REPORT OF THE
WORKING GROUP ON THE
TELECOM SECTOR
FOR THE
TENTH FIVE-YEAR PLAN
(2002-2007)

GOVERNMENT OF INDIA
DEPARTMENT OF TELECOMMUNICATIONS
MINISTRY OF COMMUNICATIONS

INDEX

CHAPTER-1

Introduction

Planning Commission constituted a Working Group on the Telecom Sector to make recommendations on the various policy matters for preparation of the Tenth Five Year Plan for Communication and Information Sector vide their O.M. No. 4 (4)/ 35 /2000 -C & I dated 23rd April 2001 (copy enclosed at Annexure I). The composition of the committee and terms of reference of the working group are as given below:

Composition:

Sl.No.	Name & Designation	Ministry/Dept./ Organisation	
1.	Shri Shyamal Ghosh, Secretary, DOT	Dept. of Telecom	Chairman
2.	Shri J. Ramanujam Member (Services)	Telecom Commission	Convenor
3.	Sr. DDG(LTP)	Department of Telecom	Member
4,	Representative	Ministry of IT	Member
5.	Representative	Ministry of Finance	Member
6.	Representative	Ministry of I & B	Member
7.	Representative	Deptt. of Space	Member
8.	Director (Operations)	Bharat Sanchar Nigam Ltd.	Member
9.	Director (Finance)	Mahanagar Telephone Nigam Ltd.	Member
10.	Secretary (IT)	Govt. of Andhra Pradesh	Member
11.	Secretary (IT)	Govt. of Bihar	Member
12.	Prof. Ashok Jhunjhunwala	IIT, Chennai	Member
13.	Shri T.V. Ramachandran	Cellular Operators Association of India	Member
14.	Shri S.C. Khanna Secretary General	Association of Basic Service Operators	Member
15.	Representative	NASSCOM	Member
16.	Representative	CII	Member
17.	Representative	FICCI	Member
18.	Representative	Telecom Equipment Manufacturers Association.	Member
19.	Representative	IDFC	Member
20.	Shri Nirmal Singh Director(C&I)	Planning Commission	Member

Terms of Reference:

1. To evolve an approach on Telecom Sector for the 10th Plan keeping in view the basic goal of development of world class telecom infrastructure for supporting accelerated growth of IT and other sectors of the economy, fulfilling the objectives of the New Telecom Policy (1999), convergence of services and markets, international scenario in the wake of WTO/IPR regimes and other relevant factors.

2. To make recommendations on development of an appropriate system of telecom network in rural areas which should be affordable but self-financing and capable of supporting a multi-media system of communications.

3. To make recommendations on the further restructuring/ reforms required in the telecom sector in the post - convergence scenario.

4. To suggest measures to be adopted for promoting private sector investment in the light of the experience gained so far and the requirement of funds for future growth.

5. To review the performance of telecom equipment manufacturing sector so far, identify the constraints and make recommendations for evolving an appropriate policy to ensure growth on the pattern of software sector.

6. Any other item that the Working Group, deems necessary to be included for making the recommendations useful.

The first meeting of the working group was held on 26th June 2001 and was presided by Chairman, Telecom Commission. It was decided to constitute four sub-groups to address various issues as per terms of reference of the working group. Details of sub group and the scope of work of each sub group are as follows:

Subgroup-I

Member(Production), Telecom Commission:	Chairman
Additional Secretary, Telecom Commission:	Member

Terms of Reference:

1). To evolve an approach on Telecom Sector for the 10^{th} Plan keeping in view the basic goal of development of world class telecom infrastructure for supporting accelerated growth of IT and other sectors of the economy, fulfilling the objectives of the New Telecom Policy (1999), convergence of services and markets, international scenario in the wake of WTO/IPR regimes and other relevant factors.

2). To make recommendations on the further restructuring/reforms required in the telecom sector in the post – convergence scenario.

Subgroup-II

Member(Services), Telecom Commission: Chairman

Terms of Reference

1). To make recommendations on development of an appropriate system of telecom network in rural areas which should be affordable but self-financing and capable of supporting a multi-media system of communications.

2). Any other item that the Working Group, deems necessary to be included for making the recommendations useful.

Subgroup-III

Member(Finance), Telecom Commission: Chairman

Terms of Reference

1). To suggest measures to be adopted for promoting private sector investment in the light of the experience gained so far and the requirements of funds for future growth.

Subgroup-IV

Member(Technology), Telecom Commission: Chairman

Terms of Reference

1). To review the performance of telecom equipment manufacturing sector so far, identify the constraints and make recommendations for evolving an appropriate policy to ensure growth on the pattern of software sector.

2). Research and Development Approach.

The Chairman of each sub-group was authorized to constitute the sub-group through induction of the representatives of various stakeholders. The composition of each Sub-Group is given in Annex II.

The second meeting of the working group was held on 22.8.2001. All the four sub- groups presented their reports and discussions were held. A presentation was made by Prof. Ashok Jhunjhunwala, of IIT Chennai, expressing his ideas for enhancing growth in the telecom sector.

The Chairman (TC) constituted a Drafting Group for preparing a final draft of the Report, under the supervision of the four Members of the TC. Based on the discussions in the Drafting Group, the final report of the Working Group has been prepared.

The Report contains 10 chapters. Chapter 10 summarises the observations and recommendations of the Working Group.

CHAPTER-2

Reforms in Telecom Sector

2.1 Background

Indian telecommunications sector has undergone a major process of transformation through significant policy reforms, particularly beginning with the announcement of NTP 1994. Historically, the process of expansion of the network was rather slow, being owned and managed by the Government under the assumption that telecommunications was a natural monopoly best run as a state-owned monopoly. By the early 1990s, this concept of a natural monopoly was increasingly challenged in many countries by technological changes, especially in the wireless field and by laudable success in several countries in lowering the cost of services for common man. Policy makers in our country began process of reforms in the 1990s that led to gradual ushering in competition for greater consumer welfare, particularly in terms of lowering of tariffs and improvement in quality of service.

2.2 First Phase - The Eighties

Telecom reforms in India began in the 1980s with the launch of a "Mission Better Communication" program. Private manufacturing of customer premise equipment was allowed in 1984 and the Center for Development of Telematics (C-DOT) was established for the development of indigenous technologies. Private franchises were freely given for public call offices (PCOs) that offered local, domestic and international calling services. Two large corporate entities were spun off from the Department of Telecommunications, e.g. Mahanagar Telephone Nigam Limited (MTNL) for Delhi and Mumbai and Videsh Sanchar Nigam Limited (VSNL) for all international services. Significantly, this began the process of corporatisation of services that had hitherto been under a government department. A high-powered Telecom Commission to direct telecommunications policies was set up in 1989 with full powers of the Government.

2.3 Second Phase - The Early Nineties

The second phase of reform commenced with the general liberalisation of the economy in the early 1990s and announcement of a New Economic Policy (NEP)-1991. Telecom equipment manufacturing was delicensed in 1991 and value-added services were declared open to the private sector in 1992, following which radio paging, cellular mobile and other value added services were opened gradually to the private sector. National Telecom Policy was announced in 1994, with a major thrust on universal service and qualitative improvement in telecom services and also, opening of private sector participation in basic telephone services. An independent statutory regulator was

established in 1997. Progressively there was growth in private sector provision of telecom services in the country.

2.4 Third Phase - The late Nineties

The most important landmark in telecom reforms, however, came with the New Telecom Policy 1999 (NTP-99) which can be termed as the new, or third, generation of reforms. Its first qualitative difference was the acceptance by the government that telecommunications was a sufficiently important for common man whereas earlier it had been viewed as a "cash cow". For example, the private sector had earlier been asked to bid for licenses to provide telecom services through a sealed bid auction in which the bidder paid a fixed fee. This proved unaffordable to the private sector owing to unrealistic calculations of the revenue potential of a license, resulting in a near zero roll-out of lines. Rather than insisting on the prior fulfillment of its revenue obligations, NTP-99 allowed private providers to "migrate" from fixed license fee regime to a revenue sharing regime. The second qualitative difference was that the regulator was strengthened, domestic long distance services were opened to the private sector, and the state-owned basic service provider under the Department of Telecommunications was corporatised.

The guiding principles of the NTP-99 are as follows:

- ❖ Affordable and effective communications to citizens is the core of the vision and goal of telecom policy
- ❖ Balance between the provision of universal service to all uncovered areas, including rural areas, and provision of high level services capable of meeting the needs of the country's economy
- ❖ Building a modern and efficient telecommunications infrastructure to meet the convergence of telecom, IT and the media
- ❖ Conversion of PCOs into Public Teleinfo Centres having multimedia capability like ISDN services, remote database access, government and community information systems etc.
- ❖ Transformation of the telecommunications sector to a greater competitive environment providing equal opportunities and level playing field for all players
- ❖ Strengthening research and development efforts in the country
- ❖ Achieving efficiency and transparency in spectrum management
- ❖ Protecting the defence and security interests of the country
- ❖ Enabling Indian telecom companies to become truly global players.

Specific targets that NTP-99 seeks to achieve are:

- Make available telephone on demand by the year 2002 and sustain it thereafter so as to achieve a tele-density of 7 by the year 2005 and 15 by the year 2010.
- Encourage development of telecom in rural areas making it more affordable by suitable tariff structure and making rural communications mandatory for all fixed service providers

- Increase rural teledensity from the current level of 0.4% to 4 by the year 2010 and provide reliable transmission media in all rural areas.
- Achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002
- Provide Internet access to all district headquarters
- Provide high-speed data and multimedia capability using technologies including ISDN to all towns with a population greater than two lakh by the year 2002.

The key policy provisions of NTP 99 are:

- As mentioned earlier,a significant shift from the fixed license fee regime to a license fee regime based on a revenue sharing mechanism
- Interconnectivity and sharing of infrastructure among various service providers within the same area of operations is permitted; cellular licensees can carry intra-circle traffic;
- Separation of the policy and licensing function of the DoT from the service provision function
- National long distance services sector to be opened to competition from January 1, 2000.
- Service providers could carry both voice and data traffic.

NTP'99 is not just a policy document. It reflects a new philosophy, a new vision, a new direction and a new commitment. The Government has undertaken its implementation with utmost earnestness, in letter and spirit. The underlying theme of the reform process has been to usher in full competition through unrestricted entry in almost all the service sectors. The migration package to revenue sharing in place of a fixed licence fee was a particularly progressive policy step which has led to a virtual 'take off" in growth of the cellular and basic service sectors. As a result of the reform process, National and International data connectivity has been opened. Basically all telecom services have been opened up for private sector participation except International voice telephony. This segment was scheduled to be reviewed by the year 2004, but now it has been decided that state monopoly of Videsh Sanchar Nigam Limited (VSNL) over international telephony will be ended by 31.3.2002. Unrestricted entry has been allowed in Basic Services on revenue sharing basis. Internet services have been opened up without any restriction on the number of entrants and without any entry fee. Cellular service providers are permitted to carry their own long distance traffic within their service area. There is no restriction on the number of GMPCS licences but the gateways for the GMPCS are to be located in India. National Frequency Allocation Plan (NFAP-2000) has come into force on 1st January, 2000. Indian Telegraph Act 1885 is being reviewed and a new Bill based on convergence is likely to be enacted soon. With all these measures, which have come one after another in quick succession, the various telecom reforms committed under NTP-99 are almost complete, some ahead of schedule. The first few years of the new millennium are expected to be a period of growth and consolidation.

CHAPTER-3

Ninth Five Year Plan (1997-2002) –A review

3.1 Growth of DELs

The total demand for new telephone connections in the country as envisaged in the Ninth Plan period was 237 lakh telephones. Out of these 237 lakh new telephones it was envisaged that the DTS(now BSNL) and MTNL will provide 185 lakh telephones and balance 52 lakh to be provided by private sector.

During mid term appraisal of IX Plan, it was observed that provision of telephones by private sector was slow and lagging behind. As such it was decided to increase the target of BSNL+MTNL to 222.7 lakh and balance by private sector.

During the Ninth Plan period, the number of DELs (Fixed Lines) increased from 14.54 million (at the beginning of 9th Plan) to 32.71 million in 2000-2001. By the end of Ninth Plan, this is expected to go up to 40.53 million. The cellular subscribers during the same period increased from 0.34 million to 3.58 million, and expected to go up to about 5.58 million by the end of Ninth Plan (2001-2002). The tele-density is estimated to increase from 1.57 as on March 31, 1997 to 4.5 per 100 population by the end of Ninth Plan.

The number of Internet users has also increased from 0.9 lakh in 1997-98 to 30 lakh in 2000-2001. The turnover of the telecom equipment manufacturers is also estimated to reach a level of Rs. 11,000 crore by the end of 2001. The details of the target and progress made during the plan period are given in the following tables:

TARGETS AND ACHIEVEMENTS (BSNL and MTNL)

ITEM	ORIGINAL TARGET 1997-2002 A	REVISED TARGET 1997-2002 B	ACHIEVEME-NT DURING 1997-2001 C	BALANCE D= B-C	TARGET 2001-2002 E
DELs(LAKH LINES)	185.00	222.70	178.93	43.77	72.3
VILLAGE PUBLIC PHONES(Nos)	239000	278866	148195	130671	144000
MICROWAVE (RKMs)	90000	70000	72911	NIL	7500
OPTICAL FIBRE CABLE(RKMs)	140000	270000	174212	95788	126000

GROWTH OF FIXED LINES, CELLULAR MOBILE TELEPHONES AND INTERNET DURING NINTH PLAN 1997-2002

(Status)

	Year				
	1997-1998	**1998-1999**	**1999-2000**	**2000-2001**	***2001-2002****
Fixed Lines (In Million)	17.8	21.61	26.65	32.71	40.53
	(3.26)	(3.81)	(5.04)	(6.06)	(7.82)
Cellular Mobile (In Million)	0.88	1.20	1.88	3.58	5.58
	(0.54)	(0.32)	(0.68)	(1.7)	(2.00)
Total	18.68	22.81	28.53	36.29	46.11
	(3.80)	(4.13)	(5.72)	(7.76)	(9.82)
Tele-density per 100 persons	1.93	2.32	2.86	3.58	4.49
Internet Subscribers (In 000)	140	250	850	3000	-
Production of Telecom Equipment (In Rs. Crore)	9960	10000	10800	11000*	-

Note:
* Estimated/Projected.
1. The figures for the year 2001-2002 are targets / anticipated achievements
2. The figures in brackets indicates additional telephones added during the year.

Source: MIS ,PIP and VAS Branches, DOT

3.2 Rural Telephony

The telecom network in the rural areas expanded at fast pace during Ninth Plan (1997-2002). The number of DELs in the rural area increased from 2.27 million in March, 1997 to 6.69 million by March 2001. During the same period, the rural teledensity increased from 0.34 percent in 1997 to 0.93 per cent in March 2001. This is expected to cross 1 per cent by end of the Ninth Plan. The bulk of the investment in rural

telecom has been made by the public sector operator viz.BSNL. The investment by the private operators in rural areas has been minuscule during the Ninth Plan. The private operators have provided only 562 VPTs during the first four year of the Ninth Plan against 4.10 lakh VPTs provided by the BSNL.

