Commission for
Communications Regulation

Response to Consultation & Consultation

Response to Consultation
Increased FWALA Licence Flexibility
&
Consultation
FWALA Geographical Service Areas (GSAs)

Document No:	07/29
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All responses to this consultation should be clearly marked:- "Reference: Submission re ComReg YY/NN" as indicated above, and sent by post, facsimile, e-mail or on-line at www.comreg.ie (current consultations), to arrive on or before 22 June 2007, to:

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Please note ComReg will publish all respondents submissions with the Response to this Consultation, subject to the provisions of ComReg's guidelines on the treatment of confidential information – ComReg 05/24

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1 Foreword

On behalf of the Commission for Communications Regulation (ComReg) I am pleased to present ComReg's response to the consultation on increasing flexibility in Fixed Wireless Access Local Area (FWALA) licences. I would like to thank all of the respondents for their contributions.

The FWALA licensing scheme has been a significant success in terms of increasing the availability of broadband to Irish consumers. Indeed, FWALA now accounts for 14.5%[1] of the broadband connections in the state, which is well ahead of international norms. Consumer demand for broadband services has continued to grow and, in an effort to address this demand, ComReg presented proposals and invited comments on how to introduce greater flexibility into the FWALA frequency planning process in order to optimise use of that part of the radio spectrum used for delivery of FWALA services.

Summaries of the responses to the consultation questions are presented in this paper, together with ComReg's consideration of those responses and how we now intend to proceed with increasing the flexibility of FWALA licences.

ComReg has decided to adopt Option 2, i.e., an increase in the service area, as detailed in the Consultation Document 06/59. The implementation of this approach will increase the area in which licensed broadband services can be deployed without increasing interference into adjacent areas. The benefits of the improved flexibility being offered to operators should, in turn, result in improved availability of services for consumers.

Taking this development a stage further, ComReg is now seeking views of interested parties on a proposal to implement Geographical Service Areas (GSAs) into the FWALA licensing scheme. This proposal was suggested by a number of the respondents to the Consultation Document 06/59.

Mike Byrne
Chairperson.

1 ComReg Quarterly Report March 2007

2 List of Respondents

There were 10 responses to the Consultation Document 06/59[2] and ComReg would like to thank all of the respondents for the time and effort taken in making their responses and for the valuable information provided. All responses received by ComReg except for annexes marked confidential will be made available on the ComReg website www.comreg.ie.

Respondents:

- **Clearwire**
- **Digiweb**
- **eircom**
- **High Speed Data Solutions**
- **Irish Broadband**
- **Last Mile limited**
- **Mr. Peter Gavigan**
- **South West Regional Authority**
- **Titan Consulting**
- **WestNet**

2 Increased FWALA Licence Flexibility

3 Introduction

In 2003 the Commission for Communications Regulation (ComReg) developed the Fixed Wireless Access Local Area (FWALA) licensing scheme, allowing licensees to provide services in a local area as defined by them. To date there are currently 180 FWALA licences issued to 13 different operators serving in excess of 75,200[3] broadband subscribers in a range of frequency bands.

ComReg is aware that because of the nature of the FWALA licensing scheme it may not be possible to eliminate 'dead zones' entirely, however the ComReg Consultation Document 06/59 "Increased FWALA Licence Flexibility" detailed six options for consideration with the aim of reducing the problem of 'dead zones'. After due consideration of all of the responses to the consultation, ComReg has decided to proceed with the implementation of Option 2 which allows licensees to increase their service area to 20km in each FWALA frequency band. Licensees will still be obliged to comply with the existing field strength contours to ensure that their networks do not cause interference to those of adjacent licensees.

In their responses to the consultation four respondents independently put forward the suggestion whereby an operator with several FWALA licences on the same channel in adjacent or overlapping areas could offer services in the entire geographical area covered by those areas, thereby creating a single extended service area with a regional, as opposed to local, area footprint. ComReg, recognising the merits of such an approach, has made proposals for the introduction of Geographical Service Areas (GSA). This proposal is set out in detail in Chapter 6 and ComReg is now seeking views of interested parties on this proposal.

3 ComReg Quarterly Report 07/17R, March 2007

4 Consultation Topics

ComReg's Consultation Document 06/59 "Increased FWALA licence flexibility" explored options to reduce the number of 'dead zones' resulting from the FWALA licensing scheme in a manner that would be simple to implement from both a regulatory and operational perspective.

'Dead zones' arise when there are two different FWALA operators on the same channel in adjacent geographical areas but with insufficient space between them to allow a third FWALA licence to be issued on the same channel (see Figure 1 below).

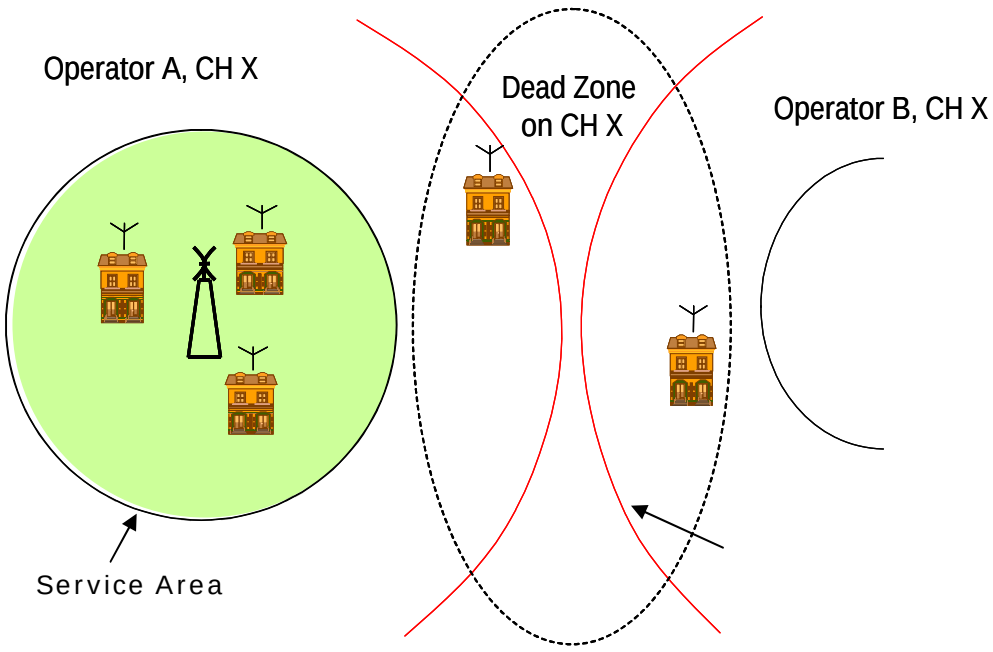

Figure 1: Illustration of a 'dead zone'

