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TELECOM REGULATORY AUTHORITY OF INDIA

CONSULTATION PAPER

ON

ISSUES RELATING TO UNIVERSAL SERVICE OBLIGATIONS

JULY 3, 2000

TABLE OF CONTENTS

1.0	BACKCROUND	Page No.
2.0	UNIVERSAL SERVICE POLICY OBJECTIVES	6
2.0	DEFINITION AND SCOPE	U
21	New Telecom Policy	6
2.2	DOT Reference	6
2.2	Key issues	12
3.0	PRESENT SCENARIO AND FUTURE PROJECTIONS	13
3.1	Demand Assessment	16
3.2	Village Public Telephones(VPT)	20
3.2.1	Technology for VPT	20
3.3	Existing Basic Service Providers	22
3.3.1	Existing Licence Obligation	22
3.4	Other Service Providers	23
	Key Issues	24
4.0	GENERAL CONCEPT OF UNIVERSAL SERVICE AND ITS FUNDING	25
4.1	General Concepts	25
4.2	Universal Service Fund	30
4.2.1	Composition of the Fund	30
4.2.2	Who will pay?	30
4.2.3	Amount of Contribution to USO Fund	31
4.2.4	Eligible Operators	33
	Key Issues	34
5.0	ASSESSMENT OF COST- APPROACHES AND METHODOLOGIES	35
5.1	Net Universal Service Costing(NUSC) Methodologies	35
5.2	Revenue Assessment and Accounting Separation	42
5.3	NTP 99 VPT Targets	43
5.4	USO Cost for VPT	43
5.4.1	Capital Cost	43
5.4.2	Capital Recovery	46
5.4.3	Operating expenses recovery	46
5.4.4	Revenue for VPTs	47
5.4.5	Net Universal Service Cost (NUSC)	50
5.5	USO cost for Rural DELs	55
5.5.1	Number of Rural DELs	55
5.5.2	Capital Cost	56
5.5.3	Capital Recovery	57
5.5.4	Operating Expenses Recovery	57
5.5.5	Revenue for Rural DELs	58

-

5.5.6	Net Universal Service Cost (NUSC) of Rural/Remote DELs	59
5.6	NUSC calculation for low calling urban subscribers	64
5.6.1	Classifying the low callers	64
5.6.2	Estimation of cost	64
5.6.3	Estimation of Revenue	64
5.6.4	Estimation of average rental	64
5.6.5	Revenue from Call charges	66
5.6.6	Summary of NUSC calculations for low calling urban DELs	67
	Key Issues	71
6.0	ORGANISATIONAL ARRANGEMENT FOR	72
	ADMINISTRATION OF USO	
6.1	Organisational Set-up	72
6.2	Universal Service Fund	74
	Key Issues	77

.

LIST OF TABLES

Table No.	Subject	Page No.
Table 3-A	Provision of DELS & VPTs by Pvt FSPs as per LA	14
Table 3-B	Circle wise VPTs current status and roll out plan	15
Table 3-C	Rural & Urban DELS projections	19
Table 3-D	Break up of VPTs technology wise	20
Table 3-E	Commitment of VPTs by Private FSPs	23
Table 4-A	Operating ratio of DTS Circles	32
Table 5-A	VPT Roll out plan	43
Table 5-B	Estimates of VPT cost	45
Table 5-C	Average RPL calculations for VPT	49
Table 5-D	Summary of USO calculations for VPT Model 1	52
Table 5-E	Summary of USO calculations for VPT Model 2	54
Table 5-F	Calculations of RPL for Rural DELs	59
Table 5-G	Summary of NUSC for Rural / remote DELs Model 1	60
Table 5-H	Summary of NUSC for Rural / remote DELs Model 2	61
Table 5-I	Summary of NUSC for rural DELs Model 3	62
Table 5-J	Summary of NUSC for rural DELs Model 4	63
Table 5-K-1	Estimate of revenue from low urban caller (200 calls p.m.)	65
Table 5-K-2	Estimate of revenue from low urban caller (500 calls p.m.)	66
Table 5-L	Estimate of NUSC requirement for low calling Urban DELs (200 calls per month)	68
Table 5-M	Estimate of subsidy requirement for low calling Urban DELs (500 calls per month)	69

3

LIST OF FIGURES

Page No.

Figure 3-A	Percentage of waitlist w.r.t total demand	16
Figure 3-B	Number of DELs and total waitlist	17
Figure 4-A	Variation of Cost and Revenue	25
Figure 4-B	Key Elements of the Network	27
Figure 4-C	USO Fund Transaction	29
Figure 6-A	Diagram depicting various transactions under USO	76

LIST OF ANNEXURES

Annexure 1-A	Telephone density Vs Telephone Charges	78
Annexure 1-B	International Practices	79
Annexure 1-C	Provision of Universal Service in various countries	89
Annexure 1-D	Funding of Universal Service – Global Scenario	92
Annexure 2-A	DOT reference to TRAI	95
Annexure 5-A	Universal Service Provide/Contributor Worksheet	98
Annexure 5-B	NUSC for VPTs - Model 1	101
Annexure 5-C	NUSC for VPTs - Model 2	102
Annexure 5-D	NUSC calculations for Rural/remote DELs - Model 1	103
Annexure 5-E	NUSC calculations for Rural/remote DELs - Model 2	104
Annexure 5-F	NUSC calculations for Rural/remote DELs - Model 3	105
Annexure 5-G	NUSC calculations for Rural/remote DELs - Model 4	106
Annexure 5-J-1	NUSC calculations for low calling urban DELs (200 calls) Model 1	107
Annexure 5-J-2	NUSC calculations for low calling urban DELs (200 calls) Model 2	108
Annexure 5-J-3	NUSC calculations for low calling urban DELs (200 calls) Model 3	109
Annexure 5-J-4	NUSC calculations for low calling urban DELs (200 calls) Model 4	110
Annexure 5-K-1	NUSC calculations for low calling urban DELs (500	111

	calls) Model 1	-
Annexure 5-K-2	NUSC calculations for low calling urban DELs (500 calls) Model 2	112
Annexure 5-K-3	NUSC calculations for low calling urban DELs (500 calls) Model 3	113
Annexure 5-K-4	NUSC calculations for low calling urban DELs (200 calls) Model 4	114
Annexure 5-L	Summary of UAL	115

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List of Abbreviations used

ACA	Australian Communications Authority
ACTA	America's Carriers Telecom Association
ARPU	Average Revenue Per User
BT	British Telecom
BTS	Base Transmission Station
CAGR	Cumulative Aggregate Rate
CAPEX	Capital Expenditure
CDMA	Code Division Multiple Access
CDOT	Centre for Development of Telematics, India
CMSO	Cellular Mobile Service Provider
CMTS	Cellular Mobile Telephone Service
CSO	Community Service Obligation
DEL	Direct Exchange Line
DHO	District Headquarters
סוס	Direct Inward Dialling
סוס	Domestic Long Distance
DOT	Department of Telecommunications India
DTME	Dual Tone Multi Frequency
DTS	Department of Telecom Services India
FCC	Eddral Communications Commission
FCD	Fixed Service Provider
CII	Clobal Information Infrastructure
CMDCC	Clobal Mobile Personal Communications System
GIVIPC5	Clobal Nobile Personal Communications System
UT	Global System for Mobile
INMADOAT	Indian Institute of Technology
INWARSAT	International Mantime Satellite
ISD	International Subscriber Dialing
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IISP	Internet Telephony Service Providers
110	International Telecommunications Union
11	Information Technology
IXC	Inter-exchange Carrier
L/D	Long Distance
LA	Licence Agreement
LATA	Local Access and Transport Area
LCUD	Low Calling Urban DELs
LDPT	Long Distance Public Telephone
LEC	Local Exchange Carrier
MARR	Multiple Access Radio Relay
MTNL	Mahanagar Telephone Nigam Limited, Delhi & Mumbai
NCA	Net Cost Areas
NGO	Non Government Organisation
NSTD	National Subsriber Trunk Dialing

NTP-94	National Telecom Policy - 94
NTP-99	New Telecom Policy - 99
NUSC	Net Universal Service Cost
OPEX	Operating Expenditure
PABX	Private Automatic Branch Exchange
PMP	Point to Multi Point
PSTN	Public Switched Telephone Network
PTIC	Public Tele-info Centres
PVT	Private
RD	Research & Development
RPL	Revenue per line
SDCA	Short Distance Charging Area
SNI	Service Node Interface
SSA	Secondary Switching Area
STD	Subsriber Trunk Dialing
TDF	Telecom Development Fund
TDMA	Time Division Multiple Access
TRAI	Telecom Regulatory Authority of India
UAL	Universal Access Levy
UNI	User Network Interface
USO	Universal Service Obligation
VOIP	Voice Over Internet Protocol
VPT	Village Public Telephone
VSAT	Very Small Aperture Terminal
WACC	Weighted Average Cost of Capital
WLL	Wireless in Local Loop
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ISSUES FOR CONSIDERATION

Based on discussion in the subsequent five Chapters of this paper, following issues are posed for public consultations :-

2 <u>UNIVERSAL SERVICE POLICY OBJECTIVES, DEFINITION AND</u> <u>SCOPE</u>

- 1. What should be the scope of low speed data services? Should it be limited by the speed of a dial up internet connection or ISDN connection or a leased line?
- 2. NTP 99 envisages provision of low speed data service to balance 2.9 lakh uncovered villages in the country by the year 2002 under USO. Service is delivered through a terminal apparatus. Should it be interpreted to mean that
 - (i) All new village phones would actually be Public Tele-info centres (PTIC) having Internet capability in accordance with the IT Policy?
 - (ii) The existing 3.17 lakh VPTs would be upgraded to PTICs by 2002? In such a case what should be the minimum terminal equipment configuration and should the cost of this PTIC terminal equipment be also included in the USO cost.

3. <u>Telephone on Internet</u>:

Envisaging a situation where voice over IP is permitted in India for ubiquitous telephony services by the ISPs. Whether ISPs be asked to discharge their USO? Whether ISPs should also contribute to the Universal Service Fund (USF)?

Internet to all DHQs :

Whether the current state of Internet Service meets the NTP 99 objective of Internet Access to all DHQs or will it be met only after the provisioning of an Internet node at each DHQ? The stipulated target for Internet access to all DHQs is Year 2000. Whether ISPs be asked to provide such nodes in their service areas in addition to the incumbent?

3. PRESENT SCENARIO AND FUTURE PROJECTIONS

VPTs

Technology for VPT

1. Should a technology neutral approach be adopted for VPTs and the most cost effective technology model in a given situation be considered for disbursement from the Universal Service Fund i.e. a standard reference proxy model for a given situation.

Existing FSPs

2. Number of uncovered villages in each area of operation of private FSPs were given in annexure of tender enquiry documents and accordingly reflected in

Annex. III of license agreement. Evaluation criteria included weightage for the number of VPTs to be installed in awarding the license for basic services. Now, in the period between tender enquiry and signing of the license agreements, some VPTs have been provided by DOT/DTS. The issue to be considered is whether DOT/DTS should be treated as a "Carrier of last resort " and compensated for providing these VPTs? Next stage comes after signing of license agreement when number of VPTs are not provided as per the agreement and subsequently DOT/DTS provide these VPTs.

- 3. Should DOT/DTS be compensated as a carrier of last resort?
- 4. Can private FSPs be absolved of their responsibility of providing VPTs in view of paid L.D. and /or offered migration package or setting up of UAL fund?
- 5. If DOT/DTS was providing VPTs and getting compensated through long distance revenue, then private FSPs either should pass on their compensation amount in the form of increased revenue share for a limited period or should pass on these benefits to consumer.
- 6. The policy of giving extra weightage to commitments obtained for VPTs from prospective bidders while considering the grant of licence does not seem to have succeeded. Should this be continued in the present or any other modified form?
- 7. Can it be considered that all VPTs may be provided by DTS with suitable compensation from USF?

4. GENERAL CONCEPT OF UNIVERSAL SERVICE AND ITS FUNDING

- 1. Should the USF be used to compensate the access deficit caused due to below cost rentals of rural DELs and low calling urban DELs as well as lower call revenues, or, the access deficit be compensated through interconnect charges and only the deficit in operating costs compensated by USF? In other words, whether interconnect charges be also an instrument of subsidy to provide rural DELs and low calling urban DELs as an alternative to the USF or complementary to it?
- 2. What should be the definition of Eligible Revenue for the purpose of UAL?
- 3. What class of operators should fund the UAL?
- 4. Whether the percentage contribution of UAL from different operators providing different services be the same or different? If it should be different, the criterion thereof?

- 5. Whether there should be a Proxy Model for evaluating the claims of USO submitted by the eligible carriers?
- 6. Should adjustments be made for the reimbursement to DOT (DTS) of the licence fee while considering their claim for payment from US Fund?

5. ASSESSMENT OF COST – APPROACHES AND METHODOLOGIES

VPTs:

- 1. Should the capex recovery for VPTs installed prior to NTP 99 be considered for support from USO Fund?
- 2. Estimates for costs of providing VPTs vary over a wide range. For the purpose of support from USF, should standard costs for ordinary, hilly and tribal areas be adopted?

Rural / Remote:

- 3. Is it reasonable to assume that average cost of rural DEL is 40% higher than that of Urban DEL?
- 4. As revenue sharing on interconnect compensates for access deficit, should USF be used only to subsidise the shortfall caused by excess of operational expenditure over revenue? Whether USF should finance only the capital investment or recurring deficit of providing a rural telephone.

Low calling Urban DEL:

- 5. Whether UAL should be raised to provide Universal Access in both urban as well as rural areas? This will involve subsidising of loss making telephones irrespective of their geographical location in the service area.
- 6. Whether low calling urban subscriber should be defined as those upto 500 metered calls per month or upto 200 metered calls per month.

6. ORGANIZATIONAL ARRANGEMENT FOR ADMINISTRATION OF USO

- 1. How should the administration of USF be organised?
- 2. Who should monitor the achievement of teledensity target in rural areas and decide on the quantum of subsidy to be given from the USF?
- 3. Recognising that Universal Service is a dynamic concept and needs to be reviewed periodically for defining its scope, commensurate with development of communication technologies and information services, should a Universal Service Advisory Board, with experts from operators, financial institutions and consumer groups, be constituted, under the aegis of TRAI, for the purpose to undertake

annual review of the services to be covered under Universal Service Obligation, proxy network model?

- 4. Should the UAL be shown and charged separately in a customer's bill like service · tax or be embedded in the cost and reflected in tariff?
- 5. For USO funding, separation of accounts of various service products is essential. For clarity and transparency, should the accounting formats and procedures for unbundled services be standardised?

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1.0 BACKGROUND

- 1. Access to Telecommunications Services has become the prime mover of the socio economic development in this information age. The role of Telecommunications, an engine of growth with multiplier effect and a social leveler, has been globally well recognised. To bridge the prevailing information gap between 'the connected' and 'the not connected', governments the world over have endeavoured to ensure the ubiquity of telecommunication nation wide. Provision of Universal Access to Basic Telecommunication Services at affordable price is considered important by the governments of all countries and mandated by their policies, regulation or legislation.
- 2. 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 affordability¹

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

<u>Accessibility</u>- 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.

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

3. Even in a monopoly situation, whether in the state or the private sector, the universal service has been considered important and ensured by Government policy, legislation or regulation. In the USA, Theodore Vail of AT&T in 1907 coined the slogan: "one system, one policy, universal service" with focus on linking together all local systems through a long distance network, and making available a rapid, efficient, nationwide and worldwide wire and radio communication service with adequate facilities at reasonable charges in preference to the then prevailing island networks. In return, AT&T was given a virtual monopoly of the US long distance market for universal service obligation. They were allowed to charge long distance tariff above cost so as to subsidise local services i.e., rental & local call charges. However, after opening up of the long distance market in 80s, most of the developed countries undertook a tariff rebalancing exercise, to reduce the cross subsidy and to make tariffs more cost

World Telecom Development Report 1998 - Universal Access

oriented. Therefore, to provide an affordable service, the need for a universal fund was felt.

- 4. Universal service definition and scope vary depending on the level of economic development of a country, its network coverage and teledensity. Universal service is desirable for social, economic, and political reasons. Un-affordable prices of telecommunications services diminish the opportunities for a person to participate in the mainstream and thus in a socially significant sense, deprived. The social and political arguments for universal access are both powerful and convincing².
- 5. Governments, throughout the developed and the developing world, have taken concrete measures to ensure accessibility and availability of telecommunication services, which may not be viable on pure commercial considerations. Universal service obligation (USO) thus arises from the requirements imposed as a result of government policy, legislation, or regulation for providing telecommunication services, as may be specified viz., in certain geographic areas, locations, or to certain customers, which can only be met at a loss or under cost conditions that fall outside normal commercial standards. In most of the developing countries, provision of telecommunication services in rural and remote areas are covered under USO. These services involve high costs and are uneconomic commercially and therefore need to be subsidised from the Universal Service Fund as subsidy from long distance may become difficult consequent upon the opening of both long distance and local telephony to competition.
- 6. The Reference paper (January 1998) on Telecommunication of Negotiating Group on Basic Telecommunications of World Trade Organization (WTO) states that any member (country) has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anticompetitive *per-se*, provided they are administered in a transparent, nondiscriminatory and competitively neutral manner and are no more burdensome than necessary for the kind of universal service defined by the member.
- 7. A study on relative affordability and telephone access shows that the teledensity increases substantially as the telephone charges as percentage of household expenditure decrease (Annexure 1-A). As the economy grows, more households are able to afford telephone expenditure.
- 8. Household telephone penetration is a good indicator of universal service. High household penetration as a universal service objective has, to a great extent, been achieved in developed countries where the ratio of telephone charges to total household income is less than 2%, as is apparent from the figure in <u>Annexure-1-A.</u>
- 9. The objective of the Universal Service in developing countries has to be related to local socio-economic conditions.

² Ewan Sutherland, Universal Service, a web based study in telecommunications policy, 1996

- 10. The common approach to Universal Service in developing countries is that of providing universal access, individually to households that can afford the telephone charges and to others by shared access (e.g. DID PABXs, public payphones).
- 11. Universal service applies to the entire population with special attention on nondiscriminatory provision of standard quality service to the low income customers, customers living in rural, remote and high cost areas, the physically disadvantaged, and elderly customers. In some of the developed economies, the universal service programme also caters to the needs of libraries, schools, health care service providers and disadvantaged persons. In the interest of affordability, these connections are sometimes provided below cost for which the operator is considered entitled for compensation from the USF.
- 12. Availability of telecommunication in rural and un-remunerative areas is defined on the basis of three criteria, viz.:
 - Population Availability of a telephone for every permanent settlement with a certain population level (India, China)
 - Distance A telephone within certain kilometres of a habitat (India, Brazil).
 - Time -A telephone within certain minutes of travelling distance from a habitat (South Africa).
- 13. The Maitland Commission³ constituted by the ITU in its report "The Missing Link", published in December 1984, recommended access to public telephones within reasonable distance in rural areas. However, even after 16 years of that report, about 60% of the humanity (world average) does not have access to telecommunications. It needs to be clarified here that the access to telecom is not available either due to non-availability or due to non-affordability or both but not because of any discrimination.
- 14. The fundamental objective of universal service is to ensure universal access to basic telecommunication services to every citizen at affordable prices. As would be seen from the nature of universal service in the emerging Global Information Infrastructure (GII), even the developed economies would aim at ensuring access to advanced telecommunication services. On the other hand, the less developed economies would focus on providing plain ordinary telephone service (POTS) to as many households as possible thereby increasing telephone penetration (teledensity) and shared access to basic-telecommunication service through public telephones in urban and rural areas.
- 15. At present, many of the developing countries of Asia, cover provision of voice and low speed data service and Internet access to the rural areas under the scope of Universal Service. The scope of basic telephone service in India covers transmission of voice or non-voice messages inclusive of ISDN facilities over a licensee's PSTN in real time. Store and forward/store and retrieve type of

³ World Telecom Development Report 1998.

message transmission is not permissible. Basic service does not cover, broadcasting of any messages, voice or non-voice over wire or wireless media, packet switched data, telex or telegraph service, mobile voice and non-voice services, and value-added-services such as Voice mail, E-mail, etc., as defined by licensor from time to time.

- 16. The European Union defines the scope of Universal service as comprising voice telephony, facsimile -Group III, and voice band data transmission via modems over PSTN between its network termination points at fixed locations. Under the Universal Service Obligation, access to emergency services, provision of certain services or equipment to disabled people etc., are also included. By including modem access, a subscriber with a PC can access the Internet.
- 17. In the context of information infrastructures and multimedia applications, the scope of universal service could be defined as access to telephony service plus a number of other useful information services, health services, library services, government information, etc. A cost and benefit trade off analysis would be needed if the scope of universal service were to implement the Information Technology Policy⁴ of India, which stipulates setting up of Public Tele-Info Centres (PTIC) having multimedia capability, specially ISDN services. In the USA too, the 1996 Telecommunication Act lays down certain guiding principles in this regard, which include access to advanced telecommunication and information services in rural and high cost areas.
- The global position regarding liberalization and universal service is included in <u>Annexure-1-B</u>. Position of universal service in various countries is given in <u>Annexure I-C</u>. A global scenario of the funding of universal service is given in <u>Annexure I-D</u>.
- 19. In India, DOT as a monopoly telecommunication service provider first adopted the VPT policy in the seventies with provision of Long Distance Public Telephones (LDPT) on the basis of population of a village, and progressively enhancing the scope to the provision of a Public telephone within 5 km of any habitation, Public telephone in every Gram Panchayat Village, and finally a Village Public Telephone (VPT) in every village. However, VPT policy is a subset of the much wider universal service obligation of the incumbent, which obliges him to provide a telephone connection at subsidised rates, in all uneconomic or unremunerative areas as well as individual connections, which may be in remunerative areas but are still loss making. The Universal Service Obligation was built in the licence itself in the form of DELs & VPTs targets that a private basic service provider was obliged to meet on quarterly basis. Due to various reasons, the goals set out in NTP 94 for VPTs as well as USO have not been achieved so far.

⁴ Planning Commission Resolution No. 1-TF/5/98 published in Govt. of India Gazette dated July 25, 98. 4

- **The NTP** 99 has laid down the Universal Service objectives, targets and the mechanism of universal access levy for funding of universal service obligation (USO). The NTP 99 forms the basis for discussion in this paper.
- 21. The TRAI (Amendment) Act 2000 Clause 11 (1) (b) (ix) requires the Authority to discharge the function of "ensuring effective compliance of Universal Service Obligation." Given the situation as it obtains now, this paper presents a methodology for this purpose.

Chapter 2

2.0 UNIVERSAL SERVICE POLICY OBJECTIVES, DEFINITION AND SCOPE

2.1 New Telecom Policy 1999

1. New Telecom Policy 99 has laid down the following universal service objectives:

- "Provide voice and low speed data service to the balance 2.9 lakh uncovered villages in the country by the year 2002
- Achieve Internet access to all district head quarters by the year 2000
- Achieve telephone on demand in urban and rural areas by 2002"
- 2. Recognizing that the Universal Service Obligation (USO) may not be fulfilled under normal commercial considerations, taking into account the affordability criteria, the NTP99 has also laid down the following mechanism for raising the resources for the purpose:

" The resources for meeting the USO would be raised through a 'universal access levy', which would be a percentage of the revenue earned by all the operators under various licences. The percentage of revenue share towards universal access levy would be decided by the Government in consultation with TRAI. The implementation of the USO obligation for rural/remote areas would be undertaken by all fixed service providers who shall be reimbursed from the funds from the universal' access levy. Other service providers shall also be encouraged to participate in USO provision subject to technical feasibility and shall be reimbursed from the funds from the universal access levy. "

2.2 DOT Reference

- 3. In pursuance of the NTP 99, the Government has made the following reference to TRAI. A copy is enclosed as Annexure 2-A.
 - "NTP-99 stipulates raising of resources to meet the Universal Service Obligation through the Universal Access Levy (UAL). UAL is required for providing VPTs and Rural telephones and should cover both capital expenditure and recurring expenses to run the service. UAL would be a percentage of the revenue earned by the operators under various licenses. The percentage referred to above has to be decided by the Government in consultation with TRAI.
 - Voice communication facility has been provided to 3,74,617 villages and the remaining villages are proposed to be covered by the year 2002; Internet access to all district headquarters (DHQ) has already been achieved

through 172 code and efforts are being made to provide nodes at all DHQs progressively by the end of year 2000;

 Making telephone on demand in rural and urban areas of the country is also proposed to be achieved by the year 2002;

4. To workout the details of the UAL, recommendation of TRAI have been sought by the Government on the following:

- a) Class of operator to fund the UAL.
- b) Various possible cost models/approaches to determine:
 - Percentage contribution from revenue of the operators and the mechanism for computing it;
 - Per unit subsidy for VPTs and rural DEL's separately to cover capital & recurring expenditure;
 - Whether per unit subsidy will be the same or different in different geographical areas/tribal and non-tribal areas of the country; and
 - Per unit subsidy for low calling urban DELs."
- 5. In the communication forwarded to the Authority, DOT has referred that the UAL is required to provide VPTs and Rural Telephones. The NTP 99 also stipulates that the implementation of the USO for rural/remote areas would be undertaken by all fixed service providers who shall be reimbursed from the universal access levy. Other service providers shall also be encouraged to participate in USO provision subject to technical feasibility and shall be reimbursed from funds from the UAL. In this context, it is mentioned that while the current emphasis in defining the scope of USO is on provision of VPTs and rural/remote DELs, it may also be considered that the scope of USO may further include low calling urban customers and a reliable voice cum data transmission service to hospitals, schools, etc.
- 6. The principle adopted by the TRAI in determining the tariffs was to provide for below cost rentals and a margin for cross subsidy from long distance charges. In this framework, one method of compensating the deficit incurred in providing access to telecommunication service (access deficit) to a customer by a Fixed Service Provider could be an access charge or equivalent interconnection payment by interconnecting Long Distance Operator to the Fixed Service Provider. This could be in addition to the fixed levy which could be a percentage of the revenue as provided in the NTP99.
- 7. New Telecom Policy 1999 while laying down the specific targets in section 2.0 stipulates:
 - Encourage development of telecom in rural areas making it more affordable by suitable tariff structure and making rural communication mandatory for all fixed service providers.

- Achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002.
- Increase rural teledensity from the current level to 0.4 to 4 by the year 2010
- and provide reliable transmission media in all rural areas.
- Provide Internet access to all district head quarters by the year 2000. Make available telephone on demand by the year 2002 and sustain it thereafter so as to achieve a teledensity of 7 by the year 2005 and 15 by the year 2010.
- Provide high-speed data and multimedia capability using technologies including ISDN to all towns with a population greater than 2 lakh by the year 2002.
- 8. There is also a commitment of the government to provide access to all citizens for basic telecom services at affordable and reasonable prices. The scope and implementation requirements of these objectives are being discussed in the following sections:

Objective 1: Provide Voice and Low Speed Data Service to the balance uncovered villages.

- 9. The Government has set the objective to provide voice telephony and low speed data services to the balance 2.9 lakhs villages. The provision of voice telephony has been the objective of all past rural telephony programs. But with the addition of low speed data services, it has become essential to define and discuss the implications, and specify the scope of such services. Four issues need to be discussed for low speed data services:-
 - Scope of low speed data services (i)
 - (ii) Definition of low speed.
 - Provision of terminal equipment to render this service (iii)
 - Whether this service should be extended to already covered villages also (iv) or should it be provided only for the villages yet to be covered.
 - Scope of low speed data service: i)

The scope of low speed data services has not been specifically laid down in NTP 99. Services like fax, E-mail, internet etc. can be provided utilising low speed data communication. It needs to be decided as to what all services from the whole gamut of low speed data services be included in the USO.

Definition of Low speed: ii)

The definition of low speed also needs to be considered. Should it be that data speed up to 56 kbps be defined as low speed data or traditionally considered low speed data up to 2.4/4.8 kbps be defined as low speed data service. Most foreign Administrations have talked about voice band data capability as the requirement, which allows for the data speed to get determined by the conditions of the local loop & a dial up modem. If higher data speeds are possible by terminal apparatus,

should the data speed be limited to what may be qualified as low speed data. The two issues, viz., data speed and the provisioning of terminal apparatus including modem, need to be addressed i.e. whether dial up connection be considered adequate or point to point leased line should also be considered.

iii) <u>Provision of terminal equipment:</u>

The services at the user end are provided through the user terminals and the terminal has to be specified based on the services required. Services like Internet & E-Mail require a MODEM and a Computer (Modem is not required if data port is available) while for a fax, a facsimile machine or a computer supporting fax is required. The IT Policy of the government aims to provide Internet services to urban as well as rural areas.

Therefore, to meet the IT goals of the government, endeavours have to be made to proliferate Internet Services to the rural areas. However, keeping in mind the current level of resources available, the roll out plan and the modalities like how the service shall be provided, the terms and conditions of the service, licensing requirement, equipment configuration, etc. would have to be worked out. It also needs to be determined whether the provisioning of terminals shall be subsidised through the UAL mechanism or through other schemes of the Government like interest free loans & financial incentives.

iv) <u>Coverage of low speed data services</u>:

NTP 99 while laying down the requirement of providing low speed data service at the balance 2.9 lakh VPTs does not make a mention of the availability or otherwise of this service in those 3.4 lakh villages that already have a VPT. Going by the history of the VPTs and the variety of services available on existing VPTs, the scope could be limited to voice telephony and low speed data capability. It may not include the provisioning of service as there can be no service without a proper terminal equipment to deliver that service.

The Government seeks to achieve the national objective of rapid, low-cost expansion of telephone and Internet connectivity in rural and remote areas as referred in Planning Commission resolution no. IT -TF/S/98. Going by this IT Policy, the VPTs in the future should have access to Internet. This access can be provided by local level connection to nearest Internet Node with or without any technical enhancement. But the bottlenecks are twofold. One is the availability of the terminal equipment at the VPT to convert it into a Public Tele- Info Centre, and the other is the inadequacy of even some of the recently introduced WLL technologies to support data services.

Objective 2: Internet Access to all District Headquarters by Year 2000.

10. Internet Services have had a phenomenal growth since the liberalisation of the Internet service provision. The total number of Internet Service Providers(ISPs)

reached 225 as on 31.03.2000 while the Internet Subscriber base has crossed 4.5

MTP 99 envisages Internet Access to all DHQs by the year 2000. IT Policy of the **government stipulates** that Internet nodes will be opened by DOT and authorised **EPs at all District** Headquarters and local charging areas by 26th January, 2000. **As an interim** measure, and till nodes are provided in all local charging areas, **access to nearest** Internet Access Nodes will be available at local call rates, is **aready available**. Internet Access is already available for all DHQs through local **call scheme**, implemented by the DTS wherein access to the nearest Internet node **is made available** at local rates even if the connection is made over long distance. **DOT in its communication** has also stated that efforts are on to make the node **available** at all DHQs by Year 2000. DTS has already fulfilled the interim **objective** and in its effort is being complemented by other Service Providers who **are making** the Internet Service available in a competitive environment.

12 Another development that is likely to affect the USO Policy in future is the possibility of providing long distance service through Voice over IP. Therefore, a view will have to be taken while licensing ISPs, on the status of VOIP service and its impact on basic telecommunication service operators.

Objective 3: Telephone on Demand by 2002

- 13. NTP 1994 for the first time as a Policy recognized the need for achieving telephone on demand as early as possible. New Telecom Policy 1999 has set the Year 2002 as the deadline to meet this target. This has been discussed in detail in Chapter 3.
- 14. Even in developed countries like Japan & USA where teledensity is very high, operators are obliged under law to discharge their USO. The NTT Corporation law stipulates that it shall impartially provide such services as are indispensable to the daily life of people at appropriate conditions, including the rate of charge. A carrier is also required to give priority to emergency calls under the Telecommunications Business Law.

The United States had also approached the universal service programmes from the perspectives of both carriers and customers. The 1996 Telecommunications Act laid down guiding principles for universal service. The guiding principles include:

- Quality services at just, reasonable and affordable rates;
- Access to advanced services in all regions of the United States;
- Access to advanced telecommunications and information services in rural and high cost areas;
- Equitable and non-discriminatory contributions from all providers of telecommunication services;
- · Specific and predictable support mechanisms;

- Access to advanced telecommunications services for schools, health-care providers, and libraries;
- A competitive neutral funding mechanism.

Based on these, the FCC develops the programmes and rules to implement them. According to these rules, the universal service in the USA currently supports the following services:

- Voice grade access to public switched services;
- Touch tone signalling;
- Single party service; access to emergency services, including to 911 (where available), a system that helps emergency workers locate the caller;
- Access to operator services;
- Access to long distance services;
- · Access to directory assistance; and
- Certain monthly phone charges and initial connection fees incurred by qualifying low income households.

The programme also supports schools and libraries in the form of discounts they receive on commercially available services, and access to Internet. Access to GII is also an universal service objective. The tele-density in the USA is 65%. 94% of the households subscribe to basic telecommunication services. As new technologies develop, the scope of universal services is expected to expand over time. A summary of the position in this regard in various countries of the world is presented in <u>Annexure 1-B.</u>

15. In France, the main component of telecom act 1996 is universal service. This act entrusted the telecom regulatory authority with evaluating the net cost of universal service and the net contribution payable by the telecom operators. The legislator has designated France Telecom as the public operator responsible for the universal service. However, "any operator that accepts to provide the universal service throughout the territory and is capable of providing this service" may be entrusted with providing the universal service. Furthermore, other fixed telephone operators can also participate in providing special social service, which is an obligation for the operator in charge of the universal service.

As per the Telecom Act 1996, the cost incurred by France Telecom in providing the universal service is to be shared equally between all operators.

16. Obviously, Indian universal service support programme would take into account the ground realities obtaining here. What is important is the policy objective of the Government regarding the provision of universal service in a competitive environment?

MEY ISSUES

- What should be the scope of low speed data services? Should it be limited by the speed of a dial up internet connection or ISDN connection or a leased line?
- 2 NTP 99 envisages provision of low speed data service to balance 2.9 lakh encovered villages in the country by the year 2002 under USO. Service is delivered through a terminal apparatus. Should it be interpreted to mean that
 - (I) All new village phones would actually be Public Tele-info centres (PTIC) having Internet capability in accordance with the IT Policy?

(ii) The existing 3.17 lakh VPTs would be upgraded to PTICs by 2002? In such a case what should be the minimum terminal equipment configuration; and should the cost of this PTIC terminal equipment be also included in the USO cost?