Status of Rural telephones and Tele-density during IX Plan (1997-2002)

Year	1997-98	1998-99	1999-2000	2000-01	2001-02*
Telephone (In Million)	2.84	3.65	4.82	6.69	8.29
Tele-density (Per 100)	0.41	0.52	0.68	0.93	1.14
Share of Rural Areas in total DELs (including cellular)	15.2	16.0	16.9	18.4	18.0

* Projected / Estimated
Source: MIS,DOT

3.3 Investments:

During this period, the public sector operators viz. BSNL, MTNL and VSNL made the major investments. The bulk of the investments in cellular mobile segment were by the private operators. The private basic operators added only 0.27 million DELs (fixed phones) during the first four years i.e. about 1.0% of the total DELs added during the Ninth Plan.

The total estimated investments by the public sector operators during the first four years of the Ninth Plan(1997-2002) was Rs.62358.20 crore. As the actual annual investment by the private sector are not available, the investment by domestic private sector during the Ninth Plan period has been estimated by taking 50 per cent of the proposed investment as per the assessment of the Industry. The actual FDI for the telecom sector is provided by RBI and the same has been taken. The total estimated investment by the private sector (domestic private investment and FDI) during the first four years of the Ninth Plan is Rs.10550.5 crore. The average annual investment by the public sector operators (viz. BSNL and MTNL)during the first four years of Ninth Plan has been about Rs.12,952 crore per annum, whereas the investment by the private sector during the same period is about Rs. 2637.6 crore per annum. The position of investment by public and private sector operators is given below:

Investment by Public and Private Sector During IX Plan (1997-2002)

(Rs. In Crore)

Operators	**1997-98**	**1998-99**	**1999-2000**	**2000-01**	**2001-02(B.E.)**
BSNL	8646.1	9450.3	12532.3	16395.0	16574.0
MTNL	912.0	977.0	1250.0	1645.0	1600.0
Total Investment by the Public Sector Operators	9558.1	10427.3	13782.3	18040.0	18174.0
Estimated Domestic Private Investment	303.0	6746.5	479.5	210.0	-
Foreign Direct Investment *	1775.6	212.7	288.6	534.6	-
Total Private Investment	2078.6	6959.2	768.1	744.6	
Grand Total (Public & Private Sector)	11636.7	17386.5	14550.4	18784.6	-

*The Working Group noted that considering the ratio of 49:51 of FDI and domestic share in equity, and a 1:1 debt. equity ratio, the actual investments would be about 4 times the amounts shown against the Foreign Direct Investment in the above table.

Source: 1. Budget Branch, DOT
2. SIA Newsletter, Ministry of Industry.
3. SIA Statistics, Ministry of Industry.
4. PIP Cell of DOT for Actual Foreign Direct Investment as obtained from RBI

Note : Actual Domestic Private Investment has been taken as approx. 50% of Proposed Domestic Private Investment.

3.4 Performance of telecom equipment manufacturing sector :

As a result of Government policy, progress has been achieved in the manufacturing of telecom equipment in the country. There is a significant telecom equipment manufacturing base in the country and there has been steady growth of the manufacturing sector in the 9th Five Year Plan. The figures for production and export of telecom equipment are shown in tabular form given below:

Production of Telecom Equipment

Year	in Rs. Crores(approx)
1996-97	8300
1997-98	9960
1998-99	10,000
1999-2000	10,800
2000-2001	11,000

Break-up of Production (2000-2001)

Type of Telecom Equipment	in Rs. Crores (approx)
Switching	2500
Transmission	2500
CPE	500
PIJF	3500
OFC	500
Others(Access , Towers, Power plants etc)	1500

Export of Telecom Equipment

Year	in Rs. Crores (approx)
1996-97	240
1997-98	296
1998-99	250
1999-00	180
2000-2001	390

Export of Telecom Consultancy

Year	in Rs. Crores (approx)
1995-96	235
1996-97	270
1997-98	313
1998-99	383
1999-2000	337

An estimated work force of 100,000 and a capital investment of around Rs. 8000 crore exist in this industry. Several MNCs have also set up their manufacturing base in the country.

CHAPTER-4

Tenth Five-Year Plan –Objectives and Projections

4.1 Objectives:

- Affordable and effective communication facilities to all citizens.
- Provision of universal service to all uncovered areas, including rural areas.
- Encouragement to development of telecom in rural areas making it more affordable by suitable tariff structure and making provision of rural communications mandatory for all fixed service providers.
- Building a modern and efficient telecommunications infrastructure to meet the convergence of telecom, IT and the media.
- Conversion of PCOs into Public Teleinfo Centres equipped with multimedia capability like ISDN services, remote database access, government and community information systems etc.
- Transformation of the telecommunications sector to a greater competitive environment, providing equal opportunities and level playing field for all players.
- Strengthening research and development efforts in the country.
- Achieving efficiency and transparency in spectrum management.
- Protecting the defence and security interests of the country.
- Enabling Indian telecom companies to become truly global players.

Specific targets:

- Make available telephone on demand by the year 2002 and sustain it thereafter so as to achieve by March 2007, a tele-density of 11.5 at the national level and 3 for rural areas.
- Increase rural teledensity from the current level of 1% to 3% by March, 2007 and to provide reliable transmission media in all rural areas.
- Achieve telecom coverage of all villages in the country by the year 2002.
- Provide reliable media to all exchanges by the year 2002.
- Provide Internet access to all district headquarters with reliable media.

- Provide high-speed data and multimedia capability using technologies including ISDN to all towns with a population greater than two lakh by the year 2002.

4.2 Demand Projections for Tenth Five Year Plan (2002-2007)

4.2.1 Physical Targets- Network to be added during the Plan.

Category	Target
Fixed/ Mobile Phones	817.10 lakh
Optical Fibre	302000 Rkms
Microwave	17000 Rkms
TAX lines	30.5 lakh
IN	104 lakh
ISDN	11.75 lakh
Internet	230 lakh
Satellite - Projection of Transponder requirement for sustaining existing services and their further growth: Normal C-band - 61 Transponders; Extended C-band -53 Transponders; Ku - band - 89 Transponders, Ka - band - 6 Transponders and MSS-(1+1) Transponder	

4.2.2 Fixed and Mobile Phones to be added during the Plan.

Year	Fixed Phones - Million Lines	Mobile Phones - Million Lines	Total - Million Lines
2002-03	7.87	2.54	10.41
2003-04	8.45	4.33	12.78
2004-05	10.02	5.67	15.69
2005-06	10.96	8.29	19.25
2006-07	12.86	10.72	23.58
Total	50.16	31.55	81.71

4.2.3:Rural and Urban lines to be added:

Year	Rural	Urban	Total - Million Lines
2002-03	1.88	8.53	10.41
2003-04	2.30	10.48	12.78
2004-05	2.83	12.86	15.69
2005-06	3.46	15.79	19.25
2006-07	4.25	19.33	23.58
Total	14.72	66.99	81.71

4.2.4Cumulative Network position expected during the Plan (projected):

(in million)

Year	Rural#	Urban#	Fixed#	Cellular#	Total#
2002-03	10.17 (1.38)	46.35 (15.11)	48.40 (4.64)	8.12 (0.78)	56.52 (5.42)
2003-04	12.47 (1.67)	56.83 (18.04)	56.85 (5.36)	12.45 (1.18)	69.3 (6.54)
2004-05	15.30 (2.03)	69.69 (21.55)	66.87 (6.21)	18.12 (1.68)	84.99 (7.89)
2005-06	18.76 (2.46)	85.48 (25.74)	77.83 (7.11)	26.41 (2.42)	104.24 (9.53)
2006-07	23.01 (3.0)	104.81 (30.74)	90.69 (8.16)	37.13 (3.34)	127.82 (11.50)

Source: Economic Research Unit, DOT

These are the cumulative DELs at the end of each year i.e. March 31st.
The figures in parenthesis are the tele-density.

4.2.5 Growth of Internet Services:

Along with fixed and mobile phones, the Internet has become a vital mode of communication through which a number of IT enabled services can also be provided. Today, the total number of Internet connections in the country has already crossed 3 million. It is estimated that about 23 million new Internet connections will be added during the Tenth Five Year Plan.

BSNL is providing Internet Dhabas in all block headquarters. Internet Dhabas have already been set up in 2205 Block headquarters by 31.5.2001.The provision will be extended further up to village level by the public and private sector operators during the Tenth Plan.

To promote the spread of Internet, it is essential that the required bandwidth and last mile connectivity is made available by the telecom operators in their respective service areas. The use of the cable network and DSL technologies may be actively promoted to provide higher bandwidth capabilities to the Internet users. Internet Dhabas, which are public Internet facilities, need to be encouraged, by providing to the franchisees/ small entrepreneurs, soft loans for purchase of end equipment like computers and other infrastructure, training support etc., under the existing Central and State Government employment generation schemes.

For dial-up Internet users, telephone call charges are a major element of cost. The high local call charges, and multi-metering of local calls, discourage the usage of Internet

facilities. Therefore, to promote greater Internet use, the call charges for Internet use need to be brought down substantially.

4.2.6 Tenth Five Year Plan – Funds Requirement (estimated):

Rs. Crores

Year	Total	Public Sector	Private Sector	Rural Network
2002-03	23,281	20,700	2,581	5,640
2003-04	26,279	21,735	4,544	6,900
2004-05	31,510	22,822	8,768	8,490
2005-06	36,224	23,963	12,261	10,380
2006-07	43,298	25,161	18,137	12,750
Total	160,672	114,381	46,291	44,160

Source: ERU, DOT

The physical and financial targets for the X Plan have been worked out based on the following assumptions:-

(i) The overall tele-density at the end of the 10th Plan has been taken as 11.5 per 100 population.
(ii) The tele-density in the rural areas shall have to reach 3 per 100 population at the end of the Plan.
(iii) The demand projections for the basic telephony (fixed phones) are based on past trends observed in the different telecommunications circles in the country.
(iv) The DELs required over and above the projected demand for the fixed telephones to achieve the targeted tele-densities are expected to be made available by the cellular mobile phone providers.
(v) An average cost of Rs.27,000 has been taken for a fixed direct exchange line (DEL) for the 10th Plan period. This includes the cost of DELs provided both in rural and urban areas either through the copper or OFC landlines or through WLL technology.
(vi) The per line cost has been taken as Rs.8,000 for CMP connection.
(vii) The per line cost in rural areas has been taken as Rs. 30,000.

In view of the increasing competition with the entry of private sector operators, it has been assumed that the public sector investment (BSNL & MTNL) would increase by only 5% per annum during the plan period. Accordingly, the investment by the public sector is expected to be about Rs. 114,381 crore and by the private sector the same is estimated to be about Rs. 46,291 crore during the 10th Plan period. However, the level of investment by the PSUs would largely depend on their internal resource generation capacity.

Of the total investment requirement of Rs. 160,672 crore during the 10th Plan period, about Rs. 46,291 crore is estimated to be the share of private sector. It has been assumed that after a lag of two years, about 20% of the private sector investment will come through internal generation. Further, based on a debt equity ratio of 60:40, about Rs. 22,220 crore would have to come through debt and Rs. 14,813 crore through equity.

It needs to be pointed out that as per available indications, the cellular mobile phone (CMP) segment is expected to expand much more enabling the country to achieve tele-density higher than that envisaged in the NTP-1999. The alternative estimates of CMPs (additional) during the 10th Plan period vary between 38 million to 50 million as against 31.55 million CMPs taken for estimating the investment requirement. The investment requirement might increase ranging between Rs. 5160 crore to Rs. 14,760 crore, taking the total investment requirement in the range of Rs, 165,832 crore and Rs. 175,432 crore. Accordingly, the investment requirement in the private sector would also be in the range of Rs. 51,451 crore and Rs. 61,051 crore, if additional CMPs are to be provided by the private sector alone.

4.2.7 Investment in the Domestic Manufacturing Industry during the X Plan:

The existing manufacturing base is not fully utilised at present. However, marginal investment to the extent of about Rs. 6000 crores if made, will help the industry to have state-of-the-art manufacturing in the country and will boost exports.
The details of the investment required are given in the table below.

Investment required in the manufacturing sector during the X Plan :

1.	Upgradation of existing processes for state of-the art manufacturing (4 model plants)	Rs.1000 Crore	Private sector/FDI
2.	One mega-fab facility	Rs.2500 Crore	FDI
3.	Test house- EMI/EMC/Safety/environmental (2 labs)	Rs. 250 Crore	Government.
4.	Optical Fibre manufacturing (2 units)	Rs.2000 Crore	Private/FDI
5.	Advanced Manufacturing infrastructure in switching, Transmission, GSM, WLL etc.,	Rs. 500 Crore	Private sector/FDI
	Total (Government.)	Rs 250 Crore	
	Total (Private sector/FDI)	Rs. 6000 Crore	

CHAPTER-5

Rural Telecom Development

5.1 Introduction

The telecom development in rural areas assumes special significance in our country as more than 70% of the population lives in villages. There is a strong two-way co-relation between telecom development and overall economic development of a region. The telecom services are important drivers for development of private sector, delivery of public services such as education, health etc. and integration of the rural areas with rest of the country. Several studies have established that income in the rural areas grows faster in telecom intensive economies A well spread out provision of affordable telecom services in rural areas enhances the ability of people to participate in market economy which, in turn, improves their productivity and contributes to their earnings. The expansion of telecom services is expected to open up huge untapped opportunities such as tele-education, tele-medicines e-commerce, e-governance etc. These are expected to further fuel the demand for telecom services for which clear indications are available in the form of bulging waiting list in rural areas of the country.

5.2 Policy Measures taken:

A number of policy measures have been taken during the past few years to expand the telecom services in the rural areas. In the National Telecom Policy – 1994, specific targets were set for rural areas. These included provision of universal service in all villages at affordable and reasonable prices; and availability of telephone on demand. It was targeted to cover all villages by the end of 1997. The NTP-1999 paved the way for faster telecom growth. This policy again stipulated several specific objectives and time-bound targets of tele-density and rural telephony. The objectives are :

(i) Strive to provide a balance between the provision of universal service to all uncovered areas, including the rural areas, and the provision of high-level services capable of meeting the needs of the country's economy.
(ii) Encourage development of telecommunication facilities in remote, hilly and tribal areas of the country.
(iii) Encourage development of telecom in rural areas making it more affordable by suitable tariff re-structuring and making rural communications mandatory for all fixed service providers.

The targets laid down in the policy are :

(i) Increase rural teledensity from the current level of 0.4 to 4 by the year 2010.
(ii) Achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002.
(iii) Areas of North East, Jammu & Kashmir and other hilly regions, tribal blocks, etc. to be identified as a special thrust areas for accelerated development of telecommunications.

5.3 Review of Progress:

5.3.1 Achievements during the IX Plan:

The telecom network in the rural areas expanded at fast pace during Ninth Plan (1997-2002). The number of DELs in the rural area increased from 2.27 million in 1997 to 6.69 million by March 2001 . During the same period, the rural teledensity increased from 0.33 percent in 1997 to 0.93 per cent in March 2001. This is expected to cross 1 per cent by end of the Ninth Plan.

