# REPORT

# ON

# AUDIT & ASSESSMENT OF QUALITY OF SERVICE

# OF

# CELLULAR MOBILE TELEPHONE SERVICE

# FOR

# DELHI-NCR CIRCLE
## *(NORTH ZONE)*

## *Report Period: April 2012 – June 2012*

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# CHAPTER-1: INTRODUCTION

## I.     Background

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

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

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

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

i)      Create conditions for consumer satisfaction by making known the quality of service, which the service provider is required to provide, and the user has a right to expect.

ii)     Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.

iii)    Generally protect the interests of consumers of telecommunication services.

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

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

## II.    Objectives and Methodology

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

i)      Verification of the data submitted by the service providers to TRAI as part of QoS monitoring reports i.e. Quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnection (POI) Congestion Reports with reference to the records maintained by the service provider.

ii)     Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using live measurement for 3 days during the month in which the audit and assessment is carried out.

iii)    Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

iv)     Drive tests of the mobile networks both operators assisted and independent drive test (as and where required).

v)      Billing and call center's data verification.

vi)     Live testing of the efficiency of the call center / customer care help line.

vii)    Level 1 (Emergency) testing.

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 2$^{nd}$ quarter (April 2012 - June 2012). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period Oct-December 2011.

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:

| S/N | Name of Service Provider | Month of Audit | TCBH Hour |
|-----|--------------------------|----------------|-----------|
| **GSM Operators** | | | |
| 1 | Aircel Ltd | May-2012 | 1900-2000 hrs |
| 2 | Airtel Ltd | May-2012 | 2000-2100 hrs |
| 3 | MTNL | May-2012 | 2000-2100 hrs |
| 4 | Idea | May-2012 | 1900-2000 hrs |
| 5 | Reliance Communication (GSM) | May-2012 | 1900-2000 hrs |
| 6 | Vodafone | May-2012 | 1900-2000 hrs |
| **CDMA Operators** | | | |
| 7 | MTS (CDMA) | May-2012 | 1900-2000 hrs |
| 8 | Reliance Communication (CDMA) | May-2012 | 1900-2000 hrs |
| 9 | Tata Communications (CDMA) | May-2012 | 1900-2000 hrs |

Note: Etisalat have stopped their operations and hence, audit was not conducted.

## II. Findings from Quality of Service Audit (Operator wise for each parameter)
### (A) Cellular Mobile Telephone Service Providers

| S/N | 3 days Live Data Audit — Name of Parameter | Bench-mark | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GSM Operators | | | | | | CDMA Operators | | |
| 1 | **Network Availability** | | | | | | | | | | |
| | a) BTS Accumulated Downtime | <=2% | 0.85% | 0.025% | 0.00% | 0.24% | 0.26% | 0.00% | 0.10% | 0.17% | 0.03% |
| | b) Worst affected BTSs due to downtime | <=2% | 0.71% | 0.00% | 0.00% | 0.16% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2 | **Connection Establishment (Accessibility)** | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | 98.56% | 99.89% | 99.72% | 96.23% | 99.64% | 99.99% | 98.87% | 98.11% | 99.12% |
| | b) SDCCH/PAGING congestion | <=1% | 0.09% | 0.04% | 0.33% | 0.67% | 0.04% | 0.25% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | 0.22% | 0.02% | 1.06% | 1.67% | 0.06% | 0.69% | 0.14% | 0.11% | 0.001% |
| 3 | **Connection maintenance (retainability)** | | | | | | | | | | |
| | a) CDR | <=2% | 0.64% | 0.58% | 0.54% | 1.67% | 0.46% | 0.86% | 0.38% | 0.42% | 0.47% |
| | b) Worst affected cells>3% TCH drop | <=3% | 2.37% | 0.98% | 1.83% | 0.15% | 0.01% | 2.79% | 1.66% | 0.00% | 0.95% |
| | c) Good voice quality | >=95% | 97.94% | 99.05% | 98.53% | 97.17% | 99.14% | 97.76% | 100.0% | 99.78% | NA |
| 4 | **No of POI having congestion** | <=0.5% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | **Response time to customers for assistance** | | | | | | | | | | |
| | a) Accessibility of call centre/Customer Care | >=95% | 83.26% | 99.12% | 100.0% | 96.01% | 97.39% | 100.0% | 98.07% | 99.55% | 100.00% |
| | b) % call answered by operators(voice to voice) within 60 sec. | >=90% | 60.65% | 38.69% | 96.47% | 92.88% | 84.62% | 98.73% | 96.56% | 88.40% | 100.00% |

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that all the operators are meeting all the network parameter. For Tata-CDMA, Good Voice Quality value is not system generated.

In Customer care data it is found that for parameter "*Accessibility of call centre/Customer Care*" benchmark is not met by Aircel & For parameter "% call answered by operators (voice to voice) within 60 sec." benchmark is not met by Aircel, Airtel, RCom-GSM & RCom-CDMA.

| One Month Data Audit | | Bench-mark | Aircel | Airtel | 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 | | | | | | | | | | |
| | a) BTS Accumulated Downtime | <=2% | 0.40% | 0.013% | 0.13% | 0.30% | 0.24% | 0.01% | 0.09% | 0.14% | 0.02% |
| | b) Worst affected BTSs due to downtime | <=2% | 1.81% | 0.00% | 0.00% | 1.61% | 0.31% | 0.00% | 0.45% | 0.10% | 0.00% |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | 98.56% | 99.89% | 99.72% | 96.23% | 99.64% | 99.99% | 98.87% | 98.11% | 99.12% |
| | b) SDCCH/PAGING congestion | <=1% | 0.09% | 0.04% | 0.33% | 0.67% | 0.04% | 0.25% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | 0.22% | 0.02% | 1.06% | 1.67% | 0.06% | 0.69% | 0.14% | 0.11% | 0.001% |
| 3 | Connection maintenance (retainability) | | | | | | | | | | |
| | a) CDR | <=2% | 0.64% | 0.58% | 0.54% | 1.67% | 0.46% | 0.86% | 0.38% | 0.42% | 0.47% |
| | b) Worst affected cells>3% TCH drop | <=3% | 2.37% | 0.98% | 1.83% | 0.15% | 0.01% | 2.79% | 1.66% | 0.00% | 0.95% |
| | c) Good voice quality | >=95% | 97.94% | 99.05% | 98.53% | 97.17% | 99.14% | 97.76% | 100.0% | 99.78% | NA |
| 4 | No of POI having congestion | <=0.5% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (B) | Customer Service Quality Parameters | | | | | | | | | | |
| 5 | Metering/billing credibility-Post paid | <= 0.1% | 0.08% | 0.02% | 0.11% | 0.15% | 0.10% | 0.032% | 0.09% | 0.08% | 0.00% |
| 6 | Metering /billing credibility-Pre paid | <= 0.1% | 0.02% | 0.045% | 0.008% | 0.003% | 0.10% | 0.02% | 0.005% | 0.10% | 0.00% |
| 7 | Response time to customers for assistance | | | | | | | | | | |
| | a) Accessibility of call centre/Customer Care | >=95% | 65.74% | 99.99% | 99.44% | 99.88% | 97.43% | 100.0% | 99.13% | 99.48% | 99.02% |
| | b) % call answered by operators(voice to voice) within 60 sec. | >=90% | 98.33% | 92.54% | 96.93% | 98.35% | 84.21% | 97.32% | 96.22% | 90.20% | 94.56% |
| 8 | Termination/closure of service | <=7days | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| 9 | Time taken for refunds of deposits after closures. (within 60 days) | 100% | 100.0% | 100.0% | 100.0% | NP | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

NA: Not Applicable, NP: Data Not Provided

From the month data assessment, it is found that most of the operators are meeting all the network parameters. For Tata-CDMA, Good Voice Quality value is not system generated.

Performance related to customer service data it is also found to be satisfactory for most of the operators except for Idea & MTNL-GSM for the parameter "*Metering/billing credibility-Post paid*" and for parameter "*Accessibility of call centre/Customer Care*" benchmark is not met by Aircel and for parameter "*% call answered by operators (voice to voice) within 60 sec.*" benchmark is not met by RCom-GSM.

## Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted in Delhi-NCR (Noida, Gurgaon & Faridabad) circle for all the operators. Route covered was about 300 Km. The speed limit of 30-35Km/hr was maintained throughout the Drive Test. Zones were selected for covering different density areas (High, Medium & Low dense areas).

| SN | Parameter | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|----|-----------|--------|--------|------|----------|----------|--------|-----|-----------|-----------|
| | | GSM Operators | | | | | | CDMA Operators | | |
| 1.1 | Blocked Call Rate (<=3%) | 1.83% | 1.27% | 2.22% | 5.16% | 3.37% | 3.0% | 0.00% | 0.00% | 0.85% |
| 1.2 | Dropped Call Rate (<=2%) | 1.22% | 0.00% | 1.23% | 5.38% | 0.52% | 0.81 | 1.45% | 1.22% | 0.28% |
| 1.3 | Percentage of connections with good voice quality (=>95%) | | | | | | | | | |
| | (i) 0-4 (w/o frequency hopping) | | | | | | | 96.13% | 97.14% | 97.20% |
| | (ii) 0-5 ( with frequency hopping) | 91.87% | 96.10% | 94.37% | 92.08% | 92.00% | 97.3% | | | |
| 1.4 | Call Setup Success Rate (>=95%) | 98.17% | 98.73% | 97.78% | 94.84% | 96.63% | 99.19% | 100.0% | 100.0% | 99.15% |

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

• 'Blocked Call Rate' benchmark is not met by MTNL-GSM & RCom-GSM.
• 'Dropped Call Rate' benchmark is not met by MTNL-GSM.
• "*%age of connections with good voice quality*" is not met by Aircel, Idea, MTNL-GSM and RCom-GSM.
• 'CSSR' benchmark is not met by MTNL-GSM.

## Independent Drive Test

The Operator Assisted Drive Test was conducted in Delhi Circle for all the operators. Route covered was about 80-100 Km. The speed limit of 30-35Km/hr was maintained throughout the Drive Test. Zones were selected for covering different density areas (High, Medium & Low dense areas).

| SN | Parameter | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | Voda fone | MTS | Rcom CDMA | Tata CDMA |
|----|-----------|--------|--------|------|----------|----------|-----------|-----|-----------|-----------|
| | | GSM Operators | | | | | | CDMA Operators | | |
| 1.1 | Blocked Call Rate (<=3%) | 0.68% | 2.15% | 1.34% | 2.46% | 4.07% | 0.92% | 0.00% | 0.00% | 1.38% |
| 1.2 | Dropped Call Rate (<=2%) | 1.36% | 0.71% | 0.67% | 3.94% | 1.16% | 0.92% | 0.00% | 1.60% | 0.92% |
| 1.3 | % of connections with good voice quality (=>95%) | | | | | | | | | |
| | (i) 0-4 (w/o frequency hopping) | | | | | | | 96.32% | 95.61% | 97.00% |
| | (ii) 0-5 ( with frequency hopping) | 92.00% | 95.90% | 91.00% | 94.72% | 78.00% | 97.80% | | | |
| 1.4 | Call Setup Success Rate (>=95%) | 99.32% | 97.85% | 98.66% | 97.54% | 95.93% | 99.08% | 100.0% | 100.0% | 98.62% |

*Key observations as could be derived from the table are as under.*

• 'Blocked Call Rate' benchmark is not met by Rcom GSM.
• 'Dropped Call Rate' benchmark is not met by MTNL-GSM.
• '%age of connections with good voice quality', is not met by Aircel, Idea, MTNL-GSM & RCom-GSM.

# Chapter 3 AUDIT PMR DATA VERIFICATION RESULTS

## I. Cellular Mobile Telephone Service

| S/N | PMR / Name of Parameter | Bench-mark | Audit | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | GSM Operators | | | | | | CDMA Operators | | |
| (A) | Network Service Quality Parameter | | | | | | | | | | | |
| 1 | Network Availability | | | | | | | | | | | |
| | BTS Accumulated Downtime | <=2% | Reported | 0.20% | 0.01% | 0.10% | 0.38% | 0.26% | 0.03% | 0.06% | 0.14% | 0.01% |
| | | | Verified | 0.20% | 0.01% | 0.10% | 0.38% | 0.26% | 0.03% | 0.06% | 0.14% | 0.01% |
| | Worst affected BTSs due to downtime | <=2% | Reported | 1.07% | 0.00% | 0.02% | 1.60% | 0.35% | 0.00% | 0.08% | 0.03% | 0.00% |
| | | | Verified | 1.07% | 0.00% | 0.02% | 1.60% | 0.35% | 0.00% | 0.08% | 0.03% | 0.00% |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | |
| | CSSR (Call Setup Success Rate) | >=95% | Reported | 98.10% | 99.86% | 99.72% | 97.94% | 99.43% | 99.99% | 99.07% | 98.77% | 98.74% |
| | | | Verified | 98.10% | 99.86% | 99.72% | 97.94% | 99.43% | 99.99% | 99.07% | 98.77% | 98.74% |
| | SDCCH/PAGING congestion | <=1% | Reported | 0.11% | 0.04% | 0.62% | 0.10% | 0.08% | 0.86% | 0.00% | 0.00% | 0.00% |
| | | | Verified | 0.11% | 0.04% | 0.62% | 0.10% | 0.08% | 0.86% | 0.00% | 0.00% | 0.00% |
| | TCH congestion | <=2% | Reported | 0.08% | 0.06% | 0.79% | 1.27% | 0.19% | 0.87% | 0.21% | 0.95% | 0.00% |
| | | | Verified | 0.08% | 0.06% | 0.79% | 1.27% | 0.19% | 0.87% | 0.21% | 0.95% | 0.00% |
| 3 | Connection maintenance (retainability) | | | | | | | | | | | |
| | CDR | <=2% | Reported | 0.79% | 0.62% | 0.71% | 1.65% | 0.90% | 0.99% | 0.43% | 0.79% | 0.68% |
| | | | Verified | 0.79% | 0.62% | 0.71% | 1.65% | 0.90% | 0.99% | 0.43% | 0.79% | 0.68% |
| | Worst affected cells>3% TCH drop | <=3% | Reported | 1.80% | 0.98% | 2.20% | 2.44% | 0.45% | 3.39% | 0.90% | 0.49% | 1.77% |
| | | | Verified | 1.80% | 0.98% | 2.20% | 2.44% | 0.45% | 3.39% | 0.90% | 0.49% | 1.77% |
| | Good voice quality | >=95% | Reported | 97.27% | 98.99% | 98.06% | 97.97% | 99.10% | 97.66% | 99.98% | 98.74% | 98.07% |
| | | | Verified | 97.27% | 98.99% | 98.06% | 97.97% | 99.10% | 97.66% | 99.98% | 98.74% | 98.07% |
| 4 | POI congestion | <=0.5% | Reported | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | Verified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (B) | Customer Service Quality Parameters | | | | | | | | | | | |
| 5 | Metering/billing credibility-Post paid | <= 0.1% | Reported | 0.07% | 0.03% | 0.11% | 0.07% | 0.09% | 0.05% | 0.00% | 0.08% | 0.01% |
| | | | Verified | 0.07% | 0.03% | 0.11% | 0.07% | 0.09% | 0.05% | 0.00% | 0.08% | 0.01% |
| 6 | Metering /billing credibility-Pre paid | <= 0.1% | Reported | 0.04% | 0.03% | 0.11% | 0.07% | 0.09% | 0.00% | 0.00% | 0.08% | 0.01% |
| | | | Verified | 0.04% | 0.03% | 0.11% | 0.07% | 0.09% | 0.00% | 0.00% | 0.08% | 0.01% |
| 7 | Resolution of billing/ charging complaints (*within 4 weeks*) | 100% | Reported | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | | Verified | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

| S/N | Name of Parameter (PMR) | Bench-mark | Audit | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | GSM Operators | | | | | | CDMA Operators | | |
| | 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% |
| | | | Verified | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 8 | **Response time to customers for assistance** | | | | | | | | | | | |
| | Accessibility of call centre/Customer Care | >=95% | Reported | 100% | 99.81% | 99.30% | 99.90% | 98.90% | 100% | 98.13% | 99.17% | 98.00% |
| | | | Verified | 100% | 99.81% | 99.30% | 99.90% | 98.90% | 100% | 98.13% | 99.17% | 98.00% |
| | % call answered by operators(voice to voice) within 60 sec. | >=90% | Reported | 93.80% | 94.74% | 89.06% | 92.40% | 91.32% | 97.44% | 95.45% | 93.28% | 94.00% |
| | | | Verified | 93.80% | 94.74% | 89.06% | 92.40% | 91.32% | 97.44% | 95.45% | 93.28% | 94.00% |
| 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% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | | Verified | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 10 | **Time taken for refunds of deposits after closures.** (*within 60 days*) | *100%* | Reported | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | | Verified | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