Document 06/59 gave details of six different options which in ComReg's view could potentially address this issue. Each option is outlined below followed in each case by a summary of the responses to the proposals. The position of the Commission is presented in Chapter 5 where each of the options are discussed in turn.

4.1 Option 1: Allow CPE deployment outside service area

Option 1 proposed permitting the use of Customer Premises Equipment (CPE) outside of the parent service area but still within the interference contour on a non-interference and non-protected basis. FWALA operators would still have to adhere to the existing interference field strength contour limits. In the consultation the following question was posed:

Q. 1. In your view is Option 1 a workable solution? If yes what constraints, if any, should apply? If no what difficulties do you foresee. Please give reasons for your answer.

4.1.1 Responses to Q.1

Seven of the nine respondents to this question supported Option 1. Those in favour of this option said that it would considerably increase their service area, it would be easy to implement and it would be unlikely to cause interference to an adjacent operator's network as the CPE would all be facing inwards towards the parent base station. Two respondents who were not in favour of this option took the view that allowing the provision of services outside the service area on a non-interference and non-protected basis would undermine the whole principle of licensed spectrum use, i.e., strictly controlled use of the spectrum, and would reduce the quality of service to the end user. One of these respondents stated that as licensed operators take greater financial risk by seeking licences they should reap the benefits of licensed spectrum.

4.2 Option 2: Increase the service area

Option 2 proposed to increase the service area in each frequency band while still maintaining the existing interference threshold contour and field strength limits as follows;

- **3.5 GHz service area would increase from 15km to 20km,**
- **10.5 GHz service area would increase from 10km to 13km, and**
- **26 GHz service area would increase from 6km to 8km.**

Questions 2 and 3 in the consultation document addressed this option.

Q. 2. In considering Option 2, in your view what is the maximum service area that could be permitted in each of the 3 FWALA frequency bands <u>while still maintaining</u> the existing interference threshold contour and field strength? Where possible please support your view with practical data or example?

Q. 3. Do you agree with the proposed increases to the service area in each of the 3 FWALA frequency bands as indicated above? (Please note that the existing interference threshold contour and field strength would be maintained if this option was adopted.)

One respondent was of the view that the original service area limits should be maintained, whereas the other seven respondents were in favour of increasing the service area in each of the 3 FWALA frequency bands while still maintaining the existing interference threshold contour and field strength. Three of the seven respondents were of the view that service could be extended right up to the edge of the interference contour while still maintaining the existing field strength limits. Two respondents proposed specific service area sizes of 17km and 22 km for the 3.5 GHz band and 15km and 28km for the 10.5 GHz band respectively. Six respondents supported ComReg's proposed increases to the service area in each of the FWALA frequency bands. The one respondent who opposed this option was of the view that an adequate distance must be left between the service area boundary and the interference contour to ensure non-interference with adjacent operators.

4.3 Option 3: Obtain Legal consent

Under Option 3, and when a FWALA application overlaps with the interference contour of one or more existing FWALA licensees, it was proposed that a FWALA licence may be issued to this applicant provided that written consent from all of the affected FWALA licensees is forwarded to ComReg with the application.

Q. 4. In your view is Option 3 a workable solution to address the issue of dead zones? If yes what constraints, if any, should apply? If no what difficulties do you foresee? Please give reasons for your answer.

4.3.1 Views of Respondents to Q.4

Five of the eight respondents to this question were in favour of this option but concerns were expressed about the need for a formal structure to gain legal consent, enforcing the conditions of any agreement and ensuring that an operator had valid reasons for refusing to allow a competitor to overlap interference contours. It would also be necessary for ComReg to assist operators seeking an overlapping licence to identify those operators who would need to provide consent.

One of the five respondents in favour of this option proposed that ComReg should make any additional spectrum available to alleviate situations where operators cannot provide service in a 'dead zone' and cannot get the consent of other operators for an overlapping service area.

Of the three respondents that were not in favour of this option one stated that repeat testing would be required at all affected sites to ensure that the interference contour is being complied with. A second respondent said that the cumulative impact of many overlapping licences could seriously impact on existing cells and could cause degradation of services to the end user. The third respondent was of the view that this option would lead to further fragmentation of the existing FWALA licences and may restrict the ability of operators to expand in the future.

4.4 Combination of Options 1, 2 and 3

Another possibility was a combination of the three options discussed above. Question 5 addressed this issue.

Q. 5. Do you agree with the view that combining Options 1, 2, and 3 is the most effective way to eliminate 'dead zones'? Please give reasons for your answer.

4.4.1 Views of Respondents to Q.5

Of the eight respondents to this question, four held the view that combining Options 1, 2, and 3 was an effective way to eliminate 'dead zones'. Two of the seven respondents supported a combination of Options 1 and 2 only. Another respondent only supported Option 2 stating that, if all 3 options were allowed, the quality of service, manageability and enforcement aspects of such a complex regime would be completely unworkable. The eighth respondent was of the view that Options 1 and 2 would undermine the value of licensed spectrum, degrade the quality of service to the end user and should not be implemented. However, this respondent did acknowledge that although Option 3 has some risks to quality of service to the end user it would allow flexibility while maintaining a degree of protection for existing operators.

