

TELECOM POLICY REFORM IN INDIA

by

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The findings, interpretations and conclusions are the author's own and should not be attributed to the Telecom Regulatory Authority of India

I. Introduction

The Indian economy is currently undergoing a structural shift. The production of merchandise such as agriculture and manufactured products are contributing a smaller share of economic output, while contribution of the service sector is growing. The service sector in India today accounts for more than 48% of economic activity and is likely to grow at the rate of 8% per annum¹. A majority of service workers are engaged in the creation, processing and distribution of information. The telecom sector therefore assumes major importance as an enabling infrastructure. Accordingly, it is vital for the country that there be a comprehensive and forward looking telecommunications policy which creates a suitable framework for development of this service industry. The availability of infrastructure for electronically transferring and accessing information is perceived as critical for hastening the realization of economic, social and cultural benefits as well as for conferring competitive advantage.

The telecom sector in India has witnessed rapid changes in the last five years. There have been far reaching developments in Information Technology (IT), consumer electronics and media industries across the globe. Convergence of both markets and technologies is a reality that is forcing realignment of the industry. At one level, telephone and broadcasting industries are entering each other's markets, while at another level, technology is blurring the difference between different conduit systems such as wireline and wireless. As in the case of most countries, separate licenses have been issued in India for Basic, Cellular, Internet Service Providers, satellite and cable TV operators, each with a distinct industry structure, terms of entry, and varying requirement to create infrastructure. However, this convergence that now allows operators to use their facilities to deliver some services reserved for other operators, necessitated a re-look into the existing policy framework.

The Government of India (Government) has recognized that provision of world class telecommunications infrastructure and information is the key to rapid economic and social development of the country. This will not only help in the development of the

¹ Handbook of Statistics on the Indian Economy, Reserve Bank of India 1998

IT industry, but also provide for widespread spillover benefits to other sectors of the economy.

The first step in this direction was announcement of the National Telecom Policy in 1994 (NTP 94). This provided for opening up the telecom sector to competition in Basic Services as well as Value Added Services like Cellular Mobile Services, Radio Paging, VSAT Services etc. It also set target for provision of telephone on demand and opening up of long distance telephony. This was followed by a New Telecom Policy declaration in March 1999 (NTP 99), to remove some of the bottlenecks and move the liberalization process forward.

The rest of this paper is organized as follows. The next section details the existing structure of the Indian Telecom Sector. Section II compares the two policy documents of 1994 and 1999. Section III analyses crucial policy issues and addresses questions likely to arise in their implementation. Section IV concludes.

Section I

II. Existing Structure of Telecom Sector

Telecommunications was not perceived as one of the key infrastructures for rapid economic development during the formative years of the Indian economy. The low levels of investment in this sector have affected the quality, quantity and range of services provided. In 1998, Indian Telephone density per 100 persons was 2.2 while the world average was 14.26 (World Telecommunication Development Report, ITU, 1999). The evolution of the subscriber base for basic services in India since 1997 is shown in *Table I*.

For the provision of basic services, the entire country is divided into 21 telecom circles, excluding Delhi and Mumbai. Department of Telecom Service (DTS) provides basic services in the 21 telecom circles, while Mahanagar Telephone Nigam Limited (MTNL) serves Delhi and Mumbai. Six private licenses have been issued for

the provision of basic services, out of which only three have commenced services at present (*see Table II*).

Private participation in the cellular mobile market, on the other hand, has been comparatively more successful. Eight cellular licenses, two in each of the metros were awarded in October 1994. Subsequently bidding resulted in the award of licenses in 18 Circles². For two circles, Jammu and Kashmir, and Andaman and Nicobar Islands, no bids were received, while for West Bengal and Assam, only one bid each was made. A list of existing cellular operators and their area of operation is provided in *Table III*.

In the last year, cellular services have grown at an annual rate of 35.49 %. The subscriber base crossed 1 million by the last quarter of 1998 and at present (Dec '99) exceeds 1.5 million (*see Table IV*). As a percentage of basic subscribers, cellular subscribers aggregate approximately 5%. This percentage is anticipated to increase substantially following significant changes in the cellular industry that are likely to occur shortly viz. entry of a third operator in certain service areas, introduction of the calling party pays (CPP) regime for cellular mobile and move to a license fee regime based on revenues generated from a fixed license fee regime.

As many as 137 licenses (of which 93 licenses were actually operational by December 98) have been issued for providing radio paging services for which bids were invited in two stages, first for 27 large cities (which had a population of over one million) and in the second round for 19 Telecom Circles. The number of licensees selected for each area range from two to four.

Among other 'Value Added Services', licenses have been issued to 14 operators for providing V-SAT based data services to closed user groups. Nine of these licenses are operational so far. 'On line services' (electronic mail, fax on demand, web page hosting, electronic data interchange) have been operational in the country for past four

² Circles have been classified by the DoT as category A, B and C based on market characteristics and telephony potential in diminishing order of attractiveness.

years. While there is free entry into this segment, growth has been slow, chiefly on account of exclusive dependence on DoT / MTNL for lines and access.

Growth of Internet services has also been retarded in India (current number of subscribers - 250,000) owing to the restrictive policy of retaining the monopoly of public sector entities, viz., VSNL and MTNL. This policy was relaxed only as late as 1998 and there has been a surge of interest since, boosted especially by significant reduction in leased circuit charges through TRAI's Telecommunications Tariff Order (TTO) of March 1999 (see *Section III for more details*). Till date 110 licenses have been issued to private Internet Service Providers (ISP) – 18 for category 'A' (All India), 37 for category 'B' (Territorial Circle & four Metro Telephone Districts of Delhi, Mumbai, Calcutta and Chennai) and 55 for Category 'C' (City). The liberal ISP policy (see *Annex I*) is expected to promote fast proliferation of Internet within the country and give boost to applications like Electronic Commerce, Web Hosting, Virtual Private Network, etc. On current estimations of demand, Internet subscriber numbers are expected to grow to about 2 million in the next two years. One provisional license has been issued for providing Global Mobile Personal Communications by Satellite (GMPCS). Issue of licenses to other prospective GMPCS operators is reportedly under consideration. A summary of the Telecom market structure emerging from the policy outlined above is presented in *Table V*.

Section II

III. The Two Policy Documents of 1994 and 1999

NTP 94 spelt out five basic objectives of which two objectives of availability of telephone on demand and universal service (connecting all villages) were targeted to be realized by 1997. Both of these objectives have remained unrealized. In regard to quality of service, matching "world standard" and providing "widest possible range of services" "at reasonable prices" were stated aims. Two other objectives were to make the country a major manufacturing base and exporter of telecom equipment and to ensure the country's defense and security needs. (The powers of licensing and

spectrum management were retained by the Government on the ground that both need to be strictly monitored in order to protect the strategic interests and security of the country).

There were serious gaps in the policy document as regards provision of a suitable environment for entry of private service provider and on the issue of regulation. The 1994 policy was designed with the approach that services should continue to be provided largely by a strong incumbent that faced little competition. The same view seems to be reflected in the 'guidelines' for selection of private basic service operators. Efforts to involve the private sector under that regime encountered certain obstacles. In addition, while major targets were specified in NTP 94, an accurate assessment of the underlying resource requirements was not done. For example, to realize the enunciated objectives, an estimated Rs. 230 billion of additional resources were required. A need for private sector contribution to the effort was clearly recognized, but various implementation problems including incomplete reforms, mitigated the efforts to achieve the targets. Meanwhile, convergence arising due to changes in technology and the overall market structure for service provision had changed and there was a need to provide fresh directions through another policy.