**No deviation found when compared to Operators reported data.**

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

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

# CHAPTER-4: DETAILED FINDINGS & ANALYSIS

## I. Cellular Mobile Telephone Service

### (A) MSC Audit

### (1) 3 Days Live Data measurement data assessment & Summarized Findings

| S/N | Name of Parameter | Benchmark | Aircel | Airtel | 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% | 0.85% | 0.025% | 0.00% | 0.24% | 0.26% | 0.00% | 0.10% | 0.17% | 0.03% |
| | b) Worst affected BTSs due to downtime | <=2% | 0.71% | 0.00% | 0.00% | 0.16% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | c) Total no. of BTSs in the licensed service area | | 2815 | 4965 | 3587 | 1245 | 2607 | 5030 | 889 | 1030 | 1234 |
| | d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | 1726 | 91 | 0 | 217 | 491 | 14 | 62 | 126 | 25 |
| | e) No. of BTSs having accumulated downtime of >24 hours in a month | | 20 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2 | **Connection Establishment (Accessibility)** | | | | | | | | | | |
| | a) CSSR | >=95% | 98.56% | 99.89% | 99.72% | 96.23% | 99.64% | 99.99% | 98.87% | 98.11% | 99.12% |
| | b) SDCCH/PAGING congestion | <=1% | 0.09% | 0.04% | 0.33% | 0.67% | 0.04% | 0.25% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | 0.22% | 0.02% | 1.06% | 1.67% | 0.06% | 0.69% | 0.14% | 0.11% | 0.001% |
| 3 | **Connection maintenance** | | | | | | | | | | |
| | a) CDR | <=2% | 0.64% | 0.58% | 0.54% | 1.67% | 0.46% | 0.86% | 0.38% | 0.42% | 0.47% |
| | b) Cells having > 3% TCH drop | <=3% | 2.37% | 0.98% | 1.83% | 0.15% | 0.01% | 2.79% | 1.66% | 0.00% | 0.95% |
| | c) Good voice quality | >=95% | 97.94% | 99.05% | 98.53% | 97.17% | 99.14% | 97.76% | 100.0% | 99.78% | NA |
| | d) No. of cells > 3% TCH drop | | 566 | 354 | 520 | 16 | 3 | 1,046 | 144 | 0 | 123 |
| | e) Total no. of cells in the network | | 7944 | 12004 | 9456 | 3637 | 7821 | 12496 | 2883 | 3090 | 4301 |

| S/N | Name of Parameter | Benchmark | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GSM Operators | | | | | | CDMA Operators | | |
| 4 | No of POI having congestion | <=0.5% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | a) Name of POI not meeting the benchmark | | Nil | Nil | Nil | NIL | Nil | Nil | Nil | Nil | Nil |
| | b) Total No. of call attempts on POI (Avg.) | | 931708 | 4530758 | 28712 | 692387 | 148731 | 257740 | 38824 | 341043 | 2351166 |
| | c) Total traffic served on POI (Erlang) (Avg.) | | 18754 | 196672 | 78232 | 24678 | 3852 | 6977 | 15017 | 12898 | 110168 |
| | d) Total No. of circuits on POI | | 40110 | 934124 | 145458 | 45279 | 8374 | 13101 | 18033 | 37186 | 376746 |
| | e) Total number of working POI Service Area wise | | 73 | 263 | 98 | 48 | 10 | 18 | 79 | 35 | 512 |
| | f) Equipped Capacity of Network in respect of Traffic in erlang | | 102207 | 358507 | 142640 | 132000 | 96000 | 284820 | 33600 | 196000 | 185000 |
| | g) Total traffic handled in TCBH in erlang | | 44068 | 178617 | 115549 | 27808 | 86636 | 243399 | 11051 | 62658 | 162543 |
| (B) | Customer Service Quality Parameters | | | | | | | | | | |
| 5 | Response time to customers for assistance | | | | | | | | | | |
| | a) Accessibility of call centre | >=95% | 83.26% | 99.12% | 100% | 96.01% | 97.39% | 100% | 98.07% | 99.55% | 100% |
| | b) % of call answered by operators(voice to voice) within 60 sec | >=90% | 60.65% | 38.69% | 96.47% | 92.88% | 84.62% | 98.73% | 96.56% | 88.40% | 100% |
| | c) No. of call attempts to call centre / customer care nos. during TCBH  (Avg) | | 22301 | 402331 | 43034 | 38646 | 139579 | 2411634 | 9449 | 48519 | 362443 |
| | d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg) | | 13526 | 155660 | 41516 | 35893 | 118112 | 2381029 | 9124 | 42891 | 362443 |

NA: Not Applicable, NP: Data Not Provided

**Parameter-wise Findings (Live Data Assessment):**

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

➢ **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark.

➢ **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark.

➢ **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark.

➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark.
*Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.*

➢ **TCH congestion (benchmark <= 2%):** All operators are meeting the benchmark.

➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark.

➢ **Cell exceeding 3% TCH drop (benchmark <= 3%):** All the operators are satisfying the benchmark.

➢ **Connections with good voice quality (benchmark >= 95%):** All the operators are meeting the benchmark. Tata-CDMA declared that data is not system generated.

➢ **No. of POI's having Congestion >0.5%:** All the operators meeting the benchmark.

➢ **%age of call answered by operator (electronically) (benchmark >95%):** Except Aircel, all the operators are meeting the benchmark.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%):** Except Aircel, Airtel, RCom-GSM & RCom-CDMA, all the operators are meeting the benchmark.

## (2) One month audit data report & summarized findings

| S/N | Name of Parameter | Benchmark | Aircel | Airtel | 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%* | 0.40% | 0.013% | 0.13% | 0.30% | 0.24% | 0.01% | 0.09% | 0.14% | 0.02% |
| | b) Worst affected BTSs due to downtime | *<=2%* | 1.81% | 0.00% | 0.00% | 1.61% | 0.31% | 0.00% | 0.45% | 0.10% | 0.00% |
| | c) Total no. of BTSs in the licensed service area | | 2815 | 4965 | 3587 | 1245 | 2607 | 5030 | 889 | 1030 | 1234 |
| | d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | 8432 | 481 | 3370 | 2808 | 4589 | 457 | 595 | 1044 | 141 |
| | e) No. of BTSs having accumulated downtime of >24 hours in a month | | 51 | 0 | 0 | 20 | 8 | 0 | 4 | 1 | 0 |
| 2 | **Connection Establishment (Accessibility)** | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | *>=95%* | 98.56% | 99.89% | 99.72% | 96.23% | 99.64% | 99.99% | 98.87% | 98.11% | 99.12% |
| | b) SDCCH/PAGING congestion | *<=1%* | 0.09% | 0.04% | 0.33% | 0.67% | 0.04% | 0.25% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | *<=2%* | 0.22% | 0.02% | 1.06% | 1.67% | 0.06% | 0.69% | 0.14% | 0.11% | 0.001% |
| 3 | **Connection maintenance (retainability)** | | | | | | | | | | |
| | a) CDR | *<=2%* | 0.64% | 0.58% | 0.54% | 1.67% | 0.46% | 0.86% | 0.38% | 0.42% | 0.47% |
| | b) Worst affected cells>3% TCH drop | *<=3%* | 2.37% | 0.98% | 1.83% | 0.15% | 0.01% | 2.79% | 1.66% | 0.00% | 0.95% |
| | c) Good voice quality | *>=95%* | 97.94% | 99.05% | 98.53% | 97.17% | 99.14% | 97.76% | 100.0% | 99.78% | NA |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | 5,828 | 3,565 | 4,699 | 100 | 64 | 10,782 | 1,407 | 0 | 1,700 |
| | e) Total no. of cells in the network | | 7944 | 12004 | 9456 | 3637 | 7821 | 12496 | 2883 | 3090 | 4301 |

