REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF
CELLULAR MOBILE TELEPHONE SERVICE

FOR

WEST ZONE – GUJARAT CIRCLE

Report Period: April 2011-June 2011.

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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 2nd[st] quarter (April -June 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period Oct – Dec 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	May-2011	2000-2100 Hrs
2	Airtel Ltd	May-2011	1900-2000 Hrs
3	BSNL	May-2011	1900-2000 Hrs
4	Idea	May-2011	1900-2000 Hrs
5	Reliance Communication (GSM)	May-2011	1900-2000 Hrs
6	Tata Communications (GSM)	May-2011	1900-2000 Hrs
7	Uninor	May-2011	1900-2000 Hrs
8	Videocon	May-2011	1900-2000 Hrs
9	Vodafone	May-2011	1900-2000 Hrs
10	Etisalat	May-2011	1900-2000 Hrs
CDMA Operators			
11	Reliance Communication (CDMA)	May-2011	1900-2000 Hrs
12	Tata Communications (CDMA)	May-2011	1900-2000 Hrs
13	MTS	May-2011	1900-2000 Hrs.

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

(A)   Cellular Mobile Telephone Services

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNINOR	ETISALAT	MTS	Rcom	TATA
	3 days Live Data Audit							GSM Operators						CDMA Operators	
1	**Connection Establishment (Accessibility)**														
	a) CSSR (Call Setup Success Rate)	>=95%	99.40%	99.40%	98.30%	99.51%	99.60%	98.17%	98.80%	98.91%	98.37%	99.80%	98.70%	99.60%	99.41%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.05%	0.16%	0.12%	0.03%	0.21%	0.04%	0.49%	0.03%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.06%	1.21%	0.09%	0.02%	1.21%	0.14%	0.36%	0.01%	0.00%	0.00%	0.08%	0.00%
2	**Connection maintenance (retainability)**														
	a) CDR	<=2%	0.40%	1.08%	1.29%	0.98%	0.34%	1.01%	1.10%	0.70%	1.36%	1.15%	0.16%	0.41%	0.33%
	b) Worst affected cells>3% TCH drop	<=3%	2.68%	2.43%	3.38%	2.53%	4.70%	7.04%	1.21%	0.91%	4.37%	14.81%	3.63%	0.33%	0.58%
	c) Good voice quality	>=95%	98.51%	97.25%	NA	96.69%	97.50%	97.79%	98.40%	97.54%	97.20%	98.50%	100%	NA	NA
3	**No of POI having >=0.5% POI congestion**		0	0	0	0	0	0	0	0	0	0	0	0	0
4	**Response time to customers for assistance**														
	a) Accessibility of call centre/Customer Care	>=95%	100%	98.5%	95%	100%	100%	96.5%	100%	100%	99.13%	96.67%	93%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	99%	95.5%	90%	98.5%	92%	100%	96%	95.5%	96%	100%	92%	95%	100%

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, RTL GSM, Tata GSM, Uninor, Etisalat and MTS not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 3.38%,4.70%,7.04%,4.37%,14.8%&3.63% respectively.

In case of Good voice quality except MTS being CDMA service provider, Tata and RCom have not given the value as it's not system generated.

Performance related to customer care, data is found to be satisfactory for most of the operators except for MTS for the parameter "Accessibility of call centre/customer care".

One Month Data Audit		Bench-mark	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNINOR	ETISALAT	MTS	Rcom	TATA
S/N	Name of Parameter		GSM Operators										CDMA Operators		
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.07%	0.10%	0.74%	0.05%	0.08%	0.01%	0.03%	0.02%	0.02%	0.47%	0.17%	0.09%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.40%	1.73%	0.02%	0.10%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.30%	99.35%	98.73%	99.51%	99.68%	98.10%	98.90%	98.86%	98.25%	99.85%	98.6%	92.1%	99.5%
	b) SDCCH/PAGING congestion	<=1%	0.00%	0.08%	0.35%	0.21%	0.04%	0.25%	0.05%	0.46%	0.02%	0.02%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.30%	1.29%	0.15%	0.08%	1.27%	0.21%	0.43%	0.01%	0.00%	0.00%	0.06%	0.00%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.40%	1.20%	1.47%	1.41%	0.35%	1.02%	1.10%	0.72%	1.37%	1.06%	0.44%	0.40%	0.32%
	b) Worst affected cells>3% TCH drop	<=3%	3.00%	2.52%	3.25%	2.76%	4.50%	6.90%	1.32%	0.55%	4.60%	12.19%	4.09%	0.37%	0.57%
	c) Good voice quality	>=95%	98.50%	97.23%	NA	96.63%	97.40%	97.71%	98.30%	97.52%	97.20%	98.60%	100%	NA	NA
4	No of POI having >= 0.5% POI congestion		0	0	0	0	0	0	0	0	0	0	3	0	0
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	<= 0.1%	0.10%	0.01%	0.05%	0.03%	0.10%	0.24%	NA	0.05%	NA	NA	0.00%	0.06%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.03%	0.02%	0.03%	0.00%	0.10%	0.16%	0.01%	0.01%	0.25%	0.01%	0.01%	0.01%	0.16%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	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%	100%	100%
8	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	>=95%	70.07%	98.08%	100%	98.6%	100%	99.46%	100%	100%	90%	98.97%	96.47%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	66.07%	93%	90%	95%	92.07%	92%	95.40%	92.5%	90%	99.63%	96%	93.2%	100%
9	Termination/closure of service	<=7days	100%	100%	100%	100%	100%	100%	NA	100%	NA	NA	Nil	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	100%	NA	100%	NA	NA	NA	100%	100%

NA: Not Applicable, NR: Not Received

From the month data assessment, it is found that all the operators are meeting the network parameters by and large, except for BSNL, RTL GSM, Tata GSM, Uninor, Etisalat, and MTS not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 3.2%, 4.5%, 6.9%, 4.6%, 12.19% & 4.09% respectively along with CSSR for RCom cdma with value of 92.1%. For POI Congestion, except 3 no. of POIs for MTS which are having more than 0.5% congestion, rest of the operators are found not having congestion on individual POIs.

In case of Good voice quality except MTS being CDMA service provider, Tata and RCom have not given the value as its not system generated.

Performance related to customer care is found to be satisfactory for most of the operators. But it is found that Aircel & Uninor are not meeting the parameter "Accessibility of call centre/customer care" & "percentage of call answered by operators (voice to voice) within 60sec". Tata GSM is not meeting the benchmark for billing & metering credibility in case of Postpaid. Tata GSM, Uninor & Tata CDMA are not meeting the benchmark for prepaid.

Operator Assisted Drive test

The Operator Assisted Drive Test was conducted at Gujarat Circle 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

SN	Parameter	City Name	Aircel	Airtel	BSNL	Tata GSM	Idea	Rcom GSM	Videocon	Vodafone	Uninor	Tata CDMA	Rcom CDMA
			GSM Operators									CDMA Operators	
1.1	Blocked Call Rate (<=3%)	Ahmadabad	1.2%	0%	0.9%	NA	0%	0%	0%	0.95%	0%	0%	0.8%
		Baroda	1.23%	0%	0%	NA	0.94%	1.09%	0%	3%	3.2%	0%	0%
		Surat	NA	0%	0%	0.80%	0.94%	0%	0%	1.09%	0.8%	0%	0%
1.2	Dropped Call Rate (<=2%)	Ahmadabad	0%	0%	2.70%	NA	0%	0%	0.87%	0%	0%	0%	0%
		Baroda	0%	0%	1.16%	NA	1.90%	0%	1.05%	2%	0%	0%	0%
		Surat	NA	0%	0.96%	0.86%	0.00%	0%	0.90%	0%	0%	0%	0%
1.3	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	Ahmadabad	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.50%	99.07%
		Baroda	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.50%	98.60%
		Surat	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.50%	99.03%
	(ii) 0-5 (with frequency hopping)	Ahmadabad	97%	96%	96%	NA	97%	98%	98%	97%	95%	NA	NA
		Baroda	96.3%	93.1%	96.73%	NA	97.7%	98.7%	97.36%	97.23%	94.5%	NA	NA
		Surat	NA	94.1%	96.4%	97.2%	98.01%	97.5%	95.68%	98.03%	95.4%	NA	NA
1.4	Call Setup Success Rate (>=95%)	Ahmadabad	98.8%	100%	98.4%	NA	99.2%	100%	99.1%	99%	100%	100%	99.1%
		Baroda	97.8%	98%	100%	NA	99%	98.9%	99.2%	96.9%	96.7%	100%	100%
		Surat	NA	100%	100%	99.2%	99%	100%	99%	99%	99%	100%	100%

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

- Blocked Call Rate & Drop call rate are not met by Uninor (3.2%) at Baroda & BSNL (2.7%) at Ahmadabad.
- Percentage of connections with good voice quality parameter is not met by the Airtel in Baroda & Surat.Also for Uninor; it is found that they are not meeting the benchmark in Baroda city.
- TATA GSM is not present in Ahmadabad & Baroda city & Aircel not present in Surat.

