

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE

FOR

NORTH ZONE – UTTAR PRADESH (EAST) CIRCLE

Report Period: Jan 2011 – March 2011

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II. Basic Telephone Service (Wireline) Providers

- Not conducted for this quarter

III. Broadband Service Providers

- Not conducted for this quarter

CHAPTER-1: INTRODUCTION

I. Background

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

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

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

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

- i) Create conditions for consumer satisfaction by making known the quality of service, which the service provider is required to provide, and the user has a right to expect.
- ii) Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.
- iii) Generally protect the interests of consumers of telecommunication services.

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

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

II. Objectives and Methodology

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

- i) Verification of the data submitted by the service providers to TRAI as part of QoS monitoring reports i.e. Quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnection (POI) Congestion Reports with reference to the records maintained by the service provider.
- ii) Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using live measurement for 3 days during the month in which the audit and assessment is carried out.
- iii) Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.
- iv) Drive tests of the mobile networks both operators assisted and independent drive test (as and where required).
- v) Billing and call center's data verification.
- vi) Live testing of the efficiency of the call center / customer care help line.

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

Systems audited:-

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

Facilities audited:-

1. Billing documents.
2. Customer Care records.

Field data collections carried out:-

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

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

- ✓ TCIL auditors visited all the NSS (Network Sub System) and BSS (Base-station Sub System) to check data for all the operators in their respective service area.
- ✓ All the NSS and BSS data for the relevant details were collected either directly from the centralized NOC or through a remote access to the NOC.
- ✓ The Radio parameters were audited/verified from the data collected from OMC-R (Operation and Maintenance Center – Radio, as part of BSS data).
- ✓ The Drive test was conducted in high, low and medium dense areas including highways, commercial complex and residential areas and special attention was paid for the areas for which TRAI has received complaints.
- ✓ The POI and other network related parameters were audited/verified from the data collected from the OMC-S (Operation and Maintenance Center – Switch as part of NSS data).
- ✓ The data related to Billing and Customer care was checked for the previous month and verified with the customers by calling them on random basis. The process of registration and handling of the complaints was also studied for the various operators. Call centre number were called for measuring the efficiency of the call centre.
- ✓ The inter operator call assessment test was carried out during the time period as is specified in the tender document. TCBH (Time Consistent Busy Hour) is taken after observation of the traffic consistently for 3 days prior to the audit activity.
- ✓ Data has been collected for busy hour of network in case of live assessment & month of audit for all service providers & verified that service providers are providing busy hour data only for QoS service. We found that TCBH hour is matching with network busy hour as provided by service providers for Uttar Pradesh East 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 Uttar Pradesh (East) 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 Uttar Pradesh (East) circle (North Zone) for Cellular Mobile (Wireless) services QoS audit & assessment. The Month of audit & TCBH information is also given below:

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

3 days Live Data Audit														
S/N	Name of Parameter	Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA	
1	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	98.02%	99.23%	95.35%	99.26%	99.41%	99.49%	96.50%	98.28%	97.85%	98.54%	98.43%	99.46%
	b) SDCCH/PAGING congestion	<=1%	0.03%	0.16%	0.07%	0.00%	0.97%	0.25%	0.24%	0.35%	0.03%	0.43%	0.00%	0.00%
	c) TCH congestion	<=2%	0.45%	0.28%	0.05%	0.19%	1.92%	0.59%	1.91%	0.95%	0.39%	0.63%	1.14%	0.00%
2	Connection maintenance (retainability)													
	a) CDR	<=2%	0.71%	0.92%	1.27%	0.43%	1.23%	0.33%	1.09%	1.55%	1.55%	1.65%	0.77%	0.87%
	b) Worst affected cells>3% TCH drop	<=5%	5.41%	3.74%	4.59%	1.04%	7.30%	4.07%	7.67%	1.12%	1.79%	4.61%	0.69%	0.00%
	c) Good voice quality	>=95%	96.57%	98.50%	96.00%	99.03%	96.15%	97.79%	95.95%	96.11%	95.14%	95.75%	NP	NP
3	Number of POI having ≥0.5% POI congestion	<=0.5%	1	0	0	0	0	0	0	1	1	0	0	0
4	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	100%	100%	97%	100%	100%	46%	99%	100%	100%	100%	88%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	93%	97.5%	97%	100%	100%	96.89%	98%	69%	100%	100%	98.64%	95%

NA: Not Applicable, NP: Not Provided

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters by and large, except for Aircel, Idea & Tata GSM which are not meeting the benchmark for “Worst affected cells >3% TCH drop” with the value of 5.41%, 7.30% & 7.67% respectively. Uninor, Aircel & Videocon are having congestion in 1POI respectively.

In Performance related customer care data it is found that most of the operators except Uninor for the parameter “calls answered by operators (voice-to-voice)” and Reliance (GSM & CDMA) for “accessibility of call centre” parameters are not satisfied the benchmark successfully.

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter		GSM Operators										CDMA	
(A)	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	0.04%	0.23%	0.87%	4.83%	0.22%	0.66%	0.04%	0.46%	1.27%	0.17%	0.35%	0.09%
	b) Worst affected BTSs due to downtime	<=2%	0.16%	0.60%	1.98%	31.03%	0.10%	1.90%	0.00%	1.93%	0.95%	1.01%	0.81%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	98.07%	99.20%	95.72%	99.30%	99.55%	99.50%	96.70%	98.03%	98.23%	99.20%	98.57%	99.75%
	b) SDCCH/PAGING congestion	<=1%	0.08%	0.13%	0.09%	0.01%	0.97%	0.27%	0.18%	0.41%	0.11%	0.54%	0.00%	0.00%
3	Connection maintenance (retainability)													
	a) CDR	<=2%	0.71%	1.08%	1.08%	0.39%	1.15%	0.34%	1.09%	1.66%	1.82%	1.84%	0.80%	0.13%
	b) Worst affected cells>3% TCH drop	<=5%	5.56%	4.28%	5.07%	2.19%	8.15%	4.92%	7.38%	0.87%	1.66%	4.80%	0.94%	0.00%
4	Number of POI having ≥0.5% POI congestion	<=0.5%	1	0	0	0	0	0	0	1	1	0	0	0
	c) Good voice quality	>=95%	96.55%	98.45%	96.00%	99.08%	96.18%	97.85%	95.97%	96.02%	95.30%	95.43%	NP	NP
(B)	Customer Service Quality Parameters													
5	Metering/billing credibility-Post paid	<= 0.1%	0.10%	0.01%	0.01%	NA	0.02%	0.12%	0.00%	NA	NA	0.10%	0.10%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.08%	0.02%	0.00%	0.00%	0.05%	0.10%	0.00%	0.09%	0.00%	0.10%	0.11%	0.00%
7	Resolution of billing/ charging complaints(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	≤1week	≤1week	≤1week	≤1week	≤1 week	≤1week	≤1week	≤1week	≤1week	≤1 week	≤1 week	≤1 week	≤1 week
8	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	96%	87%	97%	98.0%	100%	46%	73%	84.80%	100%	96.27%	87.92%	56.70%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	79%	74.5%	96.0%	99.6%	98%	87.36%	59%	98%	100%	82%	88.59%	78.60%
9	Termination/closure of service	<=7days	100%	97.15%	65.85%	NA	100%	100%	100%	NA	NA	99.96%	100.0%	96.33%
10	Time taken for refunds of deposits after closures.(within 60 days)	100%	100%	100%	100%		100%	100%	100%			100%	100.0%	100.0%

NA: Not Applicable, NP: Not Provided

From the month data assessment, it is found that all the operators are meeting the network parameters by and large, except for Etisalat is not meeting the benchmark for parameter “BTS Accumulated Downtime” & except for Parameter “Worst affected cells>3% TCH drop” Aircel, Idea, BSNL & Tata GSM are not meeting the benchmark for with the value of 5.56%, 8.15%, 5.07% & 7.38% respectively.

In case of POI Uninor, Aircel & Videocon having congestion in 1 POI respectively.

Performance related to customer care it is found parameter “calls answered by operators (voice-to-voice)” is not met by Aircel, Airtel, RCom(GSM&CDMA), Vodafone &Tata(GSM&CDMA) and for the parameter “Accessibility of call centre” Uninor, Reliance (GSM & CDMA) , Tata (GSM & CDMA) & Airtel.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted at Uttar Pradesh, East 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 Lucknow, Kanpur & Varanasi. In all the cities, zones were selected for covering different density areas (High, Medium & Low dense areas).