| S/N | Name of Parameter | Benchmark | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GSM Operators | | | | | | CDMA Operators | | |
| 4 | **No of POI having congestion** | *<=0.5%* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | a) Name of POI not meeting the benchmark | | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil |
| | b) Total No. of call attempts on POI (Avg.) | | 930178 | 5071549 | 29418 | 679263 | 155125 | 253591 | 38428 | 352671 | 3526635 |
| | c) Total traffic served on POI (Erlang) (Avg.) | | 18699 | 195419 | 78693 | 23628 | 4018 | 6928 | 15166 | 13139 | 167082 |
| | d) Total No. of circuits on POI | | 40110 | 934124 | 145458 | 45279 | 8374 | 13101 | 18033 | 37186 | 376746 |
| | e) Total number of working POI Service Area wise | | 73 | 263 | 98 | 48 | 10 | 18 | 79 | 35 | 512 |
| 5 | **Network Data** | | | | | | | | | | |
| | a) Equipped Capacity of Network Erlang | | 102207 | 358507 | 142640 | 132000 | 96000 | 284820 | 33600 | 196000 | 185000 |
| | b) Total traffic in TCBH in erlang (Avg.) | | 44068 | 178617 | 115549 | 27808 | 86636 | 243399 | 11051 | 62658 | 162543 |
| | c) Total no. of customers served (as per VLR) on last day of the month | | 1310525 | 7002164 | 4131269 | 1152114 | 3702895 | 7762614 | 323608 | 3022436 | 2203127 |
| (B) | **Customer Service Quality Parameters** | | | | | | | | | | |
| 6 | **Metering/billing credibility-Post paid** | *<= 0.1%* | 0.08% | 0.02% | 0.11% | 0.15% | 0.10% | 0.032% | 0.09% | 0.08% | 0.00% |
| | a) No. of bills issued during the period | | 61649 | 1217536 | 515392 | 145340 | 69282 | 746270 | 49549 | 453086 | 588512 |
| | b) No. of bills disputed including billing complaints during the period | | 52 | 262 | 583 | 219 | 69 | 240 | 45 | 376 | 11 |
| 7 | **Metering /billing credibility-Pre paid** | *<= 0.1%* | 0.02% | 0.045% | 0.008% | 0.003% | 0.10% | 0.02% | 0.005% | 0.10% | 0.00% |
| | a) No. of charging / credit / validity complaints during the quarter | | 467 | 4,082 | 345 | 88 | 4570 | 1,667 | 60 | 3621 | 179 |
| | b) Total no. of pre-paid customers at the end of the quarter | | 2500000 | 9,128,077 | 4302348 | 2651655 | 4570868 | 7513038 | 1194507 | 3621108 | 4836718 |

| S/N | Name of Parameter | Benchmark | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GSM Operators | | | | | | CDMA Operators | | |
| 8 | **Resolution of billing/ charging complaints** | *100% within 4 weeks* | 100% | 100% | 100.0% | 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 | | 519 | 4344 | 464 | 307 | 4639 | 1907 | 105 | 3997 | 190 |
| | b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter | | 519 | 4344 | 464 | 307 | 4639 | 1907 | 105 | 3997 | 190 |
| | c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter | | 519 | 4344 | 464 | 307 | 4639 | 1907 | 105 | 3997 | 190 |
| | d) No. of complaints disposed on account of not considered as valid complaints during the quarter | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints | *<=1 week* | 100% | 100% | 100% | 76.43% | 100% | 100% | 100% | 100% | 100% |
| 9 | **Response time to customers for assistance** | | | | | | | | | | |
| | a) Accessibility of call centre/Customer Care | *>=95%* | 65.74% | 99.99% | 99.44% | 99.88% | 97.43% | 100.0% | 99.13% | 99.48% | 99.02% |
| | b) % call answered by operators(voice to voice) within 60 sec. | *>=90%* | 98.33% | 92.54% | 96.93% | 98.35% | 84.21% | 97.32% | 96.22% | 90.20% | 94.56% |
| | c) Total no. of call attempts to call centre& customer care nos. during TCBH (Avg.). | | 1375 | 3219574 | 202987 | 23948 | 1272625 | 154462 | 289912 | 449652 | 848239 |
| | d) No. of calls connected and answered successfully to call centre& customer care nos. during TCBH (Avg.). | | 1352 | 2979272 | 196750 | 23554 | 1071719 | 150321 | 278960 | 405604 | 802058 |
| 10 | **Termination/closure of service** | *<=7days* | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | a) Total No. of requests for Termination / Closure of service received during the quarter | | 1065 | 7424 | 2570 | 8784 | 603 | 3258 | 148 | 990 | 5644 |
| | b) No.of requests for Termination / Closure of service complied within 7 days during the quarter | | 1065 | 7424 | 2570 | 8784 | 603 | 3258 | 148 | 990 | 5644 |
| 11 | **Time taken for refunds of deposits after closures.** | *100% within 60 days* | 100% | 100% | 100% | NP | 100% | 100% | 100% | 100% | 100% |

NA: Not Applicable, NP: Data Not Provided

**Parameter-wise Findings (Month Data Assessment):**

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

➢ **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark.

➢ **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark.

➢ **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark.

➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark.
   *Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.*

➢ **TCH congestion (benchmark <= 2%):** All operators are meeting the benchmark.

➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark.

➢ **Cell exceeding 3% TCH drop (benchmark <= 5%):** All the operators are satisfying the benchmark.

➢ **Connections with good voice quality (benchmark >= 95%):** All the operators are meeting the benchmark with values lying between 97.07% and 100%. Tata-CDMA declared that data is not system generated.

➢ **No. of POI's having congestion>0.5%:** All the operators are meeting the benchmark.

➢ **%age of call answered by operator (electronically) (benchmark >95%):** Except for Aircel, all the operators are meeting the benchmark.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%):** Except RCom-GSM, all the operators are meeting the benchmark.

➢ **Metering and billing credibility-Post paid (benchmark <= 0.1%):** Except Idea & MTNL-GSM, all the operators are meeting the benchmark.

➢ **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** All the operators are meeting the benchmark.

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

➢ **Termination/Closure of service (Benchmark <= 7 days):** All operators have satisfied the benchmark.

➢ **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):** All operators have satisfied the benchmark.

**(3)** **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 | 3 | 24 | 2815 |
| 2 | Airtel | 28 | 53 | 4965 |
| 3 | MTNL | 8 | 31 | 1245 |
| 4 | Idea | 9 | 37 | 3587 |
| 5 | Reliance Communication | 4 | 14 | 2607 |
| 6 | Vodafone | 16 | 54 | 5030 |
| **CDMA Operators** | | | | |
| 7 | MTS | 1 | 3 | 889 |
| 8 | Reliance Communication | 10 | -- | 1030 |
| 9 | Tata Communications | 8 | -- | 1234 |

**(4)    Performance (Graphical Representation)**

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

**A)    NETWORK PERFORMANCE**

**BTS Accumulated downtime:** All operators are meeting the TRAI benchmarks for both one month data and 3 days live data.