3. Telephone on Internet:

Envisaging a situation where voice over IP is permitted in India for ubiquitous telephony services by the ISPs. Whether ISPs be asked to discharge their USO? Whether ISPs should also contribute to the Universal Service Fund (USF)?

Internet to all DHQs:

Whether the current state of Internet Service meets the NTP 99 objective of Internet Access to all DHQs or will it be met only after the provisioning of an Internet node at each DHQ? The stipulated target for Internet access to all DHQs is Year 2000. Whether ISPs be asked to provide such nodes in their service areas in addition to the incumbent?

Chapter 3

EXEMPTISEENT SCENARIO AND FUTURE PROJECTIONS

The station of Telecommunications Sector in India started in the late eighties, with the opening up of manufacturing of terminal equipment (telephone PABXs, etc) and rural automatic exchanges of CDOT design. This created an environment of dynamic growth for the telecommunication mentioning industry. The service sector was opened up for private participation Walue - Added - Services and Cellular Mobile Telecommunications service. The NTP 94 heralded the opening of basic services to private sector and the Department of Telecommunications embarked upon the selection through a competitive bidding process for basic service operators on Telecom Circle-wise The whole process ran into certain difficulties due to ambitious by private companies resulting in non-viability of some projects. As a mesult. Letters of Intent were issued to private operators only for 13 Circles. Six Companies converted their LOIs into firm licenses. These are Bharti Telnet LECMP), Tata Teleservices (A.P), Hughes Ispat Ltd(Maharashtra), ECL Telecon Lad (Punjab), Reliance Telecom Ltd.(Gujarat) and Shyam Telelink Ltd. Reasthan). The first four have already rolled out their network and have around 1.5 lakh customers by end of March, 2000. M/s Shyam Telelink Ltd have rolled out their network in Rajasthan on 21-6-2000. They carry intra circle long distance millio over their own / leased network and in effect compete with Department of Telecom Services.

- The roll out plan for DELs and village public telephones, as per the licence agreement along with the achieved figures by private FSP's is given in <u>Table 3-A</u>. Circle wise VPT's current status and roll out plan is given in <u>Table 3-B</u>.
- **Cellular Mobile** Telephone Services are provided currently by the private sector with duopoly in the four Metros and 18 Circles. The Deptt. of Telecommunication has allowed a common standard of technology viz GSM (Group Special Mobile, which was constituted by the European Telecom Standards Institute for Transeuropean Mobile Service. It is also referred to as Global System for Mobile). Since the inception of the mobile services, there has been a rapid growth in the subscriber base, which has reached 1.884 Million as on 31.3.2000.

Sl.No	Name of the Company	Service Area	Effective date	Com	mitted targets	of DELs	Committed VPTs as %of DELS	VPTs actually provided
				I year	II Year	Actually provided Till 31.3.2000	(Licence Obligation)	
1	M/s Reliance Telecom	Gujarat	30.9.97	48000	144000	Service started on 30-3-2000	81%	Nil
2	M/s Bharti Telenet	Madhya Pradesh	30.9.97	50000	100000	91967	11%	12
3	M/s Tata Teleservices	Andhra Pradesh	30.9.97	50000	150000	26713	20%	Nil
4	M/s Hughes Ispat Ltd.	Maharashtra	30.9.97	10000	262000	22110	40%	Nil
5	M/s ECL Telecom Ltd.	Punjab	30.9.97	125000	325000	Service not started	100%	Nil
6	M/s Shyam Telelink	Rajasthan	4.3.98	29757	72273	Service started	25%	Nil
	Total			312757	1053273			

Table 3-A : Provision of DELs and VPTs by private FSPs as per Licence Agreement

S.NO	CIRCLES	TOTAL VILLAGES	STATUS AS	5 ON 1.4.2000	DOT'S TARG 2001 & 20	ET FOR 2000- 01 – 2002	DOT'S TARGET FOR 2000-2002
			VILLAGES HAVING VPTs	VILLAGES NOT HAVING VPTs	2000-2001	2001-2002	
1	A&N	282	274	8	8	0	8
2	AP	29460	23379	6081	0	0	0
3	AS	22224	14181	8043	5000	3043	8043
4	BH	79208	24923	54285	22000	32285	54285
5	GJ	18125	13923	4202	0	0	0
6	HY	6850	6807	43	43	0	43
7	HP	16997	10364	6633	3000	3633	6633
8	JK	6764	3793	2971	2000	971	2971
9	KT	27066	25801	1265	1265	0	1265
10	KL	1530	1530	0	0	0	0
11	MP	71526	46498	25028	4500	1360	5860
12	MH	42467	31541	10926	0	0	0
13	NE	14446	4336	10110	5000	5110	10110
14	OR	46989	22928	24061	12000	12061	24061
15	PB	12687	12123	564	0	. 0	0
16	RJ	38634	23727	14907	0	0	0
17	TN	17991	17845	146	146	0	146
18	UPE	75698	46492	29206	15500	13706	29206
19	UPW	39551	23531	16020	6000	10020	16020
20	WB	38337	19997	18340	9000	9340	18340
21	CA	468	421	47	47	0	47
22	DLI	191	191	0	0	0	0
	TOTAL	607491	374605	232886	85509	91529	177038

Table 3-B : Circle wise VPT's current status and roll out plan of DOT

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3.1 Demand Assessment

4. NTP 99 refers

"Make available telephone on demand by the year 2002 and sustain it thereafter so as to achieve a teledensity of 7 by the year 2005 and 15 by the year 2010."

During the nineties, there has been a marked improvement in the growth of new DELs by the incumbent operator. DELs have grown at a cumulative aggregate rate (CAGR) of 18 per cent. Currently, there are around 26 Million DELs while the waiting list has remained more or less constant as is evident from Figures 3-A & B



Figure 3-A : Percentage of Waitlist w.r.t total demand





5. Demand is defined as the sum of existing DELs and the waiting list. If services are made more affordable, demand is likely to increase. Or conversely, as the households' incomes rise, more demand would be generated. Over the decade, as shown in Figure-3B, the yearly waiting list has fluctuated between 20 and 30 lakhs though the number of DELs has increased from 45 lakhs to 260 lakhs. The waiting list as a percentage of DELs has declined from 42% at the beginning of the decade to around 10% towards the end.

- 6. In the year 1999-2000, there has been a sudden spurt in demand owing to a special low fee/ deposit registration scheme launched by Department of Telecom Services at the end of the year.
- 7. NTP 99 targets to 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 and national teledensity to 7 by 2005 and 15 by 2010. In order to meet these targets the average cumulative growth required for Urban and Rural DELs has been projected year wise in <u>Table 3-C</u>.

	Teddo A-	() Harvil di 1)	due DEL 4 y	a careficen	_				-		1		
Rural and Urban Te	lephone	growth requ	ired to ach	tove NTP	00 targeto			-		-	-	1	
	Units	1999	2000	2001	2002	3003	2004	2005	2006	8007	2000	2009	00
1 Total population	000	981324	996944	1012386	1027607	1013534	1000001	1070034	1004120	1113440	11.0071	1140013	110.00
2 Urban	000	276222	283706	291256	298859	305778	315005	323475	332101	341019	340001	30/100	19901
3 Rural	000	705102	713238	721130	728748	736756	745019	753459	761965	770427	778620	700003	/9421
4 Projection of DELs to	meet NT	P 99 targets											
DELs required to acheive 15 teledensity 5 in 2010 (A)	000		26652	32813	40397	49734	61230	75383	89145	105420	124667	147427	17434
Sin as ro (r)	000	-	20002	02010	10001	-10/01	01250	/		100120	12:10:07	1-11-146-1	17-527
Rural DELs required to aceive 4 teledensity in 6 2010 (B)	000	3881	4418	5381	6554	7982	9722	11842	14424	17568	21398	26062	3174
Total Number of Urban 7 DELs (A - B)	000		22235	27432	33843	41752	51507	63541	74722	87852	103269	121365	14259
Notes										1.00			
1,2 and 3		* Source: Po	pulation Proje	ections for l	ndia and St	ates 1996 -	2016, Cer	sus of India	a 1991.				
5	Step1	The number	of DELs for t	he year 200	0 on actual	basis							
	Step 2	The number multiplying th	of DELs for the population	he year 200 in the respo)5 and year ective year l	2010 requi	red to meet 10.15	t the teleder	nsity targets	of 7 and 1	5 have bee	en calculated	l by
10000	Step 3	The average 2006 - 2010,	growth rates it is 23 % and	of DELs re 18% respe	quired to m actively.	eet the targ	ets in step	2 were cald	ulated.For	the period 2	2000 - 2005	5&	
	Step 4	The Number	of DELs for t	he remainir	ng years hav	ve been pro	jected usin	g the growt	h rates deri	ved in Ster	3		
6		NTP 99 has:	set a rural tel	edensity tar	get of 4 by	2010. The	Rural DEL	projections	háve been	derrived by	a method :	similar to the	total DELs

The <u>Table 3-C</u> projects the number of Urban & Rural DELs, required to be installed each year in order to meet NTP 99 targets. Assuming that DTS, meets the targets given in their perspective plan year 2000 onwards, as it has exceeded the targets in the past and continues providing Rural / Remote DELs at a rate of 16.5 % of total DELs installed that year, the share of private sector has been worked out.

3.2 Village Public Telephones (VPT)

8. India has a total of 6.07 lakhs villages, out of which 3.75 lakhs villages already have a VPT as on 31.3.2000. The balance 2.32 lakhs villages are still devoid of access to a VPT. DTS has been the major provider of Village Public Telephones.

3.2.1 Technology for VPT

9. The Village telephone program has had a long history and depending upon factors like availability, cost, area, several technologies have been deployed in the network. The break up of VPTs on the basis of technology as on 1.4.2000 is given below in Table 3-D.

Operator	Technology Used	Number of VPTs		
DTS*	MARR	211313		
	Landlines	163167		
	Inmarsat	15		
	CDOT PMP	35		
	WLL	75		
	DTS Total	374605		
Bharti Telnet	WLL	. 12		
Grand Total		374617		

Table 3-D: Breakup of VPTs technology-wise

* Source: Conference of SSA Heads report, April 2000

- 10. The induction of Analogue MARR systems in the network has been stopped by the DoT from 1998-99 onwards, after which only Digital systems are to be used.
- 11. The Time Division Multiple Access/Point to Multi Point (TDMA-PMP) system developed by C-DOT and the Cor-DECT system developed by IIT, Chennai, and such other systems are expected to provide more cost effective technology solutions for application in rural areas.
- 12. With the advances made in the Cellular Mobile technologies, particularly the GSM and CDMA, and their declining prices, it is now possible to cost

Example 1 The second second

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For clages that are remote and in difficult terrain, the Satellite technology, **version relatively** more expensive, is sometimes the only technically feasible **Village** satellite phone terminals could be provided using the INSAT, **CARSAT** or GMPCS systems.

The TTU-R Recommendations, M-819-1 also stipulates the use of IMT-2000 for and rural areas for economic services and high quality of integrity and rural areas for economic services and high quality of integrity areas and coverage areas as well as remote regions. The should be able to meet the requirements of fixed wireless access areas and coverage areas, especially rural and newly areas areas.

While making an economic choice for installing a VPT, both the capital and the maintenance costs of the technology employed are to be considered. For a short instance from an exchange, the physical medium using overhead line or drop wire and erground cable has been found to be the most economic choice. Wire-line technology is also better from the point of view of data speeds compared to the content wireless local loop technologies. With the declining prices of the C-DOT mediatomatic exchanges and conversion of VPTs into exchanges, more and more telephone exchanges are getting installed closer to the villages, making the access as the most economic option.

The replaced with the newer technologies due to technology would need to replaced with the newer technologies due to technological and economic considerations. In economic terms, it becomes beneficial to replace an existing and with a new asset, in case, the maintenance cost of the existing asset exceeds the replacement and maintenance cost of the new asset over a period of time. One meds to keep in view, the quality of service provided by these assets. The incurred while providing VPT using a particular technology is likely to vary with the historical network in place. For example, the cost involved in providing VPT, in a village that is in range of an already existing BTS of a WLL system, is less when compared with the cost of landline due to only marginal cost to be incurred. But, the situation would be entirely different if such a BTS had to be provide a WLL VPT. It is expected that given the situation the operators would deploy the most cost effective means to provide VPTs, Rural and Remote approach.

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Fielder Rahman, Bangladesh Ventures for Cellular Mobile Phone Services to Access Fielder Phone (PTC, Hawaii, 1998)

17. The Wireline & Wireless technology break up for new VPTs to be provided in the year 2000-01 and 2001-02 by DTS is given below:

Technology	No. of VPTs	
Wireline	76760	
Wireless	100278	

3.3 Existing Basic Service Providers

17. As already mentioned six private Basic Service Providers have licenses for providing Basic Telephone Service as on 31.3.2000. Three of the six viz., Bharti Telnet, Tata Teleservices & Hughes Ispat Ltd, have started their services in the state of M.P., A.P. and Maharashtra respectively. The existing licenses already prescribe certain Universal Service obligation. Under NTP 99, a package has been provided to these Basic Operators for migration to the new license fee regime. The issue of obligations existing prior to NTP 99, therefore, needs to be addressed.

3.3.1 Existing Licence Obligation

19. The Basic service licence lays down the targets for VPT provisioning on a quarterly basis. Schedule "B", part II, Clause 3.3 (iii) states that "During the period of licence, Licensee shall complete installation of all necessary equipment and offer service so as to meet the committed target of DELs, VPTs by the end of 24 months and 36 months after the effective date, as given in Annex III......"

The targets for each of the operator who have started their services are tabulated in Table 3-A..

The targets for 12 & 24 months mentioned are subject to the compliance of percentage of DELs to be commissioned as VPTs (mentioned in Table) in each quarter and till all the villages get covered by VPT. For proper coordination with DTS Clause 3.3 (iii) stipulates

"Since both the DOT and Licensee will be providing village telephones in the same Service Areas, a mutually agreed procedure shall be evolved to avoid infructuous effort on the part of either as well as to avoid some villages getting left out by both."

Bharti Telnet, Tata Teleservices and Hughes Ispat Ltd. have all now completed 24 months from the effective date. They were bound by licence conditions to meet their respective targets of providing 11000, 6081 and 25760 (now left 10,296 only) VPTs respectively. The actual number of VPTs provided by them till now is 12, Nil & Nil respectively. There has been a similar default on the part of other three Basic Service Licensees.

EXAMPLE 1 CONTRUCTOR CONTR

Printe 757	Commitments as per license agreement within		Effective date	
	12months	24 months	36 months	
Blast Teleset	5,500	. 11,000	16,500	30-9-97
Tim Trimervices	6096*	6096*	6096*	30-9-97
Regtes Spar Lad	4,000	25,760**	25,760**	30-9-97

Table 3-E : Commitment of VPTs by private FSPs

Despite efforts by TRAI and the government, no revised been furnished by them. Two options exist as of now:

The Basic Service Operator may fulfil the obligations in accordance with the **Content of Service Service Operator** may fulfil the obligations in accordance with the **Content of Service Service Operator Service Operator**

and the requested to provide the telephones as a "carrier of last resort" and a suitably for running the VPT service for period of the licence by the and the BSOs.

B4 Other Service Providers

FSPs, other Service Providers like CMTS also have the means to FSPs, other Service Providers like CMTS also have the means to FSPs and Rural DELs. CMTS already have their own backbone running the Indian territory and are capable of providing these DELs. NTP FSPs encouraged the participation of these Service Providers through a policy the indian territory and in revenues through universal access levy.

from universal service fund created by universal service levy to other menders would serve as incentive for them to provide universal service. This service, they would have the added advantage of enlarging their base in rural areas, which eventually may become commercially menders base in rural areas, which eventually may become commercially become condition, as they are not permitted to provide fixed telephones at therefore do not have any obligation for basic services. VPTs / rural menters are the obligation of the BSO at present.

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KEY ISSUES

VPTs

Technology for VPT

1. Should a technology neutral approach be adopted for VPTs and the most cost effective technology model in a given situation be considered for disbursement from the Universal Service Fund i.e., a standard reference proxy model for a given situation.

Existing FSPs

- 2. Number of uncovered villages in each area of operation of private FSPs were given in Annex of tender enquiry documents and accordingly reflected in Annex. III of license agreement. Evaluation criteria included weightage for the number of VPTs to be installed in awarding the license for basic services. Now, in the period between tender enquiry and signing of license agreements, some VPTs have been provided by DOT/DTS. The issue to be considered is whether DOT/DTS should be treated as a "Carrier of last resort " and compensated for providing these VPTs? Next stage comes after signing of the license agreement, number of VPTs are not provided as per the agreement and subsequently DOT/DTS will provide these VPTs.
- 3. Should DOT/DTS be compensated as a carrier of last resort?
- 4. Can private FSPs be absolved of their responsibility of providing VPTs in view of paid L.D. and /or offered migration package or setting up of UAL fund?
- 5. If DOT/DTS was providing VPTs and getting compensated through long distance revenue, then private FSP's either should pass on their compensation amount in the form of increased revenue share for a limited period or should pass on these benefits to consumer.
- 6. The policy of giving extra weightage to commitments obtained for VPTs from prospective bidders while considering the grant of licence does not seem to have succeeded. Should this be continued in the present or any other modified form?
- 7. Can it be considered that all VPTs may be provided by DTS with suitable compensation from USF?

Chapter 4

ENERAL CONCEPT OF UNIVERSAL SERVICE AND ITS FUNDING

General Concepts

and rural / remote areas. The latter, expectedly, having comparatively per DEL but at the same time higher costs of provisioning. This has been figure 4-A. In the absence of the obligations imposed for providing per del for providing comparatively on commercial considerations, an operator could deny service to per del for providing or providing the per del for providing the absence of the obligations imposed for providing per del for providing the areas, giving rise to cherry picking or per del for providing or per del for providing the per del for providing the absence of the obligations imposed for providing to the per del for per del for providing to the per del for providing to the per del for providing to the per del for per del for providing to the per del for providing to the per del for per d

Revenue Per User (ARPU) above AB are commercially attractive to an revenue Service Obligation, however, requires him to provide service to the revenues from which, fall below AB. The slope in the line AB reflects the the revenues from the capital investment and operating point of view) of providing the revenue areas, where the ARPU is also generally lower.



USO requires provision of service to uneconomic customers in the region OBD

Figure 4-A: Variation of Cost & Revenue

DELs type by reveneue generation
3. Pricing of basic services has been under a price cap regulation which does not permit increase greater than RPL for rental & local call charges. Therefore, the tariff for these two elements were kept below cost. Accordingly, development of telecommunication network and universal service provision was based on cross subsidies from long distance to local service and from urban to rural areas. Universal service raises the issue of subsidy for provision of uneconomic networks and services. In order to compensate for the shortfall in revenue owing to the imposition of USO, one or more of the following subsidy options have been employed the world over:

(i) Cross subsidies: Operators providing access, local and long distance services cross subsidize their loss of revenue in access charges through margins provided in long distance service charges.;

(ii) Mark up On Interconnect Charges: Fixed access providers are allowed to make up for their loss through Interconnection charges taken from Long Distance operators. Tying the payment of universal service contribution (USC) to the interconnection charge could be a simple mechanism to operate when there is only one universal service provider. Anyone, who buys interconnection services should have to pay the USC, and there is no way to impose USC on those who do not consume any interconnection services. It could also encourage inefficient bypass of the network of the universal service provider. This system becomes far more complicated when there are more than one universal service provider, as it would be the case in India.

(iii) Bundled and Unbundled Funding Mechanism: Operators providing access are compensated for the losses incurred through a Universal Service funding mechanism;

(iv) A combination of these.

(v) Zero Subsidy: Generally adopted when the network of universal service provider is already well developed and the resources required for fulfilling the USO do not cause undue strain. Normally for the success of no compensation regime for USO, it needs to be considered carefully whether it would make life difficult and unfair to the universal service provider? In a liberalized market, although the incumbent operator may be in a better position to meet the USO in terms of financial strength and network coverage, it would still have to effectively compete with the new operators. If the scope of USO is expanded, over time, to cover more sophisticated services, the requirement for fair and adequate compensation would be felt even more.

A Typical Telecom Access Network

E UNI

Access Network

SNI Core Network



Figure 4-B: Key elements of the access network

CPE - Customer Premises Equipment

UNI – User Network Interface

SNI -- Service Note Interface

- 4. There is a need to unbundle the costs and revenue accruing from local, intra circle, inter circle and international services for Rural DELs, Urban DELs and VPTs in order to accurately quantify the USO requirement. A typical access network: from User Network Interface (UNI) to the Service Node Interface (SNI), is shown in figure 4-B.
- 5. Currently in India, the rental of the telephone line has been kept below cost. Adequate margins have been provided in the long distance charges to meet this deficit, generally called, access deficit, as well as, for the costs caused to access / local service provider for providing long distance functionality, to be transferred as access or carriage charge under an Interconnect agreement. The FSPs thus get a share of the long distance revenue on interconnection. The accounts need to be separated for local and long distance services for working out access charges. Besides this access deficit, owing to high operating costs of VPTs, rural / remote DELs, low calling urban DELs, there is another element of deficit due to low call revenues. The principle adopted is to compensate the access provider through the mechanism of long distance service revenue sharing on interconnection for the access deficit and causality costs, and the USO provider further getting complementary support through the mechanism of universal access levy for the DELs. As regards the VPTs, compensation is provided entirely from the UAL.

6. The generic revenue streams model that emerges is shown in Figure 4-C.



Figure 4-C, clarifies the twin roles that the FSPs shall play i.e., as Access providers and USO providers. Compensation from USO fund would be on account of the operator being a USO provider and not merely an access provider.

4.2 Universal Service Fund

4.2.1. Composition of the Fund

7. The NTP'99 provides for raising of the resources for meeting the USO through a Universal Access Levy, which is to be a percentage of the revenue earned by all the operators under various licences. The levy so collected shall constitute the Universal Service Fund. The reimbursements to the Service Providers for meeting the USO shall be made from this fund. The costs of USO provision and the revenue of the operators may vary each year depending upon technology, network performance and market conditions. The percentage of the revenue share may, therefore, also change accordingly. NTP 99 has laid down specific time bound Hence, it is first essential to estimate the cost of providing the USO targets. Universal Service in accordance with the targets stipulated by NTP 99. The size of USO Fund will be determined by the reimbursement needs to compensate for the loss incurred (shortfall in revenue) in USO provision by the Service Providers. Unlike, in certain other countries, where the Universal Service fund consists of contributions from various operators, government grants, etc., the NTP 99 provides for no other inputs into the fund except through the imposition of Universal Access Levy (UAL). UAL will have to be estimated for each year in advance. Thereafter, after the expiry of the financial year, exact quantum of the reimbursement will have to be decided.

4.2.2 Who will pay?

8. The contributions through UAL to the USO fund are to be made by all the operators under various licences. The term 'all the operators under various licences', taken in its literal sense shall include even resellers and other service providers who operate as franchisees / sub franchisees / agents. However, it would be too cumbersome to identify, maintain the records and monitor such service providers. It would perhaps be more practical to levy such charges on the licensees only, who in turn will indirectly pass on these charges to their resellers/ franchisees / sub franchisees / agents. In the USA, although the Telecom Act 96, requires all service providers to contribute to the Universal Service Fund, in practice, only the Long Distance Operators are required by FCC to make contributions to the Universal Service Fund, since contributions from other service providers are deemed to be included in the long distance lease charges, the Long Distance Operators collect from them. The US Long Distance Operators, generally known as, the Inter-exchange-Carriers (IXCs), collect the USF contribution from the subscribers showing it as National Access contribution, comprising "carrier line charge" and "universal connectivity charge" in their regular bills, as a percentage of the billed amount (5%). In 1998, the contributions to USF amounted to 4.9% of the gross revenues of all Long Distance Operators in the USA.

9. DOT in its reference has also sought the recommendation of TRAI on the class of operators to Fund UAL. The NTP99 requires all operators to pay UAL.

4.2.3 Amount of Contribution to USO Fund

10. The total requirement of USO provision is to be met from the sum total of UAL contribution from all operators. Depending upon the deficit (average cost – average revenue) on national basis for provision of VPTs and rural DELs, the USO fund requirement shall vary from year to year. Accordingly, the UAL contribution as percentage of revenue, earned by operators under various licenses, shall be calculated. The issues that arise are whether this percentage should be same or different depending upon

Physical location;

• Type of service provided.

and, what should be the criterion, if this percentage has to be different?

11. It is recognized that the cost of providing services and the revenues vary depending on the physical location and the type of service. According to the principle applied in present tariffs, rentals for access are below cost, and margins exist in long distance charges to compensate the access deficit, which actually is passed on to an access / local provider through long distance revenue sharing as interconnect charges. For determining UAL percentage of revenue across different service segments, the following options may be considered:

Option 1: Uniform %age UAL

12. A uniform percentage of levy is imposed on all the operators based on the formula:-

Option 2: Based on Elasticity of Demand: Ramsay Rule

- 13. According to Ramsey Pricing Rule, it we were to impose UAL on certain services, it should be highest on such services, which people will continue to buy anyway and low on those services, which are price sensitive. This method will minimize the distorting effect of the levy. It has the advantage that the total amount expected (coming from sectors with low elasticity of demand) would not vary over the years and hence the chances of accruing deficits in the fund are less. The disadvantages of this methodology are
 - a) Uneven distribution of USO responsibility across segments.
 - b) Estimation would be very difficult.

As all telecommunication services are price sensitive, the application of this methodology may not be considered.

Option 3: Based on profitability of a venture

14. All States of the Indian Union do not enjoy the same level of economy. This is also evident from the revenues and operating ratios of various circles of DOT. The operating ratios of various circles for the year 1997 - 98 are indicated in <u>Table 4-A</u>(Source: DOT).

Circle	Operating Ratio of DTS circles (1997 – 98)
A&N	85.0
AP	42.9
Assam	72.8
Bihar	58.0
Gujarat	45.2
Haryana	36.9
HP	74.5
JK	55.1
Karnataka	46.2
Kerala	72.6
Maharashtra	48.3
MP	52.1
NE	90.6
Orissa	64.1
Punjab	34.0
Rajasthan	45.2
TN	47.1
UP(E)	77.6
UP(W)	43.0
WB	114.7

Table 4-A : Operating Ratio of DTS Circles

In this context, Operating Ratio means the ratio of operating expenditure to operational revenue. Obviously, a higher operating ratio represents greater inefficiency. In the

Circles, where the operating ratios are lower, more surplus is generated in comparison to others. If the UAL percentages for different circles were to be related to the operating ratios or amount of surpluses generated (with circles having lower operating ratio or contributing higher UAL percentage), there would be no incentive for improving efficiency, in fact, it would actually amount to rewarding inefficiency.

4.2.4 Eligible Operators

15. All Operators who provide VPTs, Rural / Remote DELs & loss making urban telephones shall be eligible for reimbursement of shortfall in revenue, from the USO Fund. The settlement will be done at the end of the year after completion of technical and financial auditing of the claims, submitted by the operators. Cost of providing the service depends to a large extent on technology, terrain, network status and other geographic / demographic factors. There is likelihood that operators, in order to load their vacant infrastructure, use USO as a means to recover costs. Reimbursements will be provided only after ascertaining that the technology used by the operator was the most cost effective. The approach of a proxy model is suggested to determine the most cost effective available technology option in a given situation and the same shall be used for determining the claim. If service Provider deploys any other technology at a cost above the cost determined for the proxy model, the Service provider will have to bear the excess cost on his own.

KEY ISSUES

- 1. Should the USF be used to compensate the access deficit caused due to below cost rentals of rural DELs and low calling urban DELs as well as lower call revenues, or, the access deficit be compensated through interconnect charges and only the deficit in operating costs compensated by USF? In other words, whether interconnect charges be also an instrument of subsidy to provide rural DELs and low calling urban DELs as an alternative to the USF or complementary to it?
- 2. What should be the definition of Eligible Revenue for the purpose of UAL?
- 3. What class of operators should fund the UAL?
- 4. Whether the percentage contribution of UAL from different operators providing different services be the same or different? If it should be different, the criterion thereof?
- 5. Whether there should be a reference Proxy Model for evaluating the claims of USO submitted by the eligible carriers?
- 6.
- Should adjustments be made for the reimbursement to DOT (DTS) of the licence fee while considering their claim for payment from US Fund?

Chapter 5

5.0 ASSESSMENT OF COST – APPROACHES AND METHODOLOGIES

1. As per NTP'99, the implementation of the Universal Service Obligation (USO) would be undertaken by all fixed service providers, and other service providers will also be encouraged to do so. A Universal Access Levy (UAL) will be imposed on all service providers under various licenses, which will be a percentage of their gross (eligible) revenues. The percentage is to be determined on the basis of estimation of the size of fund (Universal Service Fund) required to compensate the universal service providers for the shortfall in their revenues, and the aggregate of gross (eligible) revenues of all service providers.

5.1 Net Universal Service Costing (NUSC) Methodologies

- 2. There are several approaches, for estimating NUSC. These approaches include:
 - COSTING BASED ON A WELL DEFINED NETWORK SEGMENT
 - a. Individual VPTs & Rural / Remote DELs costs Approach;
 - b. High Cost Area Approach;
 - c. Avoidable Cost Approach;
 - COSTING BASED ON COMPETITIVE BIDDING
 - COSTING BASED ON NEGOTIATED BIDDING
 - INCUMBENT'S / LICENSEE'S LIABILITY
 - NORMATIVE METHOD

3. Approach and methodology used for costing have a great impact on Net Universal Service Cost.

NETWORK SEGMENT COSTING

i) Individual VPTs & Rural / Remote DELs (National Average cost)

4. In this approach, individual VPT & Rural / Remote DELs are taken as cost centres. Theoretically, this will be the most accurate method, but will require data for individual costs and revenues for each VPT and Rural / Remote DEL for determining the NUSC. Obviously, this method, that would involve maintenance and retrieval of huge data commensurate with the number of VPTs and rural/remote DELs, to assess the costs incurred and revenue generated, would be very cumbersome, expensive and time

consuming. In practice, average costs and revenues are considered for the purpose of calculations. These averages can be at

- a) SDCA or Local area level
- b) LDCA or Secondary Switching Area level
- c) Entire Service Area of BSO i.e., Circle Level

5. The above three levels of averaging are in the decreasing order of accuracy. Smaller the area, more accurate will be the results.

6. Preferably, the averages should be calculated at SDCA level to reflect the variation in demographic, geographic parameters and the spread of existing telecom infrastructure, accurately. In case adequate data is not available at SDCA level, then geographical averaging may have to be done at at LDCA level. This will simplify the data acquisition and averaging procedure though at the cost of accuracy in comparison to that of SDCA level. In case adequate data is not available for averaging at LDCA level, it could be calculated at the Circle level.

7. In France, the telecom network is divided in 35 categories of local service areas, on the basis of population density. Costs and revenues are allocated to each of the areas, on the basis of information provided by France Telecom for its network as a whole. For each local service area, there is a net cost if the costs incurred by the operator to cover the area are greater than the income generated in that area.

8. In Indian conditions, there will be a wide variation between cost & revenue of telecommunication services in different region depending upon various demographic, existing telecom infrastructure etc. Practically, it may not be economical & feasible to calculate NUSC seaparately for each region at SDCA level. Like in France, in the Indian Telecom Network, the SDCAs can be divided into various categories based on existing telecom network, population density, terrain features and other demographic factors. The net cost as mentioned above can be calculated for these categories of SDCAs and the NUSC can be estimated accordingly. Currently the data may not be available at SDCA level to do these calculation but further annual review of NUSC should be done on this basis.

9. The NUSC can be worked out by netting off the average annual revenue from the Annual USO cost.

Net Universal Service Cost = USO Cost – Revenue generated

ii) Network Segmentation Approach

High Cost Area Approach

10. In this approach, each SDCA can be considered as a separate cost and revenue center. A proxy cost model, based on forward looking costs, for calculating the future

cost of serving a particular SDCA is to be developed and a Service Provider would be eligible to get support only when the cost of providing Universal service, as measured by the proxy model, shall exceed a certain prefixed benchmark. This benchmark can be fixed at a level higher than the national average cost of providing USO. The forward looking mechanism uses a single national cost benchmark against which a Service Provider's forward looking costs are compared to determine their need for support. For example, in USA, where this practice is followed, if a Service Provider's forward looking cost of providing Service exceeds 135% of the national average cost per line, the high cost support mechanism would provide support to those areas that exceed this benchmark.

Avoidable Cost Approach

11. This approach is based on Net Cost Areas (NCA). NCAs are areas, which are considered to be loss making and are so classified in the beginning of each year. The NUSC, in this approach, is the amount by which avoidable costs exceed the revenue foregone in serving NCAs. The following formula applies:

NUSC = Avoidable Cost - Revenue Foregone.

Avoidable Costs

12. Broadly speaking, avoidable costs are amounts of operating costs, depreciation and opportunity cost of capital that would have been avoided, if service were not supplied to NCAs during the financial year.

13. This approach is practiced in Australia.

The NUSC is sensitive to changes in the

- Opportunity cost of capital;
- technology selection;
- technology costs.

Opportunity Cost of Capital

14. The opportunity cost of capital is used to measure the return required from a project, given the expected rate of return from projects with similar risk characteristics. It is commonly known as Weighted Average Cost of Capital or WACC. The formula used for calculating pre tax WACC is:

Pre Tax WACC =
$$\frac{\text{Re} \quad \text{E} \quad \text{D}}{1 - T(1 - \gamma) \quad \text{V} \quad \text{V}}$$

where

- Re Required rate of return on equity after company tax
- Rd Pre tax average cost of debt
- T Corporate Tax
- γ Imputation factor
- E Market value of equity
- D Market value of debt

 $\mathbf{V} = \mathbf{D} + \mathbf{E}.$

Further,

$Re = Rf + \beta$	e (Rm – Rf)
where	
Rm	Market risk
Rf	Risk free rate of return
βe	Equity beta
Rm – Rf	market risk premium

15. Under the avoidable cost determination, one of the avoidable costs is the cost of assets used in meeting the USO in the net loss areas, and those assets are to be valued on a basis that a fully optimised network is installed each year i.e., the technology used is the most cost efficient.

Technology Selection

16. While determining the cost of technology, one of the most important parameters used is the relevant date of its selection. This is the date at which the technology is theoretically, selected, installed and costed. The principles for selecting technology include

- a) Availability of technology;
- b) Suitability of technology in terms of its proven acceptance, robustness, non obsolescence, terrain compatibility, network integration and supplier support;
- c) Conformance to existing national / international standards

17. In Australia, following tests were applied for declaring whether the technology is suitable as a basis for NUSC (1997 – 1998):

- a) was the technology forward looking as of 1st July 1997; and if so
- b) was that technology potentially the least cost option in some of the NCAs.