The opening up of the Internet sector set the background to NTP 99, which is a major attempt to plug the loopholes in the 1994 policy. Its enunciation of policy objectives is itself a marked improvement. Provision of 'Universal Service' (including unconnected and rural areas, re-targeted for year 2002) is sought to be balanced by provision of sophisticated telecom services capable of meeting needs of the country's economy. The latter objective is further amplified to include 'Internet' access to all district head quarters (DHQs) by 2000 and providing high speed data and multimedia capabilities to all towns of population of 200,000 and above by 2002. Apart from a target average penetration of 7 per hundred by year 2005 (and 15 per cent by 2010), targets for rural 'tele-density' have been set to increase from the current level of 0.4 per cent to 4 per cent during the same period.

To meet these teledensity targets, an estimated capital expenditure of Rs. 4,000 billion for installing about 130 million lines will be required. Recognizing the role of private investment, NTP 99 envisages multiple operators in the market for various services. **Another major change has been a shift from the existing license fee system to one based on one time entry fee combined with revenue share payments.**

Whereas NTP 94 only acknowledged the need to induct private participation in a big way into value added as well as basic services, and to "ensure fair competition", NTP 99 goes further in targeting a greater competitive environment and level playing field. Other restrictions include, for instance, a limitation on sub-licensing, on transferability of shares for a specified period (i.e. five years), and the licensee being treated as a defaulter when there is a non-compliance of any license condition. It must be borne in mind that over time, the Government has made attempts to remove restrictions that adversely affect performance of the licensee. For instance, there was earlier a condition that the last mile linkage should be only with copper wire, but this condition has been relaxed.

NTP 99 allows DOT/MTNL to enter as third cellular mobile operators in any service area if they wish to provide these services. To ensure a level playing field, DoT and MTNL will have to pay license fee but DoT's license fee will be refunded because it has to meet the Universal Service Obligations. It is worth noting that to the extent that the fee will be specifically refunded to bear the cost of Universal Service Obligation (USO), this aspect should be accounted for when calculating the USO levy and apportioning the revenues from that levy.

Some of the other notable advances marked by the NTP 99 are as follows:

- Speeding up competition in long distance, including usage of existing backbone network of public and private entities in Rail transport, Power and Energy sectors for data (immediately) and for domestic long distance voice communication when latter is opened to competition from January 2000. This opens up the scope for entry of a new category of ' infrastructure providers' or 'carrier's carrier'.

- The Fixed Service Providers (FSP) shall be freely permitted to establish 'last mile' linkages to provide fixed services and carry long distance traffic within their service area without seeking an additional licence. Direct interconnectivity between FSP's and any other type of service provider (including another FSP) in their area of operation and sharing of infrastructure with any other type of service provider shall be permitted.
- Policy to convert PCO's, wherever justified, into Public Teleinfo centres having multimedia capability like ISDN services, remote database access, government and community information systems etc.
- Transforming in a time bound manner, the telecommunications sector to a greater competitive environment in both urban and rural areas providing equal opportunities and level playing field for all players;
- Strengthening research and development efforts in the country and provide an impetus to build world-class manufacturing capabilities.
- Achieving efficiency and transparency in spectrum management.
- Commitment to restructure DoT.
- Interconnect between private service providers in same Circle and between service provider and VSNL along with introduction of competition in Domestic Long Distance.
- Undertaking to review interconnectivity between private service providers of different service areas, in consultation with TRAI.
- Permission for 'resale' of domestic telephony.
- Clarity regarding number of licenses that each operator may be granted. (This could lead to consolidation of industry operators over the long term).
- Emphasis on certain other issues including Standardisation, Human Resource Development and Training, Disaster Management and Change in Legislation

According to the new policy, the number of players in each circle for Basic Services and their mode of selection shall be decided on the basis of recommendations from TRAI. As opposed to the fixed license fee regime based on which licenses were

awarded earlier, fresh licenses shall be issued on the basis of one time entry fee and a percentage of revenue share to be determined by DoT on the basis of recommendations made by TRAI. Cable operators will be permitted to provide last-mile linkages and switched services within their service areas of operation. Subject to obtaining a basic service license, they shall also be permitted to provide two-way communication including voice, data and information services.

NTP 99 proposes that the long-term policy will be to have uniform 20-year licenses for both Basic and Cellular Mobile services. Extensions of license periods initially by five years and subsequent ten-year extensions are also envisaged. These provisions need to be used in a transparent manner, which again brings up the issue of government divesting itself of the licensing powers in favour of the regulatory authority. Internet Telephony has not been permitted under NTP 99. However, recent announcements by the Government indicate that Internet Telephony will be allowed in India in the near future.

NTP 99 represents a welcome effort to address key issues relating to telecom reforms and to lay down policies that could transform the sector into a competitive and efficient infrastructure within a reasonable time frame. The policy aims at providing a modern and efficient telecom infrastructure, and takes account of the convergence of IT, media, telecom and consumer electronics. The emphasis is on making India an "IT super-power". However, as mentioned above, the regulatory scenario for telecom is changing rapidly and there are a number of issues which would require further analysis and perhaps a change in policy framework in the next few years.

Section III

IV. Key Issues of Policy

As stated above, the new policy provides the framework within which the telecom sector in the country shall function and focuses on creating an environment, which

enables continued attraction of investment in the sector and allows creation of a world class telecommunication infrastructure. This section attempts to analyze and provide details of the issues that are likely to arise in the implementation of the new policy. For example, we discuss the nature of the interconnection regime that will most likely result in attaining the objectives of the new policy, the achievement of USO, the possibility of changing license conditions to encourage more investment in the sector and regulatory principles that are important to achieve the ambitious objectives of NTP 99. The significant issues are detailed below:

A. Interconnection

In a multi-operator environment, interconnection is a crucial regulatory issue for telecommunications policy. No new entrant into the market will be able to compete effectively unless it is able to interconnect its network with the facilities of the incumbent operator either directly or indirectly via the network of another competitive entrant. In the course of transition to competition, a pivotal issue is how best to meet the requirements of interconnection of each of the service providers. For most telephone users, the services offered by the new entrant will be almost useless unless the entrant could enable its subscribers to communicate with the large number of subscribers of the incumbent operator. Consequently, competition in the market can flourish only if entrants are able to interconnect their facilities with those of the incumbent and to do so at terms that allows the entrant to provide the service at competitive levels of price and quality. A ‘fair and reasonable’ interconnection policy is a critical input to foster competition in telecommunication markets.

Prior to NTP 99, direct interconnection among service providers was not a policy; instead, two networks had to be connected via the incumbent operator i.e. DoT (now DTS). This was combined with certain charges for interconnection that are in several instances above cost based interconnection charges. For interconnection, the principles that have been emphasised by TRAI include:

- interconnection principles regarding pricing, timeliness, point of interconnection, and quality of interconnection should be based on a “no

less favourable standard” in comparison to another operator (including the conditions implicitly or explicitly provided to one’s own operations);

- interconnection charges should be cost based;
- these costs should be those “caused” by constructing the link with, and through the use of, the network of the interconnecting service provider (these are “incremental”, or “additional” costs arising due to interconnection);
- the interconnecting service provider must be allowed access to unbundled elements of the network that it requires, and not be charged for facilities that it does not require;
- for any particular interconnection service, the same interconnection charge should apply to any service provider irrespective of the service provided;
- all interconnection service providers should be allowed to charge an interconnection price.

