

REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
NORTH ZONE – DELHI-NCR CIRCLE

Report Period: April 2011 – June 2011

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Table of Contents

CHAPTER-1: Introduction

- I. Background
- II. Objectives and Methodology

CHAPTER-2: Executive Summary

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

CHAPTER-3: Audit-PMR data verification results

- I. Cellular Mobile Telephone Service
- II. Basic Service (Wire Line) Service
 - *Not conducted for this quarter*
- III. Broadband Service
 - *Not conducted for this quarter*

CHAPTER-4: Detailed Findings & Analysis

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

(C) Inter operator call assessment

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

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

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

(E) Independent Drive Test

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

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

II. Basic Telephone Service (Wireline) Providers

- Not conducted for this quarter

III. Broadband Service Providers

- Not conducted for this quarter

CHAPTER-1: INTRODUCTION

I. Background

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

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

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

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

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

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

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

II. Objectives and Methodology

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

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

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

Systems audited:-

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

Facilities audited:-

1. Billing documents.
2. Customer Care records.

Field data collections carried out:-

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

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

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

CHAPTER-2: EXECUTIVE SUMMARY

I. Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in Delhi-NCR Circle in 2nd 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 October-December 2010.

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

Sl.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	June-2011	2000-2100 hrs
2	Airtel Ltd	June-2011	2000-2100 hrs
3	MTNL	June-2011	2000-2100 hrs
4	Etisalat	June-2011	2000-2100 hrs
5	Idea	June-2011	1900-2000 hrs
6	Reliance Communication (GSM)	June-2011	1900-2000 hrs
7	Vodafone	June-2011	2000-2100 hrs
CDMA Operators			
8	MTS (CDMA)	June-2011	2000-2100 hrs
9	Reliance Communication (CDMA)	June-2011	1900-2000 hrs
10	Tata Communications (CDMA)	June-2011	2000-2100 hrs

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

(A) Cellular Mobile Telephone Services

<u>3 days Live Data Audit</u>		Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafon e	MTS	Rcom CDM A	Tata CDM A
S/ N	Name of Parameter		GSM Operators						CDMA Operators			
1	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	98.27 %	99.90 %	98.90%	99.47 %	97.10 %	99.75 %	99.78%	99.32 %	99.70%	98.69%
	b) SDCCH/PAGING congestion	<=1%	0.36%	0.01%	0.20%	0.14%	0.84%	0.07%	0.03%	0%	0%	0%
	c) TCH congestion	<=2%	1.21%	0.06%	0.52%	0.31%	1.75%	0.15%	0.16%	0.59%	0.29%	1.12%
2	Connection maintenance (retainability)											
	a) CDR	<=2%	0.82%	0.61%	1.50%	0.74%	1.27%	0.35%	1.26%	0.25%	0.30%	0.75%
	b) Worst affected cells>3% TCH drop	<=3%	2.68%	1.04%	8.04%	2.15%	4.73%	0.59%	5.85%	0.44%	1.12%	1.96%
	c) Good voice quality	>=95%	97.35 %	98.99 %	96.61%	98.38 %	98.10 %	99.71 %	97.84%	100%	NA	NA
3	No. of POI's having >0.5% POI congestion	>0.5%	3	10	1	0	0	0	1	0	0	0
4	Response time to customers for assistance											
	a) Accessibility of call centre/Customer Care	>=95%	100%	100%	99.43%	99.73%	99.90%	37.87%	100%	100%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	95.21 %	94.58 %	35.12%	71.55 %	95.63 %	56.41 %	99.37%	96.31 %	93.99%	97.58%

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters by and large, except for Etisalat, MTNL & Vodafone not meeting the benchmark for “Worst affected cells>3% TCH drop” with the value of 8.04%, 4.73% & 5.85% respectively. Aircel, Airtel and Etisalat were found 3, 10 & 1 no of POIs respectively having congestion. CDMA service provider except MTS did not submit the value as the same is not system generated.

Performance related to customer care data is found to be satisfactory for most of the operators. Etisalat, Idea & reliance GSM show below benchmark value for the parameter “calls answered by operators (voice-to-voice)”. Reliance GSM is having a very low accessibility of call centre (37.87%).

One Month Data Audit		Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter											
(A)	Network Service Quality Parameter											
1	Network Availability											
	a) BTS Accumulated Downtime	<=2%	0.22%	0.01%	0.54%	0.13%	0.38%	0.31%	0.05%	0.16%	0.19%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.47%	0.00%	1.47%	0.03%	1.87%	0.65%	0.00%	0.99%	0.00%	0.00%
2	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	98.24%	99.87%	98.52%	99.43%	97.23%	99.76%	99.89%	99.29%	99.61%	98.66%
	b) SDCCH/PAGING congestion	<=1%	0.39%	0.04%	0.25%	0.17%	0.79%	0.06%	0.01%	0%	0%	0%
	c) TCH congestion	<=2%	1.15%	0.06%	0.79%	0.35%	1.73%	0.14%	0.09%	0.62%	0.32%	1.09%
3	Connection maintenance (retainability)											
	a) CDR	<=2%	0.77%	0.62%	1.54%	0.74%	1.49%	0.34%	1.25%	0.23%	0.31%	0.80%
	b) Worst affected cells>3% TCH drop	<=3%	2.59%	0.93%	7.67%	2.22%	4.80%	0.67%	5.33%	0.59%	1.20%	2.16%
	c) Good voice quality	>=95%	97.48%	99%	96.75%	98.38%	98.10%	99.76%	97.84%	100%	NA	NA
4	No. of POI's having >0.5% POI congestion	>0.5%	10	NP	2	0	0	0	2	0	0	0
(B)	Customer Service Quality Parameters											
5	Metering/billing credibility-Post paid	<= 0.1%	0.09%	0.03%	NA	0.07%	NP	0.10%	0.01%	0.88%	0.04%	0.03%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.09%	0.01%	1.58%	0.03%	0.01%	0.01%	0.00%	0.01%	0.01%	0.03%
7	Resolution of billing/ charging complaints	100% within 4 weeks	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%
8	Response time to customers for assistance											
	a) Accessibility of call centre/Customer Care	>=95%	NP	100%	98.64%	99.42%	100%	37.90%	100%	100%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	NP	93.42%	86.11%	70.18%	99.71%	70.16%	99.68%	94.53%	89.85%	97.43%
9	Termination/closure of service	<=7days	100%	100%	NA	99.71%	100%	100%	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	NA	100%	NP	100%	100%	100%	100%	99.76%

NA: Not Applicable, NP: Data 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, MTNL & Vodafone not meeting the benchmark for “Worst affected cells>3% TCH drop” with the value of 7.67%, 4.8% & 5.33% respectively. Aircel, Airtel and Etisalat show POI congestion. CDMA service provider except MTS did not submit the value as the same is not system generated.