4.5 Options 4, 5 and 6: 'Partial Circle', 'Reduced Size', 'Map Based' FWALA Licence

Options 4, 5, and 6 proposed that ComReg should develop a licensing framework using the exact deployment and coverage details of a licence application, e.g. 'partial circle', 'reduced size' or 'map based' FWALA licences. Such applications would be 'non-standard' and ComReg would only consider permitting this on a very limited basis in dead zone areas.

Question 6 addressed option (4) of providing service to an area by using a sectored antenna at the new base station and the possible inclusion of directional antennas at the new network's CPE locations.

Q. 6.	**In your view is Option 4 a viable solution in addressing the issue of dead zones? If yes what constraints, if any, should apply? If no what difficulties do you foresee. Please give reasons for your answer.**

4.5.1 Views of Respondents to Q.6

Of the eight respondents who answered this question four did not support this option stating the risk of interference and the reduced viability of such an approach as their reasons for not supporting it. Of those who supported it, three of them were of the view that this option was only suitable for special cases. One was of the view that it would only be suitable where the proposed service area/interference contour is limited by both antenna selection and existing Geographical boundaries. A second respondent in favour of this option was of the view that it would only be a solution in a small number of situations and only in conjunction with Options 1 and 2.

Option 5 proposed to licence networks on a case-by-case basis, permitting service areas with a reduced radius and a reduced interference threshold contour to be set by the applicant.

Q. 7.	**In your view is Option 5 a workable solution to address the issue of dead zones? If yes what constraints, if any, should apply? If no what difficulties do you foresee. Please give reasons for you answer?**

4.5.2 Views of Respondents to Q.7

There were eight responses to this question. Of the three respondents in favour of this Option, two were of the view that this option was only suitable for special cases. One respondent was of the view that it may be useful for the purposes of flexibility to offer this Option in conjunction with the other options. Two respondents were of the view that the reduced service area should be reflected in a reduced licence fee. The other five respondents were not in favour of this Option due to the risk of interference and reduced viability of such an option, similar to the concerns outlined in response to Question 6.

The proposal in Option 6 would permit licences in dead zone areas on a case-by-case basis using a planning tool and propagation model which would enable deployment without exceeding the interference threshold contour.

Q. 8. In your view is Option 6 a workable solution to address the issue of dead zones? If yes what constraints, if any, should apply? If no what difficulties do you foresee. Please give reasons for your answer.

4.5.3 Views of Respondents to Q.8

Only one of the eight respondents to this question was in favour of Option 6 but only on the basis that the proposed service area/interference contour is limited both by antenna selection and existing geographical boundaries.

4.6 Combining Options

A series of questions were then posed seeking views on optimum combinations of the proposed options and whether the existing interference field strength limits needed to be revised.

Q. 9. Which of the 6 options or combination of options as outlined in this document best address the issues in your view? Please give details as to why.

Q. 10. In your view are there other viable options that ComReg has not considered in this document? If so please give details.

Q. 11. In your view would a combination of Options 1, 2, and 3 be sufficient to eliminate the issue of 'dead zones'? Please give reasons for your answer.

Q. 12. In your view do the existing maximum permitted Field Strength (dBµV/m) limits at the Interference Contour need to be revised? If so, please provide technical details to substantiate alternative levels.

4.6.1 Views of respondents to Questions 9 to 12.

Table 1 below summarises the views of the respondents to Questions 9 and 11 on the six options detailed in Document 06/59.

Table 1: Summary of respondents' positions on the 6 Options discussed in the Consultation Document 06/59

	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 5	OPTION 6
Respondent 1	✓	✓	✓	✓*		✓*
Respondent 2			✓			
Respondent 3		✓		✓*	✓*	
Respondent 4	✓	✓				
Respondent 5	✓	✓		✓	✓	
Respondent 6	✓	✓	✓	✓*	✓*	
Respondent 7	✓	✓	✓			
Respondent 8	✓	✓	✓	✓*	✓*	

Respondent 9	✓					
Respondent 10						

* Respondents were of the view that this option was only suitable for special cases.

In considering other viable options (Question 10) the following proposals were made:

i. to allow for the amalgamation of existing overlapping licences of an operator into one single regional licence. This would have the advantage of eliminating dead zones within the region, encourage investment and aid future technological developments such as mobility;

ii. it should be permitted to site base stations anywhere within the 30km interference contour radius while maintaining the existing field strength limits;

iii. any additional spectrum that becomes available in the future should be allocated on a priority basis to operators that are currently prevented from offering services in the dead zones;

iv. other viable options are more applicable to the 3.5 GHz band as the 10.5 GHz band is extremely controllable in range and direction.

In response to Question 12 four of the seven respondents were of the view that the existing field strength limits were appropriate and should be maintained. A fifth respondent was of the view that in the 3.5 GHz band the field strength limit should be increased from 33dBµV/m to 46dBµV/m. A sixth respondent stated that ETSI[4] regulations should be applied in Ireland. Another respondent was of the view that a reduced field strength should apply with the 'reduced circle' Option 5.

[4] ETSI is the European Telecommunications Standards Institute.

5 Commission's Position

The Commission has carefully considered the views of respondents to all of the questions posed and taken into account the implications of the various options for the quality of service expectations of FWALA customers.

5.1 Option 1: Allow CPE deployment outside the service area

The Commission recognises the merits of Option 1 in terms of simplicity and ease of implementation. However the Commission is concerned in this case that as the CPE would only be permitted on a non-interference, non-protected basis it could have a negative impact upon consumers in terms of the quality of service and effectively introduce 'two tiers' of FWALA customer. The Commission is mindful of the needs of customers who wish to avail of the services of a licensed operator in terms of service guarantee and quality and their expectations regarding the services to be provided. Therefore on balance the Commission has decided not to adopt Option 1 as a solution to the 'dead zones' problem.

5.2 Option 2: Increase service area

Option 2 has the advantage of increasing the service areas for all FWALA operators and thereby increasing the availability of broadband to consumers.