NTP 99 states that direct interconnection between service providers in the same service area shall be permitted. This implies, for instance a cellular service provider can directly link it’s network to that of the other service provider in the same service area without having to interconnect via DoT. Not only is this likely to reduce price to the end-user, but perhaps also result in more efficient utilization of the networks. Although direct interconnection between private networks has been slow to take off following removal of the policy restrictions on it, increased traffic and penetration is likely to provide private operators the necessary impetus to take advantage of direct interconnection.

The necessity of providing a 'level playing field' for public and private operators is another key policy issue. In this context, for instance, an incumbent operator that deters entry to a new operator can keep efficiency from being maximised. To achieve the possible economies of scale and scope and network externalities, the role of regulation should be to reduce or eliminate market power (level the playing field) and mimic the outcomes of the competitive process (ITU, 1999). In a press statement

made recently, the Government has reiterated its commitment that in terms of NTP 99, “there is going to be the same licensing regime for all operators i.e. interconnect revenue sharing arrangements for cellular services for payment of access charges between DOT and MTNL for STD and ISD traffic will be the same as applicable to the other private operators”.

Two basic requirements emerge from this discussion: (a) a restructured DoT that can take on new entrants on competitive instead of monopolistic terms, and (b) autonomous regulation vested with requisite authority. As is well known, the autonomous regulator has been in position for last two years; the need for restructuring DoT is endorsed in NTP 99 and a time frame set for corporatisation of the DoT³.

B. Tariff Issues

Linked to interconnection and competitive efficiency is the issue of tariff and tariff policy. It is now widely recognized that enhancing efficiency and investment in telecom requires the **introduction of competition, which in turn needs a regulatory mechanism** to facilitate competition. An essential ingredient of transition from a protected market to competition is **alignment of prices to costs** (i.e. cost oriented or cost based prices), so that prices better reflect their likely levels in a competitive environment. In basic telecom, for example, a major departure from cost based pricing such as under the prevailing price structure in India, involves a high degree of cross-subsidization (*see Table VI*). This introduces inefficient decision-making by both consumers and service providers. Cost based prices also provide a basis for making subsidies more transparent and better targeted on specific **social objectives**, e.g. for achieving the USO. **For consumers**, cost based prices reflect economic costs and provide **efficiency oriented incentives for consumption**, in contrast to the present telecom tariffs in India that are not linked with either costs or incentives that

³ With the creation of Department of Telecom Services (DTS) on October 15, 1999, the service provision function has been separated. Broadly DoT will be responsible for policy, licensing and promotion of private investments in both telecom equipment manufacture and provision of telecom services. DTS will be responsible for the provision of services.

enhance economic efficiency. **For service providers**, cost based prices better prepare the ground for competition among different operators.

Cost based prices restrict the possibility of cream skimming by operators, facilitate smooth inter-flow of traffic, and reduce the dependency of operators on narrow market segments for maintaining their financial viability. This in turn also promotes a greater concern among operators for a wider set of its subscriber base, and to focus on quality of service, improving technology and service options. If tariffs for services which incorporate high level of cross-subsidies (for e.g. basic service)), are not made cost oriented, then major adjustments would be required in the pricing structure when competition takes place in the telecom market.

Traditionally, DoT tariffs have cross-subsidized the cost of access (as reflected by rentals) by domestic and international long distance usage charges. In order to promote desired efficiencies, 're-balancing' of tariffs is a necessity and therefore an important policy issue. Re-balancing of tariffs involves reducing tariffs that are above costs while increasing those below costs. Thus, re-balancing implies a reduction in the extent of cross-subsidisation in the fixed services sector. Such a rationalization is required as a condition precedent to the conversion of a single operator system to a multi-operator one.

Regarding tariff determination, as in other policy considerations, TRAI has the obligation to ensure transparency in exercising its powers (for which a systematic procedure of consultation with all interest groups has been adopted by TRAI). After going through a comprehensive consultation procedure covering service providers, consumers, policy makers and parliamentarians, TRAI issued its Telecommunication Tariff Order (TTO) on March 9, 1999. The Order represents a landmark for infrastructure regulatory agencies in India in terms of attempting to rebalance tariffs to reflect costs more closely, and to usher in an era of competitive service provision. The chief features of the tariff order were substantial reductions in long distance and international call charges, increase in rentals and local charges and steep reductions (an average of about 70 per cent) in the charge for leased circuits.

For basic services, TRAI demonstrated that tariff re-balancing was necessary to prepare the market for competition. A small proportion of the subscribers account for a major share of call revenue, and these subscribers would be the subject of competitive churn when private sector operators enter the market (*see Table VI*). Loss of such customers will have a significant effect on the revenue situation of the incumbent, making it difficult to meet the objectives of USO and network expansion. Thus, while tariffs have to be reduced for the services which are priced much above cost (e.g. long distance and international calls), tariffs for below cost items need to be increased. Such a re-balancing exercise is common when preparing the situation for competition.

The methodology of specifying tariffs included the following feature to impart flexibility. For certain services, TRAI specified particular tariff levels while for several others it showed forbearance. Even for those services for which tariff levels are specified, the framework includes the possibility of providing alternative tariffs. The tariffs specified by TRAI form a package which is termed the “standard tariff package”. This package must always be provided to the customer. In addition, the service provider is left free to provide any “alternative tariff package”. Since the standard tariff package is always available to the customer, any alternative tariff package has to be better in order to attract any customer. Therefore, the standard tariff package provides a minimum guarantee to the customer. In one sense, it specifies the peak expenditure level for the customer, with the alternative tariff packages being attractive only if the expenditure involved in them is lower than that for the standard tariff package. This method of flexibility was adopted because of the growing tendency in telecom markets to provide different tariff combinations for various baskets of services.

Traditionally, rental charges in India have been linked to the size of the exchange providing the connection. TRAI has specified that rental charge for larger exchanges, in the case of high callers, will increase by over 60 per cent in nominal terms by April 2001. There is an increase in the price of local calls for low calling

subscribers and a decline in such call charges for high calling subscribers. Domestic long distance calls will see an initial reduction of up to 23 per cent with further reductions of 28 per cent over the period to 2002. Charges for international calls to areas outside of SAARC and neighbouring countries will decrease by over 50 per cent from present levels over the same period.

In the case of basic telecom tariffs, changes in certain tariffs (e.g. rental, domestic long distance and international call) are to be phased in over a period of three years. The TRAI has also stated that it will conduct a review of the situation to assess the validity of the underlying assumptions on which it based its determinations, and to make any changes, if necessary.

For cellular mobile, tariffs were restructured because the prevailing rentals were low and call charges were high. This resulted in a tariff structure that dissuaded usage and loaded the subscriber base. Thus, call charges were reduced and rentals were increased. The methodology clearly included license fee as costs and showed that a high license fee translates into higher tariffs.

Standard monthly rental for mobile cellular has been increased from Rs 156 to Rs. 600, but the maximum call charges has been reduced from Rs. 16.80 per minute to Rs. 6 per minute. The alternative tariff packages provided by service providers have resulted in even lower tariffs. Leased circuit tariffs were decreased in order to encourage the use of telecom by business and bulk users, and to provide a competitive stimulus to such users through the use of leased circuits.

TTO 1999 evoked considerable protest from a number of quarters. The tariff package was an attempt to balance a number of objectives. The Explanatory Memorandum to the Order provided a detailed reasoning on this matter, including with respect to affordability of tariffs. Since there was a major systemic change encompassed in the tariff changes, it was not possible to be definite about any eventuality. Thus, the annual review of the situation will shed more light on the underlying situation.