Performance related to customer care data is found to be satisfactory for most of the operators. While Reliance GSM has very poor accessibility of call center, Etisalat, Idea, Reliance GSM & CDMA show poor performance for the parameter “calls answered by operators (voice-to-voice)”. Data has not been provided by Aircel for the parameters related to "Response time to customers for assistance".

Idea terminated 99.71% connections within 7 days as prescribed by TRAI (1384 out of 1388 customers). Tata CDMA refunded the balance amount to 99.76% customers within 60 days after closure (409 out of 410 customers).

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted in Delhi-NCR circle for all the operators. Route covered was about around 200 Km within the speed limit of 40Km/hr. Zones was selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators						CDMA Operators			
1.1	Blocked Call Rate (<=3%)	Delhi-NCR	0.53%	0.24%	0.00%	0.68%	4.13%	2.31%	0.75%	0.00%	0.36%	0.00%
1.2	Dropped Call Rate (<=2%)	Delhi-NCR	0.00%	0.00%	0.89%	1.37%	6.88%	0.00%	0.38%	0.00%	1.78%	0.37%
1.3	Percentage of connections with good voice quality (=>95%)	Delhi-NCR										
	(i) 0-4 (w/o frequency hopping)									94.34%	100%	96.60%
	(ii) 0-5 (with frequency hopping)		97.30%	92.83%	87.36%	96%	90.22%	91.73%	96.05%			
1.4	Call Setup Success Rate (>=95%)	Delhi-NCR	99.47%	99.76%	100%	99.32%	95.87%	97.69%	99.25%	100%	99.64%	100%

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

- MTNL is not meeting the benchmark for Blocked Call Rate (4.13%) & Dropped Call Rate (6.88%).
- “%age of good voice quality connections” parameter is not met by Airtel, Etisalat, MTNL, Reliance GSM & MTS.

Independent Drive Test

The Independent Drive Test was conducted in Delhi-NCR circle. Here again, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	Etisalat	Idea	MTNL	Vodafone	MTS	Tata CDMA
			GSM Operators						CDMA Operators	
1.1	Blocked Call Rate (<=3%)	Delhi-NCR	0.28%	0.24%	0.45%	0.34%	0.00%	0.75%	0.00%	0.74%
1.2	Dropped Call Rate (<=2%)	Delhi-NCR	0.00%	0.72%	0.45%	0.69%	4.90%	0.77%	0.97%	0.00%
1.3	Percentage of connections with good voice quality (>=95%)	Delhi-NCR								
	(i) 0-4 (w/o frequency hopping)								94.99%	96.73%
	(ii) 0-5 (with frequency hopping)		97.20%	97.85%	87.75%	96.00%	87.55%	96.85%		
1.4	Call Setup Success Rate (>=95%)	Delhi-NCR	99.72%	99.76%	99.55%	99.66%	100.00%	99.25%	100.00%	99.26%

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

- MTNL is not meeting the benchmark for Dropped Call Rate .
- Etisalat, MTNL & MTS are not meeting the benchmark for %age of good voice quality connections.

CHAPTER-3: Audit-PMR data verification results

I. Cellular Mobile Telephone Service

PMR		Bench- mark	Audit	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
(A)	Network Service Quality Parameter												
1	Network Availability												
	BTS Accumulated Downtime	<=2%	Reported	0.07%	0.02%	4.31%	0.04%	0.30%	0.37%	0.02%	0.17%	0.25%	0%
			Verified	0.07%	0.02%	4.31%	0.04%	0.30%	0.37%	0.02%	0.17%	0.25%	0%
	Worst affected BTSs due to downtime	<=2%	Reported	0.42%	0.03%	9.72%	0.04%	4.04%	0.63%	0.00%	0.00%	0.09%	0%
Verified			0.42%	0.03%	9.72%	0.04%	4.04%	0.63%	0.00%	0.00%	0.09%	0%	
2	Connection Establishment (Accessibility)												
	CSSR (Call Setup Success Rate)	>=95%	Reported	97.83%	99.59%	97.42%	99.80%	97.11%	99.61%	99.20%	99.12%	98.72%	99.85%
			Verified	97.83%	99.59%	97.42%	99.80%	97.11%	99.61%	99.20%	99.12%	98.72%	99.85%
	SDCCH/PAGING congestion	<=1%	Reported	0.04%	0.09%	0.44%	0.30%	0.12%	0.28%	0.27%	0%	0%	0%
Verified			0.04%	0.09%	0.44%	0.30%	0.12%	0.28%	0.27%	0%	0%	0%	
TCH congestion	<=2%	Reported	0.07%	0.19%	0.80%	0.54%	1.02%	0.94%	0.49%	0%	0.82%	0.01%	
		Verified	0.07%	0.19%	0.80%	0.54%	1.02%	0.94%	0.49%	0%	0.82%	0.01%	
3	Connection maintenance (retainability)												
	CDR	<=2%	Reported	0.90%	0.61%	2.93%	0.75%	1.62%	0.45%	1.05%	0.33%	0.81%	0.30%
			Verified	0.90%	0.61%	2.93%	0.75%	1.62%	0.45%	1.05%	0.33%	0.81%	0.30%
	Worst affected cells>3% TCH drop	<=5%	Reported	2.64%	0.81%	9.09%	2.33%	4.88%	0.97%	3.92%	2%	2.62%	0.11%
Verified			2.64%	0.81%	9.09%	2.33%	4.88%	0.97%	3.92%	2%	2.62%	0.11%	
Good voice quality	>=95%	Reported	97.20%	99.13%	96.96%	98.17%	98.09%	98.33%	98.12%	99.12%	98.68%	99.68%	
		Verified	97.20%	99.13%	96.96%	98.17%	98.09%	98.33%	98.12%	99.12%	98.68%	99.68%	
4	No. of POI having congestion	<=0.5%	Reported	0	0	2	0	0	0	0	0	0	0
			Verified	0	0	2	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters												
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.10%	0.04%	NA	0.04%	0.03%	0.08%	0.03%	0.00%	0.08%	0.14%
			Verified	0.10%	0.04%	NA	0.04%	0.03%	0.08%	0.03%	0.00%	0.08%	0.14%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.09%	0.08%	0.10%	0.04%	0.02%	0.03%	0.00%	0.16%	0.03%	0.13%
			Verified	0.09%	0.08%	0.10%	0.04%	0.02%	0.03%	0.00%	0.16%	0.03%	0.13%