All the electro-mechanical exchanges in the rural areas have been replaced by electronic exchanges. 90% of the rural exchanges have been covered with STD facility as on March 31,2001.

Status of Rural telephones and Tele-density during IX Plan (1997-2002)

Year	1997-98	1998-99	1999-2000	2000-01	2001-02*
Telephone (In Million)	2.84	3.65	4.82	6.69	8.29
Tele-density (Per 100)	0.41	0.52	0.68	0.93	1.14
Share of Rural Areas in total DELs (including cellular)	15.2	16.0	16.9	18.4	18.0

* Projected / Estimated

Source: MIS, DOT

Out of 6.07 lakh villages, 4.09 lakh villages have been provided with Village Public Telephones (VPTs) as on 31.3.2001. It has further been noted that about 72% population has only about 18% of the total number of phones. The rural tele-density is only about 1% as against 10.16 % in urban areas. The progress has been slow in rural areas due to inadequate availability of funds, equipment and material and the fast changing technologies. Unreliable connectivity, inadequate maintenance in rural areas and irregular and lack of power supply also contributed to slow and tardy growth of telecom network. Further the telecom services in rural areas have been unattractive due to low revenue and high costs per DEL. Therefore, one of the immediate concerns is to bridge the emerging rural-urban digital divide.

5.3.2 Role of Public Sector

Most of the rural DELs including VPTs have been provided by the public sector operator viz BSNL. As stated above, approx. 4.10 lakh VPTs have been provided so far by the public sectors (BSNL+MTNL) . The status of the rural DELs is expected to reach 8.29 million by the end of the IX plan. The bulk of the investment in rural telecom has been made by the public sector operator viz. BSNL, which is of the order of Rs. 7000 crores during the first four years of IXth plan.

5.3.3 Role of Private Sector

Roll-out of network by private operators in the rural areas has so far not been at all satisfactory, despite the Government's having laid down certain *minimum* roll-out obligations in the licence conditions for telecom service providers, in respect of rural DELs and VPTs.The private operators have provided only 562 VPTs against their obligations for providing 97806 VPTs.

It has been seen in the past that the private operators were prepared to pay penalty for non-fulfillment of rural obligations rather than making investments that they perceive will be unprofitable. In the licences issued recently to the basic service operators, it has been stipulated that the point of presence (POP) has to be established by the operators in equal proportion in rural, semi-urban and urban Short Distance Charging Areas(SDCAs).

5.4 Induction of appropriate technology:

It is well recognized that rural telephony is to be provided in a cost effective manner by taking advantages of the recent developments in access technologies. Of the total (4,08,922) VPTs provided upto March 31, 2001 about 52% are with MARR technology and 48% are on overhead lines. The remaining 1,98,569 VPTs are to be provided by wireless in local loop (WLL), INMARSAT and C-DOT-PMP technologies. However, the efficiency of existing systems at many places is not very satisfactory and a large number of VPTs specially based on MARR technology do not function properly, due to inadequate maintenance, power and other problems. Therefore, other technological options are being considered such as WLL(CDMA,CorDECT) and GSM technologies. Furthermore, 18,000 exchanges installed in rural areas are of C-DOT switching technology. These exchanges are very rugged and suitable for working without air-conditioning in extreme weather conditions of higher temperature and high humidity. Further, existing VPTs are also being upgraded for STD facility, and to serve as Public Tele-Information Centres/Information Dhabas progressively. An ambitious scheme has been undertaken to set-up Community Communication Cafes (popularly known as Sanchar Dhabas) at village panchayat levels. VPTs are also being provided in remote and far-flung areas on satellite. Thus, considering the diverse terrain and

geographical locations, specific cost-effective technological solutions are being identified and inducted for each of the clusters out of the various options.

5.5 Reliable Media:

Another important area of concern is the provision of reliable media in the rural areas. As per the available information, of the total exchanges working in the rural areas, about 45% are without reliable media. The severity of this problem is more in those States, which are relatively much larger in area with difficult and varied geographical terrain. These include, in particular Maharashtra, Madhya Pradesh, Rajasthan, North East, Himachal Pradesh, Jharkhand, Chhatisgarh, Uttaranchal and Gujarat. This implies that a much bigger effort and investment is needed in terms of providing additional equipment and OFC. Accordingly, the NTP-1999 stipulated that all the rural exchanges shall be provided with reliable media by 2002. Provision of reliable media will contribute to the viability of rural telephony. This is to be ensured through adequate bandwidth, convergence of technology for voice, data and video to be utilized through Information Communication Technology (ICT) centers, adoption of appropriate technology mix and connectivity through OFC up to the last mile. In this regard, the emphasis needs to be on evaluation of available technologies rather than on evolution.

5.6 Rural Public Telecom Facilities

The attended public telephone facility provided by the DOT/BSNL has been a great success. It improved the availability of telephone to the people who cannot afford their own phones. In a developing economy such as India, due to the affordability problems, the public telecom facilities will play a big role in meeting the demand for the Telecom services. It is, therefore, necessary to provide every possible type of Telecom service as public telecom facility. To make available the benefits of modern technologies to the largest number of people, it is necessary to have public telephones, ordinary and ISDN, public Internet booths, public IN services etc. in rural areas.

To spread Internet culture to the rural areas, it is necessary that Sanchar/ Internet Dhabhas are provided in the rural areas for use of masses. While providing this facility, it is also necessary to ensure that the content which will be useful to the rural masses is made available by the respective State Governments. The success of these public Internet Dhabhas will largely depend upon finding a killer application for its use. This would come by way of introducing voice mail which gets over the problem of language and the availability of region specific information about farming, market data etc. would be ensured on the web sites in regional languages.

To achieve this objective, all villages are required to be connected by reliable media to enable them to get the benefit of multi-media applications. The State Governments should take appropriate measures to encourage entrepreneurs in rural areas to put up equipment and run the services.

5.7 Funding Mechanism for Rural Areas:

5.7.1 Universal Service Obligation (USO) and USO Fund:

The definition and scope of Universal Service varies depending on the economic development of a country, its network coverage and tele-density. Universal Service is desirable for social and economic reasons and to enable low-income customers, customers living in rural, remote and high cost areas, the physically disadvantaged and elderly customers to participate in the mainstream and remove the feeling of isolation. The common approach to Universal Service in the developing countries like India is to provide universal access, individually to households at affordable charges and to the others by shared access.

Therefore, universal service is a dynamic concept that provides for nation-wide coverage, non- discriminatory access, and widespread affordability. Nation-wide coverage requires huge investments and also entails high operating costs. To meet the criterion of affordable pricing, the revenue may fall short of cost and hence cause deficits. The Universal Service policy has to reconcile the three contending criteria, i.e. availability, accessibility and affordability:

Availability- Provision of telephone service, whenever and wherever required, i.e. even in uneconomic areas such as rural and remote.

Accessibility- Uniform, Non- discriminatory tariff in the service area – No discrimination in terms of price, service and quality regardless of geographical location , based on the concept of geographical averaging.

Affordability- Telephone service should be priced so that most users can afford it. In uneconomic areas, this may mean tariff such as rentals below cost.

In view of the considerations enumerated above, it is essential in a public policy, to provide availability and access to all people for basic telecom services at affordable and reasonable prices. The following universal service related objectives are stipulated in NTP 99:

- Provide voice and low speed data service to the balance uncovered villages in the country by the year 2002.
- Provide Internet access to all district headquarters by the year 2000.
- Provide telephone on demand in urban and rural areas by 2002.

Under NTP 99, the implementation of the Universal Service Obligation (USO) is expected to be undertaken by all fixed service providers. As stated above, the provision of universal service in rural areas may not always be remunerative due to heavy capital investment and low returns. Wireless in Local Loop based technology is also expensive and its loading is less than economical in the rural areas. Satellite telephony is also one of

the most expensive options and would not be deployed as a normal business case. Under the circumstances, most operators would hesitate to provide rural telecom facilities in accordance with the Government policies unless firm and clear financing arrangements are available in a timely manner.

There is therefore, a need to find resources to subsidize these operators. One of the methods to raise resources for meeting the USO is through a 'universal access levy'(UAL), which could be a percentage of the revenue earned by all the operators under various licences. The percentage of revenue share towards universal access levy needs to be decided by the Government in consultation with TRAI. The implementation of the USO obligation for rural/remote areas might be undertaken by all fixed service providers to be reimbursed from the funds from the universal access levy. Other service providers could also be encouraged to participate in USO provision subject to technical feasibility and may be reimbursed from the funds from the universal access levy.

5.7.2 Telecom Development Fund:

Apart from establishing the USO Fund into which the Universal Access Levy will be credited, Govt. may also consider setting up a Telecom Development Fund under the Ministry of Communications, into which all other receipts of the Govt. from telecom sector such as licence fee, service tax etc. may be credited for being distributed in the shape of soft loans to operators providing uneconomic services, including in the rural areas with a view to plough back the earnings from the telecom sector . This fund may also receive contributions from large corporates or lines of credit from Development Banks, multilateral agencies and bilateral loans, etc.

5.8 Projections of telephone demand in rural areas and Investment requirement during the X Plan:

The estimated lines to be added in rural areas and investment requirement during the Tenth Plan are 14.72 million and Rs. 44,160 crores respectively to achieve the tele-density of 3.00 by the end of the Plan.

Year-wise target & financial outlay on rural DELs

Year	Physical Target (in million DELs)	Financial * (Rs. Crores)
2002-03	1.88	5640
2003-04	2.30	6900
2004-05	2.83	8490
2005-06	3.46	10380
2006-07	4.25	12750
Total	14.72	44160

* Per line cost of rural line is taken as Rs. 30000.

The total investment requirement for rural telephony envisaged in the 10th Plan, would far exceed the amount of collections that would be possible in the USO Fund, Therefore, it is felt that the Government should plough back the entire telecom sector licence fee and service tax collection, for the development of rural telephony, in addition to USO fund.

Keeping in view the decreasing trend in the per DEL revenue, due to tariff rebalancing measures and faster roll-out of network, the revenue generation is likely to grow at about only 11% CAGR during the X Plan. Based on this growth, the licence fee collection through revenue sharing (average 10 % of gross revenue) and service tax collection (5%) taken together would range from about Rs. 6000 crores in the first year of the Plan, to about Rs. 11,000 crores in the final year. The internal resource generation of the companies after payment of licence fees and taxes would fall far short of the investment requirements which would be in the range of Rs. 23,000 crore to Rs. 43, 000 crores during the same period. The gap will have to be filled up through market borrowing, budgetary support etc. If at least licence fee and service tax are ploughed back into the sector, apart from USO fund, it would help in meeting the investment requirement of the rural telecom sector.

5.9 Incentives for faster roll out in rural areas

Out of 2648 SDCAs in the country, only 487 SDCAs are identified as purely rural SDCAs. Further, there are large number of rural areas being served by telephone exchanges located in semi-urban areas. In rural areas, the revenue per DEL is not adequate to meet maintenance and operation costs, leave aside generate surpluses. Therefore, to translate the licence conditions into rapid expansion of network in rural areas, there is a need to give special incentives for investment and faster roll out in such areas. The following suggestions are offered:

a. The licence fee in full may be waived in respect of connections given in the rural areas.
b. The spectrum may be given free of charge in the rural areas.
c. No service tax from the rural subscribers should be charged.
d. Infrastructure status should be provided to all operators who provide telecom facilities, including in the rural sector.
e. An open and transparent franchise policy for the rural areas be worked out to enable the franchisee to provide the telecom facilities on revenue sharing basis

(Elsewhere in this Report, it has been suggested that the entire amount of licence fee collected by the Government from the telecom service providers should be ploughed back into rural telephony through the USO Fund. If this suggestion is accepted, and the guidelines framed for utilization of amounts from the USO Fund cover operational expenditure as well as capital expenditure, there may be no need for waiver of licence fee in rural areas.)

All these benefits coupled with support through the USO Fund may be extended to both private and public sector operators for a period of 10 years. This will go a long way in ensuring adequate investment in rural telecom.

5.10 Recommendations

1. The Universal Service Obligation Fund should be made operational by deciding early the nature of the Fund, the levy for the Fund, and manner of disbursements from the Fund, to ensure that the uncertainty in this regard prevalent among the operators as on date, is quickly resolved and investment in rural areas is not impeded.

2. Revenue earned by the Government from the telecom sector should be ploughed back for generating funds for rural communication. Also, financial support from the government should be made available for faster growth of telecommunication in rural areas.

3. To encourage faster roll-out of network in the rural areas, the following incentives may be provided:
    a. The licence fee in full may be waived for connections given in the rural areas.
    b. The spectrum may be given free of charge in the rural areas.
    c. No service tax from the rural subscribers may be charged.
    d. Income tax benefits on investments made in rural areas, or for companies which provide a predominant part of their services in rural areas, may be considered.
    e An open and transparent franchise policy for the rural areas be worked out to enable the franchisee to provide the telecom facilities on revenue sharing basis.

    However,if the entire amount of licence fee collected by the Government from the telecom service providers is ploughed back into rural telephony through the USO Fund and if the guidelines framed for utilization of the USO Fund cover operational as well as capital expenditure, there may be no need for waiver of licence fee in rural areas.

4. New technologies like WLL(CDMA, CorDECT) and GSM should be utilized in rural areas for easy installation and maintenance and faster roll out.

5. Satellite phones be provided in far flung and inaccessible areas where no other technology is found to be suitable.

6. As the availability of dependable power supply is a major problem in running telecommunications services in rural areas, the use of non-conventional sources of energy for rural communication should be encouraged in coordination with the

Department of Non-conventional Sources of Energy and concerned State/UT Governments.

7. Connectivity to a rural service provider should be provided from the nearest technically feasible point and the infrastructure of other public sectors like Railways, Power Grid Corporation, GAIL etc. could be utilized.

8. Reliable media should be provided through adequate band-width, convergence of technology for voice, data and video, and connectivity through OFC up to the last mile. The rural exchanges should be synchronized to enable data transmission in a time bound programme.

9. All villages should be covered by VPTs in the first year of the Tenth Plan, as envisaged in NTP-99.

10. Role of state government is vital for implementation/ maintenance of rural telecommunication. A nodal officer should be nominated by each state government for better coordination for telecom development and other related matters.

11. A consolidated rural development plan should be formulated in coordination with other government agencies involved with the basic infrastructure development like electricity, roads, water etc. in rural areas, to support telecom network.

CHAPTER-6

Private Investment Promotion

6.1 Private Sector Investment Policy and Incentives:

The attractiveness of the Indian market – the low tele density, the high latent demand, a burgeoning middle class – brought in some of the largest global telecom players, foreign institutional investors and the major Industrial Houses to invest in telecom. The initial response of the foreign partners and the Indian industry in the telecom sector, specially in the cellular segment, was very encouraging. A tremendous interest in the telecom sector was shown by the private investors and foreign investors especially after the announcement of NTP 1994.

