

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

Report Period: Jan 2011 – March 2011

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Table of Contents

CHAPTER-1: Introduction

- I. Background
- II. Objectives and Methodology

CHAPTER-2: Executive Summary

- I. Preface
- II. Findings from Quality of Service Audit (Operator wise for each parameter)
 - (A) Cellular Mobile Telephone Service Providers
 - 3 days Live Data Audit
 - One Month Data Audit
 - Operator Assisted Drive Test
 - Independent Drive Test
 - (B) Basic Telephone Service (Wireline) Providers
 - *Not conducted for this quarter*
 - (C) Broadband Service Providers
 - *Not conducted for this quarter*

CHAPTER-3: Audit-PMR data verification results

- I. Cellular Mobile Telephone Service
- 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 measurement data assessment & summarized findings
 - 2) One month audit data report & summarized findings
 - 3) Sample coverage
 - 4) Performance (Graphical Representation)
 - 5) Critical Analysis
 - (B) **Redressal**
 - 1) Sample coverage
 - 2) Performance based on live measurement for three days
 - 3) Live calling to call centre
 - 4) Level 1 calling
 - 5) Critical Analysis

(C) Inter operator call assessment

- 1) Sample coverage
- 2) Performance based on live measurement
- 3) Performance based on data collected from MSCs
- 4) Critical Analysis

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

- 1) Sample Coverage
- 2) Performance (for the respective cities)
- 3) Critical Analysis

(E) Independent Drive Test

- 1) Sample coverage
- 2) Performance (for the respective cities)
- 3) Critical Analysis

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

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 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 1st quarter (January – March 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period July – September 2010.

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	Feb-2011	1900-2000 Hrs
2	Airtel Ltd	Feb-2011	1900-2000 Hrs
3	BSNL	Feb-2011	1900-2000 Hrs
4	Idea	Feb-2011	1900-2000 Hrs
5	Reliance Communication (GSM)	Feb-2011	1900-2000 Hrs
6	Tata Communications (GSM)	Feb-2011	1900-2000 Hrs
7	Uninor	Feb-2011	1900-2000 Hrs
8	Videocon	Feb-2011	1900-2000 Hrs
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

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	Idea	RTL GSM	Tata GSM	Uninor	Videoc on	V-fone	TTML CDMA	Rcom
S/N	Name of Parameter		GSM Operators									CDMA Operators	
1	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	99.31%	99.30%	98.13%	99.24%	99.66%	98.92%	98.33%	98.43%	99.15%	98.97%	99.61%
	b) SDCCH/PAGING congestion	<=1%	0.00%	0.43%	0.04%	0.27%	0.03%	0.04%	0.19%	0.25%	0.28%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.18%	0.20%	0.31%	0.05%	0.50%	0.03%	0.38%	0.18%	0.00%	0.04%
2	Connection maintenance (retainability)												
	a) CDR	<=2%	0.41%	1.40%	1.84%	0.96%	0.35%	0.91%	1.59%	0.88%	0.98%	0.23%	0.44%
	b) Worst affected cells>3% TCH drop	<=5%	2.76%	3.86%	8.80%	8.52%	2.95%	2.65%	5.83%	3.00%	3.10%	0.00%	0.41%
	c) Good voice quality	>=95%	98.89%	96.71%	NA	96.38%	98.42%	97.94%	97.79%	97.56%	97.42%	NA	NA
3	No of POIs not meeting benchmark	<=0.5%	0	0	4	0	0	0	0	0	0	0	0
4	Response time to customers for assistance												
	a) Accessibility of call centre/Customer Care	>=95%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.0%	100.0%	100.0%	100.0%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	98.6%	100.0%	100.0%	100.0%	94.5%	100.0%	100.0%	96.0%	100.0%	100.0%	94.5%

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 BSNL, Idea & Uninor not meeting the benchmark for “Worst affected cells>3% TCH drop”. BSNL had 4 POIs with >=0.5% congestion.

Good Voice quality data was not given by RCom & TATA CDMA operator as the same is not system generated.

Performance related to customer care data is found to be satisfactory for all the operators for both "Accessibility of call centre" and “calls answered by operators (voice-to-voice)”.

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videoc on	V-fone	TTML CDMA	Rcom
S/ N	Name of Parameter		GSM Operators									CDMA Operators	
(A)	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	0.38%	0.08%	1.43%	0.04%	0.09%	0.02%	0.02%	0.08%	0.02%	0.01%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	0.58%	7.99%	2.56%	0.58%	0.04%	0.05%	0.00%	0.12%	0.01%	0.00%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	99.34%	99.10%	98.10%	99.23%	99.66%	98.86%	98.30%	97.07%	99.01%	99.72%	99.61%
	b) SDCCH/PAGING congestion	<=1%	1.00%	0.17%	0.05%	0.24%	0.04%	0.08%	0.07%	0.21%	0.34%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.39%	0.17%	0.27%	0.20%	0.56%	0.04%	0.36%	0.25%	0.00%	0.05%
3	Connection maintenance (retainability)												
	a) CDR	<=2%	0.35%	1.39%	1.81%	1.03%	0.34%	0.92%	1.63%	0.86%	1.02%	0.22%	0.44%
	b) Worst affected cells>3% TCH drop	<=5%	2.55%	4.20%	10.00%	10.74%	2.90%	2.94%	6.43%	0.86%	2.69%	0.04%	0.38%
	c) Good voice quality	>=95%	98.86%	96.82%	NA	96.25%	98.55%	97.97%	97.72%	97.33%	97.43%	NA	NA
4	No of POIs not meeting benchmark	<=0.5%	2	2	5	0	0	0	0	1	2	0	0
(B)	Customer Service Quality Parameters												
5	Metering/billing credibility-Post paid	<= 0.1%	0.04%	0.01%	0.06%	0.00%	0.10%	0.07%	N A	NA	0.04%	0.06%	0.10%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.00%	0.62%	0.01%	0.04%	0.10%	0.04%	0.16%	0.10%	0.01%	0.28%	0.04%
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 customers 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%	88.30%	100.0%	95.00%	100.0%	100.0%	95.00%	99.11%	100.00%	100.0%	100.0%	100.0%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	70.90%	100.00%	93.50%	100.00%	87.29%	86.50%	100.00%	100.00%	91.50%	79.00%	90.72%
9	Termination/closure of service	<=7days	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	100%	NA	NA	100%	87%	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 BSNL, Idea and Uninor not meeting the benchmark for “Worst affected cells>3% TCH drop”. Airtel & BSNL have below benchmark performance for “worst affected BTSs”. Aircel, Airtel, BSNL, Videocon & Vodafone were found to POIs respectively with $\geq 0.5\%$ congestion.

Good Voice quality data was not given by RCom & TATA CDMA operator as the same is not system generated.

Performance related to customer care data is found to be satisfactory for most of the operators especially for the parameter “calls answered by operators (voice-to-voice)”, except only Aircel, Reliance GSM, Tata GSM & Tata CDMA not meeting the 90% benchmark. A below benchmark performance is observed in case of Aircel (88.30%) for “accessibility of call centre” parameter. Airtel, Uninor, & Tata CDMA are not meeting the benchmark for "Metering/Billing Credibility (Post/Pre-Paid)".