Independent Drive Test

The Independent Drive Test was conducted at Gujarat circle in Baroda city were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Videocon	Vodafone	Uninor	Tata CDMA	Rcom CDMA
			GSM Operators									
1.1	Blocked Call Rate (<=3%)	Baroda	1.3%	1.3%	0%	1.3%	2.6%	3.8%	1.3%	1.3%	0%	0%
1.2	Dropped Call Rate (<=2%)	Baroda	2.6%	1.3%	0%	1.3%	0%	2.5%	2.6%	2.6%	0%	0%
1.3	Percentage of connections with good voice quality (=>95%)											
	(i) 0-4 (w/o frequency hopping)	Baroda	NA	NA	NA	NA	NA	NA	NA	NA	98.3%	98.3%
	(ii) 0-5 (with frequency hopping)	Baroda	97.4%	94.1%	96.3%	93.4%	95.5%	95.9%	94.6%	95.4%	NA	NA
1.4	Call Setup Success Rate (>=95%)	Baroda	98%	98.5%	100%	98.6%	97.3%	96.2%	98.6%	98.6%	100%	100%

Key observations as could be derived from the table are as under:
• Videocon (3.8%) could not achieve benchmark for block call rate (<=3%).
• Aircel (2.6%), Videocon (2.5%), Vodafone (2.6%) and Uninor (2.6%) could not achieve benchmark for drop call rate (<=2%).
•Good Voice Quality parameter is not met by Airtel (94.10%), Idea (93.4%) and Vodafone (94.6%)

CHAPTER-3: AUDIT-PMR VERIFICATION

I. Cellular Mobile Telephone Service

PMR Report Verification			Audit	Aircel	Airtel	BSNL	Etisalat	Idea	RTL	Tata	Uninor	Videocon	Vodafone	RCOM	Tata
S/N	Name of Parameter	Benchmark													
(A)	Network Service Quality Parameter			GSM Operators										CDMA Operators	
1	Network Availability														
	BTS Accumulated Downtime	<=2%	Reported		0.06%	0.54%	0.62%	0.04%	0.10%	0.06%	0.25%	0.10%	0.02%	0.10%	0%
			Verified		0.06%	0.54%	0.62%	0.04%	0.10%	0.06%	0.25%	0.10%	0.02%	0.10%	0%
	Worst affected BTSs due to downtime	<=2%	Reported		0.20%	1.37%	5%	0.04%	0.15%	0.11%	0.10%	0.33%	0.08%	0.16%	0%
			Verified		0.20%	1.37%	5%	0.04%	0.15%	0.11%	0.10%	0.33%	0.08%	0.16%	0%
2	Connection Establishment (Accessibility)														
	CSSR (Call Setup Success Rate)	>=95%	Reported		99.14%	98.04%	99.56%	99.22%	99.33%	99.24%	98.3%	98.18%	99.24%	99.30%	99.65%
			Verified		99.14%	98.04%	99.56%	99.22%	99.33%	99.24%	98.3%	98.18%	99.24%	99.30%	99.65%
	SDCCH/PAGING congestion	<=1%	Reported		0.09%	0.39%	0.07%	0.24%	0.09%	0.04%	0.06%	0.06%	0.21%	0.00%	0%
			Verified	ICR	0.09%	0.39%	0.07%	0.24%	0.09%	0.04%	0.06%	0.06%	0.21%	0.00%	0%
	TCH congestion	<=2%	Reported		0.21%	1.32%	0.01%	0.24%	0.28%	0.07%	0.10%	0.14%	0.20%	0.12%	0%
			Verified		0.21%	1.32%	0.01%	0.24%	0.28%	0.07%	0.10%	0.14%	0.20%	0.12%	0%
3	Connection maintenance (retainability)														
	CDR	<=2%	Reported		1.04%	1.68%	1.45%	1.09%	0.40%	0.81%	1.46%	0.80%	1.04%	0.47%	0.35%
			Verified		1.04%	1.68%	1.45%	1.09%	0.40%	0.81%	1.46%	0.80%	1.04%	0.47%	0.35%
	Worst affected cells>3% TCH drop	<=5%	Reported		2.15%	3.78%	14.10%	14.60%	2.22%	3.47%	4.61%	2.24%	3.98%	0.45%	0.07%
			Verified		2.15%	3.78%	14.10%	14.60%	2.22%	3.47%	4.61%	2.24%	3.98%	0.45%	0.07%
	Good voice quality	>=95%	Reported		98.34%	100%	98.65%	96.01%	98.54%	98.67%	97.2%	97.52%	97.42%	98.93%	99.79%
			Verified		98.34%	100%	98.65%	96.01%	98.54%	98.67%	97.2%	97.52%	97.42%	98.93%	99.79%
4	No of POI having <=0.5% POI congestion		Reported	1	0	0	0	0	0	0	0	0	0	0	0
			Verified	1	0	0	0	0	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.21%	0.01%	0.06%	NA	0.04%	0.08%	0.05%	NA	NA	0.05%	0.09%	0.03%
			Verified	0.21%	0.01%	0.06%	NA	0.04%	0.08%	0.05%	NA	NA	0.05%	0.09%	0.03%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.29%	0.10%	0.02%	0.00%	0.00%	0.04%	0.01%	0%	0.10%	0.01%	0.05%	0.17%
			Verified	0.29%	0.10%	0.02%	0.00%	0.00%	0.04%	0.01%	0%	0.10%	0.01%	0.05%	0.17%
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the	<=1 week	Reported	100%	100%	100%	NA	100%	100%	100%	NA	100%	100%	100%	100%

PMR Report Verification			Audit	Aircel	Airtel	BSNL	Etisalat	Idea	RTL	Tata	Uninor	Videocon	Vodafone	RCOM	Tata
S/N	Name of Parameter	Benchmark													
	customers account from the date of resolutions of complaints		Verified	100%	100%	100%	NA	100%	100%	100%	NA	100%	100%	100%	100%
8	**Response time to customers for assistance**														
	Accessibility of call centre/Customer Care	>=95%	Reported	100%	96%	95%	98.79%	99%	100%	99%	68.3%	95%	100%	89%	96%
			Verified	100%	96%	95%	98.79%	99%	100%	99%	68.3%	95%	100%	89%	96%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	40.08%	55%	91%	97.54%	84%	77%	91%	88.3%	88%	81%	92%	85%
			Verified	40.08%	55%	91%	97.54%	84%	77%	91%	88.3%	88%	81%	92%	85%
9	Termination/closure of service														
	No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	96%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	100%
			Verified	96%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	100%
10	**Time taken for refunds of deposits after closures.**	100% within 60 days	Reported	NA	100%	100%	NA	100%	100%	NR	NA	NA	100%	100%	92%
			Verified	NA	100%	100%	NA	100%	100%	NR	NA	NA	100%	100%	92%

Critical Analysis (PMR Verification):

a. The figures provided by all the operators match the figures obtained on verification in most of the cases.

b. Etisalat is found to be not meeting the benchmark for "Worst affected BTSs due to downtime"

c. Etisalat & Idea are not meeting the benchmark for "Worst affected cells>3% TCH drop"

d. Aircel is found to not meeting the benchmark for "Metering/billing credibility-Post paid", While Aircel & Tata CDMA are not meeting the benchmark for "Metering/billing credibility-Pre paid".

e. Accessibility of Uninor & Rcom CDMA to their call centre is not meeting the benchmark.

