

**REPORT**

**ON**

**AUDIT & ASSESSMENT OF QoS**

**OF**

**WIRELINE BASIC SERVICES,  
WIRELESS BASIC SERVICES,  
CELLULAR MOBILE TELEPHONE SERVICE  
AND BROADBAND SERVICE**

**FOR**

**WEST ZONE - MUMBAI CIRCLE**

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## CHAPTER – 1

### EXECUTIVE SUMMARY

#### 1.1 Introduction

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 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 that efforts TRAI has selected through bidding process Audit Agency to audit and assess the Quality of Service rendered by the service providers namely basic (wireline), basic (wireless), cellular mobile telephone service and broadband service having following scope of work:

#### 1.2 Scope of Work

The audit and assessment of Quality of Service is conducted for MTNL, private basic service providers, unified access service providers, cellular mobile service providers and ISPs (providing broadband service) in Mumbai Service areas in the Western Zone for basic service (wireline), basic (wireless) and cellular mobile telephone service. The scope detailed below is as per the scope of the tenders.

- 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 Interconnect (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 as per clause (b) above is carried out.
- iv) Drive tests of the mobile networks of service providers.
- v) Live testing of the efficiency of the call center / customer care help line.

### **1.3 Methodology**

#### **1.3.1 Wireline:**

The Network parameter of the QoS TRAI regulations is observed / verified for the 3 days for nearly 5% of the telephone exchanges covering 10% of the SDCA in a Service area. The network parameter for the entire month is also collected from the operator as per the requirement. There are operators who have unified NMS/NOC from where the entire data can be seen. At the same time on several occasions the data had to be collected from the respective exchange as the centralized monitoring is not available. The data related to Billing and Customer care is checked for the previous month and verified with the customer by calling the customer with the help of the operator in presence of the auditing officers. The process of registration and handling of the complaints was also studied for the various operator. Call centre number was even called for measuring the efficiency of the call centre.

#### **1.3.2 Basic Wireless and Cellular Mobile:**

All the MSC, BSC and BTS data for the relevant details were collected either from the centralized NOC or through a remote access to the NOC. The Radio parameters of the QoS TRAI Regulations were audited/observed/verified from the data collected from OMC-R. The Drive test was conducted for the highways, commercial complex and residential areas and for the areas from which TRAI has received the complaints. The POI and other network parameter was audited/observed/verified from the data collected from the OMC-S. The data related to Billing and Customer care is checked for the previous month and verified with the customer by calling the customer with the help of the operator in presence of the auditing officers. The process of registration and handling of the complaints was also studied for the various operator. Call centre number was even called for measuring the efficiency of the call centre. The Inter operator congestion was checked by calling the operator during the time specified in the tender. TCBH is taken as 19:00 Hrs as per the maximum traffic for three days observed.

#### **1.3.3 Broad band:**

5% of the POPs in 10% of the SDCA was audited for the relevant details from the centralized NOC or through a remote access to the NOC. The network parameter was also checked from the centralized NOC. MRTG, Cactii and Sandvine for link utilisation is used. Smoke Ping and Ping Test for Latency calculations was used. The data related to Billing and Customer care is checked for the previous month and verified with the customer by calling the customer with the help of the operator in presence of the auditing officers. The process of registration and handling of the complaints was also studied for the various operator. Call centre number is called for measuring the efficiency of the call centre.

## CHAPTER – 2

### REFERENCE DOCUMENTS / SOFTWARE / TOOLS USED

The following documents shall be followed and consulted while conducting the Audit and Assessment of Quality of Services of wireline basic services, wireless basic and cellular mobile services and broadband services:

1. TRAI Regulations documents
  - a. Regulations on Quality of Service of Basic and Cellular Mobile Telephone Services, 2005
  - b. Quality of Service of Broadband Service Regulations 2006.
2. PMR data of Operators provided by TRAI.
3. TRAI Tender document no. II (Audit)
4. Manufacturer's operating and configuration manual where ever made available.
5. The following Systems /Tools were used while conducting the Audit and Assessment of QoS of Wireless Services.
  - a. Drive Test Tools
  - b. OMC-R & OMC-S
  - c. MSC
6. The following Software /Tools were used while conducting the Audit and Assessment of QoS of Broadband Services.
  - MRTG, Cacti and Sandvine for link utilisation.
  - Smoke Ping and Ping Test for Latency calculations.
  - Internet Explorer and Speed test tools for testing download speed.
  - FTP and ping Test for packet loss.

**CHAPTER – 3****OPERATORS AUDITED****1 WIRELINE**

Service Provider	Zone	Name of the Circle/ Service Area
MTNL	West	Mumbai
Bharti	West	Mumbai
TTL	West	Mumbai
Reliance	West	Mumbai

Nearly 5 % of the exchanges covering 10% of SDCA were audited as per the scope of works.

**2 BASIC WIRELESS AND CELLULAR MOBILE**

Sl.	Name of service Provider	Service Area
1	BPL Mobile Communications Ltd	Mumbai
2	Vodafone Essar Limited	Mumbai
3	MTNL	Mumbai
4	Bharti Airtel Ltd	Mumbai
5	MTNL – CDMA	Mumbai
6	Reliance Communications Limited	Mumbai
7	Tata Teleservices	Mumbai

All the MSC's and BSS systems were considered for audit and assessment.

**3 BROADBAND**

S.No.	ISPs	Service Area
1	Tata Teleservices	Mumbai
2	Mahanagar Telephone Nigam Ltd.	Mumbai
3	Bharti Airtel Ltd.	Mumbai
4	Tata Communications. (VSNL)	Mumbai
5	You Telecom India Pvt lLtd	Mumbai
6	Hathway Cable & Datacom Pvt. Ltd.	Mumbai
7	Sify Limited	Mumbai
8	Reliance Communications Ltd.	Mumbai

5% of the POPs of ISP spread over in 10% SDCAs in specified service area are covered.

## CHAPTER – 4

### SERVICES / SYSTEMS AUDITED

The following Services are audited as per the documents under reference in chapter – 2.

1. Wireline Basic Services
2. Wireless Basic and Cellular Mobile Services
3. Broadband Services
4. RF Coverage

The following Systems are audited as per the documents under reference in chapter – 2.

1. PSTN Exchanges
2. Mobile Switching Centre.
3. Broadband PoPs
4. Billing Applications
5. Customer Care applications

Facilities / that are audited as per the documents under reference in chapter – 2

1. Billing documents.
2. Customer Care records.

The following field verifications against the following were conducted as per the documents under reference in chapter – 2.

1. RF network coverage
2. Inter Operator Congestion
3. Billing Complaints
4. Network Complaints
5. Customer Care efficiency

## CHAPTER – 5

## PMR DATA VERIFICATION REPORT

Verification of PMR Data submitted by operator to TRAI with QoS records maintained by Operator.

## 5.1 Wireline Services ( PERIOD : OCT-DEC 2007)

S.N.	Parameters	Benchmarks	AIRTEL	RELIANCE	TTML	MTNL
1	Provision of a telephone after registration of demand					
	100 % cases within 7 days (subject to technical feasibility)	100%	99.20%	100%	99.35%	86.44%
2	Fault incidences					
	(No. of faults/100 subscribers /month)	<3	1.47%	0.98%	2.33%	7.84%
	By 31 <sup>st</sup> March 2008					
3	Fault repair by next working day					
	By next working day	> 90%	92.48%	96.69%	94%	85.61%
4	Mean Time To Repair (MTTR)	< 8Hrs	4.62	3.24	6.44	17.61
5	Call Completion Rate within a local network					
	Should be better than 55%	> 55%	61%	NA	57%	55.46%
6	Metering and billing credibility					
	Disputed Bills over bills issued	<0.1%	0.22%	0.07%	0.12%	0.05%



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S.N.	Parameters	Benchmarks	AIRTEL	RELIANCE	TTML	MTNL
7	Customer Care					
	(Promptness in attending to customers requests) 95% of requests					
	- Shifts (< 3 days)	100%	91.78%	100%	83.11%	69.90%
	- Closures (< 24 Hrs)	100%	100.00%	98%	100.00%	90.62%
	- Additional Facility (< 24 Hrs)	100%	97.65%	96%	97.10%	86.07%
8	Response Time to the customer for assistance					
	(i) % age of calls answered (electronically):					
	within 20 seconds	80%	100%	98%	100%	100%
	within 40 seconds	95%	100%	99%	100%	100%
	(ii) % age of calls answered by operator(voice to voice):					
	within 60 seconds	80%	90.09%	97.3%	83.8%	82.96%
	within 90 seconds	95%	93.18%	99%	87.6%	85.53%
9.	Time taken for Refunds and deposits after closures. (100% within 60 days)	100%				99.31%

**Observation:**

The above data was verified with the data provided by the operators. The data was found to be as per the detail provided above.

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5.2 Wireless Basic and Cellular Mobile Services (Period : Oct – Dec 2007)

(NA- Not Available)

S.N.	Parameters	Benchmarks	GSM OPERATORS				CDMA OPERATORS		
			Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTSL
1	Network Performance								
1.1	Accumulated down time of community isolation	< 24Hrs	0	16:05	0	0	0	0	0
1.2	Call set-up Success Rate (within licensee's own network) (%)	> 95%	95.01%	99.42%	96.55%	95.4%	97.9%	99.53%	98.3%
1.3	Service Access Delay (Sec)	9 – 20 Sec	3.76	11.18	9.23	Between 7 to 10	2.19	4.06	12
1.4	Blocked Call Rate								
	(i) SDCCH Congestion (%)	< 1%	0.40%	0.7%	0.69%	0.77%	1.61%	0	0
	(ii) TCH Congestion (%)	< 2%	0.46%	0.97%	1.32%	1.7%	0.063%	0	0.58%
1.5	Call Drop Rate (%)	< 3%	1.1%	1.45%	1.71%	2.01%	1.18%	0.93%	0.45%
1.6	Percentage of connections with good voice quality (%)	> 95%	100%	98.11%	96.38%	95.2%	96.45%	99.27%	97.48%
1.8	POI Congestion (%)	< 0.5%	-	0%	0%	NA.	0.47%	0%	0.02%
2	Customer Help Lines:								
2.1	Response time to the customer for assistance								
	(i) % age of calls answered (electronically) :								
	within 20 seconds (%)	80%	100%	87.05%	84%	97.76%	NA	99.5%	100%
	within 40 seconds (%)	95%	NA	NA	97%	98.4%	NA	99.5%	100%
	(ii) % age of calls answered by operator (voice to voice):								
	Within 60 seconds (%)	80%	86%	85.68%	86%	95.5%	NA	86.23%	83.8%
	Within 90 seconds (%)	95%	90%	98.59%	96%	97.6%	NA	90.65%	87.6%

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S.N.	Parameters	Benchmarks	GSM OPERATORS				CDMA OPERATORS		
			Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTSL
3.0	Billing Complaints								
3.1	Billing complaints per 100 bills issued (%)	<0.1%	0.02%	0.06%	0.038%	0%	NA	0.08%	<0.06%
3.2	% of billing complaints resolved within 4 weeks (%)	100%	100%	100%	100%	100%	NA	100%	99.8%
3.3	Period of all refunds / payments due to customers from the date of resolution of complaints as in (ii) above (weeks)	< 4 Weeks	< 4 weeks	< 4 weeks	< 4 weeks	< 2 weeks	NA	< 4 weeks	< 4 weeks

**Observation:**

The above data was verified with the data provided by the operators. The data was found to be as per the detail provided above except for TTSL where the data is submitted for other than busy hour observed at present.

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**5.3 Broadband Services. (PERIOD : OCT-DEC 2007)**

(NA- Not Available)

S.N.	Parameters	Benchmark	Hathway	MTNL	Reliance	SIFY	TTML	YOU Telecom	Bharti	VSNL
<b>1</b>	<b>Service Provisioning/ Activation Time</b>	100% in =<15 working days								
1.1	No. of connections registered		9822	27991	6688	16867	6068	1364	3781	38250
1.2	%age of connections provided within 15 days of registration of demand	100%	91.00%	70.35%	68%	100%	100%	100%	98.8%	100%
1.3	%age of connections provided after 15 days of registration of demand		9.33%	29.65%	32.00%	0%	0%	NIL	1.2%	0%
1.4	No. of customers to whom credit is given for delayed connections			NIL	0	0	NA	NIL	NA	0
1.5	Total no. of connections provided during the period		9471	27991	55812	16867	6068	1364	3327	35824
1.6	Total no. of working connections at the period		80444	291443	55812	16667	43451	1462	42839	209526

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S.N.	Parameters	Benchmark	Hathway	MTNL	Reliance	SIFY	TTML	YOU Telecom	Bharti	VSNL
<b>2</b>	<b>Faults Repair / Restoration Time</b>									
2.1	Total no. of faults registered		55009	165965	23460	37479	8550	8868	1327	359272
2.2	%age of faults repaired by next working day	>90%	91.33%	72.55%	93%	91%	93.33%	99.43%	94.0%	86%
2.3	%age of faults repaired within 3 working days	=>99%	99.17%	91.78%	100%	99%	99%	99.88%	98.7%	95%
2.4	No. of customers to whom rent rebate is given in minimum monthly charges or equivalent usage allowance for delay in fault repair				130		NA	8		44352
	a. Rent Rebate of 7 days		252	0	5	69	NA	6	10	43050
	b. Rent Rebate of 15 days		62	0	54	16	NA	2	0	1062
	c. Rent Rebate of One Month		27	0	71		NA	0	0	240
<b>3</b>	<b>Billing Performance</b>									
3.1	Total no. of bills issued		78690	829459	143746	0	48728	27260	82083	277296
3.2	No. of bills disputed		1490	579	596	0	71	47	183	3204
3.3	%age of bills disputed	<2%	1.89%	0.07%	0.41%	0	1%	0.16%	0.22%	1.16%
3.4	%age of complaints resolved within 4 weeks	100% within 4 weeks	100%		100%	0	100%	100%	100%	99%
3.5	%age of cases to whom refund of deposits is made within 60 days of closures	100% within 60 days	99.23%	NA	100%	0	NA	98.19	100%	100%
<b>4</b>	<b>Response Time to the Customer for assistance</b>									
4.1	Total no. of calls received by operators (Voice to voice)		123195	588648	564806	80648	32428	36056	26870	1232386
4.2	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	60%-80%	36.25%	72.70%	88%	82%	98.65%	97%	86.20%
4.3	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	80%-90%	43.10%	86.70%	98%	92%	99.45%	98%	89.57%

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S.N.	Parameters	Bench- mark	Hathway	MTNL	Reliance	SIFY	TTML	YOU Telecom	Bharti	VSNL
<b>5</b>	<b>Bandwidth utilisation/throughout</b>									
5.1	No. of intra network links (POP to ISP Gateway nodes)		365 Mb MPLS VPN	14FE	34	379	29	4	NA	16
5.2	No. of intra network links having Bandwidth utilisation >90% during peak hours (TCBH)		85% (Available Bandwidth is Burstable)	NONE	0	17	0	Nil	NA	Nil
5.3	No. of Upstream links for International connectivity (ISP Gateway nodes to IGSP/NIXI node/NAP)		International (MPLS/Ether net/NIXI)	Max 12STM	88	25	4	4	1	11 STM1 B-bone 16 STM4 B-bone 2 STM16 B-bone
5.4	No. of Upstream links for International connectivity having bandwidth utilisation >90% during peak hours (TCBH)		1 Nearly 90 %	Max 1	7	NIL	0	Nil	0	Nil
5.5	Total International bandwidth available from ISP Node to IGSP/NIXI/NAP in Mbps		186.5 Mb Bharti / Vsnl / Reliance + 100Mb Nixi	MAX 1300	38471	2288	214.67	44	407	13891.33
5.6	Total International bandwidth during peak hours (TCBH) in Mbps (Enclose MRTG)		168 Mb Bharti / Vsnl + 62 Mb Nixi	MAX 1038.41	26569	1936.66	196.67	34.5	337	10194.33
5.7	%age International bandwidth utilisation during peak hours (TCBH) in Mbps (enclose MRTG)		85 -90 %	84.62%	69%	85%	91.33%	78.36%	78%	73.42%
5.8	Broadband Connection Speed available (download) from ISP node to user	>80%	= 85 %	>80%	85%	95%	91.66%	98%	99%	>80%

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S.N.	Parameters	Benchmark	Hathway	MTNL	Reliance	SIFY	TTML	YOU Telecom	Bharti	VSNL
			<b>6</b>	<b>Service Availability / Uptime (for all users) in %age</b>	>90% QE June 07 >98% w.e.f. QE Sep. 07					
6.1	Total Operational Hours		170652624	2208	736	736	736	19278280	736	25270608
6.2	Total downtime in hours		496728	nil	11.95	0	0	307656.33	0.5	301139
6.3	Service availability/uptime (for all users) in %age	>90%	99.71%	>98%	99.47%	100%	93.66%	98.4%	99.9%	Network uptime 98.96% Customer uptime 99.01%
<b>7</b>	<b>Packet loss (for wired broadband access) in %age</b>	<1%	<1%	<1%	0.54%	<1%	1	<1%	0%	0%
<b>8</b>	<b>Network latency (for wired broadband access)</b>									
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	<80 ms	<70ms	<24.4ms	<45ms	16ms	<40ms	15ms	50ms
8.2	User reference point at ISP Gateway node to IGSP/NIXI	<350 ms	< 350 ms	<300ms	<275ms	<300 ms	301ms	<300ms	180.3ms	245ms
8.3	User reference point at ISP Gateway node to international nearest NAP port abroad (satellite)	<800 ms	NA	NA	NA	NIL	NA	NA	NA	NA

The above data was verified with the data provided by the operators.