BTS Accumulated Downtime

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Live | 0.85% | 0.025% | 0.00% | 0.24% | 0.26% | 0.00% | 0.10% | 0.17% | 0.03% |
| Month | 0.40% | 0.013% | 0.13% | 0.30% | 0.24% | 0.01% | 0.09% | 0.14% | 0.02% |
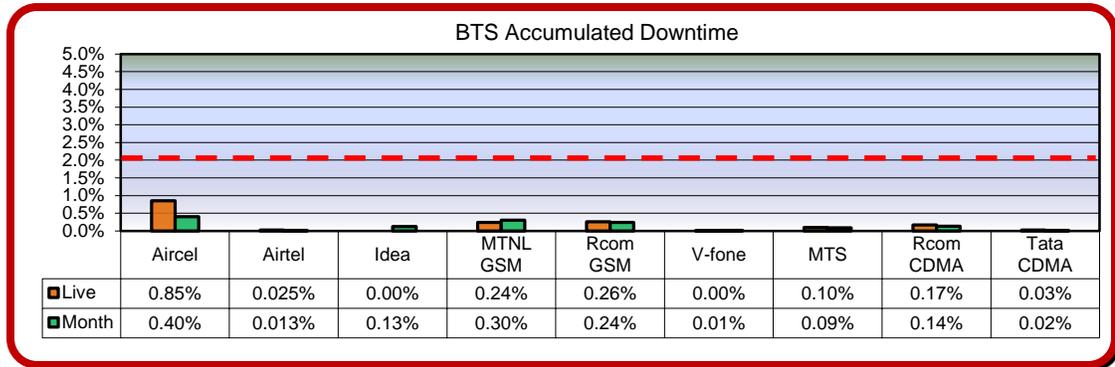
**Worst affected BTSs due to downtime:** All operators are meeting the TRAI benchmarks for both one month data and 3 days live data.



Worst affected BTSs due to downtime

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Live | 0.71% | 0.00% | 0.00% | 0.16% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Month | 1.81% | 0.00% | 0.00% | 1.61% | 0.31% | 0.00% | 0.45% | 0.10% | 0.00% |
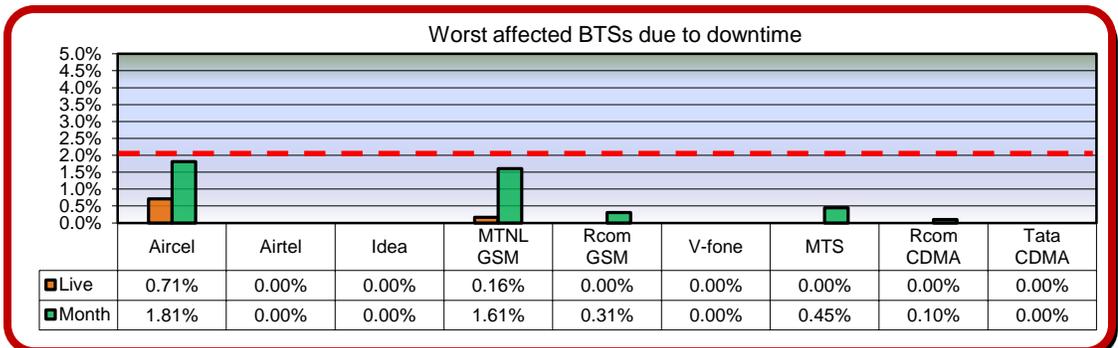
**Call setup success rate:** All operators are meeting the TRAI benchmarks (>= 95 %) for both one month data and 3 days live data.



CSSR

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Live | 98.56% | 99.89% | 99.72% | 96.23% | 99.64% | 99.99% | 98.87% | 98.11% | 99.12% |
| Month | 98.53% | 99.90% | 96.29% | 96.44% | 99.62% | 99.99% | 98.62% | 98.01% | 99.03% |
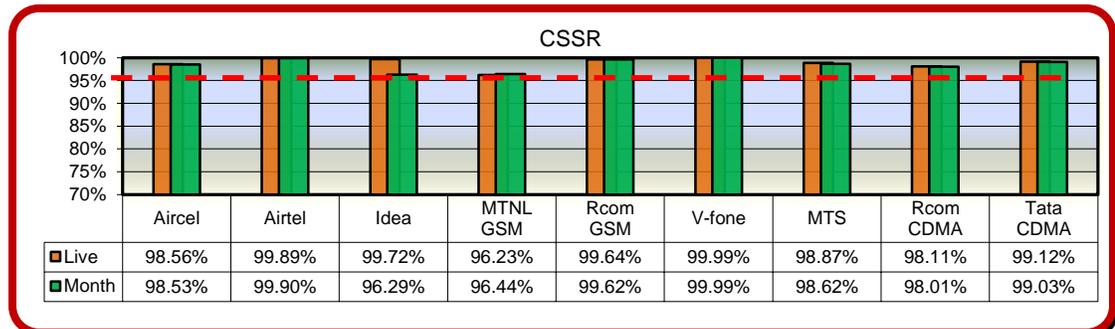
**Blocked call rate:**

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

| SDCCH/PAGING congestion | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Live | 0.09% | 0.04% | 0.33% | 0.67% | 0.04% | 0.25% | 0.00% | | |
| Month | 0.10% | 0.03% | 0.22% | 0.54% | 0.02% | 0.23% | 0.00% | | |

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

| TCH congestion | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Live | 0.22% | 0.02% | 1.06% | 1.67% | 0.06% | 0.69% | 0.14% | 0.11% | 0.001% |
| Month | 0.17% | 0.04% | 0.73% | 1.72% | 0.05% | 0.79% | 0.32% | 0.02% | 0.03% |
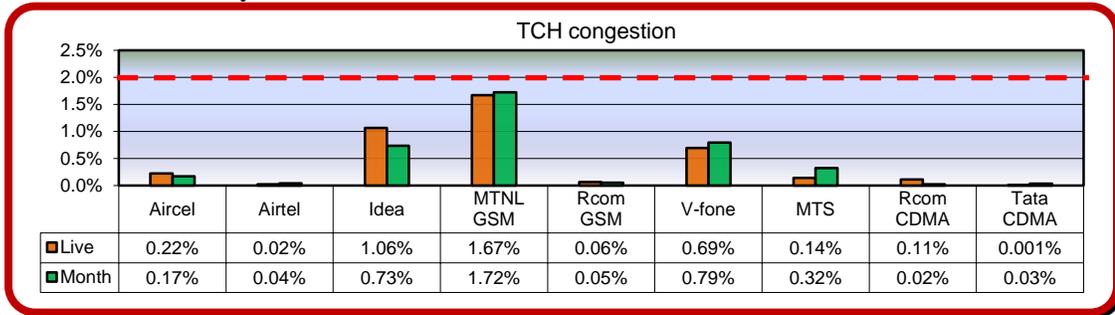
**Connection Maintainability (Retainability):**

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

| CDR | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Live | 0.64% | 0.58% | 0.54% | 1.67% | 0.46% | 0.86% | 0.38% | 0.42% | 0.47% |
| Month | 0.65% | 0.59% | 0.51% | 1.59% | 0.48% | 0.89% | 0.36% | 0.46% | 0.52% |
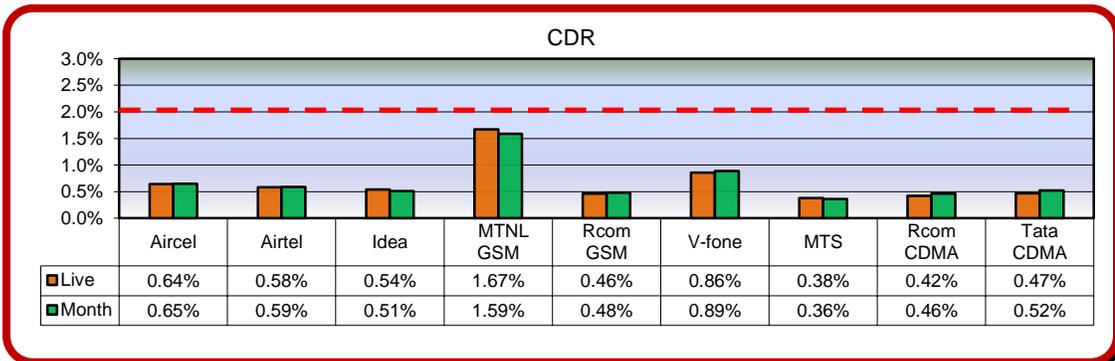
**Worst affected Cell exceeding 3% TCH Drop:** For both live and month data, it is found that all the operators meeting the benchmark of <=3%. Rests of the operators are meeting the benchmark for both cases.

