



Commission for
Communications Regulation

Response to Consultation

VoIP services in Ireland

Numbering and related issues

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1 Foreword by the Chairperson

In June of this year, ComReg opened its first consultation on the implications of Voice over Internet Protocol (VoIP) technology and on how to respond to its emergence. Our aim was to take a positive approach that would foster this new tool for marketplace competition, while at the same time avoiding harmful disruption for consumers or long-term damage to our communications infrastructure. As a result, while the consultation addressed a wide range of important areas (like interconnection and tariffing, CLI, CPS, directories, ENUM and so on); it focused most strongly on the immediate issue of numbering for VoIP services.

The consultation responses have now been analysed and the list of respondents demonstrates clearly the widespread interest in VoIP that transcends the usual community of interest for telecommunications consultations. Viewpoints were strongly expressed, with divergence between the views of traditional ‘telcos’ and new IP service providers being much less than might have been expected. ComReg detects a generally welcoming approach from all parties towards VoIP that augurs well for its future development in Ireland. The responses received were also thoughtful and well-considered and these have led to decisions that are in many ways more open than the original proposals. ComReg considers that the decisions described in this document now push the boundaries of numbering in particular, as far as possible, while still meeting our obligations of efficient and effective management of the numbering scheme. Decisions on other areas (i.e. such as access to emergency services, quality, ENUM) are either targeted at facilitating the new services or are non-interventionist in line with respondent’s wishes and/or to allow time for EU-wide approaches to develop.

A major initiative is the opening of the new ‘076’ 10-digit number range for VoIP, following the very clear welcome this received from respondents. This range of numbers is likely to be much more attractive and useful to VoIP operators than other ranges and with fewer controls. ComReg is therefore very anxious to ensure these new numbers are opened and brought into operation by all operators as rapidly and efficiently as possible. ComReg notes the concerns of some VoIP operators that a ‘special’ range might appear to carry negative connotations for some consumers but anticipates that in practice the opposite is more likely to happen. Nevertheless, ComReg has moved from its pre-consultation position by agreeing to also open up

most other number ranges to VoIP operators, including geographic numbers, in order to engender confidence in the new operators and ensure the door to service provision cannot be held closed by potential hold-ups in introducing the '076' numbers. The opening of geographic and most non-geographic number ranges has also been extended to services categorised as ECS, in view of the persuasive arguments advanced for this by respondents, though certain conditions are attached in order to protect the numbering resource and/or to accord with consumer expectations in respect of the numbers concerned.

Ongoing debate at European level will be carefully monitored by ComReg, as will advancements in other regulatory regimes worldwide. Indeed, several respondents made the point that a harmonised approach among the European regulatory authorities would have benefits for both consumers and service providers. It is therefore intended to undertake a twelve month review of the VoIP market in Ireland so that any advantageous developments may be incorporated, if appropriate, into the Irish regulatory approach to this market.

ComReg now hopes that as a result of these initiatives, and the many enhancements made to our approach to accord with the wishes of respondents for maximum flexibility, that there will now follow a rapid build-up of VoIP services for Irish consumers.

John Doherty
Chairman

2 Executive Summary

ComReg consulted on the topic of “Numbering for VoIP Services” in document 04/72, in June of this year. Interested parties had until July 31st to respond to this consultation, and in total, 17 responses were received.

VoIP and associated technologies have widely publicised advantages for consumers that include lower call costs and richer, more enhanced services that could include presence management and video calling. Different types of services are possible, typically including those that can be described as “second-line” services. These, while offering lower costs to the consumer, may not have the same stability in respects to elements that are heavily regulated in PSTN, such as access to emergency services and network integrity. These elements, although not ones that are foremost in the typical consumers’ mind when deciding whether to take-up a particular product, are of particular public interest. In informing the consumer of the differences in these products, it is important to remember that it is possible that the user of an ECS product may not be the purchaser. In the event of an emergency therefore it is possible that the user may not know that they are not guaranteed access to emergency services agencies.

In the consultation paper, ComReg proposed that geographic numbers might be allocated for VoIP services that are clearly substituting for traditional PSTN services. As responses to this were broadly positive, ComReg has decided that geographic numbers should be available to all services classified as Publicly Available Telephony Services (PATS), regardless of the technology used. Services classified as Electronic Communications Services (ECS) do not have the same rights or obligations as PATS, but in the interests of developing the VoIP market in Ireland ComReg has decided that geographic numbers should also be made available to providers of ECS, under certain conditions described herein¹.

ComReg also argued that mobile and the existing ranges of non-geographic numbers – with the exception of personal numbers – should not be made available for VoIP purposes at this stage, while providing reasons for this. It was suggested that the characteristics of Personal Numbers made them suitable for use in conjunction with VoIP. Respondents agreed very strongly that Personal Numbers should be made available and mobile numbers not (at least at this stage) be made available. Respondents were split in their views about other non-geographic number types but ComReg has found the arguments in favour of opening those ranges to be most persuasive. The result is that Freephone, Shared Cost and Universal Access numbers will all be opened to all VoIP services, with Premium Rate Numbers also being opened on those services categorised as PATS. Services operating behind Premium Rate Numbers are particularly sensitive to abuse and fraud, so need special treatment. This is especially true in the context where the inherent cross-border capabilities of VoIP might succeed in opening international access to these numbers, which were hitherto inaccessible from outside of Ireland.

The consultation document considered opening of a new, non-geographic number range for VoIP purposes and the responses received have persuaded ComReg to proceed with this initiative. The ‘076’ range, based on a 3 digit access code and 7

¹ Please refer to Annex 2 for the exact definitions of PATS and ECS.

digit subscriber number length, will allow potential VoIP service providers a greater choice of number ranges as well as much more freedom in respect of rights of use than other ranges. This range is available to both ECS and PATS classified services, though it is expected to be especially appealing to providers of ECS because of its lighter conditions of use. Service providers that wish to offer services that have a richer interface than existing PSTN products are also likely to find that using this new range will facilitate easier customer recognition of the extra benefits they offer.

It was suggested by ComReg in this consultation that differentiation of services (e.g. by specific attributes such as quality of service or access method) by the use of distinguishing numbers, rather than access codes, should be considered. Respondents were fully in agreement with the tentative opinion expressed by ComReg that distinguishing between product offerings by way of number range is not a good solution at this stage of market development.

Number portability was considered in the consultation and it was agreed by most respondents that this is both an obligation and a right accruing to providers of PATS. As it stands, therefore, all existing fixed and mobile network operators are obliged to offer this facility. Many respondents felt that geographic number portability (GNP) between PSTN and VoIP operators is especially desirable. ComReg believes that while number portability is an obligation for all PATS services (whether VoIP or PSTN), it should also be offered to and required of ECS operators. It has therefore been decided that ECS operators must be prepared to support number portability (on a reciprocal basis) where they avail of numbers and other (i.e. PATS) operators are strongly encouraged to co-operate in porting to-from such ECS operators. Any limitations on number portability must be clearly communicated to the end-user at the contract stage. Full number portability rights/obligations are also attached to the new '076' number range (for both ECS and PATS services) but implementation of this is postponed for a period to avoid burdening new operators in the marketplace.

ComReg has accepted the almost unanimous view that commercial negotiations related to interconnection agreements should be largely left to operators, with regulatory intervention only in the event of market failure. Standard interconnect agreements models already exist for both geographic and existing non-geographic numbers and these should still be applicable for those numbers irrespective of whether VoIP technology is involved or not. The existing arrangements for non-geographic numbers may also be used as models in respect of the new '076' range, to avoid delays that might otherwise arise.

ComReg's questioning of the integrity of calling line identification (CLI) when operated in some VoIP contexts, met with a mixed response. ComReg is now broadly persuaded by the arguments that VoIP sources should generally be treated as trusted sources/sinks for CLI purposes and CLI can be provided as for PSTN. However, where CLI travels without strong protection over any network elements that are outside the operator's control (e.g. the Public Internet), then the CLI should be marked as 'unavailable' before being handed over to the PSTN.

There was broad agreement with ComReg's position that VoIP origination is inconsistent with CPS from a business perspective. ComReg concluded that no steps need to be taken in respect of CPS. ComReg will keep this position under review, given the Universal Service obligations in respect of CPS. ComReg also expects that the '076' range will be included in the "All-Calls" option for CPS PSTN

origination, with implementation details to be agreed between eircom and the CPS operators.

Currently all end-users of PSTN services have the right to an entry in a telephone directory, subject to certain data protection and privacy regulations. ComReg believes that this is a right that should be carried forward, and indeed believes that this will be an expectation of consumers from their providers. Although the provision of this service is only an obligation for PATS services, ComReg expects that market forces will cause it to also be offered to subscribers of ECS.

A draft list of terms and conditions that would apply to those who require numbers for VoIP services was generally supported by consultation respondents, though with criticism from some respondents of condition 5, dealing with nomadic use. ComReg is minded to accept the views advanced and thereby enhance the attraction of the '076' range of numbers by allowing allocation on a wider basis to consumers who have a need for greater presence abroad.

This document concludes with a set of proposals that ComReg considers should form the logical next steps in the introduction of VoIP services in Ireland. Consumer education is an important facet of any VoIP product and should as a minimum cover the main differences (at user level) between standard PSTN and VoIP products. These differences may include guaranteed access to emergency service agencies, quality of service, and the in-line powering of terminals. Also covered is an indication of the main practical steps that need to be taken prior to the introduction of the new '076' number range.

ComReg intends to review the progress of VoIP services in Ireland after a period of twelve months, in order to discover how the market is developing and to ascertain whether or not further action is required. Feedback will be requested from market players, if necessary. The review will take account of ongoing developments and harmonisation efforts at European and/or worldwide level that could impact on the progress of VoIP in the marketplace.

3 Introduction

ComReg consulted on the topic of “Numbering for VoIP Services” in document ComReg 04/72, in June of this year, with a closing date of July 31. Seventeen responses were received in total, encompassing Irish and non-Irish respondents, VoIP and PSTN constituencies and business and private interests, as follows:

Respondent	Category*	Respondent	Category*
ALTO	Operator’s org.	O2	Mobile operator
AT&T	PSTN operator	Paul Cunnane	Community network
Chorus	Cable operator	Real Broadband	Broadband Access
Cisco systems	Equipment provider	Richard Barry	Private
Colt Telecom	PSTN operator	Sergiu Rosenzweig	Telecoms consultant
<i>eircom</i>	PSTN operator	Skype	VoIP provider
Esat BT	PSTN operator	Vodafone	Mobile operator
Niall O’Reilly	Private	VoIP Ireland	VoIP operator
ntl	Cable operator	---	---

**Indicative only: Respondents may actually fit in more than one of these categories (e.g. VoIP as well as PSTN).*

ComReg wishes to thank everyone who contributed to the consultation. With the exception of responses marked ‘confidential’, all written comments are available for inspection at ComReg's offices in Dublin.

This document is a response to those submissions, outlining ComReg’s decisions taken in respect of the various questions raised in the original consultation. Discussion is ongoing in a wider European and worldwide context on the topic of VoIP and the type and level of regulation that may be required to deal with this new generation of communications provision. The European Commission published a public consultation paper on VoIP and is due to publish its response to and analysis of inputs in the form of non-binding guidelines by December 2004. ComReg will take account of these guidelines as necessary, along with any other developments that may prove beneficial to the Irish consumer. This may involve amending its policy as stated in this document, in due course. In order to take account of these developments, ComReg intends to undertake a review of the VoIP market in Ireland after a period of twelve months. This review is further discussed in section 6 of this document.