**Deviation Observed**

**M/s. Hathway**

A) Service Provisioning /Activation Time: Hathway is calculating %age of connections provided within 15 days of registration of demand, as a percentage of total connections provided during the period instead of taking number of new connections registered as a base.

**M/s. Reliance**

A) Packet Loss: Packet Loss Value filed in the PMR was based on the customer complaints received during the specified time period. Percentage of packet loss was calculated as the percentage of packet loss complaints received to that of the total number of complaints received for that specified time period.

$((\text{Total Packet Loss Cases} / \text{Total Number of Cases}) * 100)$

B) Download Speed: RCOM is not maintaining any dump/supporting for the same.

C) Mismatch was found in the PMR filed to the TRAI for the month of Jan-Feb-March Under head Bandwidth utilisation, RCOM had shown '0' (zero) no. of intra network links which is not possible. As per RCOM, this was the typographical error.



## CHAPTER -6

## LIVE ASSESSMENT OF QoS OF DIFFERENT SERVICES

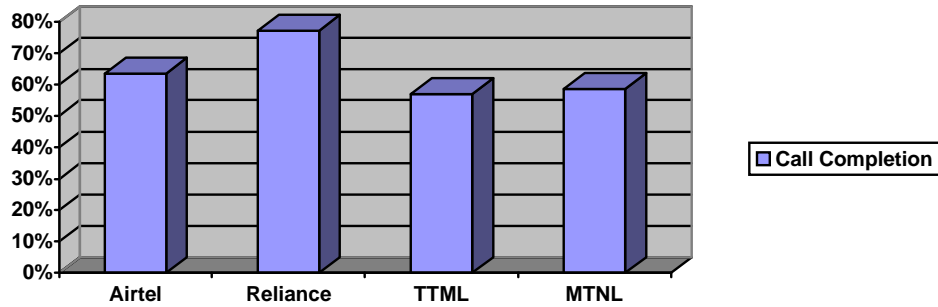
## 3 DAYS DATA

## 6.1 Wireline Services (Period: March-May 2008)

S.N.	Parameters	Benchmarks	Airtel	Reliance	TTML	MTNL
1	Call Completion Rate within a local network					
	Should be better than 55%	> 55%	63.60%	77.13% (ASR)	57%	58.76%
2	Response Time to the customer for assistance					
2.1	% age of calls answered (electronically)					
	within 20 seconds	80%	100%	100%	100%	100%
	within 40 seconds	95%	100%	100%	100%	100%
2.1	% age of calls answered by operator(voice to voice):					
	within 60 seconds	80%	81.6%	65%	99%	82%
	within 90 seconds	95%	88.6%	83%	100%	85%

**6.1.2 DATA ANALYSIS - LIVE ASSESSMENT**

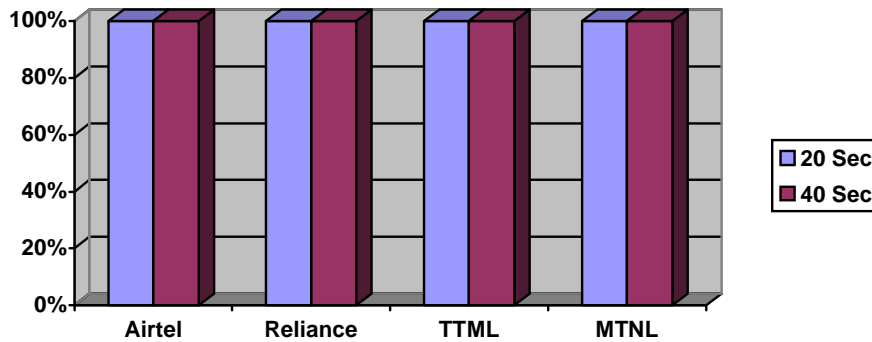
1.0 Call Completion Rate within a local network:  
Should be better than 55%: All the operators meet the benchmark.



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

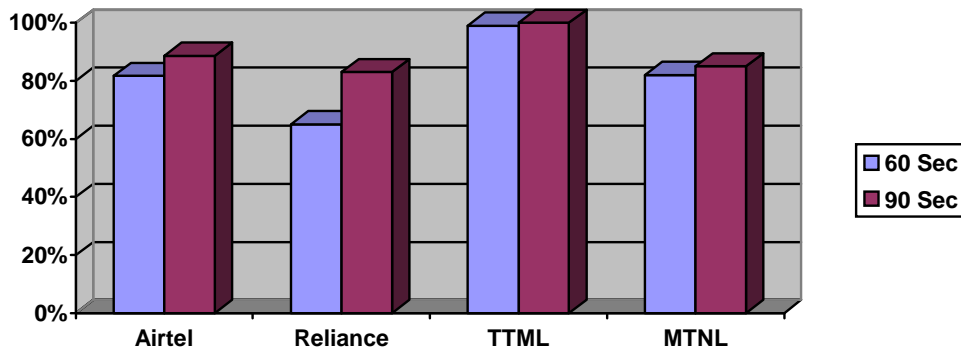
(i) % age of calls answered by operator (Electronically)

- Within 20 seconds (>80%): All the operators meet the benchmark.
- Within 40 seconds (>95%): All the operators meet the benchmark.



(ii) % age of calls answered by operator (Voice to Voice)

- Within 60 seconds (>80%): Airtel, MTNL & TTML except Reliance meets the benchmark
- Within 90 seconds (>95%): Only TTML meets the benchmark.



## 6.2 Wireless Basic and Cellular Mobile Services

### 6.2.1 Data Audited during 3 days live measurements. (Period: March-May 2008)

(NA- Not Available, NR-Not Received)

S.N.	Parameters	Benchmark	GSM OPERATORS				CDMA OPERATORS		
			Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTML
1	Network Performance								
1.2	Call set-up Success Rate (within licensees own network) (%)	> 95%	96.5%	NA	87.05%	100%	94.8%	100%	99.5%
1.3	Service Access Delay (Sec)	9 – 20 Sec	15	10.84	11.5	6	9.7	4.75	9
1.4	Blocked Call Rate								
	(i) SDCCH Congestion (%)	< 1%	0.25%	0.42%	0.42%	0.78%	0.8%	0%	0%
	(ii)TCH Congestion (%)	< 2%	0.76%	0.44%	1.79%	0.77%	0.03%	0%	0.44%
	(iii) Cell exceeding 80% TCH utilization (Nos)		30	421	413	896	0	1	18
1.5	(i) Call Drop Rate (%)	< 3%	1.2%	1.31%	0.71%	1.61%	1.4%	0.75%	0.62%
	(ii) Cell exceeding 3% TCH drop (Nos)		359	49	49	95	0	5	0
	(iii) Cell exceeding 3% TCH drop (%)		7%	1.6%	1.34%	1.72%	0%	0.65%	0%
1.6	Percentage of connections with good voice quality (%)	> 95%	97.1%	96.50%	91.33%	96.97%	82.9%	99.14%	96.97%
1.7	Service Coverage								
	In door (>= -75dBm)		88.30%	76.10%	61%	67.30%	53.3%	88.3%	94.10%
	In-vehicle (>= -85dBm)		99.90%	97.10%	92%	86.90%	84.6%	99.9%	99.90%
	Out door- in city (>= -95dBm)		100 %	99.90%	100%	100%	100%	100%	99.90%
1.8	POI Congestion (%)	< 0.5%	13.00%	0.30%	0.00%	0.12%	0.2%	0.00%	0.00%

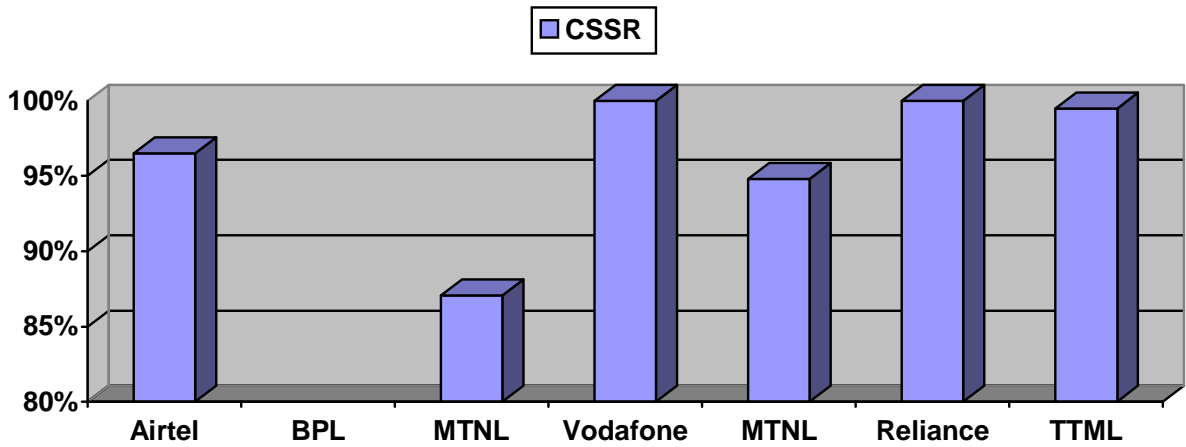
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S.N.	Parameters	Benchmark	GSM OPERATORS				CDMA OPERATORS		
			Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTML
2	Customer Help Lines:								
2.1	Response time to the customer for assistance								
	(i) % age of calls answered (electronically) :								
	within 20 seconds (%)	> 80%	100%	100%	100%	99.16%	100%	95%	100%
	within 40 seconds (%)	> 95%	100%	100%	100%	99.25%	100%	99%	100%
	(ii) % age of calls answered by operator (voice to voice):								
	Within 60 seconds (%)	> 80%	85%	86%	89%	91.56%	88%	85%	91%
	Within 90 seconds (%)	> 95%	98%	97%	100%	93.86%	100%	90%	100%

**A) NETWORK PERFORMANCE**

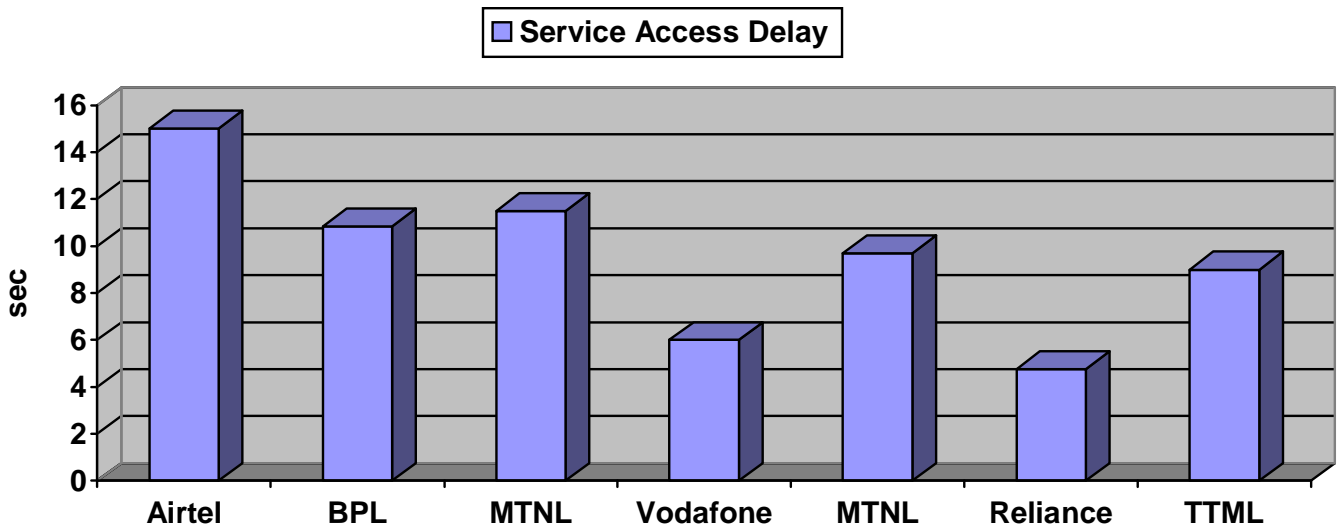
**I. Call setup success rate:**

All operators meet benchmark except for MTNL (GSM) & MTNL (CDMA). Whereas data was not received from BPL. Vodafone CSSR-100% with SDCCH and TCH congestion should not be possible.



