T E L E C O M R E G U L A T O R Y A U T H O R I T Y O F I N D I A
NEW DELHI

EXPLANATORY MEMORANDUM

RECOMMENDATIONS OF THE TRAI ON ISSUES RELATING TO CELLULAR MOBILE SERVICE

Section I

Background and Methodology

Introduction

1. Cellular Mobile Service (CMS) was introduced in India on a commercial basis in the four metro cities in 1994. This was followed by opening of 20 circles (generally coterminus with state boundaries) to private CMS operators in 1995-96. Although both Metro and Circle Cellular licenses were awarded on the basis of tenders, the terms of the two types of tenders and licenses were different in certain respects. The most important difference is in the license fee structure (and schedule of payments), the incidence of which is generally heavier in circles.

2. Two licenses were issued in each Metro and most of the circle and the Circles. Currently there are 8 Cellular Mobile Service Providers (CMSP) in the four metros and 34 CMSPs in 18 circles. In case of two circles, West Bengal and Assam, only one bid was received and subsequently only one license has been issued. No bids were received for Andaman & Nicobar Islands and Jammu & Kashmir.

3. The Govt. of India decided in Oct. 1998 to extend the license period for Circle CMS projects from 10 years to 15 year. Thereafter, the New Telecom Policy 1999 was declared in March 1999 and this provided for a revenue sharing regime for license fee, in addition to entry fee for new entrants. Also, the license period was also enhanced to 20 years for Circles as well as Metros.

The New Telecom Policy 1999 (NTP'99):

4. Availability of **affordable and effective communications** for the citizens is the main goal of the telecom policy. It is intended to create a **modern and efficient**

telecommunications infrastructure taking into account the **convergence of IT, media, telecom and consumer electronics** and thereby propel India into becoming an IT superpower. There is also emphasis on **research and development** efforts in the country as also on building **world-class manufacturing capabilities**. This requires the creation of an environment to enable generation of resources in the telecom sector as well as attract continued inflow of investment.

5. The new policy framework for the CMSPs includes :

- Initial **license period of 20 years** and extendible by additional periods of ten years thereafter
- **DOT/MTNL would be licensed as third operator** in each service area in a time bound manner
- **Entry of more operators** in a service area shall be based on recommendation of the TRAI
- CMSPs would be required to pay a **one-time entry fee**
- CMSPs would also be required to pay **license fee based on a revenue share**. It is proposed that the appropriate level of entry fee and percentage of revenue share arrangement for different service areas would be **recommended by TRAI**.
- The basis for determining the entry fee and the basis for selection of additional operators would be recommended by the TRAI.
- The CMSP shall be free to provide, in its service area of operation, all types of mobile services utilizing any type of network equipment, including circuit and/or packet switches, that meet the relevant International Telecommunication Union (ITU)/Telecommunication Engineering Center (TEC) standards.
- **Direct interconnectivity between licensed CMSPs and any other type of service provider** (including another CMSP) in their area of operation including sharing of infrastructure with any other type of service provider shall be permitted.
- **Interconnectivity between service providers** in different service areas shall be reviewed in consultation with TRAI.
- The CMSP shall be allowed to **directly interconnect with the VSNL** after opening of national long distance from January 1, 2000.

6. The Cellular Mobile Service Providers (CMSP) shall be permitted to provide mobile telephony services including **permission to carry its own long distance traffic within their service area** without seeking an additional license.

7. This was followed by a Government of India decision in July'99 permitting from

August'99 migration of existing circle and metro operators to the revenue sharing regime envisioned in NTP’99.

The references

8. The Government of India, Ministry of Communications, made **three references** with regard to Cellular Mobile Services. These references sought TRAI’s recommendations on the following :

a. **Quantum and structure of license fee** payable by Circle CMS providers in the extended period of license from 11^{th} to 15^{th} years. (Min. of Comm. *No. 842-153/98-VAS dt. 7.10.98*) **– Appendix 1**

b. Pursuant to National Telecom Policy 99, the appropriate level of **entry fee, percentage of revenue** to be shared with the licensor, **definition of revenue** for the purpose and the **basis of selection of new operators** and **any other issue** considered relevant. (Min. of Comm. *No. 842-153/99-VAS (Vol. IV) dt. 23.4.99*) **– Appendix 2**

c. **License fee arrangement for migration of the existing operators** of Cellular Metro and Cellular Circles to the new NTP’99 regime. (Min. of Comm. *No. 842-153/99-VAS (Vol.V) dt. 12.7.99*) **–Appendix 3**

The issues to be addressed can be categorized as follows :

i) Appropriate level of Entry Fee, basis of selection of new operators, and entry of fourth operator.

ii) Percentage of Gross Revenue as license fee

iii) Definition of Gross Revenue for the purpose of (ii)

iv) Any other issues considered relevant

TRAI’s approach

9. In formulating its recommendations on the matter under reference, TRAI adopted a consultative approach. A Consultation Paper, No. 99/6 dated December 14, 1999 on the subject was released by TRAI, and six Open House Discussions were conducted (five in January 2000 at New Delhi, Bangalore, Chennai, Calcutta and Mumbai, and one on May

15, 2000 at New Delhi) for wide consultation and feedback from all stakeholders.

10. Comments received during the Open House Discussions were summarised and examined, before arriving at the recommendations. A summary of comments is placed below at Appendix 5.

Study methodology

11. The viability study of the CMS projects in the Consultation Paper No. 99/6 on **Issues related to Cellular Mobile Service** was intended to provide an analytical framework for examining the issues on which recommendations are sought by the Government of India, particularly after declaration of the New Telecom Policy 1999.

12. The study is based on data provided by fifteen service providers, nine in Circles and six in Metros. A financial model using discounted cash flow technique was used to study the cash flows achieved and projected by the service providers. Indicators such as Internal Rate of Return (IRR) and Return on Equity (RoE) were arrived at for various **revenue share options** which have been termed as license fee options but would include any other outflows like USO levy, R&D cess, and administrative / regulatory charges as the model examines the impact of **total outflow.** The analysis was subjected to various sensitivity analysis as explained at para 14 below to examine the impact of variations in key parameters.

13. The study examined the impact of various revenue share options, on the **base case**, which consisted of the project profile with no revenue share. This project profile included the impact of external environment changes like entry of third and fourth operator etc. This was further subjected to various revenue outflow options including the interim license fee of 15 % revenue share implemented by the Government of India, subject to the final decision after TRAI's recommendations. The percentage of revenue share options examined are 5, 10, 15, 20, and 25 %, under two definitions of revenue. The results of analysis based on adjusted Gross Revenue are presented at Annexure II at page 161 of the Consultation Paper (No.99/6)

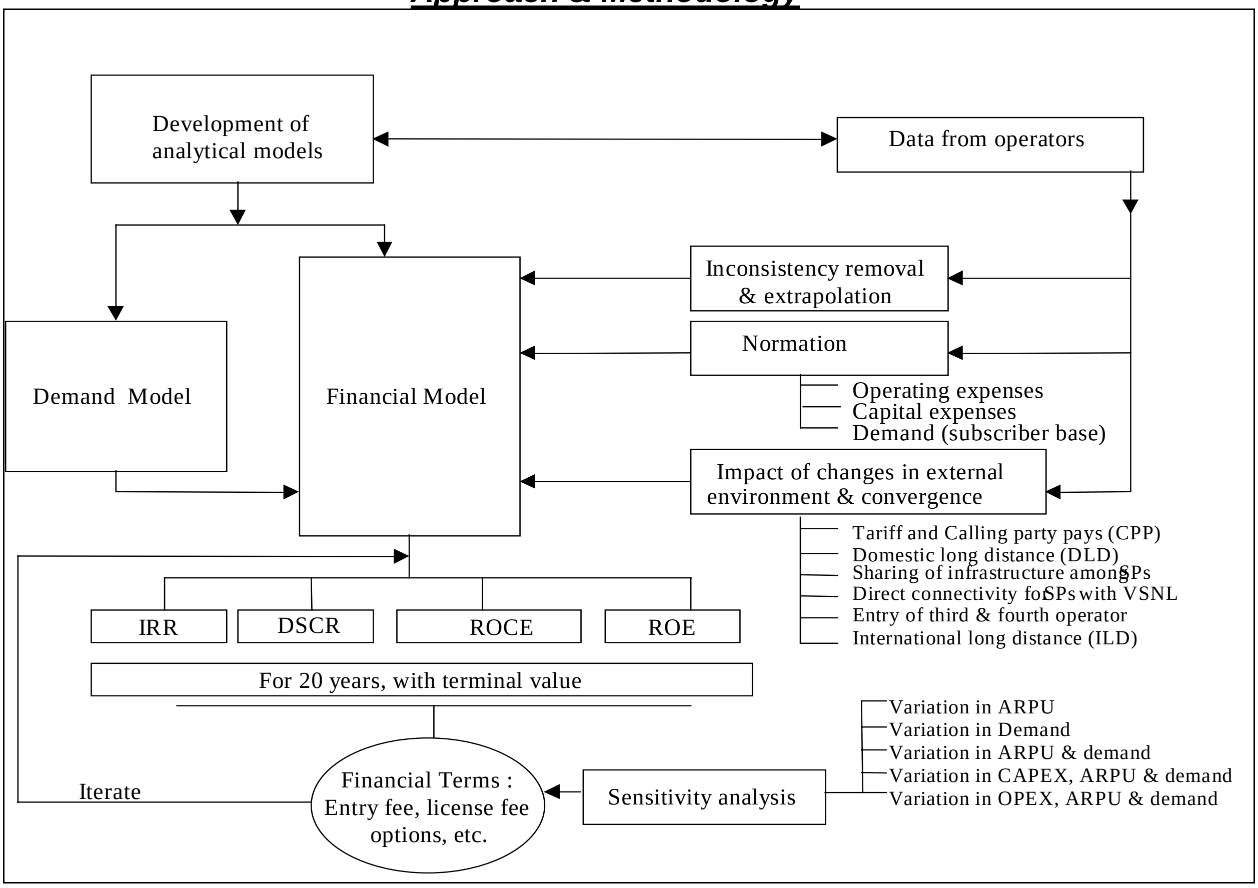
14. The analysis was further subjected to **sensitivities** as follows:

1. Drop in demand by 10%
2. Drop in Average Revenue Per Users(ARPU) by 20%
3. Drop in ARPU by 10% and increase in demand by 20%
4. Drop in CAPEX by 10%, ARPU by 5% and increase in demand by 10%
5. Drop in OPEX (excl. WPC charges and passthru) by 10%, ARPU by 3% and increase in demand by 6%
6. Drop in ARPU by 30% and increase in demand by 15%
7. Drop in ARPU by 30%, increase in demand by 45% and increase in Capex by 10%
8. Drop in CAPEX by 25%, ARPU by 12.5% and increase in demand by 25%
9. Drop in CAPEX by 25%, ARPU by 25% and increase in demand by 40%

These sensitivities capture the Internal Rate of Return (IRR) and Return on Equity (RoE) results for different scenarios.

15. The following schematic represents the approach and methodology of the Study.

Approach & Methodology



16. The results of the study are presented at Table II.3.4 of the Consultation Paper and is reproduced in **Table I** below.

