



Commission for  
**Communications Regulation**

## Consultation Paper

### Increased FWALA licence flexibility

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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](http://www.comreg.ie)  
(current consultations), to arrive on or before 15 December 2006,  
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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  
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## 1 Foreword

The availability of broadband to support the provision of data services to the public is a key national objective. The Commission for Communications Regulation (ComReg) is committed to ensuring that every avenue is explored in terms of meeting this objective and has already introduced a number of initiatives such as the Fixed Wireless Access Local Area (FWALA) and the Wideband Digital Mobile Data Services (WDMDS) licensing schemes.

In 2003, ComReg developed the Fixed Wireless Access Local Area (FWALA) licensing scheme, allowing licensees to provide services in a local area as defined by them. This licensing scheme has proved very successful and currently there are over 160 FWALA licences issued to 11 different operators<sup>1</sup>. As of June 2006<sup>2</sup> ComReg estimated that there were in excess of 52,500 broadband subscribers served via Fixed Wireless Access which represents a 192% year on year increase. Growth in the take up of these services is continuing at a high rate and ComReg is keen to promote further competition in this area.

This document sets out a number of propose modifications to the existing FWALA Licensing Scheme<sup>3</sup> which are designed to allow operators increased flexibility in the deployment of their current and future FWALA networks. Greater flexibility in deploying FWALA networks should in turn improve the availability of wireless broadband to consumers, particularly those in rural areas.

We look forward to receiving your views.

**Isolde Goggin,  
Chairman.**

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<sup>1</sup> See FWA Broadband webpage on ComReg website for more information  
<http://www.comreg.ie/FWABroadband/FWABroadband.asp>

<sup>2</sup> See page 18 of ComReg Document 06/52  
<http://www.comreg.ie/fileupload/publications/ComReg0652.pdf>

<sup>3</sup> See ComReg Document 06/17  
<http://www.comreg.ie/fileupload/publications/ComReg0617.pdf>

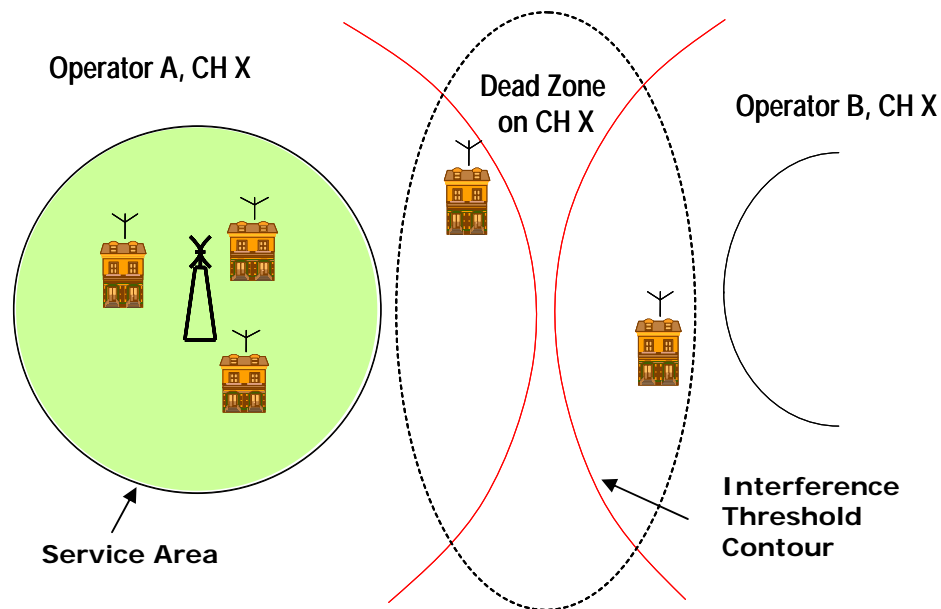
## 2 Introduction

The FWALA licensing scheme was launched in 2003. Since then, this scheme has proved to be very successful with ComReg estimating that 14% of the broadband market, or 52,500 subscribers, were served via Fixed Wireless Access in June 2006<sup>2</sup>. As of October 2006, there were in excess of 160 FWALA licences issued to 11 operators in both the 3.5 GHz and 10.5 GHz bands<sup>1</sup>.