f. "%call answered by operators(voice to voice) benchmark is not met by Aircel, Airtel, Idea, RTL, Uninor,Videocon,Vodafone & Tata CDMA.

g."Closure of service complied within 7 days" benchmark is not met by Aircel, while "time taken for refund of deposits after closures" is not met by Tata CDMA

CHAPTER-4: DETAILED FINDING & 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	TATA	VIDEOCON	V-fone	UNITECH	ETISALAT	MTS	Rcom	TATA
							GSM Operators						CDMA Operators		
A	Network Service Quality Parameter														
1	Connection Establishment (Accessibility)														
	a) CSSR	>=95%	99.40%	99.40%	98.30%	99.51%	99.60%	98.17%	98.80%	98.91%	98.37%	99.80%	98.70%	99.60%	99.41%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.05%	0.16%	0.12%	0.03%	0.21%	0.04%	0.49%	0.03%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.00%	0.06%	1.21%	0.09%	0.02%	1.21%	0.14%	0.36%	0.01%	0.00%	0.00%	0.08%	0.00%
2	Connection maintenance														
	a) CDR	<=2%	0.40%	1.08%	1.29%	0.98%	0.34%	1.01%	1.10%	0.70%	1.36%	1.15%	0.16%	0.41%	0.33%
	b) Cells having > 3% TCH drop	<=3%	2.68%	2.43%	3.38%	2.53%	4.70%	7.04%	1.21%	0.91%	4.37%	14.81%	3.63%	0.33%	0.58%
	c) Good voice quality	>=95%	98.51%	97.25%	NA	96.69%	97.50%	97.79%	98.40%	97.54%	97.20%	98.50%	100%	NA	NA
	d) No. of cells > 3% TCH drop		62.6	460	410	407	423	424	60	187	268	8	40	6	15
	e) Total no. of cells in the network		2334	18899	12155	16091	8880	6021	4923	20488	6132	54	1101	1876	2646
3	No of POI having >=0.5% POI congestion		0	0	0	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
	b) Total No. of circuits on POI		6812	126701	39818	101385	88548	14837	13133	122206	29140	1331	3791	88548	40689
	c) Avg No. of call attempts on POI		145012	596057	764336	3072996	18374	408277	268308	3776170	688299	2532	12484	18374	643454
	d) Avg traffic served on POI (Erlang)		3850	10241	28467.8	60720	25314	11365	6834	55056	19428	68	369.58	25314	15248
	e) Total number of working POI Service Area wise		36	161	49	143	166	21	44	96	50	21	42	166	189
	f) Equipped Capacity of Network in respect of Traffic in erlang		26380	248020	152479	207553	144000	88348	71142	449139	68038	413	10500	200000	238251
	g) Total traffic handled in TCBH in erlang		1825	140736	53788.2	162445	107525	33241	24705	359682	41049	110	232	73432	61842

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNITECH	ETISALAT	MTS	Rcom	TATA
			GSM Operators										CDMA Operators		
(B)	**Customer Service Quality Parameters**														
4	**Response time to customers for assistance**														
	a) Accessibility of call centre	*>=95%*	100%	98.5%	95%	100%	100%	96.5%	100%	100%	99.13%	96.67%	93%	100%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	*>=90%*	99%	95.5%	90%	98.5%	92%	100%	96%	95.5%	96%	100%	92%	95%	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 >= 95%):** All operators are meeting the benchmark with values lying between 98.17% and 99.80%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.49%.
  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 1.21 %.
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.16% and 1.36%.
- **Cell exceeding 3% TCH drop (benchmark <= 3%):** Tata GSM (7.04%), Etisalat (14.81%) BSNL (3.38%), Unitech (4.37%), MTS (3.63%) & RTLGSM (4.70%) could not achieve the benchmark, rest of the operators are satisfying the benchmark with value in between 0.33% and 2.68%.
- **Connections with good voice quality (benchmark >= 95%):** RCOM & TTSL (CDMA service) have declared that the parameter is not system generated. Rest of the operators is meeting the benchmark with values lying between 96.69% and 100%.
- **No of POI having >=0.5% POI Congestion:** None of the operator is having >0.5% POI congestion on individual POI.
- **%age of call answered by operator (electronically) (benchmark >95):** All operators are meeting the benchmark with values lying between 95% to 100%.Except MTS CDMA with 93%
- **%age of call answered by operator (Voice to voice) (benchmark >90%): All the** operators are meeting the benchmark with values lying between 90 % and 100%.

(2) Month data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNINOR	ETISALAT	MTS	Rcom	TATA
			GSM Operators										CDMA Operators		
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.07%	0.10%	0.74%	0.05%	0.08%	0.01%	0.03%	0.02%	0.02%	0.47%	0.17%	0.09%	0.002%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.40%	1.73%	0.02%	0.10%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%
	c) Total no. of BTSs in the licensed service area		778	6322	4223	5412	2960	2027	1648	6841	2124	21	367	1876	882
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		412.2	4926.7	23300.7	1836.48	1769	217.4	403	1064	261	73.2	468.7	1209	14.4
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	27	73	1	3	8	0	0	0	0	0	1	0
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.30%	99.35%	98.73%	99.51%	99.68%	98.10%	98.90%	98.86%	98.25%	99.85%	98.6%	92.10%	99.50%
	b) SDCCH/PAGING congestion	<=1%	0.00%	0.08%	0.35%	0.21%	0.04%	0.25%	0.05%	0.46%	0.02%	0.02%	0%	0%	0%
	c) TCH congestion	<=2%	0.00%	0.30%	1.29%	0.15%	0.08%	1.27%	0.21%	0.43%	0.01%	0%	0%	0.06%	0%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.40%	1.20%	1.47%	1.41%	0.35%	1.02%	1.10%	0.72%	1.37%	1.06%	0.44%	0.40%	0.32%
	b) Worst affected cells>3% TCH drop	<=3%	3.00%	2.52%	3.25%	2.76%	4.50%	6.90%	1.32%	0.55%	4.60%	12.19%	4.09%	0.37%	0.57%
	c) Good voice quality	>=95%	98.50%	97.23%	NA	96.63%	97.40%	97.71%	98.30%	97.52%	97.20%	98.60%	100%	NA	NA
	d) Total No. of cells exceeding 3% TCH drop (call drop)		70	476	396	441	426	414	64	112	288	7	45	7	15
	e) Total no. of cells in the network		2334	18899	12155	16091	8880	6021	4923	20488	6132	54	1101	1876	2646
4	No of POI having >=0.5% POI congestion		0	0	0	0	0	0	0	0	0	0	3	0	0
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	BSNL	NIL	NIL
	b) Total No. of call attempts on POI (Avg.)		138476	570107	757358	3140441	15308	473686	267496	4098066	704406	1842	13189	15308	634718
	c) Total traffic served on POI (Erlang) (Avg.)		3916	12837	28340.6	60455	25974	13396	6836	56766	17733	70	387.4	25974	15333
	d) Total No. of circuits on POI		6812	126701	39818	101385	88548	14837	13133	122206	29140	1331	3791	88548	40689

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNINOR	ETISALAT	MTS	Rcom	TATA
						GSM Operators							CDMA Operators		
	e) Total number of working POI Service Area wise		36	161	49	143	166	21	44	96	50	21	42	166	189
	f) Capacity of POI		6812	126701	37578	101385	82181	14115	12190	119822	26918	961	3130	82181	36688
5	**Network Data**														
	a) Equipped Capacity of Network Erlang		26380	248020	152479	207553	144000	88348	71142	449139	68038	413	10500	200000	238251
	b) Total traffic in TCBH in erlang (Avg.)		1825	140736	53788.24	162445	107525	33241	24705	359682	41049	110	232	73432	61842
	c) Total no. of customers served (as per VLR) on last day of the month		273653	4682463	2215421	6425139	NP	1184458	746721	11908830	1083190	4279	14371	NP	709200
(B)	**Customer Service Quality Parameters**														
5	**Metering/billing credibility-Post paid**	<= 0.1%	0.10%	0.01%	0.05%	0.03%	0.10%	0.24%	NA	0.05%	NA	NA	0.00%	0.06%	0.00%
	a) No. of bills issued during the period		2878	293830	88907	291703	28583	10362	NA	964364	NA	NA	460	324735	272070
	b) No. of bills disputed including billing complaints during the period		3	32	42	86	28	25	NA	507	NA	NA	0	206	10
6	**Metering /billing credibility-Pre paid**	<= 0.1%	0.03%	0.02%	0.03%	0.00%	0.10%	0.16%	0.01%	0.01%	0.25%	0.01%	0.01%	0.01%	0.16%
	a) No. of charging / credit / validity complaints during the quarter		148	1272	1264	34	500	3279	153	832	4783	2	4	250	2682
	b) Total no. of pre-paid customers at the end of the quarter		486468	6023017	3648608	6945490	5016919	2109567	1559914	14665665	1909998	18887	62066	2580686	1727850
7	**Resolution of billing/ charging complaints**	100% within 4 weeks	100%	100%	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		151	8802	11207	3595	528	3304	153	1339	4783	2	4	456	6589
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		151	8802	11207	3595	528	3304	153	1339	4783	2	4	456	6589
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		77	1304	1306	120	87	28	153	446	4783	2	2	149	2692

