Office of the Director of
Telecommunications
Regulation

Interconnection Rates
in the Irish Telecommunications Sector

Document No. ODTR 98/52 **November 1998**

Oifig an Stiúrthóra Rialála Teileachumarsáide
Office of the Director of Telecommunications Regulation
Abbey Court, Irish Life Centre, Lower Abbey Street, Dublin 1.
Telephone +353-1-804 9600 *Fax* +353-1-804 9680
Web: www.odtr.ie

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1 Introduction

The ability of new entrants to interconnect to the network of an incumbent operator is fundamental to the development and sustainability of competition in a telecommunications industry. This fact is recognised in both European Union (EU) and Irish legislation which sets out arrangements for ensuring that an appropriate interconnection regime is in place. Telecom Éireann, designated as an operator with significant market power (SMP), is obliged under this legislation to provide interconnection services to other licensed operators (OLOs) and to publish a reference interconnection offer (RIO) which can be availed of by anyone legitimately requesting to interconnect to its network. The RIO is required under legislation to include cost-oriented, non-discriminatory and transparent interconnection rates and Telecom Éireann is required to justify to the Director of Telecommunications Regulation (the "Director") that its rates do indeed comply with this legal requirement. The Director is able to confirm that, on the basis of the information available to her, key conveyance rates comply and that she welcomes their publication by Telecom Éireann.

The Director and her Office ("ODTR") supported by consultants KPMG have been working with Telecom Éireann to get to the position where they can assure themselves that the interconnect rates proposed by Telecom Éireann are in accordance with the legislation. The Director wishes to thank Telecom Éireann for the work it has undertaken to date and the co-operation it has extended to her office and consultants.

The purpose of this document is to set out the context in which interconnection rates are set and to indicate the current status and outstanding items. The document concludes by announcing the Director's intention to initiate a broad ranging consultation on some of the issues unresolved by this decision notice and requests comments on the appropriate scope and scale of such a consultation.

The Director notes that certain information was not available at the time of publication of this document, and the rates included should therefore be considered interim. The Director will be happy to receive justified and well-supported representations for further changes at any time.

2 Background to the Decision Notice

2.1 Legislative Background

EU and Irish legislation sets out procedures for providing interconnection. The most important of these are the following:

- Directive 97/33/EC of the European Parliament and Council of 10 April 1997 on "a common framework for general authorizations and individual licences in the field of telecommunications service" (the "Interconnection Directive");
- European Communities (Interconnection in Telecommunications) Regulation, 1998; SI no 15 of 1998 (the "Interconnection Regulations") which transposes this Directive into Irish law.

The directive and regulations place special obligations on an operator who is designated by the Director as having SMP. Among these are the following:

- interconnection charges should follow the principles of transparency, non-discrimination and cost-orientation;
- the Director may direct an organisation to justify its charges and to adjust these charges where they are not in compliance with these principles;
- the burden of proof lies on the organisation providing interconnection;
- a RIO based on market needs shall be published to which the Director may direct changes.

2.2 The linkage between cost and interconnection rates

Establishing the linkage between the costs of providing interconnection and the rates to be charged is not a simple process. A description of the main stages involved is provided in Appendix I.

One key issue that has been the subject of much discussion throughout Europe is the basis on which costs are allocated. Costs may be historic or forward-looking. The Director intends to follow the European Commission Recommendation 98/195/EC which states in paragraph 3 that:

"Interconnection costs should be calculated on the basis of forward-looking long run average incremental costs since these costs closely approximate those of an efficient operator employing modern technology."

Therefore the Director intends to move rapidly towards a forward looking approach based on long run incremental costs (LRIC). The need to modify information systems in Telecom Éireann precludes the setting of a final rate in time for 1st December but the Director hopes to achieve fast progress in the coming year. Further details on LRIC are discussed in section 3.2 below.