Table 1: Impact of License Fee Options on Base Case

Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	**0%**		**5%**		**10%**		**15%**		**20%**		**25%**	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
Circles												
A1	23.7%	25.0%	23.0%	24.0%	22.3%	23.1%	21.6%	22.1%	20.8%	21.1%	20.1%	20.2%
A4	27.6%	39.3%	26.6%	37.1%	25.6%	34.6%	24.5%	32.1%	23.5%	29.6%	22.4%	27.2%
B1	30.8%	36.2%	30.1%	35.1%	29.3%	34.0%	28.6%	32.9%	27.8%	31.7%	27.0%	30.6%
B2	26.9%	36.5%	25.9%	34.5%	24.9%	32.5%	23.9%	30.5%	22.9%	28.4%	21.9%	26.4%
B3	28.4%	30.3%	27.9%	29.6%	27.3%	29.0%	26.8%	28.3%	26.2%	27.6%	25.6%	26.9%
B4	31.7%	34.5%	30.4%	33.0%	29.2%	31.5%	28.0%	29.9%	26.7%	28.4%	25.4%	26.8%
B5	30.1%	32.5%	29.0%	31.2%	27.9%	29.8%	26.7%	28.4%	25.6%	27.0%	24.4%	25.6%
C1	30.0%	32.7%	28.9%	31.3%	27.7%	29.9%	26.5%	28.4%	25.3%	26.9%	24.1%	25.4%
C3	23.7%	24.8%	22.8%	23.7%	21.8%	22.6%	20.8%	21.4%	19.8%	20.3%	18.8%	19.1%
Metros												
M1	25.1%	29.0%	24.4%	28.1%	23.7%	27.2%	22.9%	26.2%	22.2%	25.3%	21.4%	24.2%
M2	42.5%	58.9%	41.2%	56.6%	39.8%	54.3%	38.4%	51.8%	37.0%	49.1%	35.5%	46.4%
M3	36.2%	48.0%	35.2%	46.2%	34.2%	44.3%	33.1%	42.4%	32.0%	40.5%	30.9%	38.5%
M4	26.4%	29.8%	25.4%	28.4%	24.5%	27.0%	23.5%	25.5%	22.4%	24.1%	21.4%	22.6%
M5	33.5%	37.4%	32.4%	35.8%	31.3%	34.3%	30.1%	32.7%	28.9%	31.0%	27.7%	29.4%
M6	22.3%	26.8%	21.6%	25.4%	20.8%	24.2%	20.0%	22.8%	19.2%	21.3%	18.3%	19.6%

17. The sensitivities that have been examined and included in the Consultation Paper (in its Annexure II) are available at **Appendix 4.**

18. Comments were invited from the stakeholders after the Consultation Paper was released. A number of comments were received. A summary of the comments received during the Open House Discussions as well as in writing is provided at **Appendix 5.**

19. Two events which took place after the Consultation Paper was released in December 99 related to reduction in Custom Duty on Handsets from 25% to 5% and **the lower prices**

obtained by MTNL in their tender for GSM Cellular System in the first quarter of this year. The reduction in Custom Duty resulted in lower Handset price which is expected to stimulate demand. As per BICP analysis, 1% decline in Handset prices is likely to increase demand by 1.9%, though this has to be examined in the light of further experience. The prices achieved by MTNL are likely to provide a basis for the future negotiations / tenders of the private operators. While the impact will be felt both by Metro and Circle projects, Metro data cannot be directly transposed into Circle projects. Capex projections for circles include significant investment in transmission routes which is not reflected in the type of investment in Metro projects. As already mentioned, some of the senstivity analysis for Circle projects examine the impact of increase in demand, reduction in capital cost and Average Revenue Per User(ARPUs), and drop in capex. The impact on th results has been analysed for Metro projects. The revised results for Metros have been further subjected to selected sensitivities. The results from the revised analysis of Metros are available at **Table 2** and the results of sensitivity analysis are indicated at **Appendix 6**.

Table 2 Impact of Licenses Fee Options on Base* Case taking MTNL Capex, MTNL Opex and Operator's ARPU
With drop in ARPU in 7th and 10 year

Rev Share	**0%**		**5%**		**10%**		**15%**		**20%**		**25%**	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
Metro												
M1	25.1%	29.0%	24.4%	28.1%	23.7%	27.2%	23.0%	26.3%	22.2%	25.3%	21.4%	24.4%
M2	42.3%	58.5%	41.0%	56.3%	39.6%	53.9%	38.2%	51.4%	36.8%	48.8%	35.3%	46.1%
M3	36.3%	48.2%	35.4%	46.4%	34.4%	44.6%	33.3%	42.8%	32.3%	40.9%	31.2%	38.9%
M4	27.5%	31.3%	26.5%	30.0%	25.6%	28.6%	24.7%	27.2%	23.7%	25.9%	22.7%	24.4%
M5	33.8%	37.5%	32.7%	36.0%	31.6%	34.5%	30.5%	33.0%	29.3%	31.4%	28.1%	29.8%
M6	22.5%	26.9%	21.7%	25.7%	21.0%	24.4%	20.2%	23.1%	19.4%	21.6%	18.6%	20.1%

- As explained in para 13 above.

20. The above has been taken into account for arriving at the recommendations on the relevant issues, which are set out in the following Sections.

Section II

Appropriate level of entry fee, basis of selection of new operators and entry of fourth operator

1. The Government of India decision communicated vide 842-153/99-VAS (Vol.V), dated 17.7.1999, (Appendix 3) allowing **migration of existing operators** to revenue sharing regime indicates that under the scheme of migration, it is the Government's intention to issue additional licenses early in the Service Areas in which the existing licensees opt to migrate to NTP 99 regime. The letter further indicates that:

" In the case of Cellular Services, **as per present availability of spectrum DoT/MTNL will be the third operator.** DoT/MTNL would pay license fee as per NTP 99. In addition there will be one more private operator; bid for this license will be issued on the new licensing regime i.e. a one time entry fee plus percentage share of revenue as license fee; decision on the percentage share of revenue to be taken on receipt of TRAI's recommendations. Question of issue of more licenses in future would be decided based on emerging scenario of spectrum availability and based on recommendations of TRAI (as per NTP 99, TRAI will review this as required and no later than every two years." (Para 1 (ii) of Appendix 3)

Paragraph 1 (iv) of the letter further states that the cut off date for changeover to the NTP 99 regime is 1.8.1999 and that the percentage of gross revenue to be paid towards license fee will be the same as would apply in future to the new licensee(s) in the same service area. License fee dues payable up to 31.7.1999 would be treated as Entry Fee for the existing operators, and the **new operators will bid for the entry fee.**

2. The bidding process for entry fee is expected to yield the appropriate level of entry fee as applicable to a particular service area. It is expected that the bidders would take into account the market potential, strength of the existing operators, and other aspects of business case to quote for entry fee in a realistic manner. Since Cellular Mobile Service has been in existence in the country for some years, an assessment about its potential is now expected to be far better informed. However, to guard against unjustified / speculative bidding, the process of bidding itself requires to be carefully thought through. This is discussed below.

Selection criteria – options available

3. World over, three types of selection criteria have been followed for selecting licensees for CMS:

(i) **'Beauty Parade'** or comparative selection, based on attributes considered necessary.

(ii) **'Auction'** method by which the highest bidder (out of a shortlist of pre-qualified bidders who have met all the other eligibility criteria as also the terms and conditions, technical and commercial, pertaining to the license) is awarded the license.

(iii) **Lottery method** – in which random selection is resorted to.

4. Of the above methods, lottery method is too arbitrary and does not necessarily result in the best choice. The 'Beauty Parade' method has been found to suffer from serious defects as compared to Auction method. Not only is it more subjective and less transparent, it has often resulted in disputes and does not attach an appropriate value to the license. This is falling into disuse due to the element of subjectivity which may affect the selection and legal wrangles it can give rise to. FCC attempted this for the second CMS license in USA and the process was marked by disputes. Auction method is treated as the most transparent method of selection as the monetary criteria is objective. UK has recently auctioned spectrum for 3G UMTS. Government of India have also indicated vide para 1(iv) of the letter dtd.12.7.99 (Appendix 3) that **entry fee will be bid for**. The lottery method is absolutely arbitrary and does not result in best choices.

5. In view of the above, the auction method of selection is examined in more detail. This examination covers the two arguments sometimes presented against auction method and goes on to identify the various options of implementing auctions that can be considered.

Auction method

6. This method is used very widely for selecting licensees for telecom services for which limited number of licenses are to be issued. It has many advantages, the most important being that it gives **bidders** equal opportunity to compete in a transparent and objective manner. Since auctions require a value to be assigned to the license by potential licensees, the bid value is expected to reflect this.

7. The two arguments offered against auctions are examined below:

(i) There is sometimes an apprehension that **speculative bidding** may result in high bid values which cannot later be honoured by the selected bidder(s). This sort of situation is most likely in a **single round blind bidding** where bidders may place high bids to be on the safe side. This can be avoided by implementing an open **multistage bidding** process in which the information of the last round of bids is available to all bidders to make an assessment whether to continue to bid or to drop out. Since the bids are open and could be improved upon by any other bidder in a subsequent round, the bidder will not bid unduly high and be caught with it.

Unduly high bidding is also unlikely in the services which are already in place and for which, a realistic assessment of market potential can be made.

(ii) Another argument forwarded is that **competitive bidding results in high cost of license** which has to be ultimately borne by the customers. In this regard two points may be noted -

(a) If limited entrants can function in a telecom service market (due to spectrum limitations or size of the market), then competitive bidding is the most appropriate method.

(b) In a competitive situation, with existing operators already in place and with the third operator due to enter as also the possibility of more entrants under NTP 99, it is unlikely that CMSP's will consider it a good commercial decision to pass on all the license cost to the customers. In the present case, with the entry of DTS/MTNL, competitive pricing of services may be expected and operators are likely to attempt cost reduction measures rather than increase market prices to customers.

8. By the time new operators enter, existing operators would have been in the market since 1995-96. Most of the existing operators have already expressed their willingness to migrate to the revenue sharing regime and would, therefore, be liable for a percentage of their revenue to be paid as licence fee. They would also have paid licence fee due up to 31.7.99 as entry fee. Hence for most circles, existing operators would be holding a sizeable proportion of the market. As far as revenue share is concerned, the new operators would be bound liable for the same percentage of revenue share as existing operators in the market at that time. While bidding for the entry fee, the new operators would assess the market as it exists at the time of entry and it's future potential before quoting for entry fee. Hence, the auction method will afford them an opportunity to quote according to their assessment and financial strength.

9. In view of the advantages of auction as a transparent selection mechanism, it is necessary to consider the various modalities of auction which can enable it to be implemented in a smooth manner. These are discussed below. It is recognised that the bidders pre-qualified to participate in the auction process would have already submitted detailed techno-commercial bids to indicate their financial strength and offered compliance to the commercial conditions of contract, technical specifications and roll out commitments. Attachment of weight to the pre-qualification criteria is not suggested in view of the difficulties which may arise in allotting weight objectively. Also, with respect to criteria like roll out commitments, initial projections in the bid may earn high marks which may even make the difference between winning or losing a bid – and these roll outs may not be actually implemented. It is therefore proposed that for the purpose of pre-qualification, "Past the Threshold" principle be adopted and those bids which meet the threshold levels for various criteria be shortlisted for bidding in the auction process. The threshold level for financial strength and roll out commitments are discussed later in this section. Before that a suitable design of auction process is discussed. Three options are considered below:-

(i) Option 1 – Open bidding amongst bidders pre-qualified on techno-commercial considerations

Using a **two tier bidding process** in which bidders are pre-qualified for participating in financial bidding after they meet all the **technical and commercial conditions** of tender, **bid for entry fee** may be limited to those bidders who are short-listed after the pre-qualification stage. The short-listed bidders may bid under sealed covers without knowing each other's bids, and **without being subject to a floor level reserve entry fee**. This process would involve the bidders making their own assessment of the value of the market which they may be able to garner in a competitive scenario where existing CMSPs (two private operators and one PSU) may be already in place. This valuation may be different for each circle and reflect not only the potential of the circle but also the perceived strength of the existing operators. **Since the bids of other bidders are not known, there may be a tendency to play safe by offering high bids in one shot.**

(ii) Option 2 - Open bidding for entry fee with reserve price.