The Government took following policy decisions to attract foreign direct investment:

- Foreign direct investment of up to 100% permitted for the following:
  - Manufacturing of telecom equipment
  - Internet services (not providing international gateways)
  - Infrastructure providers (Category I)
  - E-mail services
  - Voice mail services

- Foreign direct investment of up to 74% permitted for the following:
  - Internet services (providing international gateways)
  - Infrastructure providers (Category II)
  - Radio Paging services

- Foreign direct investment of up to 49% permitted for the following:
  - National long distance services
  - Basic telephone services
  - Cellular mobile services
  - Other value added services

- Additional foreign investment through holding/investment company
- Automatic approval for technology fee up to US $ 2 million, royalty to 5 per cent for domestic sales and 8 percent for exports in telecom manufacturing (higher amount through specific approvals)
- Full repatriability of dividend income and capital invested in the telecom sector
- Fiscal incentives and concessions for the telecom sector:
  - Amortization of license fee
  - Tax holiday
  - Rebate on subscription to shares/debentures

- Scope for tax exemption on financing through venture capital
- Import duty rates reduced for various telecom equipment.

In particular, the budget for 2001-02 had the following fiscal provisions for the telecommunications sector:

Direct Tax

1. The five year tax holiday and 30% deduction which was available to the telecommunications sector till 31st March, 2000 was re-introduced retrospectively for the units commencing operations on or before 31st March, 2003 for the next 5 years. These concessions were also extended to the Internet Service Providers and broad-band networks.
2. All surcharges (13% and 17%) payable by corporates and non-corporates removed except surcharge of 2% for financing National Calamity Contingency Fund
3. The dividend tax has been brought down from 20% to 10%.

Customs Duty

Customs duty on specified products has been brought down along with removal of the surcharge of 10%. Further, the concessional rate of 5% customs duty applicable/admissible to specified equipments and parts thereof for basic telephones, cellular, radio paging, V-SAT PMRTS, and Internet services has been extended up to 2002.

6.2 The initial response of the private sector was overwhelming. The major investors in the telecom sector included the following:

Major Investors in Telecom

International Telecom Players	**Institutional Investors**
1. Airtouch, USA	
2. AT&T,USA	1. AIG
3. Bell South, USA	2. Commonwealth Corporation(CDC)
4. Nynex, USA	3. EMP
5. Media One, USA	4. Asian Infrastructure Fund
6. Hughes, USA	5. Govt. of Singapore Inv. Corp.
7. Qualcomm, USA	
8. Bell Canada, Canada	
9. British Telecom, UK	**Indian Business Houses**
10. First Pacific, Hong Kong	
11. France Telecom, France	1. Birlas
12. Hutchison Whampoa, Hong Kong	2. BPL
13. Jasmine Telecom, Thailand	3. Escorts
14. Millicom, Luxembourg	4. Essar
15. Shinawatra, Israel	5. Reliance
16. Swisscom, Switzerland	6. RPG
17. Telia, Sweden	7. Tatas
18. Telecom Malaysia, Malaysia	8. Thapar
	9. Ispat.

Source: COAI paper to Sub-Group III

Consequently, the investment commitments made by the foreign direct investors, as seen from the proposals cleared by the Government, were of the order of about Rs.45884 crores till December 2000. As per available reports, investment commitments of domestic private investors were to the tune of Rs.29572 crore up to December 2000. However, the actual investment has been much lower i.e. about Rs.15000 crore by private domestic investors and Rs.5044 crore by foreign direct investors. It is observed that the investment levels between NTP 1994 and NTP 1999 have been erratic in nature and below potential as shown by the following table:

Private investment (FDI+Domestic) in the Telecom Sector

Sr. No	Year	Proposed Domestic Private Investment (Rs.in Cr.)	Approved Foreign Direct Investment (Rs. in Cr.)	Actual foreign Direct Investment (Rs.in Cr.)	Total Proposed Private Investment (Rs.in Cr.)	Total Proposed Investment in all sectors (Rs. in Cr.)	Share of Telecom in proposed Investment (%)
1.	1994	1607	16.44	14.00	1623.44	102956.65	1.58
2.	1995	2446	17822.02	206.70	20268.02	157580.6	12.86
3.	1996	715	4436.2	764.80	5151.20	109427.85	4.71
4.	1997	597	7185.6	1245.20	7782.60	107270.34	7.25
5.	1998	606	3100.13	1775.60	3706.13	88198.5	4.20
6.	1999	13493	3901.78	212.70	17394.78	157258.53	11.06
7.	2000	958	9241.87	288.60	10199.87	110413.45	9.24
	Total	20422	45704.04	4507.6	66126.04	833105.92	7.94

Source : 1.SIA Newsletter, Ministry of Industry.
1.SIA Statistics, Ministry of Industry.
2.PIP Cell of DOT for Actual Foreign Direct Investment as obtained from RBI

The investment has mainly been in the area of the cellular mobile telephone service, which accounted for about 44% of the total investment through FDI. The basic telecom service could attract only about 8% of the total FDI. It has also been noted that the domestic capital markets have not been tapped extensively and the bulk of the external resources have been obtained from the financial institutions. The details of the service/itemwise investment during August 1991 to April 2001 are given in the following table:

Foreign Direct Investment – Service Segment-wise Position Aug 1991 - Apr 2001

Sl.No.	Service/Item	FDI(Rs. in cr)	%
1.	Basic telephone service	393.7	7.80
2.	Cellular Mobile Telephone service	2215.4	43.92
3.	Radio Paging Service	91.0	1.80
4.	E-Mail Service	68.8	1.36
5.	VSAT Service	28.1	0.56
6.	Cable TV Network + Internet	60.0	1.19
7.	Satellite telephone service	48.1	0.95
8.	Radio Trunking service	7.1	0.14
9.	Manufacturing & Consultancy	750.2	14.87
10.	Holding companies	1361.8	27.00
11.	Other value added service	.2	0.00
12.	Automatic route	20.1	0.40
	Total	5044.3	100.00

Source: RBI, as collected by PIP Cell of DOT.

6.3 Private Participation – Licenses/Registration Issued

In the cellular mobile, licenses have been awarded to 3 operators, including BSNL/MTNL, in each circle and the fourth licence has been awarded for 12 circles. Services are being run in 18 telecom circles and 4 metro cities. As on March 2001, the subscriber base had reached at about 3.6 million. During the preceding two years, the growth of cellular mobile subscribers has been about 100 percent per annum. Thus, cellular mobile services are likely to grow beyond the big cities due to the participation of the incumbent service provider and the new entrants. About 456 ISP licenses have been granted and more than 111 of them have started providing services to about 3.0 million subscribers. 240 clearances have been given to ISPs for setting up their own international data gateways out of which 16 are operational. Access to Internet is available practically throughout the country on local call access basis. With better availability of bandwidth, IT-Enabled services like e-commerce, call-center, tele-education, tele-medicine, tele-banking etc. are catching up with the Indian industry. The Basic services by private operators had started in 6 telecom circles by the end of March, 2001. They have provided 3.5 lakh DELs and are expected to provide about 8 lakh DELs by the end of the 9^{th} Plan. The global companies that have invested in basic telephony include Nynex, Hughes, Bell Canada, STET and Bell South. Today, 15 state capitals of the country report that telephones are available on demand. All the exchanges in the country are now electronic and value-added services are available.

The following table sums up the position on private sector participation as on 31.3.2001 in the different service segments of telecom sector, as reflected by the number of registrations/ licences issued:

Private Sector Participation – Licences/Registration issued up to 31.3.2001

Purpose/Area	No.of companies registered/licensed	No.of Licences/Registrations issued
CMPs/4 Metros	8	8
CMPs/18 Circles	14	34
Basic Services	6	6 (Licence)+40 (LOI)
Infrastructure Provider-I	10	10
Infrastructure Provider-II	5	5
Voice Mail & Audiotex Service/ 4 cities	4	5
Public Mobile Radio Trunked Service/26 cities	19	55
ISPs	384	456
Internet Gateways Permission	62	240
VSAT Service	10	10

Source: LR and Basic Services Branch, DOT

6.4 Response of Financial Institutions and Banks

The expectations of financial institutions with regard to the telecom sector also appear to be good. They have observed that the migration to NTP 99 have made telecom projects more bankable. This would enable speedy financial closure. All telecom operators in the four metros have achieved financial closure, although operators in most of the territorial circles have yet to achieve financial closure. Notwithstanding the same, significant disbursements of sanctioned amounts have already been made by the financial institutions to the telecom companies. In fact, the sectoral cap of the financial institutions for the telecom sector is as much as 15%, while that of commercial banks is 10%. Thus, it is expected that there is no dearth of funds for telecom operators. However, to utilize the available funds for a faster roll-out, telecommunications needs to be treated as a priority sector by the banks and credit may be provided on concessional terms as is being extended for housing activities, particularly for telecom network development in rural areas.

6.5 Policy constraints as perceived by the private sector, financial institutions and investment bankers:

As mentioned earlier, the initial attractiveness of the Indian market had worn off by 1997 as the private telecom players were confronted with a series of problems that threatened the viability and survival of the industry.

A healthy, viable and competitive sector attracts foreign investors. The difficulties faced by the telecom industry coupled with ambiguities in the regulatory regime had the combined effect of discouraging foreign investors, resulting in foreign investment flowing to competing destinations like China, Latin America, etc. In India, most of the foreign investors today, other than Hughes, Hutchison, AT&T and Sing Tel, have withdrawn from the Indian telecom sector. Many foreign investors felt that the significant management time needed for approving investments in India was not justified. Even as NTP 99 improved investment sentiments and brought about increase in the private investment/network rollout; foreign investments have been minimal. Out of FDI approvals of about Rs. 52604.93 crores, only Rs. 5044.3 crores has actually materialized up to April 2001.

Generally, the evaluation of investment by the private sector (including promoters, international strategic partners, FIIs, lenders) is based on the following factors:

- Macro Economic Factors – e.g. GDP per capita
- Size of investment & investment threshold
- Scale of the markets
- Growth potential
- Bankable business models
- Other investment options in different regions
- State of the capital markets to provide access to capital & acquisition currency
- Responsive regular & predictable regulatory environment

The industry's view is that international strategic investors have shown receding interest in India for the following reasons

- Major strategic investors had stretched balance sheets due to home/region commitments
- Global meltdown of the telecom capital markets, not facilitating capital raising
- Low performance and execution track record compared to other countries – despite 6 years of liberalization
- Not perceiving a predictable regulatory environment
  -too many fundamental matters referred to the courts by different constituents – delaying the clarity required
- 49% cap on equity investments does not provide comfort on control commensurate with the investment levels

In addition, the global telecom crisis has led to many major telecom players facing problems in their home turf, as a result of which they have taken to pulling out of foreign investments.

Some of the main reasons for the constraints/bottlenecks in attracting private investments were as follows:

- Policy uncertainty
- Dual role of licensor
- Delay and unclear role Regulator
- Pending issues around interconnectivity and Universal Service Obligation
- Unrealistic projections of the telecom market by players leading to high license feed bids by players
- High license fee, high capex led to high tariffs and therefore slow take off (especially Cellular)
- Viability of standalone basic services projects in question and thus their inability to achieve financial closure
- High delays in Government approvals and clearances
- Relative inexperience of Indian FIIs in leading to projects on a cash flow basis
- SE Asian currency crisis of 1997-98 made foreign lenders minimize their exposure.

Indian players do not by themselves have the capability to invest the large amounts needed for the sector.

NTP-99 offered keenly awaited relief: in the form of shift to revenue sharing regime, extension of license period to 20 years, introduction of greater degree of competition, introduction of fourth cellular license and "limited' mobility.

Post NTP-99, several issues yet remain to be sorted out:

- License agreements of several existing operators have not yet been amended to reflect migration to NTP-99
- Non-resolution of interconnect agreement issues for GSM operators
- Establishment of equitable interconnect structure by TRAI for DLD/ILD sectors
- Spectrum availability and pricing issues
- Introduction of "limited" mobility

As far as the telecom manufacturing sector is concerned, investments in this area have varied between Rs. 10000 cr to 11000 cr during the last three years. Indigenously designed and manufactured products run the handicap of bearing the burden of paying customs, excise and sales tax to the end customers. Imported goods are generally available at half of the end customer price of indigenous manufacture. This financial

handicap can be mitigated by giving supported to Indian R&D, and encouraging the formation of joint ventures with MNCs.

6.6 Suggestions made by the Service Providers:

1. It was emphasized that uncertainties in policy must be done away with.
2. A fair and transparent Spectrum Policy should be ensured by the Government.
3. The restrictions imposed on potential players in the market for Domestic Long Distance services should be removed.
4. Opening of Internet telephony, deploying VOIP to provide phones for faster roll-out should be encouraged.
5. **Interconnect Regime** to be fair & non-discriminatory and should permit direct inter-circle connectivity between service providers as also direct connectivity to international gateways of ILDO.
6. **Equal Access** should be ensured
7. To provide support for the achievement of **Universal Service,** an appropriate financing mechanism be evolved.
8. **Provision of right of way** could be given by State Governments on simple commercial terms without any special conditions
9. **Taxation Issues:** Tax laws should be amended to permit efficiency with respect to consolidation and re structuring of the business of telecom operators.
10. **Foreign Investment Thresholds :** While there is a need to keep a sectoral cap of 49% , due to the large fund requirements, GOI should consider at least keeping the informed FII investments outside this cap. FII investors are capital market investors and not strategic investors and have capacity to provide large funds and provide market capitalization momentum.
11. The five year tax holiday under section 80I A of the Income Tax Act to telecommunications service companies who had commenced operations on or before 31st March 2000 (extended up to March, 2003 in the 2001-02 Union Budget), should be extended also to the MTNL and the BSNL, to provide them a level playing field with the private sector.
12. The subscriptions made to finance telecommunications services through the bonds and debentures of the companies should qualify for SLR requirements of banks**.** The bonds issued by the telecom companies may qualify for deduction under Section 88 of the Income Tax Act as applicable in the case of the bonds issued by the IDBI and ICICI.

6.7 Investment requirement during the X Plan:

Keeping in view the present trend of growth of the telecom network, the tele-densities to be achieved by the end of the X Plan i.e. March 31, 2007 would be 11.5 per 100 population at the national level; 3 per 100 for the rural areas and 30.74 per 100 for the urban areas. Based on this, the annual compound growth rate of telephones (Fixed

+Cellular) is required to be 22.62%- consisting of 17.48% for fixed lines and 46% for cellular lines.