C. Convergence Issues

Private Sector participation in the Indian telecom sector will provide a fillip to technology upgradation and help bridge the gap in adoption of new technology. There have been far reaching developments in the recent past in telecom, information technology, consumer electronics and media industries. According to NTP 99 convergence of both markets and technology is a reality that is forcing realignment of the telecom industry. On the one hand, telephone and broadcasting industries are entering each others markets, while technology is blurring the difference between conduit systems such as wireless and wireline. These rapid changes in technology have largely diluted the monopoly characteristic of telecom service provision, thereby opening up avenues for improved efficiency. Competition is now viable in a range of services, including long distance transmission of voice and data. Facilitating effective competition among the various players is therefore a key policy issue. This has also been acknowledged in NTP 99.

Convergence of technologies implies a need not only to consider the appropriate method of charging license fee, but also forces the policy maker to review a number of other aspects, including whether to regulate and the nature and extent of regulation. The attempt of all the policy initiatives is to promote the flexibility of technology choice and service provision. Thus, neutrality of policies towards the technology platform is seen as a desirable attribute, not only because this enhances opportunities but also because the policy maker is not in a position to anticipate the likely developments and fine-tune policy.

The basic driving force of growing competition in what was once thought to be a natural monopoly is the increasing versatility with which services can be provided, based on the digitisation of all signal transfer technology. As the manner in which signals are transferred from one location to another becomes common, it is possible for a service provider in one segment of telecommunication, say network television services, to perform the functions of another, say, the local phone company. Efforts

to maintain barriers across such segments will eventually be overwhelmed by technology. Regulation will follow convergence rather than the other way around.

Additionally, traditional methods of distinguishing between telecommunications and broadcasting are becoming less clear as a result of technology developments in both industries. The nature of telecommunications and broadcasting transactions, the technology used, and the methods of funding the infrastructure are becoming more and more similar. Some of these diversification activities are on account of technical convergence of the medium (the fibre optic cable) used to distribute services. The high and versatile data carrying capacity of fibre-optic networks means that they will also be ideal network resources to be re-sold to multiple service providers. These could be cable operators, broadcasters, telephone operators, internet service providers, or any other company that needs to send digital signals into the connected units.

In several developed systems, broadcasting is increasingly exploiting the traditional telecommunication medium of cables rather than radio waves, and vice versa. Conversely, entertainment and advertising are among the areas turning to the ordinary telephone network. The use of telecommunications infrastructure for entertainment provision will make it possible to deliver a potentially unlimited number of TV channels, and the need to limit the number of channels to preserve radio frequencies will disappear.

Convergence of IT, telecommunications and broadcasting is marked in the developed economies by growing number of alliances, partnerships and mergers in the three industries. The barriers between information products and other industries are disappearing and new competition and new alliances are appearing in developed systems. At the user level, Internet telephony and e-mail are challenging traditional telecom business models. The impact is felt both in offices and at home. While in offices, desktop and portable PCs pack the power of yesterday's mainframe computers, web television, smart phones and low price computing devices denote the future digital networked home.

D. Technology Issues

Two more issues that should be of high policy concern deserve note here. In order to become globally competitive, India has to keep pace with developments world-wide in telecommunication services and technology. Accessing of the related technologies and promoting needed investments in a competitive environment raise important policy concerns.

(i) Radio Spectrum Allocation

NTP 99 mentions the need to have a transparent process of allocation of frequency spectrum and for the interim, proposes the setting up of a suitably empowered 'Wireless Planning Co-ordination Committee'. The modalities remain to be worked out. In this context, it is possible and indeed appropriate to raise revenue by auctioning rights to the use of this spectrum, as has been done successfully in the United States and Australia. Given the fact that as the Indian economy develops the valuation of these spectrum rights is likely to undergo substantial change over time, it is advisable to award such usage rights for relatively short periods, e.g. 15 years, without restricting the service that they can be used for. For this, it is necessary to develop an efficient spectrum allocation plan with due regard to ITU's recommendations on standardisation.

(ii) Research and Development

With the huge reserve of highly qualified manpower, the R&D area is one that should be high priority. NTP 99 holds out the objective of India's emergence as an IT superpower and of Indian telecom companies becoming truly global players. It envisages government measures to ensure that industry invests adequately in R&D for service provision as well as manufacturing. Increased integration with global markets will provide the thrust (as evidenced by the software industry); this needs to be supplemented by targeted investment to realize the aims spelt out in NTP 99.

E. Quality of Service

A major objective and one around which important policies are designed is, world class quality of service. In India, as in many other developing countries the low teledensity has put a lot of emphasis on rapid expansion. With the effort focussed on expansion, quality of service issues have sometimes not received full attention even though QOS has steadily improved over the years. One of the benefits expected from private sector entry is an improvement of QOS to international standards. QOS is therefore, an important issue. Quality of service standards have been built into license conditions QOS has been also identified as one of the major areas of concern in the regulatory agenda. In fact the Regulator is devising QOS norms to be applicable across the board on all operators. Not only is it proposed to declare QOS norms, it is also proposed to monitor the quality of performance. This is also a major consumer welfare strategy.

F. Consumer Welfare

This is the prime objective of the telecom revolution in India. Telecom as an infrastructure is a necessity not only for businesses but all consumers. The policy objective in this regard is to reach the service to more and more new consumers by making access easier and to improve the service available to existing consumer. Provision of greater choice through competition is also expected to benefit the consumer in terms of better services and lower tariffs. Therefore, while liberalisation policy is itself geared to improve consumer welfare, a need has also been felt for specific policies to achieve this objective. The Regulatory framework is an important means to ensuring consumer welfare. Customer satisfaction and monitoring of performance of operators is high on the Regulatory Agenda. Interconnection policy is also focussed on achieving a nearly seamless architecture so that consumer's access is unrestricted. Another policy initiative to improve consumer welfare is to adopt tariff structure suitable to social requirements to ensure that tariff is affordable for all users.

G. Competition Issues

(i) Competition in Long Distance

At present, DoT is the only provider of domestic long distance (DLD) services in the country. The liberalisation of fixed and cellular services has resulted in private operators providing telecom services in a few states in the country. These operators are allowed to offer long distance services within their service area , but inter-circle long distance traffic is the monopoly of DoT.

According to NTP'99, DLD beyond the service area will be opened up for private operators from January 1, 2000.⁴ All access service providers will have to provide interconnection to the Domestic Long Distance Operator (DLDO) so that the subscriber can exercise choice with respect to the DLDO. NTP '99 also allows resale for domestic telephony.

At present, most of the long distance infrastructure in the country is with DoT, which has 76,000 Rkm of Optic Fibre Cable (OFC) in comparison to 3,000 Rkm with other agencies including organizations that use captive telecommunication networks, mainly for their internal operational purposes. Railways, State Electricity Boards, Power Grid Corporation of India Ltd. (PGCIL) and Gas Authority of India Ltd. (GAIL) are principal among these. However, these agencies possess Right of Way (RoW) required to deploy OFC along a route which is a critical asset. NTP 99 envisages utilisation of utilities' facilities for voice services in addition to data, which is already permitted. Hence, a telephone service provider should have an option to either build its facilities or lease them from owners of any such facilities.

⁴ There are two contrasting definitions of the term "beyond service area". One interpretation is that the intra-circle DLD services will not be opened for competition, since basic service licensees have exclusivity in their service areas for 10 years. The other view is , although the basic service license agreement confers the right to offer intra-circle long distance services, this cannot be construed as an exclusive right to offer these services.

OFC offers advantages over other transmission media for long distance carriage. Technological developments are making it possible to create higher capacities over a single pair of fibres, resulting in connectivity acquiring greater significance than system capacities. International experience has been that the non-facilities-based operators provide additional benefits (in terms of product innovations and prices customised to end-users' needs) without entailing any additional costs to the economy.