Existing private operators have expressed a view during the consultation process that they have **paid a certain entry fee for becoming operators** in various metros and circles. If the new entrants come with the significant lower entry fee then the new operators may have an advantage over existing operators since the new operators need to sink less cost up-front. This argument is further supported by the existing CMSPs on the basist of lower equipment prices now prevailing as compared to the prices paid by the existing operators when they started the service. The existing operators have a reasonably organised and articulated view in the matter i.e. they want **subsequent entrants must at least pay the same entry fee as paid by existing operators**.

- If the existing entry fee serves as the reserve price, a successful bid for entry fee would likely have to be higher than the existing entry fee. This may introduce an unnecessary distortion in the market. In fact if revenue sharing is the same percentage for old and new CMSP's, then to insist that new CMSP's pay entry-fee higher than existing CMSP's will **deny the new CMSP's a fair opportunity to bid according to their assessment of the market potential.** Also, NTP'99 was accepted without condition by the existing CMSP's.

- There are, however, other considerations which are also important from a regulatory stand point. Existing operators have been functional for five years or so and some more time may elapse before new operators enter the market. Therefore, the **early bird advantage** is available to existing operators who have an existing market. The costs paid by the existing operators for equipment are high, but this cannot be treated as an argument to force new entrants to pay an entry fee based on quotes of licence fee given by existing operators, particularly when existing operators themselves admit that the earlier quotes were too high. Also it is quite likely that the existing operators who would have depreciated much of their equipment by the time the new operators become functional, would upgrade their equipment at a prevailing market prices which are lower and shift old depreciated equipment to new and probably less revenue earning areas. Possibly, new entrants would also need to incur various **start up costs** which will not be applicable to existing operators and it is difficult to balance all the conditions (both positive and negative) of different waves of entry in different time frames in the quest for level playing field.

- Having entered first the existing SP's have had the advantage of being able to charge much higher air time charges for almost three years. The new entrants will be able to charge much less for having entered with caller's already entrenched in the business.

In the current context, when bidding for the fourth operator takes place in a completely different time frame and under different market conditions, it would appear an **artificial barrier to force the new operators to pay at least the entry fee paid by existing**

operators plus an additional element to overcome competition.

(iii) **Option 3 – Simultaneous multiple round bidding.**

The option of simultaneous multi stage bidding has the advantage of enabling the bidders to revisit their assessment of the value they first assign to licenses. After the bids are received for each round the bids will be revealed in a public transparent process. The process may continue over a number of rounds, which may be announced in advance. After each stage of building, the bidders may raise their previous bid amount by at least a minimum percentage (say 5%) or may drop out of the process. As more information becomes available about the other bids, all the bidders are in a better position to pursue alternative bidding strategies in subsequent bidding rounds that would result in efficient outcomes. This would also ensure that the licenses are appropriately valued and a fair return accrues to the Government for the natural resource of frequency spectrum.

10. Pre-qualification:

Prospective operators would be required to meet pre-determined criteria in order to qualify to bid for the license. Pre-qualifications will mainly be on the following grounds :

- Financial strength and experience as Telecom Service Provider
- Minimum roll out obligation
- Technical Plan
- Business Plan
- Payment terms and other commercial conditions.

It is recommended that perspective bidders who meet the pre-determined threshold as set out in the pre-qualification criteria be short-listed for bidding for entry fee in the next stage. No weightages need be attached to the pre-qualification crtieria. The criteria for pre-qualification could be developed on the following lines.

TABLE

Service Area	Financial Strength Networth = Rs(Cr)	Roll out obligation Access to Subscription in year ('000)	
Metros	#	#	
Circles	#	#	
Category A	#	#	
Category B	#	#	
Category C	#	#	

Details of financial strength and Roll out obligations can be the same as in the case of existing licenses.

Technical Plan

The criteria for qualifying technical plan should be based on the mandatory part of the technical specifications contained in the tender document relating to the bid. The details will need to be drawn up by technical experts taking into account the latest developments in Cellular Mobile Technology and the present state and feasibility of their introduction in the country. The plan should give the evolutionary path to be followed for introduction of seamless national and international roaming and introduction of the state of the art tele-services.

Business Plan

Pre-qualification criteria in respect of the business plans will also be required to be set carefully indicating the parameters on which the acceptability of the plan will be judged. The main parameters of judgement under this head will be :

a) Financial feasibility : Determine the reasonableness of the cost estimates, suitability of the envisaged pattern of financing and general soundness of the capital structure.
b) Commercial viability: Ascertain the extent of the profitability of the plan and its sufficiency in relating to the repayment and other obligations involving outgo of funds from the business e.g. payment of the license fee. It will also have to be seen whether the business plan provides for generation/infusion of funds at the appropriate time to meet the emerging needs of future capital expenditure for upgradation of technology. The ability to keep the service cost to the consumer under check and to effect reduction therein as situation/market demands will be another important parameter of judgement.
c) Managerial capability : Ascertain that competent persons are behind the project to

ensure its successful implementation and efficient management after commencement of commercial production.

Payment terms and commercial considerations

The payment terms and commercial conditions should be carefully spelt out and their unconditional acceptance by the bidder will be one of the crucial factors in pre-qualification.

The structure of the bidding process :

11. Selection from amongst all those who pass the pre-qualification round will be by a process of bidding. The bid will be carefully structured so as to guard against the possible misuses of the process such as pre-emptive over-bidding or cartelisation. For this purpose, a bid structure involving "Multi Stage Informed Ascending Bids" is recommended. It is also recommended that such bids be invited for the entry fee for selection of operations and issuing licenses to them. Although, as recommended earlier in the case of NLDO, TRAI is primarily of the opinion that because of its greater relevance, direct impact on operations and being equitable, revenue sharing is better basis on which to invite bids for licenses, in the case of CMSPs this choice is not available except in two vacant circles/slots. The 34 incumbent operators have already been given licenses through a process of bidding and it would not be correct to subject them to yet another process of bidding, this time concerning revenue sharing. They have already been asked to pay as license fee, albeit on a provisional basis a fixed amount of the revenue share viz. 15%. It is, therefore, recommended that a fixed percentage of revenue share be paid by all operators as the license fee and this percentage be the same for all the operators barring the exceptions specifically mentioned in the following sections.

12. The design of the process of multi stage bidding is an important parameter in ensuring success. Clear rules and procedures would need to be laid out in advance. These need to include **qualification criteria, bid security and its disposal, reserve prices, minimum bid increments**, and other bidding and allotment procedures.

13. Each stage of the auction like the Invitation for bids, pre-qualification if any, the auction itself, and the post auction grant of licenses would require to be operationalised

carefully. Auction rules need to be designed to eliminate bid rigging and other anti competitive behaviour.

14 While, the detailed bid structure can be prepared at the time bids are being called and assistance/advise of experts may be taken in doing so, based on the experience of such successful bids elsewhere, the basic outlines of the proposed structure can be given. Bids can be invited for more than one license at a time. The total number of rounds in which the bids will be finalized will be pre-determined and all bidders should be eligible to bid for all licenses on offer in each of the rounds. The licensor, may, however, if it so desires, stipulate before hand the total number of licenses that can be finally allotted to a single bidder. The TRAI's recommendation in this regard is that the number of licenses that can go to a single bidder need not be restricted. This will favour the serious and techno-financially strong bidders and will help keep the bids at operationally feasible optimal levels.

15 After each stage of bidding, bids received will be made public and all bidders(those lower than then highest bidder as well as the highest bidder) will be permitted to raise their bids in the subsequent rounds of bidding. The process will be deemed complete only on the completion of the pre-determined number of bid rounds at the end of which the highest bidder for each license will have the claim to the license in question. Licenses will become effective on payment of the amount of the winning bid for the entry fee within a period specified in the tender document.

16 It has been international practice in the auction of spectrum to associate professional and academic organizations in the design of auction procedures. This is done to ensure that the procedures are designed using sound economic principles, and that they adhere to commercial and legal practices. The recent 3G auctions in UK are a good example. It may be recommended to the licensor to consider such a course of action while designing the auction.

17 This option becomes attractive in the envisaged scenario of fourth license being offered in all or most of the Metros and Circles. Subject to any conditions that the licensor may wish to impose on the number of licenses that any one bidder may finally own (NTP 99 indicates that the CMSP shall be eligible to hold licenses for any number of service areas), multi stage bidding would enable the bidders to assign suitable values to the licenses on offer depending upon their aggregation strategies and business plans.

18. The same process of bidding will also enable selection of operators where two slots in the same circle are vacant viz. J&K and Andaman and Nicobar where no operators exist. In these circles, two bidders may be selected and it is recommended in this regard that while the second highest bidder in these circles may be considered for the second slot available, he need not be asked to match the bid of the highest bidder. It may be provided though that if the difference between he first and the second highest bids is substantial, say more than 25% fresh bids for the second slot will be invited. Such an arrangement while being equitable will act as a good incentive for attracting bids for these circles which have not proved to be attractive in the past.

Entry of new operators

19. As per para ii of **Ministry of Communications letter dated 12.7.99** (Appendix 3), DoT/MTNL would be the third operator as per present availability of spectrum. In addition, there will be one more private operator, bid for this license will be issued on the new licensing regime i.e., a one time entry fee plus percentage share of revenue as license fee (this would be the same percentage as applicable to migrating operators).

20. **NTP 99** states as follows:

"Availability of adequate frequency spectrum is essential not only for providing optimal bandwidth to every operator but also for entry of additional operators. Based on the immediately available frequency spectrum band, apart from the two private operators already licensed, DOT / MTNL would be licensed to be the third operator in each service area in case they want to enter, in a time bound manner. In order to ensure level playing field between different service providers in similar situations, licence fee would be payable by DoT also. However, as DoT is the national service provider having immense rural and social obligations, the Government will reimburse full licence fee to the DoT."

"It is proposed to review the spectrum utilisation from time to time keeping in view the emerging scenario of spectrum availability, optimal use of spectrum, requirements of market, competition and other interest of public. The entry of more operators in a service area shall be based on the recommendation of the TRAI who will review this as required and no later than every two years."

"CMSP operators would be required to pay a one time entry fee. The basis for determining the entry fee and the basis for selection of additional operators would be recommended by the TRAI. Apart from the one time entry fee, CMSP operators would also be required to pay licence fee based on a revenue share. It is proposed that the appropriate level of entry fee and percentage of revenue share arrangement for different service areas would be recommended by TRAI in a time-bound manner, keeping in view the objectives of the New Telecom Policy."

21. **In the model** employed for the analysis of the projects, entry of fourth operator was assumed two years after the entry of the third operator as per NTP 99. Para II.2.3 (iii) of the Consultation Paper (page 52) indicates that

"Specifically, third and fourth operator entry has been assumed to result in significant impact in the 6th and 8th year of the project even though actual entry may take earlier or later), with equal distribution of market share being achieved within 3-4 years of entry. The time frame for entry of fourth operator is only to facilitate analysis and does not reflect any firm views of the Authority regarding timing of entry of fourth operator. That would be examined separately."

The entry of additional operators has also been further dealt with at Part II, Chapter 3, paras 47 and 48 of the Consultation paper (page 96).

22 While TRAI has no information about the availability of spectrum either for the third or the fourth operator, the analysis reveals that even if the business in each of these Metropolitan areas and circles is required to produce a reasonable IRR, say, 16 to 18% and a decent return on the capital say around 20% it would still enable the operators to share upto about 25% of the gross adjusted revenue. The project viability parameters returned by the analysis have already been discussed in Section I above. Specifically, most of the projects examined have reasonable IRR's under the assumption of entry of 4th operator as above.

23 During the process of consultation, comments were received indicating that the impact of the entry of the third operator is required to be assessed before additional operators are introduced. The issues raised were with regard to viability of existing operators, market conditions to be assessed before entry of fourth operator, and some minimum time to elapse between the entry of the third and fourth operator. From viability point of view, under the assumptions of the analysis, some comments stated that there are some Circles where market does not appear to be adequate to support a fourth operator

at this stage. On the other hand, there are Metros and Circles where subscriber base has grown quite well. It is difficult at this point to make a realistic assessment of the impact of entry of DoT (DTS) / MTNL.