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom	Tata
			GSM Operators									CDMA Operators	
1.1	Blocked Call Rate (<=3%)	Lucknow	2.40%	0%	1%	0%	1.65%	1.65%	4.7%	1.94%	0.80%	0%	0.00%
		Kanpur	1.25%	0%	0%	0%	6.6%	2%	6.2%	1.20%	1.20%	0.65%	0.90%
		Varanasi	1.26%	0.00%	2.43%	3.30%	0.0%	0.65%	3.8%	2.60%	0.62%	0%	0.00%
1.2	Dropped Call Rate (<=2%)	Lucknow	1.60%	0%	1%	0%	2.5%	0%	0%	1.94%	1.60%	2.3%	0.00%
		Kanpur	2.51%	0%	0%	0%	1.5%	0%	0.7%	0.60%	1.20%	1.3%	0.00%
		Varanasi	0.70%	0.00%	3.25%	0.65%	0.0%	1.30%	0.75%	2.60%	0.62%	1.4%	0.60%
1.3	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	Lucknow										100%	99.10%
		Kanpur										98.06%	97.93%
		Varanasi										100%	97.50%
	(ii) 0-5 (with frequency hopping)	Lucknow	96%	98%	96%	96%	85%	95%	95%	95%	97%		
		Kanpur	93.40%	98.10%	95.5%	96.32%	82%	95%	94.8%	95.10%	95.73%		
Varanasi		93.60%	98.70%	95.6%	96.1%	91%	91%	92.2%	97.00%	95.17%			
1.4	Call Setup Success Rate (>=95%)	Lucknow	97.60%	100%	99%	100%	98.35%	98.35%	95.3%	98.06%	99.20%	100%	100%
		Kanpur	98.75%	100%	100%	100%	93.40%	98%	93.8%	98.80%	98.80%	99.35%	99.10%
		Varanasi	98.74%	100%	97.57%	96.7%	100%	99.35%	96.2%	97.40%	99.38%	100%	100%

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

- “Blocked Call Rate” benchmark is not met by Uninor for all 3 cities, Rcom GSM & Idea in Kanpur & Varanasi respectively.
- “Drop call rate” benchmark is not met by Reliance GSM & CDMA in Lucknow, Aircel in Kanpur and BSNL & Videocon in Varanasi respectively.
- “Percentage of connections with good voice quality” parameter is not met by Aircel (Kanpur & Varanasi), Reliance GSM (all 3 cities), Tata GSM (Varanasi) and Uninor (Kanpur & Varanasi).
- “Call setup success rate” is not met by Reliance GSM and Uninor in Kanpur.

Independent Drive Test

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone
			GSM Operators								
1.1	Blocked Call Rate (<=3%)	Lucknow	1.92%	0.00%	0.94%	1.50%	9.30%	0.00%	2.18%	3.63%	0.00%
		Kanpur	0.80%	0.00%	0.00%	1.20%	3.60%	1.93%	2.40%	3.75%	1.11%
		Varanasi	1.92%	0.00%	2.09%	3.87%	0.00%	0.65%	2.80%	1.20%	0.60%
1.2	Dropped Call Rate (<=2%)	Lucknow	0.96%	0.00%	0.94%	0.00%	0.00%	0.00%	1.45%	4.20%	0.70%
		Kanpur	1.53%	0.00%	0.00%	1.20%	1.81%	0.64%	2.40%	6.25%	0.55%
		Varanasi	2.88%	0.00%	0.70%	2.32%	0.00%	1.30%	1.76%	3.36%	0.00%
1.3	Percentage of connections with good voice quality (=>95%)										
	(i) 0-4 (w/o frequency hopping)	Lucknow									
		Kanpur									
		Varanasi									
	(ii) 0-5 (with frequency hopping)	Lucknow	95.10%	98.33%	97.00%	96.71%	88.00%	95.60%	96.50%	91.00%	97.87%
		Kanpur	92.90%	98.21%	95.50%	95.35%	86.00%	93.80%	97.00%	87.11%	96.87%
Varanasi		97.40%	98.80%	95.80%	96.86%	95.00%	91.00%	87.00%	88.00%	97.20%	
1.4	Call Setup Success Rate (>=95%)	Lucknow	98%	100%	99%	99%	91%	100%	98%	96%	100%
		Kanpur	99.20%	100%	100%	98.80%	96.40%	98.07%	97.60%	96.25%	98.89%
		Varanasi	98.08%	100%	97.91%	96.13%	100%	99.35%	97.20%	98.80%	99.40%

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

- “% Good Voice Quality” parameter is not met by Aircel in Kanpur, Reliance GSM in Lucknow & Kanpur, Tata GSM in Kanpur & Varanasi, Uninor in Varanasi and Videocon (all 3 cities) respectively.
- “Blocked Call Rate” is not met by Idea in Varanasi and Reliance GSM & Videocon (Lucknow & Kanpur).
- “Dropped Call Rate” is not met by Aircel & Idea in Varanasi, Uninor in Kanpur and Videocon in all the 3 cities.
- “CSSR” benchmark of 95% is not met by Reliance GSM in Lucknow.

PMR Verification

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter			GSM Operators										CDMA	
(A)	Network Service Quality Parameter														
1	Network Availability														
	BTS Accumulated Downtime	<=2%	Reported	0.31%	0.19%	0.73%	4.50%	0.41%	0.33%	0.08%	1.14%	0.48%	0.39%	0.43%	0.03%
			Verified	0.31%	0.19%	0.73%	4.50%	0.41%	0.33%	0.08%	1.14%	0.48%	0.39%	0.43%	0.03%
	Worst affected BTSs due to downtime	<=2%	Reported	1.24%	0.71%	4.99%	17.71%	0.19%	0.38%	0.02%	0.45%	0.00%	1.99%	1.16%	0.00%
Verified			1.24%	0.71%	4.99%	17.71%	0.19%	0.38%	0.02%	0.45%	0.00%	1.99%	1.16%	0.00%	
2	Connection Establishment (Accessibility)														
	CSSR (Call Setup Success Rate)	>=95%	Reported	98.86%	99.18%	97.67%	99.60%	99.67%	99.40%	99.22%	97.34%	98.08%	98.02%	98.49%	99.64%
			Verified	98.86%	99.18%	97.67%	99.60%	99.67%	99.40%	99.22%	97.34%	98.08%	98.02%	98.49%	99.64%
	SDCCH/PAGING congestion	<=1%	Reported	0.12%	0.14%	0.60%	0.82%	0.94%	0.45%	0.02%	0.29%	0.46%	0.63%	0.00%	0.00%
			Verified	0.12%	0.14%	0.60%	0.82%	0.94%	0.45%	0.02%	0.29%	0.46%	0.63%	0.00%	0.00%
	TCH congestion	<=2%	Reported	0.28%	0.33%	1.43%	0.05%	1.95%	0.66%	0.05%	0.38%	0.05%	0.81%	0.65%	0.07%
Verified			0.28%	0.33%	1.43%	0.05%	1.95%	0.66%	0.05%	0.38%	0.05%	0.81%	0.65%	0.07%	
3	Connection maintenance (retainability)														
	CDR	<=2%	Reported	0.73%	1.13%	1.53%	0.39%	1.30%	0.39%	1.12%	1.89%	1.16%	1.69%	0.96%	0.50%
			Verified	0.73%	1.13%	1.53%	0.39%	1.30%	0.39%	1.12%	1.89%	1.16%	1.69%	0.96%	0.50%
	Worst affected cells>3% TCH drop	<=5%	Reported	9.78%	3.99%	3.50%	0.42%	8.06%	1.53%	3.34%	5.74%	0.00%	7.32%	0.95%	0.17%
			Verified	9.78%	3.99%	3.50%	0.42%	8.06%	1.53%	3.34%	5.74%	0.00%	7.32%	0.95%	0.17%
	Good voice quality	>=95%	Reported	98.40%	98.32%	97.33%	99.22%	96.35%	97.95%	96.08%	95.26%	99.90%	95.51%	97.20%	99.35%
Verified			98.40%	98.32%	97.33%	99.22%	96.35%	97.95%	96.08%	95.26%	99.90%	95.51%	97.20%	99.35%	
4	No. of POI having >=0.5% POI congestion	<=0.5%	Reported	0	0	0	0	0	0	0	6	0	0	0	0
			Verified	0	0	0	0	0	0	0	6	0	0	0	0
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.09%	0.04%	0.08%	NA	0.16%	0.08%	0.00%	NA	NA	0.10%	0.08%	0.04%
			Verified	0.09%	0.04%	0.08%		0.16%	0.08%	0.00%			0.10%	0.08%	0.04%