The DLD Policy will need to address an array of issues relevant to the introduction of competition. The key determinants of DLD policy are as follows:

- *Type of Competition*, that is whether these entities compete on facilities or service or both
- *Areas of operation*, which means geographical boundaries within which these entities will be allowed to operate.
- *Degree of Competition*, which is determined by the number of entities to be licensed in the segment
- *Time Frame* for policy implementation and transition through different stages of competition

Competition can be introduced either through facilities-based or non-facilities-based modality. Non-facilities-based competition would entail competition by entities not operating their own facilities. Competition in facilities can be introduced either by allowing utilisation of infrastructure of entities such as utilities for provision of telecom services or by licensing facilities-based operators. International trends show that resellers are a feature of mature markets representing unrestricted competition in services. Most developing countries do not allow third party resale in the initial phases of liberalisation.

If the region of operation of the DLDO is nationwide, it may be possible for the new entrant(s) to compete with DoT, since the latter has presence throughout the country. Moreover, tariffs for long distance are reducing rapidly and also becoming distance

insensitive; hence it may be appropriate to foster the emergence of entities that can compete over a larger geographical area.

The degree of competition could be limited or market determined, with or without restrictions to entry. Countries with a public sector incumbent have opted for limited competition during the transition period, while incumbent restructuring was under way. Over the long term, the entry of more players in the long distance segment (on national as well as regional basis) may be examined for potential reduction in costs to user and for rapid growth of services like the 'Internet'.

Clearly, India's long distance infrastructure would be supplemented and upgraded with the entry of new player(s) in the long distance market. The final the terms and conditions and other modalities of DLD liberalization will be announced by DoT, following the recommendations of TRAI on the subject.

(ii) International Long Distance

In accordance with a commitment to WTO, the question of opening up International Long Distance to competition will be reviewed by year 2004. This position is restated in NTP 99. Commitments given to foreign investors to who shares of VSNL have been divested is perhaps one reason why Government is not in a hurry to induct competition in this segment. Opening this service to competition will give a boost to the domestic services, particularly the Internet, and will facilitate the flow of private investment. Vast scope also exists for expansion of India's services sector in the area of long distance computing and office support to leading overseas business undertakings. Pushing down international telecommunication costs through competition will expand these opportunities and bring long terms benefits to the economy. The logic in retaining this island of monopoly when the rest of the sector is being opened up needs to be considered.

International tariffs have been reduced approximately 20% in the first phase of re-balancing engineered by TRAI. The phenomena of call back and the likely decrease in accounting rates will create further pressure to re-balance tariffs in the medium term. If the only tariff reduction is a decline in international tariffs, it will imply a decline in revenues, mitigated to some extent by the volume response. Making up for the revenue loss requires certain other tariffs to increase i.e. those tariffs that are below costs or not high enough to attract competition.

(iii) Competition in Local Services

With the emergence of competition in certain circles for the provision of basic services and the continued growth of cellular subscribers, signs of competition are emerging in the provision of local services. The circles where private basic services have been launched (AP, Maharashtra including Mumbai, and MP) account for about 32% of the total DEL's provided by DoT. At the same time cellular services have shown considerable growth in the last one year. According to NTP 99, entry into basic and cellular markets will be open for more players. It is therefore, likely that more (in terms of numbers) and effective competition will exist in the future.

In addition, as the manner in which signals are transferred from one location to another becomes common, it is possible for a service provider in one segment of telecommunication, say network television services, to perform the functions of another, say, the local phone company. Efforts to maintain barriers across such segments will eventually be overwhelmed by technology.

Moreover, traditional methods of distinguishing between telecommunications and broadcasting are becoming less clear as a result of technology developments in both industries. Some of these diversification activities are on account of technical convergence of the medium (the fibre optic cable) used to distribute services. The high and versatile data carrying capacity of fibre-optic networks means that they will also be ideal network resources to be re-sold to multiple service providers. These

could be cable operators, broadcasters, telephone operators, internet service providers, or any other company that needs to send digital signals into the connected units.

According to NTP 99 'resale' of facilities will be permitted. It is the experience in advanced systems that 'resellers' use a variety of methods and marketing tools to win customers, including lower rates, access code calling, multi-level marketing, telemarketing, agent sales, direct mail, incentive programmes etc. They purchase discounted capacity from established carriers and sell it at competitive retail prices. This will give carriers a route to niche markets, which they otherwise may not be able to penetrate. International trends, however, show that resellers are a feature of developed markets and most developing countries do not allow resale in the initial phase of liberalisation.

H. Regulatory Issues

One characteristic of India's telecom reforms - and cause of much of the problems attending it - is that major reform measures like private entry into services were attempted without having a well thought out overall strategy or even a bare road map as a guide. The absence of clarity that marked the reference in NTP 94 to regulatory requirements of the reformed sector is an eloquent illustration. The following mention appeared at the very end of that policy statement:

In order to implement the above policy, suitable arrangements will have to be made to (a) protect and promote the interests of the consumers, and (b) ensure fair competition. The logical consequence of a decision to permit India-registered companies to operate both basic and 'value added' services and to promote private (including foreign) investment in the sector, is an end to DoT's monopoly on access, setting up of an independent regulator, and separation of DoT the service provider from DoT the policy maker. However, though private entry was allowed, these other regulatory steps were not taken at that time⁵.

⁵ Not only was the reference in NTP 94 ambiguous, but, as noted, the 'Guidelines' for bids for basic services, issued some months after, aimed to retain DoT's dominance and control over connectivity (see Annex IV).

The Telecom Regulatory Authority of India (TRAI) was constituted in March 1997. Responsibilities entrusted to the TRAI include tariff fixation, access charge, revenue sharing between DOT and the private sector, dispute-settlement and consumer protection. (More details in *Annex II*). The establishment of TRAI divests the DoT of several regulatory functions which the latter has exercised on behalf of Government of India. However, the process has been far from smooth, with a call now being made to strengthen the Telecom Regulatory Authority of India Act 1997.

Assessment of Regulatory Reform

Regulatory reform in Indian telecom can be seen as a two-step process. One, the establishment of an independent regulator and, two, the regulatory Authority implementing reform on the basis of its policy initiatives. A crucial concomitant of this process is the separation of the incumbent service provider from the policy maker.

Since its establishment, the telecom regulator in India has taken a number of initiatives pertaining to tariffs, interconnection charge and revenue sharing, and has provided its recommendations on license conditions/license fee for certain service segments. The regulator has also addressed a number of disputes under Section 14 of the Act.

An important feature of the TRAI Act 1999 is that the Authority has to ensure transparency while exercising its powers and discharging its functions. Hence, the TRAI has adopted a procedure of consultations, under which it prepares consultation papers on the issues under consideration, seeks comments from the general public and experts in the area, and provides an Explanatory Memorandum along with its Tariff Orders, interconnection charge or revenue sharing Regulation, and its recommendations. Such an exercise is being performed for the first time by policy makers in India.

TRAI has also been vested with powers to frame regulations necessary for its functioning, including for the levy of fees and charges for services. The TRAI Act provides for a separate fund ('Telecom Regulatory Authority of India General Fund') which will be credited with all grants, fees and charges received by TRAI and funds from other approved sources. Provision has also been made for Central Government grants towards meeting the expenses of the regulatory Authority.

As mentioned above, there is now a perception among the Government that the powers of the regulator need to be increased. An overall perspective that would be important in this regard is to emphasise a system which makes it possible to quickly implement reform. Certain other features derived from the experience of regulatory reform across countries would be of use.