Entry of fourth operator:-

24 DoT/MTNL, the incumbent in basic services, have already been identified by NTP.99 as the third operator for CMTS service as per availability of spectrum. Available information suggests that DoT/MTNL intend to enter with low tariff plans for CMTS, thus infusing strong price competition. The analysis has examined entry of the third operator in the current year, which is the sixth year of operations of existing CMSP's and entry of the fourth operator two years later as per NTP 99. On economic grounds, it appears that it may be feasible for the fourth operator to enter in some service areas but this issue is not independent of the availability of spectrum to the previous three operators. There is a view that additional spectrum, if available, should be given to the existing operators to enable them to provide service in a more cost effective manner. Additional spectrum will also result in improved quality of service. This has also been brought out by BICP in their report on Cellular Mobile Service (at para 20 of page V.). Eventually, sustaining competition requires that the existing players are able to function in an efficient manner with adequate band-width. In the circumstances a fair balance between the two objectives of increasing competition on the one hand and improving the quality, coverage and price-efficiency of the service on the other will have to be struck so that the larger objective of providing quality services at affordable prices is not jeopardized. A sub-optimal cost structure and quality of service may finally turn out to be detrimental to the growth of tele-density notwithstanding a higher number of service providers. Accordingly, the timing entry of fourth operator would need to be decided taking into account the relevant informations and a final view is possible after such information is available.

In sum:-

25 The objectives set out in the NTP 99 as well as the terms of migration offered to the incumbent CMSP's envisage entry of more operators in each service area. DoT (DTS)/MTNL will be the third operator and will pay the license fee as finally determined. For selection other operators will bid for **entry fee.** For the existing operators, the license fee payable till 31.7.1999 is taken to be the entry fee.

26 In order to ensure that experienced, competent and qualified players enter the process of bid for entry fee, **pre-qualification** is considered necessary. The pre-qualification process would minimise the possibility of non-serious players entering the fray for speculative or other reasons. The pre-qualification would need to be done on a set of pre determined criteria which each prospective entrant has to fulfil. No weightages for criteria or ranking of prospective entrants is contemplated; all applicants who fulfil the laid down criteria would be eligible to bid for entry fee.

27 As stated above, the entry fee for is to be bid for by potential operators to be selected for becoming the fourth operator. In the case of circles where one or two slots are vacant, the same selection procedure, e.g. bid for entry fee would apply. As discussed above, simultaneous multi stage bidding process is the most preferred option for ensuring that proper values are placed on the licenses in the most efficient manner. However, proper safeguards need to be incorporated in the bidding process so that economically efficient outcomes are achieved.

Section III

Percentage of revenue to be shared with the licensor

Introduction

1. In the determination of the percentage of revenue share that the CMSP's would share with the licensor, it is necessary to balance the objectives of **viability of the business case, realisation of a fair value as rent by the Government** for grant of license to run the telecom business and **to ensure that the level of license fee is not an undue burden on tariffs** offered to the consumers since the license fee constitutes a part of the cost of the project.

2. The viability analysis of the projects studied has been presented in detail in the Consultation Paper on the subject. Section I of this Explanatory Memorandum indicates the study methodology in brief, along with a summary of the results of the analysis in terms of Internal Rate of Return (IRR) and Return on Equity (RoE). Appendices 4 and 6 indicate the results of the sensitivity analysis done under various scenarios.

3. A detailed analysis of the business cases of different operators in the metros and some of the circles carried out by the TRAI on the basis of figures provided by them, indicates that it would be possible for them to get from the businesses an IRR of 16-18% and in some cases even more as also a return on equity (RoE) of 20% or more. The figures for the analysis have been provided by six out of eight metro operators and nine out of thirty four operators in the circles. An important conclusion emerging from the analysis is also that by and large the IRR available on the business is not very highly impacted by the amount of revenue shared if the difference remains within a range. Tables 1-2 in Section 1 of the memorandum attached hereto indicate that a revenue share of even higher than the present provisional 15% can be borne by the operators without any difficulty. The results of the analysis including the numbers relating to IRR and RoE emerging therefrom form a part of the discussion paper issued by the TRAI on the subject.

4. As stated above the responses in regard to the revenue share which should be payable by the operators as license fee ranged from the very low 2-3% to as high as 40% and more depending upon the view point owned by the persons/organizations concerned. A careful examination of all the issues involved, however, leads us to the conclusion that the real answer lies not in any one of the two extremes but in a rational synthesis of the two points of

views.

5. It is noted that BICP have considered 16 % IRR as reasonable in their **Report on Study of the Indian Cellular Industry** (October 1998 - Confidential) at para 32 of Executive Summary, page vii. Separately, ICICI have indicated a minimum RoE of 20 % for investors in their Report **State Cellular Projects – Assessment of Viability** (June 1998 – Confidential) at page 18.

6. **Table A** and **Table B** below indicate the number of projects that meet both the IRR and RoE benchmarks indicated in the BICP and ICICI studies, as above.

TABLE A METROS – BASE CASE

	@ 15 % REVENUE SHARE	@ 20 % REVENUE SHARE	@ 25 % REVENUE SHARE
NO. OF METROS MEETING 16 % IRR AND 20 % RoE (TOTAL EXAMINED 6)	6	6	6

TABLE B CIRCLES – BASE CASE

	CATEGORY	@ 15 % REVENUE SHARE	@ 20 % REVENUE SHARE	@ 25 % REVENUE SHARE
NO. OF CIRCLES MEETING 16 % IRR AND 20 % RoE	A (TOTAL 2)	2	2	2
	B (TOTAL 5)	5	5	5
	C (TOTAL 2)	2	2	1

7. From the above, it would appear that an outflow of significant revenue share can be borne by the CMS projects in Metros, Category A and Category B Circles, whereas for some Category C Circles, the percentage of revenue share requires to be kept at a lower level. It is noted that these are long term projects and many changes may occur over the next 10 – 15 years. Various relevant issues were taken into account for arriving at the percentage of

revenue share so as to cover a reasonable license fee as also outflows on account of USO, R&D Cess and administrative/regulatory charges. While some of them provide a basis for a low revenue share, some others point towards a higher revenue share. The Authority reached its conclusion on the basis of balancing the various revenue consideration involved which were discussed as below :

7.1 Points in favour of relatively low revenue share:-

(a) To determine the revenue share, an examination of the surplus exhibited by Internal Rate of Return(IRR) needs to be supplemented by other criteria as IRR cannot be treated as the sole determinant for arriving at a reasonable revenue share.

(b) Though the Govt. should share in the rent earned by service providers, the revenue share should balance various objectives, including attracting higher investment.

(c) It is important to leave adequate re-investable resources in the hands of the Operators to enable them to expand in the interest of consumer welfare. It is also necessary to ensure a business case in which the operator is not forced to cut corners at the cost of customer welfare.

(d) In a dynamic sector like telecom, prone to technological changes and marked by early obsolescence, it is necessary to enable the operator to hedge for future risks and provide for upgradation of networks by retaining adequate revenues for the purpose.

(e) A higher revenue share would increase costs, which in turn would result in higher tariffs for consumers.

(f) The Authority will, from time to time, review tariffs taking account of the overall costs including license fee with a view to pass benefits to consumers.

(g) Govt. of India has provided tax holiday to infrastructure sectors including telecom Sector. A need for consistency of Govt, policies also points to avoid levying too high a revenue share as license fee, as this would amount to different wings of Govt. adopting conflicting policies.

(h) If the Govt. wants to raise more resources from the sector, the taxation regime can be used for this purpose.

(i) A high revenue share may also lead to history repeating itself in the SP's not being able to meet their commitments.

7.2 Points in favour of relatively high revenue share :

(j) There will be rent in the market and the Govt. should obtain a substantial portion of this rent.

(k) The present exercise cannot be completely delinked from the background of earlier bids in which high license fee had been committed. While the migration package was intended to provide relief to operators from high license fees the earlier commitments which resulted in the selection of these operators (and exclusion of other bidders) has to be kept in view. **Appendix 7** carries details of the high license fees bid for obtaining the licenses. Hence revenue share percentage cannot be made too low. For ARPUs, prevailing at the end of 1999, license fee at the rate of Rs.500 per subscriber per month under the prevailing regime(i.e. pre-migration regime) ranged from 31% to 47% for metros and generally ranged form 34% to 566% per cent for several Circles.

(k) In several countries including those with low license fee, spectrum is either priced higher than in India or is auctioned and earns high revenues for the State. Under the current system in India, spectrum is charged at a fixed, relatively lower fee. A part of the market valuation for the scarce spectrum resource may therefore, be realized alternatively through license fee.

While the operators should share a part of the revenue for the advantages gained, they should also be enabled to generate and retain funds from the business so that they can continue to make further investments in the business. Fast growth as well as changing technology will make such further investments inevitable. Surpluses beyond that requirement can be passed on to the customers by way of reduction in prices, either voluntarily by the operation themselves or through a tariff regime enforced by the regulator.

8 The viability study has examined the total outflow from the project and therefore other contributions like USO levy, R&D cess, and administrative / regulatory charges may be met out of the revenue share recommended above. USO levy is yet to be determined and will be based on the country's requirement and may change from year to year. This amount will form part of the revenue share and be accounted for under a separate accounting system, for which recommendations will be made separately.

9 TRAI considers that in the overall revenue share taken as license fee there have to be two components viz (a) an identifiable part to cover the cost of USI, R&D and administration and regulation and (b) a reasonable amount of rent. In our view the revenue share parted with as license fee has also to represent a payment for frequency spectrum which is a highly limited national resource. It should be seen as a price for the opportunity of using the spectrum in the present situation of limited competition and is not being recommended as a means for raising revenue. If the business generates high net surpluses the appropriate mode for the government to partake of such surpluses will be through the taxation regime to which all operators will in any case be subject.

10 In this context it would be desirable to consider the view that the license fee should be the bare minimum, just enough to cover the cost of administering it. This has been professed quite persistently by the Cellular Operators' Association of India(COAI). Having examined it carefully we have found it to be unsustainable in the Indian context. The revenue share paid by the operators needs also to represent a fair compensation for the utilization of the

limited spectrum which provides them opportunities of business in preference to others In other countries too a sizeable payment has had to be made by the operators for the use of frequency spectrum. And finally, the question of revenue share has to be considered in the background of the existing operators having migrated to revenue sharing regime from the earlier fixed license fee arrangement and that if the operators were to follow the initially contracted system of payment the license fee, in terms of revenue share it would have worked out to be quite high.(**Appendix 7**)

11 TRAI considers that in the overall revenue share taken as license fee there have to be two components viz (a) an identifiable part to cover the cost of USO, R&D and administration and regulation and (b) a reasonable amount of rent. In our view the revenue share parted with a license fee has **also** to represent a payment for frequency spectrum which is a highly limited national resource. In the case of NLDO it had been recommended the first component to be at a figure of 7%, 5% for the USO and 2% for the R&D, administration as well as regulation. While even these figures are provisional and a detailed work on USO estimation is still in process, in order to introduce the levy, it would be recommended that this much revenue may be segregated and accounted for separately from the total amount to be received as the license fee. In a country as big as ours and with so huge a deficiency in universal service requirements, the related levy may have to be revised upwards from time to time at least for the next 10 years.

12 Keeping the above in view, it is recommended that revenue share should be :

- the percentage of revenue share for the 4 vacant slots in the Andaman and Nicobar and Jammu & Kashmir circles will be 10% percent of the adjusted gross revenue
- The percentage of revenue share for incumbent migranting CMSPs in the 42 slots shall be 17% of the adjusted gross revenue

- The percentage of revenue share for the one slot each available in Assam and West Bengal will be 17% of the adjusted gross revenue.
- DTS/MTNL will pay the same percentage of revenue share as license fee for the respective metros and circles in which they are licensed as the third operator.

