

Consultation Paper No. 99/4

TELECOM REGULATORY AUTHORITY OF INDIA

***CONSULTATION PAPER ON*
CERTAIN ASPECTS OF CALLING PARTY PAYS
(CPP)
*FOR CELLULAR REGIME***

August 31, 1999

Consultation Paper On
Review Of Cellular Mobile Service Tariffs
Following Migration To An Interim Revenue Share Of 15 Per Cent As License Fee
And Introduction of Calling Party Pays (CPP) Regime for Cellular Mobile

1. The TRAI's Telecommunication Tariff Order 1999 stipulated that calling party pays (CPP) regime would be implemented for cellular mobile sector from 1 August, 1999. The date for implementation has been delayed, *inter alia*, due to certain technical reasons as well as a need to address the effects of certain policy changes. Discussions with various service providers have provided a basis for addressing the technical problems in a manner that a simplified form of CPP regime for cellular mobile can be introduced in the near future. While TRAI was in consultation with various service providers on the details of implementation of the CPP regime for cellular mobile, a policy change was announced allowing cellular mobile service providers the possibility of migrating to a new license fee regime at an ad interim 15 per cent revenue share, subject to final decision of the Government on the basis of TRAI's recommendations in this regard.
2. The final decision on the percentage of revenue share that will be charged as license fee will be taken after a few months, taking account of the TRAI's recommendation on such percentage. Three points are noteworthy in this regard. One, the 15 per cent revenue share will remain in place till the final decision is taken later on the basis of TRAI's recommendation. Two, the license fee forms part of the costs incurred by the service providers. Three, the TRAI had specified Rs. 600 as monthly rental and Rs. 6 as airtime charge for the standard tariff package for cellular mobile on the basis of costs (including license fee) for metro service providers. These cost estimates were applied also to circles, together with the flexibility for circle service providers to charge higher tariffs for long distance calls.
3. The change in the license fee regime implies a change in costs incurred, which in turn implies a need for the TRAI to review the "cost-based tariffs" that it had specified for cellular mobile even for the interim period, given the substantial reduction in license fee liability for cellular service providers as a result of the interim decision of 15 per cent revenue share as license fee. The present exercise addresses tariff issues on an ad interim basis as a consumer welfare measure. This will be subject to review on the basis of the Government's final decision in regard to the percentage of revenue to be charged as license fee.
4. A comparison of the change in costs under the new license regime is easier for metros than for circles because the present license fee in metros is in terms of the subscriber base which can be linked to the revenue base. Such a link does not exist for circles because the present license fee is in terms of bid amounts that do not bear any direct relationship to the number of subscribers (and thus to revenue). Two different methods have been used in this paper to address this issue. One, while quick calculations have been made of the likely cost-reduction for circles (which improves their viability), more specific estimates for the months of May and June 1999 have been made for metros on the basis of data provided by service providers. Second, in addition to using the estimates based on metro data for May and June 1999 to assess the effect of a change in license fee and the policy changes suggested in this paper, we consider for metro and circles cellular mobile operators the impact of these changes on their internal rates of return (IRR). The latter (i.e. IRR) analysis for metro and circles service providers is based on information provided by service providers to the Authority for another study that addresses the impact of an increase in license period for cellular mobile. The latter study will be released as a consultation paper in the near future, for the purpose of TRAI making a recommendation to the Government on revenue sharing formula for license fee paid by the cellular mobile service providers.
5. An analysis in terms of IRR addresses more directly the issue of viability of service providers. For metros, this aspect was directly addressed in the TRAI's second Consultation Paper on tariff (Consultation Paper No. 98/3, dated 9 September, 1999) and in the Telecommunication Tariff Order 1999. In contrast, it was treated in an indirect and partial manner for cellular mobile service providers in circles. Thus, the IRR analysis gives us greater confidence in making the proposals for certain policy changes.
6. While quick calculations suggest that the new license fee regime will provide a substantial cost reduction for circles (thus improving their viability), more specific estimates can be made of the effect on cost-saving under the new license regime for metro cellular mobile service providers. For instance, based on data for May and June 1999, it appears that in general migration to the new license fee mechanism will result in a reduction of about 50 per cent in license fee costs for metro service providers. **As mentioned earlier, these are significant reductions in costs and therefore require a**

re-look by the Authority at the tariffs for cellular mobile, with the objective of reducing these tariffs in the standard tariff package.