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted in Gujarat for all the operators. Route covered was about around 80-100Km depending on city areas within the speed limit of 30Km/hr. The cities covered were Ahmadabad, Baroda and Surat . In all the cities, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videocon	V-fone	TTML CDMA	Rcom
1.1	Blocked Call Rate (<=3%)	AMD'BAD	3.51	2.7	1.2	6.11	1.1		0.71	0	0.71	0	0
		BARODA	1.06	1.5	1.2	0	3.7		1.15	0	0	0	0.7
		SURAT		6.6	2.5	1.47	1.1	1.7	0.81	1.4	0.6	0	0
1.2	Dropped Call Rate (<=2%)	AMD'BAD	0.87	2.4	0	0	0		0	0.7	0	0	0
		BARODA	0	1.8	3.5	0	0		1.14	4.5	0	0	1.03
		SURAT		6.7	0	0	0	0	0.8	4.4	1.51	0	0.7
1.3	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	AMD'BAD										98.17	97.42
		BARODA										98.4	97.4
		SURAT										98.6	99.08
	(ii) 0-5 (with frequency hopping)	AMD'BAD	96.09	95.6	100	93.9	98.3		95.35	98.1	97.3		
		BARODA	95.01	94.9	95.7	92.81	98.4		94.05	98	97.8		
SURAT			90	96.49	90.02	96.8	96.77	95.23	93.07	96.5			
1.4	Call Setup Success Rate (>=95%)	AMD'BAD	96.49	97.3	98.8	93.89	98.9		99.29	100	99.29	100	100
		BARODA	98.94	98.5	98.8	100	96.3		98.85	100	100	100	99.3
		SURAT		93.4	97.5	98.53	98.9	98.3	99.19	98.6	99.4	100	100

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

- Blocked Call Rate benchmark is not met by Aircel in Ahmadabad (3.51%), Airtel in Surat (6.6%) , Idea in Ahmadabad (6.11%) & RCom (GSM) in Baroda (3.7%).
- Drop call Rate benchmark is not met by Airtel in Ahmadabad (2.4%) & Surat (6.7%), by BSNL in Baroda(3.5%) and Videocon in Baroda (4.5%) & Surat (4.4%).
- Good voice quality parameter is not met by Idea in all 3 cities , by Airtel in Baroda & Surat, by Uninor in Baroda and by Videocon in Surat.
- CSSR parameter is not met by Airtel in Surat (93.4%) and Idea in Ahmadabad (93.89%).

Note: Aircel in Surat and Tata GSM in Baroda & Surat are on ICR.

Independent Drive Test

The Independent Drive Test was conducted at Ahmadabad, Surat and Baroda. Here again, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videocon	V-fone
			GSM Operators								
1.1	Blocked Call Rate (<=3%)	AMD'BAD	2.78	1.15	3.1	1.86	7.3	NA	2.18	0.97	2.73
		BARODA	0.91	2	3.6	1.1	2	NA	2	3	2.6
		SURAT	NA	5.4	4.1	0	1	0	2	0.7	0
1.2	Dropped Call Rate (<=2%)	AMD'BAD	0	1.6	0	0	0.7	NA	0	3.4	0
		BARODA	0	1.4	1.4	1.4	1.5	NA	1.4	0	1.4
		SURAT	NA	3.2	1	1.3	0	0	0	2.8	1.2
1.3	Percentage of connections with good voice quality (=>95%) (i) 0-4 (w/o frequency hopping)	AMD'BAD									
		BARODA									
		SURAT									
	(ii) 0-5 (with frequency %hopping)	AMD'BAD	96.2	96.12	100	96.4	100	NA	97	99.03	97.27
		BARODA	99	93.3	96.4	97.4	96.4	NA	96.18	97.2	94.7
		SURAT	NA	94.6	95.9	96.6	98.1	97.09	96	96	96.9
1.4	Call Setup Success Rate (>=95%)	AMD'BAD	97.22	98.85	96.9	98.14	92.7	NA	97.82	99.03	97.27
		BARODA	99.09	98	96.4	98.9	98	NA	98	97	97.4
		SURAT	NA	94.6	95.9	100	99	100	98	99.3	100

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

- Good Voice Quality parameter is not met by Airtel in Baroda (93.3%) & Surat (94.6%) and by Vodafone in Baroda (94.7%).
- Drop call Rate parameter is not by Airtel in Surat (3.2%) and Videocon in Ahmadabad & Surat (3.4% & 2.8% respectively).
- Blocked Call Rate is not met by BSNL in all the 3 cities and Airtel in Surat and RTL(GSM) in Ahmadabad..
- CSSR parameter is not met by Reliance GSM in Ahmadabad (92.7%).
Aircel in Surat and Tata GSM in Baroda & Surat are on ICR.

III. PMR Verification**I. Cellular Mobile Telephone Service**

PMR		Benchmark	Audit	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videocon	V-fone	TTML CDMA	Rcom	
S/N	Name of Parameter			GSM Operators										CDMA Operators	
(A)	Network Service Quality Parameter														
1	Network Availability														
	BTS Accumulated Downtime	<=2%	Reported	0.60%	0.20%	1.50%	0.04%	0.11%	0.02%	0.02%	0.02%	0.02%	0.01%	0.05%	0.13%
			Verified	0.60%	0.20%	1.50%	0.04%	0.11%	0.02%	0.02%	0.02%	0.02%	0.01%	0.05%	0.13%
	Worst affected BTSs due to downtime	<=2%	Reported	0.00%	8.00%	4.03%	0.00%	0.13%	0.02%	0.00%	0.12%	0.01%	0.00%	0.00%	0.14%
Verified			0.00%	8.00%	4.03%	0.00%	0.13%	0.02%	0.00%	0.12%	0.01%	0.00%	0.00%	0.14%	
2	Connection Establishment (Accessibility)														
	CSSR (Call Setup Success Rate)	>=95%	Reported	99.34%	99.30%	98.10%	99.23%	99.59%	98.86%	98.30%	97.07%	99.01%	99.72%	99.58%	
			Verified	99.34%	99.30%	98.10%	99.23%	99.59%	98.86%	98.30%	97.07%	99.01%	99.72%	99.58%	
	SDCCH/PAGING congestion	<=1%	Reported	0.00%	0.17%	0.05%	0.24%	0.06%	0.08%	0.07%	0.21%	0.34%	0.00%	0.00%	
			Verified	0.00%	0.17%	0.05%	0.24%	0.06%	0.08%	0.07%	0.21%	0.34%	0.00%	0.00%	
	TCH congestion	<=2%	Reported	0.00%	0.39%	0.17%	0.27%	0.30%	0.56%	0.04%	0.36%	0.25%	0.00%	0.09%	
Verified			0.00%	0.39%	0.17%	0.27%	0.30%	0.56%	0.04%	0.36%	0.25%	0.00%	0.09%		
3	Connection maintenance (retainability)														
	CDR	<=2%	Reported	0.35%	1.30%	1.81%	1.03%	0.37%	0.92%	1.63%	0.86%	1.02%	0.22%	0.51%	
			Verified	0.35%	1.30%	1.81%	1.03%	0.37%	0.92%	1.63%	0.86%	1.02%	0.22%	0.51%	
	Worst affected cells>3% TCH drop	<=5%	Reported	2.55%	4.20%	10.0%	10.70%	1.80%	2.94%	6.43%	0.86%	2.69%	0.40%	0.45%	
			Verified	2.55%	4.20%	10.0%	10.70%	1.80%	2.94%	6.43%	0.86%	2.69%	0.40%	0.45%	
	Good voice quality	>=95%	Reported	98.86%	96.82%	100.00%	96.25%	98.67%	97.97%	97.72%	97.33%	97.43%	99.07%	98.99%	
Verified			98.86%	96.82%	100.00%	96.25%	98.67%	97.97%	97.72%	97.33%	97.43%	99.07%	98.99%		
4	No. of POI having congestion >=0.5%	>=0.5%	Reported	1	0	0	0	0	0	3	0	0	0	0	
			Verified	1	0	0	0	0	0	3	0	0	0	0	