While the FWALA local area licensing scheme has met ComReg's objectives in terms of increased competition and broadband rollout, the nature of the licensing scheme has resulted in 'black spots' or 'dead zones' between licences where no further FWALA licences can be issued in the same band (see Figure 1 below).

As shown in Figure 1 below, a 'dead zone' arises when two FWALA licences are in close proximity to each other, thereby not leaving enough space between them to allow another FWALA licence to be issued on the same channel. Within these dead zones there may be a demand for broadband services which cannot be met under the current FWALA licensing process<sup>3</sup>.

One option could be to provide services in these zones by using licence exempt spectrum in the 2.4 GHz or 5.8 GHz. However, with a few exceptions, this is unlikely to be a long term solution due to the inability to guarantee service in these bands which can be very congested in certain areas of the country. In an effort to address this issue ComReg has decided to issue this consultation paper seeking the views of interested parties on how the FWALA licensing process may be modified to address the 'dead zones' issue.



**Figure 1: Illustration of 'dead zones'.**

### 3 Existing Service Area and Interference Contour Thresholds

ComReg document 06/17 sets out the existing FWALA licensing process and defines the current service area and interference contour thresholds. Table 1 below sets out the maximum permitted Service Area radius, the interference contour radius and the maximum permitted field strength to be used at the interference contour for each FWALA frequency band.

Frequency Band (GHz)	Maximum Service Area Radius (km)	Interference Contour Radius (km)	Maximum permitted Field Strength (dBµV/m) at the Interference Contour
3.5	15	30	33
10.5	10	30	43.3
26	6	12	50.8

**Table 1: FWALA Parameter Limits**

The **FWALA service area** is defined as the geographic area within which an operator may offer telecommunications services by means of a local area fixed wireless access network. The service area for a licence is defined by a centre point and a maximum permitted radius from that point. The centre point is normally the geographic location of the base station. The maximum size of a service area is set by ComReg and is dependent on the frequency band employed, as shown in Table 1 above.

It is intended that Customer Premises Equipment (CPE) and outlying stations<sup>4</sup> may only be deployed within the service area of a FWALA licence and may only operate on the frequency range covered by the FWALA licence and do not cause the field strength limit specified in Table 1 above to be exceeded.

The **interference contour** is defined by means of a circle around the centre point of the service area. The contour is set by ComReg and is dependent on the frequency band employed, as shown in Table 1 above.

The interference contours determine whether an application can be accommodated on a FWALA channel in a particular area with the exception of particular cases where a natural obstacle e.g. mountains, permits overlapping of interference contours. An application will be rejected if its interference contour overlaps with the interference contour of another applicant/licensee.

The **field strength** applied at the interference contour is intended to ensure that any interference to a FWALA receiver in a service area outside of this contour is at least 6dB below the thermal noise floor. The field strength is dependent on the frequency band employed, as shown in Table 1 above.

<sup>4</sup> Outlying stations are defined as base stations other than the central base station, which is generally located at the centre of the FWALA service area, which are used to provide telecommunications services within the operator's licensed service area.

## 4 Options for increasing FWALA flexibility

This section presents six options which are designed to allow operators increased flexibility in the deployment of their current and future FWALA networks. This may allow operators to address the 'dead zones' issue.

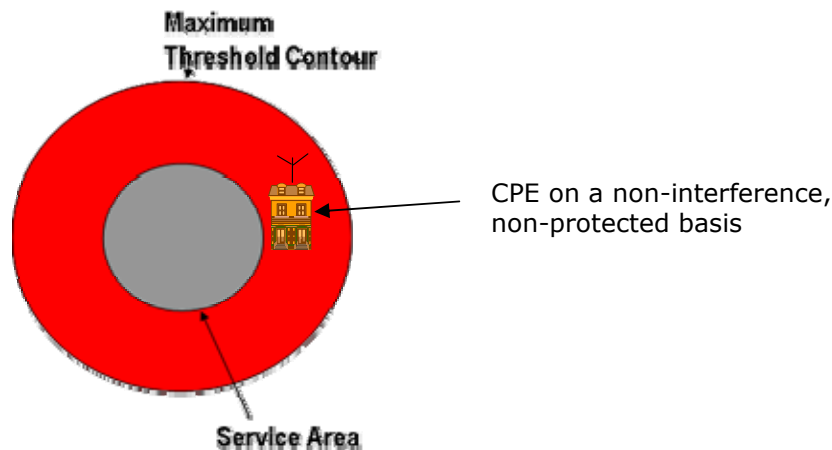
The options listed in this section are not mutually exclusive and it may be the case that two or more of these options may work together.