4 Decision Notice Issues

4.1 Geographic numbers

4.1.1 Summary of consultation issues

In the consultation paper “Numbering for VoIP services” (ComReg document 04/72), ComReg stated that it is reasonable and appropriate that geographic numbers be allocated for the purposes of facilitating VoIP services when it can be seen that these VoIP services are substituting PSTN services. ComReg does not think that these numbers should be allocated indiscriminately as there are implications for number portability, access to emergency services and other vital areas of interest. ComReg considers that if geographic numbers are allocated for this purpose, the rules of allocation should follow the existing rules for PSTN. This is to ensure that number shortages are not precipitated, and the related number changes are avoided as far as possible.

If the VoIP service can clearly be seen to be substituting the PSTN service, then it is likely that the VoIP service would qualify as PATS. The existing allocation rules that apply to geographic numbers are intended *inter alia* to minimise number changes that would be costly and disruptive to both service provider and consumer. Number changes could be brought about by multiple allocations of numbers from several different Minimum Numbering Areas² (MNAs) to a single termination point. The rules also take account of the fact that geographic numbers have important implications for consumer awareness of tariffs, and information provided to emergency services. Existing allocation rules which allow only one number per termination point should therefore remain in place.

Although existing providers who have allocations of geographic numbers do qualify as PATS, new service providers entering the market may not. ComReg suggested that this should not prevent their access to geographic numbers *per se*, but in practice such operators might not be able to meet the normal conditions applicable to these numbers. Currently operator geographic number portability (GNP) is in place for geographic numbers and this is an important right available to all current Irish consumers. As GNP is a right of PATS but not of ECS users, this would suggest that if geographic number allocations were made to an ECS, consumers might be unable to bring their numbers with them if they chose to change service provider and/or might be unable to port backwards if they so desired. This situation would be confusing to the public and therefore be unwelcome.

² The Minimum Numbering Area (MNA) is a sub-set of an STD area

- Q. 1. Do you agree with ComReg that geographic numbers could be allocated for VoIP purposes in specific cases (see also Q21)?**
- Q. 2. Do you agree that if geographic numbers are made available for VoIP use, they should follow the same rules as for PSTN (i.e. only one number per ‘line’ or termination point, allocated from the MNA in which the customer is based)?**
- Q. 3. If geographic numbers are made available for VoIP use, would you consider that this should be limited to VoIP services that qualify under the current definition of PATS (i.e. have the rights and corresponding obligations – as far as those can be applied – of PATS)?**

4.1.2 Views of Respondents

The great majority of respondents felt that allocation of geographic numbers to VoIP services is desirable, at least in principle; several emphasised the need to support number portability. Other significant points made by some respondents were that caution should be exercised to ensure artificial demand doesn't generate number shortages; that suitable arrangements should be in place for emergency call handling; that the availability of geographic numbers for VoIP services would encourage the adoption of VoIP; and that nomadic operation should not be seen as a barrier to the provision of geographic numbers.

There were mixed responses to the question of whether the same rules should apply to geographic numbers for VoIP services as for PSTN, though with most supporting this principle on the basis of technological neutrality. This would allow numbers to be allocated irrespective of the technology that is used to carry the actual calls. Several respondents felt that it would not be desirable or even possible to restrict the use of geographic numbers to within the MNA area, given the inherently nomadic nature of VoIP services; one suggested the existing rules might be relaxed in that respect. The point was made by several respondents that ISDN lines and DDI facilities can currently have more than one number attached to them, and therefore the assumption that only one number can be attached per ‘line’ is invalid. One respondent suggested this proposal should be re-oriented to allowing multiple numbers per line, restricted to the MNA in which the termination is based, in a manner similar to ISDN.

Several replies suggested that access to geographic numbers should not depend on whether or not the service qualifies under the current definition of PATS. On the other hand, some respondents were agreed that those entities that wish to offer VoIP services using geographic numbers ought to support the same set of obligations that apply to existing PATS services. One respondent suggested that if VoIP services can be seen to clearly substitute PSTN services, then these new VoIP services should be categorised as PATS, with the attached obligations and advantages.

4.1.3 Commission's Position on Geographic Numbers

ComReg agrees with the principle that geographic numbers should be made available to VoIP-based PATS services on the same terms as for PSTN-based PATS services i.e. as defined in the National Numbering Conventions. Justification for

each geographic number request must therefore be made in the normal way using the appropriate application procedure and based on customer numbers in each MNA concerned. Applicants will be required, as in the case of the PSTN, to terminate calls to those numbers (in the sense of exiting the PSTN if not final termination to the user) within the MNA to which a number refers. For example '01' numbers must be terminated off the PSTN within the relevant '01' MNA to which the number block belongs.

It is important to note that there is valuable location information associated with each STD code that is implicitly understood by existing PSTN consumers. This information is used in many ways, not least to enable end-users all over the country to estimate the cost of a call from one STD area to another and also to establish the general location of the called party. Another, more significant use of this information is by the emergency services agencies, where the number that is presented in the Calling Line Identification (CLI) allows emergency personnel to identify the installation address of the number through a reverse look-up procedure. ComReg understands the value of this information, and believes that it should not be underestimated or needlessly diluted at this stage.

To this end, providers of VoIP services, whether classified as PATS or ECS, will only be permitted to make allocations of geographic numbers to end-users who are resident within the geographic boundaries of the MNA. This is in line with existing (albeit implicit) PSTN practice, where the physical termination of the line indicates the location of the end-user. This particular clarification is needed in order to minimise the possibility that could see many numbers being demanded by entities operating outside the state, which would have a knock-on effect of causing a premature, expensive number change. If sufficient demand is created by the residents and businesses operating in the area, a number change can be justified. If that demand is created by those not in that specific area, it cannot.

A well established and valuable facility that is a long-standing obligation and right of geographic numbers for consumers is the possibility to port those numbers to competing operators within the same MNA. ComReg considers it important not to diminish those rights for any consumer unless that consumer is very cognizant of and specifically agrees to accept this limitation. Unlike PATS, non-PATS ECS operators have no automatic right to number portability³ and this is an additional reason why they can have no automatic right to geographic numbers (see section on Number Portability). Notwithstanding this and in the interests of innovation and competition, ComReg is minded to extend the numbering convention rules to facilitate non-PATS ECS operators (VoIP or otherwise), in areas where geographic numbering resources are clearly not at risk. Therefore geographic numbers will be made available to such ECS operators in MNAs where there is extensive availability for the use of their own customers, based on the same justifications as for PATS operators. In such cases, it will be an extra condition of allocation that all customers of such services must be explicitly advised³ that it may not be possible for them to port their numbers to one or more other operators.

Those ECS operators will be required (as for all others) to fully support the established GNP process from their side (i.e. including full reciprocity insofar as other operators are willing to port to/from them) and provide confirmation to

³ Apart from the direct ability to port or otherwise, the absence of a portability obligation for non-PATS services also means that competing service providers are not obliged to support routing or other porting elements (e.g. billing) in respect of ECS operators.

ComReg that they will do so. They will also be required to meet at least minimum requirements on emergency access i.e. to either provide access or else to notify their customers in unambiguous terms of any limitations on their emergency access provision when calling '112' or '999'. Such ECS operators will be required to limit allocations to a maximum of two numbers per registered user⁴.

ComReg agrees that nomadic operation for geographic numbers outside of the MNA concerned should be permitted; but permanent out-of-MNA use should not be. See also references to nomadicity of geographic numbers in section 4.11.3 below. If the service being provided is markedly different from a traditional PSTN service, with the extra benefits and features that VoIP allows, a number from the new range '076' would be more appropriate. See section 4.3 for a discussion of this range. Nomadicity is one element that will be further analysed at the review stage.

Given that ECS providers will now have access to geographic numbers for the first time, an important element that needs to be included in any product offering is that of consumer awareness concerning any limitations of service that would occur vis-à-vis dialling those numbers from a PATS service. This issue is addressed within section 5, below. It is safe to say that IP networks are not built with the same degree of redundancy as the PSTN, and therefore cannot offer the same reliability. Fundamental services that are inherent to the PSTN cannot be offered to the same degree on IP networks. What this means in practical terms is that consumers can be guaranteed that dialling 112 or 999 on a PSTN phone will give them access to the emergency services, while the same cannot be argued for VoIP services. It is the opinion of ComReg that this need not necessarily hinder the roll-out of VoIP services, so long as it can be ensured that the consumer is aware of the fundamental differences between these two types of products.

Another important issue is that the *purchasing* consumer is not always the *actual* user of the product. Any person can have access to the IP phone, which can look like a regular telephone. It is important therefore that these consumers are also aware of the limitations of VoIP services in this respect. This is further discussed in Section 5.

These issues apply to all ECS providers, irrespective of the types of numbers they use.

A list of obligations and rights that accrue to operators classified as offering either ECS or PATS is contained in Annex 2.

Note: ComReg does not agree with suggestions that geographic numbers are necessarily more attractive to consumers than non-geographic numbers and would strongly encourage ECS operators to avail of the new specially designated '076' range described herein, in preference.

Decision No. 1. Geographic numbers will be allocated to VoIP PATS applicant operators in the same manner and under the same conditions as for PSTN operators.

⁴ The reason for this restriction is that offering geographic numbers to this category of operator is a concession that could cause many additional calls on the geographic numbering resource that might otherwise trigger expensive number changes in currently unthreatened areas. The allowance for up to two numbers is an additional concession to correspond with the ISDN basic access case on PSTN.

Decision No. 2. Geographic numbers will be allocated to ECS VoIP operators in MNAs where no risk is foreseen of number changes even allowing for a large build-up of demand for VoIP during the next 5-10 years. Agreement to certain conditions will also be a condition of such allocation to ECS operators:

- a) They must be willing to fully support GNP on a full reciprocal basis for their part. Notwithstanding this, they must advise any customers to which they allocate geographic numbers as well as porting-in customers, that it may not be possible for them to port out those geographic numbers to some other operators;**
- c) They must limit geographic number allocations to consumers to a maximum of two numbers per registered user, except if agreement is specifically given by ComReg to exceed this in special circumstances;**
- d) They must undertake reasonable efforts to ensure delivery of ‘112’ and ‘999’ calls to the emergency services is achieved and users must be advised of any limitations;**
- e) They must at least advise consumers in their contracts of any other limitations of their service (including delivery of calls to the emergency services) vis-à-vis what those customers might legitimately expect compared with what would traditionally be expected from a PATS service.**

Decision No. 3. A new condition specifically attached to rights of use for geographic numbers, that has immediate effect, is that Irish geographic numbers shall not be allocated to end-users or termination nodes located outside the MNA. *Note: this condition was always implicitly understood in respect of PSTN technology, where the end-user is located at the PSTN termination point.*

4.2 Non-Geographic Numbers

4.2.1 Summary of consultation issues

ComReg proposed that Personal numbers could be allocated for VoIP purposes, provided that existing conditions of use are met. ComReg pointed out however that this type of number may be associated with relatively high tariffs by consumers and this could prove to be a disincentive to their uptake for VoIP purposes.

ComReg did not consider that other types of non-geographic numbers and mobile numbers should at this point be allocated for VoIP services. Mobile numbers are currently reserved for mobile network services, and it would not seem that current VoIP services are truly mobile, mainly because they do not offer handover. These numbers are also in a relatively limited supply.

Other non-geographic numbers (shared cost, premium rate, freephone and universal access numbers) were not considered relevant to VoIP services at this stage. In cases where these numbers are required by users of VoIP services, it is expected that these circumstances will closely mirror the usage of these numbers on the PSTN. ComReg could look at the use of these numbers for VoIP purposes in the future, or on a case-by-case basis.