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNINOR	ETISALAT	MTS	Rcom	TATA
			GSM Operators										CDMA Operators		
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		74	7498	9901	3475	441	3276	0	893	0	0	2	307	3897
	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%	100%	100%
8	**Response time to customers for assistance**														
	a) Accessibility of call centre/Customer Care	>=95%	70.07%	98.08%	100%	98.6%	100%	99.46%	100%	100%	90%	98.97%	96.47%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	66.07%	93%	90.4%	95%	92.07%	92%	95.4%	92..5%	90.4%	99.63%	96%	93.2%	100%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		180457	277066	106430	1220259	1228093	340947	88289	18262182	41408	2048	17089	173656	726667
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		126446	271739	106430	1203159	1228093	339108	88289	18262182	37276	2027	16486	173656	726667
9	**Termination/closure of service**	<=7days	100%	100%	100%	100%	100%	100%	NA	100%	NA	NA	NIL	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		52	2322	5611	2218	329	92	NA	5281	NA	NA	0	1529	2340
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		52	2322	5611	2218	329	92	NA	5281	NA	NA	0	1529	2340
10	**Time taken for refunds of deposits after closures.**	100% within 60 days	100%	100%	100%	100%	100%	100%	NA	100%	NA	NA	NA	100%	100%

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 between0.0020% and 0.74%.

➢ **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0% and 1.73%.

➢ **Call setup success rate (benchmark >= 95%):** Except RCOMCDMA with value 92.1%, rest of operators are meeting the benchmark with values lying between 98.10% and 99.85%.

➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.46%.
   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 1.29 %.

➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.32% and 1.47 %.

➢ **Cell exceeding 3% TCH drop (benchmark <= 3%):** Tata GSM (6.9%), Etisalat (12.19%), BSNL (3.25%), Unitech (4.6%), RTLGSM (4.5%) and MTS (4.09%) respectively, could not achieve benchmark. Rests of the operators are satisfying the benchmark with value in between 0.37% and 3%.

➢ **Connections with good voice quality (benchmark >= 95%):** Rcom CDMA & Tata CDMA service providers have declared that the parameter is not system generated. Rests of the operators are meeting the benchmark with values lying between 96.63 % and 100%.

➢ **No of POI having >=0.5% POI Congestion:** Except 3 no. of POIs for MTS which are having more than 0.5% congestion, rest of the operators are found not having congestion on individual POIs.

➢ **%age of call answered by operator (electronically) (benchmark >95):** Except for Aircel (70.07%) & Uninor (90%), rests of the operators are meeting the benchmark with values lying between 96.47% to 100%.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%): %):** Except for Aircel with value of 66.07%, rest of the operators are meeting the benchmark with values lying between 90.4 % and 100%.

➢ **Metering and billing credibility-Post paid (benchmark <= 0.1%):** Except for Tata GSM (0.24%), rests of the operators are meeting the benchmark with values lying between 0% & 0.1%.

➢ **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** Except for Tata GSM(0.16%), Unitech(0.25%) & Tata CDMA (0.16%), rest of the operators are meeting the benchmark with values lying between 0% & 0.1%.

➢ **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.

➢ **Termination/Closure of service (Benchmark <= 7 days):** No deviation is found for this parameter.

➢ **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):** Operators are satisfying the benchmark.

Note: Etisalat, Videocon, and Unitech are having only prepaid service.

(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	778
2	Airtel Ltd	14	98	6322
3	BSNL	9	106	4223
4	Idea	19	34	5412
5	Reliance Communication (GSM)	4	18	2960
6	Tata Communications (GSM)	3	16	2027
7	Uninor	2	15	2124
8	Videocon	2	11	1648
9	Vodafone	25	139	6841
10	Etisalat	1	4	21
CDMA Operators				
11	Reliance Communication (CDMA)	5	4	1876
12	Tata Communications (CDMA)	6	8	882
13	MTS	2	2	367

(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 except Rcom CDMA (92.1% for month data) are meeting the TRAI benchmarks (>= 95 %) for both 3 days live data and month data.

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOC	V-fone	UNITEC	ETISAL	MTS	Rcom	TATA
☐ Live	99.40%	99.40%	98.30%	99.51%	99.60%	98.17%	98.80%	98.91%	98.37%	99.80%	98.70%	99.60%	99.41%
■ Month	99.30%	99.35%	98.73%	99.51%	99.68%	98.10%	98.90%	98.86%	98.25%	99.85%	98.60%	92.10%	99.50%
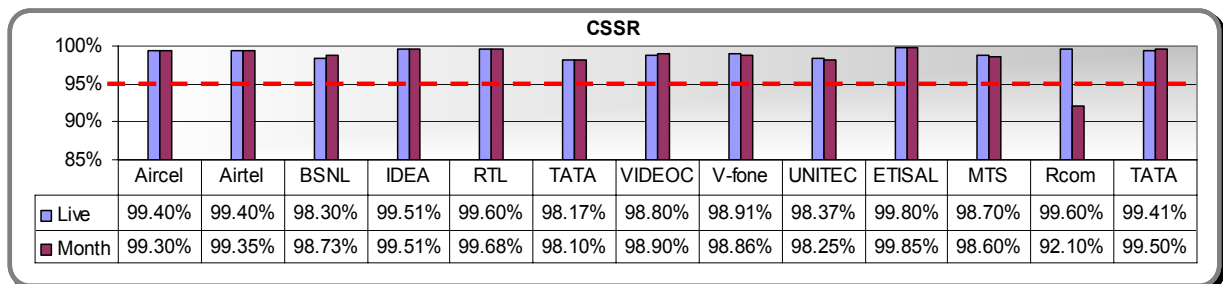
II. Blocked call rate:

SDCCH congestion (%): Operators are meeting the TRAI benchmarks (<= 1 %) for both 3 days live data & month data.
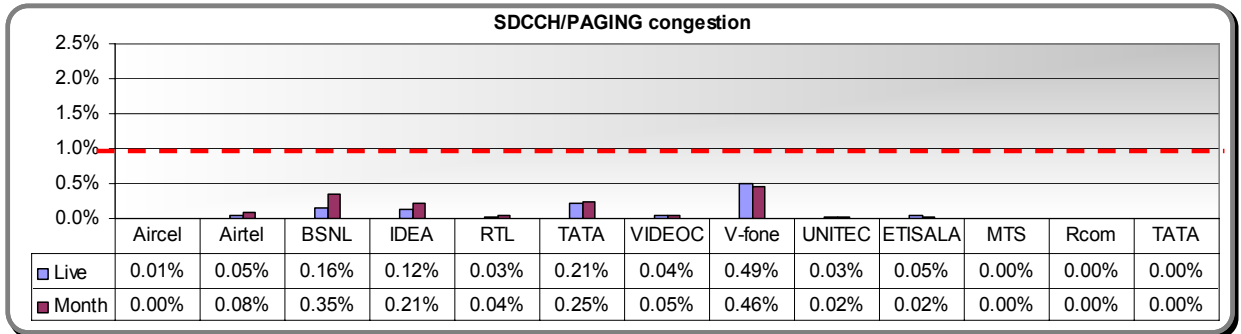
SDCCH/PAGING congestion

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOC	V-fone	UNITEC	ETISALA	MTS	Rcom	TATA
Live	0.01%	0.05%	0.16%	0.12%	0.03%	0.21%	0.04%	0.49%	0.03%	0.05%	0.00%	0.00%	0.00%
Month	0.00%	0.08%	0.35%	0.21%	0.04%	0.25%	0.05%	0.46%	0.02%	0.02%	0.00%	0.00%	0.00%

TCH congestion (%): Operators are meeting the TRAI benchmarks (<= 2%) for both 3 days live data & month data.