2.3 Progress to date on agreeing a RIO

On 10th December 1997 the Director requested Telecom Éireann to publish its RIO in accordance with its obligations under the Interconnection Directive. Telecom Éireann complied and published its RIO in January 1998. The Director undertook a public consultation on the contents of the RIO to enable her to decide whether or not the RIO as published complied with the legislation. At the conclusion of the consultation, Telecom Éireann published in August 1998 a revised RIO (including a revised list of services) which, in the opinion of the Director complied with the market needs at that time. This opinion was without prejudice to any future changes which might be considered necessary by the Director and did not extend to approval of the published rates for those services. On 16th January 1998 the Director, in accordance with Regulation 8(5) of the Interconnection Regulations, directed Telecom Éireann to justify the rates set out in the RIO having regard to the principles set out in the Interconnection Directive and Regulations. The Director subsequently employed KPMG to assist in reviewing Telecom Éireann's cost accounting system. Significant work occurred in the intervening period addressing the various components of the reference interconnection offer.

KPMG in its review of the Telecom Éireann's cost allocation procedures made a number of recommendations. Certain critical recommendations (for example those relating to the cost of capital and depreciation policy) have already been addressed. Others, which the Director considers to be less critical, will be pursued with Telecom Éireann separately and incorporated into subsequent reviews if appropriate.

During this time the Director also initiated a number of comparative studies of interconnection drivers, rates and issues in other relevant businesses; engaged KPMG to look at the issues associated with implementing a LRIC approach to calculating interconnection rates; and also, with KPMG, developed models to allow her to understand how changes in Telecom Éireann's underlying costs might influence interconnection rates.

2.4 Current status

Telecom Éireann and the ODTR are now in agreement as is set out in this document. In particular ODTR and Telecom Éireann agree, as follows:

- Telecom Éireann will publish revised interconnection rates as illustrated in Appendix II in relation to conveyance charges. Telecom Éireann also agrees to the position as set out in section 5.5 and will announce that there is to be no charge for emergency services. In addition, Telecom Éireann has agreed to the ODTR position on the method of calculation of transit rates as set out in section 5.2 and those rates set out in section 5.6, i.e. freecall, toll share and premium rate.
- In relation to the remaining rates where justification is awaited, Telecom Éireann will provide this by Friday 20th November 1998.
- The ODTR confirms that the Director will be happy to receive justified and well-supported representations for further changes at any time. (This applies not just to Telecom Éireann but to all interested parties).

Telecom Éireann will accordingly need to republish its RIO.

In discussions with Telecom Éireann the Director has had due regard to, inter alia, the following:

- The information provided by Telecom Éireann both in support of its justifications or otherwise as appropriate;
- The work of KPMG and the ODTR in reviewing the Telecom Éireann cost accounting system;
- The desirability of all interconnection charges being calculated on a LRIC basis in the future and the probable effects of such an approach;
- Comparable charges in other EU countries;
- The Commission recommendation on interconnection prices and benchmarks[1];
- Such other information as the ODTR considered relevant to its consideration of the rates;
- The Director's statutory duties and obligations to regulate the market generally, including the interconnection market.

[1] Commission Recommendation of 8 January 1998 on Interconnection in a liberalised telecommunications market 98/195/EC as amended by Commission Recommendation 98/511/EC of 29 July 1998.

3 Issues of Principle

There are a number of issues of principle that need to be stated before detailed calculations are considered.

3.1 Interim rates

The Director has at the time of this document not been provided with all the information she needs to satisfy herself that all of the rates proposed comply with the legislation. As a result the Director has had in some cases to rely on other relevant information available to her, and has decided that the rates set out in Appendix II should be considered to be interim. The Director intends to open a consultation process, as set out in section 7 of this document, and will consider representations from Telecom Éireann (and others) to change rates where the representations are backed up with a full justification based on more complete information. Furthermore, she intends to move rapidly to a LRIC based interconnection rate and will require Telecom Éireann to develop a program of work that will allow it to provide the necessary information in justification of a LRIC rate.