PMR		Bench- mark	Audit	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	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%	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance		Reported										
			Verified										
	Accessibility of call centre/Customer Care	>=95%	Reported	100%	100%	98.49%	99%	99.97%	99%	100%	97.41%	96%	95%
			Verified	100%	100%	98.49%	99%	99.97%	99%	100%	97.41%	96%	95%
% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	50.40%	77%	94.45%	28%	99.57%	59%	77%	93.96%	93%	72%	
		Verified	50.40%	77%	94.45%	28%	99.57%	59%	77%	93.96%	93%	72%	
9	Termination/closure of service		Reported										
			Verified										
	No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100%	100%	NA	99%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	NA	99%	100%	100%	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	NA	100%	100%	100%	100%	100%	100%	82%
			Verified	100%	100%	NA	100%	100%	100%	100%	100%	100%	82%

Critical Analysis (PMR Verification):

- The figures proved by all the operators match the figures obtained on verification.
- For Network Availability parameters, Etisalat & MTNL show deviation from the prescribed benchmarks.
- Etisalat is not meeting the respective benchmarks for "CDR", "Worst affected cells>3% TCH drop" & "POI congestion" with high margins.
- Etisalat is showing congestion >=0.5% in 2 POIs.
- MTS is not meeting the benchmark for "Metering/Billing Credibility-Prepaid", while Tata CDMA is not meeting this benchmark for both Postpaid & Prepaid connections.
- "% call answered by operator (voice to voice) within 60 sec." benchmark is met only by Etisalat, MTNL, MTS & Reliance CDMA.
- Idea is not meeting the 7 days' benchmark for "Termination/closure of service".
- Tata CDMA is not meeting the 60 days' benchmark for "Refund of deposits after closure of connection".

CHAPTER-4: DETAILED FINDINGS & ANALYSIS

I. Cellular Mobile Telephone Service

(A) MSC Audit

(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafon e	MTS	Rcom CDMA	Tata CDMA
			GSM Operators							CDMA Operators		
A	Network Service Quality Parameter											
1	Connection Establishment (Accessibility)											
	a) CSSR	>=95%	98.27%	99.90%	98.90%	99.47%	97.10%	99.75%	99.78%	99.32%	99.70%	98.69%
	b) SDCCH/PAGING congestion	<=1%	0.36%	0.01%	0.20%	0.14%	0.84%	0.07%	0.03%	0%	0%	0%
	c) TCH congestion	<=2%	1.21%	0.06%	0.52%	0.31%	1.75%	0.15%	0.16%	0.59%	0.29%	1.12%
2	Connection maintenance											
	a) CDR	<=2%	0.82%	0.61%	1.50%	0.74%	1.27%	0.35%	1.26%	0.25%	0.30%	0.75%
	b) Cells having > 3% TCH drop	<=3%	2.68%	1.04%	8.04%	2.15%	4.73%	0.59%	5.85%	0.44%	1.12%	1.96%
	c) Good voice quality	>=95%	97.35%	98.99%	96.61%	98.38%	98.10%	99.71%	97.84%	100%	NA	NA
	d) No. of cells > 3% TCH drop		210	113	329	186	147	38	654	11	9	78
	e) Total no. of cells in the network		7,834	10,903	4,091	8,639	3,105	6,465	11,189	2,423	833	3,989
3	No. of POI's having >0.5% POI congestion	>0.5%	3	10	1	0	0	0	1	0	0	0
	a) Name of POI not meeting the benchmark		BTSOL NLD, MTNL Local-1	Idea. Shyam Sistema, Dolphin	Airtel NLD, RCOM (GSM, CDMA & Wireline)	Nil	Nil	Nil	Nil	Nil	Nil	Nil

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafon e	MTS	Rcom CDMA	Tata CDMA
			GSM Operators							CDMA Operators		
	b) Total No. of circuits on POI		31,974	1,197,501	9,414	103,010	41,435	40,412	209,839	10,574	40,412	281,476
	c) Avg No. of call attempts on POI		690,783	4,612,903	185,581	2,209,190	610,123	727,508	4,484,216	102,020	727,508	3,528,605
	d) Avg traffic served on POI (Erlang)		12,149	179,971	5,461	54,568	12,929	16,678	115,182	1,951	16,678	142,935
	e) Total number of working POI Service Area wise		67	216	26	90	48	90	72	46	90	235
	f) Equipped Capacity of Network in respect of Traffic in erlang		98,153	3,335,066	33,098	128,076	NP	96,000	246,113	33,600	224,000	375,000
	g) Total traffic handled in TCBH in erlang		28,927	172,806	8,430	99,246	NP	88,911	208,979	4,530	121,977	135,834
(B)	Customer Service Quality Parameters											
4	Response time to customers for assistance											
	a) Accessibility of call centre	>=95%	100%	100%	99.43%	99.73%	99.90%	37.87%	100%	100%	100%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	95.21%	94.58%	35.12%	71.55%	95.63%	56.41%	99.37%	96.31%	93.99%	97.58%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		36,842	115,343	11,002	50,798	41,946	39,143	884,683	1,138	11,973	545,139
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		35,077	109,094	3,864	36,344	40,113	22,081	879,090	1,096	11,254	531,972

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Live Data Assessment):