TCH congestion

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOC	V-fone	UNITEC	ETISALA	MTS	Rcom	TATA
Live	0.00%	0.06%	1.21%	0.09%	0.02%	1.21%	0.14%	0.36%	0.01%	0.00%	0.00%	0.08%	0.00%
Month	0.00%	0.30%	1.29%	0.15%	0.08%	1.27%	0.21%	0.43%	0.01%	0.00%	0.00%	0.06%	0.00%
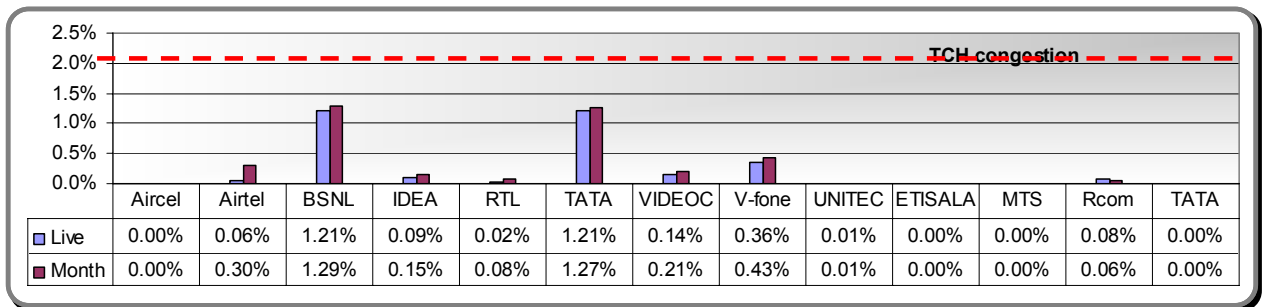
III. Connection Maintainability (Retainability):

Call drop rate (%): Operators are satisfying the TRAI benchmarks (<=2%) for both 3 days live data & one month data.

CDR

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNITECH	ETISALAT	MTS	Rcom	TATA
Live	0.40%	1.08%	1.29%	0.98%	0.34%	1.01%	1.10%	0.70%	1.36%	1.15%	0.16%	0.41%	0.33%
Month	0.40%	1.20%	1.47%	1.41%	0.35%	1.02%	1.10%	0.72%	1.37%	1.06%	0.44%	0.40%	0.32%
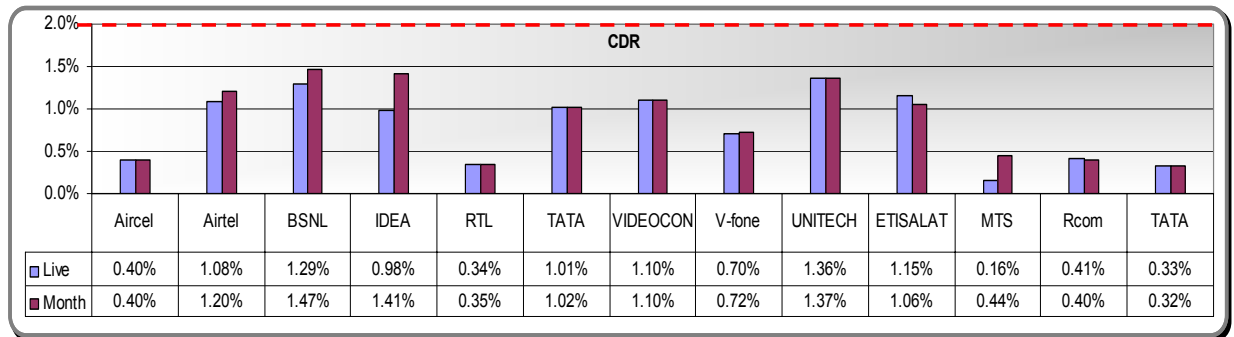
Worst affected Cell exceeding 3% TCH Drop: Tata GSM, Etisalat, BSNL, Unitech, RTL GSM and MTS have not met benchmark of worst affected cell exceeding 3%TCH Drop. Rests of the operators are meeting the benchmark for both cases.
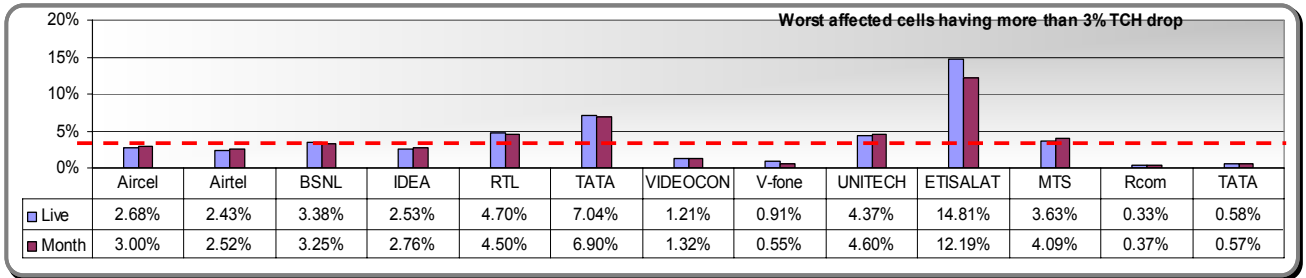
	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOCON	V-fone	UNITECH	ETISALAT	MTS	Rcom	TATA
Live	2.68%	2.43%	3.38%	2.53%	4.70%	7.04%	1.21%	0.91%	4.37%	14.81%	3.63%	0.33%	0.58%
Month	3.00%	2.52%	3.25%	2.76%	4.50%	6.90%	1.32%	0.55%	4.60%	12.19%	4.09%	0.37%	0.57%

Worst affected cells having more than 3% TCH drop

Percentage of connections with good voice quality (benchmark >= 95%): All operators are meeting the TRAI benchmarks (=> 95%) for both 3 days live data & month data.

% with Good Voice Quality

	Aircel	Airtel	Idea	RTL	Tata	Videocon	Vodafone	Uninor	Etisalat	MTS
Live	98.51%	97.25%	96.69%	97.50%	97.79%	98.40%	97.54%	97.20%	98.50%	100%
Month	98.50%	97.23%	96.63%	97.40%	97.71%	98.30%	97.52%	97.20%	98.60%	100%
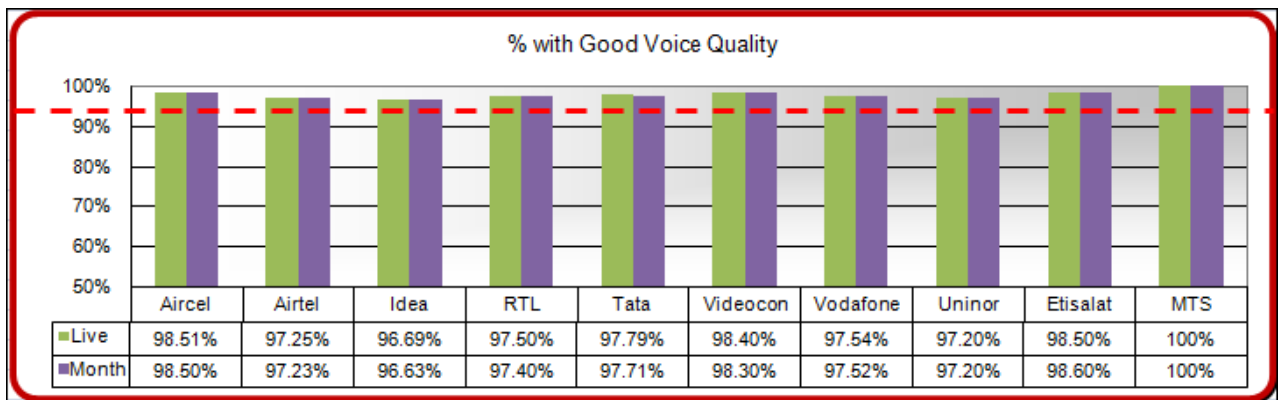
Note: BSNL, Rcom cdma & Tata cdma reported that data not generated from the system.

