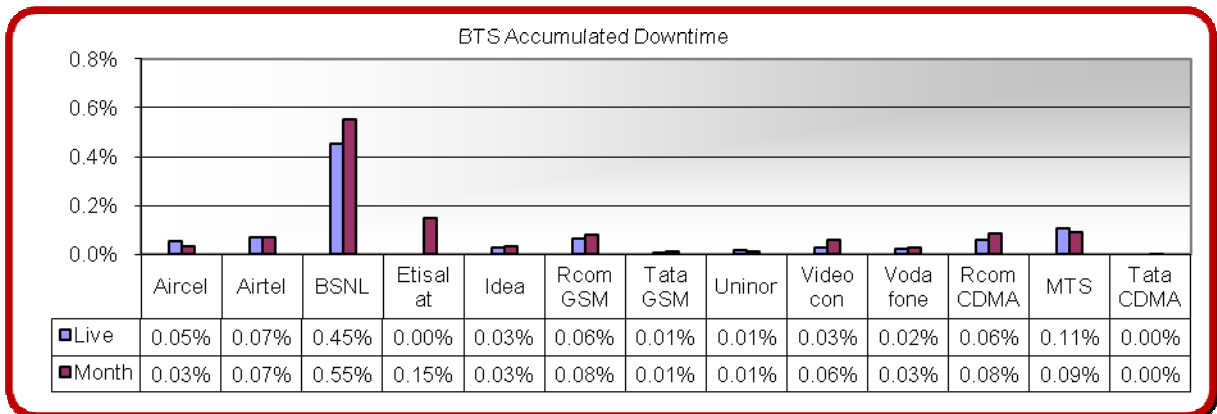
Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	1	6	891
2	Airtel Ltd	14	101	6366
3	BSNL	08	102	4331
4	Idea	21	35	5485
5	Reliance Communication	5	18	3051
6	Tata Communications	3	17	2148
7	Uninor	3	15	2288
8	Videocon	2	11	1747
9	Vodafone	20	140	7050
10	Etisalat	1	1	21
CDMA Operators				
11	Reliance Communication	7	4	1712
12	Tata Communications	7	8	835
13	MTS	1	2	603

(4) Performance (Graphical Representation)

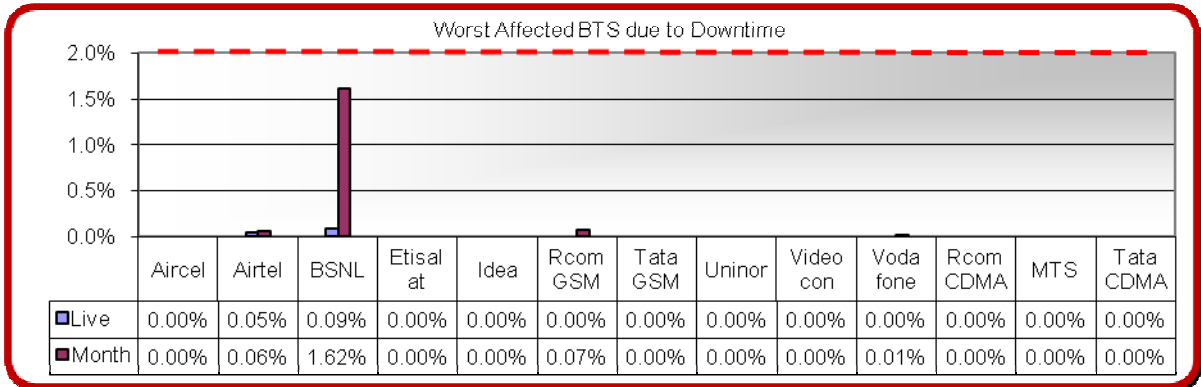
Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services

A) NETWORK PERFORMANCE

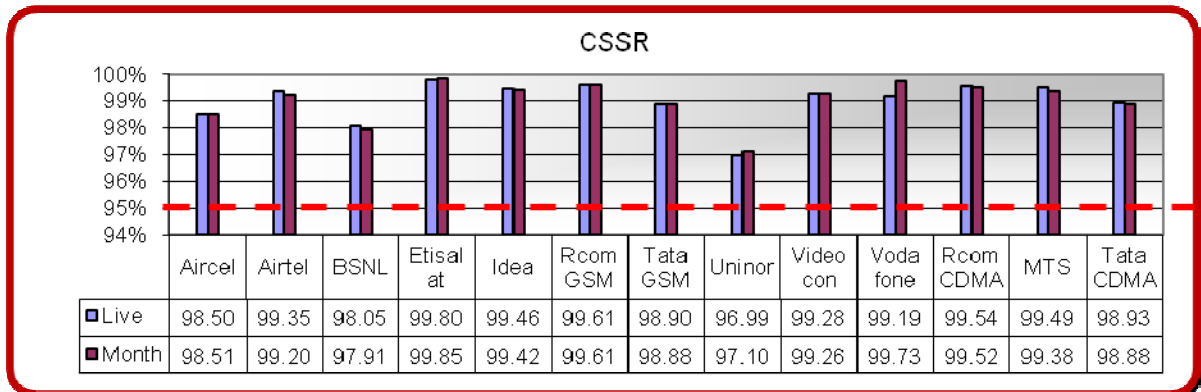
BTS accumulated downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.