As mentioned in an earlier chapter, the requirement of additional telephones to be provided in each year of the X Plan and the associated investment requirements, are summarized in the following tables:

Requirement of Additional Telephones during the 10th Plan period

(in million)

Year	Rural	Urban	Fixed	Cellular	Total
2002-03	1.88	8.53	7.87	2.54	10.41
2003-04	2.30	10.48	8.45	4.33	12.78
2004-05	2.83	12.86	10.02	5.67	15.69
2005-06	3.46	15.79	10.96	8.29	19.25
2006-07	4.25	19.33	12.86	10.72	23.58
Total	14.72	66.99	50.16	31.55	81.71

Source: Economic Research Unit, DoT

Investment Requirement (Public and Private) And Projected Investment in Rural Areas during the Tenth Plan (2002-2007)

(Rs. Crore)

	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	Total
Total Investment	**23,281**	**26,279**	**31,510**	**36,224**	**43,298**	**160,672**
By Public Sector	20,700	21,735	22,822	23,963	25,161	114,381
By Private Sector	**2,581**	**4,544**	**8,768**	**12,261**	**18,137**	**46,291**
Rural Areas	**5640**	**6,900**	**8,490**	**10,380**	**12,750**	**44,160**

Source: Economic Research Unit, DoT

Note: The investment required as given in the table does not include investment for the other services like NLD, ILD, Internet, telecom equipment manufacturing and other value added services.

6.8 Recommendations

Although numerous initiatives taken by Government by way of policy liberalization and fiscal measures have greatly improved the investment environment, the actual investment on the ground has not been as per the expectations. In the light of the

path- breaking measures taken to implement NTP '99, attracting investment for meeting the 10th Plan targets may not pose a major problem. The feedback from the financial institutions has also been encouraging. Investors are also showing interest in the sector judging from the loan applications received by the banks and financial institutions.

As we have seen, in order to achieve a tele-density of 11.5 by 2007 and a rural tele-density of 3 by 2007, an amount of Rs.46,291 crores would be needed by way of private sector investment to supplement the Public Sector investment by BSNL and MTNL. This investment excludes investment for National Long Distance and International Long Distance etc. With the opening of the basic services in an unlimited manner and the induction of the fourth Cellular operator, the number of major players in the Indian telecom scene has increased. There has been some significant M&A activity in the Indian Telecom sector to bring about economically viable units with proper synergy. This trend is likely to continue. With the Financial Institutions indicating their willingness to fund this sector there is not likely to be any difficult in raising the resources for the private sector as mentioned above.

The industry representatives pointed out many constraints facing the operators including policy uncertainties in many areas. In fact, there has not been much cohesion in the suggestions given by the various associations and many of the suggestions made are contradictory. It must be recognized that unless the industry accepts the decisions of the Government as final and get on with the job, the uncertainties will persist. On almost every issue some association or the other has been approaching TRAI, TDSAT, High Courts etc.In the process such litigation resulted in negating the progress achieved due to liberalization of the telecom sector. If all the industry associations could form an apex body for the telecom service providers, there is a possibility of some reduction in litigation. The "policy uncertainties" may then give way to policy certainties.

However, in the light of the main constraints, to accelerate growth of private investment in the Telecom sector, the following course of action is suggested:

1. <u>Need to evolve an appropriate Interconnect arrangement:</u>

The foremost concern is regarding the Interconnect regime. Interconnect issues have always posed problems in every country that has opened up the Telecom sector. The regulator in India is fully seized of this matter. It is up to the operators to arrive at a satisfactory bilateral solution failing which the regulator will step in to resolve the interconnect issues. What has been stalling the progress in this sphere is the mindset of the incumbent operator and the new operators. Therefore, it is important for all the operators to get out of their mindsets and strive to arrive at a solution which will be a win-win position for all stakeholders. Once the issues are narrowed down, it should be possible for the regulator to find a solution in the interest of the consumers.

2. Smooth Migration to the convergence regime:

Uncertainty in the regulatory regime is another important issue. Although things have improved substantially after reconstitution of the TRAI, what is causing concern is the kind of regime that would replace TRAI when the Convergence Bill becomes an Act. Industry is apprehending that they may have to start all over again with the new super Regulator getting to revalidate the licences issued by the DOT. They are not clear about the new terms and conditions that may be imposed on them. There needs to be clarity on this issue. It is necessary to clarify to all the prospective investors that the migration to the Convergence regime would be seamless.

3. Expeditious settlement of disputes:

There have been delays in the dispute settlement mechanism . It is but natural that disputes will arise at least in the initial few years of opening up of a sector from predominantly Government control to substantially private control. However, the dispute settlement mechanism should be able to address these issues in a speedy manner and clear the air of uncertainty.

4. Implement uniform guidelines for grant of Right of Way:

Faster Right of Way (ROW) permissions with long-term guarantees are essential for proliferation of broad-band optic fibre and copper cable networks in the country. Since telecom is crucial infrastructure, the Government had constituted a committee under the chairmanship of Secretary, DOT, with Secretary, IT, representatives of 4 states(Andhra Pradesh, Maharashtra, Gujarat, and Karnataka), Ministry of Surface Transport, and Ministry of Forest & Environment, as members. The committee has recommended model guidelines for adoption of a uniform policy with "single window" concept, by the State Governments as well as various agencies in granting ROW clearances. These model guidelines, if adopted by the State Governments, will have long-term impact on speedy execution of projects.

5. Early positioning of USO Fund:

There is no clarity about the Universal Service Obligation Fund. Operators are not aware of the nature of the Fund, the levy for the Fund, or what they could expect from the Fund to help them spread into the remote areas. The TRAI is already engaged in drawing up a suitable mechanism meeting the requirements of the USO. However, it is necessary to reach some finality on this issue at an early date.

6. Utilise telecom licence fees for investment in rural telephony:

The total investment requirement for rural telephony envisaged in the 10^{th} Plan, would far exceed the amount of collections that would be possible in the USO Fund, which is to be built up through a small percentage levy on the revenues of the telecom operators. Therefore, it is felt that the Government should plough back the entire

telecom sector licence fee and service tax collection, for the development of rural telephony, through the USO fund. It is anticipated that the amount of annual internal resource generation for companies in the telecom sector would fall far short of the total investment requirements during the Plan. The gap will have to be filled up through market borrowing, budgetary support etc. If at least licence fee and service tax are ploughed back into the sector, that would barely be enough to meet the investment requirement of the rural telecom sector.

7. Decide early on the CPP regime:

The Calling Party Pays regime, by making incoming calls free, will make the cellular service more affordable and promote rapid growth in the cellular segment. On the contrary, the regime will require larger investment by basic service providers without any benefit to them. Besides, their subscribers would have to pay higher charges. Balancing these two considerations, an early final decision on this issue needs to be taken to clear the uncertainty.

8. Extend Tax-Holiday Benefits to PSUs:

The five-year tax holiday under section 80I A of the Income Tax Act to telecommunications service companies who had commenced operations on or before 31st March 2000 (extended up to March, 2003 in the 2001-02 Union Budget) may be extended also to the MTNL and the BSNL. This measure is considered essential as about 70% of the new investment during the X Plan is expected to be made by the public sector.

9. Provide the status of "Industrial Undertaking" to the telecom industry in the Income Tax Act:

Considerable benefits have been given to the telecom sector on the taxation angle in the past. The infrastructure status of the industry has been continued for 5 more years mostly covering the next Plan. However, in the era of mergers and acquisitions, Section 72(a) of the Income Tax Act works as a dampener as it does not permit carry forward of business losses and accumulated depreciation of the amalgamating company against the profits of the amalgamated company. The Telecom sector industry being a service industry, is not entitled to benefit under this Section. This could be set right by including the telecom industry within the definition of industrial undertaking in the Income Tax Act.

10. Incentives for faster roll out in the rural areas:

Roll-out of network by private operators in the rural areas has so far not been at all satisfactory, despite the Government's having laid down certain *minimum* roll-out obligations in the licence conditions for telecom service providers, in respect of rural DELs and VPTs. It has been seen in the past that the private operators were prepared to pay penalty for non-fulfillment of rural obligations rather than making investments

that they perceive will be unprofitable. In the licences issued recently to the basic service operators, it has been stipulated that the point of presence (POP) has to be established by the operators in equal proportion in rural, semi-urban and urban Short Distance Charging Areas(SDCAs). It was noted that out of 2648 SDCAs in the country, only 487 SDCAs are identified as purely rural SDCAs. However, in rural areas, the revenue per DEL is not adequate to meet maintenance and operation costs, leave aside generate surpluses. The estimated investment requirement during the Tenth Plan for rural areas is Rs 41,520 crores. Therefore, to translate the licence conditions into rapid expansion of network in rural areas, there is a need to give special incentives for investment and faster roll out in such areas. The following suggestions are offered:

a. The licence fee in full may be waived in respect of connections given in the rural areas.
b. The spectrum may be given free of charge in the rural areas.
c. No service tax from the rural subscribers be charged.
d. Income tax benefits on investments made in rural areas, or for companies which provide a predominant part of their services in rural areas, may be considered.

However,if the entire amount of licence fee collected by the Government from the telecom service providers is ploughed back into rural telephony through the USO Fund and if the guidelines framed for utilization of the USO Fund cover operational as well as capital expenditure, there may be no need for waiver of licence fee in rural areas.

All these benefits coupled with support through the USO Fund may be extended to both private and public sector operators for a period of 10 years. This will go a long way in ensuring adequate investment in rural telecom.

CHAPTER-7

Telecom equipment manufacturing

7.1 Introduction

7.1.1 The main objective of telecom policy is to make available reliable telecom services on demand at affordable prices and to improve tele-density. NTP-99 emphasises the importance of convergence and the desirability of encouraging appropriate state-of-the-art technologies to achieve these objectives. A substantial part of the telecom equipment deployed in the network is still imported. The post liberalization scenario poses many challenges to the domestic telecom R&D and manufacturing sector.

7.1.2 Although, as a result of the policies followed so far, significant progress has been achieved in telecom equipment manufacturing in the country, dependence on imports seems to be increasing. The investment in domestic telecom manufacturing is to the extent of Rs. 8000 crores and production in the last three years has increased from Rs. 10,000 crores in 1998-99, to Rs. 11000 crores in 2000-2001. Thus, about 70% of the requirement of telecom equipment and material is being met through indigenous manufacturing.

7.1.3 Even though demand and physical production has significantly increased, financial turnover has not shown substantial increase, mainly because of the following factors:

(a) Prices have fallen substantially. In the case of some products, the fall in prices ranges between 50 to 70%. The price variation over the years for some of the telecom equipment is indicated below :

Year	Per line price of Switching equipment (New Tech)	Price per Km of Optical Fibre Cable (12 fibre)	Telephone Instrument
1990-91	Rs.8,000 (approx)	-	Rs.1000.00 (approx)
1995-96	-	Rs. 87829.00	Rs.426.00
1996-97	Rs.5411.96	Rs.70314.18	Rs.471.15
1997-98	Rs.5568.21	Rs. 56764.60	Rs.425.00
1998-99	-	Rs. 48949.70	Rs.369.00
1999-2000	Rs. 4389.41	Rs. 47429.93	Rs.300.00
2000-2001	Rs. 1978.84	-	Rs.290.00

(b) Of late, the import duty structure has made it cheaper to import finished telecom equipment and components. Imported telecom equipment has placed serious competitive

pressures on domestic manufactures. The duty structure in respect of some of the items is given below :

S.No.	HS Code	Classification	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001	2000-2002
01.	85.04.40	Static Converters – Telecom Power Plant	65	50	25	20	25	27.5	27.5	15
02.	85.17	Finished Telecom Equipments	65	50	40	30	35	27.5	25	15
03.	85.17.90	Parts of Telecom Equipments including Populated PCBs	65	50	30	20	25	20	15	15
04.	85.24	Telecom Software	65	50	40	30	35	0	0	0
05.	85.25	Radio Transmission Equipment	65	50	40	30	35	27.5	27.5	25
06.	85.29	Parts of 85.25/85.27	65	50	30	20	25	27.5	27.5	25
07.	85.41	Diodes, Transistors & Semiconductor Devices	65	50	20	20	25	16.5	16.5	15
08.	85.42	Electronic Integrated Circuits	65	50	20	10	10	5.5	15	0
09.	85.44	Insulated Cables	65	50	50	40	45	40	27.5	15
10.	90.01	Optical Fibre Cable	65	50	50	40	45	40	38.5	15

(c) Another major factor favouring imports of finished telecom equipment by private operators is the availability of cheaper vendor financing assistance.

(d) For certain components and systems, volumes are too low to justify local manufacturing on a sustainable basis.

7.2 Other constraints facing the manufacturing sector :

i) BSNL has been the sole buyer of domestically manufactured equipments and material, creating a situation of monopsony in the market, and resulting in uncertainty for competing manufacturers, in situations when their order books are not satisfactory.

ii) Rapid technological changes leading to obsolescence

iii) Inadequate focus on R&D

iv) Lack of indigenous technology resulting in manufacturing from SKD/CKD level and dependence on foreign suppliers

v) Continuous need for infrastructure up-gradation

vi) Poor base for indigenous components

vii) Higher interest rate on working capital

7.3 Need to Encourage Domestic Manufacturers:

7.3.1 Govt. of India has been progressively reducing import duties on various telecom equipment over the last few years. Also, Govt. of India has signed the Information Technology Agreement (ITA under WTO) and committed to reduce import duties on all telecom equipment to zero by year 2003.

7.3.2 In spite of the growing preponderance of imports in the post liberalization era, the importance of domestic telecom equipment manufacturing cannot be overlooked. There are clear linkages between the availability of domestic manufactures and the expansion of the telecom network. The total investment requirement for the

services segment during the X Plan has been estimated at about Rs. 160,000 crores. At the present rates of growth, the domestic manufacturers could be expected to contribute only around 40% of this requirement. At present the capital output ratio of the domestic industry is only about 1:1.4 and there is considerable scope for improving the same. With an improved capital output ratio of about 1:1.6, and with an additional investment of Rs. 6000 crores and an appropriate R&D effort, the domestic manufacturers could continue to contribute to about 70% of the projected demand for equipment and material during the X Plan.

7.3.3 There is a huge opportunity for introducing technologies such as WLL and GSM which are being deployed on a large scale in urban and rural areas for service provision. Presently, these technologies are being imported. Joint ventures with foreign firms could be encouraged to bring in, and indigenize, these technologies to suit local requirements. The enormous potential market in the private service sector can also be tapped by the domestic manufacturers, thus increasing the sustainability of their productive ventures and reducing their dependence on BSNL as a sole buyer of their products.

7.3.4 The export potential of indigenously manufactured products has not been tapped on a large and sustainable scale. It may be possible to reach markets especially in the developing countries where the tele-densities are still very low. The availability of technical manpower is a particular strength which could be effectively utilized, given policy support and special incentives from the Government. The large domestic demand, as explained in the preceding para, should provide the required cushion against export risk for the domestic manufacturers.

7.3.5 Other reasons why domestic manufacturers need encouragement are:

(i) to save foreign exchange

(ii) to make India a global player in telecom/IT products (as, for example, Korea has become within the last 5 years using CDMA as a vehicle)

(iii) to ensure better and assured after sales services

(iv) to get competitive lower prices

(v) to make cost effective services relating to upgradation, modification or post warranty servicing of the equipment.

(vi) to effectively cater to strategic telecom requirements including defence & rural telecom.

(vii) To provide employment opportunities to skilled and unskilled labour.

7.3.6 Though the intention of the Government to provide suitable incentives to the licensed service providers utilising indigenous equipment, is reflected in Para 8.2 of NTP 99 on ‘telecom equipment manufacture’, no progress has been made so far in translating this into active policy. The service providers may be given specific incentives for utilizing domestically manufactured equipments, such as the benefit of deduction of the costs of such investment from revenue for tax purposes.