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Unino r	Video con	V-fone	TTML CDMA	Rcom
S/ N	Name of Parameter			GSM Operators									CDMA Operators	
(B)	Customer Service Quality Parameters													
5	Metering/billing credibility-Post paid	<= 0.1%	Reporte d	0.00%	0.01%	0.06%	0.00%	0.07%	0.07%	NA	NA	0.04%	0.06%	0.04%
			Verified	0.00%	0.01%	0.06%	0.00%	0.07%	0.07%	NA	NA	0.04%	0.06%	0.04%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reporte d	0.00%	0.62%	0.01%	0.04%	0.04%	0.04%	0.16%	0.10%	0.01%	0.28%	0.04%
			Verified	0.00%	0.62%	0.01%	0.04%	0.04%	0.04%	0.16%	0.10%	0.01%	0.28%	0.04%
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reporte d	100%	100%	100%	100%	100.0 %	100.0 %	100.0 %	100.0 %	100%	100%	100%
			Verified	100%	100%	100%	100%	100.0 %	100.0 %	100.0 %	100.0 %	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	Reporte d	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance													
	Accessibility of call centre/Customer Care	>=95%	Reporte d	88.30%	100.00 %	95.00%	100.00 %	97%	95%	99%	100%	100%	100.00 %	100.0 0%
			Verified	88.30%	100.00 %	95.00%	100.00 %	97%	95%	99%	100%	100%	100.00 %	100.0 0%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reporte d	70.90%	100.00 %	93.50%	100.00 %	92.00 %	86.50 %	100.0 0%	100.0 0%	91.50%	79.00%	90.00 %
Verified			70.90%	100.00 %	93.50%	100.00 %	92.00 %	86.50 %	100.0 0%	100.0 0%	91.50%	79.00%	90.00 %	
9	Termination/closure of service													
	No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7day s	Reporte d	100.00 %	100.00%	100.00 %	100.00%	100.00 %	100.00 %	NA	NA	100.00 %	100.00%	100.00 %
			Verified	100.00 %	100.00%	100.00 %	100.00%	100.00 %	100.00 %	NA	NA	100.00 %	100.00%	100.00 %
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reporte d	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%

Critical Analysis (PMR Verification):

- a. The figures proved by all the operators match the figures obtained on verification.
- b. Only BSNL, Idea & Uninor are not meeting the benchmark for the parameter "Worst affected cells>3% TCH drop" with high margins.
- c. In case of POI congestion, BSNL (0.55%) are not meeting the benchmark with minimal margin.
- d. Airtel, Uninor & Tata CDMA are not meeting the benchmark for "Metering/Billing Credibility-Prepaid".
- e. Accessibility of Aircel's Customer Care Centre is very poor (88.3%).
- f. "% call answered by operators (voice to voice) within 60 sec." benchmark is not met by Aircel, Tata-GSM, TTML CDMA.

IV. 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	Idea	RTL GSM	Tata GSM	Uninor	Video con	V-fone	TTML CDMA	Rcom
			GSM Operators										CDMA Operators
A	Network Service Quality Parameter												
1	Connection Establishment (Accessibility)												
	a) CSSR	>=95%	99.31%	99.30%	98.13%	99.24%	99.66%	98.92%	98.33%	98.43%	99.15%	98.97%	99.61%
	b) SDCCH/PAGING congestion	<=1%	0.00%	0.43%	0.04%	0.27%	0.03%	0.04%	0.19%	0.25%	0.28%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.18%	0.20%	0.31%	0.05%	0.50%	0.03%	0.38%	0.18%	0.00%	0.04%
2	Connection maintenance												
	a) CDR	<=2%	0.41%	1.40%	1.84%	0.96%	0.35%	0.91%	1.59%	0.88%	0.98%	0.23%	0.44%
	b) Cells having > 3% TCH drop	<=5%	2.76%	3.86%	8.80%	8.52%	2.95%	2.65%	5.83%	3.00%	3.10%	0.00%	0.41%
	c) Good voice quality	>=95%	98.89%	96.71%	NA	96.38%	98.42%	97.94%	97.79%	97.5%	97.4%	NA	NA
	d) No. of cells > 3% TCH drop		57	721	62	1,307	21	155	292	145	621	0	8
	e) Total no. of cells in the network		2,079	18,750	3,042	15,572	8,436	5,872	5,016	4,785	20,056	2,607	5,628
3	No of POIs not meeting benchmark	<=0.5%	0	0	4	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark												
	b) Total No. of circuits on POI		1,877	120,131	43,416	36,720	51,780	10,046	24,457	27,249	118,211	37,997	51,780
	c) Avg No. of call attempts on POI		421,078	3,069,088	336,141	3,529,767	336,042	277,941	539,822	466,925	3,535,565	573,701	336,042
	d) Avg traffic served on POI (Erlang)		3,745	52,471	33,294	45,974	11,811	6,236	13,861	15,665	51,772	14,292	11,811
	e) Total number of working POI Service Area wise		188	156	54	160	127	18	50	72	121	186	127
	f) Equipped Capacity of Network in respect of Traffic in erlang		563	90,484	739	656	80,021	519	438	67,672	115,871	177	190,621
	g) Total traffic handled in TCBH in erlang		362	65,942	584	421	31,983	352	268	458,927	53,410	75	59,740

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Video con	V-fone	TTML CDMA	Rcom
			GSM Operators										CDMA Operators
(B)	Customer Service Quality Parameters												
4	Response time to customers for assistance												
	a) Accessibility of call centre	>=95%	100.00 %	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.00 %	100.00 %	100.00 %	100.00 %
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	98.60%	100.00%	100.00%	100.00%	94.53%	100.00%	100.00%	96.00 %	100.00 %	100.00%	94.54%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		50	100	100	100	100	100	100	100	100	100	100
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		50	100	100	100	100	100	100	96	100	100	100

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 Gujarat Service Area are as given below:-

- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 98.13% and 99.61%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 0.28%.
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 0.38%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.23% and 1.84%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except for BSNL ,Idea & Uninor with a value of 8.80% , 8.52% & 5.83% respectively, rest of the operators are satisfying the benchmark with value in between 0% and 3.86%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** CDMA service providers have declared that the parameter is not system generated (values taken are drive test results). Rest of the GSM operators are meeting the benchmark with values lying between 97.42% and 100%.
- **POI Congestion (benchmark $\leq 0.5\%$):** BSNL had 4 POIs 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. 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 with values lying between 96% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** All operators are meeting the benchmark with values lying between 94.5% and 100%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videocon	V-fone	TTML CDMA	Rcom
			GSM Operators										CDMA Operators
(A)	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	0.38%	0.08%	1.43%	0.04%	0.09%	0.02%	0.02%	0.08%	0.02%	0.01%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	0.58%	7.99%	2.56%	0.58%	0.04%	0.05%	0.00%	0.12%	0.01%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		693	6,305	1,132	5,218	2,812	1,955	1,681	1,605	6,682	869	1,876
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1,784	3,352	10,893	1,388	1,764	282	189	913	737	32	868
e) No. of BTSs having accumulated downtime of >24 hours in a month		4	504	29	0	1	1	0	2	1	0	0	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	99.34%	99.10%	98.10%	99.23%	99.66%	98.86%	98.30%	97.07%	99.01%	99.72%	99.61%
	b) SDCCH/PAGING congestion	<=1%	1.00%	0.17%	0.05%	0.24%	0.04%	0.08%	0.07%	0.21%	0.34%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.39%	0.17%	0.27%	0.20%	0.56%	0.04%	0.36%	0.25%	0.00%	0.05%
3	Connection maintenance (retainability)												
	a) CDR	<=2%	0.35%	1.39%	1.81%	1.03%	0.34%	0.92%	1.63%	0.86%	1.02%	0.22%	0.44%
	b) Worst affected cells>3% TCH drop	<=5%	2.55%	4.20%	10.00%	10.74%	2.90%	2.94%	6.43%	0.86%	2.69%	0.04%	0.38%
	c) Good voice quality	>=95%	98.86%	96.82%	NA	96.25%	98.55%	97.97%	97.72%	97.33%	97.43%	NA	NA