Worst affected BTSs due to downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.

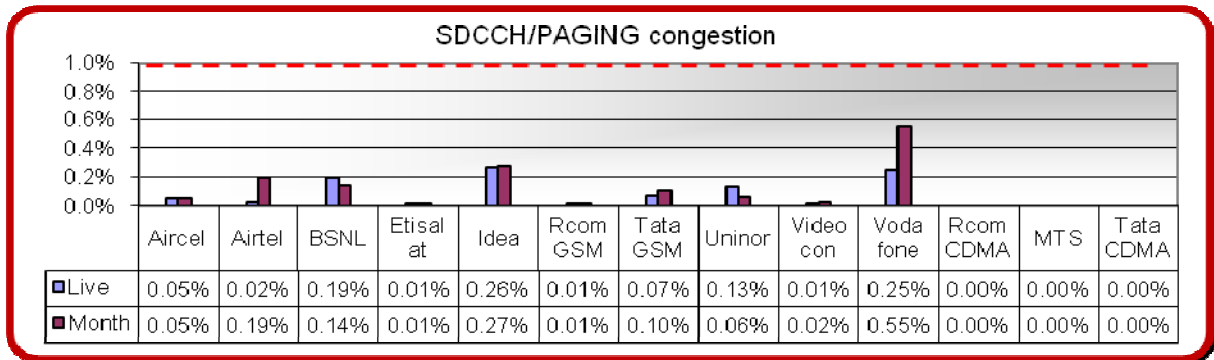


Call Setup Success Rate (CSSR): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit

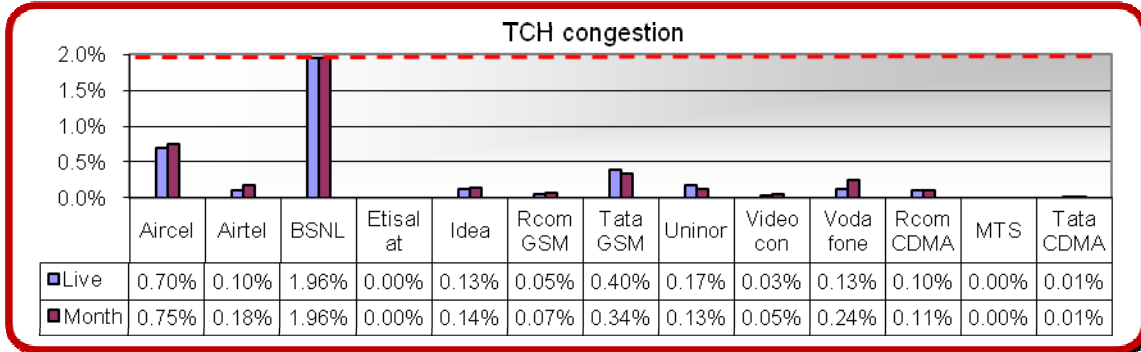


Blocked call rate:

SDCCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 1\%$) for both one month data and 3 days live data taken in the month of audit.