- Q. 4. Do you agree with ComReg that Personal numbers could be allocated for VoIP purposes in very specific cases (e.g. where justification can be provided for allocating a number to a natural person using an IP connection)?**
- Q. 5. Do you agree with ComReg that other non-geographic numbers and mobile numbers should not be allocated for VoIP purposes – at least at this point in time?**

4.2.2 Views of Respondents

There was broad agreement that Personal Numbers could be allocated for VoIP purposes where the allocation is to a person rather than a termination point, or telephone line. One respondent expressed concerns that given the relatively limited availability of this type of number, coupled with concerns over consumer perception of higher call charges, the allocation of Personal Numbers may not be appropriate for VoIP services. Conversely, one consumer felt that if a user wished to port his/her Personal Number to a VoIP operator then this should be of no concern to anyone else, while another was concerned that the term “in very specific cases” appeared too restrictive.

Of the respondents who offered answers to the question on other non-geographic number types, most disagreed with the idea that these should not be allocated for VoIP purposes. Most respondents felt that if non-geographic numbers were required by VoIP service providers, then these numbers should be made available. With respect to the availability of mobile numbers, it was generally agreed that it would not be appropriate to use mobile numbers for what are essentially nomadic services, at this time. It is possible that at some stage in the future VoIP services can become truly mobile, but that point is some way off.

4.2.3 Commission’s Position on Non-geographic numbers

ComReg agrees with the general opinion that non-discrimination and support for innovation is best served by making non-geographic numbers available to VoIP operators –on the same terms as to non-VoIP operators. As is normal for the PSTN, these numbers (apart from personal numbers) must only be used for terminating services, not for originating calls. This comparability strictly speaking only extends to PATS operators (as no PSTN operators fall in the non-PATS category), but ComReg considers that as far as possible a similar approach should be taken in respect of other ECS operators.

Non-geographic numbers, such as FreePhone, Shared Cost, Internet Access, Universal Access, Personal and Premium Rate numbers, will therefore be allocated on a service basis⁵ to VoIP PATS operators which will be required to comply with the normal allocation conditions of use that apply to each specific number type, i.e. existing allocation rules will apply, including the obligation to support NGNP. The fact that the service is being carried by VoIP should not affect these allocation rules.

⁵ In other words, numbers designated for one service (such as Freephone) are not freely interchangeable with those designated for other services (such as Shared Cost) but are to be used only for provision of the individual services for which they are designated.

Note: Only PATS operators have unqualified right to number portability under the new framework legislation.

All of the above non-geographic numbers except Premium Rate Numbers (i.e. including Personal Numbers) will also be made available to non-PATS ECS operators for the use of their own customers based on the same justifications as for PATS operators, where NGNP obligation is accepted i.e. willingness to support the full industry NGNP process on a reciprocal basis. No specific shortage of these numbers is envisaged at this stage. However, it will be an extra condition of allocation that all customers of such services must be explicitly advised by the ECS operators concerned that it may not be possible³ for them to port their numbers to one or more other operators. Providers of Personal Numbers will also be required to meet at least minimum requirements on emergency access i.e. to either provide such access or else to notify their customers in unambiguous terms of any limitations on their emergency access provision when calling '112' or '999'. And finally, if other limitations exist vis-à-vis consumer expectations from PATS services, they must also advise their customers of these (see Section 5 below).

ComReg notes that very serious consumer and operator concerns which already exist in relation to Premium Rate numbers on the PSTN could be exacerbated when the relatively borderless capabilities of VoIP are introduced. It does not therefore intend to allocate Premium Rate Numbers to ECS services at this time in view of the much lighter oversight that is likely to be maintained on such services vis-à-vis PATS. These concerns impact on acceptability of content and also on excessive and unexpected charging of consumers as well as fraud against operators and service providers. ComReg is also aware that European Commission groups⁶ are studying the cross-border issues surrounding Premium Rate Services at present, in terms of how such unacceptable extra-territorial operations might be controlled. VoIP adds more complexity to this subject and until these issues are more completely understood, and until these ongoing discussions are complete, ComReg is minded to amend the Numbering Conventions to require that all undertakings providing access to Irish Premium Rate Numbers shall do their utmost to ensure that such access is not extended to entities located outside the State⁷.

Mobile numbers will not be allocated for VoIP services at this stage, in line with ComReg's original position, which was supported by almost all respondents. This situation may change at some stage in the future if and when true mobility is approached.

Decision No. 4. Mobile numbers will not be made available for VoIP purposes for the immediate future.

Decision No. 5. Non-geographic numbers will be allocated to VoIP PATS applicant operators in the same manner and under the same conditions as for PSTN operators.

⁶ Indeed this subject was addressed in a European Commission consultation on VoIP which closed on 31/08/04.

⁷ This implies that special attention should be paid by VoIP undertakings, in which onward-addressing and routing capabilities might overcome numbering barriers to external access to Irish PRS services that are currently a part of the PSTN (e.g. by converting to a different form of address when exiting the PSTN).

Decision No. 6. Non-geographic numbers will be allocated to ECS VoIP operators to support the following services:

- (i) Freephone**
- (ii) Shared cost calls**
- (iii) Personal Numbered services**
- (iv) Universal Access Services**

Agreement to certain conditions will be a condition of such allocation to ECS operators:

- a) They must be willing to fully support NGNP on a full reciprocal basis for their part. Notwithstanding this, they must advise any customers to which they allocate non-geographic numbers as well as porting-in customers, that it may not be possible for them to port out those non-geographic numbers to some other operators;**
- b) In the case of Personal Numbers, which – along with the new ‘076’ range - are the only non-geographic numbers permitted to originate calls - they must undertake reasonable efforts to ensure that delivery of ‘112’ and ‘999’ calls to the emergency services is achieved or users advised of any limitations on this.**
- c) They must advise consumers in their contracts of any other limitations of their service (including delivery of calls to the emergency services) vis-à-vis what those customers might legitimately expect compared with what would traditionally be expected from a PATS service.**

Decision No. 7. ComReg will not allocate Premium Rate Numbers to ECS services for the immediate future.

4.3 New Number Range

4.3.1 Summary of consultation issues

ComReg suggested that it would be prudent to open a new number range for VoIP services. One reason for this is that the volume of numbers can be expected to grow quite rapidly with, for instance, several numbers per household becoming more commonplace. In addition, there is likely to be a growing need for more dedicated numbers to meet a whole range of new scenarios, such as for example those described in Section 4.3 of ComReg 04/72⁸. Once these numbers are issued, users will understandably be reluctant to change them. The opening of a new number range was therefore proposed, with the aim of providing maximum flexibility to new operators, and several possible National Destination Codes (NDCs) were suggested for this, with ‘076’ being preferred. The ‘03’ range is also available, but as this is the only remaining unopened top-level range, it was not considered justified to use it for VoIP purposes at this time⁹.

As part of its ongoing management of the national numbering plan, ComReg is gradually migrating geographic subscriber number lengths to 7 digits long, with a 3 digit access code. Existing non-geographic numbers also have a length of 10 digits.

⁸ ComReg 04/72 “Numbering for VoIP Services”.

⁹ This range is held open to support any large scale numbering operation.

This uniformity reduces the need for number analysis, thus reducing post-dial delay. It also encourages simplified recognition by consumers and foreign network operators. ComReg indicated it would prefer to stick with this approach in respect of any new range that might be opened.

- Q. 6. Do you agree that a new number range should be opened for VoIP services?**
- Q. 7. If so, do you agree that this new range should be the 076 range? If not the 076 range, which range do you think would be more appropriate?**
- Q. 8. Do you agree that the number length should be 3 + 7 digits long? If not, please suggest your alternative. Please explain your answers giving practical examples of how you see the numbers being used where appropriate (e.g. assigned to terminals, persons, gateways...).**

4.3.2 Views of Respondents

While the majority of respondents agreed that a new number range should indeed be opened for the use of VoIP services, a small number opposed the idea. Those who were against believe that a new number range might negatively differentiate VoIP services in the mind of the consumer. Some respondents who felt that a new number range would be a positive development cautioned that the use of this number range should not be compulsory and that access to other types of numbers was still necessary. Services that are not exact substitutes for the PSTN may find a better home on a new range than on an existing range.

Of those respondents that support the opening of a new number range, most were in agreement with ComReg's suggestion that the '076' range was most appropriate. Three respondents suggested alternative ranges, viz, the '075' range (in order to allow for increased demand), the '077' range (as it has a more easily recognisable STD code) and '081'. The last of these was suggested as the '08X' range is more readily recognisable as a non-geographic number type.

Where respondents support the introduction of a new number range, the proposal that the number length should be 3 + 7 digits met with broad support. This approach is consistent with existing number arrangements.

4.3.3 Commission's Position on new number range

A new non-geographic number range '076', based on the 3+7 format will be opened with immediate effect. This move is expected to be popular with all categories of VoIP operators, not least because the '076' code does not stand out as being very different from geographic numbers. While on the one hand this code lies close to the '08X' mobile ranges, on the other hand it is also within the same primary range as the existing '071' and '074' geographic ranges. This will remove any concerns about customer associations with certain 'high priced'¹⁰ non-geographic services. As this range is not intended to offer any premium rate functions, and in accord with the general views of respondents, the retail tariff ceiling will be set at national rate

¹⁰ VoIP operators concerned with such possible associations should also note the converse i.e. that freephone and lo-call numbers are also non-geographic.

level¹¹. Apart from its attraction to PATS operators as a minimal restriction range (compared with geographic and other ranges), it will greatly suit the ECS category of VoIP services as it will impose minimal obligations on them and their customers. A designation with lower service requirements and fewer regulatory restrictions will apply, as described in Annex 1. Nevertheless it will be a requirement that subscribers of ECS must be advised by their providers of any limitations of the emergency access service for '112' and '999' calls vis-à-vis what would be expected from traditional PATS service.

Full support for (non-geographic) number portability will be the main obligation on all service providers (ECS and PATS) availing of these numbers. However, to encourage their uptake, to minimise delays in introducing this new number range, and to minimise pressure on new operators, implementation of this obligation will not be phased in until a significant quantity of the '076' numbers is actually in use¹², or January 2007, whichever comes first.

The elimination of geographic restrictions¹³ should make these numbers especially attractive to VoIP operators. The essential feature that qualifies a user for one of these numbers is that termination to the user should occur for all normal purposes based on IP-related protocols and an E.164 number is required for that termination or to reach a gateway with the PSTN¹⁴.

Apart from the advantages to service providers, ComReg foresees that rapid uptake of this new range will go a long way to avoiding excessive pressure building on geographic numbers, thereby avoiding the risk of enforced number changes.

Previous comments (see section 4.1.3) in respect of consumer education apply equally to this new number range.

Decision No. 8. ComReg will open a new number range 076 XXXXXXX for use with IP-based services, with VoIP as initial candidate for allocations.

The retail tariff ceiling¹¹ for this new range will be set at standard national rate of the network operator from which the call is made.

Additional ranges, based on one or more of the access codes '075', '077', '078' and '079' will be opened later, if necessary.

The numbers will be designated for use where termination to the user should occur for all normal purposes based on IP-related protocols and an E.164 number is required for that termination or to reach a gateway with the PSTN.

¹¹ This means that the maximum retail charge which may be applied to calls to '076' numbers shall not exceed the standard national tariff rate of the network operator from which the call is made. However, actual charges may be set anywhere below this figure, subject to practical capabilities of networks and billing systems to support the choices made. Further discussion of this retail charge can be found in Section 4.7.

¹² This figure will be determined by ComReg in the light of circumstances as the market develops, but should not be less than 20,000 active users.