6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.15%	0.00%	0.08%	0.48%	0.10%	0.05%	0.00%	0.09%	0.00%	0.02%	0.04%	0.03%															
			Verified	0.15%	0.00%	0.08%	0.48%	0.10%	0.05%	0.00%	0.09%	0.00%	0.02%	0.04%	0.03%															
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100.0%	100%	100%	NA	100.0%	100%	100%															
			Verified	100%	100%	100%	100%	100%	100.0%	100%	100%		100%	100%	100%															
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	Reported	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	100%															
			Verified	100%	100%	100%		100%	100%	100%			100%	100%																
8	Response time to customers for assistance																													
																Accessibility of call centre/Customer Care	>=95%	Reported	100%	98%	99%	98%	100%	84%	100%	72.36%	100%	100%	78.00%	98.00%
	Verified	100%	98%	99%	98%	100%	84%	100%	72.36%	100%	100%	78.00%	98.00%																	
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	91.23%	91.40%	93.59%	98.92%	99.16%	94.00%	84.1%	92.49%	100%	97.62%	90.00%	90.46%															
Verified			91.23%	91.40%	93.59%	98.92%	99.16%	94.00%	84.1%	92.49%	100%	97.62%	90.00%	90.46%																
9	Termination/closure of service																													
																No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100%	100%	100%	NA	100%	100%	100%	NA	NA	99.00%	100%	100%
																		Verified	100%	100%	100%		100%	100%	100%			99.00%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	100%	NA	100%	100%	NA	NA	NA	100%	98%	98%															
			Verified	100%	100%	100%		100%	100%				100%	100%	98%	98%														

NA: Not Applicable, NP: Not Provided

Critical Analysis (PMR Verification):

- The figures proved by all the operators match the figures obtained on verification.
- Etisalat is not meeting the Network Availability parameters. BSNL is showing deviation in the "worst affected BTS due to downtime" parameter.
- Aircel, Idea, Uninor & Vodafone are having below benchmark performance for "worst affected cells >3% TCH drop"
- Uninor is having >=0.5% congestion in 6 POIs.
- Idea is having below benchmark performance of "meter/billing credibility" for post-paid connections and Aircel & Etisalat for pre-paid connections.
- Reliance GSM & CDMA and Uninor are not meeting the benchmark for "Accessibility of call centre" with 84%, 78% and 72.36% respectively.
- Tata GSM is not meeting the 90% benchmark for "%age of calls answered by operators" with a value of 84.1%.

I. Cellular Mobile Telephone Service

(A) MSC Audit

(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA	
A	Network Service Quality Parameter													
1	Connection Establishment (Accessibility)													
	a) CSSR	>=95%	98.02%	99.23%	95.35%	99.26%	99.41%	99.49%	96.50%	98.28%	97.85%	98.54%	98.43%	99.46%
	b) SDCCH/PAGING congestion	<=1%	0.03%	0.16%	0.07%	0.00%	0.97%	0.25%	0.24%	0.35%	0.03%	0.43%	0.00%	0.00%
	c) TCH congestion	<=2%	0.45%	0.28%	0.05%	0.19%	1.92%	0.59%	1.91%	0.95%	0.39%	0.63%	1.14%	0.00%
2	Connection maintenance													
	a) CDR	<=2%	0.71%	0.92%	1.27%	0.43%	1.23%	0.33%	1.09%	1.55%	1.55%	1.65%	0.77%	0.87%
	b) Cells having > 3% TCH drop	<=5%	5.41%	3.74%	4.59%	1.04%	7.30%	4.07%	7.67%	1.12%	1.79%	4.61%	0.69%	0.00%
	c) Good voice quality	>=95%	96.57%	98.50%	96%	99.03%	96.15%	97.79%	95.95%	96.11%	95.14%	95.75%	NP	NP
	d) No. of cells > 3% TCH drop		406	874	6	1	1,061	360	551	91	23	1,115	15	0
	e) Total no. of cells in the network		7,563	654,790	138	96	14,480	8,853	7,185	8,177	1,266	24,176	2,227	2,527
3	Number of POI having ≥0.5% POI congestion	<=0.5%	1	0	0	0	0	0	0	1	1	0	0	0
	a) Name of POI is not meeting benchmark		BSNL	Nil	Nil	Nil	Nil	Nil	Nil	Airtel	Idea	Nil	Nil	Nil
	b) Total No. of circuits on POI		34468	250688	109,037	1997	154026	404788	3700	48064	8171	211973	404788	66534
	c) Avg No. of call attempts on POI		799142	4317509	61,229	4535	3247026	531209	19314	2018218	127554	540302	531209	910580
	d) Avg traffic served on POI (Erlang)		25524	158811	857	156	101659	22200	353	35628	2738	126327	22200	32115
	e) Total number of working POI Service Area wise		122	213	81	22	249	96	8	82	58	287	96	219
	f) Equipped Capacity of Network in respect of Traffic in erlang		104671	443108	8680	7466	182042	294548	109270	93247	15,376	665961	294548	16769
	g) Total traffic handled in TCBH in erlang		23771.6	364297	1974	126.62	131008	100639	33727	71065	13	341859	100639	2617
(B)	Customer Service Quality Parameters													
4	Response time to customers for assistance													
	a) Accessibility of call centre	>=95%	100%	100%	97%	100%	100%	46%	99%	100%	100%	100%	88%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	93%	97.5%	97%	100%	100%	96.89%	98%	69%	100%	100%	98.64%	95%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		100	100	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)		100	100	97	100	100	46	99	100	100	100	88	100

NA: Not Applicable, NP: Not Provided

Parameter-wise Findings (Live Data Assessment):

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

- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 95.35% and 99.49%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 0.97%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.92%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.33% and 1.65%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except for Aircel, Idea & Tata GSM with value of 5.41%, 7.3% & 7.67% respectively, rest of the operators are satisfying the benchmark with value in between 0% and 4.61%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** Rcom & Tata CDMA has declared that the parameter is not system generated. Rests of the operators are meeting the benchmark with values lying between 95.14% and 99.03%.
- **Number of POI having $\geq 0.5\%$ POI congestion (benchmark $\leq 0.5\%$):** Except to Uninor , Aircel & Videocon with having 1 POIs each, all the operators are meeting the benchmark . 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 to Rcom GSM & Rcom CDMA with value of 46% & 87.8%, rest of operators are meeting the benchmark with value lying between 96.5% & 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for Uninor with a values of 69%, rest of the operators are satisfying the benchmark with value in between 93% and 100%.

	a) Equipped Capacity of Network Erlang		104671	443108	8680	7466	182042	294548	109270	93247	15,376	665961	294548	16769
	b) Total traffic in TCBH in erlang (Avg.)		23772	364297	1974	126.62	131008	100639	33727	71065	13	341859	100639	2617
	c) Total no. of customers served (as per VLR) on last day of the month		NP	11003959	NP	6081	5234937	NP	1441058	1792109	NP	10488613	NP	639678
(B)	Customer Service Quality Parameters													
6	Metering/billing credibility-Post paid	$\leq 0.1\%$	0.10%	0.01%	0.01%	NA	0.02%	0.12%	0.00%	NA	NA	0.10%	0.10%	0.00%
	a) No. of bills issued during the period		987	51209	113486	NA	34741	5065	8350	NA	NA	193753	146516	58599
	b) No. of bills disputed including billing complaints during the period		1	7	14	NA	8	6	2	NA	NA	191	147	1
7	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.08%	0.02%	0.00%	0.00%	0.05%	0.10%	0.00%	0.09%	0%	0.10%	0.11%	0.00%
	a) No. of charging / credit / validity complaints during the quarter		1466	2860	250	0	4048	597	0	8344	0	11673	575	1309
	b) Total no. of pre-paid customers at the end of the quarter		1896000	15089073	9370341	19496	7465161	6242122	3127655	3482878	19786	12738610	5015298	1357044
8	Resolution of billing/ charging complaints(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		1,467	2,867	264	14	12,067	603	2	8,344	0	32,829	722	1,331
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		1,467	2,867	264	14	12,067	603	2	8,344	0	32,829	722	1,331
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		175	2,809	0	0	2,881	106	2	3,080	0	11,992	650	1,310
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		1,292	58	0	14	344	497	0	5,264	0	20,837	72	21
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week	≤ 1 week
9	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	$\geq 95\%$	95.27%	87.00%	97.00%	98.00%	100.00%	46.00%	73.00%	84.80%	100.00%	97%	87.92%	56.70%
	b) % call answered by operators(voice to voice) within 60 sec.	$\geq 90\%$	79.00%	74.50%	96.00%	99.60%	98.00%	87.36%	59.00%	98.00%	100.00%	82.00%	88.59%	78.60%