If, due to a full justification, there is a requirement that any of these rates must be amended, the Director will consider the need to back date this rate as appropriate, having regard to the circumstances of the case.

3.2 Long Run Incremental Costs verses Fully Allocated Costs

Telecom Éireann currently uses a traditional cost system based on historical fully allocated costs. Such cost systems are driven by the following principles:

- they rely on the accounts of the company, which provide a simple and auditable basis for the calculation, and
- they consist of successive allocations, which ensure that the total of the costs have been allocated to products or services.

The consequences of these principles are straightforward. First, they provide total costs per product which are, in theory, fully auditable and reconcilable with the general ledger. Second, they rely on historical values, which reflect the past investments of the company more than the future evolution, and third, they allocate some costs using a 'rule-of-thumb' to products. These two last issues are critical for telecom operators, because they operate in a market where technological progress is high with consequent rapid changes in costs. The level of fixed and common costs is also generally high.

Incremental costing has been progressively developed and used in the telecom industry, both by operators and regulators. Incremental costing has been introduced in countries which liberalised their telecom market early, i.e. the US and the UK, and has now been recommended by the European Council and Parliament as a target for the establishment of interconnect rates.

Based on experience in other countries, the introduction of LRIC based pricing has resulted in rate decreases of between 10% and 30% dependent on the existing level of efficiency of the telecom operator.

Telecom Éireann does not currently provide costing information on an incremental cost basis. The current timetable for the introduction of LRIC in Telecom Éireann is being linked by Telecom Éireann with the implementation of new accounting systems which would mean that LRIC based costs would be not available until the end of the year 2000 at the earliest. However, LRIC based pricing can be approximated by developing models outside the core accounting systems using Top Down and Bottom Up methodologies. Operators and Regulators have used these methodologies in other countries.

The top-down methodology

This methodology is based on the actual costs (historical) of the operator, and consists of two major steps:

- Move to current cost accounting: this step involves calculating the economical value of the assets of the company, taking into account the evolution of technologies and prices.
- Determine the incremental costs: this step involves extracting the costs that are non-incremental to the total costs of the company.

The bottom-up methodology

This is based on an opposite methodology and consists of developing an engineering model of the network for an efficient operator using modern technology, and calculating the resultant costs from this model.

The Director recognises the value of the both approaches and intends to seek comments as part of the consultative process on how the approaches may best be applied, how quickly they can be implemented and practical measures to ensure a robust outcome.

ODTR and Telecom Éireann agree that LRIC based pricing is the most effective mechanism for determining interconnection rates and shall be implemented as a matter of urgency by Telecom Éireann. As part of the consultation exercise, the ODTR will require Telecom Éireann to produce an accelerated timetable for the implementation of LRIC based pricing for discussion with the industry.

4 General Points

There have been a number of general assumptions and approaches taken by Telecom Éireann, which impact some of the interconnection services proposed and have been the subject of discussion between Telecom Éireann and ODTR. These areas are briefly set out below.

4.1 Call Set Up Component of Conveyance Charges

It is recognised that there may be specific fixed costs associated with call events that are independent of the duration of the call or, indeed, of its successful completion. It is possible to recover these fixed costs either as a separate call set-up charge or integrate these costs into a higher time based charge. The ODTR is aware of the advantages and disadvantages of both approaches and has agreed with Telecom Éireann that there will be no explicit call set-up component in interconnection charges for the time being and the costs associated with call events should be included in the overall cost of conveyance. The ODTR may review this decision at some point in the future in the light of changing circumstances including, for example, a significant shift in the distribution of call holding times for interconnection traffic.