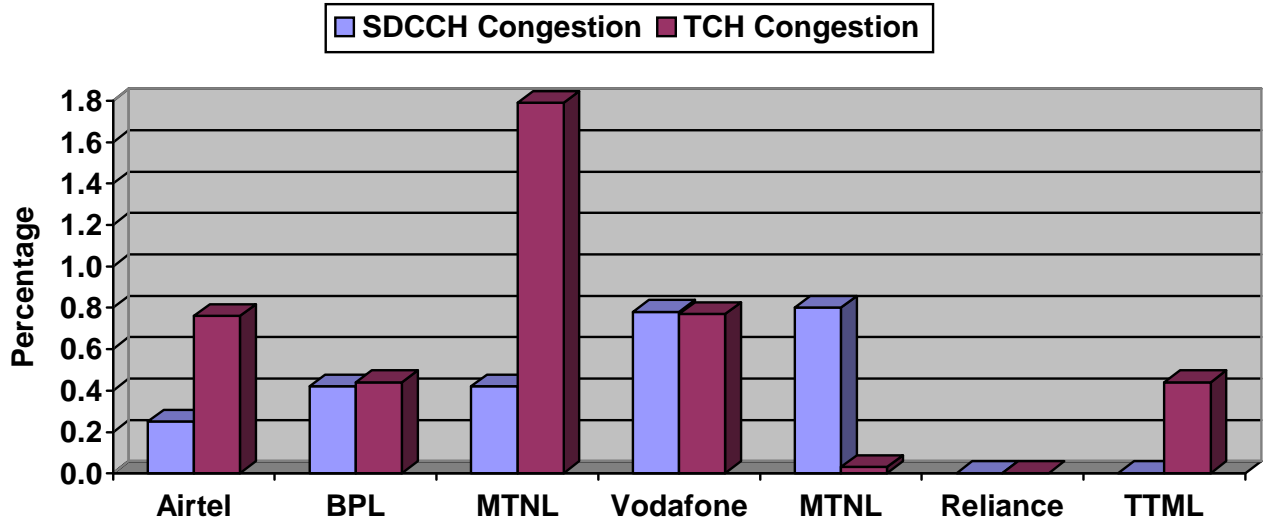
**II. Service access delay:**

All operators meet the benchmark.

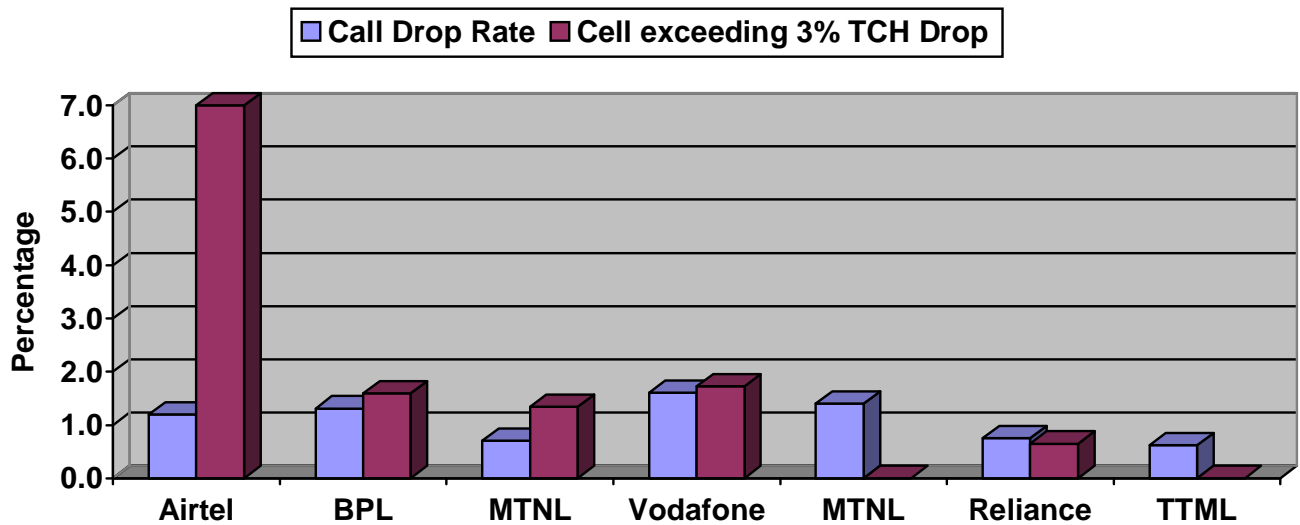


III. Blocked call rate:

- (1) SDCCH congestion (%): All operators meet benchmark.
- (2) TCH congestion (%): All operators meet benchmark.

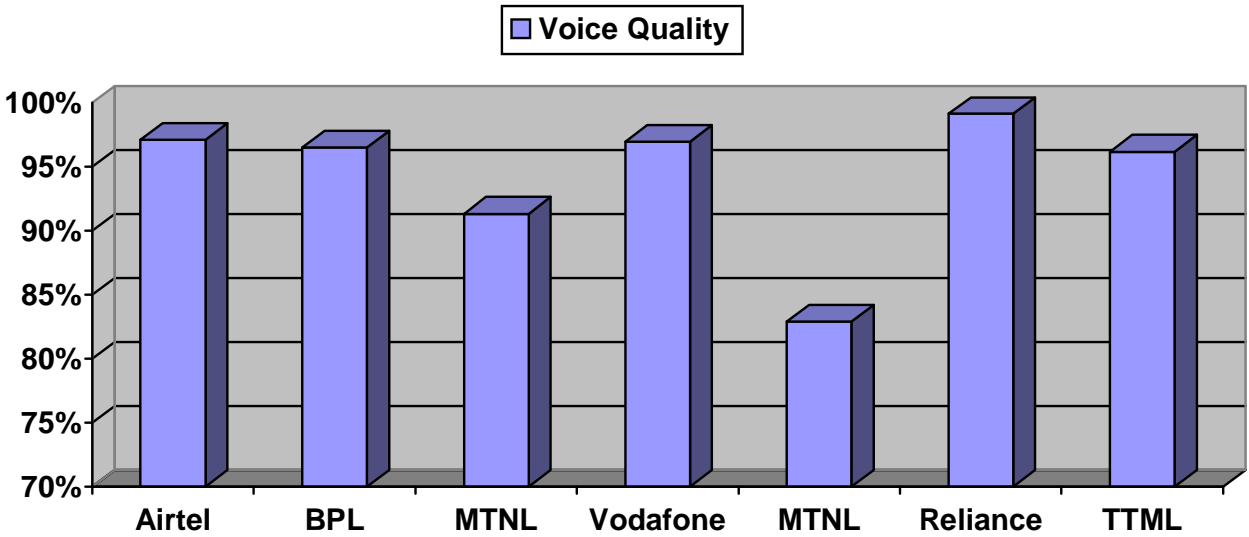


IV. Call drop rate (%):  
All operators meet benchmark.



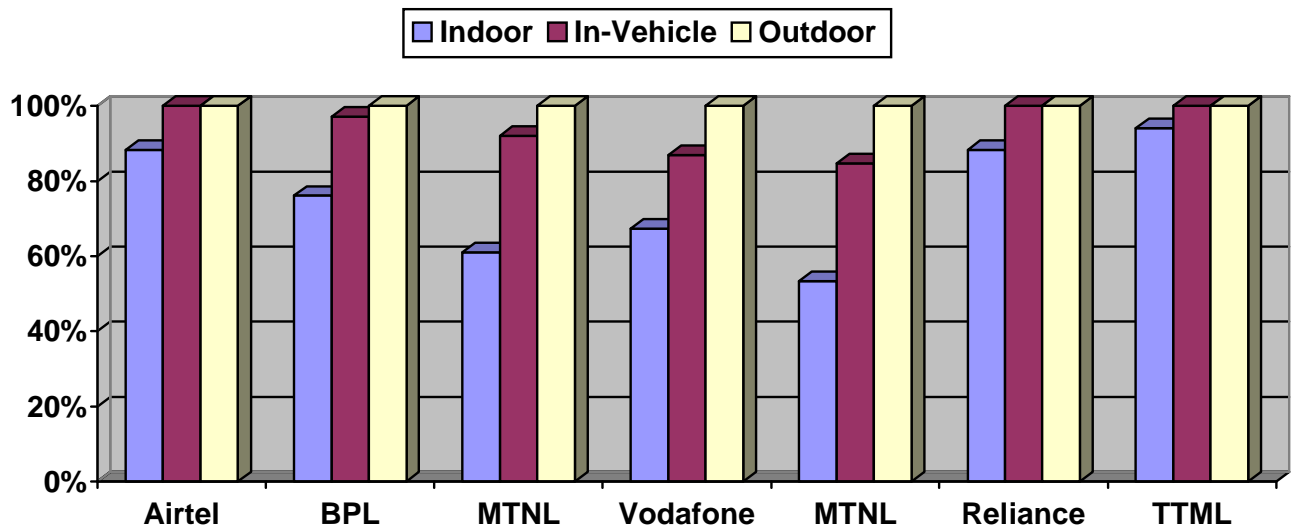
V. Percentage of connections with good voice quality:

All of operators have given this figure from drive test except for Airtel & Vodafone & all of operators meet the benchmark except for MTNL, GSM (91.33%) and MTNL (CDMA)- (82.9%).

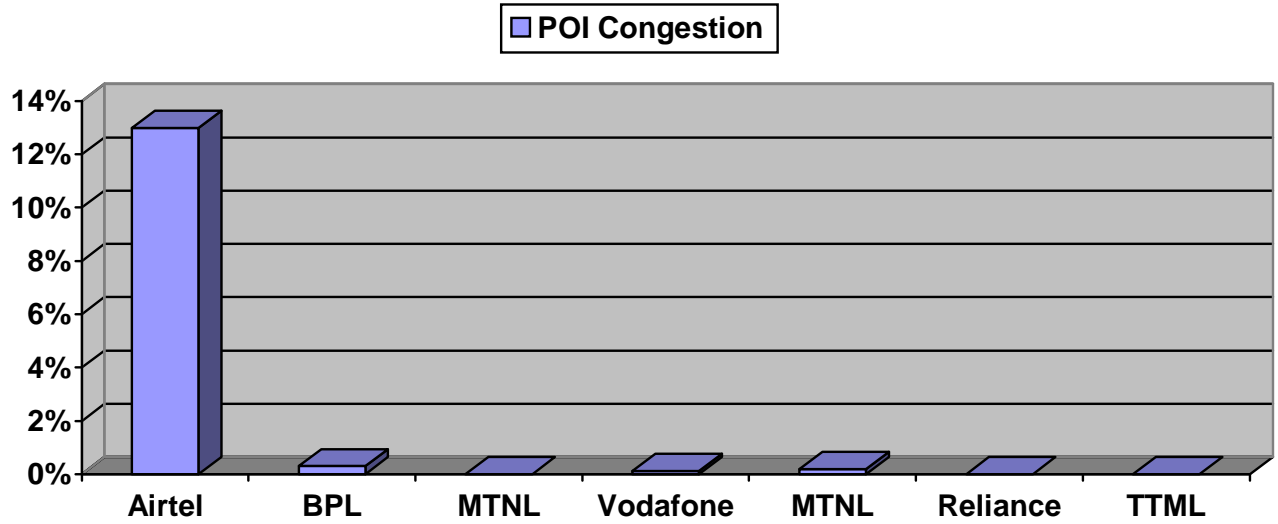


VI. Service Coverage

The data were collected through extensive Drive Test.



VII. POI Congestion:  
All operators meet benchmark except for Airtel (13%).

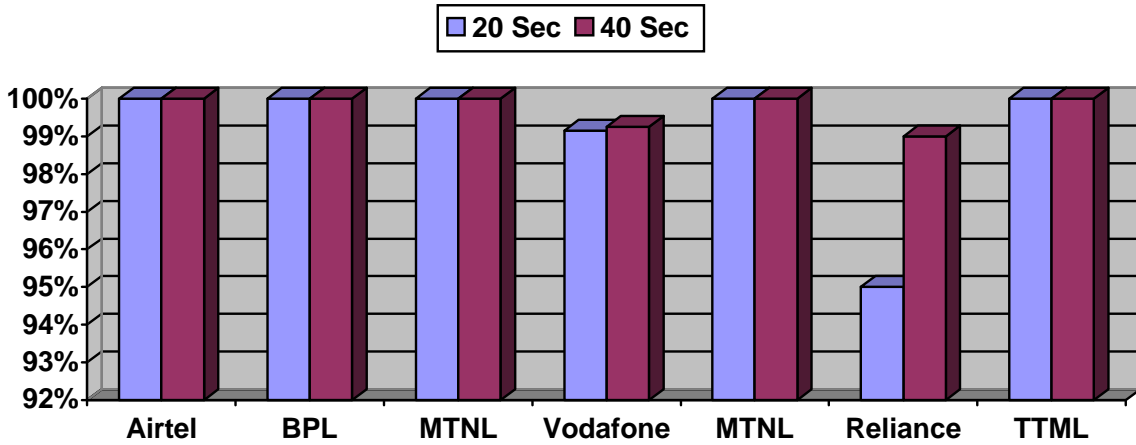




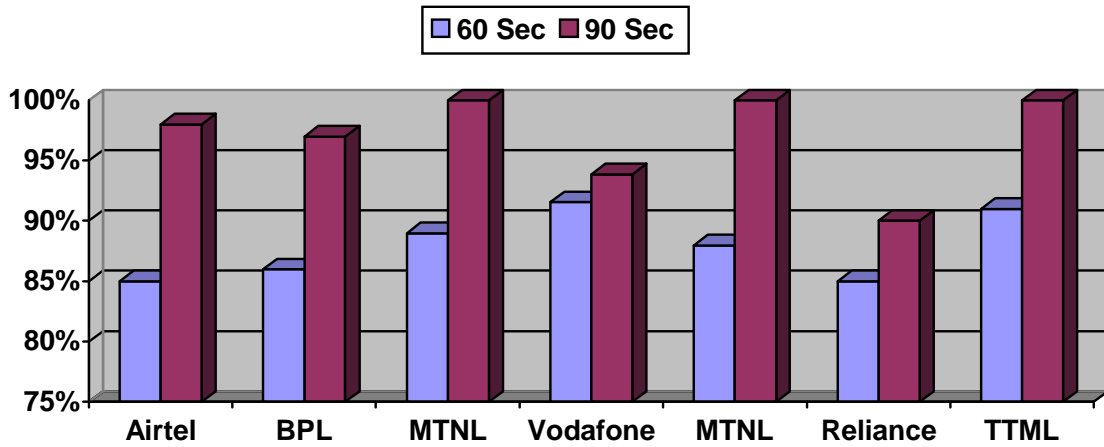
**B) CUSTOMER HELPLINE PERFORMANCE**

Response time to the customer for assistance:

- I. Percentage of call answered (Electronically);  
 With in 20 sec (%): All other operators meet benchmark.  
 With in 40 sec (%): All other operators meet benchmark.



- II. Percentage of call answered by operators (Voice to voice);  
 With in 60 sec: All other operators meet benchmark.  
 With in 90 sec: All other operators meet benchmark except for Vodafone (93.86%) and Reliance (90%).