¹³ However, these numbers, like all numbers from the Irish numbering plan, are intended only for use by customers of Irish-based service providers.

¹⁴ 'PSTN' is used in the widest sense here, to include ISDN and mobile network.

Full support for (non-geographic) number portability will be the main obligation on all service providers (ECS and PATS) availing of these numbers but mandatory implementation of this obligation will not be phased in until a significant quantity of the '076' numbers is actually in use, or January 2007, whichever comes first.

Customers must also be advised of any limitations vis-à-vis traditional PATS in the emergency access service provided when either '112' or '999' is dialled.

4.4 ENUM

Q. 9. Do you consider that ComReg should support ENUM using a distinctive number range (which could be a sub-set of range designated for VoIP, or a separate range with its own access code)?

Q. 10. Do you prefer the designation of the first digit(s) of the VoIP subscriber number to achieve this (i.e. the digits immediately following the VoIP access code), or the allocation of a separate access code (e.g. 079)?

Q. 11. Do you support the broad principle that end-users who wish to avail of this ENUM number range should be obliged to "opt-in" to the ENUM protocol, and would lose the number if subsequently opting out?

4.4.1 Summary of consultation issues

ENUM allows end-users to have one address string (e.g. a telephone number) that will connect to any termination method of their choice (e.g. VoIP). It has been suggested that specific ENUM numbers be set aside, in order to promote take-up. If this was done, then the thorny problem of validation of the user's right to use a number would be side-stepped, as ENUM sign-up would happen automatically with number allocation.

An entire range of numbers (i.e. including a separate access code) could be made available for the use of ENUM should the expected demand be great enough. Alternatively, a sub-range, i.e. using the first (and perhaps the second) digit from a VoIP access code, could be used to denote ENUM numbers.

If a user wished to opt-out of ENUM, the right to that ENUM number would be lost. If a user opted out of a telephone line subscription, this would have no impact on their right to continue holding any specific ENUM number.

4.4.2 Views of Respondents

The great majority of respondents to the first question above felt that existing E.164 numbers are adequate for ENUM purposes and that the allocation of a new range is not justified. Some respondents felt that this consultation paper is not the appropriate forum for debate on this topic. The answers to the second and third questions therefore need not be considered further, in view of the responses given to the first.

4.4.3 Commission's Position on numbers for ENUM

ComReg agrees with the responses received. It is therefore not considered necessary to open a specific range of numbers for the use of ENUM at this time. This topic may be revisited at some stage in the future, if the need arises. *Note: ComReg expects to publish a report on the ongoing deliberations of the Irish ENUM forum in October. This report will be available from ComReg's website at <http://www.comreg.ie>.]*

Decision No. 9. No specific ENUM number range will be designated at this time

4.5 Differentiation of services

4.5.1 Summary of consultation issues

Different VoIP service types could be denoted using distinctive number ranges, i.e. by using the first and perhaps second digit of the subscriber number to indicate the type of service. In these circumstances, ComReg would be obliged to validate service offerings, and it is likely that the market would be better placed to do this. This differentiation may also hinder service providers who may wish to alter their service offerings in the future.

Services that offer differing voice quality could be identified using numbers, for instance using the first and possibly second digit of the subscriber number. This would have the advantage that the calling consumer would be able to temper their expectations of quality based on the subscriber number, while high quality services would get better recognition for their offerings. Continuous monitoring to ensure that the correct quality was actually being offered would be required, and this would be difficult to achieve.

Q. 12. Do you consider that ComReg should allow or support the differentiation of different VoIP service types using distinctive number ranges?

Q. 13. Do you agree with the opinion that the selection of a number range to facilitate the provision of VoIP services should not be predicated on the quality of those services?

Q. 14. If not by number range, how can consumers be best informed about the expected quality of service?

4.5.2 Views of Respondents

Most respondents felt that this approach is unnecessary, and would needlessly complicate and potentially confuse the situation for both consumers and service providers. Given that VoIP services are in their infancy, it was felt that it is not practical to pre-empt their development by stating at this stage what attributes might differentiate the services.

One respondent was in favour of this proposal, provided that the benefit to consumer or industry was justified, while another felt that if the numbers used are from existing geographic or non-geographic ranges, the quality of service offered to consumers should be on par with that offered on the PSTN.

A typical viewpoint was that different elements make up the quality of experience that a consumer can enjoy; including reliability and availability of service. These elements may not be under the control of the service provider, who may not enjoy complete control over the access infrastructure. Nevertheless, consumers may wish to sacrifice quality in exchange for a lower cost to them, or vice versa. Indeed some respondents would consider intervention in this area to be micromanagement by ComReg, preferring instead that market forces should determine the quality of service that a consumer chooses.

4.5.3 Commission's Position on service differentiation via numbers

ComReg agrees with respondents that differentiation between VoIP services by means of number range should be avoided. There are many arguments for this, not least being the difficulty of monitoring and controlling any choices made on an ongoing basis. Indeed, even deciding exactly which service types should be included in each different number range would be problematical, considering that many innovative service types have not yet been definitively market tested. This approach could also be potentially confusing for consumers and limiting for service providers who may be restrained from up or downgrading their services as time passes and markets develop.

It is, of course, essential that the consumer be well-informed as to what level of service can be expected from each product, but numbering has only a very limited function in such matters. ComReg agrees with the respondent who summed up the situation regarding consumer safeguards thus: *It is the task of a provider of telecommunication services to inform its subscribers of the quality of the service. Article 22 of the European Universal Service Directive offers Member States the possibility to require providers of publicly available electronic communication services to publish comparable, adequate and up-to-date information for end-users on the quality of their services.*

<p>Decision No. 10. Separate access codes or number blocks will not be used to differentiate between different categories of VoIP services for the immediate future.</p>
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4.6 Number Portability

4.6.1 Summary of consultation issues

Number portability for PATS is mandated in the Universal Service Regulations and further detailed in the Numbering Conventions. All existing fixed and mobile network operators are obliged to offer number portability. In the case of geographic numbers, only operator number portability is allowed, i.e. the consumer is only permitted to port their number to a new operator, not to a different MNA. An underlying principle of number portability is that it should work in both directions, which also means that a porting customer can always revert back to the original 'donor' operator.

ComReg stated that if a new number range was opened specifically for the purposes of VoIP services, then in principle the requirement for non-geographic number portability (NGNP) should be extended to it, on a voluntary basis at first but later as a solid requirement to which consumers are entitled. It was expected that these

porting arrangements would initially only apply for porting between IP networks, not from IP onto PSTN networks (or vice versa).

ComReg noted that the question of porting (in either direction) between PSTN based services and VoIP services is not straightforward and invited inputs on this issue.

Q. 15. ComReg invites comments on the Number Portability (NP) issues.

- a) Do you agree that NP should be required between PSTN and VoIP operators for geographic numbers? Please comment on your answer.**
- b) Do you agree that NP should not be required between PSTN and VoIP operators for personal numbers (if these are permitted to be used for VoIP purposes), in view of the existing complexity of personal numbers even without taking inter-technology issues into account?**
- c) If existing number ranges (e.g. geographic or personal numbers) are allowed for use with VoIP services, do you agree that NP should be required between different (but compatible) VoIP operators?**
- d) If (a) new number range(s) are designated specifically for VoIP and/or other new technologies, do you consider that NP should be required for these between different (but compatible) operators of such services, either from the outset or at a later more mature stage of the market?**

4.6.2 Views of Respondents to part (a)

Most of the respondents feel that geographic number portability between PSTN and VoIP operators is desirable in order to allow sufficient competition to develop between established and new entrants into the market. It was felt that most subscribers will want to keep their existing numbers, and therefore NP is required in order to allow these consumers to select the service type of their choice. The point was made by several respondents that if number portability was offered, it must be done in a symmetrical way, i.e. that if a consumer is able to port a number into a network, he or she must also be able to port the number out of that network. Furthermore, in any cases where there are restrictions on porting, consumers should be informed of this.

One respondent pointed out that the use of a number now transcends PSTN routing for voice purposes and some consumers may wish to use it instead to reach other non-PSTN facilities at the IP service layer (using ENUM, as just one example).

4.6.3 Views of Respondents to part (b)

The majority of respondents do not agree that number portability should *not* be required between PSTN and VoIP operators for personal numbers, though it was clear that the concerns of some of these arose through an (unintended) interpretation that such portability would not be permitted.

4.6.4 Views of Respondents to part (c)

Most respondents were concerned that number portability should be permitted with no restrictions between different, compatible VoIP operators, and some felt that it should be a requirement, rather than an option. Several respondents also made the point that number portability should be readily available within number types (e.g. within geographic numbers or within non-geographic numbers), but not across them. The availability of number portability ought to be available therefore based on number type rather than the technology used to provide a service on that number.

4.6.5 Views of Respondents to part (d)

The answers to this question were mixed, though a number of respondents pointed out that for PATS operators, number portability is obligatory. For example, one respondent felt that there ought to be an initial period where number portability is not required, while another consumer felt that it should be required from the outset. Even those respondents who do not support the introduction of a new number range (i.e. some VoIP interests which were concerned that opening of such a range might mean their exclusion from other number types) believe that number portability is important and desirable.

4.6.6 Commission's Position on Number Portability

(a) GNP is both an obligation and privilege that pertains to PATS services and therefore VoIP operators categorised as PATS are entitled to port in geographic numbers from existing operators and are obliged in turn to fully support industry procedures in respect of porting numbers back to them.

ComReg is conscious that non-PATS ECS operators (e.g. ECS-categorised VoIP operators) have no automatic right to GNP and it is consequently not obligatory on other PATS operators to agree to allow their customers to port to those entities. However, where such ECS operators accept the full obligations of GNP on their side ComReg strongly encourages all PATS operators to reciprocate by accepting porting requests from them in the normal way, in the interests of the consumers concerned.

(b) ComReg considers that NGNP is required between PATS VoIP operators and PSTN operators in respect of Personal Numbers and this obligation also extends to other non-geographic numbers. Normal industry procedures will apply to this.

Where VoIP-based ECS operators accept the full obligations of NGNP on their side ComReg strongly encourages all PATS operators to reciprocate by accepting porting requests from them (except for Premium Rate Numbers; see Decision No. 7 above) in the normal way, in the interests of the consumers concerned.

(c) NP between VoIP operators for existing ranges is obligatory in the case of PATS. In respect of ECS, and with the exception of the new '076' number range, ComReg considers that in the interests of the end-user and to avoid discrimination between PATS and non-PATS ECS operators, portability should be an obligation attached to access to numbers, insofar as possible. Therefore, where an ECS operator ports numbers in from another operator (of any kind) that ECS operator must be prepared to allow reciprocal porting out of its own customers to that other operator.

(d) ComReg wishes to reassure those VoIP interests which are worried that the new VoIP number range in any way limits the right to avail of other number types; this is

an additional and better targeted facility, which will be more suitable to VoIP (especially for ECS) but which adds no new access barriers to the provision of other number types.

ComReg also agrees with the viewpoint of those respondents who consider that support for NGNP is obligatory for any PATS VoIP services using this new range to any/all other compatible PATS services (i.e. as for other ranges).

Concerning ECS VoIP services, ComReg is minded to make support of NGNP an obligatory condition attached to Rights of Use for the new VoIP-oriented numbers, in accordance with Regulation 14 of the Authorisation Regulations and items 1 and 3 of Part C of the schedule thereof¹⁵. This is in line with the majority support for NP in the consultation response.

Nevertheless, in order to facilitate rollout of the new range and not unduly burden emerging VoIP providers at this relatively early stage, ComReg will not demand implementation (by PATS or ECS operators) of NGNP for these numbers for the immediate future (See 4.3.3 above).