7. **This review of tariffs is combined with the tariff changes in the TRAI's tariff proposals for calling party pays (CPP) for cellular mobile, i.e. the various tariff changes due to CPP and reduction in license fee have been taken together as a package. The proposed reduction in tariffs will be introduced together with the introduction of CPP later this year. It is proposed that these changes be implemented from 1 November, 1999.**
8. In the second Consultation Paper on tariffs, the proposal for introducing CPP had two corresponding elements, namely, an increase in the tariffs for calls from basic service provider to cellular mobile, and sharing of the revenue from these calls between basic and cellular networks. The Consultation Paper had proposed that CPP should be introduced for cellular mobile together with a charge of Rs. 3.90 per minute for calls from fixed line to cellular mobile. Of this amount, 15 per cent was to be retained by the fixed line service provider and 85 per cent to be transferred to the cellular mobile service provider.
9. Calls from basic to cellular mobile are generally charged a tariff higher than a call from basic to basic in countries where CPP for cellular mobile has been implemented. The higher charge is imposed for two reasons. One, calls to cellular mobile are premium calls, which provide the possibility of contacting a person on the move. Two, revenue is required to be shared with the cellular network which receives the call.
10. **This paper has proposed that the local call charge from basic service to cellular mobile be increased by having a pulse rate of two minutes and a double pulse on answer. Further, it is proposed that Rs. 0.60 per metered call be passed on to the terminating cellular mobile network. Both these, i.e. call charge and revenue share, are much lower than the amounts proposed in the second Consultation Paper on tariffs. More detail on these aspects is given in Section III below.**
11. **The proposed charge for local calls from basic service subscriber to cellular mobile is much closer to the charge for local calls from basic to basic service subscriber, than to other calls with a higher charge (e.g. STD calls). However, since the charge for these calls is higher than that for local calls to a basic service subscriber, customers should be provided the freedom to decide whether they want the facility to bar their calls from basic network to cellular mobile network. At the same time, customers who wish to be connected to the cellular network should not be forced to obtain that connection in a manner that creates an additional burden on them, e.g. by connecting them only through the STD network.**
12. The quick analysis of this paper is based on data provided by metro cellular mobile service providers for May and June 1999 (Table 1), and data provided by various cellular service providers in metros and circles for TRAI's study on recommending the percentage revenue share for license fee (Tables 2 and 3, and Annex).

I. Cellular Mobile Service Providers in Metros

(a) Calculations based on data for May and June 1999

13. This section spells out the policies proposed for the CPP regime for cellular mobile. The likely impact of these policies on revenues for the eight cellular service providers for metros is shown in Table 1, which is based on data for May and June 1999 provided by these service providers to the TRAI.
14. We start with the present situation for cellular service providers in metros, i.e. the revenues that they earn under the prevailing tariff regime specified by TRAI. As per the calculations which formed the basis of these tariffs, the metro service providers are in general profitable at the specified tariffs. In this situation, we introduce two changes:
 - o CPP for cellular mobile; and
 - o Saving in costs due to license fee becoming 15 per cent of revenue instead of the present license fee of about Rs. 500 per subscriber per month.
1. By definition, airtime charge for incoming calls is free under CPP for cellular mobile. This results in a loss of revenue for the cellular mobile service provider. This loss in revenue is compensated to the extent of the difference between the present incidence of license fee and that under the 15 per cent revenue share as license fee. In effect, the reduction in license fee is like net increase in revenue for the purpose of viability.