POI Congestion: Except 3 no. of POIs for MTS which are having more than 0.5% congestion, rest of the operators are found not having congestion on individual POIs.

No of POI having >=0.5% POI congestion

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOC	V-fone	UNITEC	ETISAL	MTS	Rcom	TATA
Live	0	0	0	0	0	0	0	0	0	0	0	0	0
Month	0	0	0	0	0	0	0	0	0	0	3	0	0
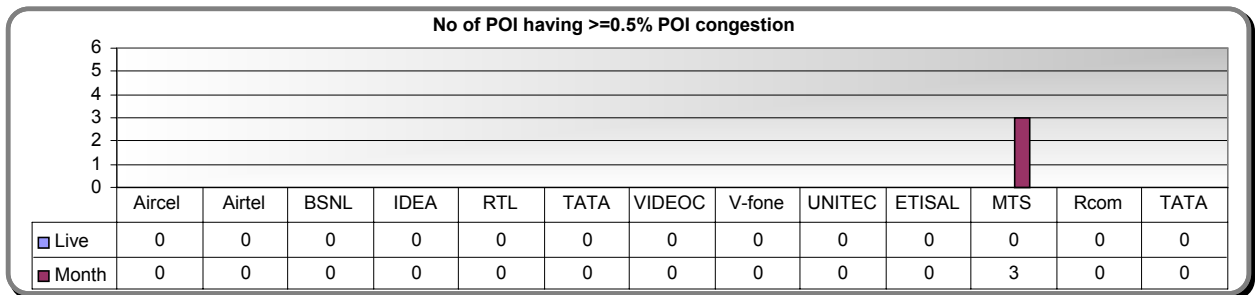
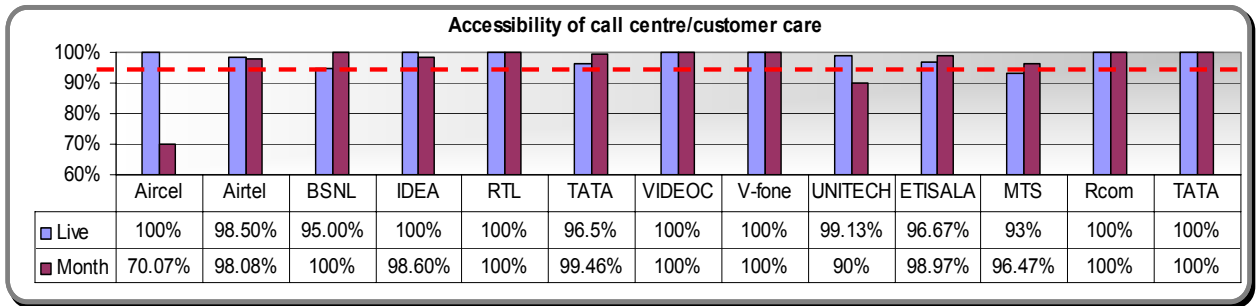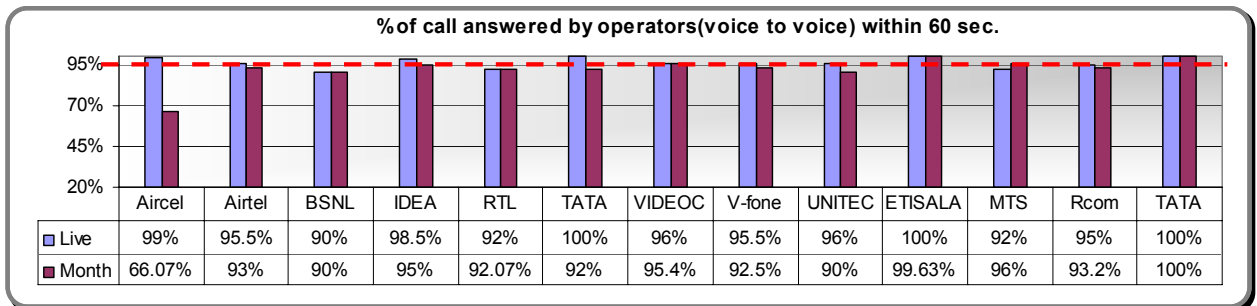B)   CUSTOMER SERVICE QUALITY PARAMETERS

(A)   Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks (>= 95%) for both one month data and 3 days live data except for Aircel(70.07%) & Unitech(90%) in month data audit , & MTS (93%) for live data.

Accessibility of call centre/customer care

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOC	V-fone	UNITECH	ETISALA	MTS	Rcom	TATA
Live	100%	98.50%	95.00%	100%	100%	96.5%	100%	100%	99.13%	96.67%	93%	100%	100%
Month	70.07%	98.08%	100%	98.60%	100%	99.46%	100%	100%	90%	98.97%	96.47%	100%	100%

Percentage of call answered by operators (Voice to voice) within 60 sec: For Live data, all operators are meeting the benchmark. For month data, except to Aircel (66.07%), rest of the operators are meeting the prescribed benchmark.

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

	Aircel	Airtel	BSNL	IDEA	RTL	TATA	VIDEOC	V-fone	UNITEC	ETISALA	MTS	Rcom	TATA
Live	99%	95.5%	90%	98.5%	92%	100%	96%	95.5%	96%	100%	92%	95%	100%
Month	66.07%	93%	90%	95%	92.07%	92%	95.4%	92.5%	90%	99.63%	96%	93.2%	100%

(3)   Critical Analysis

From the data analysis it is found that operators are meeting the network parameters by and large except for RCOM cdma for month in CSSR. Also it is found that BSNL, RTL, Tata GSM, Uninor, Etisalat & MTS are not meeting the benchmark in "Worst affected cells> 3% TCH drops".

Performance related to customer care data is not found to be satisfactory for MTS for the parameter "Accessibility of call centre" in case of live data and in month data, Aircel & Uninor is not meeting the benchmark.

Tata GSM is not meeting the benchmark for billing & metering credibility in case of Postpaid & for Prepaid, it is found that Tata GSM,Uninor & Tata CDMA not meeting the benchmark.

The above comparative study between live data & month data shows similar trends for both the cases. However, it is found that live & month data shows a large no variation among the operators. Also it is found that the above said parameter is the most effective parameter performance wise & should be taken care as priority basis.

(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	Uninor	Videocon	Vodafone	Tata (CDMA)	Reliance (CDMA)	Etisalat	MTS
Total No. of calls	14	30	30	12	30	30	30	17	30	30	30	2	4
Cases resolved with 4 weeks	14	30	30	12	30	30	30	17	30	30	30	2	4
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

3)   Live calling to Call centre: Fifty nos. of calls were made at Ahmadabad in each half and below given no. of calls got connected to the call centre within 60 Secs.

	OPERATORS NAME											
	Aircel	Airtel	BSNL	Idea	Rcom	Video-con	Voda-fone	Etisalat	Uninor	MTS	Rcom	Tata
	GSM									CDMA		
1ST HALF (10AM to 01 PM)	30	46	47	46	47	48	47	47	39	46	47	47
2ND HALF (04PM to 07 PM)	25	40	39	39	40	42	41	44	32	40	39	44
In % age	55.00	86.00	86.00	85.00	87.00	90.00	88.00	91.00	71.00	86.00	86.00	91.00

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

5) Critical Analysis: Random numbers were selected from the operators' database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. It was found that the operators had made refunds in 100% cases as claimed in their records.

(B)   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)	Etisalat	MTS
Aircel	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
BSNL	98%	99%	-	100%	98%	99%	100%	100%	100%	99%	98%	99%	97%
Idea	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reliance (GSM)	100%	98%	99%	100%	-	100%	100%	100%	100%	100%	99%	100%	100%
Tata (GSM)	99%	100%	100%	100%	100%	-	99%	100%	100%	100%	100%	100%	100%
Uninor	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	98%	100%
Videocon	100%	100%	100%	100%	100%	100%	100%	-	99%	100%	100%	100%	100%
Vodafone	98%	100%	98%	99%	100%	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%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Etisalat.	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	-	100%
MTS.	100%	100%	100%	100%	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 not much congestion on the operator networks.

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

i) 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

AHMEDABAD

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.