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| ■Live | 2.37% | 0.98% | 1.83% | 0.15% | 0.01% | 2.79% | 1.66% | 0.00% | 0.95% |
| ■Month | 2.37% | 0.96% | 1.60% | 0.09% | 0.03% | 2.78% | 1.57% | 0.00% | 1.28% |
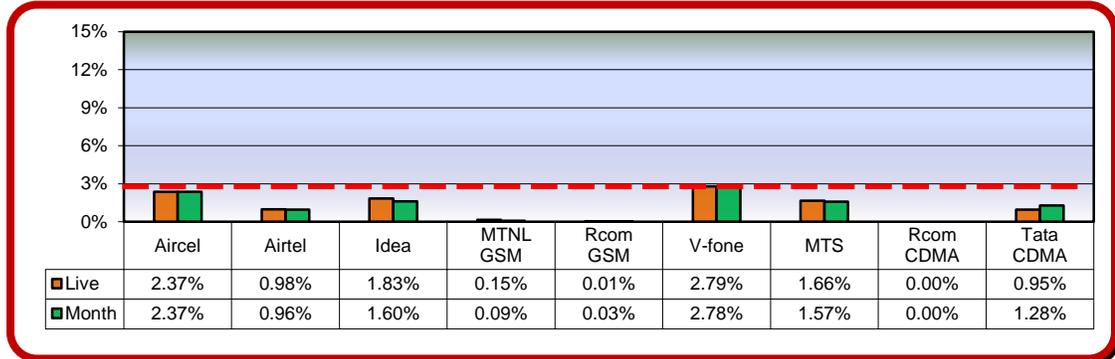
**Percentage of connections with good voice quality:** All operators are meeting the TRAI benchmarks (=> 95%) for both one month data and 3 days live data.

Connections with good voice quality

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| ■Live | 97.94% | 99.05% | 98.53% | 97.17% | 99.14% | 97.76% | 100.0% | 99.78% | |
| ■Month | 97.69% | 99.07% | 95.33% | 97.80% | 99.17% | 97.74% | 100.0% | 99.77% | |
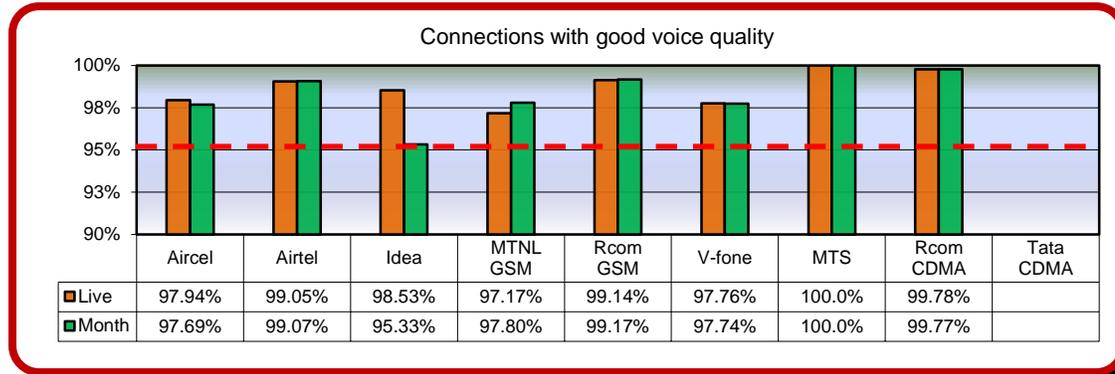
**No. of POI's having Congestion>0.5%:** All operators are meeting the TRAI benchmarks (=> 95%) for both one month data and 3 days live data.

Number of POI having ≥ 0.5% POI congestion

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| ■Live | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ■Month | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
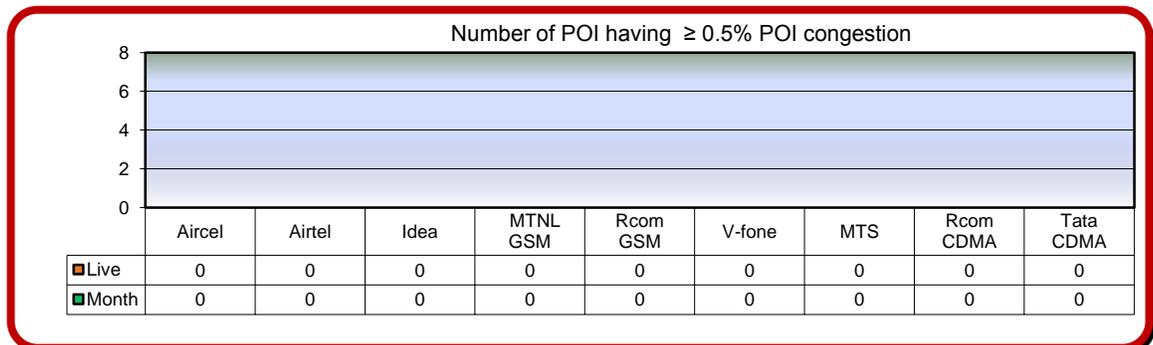
**B)**     **CUSTOMER SERVICE QUALITY PARAMETERS**

**Response time to the customer for assistance**:

**Percentage of call answered (Electronically):** All operators are meeting the TRAI benchmarks (>= 95%) for both one month data and 3 days live data except for Aircel.

Accessibility of call centre/customer care

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| ■Live | 83.26% | 99.12% | 100.0% | 96.01% | 97.39% | 100.0% | 98.07% | 99.55% | 100.00% |
| ■Month | 65.74% | 99.99% | 99.44% | 99.88% | 97.43% | 100.0% | 99.13% | 99.48% | 99.02% |
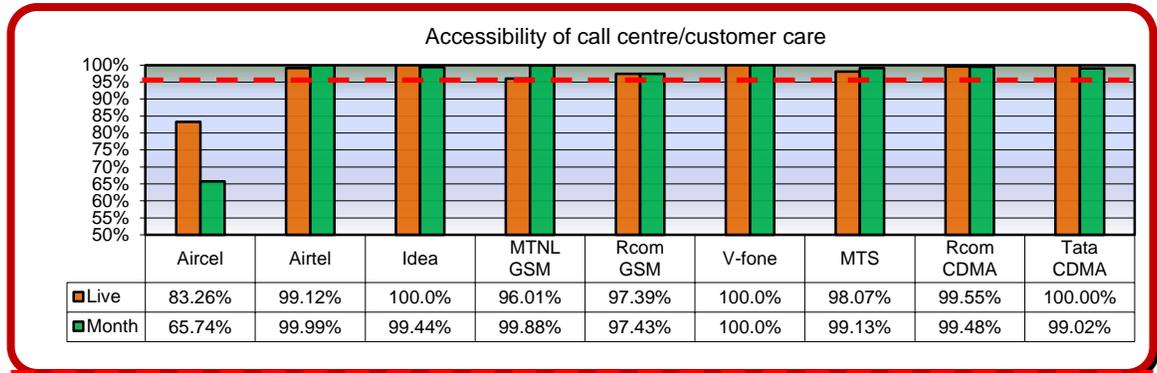
**Percentage of call answered by operators (Voice to voice) within 60 sec:** All the operators are meeting the benchmark for live & month both.