Combined effect of CPP and 15 per cent revenue share as license fee

2. The combined effect on net revenue of CPP and license fee becoming 15 per cent of revenue is shown in Row 1 of Table 1. This amount is calculated under the simplifying assumption that revenue from pre-paid business will remain unchanged after the introduction of CPP. The basis for this assumption is that those who are willing to spend a particular amount on pre-paid cards will be willing to do so even when the service becomes cheaper and the same amount allows them greater usage. In fact, with cheaper services, the demand (and hence revenues) from pre-paid cards could actually increase. Thus, by assuming the same amount of revenues from pre-paid cards as at present, Row 1 in Table 1 shows an underestimate of the effect on net revenues when CPP and 15 per cent revenue share as license fee is introduced.
3. Row 1 in Table 1 shows that for four of the eight cellular mobile service providers in metros, the viability situation improves as a result of CPP and license fee becoming 15 per cent of revenue. This, however, is only an incomplete picture of the revenue situation for service providers because the reduction in tariffs for incoming calls under CPP will encourage usage of the service and an increase in the subscriber base. The new subscribers will add to revenues both in terms of rentals as well as through usage of their phones.
4. We now consider sequentially the additional effects of various developments (e.g. CPP, increase in usage and subscriber base, revenue share for cellular mobile) and proposals for reducing cellular mobile tariffs.

Additional effect of increase in usage and subscriber base as a result of CPP

5. The introduction of CPP is on average likely to, ceteris paribus, reduce subscriber bills by about 20 to 25 per cent. With an expected response that could increase usage and subscriber base by about half this change, we consider an estimate of 10 per cent increase in subscriber base and usage by established subscribers. In the calculations shown in Table 1, new subscribers are considered as having a usage pattern similar to that prevailing with the higher (i.e. previous) tariffs, i.e. a lower usage than the existing subscribers.
6. The effect of a 10 per cent increase in subscriber base and usage, together with the new license fee regime and CPP, is shown in Row 2 of Table 1. This shows that the viability of all except one of the eight service providers improves in this situation.

Additional effect of obtaining revenue share for incoming calls from basic service subscribers to cellular mobile

7. In addition to these revenues, the cellular mobile service providers will obtain a revenue share for the incoming calls that terminate on their networks. More details of this are discussed in Section III below. For ascertaining the effect of the proposed revenue share, we have taken a revenue share of Rs. 0.60 per minute for cellular mobile's incoming calls, and assumed a 60 per cent share of basic to cellular calls in total incoming call minutes for cellular mobile, based on data earlier provided to TRAI by service providers.
8. Together with CPP, license fee 15 per cent of revenue share, a 10 per cent increase in usage and subscriber base, the effect of this revenue share on viability is given in Row 3 of Table 1. One service provider still has a negative impact on viability, while seven continue to be in a comparatively better situation.

Additional effect of a decrease in rental to Rs. 475 per month

9. With an increase in net revenues due to the above developments, including a 15 per cent revenue share as license fee, we have a basis to consider the possibility of a decrease in certain other tariffs for cellular mobile, e.g. rentals and airtime charge for outgoing calls.
10. In the Telecommunication Tariff Order 1999, rental of Rs. 600 per month and airtime charge of Rs. 6 per minute for incoming and outgoing calls was based on allocating the incidence of license fee as a cost equally between the rental and airtime charge. With the revised license fee mechanism, this method of allocating license fee would give us **a monthly rental of about Rs. 475 per month**. This rental would maintain the viability of the cellular mobile service provider in terms of covering fixed costs,

and will also encourage an increase in subscriber base. Any additional tariff reduction could take the form of reduced airtime tariffs for outgoing calls together with CPP. This would encourage further usage and increased subscriber base for cellular mobile.

11. With a reduction in rental to Rs. 475 per month, Row 4 in Table 1 shows that while five out of eight service providers in metros are likely to be more viable than at present, three have a negative effect on their net revenue in comparison to the present situation.