In several countries that have implemented significant telecom liberalization, the focus now is on convergence of policies as well as on regulation that addresses "unfair competition". Further, the rapid developments in the area of internet are posing particular problems for the regulator. It is now evident that internet service providers will be increasingly able to use their technologies to provide competitive services in comparison to those provided by the main telecom service providers. The changes are also throwing up new regulatory issues, which may even lead to a recasting of the established principles in certain cases. There is now also a tendency for service providers to bundle different services, thus creating difficulties in regulating them as separate entities. In a number of instances, convergence of services and technologies is also resulting in a convergence of regulatory authorities, or greater co-operation among the separate regulatory authorities handling the policy issues.

In this regard, it is also useful to consider the view expressed recently by International Telecommunication Union:

"Licensing frameworks around the world are facing pressures for dramatic change, however. The future is uncertain by the voice telephony paradigm

that defines the telecommunication industry is being overtaken and will inevitably disappear. It will be replaced with an IT paradigm that accommodates the multimedia characteristics, global seamlessness and virtuality that will characterize a pervasively IT-based global economy operating over converged technologies and services in cyberspace.

Regulatory regimes of the future will have to reflect different public interest concerns,. Countries that embrace rather than resist the IT paradigm will shift their focus away from a concern for the assured availability of reasonably priced basic voice services provided over traditional public networks. Instead, they will focus more on promoting multiple outlets for voice telephony and ensuring that a reliable and universal virtual public network is maintained across a crazy quilt of interconnected technologies and applications.

Overall, this will likely mean decreased reliance on individual licensing of particular services and facilities and increased reliance on general rules. It will also involve greater coordination among authorities in different industry sectors. Telecommunications regulation will be less concerned with licensing and pricing and more concerned and continuous efforts to adapt standards of reliability and interoperability to unrelenting technology changes, as well as with frequency allocation and assignment, dispute resolution and consumer protection. A lot more of the telecommunication industry will probably end up being regulated by the market.” (ITU, 1999, “Trends in Telecommunication Reform 1999”, page 129)

Recommendatory Role

In line with standard practice with regard to such legislation, Government of India has reserved the right to give policy directions to TRAI and also to seek its recommendations on matters connected with technology, service provision etc. Both these provisions have figured in recent past in reported disagreements between TRAI and Government. NTP 99 has recognized the role of TRAI recommendations in a number of areas (*see Annex II for more detail*). To help implement NTP 99, the

Government has sought TRAI's recommendations on several important issues, including:

- Policy regarding introduction of competition in domestic long distance services including recommendations on the scope of service, service area, number of long distance operators, license fee structure, selection criteria for service providers, and interconnection between service providers in different service areas;
- Issue of fresh licenses for radio paging service providers, including entry of more operators in the service area on the basis of review after two years, level of entry fee, percentage of revenue share as license fee, definition of revenue, basis for selection, and migration of existing licensees to revenue sharing arrangement regime;
- Issue of fresh licenses for VSAT service providers, including level of entry fee, percentage of revenue share as license fee, and other facets of license conditions;
- Issue of fresh licenses for the fixed service providers, including the number of private service providers for a circle besides DOT, selection criteria, migration from fixed license fee to revenue sharing arrangement regime for existing licensees, and other facets of license conditions;
- Issue of fresh licenses to cellular mobile service providers in the six vacant circles/slots (one slot each in West Bengal and Assam circles; two slots each in Jammu and Kashmir, and Andaman and Nicobar), including level of entry fee and percentage of revenue share from the licensor, definition of revenue for the purpose of revenue sharing, migration of existing cellular mobile service providers to revenue sharing arrangement, and any other issue considered relevant;
- Issue of fresh license for public mobile radio trunk services, including issue of fresh licenses throughout the country, level of

entry fee and percentage of revenue share as license fee, and definition of the revenue for the purpose of revenue sharing;

- Recommendations on terms and conditions of license agreement for GMPCS, including an examination of the provisional license, terms and conditions of the license, and quantum and structure of license fee;
- Terms and Conditions of usage of backbone network of utility service providers, including the class of operators to fund UAL, various cost models or approaches to determine the percentage contribution from the revenue for the operators and the mechanisms for computing it, per unit subsidy for VPTs and rural DELs separately to cover capital and recurring expenditure, and whether per unit subsidy will be the same or different in different geographical area/tribal and non-tribal areas of the country.

Licensing Powers remain with Government

Apart from the policy making function, Government has retained the licensing function with itself. There is no set pattern with respect to whether licensing powers should be available with the regulator or with the Government. According to ITU sources, countries where the regulator has the licensing power include:

- In Africa: Botswana, Ghana, Mauritius, Namibia, Nigeria, South Africa, Tanzania, Zambia;
- In Americas: Paraguay, United States, Venezuela;
- In Asia Pacific: Pakistan; Australia, Hong Kong, Philippines and Sri Lanka (licensing spectrum).

In India, the main issue with respect to licensing has been not that it should be with the regulator but that under the TRAI Act 1997, the terms and conditions of the license should involve a consideration of recommendations from TRAI.

Section IV

Some Concluding Observations

Telecommunications reforms policies everywhere have recognised the need to have many more participants than the incumbent operator in the process of telecommunications network expansion and service development. It is generally accepted that these new participants will stimulate development of the sector and provide a degree of competition to the incumbent public telephone operator thus positively influencing the efficiency of service provision. Thus the question is no longer to have competition- the traditional arguments for exclusivity no longer hold. Instead, it is how fast competition should be ushered in.

Even after five years since the announcement of NTP 94, which sought private sector participation in the Indian Telecom market, there is little to show by way of competition in the sector. The liberalisation of the Indian telecom sector has been riddled with uncertainty and has raised questions regarding India's commitment to the reform process (*for a chronology, see Annex III*). The bidding process for basic services resulted in only 6 out of 22 licenses being awarded out of which only 3 licensees have commenced operations. Over the last three years there have been numerous disputes between the incumbent DoT and TRAI over the jurisdiction of the latter. This has been one of the troubling issues. **In a market dominated by few players and lack of effective regulation, competition is unlikely to emerge, thus increasing the likelihood of anti-competitive behaviour on the part of the dominant players.** A regulatory framework and institutional arrangement must be developed to prevent abuse of market power and to promote competition. The Government has stated that it is committed to a strong regulator and there are indications that the TRAI Act will be modified to clarify certain provisions of the Act.

There are quite a few Circles that private service providers have not found attractive to enter. However, an effective communication infrastructure could contribute to the economic growth of these areas. There are also some 290,000 villages that remain to

be connected by phone. Setting up of a funding mechanism through the proposed Universal Service Access levy is therefore a matter of priority. The issue can also be tackled through a policy to establish clear open access and interconnection guidelines. Along with opening up access of one telecom segment to operators in other segments and vice versa, this would lead to development of a data communications market that would optimise utilisation of both installed wireline and wireless transmission capacity. The presence of many operators and a technological and regulatory environment that permits the interconnection of one network to another would also lead to a quantum expansion in reach. For example, it is conceivable that a satellite phone operator in GMPCS would resell its spare satellite capacity, which is a sunk cost, to operators who will use it to provide trunk connectivity to local rural networks, at a fraction of the cost needed for dedicated wireline trunk connectivity. It is not necessary to trade-off reach in order to raise revenue. While the need for a Universal Access Levy will remain, the duration and level of such a levy can be limited by exploring the commercial possibilities opened by competition.