Additionally, the list of options presented in this section is not exhaustive and ComReg would welcome other suggestions and supporting technical arguments on how to resolve the 'dead zone' issue.

### 4.1 Option 1: Allow use outside service area

One option to increase flexibility in the current licensing scheme would be to permit the use of Customer Premises Equipment (CPE) equipment in the area outside the service area but within the interference contour. This is the red area indicated in Figure 2. The service in this area would be provided on a non-interference, non-protected basis and FWALA Operators would still have to adhere to the existing interference field strength contour limits as detailed in Table 1. The use of directional antennas at the CPE locations would further facilitate this option.

This option would enable operators to effectively increase their service area but it may affect the quality of service to customers as it is on a non-interference non protected basis. The main advantage of this option is the ease of implementation provided.



**Figure 2: Illustration of CPE equipment deployed outside the service area but within the maximum threshold contour.**

**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.**

#### 4.2 Option 2: Increase the service area

The maximum service area for a FWALA licence per frequency band is defined in Table 2 below.

Frequency Band (GHz)	Maximum Service Area Radius (km)	Interference Contour Radius (km)	Maximum permitted Field Strength (dBµV/m) at the Interference Contour
3.5	15	30	33
10.5	10	30	43.3
26	6	12	50.8

**Table 2: Existing FWALA Parameter Limits**

ComReg is of the view that it may be possible to increase the size of service area of each licence but maintain the interference threshold contour and field strength at the current limits for each of the different bands.

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

- 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.

The advantage of this proposal is its ease of implementation and that it would increase the availability of wireless broadband in all existing and future licensed service areas. However, increasing the size of the service area may affect the quality of service provided to existing customers.

- 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 while still maintaining the existing interference threshold contour and field strength? Where possible please support your view with practical data or examples.**
- 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.)**