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Video con	V-fone	TTML CDMA	Rcom
			GSM Operators										CDMA Operators
	d) Total No. of cells exceeding 3% TCH drop (call drop)		939	715	98	1,777	28	173	322	41	540	1	7
	e) Total no. of cells in the network		2,079	18,750	3,042	15,572	8,436	5,872	5,016	4,785	20,056	2,607	5,628
4	No of POIs not meeting benchmark	$\leq 0.5\%$	2	2	5	0	0	0	0	1	2	0	0
	b) Total No. of call attempts on POI (Avg.)		92,234	3,069,080	336,146	3,529,766	240,030	286,344	531,487	699,186	3,535,566	556,137	240,030
	c) Total traffic served on POI (Erlang) (Avg.)		3,640	57,415	33,295	45,974	8,636	6,348	13,407	20,149	51,772	13,961	8,636
	d) Total No. of circuits on POI		1,877	120,131	43,416	36,720	51,780	10,046	24,457	27,249	118,211	37,997	51,780
	e) Total number of working POI Service Area wise		188	156	54	160	127	18	50	72	121	186	127
	f) Capacity of POI		5,757	116,714	43,394	315,240	47,117	9,348	21,937	25,622	115,872	32,707	47,117
5	Network Data												
	a) Equipped Capacity of Network Erlang		563	90,484	739	656	80,021	519	438	67,672	115,871	177	190,621
	b) Total traffic in TCBH in erlang (Avg.)		362	65,942	584	421	31,983	352	268	458,927	53,410	75	59,740
	c) Total no. of customers served (as per VLR) on last day of the month		227,757	4,813,506	2,237,112	6,263,735	NR	1,128,410	863,128	853,796	11,480,418	758,074	NR

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Video con	V-fone	TTML CDMA	Rcom
			GSM Operators										CDMA Operators
(B)	Customer Service Quality Parameters												
6	Metering/billing credibility-Post paid	$\leq 0.1\%$	0.04%	0.01%	0.06%	0.00%	0.10%	0.07%	N A	NA	0.04%	0.06%	0.10%
	a) No. of bills issued during the period		2,144	295,313	92,245	273,965	28,859	6,778	NA	NA	945,581	264,914	323,822
	b) No. of bills disputed including billing complaints during the period		7	25	54	100	30	14	NA	NA	437	163	339
7	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.00%	0.62%	0.01%	0.04%	0.10%	0.04%	0.16%	0.10%	0.01%	0.28%	0.04%
	a) No. of charging / credit / validity complaints during the quarter		169	42	16,509	2,624	441	1,895	2,688	144	1,178	4,138	919
	b) Total no. of pre-paid customers at the end of the quarter		409,099	679,366	3,501,698	6,294,251	4,344,607	2,095,047	1,652,867	1,499,716	13,125,155	1,417,739	2,579,409
8	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	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		169	4,207	4,140	311	471	1,895	2,688	144	1,178	574	1,258
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		169	4,207	4,140	311	471	1,895	2,688	144	1,178	574	1,258
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		87	4,182	4,124	311	71	12	2,011	144	213	396	359
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		82	25	16	0	400	1,883	677	0	965	178	899

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Video con	V-fone	TTML CDMA	Rcom
			GSM Operators										CDMA Operators
	e) Period of applying credit/waiver/adjustment to the customers 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	$\geq 95\%$	88.30%	100.00%	95.00%	100.00%	100.00%	95.00%	99.11%	100.00%	100.00%	100.00%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	$\geq 90\%$	70.90%	100.00%	93.50%	100.00%	87.29%	86.50%	100.00%	100.00%	91.50%	79.00%	90.72%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		100	66	1,573	41,859	1,262,297	53,421	58,710	12,207	125,018	14,166	213,560
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		98	66	1,447	41,430	1,262,297	41,745	58,185	11,647	112,000	10,662	213,560
10	Termination/closure of service	≤ 7 days	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		39	2,543	4,163	2,099	395	94	NA	NA	4,716	1,644	1,533
	b) No. of requests for Termination / Closure of service complied within 7 days during the quarter		39	2,543	4,163	2,099	395	94	NA	NA	4,716	1,644	1,533
11	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	100%	NA	NA	100%	87%	100%

NA: Not Applicable, NR: Not Received

(3) 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 <=2%):** All operators are meeting the benchmark with values lying between 0% and 1.43%.
- **Worst affected BTSs due to downtime (benchmark <= 2%):** Except for Airtel and BSNL with a value of 7.99% and 2.56%, all operators are meeting the benchmark with values lying between 0% and 0.58%.
- **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 97.07% and 99.86%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 1%.
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 0.56%.
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.22% and 1.81%.
- **Cell exceeding 3% TCH drop (benchmark <= 5%):** Except for BSNL ,Idea & Uninor with a value of 10.00% , 10.74% & 6.43% respectively, rest of the operators are satisfying the benchmark with value in between 0.04% and 4.20%.
- **Connections with good voice quality (benchmark >= 95%):** CDMA service providers have declared that the parameter is not system generated (values taken are drive test results). Rest of the GSM operators are meeting the benchmark with values lying between 97.43% and 100%.
- **POI Congestion (benchmark <= 0.5%):** Aircel, Airtel, BSNL, Videocon & Vodafone had POIs 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. 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 Aircel, all operators are meeting the benchmark with values lying between 95.00% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark >90%): %):** Except for Aircel, Reliance GSM, Tata GSM & Tata CDMA, all operators are meeting the benchmark with values lying between 90.72% and 100%.
- **Metering and billing credibility-Post paid (benchmark <= 0.1%):** All operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** Except for Airtel, Uninor & Tata-CDMA with values of 0.62%, 0.16 & 0.28% respectively, all other operators are meeting the benchmark.
- **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):** Except Tata CDMA, all operators have satisfied the benchmark.

(1) Sample Coverage

Switches/BSC/BTS details of operators:

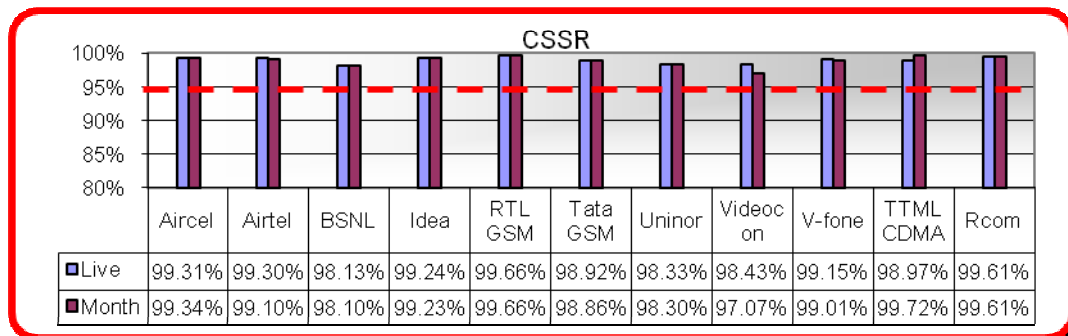
Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	1	6	693
2	Airtel Ltd	14	98	6305
3	BSNL	3	5	1132
4	Idea	4	16	5218
5	Reliance Communication (GSM)	4	18	2812
6	Tata Communications (GSM)	17	34	1955
7	Uninor	2	15	1681
8	Videoc on	2	11	1605
9	Vodafone	17	139	6682
CDMA Operators				
10	Reliance Communication (CDMA)	8	8	869
11	Tata Communications (CDMA)	4	5	1876

(2) Performance (Graphical Representation)