## 6.2.2 DATA ANALYSIS

## 6.3 Broadband Services

## 6.3.1 Data of 3 days live measurements during Mar – May 2008

S.N.	Parameters	Benchmark	Bharti	Hathway	MTNL	Reliance	SIFY	TTML	YOU Telecom	VSNL
1	Response time to the customer for assistance									
	% age of calls answered by operator (Voice to Voice)									
	Within 60 seconds	>60%	75.71%	84.30%	51%	56.60%	19.80%	99.36%	98.67%	93.00%
	Within 90 seconds	>80%	82.01%	97.20%	65%	72.60%	92%	99.36%	98.67%	98.00%
2	Bandwidth Utilization/ Throughput:									
	Bandwidth Utilization	<80%								
	i) POP to ISP Gateway Node [Intra-network] Link(s)		76%	<9%	<80%	79.13%	40%	76%	69.93%	<80%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity		Its under BTSOL	<80%	92.60%	70%	50.56%	89.00%	68.96%	74.00%
	Broadband Connection Speed (download)	>80%	93%	86.70%	80.50%	87%	94.90%	97%	92%	85%
3	Packet Loss	<1%	0%	0.70%	0.17%	0.0%	0%	0.53%	0.36%	0.00%

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S.N.	Parameters	Benchmark	Bharti	Hathway	MTNL	Reliance	SIFY	TTML	YOU Telecom	VSNL
4	Network Latency (for wired broadband access)									
4.1	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	< 120ms	23 ms	30ms	6ms	4ms	19ms	23 ms	8ms	35ms
4.2	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	< 350ms	250 ms	280ms	293ms	145ms	262ms	227 ms	215ms	180ms
4.3	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	< 800ms	NA	NA	NA	NA	NA	NA	NA	NA

**NA : Not Applicable**

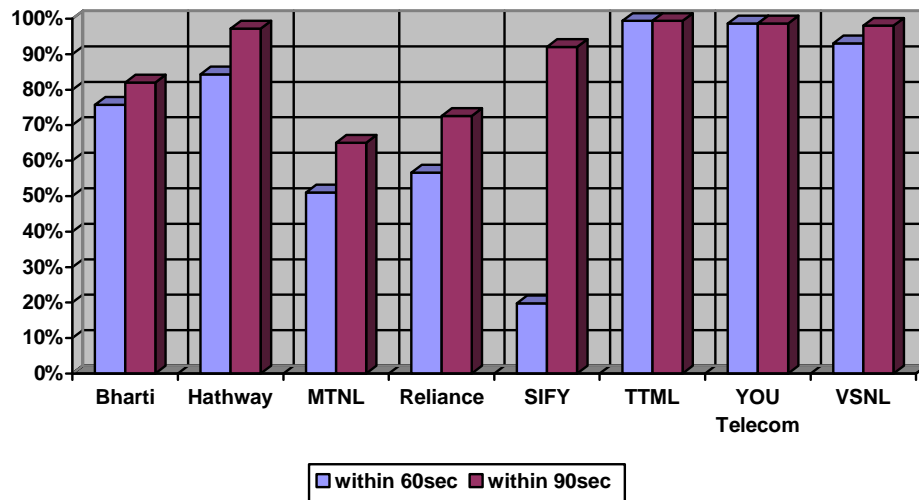
6.3.2 DATA ANALYSIS

1.0 Response time to the customer for assistance:

% age of calls answered by operator (Voice to Voice) :

- Within 60 seconds (>60%): All the operators meet the benchmark except for MTNL (51%), Reliance (56.60%) and Sify (19.80%).
- Within 90 seconds (>80%): All the operators meet the benchmark except for MTNL(65%) and Reliance (72.60%).

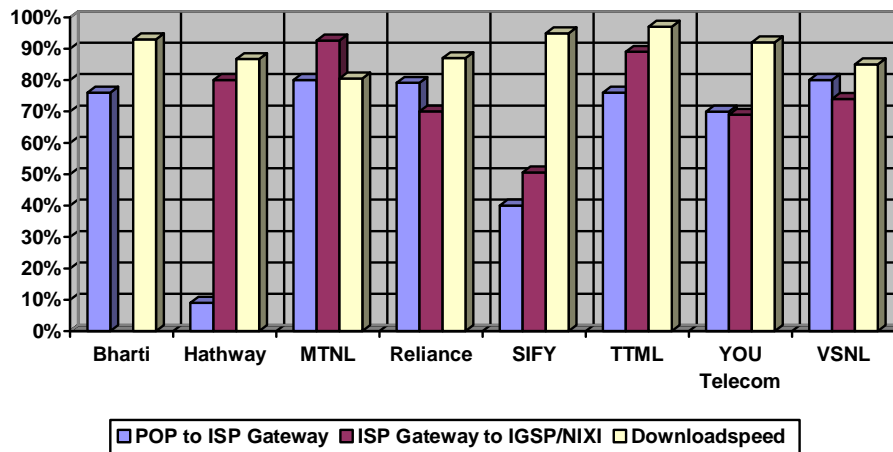
Response Time to the customer for assistance



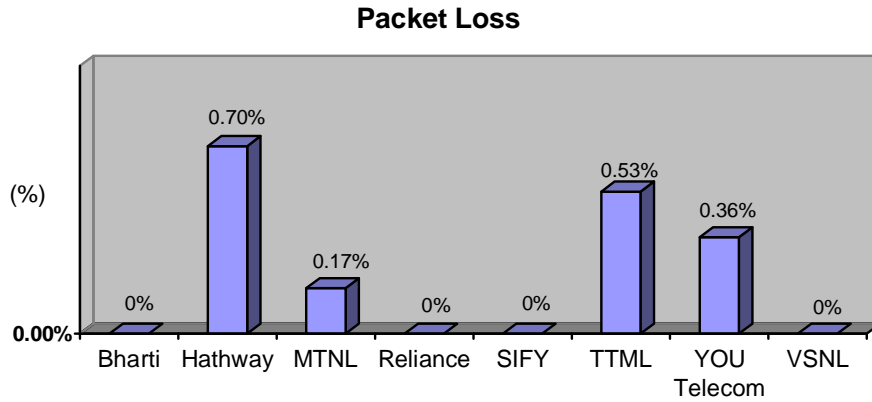
2.0 Bandwidth Utilization/ Throughput:

- POP to ISP Gateway Node [Intra-network] Link(s): All the operators meet the benchmark.
- ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: All the operators meet the benchmark except for MTNL (92.60%) and TTML (89.0%)
- Broadband Connection Speed (download) (>80%): All the operators meet the benchmark.

Bandwidth Throughput/Utilisation

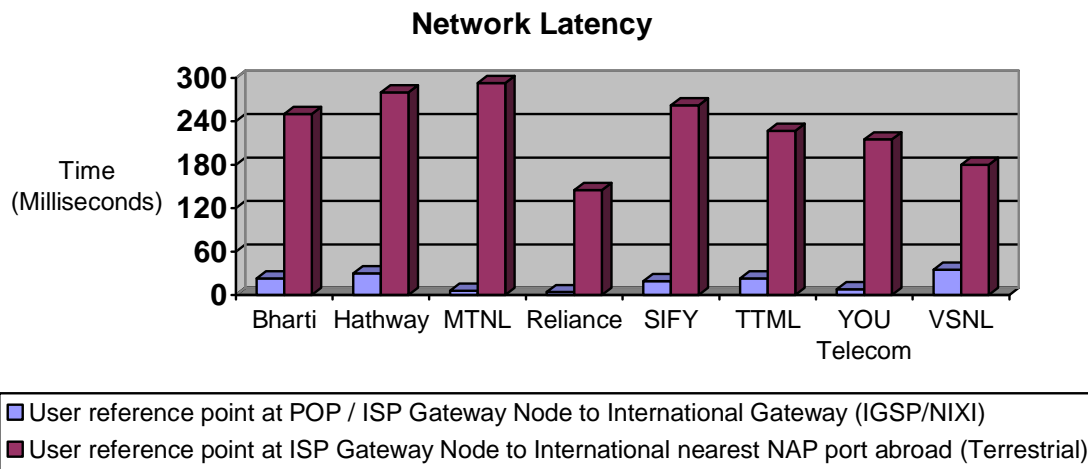


3.0 Packet Loss: All the operators meet the benchmark.



4.0 Network Latency:

- User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI): All the operators meet the benchmark.
- User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial): All the operators meet the benchmark.
- User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite): Link does not exist for the any of the operator. Hence, Not applicable.



## CHAPTER – 7

## PERFORMANCE / STATUS OF OPERATORS WRT QoS

## 7.1 QUALITY OF SERVICE ASSESSMENT : WIRELINE

## 7.1.1 OPERATOR PERFORMANCE BASED ON ONE MONTH DATA VERIFICATION IN WHICH AUDIT WAS CONDUCTED (MAR – MAY 2008).

S.N.	Parameters	BENCH-MARKS	AIRTEL	RELIANCE	TTML	MTNL
1	Provision of a telephone after registration of demand					
	100 % cases within 7 days (subject to technical feasibility)	100%	94.80%	100%	100%	96.23%
2	Fault incidences					
	(No. of faults/100 subscribers /month)	< 3%	1.60%	0.44%	1.69%	6.92%
	By 31st March 2008					
3	Fault repair by next working day					
	By next working day	>90%	96.30%	96.45%	97.85%	89.89%
	Within 3 days	100%	100%	100%	100%	95.93%
4	Mean Time To Repair (MTTR)	< 8 Hrs	7.6hrs	6.17hrs	4.72hrs	12.87 hrs.
5	Call Completion Rate within a local network					
	Should be better than 55%	>55%	63.92%	76.45%(ASR)	56.50%	56.68%
6	Metering and billing credibility					
	Disputed Bills over bills issued	< 0.1%	0.30%	0.05%	0.098%	0.05%

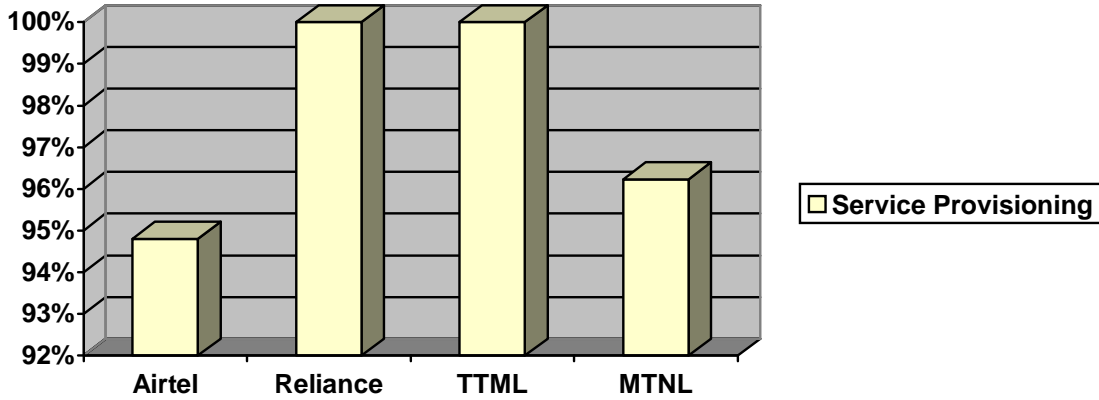
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S.N.	Parameters	BENCH-MARKS	AIRTEL	RELIANCE	TTML	MTNL
7	Customer Care					
	(Promptness in attending to customers requests) 95% of requests					
	- Shifts (< 3 days)	100%	95.83%	100%	100%	87.22%
	- Closures (< 24 Hrs.)	100%	100%	99.38%	100%	97.29%
	- Additional Facility (< 24 Hrs.)	100%	98.86%	95.84%	100%	97.07%
8	Response Time to the customer for assistance					
	(i) % age of calls answered (electronically):					
	within 20 seconds	80%	100%	95%	100%	100%
	within 40 seconds	95%	100%	100%	100%	100%
	(ii) % age of calls answered by operator(voice to voice):					
	within 60 seconds	80%	90.45%	93%	94%	94.94%
	within 90 seconds	95%	94.15%	97%	96%	94.94%

**7.1.2 Data Analysis – Monthly Data Assessment.**

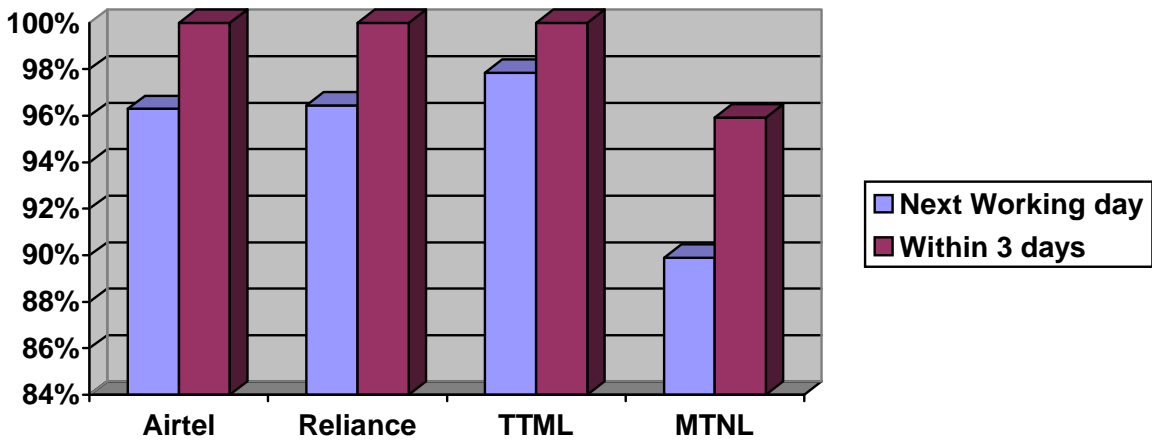
**1.0 Service Provisioning /Activation Time:**

Data not provided by MTNL. All the other operators comply with the TRAI benchmark except for Airtel (94.80%) and MTNL (96.23%)



**2.0 Fault Repair:**

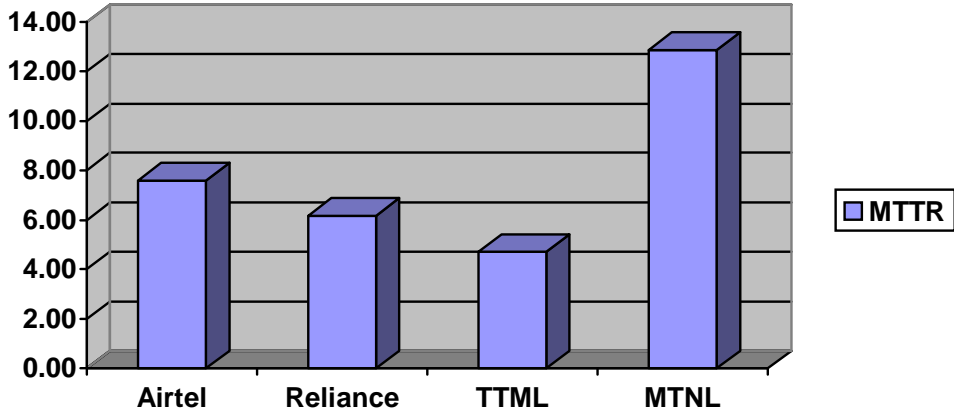
- **By next working day:** All the operators comply with the TRAI benchmark of 90%.
- **within 3 working days:** All the operators comply with the TRAI benchmark of 99% except MTNL (95.93%).





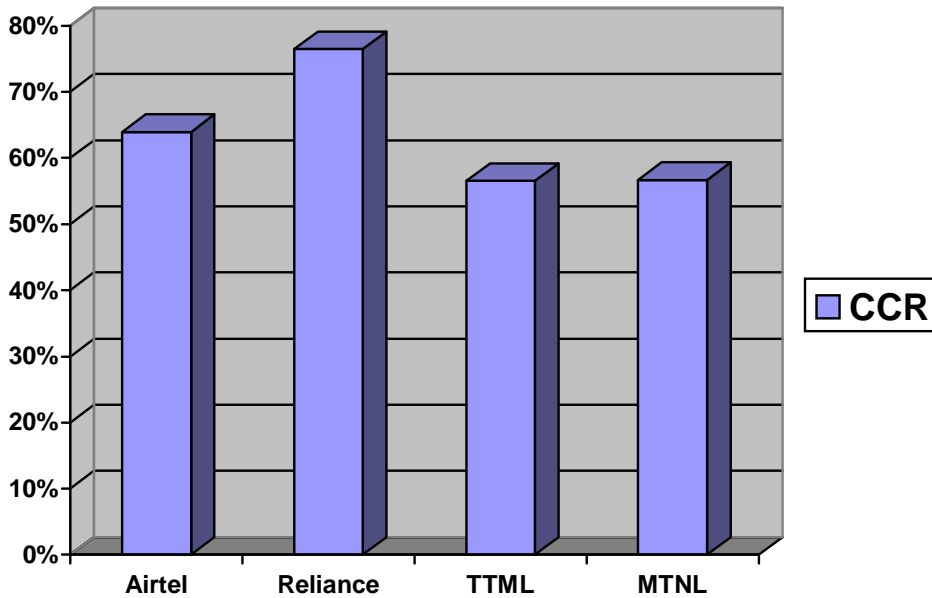
3.0 Mean Time to Repair (MTTR):

All the other operators comply with the TRAI benchmark except MTNL (12.87 hrs).