Additional effect of airtime charge being decreasing to Rs. 4 per minute for outgoing calls

12. It is proposed that the call charge for outgoing calls be reduced to Rs. 4 per minute, and that the pulse duration for a call be increased from 20 seconds at present to 30 seconds. Each pulse will therefore be charged Rs. 2.00. For simplifying the analysis of this change, it is presumed that the call is of a duration just below one minute. Row 5 of Table 1 shows the effect on net revenue when outgoing call charge is reduced to Rs. 4 per minute, rental is Rs. 475 per month, CPP is introduced, license fee is 15 per cent of revenue, and there is a 10 per cent increase in usage and subscriber base. This shows that there are still three out of the eight service providers whose "net revenue" is likely to be more than in the current situation.
13. A reduction in airtime charge for outgoing calls will also help address the issue of call-back. When incoming calls become free on account of CPP, there will be an incentive for cellular mobile subscribers to seek call-back from basic service subscribers. A reduction in call charge for outgoing calls is beneficial to customers not only because of the lower tariff, but also because it reduces the incentive for call back from cellular mobile under CPP. A reduction in call back would contribute to a reduction in network congestion, particularly in the medium term. This would improve the quality of service available to subscribers.

Additional effect of an increase in usage and subscriber base as a result of reduction in rental and airtime charge for outgoing calls

14. The decrease in rental and airtime charge for outgoing calls from cellular mobile will encourage a further increase in usage and subscriber base. The reduction in rental and airtime charge for outgoing calls implies an average decrease in bills of about 10 per cent. Taking the effect of this decrease in tariffs to result in an additional increase of 5 per cent for usage and subscriber base, the effect on net revenue of metro cellular service providers is shown in Row 6 of Table 1. In this situation, there are four service providers with a negative effect on net revenue, while the viability of four service providers is better than in the current situation.

Implication for viability when revenues from other services such as supplementary services and roaming is considered in the framework used in the second Consultation Paper on tariffs

15. A rental of Rs. 600 and airtime charge of Rs. 6 per minute were calculated in the second Consultation Paper on tariffs under the assumption that rental and call charge provide all the revenue required to cover all costs. There is now a considerable source of additional revenue in the form of charges for supplementary services and roaming. This additional revenue implies a reduced need for covering the costs incurred by charging rentals and airtime tariff. The metro cellular service providers have submitted to TRAI their data on revenue from supplementary service in May and June 1999. Adding this revenue to the "net revenue" estimates derived above, we see in Row 7 of Table 1 that only one service provider remains less viable than at present.

Other revenue aspects to consider in the analysis

16. There are certain other aspects which are likely to boost revenues, or result in a higher net revenue than is shown in Table 1. These include:
 - o The reduction in revenues is calculated from a base of Rs. 600/month as rental and Rs. 6 per minute as airtime charge. The actual average rentals and airtime charge for the service providers are lower than these estimates, and therefore the decline in revenue will also be lower than is taken into account in Table 1. For instance, the service provider which has a negative estimate for net revenue change in Row 7 of Table 1, provides a number of tariff packages with

as low or even lower airtime charge than is proposed in this paper.

- The increase in subscriber response and usage is likely to be more than is indicated in Table 1;
 - The estimates have been based on pre-paid revenue and revenue from supplementary services being the same as at present. In practice, there is likely to be an increase in this revenue base due to lower tariffs;
 - the increase in pulse rate from 20 seconds to 30 seconds for cellular mobile could imply a lower decrease in revenue than considered in Table 1.
1. For the above reasons, the tariff proposals in this Consultation Paper are likely to maintain the viability of cellular service providers in metros in a situation of CPP and 15 per cent revenue share as license fee.

(b) Effect of policy proposals on IRR of metro cellular service providers

2. Table 2 presents certain calculations of internal rates of return (IRR) for six metro cellular service providers for a twenty year period, based on data provided by them to TRAI for a study for recommending the revenue share formula for license fee from the cellular mobile service providers. The basis for calculations in Table 2 is explained in the Annex to this paper.
 3. Three situations with CPP for cellular mobile are shown in that Table, i.e.
 - decline in average revenue per user (ARPU) of 20 per cent due to tariff decline, and increase in usage of 10 per cent.
 - decline in average revenue per user (ARPU) of 30 per cent due to tariff decline, and increase in usage of 15 per cent;
 - decline in average revenue per user (ARPU) of 30 per cent due to tariff decline, increase in usage of 45 per cent, and increase in CAPEX by 5 per cent.
1. A decline of 30 per cent in ARPU is a likely upper limit for metro service providers, because while the tariff decline for customers would be in this range, the revenue for service providers will decline less because:
 - each incoming call from basic service will imply additional revenue to the service provider;
 - additional revenue will be obtained due to the increase in pulse rate from 20 seconds to 30 seconds for cellular mobile;
 - additional revenue earned from supplementary services demanded by the new subscribers has not been added in increased demand shown in Table 2.