BARODA

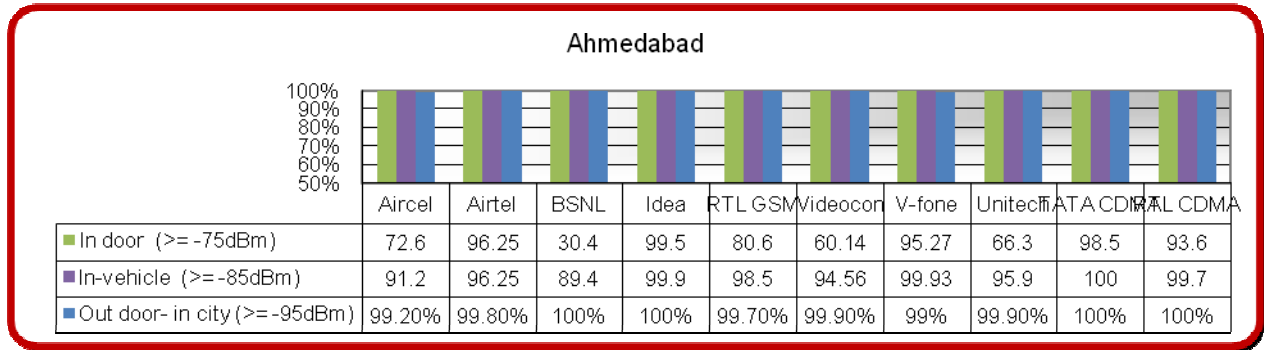|	
LOW DENSE:	Makarpura, Maneja
MEDIUM DENSE:	Alkapuri, Subhanpura, Vasana road, Akota
HIGH DENSE:	Raopura, Kothi, Mandvi, Dandiyabazar, Nyaymandir

SURAT

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

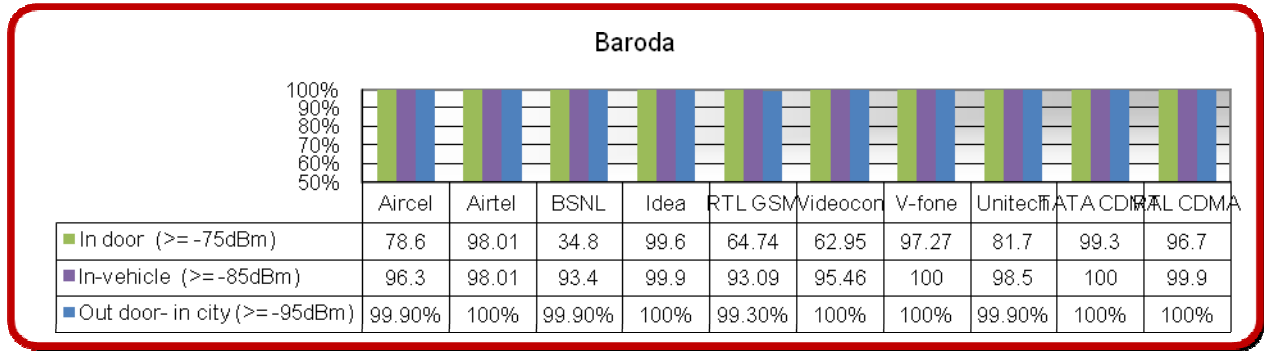## 2) Performance (for the respective cities) – Operator Assisted Drive Test

SN	Parameter	City Name	Aircel	Airtel	BSNL	TATA GSM	Idea	RTL GSM	Videocon	V-fone	Unitech	TATA CDMA	RTL CDMA
1.1	Call Attempts	Ahmadabad	82	112	109	NA	128	121	114	105	116	122	121
		Baroda	81	158	86	NA	106	91	95	99	92	97	94
		Surat	NA	100	106	116	116	98	110	91	113	114	99
1.2	Blocked Call Rate (<=3%)	Ahmadabad	1.2%	0%	0.9%	NA	0%	0%	0%	0.95%	0%	0%	0.80%
		Baroda	1.23%	0%	0%	NA	0.94%	1.09%	0%	3.00%	3.20%	0%	0%
		Surat	NA	0%	0%	0.8%	0.94%	0%	0%	1.09%	0.80%	0%	0%
1.3	Dropped Call Rate (<=2%)	Ahmadabad	0%	0%	2.7%	NA	0%	0%	0.87%	0.00%	0%	0%	0%
		Baroda	0%	0%	1.16%	NA	1.90%	0%	1.05%	2%	0%	0%	0%
		Surat	NA	0%	0.96%	0.86%	0%	0%	0.90%	0%	0%	0%	0%
1.4	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	Ahmadabad										99.5%	99.07%
		Baroda										98.5%	98.60%
		Surat										98.5%	99.03%
	(ii) 0-5 (with frequency hopping)	Ahmadabad	97%	95.6%	95.7%	NA	97.4%	97.8%	98.13%	97.27%	95.3%		
		Baroda	96.3%	93.1%	96.7%	NA	97.7%	98.7%	97.36%	97.23%	94.5%		
		Surat	NA	94.1%	96.4%	97.2%	98.01%	97.5%	95.68%	98.03%	95.4%		
1,5	Service Coverage												
	In door (>= -75dBm)	Ahmadabad	72.6	96.25	30.4	NA	99.5	80.6	60.14	95.27	66.3	98.5	93.6
		Baroda	78.6	98.01	34.8	NA	99.6	64.74	62.95	97.27	81.7	99.3	96.7
		Surat	NA	94	30.5	83.09	99.2	74.5	72.46	95.47	60.3	99.9	97.9
	In-vehicle (>= -85dBm)	Ahmadabad	91.2	96.25	89.4	NA	99.9	98.5	94.56	99.93	95.9	100	99.7
		Baroda	96.3	98.01	93.4	NA	99.9	93.09	95.46	100	98.5	100	99.9
		Suart	NA	94.01	91.8	97.45	99.9	95.9	98.77	99.9	93.4	100	100
	Out door- in city (>= -95dBm)	Ahmadabad	99.2%	99.8%	100%	NA	100%	99.7%	99.9%	99%	99.9%	100%	100%
		Baroda	99.9%	100%	99.9%	NA	100%	99.3%	100%	100%	99.9%	100%	100%
		Surat	NA	100%	99.6%	100%	100%	99.8%	100%	100%	99.9%	100%	100%
1.6	Call Setup Success Rate (>=95%)	Ahmadabad	98.8%	100%	98.4%	NA	99.2%	100%	99.1%	99%	100%	100%	99.1%
		Baroda	97.8%	98%	100%	NA	99%	98.9%	99.2%	96.9%	96.7%	100%	100%
		Surat	NA	100%	100%	99.2%	99.1%	100%	98.7%	98.9%	99.1%	100%	100%

Graphical Representation.

AHMEDABAD

Ahmedabad	Aircel	Airtel	BSNL	Idea	RTL GSM	Videocon	V-fone	Unitech	TATA CDMA	RL CDMA
In door (>=-75dBm)	72.6	96.25	30.4	99.5	80.6	60.14	95.27	66.3	98.5	93.6
In-vehicle (>=-85dBm)	91.2	96.25	89.4	99.9	98.5	94.56	99.93	95.9	100	99.7
Out door- in city (>=-95dBm)	99.20%	99.80%	100%	100%	99.70%	99.90%	99%	99.90%	100%	100%

BARODA.

Baroda	Aircel	Airtel	BSNL	Idea	RTL GSM	Videocon	V-fone	Unitech	TATA CDMA	RL CDMA
In door (>=-75dBm)	78.6	98.01	34.8	99.6	64.74	62.95	97.27	81.7	99.3	96.7
In-vehicle (>=-85dBm)	96.3	98.01	93.4	99.9	93.09	95.46	100	98.5	100	99.9
Out door- in city (>=-95dBm)	99.90%	100%	99.90%	100%	99.30%	100%	100%	99.90%	100%	100%

SURAT.