	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		274239	3748944	17559	1984	2022235	1108822	1480761	6974506	593	3985859	1052451	148770
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		216647	3246816	16849	1977	1991375	968668	457081	6140107	593	3261486	932409	116847
10	Termination/closure of service	<i><=7days</i>	100%	97.15%	65.85%	NA	100%	100%	100%	NA	NA	99.96%	100%	96.33%
	a) Total No. of requests for Termination / Closure of service received during the quarter		5	492	410	NA	165	6	318	NA	NA	2,426	251	218
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		5	478	270	NA	165	6	318	NA	NA	2,425	251	210
11	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	100%	100%

NA: Not Applicable, NP: Not Provided

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** Except to Etisalat with value of 4.83%, rest of the operators are meeting the benchmark with values lying between 0.00% and 1.27%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** Except to Etisalat with value of 31.03%, rests of operators are meeting the benchmark with values lying between 0% and 1.93%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 95.72% and 99.75%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0.00% and 0.97%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.81%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.13% and 1.84%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except for Aircel, BSNL, Idea & Tata GSM with value of 5.56%, 5.07%, 8.15% & 7.38%, rest of the operators are satisfying the benchmark with value in between 0% and 4.92%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** Rcom CDMA has declared that the parameter is not system generated. Rests of the operators are meeting the benchmark with values lying between 95.3% and 99.08%.
- **Number of POI having $\geq 0.5\%$ POI congestion (benchmark $\leq 0.5\%$):** Except for Uninor, Aircel & Videocon with havin 1 POIs each, rest of the operators are meeting the benchmark . 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 Airtel, Rcom GSM, Tata-GSM, Uninor ,Rcom CDMA & Tata CDMA with value of 87%, 46%, 73%, 84.8%, 87.92% & 56.7%, rest of the operators are meeting the benchmark with values lying between 97% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$): %):** Only BSNL, Etisalat, Idea, Uninor & Videocon are meeting the benchmark with values of 96%, 99.6%, 98%, 98% & 100% respectively. Values range from 59% to 88.59% for other operators.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** Except for Rcom GSM with a values of 0.12%, all other operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** Except for Rcom CDMA with value of 0.11%, all the operators are meeting the benchmark with values lying between 0% and 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):** Except for Airtel, BSNL, Vodafone & Tata CDMA with value of 97.15%, 65.85%, 99.96% & 96.33%, rest of the operators have satisfied the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** All operators have satisfied the benchmark.

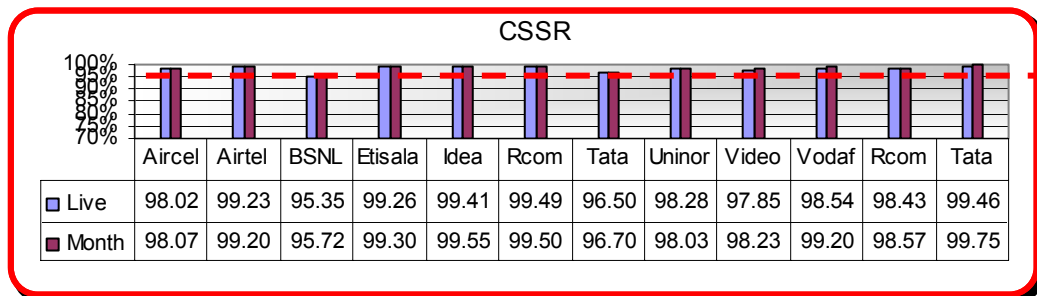
(1) Sample Coverage

Switches/BSC/BTS details of operators:

S/N	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	2	21	2515
2	Airtel Ltd	30	91	7880
3	BSNL	25		6020
4	Etisalat	1	11	32
5	Idea	6	37	4843
6	Reliance Communication (GSM)	3	17	3350
7	Tata Communications (GSM)	2	20	2401
8	Uninor	7	17	2752
9	Videocon	2	7	422
10	Vodafone	32	132	8127
CDMA Operators				
11	Reliance Communication (CDMA)	5	11	2262
12	Tata Communications (CDMA)	5	10	841

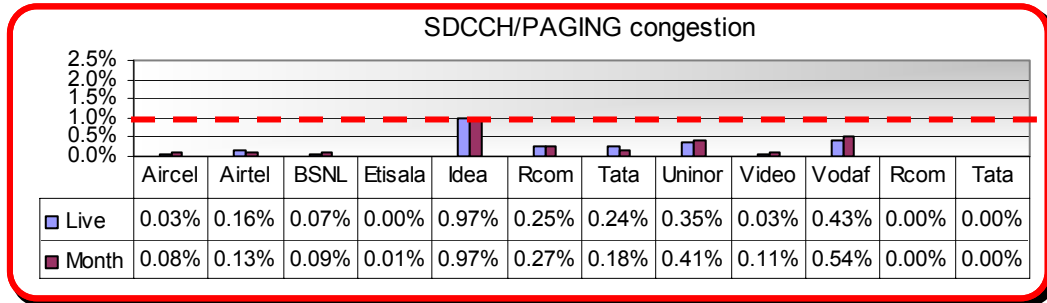
(2) Performance (Graphical Representation)**Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services****A) NETWORK PERFORMANCE**