Section IV

Definition of revenue for the purpose of revenue share

Gross Revenue definition in the Consultation Paper:

1. "Gross revenue has been defined as the revenue derived from licensed activities, including revenue on account of value added services and supplementary services. It will not include revenue on account of sale of handsets. In case a service provider subsidises the sale of handsets by giving rebate on the rental tariff or other rebates, the revenue thus foregone will be added to the gross revenue. Service tax is excluded from the above definition of Gross Revenue."

2. Further, in Annexure II of the Consultation Paper (page 161), **Adjusted Gross Revenues** are defined as Gross Revenues (as defined above) net of passthru' revenues (i.e., PSTN interconnect payable to DoT and service provision charges paid to other service providers).

3. Viability analysis was conducted using both definitions of revenue and the results have already been presented for discussion in the Consultation paper No. 99/6.

Approach to definition

4 Any recommendation of revenue for the purpose of revenue share needs to be clear and comprehensive. In application, it needs to be practical and verifiable. Revenue so defined must be amenable to check and reconciliation during implementation of the revenue sharing regime. The figures derived must be auditable to independent scrutiny.

5 Hence, in approaching the definition in more precise terms, the general principle that has been adopted is that all revenues derived from facilities created under the license be subject to the revenue share. Revenues foregone on account of subsidies, rebates and other arrangements including bundling of services with unlicensed activities require to be added back.

6 While 'the benefit of the license' is the guiding principle in defining the revenue for the

purpose of revenue share, certain implementation issues too need to be accounted for. Bundling of services and interconnection are realities that have to be taken cognisance of. Similarly, franchise arrangements that flow out of the license at any stage and therefore involve sharing of revenues (in whatever manner) between the licensee and its franchisees too require to be taken into account. Arrangements with resellers and facilities created under the license that are leased out will also be covered in a similar manner. Any proposed definition has to be robust and forward looking. Ease of obtaining relevant data and its auditability are important considerations.

7 In view of the above, the **definition of Adjusted Gross Revenue** has been derived from the definition adopted in the case of GMPCS recommendations. It has been suitably adjusted to the Cellular Mobile Service, and reads as follows:

"Adjusted Gross Revenue" for the purpose of levying license fee as a percentage of Revenue Share shall mean the "**Gross Revenue**" accruing to the Licensee by way of operations of the Cellular Mobile Service mandated under the license (inclusive of revenue on account of value-added services, supplementary services, and sale of handsets) *plus* revenue accruing through resellers, franchises etc., *plus* any revenue foregone through subsidies on handsets or any other rebates, as reduced by the following items:

- i) Interconnection/ Access charges payable to other Service Providers for carriage of calls
- ii) Roaming revenues collected on behalf of other Cellular Mobile Service Providers and passed on or liable to be passed on to them;
- iii) Service tax paid or payable;
- iv) Sale of hand sets.

8 It is recommended that the above definition be used for applying revenue share percentage to all category of service areas licensed under the CMS license.

Section V

Terms and conditions of license

1. The terms and conditions of license may require modifications as per the recommendations that would be made by TRAI in response to the Government's request. The actual modifications required can be specified only after the recommendations are firmed up and a final determination on them is made.

2. The Consultation paper No. 99/6 on **Issues relating to Cellular Mobile Service** had included a **Draft restructured license agreement for cellular mobile telephone service** for wider consultation. The comments received on this and other issues are available in Appendix 5.

3. The existing License Agreements for Circle and Metro licenses have been examined in the context of the migration package now offered under the NTP 99 regime. It would seem appropriate that rather than a *de novo* draft of license (which may have many legal implications), the Clauses or sections that may require modification as a result of decision regarding migration and revenue sharing regime be identified and a recommendation made to the licensor to amend these Clauses according to the final determination on revenue share percentage, entry fee, basis of selection of new operators, etc.

4. The following modifications would be necessary:

Circle License Agreement

Revenue share percentage and entry fee related

a. **Clause 1** of the License Agreement indicates the license fee as quantified in Condition 19 of Schedule B of the license agreement as well as the non-exclusive basis of the license in the service area (further amplified in **Clause 14 (i)**). Schedule B would require modification in accordance with the revenue share percentage indicated. Clause 14 (i) would require modification to include the terms of the migration package in terms of entry of new operators.

b. **Condition 19** of **Part III** of **Schedule B** dealing with the Payment of License Fee will need modification to the extent of the revenue share percentage, **the entry fee**, and any other charges.

Period of license related

c. **Clause 2** of the Agreement indicates the period of license (further amplified in Condition 18.2 (i) of Schedule B). This would need to be modified accordingly.

Tariff related

d. **Clause 8** deals with the maximum tariff, as given in **Schedule A.** This may need to be modified to reflect the TRAI Act. **Schedule A** will require to be modified to indicate the new tariff regime, with adequate provisions for future changes. Also provision for refund has to be built in.

Applicable system and LD connectivity

e. **Part II** of **Schedule B** deals with the Applicable Systems (GSM). This may need modification, in line with NTP 99.

f. **Sub-condition 4.4** of **Condition 4** of **Part III** of **Schedule B** indicates that all long distance connectivity outside the service area will be through PSTN network of DoT. This may need modification in line with NTP 99 and opening up of NLD.

Bank Guarantee

g. **Sub-condition 18.2 (ii)** of **Condition 18** of **Part III** of **Schedule B** deals with the Financial Conditions of Performance Bank Guarantee, which may need to be amended according to the final determination in this regard.

Others

h. Suitable amendments to relevant Clauses would be required for incorporating **USO levy** depending upon the final decision in this regard.

i. **Accounting Separation** requirements may require to be built in, to indicate the licensee's responsibility for providing separated accounts as prescribed.

j. The **effective date** has been modified in the case of Circles. This may need to be suitably incorporated into the License Agreement.

Metro License Agreement

The Clauses as indicated above would need to be modified *mutatis mutandis* in the Metro License Agreement as well.

APPENDIX 1

(MOC LETTER DATED 7.10.98)

APPENDIX 2

(MOC LETTER DATED 23.4.99)

APPENDIX 3

(MOC LETTER DATED 12.7.99)

APPENDIX 4

SENSITIVITY ANALYSIS

(Annexure II, page 162-166 of Consultation Paper No. 99/6)

Table A.4.1 : IRRs/ROEs for Base Case Sensitized to Drop in Demand by 10% Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	0%		5%		10%		15%		20%		25%	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	22.5%	23.4%	21.8%	22.5%	21.2%	21.6%	20.5%	20.7%	19.8%	19.8%	19.1%	18.9%
A4	26.2%	36.3%	25.2%	34.0%	24.2%	31.7%	23.2%	29.4%	22.3%	27.2%	21.3%	24.9%
B1	29.4%	34.3%	28.7%	33.3%	28.0%	32.2%	27.3%	31.2%	26.6%	30.1%	25.8%	29.0%
B2	25.3%	33.5%	24.4%	31.7%	23.5%	29.8%	22.6%	27.9%	21.6%	26.0%	20.7%	24.1%
B3	27.3%	29.0%	26.8%	28.4%	26.2%	27.7%	25.7%	27.1%	25.1%	26.4%	24.6%	25.7%
B4	29.7%	32.2%	28.6%	30.8%	27.4%	29.3%	26.2%	27.9%	25.0%	26.4%	23.8%	25.0%
B5	28.3%	30.5%	27.3%	29.2%	26.4%	28.1%	25.3%	26.7%	24.2%	25.4%	23.1%	24.1%
C1	28.0%	30.4%	26.9%	29.0%	25.8%	27.6%	24.6%	26.2%	23.6%	24.9%	22.4%	23.4%
C3	22.0%	22.8%	21.0%	21.7%	20.1%	20.6%	19.1%	19.5%	18.1%	18.4%	17.1%	17.2%
METROS												
M1	23.7%	27.2%	23.0%	26.4%	22.4%	25.5%	21.7%	24.6%	20.9%	23.7%	20.2%	22.8%
M2	40.7%	55.9%	39.4%	53.7%	38.1%	51.4%	36.8%	49.0%	35.4%	46.5%	34.0%	43.9%
M3	34.6%	45.3%	33.6%	43.5%	32.6%	41.8%	31.6%	40.0%	30.6%	38.1%	29.6%	36.3%
M4	24.7%	27.3%	23.8%	26.0%	22.9%	24.7%	22.0%	23.4%	21.0%	22.1%	20.0%	20.8%
M5	32.0%	35.2%	30.9%	33.8%	29.8%	32.3%	28.7%	30.8%	27.6%	29.3%	26.4%	27.8%
M6	20.9%	24.4%	20.1%	23.1%	19.4%	21.8%	18.6%	20.3%	17.8%	18.7%	17.1%	17.1%

Table A.4.2: IRRs/ROEs for Base Case Sensitized to Drop in ARPU by 20% Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	0%		5%		10%		15%		20%		25%	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	20.0%	20.1%	19.4%	19.2%	18.8%	18.4%	18.1%	17.5%	17.4%	16.7%	16.8%	15.8%
A4	22.8%	28.7%	21.9%	26.5%	20.9%	24.5%	20.0%	22.4%	19.0%	20.5%	18.0%	18.6%
B1	26.7%	30.5%	26.0%	29.5%	25.3%	28.5%	24.6%	27.4%	23.9%	26.4%	23.2%	25.4%
B2	22.6%	28.0%	21.7%	26.2%	20.8%	24.5%	20.0%	22.9%	19.1%	21.2%	18.2%	19.6%
B3	25.2%	26.5%	24.7%	25.9%	24.2%	25.3%	23.6%	24.6%	23.1%	24.0%	22.5%	23.3%
B4	25.8%	27.4%	24.7%	26.1%	23.6%	24.7%	22.4%	23.3%	21.3%	21.9%	20.1%	20.6%
B5	24.7%	26.1%	23.7%	24.9%	22.6%	23.6%	21.6%	22.4%	20.5%	21.1%	19.4%	19.8%
C1	24.1%	25.6%	23.0%	24.2%	21.8%	22.8%	20.6%	21.4%	19.4%	19.9%	18.1%	18.4%
C3	18.1%	18.4%	17.2%	17.3%	16.2%	16.2%	15.1%	15.0%	14.0%	13.8%	12.9%	12.6%
METROS												
M1	21.5%	24.6%	20.8%	23.7%	20.1%	22.8%	19.4%	21.9%	18.7%	21.0%	17.9%	20.0%
M2	36.7%	48.8%	35.5%	46.6%	34.2%	44.3%	32.9%	41.9%	31.5%	41.5%	30.2%	38.8%
M3	31.6%	40.0%	30.6%	38.4%	29.7%	36.7%	28.7%	35.0%	27.7%	33.2%	26.7%	31.7%
M4	21.2%	22.5%	20.3%	21.2%	19.3%	19.9%	18.3%	18.5%	17.3%	17.2%	16.3%	15.8%
M5	28.2%	30.2%	27.2%	28.8%	26.1%	27.4%	25.0%	26.0%	23.9%	24.6%	22.8%	23.3%
M6	18.1%	19.3%	17.4%	17.7%	16.6%	16.1%	15.9%	14.3%	15.2%	12.5%	14.3%	10.5%