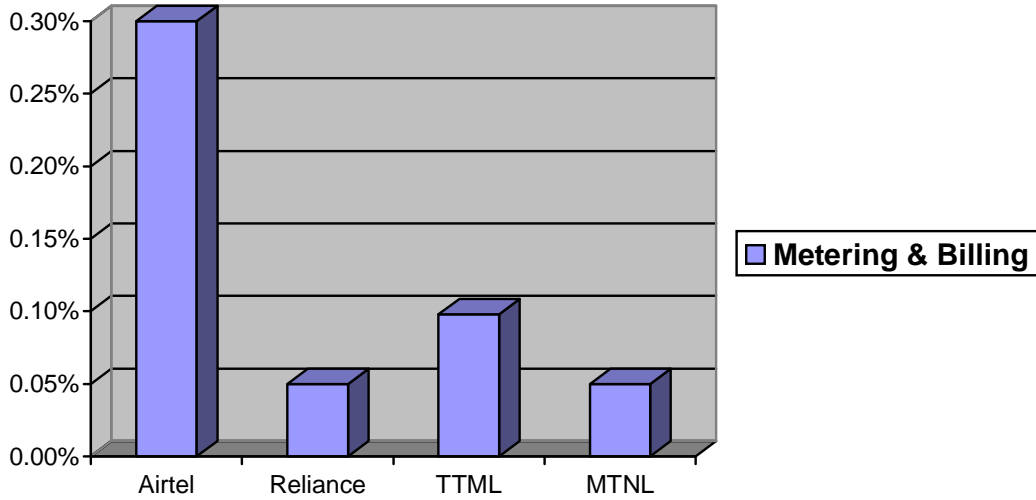
4.0 Call Completion Rate (CCR):

All the operators comply with the TRAI standards .



5.0 Metering and Billing Credibility:

Disputed Bills over Bills issued :- All the operators comply with the TRAI standards except Airtel (0.3%).

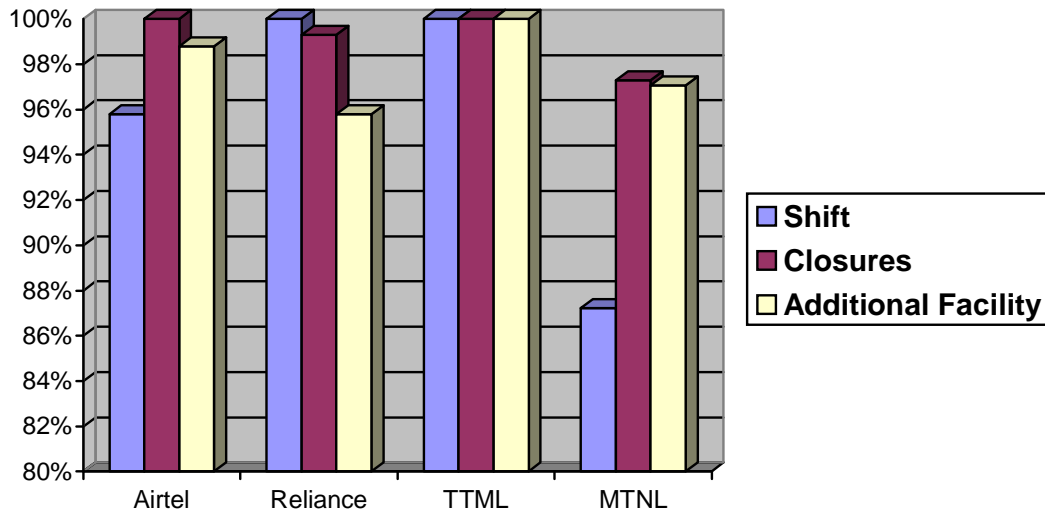


6.0 Customer Care:

Shifts (< 3 days) : All the operators meet the benchmark except Airtel (95.83%), MTNL(87.22%)

Closures (< 24 Hrs) : All meets the benchmarks except Reliance ( 99.38%), MTNL (97.29%)

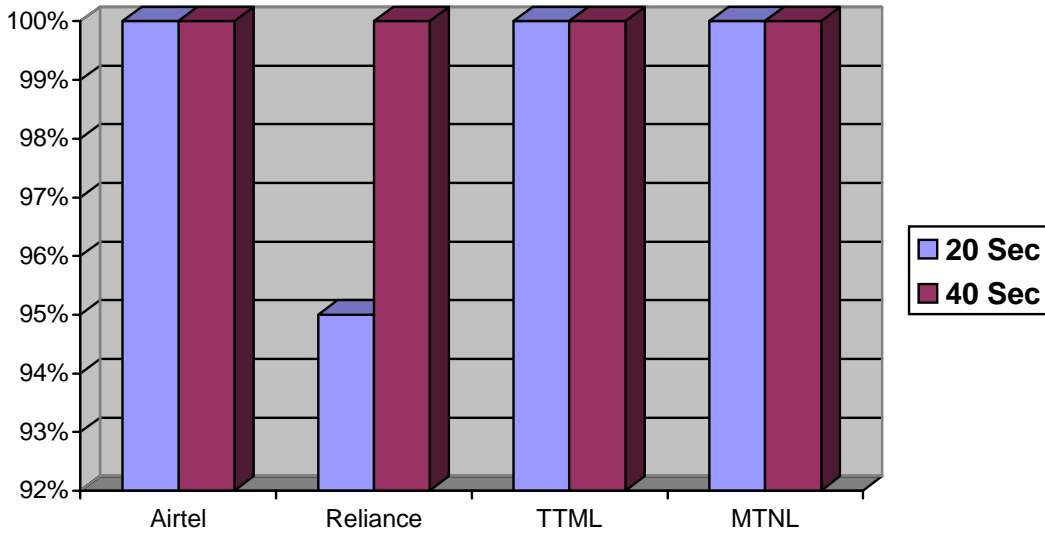
Additional Facility (< 24 Hrs) : Only TTML meets the benchmarks.



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

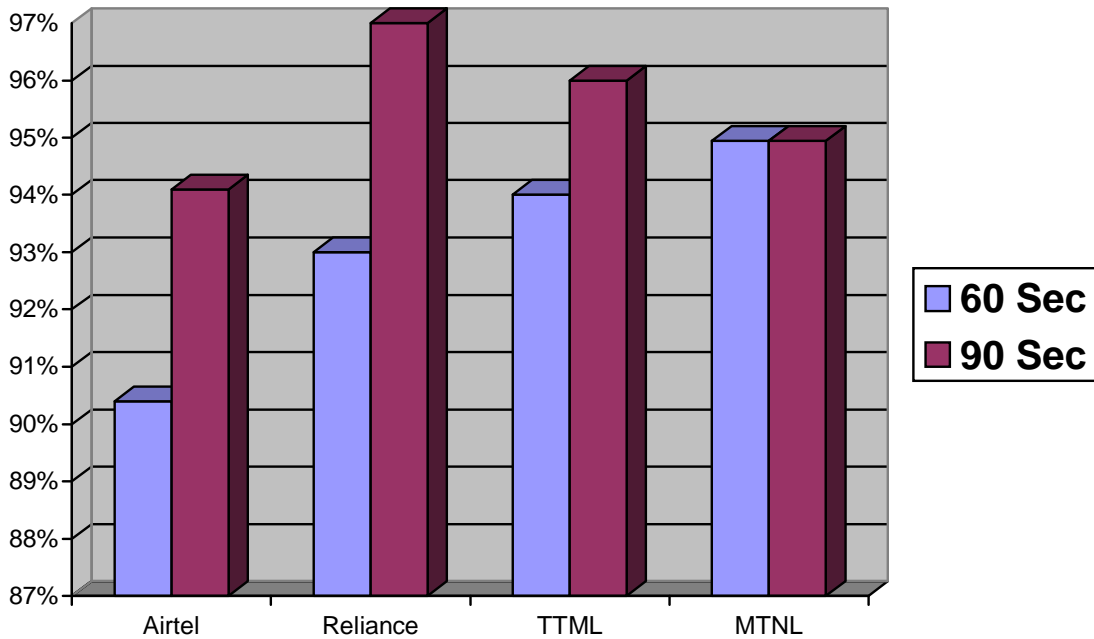
(i) % age of calls answered by operator (Electronically)

- Within 20 seconds (>80%): All the operators meet the benchmark.
- Within 40 seconds (>95%): All the operators meet the benchmark.



(ii) % age of calls answered by operator (Voice to Voice)

- Within 60 seconds (>80%): All the operators meet the benchmark.
- Within 90 seconds (>95%): All the operators meet the benchmark.



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**7.2 QUALITY OF SERVICE ASSESSMENT : WIRELESS BASIC AND CELLULAR MOBILE**

**7.2.1 OPERATOR PERFORMANCE BASED ON ONE MONTH DATA VERIFICATION DURING PERIOD MAR – MAY 2008**

(NA- Not Available, NR-Not Received)

S.N.	Parameters	Benchmarks	GSM OPERATORS				CDMA OPERATORS		
			Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTML
1	Network Performance								
1.1	Accumulated down time of Community Isolation	< 24 Hrs	0	0	0	0	7	0	0
1.2	Call set-up Success Rate (within licensees own network) (%)	> 95%	93.92%	99.49%	87.14%	100%	94.9%	100%	99.5%
1.3	Service Access Delay (Sec)	9 – 20 Sec	15	10.84	11	6	4.6	4.75	9
1.4	Blocked Call Rate								
	(i) SDCCH Congestion (%)	< 1%	0.2%	0.47%	0.45%	0.62%	0.7%	0	0
	(ii)TCH Congestion (%)	< 2%	0.76%	0.55%	1.65%	0.49%	0.13%	0	0.5%
	(iii) Cell exceeding 80% TCH utilization (Nos)		27.7	182	507	982	NR	0.16	15
1.5	(i) Call Drop Rate (%)	< 3%	1.15%	1.21%	0.84%	1.48%	1%	0.82%	2.21%
	(ii) Cell exceeding 3% TCH drop (Nos)		331	182	46	91	0	10.6	0
	(iii) Cell exceeding 3% TCH drop (%)		6.3%	2.25%	1.25%	1.72%	0%	1.9%	0
1.6	Percentage of connections with good voice quality (%)	> 95%	97.6%	96.57%	96.39%	96.95%	82.5%	NR	96.22%
1.8	POI Congestion (%)	< 0.5%	5.8%	0	0	0.12%	0.32%	0	0

**NR : Data Not Received**

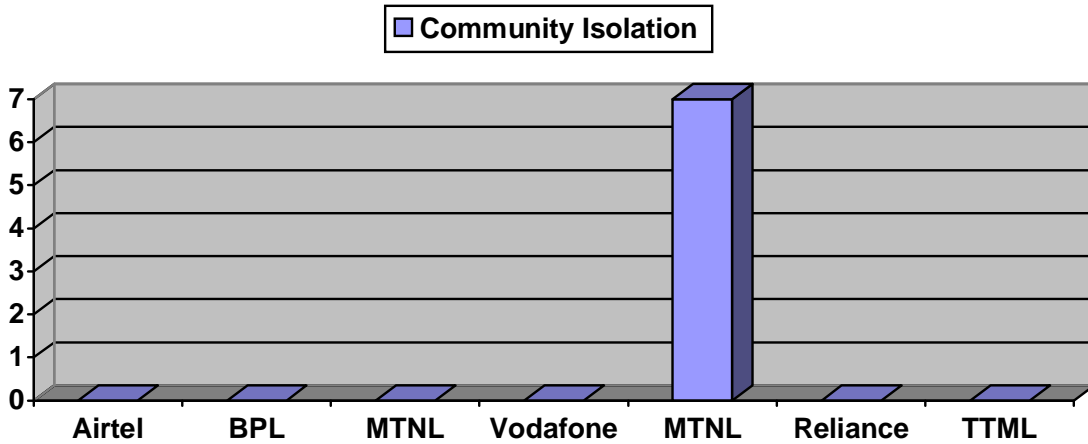
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S.N.	Parameters	Benchmarks	GSM OPERATORS				CDMA OPERATORS		
			Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTML
2	Customer Help Lines:								
2.1	Response time to the customer for assistance								
	(i) % age of calls answered (electronically) :								
	within 20 seconds (%)	> 80%	100%	85.87%	86%	99.16%	NR	99.49%	100%
	within 40 seconds (%)	> 95%	100%	NA	98%	99.25%	NR	99.49%	100%
	(ii) % age of calls answered by operator (voice to voice):								
	Within 60 seconds (%)	> 80%	89%	99.83%	88%	91.56%	NR	73.96%	100%
	Within 90 seconds (%)	> 95%	97%	99.96%	96%	93.86%	NR	81.23%	100%
3	Billing Complaints								
3.1	Billing complaints per 100 bills issued (%)	0.1%	0.04%	0.05%	0.039%	1.36%	0.12%	0.09%	0.07%
3.2	% of billing complaints resolved within 4 weeks (%)	100%	100%	100%	100%	99.9%	100%	100%	100%
3.3	Period of all refunds / payments due to customers from the date of resolution of complaints as in (ii) above (weeks)	< 4 weeks	< 2 weeks	<4 weeks	< 4 weeks	4 weeks	< 4 weeks	< 4 weeks	NR

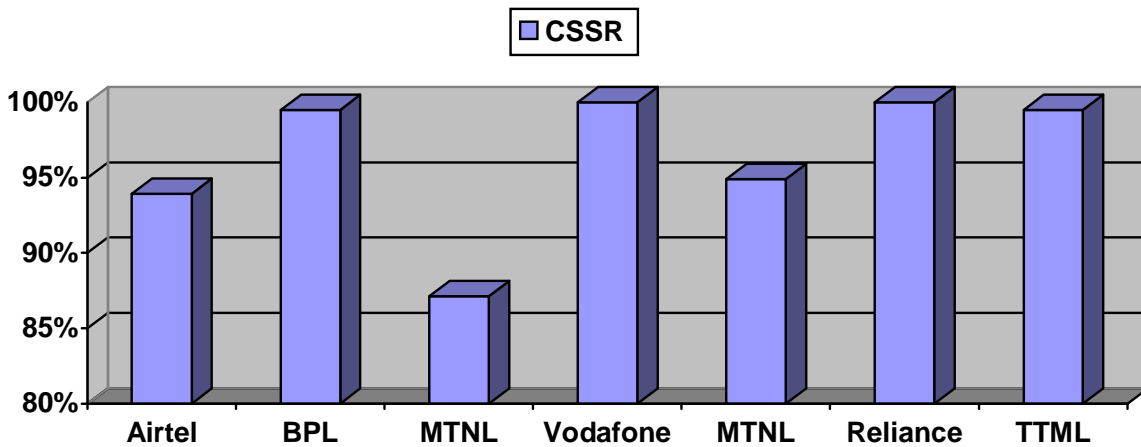
7.2.2 DATA ANALYSIS

A) NETWORK PERFORMANCE

- I. Accumulated down time of Community Isolation.  
All operator meet benchmark.