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

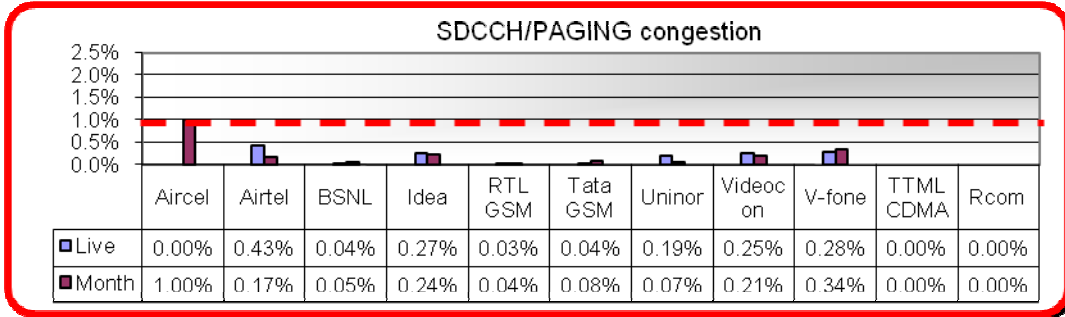
A) NETWORK PERFORMANCE

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

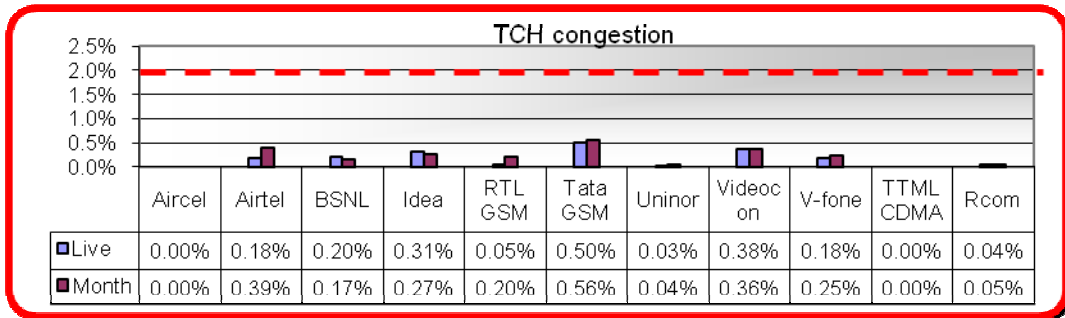


II. Blocked call rate:

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

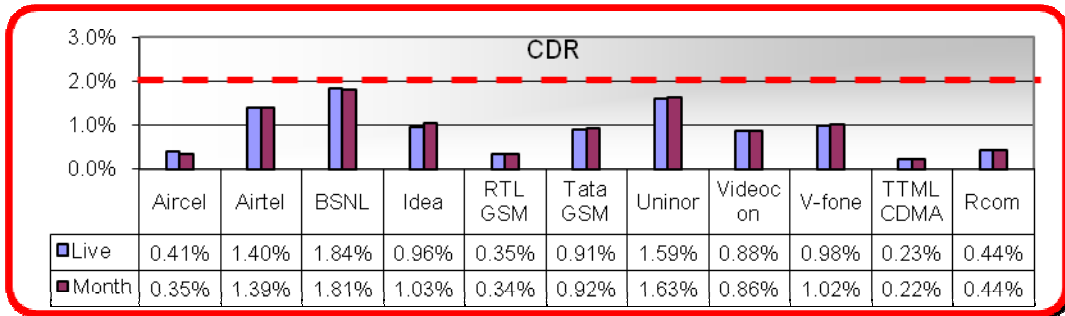


TCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

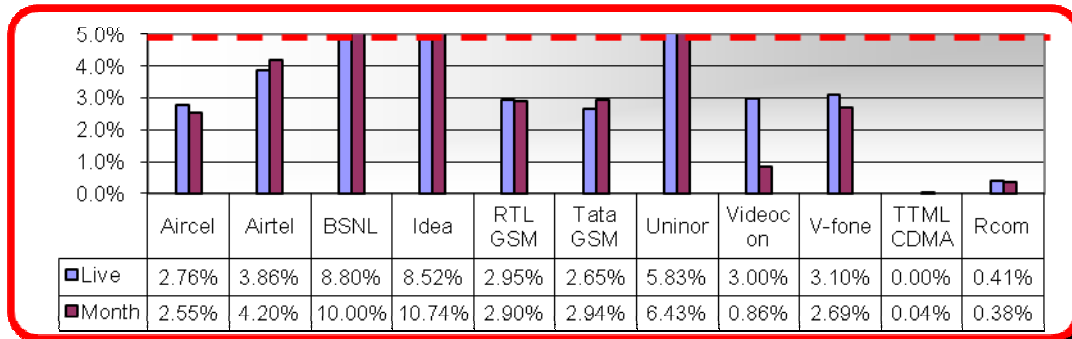


III. Connection Maintainability (Retainability):

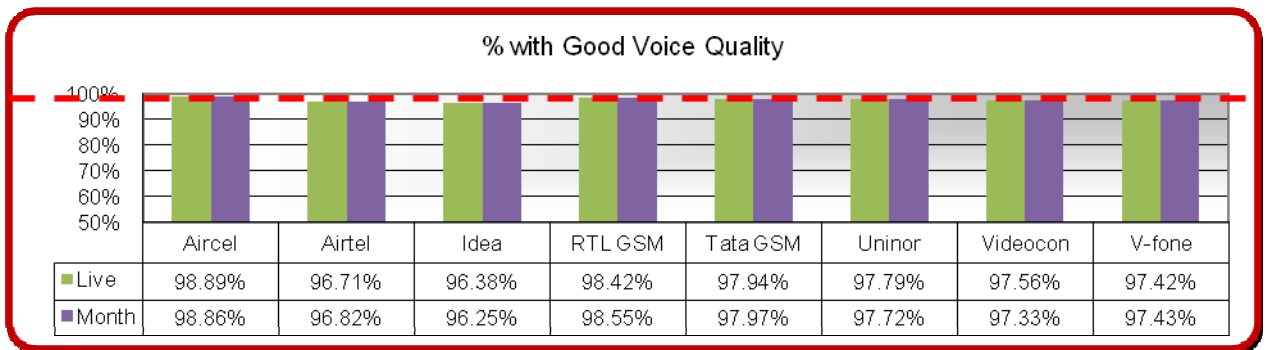
Call drop rate (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



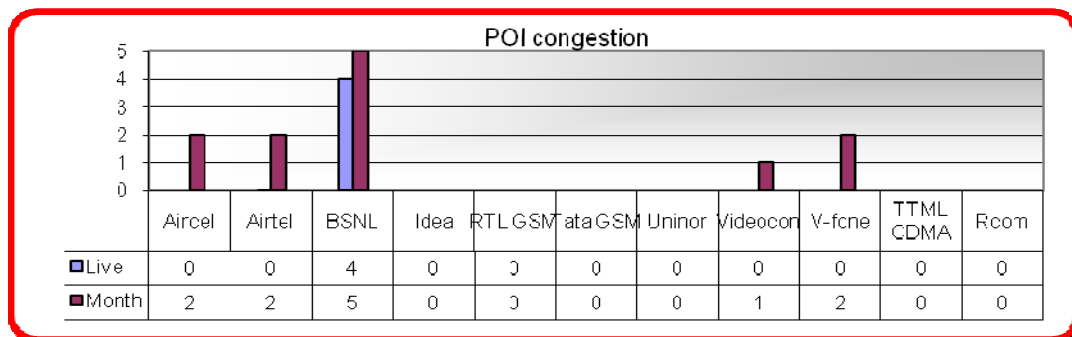
Worst affected Cell exceeding 3% TCH Drop: For both live and month data, BSNL, Idea & Uninor is found not meeting the benchmark of $\leq 5\%$. Rests of the operators are meeting the benchmark for both cases.



Percentage of connections with good voice quality (benchmark $\geq 95\%$): 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.