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

| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| ■Live | 60.65% | 38.69% | 96.47% | 92.88% | 84.62% | 98.73% | 96.56% | 88.40% | 100.00% |
| ■Month | 98.33% | 92.54% | 96.93% | 98.35% | 84.21% | 97.32% | 96.22% | 90.20% | 94.56% |
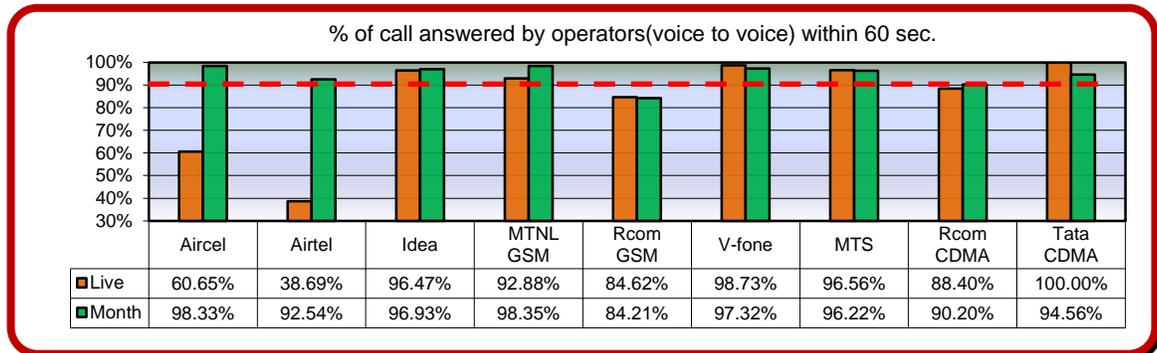
**(5)   Critical Analysis**

The above comparative study between live data & month data shows similar trends & consistency in both the cases.

All the operators meeting all the network parameter but in case of customer care data parameter "*Metering/billing credibility-Post paid*" benchmark is not met by Idea & MTNL-GSM respectively & for parameter "*Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints (≤1 week)*" benchmark is not met by MTNL-GSM.

For parameter "*Accessibility of call centre/Customer Care*" benchmark is not met by Aircel & for parameter "*% call answered by operators (voice to voice) within 60 sec*" benchmark is not met by Aircel, Airtel, and RCom-GSM & RCom-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 based on live calling for billing complaints**

| Calling Operator | Aircel | Airtel | Idea | MTNL | Reliance (GSM) | Vodafone | MTS | Reliance (CDMA) | Tata (CDMA) |
|---|---|---|---|---|---|---|---|---|---|
| Total No. of calls | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total No. of calls Answered | 89 | 91 | 93 | 87 | 92 | 90 | 96 | 88 | 91 |
| Cases resolved with 4 weeks | 89 | 91 | 93 | 87 | 92 | 90 | 96 | 88 | 91 |
| %age of cases resolved | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

**(3) Live calling to call centre**

| Calling Operator | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| Total No. of Calls ttempted | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total No. of calls onnected to IVR | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Calls got connected to agent within 60 Sec | 93 | 94 | 95 | 92 | 94 | 96 | 97 | 91 | 94 |
| %age of calls got answered | 93% | 94% | 95% | 92% | 94% | 96% | 97% | 91% | 94% |

**(4) Level 1 live calling**

| Emergency no. | | No. of calls made | Aircel | Airtel | Idea | MTNL | Rcom GSM | Vodafone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | Police | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 101 | Fire | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| 102 | Ambulance | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| 139 | Railway | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |

**(5) Critical Analysis**

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

Calls were made from Operators office at Delhi for Call Centre test calls. 100 calls total made i.e. call centre calls were successfully connected within the 60 seconds time for all the operators.

Most of the level 1 call got connected within local area of calling. It was confirmed from the called party that the location was nearer to the calling place. However there were occasion calls did not got connected for Airtel, Idea and MTS in Noida area as shown in the table above.

**(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 calling**

| Calling Operator | Aircel | Airtel | MTNL | Idea | Reliance (GSM) | Vodafone | MTS | Reliance (CDMA) | Tata (CDMA) |
|---|---|---|---|---|---|---|---|---|---|
| **Aircel** | - | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **Airtel** | 100% | - | 100% | 100% | 100% | 99% | 100% | 100% | 100% |
| **MTNL** | 100% | 97% | - | 100% | 100% | 100% | 100% | 100% | 100a% |
| **Idea** | 100% | 100% | 100% | - | 96% | 100% | 100% | 97% | 100% |
| **Reliance (GSM)** | 99% | 100% | 96% | 100% | - | 100% | 100% | 100% | 100% |
| **Vodafone** | 96% | 97% | 99% | 100% | 100% | - | 100% | 100% | 100% |
| **MTS** | 100% | 100% | 100% | 100% | 100% | 100% | - | 100% | 100% |
| **Reliance (CDMA)** | 100% | 100% | 100% | 96% | 100% | 100% | 97% | - | 100% |
| **Tata (CDMA)** | 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 300Km depending on city areas within the speed limit of 30-35Km/hr.

**Drive Test Locations**

DELHI:       Chirag Enclave, Kalu Sarai, Lado Sarai, Andheria More, Ghitorni, Badarpur Border, SaritaVihar, Nehru Place, Mathura Road, KalindiKunj, IIT, Arunvart Marg, Kalkaji Mandir

GURGAON:  Arjungarh, DLF city Phase I, Sushantlok, DLF Phase- IV, Sikandarpur, IFFCO Chowk, Rajiv Chowk, Ashok Vihar, Gurgaon Bus Stand, Pahari Road

FARIDABAD:       Badkhal road, Sec-21, Sec 28, Sec-29, Sec-18, Sec-14, Sec-13, Sec-NeelamChowk, SaraiChowk

NOIDA:       Noida film city, Botanical Garden, Sec-60, 62, 55, 12, 10, 09, 16, 06, 15, 95, 20, 4, 27, 26, 61, 32, 15, 16, 1, 6,  127, Greater Noida Expressway, Pari Chowk, Golf Road, Mamura, NH-24,DadriRoad,AmarpaliMarg,Greator Noida Expressway

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

| SN | Parameter | Aircel | Airtel | Idea | MTNL | Rcom GSM | V-fone | MTS | Rcom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.1 | Call Attempts | 328 | 394 | 406 | 465 | 386 | 368 | 275 | 411 | 354 |
| 1.2 | Blocked Call Rate (<=3%) | 1.83% | 1.27% | 2.22% | 5.16% | 3.37% | 3% | 0.00% | 0.00% | 0.85% |
| 1.3 | Dropped Call Rate (<=2%) | 1.22% | 0.00% | 1.23% | 5.38% | 0.52% | 0.81% | 1.45% | 1.22% | 0.28% |
| 1.4 | Percentage of connections with good voice quality (=>95%) | | | | | | | | | |
| | (i) 0-4 (w/o frequency hopping) | | | | | | | 96.13% | 97.14% | 97.20% |
| | (ii) 0-5 ( with frequency hopping) | 91.87% | 96.10% | 94.37% | 92.08% | 92.00% | 97.3% | | | |
| 1.5 | Service Coverage | | | | | | | | | |
| | In door  (>= -75dBm) | 75.12 | 83.27 | 74.56 | 66.82 | 49.62 | 87.3 | 92.25 | 99.86 | 92.18 |
| | In-vehicle  (>= -85dBm) | 96.70 | 97.07 | 97.88 | 93.91 | 88.13 | 98.15 | 99.38 | 100.0 | 99.70 |
| | Outdoor- in city (>= -95dBm) | 99.92 | 99.93 | 100 | 99.67 | 99.03 | 100 | 100 | 100 | 100 |
| 1.6 | Call Setup Success Rate (>=95%) | 98.17% | 98.73% | 97.78% | 94.84% | 96.63% | 99.19% | 100.0% | 100.0% | 99.15% |