1. Table 2 shows that IRRs for the six metro service providers range from about 13 per cent to about 33 per cent. In a majority of cases, the viability analysis suggests that the proposed changes in tariffs could be accommodated by the service providers. This conclusion is further strengthened if we consider the additional revenue items that are not reflected in Table 2.
2. One important point to be emphasized in this context is that with cost based tariffs, different amounts of license fee imply different amounts that consumers should pay. For example, if the license fee is lower than the 15 per cent taken as a basis for present calculations, rentals could be even lower than the proposed Rs. 475 per month, and the viability of service providers could be maintained even at the lower tariffs.

II. Cellular Mobile Service Providers in Circles

3. Table 3 shows estimates of IRR for certain cellular service providers in circles if CPP is introduced, together with rental of Rs. 475 per month and Rs. 4 per minute outgoing airtime charge. An examination of the tariff situation for circles shows that the average prevailing tariffs are lower than in metros. Another relevant point in this regard is that revenues in circles also comprise revenue from long distance calls. Therefore, the impact of a decline in airtime charge will not be as much in circles as for metros, and the proposed tariff reduction will imply a smaller reduction in tariffs for circles than for metros.
4. It is worth recalling that the estimates of Rs. 600/month as rental and Rs. 6/minute airtime charge had been calculated based on metro data. These did not cover the cost of providing cellular services in

circles unless some flexibility was provided for charging long distance calls. This was done in the Telecommunication Tariff Order 1999, but the estimates for circles were still less certain than for metros. Hence, the situation for circles needs to be studied with greater detail. This exercise has been conducted for a number of cellular mobile service providers in circles, based on data provided by them for an analysis of the effect of an extension of the license period. Table 3 shows these estimates for service providers in circles classified as "A", "B", and "C" for licensing purpose.

5. In view of the reduction in ARPU being less than that for metros, Table 3 shows the situation with:
 - o 10 per cent reduction in ARPU and 5 per cent increase in demand;
 - o 20 per cent reduction in ARPU and 10 per cent increase in demand.
1. In addition, the situation with 30 per cent decrease in ARPU and 15 per cent increase in demand is shown for purpose of comparison.
2. The IRRs in Table 3 range from about 14 per cent to about 29 per cent for 10 and 20 per cent reduction in ARPU and their associated increase in demand. As for metros, the viability analysis shows that in most cases the proposed change in policy can be accommodated by cellular mobile service providers in circles. As earlier, this conclusion is strengthened if we account for certain revenue items that are not taken into account in Table 3.