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

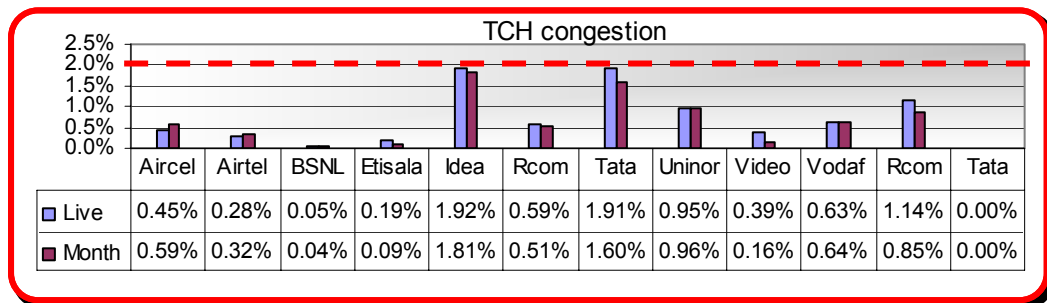


II. Blocked call rate:

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

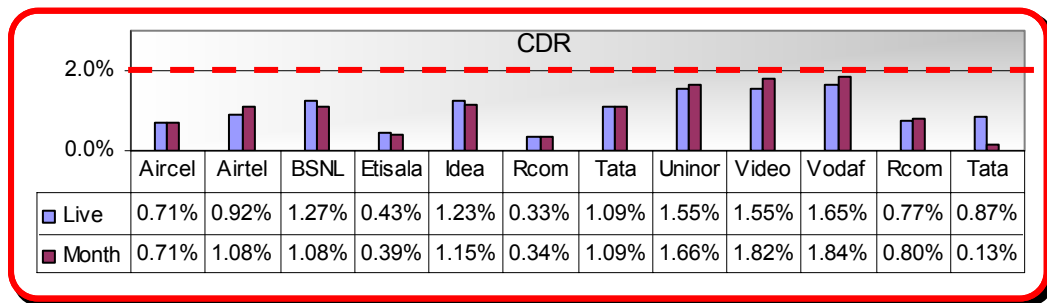


TCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

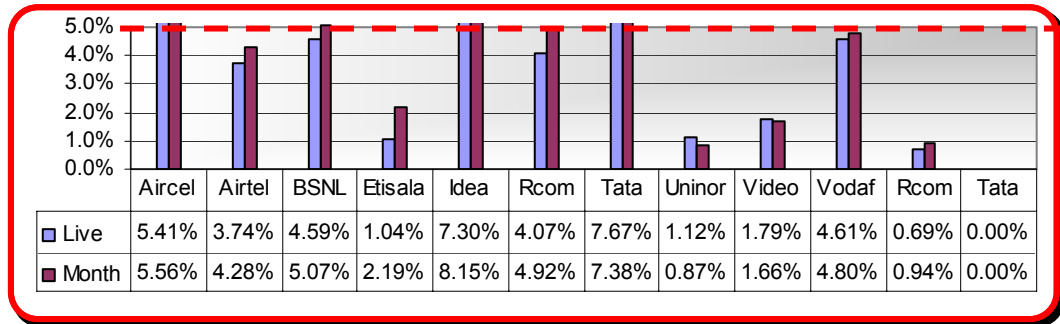


III. Connection Maintainability (Retainability):

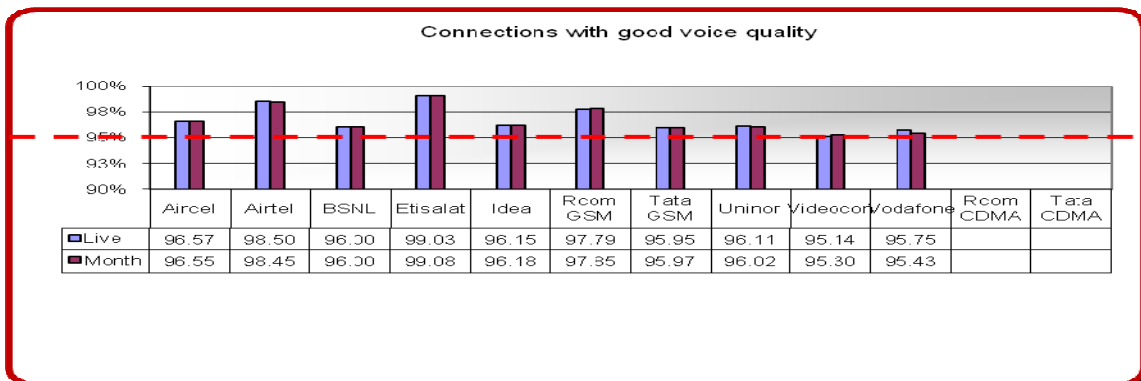
Call drop rate (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



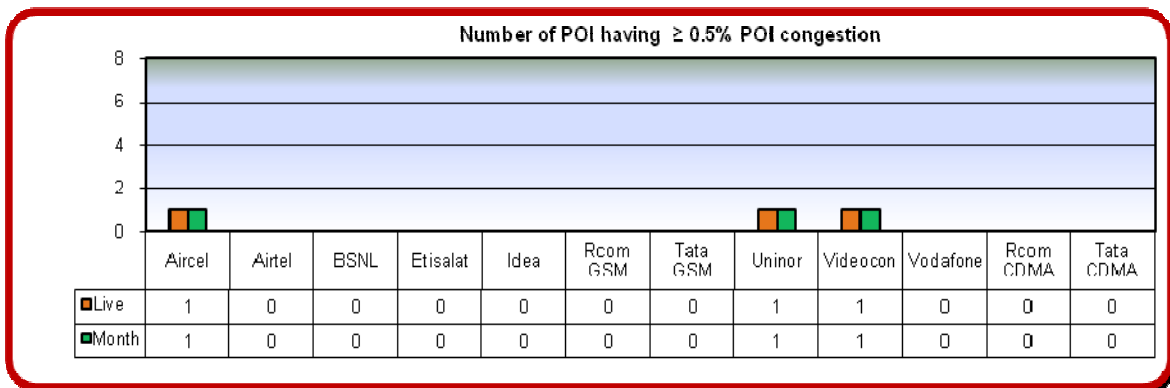
Worst affected Cell exceeding 3% TCH Drop: Aircel, Idea & Tata GSM are not meeting the benchmark in live data & month of audit for both. BSNL is also not meeting the benchmark for month of audit. Rests of the operators are meeting the benchmark for both cases.



Percentage of connections with good voice quality (benchmark >= 95%): All operators are meeting the TRAI benchmarks (\Rightarrow 95%) for both one month data and 3 days live data taken in the month of audit. CDMA service providers has not submitted data as same is not system generated.



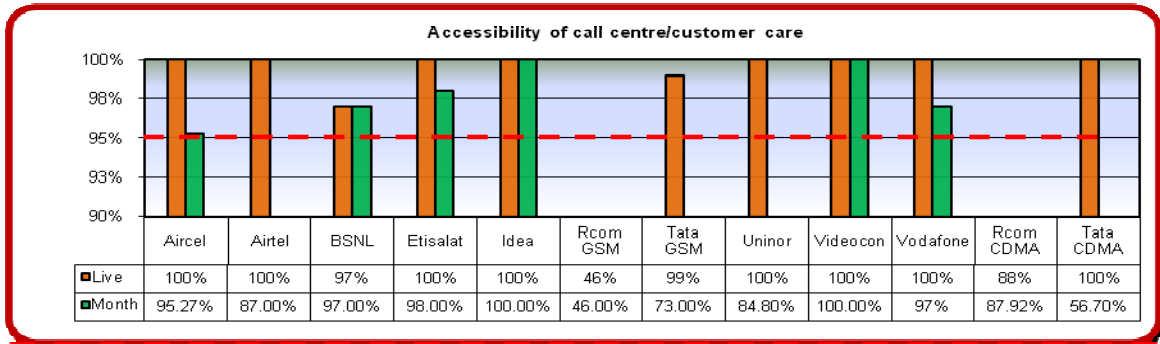
Number of POI having $\geq 0.5\%$ POI congestion: Aircel, Uninor & Videocon were found 1 no of POI having congestion for live & month both.



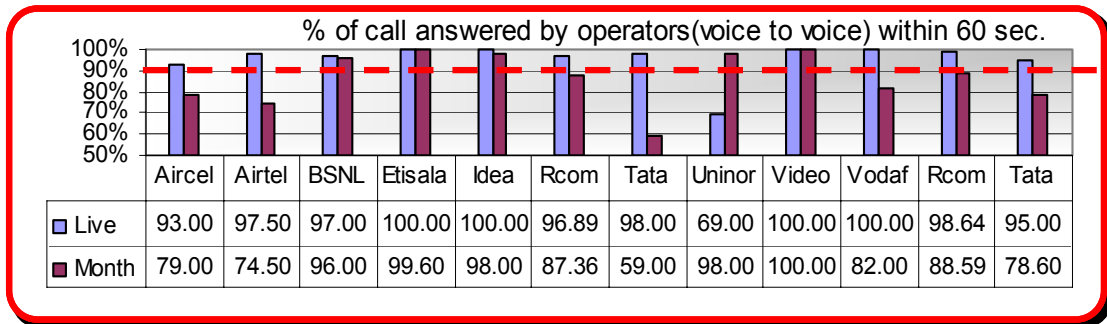
B) CUSTOMER SERVICE QUALITY PARAMETERS

(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 except for Rcom GSM & Rcom CDMA in live data & month of audit data .Airtel, Tata GSM, Uninor & Tata CDMA are not meeting the benchmark in month of audit.



Percentage of call answered by operators (Voice to voice) within 60 sec: For live data, Uninor is not meeting the benchmark & for month of audit, Aircel, Airtel, Rcom GSM, Tata GSM, Vodafone, Rcom CDMA & Tata CDMA are not meeting the benchmark. Rests of the operators are meeting the 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 Network Availability(Etisalat), “worst affected cells $>3\%$ TCH drop” (Aircel, BSNL, Idea & Tata GSM), metering/billing credibility for postpaid & prepaid (Rcom GSM & Rcom CDMA) “accessibility of call centre” (Airtel, Rcom GSM Tata GSM, Uninor, Rcom CDMA & Tata-CDMA) & “%age of calls answered by operator” (Aircel, Airtel, Rcom GSM, Tata GSM,Uninor,Vodafone, Rcom CDMA & Tata CDMA) .