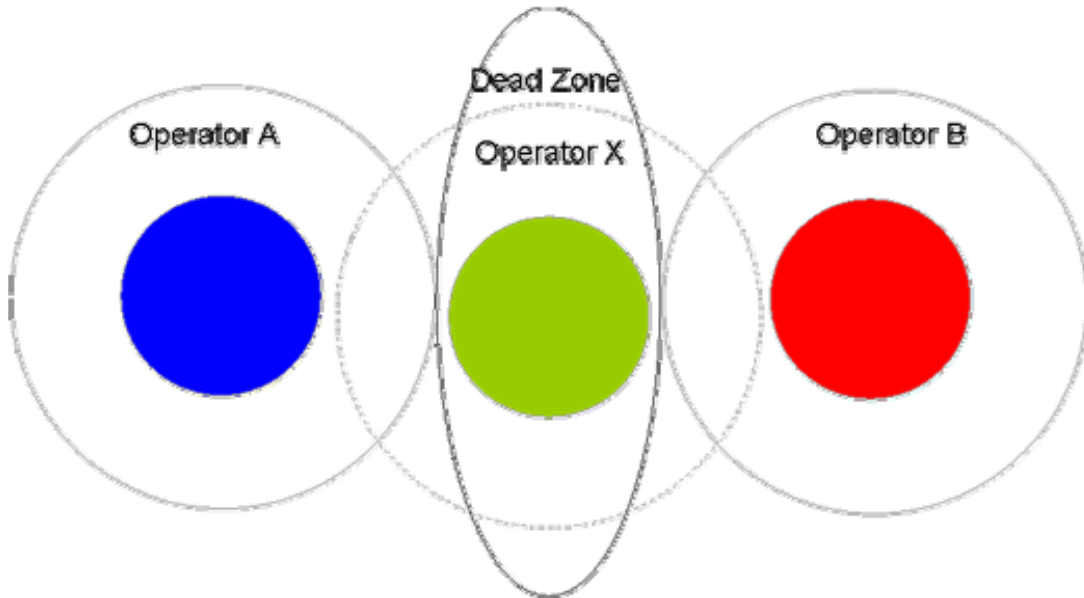
#### 4.3 Option 3: Obtain legal consent

As outlined in Chapter 1, 'dead zones' arise when two FWALA licences are in close proximity to each other, thereby not leaving enough space between them to allow another FWALA licence to be issued on the same channel. In these

instances, ComReg cannot issue a FWALA licence in that area, as the interference contour of the new licence would overlap with the interference contour of an existing FWALA licence.

Under option 3, when a FWALA application overlaps with the interference contour of one or more existing FWALA Licensees, this option proposes that a FWALA licence may be issued to this applicant provided that written consent from all the affected existing FWALA Licensees is forwarded to ComReg on application.

Figure 3 below shows an example of how Option 3 could work. Under this option, ComReg would be able to issue a FWALA licence to Operator X in the 'dead zone', provided that Operator X had obtained the written consent from the existing FWALA operators (i.e. Operator A and Operator B).



**Figure 3: Option 3 example: Operator X obtains a FWALA licence in the 'dead zone' area with the consent of the neighbouring Licensee(s).**

**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.**

Although Options 1, 2 and 3 individually go some way to resolving the issue of 'dead zones' none of the Options alone would completely eliminate them. It is ComReg's view that combining Options 1, 2 and 3 would prove the simplest and most effective way to eliminate 'dead zones'.



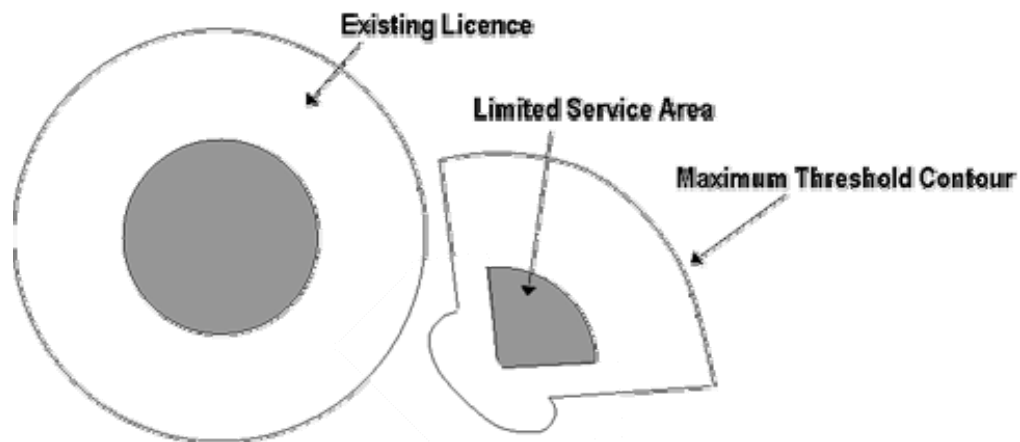
**Q. 5. Do you agree with the view that combining Options 1, 2 and 3 is the most effective way to eliminate ‘dead zones’? Please give reasons for your answer.**

**4.4 Option 4: ‘Partial Circle’ FWALA licence**

Option 4 proposes that ComReg develop a framework to licence ‘partial circle’ FWALA licences using the exact deployment and coverage details of the application. This would be a ‘non-standard’ FWALA application which ComReg would only consider using on a very limited basis in dead zone areas.

Figure 4 below shows an example of a ‘partial circle’ FWALA licence. In this instance, there is a sectored antenna at the new base station and (possibly) directional antennas at the CPE locations.