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

- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 97.1% and 99.9%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 0.84%.
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 0.06% and 1.75%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.25% and 1.50%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** Except for Etisalat, MTNL & Vodafone, all the operators are satisfying the benchmark with value in between 0.44% and 2.68%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** CDMA service providers have declared that the parameter is not system generated. GSM operators are meeting the benchmark with values lying between 96.61% and 99.71%.
- **POI Congestion (benchmark $\leq 0.5\%$):** Aircel, Airtel, Etisalat & Vodafone were found 3, 10, 1 & 1 no of POIs having congestion. However, in such cases too, some 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 Reliance GSM, all the operators are meeting the benchmark with values lying between 99.43% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Etisalat, Reliance GSM & Idea are not meeting the benchmark value of 90%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators						CDMA Operators			
(A)	Network Service Quality Parameter											
1	Network Availability											
	a) BTS Accumulated Downtime	<=2%	0.22%	0.01%	0.54%	0.13%	0.38%	0.31%	0.05%	0.16%	0.19%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.47%	0.00%	1.47%	0.03%	1.87%	0.65%	0.00%	0.99%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		2,756	4,610	1,364	3,341	1,072	2,155	4,557	805	833	1,126
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		4,346	472	5,312	3,061	2,949	4,862	1,678	954	1,135	234
	e) No. of BTSs having accumulated downtime of >24 hours in a month		13	0	20	1	20	14	0	8	0	0
2	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	98.24%	99.87%	98.52%	99.43%	97.23%	99.76%	99.89%	99.29%	99.61%	98.66%
	b) SDCCH/PAGING congestion	<=1%	0.39%	0.04%	0.25%	0.17%	0.79%	0.06%	0.01%	0.00%	0%	0%
	c) TCH congestion	<=2%	1.15%	0.06%	0.79%	0.35%	1.73%	0.14%	0.09%	0.62%	0.32%	1.09%
3	Connection maintenance (retainability)											
	a) CDR	<=2%	0.77%	0.62%	1.54%	0.74%	1.49%	0.34%	1.25%	0.23%	0.31%	0.80%
	b) Worst affected cells>3% TCH drop	<=3%	2.59%	0.93%	7.67%	2.22%	4.80%	0.67%	5.33%	0.59%	1.20%	2.16%
	c) Good voice quality	>=95%	97.48%	99.00%	96.75%	98.38%	98.10%	99.76%	97.84%	100.00%	NA	NA
	d) Total No. of cells exceeding 3% TCH drop (call drop)		203	101	314	192	149	43	596	14	10	86
	e) Total no. of cells in the network		7,834	10,903	4,091	8,639	3,105	6,465	11,189	2,423	833	3,989

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators						CDMA Operators			
4	No. of POI's having >0.5% POI congestion	>0.5%	10	NP	2	0	0	0	2	0	0	0
	a) Name of POI not meeting the benchmark		BTSOL NLD, MTNL Local-1	Idea. Shyam Sistema, Dolphin	Airtel NLD, RCOM (GSM, CDMA & Wireline)	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	b) Total No. of call attempts on POI (Avg.)		671,377	4,181,361	207,155	2,260,725	600,875	745,497	4,230,179	100,373	745,497	3,546,208
	c) Total traffic served on POI (Erlang) (Avg.)		10,826	167,901	5,786	54,121	12,685	16,998	110,029	1,901	16,998	142,091
	d) Total No. of circuits on POI		31,974	1,197,501	9,414	103,010	41,435	40,412	209,839	10,574	40,412	281,476
	e) Total number of working POI Service Area wise		67	216	26	90	48	90	72	46	90	235
	f) Capacity of POI		30,636	1,173,212	8,559	100,305	41,435	33,966	204,085	10,037	33,966	281,476
5	Network Data											
	a) Equipped Capacity of Network Erlang		98,153	3,335,066	33,098	128,076	NP	96,000	246,113	33,600	224,000	375,000
	b) Total traffic in TCBH in erlang (Avg.)		28,927	172,806	8,430	99,246	NP	88,911	208,979	4,530	121,977	135,834
	c) Total no. of customers served (as per VLR) on last day of the month		1,081,958	6,263,119	288,702	3,549,685	1,036,138	NP	6,290,035	194,554	NP	2,414,023
(B)	Customer Service Quality Parameters											
5	Metering/billing credibility-Post paid	<= 0.1%	0.09%	0.03%	NA	0.07%	NP	0.10%	0.01%	0.88%	0.04%	0.03%
	a) No. of bills issued during the period		120,883	1,032,512	NA	470,507	NP	35,102	783,007	1,702	502,201	556,073
	b) No. of bills disputed including billing complaints during the period		104	326	NA	333	NP	35	54	15	211	157

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators						CDMA Operators			
6	Metering /billing credibility-Pre paid	<= 0.1%	0.09%	0.01%	1.58%	0.03%	0.01%	0.01%	0.00%	0.01%	0.01%	0.03%
	a) No. of charging / credit / validity complaints during the quarter		2,104	621	10,814	992	188	450	174	117	350	1,782
	b) Total no. of pre-paid customers at the end of the quarter		2,218,190	8,395,860	682,992	3,578,666	2,217,900	4,425,489	6,754,715	814,971	3,433,649	5,699,481
7	Resolution of billing/ charging complaints	100% within 4 weeks	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		2,208	15,692	10,814	6,568	394	485	347	215	561	15,067
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		2,208	15,692	10,814	6,568	394	485	347	215	561	15,067
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		1,085	947	1	1,325	NP	255	228	132	268	1,939
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		1,123	14,745	10,813	5,243	NP	230	119	83	293	13,128
	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%
8	Response time to customers for assistance											
	a) Accessibility of call centre/Customer Care	>=95%	NP	100.00%	98.64%	99.42%	100.00%	37.90%	100.00%	100.00%	100.00%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	NP	93.42%	86.11%	70.18%	99.71%	70.16%	99.68%	94.53%	89.85%	97.43%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		NP	122,485	11,323	44,917	28,087	39,176	921,916	713	12,212	510,859

S/N	Name of Parameter	Bench- mark	Aircel	Airtel	Etisalat	Idea	MTNL	Rcom GSM	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators						CDMA Operators			
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		NP	114,426	9,750	31,524	28,005	27,487	918,997	674	10,973	497,705
9	Termination/closure of service	<i><=7days</i>	100%	100%	NA	99.71%	100%	100%	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		1,905	7,222	NA	1,388	22,901	171	3,595	4	558	410
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		1,905	7,222	NA	1,384	22,901	171	3,595	4	558	410
10	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	100%	100%	NA	100%	NP	100%	100%	100%	100%	99.76%

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.01% and 0.54%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.87%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 97.23% and 99.99%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 0.79%.
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 0.06% and 1.73%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.23% and 1.54%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except for Etisalat, MTNL & Vodafone, all the operators are satisfying the benchmark with value in between 0.59% and 2.59%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** CDMA (Rcom & Tata) service providers have declared that the parameter is not system generated. GSM operators are meeting the benchmark with values lying between 96.75% and 99.76%.
- **POI Congestion (benchmark $\leq 0.5\%$):** Aircel, Etisalat & Vodafone were found 10, 2 & 2 no of POIs having congestion. Other operators are meeting the benchmark with value of 0%. Here POI congestion indicates that there were call failure greater than 0.5% on that particular POI. The call here indicates only those calls which have been already being seized by the switch and processed. But cases were found where individual POIs are showing high utilization/usage which is managed by overflow technique i.e. 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 Reliance GSM, all the operators are meeting the benchmark with values lying between 98.64% and 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Etisalat, Reliance (GSM & CDMA) and Idea are not meeting the benchmark value.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** Except for MTS with value of 0.88, all other operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** Except for Etisalat with value of 1.58%, all the operators are meeting the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark ≤ 7 days):** All operators, except Idea (99.71%), have satisfied the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** All operators, except Tata CDMA (99.76%) have satisfied the benchmark.

