Quality of Service of Cellular Mobile Service in Mumbai Metro Circle – A Study
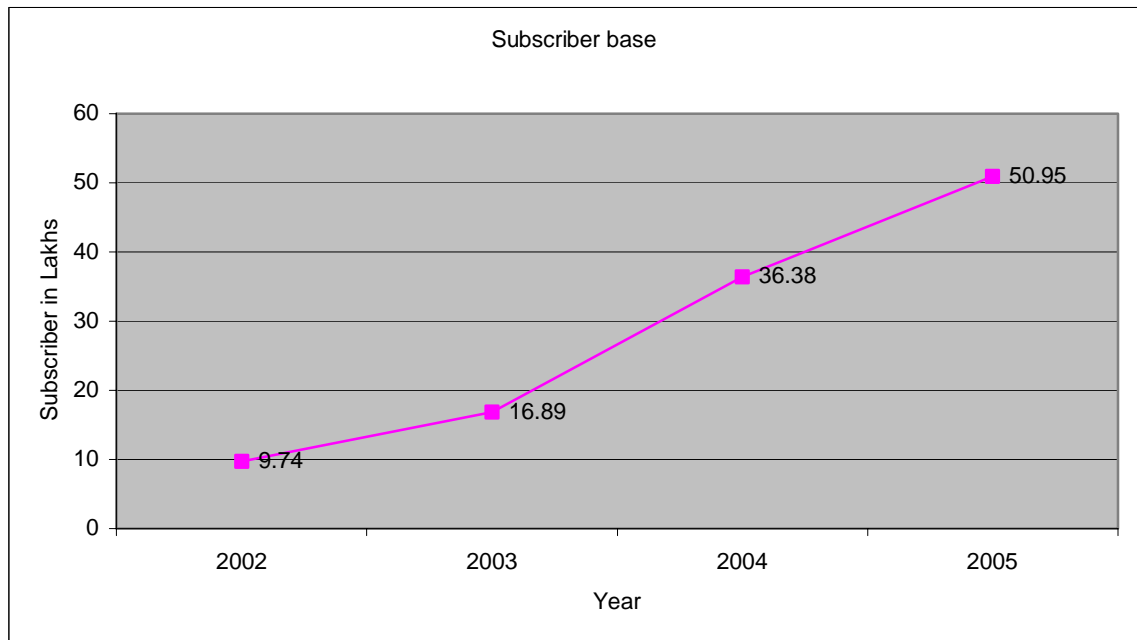
1.   Introduction

TRAI has been receiving a number of complaints from the Consumers regarding Call Drops, poor coverage etc in various cities across the country, especially in the Metro cities, where the number of Subscribers have increased many folds during the last five years. TRAI has been discussing these issues with the Service Providers very frequently. From the discussions with the Service Providers, it is learnt that apart from the problem of inadequate junctions between network of different operators at some of the places, the Service Providers are not able to provide satisfactory service due to non availability of permission for setting up new Base Stations (BTS) from the Civic and Defence Authorities. TRAI also conducted drive tests to understand the intensity of the problem. One such Drive Test was undertaken by TRAI recently   to assess the quality of service of the networks of M/s Bharti (Airtel), Hutch and BPL in Mumbai Metro City.

2 <u>Growth of mobile service in Mumbai:</u>

The Cellular mobile service in Mumbai has been experiencing tremendous growth in the last five years. The subscriber base of cellular mobile service, which was about 9.74 Lakhs in March 2002, has increased to 50.95 Lakhs by March 2005. The year wise growth is shown below:

Subscriber base

3. **<u>Problems associated with exponential growth in mobile sector:</u>**

(A) <u>Coverage issues</u>:

3.1 Though the mobile operators are meeting the quality of service benchmark for the service area of Mumbai as a whole, there are some pockets where the QoS is observed to be below the Standard norms. The results of the drive test revealed that the quality of service of the networks of M/s Airtel, Hutch and BPL was not as per the prescribed standards in respect of the coverage, interference and Call drops at some of these locations. The detail of such locations, operator wise, is given below:

(**i) Airtel :**

(a) Coverage problem: The following patches of **inadequate coverage (-85 dBm and below)** were observed at the following locations

(i) Navi Nagar Colaba (ii) Aarey Road (E) (iii) LBS Road - Kanjur Marg (iv) Vashi Bridge (v) Kalwa (vi) Airoli (vii) Gore Gaon Chechnaka (viii) Naval Dock Yard..