Table A.4.3 : IRRs/ROEs for Base Case Sensitized to Drop in ARPU by 10% and Increase in Demand by 20%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	0%		5%		10%		15%		20%		25%	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	23.9%	25.3%	23.2%	24.3%	22.5%	23.3%	21.7%	22.3%	21.0%	21.3%	20.2%	20.3%
A4	27.7%	39.3%	26.7%	36.8%	25.6%	34.2%	24.5%	31.8%	23.4%	29.2%	22.2%	26.7%
B1	31.2%	36.8%	30.5%	35.6%	29.7%	34.4%	28.9%	33.2%	28.1%	32.1%	27.2%	30.8%
B2	27.5%	37.6%	26.5%	35.6%	25.5%	33.5%	24.4%	31.3%	23.4%	29.1%	22.3%	27.0%
B3	28.9%	30.8%	28.3%	30.1%	27.7%	29.4%	27.1%	28.7%	26.5%	28.0%	25.9%	27.2%
B4	32.0%	34.9%	30.7%	33.3%	29.4%	31.7%	28.1%	30.1%	26.8%	28.4%	25.4%	26.8%
B5	30.4%	32.8%	29.2%	31.4%	28.0%	30.0%	26.8%	28.5%	25.6%	27.0%	24.4%	25.6%
C1	30.5%	33.3%	29.3%	31.8%	28.1%	30.3%	26.9%	28.8%	25.6%	27.2%	24.3%	25.6%
C3	24.3%	25.4%	23.3%	24.3%	22.3%	23.1%	21.3%	21.9%	20.2%	20.7%	19.2%	19.5%
METROS												
M1	25.8%	30.0%	25.0%	29.0%	24.2%	27.9%	23.3%	26.8%	22.5%	25.7%	21.7%	24.8%
M2	42.8%	59.1%	41.4%	56.7%	39.9%	54.1%	38.4%	51.4%	36.9%	48.6%	35.3%	45.7%
M3	36.7%	48.7%	35.7%	46.8%	34.6%	44.9%	33.4%	42.9%	32.3%	40.8%	31.1%	38.7%
M4	26.9%	30.7%	25.9%	29.1%	24.8%	27.5%	23.7%	25.9%	22.5%	24.3%	21.4%	22.6%
M5	33.6%	37.5%	32.5%	35.8%	31.2%	34.1%	30.0%	32.4%	28.7%	30.7%	27.4%	29.0%
M6	22.8%	27.4%	22.0%	26.1%	21.1%	24.7%	20.3%	23.2%	19.4%	21.8%	18.5%	20.0%

Table A.4.4 : IRRs/ROEs for Base Case Sensitized to Drop in ARPU by 30% and Increase in Demand by 15%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	0%		5%		10%		15%		20%		25%	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	19.2%	19.0%	18.6%	18.2%	17.9%	17.3%	17.3%	16.5%	16.6%	15.6%	15.9%	14.7%
A4	21.5%	25.8%	20.6%	23.7%	19.6%	21.7%	18.6%	19.8%	17.6%	17.9%	16.6%	16.1%
B1	25.9%	29.3%	25.2%	28.3%	24.5%	27.2%	23.7%	26.2%	23.0%	25.1%	22.2%	24.0%
B2	21.9%	26.6%	21.1%	24.9%	20.2%	23.2%	19.3%	21.5%	18.3%	19.8%	17.4%	18.1%
B3	24.7%	25.9%	24.1%	25.2%	23.6%	24.6%	23.0%	23.9%	22.5%	23.3%	21.9%	22.6%
B4	24.4%	25.7%	23.2%	24.3%	22.1%	22.9%	20.9%	21.5%	19.7%	20.1%	18.4%	18.7%
B5	23.3%	24.5%	22.3%	23.2%	21.2%	21.9%	20.1%	20.7%	19.1%	19.5%	17.9%	18.2%
C1	22.7%	23.9%	21.6%	22.5%	20.4%	21.0%	19.1%	19.6%	17.8%	18.1%	16.6%	16.6%
C3	16.9%	17.0%	15.9%	15.9%	14.8%	14.7%	13.7%	13.5%	12.5%	12.2%	11.3%	10.8%
METROS												
M1	20.9%	23.9%	20.2%	23.0%	19.4%	22.0%	18.6%	21.0%	17.8%	20.0%	17.0%	19.0%
M2	35.3%	46.1%	34.0%	43.8%	32.7%	41.4%	31.4%	40.9%	30.0%	38.2%	28.6%	36.6%
M3	30.6%	38.3%	29.7%	36.6%	28.7%	34.9%	27.7%	33.2%	26.7%	31.7%	25.8%	30.3%
M4	19.8%	20.5%	18.8%	19.1%	17.7%	17.7%	16.6%	16.2%	15.5%	14.8%	14.3%	13.2%
M5	26.8%	28.3%	25.7%	26.9%	24.6%	25.4%	23.4%	24.0%	22.2%	22.5%	21.0%	21.0%
M6	17.2%	17.3%	16.5%	15.6%	15.7%	13.8%	14.9%	11.9%	14.1%	9.8%	13.1%	7.5%

Table A.4.5 : IRRs/ROEs for Base Case Sensitized to Drop in ARPU by 30%, Increase in Demand by 45% and increase in CAPEX by 10%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	0%		5%		10%		15%		20%		25%	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	21.3%	21.7%	20.5%	20.7%	19.8%	19.8%	19.1%	18.8%	18.3%	17.9%	17.6%	16.9%
A4	24.0%	30.4%	22.9%	28.0%	21.8%	25.7%	20.6%	23.4%	19.5%	21.2%	18.3%	19.1%
B1	28.3%	32.6%	27.5%	31.4%	26.7%	30.2%	25.9%	29.0%	25.1%	27.8%	24.2%	26.6%
B2	24.8%	31.9%	23.8%	29.9%	22.8%	27.9%	21.8%	26.0%	20.8%	24.0%	19.7%	22.1%
B3	26.8%	28.4%	26.3%	27.7%	25.7%	27.0%	25.1%	26.3%	24.5%	25.5%	23.8%	24.8%
B4	27.6%	29.4%	26.3%	27.8%	25.0%	26.3%	23.7%	24.7%	22.4%	23.2%	21.0%	21.6%
B5	26.3%	27.8%	25.1%	26.4%	23.9%	25.0%	22.8%	23.8%	21.6%	22.3%	20.4%	20.9%
C1	26.3%	28.2%	25.1%	26.6%	23.9%	25.1%	22.6%	23.6%	21.3%	22.0%	19.9%	20.4%
C3	20.7%	21.3%	19.6%	20.1%	18.6%	18.9%	17.6%	17.7%	16.4%	16.5%	15.2%	15.1%
METROS												
M1	23.6%	27.4%	22.7%	26.3%	21.9%	25.1%	21.1%	24.1%	20.1%	22.9%	19.2%	21.7%
M2	38.2%	50.6%	36.8%	48.0%	35.3%	45.3%	33.7%	42.5%	32.2%	40.7%	30.5%	39.2%
M3	33.4%	42.8%	32.3%	40.9%	31.2%	38.9%	30.1%	36.9%	28.9%	34.8%	27.9%	33.3%
M4	22.6%	24.6%	21.4%	22.8%	20.2%	21.0%	18.9%	19.3%	17.6%	17.5%	16.2%	15.7%
M5	29.2%	31.3%	27.9%	29.7%	26.7%	28.0%	25.4%	26.4%	24.0%	24.7%	22.6%	23.0%
M6	19.9%	22.6%	19.0%	21.0%	18.1%	19.3%	17.3%	17.6%	16.4%	15.7%	15.6%	13.7%

Table A.4.6 : IRRs/ROEs for Base Case Sensitized to Drop in Capex by 10%, Drop in ARPU by 5% and Increase in Demand by 10%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	0%		5%		10%		15%		20%		25%	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	24.1%	25.5%	23.4%	24.5%	22.6%	23.6%	21.9%	22.6%	21.2%	21.6%	20.4%	20.6%
A4	28.1%	40.3%	27.0%	37.9%	25.9%	35.3%	24.9%	32.9%	23.8%	30.4%	22.7%	27.8%
B1	31.3%	37.0%	30.6%	35.8%	29.8%	34.7%	29.1%	33.6%	28.3%	32.4%	27.5%	31.2%
B2	27.5%	37.7%	26.5%	35.7%	25.5%	33.6%	24.5%	31.5%	23.4%	29.4%	22.4%	27.2%
B3	28.8%	30.8%	28.3%	30.1%	27.7%	29.4%	27.1%	28.7%	26.6%	28.0%	25.9%	27.3%
B4	32.3%	35.3%	31.0%	33.7%	29.8%	32.2%	28.5%	30.6%	27.2%	28.9%	25.9%	27.3%
B5	30.6%	33.2%	29.5%	31.8%	28.4%	30.4%	27.2%	29.0%	26.0%	27.5%	24.8%	26.1%
C1	30.7%	33.6%	29.5%	32.2%	28.4%	30.7%	27.1%	29.2%	25.9%	27.6%	24.6%	26.0%
C3	24.4%	25.5%	23.4%	24.4%	22.4%	23.3%	21.4%	22.1%	20.4%	20.9%	19.3%	19.7%
METROS												
M1	25.6%	29.7%	24.8%	28.7%	24.0%	27.7%	23.3%	26.7%	22.6%	25.8%	21.9%	24.9%
M2	43.1%	59.8%	41.7%	57.5%	40.3%	55.1%	38.9%	52.5%	37.4%	49.8%	35.8%	46.9%
M3	36.8%	49.0%	35.7%	47.2%	34.7%	45.3%	33.6%	43.3%	32.5%	41.3%	31.3%	39.2%
M4	27.1%	30.9%	26.1%	29.5%	25.1%	28.0%	24.1%	26.5%	23.0%	24.9%	21.9%	23.3%
M5	34.1%	38.1%	32.9%	36.5%	31.7%	34.9%	30.5%	33.2%	29.3%	31.5%	28.0%	29.8%
M6	22.8%	27.5%	22.0%	26.2%	21.2%	24.9%	20.4%	23.4%	19.5%	22.0%	18.7%	20.3%

Table A.4.7 : IRRs/ROEs for Base Case Sensitized to Drop in CAPEX by 25%, drop in ARPU by 12.5% & Increase in Demand by 25%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	**0%**		**5%**		**10%**		**15%**		**20%**		**25%**	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	24.4%	26.0%	23.7%	25.0%	23.0%	24.0%	22.2%	23.0%	21.5%	22.0%	20.7%	20.9%
A4	28.5%	41.1%	27.4%	38.6%	26.3%	36.0%	25.1%	33.3%	24.1%	30.8%	22.9%	28.2%
B1	31.9%	37.7%	31.1%	36.6%	30.3%	35.4%	29.5%	34.2%	28.7%	33.0%	27.9%	31.8%
B2	28.1%	38.9%	27.0%	36.8%	26.0%	34.6%	25.0%	32.5%	23.9%	30.2%	22.8%	28.0%
B3	29.2%	31.2%	28.7%	30.5%	28.1%	29.8%	27.5%	29.1%	26.9%	28.4%	26.3%	27.7%
B4	32.8%	36.0%	31.5%	34.3%	30.2%	32.7%	28.9%	31.0%	27.5%	29.3%	26.1%	27.7%
B5	31.1%	33.7%	29.9%	32.3%	28.7%	30.8%	27.5%	29.3%	26.3%	27.8%	25.0%	26.3%
C1	31.4%	34.5%	30.2%	32.9%	28.9%	31.4%	27.7%	29.8%	26.4%	28.2%	25.1%	26.6%
C3	24.9%	26.2%	24.0%	25.0%	22.9%	23.9%	21.9%	22.7%	20.9%	21.5%	19.8%	20.2%
METROS												
M1	26.2%	30.6%	25.4%	29.6%	24.6%	28.6%	23.8%	27.5%	22.9%	26.4%	22.1%	25.2%
M2	43.5%	60.6%	42.1%	58.2%	40.6%	55.6%	39.1%	53.0%	37.6%	50.1%	36.0%	47.1%
M3	37.3%	49.9%	36.3%	48.0%	35.2%	46.1%	34.0%	44.0%	32.9%	42.0%	31.7%	39.8%
M4	27.9%	32.3%	26.9%	30.7%	25.8%	29.1%	24.7%	27.4%	23.5%	25.7%	22.3%	24.0%
M5	34.5%	38.7%	33.3%	37.0%	32.1%	35.3%	30.8%	33.6%	29.5%	31.8%	28.2%	30.1%
M6	23.2%	28.3%	22.4%	26.7%	21.5%	25.5%	20.7%	24.0%	19.8%	22.5%	18.9%	20.8%