4.2 Peak/Off Peak/Weekend Split for Conveyance Charges

Telecom Éireann proposes different interconnection rates for different times of the day or week. The split of tariffs between peak/off peak/weekend as supplied by Telecom Éireann and used when calculating interconnection rates for call origination and termination is based on a gradient calculated from actual revenues collected by Telecom Éireann. The ODTR has recalculated the gradients based on actual retail prices and other considerations and has found that this would have little significant impact on interconnection rates. The principles of the calculation using total traffic and total revenues split by day, evening and weekend are acceptable. The ODTR believes it is equitable to split the interconnect tariff based on the current retail rates charged to consumers.

ODTR also notes that Telecom Éireann now agrees that the same gradient for peak, off-peak and weekend rates will also apply to transit calls.

The Director will consider the issue of flat rate pricing in the consultation exercise discussed in section 7.

4.3 Volumes Used to Set Interconnect Rates

It is noted that Telecom Éireann is already improving efficiency with the result that volumes of traffic are growing faster than costs. It is likely that competition will compound this; lower prices and more active marketing will stimulate overall usage and competitive pressure will require even more attention to cost containment. The Director believes that it is right that interconnecting parties are able to benefit from this improvement in efficiency in advance of the imposition of a LRIC based system which, based on international experience, is likely to result in a further fall in interconnection charges. The Director and Telecom Éireann agree that projected 1999 traffic volumes should be used to calculate interconnection costs at this time.

In principle, the ODTR believes that interconnection rates should be based on volume data that is as up to date as possible and therefore requires regular volume data to be provided by Telecom Éireann. The Director and Telecom Éireann therefore agree that Telecom Éireann shall provide ODTR with quarterly updates (at dates to be agreed) of volume data for all types of PSTN traffic.

4.4 Routing Factors

Routing factors are used to calculate interconnection charges from individual network element costs. The Director and Telecom Éireann agree the routing.

4.5 Weighted Average Cost of Capital

The ODTR agrees with the methodology used for the calculation of the ROCE rate. As recommended by the European Commission in its recommendation on interconnect services dated 8 April 1998, Telecom Éireann has followed the Weighted Average Cost of Capital method. The Director and Telecom Éireann have agreed a ROCE rate.

4.6 Asset Lives & Depreciation

Telecom Éireann's decision to revise the economic lives of several significant classes of fixed asset during 1997/98 has resulted in increasing the depreciation charge substantially. In particular, depreciation has been accelerated, thus inflating costs on which tariffs are based. It has also resulted in one off charges for those assets written down to zero during the year.

While this has partly been addressed in the Telecom Éireann SCP system, there remained a significant amount of accelerated depreciation included in the costings. While not all of this depreciation is network related, the accelerated depreciation for network elements has in the short term overstated Telecom Éireann's network costs. Telecom Éireann has agreed to remove all accelerated depreciation from its calculations of interconnection rates.

4.7 Capital Employed

In Telecom Éireann's calculation of its capital employed for its network business, the inclusion of a notional debtor figure was discussed. ODTR and Telecom Éireann have agreed that this figure will not be included in the calculations.

4.8 Additional Billing Costs

Telecom Éireann believes that certain additional costs for carrier services billing and administration should be applied to call origination, termination and transit.

At the date of this report, the Director does not consider that these costs have been adequately broken down and justified and these costs will not, at this stage, be included.

5 Component Specific Elements

There have been a number of specific assumptions and approaches taken by Telecom Éireann, which impact specific interconnection services and have been the subject of discussion between Telecom Éireann and ODTR. These areas are briefly discussed below.

5.1 Call Termination & Origination

Agreed call termination and origination rates are set out in Appendix II.

5.2 Transit

The present transit offer consists of two rates: transit to mobile and transit to fixed. Each is split into peak and off-peak prices. Telecom Éireann has not to date adequately justified its proposed rates.

ODTR and Telecom Éireann have agreed that transit traffic may be passed to the Telecom Éireann network at any tandem exchange.

Telecom Éireann proposes a higher charge for transit to fixed than for transit to mobile justifying this on the additional routing complexity for fixed calls[2]. Telecom Éireann has also proposed that if the originating network can appropriately identify the terminating operate the additional charge will be waived.