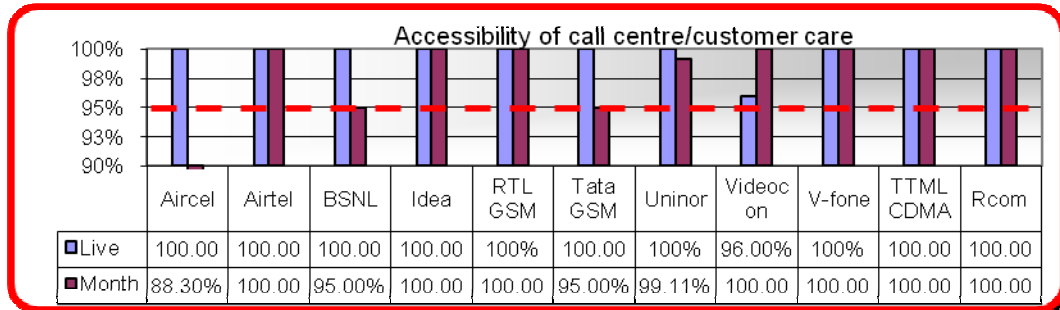
POI Congestion Aircel, Airtel, BSNL, Videocon & Vodafone were found have POIs with more than 0.5% congestion during the month of audit. BSNL had 4 such POIs during the live data audit too.



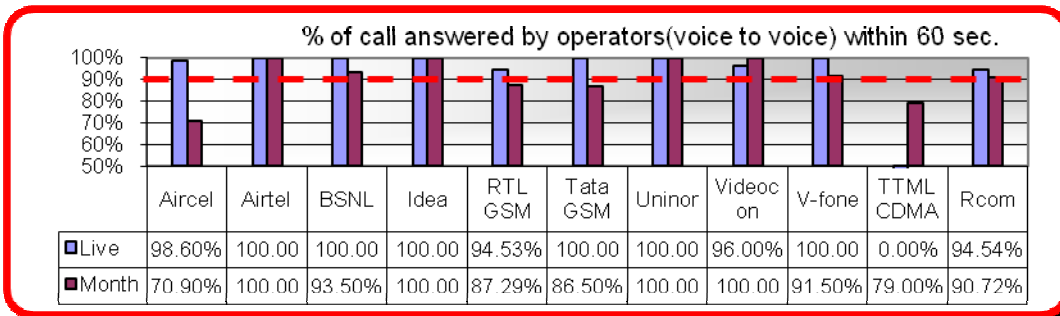
B) CUSTOMER SERVICE QUALITY PARAMETERS

(A) Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit except for Aircel in month data audit (88.30%),



Percentage of call answered by operators (Voice to voice) within 60 sec: For Live data, all operators are meeting the benchmark. For month data, only Aircel Reliance GSM, Tata-GSM & CDMA are not meeting the benchmark. Rest all operators are meeting the prescribed benchmark.



(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 “accessibility of call centre” (BSNL & Tata-GSM) and “%age of calls answered by operator” (Reliance GSM).

(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	Idea	Reliance (GSM)	Tata GSM	Vodafone	Tata (CDMA)	Reliance (CDMA)
Total No. of calls	6	7	5	6	13	11	10	5	16
Cases resolved with 4 weeks	6	7	5	6	13	11	10	5	16
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%

4) Call Center calling : Fifty nos. of calls were made at Ahmadabad in each half and below given no. of calls got connected to the call center within 60 sec

	OPERATORS NAME									
	Aircel	Airtel	BSNL	Idea	Rcom	Video-con	Voda-fone	Uninor	TTML	Rcom
	GSM								CDMA	
1ST HALF (10AM TO 01 PM)	34	48	42	47	47	46	45	47	47	46
2ND HALF (04PM TO 07 PM)	28	46	40	44	37	44	35	40	30	39
In % age	62.00	94.00	82.00	91.00	84.00	90.00	80.00	87.00	77.00	85.00

5) 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 Ahmadabad it was found to be functional.

6) 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 (Gujarat 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	Idea	Reliance (GSM)	Tata (GSM)	Uninor	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)
Aircel	-	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	98%	-	100%	98%	100%	100%	100%	100%	99%	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)	99%	96%	100%	100%	97%	-	97%	100%	100%	100%	100%
Uninor	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
Videocon	100%	98%	96%	100%	98%	100%	100%	-	99%	100%	99%
Vodafone	99%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Reliance (CDMA)	100%	100%	100%	100%	100%	100%	98%	100%	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 Gujarat 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***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.

BADODA

LOW DENSE: Makarpura, Maneja
 MEDIUM DENSE: Alkapuri, Subhanpura, Vasana road, Akota
 HIGH DENSE: Raopura, Kothi, Mandvi, Dandiyabazar, Nyaymandir

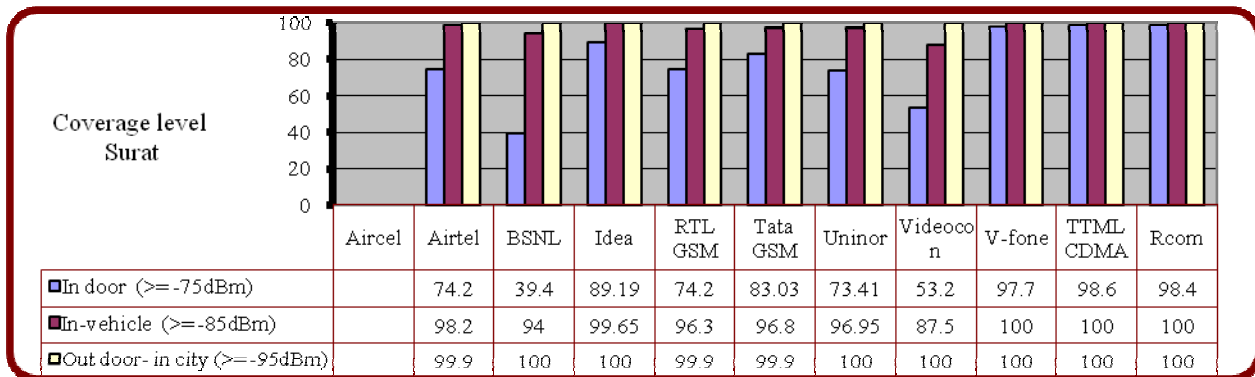
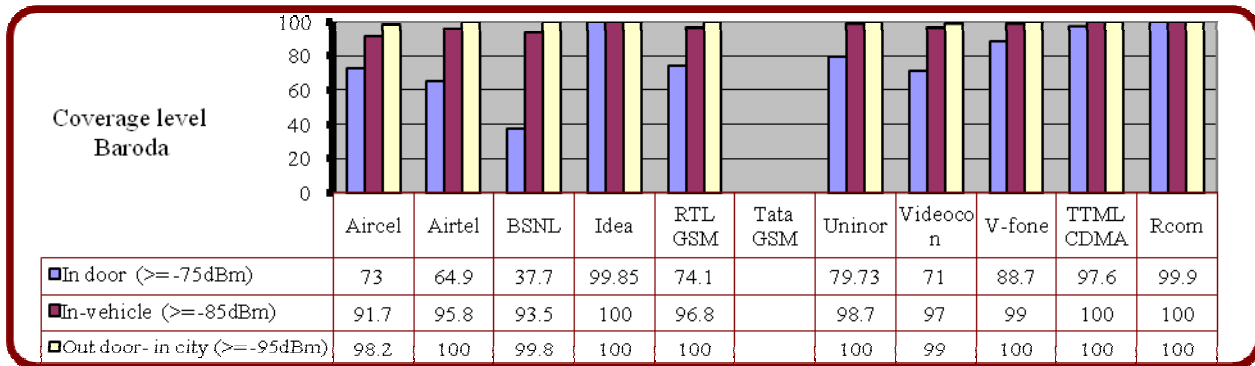
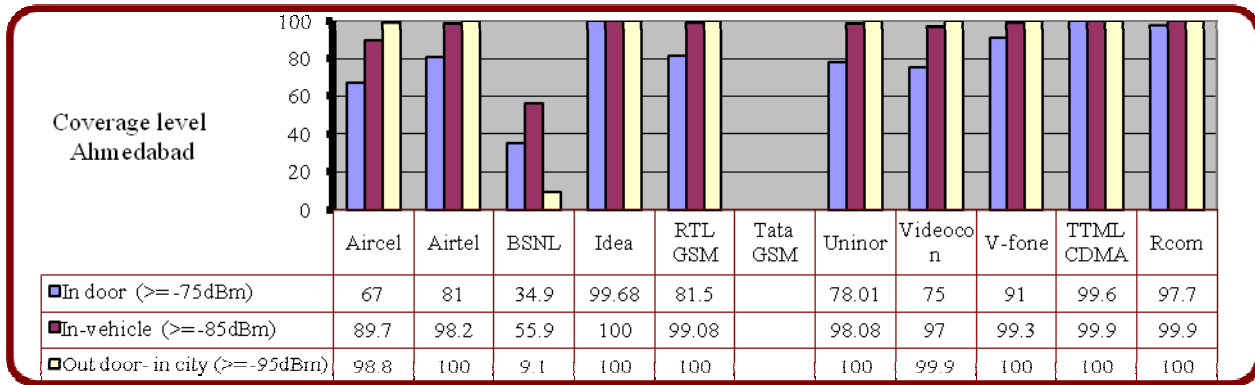
SURAT