Considering the views of the respondents the Commission carried out a more detailed technical analysis of the frequency propagation and attenuation characteristics in each of the three frequency bands and is of the view that a uniform service area and interference contour radius can be applied across each FWALA frequency band. Appendix A contains a detailed technical analysis of the derivation of the interference criteria.

The Commission is of the view that Option 2 best addresses the issues of dead zones and therefore will proceed with implementing this option on the following basis:

i. the service area for each FWALA frequency band will be increased to 20km. Similar sized service areas will attract the same licence fee irrespective of frequency band;
ii. the interference field strength contour shall be limited to a radius of 30km in each band;
iii. and the existing maximum interference field strength, as currently specified for each band, shall be maintained at the new (where applicable) interference contour.

The original and revised FWALA parameters are illustrated in Figure 2 below.

Figure 2: Illustration of Revised FWALA Parameter Limits

The Commission's decision is based on a number of considerations:

i. Increasing the service area will allow Licensees to deploy FWALA services over a greater area and will therefore help to increase the availability of FWALA services throughout Ireland;

ii. Throughout this consultation, a number of respondents have highlighted the need to ensure that licensed services are protected. By setting the size of the service area to 20 km ensures that there will be at least a 20 km buffer zone between the FWALA base stations / customer premises equipment of different operators. This 20 km buffer zone, coupled with the maximum field strength limit at the interference contour and the radio propagation characteristics at these frequency bands should ensure that any unwanted signal is sufficiently attenuated by the time it reaches the service area of a different operator. It should be noted that one respondent to this consultation had suggested that based on their simulations a service area of 22 km for the 3.5 GHz band would ensure that the signal was attenuated sufficiently to meet the maximum field strength limit at the interference contour;

iii. Regarding the 10.5 GHz and 26 GHz bands, the higher attenuation in these bands will mean that signal strength in these bands will decrease more rapidly than at 3.5 GHz. This increased attenuation should counteract the higher maximum field strength thresholds which are allowed in the 10.5 GHz and 26 GHz bands, and therefore ensure that any unwanted signal is sufficiently attenuated.

iv. A number of respondents suggested that a reduced licence fee should apply where there is a reduction in the size of a service area. Standardising the size of the service area for each FWALA frequency band will mean the same licence fee will apply to similar sized service areas in each band.

5.3 Option 3: Obtain legal consent

The Commission is of the view that although Option 3 has merits the concerns expressed about the need for a formal structure to gain legal consent and of the risk of further fragmentation of the market mitigate against this Option. Having given these concerns due consideration the Commission has decided not to proceed with Option 3.

5.4 Options 4, 5, and 6: 'Partial circle', 'Reduced Size', 'Map Based' FWALA Licence

The Commission shares the concerns expressed by respondents that Options 4, 5 and 6 could lead to increased risk of interference and difficulties in ensuring licence compliance. Therefore the Commission will not be adopting these options as a solution to eliminating 'dead zones'.

5.5 Questions 9 to 12

The Commission is of the view that all issues raised here have been addressed in the responses above, with the exception of the following three issues:

i. One respondent proposed that any future spectrum should be allocated on a priority basis to operators that are currently prevented from offering services in the dead zones. The Commission notes this response and will take this issue into consideration in future spectrum allocations;

ii. Four respondents proposed that an operator with several FWALA licences on the same channel in adjacent or overlapping areas could offer services in the entire area covered by them thereby creating one large service area with a regional as opposed to a local area footprint. This is addressed in detail in Chapters 6 and 7 of this document;

iii. In relation to the use of ETSI standards for FWALA, operators should note that ComReg Document 06/42R Interface Requirements for Radio Services in Ireland[5], details the ETSI standards that apply in Ireland for all radio services. FWALA details are contained in Table 9 page 24 of that document. In accordance with European legislation and in the interest of technology neutrality, equipment which can demonstrate equivalence to the relevant ETSI standard may also be permitted.

5 06/42R Interface Requirements for Radio Services in Ireland can be downloaded from http://www.comreg.ie/publications/default.asp?nid=102528&ctype=5

6 Consultation on Geographical Service Areas (GSA)

Four respondents to the consultation proposed that it would be desirable if an operator with several FWALA licences on the same channel in adjacent or overlapping areas could offer services over the entire area covered by the licences, thereby creating one large service area with a regional as opposed to local area footprint.

ComReg believes that there is merit in this proposal, as the introduction of a Geographical Service Area into the FWALA licensing scheme will allow FWALA licensees to provide services in areas that previously were considered 'dead zones'. Over time, this could result in increased availability of FWALA services throughout Ireland.

This chapter sets out ComReg's proposal in relation to the introduction of Geographical Service Areas into the FWALA licensing scheme. ComReg is now seeking the views of interested parties on this proposal before making any decision on whether or not to proceed with its implementation.

6.1 Description of ComReg's GSA Proposal

ComReg proposes to authorise the provision of FWALA services in areas previously unauthorised where two or more licences held by the same licensee overlap on the same channel, and the area in question is too small to facilitate a standard FWALA frequency assignment to another licensee. Areas authorised by existing FWALA licences and newly authorised areas will constitute a Geographical Service Area (GSA). Examples of GSAs and the terms used below are set out in Appendix B.

The maximum area that can be applied for in respect of a GSA is dependent upon:

- maintenance of the existing 10km Interference Buffer Zone to the edge of their FWALA licences, as specified under the FWALA licensing scheme; and
- not exceeding the interference field strength limits at the edge of the buffer zone as specified under the FWALA licensing scheme.

6.1.1 Eligibility Criteria

A licensee will be eligible to apply to ComReg to form a GSA based around its individual FWALA licences when certain criteria are met. These are that:

i. two or more FWALA licences overlap[6]; **AND**
ii. the FWALA licences are on the same channel; **AND**
iii. the FWALA licences are licensed to the same licensee.

6.1.2 Application Process

In order to provide FWALA services in an area that was previously unauthorised, as part of a GSA, a licensee will have to apply to ComReg for approval of the GSA.