The Director notes Telecom Éireann's arguments and proposes that the matter of appropriate routing arrangements and operator identification codes be considered as part of the consultation announced in section 7. However, at present the Director does not consider that a justification for the level of difference has been made to her satisfaction. As a pragmatic interim measure, she therefore proposes that the mobile rate be used for all transit calls and that this rate is recalculated excluding those items discussed in section 4 that remain of concern to her.

It is agrees between Telecom Éireann and ODTR that Telecom Éireann shall recalculate its transit rates taking into account:

- the need for common transit rates (peak, off-peak and weekend without call set-up) for calls to fixed and to mobile based on the lower rate for calls to mobile;
- those changes that were incorporated into the recalculation of the call origination and termination rates and which also impact transit calls.

5.3 International Rates

The latest proposal from Telecom Éireann for international rates provides rates only from the tertiary node. These rates are split into peak and off-peak rates. These rates bundle the three major components of the international access:

- the national component;
- the use of the international network;
- the accounting rates.

Telecom Éireann has agreed to accept international traffic at any secondary or tertiary node, and will set charges based on the different elements of the national network used and the following calculation:

[2] Mobile calls are identified by an individual STD code. Fixed transit calls are routed to a tandem switch based on the STD code. It is only here that number analysis occurs to see which OLO the call is destined for and how it should then be routed. This can result in additional transmission requirements.

Cost of international interconnection = National cost of conveyance +
cost of international network +
settlement rate paid to foreign operators.

The Director will make an appropriate direction if the justification does not demonstrate compliance with the legal requirements. In considering Telecom Éireann's justification, ODTR will take due account of international information and reciprocal charging arrangements in other countries where this is available.

Telecom Éireann has agreed to recalculate the cost of international interconnection based on the formula given above. The national and international network costs shall reflect relevant compliance conditions given in section 4. Telecom Éireann has agreed to provide a full justification of these component cost to ODTR by 20 November.

5.4 Interconnect Paths & In Span

The ODTR does not believe that the available information provided (and the extent to which it is broken down) in relation to charges for interconnection paths and data build costs fully justify the proposed charges. Full cost justification should be provided for all component costs relevant to interconnection paths based on current costs.

ODTR notes that there should be no marketing costs associated with an interconnection link and therefore all product management costs should be factored out and that the costs associated with Telecom Éireann's own consumption of leased lines should be excluded from any justification of the proposed tariffs.

Furthermore, ODTR does not accept restrictions on how close to Telecom Éireann's premises another operator may bring interconnecting cables; if for what ever reason this is not possible Telecom Éireann must bear any additional costs.

The Director will make an appropriate direction if the justification does not demonstrate compliance with the legal requirements. In considering Telecom Éireann's resubmitted justification, ODTR will take due account of international information where this is available, and make appropriate directions based on information to hand.

Telecom Éireann has agreed to recalculate its interconnection link charges in accordance with the legislation and in the light of the above comments, and provide ODTR with full cost justification for the level of such revised charges. This is to be provided on or before Friday 20 November 1998.

5.5 Emergency Services

The Director and Telecom Éireann have agreed that there shall be no charge for access to emergency services.

5.6 Access to Freecall, Toll Share and Premium rate

Telecom Éireann has agreed to incorporate the call set-up charge into the per minute charge in line with the principle established in section 4.1.

5.7 Operator services, enquiry services, access to the speaking clock, access to paging, access to packet services

The Director does not accept that Telecom Éireann has justified that charges for any of these services are cost-oriented. Telecom Éireann has agreed to recalculate its rates and justify these to

ODTR.

Telecom Éireann has agreed to recalculate its interconnection charges for the above rates and to provide ODTR with full cost justification for the level of such revised charges. This is to be provided on or before Friday 20 November 1998. In considering Telecom Éireann's justification, ODTR will take due account of international information where this is available.