(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	Etisalat	Idea	Reliance (GSM)	Tata (GSM)	Uninor	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)
Total No. of calls	70	60	40	-	30	20	2	40	-	70	30	40
Cases resolved with 4 weeks	70	60	40	-	30	20	2	40	-	70	30	40
%age of cases resolved	100%	100%	100%	-	100%	100%	100%	100%	-	100%	100%	100%

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

	OPERATORS NAME											Rcom	Tata
	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom	TATA	UNINOR	Videocon	Vodafone			
	GSM										CDMA		
1ST HALF (10AM TO 01 PM)	34	39	46	46	49	22	31	40	44	35	38	37	
2ND HALF (04PM TO 07 PM)	39	29	40	44	46	39	47	44	46	40	36	35	
In % age	73.00	68.00	86.00	90.00	95.00	61.00	78.00	84.00	90.00	75.00	74.00	72.00	

(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 Lucknow 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 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 (Uttar Pradesh East 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	Etisalat	Idea	Reliance (GSM)	Tata (GSM)	Uninor	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)
Aircel	-	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	99%	100%	98%	100%	100%	100%	100%	99%	100%	100%
BSNL	100%	96%	-	100%	100%	98%	100%	100%	100%	100%	100%	100%
Etisalat	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	97%	100%
Idea	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%
Reliance (GSM)	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Tata (GSM)	99%	99%	100%	100%	100%	97%	-	97%	100%	100%	100%	100%
Uninor	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
Videocon	100%	100%	98%	100%	100%	100%	100%	100%	-	99%	100%	99%
Vodafone	99%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Reliance (CDMA)	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%	-	100%
Tata (CDMA)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-

(3) Critical Analysis

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

(D) Drive test of the mobile network of service providers**(1) Sample Coverage**

The Operator Assisted Drive Test was conducted at Uttar Pradesh (East) circle 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***LUCKNOW***

LOW DENSE: Charbagh, Nakahidola, Aminabad,, Medical college, Chowk, Amausi
 MEDIUM DENSE: Ram Ram bank, Tehripulia, Kalyanpur, Politechnic, Hazratganj
 HIGH DENSE: Narhi, Joppling road, Mahanagar, Vikasnagar, Vijaykhand, Gomtinagar

KANPUR

LOW DENSE: Cantt, Ramadevi, Mallroad, Barachauraha, Bhautipanki, Govind Nagar
 MEDIUM DENSE: Kalyanpur, Panki, Armapur, bus stand, Bhauti,, Ghanta ghar
 HIGH DENSE: Birhanaroad, Nayaganj, Moolganj, Rehmani Market, Vijas Nagar

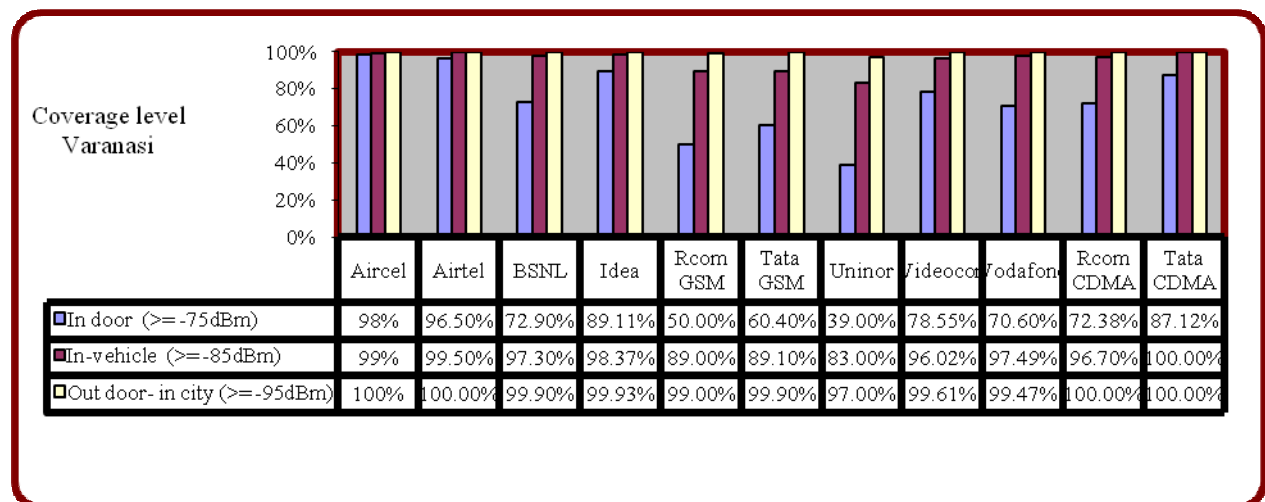
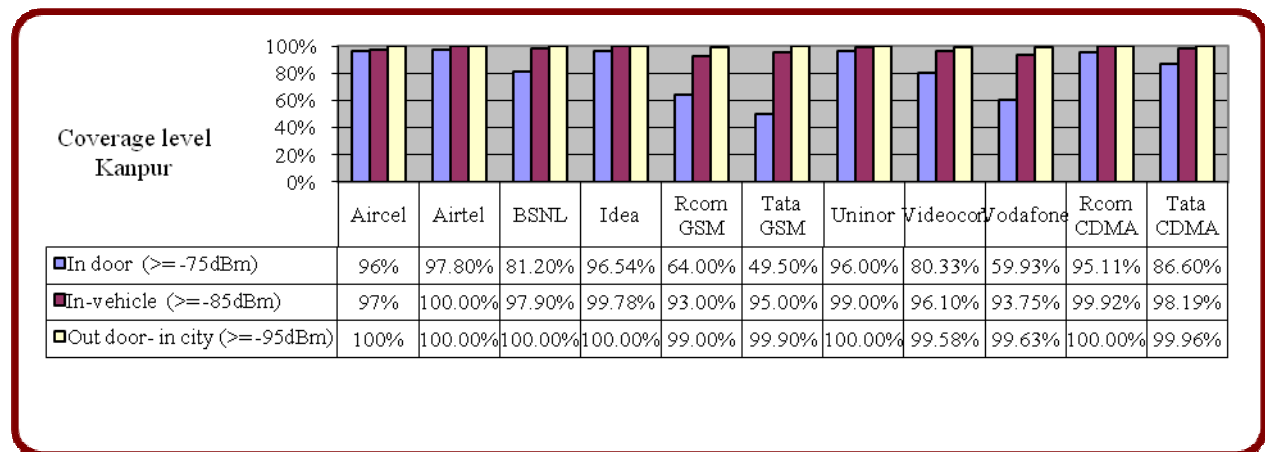
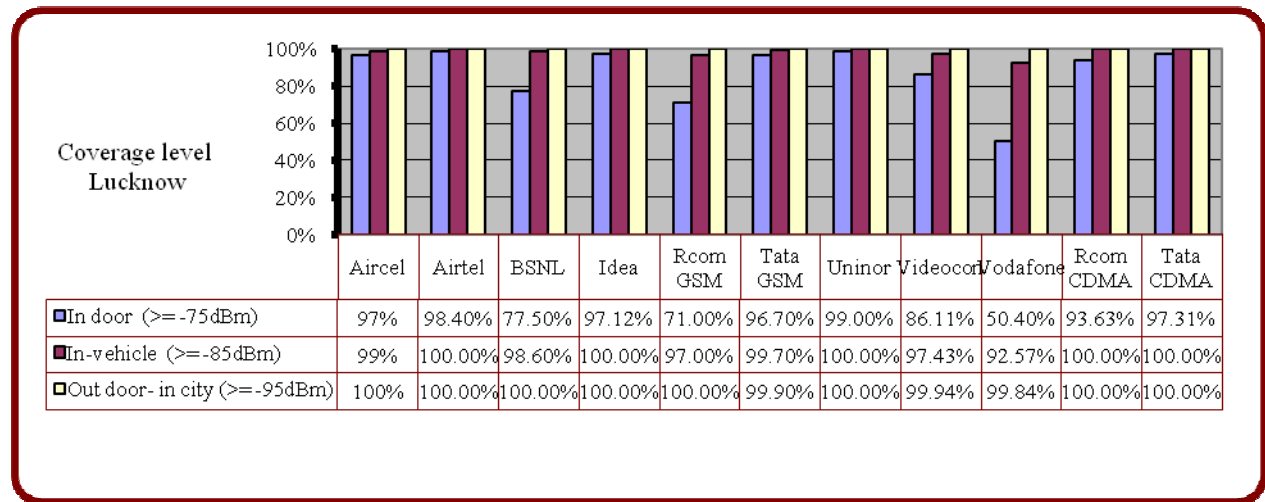
VARANASI

LOW DENSE: Rathyatra, Gurubagh, godhulia chowk, Adampurwa, BHU
 MEDIUM DENSE: Ashokpur colony, Bhagwanpur, Chatipur, Lanka, DLW
 HIGH DENSE: Mint house, Chauka ghat, Jawahar Nagar, Lehrata rly colony.