A licensee must identify which specific overlapping FWALA licences they wish to use to form a GSA. It is proposed that only one of the existing FWALA licences will be amended to authorise

6 FWALA licences overlap if their interference limit contours overlap.

provision of FWALA services in an area previously unauthorised and forming part of the GSA. This licence is referred to as the 'Lead Licence' and will be designated as such by ComReg.

In applying to form a GSA, it is proposed that a licensee will have to provide ComReg with the following:

1. the ComReg reference numbers of the licences that it wishes to use to form a GSA. As shown in appendix B, this determines the maximum sized GSA that can be formed;

2. a map[7] showing the area that the licensee wishes to be covered by the GSA. This map should be in PDF format and dated so that it can be displayed on the ComReg website. (See Appendix B of this document for examples of different constructions of GSAs); and

3. a commitment to publicly offer services in all of the area previously unauthorised and forming part of the GSA within 12 months of amendment by ComReg of the Lead Licence (this will be known as the "GSA Commitment");

4. the licensee should provide ComReg with the square kilometres of the proposed GSA Commitment area;

5. a performance bond[8] in respect of the GSA Commitment. In respect of a previously unauthorised area of 1257 square kilometres[9] (equivalent to the size of an existing FWALA licence), ComReg proposes a performance bond of €15,000. In respect of any other size of previously unauthorised area, ComReg proposes to require a performance bond scaled pro rata from the baseline figure of €15,000 with a minimum performance bond of €5,000. The formula to be used to calculate the performance bond will be:

   Performance bond (in euro) = ((area/1257) * 15,000) rounded up to the nearest euro.

If ComReg approves the formation of a GSA, the Lead Licence will be amended and the licensee informed accordingly. Once a GSA has been authorised ComReg will not, except in extraordinary circumstances, consider further applications to alter the relevant GSA for a period of twelve months from the date of amendment of the licence by ComReg.

6.1.3 Amendment of the Lead Licence

ComReg will amend the Lead Licence:

1. to authorise the provision of FWALA services in an area that was previously unauthorised and which is now forming part of a GSA;
2. to extend the licensee's existing FWALA licence obligations to this previously unauthorised area;
3. to reflect the eligibility criteria set out above; and
4. to include, as a condition of the licence, the GSA Commitment.

7 ComReg will supply details of map requirements, such as scale, topography etc in the Response to Consultation document.

8 Other conditions concerning the performance bond such as period of validity will be similar to those described in ComReg Document 06/17 "Revised Guidelines to Applicants for Fixed Wireless Access Local Area (FWALA) Licences".

9 The value of 1257 km2 is the area of a 20km radius circle (rounded up to the nearest whole number).

ComReg will assess compliance with the GSA Commitment. Failure to comply with this GSA Commitment may result in forfeiture in whole or in part of the performance bond and revocation of the licence.

It is only after ComReg has authorised a GSA that a licensee will be allowed to deploy FWA apparatus[10] and can begin offering services within a GSA.

6.1.4 Existing FWALA Licences

Licensees will still be obliged to comply with the licence conditions of their existing FWALA licences.

6.2 Issues taken into consideration in developing the GSA proposal

In developing ComReg's proposal for introducing GSAs into the FWALA licensing scheme, ComReg took the following into consideration:

- it must be possible to form a GSA under the existing FWALA licensing scheme;
- the services in a GSA should receive the same level of protection from unwanted interference as currently provided under the FWALA licensing scheme;
- facilitating improved availability of FWALA services to the consumer.

6.3 Summary

In summary, ComReg is proposing to allow the formation of GSAs under the FWALA licensing scheme. ComReg is of the view that facilitating the development of GSAs has the potential to improve the availability of wireless broadband services to consumers and it should also benefit FWALA operators by giving them the ability to grow their customer base. Potentially, this could lead to greater competition among broadband service providers across all platforms, thereby benefiting the consumer.

10 Outlying Stations or Customer Premises Equipment.

Q. 1.	**Taking in to account the future development of wireless broadband in Ireland, do you agree that ComReg's proposal to introduce Geographical Service Areas into the FWALA licensing scheme is appropriate?**
Q. 2.	**If not, please specify your reasons and any alternative proposal(s) that you may have which would achieve the same aims and objectives.**

Q. 3.	**What difficulties, if any, do you foresee with ComReg's Geographical Service Areas proposal? Do you have any views on how these might be addressed or mitigated? Please provide reasons and explanations for your views.**

Q. 4.	**The use of a Performance Bond is suggested as an appropriate regulatory measure in order to ensure compliance with the GSA Commitment. Are there any alternative mechanisms, in your view, which would be more appropriate? Please give reasons for your answer.**

Q. 5.	**In your view is the proposed level of the Performance Bond sufficient to ensure roll-out of services in the GSA Commitment areas? If not, please support your views with alternative levels and reasoning for your proposal.**

7 Submitting Comments to the Consultation on GSA

All comments are welcome; however it would make the task of analysing responses easier if comments were referenced to the relevant question numbers from this document.

The consultation period will run from 15 May 2007 to 22 June 2007 during which the Commission welcomes written comments on any of the issues raised in this paper.

Having analysed and considered the comments received, ComReg will review the flexibility in deployment of FWALA networks and publish a report on the consultation which will, inter alia summarise the responses to the consultation.

In order to promote further openness and transparency ComReg will publish all respondents submissions to this consultation, subject to the provisions of ComReg's guidelines on the treatment of confidential information – ComReg 05/24. We would request that electronic submissions be submitted in an-unprotected format so that they can be appended into the ComReg submissions document for publishing electronically.

Please note
ComReg appreciates that many of the issues raised in this paper may require respondents to provide confidential information if their comments are to be meaningful.

As it is ComReg's policy to make all responses available on its web-site and for inspection generally, respondents to consultations are requested to clearly identify confidential material and place confidential material in a separate annex to their response.

Such Information will be treated subject to the provisions of ComReg's guidelines on the treatment of confidential information – ComReg 05/24.

7.1 Expressions of interest

In order to place priorities on the work programme, ComReg is now seeking expressions from licensees interested in implementing GSAs.