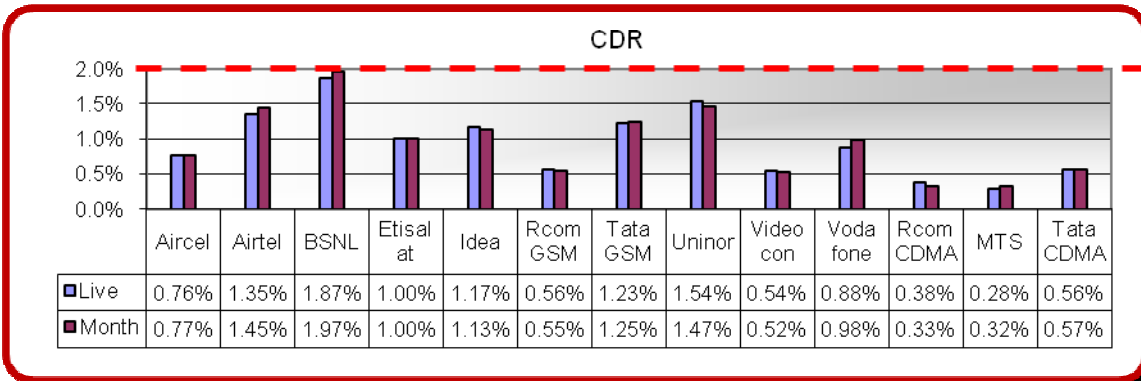


TCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



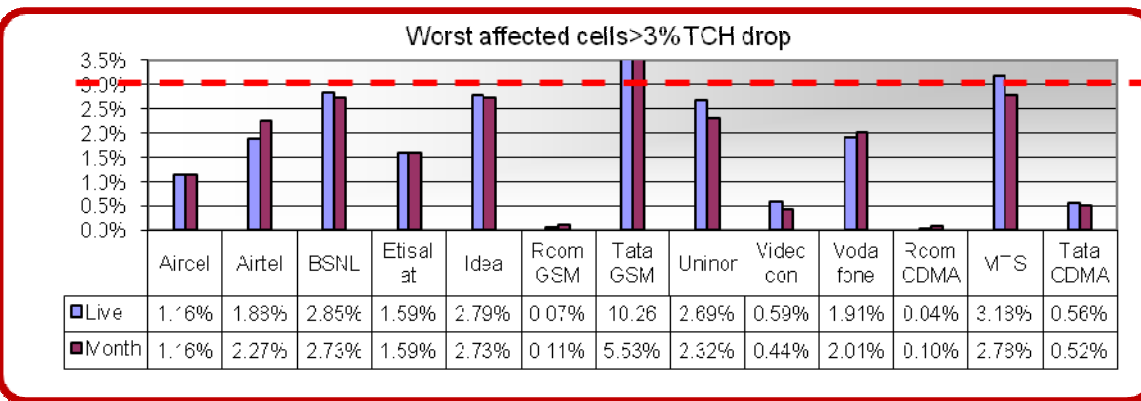
Connection Maintainability (Retainability):

Call Drop Rate (CDR) (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



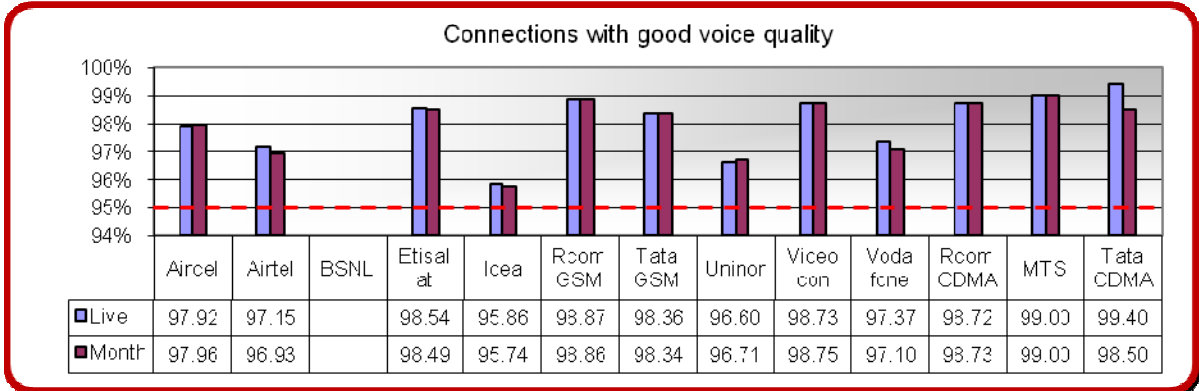
Worst affected Cell exceeding 3% TCH Drop: BM 3%.

All the operators are meeting the benchmark for 3% TCH Drop except Tata GSM, which has missed the benchmark for both Live and Month data and MTS which has missed the benchmark for Live data.