III. Tariff for Calls From Basic Service Subscriber to Cellular Mobile

3. The second Consultation Paper on tariffs had proposed that a call from basic service subscriber to cellular mobile be charged Rs. 3.90 per minute and 85 per cent of this amount be given to the terminating cellular mobile network. In the context of the present policy situation, an amount of Rs. 3.90 per minute (and 85 per cent of this to be given to cellular mobile for incoming call) is not required to compensate the negative effect on revenue for the cellular mobile service providers in metros. A question arises whether there is any necessity for:
 - o raising the tariff for a call from basic service subscribers to cellular mobile; and,
 - o providing any amount to the cellular mobile service provider for incoming calls.
1. As mentioned above, the charge for calls by basic service subscribers to cellular mobile needs to be increased for two reasons. One, these calls are premium calls to access persons who may not be possible to be accessed through fixed line telephony. Additionally, this higher charge will reduce the asymmetry in the charge for calls from basic service to cellular mobile and vice-versa. This would reduce the likelihood of undue pressure on the network which adversely affects the quality of service.
2. Two, a portion of the increase in the charge for calls from basic services to cellular mobile should be passed on to cellular mobile. This revenue sharing is required in order to provide an incentive for cellular mobile service providers to maintain the network for incoming calls. No return on such calls would reduce such an incentive. Further, some payment should be provided to the terminating cellular mobile network for performing the task of terminating the call. The latter aspect will be considered in detail in a forthcoming paper by the TRAI on access/carriage charges in an interconnection regime.
3. The TRAI has received several comments on its CPP proposal in the second Consultation Paper on tariffs. Some state that a tariff of Rs. 3.90 per minute (or of Rs. 3.60 per minute subsequent to the tariffs specified in Telecommunication Tariff Order ("TTO") 1999) is too high an amount, and will discourage calls being made from basic service subscriber to cellular mobile subscriber. Basic service providers want to retain 40 to 50 per cent of the Rs. 3.90 charged per minute for such calls, while the cellular mobile service providers want a share larger than 85 per cent proposed in the second Consultation Paper on tariffs. Both support their claims on the grounds that their revenues would decline in the alternative scenario.
4. As mentioned above, a charge of Rs. 3.90 per minute for calls from basic service subscriber to cellular mobile is higher than the appropriate amount in the present situation. **It is proposed that calls from basic service to cellular mobile have a double pulse on answer, and the pulse rate for local calls be reduced from 180 seconds to 120 seconds.** This implies the following charge for such calls:

Call duration	Amount with call charge of Rs. 0.80 per metered call (Rs.)	Amount with call charge of Re. 1.00 per metered call (Rs.)	Amount with call charge of Rs. 1.20 per metered call (Rs.)
Less than 120 seconds	1.60	2.00	2.40
Each two minutes from 120 seconds onwards	0.80	1.00	1.20

5. This can be compared with the present charge for local calls and for STD calls beyond 50 kms. (please note that STD calls up to 50 kms. radial distance are charged at local call rates). Take for instance a call of one minute duration for this purpose. The amount charged for a call from basic service subscriber to cellular mobile will be that given in the first row of the above Table. For local calls and other STD calls from basic service to basic service subscriber, peak hour charge will be:

Radial distance between any two exchanges or between two charging centres	Amount with call charge of Rs. 0.80 per metered call (Rs.)	Amount with call charge of Re. 1.00 per metered call (Rs.)	Amount with call charge of Rs. 1.20 per metered call (Rs.)
Up to 50 kms.	0.80	1.00	1.20
Above 50 kms. and up to 200 kms.	4.00	5.00	6.00
Above 200 kms. and up to 500 kms.	10.40	13.00	15.60
Above 500 kms. and up to 1,000 kms.	14.40	18.00	21.60
Above 1,000 kms.	20.00	25.00	30.00

Note: While STD call charge for radial distance above 50 kms. will increase with duration of the call, the charge for local call (or for STD call for radial distance up to 50 kms.), the pulse rate is 180 seconds.

6. The call charge for STD calls is in general much higher than the charge proposed for local calls from basic to cellular mobile. This difference is even more than that shown in the Tables above because the pulse rates for STD calls (other than those priced at local call charge) at present is less than 15 seconds while that for calls from basic to cellular mobile is two minutes. The proposed charges for local calls from basic to cellular mobile are much closer to a local call charge than to STD call charges. **However, since the proposed charges for a call from basic service subscriber to cellular mobile are higher than those for a local call to basic service network, the customer should have the option of barring the facility for making such calls. Similarly, if a customer wants to have the facility of making local calls from basic to cellular mobile, that customer should be provided this facility without any additional burden, such as forcing the connection through an STD network even if the customer does not wish to be connected to that network.**
7. Further, it is proposed that Rs. 0.60 per metered call unit be passed on by the basic service network to the terminating cellular mobile network, when calls are made by basic service subscribers to cellular mobile. At a notional call charge of Rs. 1.20 per metered call unit, this works out to half the amount charged for the call.
8. As in the case of the tariffs proposed for cellular mobile, the tariffs and revenue share proposed in this section are also to be implemented as ad interim measures.