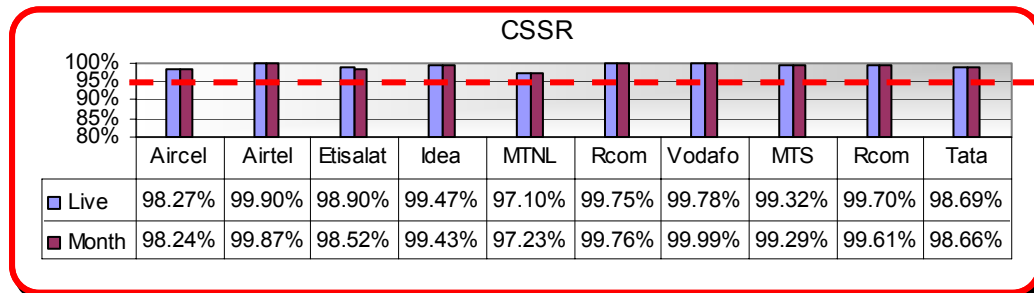
(1) Sample Coverage

Switches/BSC/BTS details of operators:

Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	3	23	2756
2	Airtel Ltd	10	51	4610
3	MTNL	2	31	1072
4	Etisalat	1	8	1364
5	Idea	8	35	3341
6	Reliance Communication (GSM)	4	12	2155
7	Vodafone	4	50	4557
CDMA Operators				
8	MTS (CDMA)	1	--	805
9	Reliance Communication (CDMA)	7	--	833
10	Tata Communications (CDMA)	8	--	1126

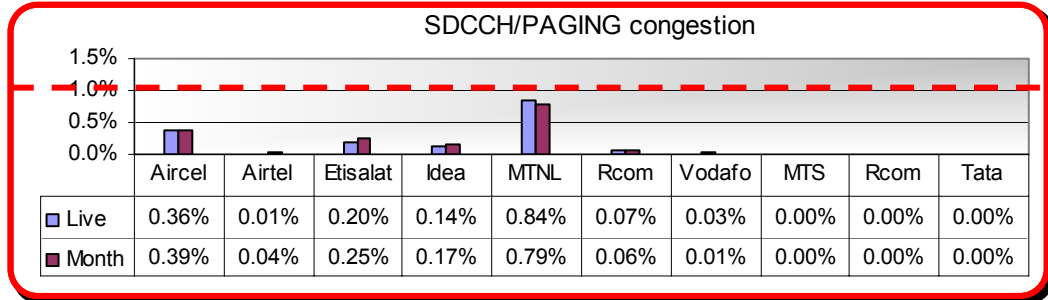
(2) Performance (Graphical Representation)**Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services****A) NETWORK PERFORMANCE**

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

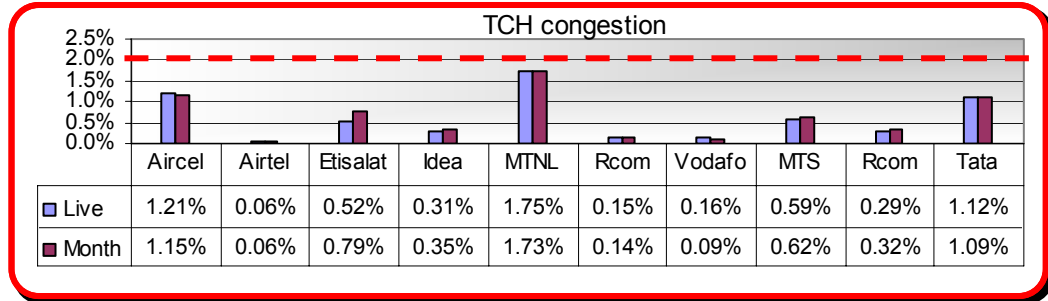


II. Blocked call rate:

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

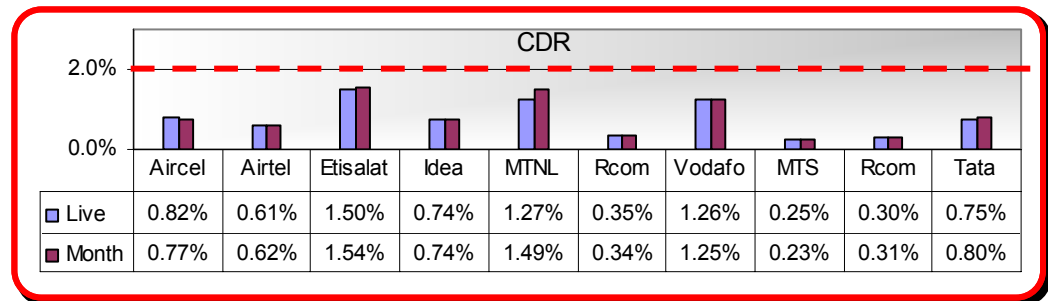


TCH congestion: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data.