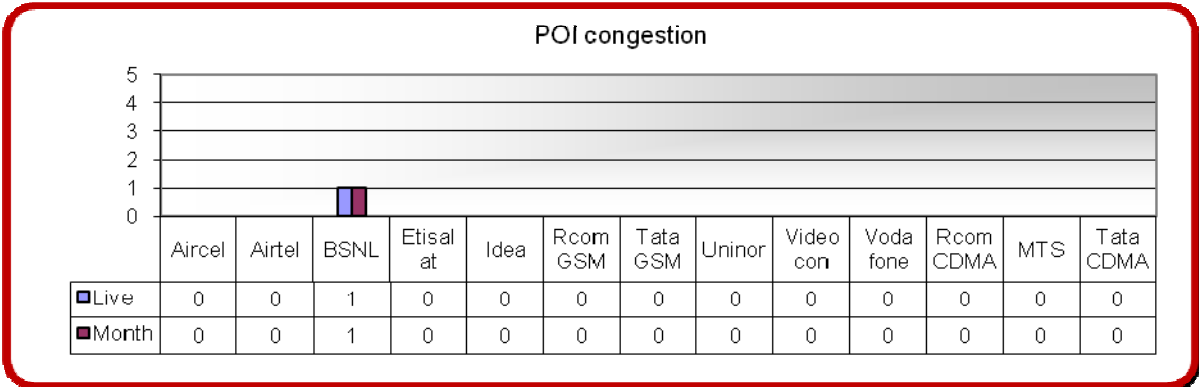


Percentage of connections with good voice quality (benchmark >= 95%):

BSNL has declared that this KPI is not system generated. All other operators meet the BM requirement.



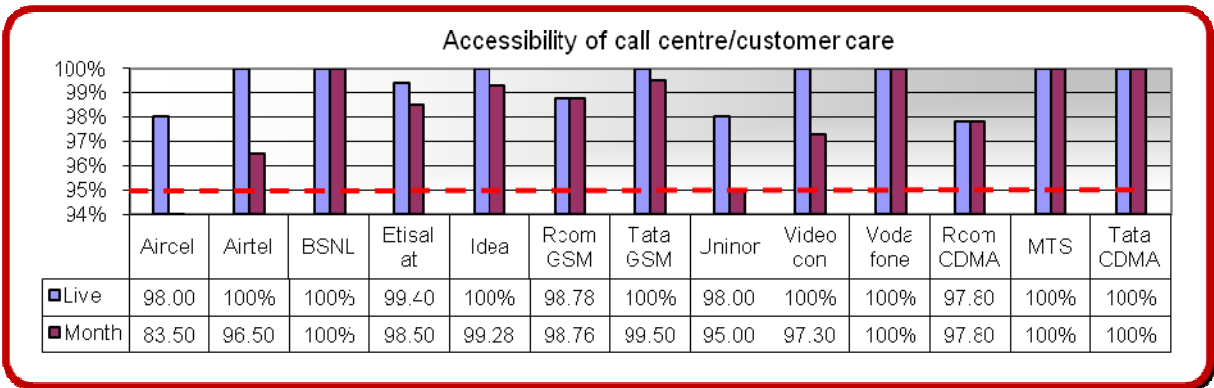
POI Congestion: BSNL have one POI facing congestion beyond BM value. There is no congestion w.r.t other operators.



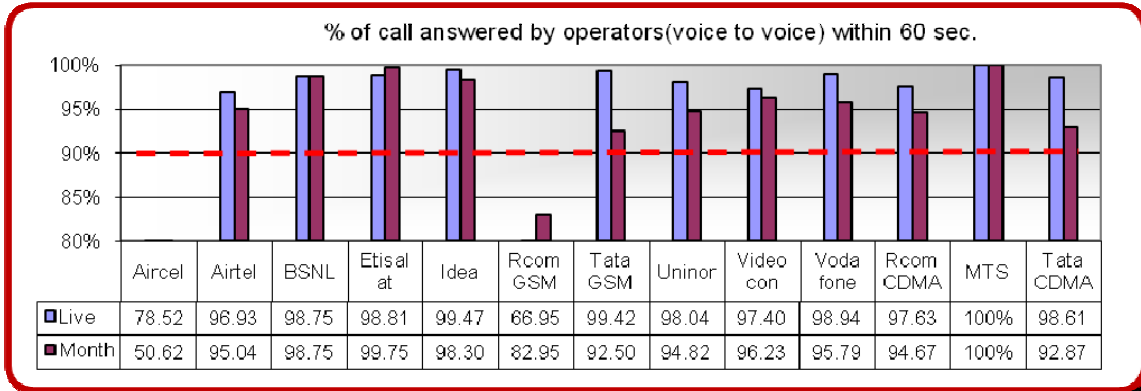
B) CUSTOMER SERVICE QUALITY PARAMETERS

Response time to the customer for assistance:

Percentage of call answered (Electronically): BM:>=95% : Aircel is not meeting the benchmark in case of month data. All other operators meet the BM requirements.



Percentage of call answered by operators (Voice to voice) within 60 sec. BM >=90%
 Aircel & Rcom GSM do not meet the Bench mark for both Live and month data.