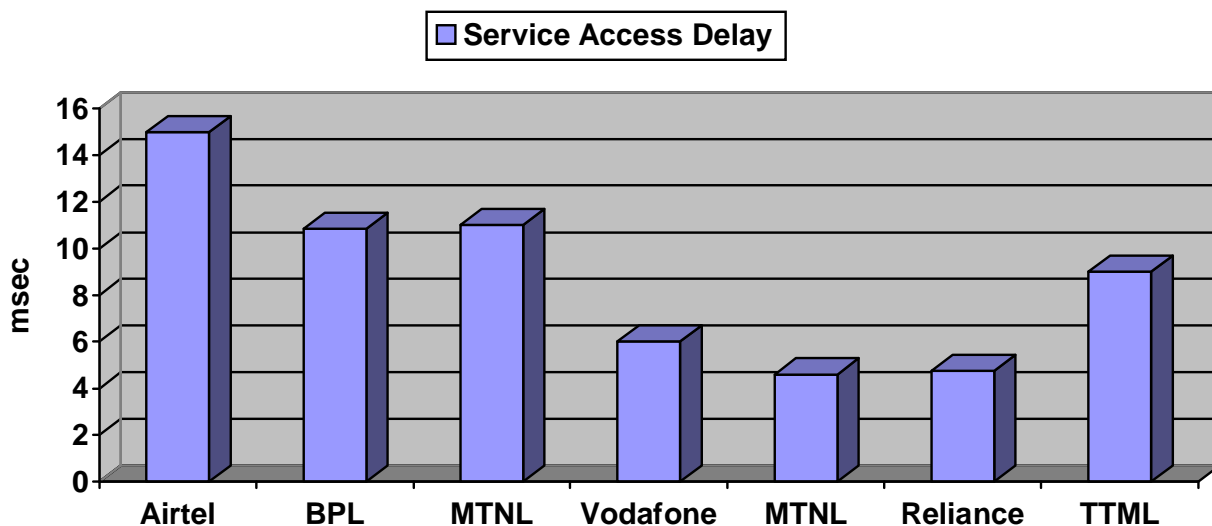


- II. Call setup success rate:  
All operators meet benchmark except for MTNL (GSM) & MTNL(CDMA).



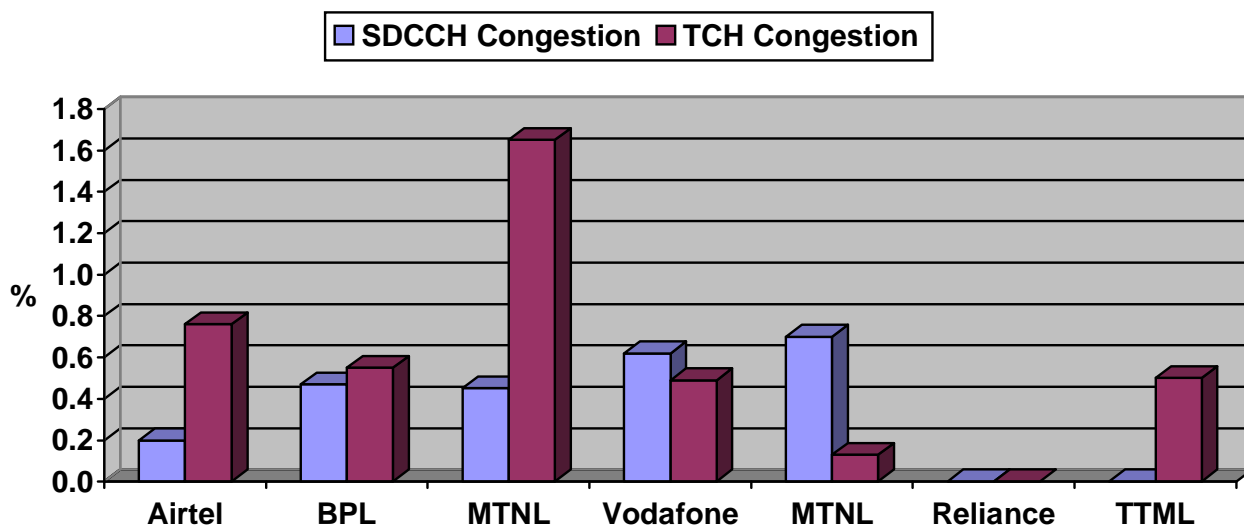
III. Service access delay:

All operators meet the benchmark.

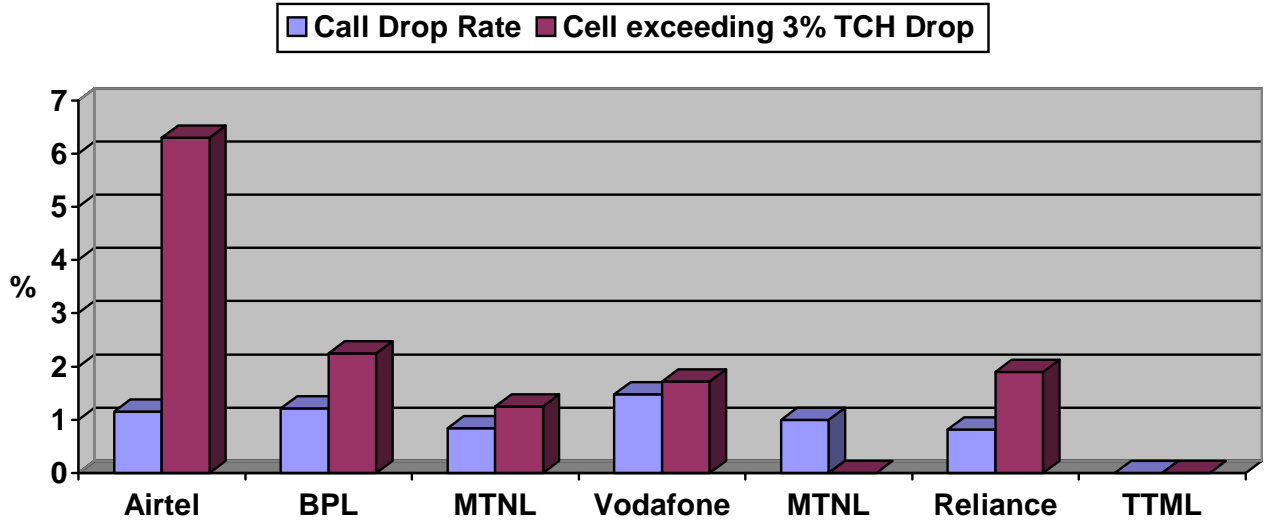


IV. Blocked call rate:

- (1) SDCCH congestion (%): All operators meet benchmark.
- (2) TCH congestion (%): All operators meet benchmark.

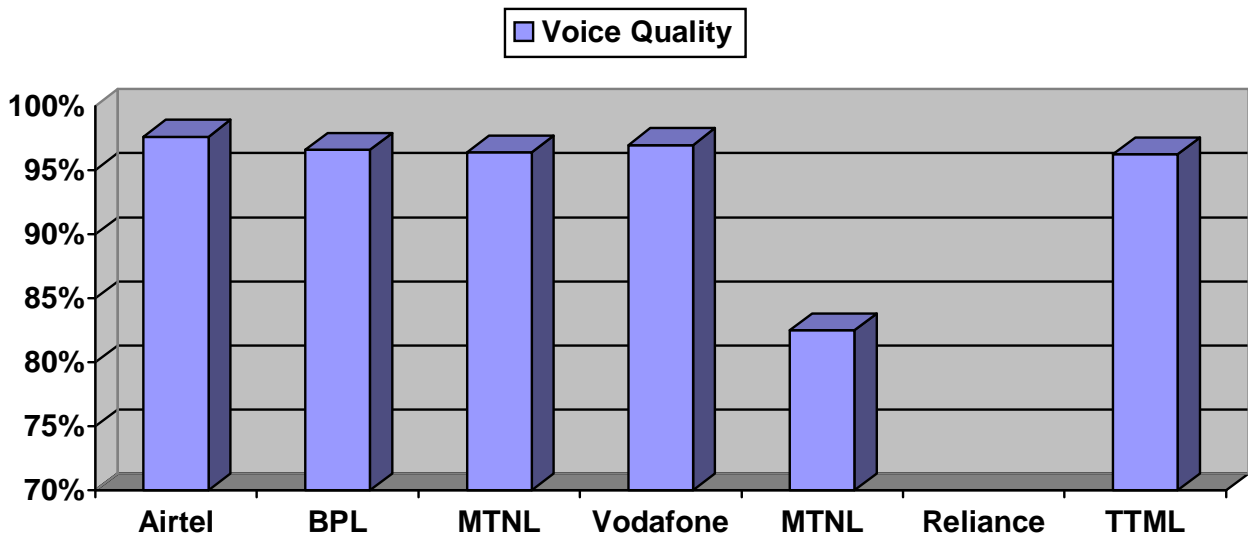


V. Call drop rate (%): All operators meet benchmark.  
 Cell Exceeding 3% TCH drop : No benchmark set by TRAI.



VI. Percentage of connections with good voice quality:

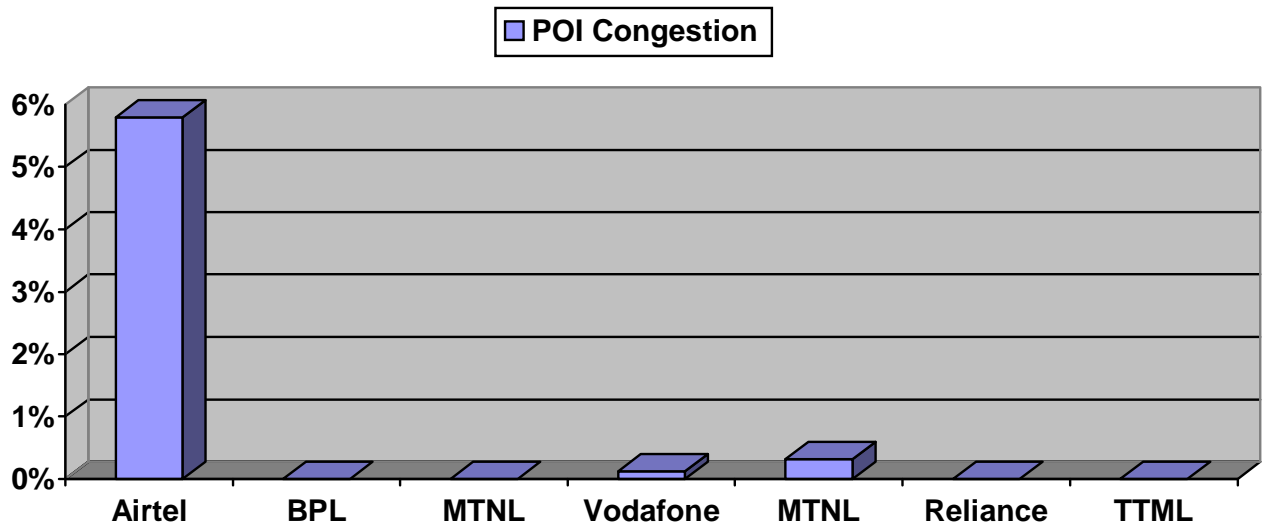
Data received from Airtel, Vodafone, MTNL (GSM), TTML and MTNL-CDMA. MTNL-CDMA(82.5%) do not meet the TRAI benchmarks.





VII. POI Congestion:

Data received from all except BPL. All other operators meet benchmark EXCEPT Airtel (5.8%).



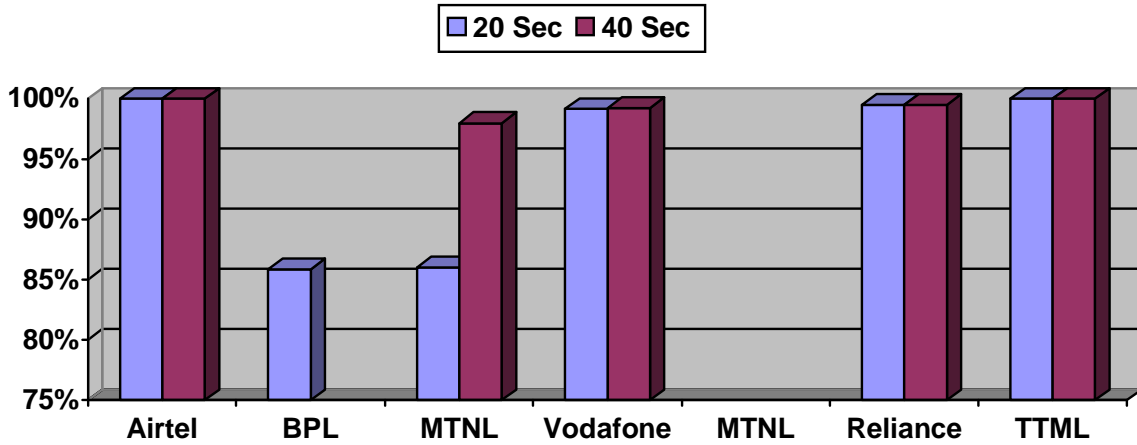
**B) CUSTOMER HELPLINE PERFORMANCE**

Response time to the customer for assistance:

I. Percentage of call answered (Electronically);

With in 20 sec (%): All meet benchmark except data not received from MTNL.

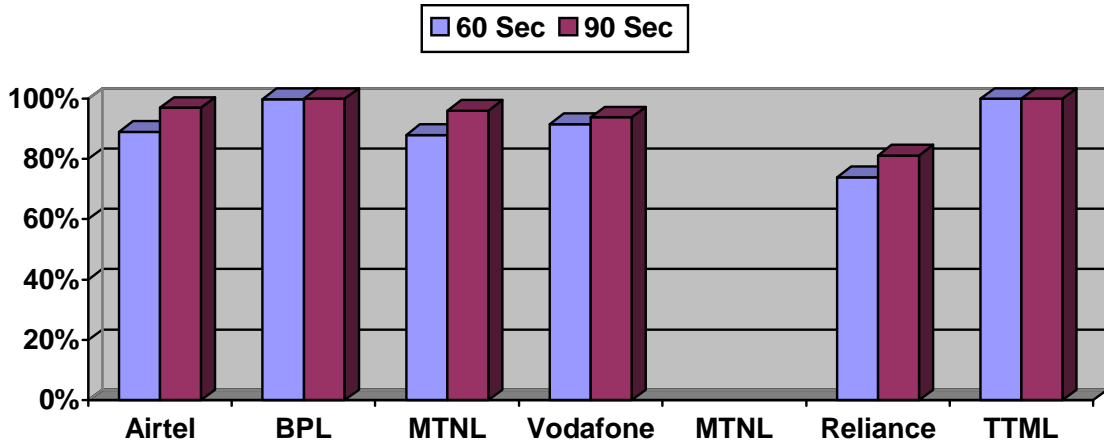
With in 40 sec (%);All meets TRAI benchmark except data not received from BPL and MTNL.