18. ACA, the regulator considered Cable, WLL, Point to Multi Point Microwave and satellite solutions to be suitable forward looking technologies for 1997 –98. GSM technology was rejected on the basis that the Codec available then did not conform to the Australian Standard. However, with the augmentation of EFR codec, GSM has been included for the year 1998 –99. Further, aerial cable was rejected on account of higher maintenance costs.

Technology Costs

*19. The cost of technology includes

- Installed costs of switches, junctions, cable, WLL, point to multipoint microwave, satellite, payphones etc.;
- 2. Depreciation model and rates to be used for these technologies
- 3. Relevant Operating expenses technology wise.

20. ACA, has defined operating expenses as "any and all costs, which are a direct result of providing telecommunications service, and are expensed (or 'written off') for tax and/ or book purposes in the year in which they occur". These include;

- Costs resulting from customer demand activity occurring in the depot (e.g. installing a cross connect) or a central or regional location (e.g. repair call answering)
- All other costs that are not directly related to customer demand occurring in the depot (e.g. land and building maintenance) or at a central or regional location (e.g. directory publishing)

Revenue Foregone¹

21. Revenue foregone means an amount equal to so much of the revenue earned by the operator during that financial year as it is reasonable to expect that the person would not have earned during the financial year if the operator had not supplied services to net cost areas during that financial year.

22. A basic principle for inclusion of the revenue in revenue foregone category is that there should be an established relationship between the USO, DELs, and the revenue received.

23. The revenue foregone is calculated as the sum of all revenues earned as a result of service being supplied in the NCAs. Revenue will be made up of Revenue earned from outgoing calls, revenue earned for calls coming into the NCAs, corrected for calls placed between NCAs in order to avoid double counting of the revenue.

24. The revenue components include

- 1. Local call revenue
- 2. Long distance originating revenue
- 3. Long distance between NCAs
- 4. International
- 5. Mobile related
- 6. Payphones
- 7. Access Revenue

NUSA for 1977 - 98, Australian Communications Authority, October, 1999

8. Others like operator assisted revenue, yellow pages revenue, discounts, ISP revenue

25. In addition to the above, Australia also includes long distance terminating charges to the above category as this has a relationship with the DELs to be provided under USO-USO DEL. If this concept of terminating charges is applied in India too, it is likely that most of the USO DELs would become profit making. This is a subject of future consideration in the Indian context.

COMPETITIVE BIDDING

26. Another methodology for determining USO subsidy, is the bidding process. Under this methodology, an operator may be selected for providing VPTs through open competitive bidding. The lowest bidder shall be selected and financing for meeting the USO of providing VPTs should be met through the USO Fund made up by the universal access levy. However, it cannot be done at the national level i.e. only one operator to be given the responsibility of providing USO all over the country. It will have to be LDCA/SDCA level.

27. However, in the present Indian scenario, operators have been licensed to operate in a given geographical area, a Circle. Hence, the number of operators eligible to participate in the open competitive bidding would be limited to DoT, private basic operator holding a licence for that Circle and other service providers such as CMTS operators operating in the Circle, since NTP 1999 encourages other service providers to participate in USO. A new operator for providing only VPTs will not have the competitive edge, besides license complexities, the restriction on number of participants in the open competitive bidding would also have the effect of limiting competition.

28. Chile is a good example of this methodology. Universal Service program in Chile is founded on market principles through a competitive tendering process. The policy is to provide direct subsidies where market incentives are insufficient to satisfy the needs for Basic Telecommunications.

29. In Chile, each year a list of projects is drawn, which allow for the fulfilment of **community request for public payphone services** in a cost effective manner. The projects are then evaluated in order to estimate the amount of subsidy required by the private sector in implementing them. Within the budget for subsidies, a portfolio of projects is then selected to maximise the achievement of social goals. The selected projects are then granted, through a public bidding to the enterprises, which requires the lowest levels of subsidy. For each project the enterprise can decide freely on the technology to be adopted, which must be specified in the bidding document. Both the fixed line and Mobile operators are allowed to participate in the bidding process. The subsidy amount is granted only after successful completion of the project. The subsidy is given from Telecom Development Fund (TDF). This in effect means that the subsidy is direct and is funded from all tax payers.

NEGOTIATED BIDS

Recognising funding support and encouragement for Universal Service under NTP 99, some NGOs or Private sector may undertake to provide basic telecom services to rural/ remote areas on conditions, which may be negotiated with the licensor on case-to-case basis.

INCUMBENT'S / LICENSEES LIABILITY

30. In the UK, the provision of Universal Service is the liability of the incumbent i.e., British Telecom. In 1997, Oftel, the regulator, decided that BT does not bear undue burden as a national Universal service Provider. While assessing the costs of serving the

- Uneconomic customers even in profitable areas;
- Uneconomic areas; and
- Uneconomic public call boxes,

31. Oftel estimated the annual USO cost as 44 - 65 Million Pounds. Then, it assessed that BT had the following benefits as the Universal service Provider:

- Ubiquity (i.e., the increased likelihood of winning the custom of people who move out of uneconomic areas to economic areas)
- Life cycle benefits (the increased likelihood of retaining profitable customers who have been served when they were unprofitable)
- Brand image as it is seen to serve the community.

32. These benefits when converted into monetary terms ranged between 102 - 151 Million pounds. Therefore, BT was not granted any support for the purpose. However, a review of the policy has been undertaken in 1999 wherein Oftel, is of the view that the estimates of benefits have been on the higher side. The Policy is currently under review. This methodology is not applicable to India as the level of telephone penetration, teledensity, size of the nation and the USO liability is very different from that of UK. Further, from the example of UK, it can be learnt that such estimations of benefit are not likely to be accurate enough. In Japan too, the liability of USO is on the incumbent. It was not until mid 1990s that both the government and NTT raised the concern about the need for a mechanism to ensure the provision of Universal Service. A study group in the Ministry of Post and Telecommunication is dealing with the subject.

NORMATIVE METHOD

33. In this method, a certain amount may be fixed for payment as compensation for loss incurred by a service provider for each new VPT installed; the amount could be predetermined and set by the TRAI each year by considering all other related aspects, viz., capital cost of installation, operating expenses, etc., and assuming that the most cost effective technology is employed for typical areas, viz., ordinary, backward, remote, hilly, tribal, mountainous, difficult terrain etc.

34. The USO funding could be made to the concerned service providers on the basis of normated estimates of capital and operational expenditure.

35. The basis for fixing the normative values shall be to link them as closely as possible to the actual costs. Therefore, the normated estimates of capital and operational expenditure shall be made for various technological options for application in different areas as may be classified. As far as the revenue from VPTs is concerned, it can be broadly linked to the income level of a state and all those states, which have the per capita income, lower than the national average should be compensated additionally.

36. The normative method is simple in concept but could be quite complex in implementation. Also, the sustainability of VPTs may eventually become the responsibility of the administrator of the USO fund.

Replacement cost

37. Some times, the asset is to be replaced prematurely either due to its poor performance or unavailability of spares or because of a phase out policy programme. It has been observed that performance of existing analogue MARR systems has not been satisfactory. Simultaneously with providing reliable transmission media to connect rural / remote areas to the national backbone network as envisaged in NTP 99, it may be necessary that these systems are replaced either with Digital MARR or overhead lines, the latter if only a few spans are needed. Since, the definite schedule of replacement of these MARRs is not known, it is difficult to take into account the replacement cost of existing MARR systems in various cost methodologies discussed in this paper. It has also been observed that VPTs with STD facility are really not uneconomic. For, the VPTs and Rural DELs that continue to function through out the asset life period as envisaged, replacement cost has already been provided through the capital recovery, which has the element of depreciation for this purpose.

5.2 Revenue Assessment and Accounting Separation

38. While estimating, the USO fund requirement for VPTs, Rural DELs / Remote DELs, low calling urban DELs, assumptions had to be made in the absence of exact data from Service Providers. Service Providers do not have the break up of local and long distance revenues collected by them possibly due to not having the necessary service specific accounting systems in place. This has been one of the major bottlenecks in exactly estimating the USO fund.

39. It is necessary to have the revenue break up (local / STD / ISD) from VPTs, Rural DELs / Remote DELs and low calling urban DELs. Data from all FSPs would be required in a standardised format. A typical format i.e. Universal Service Provider/Contributor Worksheet is placed at <u>Annexure 5-A</u> which desires above said revenue breakup from FSPs as well as other service providers.

5.3 NTP 99 VPT Targets

40. Shared access is provided via Village Public Telephones (VPTs) in rural areas. The National Telecom Policy (NTP) envisages a minimum of one Public telephone in every village of the country by 2002. In order to meet the targets of NTP 99, DoT has chalked out a Roll-out plan for the period 2000 - 2001 and 2001-02. This plan contains the number of VPTs to be provided by DTS and the Private sector operators. DOT is providing all the VPTs in Circles other than those where BSOs have obligation to do so. The commitment as per the Rollout plan is given in <u>Table 5-A</u>.

VPT	Prior to 98	98 - 99	99 - 00	2000 - 01	2001 - 02
Targets					
DOT		45000	45136	85509	91529
Private		16755	23119	27912	27924
Total		61755	68255	113421	119453
Achieved			-		
DOT		37058	33965		
Private		Nil	12		
Total		37058	33977		
Cumulative Total	303582	340640	374617	488038	607491

Table	5-A:	VPT	Roll	out

Source: DOT, Other private FSPs

The Annual Cost and Revenue for VPTs have been calculated based on the above data.

5.4 USO Cost for VPT

5.4.1 Capital Cost

41. The cost of VPT depends upon the terrain and technology deployed. The technology wise break up of VPTs as on 31.3.2000 is as follows:

Technology	No. of VPTs	% Share
A-MARR	211313	56%
Landline	163167	44%
Satellite	15	0%
CDOT	35	0%
WLL	87	0%
	374617	100%

42. The performance of analog MARR, in the network, has been observed to be not very satisfactory. Digital technologies like Digital MARR, WLL etc. are likely to be deployed in the near future. As the deployment of new technology increases, the cost per line is expected to decline owing to economy of scale and technological developments.

43. The villages covered so far are those that had relatively less difficulties of physical access. Most of the VPTs yet to installed are in far flung areas and due to difficult accessibility and unavailability of network connectivity, the costs of provisioning are likely to be higher. The factors affecting the capital cost for installing a VPT vary significantly depending on geographic and demographic factors, existing telecom infrastructure and technology employed.

44. The capital cost estimates range between Rs. 18,000 to Rs. 2,00,000 per VPT. The estimate of Rs. 18,000 per VPT is on account of providing a VPT through GSM technology by a CMTS provider in an area where the mobile network has already been established. This only includes the incremental cost of providing a VPT (mainly comprising of the cost of a handset and relevant directly attributable incremental cost of the system).

45. The Wireline & Wireless technology break up for new VPTs to be provided in the year 2000-01 and 2001-02 by DTS is given below:

Technology	No. of VPTs
Wireline	76760
Wireless	100278

As estimated above, the cost of VPT through GSM technology by a CMTS provider may be Rs. 18000/- but depending upon the availability of base station coverage and distribution of subscriber in coverage area, the cost may go up also.

46. Further, DOT in a recent communication has stated that the average cost of providing a MARR may be taken as Rs 1.1 lakh while that of a landline may be taken as Rs 1.5 lakhs. Some of the Private operators have given an estimate of Rs 2 lakhs. The average cost of providing a VPT as indicated by some of the DTS circles is given in Table-5-B:

SSA (Circle)	Wireline	Wireline		
	Capital expenditure	Annual recurring expense	Capital expenditure	Annual recurring expense
Average from Trichy, Salem, Madurai, Tirunelveli & Thanjavur (Tamil Nadu)	55,000	NA	100,000	NA
Salem (Tamil Nadu)	55,000	1,800 (3.27%)	130,000	18,000 (13.8%)
Trichy (Tamil Nadu)	33,650 for each km distance from the exchange	4,800 (4.75% for 3 Kms)	131,385	10,800 (8.22%)
UP(west) (Uttarkashi)	25510 per Km	10000 (13%)	154388	6200 (4%)
Ernakulam	50000	5852 (11.7%)		
Punjab	32476	1883 (5.79%)	68250	5644 (8.26%)
Rajasthan	33,560 for each km distance from the exchange	NA	62,784	NA

Table 5-B: Estimates of VPT cost

47. These estimates suggest a wide range of capital costs. The perspective plan of DOT has considered an average cost of Rs 75,000 for each VPT. DOT RD Cell report has considered a cost of Rs 91,000. Therefore, for the purpose of determining the USO cost on account of VPTs, the average cost of existing VPTs has been taken as Rs 75000. For the proposed VPTs, the costs are likely to vary because of the technological advancement on one hand and remoteness of left over villages on the other. It is, therefore, pertinent to consider a range of costs between Rs 50, 000 and Rs 1 lakh for the proposed VPTs and then estimate the implication of these variations on the USO Fund.

Estimate A: Rs 50,000 Estimate B: Rs 75,000

Estimate C: Rs 100,000

48. In Bangladesh, Grameen Telecom is using Cellular technology for its Village Pay Phones (VPP) project. It costs less than half of fixed line cost. This scheme has proved to be very successful to provide rural telecom system in Bangladesh.

5.4.2 Capital recovery

49. The lump sum capital investment has to be converted into equivalent annual expenditure amounts. This amount depends upon, inter alia, the ratio of debt to equity, rate of interest on debt and return on equity, and the depreciation period. Depreciation is conceptually analogous to repayment of the principal of a loan.

50. To estimate annual cost of capital, the following parameters are taken:

Return on equity	20%
Depreciation (Straight line)	10%
Debt to equity ratio	1:1
Interest on debt	14 to 16%

51. With the above parameters, the annual recurring expenditure on the capital investment would be about 24%. DTS in their letter dated 31-5-2000, mentioned that for the time being annual cost of capital may be considered @ 22% of capital investment. Considering the above, the annual recurring expenditure is estimated @ 22% and 24% of capital investment

52. To this, the expense for operations and maintenance need to be added to obtain the overall annual cost stream.

Replacement Cost.

53. The VPTs and Rural / Remote DELs become due for replacement on age cum condition basis. The issue under consideration is how the replacement cost should be taken into account while calculating the net universal service cost. The capital recovery provided to the operator has a depreciation component, which is actually in the hands of the operator for funding the replacement. Therefore, no separate replacement cost needs to be provided through USO. However, the operating expenses for replaced VPTs will continue to be provided, at current costs, as subsequently explained in the next section.

5.4.3 Operating expenses recovery

54. The operating expenses are incurred for maintenance of an existing service. This includes Cost of O&M staff, tools and plants for maintenance and maintenance spares.

55. The estimates received from the circles have been compiled in Table 5-B. The average operating expense, in case of wireline VPT is 8%, while that of MARR is around 9% of capital cost. The weighted operating expense for the current distribution of MARR (56%) and Landline (44%), works out to 8.56%. the operating expenses for wireline VPTs, as shown in <u>Table 5-B</u> above varies between 3% to 13% and the same for MARR varies from 4% to 13.8%. By varying the operating expenses of wireline and MARR within the range given in <u>table 5-B</u>, the opex lies between 8% and 12%. In case, existing MARR due to their poor reliability and maintenance are replaced either with digital MARR or with landlines, the operating expenses will come down. A study by ICICI has estimated OPEX as 10% of capital cost. Taking all the above factors into account, operating expenses has been taken as 10% and sensitivity analysis has been done for 8% & 12% Opex. DTS in their letter dated 31-5-2000 has indicated operation & maintenance charges @ 12%.

5.4.4 Revenue for VPTs

56. Revenue Per VPT (RPV) has been calculated based on the random sample data collected from different circles.

57. The sample data considered for calculations has been obtained from the following sources:

- (1) Initially, a study on USO², based on data received from DOT for a sample of VPTs in 10 SSAs. This data has been included in our analysis.
- (2) Subsequently, information has been received form Haryana, Madhya Pradesh, Tamilnadu, Karnataka, Bihar and Rajasthan circles in respect of revenue generated from STD & NSTD VPTs employing MARR and O/H lines. It may be noted that data on revenue received from Madhya Pradesh appeared to be significantly lower and hence considering that to be an exception, it has been excluded while calculating the Revenue Per VPT.

(3) Bharti Telnet has reported an average revenue of Rs 216/- per VPT.

58. The total sample size considered for the calculation is as follows:

Sample size of VPTs

59. The total No. of VPTs as on 31st March, 2000 is 374617. A sample of 38411 VPTs has been taken, which is around 10 % of total number of VPTs. Circle wise details of the samples are given below. It can be observed that the sample size is not only sufficient but is also spread over various circles.

² ICICI study for TRAI

	Sample VPTs -	Sample VPTs -	Total
Circle	Non -STD	STD	sample
ICICI' sample covering 10 SSAs	87	6	93
Rajasthan	18110	0	18110
Bihar	44	14	58
Haryana	1247	0	1247
Tamilnadu	27	0	27
Karnataka	18876	0	18876
Weighted Average	38391	20	38411

60. Based on the above sample data the analysis has been carried out. The following factors have been considered:

(1) Technology mix - MARR and O/H

(2) STD to NSTD mix - Ratio of VPTs with STD and without STD

Technology Mix

61. Although revenue generation pattern should be independent of the technology, it has been observed that because of poor reliability of MARR (higher downtime) the revenue generated from MARR based VPTs are lower. Therefore, we have applied the ratio of MARR to O/H VPTs on the sample data to arrive at the average revenue estimates.

STD to NSTD Mix

62. There is a significant variation in the revenue generated from VPTs with and without STD facility. The ratio of STD and NSTD VPTs considered for arriving at the average RPL has been considered as 7: 93. As more STD VPTs are likely to be installed in future, NUSC has been estimated by varying this ratio to 85:15 in 2000 – 20001 and to 70:30 in 2001:2002.

Calculation of Revenue per VPT

63. Considering the above factors and the actual data provided, the weighted average of gross Revenue per VPT works out to Rs. 265 per month. The average revenue estimate provided by Bharti Telnet is Rs 216 (average of 12 nos. of VPTs). The details are given in Table 5-C. From this table it can be seen that average revenue for STD VPT is more than four times the average RPL of Non STD VPT. It implies that there is substantial revenue earning potential even in VPTs if STD facility is provided. Some of the factors for the low ratio of STD to NSTD VPTs have been observed to be the following:

- lack of reliable transmission medium
- STD facility is not available in all exchanges in rural areas at present
- high security deposit for providing the STD facility by the franchisee

- high cost of call loggers, in the absence of which, billing disputes arise
- technological limitation of 2/15 MARR systems which results in poor call completion rate

64. Apart from the above factors, one additional reason which is a limiting factor on the growth of STD VPTs in DOT is the requirement of depositing of the collected amount in treasury which are only located in District Headquarters/major centres. A delay in depositing the amount results in disconnection of VPTs. A non-functional VPT does not earn any revenue.

Overall average	NSTD Nos.	Average Monthly RPL	STD Nos.	Average Monthly RPL	Gross Monthly RPL
ICICI' sample covering various Circles	87	139	6	6051	-
Rajasthan	18110	59	NA	0	
Bihar	44	116	14	1629	
Haryana	1247	86	0	0	
Tamilnadu	27	265	0	0	
Karnataka	18876	63	0	0	
Weighted Average	38391	62	20	2956	265

Table 5-C: Average RPL calculations for VPT

If the percentage of NSTD:STD increases from 93:7 currently to 85:15 in 2000-01 and 70:30 in 2001-02, the average Gross monthly revenue per VPT would change from Rs.265 to Rs.593 in 2000-01 and to Rs.930 in 2001-02.

65. Therefore, average revenue of Rs 265 per month per VPT has been considered for arriving at the USO requirements, on account of VPTs. 25% commission is paid to VPT operator, therefore, net revenue with operator is Rs 168 per month per VPT. Three options exist:

- 1. No commission to be reimbursed from USO fund. It means total VPT revenue to be taken into account while calculating the NUSC. This option may reduce the incentive for a franchisee for providing VPT service;
- 2. The total commission to be reimbursed from USO fund. In this case, an operator may fix up higher commission charges and pass on this money to its own franchisee or subsidiary company. This will result in increase of burden on and bypass of USO fund;

3. A cap may be fixed on the commission say, 25%, which will be reimbursed from USO fund. If an operator desires to pay more commission, then that should be done from his own profit.

Average monthly RPL for non STD VPT as given in the table above is RS. 62/- which works out to be RS. 744/- on per annum basis. This is based on a sample of 38391 VPTs spread in various circles. DTS data received on 2-6-2000 indicates it to be RS 636/- per annum. Since sample size taken in the paper is more than 10% of non STD VPTs, in DTS data sample size is not given, therefore average revenue for non STD VPT is taken as Rs. 744/- per annum.

5.4.5 Net Universal Service Cost (NUSC)

66. As explained above, average unit cost of VPT and average Revenue have been calculated on the basis of sample data available from various sources. For the sake of convenience, the average VPT cost, capital recovery, operating expenses and average revenue are summarized in the table given below:

Parameter	Values considered for calculation
Average Capital cost Pre NTP 1999 VPTs	Rs 75,000
Post NTP 1999 VPTs	Rs 50,000, Rs 75,000 and Rs 1,00,000
Capital Recovery	22%, 24%
Operating expenses	8%, 10% and 12%
Average revenue per line	Rs 265 (no commission) Rs 168 (after 37.5% commission)

67. In this costing methodology, the Net Universal Service Cost has been worked out by netting off the average annual revenue from the Annual USO cost.

Net Universal Service Cost = USO Cost – Revenue generated from VPTs

- Step 1 Computation of the USO cost towards capital and operational expenditure (a)
- Step 2 Computation of the revenue generated (b)

Step 3 – Computation of the NUSC.

Net Universal Service cost on account of VPTs

68. The USO cost on account of VPTs, consists of two elements i.e., capital recovery and operational expenditure. Following cost models have been considered for capital recovery and Operating expenses recovery;

Model 1:

Only operational expenditure is considered in the USO cost for all VPTs

69. In this model, it has been considered that the capital expenditure on the VPTs will be recovered through the surplus that is generated through the long distance revenue. This is substantiated as all the operators are providing long distance services in their area of operation, either on an intra circle level or on a national level and are thus having surplus, originally mooted for this purpose while determining the long distance tariffs. Therefore, USO will compensate for only that portion of revenue loss, which the operator incurs purely on account of the low revenue pattern of VPTs. The cost model diagram is given below:



- 70. However, in an access charge regime, if it were there, this model may have a major deficiency. In the access charge regime, the long distance interconnection revenue shall compensate for the deficit on account of access only, which is the difference between access cost and rental received. In the case of VPT, as there is no rental, this model will not be applicable, but it would for the rural DELs.
- 71. The capital cost of pre NTP 99VPTs, as already explained, has been found to vary in the range of Rs 50000 to Rs 100000. However, in order to simplify the calculations the cost are VPTs has been taken as Rs 75000. Sensitivity analysis has been done by varying the cost to Rs 50,000 on the lower side and Rs 1,00,000 on the higher side for VPTs only. Similarly, for reasons given above, operating expenses @ 10% has been taken in calculations and sensitivity analysis has been done by varying it to 8% on lower side and 12% on the higher side. The detailed calculations are given in Annexure 5-B.

• 72. The summary of Net Universal service Cost using this model is given in the . <u>Table -5-D</u> below:

Table 5-D: Summary of USO calculations for VPT Model 1

	1	1	Model 1		
	S	ummary of	NUSC Requ	irement	
Capital Cost		1999 - 2000 2000 - 2001 20		2001 - 2002	
Capital cost of Opex has been and 12%.	pre NTP 99 taken as 10	VPT takes	n as Rs 75000 sitivity analys). sis has been carri	ed out for 8%
Post 99 VPT	Capital Recovery	Opex	N	USC (in Rs Cror	res)
2 and the st		8%	98.8	108.1	117.9
		10%	153.3	174.0	195.7
50000	0%	12%	207.8	239.8	.273.5
-1 -2		8%	105.6	146.7	189.9
		10%	161.8	222.2	285.7
75000	007	120%	218.0	297.6	2015
/5000	0%	1210	210.0		301.3
/5000	0%	8%	112.4	167.1	224.7
/5000	0%	8% 10%	<u>112.4</u> 170.3	167.1 247.7	<u> </u>

NUSC variation due to change in ratio of non STD and STD VPTs in the year 2000-2001 and 2001-2002 is given in the following tables:

				Model 1						
	Summer	Change in Non STD and STD VPTs ratio								
Capital Cost	N N. 1997		1999-2000 2000-2001 2001-2002 1999-200 2000-2001* 2							
Pre 99	VPT, capital cost tak	enæ Ps7	5000				-12			
Post 99 VPT capital cost	Capital Recovery	Opex	NU	NUSC (in Rs Crares)			NUSC (in Rs Crores)			
		8%	98.8	108.1	117.9	98.8	76.7	-8.9		
		10%	153.3	174.0	195.7	153.3	142.5	68.9		
50000	0%	12%	207.8	239.8	273.5	207.8	208.4	146.7		
		8%	105.6	146.7	189.9	105.6	115.2	63.1		
		10%	161.8	222.2	285.7	161.8	190.7	158.9		
75000	0%	12%	218.0	297.6	381.5	218.0	266.2	254.7		
		8%	1124	167.1	224.7	1124	135.7	97.9		
1.1		10%	170.3	247.7	329.1	170.3	216.2	2023		
100000	0%	12%	228.2	328.3	433.6	228.2	296.8	306.8		

*The ratio of non STD to STD VPTs in the year 2000-2001 is estimated 85:15

** The same ratio in 2001-2002 is estimated to be 70:30 Model 2

For VPTs existing prior to NTP 99:

73. Recovery towards only the operational expenditure

For VPTs installed after NTP 1999:

74. Recovery towards both the capital and operational expenditure

75. The rationale behind considering Model 2 is that the NTP-1999 shall cover the activities undertaken henceforth i.e. from 1999 onwards. Also investments made in the past by DoT have been made out of the surplus generated by DoT when it was the only telecom services provider in the country. Therefore the recovery of capital should not be compensated from the USO fund for the VPTs installed prior to the NTP 1999. However, since DoT would have to incur annual operational expenditure on already installed VPTs to maintain service, it needs to be compensated to the extent the annual operational expenditure, which is not met by the revenue generated from these VPTs. For VPTs installed in post 99 period, both capital recovery and operating expenses have to be compensated from USO fund in accordance with NTP 99. The tariff revision exercise of TRAI shall take this into account so that operators do not get double compensation both from USO fund as well as the margins in tariffs for compensating access deficit.

76. The cost model diagram is given below:



77. The Capital cost of VPT and operating expenses has been taken as explained in Model 1 above. The capital recovery has been taken into account at the rate of 22% and 24%. Working with the figures of costs and revenue discussed earlier, the cost of USO for VPTs has been estimated and is summarised in the Table-5-E

78. The summary of Net Universal service Cost using this model is given in the Table 5-E below: \cdot

	Summary	y of NUSC	Requirement		-
Capital Cost			1999 - 2000	2000 - 2001	2001 - 2002
Pre 99 VPT 75000				× .	
Post 99 VPT	Capital Recovery	Opex	N	USC (in Rs Cro	res)
		8%	139.6	285.0) 438.2
		10%	194.1	350.9	515.9
	24%	12%	248.6	416.	593.7
		8%	136.2	270.3	411.5
		10%	190.7	336.	489.3
50000	22%	12%	245.2	402.0	567.0
		8%	166.8	439.3	2 726.2
		10%	223.0	514.	7 821.9
	24%	12%	279.2	590.3	917.7
		8%	161.7	414.9	681.5
2		10%	217.9	490.3	3 777.3
75000	22%	12%	274.1	565.	8 873.0
		8%	194.0	520.9	865.1
		10%	251.9	601.4	4 969.6
	24%	12%	309.8	682.0	0 1074.1
	A COMPANY OF A COMPANY	8%	187.2	491.4	4 811.8
Contractor Al	and the second second	10%	245.1	572.0	916.2
100000	22%	12%	303.0	652.	5 1020.7

Table 5-E: Summary of USO calculations for VPT Model 2

79. The detailed work sheets for both the Models are placed at <u>Annexure 5-B & 5-C</u> respectively.

80. The above models suggest an approach to work out Net Universal service Cost estimates. These figures should be calculated every year based on actual data and it is also suggested that averaging of cost and revenue should be done at Circle level as explained earlier. The impact of increase in NSTD:STD ratio from 93:7 to 85:15 in 2000-01 to 70:30 in 2001-02 is tabulated below:

			-	Model 2				
	Summary o	f NUSC	Requirement	t		Change in	nonSTD and S	TD VPTs ratio
Capital Cost			1999 - 2000	2000 - 2001	2001 - 2002	1999 - 2000	2000 - 2001*	2001 - 2002**
Pre 99 vpt 75000								
Post 99 VPT	Capital Recovery	Opex	NU	JSC (in Rs Cro	ores)	N	USC (in Rs Cr	ores)
		8%	139.6	285.0	438.2	139.6	240.4	298.2
		10%	194.1	350.9	515.9	194.1	306.2	376.0
	24%	12%	248.6	416.7	593.7	248.6	372.1	453.8
		8%	136.2	270.3	411.5	136.2	225.6	271.5
		. 10%	190.7	336.1	489.3	190.7	291.5	349.3
50000	22%	12%	245.2	402.0	567.0	245.2	357.3	427.1
	24%	8%	166.8	439.2	726.2	166.8	394.6	5 586.2
		10%	223.0	514.7	821.9	223.0	470.1	682.0
		12%	279.2	590.2	917.7	279.2	545.5	5 777.8
		8%	161.7	414.9	681.5	161.7	370.2	541.5
		10%	217.9	490.3	777.3	217.9	445.7	637.3
75000	22%	12%	274.1	565.8	873.0	274.1	521.2	733.1
	about the second second	8%	194.0	520.9	865.1	194.0	476.2	2 725.2
		10%	251.9	601.4	969.6	251.9	556.8	8 829.6
	24%	12%	309.8	682.0	1074.1	309.8	637.4	934.1
		8%	187.2	491.4	811.8	187.2	446.7	671.8
		10%	245.1	572.0	916.2	245.1	527.3	3 776.3
100000	22%	12%	303.0	652.5	1020.7	303.0	607.9	880.7

*The ratio of non STD to STD VPTs in the year 2000-2001 is estimated 85:15 ** The same ratio in 2001-2002 is estimated to be 70:30

5.5 USO cost for Rural DELs

81. Rural DELs are telephone connections provided on ownership basis in the rural areas. It is different from VPT in the sense that for Rural DELs, a subscriber pays a fixed rental as against a VPT, which is a public payphone. The total number of Rural DELs as on 31.03.2000 is 4417624.

5.5.1 Number of Rural DELs

82. The exact number of rural DELs for the year 1996 to 2000 has been taken from the information provided by DoT. The percentage of rural DEL has been observed to be 16.5 per cent of total DELs for the period 1996 to 2000. Assuming the same ratio for Rural DELs to Total number of DELs, the number of rural DELs from 1987 to 1994 has been estimated for each year. The future projection of rural DELs has been

based on the targets set by NTP 99. The targets laid down by NTP 99 stipulates that the telephone density should reach 7% by 2005 and shall be 15% by2010 and target for Rural Tele – density is 4% by the year 2010. The number of DELs required to meet the teledensity targets will depend upon the population of the country in the year 2005 and 2010. 1991 Census has projected the population till 2010.

83. These details have been worked out in <u>Table 3-C</u> of Chapter 3 where number of rural DELs have been calculated to achieve these targets of NTP 99.

5.5.2 Capital Cost:

84. The capital investment on local network is available for the year 1992 to 1998 from DoT. From this investment and the number of DELs installed in each year the average capital cost per DEL can be calculated. From the sample estimates of SSAs of DOT and the estimates provided by private operators, the average cost of rural DEL comes to 40% higher than urban DEL cost.

Cost per Rural DEL

Available data: Cost per DEL and Number of Rural DELs as explained above.

85. The mathematical expression for calculating cost of Rural DEL is as follows:

$$Cu X Du + Cr X Dr = C X D \dots (i)$$

where,

D	Total Number of DELs
Dr	Number of Rural DELs
Du	Number of Urban DELs
С	Avg Cost per DEL
Cr	Avg Cost per Rural DEL
Cu	Avg Cost per Urban DEI

Cost of an Urban DEL on an average is equal to 1.4 times Rural DELs. Therefore,

Cr = 1.4 X Cu(ii)

Further, the number of Rural DEL is estimated as 16.5% of total number of DELs

Dr = 0.165 X D(iii)
Du = 0.835 X D(iv)
D = Dr + Du	(V)

Solving the above equations, we get

86. Thus the average cost of a rural DEL is 30% higher than the national average cost per line.

5.5.3 Capital Recovery

87. Capital recovery percentage shall be same as that for VPT i.e. 24% with a sensitivity analysis for 22%.

5.5.4 Operating Expenses Recovery

88. DOT estimates the annual operating expense on its operations as 10% of the capital expenditure. From the data available in Annual reports of DOT, the average expenditure on operations is observed to be in the range of $10 \sim 12$ % of the total expenditure as tabulated below:

	1995 -96	1996 - 97	1997 - 98
Operational Expenditure	608.2	685.6	896.2
Total Expenditure	4924.9	6767.4	8393.6
Percentage Expenditure	12.3	10.1	10.7

As the total expenditure and the operational expenditure includes elements other than just local, it is likely that this percentage would vary a little. In a report on USO^3 , it has been estimated that this percentage does not vary much over the Rural and Urban areas. It is so because the capital expenditure per DEL is higher than that of Urban. Therefore, in absolute money terms, the operational investment has been estimated 40% higher in case of Rural DELs when compared with Urban DELs. In the calculations here, the opex has been taken as 10% and sensitivity analysis has been carried out for an opex of 8% and 12%.

89. Currently, the Rural network is largely based on wireline and Analog Radio. With the advent of other technologies, the situation is going to change in near future. Technologies like Digital radio, WLL, VSAT etc. may be deployed in future for which operating expenses is likely to be comparatively lower. While reviewing the operating expenses these factors may be kept in mind. The operating expenses may be taken depending upon the maintenance requirement of each technology.

5.5.5 Revenue for Rural DEL

³ ICICI Report for TRAI

90. The revenue accruing from Rural DELs was not separately available. In the absence of data, estimations have been made based on samples available.

Estimate 1

Average revenue of Rs. 4597 per rural DEL per annum has been arrived at from a sample study of 10 SSAs.