8 Next Steps

The following steps will be taken to implement the Commission's position as outlined in Section 5 above:

- ComReg's FWALA Guidelines, Document 06/17, will be revised;
- the revised guidelines will apply immediately to all existing FWALA licences and applications;
- FWALA licensees will be informed in writing by ComReg of these changes

Additionally, as detailed in Sections 6 and 7, ComReg is now consulting on the proposal to introduce Geographical Service Areas (GSAs) into the FWALA licensing scheme and welcomes comments from interested parties.

Appendix A: Derivation of Maximum EIRP over distance

FWALA systems are intended to provide data and/or voice telecommunications services to end users within a specific geographical coverage area. A significant factor in determining the size of the coverage area is the link budget between the transmit and receive stations. To protect co-channel systems in geographically adjacent areas, it is necessary to define an 'interference zone', at the extremity of which specific field strength should not be exceeded. A limit is placed on the size of this 'interference zone' to ensure that the available radio channels may be re-used within a reasonable distance, whilst enabling operators to take full advantage of the operational range of available FWALA equipment.

Assuming a transmitter power of 29dBm, a receiver antenna gain of 15 dBi at 3.5 GHz and 20 dBi for both 10.5 GHz and 26 GHz bands, and a spherical earth ComReg has determined that it is possible to reduce the interference zone to 10km beyond the service area in each frequency band and still ensure sufficient protection to adjacent co-channel networks. FWALA operators should be aware that in order not to exceed the existing maximum field strength limits at a distance of 30km from the nominal base station it will be necessary to reduce the transmit power of outlying stations.

Using free-space path propagation ComReg has calculated the maximum EIRP[11] allowed at base stations located at a range of distances from the interference threshold contour limit of 30km to ensure that the permitted field strength limits are not exceeded.

Table A.1 below details the maximum EIRP required to maintain the existing field strength at varying distances for each FWALA frequency band.

Table A.1: EIRP limits for base station distances from interference contours

Frequency band	Distance of base station from interference contour (km)	Interference field strength limit not to be exceeded at 30 km radius (dBµV/m)	Maximum EIRP at base station (dBW)
3.5 GHz	30	33	-12.3
	20	33	-16.0
	10	33	-21.8
10.5 GHz	30	43	-2.3
	20	43	-5.8
	10	43	-11.8
26 GHz	30	50	4.7
	20	50	1.2
	10	50	-4.8

11 Equivalent isotropically radiated power

Appendix B: Examples of Geographical Service Areas

This Appendix provides examples of ways in which GSAs can be created.

It should be noted that a licensee does not have to apply for the maximum sized GSA allocation. Instead the licensee is encouraged to submit a realistically sized GSA application, only including those areas where it plans to provide services within the next 12 months. The GSA map to be supplied with each application will be published on ComReg's website (see Section 6.1.2). This map will form the basis of the GSA roll-out commitment which ComReg expects licensees to comply with.

B.1 Example 1 – Creating a GSA

This example highlights how a GSA can be formed by adding overlapping FWALA licences on the same frequency. Figure 3 shows the area occupied by a single FWALA Licence. The standard parameters apply to the interference contour and the maximum service area as set out in Section 5.2, Figure 2.

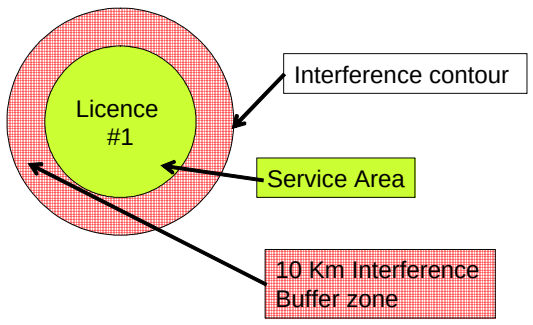

Figure 3: Single FWALA Licence

If this Licensee obtains a second FWALA licence then a GSA may be formed as shown in Figure 4 provided that the criteria for forming a GSA are met, i.e. the FWALA licences are on the same frequency and their interference contours overlap.

The GSA area shown in Figure 4 is the maximum area that can be obtained. This area allows the Licensee to provide services in a larger area while still maintaining the 10 km interference buffer zone.

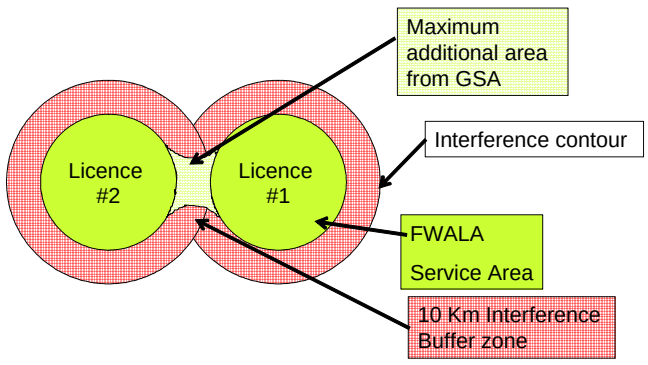

Figure 4: GSA formed by Two Overlapping FWALA Licences

Figure 5 shows an example of a GSA formed by three overlapping FWALA circles.

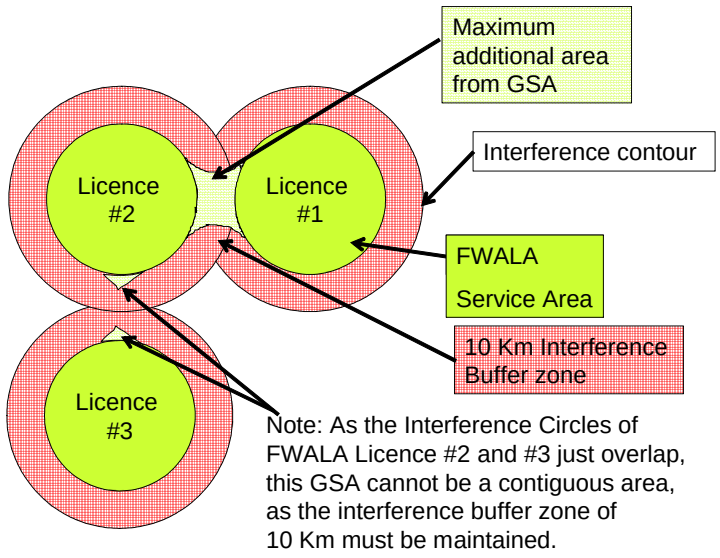

Figure 5: GSA formed by Three Overlapping FWALA Licences

As demonstrated in Figure 5 above, the degree of overlap between licences affects the maximum additional GSA area that can be applied for. In this example it should be noted that Licences #2 and #3 just overlap.