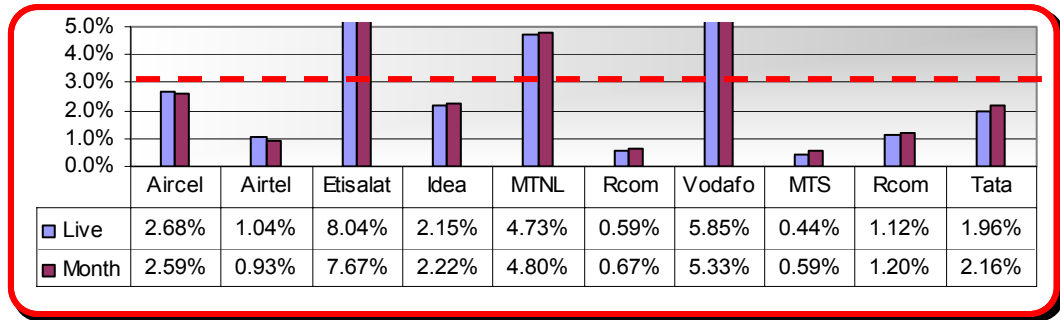


III. Connection Maintainability (Retain ability):

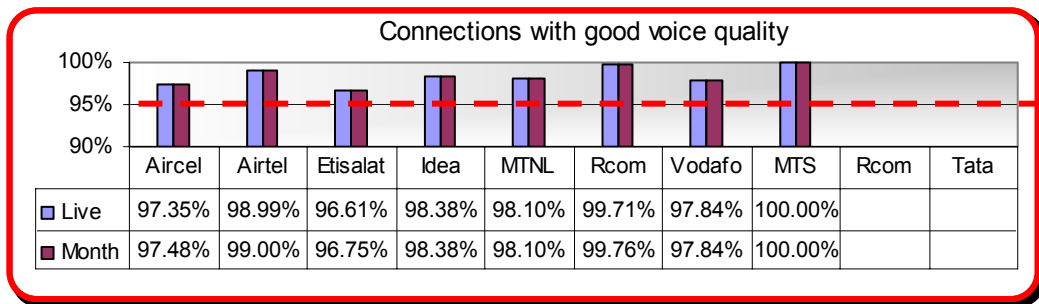
Call drop rate: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data.



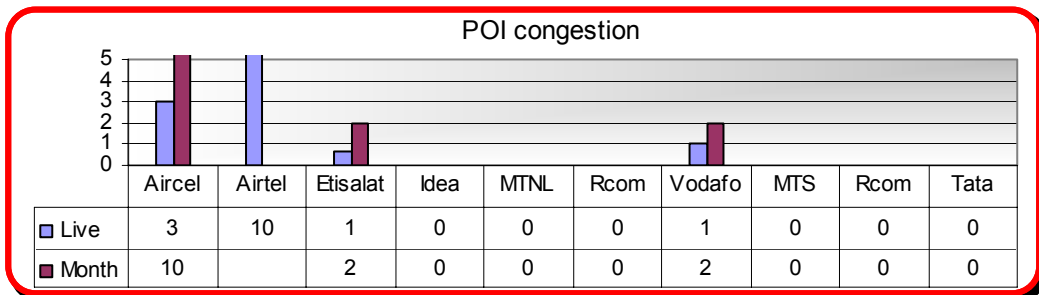
Worst affected Cell exceeding 3% TCH Drop: For both live and month data, It is found that Etisalat, MTNL & Vodafone are fails to meet the benchmark of $\leq 3\%$. Rests of the operators are meeting the benchmark for both cases.



Percentage of connections with good voice quality: All operators are meeting the TRAI benchmarks ($\Rightarrow 95\%$) for both one month data and 3 days live data. RCOM CDMA & Tata CDMA did not submit the value as the same is not system generated.



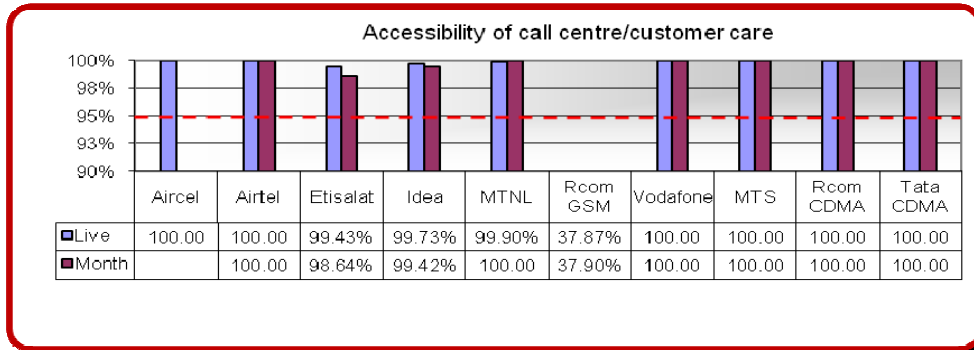
POI Congestion: Aircel, Airtel, Etisalat & Vodafone are found to have 3, 10, 1 & 1 POIs respectively with $\geq 0.5\%$ congestion during Live data audit. During the month data audit, Aircel has 10, Etisalat has 2 and Vodafone has 2 such POIs. Airtel has not provided the data.



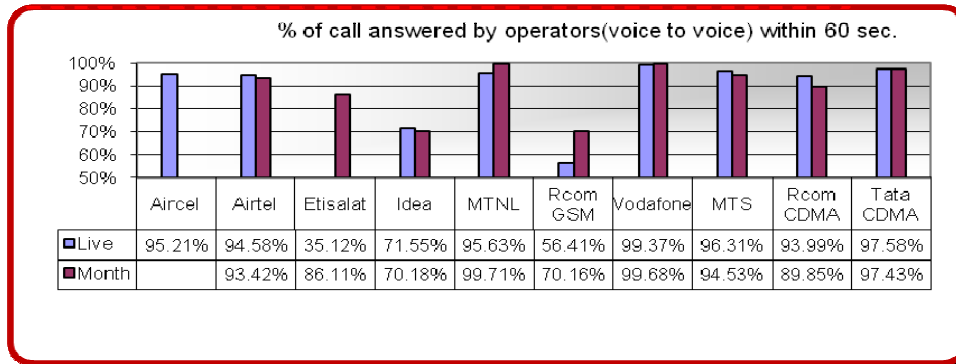
B) CUSTOMER SERVICE QUALITY PARAMETERS

(A) Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit except for Reliance GSM in both live data audit (37.87%) and month data audit (37.90%).



Percentage of call answered by operators (Voice to voice) within 60 sec: Etisalat, Idea & reliance GSM do not meet the 90% benchmark against this parameter. Reliance CDMA too is found to have a slightly below benchmark performance during the month audit.



(3) Critical Analysis

The above comparative study between live data & month data shows similar trends & consistency in both the cases. However, inconsistency in live & month data was found for parameter “%age of calls answered by operator” for Etisalat & Reliance GSM.