Decision No. 11. VoIP operators categorised as PATS are entitled and obliged to number portability and other operators shall co-operate with them in operation of the normal GNP and NGNP processes for geographic and non-geographic numbers, respectively.

Decision No. 12. VoIP operators categorised as ECS (but not PATS) are required to support number portability from their side for any numbering designations they hold and other operators are strongly encouraged to co-operate with them in operation of the normal GNP and NGNP processes for geographic and non-geographic numbers, respectively.

Decision No. 13. In line with Decision No. 7 above, dealing with allocation of Premium Rate Numbers, ECS operators (which are not PATS) are not deemed eligible to port in Premium Rate Numbers from other operators at this time.

Note: Decision No. 8 above includes coverage of number portability in respect of the new '076' non-geographic number range.

4.7 Retail Tariffing and Interconnection Issues

4.7.1 Summary of consultation issues concerning tariffing

For the purposes of call origination, ComReg put forward the principle that the retail price for delivering a call from the PSTN to an IP operator's interconnect gateway should in principle be no different from that for delivering from the same PSTN point to any other operator's network.

If existing numbers are allocated for VoIP services then it seems reasonable that existing rules for these numbers in respect of retail tariffs, settlements and retention should apply equally to VoIP operators.

¹⁵ See also Authorisation Directive 2002/20/EC Article 30 and Recital 40.

ComReg does not regulate individual tariffs, but may impose tariff ceilings to aid consumer recognition and understanding. ComReg believes that the cost of a call to new “VoIP numbers”, should be no more than the standard national rate, and expects that in many cases it will be substantially lower than this.

Q. 16. Do you anticipate any undue difficulties in respect of commercial negotiations between operators (whether existing or new market entries) in respect of the development of tariffs for new VoIP services, whether based on existing or new number ranges?

Q. 17. If yes, what broad criteria should be applied to these tariffs?

Q. 18. Specifically, would you agree with ComReg’s proposal that the maximum retail tariff for calls from PSTN to VoIP destinations in Ireland (i.e. where the PSTN/VoIP gateway or the final destination is in Ireland) should not exceed national rate for the originating PSTN network? Please comment on this and on the corresponding situation where any VoIP network that may be subject to regulation originates such a call, where the termination may be on a) PSTN or b) IP. If you feel national rate is excessive for VoIP, would you alternatively consider that local rate is a practical alternative maximum amount to set down?

Q. 19. Alternatively, is there merit in allowing totally free market competition to set the retail tariff without any number-related indication for customer transparency of the maximum permitted retail prices? If ‘yes’, is it also your view that commercial negotiations can generally be concluded sufficiently quickly without such a retail ‘starting point’?

4.7.2 Views of Respondents

Most respondents feel that no undue difficulties or delays will be experienced in respect of commercial negotiations between operators. Two respondents were concerned however that existing PSTN operators may choose to leverage their market power by artificially inflating the retail costs of calls to non-geographic VoIP numbers. One respondent felt that differences in business models between the PSTN and IP worlds may complicate negotiations between the two with respect to the respective revenue sharing.

A very strong argument in favour of ComReg setting an initial VoIP industry retail price point for the new VoIP non-geographic number was advanced by one (fixed line) operator, based on recent experience with non-geographic numbers. It was noted that, while most PSTN-to-VoIP calls will be originated on *eircom*’s network, the *eircom* billing system cannot easily handle multiple prices for the same number range, thus limiting the flexibility available to individual VoIP operators to have

their own differentiated termination rates. This operator recommended that ComReg should develop a very focused industry agreed implementation plan, along the lines of that used for introduction of the Premium Rate Services framework discussed in ComReg 03/54R¹⁶.

Nevertheless, the overwhelming view of respondents, including VoIP-based respondents was that this issue can be dealt with best by free market forces. Some comments reinforce the opinion that calls within Ireland to VoIP numbers should be treated for the purposes of tarriffing as local calls. Another respondent feels that the important issue is simply that VoIP operators should be able to compete with existing operators.

4.7.3 Commission's Position on tarriffing

ComReg notes the carefully reasoned – albeit reluctant - arguments in favour of intervention on tariffs advanced by one operator, and accepts that these are based on recent industry experience.

ComReg believes that retail pricing of the “076” number range is, subject to being at or less than the standard national rate, a matter for industry to resolve. Given the current limitations of retail billing systems all calls to 076 numbers may initially have to have the same retail tariff and ComReg anticipates that this will be resolved in a similar manner to PRS numbers. See Section 4.7.6 for a discussion on wholesale settlement and retention arrangements.

ComReg is therefore minded to encourage negotiations to proceed of their own volition while only taking action when necessary i.e. in situations where the dispute resolution procedure is called into play. This approach is subject to modification in due course if the development of the market is judged to be hampered by a lack of success in the normal negotiations process.

ComReg will only initiate moves in respect of tarriffing for VoIP services at the retail level as discussed above. Should ComReg receive appeals or complaints from VoIP operators or if it considers that market development or competition are being impeded or unduly slowed through failure or lack of balance in commercial negotiations, further intervention may be required.

4.7.4 Summary of consultation issues concerning settlement and retention

ComReg stated it considers that arrangements for negotiation of wholesale interconnection agreements for existing numbers can serve as a template for the negotiation of new interconnection agreements covering VoIP numbers. ComReg believes that these interconnection matters should be negotiated directly between the operators involved.

ComReg also noted that various regulations require all network operators to open access from their networks to all relevant numbers that are allocated by ComReg, subject only to commercial negotiations. It is expected by ComReg that operators using IP technology may have a smaller cost base. These commercial negotiations are a matter between operators. However, any operator who is designated with Significant Market Power (SMP) is regulated and as such, interconnection agreements may be subject to their published Reference Interconnect Offer (RIO).

¹⁶ See ComReg documents “Review of the Premium Rate Services Numbering Scheme - Consultation” ComReg 03/27 and “Review of the Premium Rate Services Numbering Scheme – Response to Consultation” ComReg03/54R

- Q. 20. Do you agree that the *wholesale* settlement and retention arrangements that would apply to any usage of existing number ranges for VoIP purposes should follow existing PSTN arrangement, or do you consider that VoIP represents a special case which would necessitate changes?**
- Q. 21. Do you agree that retail, settlement and retention principles that would apply to any new VoIP non-geographic number range could be quickly determined based on existing arrangements for other non-geographic services (and non taking account of the special case for Premium Rate services)?**
- Q. 22. Do you agree with ComReg's position on the VoIP interconnection issues of opening of number ranges, call termination and call origination?**

4.7.5 Views of Respondents

Most respondents agree that existing PSTN arrangements with respect to the wholesale settlement and retention arrangements should equally apply to the use of existing number ranges for VoIP services, with one VoIP provider stating it would be wrong to consider VoIP as a special case. The arguments used to back this up include the fact that wholesale settlement and retention arrangements between the PSTN and IP worlds should be broadly similar, if not identical, to those already in place. Standard interconnection offers for geographic and non-geographic numbers already exist and these should be used wherever possible. This should also be possible if a number range is set aside for the exclusive use of VoIP services. Nevertheless, one respondent felt that ComReg should set regulated wholesale prices for wholesale IP services, while another suggested that if difficulties do arise in respect of commercial negotiations, ComReg should be prepared to step in with dispute resolution measures.

Most respondents agree that existing arrangements for non-geographic numbers could be used as a template for any new VoIP non-geographic number range, though one felt that further discussion may be needed at an industry level to determine the most appropriate interconnection arrangements. Another respondent suggested that as the cost of conveying a call on an IP network should normally be less than that on the PSTN, the VoIP network retention might in turn be lower than that of a PSTN network.

Although most respondents agreed that the routing of a VoIP call from a PSTN caller to a PSTN - IP gateway should pose no commercial difficulty, some expressed concern that multiple price points within the same STD are unattainable in the current situation. One respondent felt that further discussion at industry level may be necessary to resolve this.

4.7.6 Commission's Position on settlement and retention issues

ComReg is encouraged by the consultation responses to believe that a pro-active regulatory position on wholesale settlement and retention rates and/or retail rates for all number ranges, other than the 076 number range, is not only unnecessary but

would – at least at this stage – not be welcomed by those affected. The responses suggest that existing PSTN commercial processes can be expected to work equally well for VoIP services entering the market.

Decision No. 14. For all number ranges other than 076 ComReg will not initiate moves in respect of interconnection, settlement or retention terms for VoIP services but may instead respond, if necessary, to appeals or complaints from VoIP operators if it considers that market development or competition are being impeded or unduly slowed through failure or lack of balance in commercial negotiations.

Furthermore, it should be expected that preceding arrangements for non-geographic numbers (such as the previously mentioned Premium Rate Services Numbering Scheme) can act as suitable templates to bring the new VoIP ‘076’ number range efficiently into operation. Payment flows and settlement arrangements will be in line with practice for existing Number Translation Codes (NTCs). It will therefore be necessary to publish regulated retention rates and ComReg will direct eircom to provide it with a submission in this regard. ComReg proposes that this rate, which will of necessity be based on forecasts, would remain in force as a final rate until 31 March 2005 and as an interim rate for 2005/06. ComReg envisages that this rate should be published as soon as retail pricing arrangements have been finalised.

Decision No. 15. For the 076 number range new retention rates will need to be established, and where operators have existing SMP obligations relating to retention rates these obligations will apply equally to the retention rates for the 076 number range.

4.8 Calling Line Identification

4.8.1 Summary of consultation issues

ComReg believes that unless the status of the CLI can be guaranteed then it should either not be displayed, or come with some sort of health warning. In such circumstances, it should be displayed as “Unavailable” before being handed over to the PSTN from a VoIP source.

Q. 23. Do you agree with ComReg’s view that unless the unaltered status of CLI on VoIP services can be guaranteed with a very high degree of certainty, it should either come with a ‘health warning’ to this effect, or else not be displayed – and in any case should be ‘Unavailable’ for PSTN purposes?

4.8.2 Views of Respondents

The use of an “Unavailable” flag for the purposes of an unidentifiable or unconfirmed CLI was generally accepted by many respondents. Others, however, cautioned that a high level of security is necessary to successfully operate VoIP services and therefore the CLI ought to be guaranteed. An individual response stated that CLI can also be and is manipulated on the PSTN by end-users (‘blue-boxing’;

‘phone-phreaking’) as well as by unscrupulous and fraudulent service providers. This respondent felt that, in order not to reduce the credibility of VoIP, CLI should only be invalidated for VoIP services after repeated serious issues of hacking/fraud have occurred, of a magnitude significantly greater than occurs on the PSTN. Another, conversely, argued strongly that CLI for VoIP calls must be transmitted with absolute certainty if it is to be permitted at all, while noting that the US National Institute of Standards and Technology has published a study “Security Considerations for Voice Over IP Systems; NIST Special Publication 800-58” that draws attention to the greater risks of VoIP where calls traverse the Internet.

4.8.3 Commission’s Position on CLI

ComReg continues to have serious concerns with the risk of abuse of CLI. Not only do important privacy issues arise but there is potential for financial loss or even – in extreme cases – for harmful indirect consequences such as loss of life or property. ComReg also believes that these risks are likely to be much greater where calls pass over certain VoIP networks or services than when they are confined to the traditional PSTN¹⁷. ComReg considers this risk may arise in respect of CLI received by the PSTN from certain VoIP sources but also in respect of the handling and security of CLI passed from the PSTN to some VoIP services.