7.4 Anomalies in Duty Structure:

7.4.1 The customs duty, sales tax and excise duty structures sare such that there a level playing field is not provided to domestic manufacturers. The existing structures encourage imports against the indigenously manufactured products as the impact of taxes is more on the latter, pushing up the prices. Further, while import duties on finished products will be zero by 2003 under the WTO regime, on most inputs/components used by the indigenous telecom industry , duties shall continue to range between 15% to 25%.

7.4.2 At present, IT sector enjoys tax concessions and the same is not extended to telecom sector. Information and Communications are converging. The components and inputs used in the manufacturing of telecom equipment are similar to the ones used in manufacturing of IT infrastructure. Telecom systems are software intensive.

7.4.3 There is a cascading effect of multiple taxation on many products. The Government of India and State Governments are considering the introduction of national VAT to avoid the problems being caused due to the existing tax structure.

7.4.4 Manufacturing involves a lot of sub-system manufacturing. Each sub-system manufacturing involves Sales Tax and Excise Duty, only part of which is recovered by MODVAT. A system is to be considered for introduction of single point tax for manufacturing (at final system level).

7.4.5 It is noted that supplies of the Telecom Equipment by indigenous industry even to the BSNL , MTNL and other licensed Telecom Service providers are having to bear punitive taxes of 10%/12% on account of the Central Sales Tax due to denial of “C” form facility to the Telecom Sector while Imports of Telecom Equipment are chargeable to just 4% SADD in lieu of CST thereby causing 8% cost disadvantages to the indigenous Telecom Industry in addition to the Customs Duty disadvantages considering the inverted tarrif structure. The CST Act has earlier granted “C” form facility to Power Sector & to the Mining Sector more than 30 years back. At the time of drafting of CST Act in 1956, the Telecom Sector was totally in the hands of Department of Telecommunications which being a Govt. Dept. had “D” form facility equivalent to “C” form, and corporatization of any of the Telecom Services was not envisaged at that time. Now, with corporatization of DoT into BSNL as also the existence of a large number of private Telecom Services Providers, it is essential that an amendment be made in section 8(3) (b)of the CST Act having the effect of including the Telecommunication Sector in the said clause, in addition to Power and Mining Sector, so as to allow the benefit of “C” form to the Telecom Sector.

7.5 Testing Facilities

7.5.1 India does not have adequate testing facilities to get design approvals for commercialization of products in European and American countries. Indian test reports or interface approvals for electrical safety etc. are not acceptable to these countries and

necessary approvals are to be taken which is a lengthy process. Similarly EMI, EMC test facilities are not available in India and the products are to be tested and approved in foreign countries (e.g. Taiwan).

7.5.2 There are no internationally accredited test houses which can certify products against specifications for type approval. Domestic manufacturers have to depend on test houses in Europe or USA where there is a long waiting time, and high charges. Such test houses, if set up, can recover the investment by testing for clients world-wide.

7.5.3 Further, the country does not have major test equipment vendors with renting and leasing warehouses . It is not possible for an Indian R&D or manufacturing company to take on lease test equipment at short notice whereas this practice is common in other countries where major test equipment vendors take responsibility for setting up and managing the test facilities in a manufacturing line against a lease agreement. This can be very beneficial to industry.

7.6 Manufacturing of components :

7.6.1 Non-availability of indigenous components is a major constraint facing the manufacturing industry. Most of the critical components like ICs, ASICs are imported. Hence, the cost of the product is influenced by the global component market, import duties etc. Component obsolescence in international market requires frequent changes in design for the indigenously developed products.

7.6.2 Availability of support from chip manufacturers is not certain, as they do not regard India as a large development base. As a result, support of chip sets are lacking from parent company. This requires alternative solutions. Further, capability and strength of making indigenous VLSIs, providing telecom & embedded solutions require full exploitation of the country's infrastructure and export market.

7.6.3 Since the equipments are directly imported in the Indian market, the development work in R & D centres have received a set back. Design capability for ASIC and programmable GATE array technologies available within India may be utilized for the above purpose.

7.6.4 In view of this, indigenous manufacturing of electronic components should be encouraged to have a strong component base to eliminate delays in productionisation process on account of component procurement. Duties on inputs to the component industry should be made zero under deemed export status.

7.6.5 However, it is noted that there is a chicken-and-egg syndrome when it comes to systems manufacturing and component manufacturing. A positive feedback cycle can be achieved only by adopting a strategic focus approach. After careful assessment of existing design capabilities within the country, a components for large volume products (e.g. the baseband ASICs for a 3G handset, or a SLIC for a DLC system), could be undertaken. Even if the IC is fabricated abroad, the component may be treated as

indigenous and the products that use these components should be strategically encouraged. This will have a multiplier effect on the component industry. If this is done for a few ICs, the setting up of IC fabrication units will automatically follow. An inverted approach may lead to unsustainable investment in fabrication facilities.

7.7 Quality of manufacturing :

7.7.1 At present, the quality of indigenous manufacturing is not always at par with international standards. The manufacturing efficiency must move towards international levels in a time-bound fashion, so that manufacturing infrastructure in the country can cater to local market as well as exports. Most of the manufacturing facilities are old. Due to rapid technological changes and high obsolescence in telecom industry, additional investments in manufacturing and testing infrastructure at regular intervals are needed.

7.7.2 Encouragement should be given to establishing large world-class manufacturing lines with economies of scale. Since many local manufacturers will not need captive lines of such large scale, such units have to be set up as contract manufacturing plants. Both procurement of components and manufacturing will be on a large scale, driving down product costs. Exports will not be possible unless this first step is taken. Thus, contract manufacturing, both for local market as well as for export, may be actively encouraged by policy initiatives, provided the unit is world-class in scale.

7.7.3 In line with the Government's decision to change the custom duty for finished telecom equipment under agreement with WTO, there should be zero custom duty for import of capital goods for telecom manufacturing. This will help in fulfilling the provisions of NTP-1999, for developing world class manufacturing facilities.

7.8 Transfer of technology and value addition :

7.8.1 When ever a technology is imported, it needs to be ensured that it is current and futuristic. In-depth transfer of technology to manufacturing units would enable local value addition for making the equipment compatible to the Indian network and future value addition in terms of hardware and software by Indian R&D. Foreign companies should ensure significant local value addition in manufacturing.

7.8.2 There is a strong case for investment by domestic industry in new technologies like WLL, Mobile, DWDM and other new generation technologies, provided a climate conducive to investment is created. To achieve this, indigenous manufacturing should be made economically viable vis-à-vis imports of finished products. There is a strong need for creation of confidence & environment so indigenous products are used by telecom network operators.

7.9 Export of telecom equipment :

7.9.1 Some indigenously manufactured telecom equipments have export potential. But, it has not been fully exploited due to various reasons including absence of strategic focusing on products with good potential demand abroad, lack of promotional activities etc.

7.10 Recommendations

1. To encourage the use of indigenous manufactured equipment, the service providers may be given the benefit of deducting from the gross adjusted revenue, 1/3rd of the cost of the investment on account of purchasing the indigenously manufactured equipment during the year, for the purpose of levying revenue sharing charges.

2. The customs duty, sales tax and excise duty should be rationalized to make the indigenous manufacturing economically viable vis-à-vis imports of finished products. The net differential between customs duties on finished products, and local duties (excise, sales tax etc.) should be taken into account. This is to be evaluated periodically and corrective action taken.

3. To establish a level playing field for the indigenous telecom industry, deemed export status should be granted to the indigenous telecom equipment industry. Deemed export status shall ensure that the indigenous telecom equipment manufacturer can also import all his inputs/components at zero duty or alternatively, procure the same from indigenous manufacturers who can, in turn, claim deemed export benefits.
4. The tariff concessions being provided for Information Technology Industry should be extended to Telecom Manufacturing Sector also.
5. " C" Form facility should be granted to Telecom Sector by amending Section 8(3)(b) of the Central Tax Act, 1956, so as to bring it at par with the Power & Mining Sector and to correct anomalous situation whereby the indigenous telecom industry is having to bear panel rates of CST @ 10% /12% whereas imports qualify for 4% SADD.
6. Imports should also be covered by VAT so as to provide a level playing field to the indigenous industry.

7. Indigenous manufacturing facilities for electronic components, chips etc., should be established to have a strong component base, so that delays on account of component procurement are eliminated. R&D units that are capable of developing ICs and owning their IPR should be encouraged by declaring their product as indigenous for policy purposes even if the ICs are fabricated abroad. This will lead to establishing a strong market presence and the setting up of commercially viable fabrication facilities.

8. Manufacturing and testing infrastructure (e.g. EMI,EMC, environmental etc.,) should be upgraded to international standards. Government support may be extended in

conjunction with financial institutions for creation of world class manufacturing units to enable exports which can ensure that the manufacturing industry does not depend only on the local market

9. Considering that large scale investments are required in telecom equipment manufacturing and the cost of financing is high, a telecom financing corporation may be set up to ensure cheaper financial assistance for telecom manufacturers/operators.

10. Comprehensive test facilities should be established to facilitate expeditious development and productionisation for cutting edge telecom technologies. Internationally accredited test houses should be set up that can certify products against specifications for Type Approval.

11.Procedural reforms in terms of greater transparency, simplified procedures, reduced number of clearances, and supportive infrastructure, may be made.

12.A conducive set of labour laws including simplified exit policy may be introduced keeping in mind the rapid developments in Telecom Technology and rapid obsolescence.

13. Special Custom Zones may be created in select areas to simplify procedures and accelerate clearances.

14. In-depth transfer of technology to manufacturing units especially in cutting edge technologies where large scale deployment is possible, would enable local value addition for making the equipment compatible to the Indian network and future value addition in terms of hardware and software by Indian R&D. Foreign companies should ensure significant local value addition in manufacturing and a commitment to continuously upgrade the technology.

15. Interface approvals for all imported telecom equipment including consumer premises equipments like terminals, EPABXs, FAXs etc., may be insisted on, to ensure minimum quality standards, and to discourage fly-by-night suppliers of such equipments.

16. Strong promotional activity for encouraging exports through participation in international exhibitions along with seminars on technology and services should take place to highlight technology and products and for brand promotion. Strategic focus should be placed on a few select products having a competitive advantage and a few countries should be targeted where volumes can be large. Targeted marketing should be done jointly by industry and government trade bodies.

17. Bilateral agreements within the SAARC countries and other regions having export potential for telecom equipment should be entered into. Mutual Recognition Arrangements (MRA) in quality analysis and certification should be made with different developing countries, to avoid the lengthy approval procedures.

18. Suitable measures be taken to discourage cheaper non-standard imports e.g. (i) designating specific ports for import of finished telecom equipments to ensure that uniform procedures and policies are enforced on all imports (ii) printing of Maximum Retail Price should be made compulsory on all imported goods (iii) an appropriate fee for approval of imported customer premises equipment should be charged by TEC, comparable to rates charged in other countries.

19. There is need to introduce reforms in customs procedures and clearances such as self-certification by manufacturers and post audit. Procedural (a-posteriori) controls in place of physical (a-priori) controls to reduce customs clearance duration to1 day, be introduced through policy changes in customs.

20. A 10-year tax holiday may be extended to existing manufacturing units as well as new manufacturing units being set-up, in line with tax holiday already granted to licensed telecom operators.

CHAPTER-8

Research and Development

8.1 Introduction

Research and Development (R&D) in telecom would play a key role in achieving the objectives of the Tenth five year plan and in the development of telecom and other related sectors. At present, the Centre for Development of Telematics (C-DOT) is the main R&D Centre for telecom in the country. Academic institutions like the IITs and other public & private sector organisations are also involved to some extent. Though, indigenously developed switching technology has greatly improved the telecom network and connectivity, indigenous R&D could not keep pace with the rapidly changing telecom technologies. Rapid changes in telecom technology, short life-cycles of products, lack of indigenous components, slow upgradation of hardware and non adherence to targeted time-frames are nullifying the efforts and achievements of indigenous R&D. In the absence of indigenous technology, manufacturing units are importing SKD/CKD kits for manufacturing of telecom equipment from foreign suppliers.

Government policy has been to promote, develop and strengthen the telecom manufacturing within the country. The NTP –99 specifically declares as one of its objectives, the strengthening of R&D efforts in the country to provide an impetus to build world class manufacturing capabilities and enable Indian telecom companies to become truly global. R&D efforts will be of actual use only if the products developed can be deployed locally. R&D, therefore, is required to be based on the country's needs and the areas for basic and applications research need to be clearly identified.

8.2 R& D Efforts made so far:

C-DoT was established in 1984 as an autonomous body with the objective of developing a new generation of digital switching systems. It has developed a wide range of switching and transmission products for rural and urban applications. These include Main Automatic Exchanges with ISDN and IN facilities, the medium capacity SBM RAX, the small capacity Rural Automatic Exchange which is suitable for rural environment and can work without air-conditioning, integrated TDM access point-to multi point for serving sparsely distributed populations etc. These efforts have been supported by PSUs like ITI and HTL who have developed products like the ISDN for MAX-L, Network Synchronization Equipment, High Powered and Low Noise Amplifiers, Managed Lease Line Network Equipment etc. The focus has been on revitalization of R&D with a transition from object oriented, academic research to applied, commercial research. Excellent R&D work has also been done by IIT Chennai , for CORDECT, which is a field proven and cost-competitive technology, and has been deployed in several countries.

8.3 Suggested R&D approach :

8.3.1 At present, telecom software is developed in India by MNCs for the systems being designed and developed abroad. Local IPRs for telecom software are not generated, since the system design is not significant in India. Potential areas for software development are as follows:

- Development of protocols for telecom systems for fixed and mobile applications
- IP related software for Routers, soft-switches, media-gateways etc.,
- ATM switches
- Operation Support Systems like call centres, billing systems, Network Management Systems etc.,

8.3.2 The emphasis should be on application oriented research which should result in productionisation of technology. Dependence on foreign resources for materials, components, micro-electronics etc., sometimes results in delays and projects over-runs. . In order to provide the indigenous production infrastructure with locally developed materials, the basic research institutes need to be strengthened for doing research in telecommunication materials, processes and technologies/products. Research Institutes like TIFR (Tata Institute of Fundamental Research), Centre for Artificial Intelligence and Robotics (Bangalore), SCL(Chandigarh), Centre for Material Engineering & Technology, CEERI (Pilani), SAMEER(Chennai), Centre for Advanced Technology (CAT) etc, can be geared to contribute towards concepts, basic tools for equipment design, state-of-the art electronic components, photonic components, sub-micron IC fabrication, telecom protocols etc., needed in the current generation technologies. Prestigious academic institutes like IITs, IISC, RECs, BITS(Pilani) etc., can also be encouraged to endow Telecom Chairs for basic research in telecom field.