(B) Redressal**(1) Sample coverage**

A sample of billing complaints was taken for each operator and calls were made for assessing the resolution of billing/charging complaints within 4 weeks as claimed by the respective operators.

(2) Performance (live calling for billing complaints)

Calling Operator	Aircel	Airtel	MTNL	Etisalat	Idea	Reliance (GSM)	Vodafone	MTS	Reliance (CDMA)	Tata (CDMA)
Total No. of calls	14	12	15	10	13	11	10	5	5	16
Cases resolved with 4 weeks	14	12	15	10	13	11	10	5	5	16
%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 in each half and below given no. of calls got connected to the call center within 60 Sec.

	CALLS MADE	OPERATORS NAME									
		Aircel	Airtel	Etisalat	Idea	MTNL	RCOM	Vodafone	MTS	RCOM	TATA
		GSM					CDMA				
1ST HALF (10AM TO 01 PM)	50	46	48	47	48	47	15	45	48	48	47
2ND HALF (04PM TO 07 PM)	50	45	44	40	33	45	36	44	44	41	44
In % age		91.00	92.00	87.00	81.00	92.00	51.00	89.00	92.00	89.00	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 Delhi 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 (Delhi-NCR Circle) were made between 1100 to 1400 hrs and between 1600 to 1900 hrs.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	MTNL	Etisalat	Idea	Reliance (GSM)	Vodafone	MTS	Reliance (CDMA)	Tata (CDMA)
Aircel	-	98%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%
MTNL	100%	100%	-	100%	100%	98%	100%	100%	100%	100%
Etisalat	100%	100%	100%	-	100%	100%	100%	100%	97%	100%
Idea	100%	100%	100%	100%	-	100%	100%	100%	100%	100%
Reliance (GSM)	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
Vodafone	99%	100%	100%	100%	100%	100%	-	100%	100%	100%
MTS	100%	98%	100%	100%	100%	100%	100%	-	100%	100%
Reliance (CDMA)	100%	100%	100%	100%	100%	100%	100%	100%	-	100%
Tata (CDMA)	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 Delhi-NCR for all the operators. Route covered was about around 200Km depending on city areas within the speed limit of 40Km/hr.

Drive Test Locations

DELHI-NCR

HIGH DENSE: MG Road, Tigri, Khanpur, Pehladpur, Badarpur Border, Sector-18 Noida, Nehru Place, ISBT, Dariyaganj, Red Fort, Delhi Gate, Madhuban Chowk, Rithala, Wazirabad, Kanjhawala

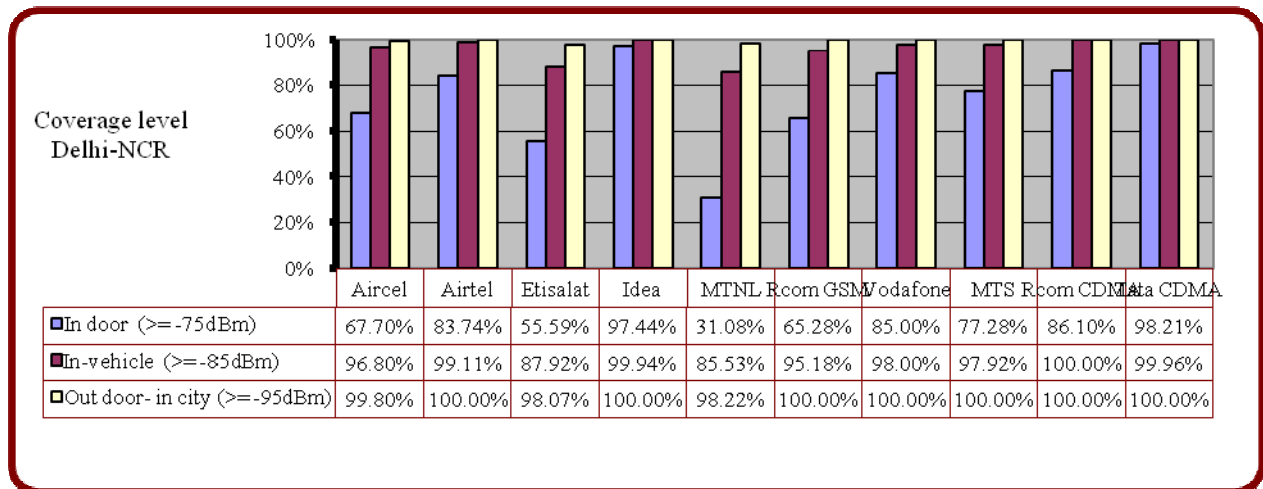
MEDIUM DENSE: Greater Kailash, Vasant Vihar, IFFCO Chowk, Ghitorni, Chattarpur, NHPC Chowk, Badkal More, Akshardham, Nizamuddin, Sarai Kale Khan, Ashram, Barakhambha Road, Shankar Road,

LOW DENSE: Sector-62 Noida, Sarita Vihar, Jasola, Kalindi Kunj

2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	Etisalat	Idea	MTNL	Reom GSM	Vodafone	MTS	Reom CDMA	Tata CDMA
			GSM Operators						CDMA Operators			
1.1	Call Attempts	Delhi-NCR	375	423	225	292	218	130	266	205	281	269
1.2	Blocked Call Rate (<=3%)	Delhi-NCR	0.53%	0.24%	0.00%	0.68%	4.13%	2.31%	0.75%	0.00%	0.36%	0.00%
1.3	Dropped Call Rate (<=2%)	Delhi-NCR	0.00%	0.00%	0.89%	1.37%	6.88%	0.00%	0.38%	0.00%	1.78%	0.37%
1.4	Percentage of connections with good voice quality (>=95%)	Delhi-NCR										
	(i) 0-4 (w/o frequency hopping)									94.34%	100.00%	96.60%
	(ii) 0-5 (with frequency hopping)		97.30%	92.83%	87.36%	96.00%	90.22%	91.73%	96.05%			
1.5	Service Coverage	Delhi-NCR										
	In door (>= -75dBm)		67.70%	83.74%	55.59%	97.44%	31.08%	65.28%	85.00%	77.28%	86.10%	98.21%
	In-vehicle (>= -85dBm)		96.80%	99.11%	87.92%	99.94%	85.53%	95.18%	98.00%	97.92%	100.00%	99.96%
	Out door- in city (>= -95dBm)		99.80%	100.00%	98.07%	100.00%	98.22%	100.00%	100.00%	100.00%	100.00%	100.00%
1.6	Call Setup Success Rate (>=95%)	Delhi-NCR	99.47%	99.76%	100.00%	99.32%	95.87%	97.69%	99.25%	100.00%	99.64%	100.00%

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:

- MTNL is not meeting the benchmark for Blocked Call Rate (4.13%) & Dropped Call Rate (6.88%).
- Airtel, Etisalat, MTNL, Reliance GSM & MTS are not meeting the benchmark for “%age of good voice quality connections”.