6 Determination of rates to be provided in the Reference Interconnect Offer

The rates referenced in this document will have effect from the date on which Telecom Éireann adjusted its RIO, that is August 1998.

Interconnection services for which rates are not listed in Appendix II and for which additional information is to be provided by Telecom Éireann will be reviewed by ODTR, with a view to approving these rates or issuing appropriate directions by December 1st 1998.

7 Next Steps

As was mentioned in section 4.2, this decision notice is to be considered to be of an interim nature. The Director reiterates that she welcomes further representations at any stage. Furthermore, the Director is also aware of a number of substantive issues that have yet to be addressed. Among these are the following:

- The consideration of the appropriateness of rebalancing of Telecom Éireann's tariffs in a fully liberalised environment, including the use of the retail price cap, the recovery of costs associated with the access network and universal service ;
- The implementation of a LRIC based approach including use of bottom-up estimation methods;
- Principles to be adopted in the future regarding interconnection rates (for example, the possibility of flat rate charging);
- The procedures, mechanisms and timetable for approving and implementing revisions to the rates and changes to the RIO in general (including the addition of new services);
- The level of information that it will be appropriate to publish in the future;
- The extent to which accounting separation should be applied.

The Director appreciates the significance that decisions in these areas will have on all players in the market and therefore intends to embark on a consultation exercise that will be initiated early in 1999. She would already welcome views on what other issues may be appropriate to include in the consultation.

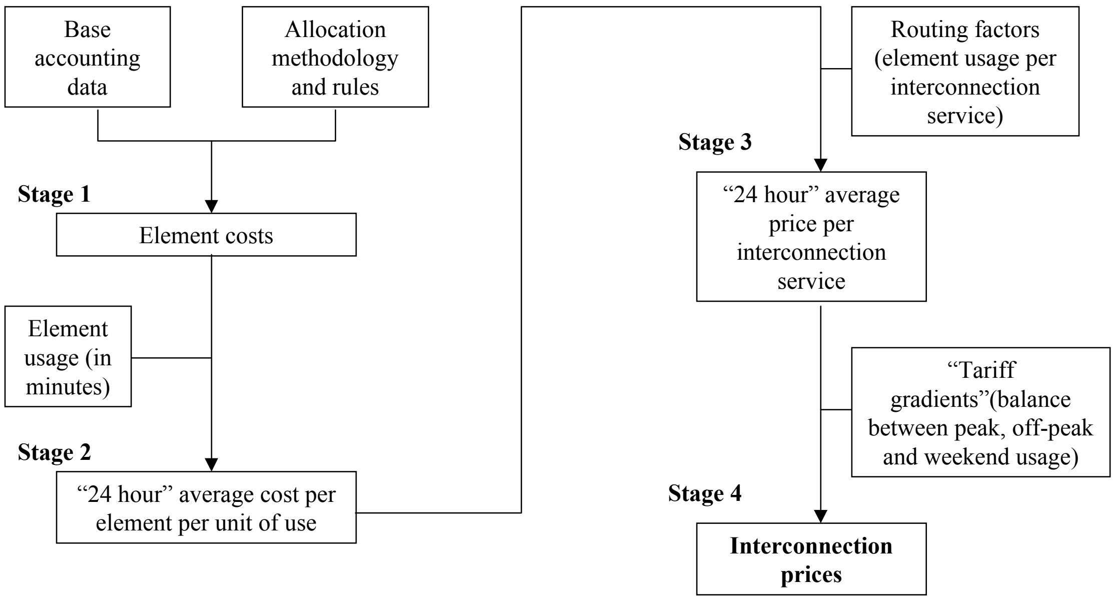
Comments should be sent to Maeve O'Reilly of ODTR, Abbey Court Irish Life Centre, Lower Abbey Street, Dublin 1; Fax: 01 804 9680; email: oreillym@odtr.ie. Responses are invited by Wednesday 16th December 1998.