Critical Analysis

The above comparative study between live & month data shows consistency in both the cases. Inconsistency was found in case of BSNL for “worst affected BTs due to downtime” and for Tata GSM for “worst affected cells with >3% TCH drop”. Tata GSM has exceptionally high value against this parameter.

Aircel has a very poor performance in case of “response time to customers for assistance parameters”. Also Rcom GSM has very low %age of calls answered by operator with the prescribed time of 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	Idea	Rcom GSM	Tata GSM	Uninor	Vodafone	Videocon	Rcom CDMA	MTS. CDMA	Tata. CDMA
Total No. of Calls Attempted	18	44	100	100	100	51	100	100	100	100	2	1
Total No. of calls answered	14	28	74	68	48	32	78	68	13	76	2	1
Cases resolved with 4 weeks	14	28	74	68	48	32	78	68	13	76	2	1
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Live Calling to Call Centre

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Videocon	Vodafone	MTS	Rcom	Tata
Calls Attempted	100	100	100	100	100	100	100	100	100	100	100	100
Calls connected to IVR	100	100	100	100	100	100	100	100	100	100	100	100
%age of calls connected to IVR	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Calls got connected to agent within 60 Sec	98	96	94	96	100	100	98	94	98	100	96	98
%age of calls got answered by agent in 60 sec.	98%	96%	94%	96%	100%	100%	98%	94%	98%	100%	96%	98%

(4) Level-1 Live Calling.

Emergency Calls were made in Gujarat circle for each city and results are tabulated below.

Emergency No	No. of Calls attempted	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom	Tata	Uninor	Video	Vodafone	Rcom	MTS	Tata
Ahmedabad														
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1
101	1	1	1	1	1	1	1	1	1	1	1	1	1	1
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1
139	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Surat														
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1
101	1	1	1	1	1	1	1	1	1	1	1	1	1	1
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1
139	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Jamnagar														
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1
101	1	1	1	1	1	1	1	1	1	1	1	1	1	1
102	1	1	1	1	1	1	1	1	1	1	1	1	1	1
139	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Critical Analysis

Random numbers were selected from the operators' available database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. Majority of the calls were not successful for various reasons such as customer not reachable, number busy or switched off etc. Among the successful calls, it was found that the operators had made refunds in 100% cases as claimed by their records.

Good results were found for all the operators during live calling to their respective call centers.

Good results were also found in case of Level-1 calling for emergency nos. 100, 101 & 102.

(C) Inter operator call assessment**(1) Sample coverage**

A sample of 2x50 test calls per Service Providers with in the licensed service area (Gujarat Circle) were made between 1900 to 2000 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL	Idea	Reliance (GSM)	Tata (GSM)	Uninor	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)	Etisalat	MTS
Aircel	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	99%	100%	99%	100%	100%	100%	100%	99%	99%
BSNL	98%	99%	-	100%	100%	99%	100%	100%	100%	99%	98%	99%	97%
Idea	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	99%	100%
Reliance (GSM)	100%	98%	100%	99%	-	100%	100%	100%	100%	100%	99%	100%	100%
Tata (GSM)	100%	100%	99%	100%	100%	-	99%	100%	100%	100%	100%	100%	100%
Uninor	100%	100%	98%	100%	100%	100%	-	100%	100%	100%	100%	98%	100%
Videocon	100%	100%	99%	100%	100%	98%	100%	-	99%	100%	100%	100%	99%
Vodafone	98%	100%	98%	99%	99%	100%	100%	100%	-	100%	100%	99%	100%
Reliance (CDMA)	100%	100%	99%	100%	100%	100%	98%	100%	99%	-	100%	100%	98%
Tata (CDMA)	100%	100%	100%	99%	100%	100%	99%	100%	100%	100%	-	100%	100%
Etisalat.	100%	99%	100%	100%	99%	100%	100%	98%	100%	100%	100%	-	100%
MTS.	100%	100%	99%	98%	100%	100%	100%	99%	100%	99%	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 no 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 Ahmadabad, Surat & Jamnagar for all the operators. Route covered was about around 80-100Km depending on city areas within the speed limit of 30-35Km/hr.

DRIVE TEST LOCATIONS

AHMADABAD

LOW DENSE: Naroda, GIDC
MEDIUM DENSE: S.G. Highway, CG Road, Ashram Road
HIGH DENSE: Relief Road, Gandhi Road, manek chowk, Kalupur Rly Station area.

SURAT

LOW DENSE: Adajan, SainagarSoc.
MEDIUM DENSE: Udhana, racecourse, Katargam, Bhavnagar road, Kalavad road, raiya.
HIGH DENSE: Varacha, Sonibazar, Bhaktinagar, Gondal.