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

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	
			GSM Operators											
1.1	Call Attempts	Lucknow	125	103	100	106	121	121	107	154	128	130	113	
		Kanpur	159	225	64	86	137	150	145	167	165	154	120	
		Varanasi	160	120	123	152	142	153	132	117	160	144	162	
1.2	Blocked Call Rate (<=3%)	Lucknow	2.40%	0%	1%	0.00%	1.65%	1.65%	4.70%	1.94%	0.80%	0.00%	0%	
		Kanpur	1.25%	0%	0%	0.00%	6.60%	2.00%	6.20%	1.20%	1.20%	0.65%	0.9%	
		Varanasi	1.26%	0%	2.43%	3.30%	0.00%	0.65%	3.80%	2.60%	0.62%	0.00%	0%	
1.3	Dropped Call Rate (<=2%)	Lucknow	1.60%	0%	1%	0.00%	2.50%	0.00%	0.00%	1.94%	1.60%	2.30%	0%	
		Kanpur	2.51%	0%	0%	0.00%	1.50%	0.00%	0.70%	0.60%	1.20%	1.30%	0%	
		Varanasi	0.70%	0%	3.25%	0.65%	0.00%	1.30%	0.75%	2.60%	0.62%	1.40%	0.6%	
1.4	Percentage of connections with good voice quality (>=95%)													
	(i) 0-4 (w/o frequency hopping)	Lucknow											100%	99.1%
		Kanpur											98.06%	97.93%
		Varanasi											100%	97.5%
	(ii) 0-5 (with frequency hopping)	Lucknow	96%	98.4%	96%	95.60%	85%	94.60%	95%	95.30%	97.20%			
		Kanpur	93.40%	98.1%	95.50%	96.32%	82%	95%	94.80%	95.10%	95.73%			
Varanasi		93.60%	98.7%	95.60%	96.10%	91%	91%	92.20%	97%	95.17%				
1.5	Service Coverage													
	In door (>= -75dBm)	Lucknow	97%	98.4%	77.5%	97.12%	71%	96.7%	99%	86.11%	50.40%	93.63%	97.31%	
		Kanpur	96%	97.8%	81.2%	96.54%	64%	49.5%	96%	80.33%	59.93%	95.11%	86.60%	
		Varanasi	98%	96.5%	72.9%	89.11%	50%	60.4%	39%	78.55%	70.60%	72.38%	87.12%	
	In-vehicle (>= -85dBm)	Lucknow	99%	100%	98.6%	100%	97%	99.7%	100%	97.43%	92.57%	100%	100%	
		Kanpur	97%	100%	97.9%	99.78%	93%	95%	99%	96.10%	93.75%	99.92%	98.19%	
		Varanasi	99%	99.5%	97.3%	98.37%	89%	89.1%	83%	96.02%	97.49%	96.70%	100%	
	Out door- in city (>= -95dBm)	Lucknow	100%	100%	100%	100%	100%	99.9%	100%	99.94%	99.84%	100%	100%	
		Kanpur	100%	100%	100%	100%	99%	99.9%	100%	99.58%	99.63%	100%	99.96%	
		Varanasi	100%	100%	99.9%	99.93%	99%	99.90%	97%	99.61%	99.47%	100%	100%	
1.6	Call Setup Success Rate (>=95%)	Lucknow	97.60%	100%	99%	100%	98.35%	98.35%	95.30%	98.06%	99.20%	100%	100%	
		Kanpur	98.75%	100%	100%	100%	93.40%	98.00%	93.80%	98.80%	98.80%	99.35%	99.1%	
		Varanasi	98.74%	100%	97.57%	96.70%	100.00%	99.35%	96.20%	97.40%	99.38%	100%	100%	

Graphical Representation



(3) Critical Analysis

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

- Blocked Call Rate benchmark is not met by Uninor for all 3 cities, Rcom GSM & Idea in Kanpur & Varanasi respectively.
- Drop call rate benchmark is not met by Reliance GSM & CDMA in Lucknow, Aircel in Kanpur and BSNL & Videocon in Varanasi..
- "Percentage of connections with good voice quality" parameter is not met by Aircel (Kanpur & Varanasi), Reliance GSM (3 cities), Tata GSM (Varanasi) and Uninor (Kanpur & Varanasi).
- Call setup success rate is not met by Reliance GSM and Uninor in Kanpur.

(E) Independent Drive Test**(1) Sample Coverage**

The Independent Drive Test was conducted at Uttar Pradesh (East) circle 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***LUCKNOW***

LOW DENSE: Charbagh, Nakahidola, Aminabad,, Medical college, Chowk, Amausi
 MEDIUM DENSE: Ram Ram bank, Tehripulia, Kalyanpur, Politechnic, Hazratganj
 HIGH DENSE: Narhi, Joppling road, Mahanagar, Vikasnagar, Vijaykhand, Gomtinagar

KANPUR

LOW DENSE: Cantt, Ramadevi, Mallroad, Barachauraha, Bhautipanki, Govind Nagar
 MEDIUM DENSE: Kalyanpur, Panki, Armapur, bus stand, Bhauti,, Ghanta ghar
 HIGH DENSE: Birhanaroad, Nayaganj, Moolganj, Rehmani Market, Vijas Nagar