8.4 :Need for a Nodal agency for R&D:

8.4.1 A nodal agency such as Research Council comprising of representatives of the different stakeholders and scientific and telecom experts is required to direct, co-ordinate and fund indigenous R&D activities related to telecom. The main activities may include technology forecast and assessment, identification of focus areas for indigenous R&D, time-frames for development and induction of technologies and coordination with different R&D organisations to avoid duplication of efforts and to ensure timely development of marketable products at competitive prices. The nodal agency may also monitor and review global technological developments.

8.5 **Funding of R&D projects :**

8.5.1 Funding of R&D projects is a critical issue for the success of this area. In order to promote indigenous R&D efforts in the field of telecom, there is a need to develop an appropriate funding mechanism to sustain R&D activities. Government may provide funding in the form of grant to the proposed nodal agency or R&D Council for providing financial support to the institutions/ organisations engaged in R&D activities.

Further, Venture capital funds could be an important source of funding R&D venture. Such funds would be useful specially for the new and young companies who cannot raise capital through conventional routes such as term loans or public offers.

8.6 Human Resource Development :

8.6.1 Human resources are the key to success of both telecom R&D and equipment manufacturing. R&D organisations are facing problems in this area due to flight of technical manpower because of the lucrative offers from overseas companies. Therefore, flexibility may be given to all R&D organisations with regard to the pay and perks similar to those offered in private R&D organisations. There is a need to develop focused HRD programmes by each organisation to invest, retain and use the human resources. Establishment of a national level academic/R&D institute for running courses on various aspects of telecom including design, development, mass production and management of telecom network and technologies may be considered.

8.6.2 IITs and other advanced academic institutions also need to be encouraged by funding initiatives to introduce specialized programmes for students in telecom and IT. These programmes should aim to bridge the gap between the syllabi of traditional engineering graduates and the needs of industry. Continuing education programmes should offer short courses on emerging technologies and standards. Such programmes can become financially sustainable for the institutions, and if developed properly, can attract a wide participation.

8.7 Recommendations

1. Telecom R&D should be strengthened in order to have indigenous telecom technology. All available expertise in the country should be pooled to develop R&D. Present institutions like CDOT should be strengthened through continued Government budgetary support. Government R&D organisations, academic institutions, public sector and private sector organisations should also be involved and encouraged to develop telecom technologies.

2. National standards in selected focus areas should be explicitly defined to address the needs of local consumer/subscriber and which can encourage indigenous R&D and manufacturing. Such national standardisation efforts, which are in harmony with international standards, have been used successfully by all countries which have become

advanced players in telecom, as a way of providing an early-bird advantage to local players.

3. As the telecom technologies are changing at an extremely fast pace, basic research in telecom should be given importance either by improving the infrastructure available with the existing R&D institutions or by establishing new research centres. Facilities for basic design tools, fabrication of state-of-the-art micro-electronic circuits, photonic components etc., should be established, which can serve as support infrastructure to basic research. Applications research also needs to be encouraged so that the research projects become commercially viable and products appropriate for deployment in local conditions are developed.

4. A Communications Research Council may be established with a view to funding R&D projects taken up by the industry, public and private sector, research institutes, universities etc. Annual grant of Rs. 5 crores from the Government may be provided to the Council. The Council should evaluate and fund R&D projects aimed at generating commercially significant IPR (Intellectual Property Rights), and developing appropriate products. The Council could be the nodal agency for coordinating all indigenous R&D activities in the sector. The main activities could include technology forecasting and assessment, identification of focus areas for indigenous R&D, time-frames for development and induction of technologies, coordination with different R&D organisations to avoid duplication of efforts, monitoring and review of activities, etc.The Council may also encourage Joint Ventures between public /private sector domestic companies, research institutes etc, and MNCs for R&D. The Industry would be encouraged to join the council and contribute financially to give the council a representative character.

A venture capital fund may be created to promote and fund R&D ventures in telecom sector.

5 Manufacturing companies with reasonable level of R&D facilities should be given suitable incentives for making investment in result- oriented R&D projects.

6 Since R&D organisations in the public sector face a high rate of attrition of human resources due to flight of scientific talent to other organizations, they should be given flexibility to retain them by providing adequate pay and perks.

7 To encourage Indian patents outside the country, since the legal fee for granting a patent is very high, 50% of such legal and registration fee may be reimbursed by the Indian Government.

8 There is scope for development of software components in the telecom industry indigenously. The country's available scientific manpower should be utilized to make India a future global center for the development of telecom software. It is essential to identify potential areas for such research.

CHAPTER-9

Customer Services

9.1 Introduction

Liberalization of telecom sector of the Indian economy aims at improving accessibility, availability, reliability and connectivity through private sector participation and to bring about much needed improvement in the Quality Of Service (QOS). Through increased competition, the service providers are expected to become more sensitive and responsive to the customers needs and choices and endeavour to give him greater satisfaction. The Telecom Regulatory Authority of India has the mandate to safeguard the customer's interests and to set the standards of quality of service.

The rapid technological advances which have taken place in the telecom sector have brought about significant improvements in the quality of service provided to customers. With the digitization of exchanges, and upgradation of external network, the fault rate has come down from 17.37 per month per 100 stations in 1997-98 to 11.7% in 200-01. The target is to bring it to single digits during the year 2001-02. About 95% of these faults are rectified within a week. The computerization of customer services has also gone a long way in improving the quality of service. Some of the activities which have been computerized are directory enquiry, fault repair services, waiting list, telephone revenue billing etc.

While the services have improved considerably, the customer is not always satisfied with the quality of service he gets. Redressal of his grievances takes time. Awareness about consumer rights is also lacking. With this in view, the 10^{th} Five Year Plan intends to provide for customer care and services as one of its sector objectives. All service providers have to adhere to the QOS parameters prescribed by the regulator, and extend state-of-the-art services and technologies to the customers. The regulator is expected to create awareness among customers about their rights and the obligations of the service providers. The regulator should have adequate machinery to monitor and supervise the adherence by operators to the QOS parameters.

9.2 Recommendations

1. The QOS parameters for operators, both for network performance and service management, should be widely publicized by the regulator. Penalties for the defaulting operators, in the form of compensation to subscribers, should also be prescribed. A set of parameters prescribed recently by the TRAI is tabulated below:

Performance Parameters for Basic Telecommunication Services

No.	Parameters	Short Term target/achievement (within 12months)	Intermediate term target/achievement (within 24months)	Long term target/achievement (within 48months)
1.	Provision of a telephone after registration of demand	<21 days	<15 days	<7 days
2.	Fault incidences (No. of faults/100 subscribers/month)	<12	<7	<3
3.	Fault repair by next working day	>85 %	>87 %	>90 %
4.	Mean Time in Repair (MTTR)	<24 Hrs.	<12 Hrs	<8 Hrs.
5.	Grade of Service	to be	finalised	
6.	Call Completion Rate within a local network should be better than	>55 %	>60 %	>65 %
7.	Metering and billing credibility	Not more than 0.2% of Bills issued should be disputed over a billing cycle	Not more than 0.15% of Bills issued should be disputed over a billing cycle	Not more than 0.1% of Bills issued should be disputed over a billing cycle
8.	Operated Assisted Trunk Calls	Urgent Call <1 Hr.30 Mts. Delay		
9.	Response Time to other operator assisted services	85% Call <10 Sec.	90% Call <10 Sec.	95% Call <10 Sec.
10.	Customer Care (Promptness in attending to customers request) 95% of requests			
	a)Shifts b)Closures c) Addl. Facility	<7 days <24 Hrs. <48 Hrs.	<5 days <24 Hrs. <36 Hrs.	<7 days <24 Hrs. <24 Hrs.

11.	Percentage of repeat faults	<2%	<1.5%	<1%
12. (i)	Customer perception of service % satisfied with provision of service	>80	>90	>95
(ii)	% satisfied with the billing performance	>80	>85	>90
(iii)	% satisfied with help services	>80	>85	>90
(iv)	% satisfied with network performance, reliability and availability	>85	>90	>95
(v)	% satisfied with maintainability	>85	>90	>95
(vi)	Overall Customer satisfaction	>80	>85	>95
(vii)	Customer satisfaction with offered supplementary services % satisfied	>80	>85	>95

Narrative amplification of tabulated parameters:

1. The telephone should start functioning after registration in less than the periods prescribed.
2. The number of faults per 100 subscribers in a month should not exceed the number of faults prescribed.
3. For short term, 85% of the faults booked should be cleared by next working day.
4. The average duration of fault clearance should be as per norms prescribed.
5. Grade of Service is defined as the permissible limit of the number of calls out of 100 calls that can fail during the busy hour.
6. The call completion rate means the percentage of calls successful in first attempt in a local network.
7. In the meter reading and telephone bills issued in a billing cycle, the percentage of bills disputed should not exceed the percentage prescribed.
8. The urgent trunk calls booked should mature in less than 1hr 30 minutes.
9. This indicates that the percentage of calls made on operator assisted special services like 199, 197 and 180 services etc. to be answered by the operator in the prescribed period.
10. 95% of the request from customers for shifting, closing of telephones and additional facility required should be complied within the prescribed period.
11. The percentage of repeat faults implies that fault should not re-occur in more than the prescribed percentage of original faults.
12. This relates to customer perception of services and is defined below serially

(i) The percentage of telephone subscribers satisfied with the telecom services provided should exceed the limits prescribed.
(ii) Percentage of subscribers satisfied with the bill received by them.
(iii) Percentage of telephone subscribers satisfied with help services like 199, 197 etc.
(iv) Percentage of subscribers satisfied with the switching equipment/ access equipment, telephone instruments, reliability and availability.
(v) Percentage of subscribers satisfied with maintenance.
(vi) Percentage of customers who are satisfied overall with the services offered.
(viii) Percentage of customers satisfied with supplementary services.

2. All service providers should come out with their charters (like citizens' charters) detailing customer rights, service provider's obligations and compensation for the customer for non-adherence of obligations.

3. All customer related services like fault booking, commercial matters relating to opening and closing of services, billing matters should be fully computerized during the 1st two years of the 10th Five Year Plan and integrated with each other with computable data banks. This will enable introduction of 'Call Centres' so that the customers are able to do business such as purchase, sales and support services, etc., over telephone itself. A Call Centre is an efficient way of taking care of customers and for providing customer services. A Call-Centre can also act as a computerized public grievance cell.

4.All customer services available to urban customers should be extended in a phased manner to rural customers during the 10th Plan period.

Chapter 10

Summary and Recommendations

SUMMARY

The development of the telecom sector has experienced a major process of transformation in terms of its growth, technological content, and market structure in the last decade through policy reforms introduced by the Government. The impetus of these changes is expected to continue, and at a much faster pace, through the Tenth Plan period. With increasing competition in telecom services, higher levels of consumer satisfaction are bound to be achieved, with affordable prices and improved quality of services. Wireless telephony and the Internet are expected to be the preferred means of communication as convergence of telecommunications, broadcasting, and information technology progresses. A supportive policy framework needs to be in place during this period of rapid growth and transformation.

The Government has undertaken the implementation telecom policy with utmost earnestness, in letter and spirit to usher in competition in almost all the service sectors. The migration package to revenue sharing in place of a fixed licence fee, has led to a virtual 'take off" in growth of the cellular and basic service sectors. National and International data connectivity has been opened. Virtually all telecom services have been opened up for private sector participation except International voice telephony. It has been decided that state monopoly of Videsh Sanchar Nigam Limited (VSNL) over international telephony will be ended by 31.3.2002, as against the earlier targeted date of March 31, 2004. further, unrestricted entry has been allowed in Basic Services on revenue sharing basis. Internet services have also been opened up without any restriction on the number of entrants and without any entry fee. Cellular service providers are permitted to carry their own long distance traffic within their service area. There is no restriction on the number of GMPCS licences with gateways to be located in India. National Frequency Allocation Plan (NFAP-2000) has been brought into effect from 1st January, 2000. The Indian Telegraph Act 1885 is being reviewed and is to be replaced by a new Bill based on convergence. With all these measures, which have come one after another in quick succession, the various telecom reforms committed under NTP-99 are almost complete, some ahead of schedule.

During the Ninth Plan period, the number of Direct Exchange Lines has already increased by more than 2.5 times; from 14.5 million at the beginning of the Plan the number of DELs is expected to reach 40.53 million by the end of the Plan. From 0.34 million at the beginning of the Plan, cellular mobile phones too have crossed the 5.5 million mark. Tele-density has increased from 1.57 as on 31.3.1997, to 3.58 on 31.3.2001, and is expected to reach 4.5 by the end of the Plan. Rural tele-density has also increased from 0.34% in March, 1997 to 0.93% in March 2001, and is expected to cross 1% by the end of the Plan. Internet connections have reached 3 million by the end of March, 2001. The total estimated investment by the public and private sector operators during the first four years of the Ninth Plan (1997-2002) was Rs.62358.20 crore. The average annual investment by the public sector operators (viz. BSNL and MTNL) during

the first four years of the Ninth Plan has been about Rs.12,952 crore per annum, whereas the investment by the private sector during the same period has been about Rs. 2637.6 crore per annum.

Keeping in view the present trend of growth of the telecom network, the tele-densities to be achieved by the end of the Tenth Plan i.e. March 31, 2007 would be 11.5 per 100 population at the national level; 3 per 100 for the rural areas and 30.74 per 100 for the urban areas. Based on this, the annual compound growth rate of telephones (Fixed +Cellular) is required to be 22.62%- consisting of 17.48% for fixed lines and 46% for cellular lines. During the Plan, a total of 81.7 million phones, including 31.55 million cellular phones are to be provided. Of these, 14.72 million will be in rural areas. To achieve these targets, a total investment of Rs. 160,672 crores has been estimated; of this investment, an amount of Rs. 44,160 crores will be required for the rural areas. The public sector is expected to invest about Rs. 114,381 crores, and the private sector Rs. 46,291 crores. In addition, in the manufacturing industry, an investment of about Rs.6000 crore is also required during the Plan to have state of the art facilities.

The provision of phones in rural areas in order to ensure universal service is not going to be remunerative. The new technologies such as Wireless in Local Loop and satellite telephony are also quite expensive, as the loading is less than economically optimal in rural areas. Even in the case of fixed telephony, the capital costs are high and the revenue per line is not sufficient to service capital and meet the operational and maintenance costs. Under these circumstances, most operators would hesitate to provide rural telecom facilities in accordance with Government policy unless firm and clear financing arrangements are made. Without such financing arrangement, we run the risk of widening the digital divide between the rural and urban areas of the country.

Taking into account the large investment requirement in the Tenth Plan Period and the need to have a conducive policy environment for a balanced growth of the telecom sector, the Working Group, after carefully considering the various ideas and suggestions made by the different stakeholders in the telecom development process, makes the following recommendations:

RECOMMENDATIONS

Rural Telecom Development:

1. The Universal Service Obligation Fund should be made operational by deciding early on the nature of the Fund, the levy for the Fund, and manner of disbursements from the Fund, to ensure that the uncertainty in this regard prevalent among the operators as on date is quickly resolved and investment in rural areas is not impeded.
2. A Telecom Development Fund may be set up into which the revenue earned by the Government from the telecom sector should be deposited, and ploughed back into rural communication, through soft loans to service providers in rural areas. A proposal in this regard needs to be examined in consultation with Ministry Of Finance.