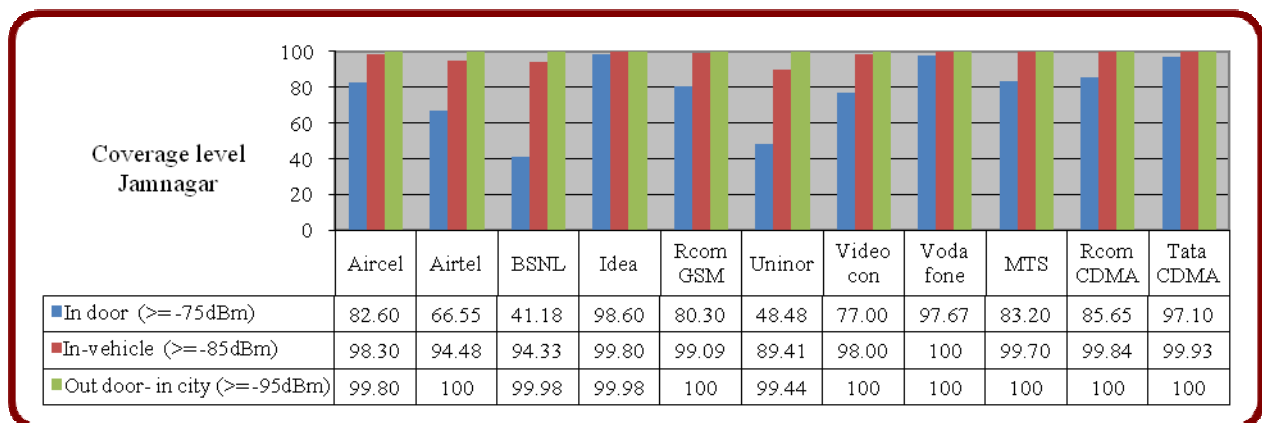
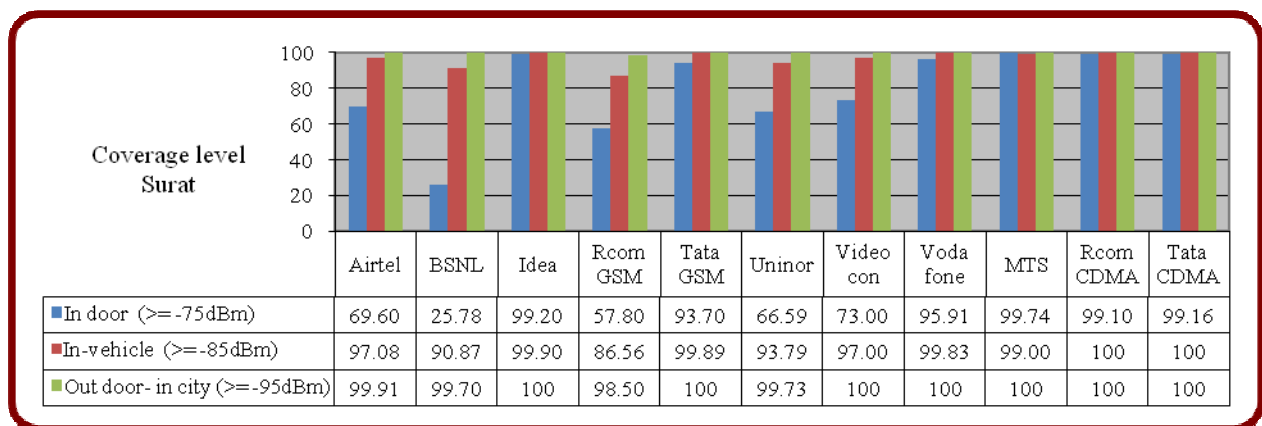
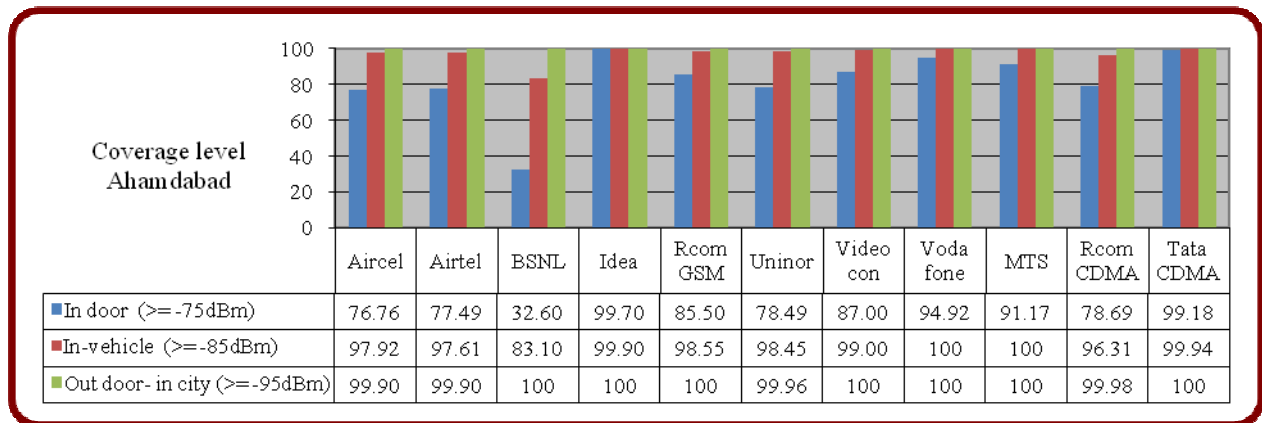
JAMNAGAR.