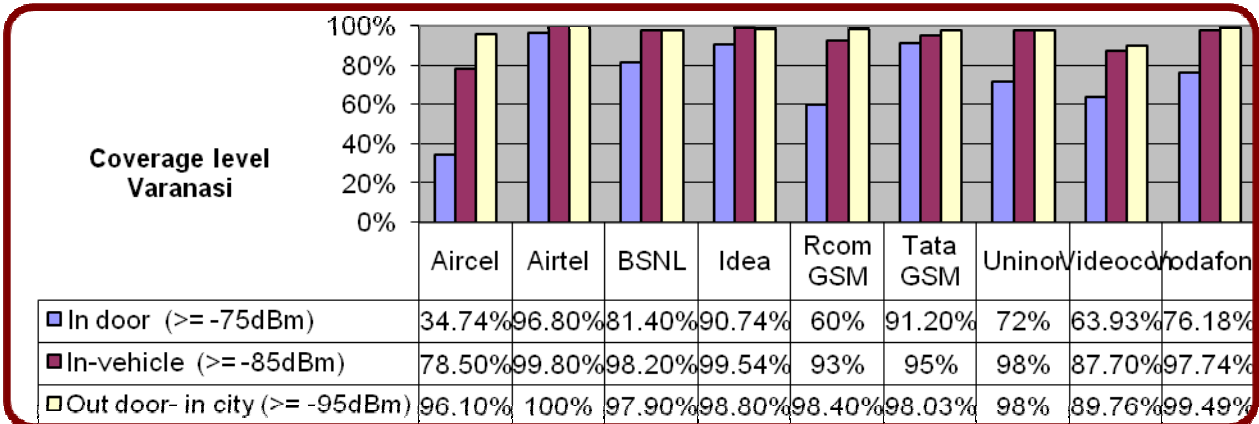
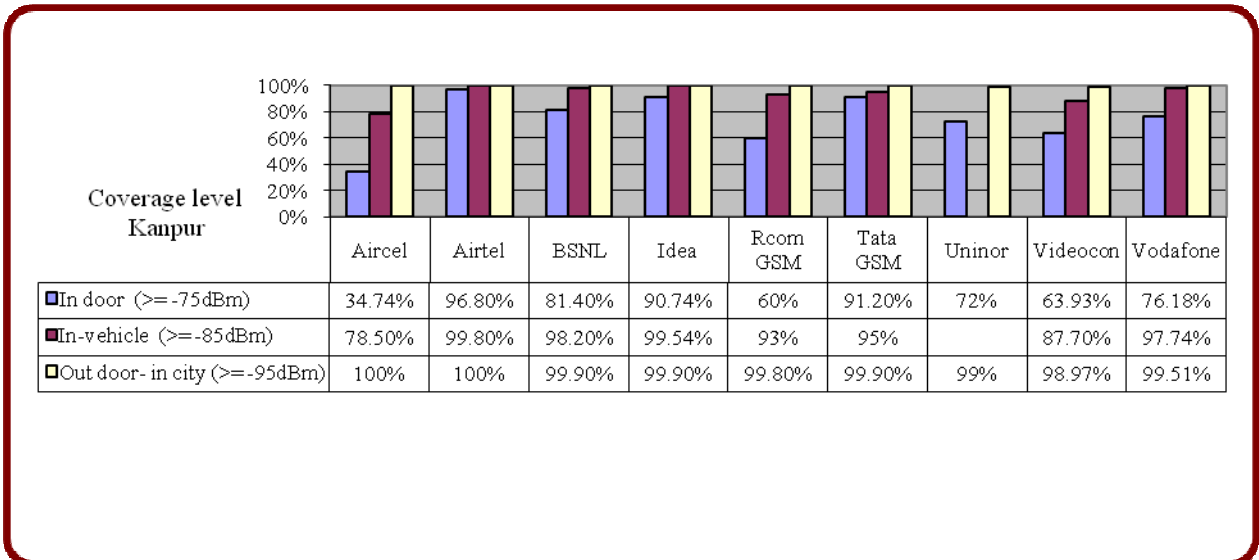
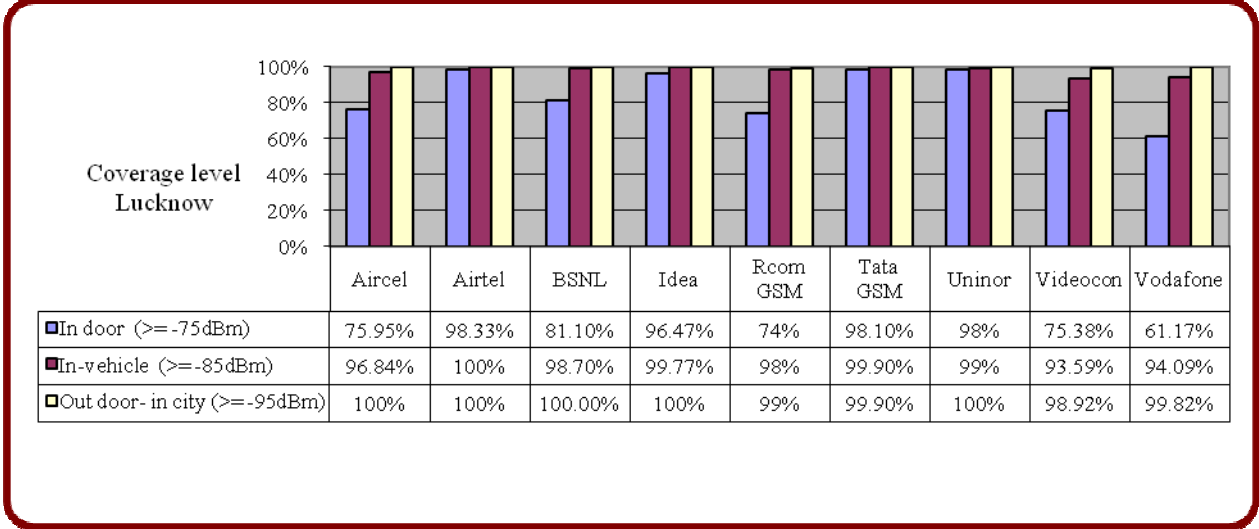
VARANASI

LOW DENSE: Rathyatra, Gurubagh, godhaulia chowk, Adampurwa, BHU
 MEDIUM DENSE: Ashokpur colony, Bhagwanpur, Chatipur, Lanka, DLW
 HIGH DENSE: Mint house, Chauka ghat, Jawahar Nagar, Lehrata rly colony

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

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone
			GSM Operators								
1.1	Call Attempts	Lucknow	104	99	106	134	119	129	137	119	143
		Kanpur	130	218	64	84	165	155	83	160	180
		Varanasi	104	124	143	129	125	153	102	166	186
1.2	Blocked Call Rate (<=3%)	Lucknow	1.92%	0%	0.94%	1.50%	9.30%	0%	2.18%	3.63%	0.00%
		Kanpur	0.80%	0%	0%	1.20%	3.60%	1.93%	2.40%	3.75%	1.11%
		Varanasi	1.92%	0%	2%	3.87%	0.00%	0.65%	2.80%	1.20%	0.60%
1.3	Dropped Call Rate (<=2%)	Lucknow	0.96%	0%	0.94%	0.00%	0.00%	0.00%	1.45%	4.20%	0.70%
		Kanpur	1.53%	0%	0%	1.20%	1.81%	0.64%	2.40%	6.25%	0.55%
		Varanasi	2.88%	0%	0.70%	2.32%	0.00%	1.30%	1.76%	3.36%	0%
1.4	Percentage of connections with good voice quality (>=95%)										
	(i) 0-4 (w/o frequency hopping)	Lucknow									
		Kanpur									
		Varanasi									
	(ii) 0-5 (with frequency hopping)	Lucknow	95.10%	98.33%	97%	96.71%	88%	95.60%	96.50%	91%	97.87%
		Kanpur	92.90%	98.21%	95.50%	95.35%	86%	93.80%	97%	87.11%	96.87%
Varanasi		97.40%	98.80%	95.80%	96.86%	95%	91%	87%	88%	97.20%	
1.5	Service Coverage	Kanpur									
	In door (>= -75dBm)	Lucknow	75.95%	98.33%	81.10%	96.47%	74%	98.10%	98%	75.38%	61.17%
		Kanpur	68.31%	97.88%	81.20%	93.90%	60%	95.60%	51%	69.69%	67.77%
		Varanasi	34.74%	96.80%	81.40%	90.74%	60%	91.20%	72%	63.93%	76.18%
	In-vehicle (>= -85dBm)	Lucknow	96.84%	100%	98.70%	99.77%	98%	99.90%	99%	93.59%	94.09%
		Kanpur	94.61%	100%	97.90%	99.50%	90%	91%	87%	91.18%	95.15%
		Varanasi	78.50%	99.80%	98.20%	99.54%	93%	95%	98%	87.70%	97.74%
	Out door- in city (>= -95dBm)	Lucknow	100%	100%	100.00%	100%	99%	99.90%	100%	98.92%	99.82%
		Kanpur	100%	100%	100%	100.00%	99%	99.90%	100%	99.70%	99.64%
Varanasi		100%	100%	99.90%	99.90%	99.80%	99.90%	99%	98.97%	99.51%	
1.6	Call Setup Success Rate (>=95%)	Lucknow	98%	100%	99%	99%	91%	100%	98%	96%	100%
		Kanpur	99%	100%	100%	99%	96%	98%	98%	96%	99%
		Varanasi	98%	100%	98%	96%	100%	99%	97%	99%	99%

Graphical Representation



(3) Critical Analysis

- Good Voice Quality parameter is not met by Aircel in Kanpur, Reliance GSM in Lucknow & Kanpur, Tata GSM in Kanpur & Varanasi, Uninor in Varanasi and Videocon (3 cities).
- Blocked Call Rate is deviated by Idea in Varanasi and Reliance GSM & Videocon (Lucknow & Kanpur).
- Dropped Call Rate is not met by Aircel & Idea in Varanasi, Uninor in Kanpur and Videocon in all the 3 cities.
- CSSR benchmark of 95% is not met by Reliance GSM in Lucknow.

(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 (Uttar Pradesh East) 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 Aircel, BSNL, Idea, TTSL(GSM),.

Regarding the POI Congestion, Videocon is not meeting the benchmark for live measurement & month of audit and Uninor and Videocon are also not meeting the benchmark for month of audit. All other operators are meeting the TRAI benchmarks ($\leq 0.5\%$) for both one month data and 3 days live data taken in the month of audit.

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

Regarding **Metering/Billing Credibility** issues, Rcom(GSM) shows below benchmark value for Post-paid connections.

Regarding **Time taken for refund of deposits after closures** issues, Airtel, BSNL & Tata CDMA shows below benchmark value.

Blocked Call Rate benchmark is not met by Uninor for all 3 cities, Rcom GSM & Idea in Kanpur & Varanasi respectively.

Drop call rate benchmark is not met by Reliance GSM & CDMA in Lucknow, Aircel in Kanpur and BSNL & Videocon in Varanasi

III. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

IV. Broadband Service Providers

.....Audit not done for this quarter