IV. The Main Questions To Be Addressed

9. **The main questions include:**

- a. **Is the reduction in rental for cellular mobile to Rs. 475 warranted?**
- b. **Should the airtime call charge for outgoing calls be reduced to Rs. 4 per minute, with a pulse rate of 30 seconds instead of 20 seconds?**
- c. **Is there a significantly different effect of these tariffs on circles in comparison to metros?**
- d. **Should there be a different treatment for cellular mobile service providers in circles, and if so, what should be the form of this different treatment?**
- e. **Should the increase in call charge from basic service to cellular mobile be with a double pulse on answer and subsequently with a pulse rate of 120 seconds?**
- f. **Should the basic service subscriber be allowed the option of barring calls to cellular network? If so, should this barring facility be given only to those who have STD facility and can bar it, or should it be independent?**
- g. **Is Rs. 0.60 per metered call unit an appropriate amount to be given to the terminating cellular mobile network for incoming calls from basic service subscriber?**

ANNEX

The TRAI obtained data from a number of service providers to conduct its assessment of the percentage revenue share to be charged as license fee for cellular mobile. A viability analysis of the financial data was conducted to calculate, inter alia, internal rates of return (IRR) for the each of the service providers. The data provided covered a period of fifteen years, including the actual data for the previous years and projected data for the future years. This data was examined and corrected for inconsistencies, missing parameters/observations, and other anomalies on the basis of interaction with the service providers and/or reasonable assumptions.

In view of the New Telecom Policy (NTP), 1999 wherein the tenure of the cellular licenses has been extended to 20 years, the data provided by the operators for the 15 year period has been extrapolated for years 16 to 20. The demand estimates for years 15 to 20 were extrapolated on the basis of compound annual growth rate (CAGR) for demand as projected by the service providers for years 11 to 15. Certain checks were conducted on the data to ensure that the CAGRs projected were in a reasonable range, and that the demand projections were in line with the objectives spelt out in NTP 1999. Similarly, estimates were projected for CAPEX, OPEX and other elements of costs.

In line with the migration package announced for the existing service providers, license fee under the original license conditions is payable till 31st July, 1999 and a revenue share of 15% as (interim) license fee has been assumed from August 1st, 1999 onwards for the purpose of these calculations.

In addition, the viability analysis takes into account the impact of changes in external environment which are expected to arise at various points during the license period, and are expected to have an effect on the viability of the service providers. These changes include change in tariffs, direct connectivity with VSNL, sharing of infrastructure among service providers within a service area, entry of additional operators, increase in data traffic and opening of DLD/ILD services.

Based on the above, the viability of the service providers has been assessed by calculating IRRs based on Discounted Cash Flow technique. The calculations are further sensitized to the variations in ARPU and demand to assess the impact of various tariff changes and CPP on IRRs as exhibited in Tables 2 and 3 of this paper. Adjustments to ARPUs are made to take account of the reductions in tariff and introduction of CPP

which will reduce the realization of the cellular service providers on incoming calls. However, it is expected that an increase in affordability due to reductions in tariffs will result in an increase in demand, i.e. subscriber base. In the case of circles, given the low capacity utilization of their existing networks, no additional CAPEX is envisaged for the incremental demand resulting from proposed reduction in tariff. In metros, though no additional CAPEX is envisaged for 10-15% increase in demand, a higher price elasticity of demand in metros may result in a spurt in demand and thus additional investments for network up-gradation.

It can be seen from Tables 2 and 3 that IRRs for Metro projects vary from 13.1% (for a 30% drop in ARPU and 15% increase in demand) to 33.5% (for 30% drop in ARPU and 45% increase in demand accompanied by increase in Capex by 5%). IRRs for circles range from 10.4% (for a 30% drop in ARPU and 15% increase in demand) to 29.2% (for 10% drop in ARPU and 5% increase in demand). As may be seen from the viability reflected in IRRs, most of the 16 projects examined are expected to be able to accommodate the proposed tariff changes.