Table A.4.8 : IRRs/ROEs for Base Case Sensitized to Drop in CAPEX by 25%, drop in ARPU by 25% & Increase in Demand by 40%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	**0%**		**5%**		**10%**		**15%**		**20%**		**25%**	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	23.0%	24.0%	22.3%	23.1%	21.5%	22.1%	20.8%	21.1%	20.0%	20.1%	19.3%	19.1%
A4	26.5%	36.4%	25.4%	33.9%	24.3%	31.3%	23.1%	28.8%	22.0%	26.3%	20.9%	24.0%
B1	30.4%	35.6%	29.6%	34.5%	28.9%	33.3%	28.1%	32.1%	27.2%	30.9%	26.4%	29.7%
B2	26.5%	35.7%	25.6%	33.7%	24.5%	31.6%	23.5%	29.5%	22.4%	27.3%	21.4%	25.2%
B3	28.1%	29.9%	27.5%	29.2%	27.0%	28.5%	26.4%	27.8%	25.7%	27.1%	25.1%	26.3%
B4	30.5%	33.0%	29.2%	31.4%	27.9%	29.8%	26.5%	28.2%	25.2%	26.5%	23.8%	24.9%
B5	28.9%	31.1%	27.7%	29.6%	26.5%	28.2%	25.3%	26.7%	24.1%	25.2%	22.8%	23.7%
C1	29.1%	31.6%	27.9%	30.1%	26.6%	28.6%	25.4%	27.0%	24.2%	25.5%	22.8%	23.9%
C3	23.1%	24.0%	22.0%	22.8%	21.0%	21.6%	19.9%	20.4%	18.8%	19.2%	17.7%	17.9%
METROS												
M1	25.1%	29.3%	24.2%	28.2%	23.4%	27.1%	22.5%	25.9%	21.6%	24.8%	20.7%	23.6%
M2	41.1%	56.3%	39.7%	53.8%	38.2%	51.1%	36.7%	48.4%	35.1%	45.5%	33.5%	42.4%
M3	35.5%	46.8%	34.5%	44.8%	33.4%	42.9%	32.2%	40.8%	31.1%	38.7%	29.9%	36.6%
M4	25.9%	29.4%	24.7%	27.7%	23.6%	26.0%	22.4%	24.2%	21.2%	22.4%	19.9%	20.6%
M5	32.1%	35.4%	30.9%	33.7%	29.6%	32.0%	28.5%	30.4%	27.2%	28.7%	25.8%	27.0%
M6	21.6%	25.6%	20.8%	24.2%	19.9%	22.8%	19.0%	21.1%	18.1%	19.3%	17.2%	17.4%

Table A.4.9 : IRRs/ROEs for Base Case Sensitized to Drop in OPEX by 10%, drop in ARPU by 3%

& Increase in Demand by 6%
Assuming Share of Adjusted Gross Revenue as lic. fee from Aug 1, 1999 onwards

Lic. Fee	**0%**		**5%**		**10%**		**15%**		**20%**		**25%**	
Op Code	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**	**IRR**	**ROE**
CIRCLES												
A1	24.2%	25.7%	23.5%	24.7%	22.8%	23.8%	22.1%	22.8%	21.4%	21.8%	20.6%	20.8%
A4	28.3%	40.9%	27.3%	38.5%	26.2%	36.1%	25.2%	33.5%	24.1%	31.0%	23.1%	28.6%
B1	31.4%	37.0%	30.6%	35.9%	29.9%	34.8%	29.1%	33.7%	28.4%	32.5%	27.6%	31.4%
B2	27.6%	38.0%	26.6%	36.0%	25.7%	34.0%	24.7%	31.9%	23.7%	29.8%	22.6%	27.7%
B3	28.9%	30.9%	28.4%	30.2%	27.8%	29.6%	27.3%	28.9%	26.7%	28.2%	26.1%	27.5%
B4	32.7%	35.9%	31.5%	34.3%	30.3%	32.8%	29.0%	31.2%	27.7%	29.6%	26.4%	28.0%
B5	31.1%	33.7%	30.0%	32.4%	28.8%	31.0%	27.7%	29.6%	26.5%	28.2%	25.3%	26.7%
C1	30.9%	33.9%	29.8%	32.5%	28.6%	31.0%	27.5%	29.5%	26.2%	28.0%	25.0%	26.5%
C3	24.6%	25.8%	23.6%	24.7%	22.7%	23.6%	21.7%	22.4%	20.7%	21.3%	19.7%	20.1%
METROS												
M1	25.7%	29.9%	25.0%	28.9%	24.3%	28.0%	23.5%	27.0%	22.8%	26.0%	22.0%	25.0%
M2	43.7%	61.0%	42.4%	58.7%	41.0%	56.4%	39.6%	53.9%	38.2%	51.3%	36.7%	48.6%
M3	37.0%	49.4%	36.0%	47.6%	35.0%	45.8%	33.9%	43.9%	32.8%	41.9%	31.7%	39.8%
M4	27.6%	31.5%	26.6%	30.1%	25.6%	28.7%	24.6%	27.2%	23.6%	25.7%	22.5%	24.2%
M5	34.5%	38.7%	33.4%	37.2%	32.3%	35.6%	31.1%	33.9%	29.9%	32.3%	28.7%	30.7%
M6	23.1%	28.0%	22.3%	26.6%	21.5%	25.5%	20.7%	24.1%	19.9%	22.6%	19.1%	21.1%

APPENDIX 5

Summary of Comments Received in response to Consultation Paper and Open House Discussions

General Comments

1. Review of tariffs as current levels do not reflect costs as well as reduced license burden due to migration.
2. USO funding should be determined before license fee is fixed.
3. Affordability of mobile services more important than viability.
4. Cancellation of licenses if license fee is changed.
5. No point in industry contributing to the R&D fund and service providers who do import substitution should be provided with some benefits. The volumes are too low in India to justify manufacturing of handsets.
6. SAARC countries should be studied for determining tariffs.
7. TRAI should have an indexed tariff cap on a basket containing rental, free airtime, etc. to provide flexibility to operators.
8. Greater flexibility to operators in matters of tariffs with floor prices for dominant operator with monopoly over access provision and with a fixed line operation.
9. Greater flexibility to operators in tariff setting with differential tariffs allowed in different areas of circle.
10. License conditions should ensure greater disclosures relating to Capex, procurement of equipment etc.
11. Restrictions on lock-in of present shareholding for period of 5 years from effective date of license agreement not required for existing and new operators.
12. Lock-in period required except when company goes sick.
13. Forbear regulation in mobile telephony which is a Value Added Service. Regulator just needs to ensure effective Competition in all Enhanced & Value Added Services. Free Play to market forces.
14. Incentives needed to ensure service in areas where there are no cellular operators. These could be related to scope of license in terms of allowing additional services, assistance from international funding agencies, funding through the USO fund, reimbursement of license fee to DTS for providing services in these areas.

Revenue Share

Basis of License Fees

15. License fees not appropriate vehicle for raising resources for Union budget; Corporate tax should be used for raising resources for government
16. Basis of License fee should not be rent as:
    - Entry fee is being paid
    - Rent paid when offering attractive investment opportunity; India needs to attract investment
17. License fee should include element of rent in addition to covering cost of regulation and administration, USO, R&D
18. License fee should support only the following:
    - Administrative an regulatory costs
    - R&D and common services such as training, PTCC etc.
19. License fee should cover administrative expenses, R&D, USO levy, contribution to general revenue with a 20% cap on project IRR.
20. Historical context of license fee is important. Reasonable revenue must accrue to Government from grant of licenses. Metro License fee should be higher because of windfall profits made by service providers. It could be lower for

Category A Circles and nominal for others.

Level of Revenue Share

21. Use of low revenue share to drive down tariffs, ensure adequate return on investments for faster expansion of telecom services and enable Indian companies to become global players.
22. 4-8% revenue share as cost of administering and regulating license should be charged.
23. Revenue share of 5% as rent and in addition, charge for USO, R&D, cost of regulating license etc.
24. Determine level of revenue share based on cost of regulation and administration of sector or best international practices (or developing and Asia-Pacific economies).
25. Lay down cap on IRR to determine revenue share and tariffs and use a graded revenue share profile over the project period as in the case of Thailand.
26. Bankability as a key factor in determination of revenue share.
27. License Fee based on revenue share should be correlated with originally bid amounts.
28. A high figure of 5% should be adopted. Unused surpluses in this fund may be transferred in later years to the USO fund, thus lightening the load on that fund.
29. Minimum IRR of 25% for foreign equity investment and 20% for domestic investment should be considered for determining revenue share.
30. Total outflow (spectrum fees + license fees etc.) should be considered.
31. Revenue share should be 50-55% of gross revenue keeping a threshold IRR of 16-18%.
32. Shift license regime back to fixed license fee to ensure other services like Radio Trunk services and Paging are not unfairly discriminated against.
33. 25% for Metros, 10% for Category A Circles, nominal for others.
34. License fee should be 20-25% in the national interest, even though this will have adverse impact on price to consumer.

Period of Revenue Share

35. Revenue share needs to be fixed for 20-year period to:
    - Ensure stability
    - Dispel uncertainty
36. Uncertainty arising from interim arrangement of revenue share makes attracting investment difficult.
37. Considering technology trends, 20 years is too long. Revenue share can be reviewed after 7 years allowing 2 years for stabilisation and 5 years for license fee.
38. Revenue share as license could be set on a permanent basis; R&D cess, Administrative expenses, and USO levy would need periodic review.

Definition of Revenue and Implementation Issues

39. Definition of revenue should exclude all pass thru revenues and hand set sales, i.e., exclude all revenues that are not retained. Roaming revenues should be specifically excluded.
40. Exclusion of taxes, roaming charges, pass thru revenue from definition of revenue.
41. Options for payment mechanism for License fee:
    - License fee to be paid within 15 days of end of quarter.
    - Payment on the lines of advance tax paid by companies for Corporate tax.
    - Payment in advance on quarterly basis with adjustments in following quarter.
42. WPC charges should also be excluded from the revenue, especially for Circles.
43. The definition needs to be clear and simple.

Others

44. Implementation of differential service tax.
45. Differential treatment of metros and circles and within metros Mumbai/Delhi and Chennai/Calcutta.
46. Metros should be levied higher license fee compared to circles given the better business potential in Metros.
47. If cost of administration / regulation is covered by revenue share, no need for different revenue share for metros and circles.
48. Differential USO levy; Category C should not pay USO levy.
49. USO levy should be linked to tele-density, market share, type of service, business potential etc.
50. Service providers should contribute to USO through a percentage of Adjusted Gross Revenue (Revenue excluding interconnection/access charges, equipment sales to consumers, customer deposits, service tax, USO levy.)
51. No rent if operators are contributing to USO fund.
52. Uniform Service Tax best vehicle for raising budgetary resources.
53. Quality of Service parameters need to be finalised.