3. To encourage faster roll-out of network in the rural areas, the following incentives may be provided:

a The licence fee in full may be waived for connections given in the rural areas.

b. The spectrum may be given free of charge in the rural areas.

c No service tax from the rural subscribers may be charged.

d Income tax benefits on investments made in rural areas, or for companies which provide a predominant part of their services in rural areas, may be considered.

e.An open and transparent franchise policy for the rural areas be worked out to enable the franchisee to provide the telecom facilities on revenue sharing basis

However, if the entire amount of licence fee collected by the Government from the telecom service providers is ploughed back into rural telephony through the USO Fund and if the guidelines framed for utilization of the USO Fund cover operational as well as capital expenditure, there may be no need for waiver of licence fee in rural areas.

4. New technologies like WLL(CDMA, CorDECT) and GSM should be utilized in rural areas for easy installation and maintenance and faster roll out.

5. Satellite phones be provided in far flung and inaccessible areas where no technology is found to be suitable.

6. As the availability of dependable power supply is a major problem in running telecommunications services in rural areas, the use of non-conventional sources of energy for rural communication should be encouraged in coordination with the Department of Non-conventional Sources of Energy and concerned State/UT Governments.

7. Connectivity to a rural service provider should be provided from the nearest technically feasible point and the infrastructure of other public sectors like Railways, Power Grid Corporation, GAIL etc. could be utilized.

8. Reliable media should be provided through adequate band-width, convergence of technology for voice, data and video, and connectivity through OFC up to the last mile. The rural exchanges should be synchronized to enable data transmission in a time bound programme.

9. All villages should be covered by VPTs in the first year of the Tenth Plan, as envisaged in NTP-99.

10. Role of state government is vital for implementation/ maintenance of rural telecommunication. A nodal officer should be nominated by each state government for better coordination for telecom development and other related matters.

11. A consolidated rural development plan should be formulated in coordination with other government agencies involved with the basic infrastructure development like electricity, roads, water etc. in rural areas, to support telecom network.

Private Investment Promotion:

12. An apex body of industry associations should be formed as a Forum for evolving a unified approach on behalf of all operators on various issues concerning the telecom service industry. This would help to avoid perceived "policy uncertainties", helping progressive implementation of policy initiatives.
13. On interconnect issues, the incumbent as well as the new entrants need to change their mindsets and sort out their differences bilaterally. Once the issues are narrowed down, the regulator can step in to find a solution in the remaining areas.
14. A seamless migration to the convergence regime should be ensured. The operators should not be asked to start all over again to revalidate the licences issued by DOT. The terms and conditions for migration to the new converged regime should be spelt out clearly.
15. The model guidelines suggested by the Committee on Right of Way should be adopted by all the State Governments and other agencies. This will have a long term effect on speedy implementation of projects.
16. An early final decision on the Calling Party Pays (CPP) regime, balancing the concerns of the cellular mobile and basic operators, needs to be taken to clear the uncertainty.
17. The five-year tax holiday under section 80I A of the Income Tax Act to telecommunications service companies who had commenced operations on or before 31st March 2000 (extended up to March, 2003 in the 2001-02 Union Budget) may be extended also to the MTNL and the BSNL. This measure is considered essential as about 70% of the new investment during the X Plan is expected to be made by the public sector.
18. The telecom industry should be brought within the definition of "industrial undertaking" in the Income Tax Act, so that carry forward of business losses and accumulated depreciation of amalgamating companies against the profits of the amalgamated company, is possible and mergers and acquisitions are facilitated for ensuring fair competition.
19. To utilize the available funds for a faster roll-out, telecommunications needs to be treated as a priority sector by the banks and credit may be provided on concessional terms as is being extended for housing activities, particularly for telecom network development in rural areas.

Telecom Equipment Manufacturing:

20. To encourage the use of indigenous manufactured equipment, the service providers may be given the benefit of deducting from the gross adjusted revenue, 1/3rd of the cost of the investment on account of purchasing the indigenously

manufactured equipment during the year, for the purpose of levying revenue sharing charges.

21. The customs duty, sales tax and excise duty should be rationalized to make the indigenous manufacturing economically viable vis-à-vis imports of finished products.
22. To establish a level playing field for the indigenous telecom industry, deemed export status should be granted to the indigenous telecom equipment industry, so that the indigenous telecom equipment manufacturer can also make imports of inputs/components at zero duty or alternatively, procure the same from indigenous manufacturers who can, in turn, claim deemed export benefits.
23. The tariff concessions being provided for Information Technology Industry should be extended to Telecom Manufacturing Sector also.
24. " C" Form facility should be granted to Telecom Sector by amending Section 8(3)(b) of the Central Tax Act, 1956, so as to bring it at par with the Power & Mining Sector and to correct anomalous situation whereby the indigenous telecom industry is having to bear panel rates of CST @ 10% /12% whereas imports qualify for 4% SADD.

25. Imports should also be covered by VAT so as to provide a level playing field to the indigenous industry.
26. Indigenous manufacturing facilities for electronic components, chips etc., should be established to have a strong component base, so that delays on account of component procurement are eliminated. R&D units that are capable of developing ICs and owning their IPR should be encouraged by declaring their product as indigenous for policy purposes even if the ICs are fabricated abroad. This will lead to establishing a strong market presence and the setting up of commercially viable fabrication facilities.
27. Manufacturing and testing infrastructure (e.g. EMI,EMC, environmental etc.,) should be upgraded to international standards. Government support may be extended in conjunction with financial institutions for creation of world class manufacturing units to enable exports which would ensure that the manufacturing industry does not depend only on the local market.
28. Comprehensive test facilities should be established to facilitate expeditious development and productionisation for cutting edge telecom technologies. Internationally accredited test houses should be set up that can certify products against specifications for Type Approval.
29. Procedural reforms in terms of greater transparency, simplified procedures, reduced number of clearances, and supportive infrastructure, may be made. Special Custom Zones may be created in select areas for this purpose.
30. A conducive set of labour laws including simplified exit policy may be introduced keeping in mind the rapid developments in Telecom Technology and rapid obsolescence.
31. In-depth transfer of technology to manufacturing units especially in cutting edge technologies where large scale deployment is possible, would enable local value addition for making the equipment compatible to the Indian network and future value addition in terms of hardware and software by Indian R&D. Foreign

companies should ensure significant local value addition in manufacturing and a commitment to continuously upgrade the technology.

32. Interface approvals for all imported telecom equipment including consumer premises equipments like terminals, EPABXs, FAXs etc., may be insisted on, to ensure minimum quality standards, and to discourage fly-by-night suppliers of such equipments.
33. Strong promotional activity for encouraging exports through participation in international exhibitions along with seminars on technology and services should take place to highlight technology and products and for brand promotion. Strategic focus should be placed on a few select products having a competitive advantage and a few countries should be targeted where volumes can be large. Targeted marketing should be done jointly by industry, government and trade bodies.
34. Bilateral agreements within the SAARC countries and other regions having export potential for telecom equipment should be entered into. Mutual Recognition Arrangements (MRA) in quality analysis and certification should be made with different developing countries, to avoid the lengthy approval procedures.
35. Suitable measures be taken to discourage cheaper non-standard imports e.g. (i) designating specific ports for import of finished telecom equipments to ensure that uniform procedures and policies are enforced on all imports (ii) printing of Maximum Retail Price should be made compulsory on all imported goods (iii) an appropriate fee for approval of imported customer premises equipment should be charged by TEC, comparable to rates charged in other countries.
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research centres. Facilities for basic design tools, fabrication of state-of-the-art micro-electronic circuits, photonic components etc., should be established, which can serve as support infrastructure to basic research. Applications research also needs to be encouraged so that the research projects become commercially viable and products appropriate for deployment in local conditions are developed.

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44. To encourage Indian patents outside the country, since the legal fee for granting a patent is very high, 50% of such legal and registration fee may be reimbursed by the Indian Government.
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46. The Quality of Service (QOS) parameters for operators, both for network performance and service management, should be widely publicized by the regulator. Penalties for the defaulting operators, in the form of compensation to subscribers, should also be prescribed.
47. All service providers should come out with their charters (like citizens' charters) detailing customer rights, service provider's obligations and compensation for the customer for non-adherence of obligations.
48. All customer related services like fault booking, commercial matters relating to opening and closing of services, billing matters should be fully computerized

during the first two years of the 10th Five Year Plan and integrated with each other with computable data banks. Call-Centres can also be made to function as computerized public grievance cells.

49 All customer services available to urban customers should be extended in a phased manner to rural customers during the 10th Plan period.

Promotion of Internet use

50. To promote the spread of Internet, it is essential that the required bandwidth and last mile connectivity is made available by the telecom operators in their respective service areas. Use of the cable TV networks and DSL technologies to provide higher bandwidths to Internet users may be promoted. Further, Internet Dhabas, which are public Internet facilities, need to be encouraged, by providing to the franchisees/ small entrepreneurs soft loans for purchase of end equipment like computers and other infrastructure, training support etc., under the existing Central and State Government employment generation schemes.

51.For dial-up Internet users, telephone call charges are a major element of cost. The high local call charges, and multi-metering of local calls, discourage the usage of Internet facilities. Therefore, to promote greater Internet use, the call charges for Internet use need to be brought down substantially.

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MINUTES OF THE 2ND MEETING OF THE WORKING GROUP FORMULATION OF TENTH FIVE YEAR PLAN (2002-2007) HELD ON 22ND AUGUST, 2001 AT 1100 HOURS INCONFERENCE HALL, 13TH FLOOR, SANCHAR BHAVAN, NEW DELHI.

The 2nd meeting of the Working Group of the Telecom Sector for the 10th Five Year Plan was held on 22.8.2001 at 1100 hours under the Chairmanship of Secretary, Department of Telecommunications. The list of the participants is as per Annexure –I.

1. Introductory remarks by Secretary, Telecom :

Secretary, Telecom welcomed all the participants. He said that the formation of the 10th Five Year Plan is a good opportunity to get the facts and figures in the right perspective.. Also this particular document can be referred as a future plan document. The report of this Working Group can be used as a base document particularly in the matter of investment. The focus of this plan should be affordable telecom services.

The industry representatives has to give their proposed investment during the plan period and also to keep target of the investment. These figures will help in making way for any kind of policy changes and procedural changes.

The purchasing power has improved in the rural sector as well as in the country side. The investment in the rural sector will certainly become viable with the right kind of partnership. In telecom sector, Govt. direct expenditure or budgetary support was not there. The surplus generated has only been ploughed back in telecom sector. The historical data shows that the cost per line has come down significantly in the recent years. The cost of reliable media has also come down which has generated more surplus. We can take reference of China making progressed in the telecom sector. One third of the Government spending in China is in Telecom Sector. China has already achieved most of the modern telecom facilities during the last decade. This is a fact that telecom sector in India is not growing at the expected rate.

He suggested to set up a small drafting group for the formation of report of Five Year Plan. The Group will consist of the members of the Telecom Commission, representatives of industry, representatives of the public sector. He also said that the report has to be submitted within first week of September, 2001.

2. Presentation by Dr. A. Jhunjhunwala :

Dr. A. Jhunjhunwala, Professor IIT, Chennai gave a presentation on "Telecom Project Development for India". He spelt out the need for reduction in per line cost of telephones to make telecom on affordable service for Indian households. He also stressed that the R&D in telecom should be encouraged. The "Access Network" technology to promote telecom facilities in small town and rural areas was also highlighted in the presentation.

3. Discussion on the draft report :

The Chairman of the four Sub-groups read out their reports and their recommendations. Dr. Jhunjhunwala recommended that franchisee should be encouraged in the rural areas. This will play a vital role in having large number of employment. He also said that Govt. should give incentive to the telecom operators so that the telecom services can be expanded in rural areas. He also opined that the use of internet should be promoted.

Almost all the sub-groups suggested the following recommendations :

"Revenue earned from the telecom sector should be ploughed back for generating fund for rural telecommunication". To this the Ministry of Finance and Prof. Jhunjhunwala said that the proposition of these sub-groups cannot be realistic unless the presentation is made in an objective manner. They suggested that a rationale has to be worked out for getting the financial support from the Finance Ministry in a convincing manner.

Director(C&I), Planning Commission suggested that a vision document should be prepared for the development of the rural network. Also, a national multi media backbone only for the rural areas should be developed. The way of financing of these projects should be worked out and the sources of the funds should be located.

Director(O), BSNL said that unless the kind of funding is clear it will be difficult to provide service in the rural areas. He agreed that the development in rural areas is needed but at the same time since these are non-profitable areas the kind of funding from the Govt. should be known. He said that in most of the States the rural areas are not equipped with basic infrastructure. Education is missing and hence the demand for multi media or internet is not there.

The meeting ended with a vote of thanks and it was decided that the drafting group will meet soon to finalise the report.

LIST OF PARTICIPANTS

Annexure III

Sl. No.	Ministry/Department/Organisation	Name of the Participant
1.	Department of Telecom.	1. Shri Shyamal Ghosh, Secretary Telecom. 2. Shri J. Ramanujam, Member(S) 3. Shri R.N. Goyal, Member (P) 4. Shri R. Ramanathan, Member(F) 5. Shri C.V. Rajan, Member (T) 6. Shri Ramesh Chandra, Advisor (HRD) 7. Shri K.N. Singh, Advisor (O) 8. Shri P.V. Vaidyanathan, Advisor (P) 9. Ms Ruchira Mukherjee, Advisor (F) 10. Ms Anuradha Mitra, DDG(EAF) 11. Dr. S.M. Jharwal, DDG(ERU) 12. Ms Geeta Banerjee, Director (CP)
2.	TEC	Sr. N.K. Mangla, Sr. DDG
3.	Ministry of IT	Shri K.B.Narayanan, Addl. Director
4.	Ministry of Finance	Mrs. Snehlata Shrivastava, Director (DEA)
5.	Department of Space	Shri K.N. Shankara, Director SCP
6.	IIT Chennai	Dr. A. Jhunjhunwala
7.	BSNL	(i) Shri Shabbir Ahmed, Director (Plg and Services) (ii) Shri B.M. Bhardwaj, DDG(LTP)
8.	MTNL Corporate Office	Shri S. Sundersan, Director (F)
9.	ABTO	Shri S.C. Khanna, Secretary General
10.	CI I	Ms Usha Harikrishnan, Dy. Director
11.	FICCI	(i) Shri T.R.Dua, Director Bharti Telecom. (ii) Shri Rajpal Singh, Asstt. Secty. Telecom.
12.	TEMA	(i) Shri Arun Khanna, President (ii) Shri N.K. Goyal, Vice president (iii) Shri S.K. Khanna, E.D (iv) Shri P. Balaji, Secretary General (v) Shri Sanjay Aggarwal, Treasurer
13.	Planning Commission	(i) Shri Nirmal Singh, Director (C&I) (ii) Shri S.S. Das (iii) Shri M.S. Rawat
14.	NASSCOM	Shri Arun Kumar, Vice Chairman
15.	COAI	Shri T.V. Ramachandran, DG
16.	ITI	Shri Mahesh Chandra, EDR