Table 1 : Increase/Decrease In Net Revenue For Cellular Service Providers In Metros As A Result Of Certain Policy Changes.																	
																(Rs. in lakh)	
		Service Prov. A		Service Prov. B		Service Prov. C		Service Prov. D		Service Prov. E		Service Prov. F		Service Prov. G		Service Prov. H	
		May'99	Jun'99	May'99	Jun'99	May'99	Jun'99	May'99	Jun'99	May'99	Jun'99	May'99	Jun'99	May'99	Jun'99	May'99	Jun'99
1	Net effect on revenue of license fee becoming 15% of revenue and incoming calls becoming free	-3	-59	-104	-92	+66	+31	-43	-30	+67	+49	+11	+13	+29	+32	-70	-47
2	Net effect in row 1 plus 10% increase in usage and subscriber base	+110	+58	+30	+51	+123	+93	+56	+68	+81	+68	+21	+23	+48	+54	-42	-17
3	Net effect in rows 2 plus Rs. 0.60 per minute paid to cellular mobile terminating network	+139	+85	+65	+84	+135	+108	+83	+95	+83	+70	+24	+27	+49	+55	-35	-11
4	Net effect in row 3 plus reduction in revenue if rental is Rs. 475 per month	+29	-24	-7	-19	+84	+61	-8	+1	+67	+45	+17	+24	+28	+28	-49	-36
5	Net effect in row 4 plus decrease in revenue if outgoing call is Rs.4 per minute	-72	-131	-171	-174	+28	-6	-99	-88	+55	+33	+6	+9	+14	+14	-84	-65
6	Net effect in row 5 plus an additional 5% increase in usage and subscriber base	-15	-73	-105	-103	+57	+26	-50	-39	+63	+42	+11	+14	+23	+24	-70	-50
7	Net effect in row 6 plus revenue from supplementary services	+87	+29	+163	+200	+93	+59	+140	+151	+63	+44	+184	+152	+39	+42	-60	-40

Source : Calculations by TRAI based on data provided by service providers.

Notes :

1. Increase/Decrease in revenue is adjusted for the 15% license fee to be paid on revenue

2. Increase in usage includes usage by new subscriber. For new subscribers, the pattern of usage is taken as the average usage at higher (i.e prevailing) tariffs.

3. Estimates have been rounded to nearest integer value.

4. In row 3, a call duration of three minute is used. Also, 60 per cent of the total incoming calls are taken as those from basic service subscribers.

Table 2 : Internal Rates of Return for certain Metro Cellular Mobile Service Providers with Introduction of Calling Party Pays for Cellular Mobile

	Service Prov. 1	Service Prov. 2	Service Prov. 3	Service Prov. 4	Service Prov. 5	Service Prov. 6
Drop in ARPU by 20%, and increase in demand by 10%	18.5%	33.3%	28.1%	17.8%	23.9%	15.5%
Drop in ARPU by 30%, and Increase in Demand by 15%	16.7%	30.8%	26.1%	15.2%	21.1%	13.1%

Drop in ARPU by 30%, and	19.3%	33.5%	28.7%	17.9%	23.5%	16.0%
Increase in Demand by 45% and increase in CAPEX by 5%						
Source : Calculations by TRAI based on data provided by service providers.						

Table 3 : Estimates of Internal Rates of Return for certain Cellular Mobile Service Providers in Circles with Introduction of Calling Party Pays for Cellular Mobile			
	Internal Rate of Return if Drop in ARPU by 10%, and Increase in Demand by 5%	Internal Rate of Return if Drop in ARPU by 20%, and Increase in Demand by 10%	Internal Rate of Return if Drop in ARPU by 30%, and increase in demand by 15%
"A" Circle			
Serv. Prov. 1	18.6%	17.1%	15.4%
Serv. Prov. 2	29.2%	27.6%	25.6%
Serv. Prov. 3	21.9%	20.0%	17.7%
"B" Circle			
Serv. Prov. 1	26.1%	24.6%	22.7%
Serv. Prov. 2	21.4%	19.9%	18.0%
Serv. Prov. 3	24.8%	23.6%	22.1%
Serv. Prov. 4	23.8%	21.5%	18.7%
Serv. Prov. 5	22.9%	20.7%	18.2%
"C" Circle			
Serv. Prov. 1	21.9%	19.5%	16.2%
Serv. Prov. 2	16.3%	13.9%	10.4%
Source : Calculations by TRAI based on data provided by service providers.			