Estimate 2

91. For assessing the average revenue per rural DEL for the nation, the following principle has been used.

Data Available:

- 1) Total Number of DELs, circle wise
- 2) Total Number of Rural DELs and Urban DELs, circle wise
- 3) Actual Revenue for each SDCA of Karnataka Circle
- 4) Total revenue for each circle.

92. Since actual revenue for each SDCA of Karnataka Circle was available, revenue for all the rural areas of Karnataka was calculated by subtracting the revenue of urban areas from the total revenue. With this the ratio of rural revenue to urban revenue for Karnataka was calculated. With the ratio of no. of rural DEL to no. of urban DEL already available for each Circle and with the revenue ratio for Karnataka as calculated above, the rural revenue for each Circle has been calculated.

93. The average Rural Revenue per DEL for the nation comes to Rs 4724 per annum. The detailed calculation is given in the Table 5-F:

State	Number of DELs (as on 31.3.1998)	Urban DELs	Rural DEL as on 31.03.1998	Ratio of Rural DEL to Urban DEL	Ratio of Rural Rev to Urban Rev	Total Revenue (in lakhs)	Rural Revenue (in lakhs)
A&N	8272	5475	2797	0.5	0.3	690	151.4
AP	1167419	912183	255236	0.3	0.2	113904	15193.0
Assam	161531	130655	30876	0.2	0.1	126	14.5
bihar	399093	. 330580	68513	0.2	0.1	30452	3116.3
Guj	1292440	1044063	248377	0.2	*0.1	117160	13557.3
Har	428395	350222	78173	0.2	0.1	32210	3522.3
HP	181886	84716	97170	1.15	0.6	7500	2901.4
JK	89362	75636	13726	0.2	0.1	8103	735.5
Karnataka	1227683	954139	273544	0.3	0.2	119164	16232.3
Kerala	1084019	569001	515018	0.9	0.5	65703	21839.0
Mah	1529555	1174611	354944	0.3	0.2	130321	18574.5
MP	800784	618346	182438	0.3	0.2	59154	8259.8
NE	116479	95639	20840	0.2	0.1	7507	803.5
OR	266098	201707	64391	0.3	0.2	17356	2592.5
Pun	890495	769947	120548	0.1	0.1	67300	5336.4
Raj	755560	573886	181674	0.3	0.2	54706	8113.4
TN	1165806	993838	171968	0.1	0.1	91488	7951.1
UP(W)	654547	587681	66866	0.1	0.1	51301	3021.7
UP(E)	686212	564062	122150	0.2	0.1	48986	5214.1
WB	314426	196158	118268	0.6	0.3	16136	4018.7
Total	13220062		2987517			1039267	141148.4

Table 5-F: Calculation of RPL for Rural DELs

Rural Revenue Estimation

Average Revenue per Rural Del (in Rupees) Rs 4724.6 per annum.

The revenue for the calculations has been taken as Rs 4724 per annum per Rural DEL. DTS vide their letter dated 31-5-2000 has indicated that on the basis of information available for 15 telecom circles the cumulative average revenue per annum works out to be Rs. 2232/-. The revenue per rural DEL is likely to be in the range of Rs 2232 to Rs 4724.

5.5.6 Net Universal Service Cost of Rural / Remote DELs

94. With the growth in economy of the country, it is estimated that rural DEL revenue will not remain constant in the times to come. It is assumed that rural DEL revenue may increase @ 5% every year.

95. The USO cost for Rural DELs comprise of two elements i.e., capital recovery and operational expenditure. Various cost models have been considered upon the capital recovery and Operating expenses;

Model 1: Only operational expenditure is considered in the USO cost for all Rural DELs.

The details of this model have already been explained in VPTs case.

٠.

The detailed estimates for the years 1999 ~ 2007 are given in Table 5-G below:.

Table 5-G : Summary of NUSC for Rural / Remote DELs - Model 1

		NUSC Amount in (Rs Crores)									
Model 1		99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07		
	8%	-841.4	-1069.9	-1357.9	-1719.8	-2173.3	-2740.6	-3448.6	-4		
	10%	-596.3	-782.6	-1021.7	-1326.7	-1714.3	-2204.8	-2823.7			
Capital Recovery 0%	12%	-351.2	-495.4	-685.5	-933.7	-1255.2	-1669.0	-2198.8	-2		
Rural Revenue = Rs 2232 (as per DOT)											
Model 1	-	99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~0		
Capital Recovery	Opex										
0%	8%	259.5	270.9	275.3	269.4	249.5	210.5	145.7			
	10%	504.6	558.2	611.5	662.5	708.6	746.2	770.6			
	12%	749.7	845.5	947.7	1055.5	1167.6	1282.0	1395.6			

96. This indicates that if only operating expenses are taken for all Rural / Remote DELs, then they become profitable and there is no need of any compensation from USO.

60

Model 2:

For Rural DELs existing prior to NTP 99: Recovery towards only the operational expenditure

For Rural DELs installed after NTP 1999:

Recovery towards both the capital and operational expenditure

97. Working with this model the USO amount in respect of Rural / Remote DELs works out to be as given in Table 5-H below:

					NUSC (in	Crores)	1.00		7
lodel 2	1	99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
apital Recovery	Opex								
24%	8%	-627.538	-306.974	32.42364	390.9998	764.4308	1146.108	1526.433	1906.161
	10%	-390.831	-30.1506	354.7109	765.7945	1199.888	1651.669	2113.026	2581.687
	12%	-154.124	246.6728	676.9982	1140.589	1635.346	2157.229	2699.619	3257.214
22%	8%	-670.248	-400.937	-120.845	169.1097	463.1383	752.9389	1026.954	1283.67
	10%	-433.541	-124.114	201.4426	543.9044	898.5957	1258.5	1613.547	1959.197
	12%	-196.834	152.7095	523.7299	918.6992	1334.053	1764.061	2200.14	2634.723
Pural Revenue = Rs 2232 (as per DOT)									
lodel 2		99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
apital Recovery	Opex								
24%	8%	473.3343	1033.888	1665.594	2380.201	3187.278	4097.134	5120.784	6284.081
	10%	710.0411	1310.711	1987.881	2754.995	3622.735	4602.695	5707.377	6959.608
	12%	946.7478	1587.535	2310.168	3129.79	4058.192	5108.256	6293.97	7635.135
22%	8%	430.6242	939.9247	1512.325	2158.311	2885.985	3703.965	4621.305	5661.59
	10%	667.331	1216.748	1834.613	2533.105	3321.442	4209.526	5207.898	6337.117
	12%	904.0377	1493.572	2156.9	2907.9	3756.9	4715.087	5794.491	7012.644

Table 5-H: Summary of NUSC for Rural / Remote DELs Model -2

Model 3:

For all the Rural DELs

Recovery towards both the capital and operational expenditure. Both Capiatl recovery and operational expenditure have been taken at current cost of rural DELs.
In this model both capital recovery as well as operating expenses have been 98. provided for the rural DELs. In case of VPT even before NTP 99 there were specific targets to cover the villages and accordingly it was presumed that the cost of providing VPTs shall be taken care of in the revenue stream emanating from other services. However, in case of rural DEL there were no such specific targets before NTP 99 and it was only in NTP 99 that rural tele-density of 4% in year 2010 has been defined. Considering this aspect, this model has been worked out to take into account capital recovery and operating expenses on all rural DELs. Taking into account the opportunity cost provided by the incumbant operator this expenditure could have been done otherwise in more revenue earning services. On the contrary, the argument can be taken that this was a social obligation of the monopoly operator to provide these services nationwide to given it wider coverage. Secondly the private service providers in this model will be asked to compensate for those policies and programmes which were executed even before the liberalisation of telecom sector in the country.

99. Working with this model the USO amount in respect of Rural / Remote DELs would be as given in Table 5-I below:

Model 3					1.1.1	1.000			
		99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
Capital Recovery	Opex	1	2000	100000	1				a contraint
24%	8%	1421.3	1685.2	1938.8	2182.1	2412.1	2564.6	2737.4	2846.3
	10%	1658.1	1962.1	2261.0	2556.9	2847.5	3070.2	3324.0	3521.9
	12%	1894.8	2238.9	2583.3	2931.7	3283.0	3575.7	3910.6	4197.4
22%	8%	1207.9	1425.3	1626.6	1811.0	1973.5	2053.2	2137.0	2145.5
	10%	1444.6	1702.1	1948.9	2185.8	2408.9	2558.8	2723.6	2821.0
	12%	1681.3	1978.9	2271.2	2560.6	2844.4	3064.4	3310.2	3496.6
Rural revenue = Rs 2	232 (as pe	DOT)							
Model 3									
and the second second		99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
Capital Recovery	Opex								
24%	8%	2522.2	3026.1	3571.9	4171.3	4834.9	5515.6	6331.7	7224.3
	10%	2758.9	3302.9	3894.2	4546.1	5270.4	6021.2	6918.3	7899.8
	12%	2995.6	3579.8	4216.5	4920.9	5705.8	6526.8	7504.9	8575.3
22%	8%	2308.8	2766.1	3259.8	3800.2	4396.3	5004.3	5731.3	6523.4
	10%	2545.5	3043.0	3582.1	4175.0	4831.8	5509.8	6317.9	7198.9
	12%	2782.2	3319.8	3904.4	4549.8	5267.2	6015.4	6904.5	7874.5

Table 5-I : Summary of USO calculations for Rural DEL Model - 3

Model 4

100. This model is similar to Model 3, except for the fact that the capital recovery on pre NTP 99 Rural DELs, have been taken on the historical cost.

101. The operating expenses have been provided at current costs of rural DELs. The reimbursement of operational expenses from Universal Service Fund that would have been incurred had those DELs been provided in the current year.

Model 4									
		99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
Capital Recovery	Opex								
24%	8%	1917.808	2115.524	2307.956	2473.521	2627.597	2708.947	2813.094	2876.719
	10%	2154.515	2392.347	2630.243	2848.316	3063.054	3214.508	3399.687	3552.246
	12%	2391.222	2669.171	2952.531	3223.111	3498.512	3720.069	3986.28	4227.773
22%	8%	1662.986	1819.686	1965.06	2078.088	2171.041	2185.542	2206.393	2173.348
	10%	1899.693	2096.509	2287.347	2452.883	2606.498	2691.103	2792.986	2848.875
	12%	2136.399	2373.333	2609.635	2827.677	3041.955	3196.663	3379.579	3524.402
Rural revenue = Rs	2232 (as p	er DOT dat	a)						
Model 4			·						
Capital Recovery	Opex	99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
24%	8%	3018.7	3456.4	3941.1	4462.7	5050.4	5660.0	6407.4	7254.6
	10%	3255.4	3733.2	4263.4	4837.5	5485.9	6165.5	6994.0	7930.2
	12%	3492.1	4010.0	4585.7	5212.3	5921.4	6671.1	7580.6	8605.7
22%	8%	2763.9	3160.5	3598.2	4067.3	4593.9	5136.6	5800.7	6551.3
	10%	3000.6	3437.4	3920.5	4442.1	5029.3	5642.1	6387.3	7226.8
	12%	3237.3	3714.2	4242.8	4816.9	5464.8	6147.7	6973.9	7902.3

The NUSC assessment from this Model is summarised in <u>Table 5-J</u>. Table 5-J: Summary of NUSC calculations for rural DEL Model - 4

As indicated in para no. 93, the average rural DEL revenue worked out by DTS is Rs. 2232/- per annum The detailed NUSC calculation for all four models, for rural DELs, have been given in Annexure 5-D to 5-G. So far rural DEL revenue has been taken as a constant figure for calculation of NUSC but with growth in GDP, it is assumed that rural DEL revenue may be increased by 5%. The calculation for NUSC for rural/ remote DELs with 5% increase in revenue are given in <u>Table 5-J-1</u>.

Table 5-J-1: Summary of NUSC with 5% increase in Rural DEL revenue

1	99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
Model 1	-596.3	-893.6	-1298.7	-1845.	6 -2578.3	-3554.1	-4846.7	-6551.8
Model 2	-390.8	-157.2	37.4	171.	4 210.1	106.1	-204.3	-796.9
Model 3	390.8	157.2	-37.4	-171.	4 -210.1	-106.1	204.3	796.9
Model 4	2154.5	2265.3	2312.9	2253.	9 2073.3	1668.9	1082.4	173.7

5.6 NUSC calculation for low calling urban subscribers

99. A significant number of urban subscribers are low callers. These subscribers do not make enough calls to fall in the profit-giving category. NTP 99 stipulates provision of access to all people for basic telecom services at affordable and reasonable prices and provision of telephone on demand in urban and rural areas by 2002. No distinction is made between high and low calling subscribers for provision of service.

5.6.1 Classifying the Low Callers

100. NTP 99 as well as the DOT reference does not define the benchmark or threshold to characterize low calling urban subscribers. For the present, based on the current calling pattern, the limit of 400 calls monthly has been considered as one of the options for classifying an urban subscriber as low calling urban subscribers. The other definition is as per the Telecom Tariff Order, 1999 of TRAI, which classifies all the callers who make less than 500 calls per month as a Low Urban Caller. Although estimation of NUSC has been done for low calling urban subscribers with the definition of DOT (upto 200 metered calls per month) as well as per definition of TTO '99 (upto 500 metered calls per month) but TRAI defines low calling urban subscriber as per TTO'99.

5.6.2 Estimation of costs

101. The cost of providing an Urban DEL has been calculated using the methodology that is similar to Rural DELs. The number of DELs has been taken from the data available in Annual Reports of DOT and its Perspective Plan (1997 – 2007). The annual recurring expenditure comprising of capital recovery@24% (22%) on the investments and operational expenditure has been considered. DOT has indicated annual recurring expenditure on capital investment @ 22%. Four Models have been considered for low calling urban DELs as well. The economic life of the DEL has been taken as 10 years and hence the depreciation rate considered is 10%. After, expiry of its life (10 years), these DELs would be replaced from the depreciation amount already provided for in the capital recovery. However, the operational expenses have been considered to cover the costs of operation.

5.6.3 Estimation of Revenue

Revenue earned from the subscriber comprises of rentals and call charges.

5.6.4 Estimation of average rental

102. The rental for low calling urban subscribers depends upon the size of the exchange one is connected to and also on the tariff package applicable (200 calls p.m. and 500 calls p.m.). The percentage of subscribers connected to the exchanges in the urban areas (i.e., the exchanges with more than 1000 lines) is available for DTS as shown in Table 5-K :

Exchange Lines	Percentage of subscribers (A)	Bi - Monthly Rental (in Rs) (B)	Free Calls (Bi- Monthly)
1000 - 29999	14.29	200	150
30000 - 99999	20.42	275	150
1 lakh - 2.99 lakh	17.36	360	150
> 3 lakhs	32.62	380	150

Table 5-K-1: Estimate of revenue from low Urban caller (200 calls p.m.)

103. The balance are connected to exchanges with less than 1000 lines capacity. They have been classified as rural subscribers and hence are not shown in this table. From <u>Table 5-K</u>, the average rental per low calling urban caller has been calculated using the formula: -

Average Rental per low calling Urban Subscriber =

 $\Sigma (A X B)$ ΣA

where,

A is Percentage of subscribers in the designated slab (Exchange capacity) B is Bi - Monthly Rental (in Rs)

The average rental comes to Rs 320 bi-monthly.

If the low calling Urbans Subscribers are classified as those less than 500 calls (TTO 99), then the average rental comes to Rs 422 bi-monthly.

Exchange Lines	Percentage of subscribers (A)	Bi - Monthly Rental (in Rs) (B)	Free Calls (Bi- Monthly)
1000 - 29999	14.29	240	120
30000 - 99999	• 20.42	360	120
> 1 lakh	49.98	500	120

Table 5-K-2: Estimate of revenue from low Urban callers (500 Calls p.m.)

5.6.5 Revenue from Call Charges

Call Charges estimate

The percentage of Subscribers in various slabs (Source: DOT) are given in the table below:

			200 calls pe	er month	500 Calls per month	
Bimonthly Slabs	%age of Subscribers	Average Number of Calls	Payable Calls	Total Revenue	Payable Calls	Total Revenue
Nil	5.65	0	0	0	0	0
1 to 50	3.36	43.5	0	0	0	0
51 to 75	1.81	65.25	0	0	0	0
76 to 100	2.22	87	0	0	0	0
101 to 120	2.08	104.4	0	0	0	0
121 to 150	3.31	130.5	0	0	11	11
151 to 200	6.14	174	24	19.2	54	54
201 to 400	21.18	292	142	113.6	172	172
401 to 500	7.72	450		1	330	330
501 to 1000	20.98	710			590	590

The Call charges in the respective slabs are as per the prevalent nature of distribution given by DOT.

DTS classifies the low calling Urban subscribers as those making less than 200 calls per month. The TTO 99 classifies the Low calling Urbans as those making less than 500 calls per month. NUSC has been calculated for both the estimates.

105. Based on the above call distribution the revenue has been calculated for each low calling urban DELs.

The Average revenue per urban Low caller

= Average Rental + Call Charges Revenue from low calling urban subscribers

5.6.6 Summary of NUSC Calculations for Low Calling Urban DELs

106. The NUSC requirement for the low calling urban subscribers using the four Models described earlier. The summary of the calculations is given in <u>Table</u> <u>5-L</u> below:

Model 1 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Recor 09-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Recor 09-00 00-01 10966 1255.9 1435.8 1638.1 1869.9 2008.8 2155.1 0% 122% 1635.6 1485.0 7230.2 230.0 279.4 2616.5 2848.4 3020.9 0% 122% 1635.6 1485.0 7230.2 230.0 73363.0 3338.0 4303.0 4030.7 0% 12% 1655.6 1485.0 7280.4 249.0 536.0 400.0 56.0 6-07 0 <t< th=""><th>Summary of I</th><th>Low Calling Urban Ca</th><th>ller NUSC</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	Summary of I	Low Calling Urban Ca	ller NUSC							
Model 1 99-00 00-01 01-02 02-03 03-04 04-05 05-06 05-06 05-06 Capital Recor Opex 8% 966.0 1036.6 1255.9 1435.8 1638.1 1864.9 2008.8 2155.1 10% 1255.9 1485.0 1722.8 1983.0 2279.4 2516.5 2848.4 3022.9 0% 12% 1635.8 1883.4 2189.7 2530.2 2320.7 3388.0 4030.7 1						Amount of N	USC requin	ed (in Rs O	rores)	
Capital Recol Opex	Model 1		99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
8% 966.0 1066.6 1255.9 1445.8 1633.1 1864.9 2003.6 2156.5 0% 12% 1655.8 1883.4 2189.7 2303.2 2207.7 3383.0 3082.0 4000.7 10% 12% 1655.8 1883.4 2189.7 2302.2 2207.7 3388.0 4000.7 10% 12% 1655.8 1883.4 2189.7 2302.2 2207.7 3388.0 4007.7 10% 10.7 </td <td>Capital Reco</td> <td>Opex</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Capital Reco	Opex								
10% 1285.9 1485.0 1722.8 1983.0 2279.4 2616.5 2848.4 3022.9 0% 12% 1635.8 1883.4 2188.7 2530.2 230.7 3388.0 3388.0 4030.7 1		8%	956.0	1096.6	1255.9	1435.8	1638.1	1864.9	2008.8	2155.1
0% 12% 1635.8 1883.4 2189.7 2530.2 2920.7 3368.0 3668.0 4030.7 Model 2		10%	1295.9	1495.0	1722.8	1983.0	2279.4	2616.5	2848.4	3092.9
Model 2 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Reco Opex	0%	12%	1635.8	1893.4	2189.7	2530.2	2920.7	3368.0	3688.0	4030.7
Model 2 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Reco Opex -										
99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Reco 0pex 111.7 776.6 1526.7 2369.9 3313.8 4365.4 5196.3 6060.9 24% 10% 451.5 1174.9 1993.6 2917.1 3955.1 5116.9 6055.9 9698.7 24% 10% 46.0 635.4 1297.1 2036.7 2859.1 3768.4 4473.6 5198.1 22% 10% 335.9 1033.8 1764.0 2583.9 330.4 451.9 5313.3 6135.9 12% 725.8 1432.2 2230.9 3131.1 4141.7 5271.5 6152.9 7073.8 Model 3 117% 299-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 299-00 00-01 01-02 02-03 03-04 04-05 05-06 6627.9 7087.3 7587.1 24% 10% 22897.8 3496.	Model 2									-
Capital Paco Opex m			99~00	00-01	01~02	02~03	03~04	04~05	05~06	06~07
8% 111.7 776.6 1526.7 2369.9 3313.8 4366.4 5196.3 6000.9 24% 10% 451.5 1174.9 1993.6 2917.1 3955.1 5116.9 6035.9 6998.7 12% 791.4 1573.3 2460.5 3464.3 4596.4 5868.5 6875.5 7936.6 8% 460.0 653.4 1297.1 2036.7 2859.1 3768.4 4473.6 5198.1 22% 10% 385.9 1033.8 1764.0 288.9 3600.4 4519.9 513.3 6152.9 7073.8 Model 3 - <td>Capital Reco</td> <td>Opex</td> <td></td> <td></td> <td></td> <td>1.</td> <td></td> <td></td> <td></td> <td></td>	Capital Reco	Opex				1.				
24% 10% 451.5 1174.9 1993.6 2917.1 3955.1 5116.9 6035.9 6998.7 12% 791.4 1573.3 2460.5 3464.3 4596.4 5868.5 6875.5 7936.6 8% 46.0 635.4 1297.1 2036.7 2889.1 3788.4 4473.6 5198.1 22% 10% 385.9 1033.8 1764.0 2583.9 3500.4 4519.9 5313.3 6135.9 12% 725.8 1432.2 2230.9 3131.1 4141.7 5271.5 6152.9 7073.8 Model 3		8%	111.7	776.6	1526.7	2369.9	3313.8	4365.4	5196.3	6060.9
12% 791.4 1573.3 2460.5 3464.3 4596.4 5868.5 6875.5 7366.6 8% 46.0 635.4 1297.1 2036.7 2859.1 3768.4 4473.6 5198.1 22% 10% 385.9 1033.8 1764.0 2883.9 3500.4 4519.9 5313.3 6135.9 12% 725.8 1432.2 2230.9 3131.1 4141.7 5271.5 6152.9 7073.8 Model 3	24%	10%	451.5	1174.9	1993.6	2917.1	3955.1	5116.9	6035.9	6998.7
8% 46.0 6635.4 1297.1 2036.7 2859.1 3768.4 4473.6 5198.1 22% 10% 385.9 1033.8 1764.0 2583.9 3500.4 4519.9 5313.3 6135.9 12% 725.8 1432.2 2230.9 3131.1 4141.7 5271.5 6152.9 7073.8 Model 3 4473.6 5198.1 Capital Reco Opex 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 8% 2898.8 3496.5 4167.9 4891.8 5675.6 6527.9 7087.3 7587.1 24% 10% 3238.7 3894.8 4634.8 5439.0 6317.0 7279.5 7927.0 8524.9 12% 3578.6 4233.2 5101.7 5986.2 6958.3 8031.0 8766.6 9462.8 22% 10% 2940.8 3527.1 4185.1 4895.6 </td <td></td> <td>12%</td> <td>791.4</td> <td>1573.3</td> <td>2460.5</td> <td>3464.3</td> <td>4596.4</td> <td>5868.5</td> <td>6875.5</td> <td>7936.6</td>		12%	791.4	1573.3	2460.5	3464.3	4596.4	5868.5	6875.5	7936.6
22% 10% 385.9 1033.8 1764.0 2583.9 3600.4 4519.9 5313.3 6135.9 12% 725.8 1432.2 2230.9 3131.1 4141.7 5271.5 6152.9 7073.8 Model 3		8%	46.0	635.4	1297.1	2036.7	2859.1	3768.4	4473.6	5198.1
12% 725.8 1432.2 2230.9 3131.1 4141.7 5271.5 6152.9 7073.8 Model 3	22%	10%	385.9	1033.8	1764.0	2583.9	3500.4	4519.9	5313.3	6135.9
Model 3 Model 4 Model 3 Model 3 Model 3 Model 3 Model 3 Model 4 Model 4 Model 3 Model 3 Model 3 Model 3 Model 3 Model 4 Model 3 Model 3 Model 3 Model 3 Model 3 Model 3 Model 4 Model 3 Model 4 Model 3 Model 4 Model 3 Model 3 Model 4 Model 4 <t< td=""><td></td><td>12%</td><td>725.8</td><td>1432.2</td><td>2230.9</td><td>3131.1</td><td>4141.7</td><td>5271.5</td><td>6152.9</td><td>7073.8</td></t<>		12%	725.8	1432.2	2230.9	3131.1	4141.7	5271.5	6152.9	7073.8
Capital Recor Opex 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 8% 2898.8 3496.5 4167.9 4891.8 5675.6 6527.9 7087.3 7587.1 24% 10% 3238.7 3894.8 4634.8 5439.0 6317.0 7279.5 7927.0 8524.9 12% 3578.6 4293.2 5101.7 5986.2 6958.3 8031.0 8766.6 9462.8 8% 2601.0 3128.7 3718.2 4348.4 5024.2 5750.7 6207.1 6597.1 22% 10% 2940.8 3527.1 4185.1 4895.6 5665.5 6502.2 7046.7 7534.9 12% 3280.7 3925.4 4662.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4	Model 3									
8% 2898.8 3496.5 4167.9 4891.8 5675.6 6527.9 7087.3 7587.1 24% 10% 3238.7 3894.8 4634.8 5439.0 6317.0 7279.5 7927.0 8524.9 12% 3578.6 4293.2 5101.7 5996.2 6958.3 8031.0 8766.6 9462.8 8% 2601.0 3128.7 3718.2 4348.4 5024.2 5750.7 6207.1 6597.1 22% 10% 2940.8 3527.1 4185.1 4895.6 5665.5 6502.2 7046.7 7534.9 12% 3280.7 3925.4 4652.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4	Capital Reco	Opex	99-00	00-01	01~02	02~03	03~04	04~05	05~06	06-07
24% 10% 3238.7 3894.8 4634.8 5439.0 6317.0 727.9.5 7927.0 8524.9 12% 3578.6 4293.2 5101.7 5986.2 6958.3 8031.0 8766.6 9462.8 8% 2601.0 3128.7 3718.2 4348.4 5024.2 5750.7 6207.1 6597.1 22% 10% 2940.8 3527.1 4185.1 4895.6 5665.5 6502.2 7046.7 7534.9 12% 3280.7 3925.4 4652.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4		8%	2898.8	3496.5	4167.9	4891.8	5675.6	6527.9	7087.3	7587.1
12% 3578.6 4293.2 5101.7 5986.2 6958.3 8031.0 8766.6 9462.8 8% 2601.0 3128.7 3718.2 4348.4 5024.2 5750.7 6207.1 6597.1 22% 10% 2940.8 3527.1 4185.1 4895.6 5665.5 6502.2 7046.7 7534.9 12% 3280.7 3925.4 4652.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03	24%	10%	3238.7	3894.8	4634.8	5439.0	6317.0	7279.5	7927.0	8524.9
8% 2601.0 3128.7 3718.2 4348.4 5024.2 5750.7 6207.1 6697.1 22% 10% 2940.8 3527.1 4185.1 4895.6 5665.5 6502.2 7046.7 7534.9 12% 3280.7 3925.4 4652.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4		12%	3578.6	4293.2	5101.7	5986.2	6958.3	8031.0	8766.6	9462.8
22% 10% 2940.8 3527.1 4185.1 4895.6 5665.5 6502.2 7046.7 7534.9 12% 3280.7 3925.4 4652.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 8% 3689.644 4194.54621 4774.019949 5413.078101 6088.8642 6835.7138 7310.7999 7689.9138 24% 10% 4029.528 4592.91139 5240.916429 5960.281711 6730.1703 7587.2848 8150.4315 8627.7364 12% 4369.412 4991.27658 5707.81291 6507.485321 7371.4765 8338.8557 8990.0631 9565.559 8% 3325.847 3768.60668 4273.851887 4826.271007 5402.9376 6032.8499 6411.9479 6691.3514 22% 10% 3665.731 4166.97186 4740.748367 5373.474617		8%	2601.0	3128.7	3718.2	4348.4	5024.2	5750.7	6207.1	6597.1
12% 3280.7 3925.4 4652.0 5442.8 6306.8 7253.8 7886.4 8472.8 Model 4 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 99-00 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital 99-00 99-00 99-00 99-00 99-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00 90-00	22%	10%	2940.8	3527.1	4185.1	4895.6	5665.5	6502.2	7046.7	7534.9
Model 4 99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Recovery Opex		12%	3280.7	3925.4	4652.0	5442.8	6306.8	7253.8	7886.4	8472.8
99-00 00-01 01-02 02-03 03-04 04-05 05-06 06-07 Capital Recovery Opex 8% 3689.644 4194.54621 4774.019949 5413.078101 6088.8642 6835.7138 7310.7999 7689.9138 24% 10% 4029.528 4592.91139 5240.916429 5960.281711 6730.1703 7587.2848 8150.4315 8627.7364 12% 4369.412 4991.27658 5707.81291 6507.485321 7371.4765 8338.8557 8990.0631 9565.559 8% 3325.847 3768.60668 4273.851887 4826.271007 5402.9376 6032.8499 6411.9479 6691.3514 22% 10% 3665.731 4166.97186 4740.748367 5373.474617 6044.2437 6784.4209 7251.5795 7629.174 12% 4005.615 4565.33705 5207.644848 5900.678227 6385.5409 7355.9019 901.2111 9566.9053	Model 4									
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I		12%	4005 615	4565 33705	5207 644949	5920 678227	6685 5/00	7535 0010	8091 2111	8566 9966

Table 5-L: Estimate of NUSC requirement for low calling Urban DELs (200 calls per month)

Summary of Low	Calling Urban Caller	NUSC							1
,				Amou	int of NUSCI	required (in F	Tis Crores)		
Model 1		99-00	00-01	01~02	02-03	03-04	04-05	05-06	06-07
Capital Recovery	Opex							1.12	
	8%	-806.7	-1124.4	-1538.1	-2074.1	-2765.2	-3652.4	-4640.5	-5847.8
1.000	10%	-251.4	-473.5	-775.3	-1180.1	-1717.3	-2424.4	-3268.6	-4315.5
0%	12%	304.0	177.4	-124	-286.0	-669.5	-1196.5	-1896.8	-2783.3
Summary of Low	Calling Urban Caller	NUEC							
	•			Amou	int of NLEC	required (in F	As Orores)		
Model 2		99-00	00-01	01~02	02-03	03-04	04~05	05-06	06-07
Capital Recovery	Opex					1	1000		
	8%	-3036.9	-2696.9	-2390.6	-2145.3	-1998.0	-1998.0	-2291.3	-2827.4
1	10%	-2481.6	-2046.0	-1627.7	-1251.2	-950.1	-770.0	-919.4	-1295.1
24%	12%	-1926.2	-1395.1	-864.9	-357.2	97.7	458.0	452.4	237.2
	8%	-3144.1	-2927.4	-2765.7	-2689.7	-2740.8	-2973.4	-34720	-4237.1
	10%	-2588.8	-2276.5	-2002.8	-1795.7	-1693.0	-1745.4	-2100.1	-2704.8
22%	12%	-2033.5	-1625.7	-1240.0	-901.6	-645.2	-517.5	-728.3	-11725
Summary of Low	Calling Urban Caller	NUSC					1.000		
Model 3		Amount of NUSC required (in Pis Crores)					As Crores)		
		99-00	00-01	01~02	02-03	03-04	04~05	05-06	06-07
Capital Recovery	Opex			1.					
	8%	1517.0	1747.2	1924.8	1975.2	1861.0	1535.3	798.5	-333.7
	10%	2072.4	2398.0	2687.7	2869.3	2908.8	2763.3	2170.4	1198.5
24%	12%	2627.7	3048.9	3450.5	3763.3	3956.7	3991.3	3542.2	2730.8
	8%	1030.3	1146.3	1190.2	1087.4	796.6	265.5	-639.7	-1951.3
	10%	1585.6	1797.2	1953.0	1981.5	1844.4	1493.4	732.2	-419.0
22%	12%	2141.0	2448.0	2715.9	2875.5	2892.2	2721.4	2104.0	1113.3
Summery of Low	Calling Urban Caller	NUSC							
				Amp	unt of NUSC	required (in l	Rs Crores)		
Model 4		99-00	00-01	01~02	02-03	03-04	04-05	05-06	06-07
Capital Recovery	Opex			1		1		1.000	
	8%	2809.1	2887.7	2915.2	2826.9	2536.2	2038.3	1163.6	-165.8
	10%	3364.4	3538.6	36/8.0	3721.0	3584.0	3266.3	2535.5	1366.5
24%	12%	3919.8	4189.5	4440.9	4615.0	4631.8	4494.2	3907.3	2898.8
	8%	2214.7	2191.8	2098.0	1868.1	1415.4	726.5	-305.0	-1797.3
	10%	2770.0	28427	2860.8	2762.2	2463.3	1954.5	1066.9	-265.0
22%	12%	3325.4	3493.5	36237	3656.3	3511.1	31824	24387	1267.3

Table 5-M: Estimate of NUSC requirement for low calling Urban DELs (500 calls per month)

107. The NUSC calculations for low calling Urban Subscribers as defined in TTO 99 has been done and is given in <u>Table 5-M</u>

108. French Telecom Regulatory Authority, ART, has created a model to evaluate the cost of uneconomic subscribers in profitable areas. For each subscriber, the net cost appears when the cost incurred by the operator for serving the subscriber id higher than revenue generated by the subscribers.

- 109. Following important issues emerge from the NUSC calculations for low urban calling subscribers
- Due to large number of low calling Urban Subscribers, the estimate is very data sensitive. Any variation in capital recovery, operating expenses etc. affects the NUSC to a large extent.
- In Model 1&2, the NUSC becomes negligible when the definition of low urban callers is taken as given in TTO 99.
- In Model 2, capital Recovery has been included in respect of Rural DELs / LCUS installed post NTP 99. The impact of these DELs becomes prominent as the years go by. It implies that even in Model 2, wherein the current NUSC may be low, it shall not remain so and shall increase every year for the reasons explained above.

NUSC calculations for low calling urban subscribers are given in Annexure 5-J-1 to 5-J-4 for 200 calls per month (as per DOT) and 5-K-1 to 5-K-4 for 500 calls per month (as per TTO 99).

UAL Calculations

For estimating the UAL, the revenue of the sector has been taken as Rs 32000 Crore for the year 1999 – 2000. An annual increase of 20% has been considered thereafter. UAL has been calculated for various NUSC options, estimated in this paper, as a percentage of total revenue of telecom sector. The Summary of UAL estimates with various combinations are given in Annexure 5 - L.