II. Percentage of call answered by operators (Voice to voice);

With in 60 sec: All meet the benchmarks except reliance (73.96%).

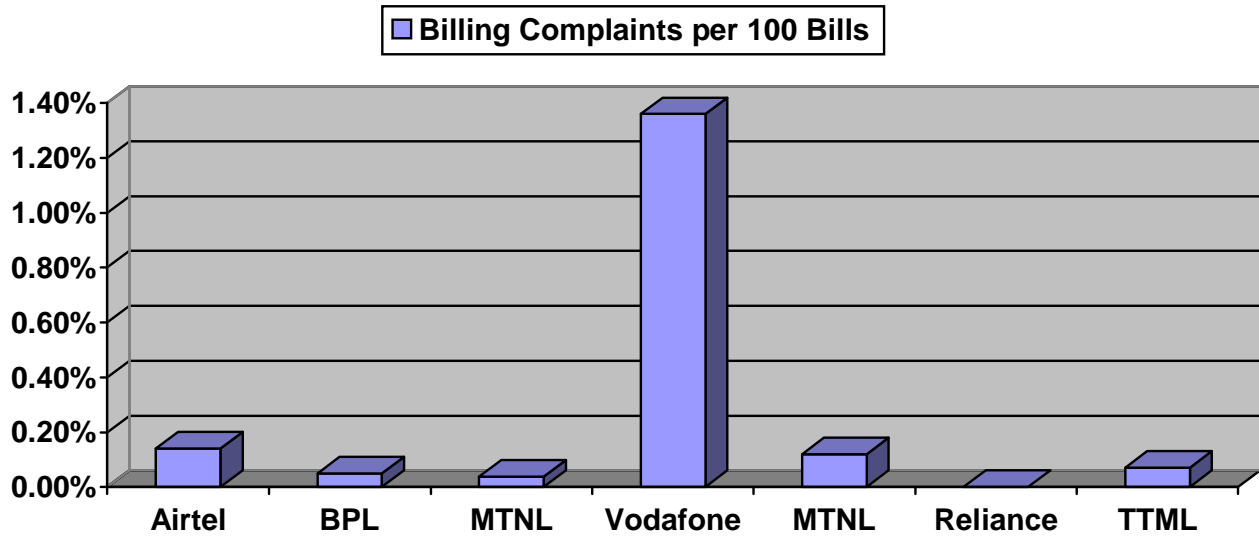
With in 90 sec: All meet the benchmarks except reliance (81.23%).



**C) BILLING COMPLAINTS**

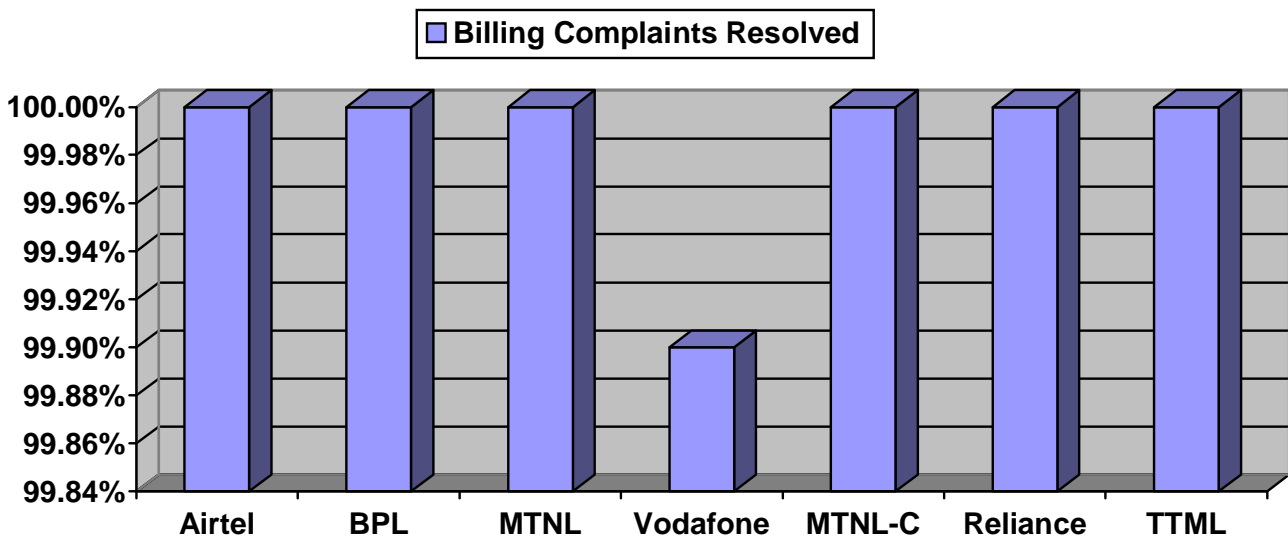
**I. Billing Complaints per 100 bills issued**

All meet TRAI benchmarks except Vodafone (1.36%)



**II. Percentage of Billing Complaints resolved within 4 weeks**

All meet TRAI benchmarks except Vodafone (99.9%)



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**7.3 QUALITY OF SERVICE ASSESSMENT : BROADBAND**

**7.3.1 OPERATOR PERFORMANCE BASED ON ONE MONTH DATA VERIFICATION DURING PERIOD MAR – MAY 2008.**

(NA: Not Applicable, NP: Data Not Provided)

S.N.	Parameters	Benchmark	Hathway Cable & Datacom Pvt. Limited	Reliance	Sify Technologies Limited	You Telecom India Pvt. Limited	MTNL	TTML	Bharti Airtel Limited	VSNL
1	Service Provisioning /Activation Time									
1.1	100% cases in days (subject to technical feasibility) (<15 working days )	100%	98.50%	100	100%	99.90%	78.60%	100%	97.71%	100%
1.2	In all cases where payment towards installation charge & security deposit is taken and the Broadband connection is not provided within 15 working days .  (A credit at the rate of Rs.10/ per day, subject to a maximum of installation charge or equivalent usage allowance shall be given to the customer, at the time of issue of first bill)	100%	100%	0	0	100%	NP	NA	NP	NA
2	Fault Repair / Restoration Time									
	By next working day:	> 90%	84.74%	97%	86.60%	98.70%	74%	94%	93.90%	88%
	within 3 working days:	99%	91.96%	100%	100%	99.71%	85%	100%	99.32%	96%

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2.1	<b>Rebate:</b>		-							
	Faults Pending for > 3 working days and < 7 working days:	Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance	18	0	0	7	NP	0	32	12301
	Faults Pending for > 7 working days and < 15 working days:	Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance	5	0	0	0	NP	0	6	178
	Faults Pending for > 15 working days:	Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance	3	0	0	0	NP	0	4	33

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3	Billing Performance									
	Billing complaints per 100 bills issued	< 2%	1.90%	0.21%	NA	0.25%	0.04%	0.19%	0.14%	2.85%
	%age of Billing Complaints resolved within 4 weeks	100%	100%	100%	NA	100%	100%	100%	100%	100%
	Time taken for refund of deposits after closure: within 60 days	100%	100%	100%	NA	100%	100%	100%	100%	100%
4	Response time to the customer for assistance									
	% age of calls answered by operator (Voice to Voice)									
	Within 60 seconds	> 60%	60-80%	80.84%	93%	96.00%	35.74%	98.38%	88.71%	94.47%
	Within 90 seconds	> 80%	80-90%	85.99%	98%	98.00%	75.26%	98.38%	92.24%	98.17%
5	Bandwidth Utilization/ Throughput:									
	Bandwidth Utilization (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.)	< 80% link(s) / route bandwidth utilization during peak hours (TCBH).								
	i) POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	<9%	45%	51.33%	73.80%	<80%	78%	76%	<80%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	<80%	73%	54.19%	79.31%	86.30%	89%	Its under BTSOL	<80%
	Broadband Connection Speed (download) (Subscribed Broadband Connection Speed to be met > 80% from ISP Node to User.)	> 80%	89%	>90%	93.90%	85%	80.50%	96%	94.50%	85%

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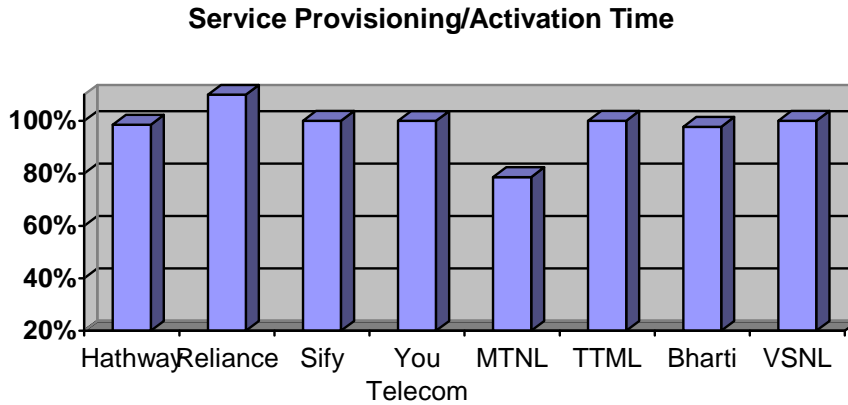
6	Service Availability / Uptime (for all users)									
	With effect from quarter ending September 2007 and onwards	> 98%	99%	99.95%	100%	98%	99.24%	99.99%	99.87%	98%
7	Packet Loss	< 1%	<1%	<1%	<1%	0.60%	<1%	0.40%	<b>0%</b>	0%
8	Network Latency (for wired broadband access)									
	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	< 120 msec	8ms	4ms	NP (Figures not provided, however commented that always maintained below benchmark.	10ms	7ms	23 ms	25 ms	80ms
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	< 350 msec	250ms	145ms	NP (Figures not provided, however commented that always maintained below benchmark.	240ms	280ms	254 ms	260 ms	180 ms
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	< 800 msec	NA	NA	NA	NA	NA	NA	NA	NA

**7.3.2 DATA ANALYSIS – MONTHLY DATA ASSESSMENT**

**A) CUSTOMER ASSISTANCE**

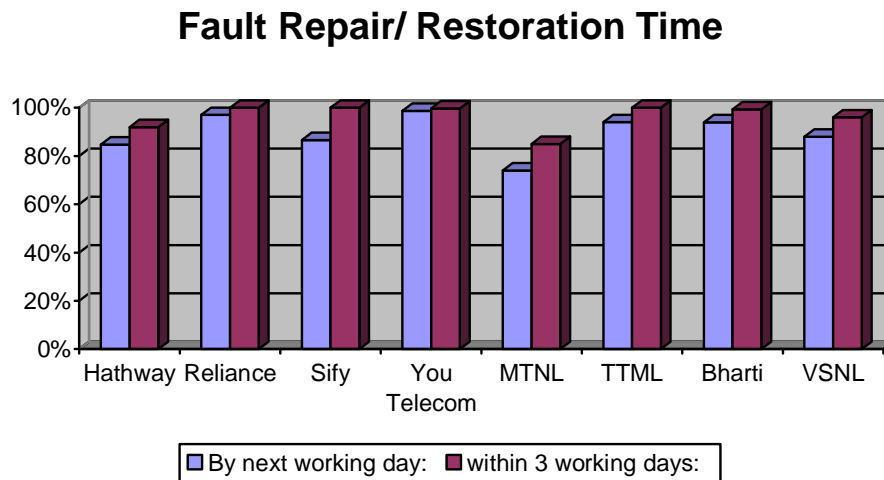
**I. Service Provisioning /Activation Time:**

Reliance, Sify, VSNL and TTML comply with the TRAI benchmark of 100%. You Telecom (99.90%), Hathway (98.50%) and Bharti (97.71%) deviates marginally and the least being MTNL with 78.60%.



**II. Fault Repair / Restoration Time:**

- By next working day: Reliance, You Telecom, Bharti and TTML comply with the TRAI benchmark of 90%. VSNL (88%), Hathway (88.74%) and Sify (86.60%) deviates marginally and the least being MTNL with 74.71%.
- within 3 working days: All the operators comply with the TRAI benchmark of 99% except for VSNL (96%),Hathway (91.96%) and MTNL (85%).
- Rebate: All the operators are giving rebate to the eligible customers.



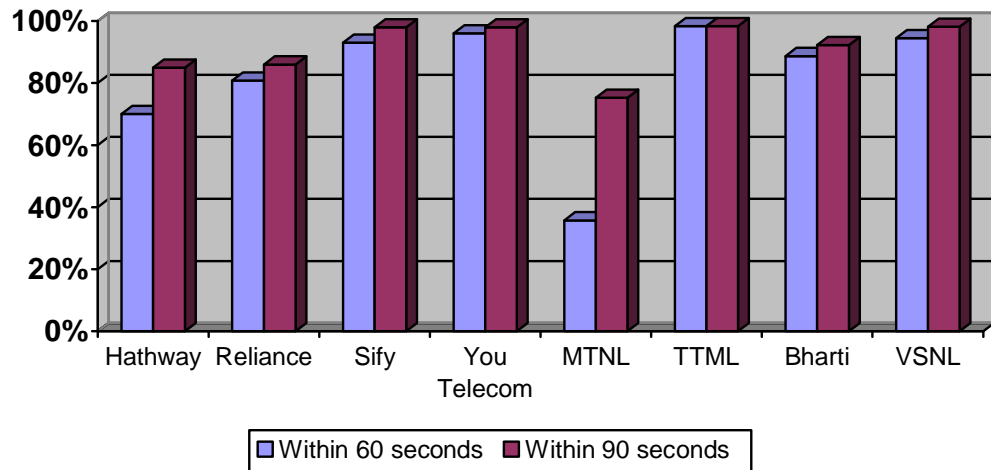


III. Response time to the customer for assistance:

% age of calls answered by operator (Voice to Voice)

- Within 60 seconds (>60%): All the operators meet the benchmark except for MTNL (35.74%).
- Within 90 seconds (>80%): All the operators meet the benchmark except for MTNL (75.26%).

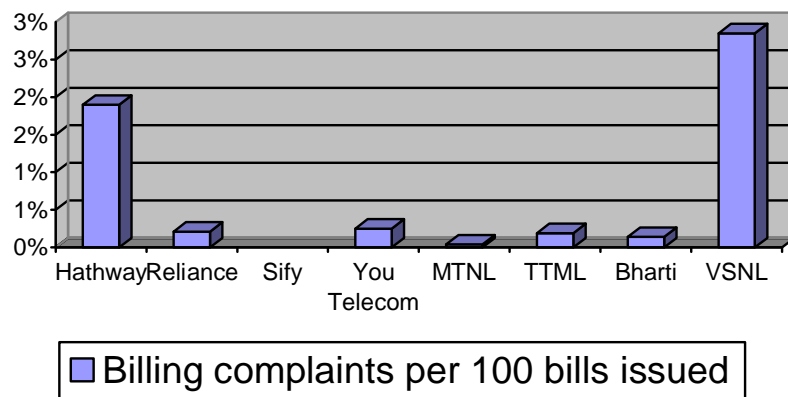
**Response Time to the Customer for Assistance**



**B) BILLING PERFORMANCE**

- I. Billing Performance: All the operators comply with the TRAI standards except for VSNL (2.85%).