Nevertheless, while remaining alert to any instances of CLI abuse, ComReg is persuaded by the arguments received in favour of treating VoIP services as trusted sources/sinks for CLI. It could hamper the growth of VoIP services to do otherwise and ComReg also accepts that already in the PSTN world there exists the same presumption of trust, despite some past abuses. This trust of VoIP services should extend in an unqualified fashion to all network segments fully under the VoIP operator’s control (e.g. VPNs) and likewise to any Internet segments where appropriate and stringent end-to-end¹⁸ security measures are taken to guarantee privacy of the data. In any case where such traffic over the Internet is not strongly protected, all CLI should be set to “Unavailable” by the operator handling that traffic at its entrance/exit nodes to the Internet.

It should also be noted that the provision of CLI is bound by legislation governing the protection of personal data and privacy, in particular, the Data Protection Telecommunications Directive (2002/58/EC). This particular piece of legislation falls under the remit of the Data Protection Commissioner¹⁹.

Decision No. 16. Calling Line Identification (CLI) for public subscriber numbers from the national numbering scheme must only be provided by VoIP operators who are in a position to fully guarantee its veracity, i.e. where the call traffic is over fully secured networks and does not pass unprotected over the public Internet. If the CLI

¹⁷ The NIST document referred to above suggests as much but other sources could also be quoted e.g. <http://www.securityfocus.com/news/9061> (also quoted in Dow Jones Newswires – see <http://www.totaltele.com/vprint.asp?txtID=109545>)

¹⁸ This means end-to-end within the context of each individual operator’s control where more than one is involved. If doubt exists, then ComReg considers that in the interests of privacy, the safe designation of “unavailable” must be applied.

¹⁹ <http://www.dataprivacy.ie>

cannot be guaranteed, then in the interests of privacy, it must be set to “Unavailable”.

4.9 Carrier Pre-Select

4.9.1 Summary of consultation issues

ComReg stated it did not believe that calls originating from VoIP services can be easily made amenable to CPS. However callers who wish to contact those consumers that use VoIP services should be able to do so using CPS services. Normal principles governing non-geographic numbers for CPS services should apply.

Q. 24. Do you agree with ComReg’s view that in principle VoIP origination is incompatible with CPS, while PSTN origination to VoIP numbers can follow principles already established for other non-geographic numbers?

4.9.2 Views of Respondents

There was almost universal agreement with the opinion that VoIP origination is incompatible with CPS, with one summing this position up as ‘*VoIP is a market solution to competition, whereas CPS is a regulated one*’. Some respondents were keen to emphasise that the ‘incompatibility’ between CPS and VoIP lies not in the technical implementation, but rather that currently, CPS describes a technical solution that allows PSTN users to select the operator who carries their calls. Two respondents raised an important point to the effect that any decision taken regarding CPS may have implications on Universal Services obligations. Thus any decisions taken by ComReg should take these existing obligations into consideration and ensure that they are carried forward.

It was also a general opinion by those who are involved in the CPS market that “*origination from PSTN to VoIP numbers can be handled under existing principles*”, agreeing with ComReg’s position that the general principles affecting CPS in respect of other non-geographic numbers would apply equally in the case of the new ‘076’ number range.

4.9.3 Commission’s Position on CPS

ComReg notes the broad agreement with its position and accordingly accepts that no steps need to be taken *at this stage* in respect of CPS for VoIP. ComReg will keep this matter under active review. ComReg also accepts the clarification from some respondents that, while it brings no obvious advantages from a business or regulatory perspective, it could be technically feasible to apply CPS to VoIP services.

ComReg also agrees with respondents that are already engaged in CPS that PSTN calls to VoIP numbers can be handled under existing principles and therefore expects that the procedures and timelines used in respect of the introduction of other number ranges into the CPS “All-Calls” option can be reused in respect of the introduction of the new VoIP number range. Actual timelines will be agreed between *eircom* and the CPS operators in due course.

Note: At a substantive level, ComReg would not refuse to support any future request for CPS by some VoIP operator which demonstrated that a combination of CPS and VoIP made business sense for it.

4.10 Directory Enquiries

4.10.1 Summary of consultation issues

Subscribers to PSTN services currently have the right to an entry in a telephone directory. ComReg believes that this right should be afforded to subscribers of VoIP services, notwithstanding the fact that it may not be implemented in the short to medium term due to practical or market development reasons.

Q. 25. ComReg invites responses from interested parties on the topic of Directory

Enquiry entries for VoIP users availing of public telephone numbers.

a) Should a listing in a publicly available directory be available to all subscribers to these VoIP services?

b) Should this directory be linked to the National Directory Database (NDD), if separate?

4.10.2 Views of Respondents

Respondents mostly agree that subscribers should be entitled to have a listing in a publicly available directory, although one respondent feels that this should be market rather than regulation driven and others note that the right to a listing only applies to subscribers to PATS services. There was also general agreement that where a listing is provided, this should be linked to the NDD. One respondent did caution that the integrity of the NDD must be paramount.

4.10.3 Commission's Position on directory entries

ComReg considers that where a VoIP service is designated as PATS then it is obliged to facilitate its customers in obtaining a directory listing for its customers in the public telephone directory operated by the designated Universal Service Provider (currently *eircom*). The decision on whether to avail of such a listing is for each individual customer to decide. Such a VoIP PATS service is also obliged to provide customer data to the NDD, but again where the customer has consented to this. Where a VoIP service is classified as an Electronic Communications Service (ECS), there is no *obligation* to provide a directory listing for customers. ComReg is of the view, however, that this is likely to be a service that will be demanded by the market and that service providers (both VoIP operators and directory providers) will wish to provide this facility.

Decision No. 17. Those who offer VoIP services that are classified as PATS are obliged to offer their customers a listing in the National Directory Database (NDD) and also to facilitate directory inquiry services and operator assistance. This obligation is specified in the

Universal Service regulations²⁰. ComReg encourages VoIP operators and directory providers to also offer this important service to users of ECS services.

4.11 Terms and Conditions of Use

4.11.1 Summary of consultation issues

ComReg expects that operators intending to apply for block of numbers (whether for existing or new number ranges) should follow existing application procedures and abide by the terms and conditions already in force. Added to this, ComReg proposed a number of further terms and conditions that might apply to allocations of numbers dedicated to VoIP services. These cover the conditions of use over and above those that are indicated in the National Numbering Conventions²¹, and cover eventualities such as the procedure to be taken if the status of the service provider changes, and the limitations of secondary number allocation.

Q. 26. ComReg calls for comments regarding these terms and conditions. Do you feel that these are appropriate to the proposed use of numbers for VoIP services? Are there any conditions of use that are unnecessary or (conversely) omitted from this set? Respondents are invited to respond to these issues, with suggested alterations if so desired.

4.11.2 Views of Respondents

There is broad acceptance of the terms and conditions that ComReg has proposed, except for condition 5:

“VoIP numbers are issued for use within Ireland but occasional nomadic use outside Ireland (e.g. for travel by the number-holder) is permitted. Where continuous use occurs outside Ireland (e.g. for any continuous period of more than 6 months) and/or for longer-term nomadic use where more time is spent outside Ireland than inside, then a number or numbers from the visited country (countries) should be obtained.”

Four of the respondents thought this condition could inhibit the growth of the VoIP market and be very difficult to police, both by the service provider and ComReg; conversely one (VoIP-based) respondent considered condition 5 to be very progressive in its acceptance of nomadicity. Arguments advanced against condition 5 were that it would inhibit non-resident businesses setting up nominal presences in Ireland; that Irish citizens might (permanently) use VoIP numbers from other countries here so the converse should also work (and both should be permitted); and that no similar rule applies to mobile numbers, whose operation is in some ways analogous.

²⁰ Article 4 of Universal Service Regulations

²¹ ComReg document 04/35, available from <http://www.comreg.ie/fileupload/publications/comreg0435.pdf>.

Some responses emphasised the need to ensure transparency for the consumer in respect of termination charges to the numbers, as well as any limitations on support for number portability.

4.11.3 Commission's Position on terms and conditions for '076' numbers

ComReg welcomes the broad support for its proposed terms and conditions for the new '076' range of numbers dedicated to VoIP (and similar or related services) and will use these as the basis of its designation for the new range and for associating conditions of use. ComReg also notes the concerns of some respondents with condition 5 permitting nomadicity but not permanent use of Irish numbers outside the State. Having studied these responses ComReg agrees they have merit in the case of this specific range of numbers (and possibly certain other non-geographic numbers), so long as number shortage is not imminent on the range. ComReg is therefore minded to remove condition 5 from the list and instead to insert a more liberal requirement that service providers must develop policies for sub-allocation of the numbers only to recipients which are either Irish based (at the time of allocation) or alternatively who have some clear association with Ireland, current or historical. The resultant high level of flexibility that the range offers will also act as an incentive to sway user preferences towards the new VoIP range, as against geographic numbers. Revised terms and conditions are attached in Annex 1.

ComReg notes that some responses to the above question appeared to address all number types, rather than just the new '076' range that was the focus of the question. In that respect, it should be noted that geographic numbers convey a clear regional context to (calling) consumers and ComReg is not in favour of diluting this transparency by permitting allocation of numbers to those who are not resident in the MNA. The need for this transparency cannot be superseded by the interests of the number-holder, who might prefer to disguise her true location, as in many cases the caller (who is actually the bill payer) may be deliberately setting out to select a service that is locally based. In addition, as stated elsewhere herein, there are other important reasons for restricting nomadicity of geographic numbers (e.g. their greater vulnerability to exhaustion means not enhancing their "attractiveness"). While ComReg accepts the views of some respondents that policing such restrictions is not a simple task, it seems fair to state that any serious and large-scale abuse would quickly become apparent, and the risk and impact of corrective action would represent a significant deterrent to abusers.

Decision No. 18. ComReg will adopt conditions of use for the new '076' number range broadly as described in the consultation document ComReg 04/72 but with a more liberal approach to nomadicity. The draft²² text of the conditions of use is attached hereto as Annex 1.

²² The text is draft in the sense that it may be altered in detail but not in orientation, to suit the format of the National Numbering Conventions and/or Numbering Applications documents

5 Consumer Awareness of ECS limitations

Much of the worldwide debate surrounding VoIP issues focuses on the need to educate the consumer as to the differences between traditional PSTN products and VoIP products. Earlier sections of this document have alluded to this need for consumer awareness measures concerning any limitations on VoIP²³ services to which they subscribe. The need for this arises in the context of subscribers dialling telephone numbers, of which they have certain expectations, based on PSTN experience and history over many years. There can be no objection to a customer knowingly selecting any particular service, complete with limitations, so long as the selection is done with full knowledge of what to expect and accordingly ComReg considers that steps will be needed to impart this knowledge to the consumer.

In general, current IP networks are not yet built with the same degree of redundancy as the PSTN, and therefore cannot offer the same reliability. In addition, fundamental services expected by consumers that are inherent to the PSTN cannot yet be offered with the same degree of certainty on IP networks. For instance, consumers can be reasonably certain that dialling '112' or '999' on a PSTN phone will give them access to the emergency services, while the same cannot yet be argued for VoIP services, and caller location capability for emergency calls is currently even more difficult for VoIP services. Another important issue is that the *purchasing* consumer is not always the *actual* user of the product. Any person can have access to an IP phone, which can look like a regular telephone and it is therefore important that these 'secondary' users of VoIP services are also aware of limitations in emergency access. Specifically in relation to the provision of access to emergency services, it should be noted that international groups such as the Internet Engineering Task Force (IETF²⁴) are currently working on solutions to this issue, and ComReg would strongly recommend to those intending to offer VoIP services that they keep abreast and where necessary implement these solutions.