KEY ISSUES

VPTs:

- 1. Should the capex recovery for VPTs installed prior to NTP 99 be considered for support from USO Fund?
- 2. Estimates for costs of providing VPTs vary over a wide range. For the purpose of support from USF, should standard costs for ordinary, hilly and tribal areas be adopted?

Rural / Remote:

- 3. Is it reasonable to assume that average cost of rural DEL is 40% higher than that of Urban DEL?
- 4. As revenue sharing on interconnect compensates for access deficit, should USF be used only to subsidise the shortfall caused by excess of operational expenditure over revenue? Whether USF should finance only the capital investment or recurring deficit of providing a rural telephone.

Low calling Urban DEL:

- 5. Whether UAL should be raised to provide Universal Access in both urban as well as rural areas? This will involve subsidising of loss making telephones irrespective of their geographical location in the service area.
- 6. Whether low calling urban subscriber should be defined as those upto 500 metered calls per month or upto 200 metered calls per month.

Chapter 6

6.0 ORGANIZATIONAL ARRANGEMENT FOR ADMINISTRATION OF USO

1. Administration of Universal Service Obligation involves, among others, collection of information from eligible operators to assess net cost of meeting USO, collection of contributions, and disbursement to qualifying USO providers of huge sums of money, calling for standardization of formats and procedures for maintenance of accounts by all Service Providers for the sake of uniformity, and total transparency. The major functions that would need to be performed by an organization responsible for the administration of USO would be:

- To determine the aggregate USO support on yearly basis from the claims filed by USO Providers and compute the percentage of Universal Access Levy (UAL) accordingly. The Universal Access Levy would be deposited in a USO Fund.
- To determine a service provider's eligible revenues for imposing UAL
- To determine the "eligible service providers" for USO support;
- To make recommendations on the quantum of UAL;
- To evaluate the claims for funding support of Service Providers meeting Universal Service Obligation;
- To carry out technical and financial audit of claims of USO providers, against the most cost-effective network solution (proxy model, if need be) as reference standard for providing VPTs, rural and remote direct exchange lines in different geographic / demographic situations;
- To settle the claims of eligible service providers and make disbursements from the USO Fund;
- For carrying out the above, prescribe the relevant formats and procedures for maintenance of technical and financial data records by the various service providers;
- To manage the balances of USO fund, arising out of estimates that are higher than actually required. Generally, these are carried forward to the next year to provide relief and lessen the contributions from the service providers to that extent.

2. The TRAI (Amendment) Act 2000 (Section9 (b) (ix)) mandates it to discharge the function of "ensuring effective compliance of Universal Service Obligation". The Act (Section 13 of Principal Act) also empowers TRAI to issue such directions from time to time to the Service Providers, as it may consider necessary for compliance.

6.1 Organizational Set-up

3. Various organizational models for USO administration are feasible, viz.,

- The TRAI will set up an In-house Unit for administration of USO
- Through a competitive procedure a reputed firm of Chartered Accountants and Telecom Consultants with the required professional competences may be selected and appointed by the TRAI, on an yearly contract basis, to carry out the USO administration on its behalf.
- The Government could set up an Organizational Unit within the Department of Telecom.
- 4. The criterion for making the choice is to go for the most cost-effective method for implementing a transparent mechanism for USO. The contributing parties must be assured with confidence that the system is being administered in open, fair, non-discriminatory and a competitively neutral manner. The fund administration should be:
 - transparent in methodology,
 - flexible to take into account technological innovation and market changes, compatible in a competitive environment,
 - low in administrative and implementation costs, and
 - provide incentives to operators for universal service provision.
- 5. Advantage of TRAI administering the universal service fund is that it is already overseeing the operation of the industry and the incumbent operator in particular, which is normally the major universal service provider, if not the only one. Furthermore, it is suitable for the TRAI to administer the fund because it does not have any interest in the business of any particular operator. Under any mechanism, the regulator would have to recommend to the Government or decide on the quantum of subsidies and the eligible parties. For example, if the universal service providers are to be selected through a competitive tendering process, it would be necessary for the regulator to lay down the operating conditions for successful bidders, like the quality of service, the carrier of last resort responsibility at all times and the level of charges. Assessment of bids would also need to be done objectively.
 - 6. The situation in other countries, where telecommunication services are liberalized, like Australia, France and the USA is that the fund administration is done by the ACA, ART and FCC, their respective Regulatory bodies. A summary of practices followed in some other countries of APEC and Asian regions is presented in Annexure 1-C.
 - 7. Telecom policy, emerging technologies, customer expectations and market forces are key drivers to the growth of telecommunication services. Many of the emerging services, like multimedia (tele-education, tele-medicine, etc.), and IT application services could over a period of time fall within the ambit of universal service. There is need for constituting a Universal services Advisory group comprising representatives of Service Providers, Telecom Services Users/Consumer protection bodies, Professional Institutions, etc. under the aegis of TRAI, with expert committees for each of the following to

review periodically the USO provisioning. The scope of the work may also include :

- Services, geographic locations, organizations and persons that may be covered under USO;
- Proxy network model;
- Ceilings and floors for UAL
- Waiver of UAL

8. In USA, the Joint Federal-State Telecom Board, commonly known as Joint Board, makes recommendations to the FCC on Universal service.

9. In France, universal service fund and its control committee were set up in 1997. At the moment, it is mainly France Telecom and Mobile operators that contribute to universal service Fund. The other contributions are paid by local loop operators and radio paging operators acting as carriers for other operators. Long distance operators and calling card operators do not contribute to the universal service, as only the operators directly connected to the subscribers are required to participate. French Telecom Regulatory Authority sets out the method used for the assessment, applies it and then proposes to the telecom Minister the net cost of universal service obligations, and operators contributions to the universal service cost. The telecom Minister makes a record of amount.

6.2 Universal Service Fund

Cost of universal service is to be met by contributions as UAL from all licensees 10. as a percentage of their eligible gross revenues. The percentage is determined by the total expected size of the fund and the total of all operators' eligible revenues. The collections of UAL would constitute the Universal service fund. The Fund could either be Real, i. e., Under the real fund disbursement mechanism, the USO physical, or Virtual. contributions would actually be collected to form the Universal Service Fund, and disbursed to USO Providers by the organization responsible for administration of USO, say, the Administrator of Universal Service Fund. In a Virtual Fund, there would be no physical fund but only a settlement mechanism established by the regulator based on information and cost studies furnished by the operators that will provide for the amounts that a USO provider can receive directly from other operators. Virtual fund will become increasingly difficult to manage as the number of operators, both that pay and that receive, increases. The other big disadvantage of this mechanism is that the settlement procedure might become cumbersome or even non-workable owing to disagreements, defaults and litigation. The real or a physical Universal service fund is particularly suitable for the environment of multiple universal service providers, since payments into and out of the fund are not directly connected. The important point is that each operator knows clearly the total amount of universal service contribution required and its own share in the total and, of course, how these figures have been worked out. In the case of a single universal service provider, the benefits of setting up a physical universal service fund may not be so obvious. But still the benefits of a transparent funding mechanism could be realized by asking the contributing parties to make direct payments to the universal service provider for the sole purpose of providing universal service. This could be regarded as operating a virtual fund.

11. Under a real fund disbursement mechanism, the Universal Service Administrator would have the prime task of computing the UAL, its collection, composition of the USO Fund, disbursement and administering the fund in an open, transparent and enforceable manner.

12. As the TRAI is to discharge the responsibility of ensuring effective compliance of USO, an in-house Unit or the appointment of an independent agency, reporting to TRAI, to administer the Universal service fund, would be preferable. This has the added advantage that the TRAI could constantly review and monitor the working of the Administrator of the universal service fund, to ensure greater transparency in implementation of USO. As stipulated in NTP 99, the revenue percentage is to be fixed by the government in consultation with TRAI. It is, therefore, imperative that TRAI should annually recommend to DOT, the percentage of the Universal access levy to be imposed. Non-disbursed balances in the USF could be carried over to the next year.

13. In management of the Universal Service Obligation, the basic data on costs and revenues would be furnished by the various operators for VPTs, rural/remote DELs, low calling urban DELs, share of revenues passed on interconnection to the long distance operator through interconnect mechanism, etc. under the various revenue streams depending upon the services like access, local, long distance and international -service. It is likely that all operators do not follow the same accounting formats and procedures. One of the pre-requisites would, therefore, be to follow standard accounting formats and procedures as may be prescribed, uniformly by all operators which shall clearly reflect the costs incurred in providing a specific service in a specific area and revenues arising there-from. There would be rigorous audit requirements before claims for support from USO fund could be settled.

Collection of UAL

14. Universal access levy reflects the subsidisation of universal service costs to be collected as a percentage of the eligible gross revenues of all service providers. It is not a voluntary payment or donation, but an enforced contribution that is more like a tax. A service provider would normally, and justifiably so, pass on the burden to a customer either by embedding it in the price for the services offered or show it separately in his/her bill, like the service tax. As is the practice in the USA and some other countries, showing it clearly and separately in a customer's bill will make it transparent and bring about better understanding of universal service burden. There should be no doubt that eventually, the burden of all fees and levies imposed on the service providers, will get passed on to customers. Figure 6-A makes it abundantly clear.



Figure 6-A : Diagram depicting various transactions under USO

Eligible Service providers (for receiving USO Support)

15. The NTP99 provides for support to all service providers, who participate in the provision of VPTs, DELs in rural and remote areas and low calling urban DELs of the country. The basic responsibility is that of the Basic Service providers but others are to be encouraged to participate in the universal service programme. Such other operators, besides the Fixed service providers, engaged in provision of universal service will be eligible for support from universal service fund. Their claims will be examined by the TRAI.

KEY ISSUES

- 1. How should the administration of USF be organised?
- 2. Who should monitor the achievement of teledensity target in rural areas and decide on the quantum of subsidy to be given from the USF?
- 3. Recognising that Universal Service is a dynamic concept and needs to be reviewed periodically for defining its scope, commensurate with development of communication technologies and information services, should a Universal Service Advisory Board, with experts from operators, financial institutions and consumer groups, be constituted, under the aegis of TRAI, for the purpose to undertake annual review of the services to be covered under Universal Service Obligation, proxy network model etc.
- 4. Should the UAL be shown and charged separately in a customer's bill like service tax or be embedded in the cost and reflected in tariff?
- 5. For USO funding, separation of accounts of various service products is essential. For clarity and transparency, should the accounting formats and procedures for unbundled services be standardised?

ANNEXURE-I-A

Telephone density v/s telephone charges

Percentage of households with telephone



Telephone charges as % of household expenditure

International Practices

World over, shortfall in revenue caused by Universal Service Obligations is . compensated by adoption of one of the following Methodologies.

- High Cost Approach to determine eligibility and USO cost;
- Avoidable Cost Approach in Australia;
- Bidding Process as in Chile;
- Based on the International Traffic Minutes as in Hong Kong;
- Incumbent's liability as in Japan, UK;
- Licence Obligations of FSPs as in India.

The applicability of each of the above methodologies in the Indian scenario has already been analysed. The country case studies presented here, illustrate how these models have actually been implemented.

A. High Cost Approach

USA

Definitions (as in Section 203 of the REA Act and Telecom Act of 1996 of USA):

<u>Telephone Service</u>: "The term Telephone service shall be deemed to mean any communication service for the transmission or reception of voice, data, sounds, signals, pictures, writings, or signs of all kinds by wire, fiber, radio, light or other visual or electromagnetic means and shall include all telephone lines, facilities, or systems used in the rendition of such service, but shall not be deemed to mean message telegram service or Community Antenna Television system service or facilities other than those intended exclusively for educational purposes, or radio broadcasting services, or facilities, within the meaning of section 3 (O) of the Communications Act of 1934, as amended."

<u>Rural Area</u>: "The term Rural area shall be deemed to mean any area of the United States not included within the boundaries of any incorporated city, village, or borrough, as defined by the Bureau of Census having a population in excess of 5,000 inhabitants." Rural carriers can borrow funds from the REA agencies. Loans from "Rural Electrification and Telephone Revolving Fund" established under Section 301 are granted by the Administrator of REA, and from "Rural Telephone Bank" under Section 401 by its Governor at rates specified by him. The REA Administrator is also the Governor of the Rural Telephone Bank.

Universal Service and Universal Service Obligation:

Primarily, before the 1996 Act, universal service had typically focussed on the goal of providing a telephone line to all US residents at a uniform price, maintaining affordable costs for basic dial tone service to all residents, and discounting services for consumers with low incomes. In order to pay for this service, the FCC designed a complex scheme of subsidization whereby long distance rates subsidized local rates; business rates subsidized residential rates; and urban rates subsidized rural rates. Section 254 of the 1996 Act recognizes that Universal service is an evolving level of telecommunications services and requires the FCC to periodically review the definition, giving credence to the current state of technology. It further requires the FCC to set up a **Federal-State Joint Board** to define the telecommunication services to be supported by federal universal service support mechanisms. Section 254 requires that the FCC and the Joint Board base their decisions concerning universal service on the following principles:

- 1. Quality services should be available at just, reasonable, and affordable rates;
- Access to advanced telecommunications and information services should be provided in all regions of the nation;
- 3. Consumers in all regions of the nation, including low income consumers and those in rural, insular, and high cost areas, should have access to advanced telecommunications and information services that are reasonably comparable to those provided in urban areas and are available at rates that are reasonably comparable for similar services in urban areas;
- 4. All providers of telecommunication services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service;
- 5. There should be specific, predictable, and sufficient Federal and State mechanisms to preserve and advance universal service; and
- 6. Elementary and secondary schools and classrooms, healthcare providers, and libraries should have access to advanced telecommunication services.

Based on the above and the following four factors:

- Need of service for education, public health, or public safety;
- Popularity of services among residential consumers;
- Availability of services provided by telecommunication service providers; and
- Services which are consistent with the public interest, convenience and necessity,

the Joint Board recommended and FCC agreed to include the following services for . universal service support.

- Single-party service;
- DTMF or its functional digital equivalent;
- Access to emergency services;
- Access to Operator services;
- Access to inter-exchange services;
- · Access to directory assistance; and
- Toll blocking for low-income consumers.

The evaluation of affordability includes local calling area size, income levels, cost of living, population density, and subscribership levels.

A Carrier eligible to receive universal service support is one, which offers, and advertises the services recommended for universal service support and their rates, in the general (public) media throughout its service area, through the use of its own facilities or a combination of its own facilities and resale of other carrier's services. <u>Technology used</u> by a carrier will not be a criterion for receiving universal service support.

The fundamental issue behind providing universal service support is the subsidization of services for consumers who live in rural, insular and high cost areas. The Joint Board considered the following factors into account for calculating the amount of support:

- Number of consumers in a given high cost area;
- The cost of providing service to these consumers; and
- The portion that the carrier must recoup from sources other than federal support mechanism.

Universal service funding mechanism:

In principle, all providers of telecommunication services are required to make an equitable and non-discriminatory contribution to the preservation and advancement of universal service. The Joint Board recommended that all <u>interstate</u> telecommunications carriers make contributions to the Universal Service Fund based on their gross telecommunications revenues net of payments to other telecommunications carriers. Thus, only Long Distance Carriers pay contribution to US Fund. The FCC revised the Joint Board's recommendations by ordering that <u>contributions be determined on the basis of end-user telecommunications revenues</u>. The FCC also decided to allow <u>recovery through the contributing carrier's interstate rates</u>. Carriers whose contributions would be less than cost of collection have been exempted from contribution and reporting requirements. Carriers also receive credit for providing services on discount to rural health providers. FCC has adopted the recommendation of the Joint Board to appoint a universal service advisory board to appoint a neutral, third party administrator to monitor the universal support mechanisms. The IXCs' contribution to Universal Service Fund in '98 amounted to about 4.9% of their gross revenues.

U/S Costing methodology - proxy model, bench mark, and high-cost support

The Joint Board recommended that the FCC and State commissions work to develop a proxy cost model for calculating the future costs of serving a particular geographic area. A carrier would be eligible to support only when the costs of providing universal services, as measured by the proxy model, exceeded the benchmark. The FCC agreed that a cost methodology, based on forward-looking economic cost, should be used to calculate the cost of providing universal service for high cost areas. The cost model represents the

most sophisticated tool for estimating non-rural carriers forward looking cost of providing supported services, which is the basis for prices in competitive markets. The new forward looking mechanism uses a single national cost benchmark of 135% against which a carriers' forward -looking costs are compared to determine their need for support. Thus, if a carrier's forward looking cost of providing service exceeds 135% of the national average cost per line; the new high-cost support mechanism would provide federal support for all intrastate costs that exceed this benchmark. Beginning January 1, 2000, the FCC's universal service cost model and the benchmark will be used. Statewide average cost per line will be compared to the national benchmark set at 135% of the national average forward looking cost per line. The support is targeted to the highest-cost wire centre within the State. This approach is pro-competitive because it ensures that support provided to incumbent LEC and its competitors is commensurate with the relative costs of providing supported services in particular wire centres. Portability of support is also provided in the system. When an LEC looses a customer to a competitor, the competitor receives the support for that customer's line. Non-rural carriers, as also rural carriers are now eligible for universal service support by a decision of FCC. Earlier, only LECs and CLECs were eligible for support from USF for high cost areas.

Impact of U/S contribution - who pays?

While the subsidization of universal service costs is not expressly defined as a tax, the goals of universal service are to be achieved by levying a proportionate charge on all telecommunications service providers, which would make more visible both the nature and amounts of the cross-subsidies encompassed within the universal service programme. An enforced contribution is not a voluntary payment or donations and falls under the essential characteristics of a tax. The FCC has allowed recovery of universal service contribution by IXCs through charges passed on to the consumers of telecommunication. services. It is, therefore, tantamount to a tax on consumers.

How a subscriber is billed?

A customer can choose the plans (packages) from the many offered by LECs and IXCs.

In addition to the call charges according to the chosen plans, a customer pays:

To IXC (Inter-eXchange Carrier - L/D operator)

- a monthly fee for the selected plan (\$3 typical)
- National Access Contribution (univ. serv. contribution is inherent in it) comprising:
- A fixed monthly carrier line charge (subscription) (\$1.51 typical). In case of change of L/D operator earlier in a month, pro-rata for the number of days subscribed, and
- a universal connectivity charge at 5% of the billed amount.
- a federal tax like our central sales tax, which is a certain % age of the billed amount
- a state tax like our state sales tax, which is a certain % age of the billed amount

To LEC (Local Service Providers)

- a fixed monthly subscription charge (in NJ, \$13.77 for a residential line, local calls free),
- taxes and surcharges as assessed by Local, State and Federal Governments:
- a fixed Federal subscriber line charge (\$3.50),
- Local number portability surcharge,
- a federal tax like our central sales tax, which is a certain %age of the billed amount, and
- State tax, like our state sales tax, which is a certain % age of the billed amount.

Access Charge Regime Review:

In the access charge regime, LEC charges IXC for originating and terminating access. It is the largest expense for IXCs and in a way makes them the largest customers of LEC. A LEC handles all local and Intra-LATA (Local Access and Transport Area) calls. An Inter Exchange Carrier (IXC - Long Distance Service Provider) maintains its Point of Presence where it interconnects with a LEC's network to carry Inter-LATA traffic. LATAs are large territorial areas. There are about 200 LATAs in the USA. LECs must provide equal access to all IXCs. The IXC pays access charges based on per minute of traffic to the originating and terminating LECs. Currently, it is about 2 cents per minute each for the originating and terminating access. This method of Access reimbursement to LECs from IXCs may be changed to a <u>Carrier Line Charge method</u>, whereby, flat fees may be paid based on quantity of local lines connected to particular IXC rather than per minute.

Internet Service Providers (Univ. Service contribution and VOIP):

Internet Operators are exempted from contributing to the Universal Service Fund. The ACTA (America's Carriers Telecommunications Association) had petitioned to FCC in March 1996 that ITSPs are telecommunication carriers and as such should be subject to FCC regulation and that it was incumbent upon the FCC to examine and adopt rules, policies and regulations governing the users of the Internet for the provisioning of telecommunication services.

The FCC in June 1996 decided that "on the Internet, voice traffic is just a particular kind of data, and imposing traditional regulatory divisions on that data is both counterproductive and futile. We shouldn't be looking for ways to subject new technologies to old rules."

The ACTA in July 1996 submitted to the FCC that it was not in the public interest to permit long distance service to be given away, depriving those who must maintain the telecommunications infrastructure of the revenue to do so. The FCC maintained "Let's not apply out-of-date rules to new situations, even as we are trying to reform the creaky old access regime."

The FCC in its April 10, 1998 Report to the Congress:

- 1. Reaffirmed that Internet Service Providers are not subject to:
 - Universal Service Obligation
 - Access fees paid by long distance service providers
 - Rate regulation
- Noted that ISPs indirectly contribute to Universal Service Fund via their leased line payments;
- 3. Recognized that phone-to-phone services offered by Internet Telephony Service Providers (ITSP) more closely fit the definition of a "telecommunication (telephone) service" than an "information service" but chose to take no action at present;
- 4. Left the door open for case-by-case review.

B. Avoidable Cost Approach

Australia

In Australia, the Universal Service gained focus in 1975 Telecommunication Act with the formulation of Community Service Obligation (CSO) concept. The efforts were supplemented by Australian Telecommunications Corporation Act 1989. With the liberalisation in 1991, an explicit costing and funding mechanism was developed under the framework specified by Telecommunications Act 1991. Telecommunications Act 1997 reinforced those principles and widened the scope of USO.

Currently, USO is the requirement to ensure that standard telephone services and payphone services are reasonably accessible to all people in Australia on an equitable basis wherever they reside or carry on business (subsection 149(1) of the Telecommunications Act 1997 (the Act)). The policy intentions of the Act include

- all people in Australia should have reasonable access (whether for private or commercial reasons) to the standard telephone service and to payphones wherever they reside or carry on business;
- the USO should be provided as efficiently and economically as practicable;
- losses incurred in satisfying the USO must be shared on an equitable basis amongst all carriers unless they are granted an exemption; and
- the basis and the methods for calculating the net cost of delivering the USO in Australia, known as the Net Universal Service Cost, should be open to scrutiny by the carriers and the public (bearing in mind

issues of commercial confidence)."

Under the Telecommunications Act 1997, Minister can specify any carrier as a national or a regional USP. Mainly, Telstra, the incumbent operator, provides the Universal Service and its costs are shared by all the Service Providers. The Universal Service Provider prepares a Universal service plan, and after seeking the approval of the Minister, it is his responsibility to make all reasonable efforts to implement it. Australian Communications Authority (ACA), keeps a public register of all approved universal service plans. The scope of Universal Service also includes a National Relay Service for people with hearing and/ or speech impairments. Australian Communications Exchange is currently the Universal Service Provider for National Relay Service.

The pricing of the services offered by Universal Service Provider under USO are subjected to regulation under the Telecommunications Act 1997. These regulations primarily are in the form of Price controls and are specified by the Minister.

Costs & Revenue

The regulator at the beginning of the year identifies the net cost areas on the grounds that they are likely to be loss making as a whole. Costs of providing the Universal Service are determined at the end of the year using a computerised Net Universal Service Cost (NUSC) model. The methodology used is called the **Avoidable Cost Approach**. The Net Universal Service Cost is determined by subtracting avoidable revenue from the avoidable costs.

The components of avoidable costs include operating costs, Depreciation and Cost of Capital while avoidable revenue is determined by including the incoming call revenues in the total revenue. The NUSC is summed up for all the net cost areas to determine the total NUSC.

Funding Mechanism

In Australia, Universal Service is supported through a virtual fund. All carriers who operated in a financial year are participating carriers for that year. At the end of the year, the amount required in the fund is calculated (using avoidable cost methodology) and then the settlements are done amongst the carriers. The Carriers are required to submit revenue returns to the regulator for sharing the net USO costs. The claims submitted are subjected to independent audits. Universal service support is provided to the USO providers on the basis of the claims submitted. Contributions in the Universal Service Reserve Fund, is collected from all carriers, as a percentage of carrier's eligible revenue¹, as per the following formula:

Levy payable = Total NUSC x Carriers eligible revenue / Total eligible revenue

C. Bidding Principle

Chile

In 1994, the Telecommunications General Law liberalized the Chile's telecommunications market. A Telecommunications Development Fund (TDF) was created by the law to promote an increase in coverage of public services to rural areas and

¹ Eligible Revenue is defined in the Telecommunications Universal Service Obligation (Eligible Revenue) Regulations 1998.

urban areas of low income and low teledensity. The universal service program implemented by the government also aims at

- i. facilitating the introduction of new services and technologies;
- ii. reducing artificial entry barrier; and
- iii. preventing and correcting anti-competitive behaviour.

The TDF targets at the provision of Pay phones in rural areas and provides the minimum required subsidies for the purpose.

Methodology

Chile, implements its universal service programme through competitive bidding process. A list of all projects based on the requirement is prepared and tenders are invited. The tenders are technology neutral and define in detail the terms and conditions for the projects including the number of payphones, the tariff level, principles of interconnection and maximum subsidy available. On evaluation, project is given to the bidder, who demands the lowest level of subsidy. Subsidy amount is granted only after successful completion of the project.

Funding Mechanism

The National Fiscal Authority funds TDF. This in effect means that the subsidy is direct and is funded by all tax payers. This is in line with the government's policy of having only explicit subsidy mechanism in order to avoid market distortion.

In the Chile Model, there is a likelihood of bids being unsustainably low. This might result in operators running into financial problems and in turn incurring delays. The problems would be aggravated with no upfront support being available during the financial year.

D. International Traffic Minutes

Hong Kong

With liberalisation of Hong Kong's voice telecommunications market in 1995, the monopoly of Hong Kong Telephone Company Limited (HKTC) was subjected to competition from three other fixed service providers. The responsibility of USO is rested on the incumbent until the network of other operator is developed. Other licensees have been mandated to assist through Universal Service Contributions (USC).

Scope of Universal Service

The scope of Universal Service in Hong Kong includes only the Basic Services, comprising of following elements:

Connection and continued provision of connectivity to a PSTN;

- Provision of a dedicated telephone number;
- Appropriate directory listing;
- A standard telephone hand set without switching capacity;
- Standard billing and collection services;
- A reasonable number of payphones in public areas, including usage by the physically disadvantaged;
- operator provided directory enquiries, fault reporting, service difficulty and connection services; and
- access to emergency services.

The scope also includes provisioning of apparatus and services to physically disadvantage and elderly customers at concessionary rates. The government on specified services like residential telephones exercises Price controls. However, there is a trend of lifting these controls as competition increases.

Costs & Revenue

The USP is provided support for serving those customers, who would not have been served on a purely commercial basis. The net costs of Universal service are based on individual customers and are calculated by subtracting relevant revenue from relevant costs (avoidable costs). The avoidable costs and revenues also include premium service possible on the standard telephone line:

Fund Administration

The local calls in Hong Kong are not billed on a per minute or a per call basis. Therefore, only those service providers and carriers that provide international services (Fixed, Mobile, VPN & International simple resale operators) are required to pay USC based on **international traffic minutes**. The operators to fund USO follow a settlement mechanism. An interim USC is collected every month by the USP based on the rates approved by the Telecommunications Authority. Final settlement is done at the end of the financial year.

E. Incumbent's liability

Japan

In Japan, there is no clear definition of Universal Service despite liberalisation of the telecom services. The onus for providing, Universal Service is only on NTT. NTT CORPORATION law obliges NTT, the incumbent, to

" try to assure the provision of proper, equal and stable nationwide telephone service throughout JAPAN, including the areas with low population density".

Price controls are also exercised by the Ministry to keep a check on the rates. The scope of the service includes such services that are indispensable to the daily life of the people at appropriate conditions, including rate of charge.

Telecommunication Business Law of Japan does lay down a few principles of Universal Service:

- Any facilities based carrier shall not refuse to provide telecommunications services without due reasons;
- Any carrier shall give priority to emergency services;
- Any telecommunications carrier shall not discriminate between customers unfairly in providing services.

However, with the advent of Multimedia, Japan, is now considering a framework for Universal service.

F. License Obligations

India and Philippines are examples of this model as detailed in the earlier Chapters.

G. Other Countries

The Universal Service Program and funding methodologies of other countries of the APEC and SAARC region are given in Annexure 1-C.

Annexure 1-C : Provision of Universal Service in various countries

	Objectives	Legal Framework	Target Social Groups	USO Service Scope	USO Provider (s)
Australia	Reasonable access to USO services for all	1991 & 1997 Telecoms Act	All rural and remote areas	e Standard Telephone services Payphones Prescribed carriage services	Telstra (incumbent) Plan-National and Regional USO providers Selected by tender
Bangladesh	Access at reasonable and affordable rates, Increase Teledensity	Telecom Act and Government policy	All rural and remote areas	Basic telephone service Directory and Emergency Services Access to Internet	Incumbent and other Operators according to their licence conditions
Bhutan	Access within reasonable time to a Payphone in urban and rural/remote areas	Government Policy	All rural and remote areas	Basic Telephone Service	Incumbent Operator
Canada	Provision of reliable & affordable universal telecom services	1993 Telecoms Act	Low income households High cost areas	Access to PSTN Emergency services Directory services	Incumbent and other eligible local exchange carriers

-

Chile	Introduce new services & Technology Remove barriers to entry Prevent anti- competition Act if market incentive insufficient	Telecom General Law By-law of the Telecom Development Fund	Rural areas Urban areas of low income and low teledensity	Installation of Public payphones	Winning operators in the tender for subsidized projects
Peoples' Republic Of China	Increase the teledensity	Government policy mandating the network expansion plan for local telecom authorities	Remote and high cost areas Undeveloped areas	Widely accessed fixed line services No discrimination with respect to geographic locations, prices and quality of services	China Telecom
India	Access to all on demand and all villages to have Public Telephones by 2002. Access to Internet from Dist. HQ by 2002	National Telecom Policy 1999	All rural / remote areas and low calling urban lines	Standard Telephone Services Voice and Low Speed Data services Internet access	All Fixed Service Providers

Maldives	Provision of Public Telephones on the basis of population of a inhabitation	License condition	All rural and remote areas	Basic Telephone service and Emergency (Police, Fire, Ambulance etc.)	Incumbent
Nepal	Public Telephones, population criteria Increase Teledensity, protect consumer interest	Telecom Act 1997 and other laws of the country and Govt. Policy	All Village Dev. Council, rural and remote areas, Low Income households	Basic Telephone Service Voice, Gr.III FAX, Voice band data not less than 9.6 kbps	Incumbent and other licensees
Pakistan	Individual access at reasonable and affordable rates and public Telephones on the basis of population	Telecom Act 1996 and Govt. Policy as also license conditions	Low income households, High cost areas, All rural and remote areas Undeveloped areas Physically handicapped, Senior citizens	Basic Telephone Service , Emergency services, Access to Internet	Incumbent and other operators according to their license conditions
Sri Lanka	Access at reasonable and affordable rates	Telecom Act No formal imposition of USO	Far flung network of Post offices and sub post offices	Basic Telephone service, Voice, Group 3 FAX and Telegraph services	Incumbent operator

Source: APEC and Telecom Administrations of SAARC Countries

ANNEXURE 1-D

	Costing Methodology	Contributing Parties	Allocation Basis	Compensation Mechanism	Funding transparency
Australia	Avoidable costs on the basis of net cost areas	All fixed and mobile operators	Total eligible revenues	Trust fund administered by the Australian Communications Authority (ACA)	Transparent to the regulator and participating carriers Regulators' annual assessment of liabilities and entitlements are gazetted
Bangladesh	Forward looking economic cost	Government as Budgetary Grant Contribution from Service Providers		To be framed	
Bhutan	Access deficit	Government Grant	At actual cost	-	Ensured by regulations
Canada	Accounting calculation based on incumbent's costs	Fixed and mobile operators providing long distance services	Long distance traffic minutes	Universal service central fund administered by an independent body	Regulatory regime has been developed through public proceeding Appeals can be filed with the regulatory agency, federal court or the Govt.
People's Republic Of China	No specific USO f Funding required f	unding mechanism h or the development of	as been set up. of universal netv	vork is organized by the MPT.	

Funding of Universal Service - Global Scenario

India	Historical and Forward looking economic costs	All licencees for Various types of Telecom services	Reimbursement of costs of providing and operating VPTs, Rural /remote DELs	Universal Access Levy as a percentage of revenue earned	Ensured by Regulations
Indonesia	20% of Telkom and its JOS partners' annual investments in installations	International & mobile service providers	Interconnection Traffic minutes	Included in the charge for interconnecting to the PSTN	
Japan	No compensation is provider	paid to the univers	sal service		
Korea	Non-traffic sensitive deficit net of traffic sensitive profits and interest earned on annual average installation fees	Operators inter- connect with Korea Telecom	Interconnection Traffic minutes	Included in the interconnection charge	Transparency ensured by regulations which specify that interconnection charge be based on costs, which include the non-traffic sensitive deficit
Malaysia	No compensation is provider	sation is paid to the universal service			
Maldives	No separate costing model employed	Incumbent	-	-	
Nepal	Access Deficit	All Service Providers	Percentage of total revenues	Regulator through independent body appointed by the Government	Assessment by Regulator and notification to Public

ŝ,

Pakistan	Forward looking economic cost	All service providers	Percentage of total revenues	Administered by Regulator through an independent body appointed by it.	Ensured by regulations
Sri Lanka		-	-	By incentives for rural roll out	By Regulations
USA	Plan- forward looking economic costs	All providers of telecom services Federal and state sources	End-user revenues	Universal service fund administered by a non-Govt. Body Plan to set up three separate independent corporations to administer three universal service funds Some programmes are managed by state authorities	The contribution system is competitively neutral among all carriers of long distance services. Local service carriers will eventually expand into this segment of the market All eligible carriers are eligible to contribute and receive support for providing universal service.

Source: APEC, ITU and Telecom Administration of SAARC countries.

94

Annexure 2-A

No.5-2/99-Regln-II Government of India Ministry of Communications Department of Telecommunications

Sanchar Bhawan, 20, Ashoka Road, New Delhi-110 001.

Date: 21.05.1999.

To

The Secretary, Telecom Regulatory Authority of India, New Delhi-110 001.

Subject: <u>Recommendation of TRAI on the issue of funding the</u> <u>Universal Service Obligation.</u>

Dear Sir,

The Government has defined the Universal Service Obligation (USO) through the statement of New Telecom Policy, 1999 (NTP-99) covering the following objectives:-

i) Provide voice and low speed data service to the villages in the country.

ii) Achieve Internet Access to all district headquarters.

iii) Achieve telephone on demand in urban and rural areas.