(b) Interference: The following areas have been detected to have poor voice quality due to interference:

(i) Nepeansea Road (ii) Mohammad Ali Road (iii) S V Road- Santa Cruz(E) (iv) Cadell Road-Prabha devi (vi) Infinity Mall, Goregaon (vii) Western Express High Way – Kandivali, Malad, Aarey Check Naka-Goregaon,Jogeshwari (viii) Peninsula Corporate Park (ix) Hazi Ali Near Maha Laxmi Mandir (x) Thane

M/s Airtel has submitted its action plan to address the above problems. Airtel has planned new sites at Aarey Road, LBS-Road- Kanjumarg, Vashi Bridge, Goregaon Checknaka and Cadell Road- Prabha devi

In other locations the Company planned to address the problem through frequency optimization.

(ii) Hutch:

(a) Coverage: The patches of **inadequate coverage (-85 dBm and below)** were observed at the following locations which is affecting the voice quality also:

Express Building, SBI Wood House Road, Aarey Milk Colony, Bharat Mata - Parel, Navy Nagar, Worli, Breach Candi, Kolaba, Old Custom House, Mohd. Ali Road, Dharavi, Ram Mandir-Borivali, Goregaon Check naka, Vrindavan, Byculla, Fort, Santa Cruz East-West, Khar East-Kalina , Vikhroli East, LBS Marg-Godrej, Kurla East, Arodia East, Deonar, Dadar West, Mahul Refinery, Motunga East.

(b) Interference: The following areas have been detected to have poor voice quality due to interference:

Wilson College, Marrin Drive, Andheri Flyover, LBS Marg- Kurla, Plaza Ciema, Sion Bridge, Vashi Bridge, Kanjur Marg, Mulund, Check Naka, Jogeshwary Fly over, RCF Office, New Prabha devi Road.

M/s Hutch has planned to setup new sites at Aarey milk colony, SBI wood House Road, Navy Nagar, Goregaon Chencknaka, and Vikhroli Easts. At rest of the places the problems are to addressed by Site optimization.

(**iii) BPL:**

In the drive test of BPL network , there were as many as 80 locations where the coverage and Voice quality problems were encountered. However BPL plans to setup new sites at Kirti College, Sidhivinayk Temple, Pedder Road, Nana Chowk, NSE complex, Goregaon, Atharva College, Malad, Ghat koper, Vikhroli, Bhandup, Vikhroli Godrej Campus, MMRDA Building, Mankhurd Link Road, Matunga Labour Camp, Santa Cruz.

In other locations the Company planned to address the problem through frequency optimization.

3.2 From the reports of the drive tests, it is revealed that all the service providers have coverage problems in some of the common locations. These common locations where such problem is observed are given below:
1. Navy Nagar / Army Cantonment, Colaba
2. HPCL Refinery, Mahul
3. Aarey Milk Colony, Goregaon
4. Bhabha Atomic Research Centre (BARC), Deonar
5. Air India Colony, Kalina
6. Vashi Check Naka
7. Mantralaya (Secretariat)

3.3 Discussions with the Service Providers revealed that the above-mentioned areas are currently covered remotely by sites from the neighboring locations. Due to the coverage from remote Base Stations (BTSs), the signal strength in these areas is barely sufficient to mature a call. The Service Providers have taken efforts to optimize the serving sites outside these areas. In order to reach these areas from neighboring locations, they have installed antennas at a higher elevation on the roof top of the buildings. Antennas are already in uptilt position, further up tilting will only deteriorate coverage in the immediate vicinity at the cost of covering these areas remotely .The areas therefore have very poor coverage resulting into bad quality of service due to multiple serving signals from sites in adjoining area. If the sites are permitted in the above areas, it will obviate problems.

3.4   Navy Nagar is in the southern tip of Mumbai. The Operators have sites outside the Defence area. The area is surrounded by sea from three sides and has civil area only on one side. The signal strength in some areas drops to –105 dBm due to thick vegetation. The interference due to reflections from the seawater is also resulting in poor voice quality. As such the operators are not able to provide coverage without actually planning sites inside the defence land.