## Graphical Representation
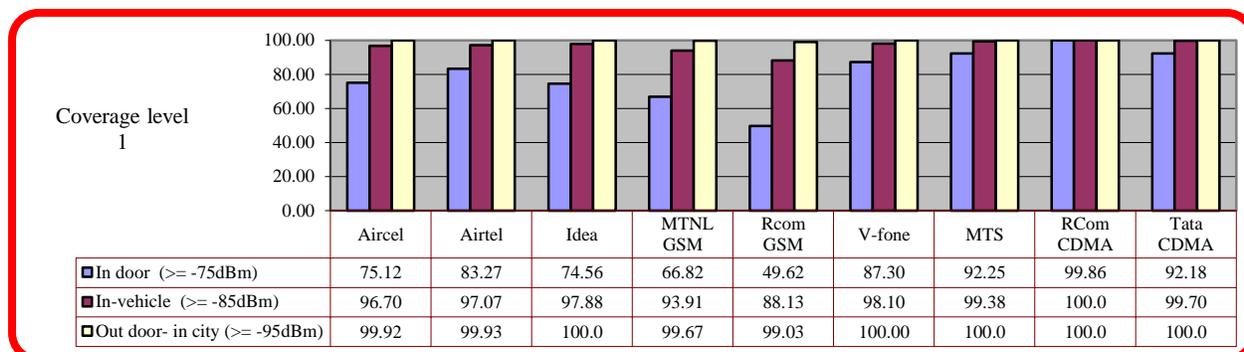


| | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | RCom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| In door  (>= -75dBm) | 75.12 | 83.27 | 74.56 | 66.82 | 49.62 | 87.30 | 92.25 | 99.86 | 92.18 |
| In-vehicle  (>= -85dBm) | 96.70 | 97.07 | 97.88 | 93.91 | 88.13 | 98.10 | 99.38 | 100.0 | 99.70 |
| Out door- in city (>= -95dBm) | 99.92 | 99.93 | 100.0 | 99.67 | 99.03 | 100.00 | 100.0 | 100.0 | 100.0 |

### (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 MTNL-GSM & RCom-GSM.
- 'Dropped Call Rate' benchmark is not met by MTNL-GSM.
- '%age of connections with good voice quality' is not met by Aircel, Idea, MTNL-GSM, and RCom-GSM.
- "CSSR" is not met by MTNL-GSM

**(E)**  **Drive test of the mobile network of service providers**

**(2) Sample Coverage**

The Operator Assisted Drive Test was conducted at Delhi-NCR for all the operators. Route covered was about around 80-100 Km depending on city areas within the speed limit of 30-35Km/hr.

**Drive Test Locations:**

Central Delhi, Greater Kailsah, Chirag Enclave, Kalu Sarai, Lado Sarai, Sarohani Nagar, Chanakya Puri, Vandematram Marg, Pusha Roadouter Ring Road,Iit,Africa Avenue,Vinay Marg,Panchsheel Marg,Vandematram Marg, Pusha Road,Panchkuain Marg,Cp Circle,B.K.S

## 2) Performance (for the respective cities) - Independent Drive Test

| SN | Parameter | Aircel | Airtel | Idea | MTNL | Rcom GSM | Voda fone | MTS | Rcom CDMA | Tata CDMA |
|----|-----------|--------|--------|------|------|----------|-----------|-----|-----------|-----------|
| 1.1 | Call Attempts | 147 | 139 | 149 | 203 | 172 | 109 | 128 | 187 | 217 |
| 1.2 | Blocked Call Rate (<=3%) | 0.68% | 2.15% | 1.34% | 2.46% | 4.07% | 0.92% | 0.00% | 0.00% | 1.38% |
| 1.3 | Dropped Call Rate (<=2%) | 1.36% | 0.71% | 0.67% | 3.94% | 1.16% | 0.92% | 0.00% | 1.60% | 0.92% |
| 1.4 | Percentage of connections with good voice quality (=>95%) | | | | | | | | | |
| | (i) 0-4 (w/o frequency hopping) | | | | | | | 96.32% | 95.61% | 97.00% |
| | (ii) 0-5 ( with frequency hopping) | 92.00% | 95.90% | 91.00% | 94.72% | 78.00% | 97.80% | | | |
| 1.5 | Service Coverage | | | | | | | | | |
| | In door  (>= -75dBm) | 66.90 | 86.60 | 74.54 | 67.20 | 42.86 | 89.13 | 91.91 | 81.13 | 97.31 |
| | In-vehicle  (>= -85dBm) | 94.70 | 96.90 | 97.63 | 94.60 | 78.06 | 99.46 | 99.88 | 99.62 | 99.90 |
| | Outdoor- in city (>= -95dBm) | 99.60 | 99.70 | 100 | 99.81 | 95.93 | 99.52 | 100 | 100 | 100 |
| 1.6 | Call Setup Success Rate (>=95%) | 99.32% | 97.85% | 98.66% | 97.54% | 95.93% | 99.08% | 100% | 100% | 98.62% |

### Graphical Representation
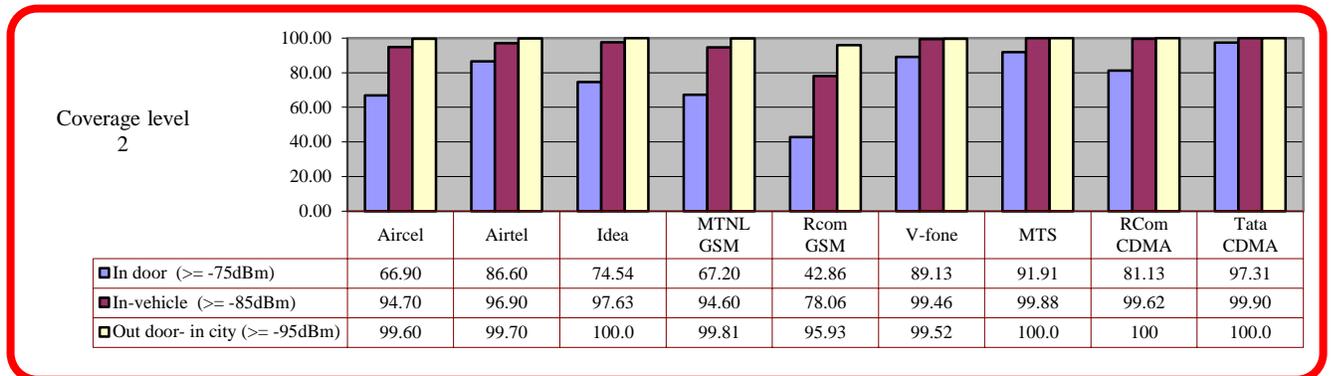


| Coverage level 2 | Aircel | Airtel | Idea | MTNL GSM | Rcom GSM | V-fone | MTS | RCom CDMA | Tata CDMA |
|---|---|---|---|---|---|---|---|---|---|
| In door  (>= -75dBm) | 66.90 | 86.60 | 74.54 | 67.20 | 42.86 | 89.13 | 91.91 | 81.13 | 97.31 |
| In-vehicle  (>= -85dBm) | 94.70 | 96.90 | 97.63 | 94.60 | 78.06 | 99.46 | 99.88 | 99.62 | 99.90 |
| Out door- in city (>= -95dBm) | 99.60 | 99.70 | 100.0 | 99.81 | 95.93 | 99.52 | 100.0 | 100 | 100.0 |

### (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 RCom-GSM.
- 'Dropped Call Rate' benchmark is not met by MTNL-GSM.
- '%age of connections with good voice quality' is not met by Aircel, Idea, MTNL-GSM, and RCom-GSM.

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

From live & month findings, it can be concluded that on an average, performance of the operators in the service area (Delhi-NCR) is satisfactory for **Network Parameters**.

Under **Customer Service Quality Parameter** for parameter "*Metering/billing credibility-Post paid*" benchmark is not met by Idea & MTNL-GSM & for parameter "*Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints (≤1 week)*" benchmark is not met by MTNL-GSM.

For parameter "*Accessibility of call centre*" Aircel is not meeting the benchmark & for parameter Aircel, Airtel, RCom-GSM & RCom-CDMA.

During **Drive Tests**, for the parameter "%age of connections with good voice quality", Aircel, Idea, MTNL & Rcom GSM are not meeting the benchmark. It is also found that for parameters "Blocked call rate" & "Dropped call rate" are not met by MTNL & RCom-GSM and for parameter "CSSR" benchmark is not met by MTNL.

## II.     Basic Telephone Service (Wireline) Providers
           *……...Audit not done for this quarter*

## III.    Broadband Service Providers
           *……...Audit not done for this quarter*