2. NTP-99 stipulates raising of resources to meet the Universal Service Obligation through the Universal Access Levy (UAL). Universal Access Levy is required for providing Village Public Telephone (VPT) and Rural Telephones and should cover both capital expenditure and recurring expenses to run the service. The Universal Access Levy would be a percentage of the revenue earned by the operators under various licences. The percentage referred to above has to be decided by the Government in consultation with TRAI.

3. The Department of Telecom has already provided voice communication facility to 3,40,640 villages (as of 1.4.1999) and the remaining 2,66,851 villages are proposed to be covered by the year 2002.

Internet Access to all district headquarters (DHQ) has already been achieved through 172 code and efforts are being made to provide nodes at all DHQs progressively by the end of year 2000. Making telephones available on demand in rural and urban areas of the country is also proposed to be achieved by the year 2002.

4. The implementation of the USO is the responsibility of fixed service providers who as per the NTP-99 provisions would be reimbursed from the funds raised through UAL. Other service providers may also be encouraged to participate in the USO provision subject to technical feasibility and are eligible for reimbursement from the funds raised through UAL.

5. To work out the details of the UAL, recommendations of the TRAI are solicited by the Government on the following :-

- a) Class of operators to fund UAL,
- b) Various possible cost models/approaches to determine :
 - i) Percentage contribution from the revenue of the operators and the mechanism for computing it.
 - ii) Per unit subsidy for VPTs and rural DELs separately to cover capital and recurring expenditure.
 - Whether per unit subsidy will be the same or different in different geographical areas/ tribal and non tribal areas of the country.

6. A copy of NTP-99 has already been forwarded to TRAI vide letter No.1-20/99-Regulation dated 5-4-1999, a copy is also enclosed herewith forready reference.

7. We would be grateful if TRAI could indicate the time frame when it would be possible to make available the requisite recommendations.

Thanking you,

Yours faithfully, Sd/-(A.K. BHARGAVA) DY. DIRECTOR GENERAL(REGULATION) 21.05.1999 Tel.No.3372074

Government of India Ministry of Communications Department of Telecommunications Sanchar Bhawan, 20, Ashoka Road, New Delhi-110 001.

No.5-2/99-Regln-II

dated 13-10-1999

To

The Secretary, Telecom Regulatory Authority of India, 16th Floor, Jawahar Vyapar Bhawan 1, Tolstoy Marg, New Delhi-110 001.

Subject: <u>Recommendation of TRAI on the issue of funding the Universal Service</u> <u>Obligation (USO).</u>

Sir,

In continuation of this office letter of even No. dated 19-05-1999 and further to the meetings with TRAI on this issue during the first week of October, I am directed to state that the relevant information on USO as desired by TRAI is to be collected from the DOT units which may take about 3-4 months as it involves traffic observations, and lot of other data to be collected from the basic records of the scattered DOT field units. In addition, cost model/approach to determine per unit subsidy for low calling urban DELs also needs to be considered and may be added as item No. iv of para 5 (b) to this office letter of even No. dated 19-05-1999.

Sd/-(K.S. Guliani) Deputy Director General(Regulation)
ANNEXURE-5-A

Telecom Regulatory Authority of India

TR	AI Form 2000/	UNI	VERSAL SERVICE PROVIDE	CRS'/	CONTRIBUTORS' WORKSHI	ET	
Ple	ase read instructions before	com	oleting. Report actual amounts	s bille	d to customers during the filing	period w	vithout subtracting
und	collectibles. Report revenues	in w	hole rupees. Do not report neg	gative	amounts.		3
Α.	UNIVERSAL SERVICE PR	OVID	ERS' / CONTRIBUTORS IDEI	NTIFI	CATION	2. 10	
1.	Legal Name of Universal Se	rvice	Provider/ Contributor				
2.	Name for doing business, if	differ	ent from 1.				
3.	Principal communications b	usine	ess (check only one)				
a.	Basic Services	e.	Local Reseller	1.	Prepaid Card	m.	International
b.	Cellular/Mobile	f.	Other Mobile	j.	Internet Access	n.	Long Distance service reseller
c.	Incumbent	g.	Paging & Messaging	k.	□ Satellite/VSAT/ GMPCS	ο.	Other Service (specify)
d.	Long Distance Service	h.	Pay phone service	ï,	Shared service provider(DID PABXs etc.)		
4.	Holding Company						
5.	Management Company, if	nana	ged by another entity				
6.1	Principal Carrier Identification	on co	de used for long disance service	9			
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о. В.	CONTACT INFORMATION	mer	inquines	14.	1	19.10	
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11.	Email of contact person						
12.	Complete Mailing address	of co	ntact				
10	(for sending universal sei	vice	WORKSNEETS)				
13.	for sending bills for unive	rsal s	ervice contribution)				
C.	CERTIFICATION (TO BE S	GNE	D BY AN OFFICER OF THE L	INIVE	ERSAL SERVICE PROVIDER/C	ONTRI	BUTOR
14	 I certify that I am an offic best of my knowledge, i an accurate statement of 	er of nform f the	the above-named universal s ation and belief, all statement affairs	ervice s of fa	e provider / contributor, that I h act contained in this Workshee	ave exa t are true	mined this report and to the and that said Worksheet is
5					Signatu Name & Designation o D	re f the Off ate	icer
15.]	Due by 1 st Sept	o 31 st	March		

16.	This filing is:	• Orig_l Filing	lised Filing	
Note: work	Do not include a sheet to TRAI. Th	cheque with this filing. For additional information, please ca address and telephone number of TRAI are available on its	II the Telecom Regulatory Aut website at www.trai.gov.in.	hority of India. Mail this
D. CO	ONTRIBUTOR REV	ENUE INFORMATION		
17.	Year of Data	Filing Period		Total Revenues
		Data for 1st April to 31 st March		
Reve	nue Data ixed services from	DELs		
18.	Monthly rental, le phonogrammes, e	ocal calls, installation charges, special features charges a tc.)	and any other services(e.g.	-
	a) Rural & remo	te areas		
	b) Urban areas			
19. 1	ong Distance Cha	rges		
	a) Domestic			
	b) International	(i) from call charges		
20. L	eased Lines	(ii) nom settement charges		
21 0	ther local telecom	senvice revenues		
Mah				
(inclu	ides wireless telep	nony, paging and other mobile services)		
22. 1	Monthly, activation,	and message charges except toll		
Long	g Distance (Trunk) (a) Do (b) In	Service omestic ternational (i) From call charges		
23. (Operator and STD/	SD calls with alterntive billing arrangments (credit card, co	llect, international call back	
24.0	ther switched STD	/ISD service (includes IN services)		
25. L	ong distance priva	e line services		
26. 5	atellite services			
27.	All other long distar	ice services		
Reve	enue from all othe	rsources		-
28. N	Nonthly service, loc	al calling, connection(rental) charges, special features and o	her service charges	
29. T	ariffed subscriber l	ne charges		
30. L	ocal private line an	d special access service		
31. F	Public telephone re-	venues - rural - urban		
32. 0	Other local telecom	service revenues		
Mob (inclu	ile service udes wireless telep	hony, paging and other mobile services)		
24	According and activat	aludias seemies but evolution truck at anot		
34. M	nessage charges in	cluding roaming but excluding trunk charges		A Contraction
Trun	k Services			

35. Prepaid	calling card	
36. Internatio	onal calls that both originate and terminate in foreign points	
37. Operator other than re	r and trunk calls with alterntive billing arrangments (credit card, collect, international call back etc.) evenues reported on Line 36 above.	
38. Other sw	vitched trunk service (includes IN service etc.)	
39. Long dis	tance private line services	
40. Satellite	services	
41. All other	long distance services	
Packet Swit	tched Public Data Network	
42. Monthly	Subscription	-
43. Usage C	harges	
44. Other so	urces	
Internet(Tie	r 1,2,3)	
45. Subscrip	tion	
46. Usage C	Charges	
47. Other so	urces	
Charges on 48. Any othe	end-user bills identified as recovering universal service contributions (universal service levy) er income from assets, etc.	
49. Subtotal		
Other rever	nues that will not be included in the contribution base	
50. Enchand mtce & non-	ced services, billing and collection, customer premises equipment, published directory, inside wiring telecom products and service revenues	
51. Gross bi	lled revenues from all sources	
52.	Request for nondisclosure of information contained in Worksheet. Certification that the inform Wor heet is privileged or confidnetial commercial or financial information and that disclosure of substantial harm to the competitive position of the entity filing the Worksheet. This box may be che a separate request.	nation contained on this ch information may cause cked in lieu of submitting

Annexure 5 - B						1
Model 1						
		1				-
1	1					
0						
Cost & Revenue e	stimation	1				-
Cost of individual	VPT					-
Sensitivity Analysis	has been done by	varying the o	cost to Rs 50	0000 and Rs 1	lakh for post N	ITP 99 VPT
		1.0				
Douonus estimates	(as coloulated from	Do 2100 mor		VOT		
nevenue estimates	(as calculated from	115 3160 per	.annum.pei			
	3100	5100				
						1
Capital Cost of	Old VPT @ Bs	\$ 75000				
Capital Cost of	Old VPT @ Rs	5 75000 Rs 75000				
Capital Cost of Capital Cost fo	Old VPT @ Rs r New VPT @ I	s 75000 Rs 75000 Total	Revenue			
Capital Cost of Capital Cost fo	Old VPT @ Rs r New VPT @ I Number of	s 75000 Rs 75000 Total Annual	Revenue (in			
Capital Cost of Capital Cost fo	Old VPT @ Rs r New VPT @ I Number of VPTs	s 75000 Rs 75000 Total Annual Cost*	Revenue (in crores)**	NUSC***		
Capital Cost of Capital Cost fo	Old VPT @ Rs r New VPT @ I Number of VPTs	5 75000 Rs 75000 Total Annual Cost* in crores	Revenue (in crores)**	NUSC*** in crores		
Capital Cost of Capital Cost fo	Old VPT @ Rs r New VPT @ I Number of VPTs 340640	s 75000 Rs 75000 Total Annual Cost* in crores	Revenue (in crores)**	NUSC*** in crores		
Capital Cost of Capital Cost fo Till 1999 1999 ~ 00	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275	Revenue (in crores)**	NUSC*** in crores 161.834544		
Capital Cost of Capital Cost fo Till 1999 1999 ~ 00 2000 ~ 01	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706	Revenue (in crores)** 119.12821 155.19608	NUSC*** in crores 161.834544 222.174516		
Capital Cost of Capital Cost fo Till 1999 1999 ~ 00 2000 ~ 01 2001 ~ 02	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565	Revenue (in crores)** 119.12821 155.19608 193.18214	NUSC*** in crores 161.834544 222.174516 285.723512		
Capital Cost of Capital Cost fo Till 1999 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565	Revenue (in crores)** 119.12821 155.19608 193.18214	NUSC*** in crores 161.834544 222.174516 285.723512		
Capital Cost of Capital Cost fo Capital Cost fo 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565	Revenue (in crores)** 119.12821 155.19608 193.18214	NUSC*** in crores 161.834544 222.174516 285.723512		
Capital Cost of Capital Cost fo Capital Cost fo Till 1999 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes *	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491	 75000 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 	Revenue (in crores)** 119.12821 155.19608 193.18214	NUSC*** in crores 161.834544 222.174516 285.723512		
Capital Cost of Capital Cost fo Capital Cost fo Till 1999 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes * *	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491 Total annual cost Revenue = Total	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 = operating enumber of VF	Revenue (in crores)** 119.12821 155.19608 193.18214 expenses@1 PTs X Rs. 26	NUSC*** in crores 161.834544 222.174516 285.723512 0%		
Capital Cost of Capital Cost fo Capital Cost fo 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes * **	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491 Total annual cost Revenue = Total NUSC = Total ann	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 = operating enumber of VF nual cost - Re	Revenue (in crores)** 119.12821 155.19608 193.18214 275 X Rs. 26 evenue	NUSC*** in crores 161.834544 222.174516 285.723512 0% 55		
Capital Cost of Capital Cost fo Capital Cost fo 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes * **	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491 Total annual cost Revenue = Total NUSC = Total annual	75000 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 478.90565 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3707 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3707 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3707 377.3706 377.3706 377.3706 377.3707 377.3706 377.3706 377.3706 377.3707 377.3706 377.3706 377.3706 377.3707 377.3707 377.3707 377.3706 377.3707 377.3706 377.3707 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3707 377.3706 377.3707 377.3706 377.3707 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3706 377.3707 377.3706 377.3707 377.3706 377.3707 377.3706 377.3706 377.3706 377.3706 377.3707 377.3706 377.	Revenue (in crores)** 119.12821 155.19608 193.18214 2015 X Rs. 26 evenue	NUSC*** in crores 161.834544 222.174516 285.723512 0% 55		
Capital Cost of Capital Cost fo Capital Cost fo Till 1999 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes * * **	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491 Total annual cost Revenue = Total NUSC = Total annual	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 = operating enumber of VF nual cost - Re	Revenue (in crores)** 119.12821 155.19608 193.18214 expenses@1 PTs X Rs. 26 evenue	NUSC*** in crores 161.834544 222.174516 285.723512 0% 55		
Capital Cost of Capital Cost fo Capital Cost fo 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes * **	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491 Total annual cost Revenue = Total NUSC = Total ann	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 = operating enumber of VF nual cost - Re	Revenue (in crores)** 119.12821 155.19608 193.18214 27s X Rs. 26 evenue	NUSC*** in crores 161.834544 222.174516 285.723512 0% 55		
Capital Cost of Capital Cost fo Capital Cost fo 1999 ~ 00 2000 ~ 01 2001 ~ 02 Total Notes * **	Old VPT @ Rs r New VPT @ I Number of VPTs 340640 33977 113421 119453 607491 Total annual cost Revenue = Total NUSC = Total annual	5 75000 Rs 75000 Total Annual Cost* in crores 255.48 280.96275 377.3706 478.90565 = operating enumber of VF nual cost - Re	Revenue (in crores)** 119.12821 155.19608 193.18214 275 X Rs. 26 evenue	NUSC*** in crores 161.834544 222.174516 285.723512 0% 55		10

Annexure 5	- C			NUSC for	VPTs				1			·	
S									-				
Model 2							1.	1					
				1.1	1					1			
									1				
							1					1	
Cost & Revenu	e estimation			9			1						
	-					1	1				-		
Cost of individ	lual VPT	Rs. 75000				-							1
Sensitivity Anal	ysis has been done	by varying the	e cost to Rs 50	0000 and Rs 1	lakh for post	NTP 99 VP	S						
Revenue Estim	ates (as calculated	d from sample (Rs 3180 per.	annum.per V	'PT	Τ.	1	1	1				
	3180	3180	3180	1									
Capital Cost	t of Old VPT @	Rs 75000		1		A 10						J	
Capital Cost	for New VPT	@ Rs 75000				4	1.5		1				
			Total	Revenue			1	-	-				
		Capital	Annual	(in								t l	
	Number of VPTs	investment	Cost*	crores)**	NUSC***		-						
			in crores			· · ·			1	1			1
				1999 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 -		Adda and							
Till 1999	340640	255480	255.48										
1999 ~ 00	33977	25482.75	342.12135	119.128206	222.993144	S-1							
2000 ~ 01	113421	96407.85	669.90804	155.196084	514.711956								
2001 ~ 02	119453	101535.05	1015.12721	193.182138	821.945072								
Total	607491					1. 1. 1.							
								-					
1		-									-		
Notes	T		0.0.10/		0.100/	-			-				
**	Total annual cost :	= capital recove	ery@24% + op	perational exp	ense@10%			-	-				
***	Hevenue = 1 otal n	number of VPIs	5 X 265										
	NUSC = Total ann	ual cost - Heve	enue					-					
						*							
						a la sur de							
					1			+			+		
										1			100
		and the second sec					1		-	1			102

	Annexure 5-D	1	1		1	1	1	1		1	1000	1			1	1	1			1	-	1
	USO calculatio	ns for R	ural / re	mote DE	Ls			Model	1	NUSC	OPEX	(10%)-1	Revenue	e from C	Call char	aes only	(V)					
		1	1		0	1			1	1		1					-			0	0	0
no.	Particulars	Units													1							
1	Year	000	87~88	88-89	89~90	90-91	91~92	92-93	93-94	94~95	95~96	96~97	97~98	98~99	99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
2	Bural DELS (D)	000	627 132	688 7505	4589	837 2505	958 6335	1121 456	8025.	9/95.3	119/8.4	14542.6	2080 55	21593./	20052.23	5380 666	40396.9	49/34.3	0722 400	11842	89145.1	17567 0
-	Canital investment	000	OLT.TOL	000.7000	101.100	001.2000	300.0000	1121.400	1064.66	1040	1041.007	2020.000	2000.00	0052.001	4411.024	5000.000	0000.001	1302.047	JILL.400	11042	14420.00	17507.6
	capital inversiment									-				-								
4	MTNU(C)	Rs Crores	1170 5	1720.9	2212 5	2359 0	2823 2	3707 73	4213.81	5203 062	6515 55	6714 08	7781 40	8734								
-		no ororeo	1110.0	1720.0	LL Theo	2003.0	LULUL	0101.10	4210.01	OLOU.UUL	0010.00	0714.00	1.01.40	0/04		1						
	Capital cost per DEL	1.1				1 contraction		and the		Asia at	1.000		and the second		in the second		1.000	anand an	1. Same	1.5.2	Acres 1	Course.
5	A = C / D	Rs		47057.7	53351.82	48627.65	38379.55	37573.27	34289.28	29400.81	29845.4	26183.92	23876.19	23032,7	21996.23	21006.4	20061.11	19158.36	18296.23	17472.9	16686.62	15935.73
	Capital Cost per	-																				
6	Orban DEL Capital Cost per rural	Rs		43897.11	49768.49	45659.77	36037.14	35280.06	32196.51	27606.4	28023.85	24585.84	22418.96	21626.95	20653.74	19724.32	18836.72	17989.07	17179.56	16406.48	15668.19	14963.12
7	DEL = 1.3*(A)	-		61455 05	69675 89	63023 68	50452	40302 00	45075 11	38648 96	30233 30	34420 17	31386 54	30277 73	28015 23	27614.05	26371 41	25184 7	24051 30	22060 08	21025 47	20049 37
	USO Deficit due	to Dur	I / Dam	ato DEL	00010.00	00020.00	00102	40002.00	40070.11	00040.00	00200.00	04420.11	01000.04	00211.10	20310.20	21014.00	20071.41	20104.7	24001.00	22303.00	21000.41	20340.07
0	050 Dencit due	to nur	al / nem	ole DEL	3	5.000		1	1 all and													
9		DELS	87~88	88~89	89~90	90~91	91~92	92-93	93-94	94~95	95~96	96~97	97~98	98~99	99~00	00-01	01-02	02~03	03-04	04~05	05~06	06~07
0		Pre 1988	385.4099	275.2928	312.1141	286.347	226.0004	221.2526	201.9146	173.1286	175.7465	154.1857	140.5965	135.6295	129.5262	123.6975	118.1311	112.8152	107.7385	102.8903	98.26024	93.83853
2		1989		31.0/3/6	42.93951	43 74000	34 52203	33,70670	30 84207	23.01039	29.17856	23 55240	21 4754	20 71700	10 79520	19 90505	18 04477	17.0207	14.82227	14.1552/	15.01828	14 3340
3		1990			47.07007	51.18656	40.39918	39.55047	36.09367	30.94796	31.41594	27.56178	25.13262	24.24474	23.15373	22.11181	21.11678	20 16652	19 25903	18 39237	17.56472	16 774
4		1992				01110000	61.23561	59.94915	54,70947	46.90979	47.61914	41.77714	38.0951	36,74929	35.09557	33.51627	32.00804	30.56768	29.19213	27.87849	26.62395	25.4258
5		1993						80.42119	73.3922	62,929	63.8806	56.04361	51.1042	49.2988	47.08036	44.96174	42.93846	41.00623	39.16095	37.39871	35.71577	34,10856
6		1994							91.39813	78.36791	79.55296	69.79327	63.64203	61.3937	58.63098	55.99259	53.47292	51.06664	48.76864	46.57405	44.47822	42.4767
7	1.	1995		(C					12.000	125,136	127.0283	111.4443	101.6221	98.03202	93.62058	89.40765	85.38431	81.54201	77.87262	74.36835	71.02178	67.8258
8		1996		1							115.0743	100.9568	92.05893	88.8067	84.8104	80,99393	77.3492	73.86849	70.5444	67.36991	64.33826	61.44304
9		1997										131.7095	120.1012	115.8583	100.6447	105.6657	100.9107	96.36976	92.03312	87.89163	83.9365	80,15936
1		1990									-		200.900	201.5256	192.4572	183 0897	173.5256	166 9824	150 4682	152.0001	145.0003	139.4305
2		2000												200.7507	221,2139	211,2593	201.7526	192.6738	184 0035	175 7233	167.8158	160 264
3		2001	-			1										265.9349	253.9678	242.5392	231.625	221.2018	211.2478	201.7416
4		2002															309.3328	295.4128	282.1192	269.4239	257.2998	245.7213
25		2003																359.8127	343.6212	328.1582	313.3911	299.2885
26		2004									-								418.5307	399.6968	381.7105	364.5335
27	1	2005	-																	486.8298	464.9224	444.0009
20	OPEY	2000																			566.2772	540.7948
0	USO Cost due to Rura	DELS	in crores	37.87376	402,7297	420.6682	393,2496	465 4093	516 1296	567.6834	691.342	738,2364	882 0779	1051.667	1225 556	1436 341	1681 038	1965 204	2295 301	2678 842	3124 571	3642 653
	Revenue (only call											(
31	charges)		Rs 4124 p	er annum p	er Rural D	EL						-		11.0	1821.828	2218.987	2702.726	3291.92	4009.559	4883.641	5948.276	7245.002
2	NUSC		in Rs cro	res						-	1				-596.27	-782.65	-1021.7	-1326.7	-1714.3	-2204.8	-2823.7	-3602.3
_	Revenue per Rural DEL	@ 5% ann	ual increase	9											4124	4330.2	4546.71	4774.046	5012.748	5263.385	5526.554	5802.882
-	Total Revenue	to serve and	in Rs Crore	S			-								1821.828	2329.936	2979.755	3810.809	4873.644	6232.901	7971.259	10194.45
+	NUSC with 5% increase	in revenue													-596.2725	-893.5955	-1298./1/	-1845.605	-25/8.343	-3554.059	-4846.688	-6551./92
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Se no. Particulars	Units												1						-		
1 Year	000	87~88	88~89	89~90	90-91	91-92	92-93	93-94	94~95	95~96	96-97	97~98	98~99	99~00	00~01	01~02	02~03	03~04	04~05	05~06	06~07
2 Total DELS (D)	000	3800.8	41/4.3	4589	50/4.3	5809.9	6/96./	1204 004	9/95.3	119/8.4	14542.6	1/801./	21593.7	20052.23	32812.0	40396.9	49/34.3	0700 400	/5382.0	89145.1	105420
Capital inverstment		027.132	000.7395	/5/.165	637.2595	906.6335	1121.450	1324.224	1040	1941.307	2323.959	2909.55	3052.561	4417.024	5360.000	0553.051	/902.34/	9722.498	11044	14423.50	1/56/
4 MTNL) (C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.73	4213.81	5203.062	6515.55	6714.08	7781.49	8505.27								-
Capital cost per DEI 5 A = C / D	Rs		47057.7	53351.82	48627.65	38379.55	37573.27	34289.28	29400.81	29845.4	26183.92	23876.19	22429.51	21308.03	20242.63	19230.5	18268.98	17355.53	16487.75	15663.36	14880.1
Capital Cost per 6 Urban DEL	Rs		44185.63	50095.61	45659.77	36037.14	35280.06	32196.51	27606.4	28023.85	24585.84	22418.96	21060.57	20007.54	19007.17	18056.81	17153.97	16296.27	15481.46	14707,38	13972.0
Capital Cost per 7 rural DEL = 1.3*(A)			61859.88	70133.85	63923.68	50452	49392.09	45075.11	38648.96	39233.39	34420.17	31386.54	29484.8	27913.52	26610.03	25279.53	24015.55	22814.78	21674.04	20590.34	19560.8
8 USO Deficit du	e to Rural	DELs			5	1				-				1.1							-
9	DELs	87~88	88~89	89~90	90~91	91~92	92~93	93~94	94~95	95-96	96~97	97~98	98~99	99~00	00~01	01~02	02~03	03~04	04-05	05~06	06~07
10	Pre 1988	387.9431	387.9431	314.1656	286.347	226.0004	221.2526	201.9146	173.1286	175.7465	154.1857	140.5965	132.0776	125.4737	119.2	113.24	107.578	102.1991	97.08916	92.23471	87.6229
11	1989		53.37178	43.22174	39.39456	31.0923	30.43911	27.77867	23.81839	24.17856	21.21229	19.34274	18.17075	17.20241	16.3991	15.57914	14.80019	14.06018	13.35717	12.68931	12.0548
12	1990			47.98944	43.74009	34.52203	33,79678	30.84287	26.44574	26.84565	23.55218	21.4764	20.17512	19.09997	18.20805	17.29765	16.43276	15.61113	14.83057	14.08904	13.384
13	1991			Concernal de	51.18656	40.39918	39.55047	36.09367	30.94796	31.41594	27.56178	25.13262	23.60981	22.35162	21.30785	20.24246	19.23034	18.26882	17.35538	16.48761	15.6632
14	1992					61.23561	59.94915	54.70947	46.90979	47.61914	41.77714	38.0951	35.78688	33.87976	32.29766	30.68278	29.14864	27.69121	26,30665	24.99131	33.2384
15	1993						80.42119	73.3922	62.929	63.8806	56.04361	51.1042	48.00774	45.44936	43.32699	41.16064	39.10261	37.14/48	35.2901	33,5256	31.8493
16	1994							91.39813	78.36791	79.55296	69.79327	63.64203	59.78589	56.59984	53.95676	51,25893	48.69598	46.26118	43.94812	41.75072	39,6631
17	1995								125.136	127.0283	111.4443	101.6221	95.464/1	90,37729	36.1569	81.84906	70.4000	73.86877	70.17533	66.66657	63.3332
10	1990									115.0743	121 7005	120 1012	110 0040	106 0117	101 8228	74,14004	01 906	00.91/34	03.5/14/	70 70022	74.9400
20 Onex @10% (in Bs	1998										131.7095	208 006	106 2482	185 7800	177 114	169 2593	150 8454	151 8531	144 2604	137 0474	130 104
21 Crorpe)	1999						-					200.300	105 4034	185 0753	176 4328	167 6111	159 2306	151 260	143 7056	196 5203	120 60/
22	2000												100.4004	726.0716	716.0993	705 9204	696 2504	687.064	678.3368	670.046	662 169
23	2001			a										120.0110	871 3037	858 4904	846 3178	834 7538	823 768	813 3315	803 416
24	2002															1008.186	993.3593	979.2744	965.8937	953.182	941.105
25	2003								1				-				1166.571	1149.416	1133.118	1117.635	1102.92
26	2004			-	-	p-												1349.84	1329.99	1311.131	1293.21
27 Capex@24% +	2005								1	1		1							1561.897	1538.928	1517,10
28 Opex@10% (in	2006													1						1807.276	1780.69
29 Rs Crores)	2007												1					1			2091.19
30 USO Cost		in crores	53.37178	405.3768	420.6682	393.2496	465.4093	516.1296	567.6834	691.342	738.2364	882.0779	1024.125	1696.055	2511.676	3450.656	4536.655	5792.797	7245.829	8926.716	10880.7
31 Revenue		in Crores		Rs 4724 p	er annum p	per Rural D	EL						_	2086.886	2541.827	3095.945	3770.861	4592.909	5594.161	6813.69	8299.07
32 NUSC		in Crore	5							-				-390.83	-30.151	354.711	765.795	1199.89	1651.67	2113.03	2581.6
Revenue per Rural D	EL @ 5% annu	al increase							1					4724	4960.2	5208.21	5468.621	5742.052	6029.154	6330,612	6647.14
Total Revenue														2086.886	2668.918	3413.279	4365.243	5582.709	7139.724	9130.996	11677.6
NUSC	4				-					-				-390.8308	-157.2419	37.37656	171.4126	210.0877	106.105	-204.2804	-796.869
		_								-											
		-								-									-	-	1/
																			-		10

_	Annexure 5-F			in the second	10000		100	1				100	the second				1000					
	USO calculation	ons for F	Rural / R	emote I	DELs				Model	3	Capex	24% &	Opex@10	0%								
Sano	Particulars	Unite			-														-		-	-
1	Year	Grinto	87~88	88-89	89-90	90-91	91-92	92~93	93-94	94~95	95-96	96-97	97-98	98~99	99-00	00-01	01-02	02~03	03-04	04-05	05~06	06-07
2	Total DELs (D)	000	3800.8	4174.3	4589	5074.3	5809,9	6796.7	8025.6	9795.3	11978.4	14542.6	17801.7	21593.7	26652.23	32812.6	40396.9	49734.3	61229.9	75382.5	89145.1	105420.4
3	Rural DELS (Total)*		627.132	688.7595	757.185	837.2595	958.6335	1121.456	1324.224	1648	1941.307	2323.959	2989.55	3652.581	4417.624	5380.666	6553,651	7982.347	9722.499	11842	14423.56	17567.9
4	Capital inverstment on local (DOT & MTNL) (C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.73	4213.81	5203.062	6515.55	6714.08	7781.49	8505.27								
5	Capital cost per DEL A = C / D	Rs		47057.7	53351.82	48627.65	38379.55	37573.27	34289.28	29400.81	29845.4	26183.92	23876.19	22429.51	21308.03	20242.63	19230.5	18268.98	17355.53	16487.75	15663.36	14880.19
6	Capital Cost per Urban DEL	Rs		44185.63	50095.61	45659.77	36037.14	35280.06	32196.51	27606.4	28023.85	24585.84	22418.96	21060.57	20007.54	19007.17	18056.81	. 17153.97	16296.27	15481.46	14707.38	13972.01
	Capital Cost per		1.1.1	C1050.00	70100.05	00000.00	50450	40000.00	45075 44	00040.00	00000.00	3	04000 54	00404.0	07010 50	00040.00	05070 50	01015 55	00011.70		00500.04	10500.00
- /	LICO Defielt de	a to Due	IDE!	01059.88	70133.85	03923.68	50452	49392.09	45075,11	30040.96	39233.39	34420.17	31300.54	29404.8	2/913.52	20010.03	252/9.53	24015.55	22014.78	210/4.04	20590.34	19300.82
8	USU Deficit du	e to Hul	al DELS					-		-				-						-		-
9		DELS	87-88	88~89	89~90	90-91	91-92	92-93	93-94	94~95	95-96	96-97	97-98	98~99	99-00	0001	01-02	02-03	03-04	04~05	05-06	06~07
10 11 12 13 14 15 16 17 18 19 20 21		Pre 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998	942.1476	1068.163 81.73249	973.5799 86.83153 96.40973	768.4015 83.00435 92.16039 107.8501	752.2587 74.70209 82.94232 97.06272 147.1241	686.5097 74.0489 82.21708 96.214 145.8377 195.6398	588.6371 71.38846 79.26317 92.75721 140.598 188.6108 234.8843	597.5383 67.42818 74.86604 87.6115 132.7983 178.1476 221.854 354.2514	524.2312 67.78835 75.26594 88.07948 133.5077 179.0992 223.0391 356.1436 322.6287	478.028 64.82208 71.97247 84.22532 127.6657 171.2622 213.2794 340.5596 308.5111 402.4875	140.5965 62,95253 69,89669 81.79616 123,9836 166,3228 207,1282 330,7374 299,6133 390,8793 679,9017	132.0776 18.17075 68.59542 80.27334 121.6754 163.2263 203.272 324.58 294.0354 393.6022 667.2438 664.6775	125.4737 17.20241 19.09997 79.01515 119.7683 160.6679 200.086 319.4926 289.4267 377.5897 656.7855 654.2594	119.2 16.3991 18.20805 21.30785 118.1862 158.5456 197.4429 315.2722 285.6035 372.6019 648.1096 645.6169	113.24 15.57914 17.29765 20.24246 30.68278 156.3792 194.7451 310.9644 281.701 367.5107 639.2539 636.7952	107.578 14.80019 16.43276 19.23034 29.14864 39.10261 192.1821 306.8719 277.9937 362.674 630.841 628.4147	102.1991 14,06018 15,61113 18,26882 27,69121 37,14748 46,26118 302,9841 274,4717 358,0792 622,8487 620,4531	97.08916 13.35717 14.83057 17.35538 26.30665 35.2901 43.94812 70.17533 271.1258 353.7142 615.2561 612.8897	92.23471 12.68931 14.08904 16.48761 24.99131 33.5256 41.75072 66.66657 60.3929 349.5674 608.0431 605.7044	87.62297 12.05484 13.38459 15.66323 33.23845 31.84932 39.66318 63.33324 57.37325 74.84987 601.1907 598.8784
22 23 24 25 26 27 28	Capex@24% (current cost) + Opex@10%	2000 2001 2002 2003 2004 2005 2006													726.0716	871.3037	705.9204 858.4904 1008.186	696.2504 846.3178 993.3593 1166.571	687.064 834.7538 979.2744 1149.416 1349.84	678.3368 823.768 965.8937 1133.118 1329.99 1561.897	670.046 813.3315 953.182 1117.635 1311.131 1538.928 1807.276	662.1698 803.4168 941.1059 1102.927 1293.216 1517.107 1780.699
29	(in Rs Crores)	2007			1							1					-				Sec. 1	2091.199
30	USO Cost due to Run	al DELs	in crores	81.73249	1156.821	1051.416	1154.09	1280.467	1396.139	1714.495	1969.783	2262.813	2553.808	3121.43	3744.939	4503.897	5356.988	6327.769	7440.424	8664.341	10137.67	11820.94
31	Hevenue				Hs 4724 p	er annum p	er Rural DE	L			-				2086,886	2541.827	3095.945	3770.861	4592.909	5594.161	6813.69	8299.076
32	NUSC		in Crores	3	-				1.1.1.1			-			1658.05	1962.07	2261.04	2556.91	2847.52	3070.18	3323.98	3521.87
1	Hevenue per Rural DE	L @ annual	increase of	5%	-									-	4724	4960.2	5208.21	5468,621	5742.052	6029.154	6330,612	6647.142
	NUSC														1658.053	1834.979	1943.709	4365.243	1857.715	1524.617	1006.677	143.3099
			-						-	-			-						-			105