Experience around the world is also showing that due to the networked nature of telecommunications markets, introduction of effective competition requires the active presence of regulators, especially in the early stages of market reform. Digital convergence however is imposing new challenges to the regulatory frameworks that had developed in recent years for the promotion of competition in the telecommunication market. In December 1996, International Telecommunications Union held a colloquium on regulatory implications on telecommunications convergence. It was emphatically noted that in the future, impact of convergence upon regulation would be greater than the impact of regulation on convergence.

Convergence of technologies implies a need not only to consider the appropriate method of licensing and charging license fee, but also forces the policy maker to review a number of other aspects, including whether to regulate and the nature and extent of regulation. The attempt of all the policy initiatives should be to promote the flexibility of technology choice and service provision. Thus, neutrality of policies towards technology/platform is seen as a desirable attribute, not only because this

enhances opportunities but also because the policy maker is not in a position to anticipate the likely developments and fine-tune policy.

The Government of India has recently announced a change in its licensing policy, for example, for cellular mobile, which now allows technology neutrality (with the condition that technology must be digital). Similarly, NTP 99 provides flexibility for different service providers to provide another type of service, subject to having obtained the relevant license for providing that service. Likewise, NTP 99 has increased the flexibility with respect to interconnection among service providers within a service area.

In India's case, license fees have been identified as source for government revenue. Given India's fiscal situation and the revenue raising possibilities of telecom licenses, it is difficult to abjure the revenue maximising option. However, focusing only on revenue maximization does not lead to satisfactory results even from the view point of this limited objective. **Further, if revenues have to be earned from any sector, it is more efficient to earn it out of the actual earnings rather than to seek them from projected earnings in an uncertain environment.** There is considerable evidence to suggest that high license fees are responsible to a large extent for rendering telecom projects 'non-bankable' and for the slow take-off of sector liberalization.

In India, there is a major emphasis on expanding the teledensity in the next seven years, and the Government has explicitly recognized the role of the private sector in meeting such targets. Delay in implementing the operations will create problems in meeting the stated objectives. The need of the hour is to begin operations in as many places as possible, and to infuse competition so that another objective of the Government policy can be met with success through the market itself, namely to provide the services at affordable prices. To that extent, any license fees charged should be low, covering for instance contributions to the proposed Universal Service Access levy, the cost of regulation, and some additional amount to meet other objectives such as the creation of a Telecom Fund.

The delays in the reform process have been very costly to the economy. The gap between the FDI commitments (Rs 280 billion) and the actual investment (Rs. 40 billion up to 1997-98) provides one index of the growth that could have been registered by the sector if correct policies were in place. In terms of physical delays, by conservative estimates, some two million additional telephone lines (and an equal number of Internet connections) would have been facilitated by now.

One final comment. It is in the fitness of things that policy statements for the telecom sector have been periodically reviewed with the changing telecom scenario. Although the reform process has been underway for more than four years with little to show by way of introduction of competition in the sector, it will not be amiss to claim that there is awareness of the crucial issues that need to be addressed. Given the acknowledged importance of telecommunications to overall national interests, governments tend to get involved in the management of the sectors progress. Unfortunately in terms of development, the interests of the government and the private sector do not always reconcile easily - which has resulted in telecom stagnation in many countries, including India. Evidence shows that governments which most 'competently' foster private sector advancement of their telecommunications industries are best placed to gain world class telecommunications services and the attendant benefits. Arguably, early liberalisation could give any country a first mover advantage in attaining high telecommunications performance. However, hasty adoption of developing economies of liberal frameworks adopted by developed economies could easily fail and in the process discredit the idea of liberalisation. Enthusiasm for liberalisation and its possibilities needs to be juxtaposed with a realistic transformation programme that takes into account the country's economic and political dynamics.

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Table I: Subscriber Base - Basic Services

Service Provider	1996-97	1997-98	1998-99
DOT	11,530,276	14,394,956	17,939,773
MTNL	3,012,324	3,406,740	3,653,913
Bharti Telenet Ltd.	Nil	Nil	13,980
Hughes Ispat Ltd.	Nil	Nil	6,070
Tata Teleservices	Nil	Nil	Nil
Total	14,542,600	17,801,696	21,613,736

Source: Quarterly Report Submitted by the Service Providers

Table II : List of Basic Service Providers and their Area of Operation

Area of Operation	Name of Service Provider
All over India	Department of Telecommunications
Delhi & Mumbai	MTNL
M.P.	Bharti Telenet Ltd.
Maharashtra	Hughes Ispat Ltd.
A.P.	Tata Teleservices Pvt. Ltd.
Gujarat	Reliance Telecom Pvt. Ltd.
Punjab	Essar Comvision Ltd.
Rajasthan	Telelink Network (India) Ltd.

The operators printed in Red color are not in operation at present.

Table III Subscriber Base - Cellular Services

Category	Mar '97	Mar'98	Mar'99	Dec'99
All Metros	325,967	551,757	519,543	693,330
'A' Circle	9,698	176,954	354,799	473,784
'B' Circle	3,000	138,309	284,189	379,521
'C' Circle	366	15,296	36,915	36,976
All India	339,031	882,316	1,195,446	1,583,611

Source: Monthly Report Submitted by Cellular Operators Association of India.

Table IV : List of Cellular Service Providers and their Area of Operation

Area Category	Area of Operation	Name of Service Provider
Metros	Delhi	Bharti Cellular Ltd.
	Delhi	Sterling cellular Ltd.
	Mumbai	BPL Mobile Communications Ltd.
	Mumbai	Hutchison Max Ltd.
	Chennai	RPG Cellcom Ltd.
	Chennai	Skycell Communications Pvt. Ltd.
	Calcutta	Modi Telestra Pvt. Ltd.
	Calcutta	Usha Martin Telecom Ltd.
Category A	A.P.	J.T.Mobile
	A.P.	Tata Cellular
	Gujarat	Birla AT&T
	Gujarat	Fascel
	Karnataka	Modicom
	Karnataka	J.T.Mobile
	Maharashtra	Birla AT&T
	Maharashtra	BPL Cellular
	Tamil Nadu	BPL Cellular
	Tamil Nadu	Srinivas Cellcom
Category B	Haryana	AirCel Digilink
	Haryana	Escotel
	Kerala	BPL Cellular
	Kerala	Escotel
	M.P	RPG Cellcom
	M.P	Reliance Telecom
	Punjab	Modicom
	Punjab	JT Mobile
	Rajasthan	Aircel Digilink

Area Category	Area of Operation	Name of Service Provider
	Rajasthan	Hexacom
	Rajasthan	Modicom
	U.P (E)	Koshika Telecom
	U.P.(E)	Aircel Digilink
	U.P.(W)	Escotel
	U.P.(W)	Koshika Telecom
	W.B.	Reliance Telecom
Category C	Assam	Reliance Telecom
	Bihar	Koshika Telecom
	Bihar	Reliance Telecom
	H.P	Bharti Telenet
	H.P	Reliance Telecom
	Orissa	Koshika Telecom
	Orissa	Reliance Telecom
	North East	Hexacom
	North East	Reliance Telecom

The operators printed in Red color are not in operation.