LOW DENSE: Patel colony, Bedibunder road.
MEDIUM DENSE: Sat rasta chowk, Khodiyar road, Digjam Chowk, satyam col. Road.
HIGH DENSE: Town hall, chandi bazaar, Jain Derasar, Limda lane.

2) Performance (for the respective cities) - Operator Assisted Drive Test

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	Ahmadabad	91	133	107	139	106	ICR	126	114	110	115	113	110
		Surat	ICR	101	112	112	91	95	90	88	102	108	92	97
		Jamnagar	68	82	72	86	92	ICR	85	80	91	82	82	75
1.2	Blocked Call Rate (<=3%)	Ahmedabad	0.00	0.00	0.90	0.71	0.00	ICR	0.00	0.00	0.00	0.00	0.00	0.00
		Surat	ICR	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jamnagar	0.00	0.00	1.30	1.16	0.00	ICR	0.00	0.00	0.00	0.00	0.00	0.00
1.3	Dropped Call Rate (<=2%)	Ahmedabad	0.00	0.00	0.90	0.00	0.00	ICR	0.00	0.00	0.00	0.00	0.00	0.00
		Surat	ICR	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jamnagar	0.00	0.00	0.00	0.00	0.00	ICR	1.17	0.00	0.00	0.00	0.00	0.00
1.4	(i) 0-4 (w/o frequency hopping)	Ahmedabad										99.31	98.30	99.84
		Surat										99.08	98.09	98.40
		Jamnagar										98.48	99.97	99.99
	(ii) 0-5 (with frequency hopping)	Ahmedabad	98.00	96.20	97.60	96.90	98.30	ICR	95.15	97.00	97.33			
		Surat	ICR	94.60	96.70	98.20	98.08	96.76	95.15	96.00	98.00			
		Jamnagar	98.00	96.70	94.34	98.60	98.88	ICR	98.83	98.00	98.33			
	1.5	In door (>= -75dBm)	Ahmedabad	76.76	77.49	32.60	99.70	85.50	ICR	78.49	87.00	94.92	91.17	78.69
Surat			ICR	69.60	25.78	99.20	57.80	93.70	66.59	73.00	95.91	99.74	99.10	99.16
Jamnagar			82.60	66.55	41.18	98.60	80.30	ICR	48.48	77.00	97.67	83.20	85.65	97.10
In-vehicle (>= -85dBm)		Ahmedabad	97.92	97.61	83.10	99.90	98.55	ICR	98.45	99.00	100	100	96.31	99.94
		Surat	ICR	97.08	90.87	99.90	86.56	99.89	93.79	97.00	99.83	99.00	100	100
		Jamnagar	98.30	94.48	94.33	99.80	99.09	ICR	89.41	98.00	100	99.70	99.84	99.93
Out door- in city (>= -95dBm)		Ahmedabad	99.90	99.90	100	100	100	ICR	99.96	100	100	100	99.98	100
		Surat	ICR	99.91	99.70	100	98.50	100	99.73	100	100	100	100	100
		Jamnagar	99,8	100	99.98	99.98	100	ICR	99.44	100	100	100	100	100
1.6	Call Setup Success Rate (>=95%)	Ahmedabad	100	100	99.10	99.30	100	ICR	100	100	100	100	100	100
		Surat	ICR	100	100	99.11	100	100	100	100	100	100	100	100
		Jamnagar	100	100	98.70	99.84	100	ICR	100	100	100	100	100	100

Graphical Representation



(3) Critical Analysis

The drive test data was found to be satisfactory for most of the parameters. However, a few deviations found are listed below:

One Blocked call was observed in case of BSNL in Ahmadabad and Surat. One blocked call was also observed in case of Idea in all the three cities. However, both BSNL and Idea could achieve the benchmark for “Blocked Call rate”.