LOW DENSE: Adajan, Ramnagar, Palanpur patia, Jahangirpura
 MEDIUM DENSE: Udhna, Harinagar, Bamroliroad, Katargam, Vastadevdi.
 HIGH DENSE: Varacha, Kapodara, Punagam

2) Performance (for the respective cities)

SN	Parameter	City Name	Airceel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videoco n	V-fone	TTML CDMA	Rcom
			GSM Operators							CDMA Operators			
1.1	Call Attempts	AMD'BAD	114	125	126	131	143	NA	141	136	119	130	144
		BARODA	94	109	84	104	102	NA	87	88	105	103	97
		SURAT	NA	133	118	136	137	111	123	112	132	105	138
1.2	Blocked Call Rate (<=3%)	AMD'BAD	3.51	2.7	1.2	6.11	1.1	NA	0.71	0	0.71	0	0
		BARODA	1.06	1.5	1.2	0	3.7	NA	1.15	0	0	0	0.7
		SURAT	NA	6.6	2.5	1.47	1.1	1.7	0.81	1.4	0.6	0	0
1.3	Dropped Call Rate (<=2%)	AMD'BAD	0.87	2.4	0	0	0	NA	0	0.7	0	0	0
		BARODA	0	1.8	3.5	0	0	NA	1.14	4.5	0	0	1.03
		SURAT	NA	6.7	0	0	0	0	0.8	4.4	1.51	0	0.7
1.4	Percentage of connections with good voice quality (>=95%)												
	(i) 0-4 (w/o frequency hopping)	AMD'BAD										98.17	97.42
		BARODA										98.4	97.4
		SURAT										98.6	99.08
	(ii) 0-5 (with frequency hopping)	AMD'BAD	96.09	95.6	100	93.9	98.3	NA	95.35	98.1	97.3		
		BARODA	95.01	94.9	95.7	92.81	98.4	NA	94.05	98	97.8		
SURAT		NA	90	96.49	90.02	96.8	96.77	95.23	93.07	96.5			
1.5	Service Coverage												
	In door (>= -75dBm)	AMD'BAD	67	81	34.9	99.68	81.5	NA	78.01	75	91	99.6	97.7
		BARODA	73	64.9	37.7	99.85	74.1	NA	79.73	71	88.7	97.6	99.9
		SURAT	NA	74.2	39.4	89.19	74.2	83.03	73.41	53.2	97.7	98.6	98.4
	In-vehicle (>= -85dBm)	AMD'BAD	89.7	98.2	55.9	100	99.08	NA	98.08	97	99.3	99.9	99.9
		BARODA	91.7	95.8	93.5	100	96.8	NA	98.7	97	99	100	100
		SURAT	NA	98.2	94	99.65	96.3	96.8	96.95	87.5	100	100	100
	Out door- in city (>= -95dBm)	AMD'BAD	98.8	100	9.1	100	100	NA	100	99.9	100	100	100
		BARODA	98.2	100	99.8	100	100	NA	100	99	100	100	100
SURAT		NA	99.9	100	100	99.9	99.9	100	100	100	100	100	
1.6	Call Setup Success Rate (>=95%)	AMD'BAD	96.49	97.3	98.8	93.89	98.9	NA	99.29	100	99.29	100	100
		BARODA	98.94	98.5	98.8	100	96.3	NA	98.85	100	100	100	99.3
		SURAT	NA	93.4	97.5	98.53	98.9	98.3	99.19	98.6	99.4	100	100

3) 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:

- Blocked Call Rate benchmark is not met by Aircel in Ahmadabad (3.51%), Airtel in Surat (6.6%) , Idea in Ahmadabad (6.11%) & RCom (GSM) in Baroda (3.7%).
- Drop call Rate benchmark is not met by Airtel in Ahmadabad (2.4%) & Surat (6.7%), by BSNL in Baroda(3.5%) and Videocon in Baroda (4.5%) & Surat (4.4%).
- Good voice quality parameter is not met by Idea in all 3 cities , by Airtel in Baroda & Surat, by Uninor in Baroda and by Videocon in Surat.
- CSSR parameter is not met by Airtel in Surat (93.4%) and Idea in Ahmadabad (93.89%).
- TATA GSM do not have service in Ahmadabad & Baroda.
- Aircel is not present in Surat

(E) Independent Drive Test

(1) Sample Coverage

The Independent Drive Test was conducted at Gujarat after 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

AHMADABAD

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

BADODA

LOW DENSE: Makarpura, Maneja
MEDIUM DENSE: Alkapuri, Subhanpura, Vasana road, Akota
HIGH DENSE: Raopura, Kothi, Mandvi, Dandiyabazar, Nyaymandir