1 Year 87-58 88-99 99-90 91 2 Total DELs (D) 000 3800.8 4174.3 4569 3 Rural DELS (Total)* 627.132 688.7595 757.185 1 Capital inverstment on local (DOT & Capital cost per 627.132 688.7595 757.185 1 Capital cost per 7 750.7155 1720.9 2212.5 Capital cost per 47057.7 53351.82 4 Capital Cost per 44185.63 50095.61 4 Capital Cost per 61850.88 70133.85 6 Qubran DEL 8.8 47057.7 53351.82 6 Qubran DEL Ra 44185.63 50095.61 4 Capital Cost per 6 61850.88 70133.85 6 USO Deficit due to Rural DELs 7-88 89-90 9 9 10 Pre 1988 94.176 106.163 13 1991 16 1993 16 17 1995 14 1992 16 1994		1.000.000			Concernance of the second								1000		Contraction in the	1000		in a second		and the second second		1
2 Total DELs (D) 000 3800.8 4174.3 4599 3 Rural DELS (Total)* 627.132 688.7595 757.165 3 Capital Inversiment on local (DOT & MITNI) (C) Re Cores 1170.5 1720.9 2212.5 Capital Cost per 5 DEL & a C /D Re 47057.7 53351.82 6 Capital Cost per 6 Urban DEL Re 44185.63 50095.61 6 Capital Cost per 7 nural DEL = 1.37(A) Re 61659.88 7013.85 6 9 DELs 87-88 88-89 89-90 9 9 11 1999 128.172 144.762 168.163 973.5789 7 12 1999 128.172 144.762 168.161 1973.5789 1 13 1991 1992 1 1 1 1 1 14 1992 1 1993 1 1 1 1 1 1 1 1 1 1 1 1 1			87-88	88~89	89~90	90~91	91~92	92~93	93-94	94-95	95~96	96-97	97~98	98~99	99~00	00~01	01~02	02~03	03~04	04~05	05-06	0
3 Rural DELS (Total)* 627.132 688.7595 757.185 1 Capital Inversiment on local (DOT & NTML (C) Rs Crores 1170.5 1220.9 2212.5 Capital Cost per 5 DEL A = C/D Capital Cost per 6 HTML (C) Rs 47057.7 53351.82 Capital Cost per 6 Urban DEL Rs 47057.7 53351.82 6 Capital Cost per 7 mart DEL = 1.3*(A) Rs 61859.88 70133.85 6 USO Deficit due to Rural DELs 0 0 8-8-9 80-90 9 9 DEL all Cost per 7 mart DEL = 1.3*(A) Rs 61859.88 70133.85 6 USO Deficit due to Rural DELs 1996 128.012 134.7162 1068.163 973.5799 7 11 1991 16 1992 1 1 1 13 1991 16 1 1 1 1 14 1992 1 1 1 1 1 1 1 1 1 1 1 1 <td>Ls (D)</td> <td>000</td> <td>3800.8</td> <td>4174.3</td> <td>4589</td> <td>5074.3</td> <td>5809.9</td> <td>6796.7</td> <td>8025.6</td> <td>9795.3</td> <td>11978.4</td> <td>14542.6</td> <td>17801.7</td> <td>21593.7</td> <td>26652.23</td> <td>32812.6</td> <td>40396.9</td> <td>. 49734.3</td> <td>61229.9</td> <td>75382.5</td> <td>89145,1</td> <td>4</td>	Ls (D)	000	3800.8	4174.3	4589	5074.3	5809.9	6796.7	8025.6	9795.3	11978.4	14542.6	17801.7	21593.7	26652.23	32812.6	40396.9	. 49734.3	61229.9	75382.5	89145,1	4
Capital inversiment on local (DOT & MTKL) (C) Rs Crores 1170.5 1720.9 2212.5 Capital cost per 5 DEL A = C / D Rs 47057.7 53351.82 4 Capital Cost per 6 Urban DEL Rs 47057.7 53351.82 4 Capital Cost per 7 mm DEL = 1.3'(A) Rs 61859.88 70133.85 6 USO Deficit due to Rural DELs 9 DELs 97.879.97 93.872 134.7162 10 Pre 1988 942.1476 1068.163 973.5799 7 11 1990 128.472 134.7162 105.1611 11 13 1991 163.1621 134.7162 11 14 1992 11 1991 163.1641 11 15 1993 11 1992 11 11 16 1994 11 1992 11 11 1995 2001 2001 2001 2001 2001 2001 2001 2001 2001 2001 2001 2001 2001 </td <td>ELS (Tota</td> <td>1)*</td> <td>627.132</td> <td>688.7595</td> <td>757.185</td> <td>837.2595</td> <td>958.6335</td> <td>1121.456</td> <td>1324.224</td> <td>1648</td> <td>1941.307</td> <td>2323.959</td> <td>2989.55</td> <td>3652.581</td> <td>4417.624</td> <td>5380.666</td> <td>6553.651</td> <td>7982.347</td> <td>9722.499</td> <td>11842</td> <td>14423.56</td> <td>5</td>	ELS (Tota	1)*	627.132	688.7595	757.185	837.2595	958.6335	1121.456	1324.224	1648	1941.307	2323.959	2989.55	3652.581	4417.624	5380.666	6553.651	7982.347	9722.499	11842	14423.56	5
Capital cost per 5 DEL A = C /D Rs 47057.7 53351.82 Capital Cost per 6 Urban DEL Rs 44185.63 50095.61 Capital Cost per 7 rurral DEL = 1.3"(A) Rs 44185.63 50095.61 2 Capital Cost per 7 rurral DEL = 1.3"(A) Rs 61859.88 70133.65 6 9 Deficit due to Rural DELs 87-88 88-89 89-90 9 9 Pre 1988 942.1476 1068.163 973.5780 713.7621 11 1999 123.6121 143.7162 15 15 1993 15 15 1993 9 163.1641 1 16 1994 16 1 16 1994 9 10 1 </td <td>nverstme (DOT & C)</td> <td>nt Rs Crores</td> <td>1170.5</td> <td>1720.9</td> <td>2212.5</td> <td>2359.9</td> <td>2823.2</td> <td>3707.73</td> <td>4213.81</td> <td>5203.062</td> <td>6515.55</td> <td>6714.08</td> <td>7781.49</td> <td>8505.27</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	nverstme (DOT & C)	nt Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.73	4213.81	5203.062	6515.55	6714.08	7781.49	8505.27								
Capital Cost per 6 Urban DEL Rs 44185.63 50095.61 Capital Cost per 7 rural DEL = 1.3*(A) Rs 61659.88 70133.65 6 9 DELs 87-88 88-89 89-90 9 9 DELs 87-88 88-89 89-90 9 10 Pre 1988 942:1476 1068.163 972.5780 713.7850 11 1999 123.6172 134.7162 143.7162 13 1999 123.6172 134.7162 14 1992 15 15 1993 15 1993	cost per	Rs		47057.7	53351.82	48627.65	38379.55	37573.27	34289.28	29400.81	29845.4	26183.92	23876.19	22429.51	21308.03	20242.63	19230.5	18268.98	17355.53	16487.75	15663,36	
Capital Cost per Trural DEL = 1.3'(A) Test (BSO Deficit due to Rural DELs 9-90 9 9 DELs 87-88 88-89 99-90 9 10 Pre 1988 942.1476 1066.163 973.5789 7133.85 10 Pre 1988 942.1476 1066.163 973.5789 714.7162 11 1999 129.6172 143.7162 176 13 1999 129.6172 143.7162 16 1992 16 177 17 1996 171 1996 16 1996 171 1996 17 1996 171 1996 18 1996 171 1996 19 1997 1996 172 1996 10 1997 10 1996 10 1997 10 22 20001 10 10 23 2001 10 10 24 2002 10 10	Cost per	Re		44185 63	50095 61	45650 77	36037 14	35280.06	32106 51	27606 4	28023.85	24585 84	22418 96	21050 57	20007 54	19007 17	18056 81	17153 97	16296 27	15481 46	14707 38	I
Image: Constraint DEL = 1.3" (A) If is a list of the image in the ima	Cost per			44105.00	50055.01	40000.77	00007.14	55255.00	02100.01	27000.4	20020,00	24000.04	LETTO.SU	21000.07	20007.04	10007.17	10000.01	11100.07	TOLOGILT	10101.40	14707.00	T
9 DELs 87–85 88–89 89–90 97 10 Pre 1988 942.1476 106.163 973.5799 7	L = 1.3*(A Deficit	due to Ru	Iral DEL	61859.88 S	70133.85	63923.68	50452	49392.09	45075.11	38648,96	39233.39	34420.17	31386.54	29484.8	27913.52	26610.03	25279.53	24015.55	22814.78	21674.04	20590.34	f
10 Pre 1988 942.1476 1068.163 973.5760 11 1999 129.6172 134.7162 13 1990 163.1641 1 13 1991 163.1641 1 14 1992 161.1641 1 15 1993 161.1641 1 16 1994 163.1641 1 17 1995 161.1641 1 18 1994 199.1 199.1 101.162 19 1995 199.1 199.1 101.162 20 1998 199.1 199.1 101.162 21 1999 200.1 202.1 203.1 202.1 23 2000 - 203.1 202.1 203.1 204.1 205.1 205.1 205.1 205.1 207.1 207.1 127.1.46.1 13.1 129.6.172.1 127.1.46.1 129.6.172.1 127.1.46.1 14.1 15.1 129.6.172.1 127.1.46.1 15.1 129.		DELs	87~88	88-89	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97~98	98-99	99-00	00~01	01~02	02-03	03-04	04~05	05-06	0
11 1989 122.6172 134.7162 12 1990 163.1641 1 13 1991 163.1641 1 14 1992 163.1641 1 15 1993 16 169.1641 16 1994 163.1641 1 17 1995 16 1993 16 1994 1995 1 19 1995 1 1995 20 1996 1 1997 20 1999 1 1992 21 2000 1999 1 22 2000 1 1993 23 2001 1 1 24 2002 1 1 23 2003 1 1 1 24 2002 1 1 1 25 2003 1 1 1 1 26 2004 1 1 1		Pre 1988	942.1476	1068.163	973.5799	768.4015	752.2587	686,5097	588.6371	597.5383	524.2312	478.028	140.5965	132.0776	125.4737	119.2	113.24	107.578	102.1991	97.08916	92.23471	É
12 1990 163.1641 1 13 1991 1 1 14 1992 1 1 15 1993 1 1 16 1994 1 1 17 1995 1 1 18 1994 1 1 19 1996 1 1 19 1996 1 1 20 1998 1 1 21 1999 1 1 22 2000 1 1 23 2001 1 1 24 2002 1 1 26 2003 1 1 27 2006 1 1 29 Pac Yores 2007 1 1 29 Pac Yores 2007 1 1 31 Revenue In Crores 184 4724 per 1 19 90		1989		129.6172	134.7162	130.889	122.5868	121.9336	119.2731	115.3129	115.673	112.7068	110.8372	18.17075	17.20241	16.3991	15.57914	14,80019	14.06018	13.35717	12.68931	E
13 1991 1 14 1992 1 15 1993 1 16 1994 1 17 1995 1 18 1996 1 19 1997 1 20 1998 1 21 1999 1 22 2000 1 23 2001 1 26 2002 1 26 2003 2005 27 2007 2007 28 Opex #00% (In 2005 29 Recrores) 2007 30 USO Cost due to Rural DELs n crores 129.6172 1271.46 31 Revenue In Crores Re 4724 per Revenue 7030 USO Cost due to Rural DEL © 5% annual increase of revenue NUSC OS* annual increase of revenue NUSC OS* annual increase of revenue		1990			163.1641	158.9147	149.6967	148.9714	146.0175	141.6204	142.0203	138.7268	136.651	135.3498	19.09997	18.20805	17.29765	16.43276	15.61113	14.83057	14.08904	
14 1992 15 1993 16 1994 17 1995 18 1996 19 1997 20 1996 21 1999 23 2000 24 2000 26 2003 27 Capex #24% + 28 Opex #10% (n 29 Rs Crores 2007 30 30 USO Cot due to Rural DELs 18 NUSC In Crores Rs 4724 per 70 YUSC In Revenue NUSC Stream Increase Total Revenue Stream DEL® 5% annual Increase		1991				174.0343	163.2469	162.3982	158.9414	153.7957	154.2637	150.4095	147.9804	146.4576	145.1994	21.30785	20.24246	19.23034	18.26882	17.35538	16.48761	1
15 1993 1993 16 1994 1994 17 1995 1995 18 1996 1995 19 1995 1995 20 1998 1997 20 1998 1997 21 1999 1997 22 2000 1 23 2001 1 24 2002 2027 25 2004 2025 26 2005 1 27 Capex @24% + 2005 28 Opex @10% (n. 2006 29 Ra Crores) 2007 30 USO Cost due to Rural DELs in Crores 16 rores Ra 4724 per 31 Revenue per Rural DEL @ 5% annual incroses Ra 4724 per 70 at Revenue per Rural DEL @ 5% annual incroses Total Revenue 70 at Revenue per Se annual incroses Total Revenue		1992					208.2011	206.9146	201.6749	193.8752	194.5846	188.7426	185.0606	182.7523	180.8452	179.2631	30.68278	29.14864	27.69121	26.30665	24.99131	E
1996 1996 19 1995 19 1996 19 1997 20 1998 21 1999 23 2000 23 2001 24 2002 25 2003 26 2004 27 Capex @24% + 280 Opex @10% (in 2006 29 Recores) 2007 30 USO Cate due to Rural DELs n corres 129 6172 31 Revenue per Rural DEL @ 5% annual increase To Carle Revenue Total Revenue process or revenue NUSC Set senual increase		1993						2/3.432	266.403	255.9399	256.8914	249.0545	244.115	241.0186	238.4602	236.3378	234.1/15	39.10261	37.14/48	42 04912	33.5250	
19 1996 19 1997 19 1997 20 1998 21 1998 22 2000 23 2001 24 2002 25 2003 26 2004 27 Capex @24% + 280 Opex @10% (in 2006 29 Re Crores) 2007 20 JUSO Cost due to Rural DELs in Crores 18 Revenue in Crores Re 4724 per 30 LISO Cost due to Rural DELs in Crores Re 4724 per 31 Revenue per Rural DEL @ 5% annual increase Total Revenue NUSC G9% ennual increase Total Revenue NUSC 6% sennual increase Total Revenue NUSC 6% ennual increase		1994				-			310.7537	425 4626	427 3548	411 7708	401 0486	305 7012	300 7038	386 4834	382 1756	378 0831	374 1953	70 17533	66 66657	1.
16 1997		1996			-					TROTTORO	391.2526	377.1351	368.2372	362.6593	358.0506	354.2274	350.3249	346.6176	343.0956	339.7498	60,3929	1 5
20 1996 1997 21 1999 9 22 2000 1 23 2001 1 24 2002 1 25 2002 1 26 2003 1 27 Capex @24% + 2005 1 28 Opex @10% (in 2006 1 29 Re Corees 2007 1 30 USO Cord due to Rural DELs n Crores 129 6172 1271.46 31 Revenue in Crores Re 4724 per 1 32 NUSC in Crores Re 4724 per 1 NUSC G% annual increase Total Revenue NUSC G% annual increase 1		1997										447.8122	436.204	428.9269	422.9144	417.9266	412.8354	407.9988	403.404	399.0389	394.8921	7
21 1999		1998			1								710.2805	697.6226	687.1643	678.4884	669.6327	661.2198	653.2275	645.6349	638.4219	E
22 2000 23 2001 24 2002 25 2003 26 2003 27 Capex @24% + 2005 2005 28 Opex @10% (In 30 USC Cort due to Rural DELs ncrores 128 Havenue 10 Corres 31 Revenue per Rural DEL 10 Corres Revenue per Rural DEL © 5% annual incroses To Cares Total Revenue NUSC % annual increase Total Revenue 10 Crease		1999						-		1				664.6775	654.2594	645.6169	636.7952	628.4147	620.4531	612.8897	605.7044	5
23 2001 24 2002 25 2003 26 2004 27 Capex @24% + 28 Opex @10% (n 29 Re Crores) 200 USC Cost due to Rund DELs n crores 31 Revenue in Crores Revenue por Rural DEL @ 5% annual increase Total Revenue VUSC CS% annual increase NUSC CS% annual increase		2000			_	-			-						726.0716	716.0993	705.9204	696.2504	687.064	678.3368	670.046	6
24 2003 26 2003 28 2004 29 Ra Correal 200 2004 28 Opex @10% 29 Ra Correal 200 2007 30/USO Cost due to Rural DELs in Crores 1Revenue in Crores 72 NUSC 1Revenue in Crores Total Revenue NUSC Ses annual increase Total Revenue NUSC Ses annual increase		2001	-							-	-					8/1.303/	1000 100	846.3178	834.7538	823.768	813.3315	10
200 2004 27 Capex @24% + 2006 28 Opex @10% (In 2006 30 USO Cost due to Rural DELs ncrores 30 USO Cost due to Rural DELs In Crores 31 Revenue In Crores 732 NUSC In Crores 734 Revenue per Rural DEL @ 5% annual increase 7041 Revenue NUSC % annual increase		2002														-	1008.100	1166 571	1140 416	1133 118	1117 635	
27 Capex @24% + 2005 28 Opex @10% (in 2006 29 Bas Crores) 2006 30 USO Cost due to Rural DELs in crores 129.6172 31 Revenue in Crores Re 4724 per 32 NUSC In Crores Re 4724 per Total Revenue per Rural DEL @ 5% annual increase NUSC G9% annual increase Total Revenue In Crores NUSC G9% annual increase		2004															-	1100.011	1349.84	1329.99	1311.131	
28 Opex @10% (n 2007 29 Rs Crores) 2007 2007 30 USO Cost due to Rural DELs in crores 129.6172 1271.46 31 Revenue In Crores Rs 4724 per 32 NUSC In Crores Revenue per Rural DEL @ 5% annual incrose Total Revenue Total Revenue USC % annual incrose NUSC 6% annual increase of revenue 10	@24% +	2005										1								1561.897	1538.928	1
29 Re Croree) 2007 129.6172 129.6172 127.1.46 30 USC Cest due to Rural DELs n crores 129.6172 127.1.46 31 Revenue In Crores Re 4724 per 32 NUSC In Crores Re 4724 per Total Revenue Nusc S% annual increase Nusc S% annual increase	10% (n 2006					1		1				1						1.000		1807.276	1
30 USO Cost due to Rural DELs in crores 129.6172 1271.46 31 Revenue in Crores Rs 4724 per 32 NUSC in Crores Rs 4724 per 31 Revenue per Rural DEL © 5% annual increase Total Revenue NUSC 68% annual increase of revenue	Crores)	2007										C		1	1		-					2
31 Hevenue In Crores He 4724 per 32 NUSC In Crores Revenue per Rural DEL © 5% annual increase Total Revenue NUSC @5% sanual increase of revenue	t due to	Rural DELs	in crores	129.6172	1271.46	1232.24	1395.99	1600.16	1791.701	2181.268	2505.18	2843.535	3164.909	3684.646	4241.4	4934.174	5726.188	6619.177	7655.963	8808.669	10213.38	1
JZ III Crores Revenue per Rural DEL @ 5% annual increase Increase Total Revenue NUSC@5% annual increase of revenue			in Crores		Hs 4724 p	er annum p	er Hural DE	L							2086.886	2541.827	3095.945	3770.861	4592.909	5594.161	6813.69	8
Total Revenue P I fural DEL @ 5% annual increase Total Revenue NUSC@5% annual increase of revenue		0.00	in Crores	5	-										2154.51	2392.35	2630.24	2848.32	3063.05	3214.51	3399.69	3
NUSC@5% annual increase of revenue	per Hural	DEL @ 5% a	nnual increa	150						-					4/24	4960.2	5208.21	5468.621	5/42.052	7120 704	0120.000	6
	% annua	increase of n	avenue												2154 515	2265 256	2312 909	2253 934	2073 254	1668.945	1082 381	1
	a waringa				1		-			-				-	2104.010	2200.200	A.0 12.000	FF001004	LOIDEON	1000.040	1002.001	Ľ
			-										-		(()				-		-	t

	Annexure 5-J-1	1		Model 1							1	1			1				1		-	
	NUSC calculation	s for low a	calling Ur	ban DELs (U	pto 200 calls	per mont	h)				Opex@109	for all LCU	IS		10000		1					
	Particulars	Units	1	1	1	1	1			1	1	1	1									
	1 Year		87-88	88-89	89-90	90~91	91-92	92-93	93-94	94-95	95~96	96~97	97~98	98~99	99-00	00-01	01~02	02-03	03~04	04~05	05~06	06-07
	2 Total DELs (D)	000	3800.8	4174.3	4589.0	5074.3	5809.9	6796.7	8025.6	9795.3	11978.4	14542.6	17801.7	21593.7	26652.2	32812.6	40396.9	49734.3	61229.9	75382.5	89145.1	105420.4
	Low Calling Urban	000	1010.0	10001	1170.0	1000.0	1004.0		0575.0			4007.7	FOTO	0050 7	0.402.0	10470.0	10000 5	15040.0	10070 5	04070.0	-	00500.0
-	S[DELS- (0.362-D]	000	1219.0	1009.0	14/2.0	1020.3	1004.0	2101.0	2575.3	3112.4	3034.3	4007.7	5050,4	00003.7	6493.9	104/9.3	12920.5	15949.0	19070.5	24213.3	20044.0	33560.6
	Capital Inverstment on local (DOT & 4 MTNL) (C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.7	4213.8	5203.1	6515.6	6714.1	7781.5	8505.3								
	Capital cost per DEL 5 A = C / D	Rs		47057.1	53351.8	48627.7	38379.6	37573.3	34289.3	29400.8	29845.4	26183.9	23876.2	22429.5	21308.0	20242.6	19230.5	18269.0	17355.5	16487.8	15663.4	14880.2
	Capital Cost per	Rs		44185.6	50095.6	45659.8	36037.1	35280.1	32196.5	27606.4	28023.9	24585.8	22419.0	21060.6	20007.5	19007.2	18056.8	17154.0	16296.3	15481.5	14707.4	13972.0
	7	NUSC	C for low ca	iling urban (in l	Rs Crores)					1.	1		1			1					1	
	в		87-88	68~89	69~90	90~91	91-92	92~93	93~94	94-95	95~96	96~97	97~98	98-99	99-00	00~01	01-02	02-03	03~04	04-05	05~06	06~07
	9	Till 1988*	538.9	754.8	611.0	556.9	439.5	430.3	392.7	336.7	341.8	299.9	273.4	256.9	244.0	231.8	220.2	209.2	198.8	188.8	179.4	170.4
1	0	1989		53.0	60.0	54.7	43.2	42.3	38.6	33.1	33.6	29.5	26.9	25.2	24.0	22.8	21.6	20.6	19.5	18.6	17.6	16.7
1	1	1990	-		66.7	60.8	48.0	46.9	42.8	36.7	37.3	32.7	29.8	28.0	26.6	25.3	24.0	22.8	21.7	20.6	19.6	18.6
1	2	1991			1	71.1	56.1	54.9	50.1	43.0	43.6	38.3	34.9	32.8	31.2	29.6	28,1	26.7	25.4	24.1	22.9	21.8
1	3	1992		1.			85.1	83.3	76.0	65.2	66.1	58.0	52.9	49.7	47.2	44.9	42.6	40.5	38,5	36,5	34.7	33.0
_1	4	1993	1	-	12000			111.7	102.0	87.4	88.7	77.9	71.0	66.7	63.4	60.2	57.2	54.3	51.6	49.0	46.6	44.2
1	5	1994							127.0	108.9	110.5	97.0	88.4	83.1	78.9	75.0	71.2	67.6	64.3	61.0	58.0	55,1
1	6	1995			-					148,3	150.5	132.0	120.4	113.1	107.4	102.1	97.0	92.1	87.5	83.1	79.0	75.0
1	7	1996	-	1			-			-	202.3	177.5	161.8	152.0	144.4	137.2	130.4	123.8	117.6	111.8	106,2	100.9
1	3	1997										204.9	186.8	175.5	166.7	158.4	150.5	143.0	135,8	129.0	122.6	116.4
1	9	1998	-		-					-			222.1	208.7	198.2	188.3	178.9	170.0	161.5	153.4	145.7	138.4
2	2	1999	-							-			-	251.7	239.2	227.2	215.8	205.0	194.8	185.1	175.8	167.0
2	4	2000								-	-				328.2	311.7	296.2	281.4	267.3	253.9	241.2	229.2
2		2001									-					377.4	358.5	340.6	323.6	307.4	292.0	211.4
-2	3	2002				-											442.2	420.1	399.1	379.2	360.2	342.2
- 4		2003					-											518.3	492.3	467.7	444.3	422.1
- 2		2004	-				-		-							-			607.3	376,9	048.1	520.7
- 2		2005					-			-					-		-			/11./	676.1	642.3
2	OPEY	2006	-														-	-			028.2	700 6
2	OPEA	2007	-		-									-	-	-				-		700.9
3	Total Cost of low call	ng Urban s	ubscribers	53.0	737.7	743.5	671.9	769.5	829.2	859.2	1074.5	1147.6	1268.6	1443.4	1699.4	1991.8	2334.5	2736.0	3206.5	3757.9	4198.2	4689.1
3	Revenue from low un	oan callers			in crores	11010		1.00.0							403.6	496.8	611.7	753.0	927.1	1141.4	1349,8	1596.2
3	NUSC for Low Urt	an Caller	s		In crores										1295,9	1495.0	1722.8	1983.0	2279.4	2616.5	2848.4	3092.9
-	1		-					-														107

Annexure 5-	J-2	1 m m m			1		1 - 1	Model 2	100000	Capex@2	4% for Pos	t '99 LCUS	& Opex@1	0% (for all)						
NUSC calcul	ations for los	w calling U	ban DELs (Upto 200 c	alls per mol	nth)				-		111111	1200	1		1.1					
Particulars	Units	1	1	1	1	T						1	-	-		-	1				-
1 Year		87-88	88~89	89-90	90~91	91-92	92-93	93-94	94~95	95~96	96-97	97~98	98-99	99~00	00~01	01~02	02~03	03-04	04-05	05-06	06~07
2 Total DELs (D)	000	3800.8	4174.3	4589	5074.3	5809.9	6796.7	8025.6	9795.3	11978.4	14542.6	17801.7	7 21593.7	26652.23	32813	40397	49734	61230	75383	89145	105420
Low Calling		-		1				1													
3 Urban DEL	1	1210 6	1330 5	1472 6	1628 3	1964 3	21917	2575 3	2112 4	2924.2	4667 7	5659	6853 7	8402 0	10470 3	10000	15040 8	10678 7	04070.0	000444	22560 1
Capital	-	1610.0	1000.0	1472.0	1020.0	1004.5	2101.0	2010.0	5112.4	0004.0	4007.7	0000.4	+ 0000.7	0433.0	10473.3	12320.5	10343.0	19070.0	E46/3.3	20044.0	33300.0
inverstment on					1.0					1000		1100			11.077	1.000					
local (DOT &				1.	1									10 mil A							
4 MTNL)(C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.7	4213.8	5203 1	6515.6	6714.1	7781 5	8505 3		-		1		-		
Capital cost					-			- Link	020011	001010		110110	0000.0	-	-	-			-		
per DEL A = C				1.00							10.001	1.000	1.000	1.000	1 1 2 3	N	1				
5/D	Da.	12000	47057 7	53351 8	48627 7	38370 6	37579 9	24280 3	20400 8	20845 4	26182 0	23876 5	22420 5	21208 0	202426	10220 5	10260 0	17966 6	16407 0	18663 4	14000
Capital Cost			47007.7	50001.0	40027.7	50575.0	0/0/0.0	04200.0	20400.0	20040.4	20105.0	20070.2	66420.0	21500.0	20242.0	19230.3	10209.0	17300.0	10407.0	10003,4	14000.4
per Urban DEL		100	1 Sec	1.00		1.			1000	1.111	10000	1.11.01		1.000	11 11 11					1.11	1.000
6 = A/1.065	Re		44185.6	50095 6	45659.8	36037.1	35280 1	32196 5	27606.4	28023.9	24585 8	22419 0	21060 6	20007 5	19007 2	18056.8	17154 0	16296 5	15481 5	14707.4	13072 (
7	N	USC for low c	alling urban (i	n Rs Crores)	1000010	0000111	0010011	02100.0	21000.1	20020.0	2.4000.0	LETION	21000.0	20001.0	10007.1	100000	11104.0	10200.0	1010100	Tarbite	TOUTERS
0		87~88	88-89	89-90	90~91	91-92	92-93	93-94	94~95	95-96	96-97	97-98	98-99	99~00	00-01	01-02	02-03	03~04	04-05	05-06	06-07
9	Till 1988*	538.9	538.9	611.0	556.9	439.5	430.3	392.7	336.7	341.8	299.9	273.4	256.9	244.0	231.8	220.2	209.2	198.8	188.8	179.4	170.4
Ó	1989		53.0	60.0	54.7	43.2	42.3	38.6	33.1	33.6	29.5	26.9	25.2	24.0	22.8	21.6	20.6	19.5	18.0	17.6	16.7
1	1990	1		66.7	60.8	48.0	46.9	42.8	36.7	37.3	32.7	29.8	28.0	26.6	25.3	24.0	22.8	21.7	20.6	19.6	18.0
2	1991			1	71.1	56.1	54.9	50.1	43.0	43.6	38.3	34.9	32.8	31.2	29.6	28.1	26.7	25,4	24.1	22.9	21.8
3	1992			2	1	85.1	83.3	76.0	65.2	66.1	58.0	52.9	49.7	47.2	44.9	42.6	40.5	38.5	36.5	34.7	33.0
4	1993		1				111.7	102.0	87.4	88.7	77.9	71.0	66.7	63.4	60.2	57.2	54.3	51.6	49.0	46.6	44.2
5	1994	1						127.0	108.9	110.5	97.0	88.4	83.1	78.9	75.0	71.2	67.6	64.3	61.0	58.0	55.1
5	1995	1							148.3	150.5	132.0	120.4	113.1	107.4	102.1	97.0	92.1	87.5	83.1	79.0	75.0
7	1996				1	1		1.		202.3	177.5	161.8	152.0	144.4	137.2	130.4	123.8	117.6	111.8	106.2	100.6
3	1997		-								204.9	186.8	175.5	166.7	158.4	150.5	143.0	135.8	129.0	122.6	116.4
	1998									-		222.1	208.7	198.2	188.3	178.9	170.0	161.5	153.4	146.7	138.4
2	1999											1	251.7	239.2	227.2	215.8	205.0	194.8	185,1	175.8	167.0
	2000						-		-					1115.7	1099.3	1083.7	1068.9	1054.9	1041.5	1028.8	1016.7
	2001														1283,1	1264,2	1246.3	1229,3	1213.1	1197.7	1183.
	2002			-												1503.6	1481.5	1460.5	1440.6	1421.0	1403.0
	2003						1										1/62.1	1/30.2	1/11.0	1688.2	1005.4
Canital	2004								-			-	1			-		2004.9	2034,5	2005.7	1978.3
7 recovery +	2005			-				-				-	-			-			2419.0	2304.0	2350.2
OPEX	2003			-									-							\$199.9	2104,0
al	2007			-		-			-		-		-	-							\$302.9
Total Cost of low	calling Urban s	ubscribers (in	53.0	7377	743 5	671.9	769 5	829.2	859.2	1074 5	1147.6	1268.6	1443.4	2487.0	3685 1	5089.2	6734 5	8662 0	10921.0	12860 8	15049 0
Revenue from to	w urban callers	Lectropic fit	0010	TUTI	in crores	0/110	100.0	ULU.L	000.2	.014.0				2035.5	2510.2	3095.6	3817.4	4707.5	5804.9	6834.0	8044.1
2 NUSC for Lo	w Urban Call	ers			in crores					-			1	451 5	1174 9	1993.6	2017 1	3955.1	5116.9	6035.9	6998 7
The shore shore so	oun					-							-	-01.0	1114.0		avitit	000011	0110.0	0000.0	
-					-					-	-					-				-	109