B.2 Example 2 –A GSA enclosing an area that is not large enough to accommodate another FWALA licensee

Figure 6 shows an example of four overlapping FWALA licences which together form a contiguous set of licences that completely enclose an area. As the area enclosed is not large enough to accommodate another FWALA licensee[12] the complete enclosed area can be included in the GSA.

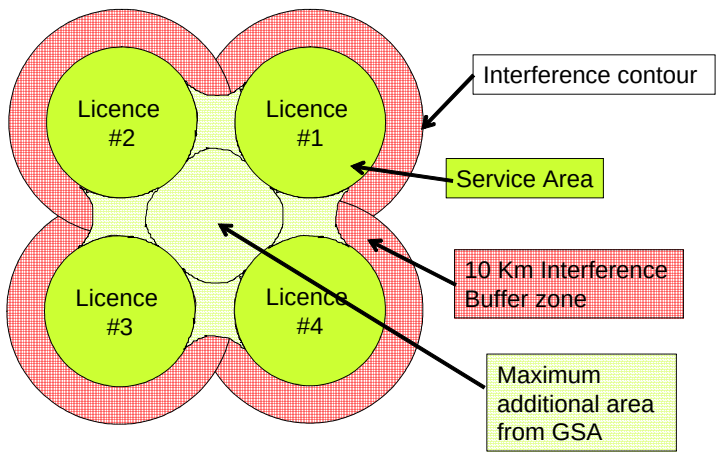

Figure 6: A GSA enclosing an area that is not large enough to accommodate another FWALA Licensee

12 An interference circle of 30 Km radius cannot fit in the enclosed area.

B3 Example 3 – A GSA enclosing an area that is large enough to accommodate another FWALA licensee

Figure 7 shows an example of a GSA which completely encloses an area, and surrounds the FWALA licence of "Another Licensee"

However, in this example the enclosed area is large enough to accommodate another FWALA Licensee and therefore the enclosed area cannot form part of the GSA as the Licensee must maintain a 10 km interference buffer zone to existing or future FWALA Licensees.

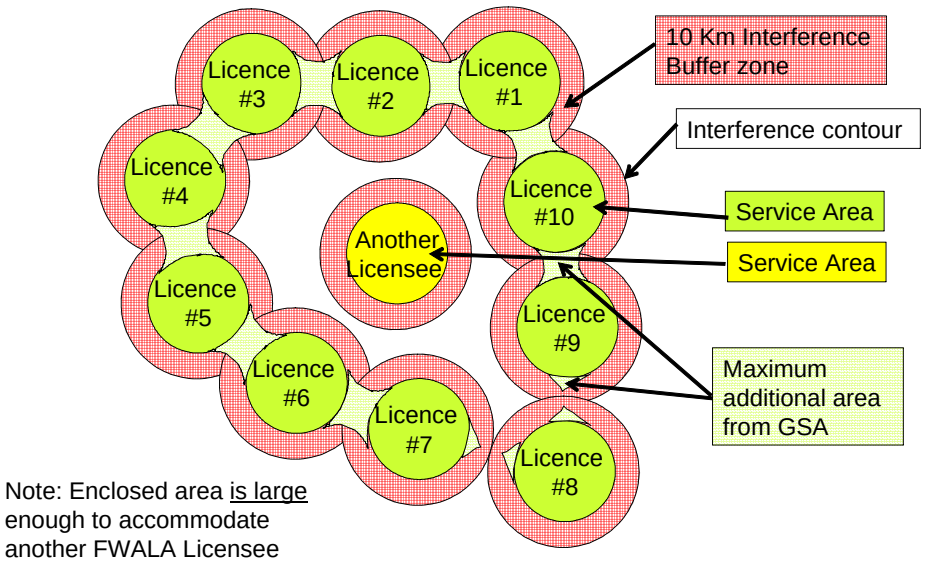

Figure 7: A GSA enclosing an area that is large enough to accommodate another FWALA Licensee

Continuing with this example, the enclosed area could form part of a GSA if an additional licence was obtained by the FWALA Licensee such that it resulted in the enclosed area not being large enough to accommodate another FWALA licensee, see Figure 8.

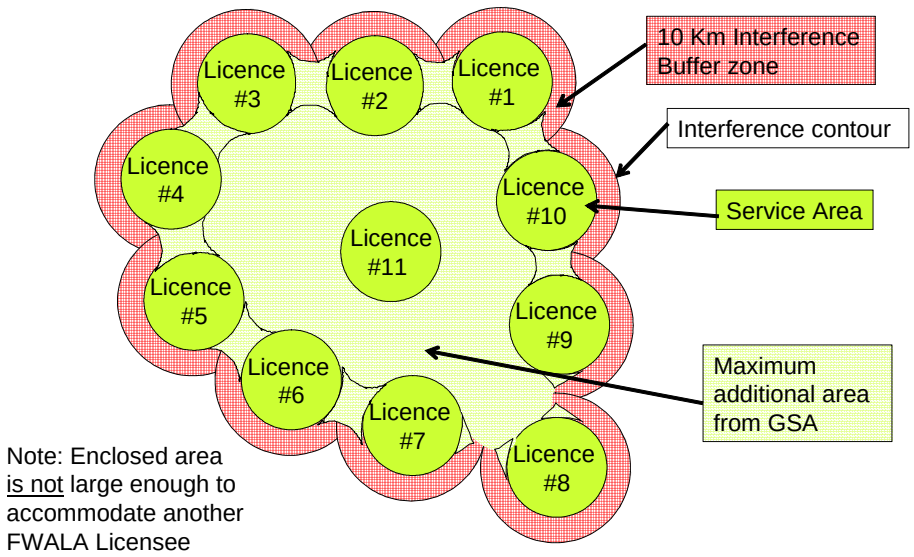

Figure 8: A GSA enclosing an area that is not large enough to accommodate another FWALA Licensee

B.4 Example 4 – Removal of a FWALA Licence and its effect on a GSA

The removal[13] of a FWALA Licence will affect the area covered by a GSA. Figure 9 shows an example where the FWALA Licensee surrenders Licence #3 and the maximum area that can be covered by the GSA is reduced accordingly.