**Billing Performance**

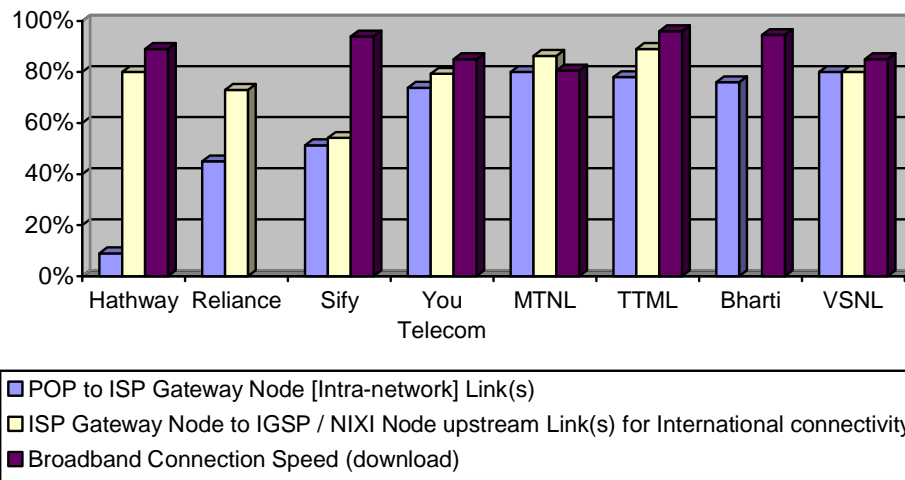


**C) NETWORK PERFORMANCE**

**I. Bandwidth Utilization/ Throughput:**

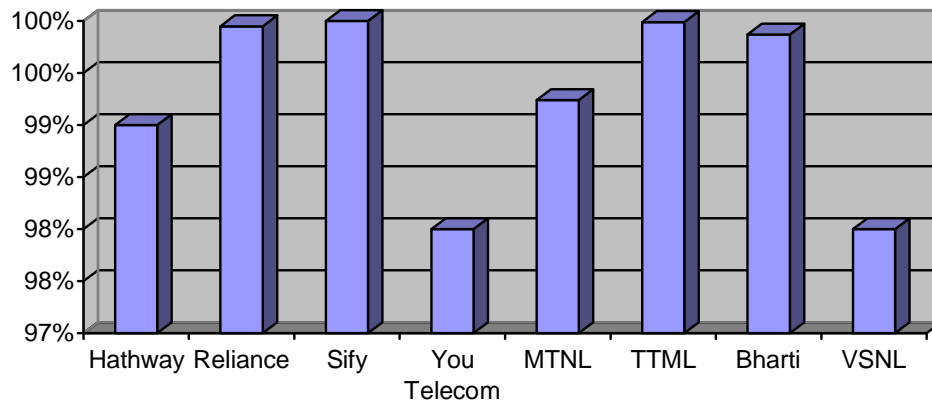
- POP to ISP Gateway Node [Intra-network] Link(s): All the operators meet the benchmark.
- ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: All the operators meet the benchmark.
- Broadband Connection Speed (download) (>80%): All the operators meet the benchmark.

**Bandwidth Utilisation**



**II. Service Availability / Uptime (for all users): All the operators comply with the TRAI standards.**

**Service Availability/ Uptime**

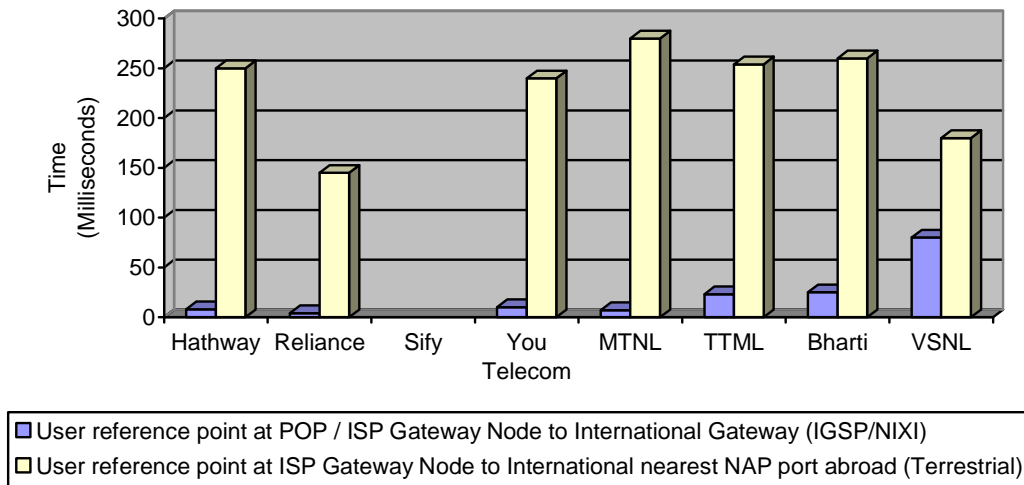


III. Packet Loss: All the operators comply with the TRAI standards.

IV. Network Latency:

- User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI): All the operators meet the benchmark.
- User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial): All the operators meet the benchmark.
- User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite): Link does not exist for the operators. Hence, Not applicable.

### Network Latency



## CHAPTER – 8

## DRIVE TEST FINDING

## 9.1 DIVE TEST DATA ANALYSIS

S.N.	Parameters	GSM OPERATORS				CDMA OPERATORS		
		Airtel	BPL	MTNL	Vodafone	MTNL	Reliance	TTML
1	Drive Test							
1.1	Call Attempts	200	236	226	285	355	NA	444
1.2	Blocked Call	0	3	5	4	0	NA	6
1.3	Dropped Call	12	5	4	4	13	NA	3
1.4	Percentage of connections with good voice quality (%)							
	(i) 0-4 (w/o freq. hopping)							
	(ii) 0-5 ( with freq. hopping)	NA	96.5	91.3	95.6	91.33	NA	96.2
1,5	Service Coverage							
	In door (>= -75dBm)	88.3%	76.1%	61%	67.3%	53.3%	88.3%	94.1%
	In-vehicle (>= -85dBm)	99.9%	97.1%	92%	86.9%	84.6%	99.9%	99.9%
	Out door- in city (>= -95dBm)	100%	99.9%	100%	100%	100%	100%	99.9%

## 9.2 DRIVE TEST LOCATIONS:

## 1. Dense population

Mumbai Central, Mahalaxmi, Kalba Devi, Girgaon, Nagpara, Madanpura, Fort, Colaba, Cuffeparade, Nariman point

## 2. Medium Population

Andheri, Jogeshwari, Goregaon, Lokhandwala,

## 3. Low population

Vasi and Narul

## CHAPTER – 9

## POI CONGESTION: VOICE CALL TEST

## 9.1 INTER OPERATOR CALL CONGESTION ASSESSMENT

## 9.1.1 Summary

Calling Operator	Called operator					
	MTNL,Dolphin	Vodafone	Airtel	BPL	Reliance	Tata Tel
MTNL,Dolphin	-	99%	100%	100%	98%	96%
Airtel	96%	100%	-	100%	100%	95%
BPL	100%	100%	100%	-	100%	100%
Vodafone	95%	-	97%	100%	96%	100%
Reliance	98%	97%	99%	98%	-	99%
Tata	100%	80%	90%	97%	97%	-

## 9.1.2 Detailed Records

SI. No.	Calling Number of Operator	Called operator	Total no of calls	Outcome (Success %)	Remarks for Failure (All Routes are Busy, Attempt Rejected, etc)
1	Tata	MTNL,Dolphin	50	100%	
		Reliance	50	98%	NOT REACHABLE
		BPL	50	98%	NOT REACHABLE
		Airtel	50	90%	NOT REACHABLE
		Vodafone	50	90%	NOT REACHABLE
		MTNL,Dolphin	50	100%	
		Reliance	50	96%	NOT Reachable
		BPL	50	96%	NOT Reachable
		Airtel	50	90%	1(attempt rejected),
		Vodafone	50	70%	NOT Reachable
2	Dolphin	Airtel	50	100%	
		Tata	50	98%	attempt rejected
		Reliance	50	96%	NOT Reachable
		BPL	50	100%	
		Vodafone	50	100%	
		Airtel	50	100%	
		Tata	50	94%	attempt rejected
		Reliance	50	100%	
		BPL	50	100%	
		Vodafone	50	98%	All routes are busy

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SI. No.	Calling Number of Operator	Called operator	Total no of calls	Outcome (Success %)	Remarks for Failure (All Routes are Busy, Attempt Rejected, etc)
3	BPL	Airtel	50	100%	
		Tata	50	100%	
		Reliance	50	100%	
		MTNL,Dolphin	50	100%	
		Vodafone	50	100%	
		Airtel	50	100%	
		Tata	50	100%	
		Reliance	50	100%	
		MTNL,Dolphin	50	100%	
		Vodafone	50	100%	
4	Airtel	BPL	50	100%	
		Tata	50	94%	2attempts rejected & 1 all routes are busy.
		Reliance	50	100%	
		MTNL,Dolphin	50	94%	All routes are busy
		Vodafone	50	100%	
		BPL	50	100%	
		Tata	50	96%	Attempts rejected
		Reliance	50	100%	
		MTNL,Dolphin	50	98%	All routes are busy
		Vodafone	50	100%	
5	Reliance	BPL	50	96%	Not reachable
		Tata	50	100%	
		Airtel	50	98%	All routes are busy
		MTNL,Dolphin	50	100%	
		Vodafone	50	98%	1 call is not reachable
		BPL	50	100%	
		Tata	50	98%	Attempts rejected
		Airtel	50	100%	
		MTNL,Dolphin	50	96%	Not reachable
		Vodafone	50	96%	All routes are busy
6	Vodafone	BPL	50	100%	
		Tata	50	100%	
		Airtel	50	96%	All routes are busy
		MTNL,Dolphin	50	94%	All routes are busy
		Reliance	50	92%	2 attempts are rejected & 2 not reachable
		BPL	50	100%	
		Tata	50	100%	
		Airtel	50	98%	All routes are busy.
		MTNL,Dolphin	50	96%	All routes are busy.
		Reliance	50	100%	

## CHAPTER – 10

## CUSTOMER CARE CALL CENTRE

## 10.1 WIRELINE SERVICES

S.N.	Parameters	Airtel	MTNL	Reliance	TTML
1	Parameters				
1.1	Complaints per 100 bills issued	0.50%	0.05%	0.03%	0.10%
1.2	Percentage of billing complaints resolved within 4 weeks	99.60%	100%	100%	100%
1.3	Response time to customer for assistance: % of calls answered by operator within 90 seconds	89.19%	94.94%	97%	95.84%
2	Call Centre				
2.1	Total no of complaints received in the call centre	6818	8966	562	3785
2.2	Complaints per 100 customers per months	0.57%	0.43%	0.40%	1.92%
2.3	Total no of complaints redressed by the call centre within the specified time limit	6117	4282	-	3721
3	Nodal Officer				
3.1	Total no of complaints received by the nodal officers	67	0	0	37
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	57.26%	0	0	0.98%
3.3	Total no of complaints redressed within the specified time limit	100%	0	0	37
4	Appellate Authority				
4.1	Total no of appeals received by the appellate authority	11	0	0	0
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	100%	0	0	0
4.3	Total no of appeals decided within 3 months	100%	0	0	0

**10.2 WIRELESS BASIC AND CELLULAR MOBILE SERVICES**

S.N.	Parameters	AIRTEL	BPL	MTNL (GSM)	Vodafone	MTNL (CDMA)	Reliance
1	Parameters						
1.1	Complaints per 100 bills issued	0.03	0.05	0.041	1.36	0.12%	0.09%
1.2	Percentage of billing complaints resolved within 4 weeks	100%	100%	100%	99.9%	100%	100%
1.3	Response time to customer for assistance: % of calls answered by operator within 90 seconds	95.34%	99.96%	95%	93.86%	-	81.23%
2	Call Centre						
2.1	Total no of complaints received in the call centre	59708	1769	4680	23631	4067	*
2.2	Complaints per 100 customers per months	21	0.5	0.26	0.68	3.13	*
2.3	Total no of complaints redressed by the call centre within the specified time limit	N/A	100%	4407	10197	4058	*
3	Nodal Officer						
3.1	Total no of complaints received by the nodal officers	607	9	0	629	0	125
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	1.017	0.5	0	3	0	-
3.3	Total no of complaints redressed within the specified time limit	100%	100%	0	10197	0	125
4	Appellate Authority						
4.1	Total no of appeals received by the appellate authority	194	1	0	0	0	0
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	32	0.05	0	0	0	-
4.3	Total no of appeals decided within 3 months		1	0	0	0	0

\* This is new requirement and not part of QoS, hence shall be provided from September 08



## 10.3 BROADBAND SERVICES

S.N.	Parameters	Airtel	Tatatel	Reliance	Sify	Hathway	MTNL	You Telecom	VSNL
<b>1</b>	<b>Parameters</b>								
1.1	Complaints per 100 bills issued	0.50%	0.098%	0.21%	NA	1.90%	2.8%	0.26%	2.85%
1.2	Percentage of billing complaints resolved within 4 weeks	99.6%	100%	100%	NA	100%	100%	100%	100%
1.3	Response time to customer for assistance: % of calls answered by operator within 90 seconds	89.19%	95.84%	96%	82%	90%	27.17%	91%	98.17%
<b>2</b>	<b>Call Centre</b>								
2.1	Total no of complaints received in the call centre	6818	3785	64.00	5936	23220	51342	3044	18152
2.2	Complaints per 100 customers per months	57.19%	1.92%	1.10%	1.4%	28%	12%	16%	59%
2.3	Total no of complaints redressed by the call centre within the specified time limit	93.32%	98.31%	97%	100%	92%	94.73%	99.4%	94%
<b>3</b>	<b>Nodal Officer</b>								
3.1	Total no of complaints received by the nodal officers	67	37	0	8	5	24	18	1038
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	57.26%	0.98%	0	0.13%	4.72%	0.046%	1%	6%
3.3	Total no of complaints redressed within the specified time limit	100%	37%	0	100%	100%	100%	100%	1038
<b>4</b>	<b>Appellate Authority</b>								
4.1	Total no of appeals received by the appellate authority	11	0	0	0		4	3	70
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	100%	0	0	0		16.6%	17%	7%
4.3	Total no of appeals decided within 3 months	100%	0	0	0		100%	100%	100%

**ANNEXURE - I**

**List of Exchanges / Switches**

**1. WIRELINE:**

AIRTEL: MALAD

TTML : MAROL, TECHNOPOLIS EXCHANGE

RELAINCE: MUMBAI

MTNL: CITY-I, FOUNTAIN-I, WADALA-III, PRABHADEVI-II, ANDHERI-II, VERSOVA-I,  
GOREGAON-II, CHARKOP, FOUNTAIN TAX, MULUND-IV, VASHI-1, POWAI-I

**2. WIRELESS BASIC AND CELLULAR MOBILE**

AIRTEL: MSC1, MSC2, MSC3, MSC4, MSC5, MSC6, MSC7

BPL : MSC1, MSC2, MSC3

TTML : MSC1, MSC2, MSC3, MSC4, MSC5

RELAINCE: MSC1, MSC2, MSC3, MSC4, MSC5, MSC6

MTNL(GSM) : MSC-BKC, MSC-CFD & MSC-PBD

MTNL(CDMA) : MSC-BKC, MSC-VASI

VODAFONE:

SAHAS: MSC1, MSC5, MSC6, MSC7, MSC8, MSC9, MSC10, MSC11 & MSC12

MAHIM: MSC2, MSC3, MSC4

SUNCITY: MSC14, MSC15, MSC16