Table V : Telecom Market Structure

Segment	Market Structure	Number of Operators	Service Areas	Period of License
Fixed Telephone Services	Duopoly	2	Circles	15 years
Domestic Long Distance	Monopoly (DoT/MTNL)	1	All India	No Limit
International	Monopoly (VSNL)	1	All India	No Limit
Cellular	Limited Competition	2	Metros and Circles	10 years
Radio Paging	Limited Competition	4	Cities and Circles	10 years
GMPCS*	Full Competition	1	All India	Provisional - One Year

(GMPCS* - Global Mobile Personal Communication System by Satellite)

- Source: TRAI Consultation Paper on Domestic Long Distance -July 99 (Page 3)

Table VI: Revenue Contribution by different Subscriber Groups

<u>Share of Total Subscribers</u>	<u>The Contribution of These Subscribers to Call Revenue</u>
2.7 % (those making more than 10,000 call bi-monthly)	46.1 %
2.5 % (those making between 5001 and 10,000 call bi-monthly)	9.8 %
7.9 % (those making between 2,001 and 5,000 calls bi-monthly)	13.4 %
14 % (those making between 1,001 and 2,000 calls bi-monthly)	11.6 %
21.3 % (those making between 501 and 1,000 calls bi-monthly)	10 %
51.7 % (those making 0 to 500 calls bi-monthly)	8.1 %

Annex I

Salient Features of ISP Policy

Following are the main features of the policy for Internet Service Provider (ISP):

- No restriction on the number of service Providers
- Operation could be on national, regional or district basis
- Service provider has option of building or leasing capacity from infrastructure owners (Railways, energy utilities)
- Foreign equity participation capped at 49 percent
- No prior experience in IT and telecom required
- Licenses to be issued for a period of 15 years, extendable by 5 years
- No license fee for the first 5 years. Token fee of Re 1 per annum thereafter
- Service Providers allowed to set up International gateways after obtaining security clearance
- Telephony on Internet not permitted

Freedom to fix tariffs i.e tariff for Internet services have been forborne by TRAI. However, TRAI may review and fix tariff at any time during the validity of the license.

Annex II

Main Functions Entrusted to Telecom Regulatory Authority of India

- To ensure technical compatibility and effective interconnection between different operators and service providers
- Regulate the revenue sharing arrangement between different service providers
- To lay down and ensure time frames for making available local and long – distance DoT circuits between service providers
- To protect consumer interests through monitoring of service quality standards
- To ensure compliance of license conditions, universal service obligations and the stated overall pricing policy by all operators and service providers
- To levy fees and other charges and to make regulations in that behalf
- To settle disputes between service providers
- To fix tariff for telecom service and ensure price regulation
- To render advice to the government in the national context on technology options, service provision and other allied matters concerned with telecom
- Any other matter referred to it by the government

TRAI is to exercise recommendatory functions on the need and timing for introduction of new service provider and the terms and conditions of license to a service provider.

In the exercise of its powers and the performance of its functions, TRAI shall be bound by directions on questions of policy given by the Government.

TRAI is vested with judicial authority and powers. Appeals against its decisions will lie with the High Court.

Source: Telecom Regulatory Authority of India Act (1997)

Annex III

CHRONOLOGY OF INDIAN TELECOM DEREGULATION

DATE	EVENT
June, 1992	Bids invited for radio paging services in 27 cities
July, 1992	Bids invited for cellular mobile services in four metro cities
May, 1994	National Telecom Policy announced
July, 1994	Radio paging, V-SAT data services, electronic mail services, voice – mail and video – text services opened to private providers
September, 1994	DoT guidelines for private sector entry into basic telecom services in the country
October, 1994	Eight cellular licensees for four metros finalized after over two years of litigation
January, 1995	DoT calls for proposal to operate basic, cellular telecom services and public mobile radio trunked (PMRT) services
August, 1995	DoT receives bids for basic, cellular and PMRT services
December, 1995	Most cellular operators in circles sign license agreements
December, 1995	DoT announces cap on the number of circles basic operators can roll out services in. Licensees selected for five circles.
January, 1996	After setting reserve prices for circles, DoT invites fresh bids for basic services in 13 circles
March, 1996	Five successful bidders short-listed for providing basic services
May, 1996	Poor response to third round of basic telecom bidding. Only one company bids - for Madhya Pradesh.
July, 1996	Selected bidder of first round refuses to extend bank guarantees for its four circles. Challenges in court DoT move to encash guarantees.
Oct. 1996 – Jan.	Three more companies move court against DoT move to encash

1997	guarantees.
January, 1997	Telecom regulatory Authority of India (TRAI) formed.
February, 1997	First basic telecom service company signs license and interconnect agreements with DoT for Madhya Pradesh
March, 1997	Second basic service provider signs basic telecom license pact for Gujarat
April, 1997	TRAI quashes DoT move to increase tariffs for calls from fixed-line telephone to cellular phones
August, 1997	VSNL calls for global tenders to find a partner for its South Asian regional hub project
September, 1997	Internet Policy cleared; license agreement for basic services in Maharashtra also becomes operational
November, 1997	Basic service licensees for Andhra Pradesh and Punjab sign basic telecom agreements with DoT.
March 1999	TRAI Issue First Tariff Order.
March 1999	New Telecom Policy approved.
July 1999	Conditions for migration to revenue sharing from fixed license fee regime issued
January 2000	Ordinance promulgated divesting TRAI of adjudicatory role. TDSAT created to settle disputes between licensor and licensee. Appeals against TRAI decisions to be heard by TDSAT.

Annex IV

Guidelines for private sector entry into basic and cellular telecom services

Following are the main features of the 'guidelines' issued by DoT in September 1994:

- Each circle to have two operators offering basic telecom services: DoT or MTNL and a new private sector operator. (Public sector companies were not eligible to bid for the circles).
- Beside these two basic operators, there would be private operators offering 'Value Added Services' like cellular phones, radio paging and radio trunking services.
- The basic private operator will be allowed to set up an independent telephone network that will include local exchanges, exchanges at the district level and exchanges at the state level; interconnection outside his service area will be only through DoT.
- Both the private operator and DoT will pay each other access charge while accessing each other's network; international calls will involve a higher access charge.
- Penalties to be levied if the private operator does not conform to the 'roll-out' (network expansion) plans furnished to DoT while bidding.
- DoT's tariffs to serve as ceiling levels; future tariff revisions to be decided by the Telecom Regulator
- Tender conditions specifying the type of bidder, foreign collaborations, net worth and operating experience ensure that only financially strong and technically competent private bidding companies offer basic telecom services. The experience criteria specifies that every local bidder must have a foreign collaborator.
- Choice of technology and equipment rests with private operators provided they meet ITU/DoT technical specifications.

The single private operator in each circle, according to the tender guidelines, is not be allowed to carry long-distance national or international traffic outside the circle of its operation, necessitating complex interconnection between networks. The inter-circle telecom traffic is to be exclusively handled by DoT and international calls will be routed through VSNL. This DoT monopoly of inter-circle long-distance traffic and VSNL monopoly of international call traffic is to be reviewed by the proposed Telecom Regulator in 1999 and 2004 respectively.

Box 1: Post Script

The Government promulgated an Ordinance on January 24, 2000 to amend the TRAI Act. Under the Ordinance, the Telecom Regulatory Authority of India (TRAI) has been given enhanced powers, while it has been divested of judicial powers. A new body, the Telecom Dispute Settlement and Appellate Tribunal (TDSAT) has been created to discharge the adjudicatory functions of the original TRAI.

The Ordinance unambiguously confers upon TRAI powers to determine tariffs, prescribe quality of service standards for service providers and fix the terms and conditions of interconnectivity between service providers. Such decisions of TRAI can only be challenged in TDSAT. In addition, wherever TRAI has been given a recommendatory role, it will be mandatory for the Government to seek recommendations from the TRAI, although the recommendations will not be binding.

TDSAT will *inter-alia*, adjudicate, on disputes between DoT in its capacity as the licensor of telecom services and the licensees as and when they arise. Decisions of TDSAT can be appealed only in the Supreme Court.