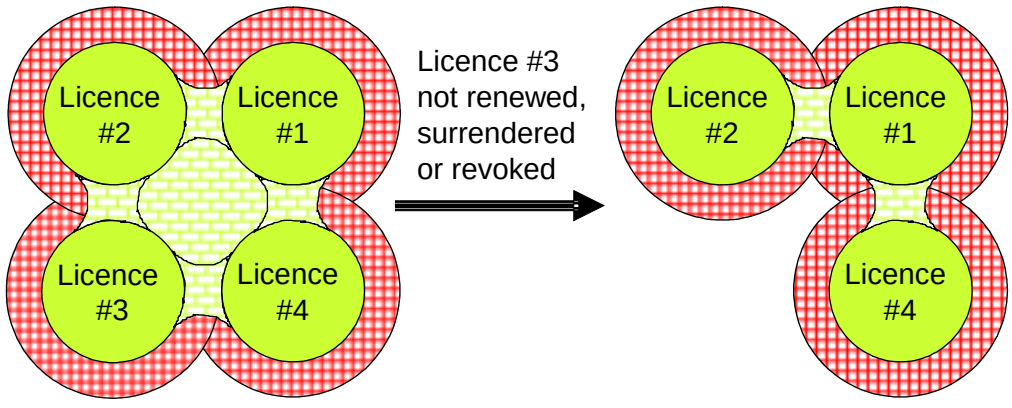

Figure 9: Removal a FWALA licence and its effect on a GSA

B.5 Example 5 –GSA Commitment areas

The previous examples in this Appendix showed the maximum GSA areas that can be applied for based upon the number of overlapping FWALA licences and the nature of the overlap. While a licensee may apply for the maximum GSA area possible, ComReg encourages applicants to submit a realistically sized GSA application, only including those areas where it plans to provide services within the next 12 months, i.e. the GSA Commitment areas

Figure 10 shows an example where the GSA area applied for is smaller than the maximum possible sized GSA in this case. In submitting its GSA application and map to ComReg the applicant has identified the "GSA commitment areas" (the yellow areas) as the areas that it commits to provide services within the next 12 months. Once approval for this GSA is obtained, it is only the "GSA commitment areas" (the yellow areas) that will form part of the GSA where the licensee is allowed to provide services.

13 Examples of removal of a FWALA Licence include non-renewal, surrender or revocation.

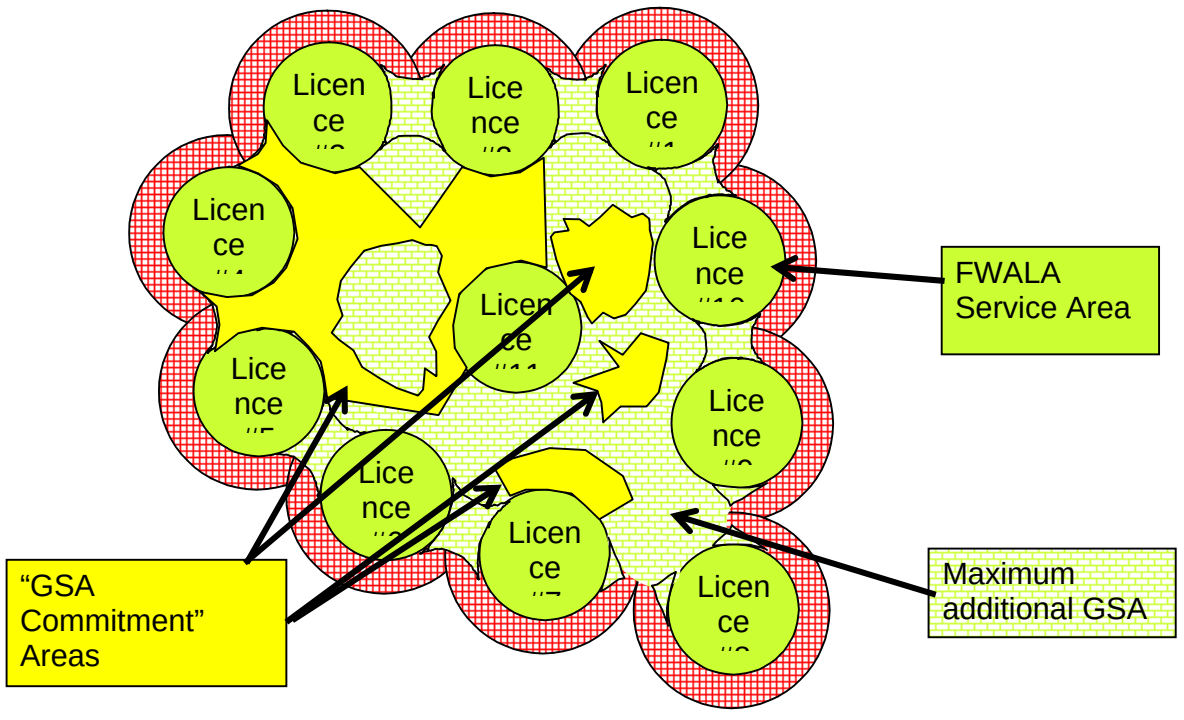

Figure 10: Example of GSA area applied for, i.e. "GSA Commitment areas"