Entry of third and fourth operator

Basis and Structure of Entry Fee

1. Highest bid amount should be paid by new operator. In addition a one-time fee related to level of investment envisaged should be levied to eliminate non-serious offers and to meet initial costs of selection and setting up.
2. New operators should bid and initially pay a high amount of which 80% should be refunded in 5 years. The floor levels for residual 20% could be Rs.50 Cr. for metros, Rs.30 Cr. (class A), Rs.20 Cr. (class B) and Rs.10 Cr. (class C) for circles
3. One time payment of license fee at time of entry in view of ineffective enforcement of payment of license fee over long period of time.
4. The existing operators should be treated as “defaulters” as they have breached the contract in several ways. The entry fees for such “defaulting licensees” should include exemplary penalty to discourage future defaults.
   The entry fee (penalty) for the existing operators should be highest license fee payable in each category (for circles) applied uniformly to all the service providers. For metros, it should either be 4 times the amount calculated for category A or a fresh bid where the highest amount quoted by new entrants for “entry fees” and “percentage of license fees” should be applied to existing metro operators.
   The existing practice of awarding the contract to the highest bidder at its bid amount should be continued with.
5. Need to examine capital cost structure and license fee already paid to determine entry fees for third and fourth operator.
6. Entry fee and fee for extension of license should include element of rent in return for revenue earning opportunity provided to selected service providers in limited competition scenario.
7. Different amounts are due for different operators on the said date. It is discriminatory against those operators who rolled out their operations early. The entry fee should be 40% of the bid NPV. Then, for next three years, they need not pay revenue share.

Selection of Fourth Operator

8. Issues that ought to be considered for allowing entry of fourth operator
   - Level playing issues
   - Appropriate regulation of PSTN monopolies and their affiliates
   - Huge entry fee paid by existing operators
   - Interconnection principles

- USO
- Adequacy of frequencies etc.
- Viability of existing operators and market conditions
- Level playing field
- Minimum period between entry of 3rd and 4th operator

9. Need for pre-conditions for short-listing of bidders for fourth operator and clear and transparent evaluation criteria for selection.
10. UK and Australia have an auction process; in India, current operator has paid dearly in the bidding process.
11. Bidding is not preferable, as auctions are very dangerous when first/second wave entrants have not stabilized in the market. Market ought to be given time to stabilise before allowing entry of fourth operator.
12. Level playing field should be ensured for the fourth operator.
13. It is premature to consider fourth operator at this stage.
14. Entry fee for the 3rd operator may require to be considered.

Level Playing field

1. Inclusion of social obligations in level playing field.
2. Discrimination against private sector operators as regards lower rural tariffs being allowed to be charged by DoT / DTS.
3. Various handicaps of public sector.
4. Entry of DoT (or a company administered by DoT) and corporatization of MTNL makes level playing field difficult. DoT should not have licensing powers and DTS should be corporatised.
5. MTNL should be allowed to provide CMS in Circles.
6. DTS should pay an equal percentage of revenue share as the other operators and license fee should not be refunded to DoT.
7. Same entry fees or differential revenue share for second operator in a circle when an operator has started service later than the first operator in a circle and has the advantage of lower fee and lower equipment prices.
8. 30% of present value of bid license fee as entry fee and revenue share thereafter for all operators.
9. Percentage of revenue share as license fee should be less for PSU operators for some time period owing to the inherent liabilities and other disadvantages.
10. Unfair trade practices arising from differential entry fees for operators in the same circle. (BPL Case in TN Circle).
11. In order to protect consumer interests in Tamil Nadu, BPL could be refunded license fee rather than Aircell be asked to pay more.

Analysis

1. 20-year license period required for bankability, however revenue streams cannot be accurately predicted for the period.
2. Use of data of most efficient operator for analysis.
3. Capex should be consistent with international price trends. Refer MTNL capex of Rs.4000 per line.
4. Metros and some circles came earlier at higher Capex costs and these are audited figures.
5. Operator data given to TRAI is not reliable now, because conditions have changed.
6. Costs are bound to come down and markets will continue to grow. The Capex figures given by operators vary heavily and do not appear to be reliable. ARPU data has not been normated by TRAI.

COAI comments related to analysis

7. Normation of Capex: Removal of Capex normation to reflect capex required for data services.
8. Subscriber Base: Growth in subscriber base due to decrease in monthly rentals: 5% increase (instead of 10%) in subscriber base due to 10% decrease in monthly rentals from 2000-01.
9. Impact of entry of new operators on ARPU and Opex: Reduction in ARPU by 10% and increase in Opex by 15% after entry of more operators to reflect fully, the impact of increased competitive pressures.
10. Impact of CPP
    - 20-27% decline in ARPUs resulting in 10-15% decline in total revenues.
    - The increase in subscriber numbers and significant rise in MoUs will translate into higher Capex requirement.
    - Proportion of incoming calls 60-65%
    - Increase in pre-paid subscriptions to 30-35% of total subscriptions.
11. Operating Margins: Internationally operating margins stabilise between 40% and 50%, lower than 70% assumed in TRAI model.
12. Terminal value calculation: EBIDTA multiplier of 3.5 based on WACC of 18%, effective tax rate of 25% and constant cash flows for 10 years after terminal year (year 20).

13. **DoT comments related to analysis**

(i) Data of most efficient operator for calculating returns and the recommendations
(ii) Normation of Capex in line with present cost of equipment
(iii) Additional Sensitivities
- Decreasing Capex
- Decreasing Opex due to change in the licensing regime and streamlining of operations
- Initially an increase in ARPU for a period of 4 years and then decrease due to fall in tariffs because of increased competition
- Increase in subscriber base

APPENDIX 6

SENSITIVITY ANALYSIS WITH RECENT CHANGES

Tables of Results using data available from MTNL

Table A.5.1 Impact of Licenses Fee Options on Base Case taking MTNL Capex, MTNL Opex and Operator's ARPU

With drop in ARPU in 7th and 10 year : Sensitivity 6 (Drop in ARPU by 30 % and increase in demand by 15 %)

Rev Share	0%		5%		10%		15%		20%		25%	
Op Code	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE
M1	21.0%	24.1%	20.3%	23.2%	19.5%	22.2%	18.8%	21.3%	18.0%	20.2%	17.2%	19.2%
M2	35.1%	45.8%	33.9%	43.5%	32.6%	41.1%	31.2%	40.6%	29.9%	38.0%	28.5%	36.4%
M3	31.0%	38.9%	30.1%	37.3%	29.1%	35.6%	28.3%	34.1%	27.3%	32.7%	26.3%	31.1%
M4	21.6%	23.1%	20.6%	21.7%	19.6%	20.3%	18.6%	18.9%	17.6%	17.5%	16.5%	16.0%
M5	27.3%	28.9%	26.3%	27.5%	25.2%	26.1%	24.0%	24.7%	22.9%	23.3%	21.7%	21.9%
M6	17.6%	18.1%	16.9%	18.3%	16.1%	16.8%	15.4%	15.3%	14.5%	13.7%	13.6%	11.9%

Table A.5.2 Impact of Licenses Fee Options on Base Case taking MTNL Capex, MTNL Opex and Operator's ARPU

With drop in ARPU in 7th and 10 year : Sensitivity 7 (Drop in ARPU by 30 %, increase in demand by 45 % and increase in capex by 10 %)

Rev Share	0%		5%		10%		15%		20%		25%	
Op Code	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE
M1	23.7%	27.5%	22.9%	26.4%	22.1%	25.4%	21.2%	24.4%	20.3%	23.2%	19.4%	22.0%
M2	38.0%	50.3%	36.6%	47.7%	35.1%	45.0%	33.6%	42.3%	32.0%	41.3%	30.4%	39.0%
M3	34.0%	43.7%	33.0%	41.8%	31.9%	40.0%	30.8%	38.0%	29.7%	36.1%	28.6%	34.4%
M4	24.8%	27.8%	23.7%	26.2%	22.6%	24.5%	21.4%	22.8%	20.2%	21.1%	18.9%	19.3%
M5	29.8%	32.1%	28.6%	30.5%	27.4%	28.9%	26.2%	27.3%	24.9%	25.7%	23.6%	24.1%
M6	20.3%	23.2%	19.5%	21.9%	18.6%	20.3%	17.8%	18.5%	17.0%	18.3%	16.1%	16.7%

Table A.5.3 Impact of Licenses Fee Options on Base Case taking MTNL Capex, MTNL Opex and Operator's ARPU

With drop in ARPU in 7th and 10 year : Sensitivity 8 (Drop in capex by 25 %, ARPU by 12.5 % and increase in demand by 25 %)

Rev Share	0%		5%		10%		15%		20%		25%	
Op Code	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE	IRR	ROE
M1	26.2%	30.6%	25.4%	29.6%	24.6%	28.5%	23.8%	27.5%	23.0%	26.4%	22.1%	25.3%
M2	43.2%	60.1%	41.8%	57.7%	40.4%	55.2%	38.9%	52.5%	37.4%	49.7%	35.8%	46.8%
M3	37.4%	50.0%	36.4%	48.2%	35.3%	46.2%	34.2%	44.3%	33.1%	42.2%	31.9%	40.1%
M4	28.9%	33.7%	27.9%	32.2%	26.8%	30.6%	25.8%	29.0%	24.7%	27.4%	23.6%	25.8%
M5	34.6%	38.8%	33.5%	37.1%	32.3%	35.5%	31.1%	33.8%	29.8%	32.1%	28.5%	30.4%
M6	23.3%	28.5%	22.5%	27.0%	21.7%	25.6%	20.9%	24.4%	20.0%	22.8%	19.2%	21.2%

APPENDIX 7

Table II.1.4 Licenses for Circle CMSPs

S.N.	Circle	Name of Operator	Total levy quoted for 10yrs.	PV of quoted levy	License fee accepted	PV of license fee
1	A.P.	J.T.Mobile	1001.00	502.76	1001.00	502.76
2	A.P.	Tata Cellular	858.00	430.94	1001.00	502.76
3	Gujarat	Birla AT&T	1794.10	901.11	1794.10	901.11
4	Gujarat	Fascel	1229.25	617.41	1794.10	901.11
5	Karnataka	Modicom	1393.00	699.65	1393.00	699.65
6	Karnataka	J.T.Mobile	1320.00	662.99	1393.00	699.65
7	Maharashtra	Birla AT&T	1657.70	832.60	1657.70	832.60
8	Maharashtra	BPL Cellular	1463.00	734.81	1657.70	832.60
9	Tamil Nadu	BPL Cellular	836.00	419.89	836.00	419.89
10	Tamil Nadu	Srinivas Cellcom	450.00	252.57	836.00	419.89
11	Haryana	AirCel Digilink	240.00	134.71	240.00	134.71
12	Haryana	Escotel	245.86	123.49	240.00	134.71
13	Kerala	BPL Cellular	517.00	259.67	517.00	259.67
14	Kerala	Escotel	384.83	193.29	517.00	259.67
15	M.P	RPG Cellcom	51.00	25.62	51.00	25.62
16	M.P	Reliance Telecom	5.61	2.82	51.00	25.62
17	Punjab	Modicom	1266.00	635.86	1266.00	635.86
18	Punjab	JT Mobile	914.50	459.25	1266.00	635.86
19	Rajasthan	Aircel Digilink	210.00	117.87	382.00	191.86
20	Rajasthan	Hexacom	161.00	99.26	382.00	191.86
21	Rajasthan	Modicom	382.00	191.86	Not eligible	Not eligible
22	U.P (E)	Koshika Telecom	210.88	146.00	210.88	146.00
23	U.P.(E)	Aircel Digilink	210.00	117.87	210.88	146.00
24	U.P.(W)	Escotel	406.21	204.02	406.21	204.02
25	U.P.(W)	Koshika Telecom	258.21	178.75	406.21	204.02
26	W.B.	Reliance Telecom	42.00	21.26	42.00	21.26
27	Assam	Reliance Telecom	1.32	0.67	1.32	0.67
28	Bihar	Koshika Telecom	136.53	94.52	136.53	94.52
29	Bihar	Reliance Telecom	2.64	1.33	136.53	94.52
30	H.P	Bharti Telenet	14.96	8.14	14.96	8.14
31	H.P	Reliance Telecom	1.32	0.67	14.96	8.14
32	Orissa	Koshika Telecom	89.22	61.77	89.22	61.77
33	Orissa	Reliance Telecom	2.64	1.33	89.22	61.77
34	North East	Hexacom	1.90	1.25	1.90	1.25
35	North East	Reliance Telecom	1.32	0.67	1.90	1.25