Independent Drive Test

(1) Sample Coverage

The Independent Drive Test was conducted at Delhi-NCR after operators assisted drive test was over for respective operators. Route cover was about around 200 Km depending on city areas within the speed limit of 40Km/hr.

Drive Test Locations

DELHI-NCR

HIGH DENSE: MG Road, Tigri, Khanpur, Pehladpur, Badarpur Border, Sector-18 Noida, Nehru Place, ISBT, Dariyaganj, Red Fort, Delhi Gate, Madhuban Chowk, Rithala, Wazirabad, Kanjhawala

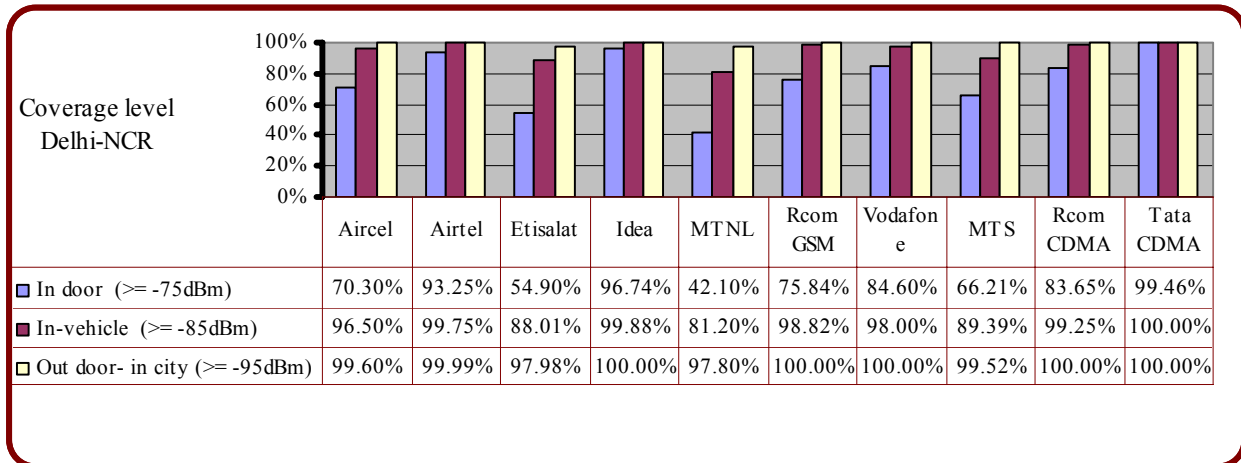
MEDIUM DENSE: Greater Kailash, Vasant Vihar, IFFCO Chowk, Ghitorni, Chattarpur, NHPC Chowk, Badkal More, Akshardham, Nizamuddin, Sarai Kale Khan, Ashram, Barakhambha Road, Shankar Road,

LOW DENSE: Sector-62 Noida, Sarita Vihar, Jasola, Kalindi Kunj

2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	Etisalat	Idea	MTNL	Reom GSM	Vodafone	MTS	Reom CDMA	Tata CDMA
			GSM Operators							CDMA Operators		
1.1	Call Attempts	Delhi-NCR	362	414	221	291	102	185	266	103	214	269
1.2	Blocked Call Rate (<=3%)	Delhi-NCR	0.28%	0.24%	0.45%	0.34%	0.00%	1.08%	0.75%	0.00%	0.93%	0.74%
1.3	Dropped Call Rate (<=2%)	Delhi-NCR	0.00%	0.72%	0.45%	0.69%	4.90%	0.54%	0.77%	0.97%	1.40%	0.00%
1.4	Percentage of connections with good voice quality (=>95%)	Delhi-NCR										
	(i) 0-4 (w/o frequency hopping)									94.99%	99.48%	96.73%
	(ii) 0-5 (with frequency hopping)		97.20%	97.85%	87.75%	96.00%	87.55%	95.57%	96.85%			
1.5	Service Coverage	Delhi-NCR										
	In door (>= -75dBm)		70.30%	93.25%	54.90%	96.74%	42.10%	75.84%	84.60%	66.21%	83.65%	99.46%
	In-vehicle (>= -85dBm)		96.50%	99.75%	88.01%	99.88%	81.20%	98.82%	98.00%	89.39%	99.25%	100%
	Out door- in city (>= -95dBm)		99.60%	99.99%	97.98%	100%	97.80%	100%	100%	99.52%	100%	100%
1.6	Call Setup Success Rate (>=95%)	Delhi-NCR	99.72%	99.76%	99.55%	99.66%	100%	98.92%	99.25%	100%	99.07%	99.26%

Graphical Representation



(3) Critical Analysis

- MTNL is not meeting the benchmark for Dropped Call Rates (4.9%).
- Etisalat, MTNL & MTS are not meeting the benchmark for “%age of good voice quality connections”.

(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 (Delhi-NCR) is by and large satisfactory for **Network Parameters**. However, Etisalat, MTNL & Vodafone are not meeting the benchmark for “Worst affected cells>3% TCH drop”. Aircel, Airtel, Vodafone and Etisalat have shown POIs with more than 0.5% congestion.

Under **Customer Service Quality Parameter** “operator answered calls (voice-to-voice) within 60 seconds” parameter, Etisalat, Idea & Reliance are not fulfilling TRAI benchmark of $\geq 90\%$. Apart from this, the “accessibility of call centre” parameter benchmark is not met by Reliance GSM.

Regarding **Metering/Billing Credibility** issues, MTS has shown a below benchmark value for Post-paid connections. Similar result has been found for Etisalat for pre-paid connections.

During **Drive Tests**, high Dropped & Blocked Call Rates were found in case of MTNL. Most of the GSM operators have met the benchmark for “%age of connections with good voice quality” except for MTNL, MTS & Etisalat.

III. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

IV. Broadband Service Providers

.....Audit not done for this quarter