3.5   Aarey colony is bordering the Sanjay Gandhi National Park and is full of thick vegetation. The private road which connects Western Express highway to Powai lake and also leads to the Eastern highway. The stretch of road is approx 4-5 Kms with no dedicated server. The signal strength drops to below –105 dBm in many places on this road. Thus the Operators are not able to cover the road from the other sides as there is a national reserve forest adjoining the same. Permission is required from Agriculture, Animal Husbandry, Dairy Development & Fisheries Deptt. for setting up new sites.

3.6   Vashi Bridge is over the creek and is more than 1.5 Kms in length. It connects greater Mumbai and navi Mumbai. As it is open and over the creek , the signals of dominant servers from 10 to 12 cell sites lead to high interference. Thus the operators need to have a dominant server right on the bridge.

3.7   Attempts have been made by the service providers to put cell sites in these areas by approaching the concerned Govt. Authorities like Defence, Airport Authorities and Municipal Corporations but in vain.

3.8   The position with regards to the proposed sites to cover the above areas is as follows:

Operator	Existing cell sites	Proposed additional sites
Airtel	NIL	05
Hutch	NIL	09
BPL	NIL	05
MTNL	379*	81*
Tata	NIL	05
Reliance	NIL	03

* The existing cell sites and proposed cell sites are given for entire Mumbai service area.

(B) <u>**Interconnection issues**</u>**:**

3.9   The network of M/s Bharti Tele-ventures Ltd. (Airtel) is experiencing increasing congestion at its Points of Interconnection (POIs) with MTNL. The details of POI congestion (in %) in the various POIs are given below:

Name of POI	July, 05	August, 05	September, 05
POI with MTNL Dolphin	2.00	5.00	7.00
POI with MTNL Tandem -			
Cumballa level3	2.00	2.00	2.00
Ghatkopar level5	1.00	0.00	2.00
Vile Parle level6	0.00	2.00	3.00
Saki Vihar level8	0.00	0.00	1.00
Mulund	0.00	0.00	1.00

The benchmark for POI congestion is <0.5%.

3.10   Demands of Airtel for 48 E1 ports at Thane TAX and 7 E1s at Fountain TAX are pending with BSNL. Similarly, M/s BPL is also having pending demands for interconnection with BSNL for 12 E1s at Thane TAX. These demands are pending for periods 90 days to 180 days. Considering the huge growth in mobile subscriber base, these demands for interconnection need to be met at the earliest.

(4) Problems relating to Spectrum:

4.1   The operators are facing shortage of spectrum due to high growth and delay in allocating additional spectrum. This is also an issue affecting the quality of service of mobile services all over the Mumbai as due to the lack of the spectrum, the operators are not able to optimize their frequencies to generate a good voice quality in CBD areas in peak hours. In the dense areas, for Site configuration, more number of Transceivers Units (TRUs) are required. Because of that the loading on the existing frequencies is increased, which is resulting in co-channel and adjacent channel interference. The position regarding spectrum allotted to various operators in Mumbai is given below:

Operator	Subscriber base (as on October 05)	Spectrum allotted	Norms for additional Spectrum
Hutchison	1666063	2 x 10 MHz	Norms for additional spectrum beyond 2x10 MHz under finalisation by DOT
BPL	1317043	2 x 10 MHz	Same as above
Bharti/Airtel	1001518	2 x 8 MHz	Same as above`
MTNL GSM	728918	2 x 6.2 MHZ	Addl. Spectrum on achieving Subs Base > 5 lakhs
MTNL CDMA	48455	2x 3.75 MHz	Within norms
Reliance Infocom CDMA	1100188	2 x 5 Mhz	Same as above
Tata CDMA	227626	---do--	---do---

4.2   GSM service providers in Mumbai have already crossed the benchmark for allocation of additional spectrum.

(5) Way out for addressing the problem::

5.1   addressing the problems relating to coverage in certain areas of Mumbai, urgent action is needed for expediting the clearances for setting up cell sites in these areas. The issue is being taken up with the Civic Agencies, Government Department and Defence Authorities for expediting clearances for setting up cell sites.

5.2   The operators have already crossed the benchmarks for allocation of additional spectrum, the provision of additional spectrum may be looked into by the concerned Authorities.