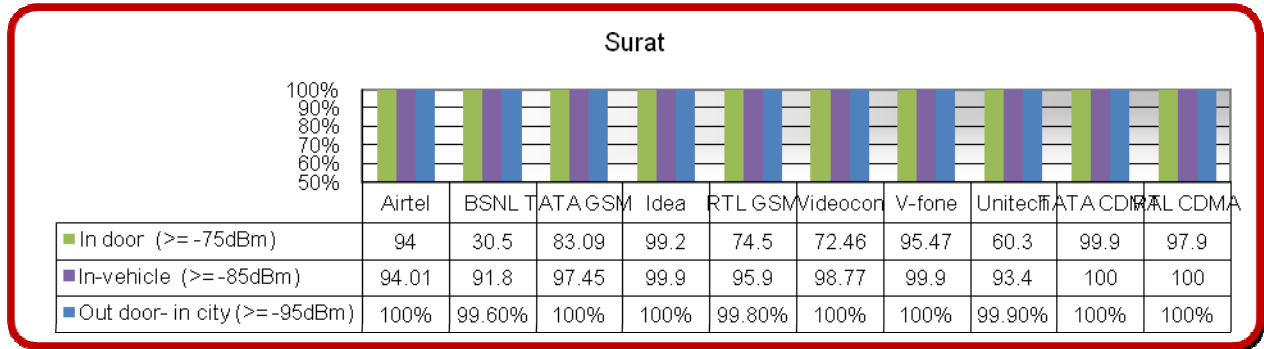| Surat	Airtel	BSNL	TATA GSM	Idea	RTL GSM	Videocon	V-fone	Unitech	TATA CDMA	RL CDMA
In door (>=-75dBm)	94	30.5	83.09	99.2	74.5	72.46	95.47	60.3	99.9	97.9
In-vehicle (>=-85dBm)	94.01	91.8	97.45	99.9	95.9	98.77	99.9	93.4	100	100
Out door- in city (>=-95dBm)	100%	99.60%	100%	100%	99.80%	100%	100%	99.90%	100%	100%

(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:

- Tata GSM is having network services in only Surat city among all these 3 cities.
- Aircel is having network services in Ahmadabad & Baroda among all these 3 cities
- For Blocked Call Rate, except to Uninor in Baroda (3.20%), rests of the operators are meeting the benchmark.
- For Drop call Rate, except to BSNL in Ahmadabad (2.7%), rests of the operators are meeting the benchmark.
- For Good voice quality parameter, it is found that Airtel is not meeting the benchmark with value of 93.1% & 94.1% for Baroda & Surat respectively. Also Uninor with value of 94.5% is not meeting the benchmark for Baroda city.
- CSSR parameter is met by all the operators in all the three cities.
- Aircel in Surat and Tata GSM in Baroda & Surat are on ICR.

(D) Independent Drive Test

ii)   Sample Coverage

The Independent Drive Test was conducted at Baroda 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

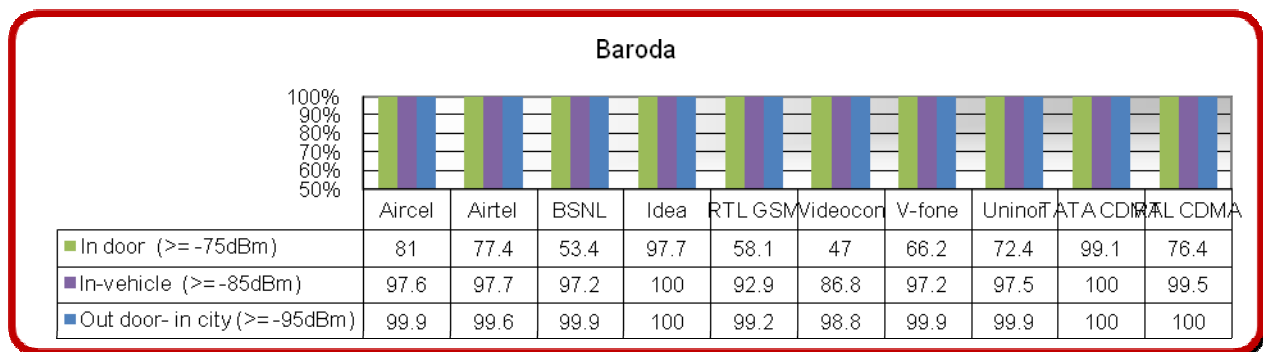.   *BARODA*

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

2) Performance (for the respective cities) – Independent Drive Test

SN	Parameter	City Name	Aircel	Airtel	BSNL	TATA GSM	Idea	RTL GSM	Videocon	V-fone	Uninor	TATA CDMA	RTL CDMA
1.1	Call Attempts	**Baroda**	75	75	70	NA	76	75	78	76	76	89	93
1.2	Blocked Call Rate (<=3%)	**Baroda**	1.30%	1.30%	0.00%	NA	1.30%	2.60%	3.80%	1.30%	1.30%	0.00%	0.00%
1.3	Dropped Call Rate (<=2%)	**Baroda**	2.60%	1.30%	0.00%	NA	1.30%	0.00%	2.50%	2.60%	2.60%	0.00%	0.00%
1.4	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	**Baroda**	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.3%	98.30%
	(ii) 0-5 (with frequency hopping)	**Baroda**	97.40%	94.10%	96.30%	NA	93.40%	95.5%	95.90%	94.60%	95.45%	NA	NA
1,5	Service Coverage												
	In door (>= -75dBm)	**Baroda**	81	77.4	53.4	NA	97.7	58.1	47	66.2	72.4	99.1	76.4
	In-vehicle (>= -85dBm)	**Baroda**	97.6	97.7	97.2	NA	100	92.9	86.8	97.2	97.5	100	99.5
	Out door- in city (>= -95dBm)	**Baroda**	99.9	99.6	99.9	NA	100	99.2	98.8	99.9	99.9	100	100
1.6	Call Setup Success Rate (>=95%)	**Baroda**	98.00%	98.5%	100%	NA	98.60%	97.3%	96.20%	98.6%	98.6%	100%	100%

Graphical Representation
BARODA.

	Aircel	Airtel	BSNL	Idea	RTL GSM	Videocon	V-fone	Uninor	TATA CDMA	RTL CDMA
In door (>=-75dBm)	81	77.4	53.4	97.7	58.1	47	66.2	72.4	99.1	76.4
In-vehicle (>=-85dBm)	97.6	97.7	97.2	100	92.9	86.8	97.2	97.5	100	99.5
Out door- in city (>=-95dBm)	99.9	99.6	99.9	100	99.2	98.8	99.9	99.9	100	100

(3) Critical Analysis

- Independent drive test had done at Baroda.
- Drive test path as taken as done for dependent drive test.
- Tata GSM is not having network services in Baroda city.
- Blocked Call Rate is not achieved by Videocon in Baroda (3.8%).
- Drop call Rate parameter is not achieved by Aircel (2.6%), Videocon (2.5%), Vodafone (2.6%) and Uninor (2.6%).
- Good Voice Quality parameter is not met by Idea (93.4%) & Vodafone (94.6%) in Baroda.
- CSSR parameter is met by all the operators.
- Aircel in Surat and Tata GSM in Baroda & Surat are on ICR.

(E)   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 "Worst affected BTS due to downtime" is not met by Etisalat in PMR data, Call setup success rate not met by Rcom CDMA for month data. "Worst affected cells >3% TCH drop" is not met by BSNL, RTL, Tata GSM, Uninor, MTS & Etisalat for month & live data. In case of PMR report, Idea & Etisalat is not meeting the benchmark.

Under **Customer Service Quality Parameter** "Accessibility of call centre" is not met by Aircel, Uninor, MTS and Rcom CDMA.

Regarding **Metering/Billing Credibility** parameter, which for Tata GSM shows below benchmark value for Post-paid connections. For Prepaid connections, it is found that Aircel, Tata GSM, Uninor & Tata cdma are not meeting the benchmark. It is found that Aircel is not meeting the benchmark for Closure of service & "time taken for refund of deposits after closures" not met by Tata cdma in PMR report.

During **Drive Tests**, Blocked Call Rates is not met by Unitech for dependent drive test & Videocon in independent drive test at Baroda city. Similarly, For dropped call rate, it is found that Aircel, Videocon,, Vodafone, and Unitech are not meeting the benchmark for independent drive test at Baroda city along with BSNL also at Ahmadabad for dependent drive test. Most of the GSM operators have below benchmark %age of connections with good voice quality.

III.   Basic Telephone Service (Wireline) Providers
……...Audit not done for this quarter

IV.   Broadband Service Providers
……...Audit not done for this quarter