/ENDS

Appendix I – Calculation of a cost based interconnection

There are several stages in demonstrating the link between an interconnection price and the cost profile of an organisation. In this appendix we set out the main stages. These are summarised in the following diagram.

The stages of calculating a cost-based interconnection price



Stage 1 – Calculation of element costs

The first stage in establishing the linkage between cost and interconnection price is to calculate the cost of key network elements that are used to deliver an interconnection service. This requires a detailed review of base accounting data and the methodology and rules which are used to allocate costs to network elements. Base data may be historic costs or an estimate of future costs. One approach to looking at future costs is to use Long Run Incremental Costs (LRIC). Where the cost calculated is the cost of incrementing the network to handle one extra unit of usage based on the current economic value of the assets employed.

Historic costs include operating expenses and depreciation charges. An allowance is also generally included for financing costs through, for example, the application of a weighted average cost of capital. Costs, where possible, will be directly attributed to network elements. Other costs will be apportioned to different products based on suitable drivers such as staff numbers or product volumes.

The output of this stage is the total cost of the principal network elements, for example, the costs of primary switches or transmission links between local and primary switches.

Stage 2 – Calculation of an average cost per element per unit of use

The basic unit of use of an interconnect service is the paid minute and thus the next stage of the process is a calculation of the average cost per network element per minute. This is often referred to as a "24 hour rate" for the reason that there is, at this stage, no differentiation between the different times of day when the call might be handled.

To perform this calculation, it is necessary to understand how much each network resource is used. This may be derived from measurement (possibly supplemented by growth predictions) or, as appropriate, a theoretical appreciation of how calls are routed through the network and what resources an average call therefore consumes. For example a local call may use one or two local switching centres. If an average percentage is known for how many switches are used for an average call and the number of local calls are known the total usage of switches by local calls can be calculated.

Implicit in this process, is the understanding that network resources will carry a mix of traffic including both interconnection traffic and traffic from Telecom Éireann's own customers. As Telecom Éireann is not permitted to discriminate between its own retail divisions and other operators, all traffic is used when calculating the rate.

Stage 3 – Calculation of average price per interconnection service.

The next stage of the process involves a consideration of what network elements are needed to provide what interconnection services. This considers how an 'average' interconnection call would be routed through the network and what resources would be used. This is done by applying routing factors to weight the cost of each network element used.

Routing factors will depend on the profile of calls generated by an interconnecting party in terms of both time of day and location. Thus for existing operators they could be measured retrospectively. However, a theoretical approach based on general network averages may also be used and are often more appropriate since profiles vary between operators and can change over time.

The output of this stage is the average cost per minute of each interconnection service

Stage 4 – Application of tariff gradient to get interconnection prices

Retail tariffs for telecommunications services vary by time of day and it may be appropriate for interconnection rates to vary in a similar manner. Therefore the final stage of the process is to adjust the 24-hour rate to take account of these differences. The aim is to get to a stage where the rate used when applied to a representative usage profile results in the average 24-hour rate.

Appendix II – Interconnection Rates For Call Origination And Termination

CALL TERMINATION

Primary		
	Peak	0.82
	Off Peak	0.41
	Weekend	0.33
Single Tandem		
	Peak	1.27
	Off Peak	0.63
	Weekend	0.52
Short Double Tandem		
	Peak	1.56
	Off Peak	0.78
	Weekend	0.64
Long Double Tandem		
	Peak	1.78
	Off Peak	0.88
	Weekend	0.73

CALL ORIGINATION

Primary		
	Peak	0.82
	Off Peak	0.41
	Weekend	0.33
Single Tandem		
	Peak	1.27
	Off Peak	0.63
	Weekend	0.52
Short Double Tandem		
	Peak	1.56
	Off Peak	0.78
	Weekend	0.64
Long Double Tandem		
	Peak	1.78
	Off Peak	0.88
	Weekend	0.73