Some other issues that have been discussed in which potential limitations of (non-PATS) ECS services can arise include number portability (discussed earlier, in detail) and in-line powering of terminals. Traditional fixed phones are powered from the telephone exchange rather than any localised power supply. Nevertheless ComReg is aware that the increasing prevalence of battery operated mobile phones and DECT phones has made consumers more aware of the fact that this type of equipment can and does fail, sometimes in the most awkward of circumstances. It is important, however, that consumers are made aware of the consequences of this and that a directly connected PSTN phone may be the only absolute guarantee of being able to access emergency service agencies at any time.

One other important education issue is that of quality. ComReg accepts that the quality of VoIP services differs from that offered by the PSTN, potentially offering a higher level of quality. As mentioned in our consultation document ComReg 04/72, ComReg believes that quality is an issue that is best regulated by the market, and it is reasonable to expect that differentiation of products will, at least at the beginning, and not exclusively, focus on price or quality. In order to enable consumers to judge

²³ Although reference is made here to VoIP, the same need would arise in respect of any ECS service that offered different capabilities to what the consumer traditionally expects from the telephone service.

²⁴ <http://www.ietf.org>

for themselves, it is essential that quality of service standards and statistics be readily available, and in a standardised format. This will allow consumers to choose the VoIP product that suits them best.

It is the opinion of ComReg that these issues need not hinder the roll-out of VoIP services, but it must be ensured that the consumer is aware of any fundamental differences from traditional telephone service performance when taking up the new products.

How these limitations are most effectively communicated to consumers is still a matter of some debate but at this stage ComReg supports the approach suggested by the European Commission²⁵ that at a minimum the consumer should be advised of them within the SP-subscriber contract. Decisions about consumer awareness have therefore been made at various points in this document based on that approach, pending wider analysis and identification of possible alternatives. However, the issues of exactly what information should be imparted to consumers and whether other mechanisms than the customer contract might be best, remain open for discussion in the longer term and ComReg intends to include this matter in its 12 month review, mentioned earlier in this document. For example, it is arguable that more immediate point-of-use advice (or alert) might be needed for users of VoIP handsets concerning '112'/'999' calls, bearing in mind they will not always be the actual subscribers and may be unaware that support is different.

ComReg has found from past experience that the co-regulatory approach works well in Ireland, based on an industry forum set up with terms of reference aimed at tackling some specific problem. It will, as part of its 12-month review consider the setting up of such a forum to address the overall question of consumer education, and taking into account the Irish consumer experience of VoIP in the meantime. A possible outcome could be an industry Code of Practice for dealing with consumers that on the one hand encourages a positive view of the benefits of VoIP, while on the other hand ensuring that consumers receive proper guidance on any characteristics or limitations of individual VoIP services compared with their expectations. The question of whether such a Code should then be voluntary or become mandatory can be decided by the review, though it is clear that ComReg has relevant powers under Regulation 18 of the Universal Service Regulations as well as relevant objectives concerning promotion of the interests of users under Section 12(2) (c) of the Communications Regulation Act of 2002. ComReg would be reluctant to take the mandatory approach if experience shows a good level of transparency from existing VoIP providers, unless those providers considered it to be in their own interests to have a regulatory backing to the Code. Such a forum would be open to all interested parties and ComReg encourages the industry to work voluntarily towards its own Code between now and the time of the review; any voluntary code – which should be the work of as wide an audience as possible - could be submitted to ComReg at any time during the next 12 months in order to be considered in the review.

Although it is in the context of VoIP that these consumer education issues have arisen, it should be noted that they apply equally to all ECS providers, irrespective of the types of numbers they use or the ECS technology they employ.

²⁵ European Commission consultation on the Regulatory Treatment of Voice over Internet Protocol (VoIP), which closed on 31 August 2004.

6 Next Steps

In light of the issues discussed in this paper, ComReg must now consider the necessary steps to take in order to facilitate the speedy introduction of VoIP services into Ireland.

As mentioned in Section 5 above of this paper, consumer education is seen by ComReg as a very important element that must be introduced in line with new products. This is especially true for products that are not direct PSTN-substitutes, where service providers may not be able to guarantee the same level of service as provided by the PSTN. End-users will need to be clearly informed that products that are classified as ECS, for instance, may not be able to guarantee access to emergency services. In order to promote consumer awareness with respect to new VoIP services, ComReg intends to facilitate industry co-operation by working with providers of VoIP services to ensure a considered and consistent approach. To this end an industry forum may be set up whose terms of reference could include development of a common industry consumer guide. Helpful entries for the telephone directory can also be considered (e.g. how/where a consumer may safely verify what level of emergency access is available, what happens in event of power failure etc). This has been discussed in Section 5.

ComReg will make geographic, personal numbers and other existing non-geographic numbers available immediately. In relation to the practicalities of the number application procedure, operators, as mentioned previously in this document, may offer services that fall into one of two categories, Electronic Communications Services (ECS) and Publicly Available Telephone Services (PATS). The definitions of each are set down in Irish legislation²⁶, and can be seen in full, along with the rights and obligations that accrue to each classification in Annex 2.

Applications for these numbers will be accepted from the 11th of October 2004. The application procedure for these numbers remains the same as the existing application procedure, which is detailed in ComReg document 04/36, though ComReg may request additional information from ECS applicants, if necessary.

A number of practical steps need to be completed before the '076' number range will be opened. Retail and interconnect billing agreements must be put in place, and negotiation must occur between individual operators on interconnection issues. ComReg believes that a very focused project plan, along lines similar to that used for the introduction of the Premium Rate Scheme, should be used, targeted at a very efficient introduction of the '076' number range.

It is expected by ComReg that since the overall expectation of respondents was that no undue difficulties would be met in respect of commercial negotiations between operators, that the opening of the '076' number range should be completed as efficiently and quickly as possible, certainly by the end of this year. ComReg therefore expects that services could be launched on the '076' range from the 1st of January 2005.

²⁶ "PATS" is defined in the Universal Service Regulations. "ECS" is defined in the Framework Regulations.

The '076' number range will be allocated as mentioned from the date shown above. A first come first serve approach will be taken in relation to the actual allocation of numbers. This approach will apply unless a very large number of applications is received such that a fair and balanced mechanism has to be utilised to ensure that all applications are treated equally. One such mechanism could be a lottery, and the actual method used will be at ComReg's discretion. Interested parties should contact ComReg for a temporary application form, which will be used prior to the updating of ComReg document 04/36.

As previously mentioned, ComReg will review the progress of marketplace introduction of VoIP services in Ireland after a period of twelve months in the light of decisions now being made, to decide what further actions, if any, are needed. At that stage it may be necessary to seek certain information²⁷ from those who are active in this market in order to provide a reliable basis for any changes. The review will cover the general development of the market *per se* and will attempt to ascertain if obstacles exist that are stunting this development and, if so, what possible action can be taken to mitigate these. The review will also take account of ongoing developments and harmonisation efforts at European and/or worldwide level that could impact on the progress of VoIP in the marketplace.

A range of numbering decisions have been made as a result of this public consultation and as these impact the National Numbering Conventions and the numbering applications procedures, those documents will be amended accordingly in due course.

²⁷ Such a request would be made in accordance with Article 17 of the Framework Regulations.

Appendix A – Legislation

Framework Regulations means the European Communities (Electronic Communications Networks and Services) (Framework) Regulations, 2003 (S.I. No. 307 of 2003).

Universal Service Regulations means the European Communities (Electronic Communications Networks and Services) (Universal Service and Users' Rights) Regulation, 2003 (S.I. No. 308 of 2003).

Section 4 of the Consultation document ComReg 04/72 states:

”In accordance with the terms of Regulation 22 of the Framework Regulations, ComReg is vested with the responsibility for administering the national telecommunications numbering resource, while under Regulation 14 of the Authorisation Regulations²⁸; ComReg has a statutory obligation to define conditions to be attached to rights of use of numbers. As such, ComReg must now decide whether numbers are to be allocated for VoIP services, and if so, must decide which type(s) of number to allocate and under what conditions of use. This paper seeks views on these matters that will guide ComReg in making its numbering decisions.”

²⁸ European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations, S.I. 306 of 2003 (The Authorisation Regulations).

Appendix B – List of Directions and Decisions

Decision No. 1. Geographic numbers will be allocated to VoIP PATS applicant operators in the same manner and under the same conditions as for PSTN operators. 12

Decision No. 2. Geographic numbers will be allocated to ECS VoIP operators in MNAs where no risk is foreseen of number changes even allowing for a large build-up of demand for VoIP during the next 5-10 years. Agreement to certain conditions will also be a condition of such allocation to ECS operators: a) They must be willing to fully support GNP on a full reciprocal basis for their part. Notwithstanding this, they must advise any customers to which they allocate geographic numbers as well as porting-in customers, that it may not be possible for them to port out those geographic numbers to some other operators; c) They must limit geographic number allocations to consumers to a maximum of two numbers per registered user, except if agreement is specifically given by ComReg to exceed this in special circumstances; d) They must undertake reasonable efforts to ensure delivery of '112' and '999' calls to the emergency services is achieved and users must be advised of any limitations; e) They must at least advise consumers in their contracts of any other limitations of their service (including delivery of calls to the emergency services) vis-à-vis what those customers might legitimately expect compared with what would traditionally be expected from a PATS service. 13

Decision No. 3. A new condition specifically attached to rights of use for geographic numbers, that has immediate effect, is that Irish geographic numbers shall not be allocated to end-users or termination nodes located outside the MNA. *Note: this condition was always implicitly understood in respect of PSTN technology, where the end-user is located at the PSTN termination point.* 13

Decision No. 4. Mobile numbers will not be made available for VoIP purposes for the immediate future. 15

Decision No. 5. Non-geographic numbers will be allocated to VoIP PATS applicant operators in the same manner and under the same conditions as for PSTN operators. 15

Decision No. 6. Non-geographic numbers will be allocated to ECS VoIP operators to support the following services: (i) Freephone; (ii) Shared cost calls (iii) Personal Numbered services (iv) Universal Access Services. Agreement to certain conditions will be a condition of such allocation to ECS operators: a) They must be willing to fully support NGNP on a full reciprocal basis for their part. Notwithstanding this, they must advise any customers to which they allocate non-geographic numbers as well as porting-in customers, that it may not be possible for them to port out those non-geographic numbers to some other operators; b) In the case of Personal Numbers, which – along with the new '076' range - are the only non-geographic numbers permitted to originate calls - they must undertake reasonable efforts to ensure that delivery of '112' and '999' calls to the emergency services is achieved or users advised of any limitations on this. c) They must advise consumers in their contracts of any other limitations of their service (including delivery of calls to the emergency services) vis-à-vis what those customers might legitimately expect compared with what would traditionally be expected from a PATS service. 16

Decision No. 7. ComReg will not allocate Premium Rate Numbers to ECS services for the immediate future. 16

Decision No. 8. ComReg will open a new number range 076 XXXXXXXX for use with IP-based services, with VoIP as initial candidate for allocations. The retail tariff ceiling for this new range will be set at standard national rate of the network operator from which the call is made. Additional ranges, based on one or more of the access codes '075', '077', '078' and '079' will be opened later, if

necessary. The numbers will be designated for use where termination to the user should occur for all normal purposes based on IP-related protocols and an E.164 number is required for that termination or to reach a gateway with the PSTN. Full support for (non-geographic) number portability will be the main obligation on all service providers (ECS and PATS) availing of these numbers but mandatory implementation of this obligation will not be phased in until a significant quantity of the '076' numbers is actually in use, or January 2007, whichever comes first. Customers must also be advised of any limitations vis-à-vis traditional PATS in the emergency access service provided when either '112' or '999' is dialled. 18