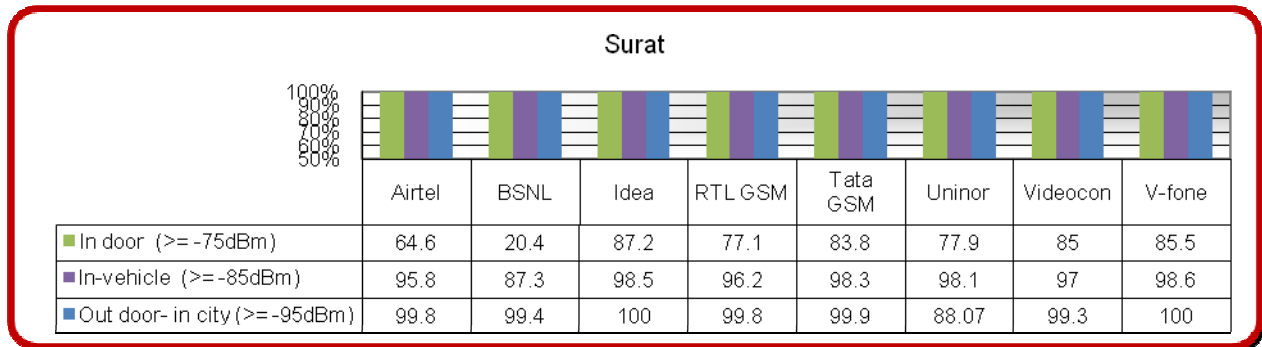
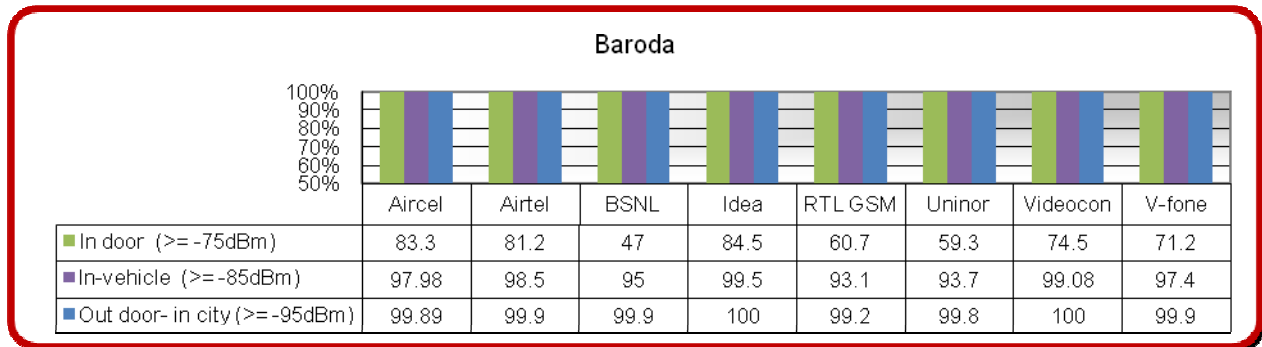
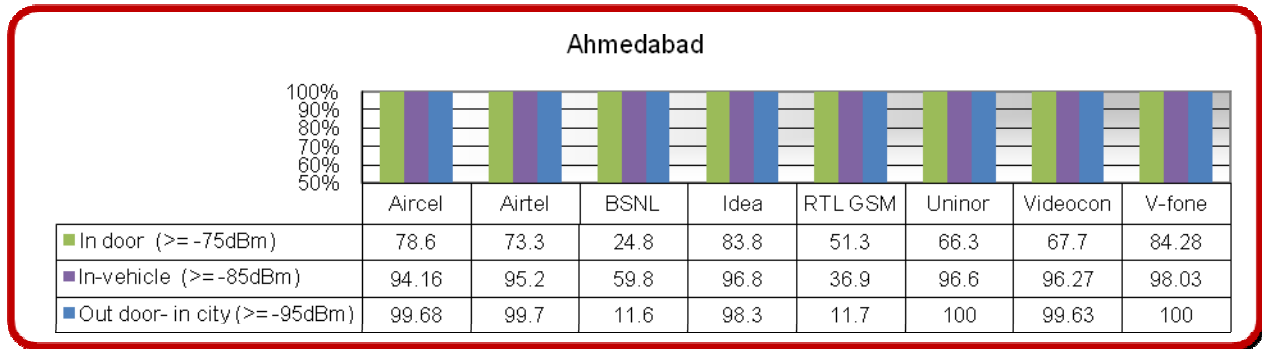
SURAT

LOW DENSE: Adajan, Ramnagar, Palanpur patia, Jahangirpura
MEDIUM DENSE: Udhna, Harinagar, Bamroliroad, Katargam, Vastadevdi.
HIGH DENSE: Varacha, Kapodara, Punagam

2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Uninor	Videoc on	V-fone
			GSM Operators								
1.1	Call Attempts	AMD'BAD	119	113	122	125	126		140	143	121
		BARODA	71	70	65	68	66		70	68	70
		SURAT		92	96	76	109	105	110	104	80
1.2	Blocked Call Rate (<=3%)	AMD'BAD	2.78	1.15	3.1	1.86	7.3		2.18	0.97	2.73
		BARODA	0.91	2	3.6	1.1	2	0	2	3	2.6
		SURAT		5.4	4.1	0	1	0	2	0.7	0
1.3	Dropped Call Rate (<=2%)	AMD'BAD	0	1.6	0	0	0.7		0	3.4	0
		BARODA	0	1.4	1.4	1.4	1.5		1.4	0	1.4
		SURAT		3.2	1	1.3	0	0	0	2.8	1.2
1.4	Percentage of connections with good voice quality (>=95%) (i) 0-4 (w/o frequency hopping)	AMD'BAD									
		BARODA									
		SURAT									
	(ii) 0-5 (with frequency hopping)	AMD'BAD	96.2	96.12	100	96.4	100		97	99.03	97.27
		BARODA	99	93.3	96.4	97.4	96.4		96.18	97.2	94.7
		SURAT		94.6	95.9	96.6	98.1	97.09	96	96	96.9
1.5	Service Coverage In door (>= -75dBm)	AMD'BAD	78.6	73.3	24.8	83.8	51.3		66.3	67.7	84.28
		BARODA	83.3	81.2	47	84.5	60.7		59.3	74.5	71.2
		SURAT		64.6	20.4	87.2	77.1	83.8	77.9	85	85.5
	In-vehicle (>= -85dBm)	AMD'BAD	94.16	95.2	59.8	96.8	36.9		96.6	96.27	98.03
		BARODA	97.98	98.5	95	99.5	93.1		93.7	99.08	97.4
		SURAT		95.8	87.3	98.5	96.2	98.3	98.1	97	98.6
	Out door- in city (>= -95dBm)	AMD'BAD	99.68	99.7	11.6	98.3	11.7		100	99.63	100
		BARODA	99.89	99.9	99.9	100	99.2		99.8	100	99.9
		SURAT		99.8	99.4	100	99.8	99.9	88.07	99.3	100
1.6	Call Setup Success Rate (>=95%)	AMD'BAD	97.22	98.85	96.9	98.14	92.7		97.82	99.03	97.27
		BARODA	99.09	98	96.4	98.9	98		98	97	97.4
		SURAT		94.6	95.9	100	99	100	98	99.3	100

Graphical Representation



(3) Critical Analysis

- Good Voice Quality parameter is not met by Airtel in Baroda (93.3%) & Surat (94.6%) , while Vodafone in Baroda (94.7%) respectively.
- Drop call Rate parameter is not by Airtel in Surat (3.2%) and Videocon in Ahmadabad & Surat(3.4% and 2.8% respectively).
- Blocked Call Rate is not met by BSNL in Baroda (3.6%) and Surat (4.1%) respectively.
- CSSR parameter is not met by Reliance GSM in Ahmadabad (92.7%).
- TATA GSM do not have service in Ahmadabad & Baroda.
- Aircel is not present in Surat

(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 (Gujarat) is by and large satisfactory for **Network Parameters**. However, the benchmark of $\leq 5\%$ for “worst affected cells $>3\%$ TCH drop” is not met by Uninor (5.83% & 6.43% for month & live data respectively), BSNL (10% for month data) and Idea (10.74% for month data).

Under **Customer Service Quality Parameter** “operator answered calls (voice-to-voice) within 60 seconds” parameter it is found that except for Airtel, Rcom GSM & Tata, other operators are fulfilling TRAI benchmark of $\geq 90\%$. Apart from this, the “accessibility of call centre” parameter benchmark is not met by Airtel.

Regarding **Metering/Billing Credibility** issues, Airtel, Uninor and Tata CDMA shows below benchmark value for Pre-paid connections.

During **Drive Tests**, high Blocked Call Rates were found in case of Airtel (Surat), Airtel (Ahmadabad), Idea (Ahmadabad), and BSNL (Baroda & Surat). Similarly, dropped call rate benchmark was not met by Airtel (Ahmadabad and Surat), BSNL (Baroda) and Videocon (Baroda). Most of the GSM operators have below benchmark %age of connections with good voice quality. Airtel is seen to have 93.4% CSSR in Surat with is less than the TRAI benchmark of 95%.

III. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

IV. Broadband Service Providers

.....Audit not done for this quarter