E) Independent Drive Test

The Independent Drive Test was conducted at various cities as given by TRAI.

Locations for Independent Drive Tests

Mehasana

Low Dense: Motera Chowk FCI, Khodiyar road.
Medium Dense: Biladi bagh, Somnath Chowk, Dist Police Hq.
High dense: Azad chowk, Vanikar club, Para, Sidhpuri market, Para clock tower. Dhobighat.

Godhra

Low Dense: Darshan Soc. Bhuravav road, Ankaleshwar mahadeo road.
Medium Dense: Civil hospital, Vaibhavnagar, Civil line road
High dense: Nehru park, MG road, Lalbaug mandir road, Kalal Darwaza, Main bazaar, Rly station.

Daman

Low Dense: Nani Daman, moti Daman, Khariwad.
Medium Dense: Devka Beach, Bus stand, Marwad.
High dense: Darikadiya, Dalwada, Tat rakshak, M G road.

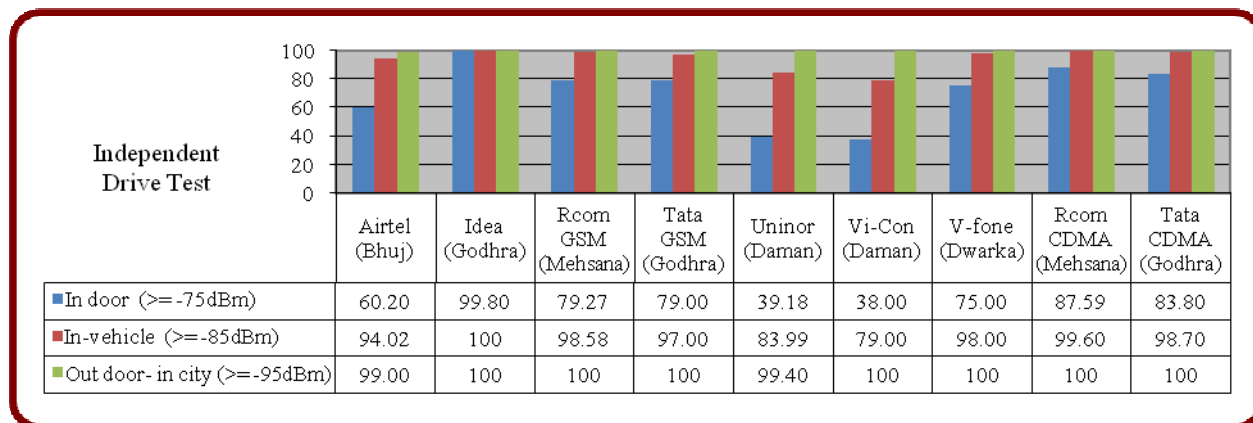
Bhuj

Low Dense: Kutch University, BSF camp, and nearby area.
Medium Dense: Bhuj MIDC, Railway station, madhapar,
High dense: Muton market, ST Stand, Himasar lake,

Dwarka

Low Dense: Iskon Darwaza, Advent Cinema, ITI,
Medium Dense: Mithapur-Dwarka highway, Income tax office, Homeguard office,
High dense: Hotel Gokul, Hotel Ganga, Bangad Bhavan, satnamwadi, Temple parking,

Graphical Representation



(3) Critical Analysis

The independent Drive tests were conducted at different cities/towns for different operators. Maximum possible area of the city/town was covered during drive tests. All the operators were found to be performing satisfactorily against the prescribed benchmarks.

However, Uninor & Videocon were found to have lower indoor-coverage level.

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

From live & month data assessment, it can be concluded that on an average, performance of the operators in the Gujarat service area is satisfactory for **Network Parameters**. Tata GSM is having a high %age of cells with >3% TCH drop. BSNL is having one POI with congestion >=0.5%.

Under **Customer Service Quality** section, benchmark for the parameter “operator answered calls (voice-to-voice) within 60 seconds” is found not satisfying for Airtel & Rcom GSM. The performance of Airtel is also poor in terms of accessibility of call centre.

Regarding **Metering/Billing Credibility** issues, Airtel & Uninor are found to be not meeting the benchmark for Post/Pre-paid services.

II. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

III. Broadband Service Providers

.....Audit not done for this quarter