Decision No. 9.No specific ENUM number range will be designated at this time 20

Decision No. 10.Separate access codes or number blocks will not be used to differentiate between different categories of VoIP services for the immediate future. 21

Decision No. 11.VoIP operators categorised as PATS are entitled and obliged to number portability and other operators shall co-operate with them in operation of the normal GNP and NGNP processes for geographic and non-geographic numbers, respectively. 24

Decision No. 12.VoIP operators categorised as ECS (but not PATS) are required to support number portability from their side for any numbering designations they hold and other operators are strongly encouraged to co-operate with them in operation of the normal GNP and NGNP processes for geographic and non-geographic numbers, respectively. 24

Decision No. 13.In line with Decision No. 7 above, dealing with allocation of Premium Rate Numbers, ECS operators (which are not PATS) are not deemed eligible to port in Premium Rate Numbers from other operators at this time. 24

Decision No. 14.For all number ranges other than 076 ComReg will not initiate moves in respect of interconnection, settlement or retention terms for VoIP services but may instead respond, if necessary, to appeals or complaints from VoIP operators if it considers that market development or competition are being impeded or unduly slowed through failure or lack of balance in commercial negotiations. 28

Decision No. 15.For the 076 number range new retention rates will need to be established, and where operators have existing SMP obligations relating to retention rates these obligations will apply equally to the retention rates for the 076 number range. 28

Decision No. 16.Calling Line Identification (CLI) for public subscriber numbers from the national numbering scheme must only be provided by VoIP operators who are in a position to fully guarantee its veracity, i.e. where the call traffic is over fully secured networks and does not pass unprotected over the public Internet. If the CLI cannot be guaranteed, then in the interests of privacy, it must be set to "Unavailable". 29

Decision No. 17.Those who offer VoIP services that are classified as PATS are obliged to offer their customers a listing in the National Directory Database (NDD) and also to facilitate directory inquiry services and operator assistance. This obligation is specified in the Universal Service regulations. ComReg encourages VoIP operators and directory providers to also offer this important service to users of ECS services. 31

Decision No. 18.ComReg will adopt conditions of use for the new '076' number range broadly as described in the consultation document ComReg 04/72 but with a more liberal approach to nomadicity. The draft text of the conditions of use is attached hereto as Annex 1. 33

Appendix C - Acronyms

CLI (Calling Line Identifier) is a facility that enables identification of the number from which a call is being made.

CPS (Carrier Pre-Selection) is the facility offered to customers which allows them to opt for certain defined classes of call to be carried by an operator selected in advance (and having a contract with the customer), without having to dial a routing prefix or follow any other different procedure to invoke such routing. The CPS operator need not be the access provider.

DDI (Direct Dial In) is a switchboard's capability to route an incoming call to the extension dialled without the intervention of an operator.

E.164 Standard is an ITU-T standard that defines the international public telecommunication numbering plan.

ENUM (Electronic Numbering) is a protocol for converting an ordinary telephone number into a format that facilitates Internet-based look-up of any kind of addressing information.

IETF (Internet Engineering Task Force) The Internet standardisation body.

MNA (Minimum Numbering Area) is a defined geographic area that is equal to or one of a few subdivisions of an STD area. Location portability (of geographic numbers) may not extend beyond an MNA's boundaries, for practical (PSTN-oriented) reasons.

NDD (National Directory Database) is a record of all subscribers in the state, including those with fixed, mobile and personal numbers, who have not refused to be included in that record.

NP (Number portability) between operators enables a customer to transfer from one operator to a second operator, while retaining the same number provided the customer remains at the same address or at least within the same MNA. *Note GNP is Geographic NP and NGNP is Non-geographic NP.*

NRA (National Regulatory Authority) is the relevant regulatory authority in each country. In Ireland, the NRA is ComReg.

SMP (Significant Market Power) The Significant Market Power test is set out in various European Directives, including the Interconnection Directive, the Amending Leased Lines Directive and the Revised Voice Telephony Directive. It is used by the National Regulatory Authorities (NRA) to identify those operators who must meet additional obligations under the relevant directive. It is not an economic test; rather it requires a consideration of the factors set out in the test within a specified market.

STD (Subscriber Trunk Dialling) is another term for NDC (National Destination Code), without any dialling prefix (e.g. '0').

VPN (Virtual Private Network) consists of a private network that may be based around one or more inter-linked 'islands' connected together through secure connections. In addition, the network may include individual outworkers who are also connected through secure connections.

Annex 1 Conditions of Use for new 076 number range for IP-based services

Note: The following text is amended to take account of Commission viewpoints following analysis of consultation responses.

1. Numbers allocated for use for VoIP (and other IP-based) services (specifically numbers that fall under the ITU-T Recommendation E.164) are part of the National Numbering Scheme that is administered by the Commission for Communications Regulation (ComReg). These numbers are subject to the National Numbering Conventions and they are allocated strictly on that understanding.
2. Numbering resources designated for IP purposes shall be assigned to specific termination points or to specific personnel, as appropriate. Both of these categories are deemed to be ‘number-holders’ for the purposes of these Conditions of Use.
3. The number-holder must normally be resident in Ireland or otherwise establish genuine and specific reasons why a number or numbers from the Irish numbering plan should be allocated (e.g. a genuine and strong association with Ireland, current or historical).
4. In accordance with the National Numbering Conventions, it is a condition of allocation that serious and/or repeated contravention of the Conventions is considered to be grounds for immediate withdrawal of Rights of Use to the numbers concerned.
5. Where cases are reported of contravention of any paragraphs above, ComReg’s decision on whether or not to withdraw the number shall be accepted as final, provided that ComReg has first given (or made reasonable attempts to give) the number-holder an opportunity to explain its usage and justify the amount of time during which the number is in use or potentially in use abroad. This is a proportionate and necessary level of control of the numbering plan resources to ensure they are protected, in view of the difficulty of controlling extra-territorial usage and the potential growth of demand for this kind of numbering resource.
6. Allocations of VoIP numbers are currently made without charge. Assignees should be aware that this situation could change in the future.
7. No proprietary rights in respect of these numbers shall be acquired by the Assignee.
8. Primary level Assignees shall immediately advise ComReg of any changes in their status as Service Provider/operator. Further, the Assignee shall advise ComReg of any change in circumstances that may be capable of preventing the Assignee from complying with the conditions of allocation herein and/or any further conditions imposed and/or directions issued from time to time. End user Assignees (i.e. secondary level Assignees) shall correspondingly advise their providers of any changes that might affect their individual number allocations.

Annex 2 Rights/Obligations of Publicly Available Telephony Service (PATS) v Electronic Communications Services (ECS)

“**Electronic Communications Service**” means a service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks, including telecommunications services and transmission services in network used for broadcasting, but excludes:

- (a) a service providing, or exercising editorial control over, content transmitted using electronic communications network and services; and
- (b) an information society service, as defined in Article 1 of Directive 98/34/EC, which does not consist wholly or mainly in the conveyance of signals on electronic communications networks.

“**Publicly Available Telephone Service**” means a service available to the public for originating and receiving national and international calls and access to emergency services through a number or numbers in a national or international telephone numbering plan, and in addition may, where relevant, include one or more of the following services: the provision of operator assistance, directory inquiry services, directories, provision of public pay phones, provision of service under special terms, provision of special facilities for customers with disabilities or special social needs or the provision of non-geographic services or both.

<i>Obligations</i>	Au: Authorisation Regulations; US: Universal Service Regulations; A: Access Regulations; F: Framework Regulations	ECS	PATS
Notification to ComReg	Au 4 Any person who intends to provide an ECN or ECS shall, before doing so, notify the Regulator of his or her intention to provide such a network or service.	Yes	Yes
Contracts	US 17 An undertaking that provides end-users connection or access or both to the PTN shall do so in accordance with a contract.	Yes	Yes
Emergency Services	<p>US 19(2) An undertaking providing PATS at fixed locations shall take all reasonable steps to ensure uninterrupted access to emergency services.</p> <p>US 22(1) Operators offering PATS must ensure that their end-users are able to access free of charge the emergency numbers 112 and 999.</p> <p>US 22(2) Those operating PTNs (i.e. an electronic communications network which is used to provide PATS) must, as soon as practicable, make caller location information available to authorities handling emergencies, to</p>	<p>Best endeavours</p> <p>Best endeavours</p> <p>No</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>

	the extent technically feasible, for all calls to 112 and 999.		
Number Portability	<p>US 26(1) Operators offering PATS shall insure that a subscriber to such service can retain his or her number independently of the undertaking providing the service.</p> <p>For the new '076' range, number portability will be required as soon as is practicable for both ECS and PATS.</p>	No	Yes
Integrity and Availability of Network	US 19(1) The regulator may specify obligations to be complied with by an undertaking operating a PTN at fixed locations, in order to ensure the integrity of the network and in the event of catastrophic network breakdown or in cases of force majeure, to ensure the availability of the PTN and PATS at fixed locations.	No	Yes
Transparency and publication of information	US 18(1) The regulator shall ensure that transparent and up to date information on applicable prices and tariffs, and on standard terms and conditions in respect of access to and use of pPATS is available to end users and consumers in accordance with this regulation.	Best endeavours	Yes
Quality of Service	US 18(4) The regulator may specify obligations to be complied with by an undertaking providing publicly available ECS requiring such undertaking to publish comparable, adequate and up to date information for end-users on the quality of its services.	Yes	Yes
Directory	US 21(1) An undertaking providing PATS shall ensure that its subscribers have the right, without charge, to have an entry in a directory and a directory inquiry service. Article 11 of the privacy directive (97/66/EC) also applies.	All reasonable requests	Yes
Access to directory enquiry and operator assistance services	US 21(2) An undertaking that assigns telephone numbers to subscribers shall meet all reasonable requests to make available, for the purposes of the provision of publicly available directory inquiry services, directories ... , the relevant information in an agreed format on terms that are fair, objective, cost oriented and non-discriminatory.	Yes	Yes
	US 21(3) An undertaking providing a connection to the public telephone network to end-users shall ensure that all such end-users can access operator assistance services and a directory inquiry service.	Yes	Yes

Security and Privacy Obligations	Articles 4, 5, 6, 7 and 9 apply to those providers of PTNs and ECS. These articles cover the technical and organisational measures that must be taken to safeguard the security of its services; as well as the storage and treatment of traffic data.	Yes	Yes
<i>Rights</i>			
Interconnection	A 5 Operators of public communications networks have the right and when requested by authorised undertakings an obligation to negotiate interconnection.	Yes	Yes
Numbers	F 22(3) The regulator shall, subject to ensuring the proper management of the national numbering scheme, grant rights of use for numbers and number ranges for all publicly available ECS in a manner that gives fair and equitable treatment to all undertakings providing publicly available ECS.	Yes	Yes
Carrier Selection and Pre-Selection	US 16(1) Those entities classified as offering PATS may explicitly request access to carrier selection and pre-selection on the network of an operator that has been designated as having significant market power.	No	Yes
Number Portability	As above. Those service providers who expect to port numbers into their network must also be prepared to port numbers out of their network. This is known as reciprocal portability.	No	Yes
Directory	As above. Only subscribers of PATS have the rights to be listed in a public telephone directory.	No	Yes

It should also be noted that those entities who wish to be allocated numbers from the national numbering scheme must also abide by the National Numbering Conventions and any and all terms and conditions of use that accompany the said allocation.

This is not an exhaustive list of rights and obligations. Any entity wishing to operate as an ECS or PATS provider should ensure that they have a full understanding of the requirements which they will need to fulfill.