1	1 Year		87~88	88~89	89-90	90-91	91-92	92-93	93~94	94-95	95-96	96~97	97~98	98~99	99~00	00~01	01-02	02~03	03~04	04-05	05~06	06~07
	2 Total DELs (D)	000	3800 8	4174.3	4589.0	5074 3	5809 9	6796 7	8025 6	9795 3	11978.4	14542 6	17801 7	21593 7	26652 2	32812 6	40396.9	49734 3	61229.9	75382 5	89145 1	105
-	I ow Calling	000	0000.0	4114.0	4000.0	0014.0	0000.0	0100.1	0020.0	0700.0	11070.4	14042.0	11001.1	LIUUUI	LOUDELL	OLOTE.O	40000.0	40104.0	O TELOTO	10001.0	00140.1	100,
1	3 Urban DELs	000	1219.6	1339.5	1472.6	1628.3	1864.3	2181.0	2575.3	3112.4	3834,3	4667.7	5658.4	6853.7	8493.9	10479.3	12928.5	15949.8	19676.5	24273.3	28544.6	335
	Capital	1.00		1.000				1000	1			1.00	10000	1000		-	11000	0-01				1
	inverstment on							1.000		1.000								1 1 2				
	4 MTNL) (C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.7	4213.8	5203.1	6515.6	6714.1	7781.5	8505.3						-	10.00	1.1
1.11	Capital cost per	-										-			-							
	5 DEL A = C/D	Rs		47057.7	53351.8	48627.7	38379.6	37573.3	34289.3	29400.8	29845.4	26183.9	23876.2	22429.5	21308.0	20242.6	19230.5	18269.0	17355.5	16487.8	15663.4	148
	Capital Cost per	-								- Reported				1								
	Urban DEL = A /															10007.0			40000.0	15101 5	4.707	
	7	MUSC to	r low callin	44185.6	50095.6	45659.8	36037.1	35280.1	32196.5	27606.4	28023.9	24585.8	22419.0	21060.6	20007.5	19007.2	18056.8	1/154.0	16296.3	15481.5	14/07.4	139
1 8	8	100010	87-88	88-89	89~90	90~91	91~92	92~93	93~94	94~95	95~96	96~97	97-98	98-99	99-00	00-01	01~02	02-03	03-04	04~05	05~06	06-07
	9	Till 1988*	538.9	754.5	611.0	556.9	439.5	430.3	392.7	336.7	341.8	299.9	273.4	256.9	244.0	231.8	220.2	209.2	198,8	188.8	179.4	1
10	0	1989	1	113.5	120.6	115.3	103.8	102.9	99.2	93.7	94.2	90.0	87.4	85.8	24.0	22.8	21.6	20.6	19.5	18.6	17.6	5
11	1	1990	-		133.9	128.0	115.2	114.2	110.1	104.0	104.6	100.0	97.1	95.3	93.9	25.3	24.0	22.8	21.7	20.6	19.6	5
12	2	1991				149.8	134.8	133.7	128.9	121.7	122.4	117.0	113.6	111.5	109.9	108.3	28.1	26.7	25.4	24.1	22.9	2
12	3	1992	-				204.4	202.6	195.3	184.5	185.5	1/7.3	1/2.2	169.0	166.5	164.2	161.9	40.5	38.5	36.5	34./	
14	4	1993			-			2/1.0	326.3	308.2	240.8 309.8	206.3	231.0	220.7	223.4	220.2	270.5	267.0	263.6	49,0	58.0	
16	6	1995	-	-					520.5	419.7	421.9	403.5	- 391.8	384.5	378.9	373.5	368.4	363.6	359.0	354.6	79.0	
17	7	1996	-		-			-		4100	567.2	542.4	526.7	516.9	509.3	502.1	495.3	488.7	482.5	476.7	471.1	1 1
18	B	1997		-	1000							626.1	608.1	596.7	588.0	579.6	571.7	564.2	557.0	550.3	543.8	5 5
19	9	1998		1. 100 C		P						1.1.1	722.9	709.4	699.0	689.1	679.7	670.7	662.2	654.2	646.5	6 6
20	D	1999	10.00	1	Circ Ti	01.272							1	855.9	843.3	831.4	820.0	809,2	799.0	789.2	780.0	7
21	1	2000			1291			1						20 Miles 14	1115.7	1099.3	1083.7	1068.9	1054.9	1041.5	1028.8	10
22	2	2001	-	-	1	1		-		-						1283.1	1264.2	1246.3	1229.3	1213.1	1197.7	11
20	3	2002	-									-				-	1503.6	1481.5	1460.5	1440.6	1421.6	14
24		2003					-						-		-			1/02.1	2064.0	2034.5	2005 7	10
26		2004																	2004.0	2419.6	2384.0	23
27	Capital recovery	2006	-			1000	1-201		100007			1	1				1				2135.9	21
28	+ OPEX	2007							1	D											-	23
29	9													10010			-	0050 1				100
30	Poter Cost of low c	alling Urban s	subscribers	113.5	865.5	950.0	997.7	1255.4	1514.4	1815.9	2396.1	2890.4	3512.2	4291.2	52/4.2	6405.0	2005.6	9256.4	4707.5	13084.4	14/60.9	165
27	MUSC for Low	Ilshan Callers	lare		in crores					-					2033.5	2010.2	A624 0	E420.0	6217.0	7070 5	7027.0	05
32	LOSC IOF LOW	orban Ca	ners		in crore	S		udd beur	land the second		L. 1000 -	and will not	affect the	autholdu a	3230.7	3094.0	4034.0	3439.0	0317.0	1219.5	1921.0	05
-	For pre 1988 Lou	v calling Un	ban DELS, C	only opex n	as been s	nown as t	ne capex w	ould nave	iready bee	n recovere	a by 1996 a	na wili noi	enect me	subsidy c	alculation	s for post	1999					-
															-	-		-				-
32	* For pre 1988 Lov	Urban Cal v calling Urb	llers ban DELs, c	only opex h	in crore as been s	es hown as t	he capex w	ould have	already bee	n recovere	d by 1998 a	nd will not	effect the	subsidy c	3238.7 alculation	3894.8 s for post	4634.8 1999	5439.0	6317.0	7279.5	7927.0	

Annexure 5-J-	-4				Model 4	Sec. Sec.	1		1	1		1						1			
NUSC calcula	tions for	low callin	ng Urban	DELs (up	to 200 ca	lis per me	onth)			Capex@2	% (Histori	cal cost) &	Opex@10	% for all L	cus		-				
Particulars	Units			1	1	1	T							1.2							1
Year		87~88	88-89	89~90	90~91	91-92	92-93	93-94	94-95	95-96	96-97	97-98 **	98-99 **	99-00	00-01	01-02	02-03	03-04	04-05	05-05	106-0
Total DELs (D)	000	3801	4174	4589	5074	5810	6797	8026	9795	11978	14543	1,7802	21594	26652	32813	40397	49734	61230	75303	00145	1
Low Calling		1920	1220	1473	1628	1864	2181	2575	3110	3834	4668	5658	6954	8404	10479	12020	15050	10676	84373	20545	
Capital Inverstment on local (DOT & MTNL) (C)	Rs Crores	1171	1335	2213	2360	2823	3708	4214	5203	6516	6714	7781	8505		1 10473	TEBES	13830	10070	energ	- Carto	
Capital cost per DEL_A = C/D	Rs		47058	53352	48628	38380	37573	34289	29401	29845	26184	23876	22430	21308	20243	19231	18269	17356	16488	19063	
Capital Cost per Urban DEL = A/1.065	Rs		44186	50096	45660	36037	35280	32197	27606	28024	24586	22419	21061	20008	19007	18057	17154	16296	. 15481	14707	
	NUSCI	or low call	ing urban (in Rs Crore	s)																-
		87-88	88~89	89-90	90-91	91~92	92~93	93~94	94~95	95~96	96~97	97-98	98~99	99~00	00~01	01~02	02~03	03-04	04-05	06-06	08-
	Till 1988*	538.9	754.5	611.0	556.9	439.5	430.3	392.7	336.7	341.8	299.9	273.4	256.9	244.0	231.8	220.2	209,2	198.8	180.0	170.4	-
	1989		180.1	187.1	181.8	170.3	169.4	165.7	160.2	160.7	156.6	154.0	152.3	24.0	22.8	21.6	20.6	19.5	10.6	17.0	-
100 million (1997)	1990			226.7	220.8	207.9	206.9	202.8	196.7	197.3	192.7	189.8	188.0	186.6	25.3	24.0	22.8	21.7	20.0	10.0	-
	1991				241.8	226.8	225.6	220.8	213.6	214.3	208.9	205.6	203.4	201.8	200.3	28.1	26.7	25,4	24.1	22.0	-
	1992	-				289.2	287.4	280.2	269.3	270.3	262.2	257.1	253,9	251.4	249.0	246.8	40,5	38.5	30.9	24.7	-
	1993					-	379.8	370.1	355.5	356.9	346.0	339.1	334.8	331.5	328.3	325,3	322.4	. 51.6	- 49.0	40.0	-
	1994					-		431.7	413.6	415.2	401.7	393.1	387.8	383.0	3/9./	3/5.9	3/2.4	369.0	410.0	50.0	-
	1995								504.1	506.3	467.8	4/0.2	408.9	403.3	457.9	452.8	447.9	443.3	439.0	70.0	-
	1996			-		-				667.9	605.0	679.6	667.0	650.0	660 1	642.2	609.4	603.2	697.0	614.3	-
	1997					-					030.0	765 2	741 7	721.2	721.4	712.0	702.0	604 5	808 E	676.6	-
	1990				-	2						100.2	855.0	942.2	921 4	920.0	800.2	709.0	780.5	200.0	-
	2000							-		-			000.0	1115 7	1000 3	1083 7	1068.0	1054.9	1041.5	1028.8	-
	2000					*		-						1113.7	1283 1	1264.2	1246 3	1229.3	1213.1	1107.7	-
	2002							-	-	-	-	1000			1200.1	1503.6	1481 5	1460.5	1440.6	1421.6	-
	2002					× 2.						-	-			1000,0	1762.1	1736.2	1711.6	1608.2	-
	2004						-									-		2064.9	2034.5	2005.7	-
	2005				-	1	1				1								2419.6	2384.0	-
Capital recovery	2006						-					1	-	-		11000				2135.9	-
+ OPEX	2007		-				1		1				-						-		-
		1	C	-		1.2.2		1. The second				1	1		1. Sec. 1.						-
Total Cost of	low calling	Urban	180.1	1024.8	1201.2	1333.8	1699.5	2063.9	2449.8	3150.6	3715.4	4369.5	5148.5	6065.0	7103.1	8336.5	9777.7	11437.7	13392.2	14984.4	1
Revenue from lov	w urban ca	llers		in crores					1		-		1	2035.5	2510.2	3095.6	3817.4	4707.5	5804.9	6834.0	
Subsidy for Lo	ow Urban	Callers		in crores										4029.53	4592.91	5240.92	5960.28	6730.17	7587.28	8150.43	86
For pre 1988 Lo	w calling U	rban DELs	, only opex	has been a	shown as th	e capex wo	ould have a	ready been	recovered	by 1998 and	d will not e	fect the su	ubsidy calc	ulations fo	r post 1999)					

Annexure 5-K-	1		Model 1					-													
NUSC calculat	tions for low c	alling Url	ban DEL	s (Upto 50	0 calls p.m.)				Opex@10%	for all LCL	JS		1							
Particulars	Units			1	I							1								1.1.1	-
Year		87-88	88~89	89-90	90-91	91~92	92-93	93-94	94-95	95-96	96-97	97~98	98-99	99~00	00~01	01~02	02-03	03-04	04~05	05~06	06-07
Total DELs (D)	000	3800.8	4174.3	4589.0	5074.3	5809.9	6796.7	8025.6	9795.3	11978.4	14542.6	17801.7	21593.7	26652.2	32812.6	40396.9	49734.3	61229.9	75382.5	89145.1	105420
Low Calling											-		1							1	1
Urban DELs										1											-
(0.624*D)		1992.7	2188.6	2406.0	2660,4	3046,1	3563.5	4207.8	5085.2	6264.8	7626.4	9245.2	11198.2	13878.0	17122.0	21123.7	26060.0	32149.0	39659.6	46638.4	54834
Capital			-					-				1									
inverstment on						1.00	A second second	1.000	1.00			1 /								1.000	
local (DOT &	1		1.20	la serie de la ser	1				1									1			
4 MTNL) (C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.7	4213.8	5203.1	6515.6	6714.1	7781.5	8505.3		-				1		
Capital cost per	1.		100.000		1000	1		C								1 1 1		11			
DEL A=C/D	Rs	-	47057.7	53351.8	48627.7	38379.6	37573.3	34289.3	29400.8	29845.4	26183.9	23876.2	22429.5	21308.0	20242.6	19230.5	18269.0	17355.5	16487.8	15663.4	14880
Capital Cost per			1			1											1. The second se	(1345 C)	1		
Urban DEL =	Rs	125-1	44185.6	50095,6	45659.8	36037.1	35280.1	32196.5	27606.4	28023.9	24585.8	22419.0	21060.6	20007.5	19007.2	18056.8	17154.0	16296.3	15481.5	14707.4	13972
1	NUSC IC	or low callin	ng urban (in Rs Crores)				1									1	1		
9		87~88	88-89	89-90	90-91	91~92	92-93	93-94	94~95	95~96	96~97	97-98	98~99	99-00	00~01	01-02	02-03	03-04	04-05	05-06	06~07
	Till 1988*	880.5	1232.7	998.3	909.9	718.1	703.0	641.6	550.1	558,4	489.9	446.8	419.7	398.7	378.8	359.8	341.8	324.7	308.5	293.1	278
	1989		B6.5	98.1	89.4	70,6	69,1	63.0	54.1	54.9	48.1	43.9	41.2	39.2	37.2	35.4	33,6	31,9	30.3	28.8	27.
	1990			108.9	99.3	78.4	76.7	70.0	60.0	60.9	53.5	48.7	45.8	43.5	41.3	39.3	37.3	35.4	33.7	32.0	30.
	1991		-		116.2	91.7	89.8	81.9	70.2	71.3	62.6	57.0	53.6	50.9	48.4	45.9	43.6	41.5	39.4	37.4	35
	1992					139.0	136.1	124.2	106.5	108.1	94.8	86.5	81.2	77.2	73.3	69,6	66.2	62.9	59.7	56.7	53
	1993	-					182.5	166.6	142.8	145.0	127.2	116.0	109.0	103.5	98.3	93.4	88.8	84.3	80.1	76.1	72.
	1994			-		1.5		207.4	177.9	180.6	158.4	144.4	135.7	128,9	122.5	116.3	110.5	105.0	99.7	94,8	90.
	1995	-	-				-		242.2	245.9	215.7	196.7	184.8	175.6	166.8	158.4	150.5	143.0	135.8	129.0	122
-	1996					-		-		330.6	290.0	264,4	248.4	236.0	224.2	213.0	202.3	192.2	182.6	173.5	104
	1997						-			-	334.0	305.3	200.0	272.4	230.0	240.9	233.0	221.9	210.0	200.3	190
	1998					-		-				302.9	411.3	300 7	307.7	292.0	335.0	203.0	202.0	230.1	270
	2000	-	-									-	411.0	536.2	509.4	483.9	459.7	436.7	414.9	394 1	374
	2000		-	-			-					-		000.2	616.6	585.8	556.5	528.6	502.2	477.1	453
	2002			-											01010	722.6	686.5	652.1	619.5	588.5	559
	2003			-							-						846.8	804,4	764.2	726.0	689
5	2004		24		C	1	1.5. 1.2.				2				10000			992.3	942.7	895.5	850
1	2005	1	1			1						1					-		1162.8	1104.6	1049
	2006	2													1					1026.4	975
OPEX	2007						1							-		10000	0.000		1.	1.5.3	1145.
								1			1.2						Sec.		(
Total Cost of low of	calling Urban subs	scribers (in	86.5	1205.3	1214.7	1097.7	1257.2	1354.8	1403.9	1755.6	1875.0	2072.7	2358.4	2776.6	3254.4	3814.3	4470.3	5239.1	6139.9	6859.3	7661.
Revenue from low	urban callers	in crores						1						3028.0	3727.9	4589.6	5650.4	6956.4	8564.3	10127.9	11977.
NUSC for Low	Urban Callers			in crores		-	francisco (-		1-1-1	-251.4	-473.5	-775.3	-1180.1	-1717.3	-2424.4	-3268.6	-4315.
	1					1000	1.000	1.5000.001	1200			1		1		1.1.1.1.1.1.1.1.1		1.2.1.2	1		-
			-				14					1								-	11
											1										
							1	1											and the second sec	1	

IN	Intexture 5-1-2	-	1	1		1	Model 2						-						1000			-
114	USC calculatio	ns for lo	w calli	ng Urba	n DELs	(Upto 50	0 calls p.	.m.)			Capex@	24% (for	r post 99	LCUS) & C	pex@10%(for all LCUS	5)					1.000
Pa	articulars	Units																		1	- Louis and	
1 Ye	ear		87-88	88-89	89-90	90~91	91-92	92-93	93~94	94~95	95-96	96-97	97-98	98-99	99-00	00-01	01~02	02~03	03-04	04~05	05~06	06~07
2 Tc	otal DELs (D)	000	3800.3	4174.3	4589	5074.3	5809.9	6796.7	8025.6	9795,3	11978	14543	17802	21593.7	26652.23	32813	40397	49734	61230	75383	89145	1054
3 DE	ow Calling Urban ELs		1992.7	2188.6	2406.0	2660.4	3046.1	3563.5	4207.8	5085.2	6264.8	7626.4	0245.2	11198.2	13878.0	17122.0	21123.7	26060.0	32149.0	39659.6	46638.4	54834
Ca	apital inverstment n local (DOT &																					
4 M	TNL)(C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.7	4213.8	5203.1	6515.6	8714.1	7781.5	8505.3								
5 DE	apital cost per EL A = C / D	Rs	-	47057.7	53351.8	48627.65	38379.55	37573.3	34289.283	29401	29845	26184	23876	22429.500	21308.03	20242.632	19230.5	18268.98	17355.53	16487.75	15663.36	14880.1
Ca Ur 6 1.0	apital Cost per rban DEL = A / 065	Rs		44185.6	50095.6	45659.77	36037,14	35280.1	32196.51	27606	28024	24586	22419	21060 572	20007.54	19007.166	18056.81	17153.07	16296.27	15481.46	14707.38	13972.0
7	NU	JSC for low	w calling	g urban (li	Rs Cron	es)				-			-	- Sector Contractor	and the second			and the family of	a de la de la de la de la de			
8			87~88	88~89	89~90	90~91	91-92	92~93	93~94	94~95	95-96	96~97	97~98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05~06	06~07
9		Till 1988*	880.5	880.5	998.3	909.9	718.1	703.0	641.6	550.1	558.4	489.9	446.8	419.7	398.7	. 370.0	359.8	341.8	324.7	308.5	293.1	278.
10		1989		86.5	98.1	89.4	70.6	69.1	63.0	54.1	54.9	48.1	43.9	41.2	30,2	37.2	95.4	33.6	31.9	30.3	28.8	27.
11		1990			108.9	99.3	78.4	76.7	70.0	60.0	60.9	53.5	48.7	45.8	43,5	41.0	39,3	37,3	35.4	33.7	32.0	30.
12		1991		1.11	A 22.1	116.2	91.7	89.8	81.9	70.2	71.3	62.6	57.0	53,6	50.9	48.4	45.0	43.6	41.5	39,4	37.4	35,
13		1992		-	-		139.0	136.1	124.2	106.5	108,1	94,8	86.5	81.2		73,3	69.6	66.2	62.9	59.7	56.7	53.
14		1993	-		-	-		182.5	166.6	142.8	145.0	127.2	116.0	109.0	103,5	08.3	93,4	88.8	84.3	80.1	76,1	72.
15		1994	1				1	1.1.1.1	207.4	177.9	180.6	158.4	144.4	135,7	120.0	122.0	116,3	110,5	105.0	99.7	94.8	90.
16		1995		-				-		242.2	245.9	215.7	196.7	184.8	175.6	166.8	158.4	160.5	143.0	135.8	129.0	122.
17		1996				-		1.000			330.6	290.0	264.4	248.4	236,0	224.2	213.0	202.3	192.2	182.6	173.5	164.
18		1997	-		-					-		334.8	305.3	286.8	272.4	268.0	245,9	233.6	221,9	210.8	200,3	190.
19	manual la l	1998			-					-			362.9	340.9	323.9	307.7	292,3	211.1	263.8	250.6	238.1	226.
20	Opex only	1999	-	-	-					-	-	-		411,3	390.7	1700.0	352.6	1746 6	318.3	302.4	1680.0	1661
22		2000		-								-			1025.0	2000.4	2055 6	2026.2	2009 6	1092.0	1056.0	1001.
23		2002	-		-				-	-						2000.4	2455.8	2420.6	2386.3	2353 7	23227	2293
24		2002	-		-			1		-	1	-	-				2.400.0	2879.0	2836 7	2796.5	2758.3	2722
25		2004	-	-	-							-	-					2010.0	3373 7	3324.1	3277.0	3232
26		2005	-	-		1			-		-		-						UGTUIT	3953.4	3895.2	3840.
27 C	apital recovery +	2006									1000				-						3489.7	3438.
28	OPEX	2007									1			1								3893.
29		1	1.	1					1.0.11		1.1.1.1.								The second se	1.000	(1.1
30	Total Cost of low	calling Un	rban	86.5	1205.3	1214.7	1097.7	1257.2	1354,8	1403.9	1755.6	1875.0	2072.7	2358.4	4063.5	6021.0	.8315.1	11003.4	14153.6	17845.0	21027.8	24578.
31 Re	evenue from low u	rban calle	in crores	S	-						1		12.00		6545.0	8067.0	9942.8	12254.6	15103.8	18615.0	21947.2	25873.
	USC for Low Un	rban Call	lers			in crores	S	1.000		-	1.1.1.1		12.002		-2481.6	-2046.0	-1627.7	-1251.2	-950.1	-770.0	-919.4	-1295.1
32 NI					1		-			10-24						-				1.000		
32 NI					1	1					- · · · · · · · · · · · · · · · · · · ·		1.1									

	Annexure 5-	-K-3		Model 3				1														
	NUSC calcu	lations for	or low call	ling Urba	n DELs (u	pto 500 c	alls per	month)			Capex@	24% (Curr	ent Cost)	& Opex@	10%			1				
1	Particulars	Units	1	1	I		I	1	1.			1	T	I	T	-		-	1.1		1	-
1	Year		87-88	88~89	89~90	90~91	91-92	92~93	93~94	94-95	95-96	96~97	97~98	98~99	99~00	00-01	01-02	02~03	03~04	04-05	05~06	06-07
2	Total DEL a (D)	000	2800.8	4174 9	4580.0	5074 3	E900.0	8706 7	2005 6	0705 9	11078 4	14540.8	17901 7	21502 7	200000	22812.0	40206.0	40794 9	61000 D	75202 6	-	105420
- 2	Low Calling	000	3000,0	4174.0	4009.0	0074.0	5609.9	0/90./	0023.0	9/90.3	119/0.4	14042.0	1/001,/	21593.7	20032.2	32012.0	40390,9	49/34.3	01229.9	10002.0	03145.1	100420
3	Urban DELs		1992.7	2188.6	2406.0	2660.4	3046.1	3563.5	4207.8	5085.2	6264.8	7626.4	9245.2	11198.2	13878.0	17122.0	21123.7	26060.0	32149.0	39659.6	46638.4	54834
4	Capital inverstment on local (DOT & MTNL) (C)	Rs Crores	1170.5	1720.9	2212.5	2359.9	2823.2	3707.7	4213.8	5203.1	6515.6	6714.1	7781.5	. 8505.3								
	Capital cost per DEL A = C			47057.7	50051.0	40507.7	20270.0	07570.0	04000.0	00400.0	200.45	20182.0	02070.2	20420.5	51200.0	20040 6	10000 5	19060.0	17255 5	15407.0	15663 4	14890
5	/ <u>u</u>	ns		4/05/./	53351.6	40027.7	36379.0	3/5/3.3	04209.0	29400.8	29645.4	20183.9	23676,2	22429.0	21308.0	20242.0	19230,5	18209.0	1/355,5	10407.0	15003.4	14000.
6	Capital Cost per Urban DEL = A / 1.065	Rs		44185.6	50095.6	45659.8	36037.1	35280.1	32196.5	27606.4	28023.9	24585.8	22419.0	21060.6	20007.5	19007.2	18056.8	17154.0	16296.3	15481.5	14707.4	13972.
7		NUSC	for low call	ing urban (In Rs Crore	s)				2.00				1.1	1.5.1.1						1000	
8			87~88	88~89	89~90	90-91	91-92	92-93	93~94	94~95	95-96	96~97	97~98	98~99	99~00	00~01	01~02	02~03	03-04	04~05	05~06	06~07
9		Till 1988*	880.5	1232.7	998.3	909.9	718.1	703.0	641.6	550.1	558,4	489.9	446.8	419.7	398.7	378,8	359.8	341.8	324.7	308.5	293.1	278.
10		1989	1200	185.5	197.1	188.4	169.5	168.1	162.0	153.0	153.9	147.1	142.9	140.2	39,2	37.2	35,4	33.6	31.9	30.3	28.8	27.
11		1990			218.8	209.2	188.3	186.6	179,9	169.9	170.8	163.4	158.6	155.7	153.4	41.3	39.3	37.3	35.4	33.7	32.0	30.
12		1991		-		244.8	220.3	218.4	210.5	198.9	199.9	191.2	185.7	182.2	179.5	177.0	45.9	43.6	41.5	39.4	37.4	35.
13		1992					333.9	331.0	319.1	301.4	303.0	289.8	281.4	276.2	2/2.1	268.2	264.6	66.2	62.9	59.7	56.7	53.
14		1993	-	-	-		-	444.0	428,1	404.3	406.5	388.7	3/7.5	370.5	305.0	359.8	354.9	350.3	84.3	80.1	70.1	12.
15		1994							533,1	695 7	690 4	650.2	640.2	626.3	610 1	610.2	601.0	430.Z	430.7 586 5	570 3	120.0	122
17		1006								005.7	005.4	896 2	860.6	844.6	832.2	820.4	800.2	708 5	728 4	778.8	769 7	164
18		1997									52,0.0	1023.0	993.5	975.0	960.7	947 1	934.1	921.8	910.1	899.0	888.5	878
19		1998										100.010	1181.1	1159.1	1142.1	1125.9	1110.5	1095.9	1082.0	1068.8	1056.3	1044
20		1999												1398.5	1377.9	1358.4	1339.8	1322.2	1305.4	1289.5	1274.4	1260
21		2000				S									1823.0	1796.2	1770.7	1746.5	1723.5	1701.7	1680.9	1661
22		2001								-						2096.4	2065.6	2036.3	2008.5	1982.0	1956.9	1933.
23		2002															2456.8	2420.6	2386.3	2353.7	2322.7	2293.
24		2003		120			10					1.1.1.1						2879.0	2836.7	2796.5	2758.3	2722.
25		2004								1			1.1			-	-		3373.7	3324.1	3277.0	3232.
26	Capital	2005	-						_	-			-			-				3953.4	3895.2	3840.
27	recovery +	2006																			3489.7	3438.
28	OPEX	2007				1			-									-				3893.
30	Total Cost	f low calling	Lithan	185 50675	1414 1776	1552 2369	1630.16	2051 1365	2474 37	2988.98	3014 05	4722 579	5738.45	7011 32	8617 39	10465 1	12630 5	15123.88	18012.6	21378 3	24117 58	27071 8
31	Bevenue from k	w urban ca	llers	100.00075	1414.17/0	1002.2009	in crores	2001,1000	2414.31	2000.00	3014.85	4/66.0/9	5150,45	7011.32	6545.02	8067.02	9942.81	12254 63	15103.76	18615	21947.21	25873
32	NUSC for Lo	w Urban	Callers				in crore	e							2072	2308	2687 7	2860 3	2908 8	2763	2170 4	1198
E	* Ear pre 1999	ow colling	Urban DEI	a anh on	w has been	chown as	the capev	would have	already	baan raco	uprod bu	1009 and 1	will not off	loct the ci	ibeidu ca	culation	for nost	1000	2000.0	2100	2110.4	1100.0
-	Loi his 1900 1	Low caning	orban DEL	a, only ope	A nas been	situwh as i	ine capex	would have	aneauy	Deen reco	vered by	isso and i	ann not en	ect the st	inaidy ca	cutations	to post	1999	-		-	

Annexure	5- K-4			Model 4							-						1.00		(r		
NUSC cal	ulations	for low ca	lling U	rban DE	Ls (upt	o 500 c	alls p.n	n.)		Capex®	24% (H	istorical	Cost) &	Opex@10	Xa		1000	1			
Particulars	Units	1	1	T	The second	T	1	T			I	I	T	T.						-	-
1 Year		87-88	88-89	89-90	60-91	91-92	92-93	93~94	94~95	95-96	96~97	97~98	98-99	99~00	00-01	01-02	02~03	03-04	04~05	05~06	06~07
Total DELs	000	3801	4174	4589	5074	5810	6797	8026	9795	11978	14543	17802	21594	26652	32813	40397	49734	61230	75383	89145	1054
Low Calling		1007	0100	2406	2660	3046	3563	4208	5085	6265	7626	9245	11108	13878	17122	21124	26060	32140	30860	46638	54
Capital inversiment on local		1993	2108	2400	2000	3040	5500	4200	0000	0205	1020	0240	11150	13070	-	21124	20000	02145	33000	40030	040
(DOT & 4 MTNL) (C)	Rs Crores	1171	1721	2213	2360	2823	3708	4214	5203	6516	6714	7781	8505								
Capital cost		1				100							1700					1.50	100		
5 C / D Capital Cost	Rs	-	47058	53352	48628	38380	37573	34289	29401	29845	26184	23876	22430	21308	20243	19231	18269	17356	16488	15663	14
per Urban DEL = 6 A/1.065	Rs		44186	50096	45660	36037	35280	32197	27606	28024	24586	22419	21061	20008	19007	18057	17154	16296	15481	14707	139
7	NUSC for	low calling	urban (i	n Rs Cro	res)																
8	1	87-88	88-89	89-90	90-91	91~92	92-93	93~94	94~95	95-96	96~97	97-98	98-99	99~00	00-01	01~02	02-03	03-04	04~05	05~06	06-07
0	TIII 1988*	880.5	1232.7	998.3	909.9	718.1	703.0	641.6	550.1	558.4	489.9	446.8	419.7	398.7	378.8	359.8	341.8	324.7	308.5	293.1	27
0	1989		294.2	305.8	297.1	278.2	276.8	270.7	261.7	262.5	255.8	251.6	248.9	39.2	37.2	35.4	33.6	31.9	30.3	28.8	2
1	1990			370,3	360.7	339.8	338.1	331.4	321.4	322.3	314.9	310.2	307.2	304,9	41.3	39.3	37.3	35.4	33.7	32.0	3
2	1991		1		395.0	370.5	368.6	360.7	349.1	350.1	341.4	335.9	332.4	329.7	327.2	45.9	43.6	41.5	39.4	37.4	3
3	1992				-	472.6	469.6	457.7	440.0	441.6	428.4	420.0	414.8	410.7	406.9	403.2	66.2	62.9	59.7	56.7	5
4	1993					-	620.6	604.7	580.9	583.1	565.3	554.1	547.0	541.6	536.4	531.5	526.8	84.3	80.1	76.1	7
5	1994							705.3	675.7	678.4	656.3	642.3	633.6	626.8	620.3	614.2	608.4	602.9	99,7	94.8	9
0	1995						1		823.6	827.2	797.1	778.1	766.1	756.9	748.1	739.8	731.9	724.3	717.2	129.0	12
7	1996			1				1		1123.9	1083.3	1057.8	1041.7	1029.3	1017.5	1006.3	995.7	985.5	975.9	966.8	16
5	1997			1	12-2-			1	1.000	Y - 12 - 14	1138.2	1108.7	1090.2	1075.9	1062.3	1049.3	1037.0	1025.3	1014.3	1003.7	9
0	1998											1233.9	1211.9	1194.9	1178.7	1163.3	1148.7	1134.8	1121.6	1109.1	109
0	1999		1	-	100000					1000			1398.5	1377.9	1358.4	1339.8	1322.2	1305.4	1289.5	1274.4	126
1	2000			(1.000		10000				1.	1823.0	1796.2	1770.7	1746.5	1723.5	1701.7	1680.9	166
2	2001								1.00		1	-			2096.4	2065.6	2036.3	2008.5	1982.0	1956.9	193
3	2002			1	1.000				1	1			1			2456.8	2420.6	2386.3	2353.7	2322.7	229
4	2003									1			1	-			2879.0	2836.7	2796.5	2758.3	272
2	2004		1		1200	-			(-				() () () () () () () () () ()	1.1	1.22	3373.7	3324.1	3277.0	323
Capital	2005				100			1	12.21		-	_	-		2	1.1.1.1.1			3953.4	3895.2	384
recovery +	2006						_	-							(1			3489.7	34:
OPEX	2007			-	-	-		1	1	1.000					-						389
Total Cost subsc	t of low callin ribers (in cro	ng Urban pres)	294.2	1674.4	1962.6	2179.2	2776.7	3372.2	4002.6	5147.7	6070.6	7139.2	8412.1	9909.5	11605.6	13620.8	15975.6	18687.7	21881.3	24482.7	2723
Revenue from	low urban	callers		in crores										6545.0	8067.0	9942.8	12254.6	15103.8	18615.0	21947.2	2587
NUSC due	to low ur	ban caller	s	in crore	es			1.1		1.000		1		3364.4	3538.6	3678.0	3721.0	3584.0	3266.3	2535.5	136
* For pre 198	8 Low callin	ng Urban DE	Ls, only	opex ha	s been sh	nown as	the cape	would i	nave alre	ady beer	recove	red by 1	998 and	will not eff	ect the sul	bsidy calc	ulations fo	or post 199	9		
		1	1																		-
5																					

Annex 5-L

UAL Summary Sheet

VPT and Rural DEL Rural Revenue = Rs 4724 per annum

			1.	24% caj	oital reco	very &	10% opex	¢	
UAL	Reven	32000	38400	46080	55296	66355	79626	95551.488	1E+05
		99-00	00~01	01-02	02-03	03-04	04-05	05~06	06~07
Model 1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Model 2		0.0	1.3	2.6	1.4	2.1	2.7	2.9	2.3
Model 3		5.9	6.4	6.7	4.6	4.6	4.4	4.2	3.1
Model 4	1	7.4	7.6	7.5	5.2	5.0	4.6	4.3	3,1

Including VPT, Rural DEL and LCUS

UAL	99~00	00-01	01~02	02~03	03~04	04~05	05~06	06~07	UAL with 500 calls		100	1.000		1	Concella State		
	Upto 200 Calls		1	1			1.			99-00	00-01	01-02	02-03	03-04	04~05	05~06	06~07
Model 1	2.7	2.4	2.1	1.5	1.1	0.7	0.0	-0.4	Model 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Model 2	0.9	4.3	6.9	6.7	8.1	9.1	9.2	8.4	Model 2	0.0	0.0	0.0	0.0	0.3	1.2	1.4	0.6
Model 3	16.0	16.6	16.7	14.5	14.1	13.6	12.5	10.5	Model 3	12.4	12.7	12.5	9.8	9.0	7.9	6.5	5.0
Model 4	17.6	17.7	17.5	15.0	14.5	13.8	12.6	10.5	Model 4	17.9	16.8	15.5	11.9	10.4	8.7	6.9	4.3

VPT and Rural DEL

Rural Revenue = Rs 2232 per annum

	99~00	00-01	01~02	02-03	03~04	04~05	05-06	06~07
Model 1	 2.1	2.0	1.9	1.5	1.4	1.1	0.8	0.7
Model 2	2.9	4.8	6.1	5.0	5.8	6.4	6.7	6.1
Model 3	 9.3	9.9	10.2	8.2	8.3	8.2	8.0	6.9
Model 4	10.9	11.1	11.0	8.7	8.6	8.3	8.0	6.9

Including VPT, Rural DEL and LCUS

UAL	99~00	00-01	01~02	02-03	03-04	04~05	05-06	06~07	UAL with 500 calls	2 1000		1	1.00	1000			
	Upto 200 Calls		1	1			1.000			99-00	00-01	01-02	02-03	03~04	04-05	05-06	06-07
Model 1	6.1	5.9	5.7	5.1	4.8	4.4	3.8	3.4	Model 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Model 2	4.3	7.8	10.4	10.3	11.8	12.8	13.0	12.2	Model 2	0.0	0.0	0.0	0.0	4.4	5.4	5.7	4.9
Model 3	19.4	20,1	20.3	18.1	17,8	17.3	16.3	14.3	Model 3	15.8	16.2	16.1	13.4	12.7	11.6	10.2	8.8
Model 4	23.5	23.0	22.4	19.5	18.7	17.9	16.6	14.4	Model 4	21.4	20.3	19.0	15.5	14.0	12,4	10,7	8.1

115