Each non-standard ‘partial circle’ FWALA application would have to be assessed on a case by case basis to determine the likelihood of interference to existing licensees. The limited size of the FWALA licences proposed under Option 4 may not be commercially viable and thereby could reduce the attractiveness of such licences to potential operators. However it may appeal to smaller operators wishing to serve rural communities.



**Figure 4: Illustration of a ‘partial circle’ FWALA licence**

**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.**

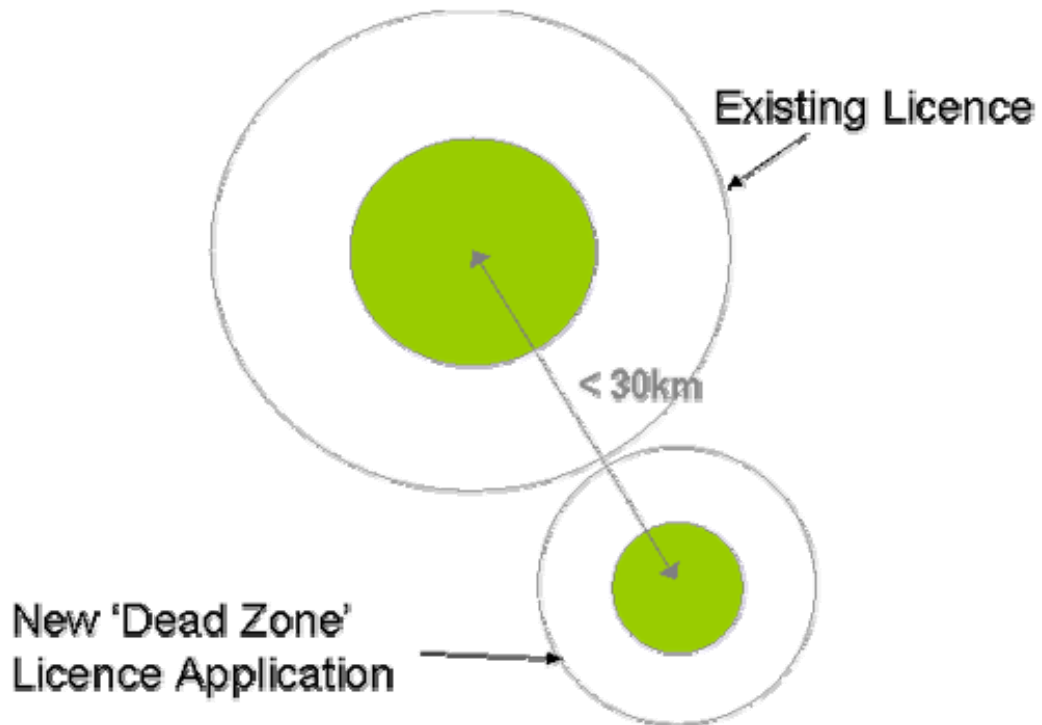
**4.5 Option 5: ‘Reduced Size’ FWALA licence**

Option 5 proposes that ComReg develop a framework to allow the licensing of ‘reduced size’ FWALA licences using the exact deployment and coverage details of the application. This would be a ‘non-standard’ FWALA application which ComReg would only consider using on a limited basis in dead zone areas.

When assessing an application under this option, ComReg will carry out interference analysis checks using the propagation model ITU-R p.452<sup>5</sup> to determine the likelihood of interference to existing licensees.

A 'reduced size' FWALA licence is one where a reduced service area and interference contour radius is issued (see Figure 5 below). ComReg proposes that the maximum permitted Field Strength (dBµV/m) at the Interference Contour for this licence would be the standard FWALA threshold limits, as outlined in Table 2 above.

This option may facilitate the provision of FWALA services in some of the areas not currently serviced by existing Licensees, but may also result in increased interference issues between adjacent Licensees due to the reduced distance between service areas. As this Option is for a reduced size service area it has a reduced attractiveness given that the limited number of likely customers could well impact into commercial viability.



**Figure 5: Illustration of 'reduced size' FWALA licence**

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<sup>5</sup> ITU-R P.452 Prediction procedure for the evaluation of microwave interference between stations on the surface of the Earth at frequencies above about 0.7 GHz\*.

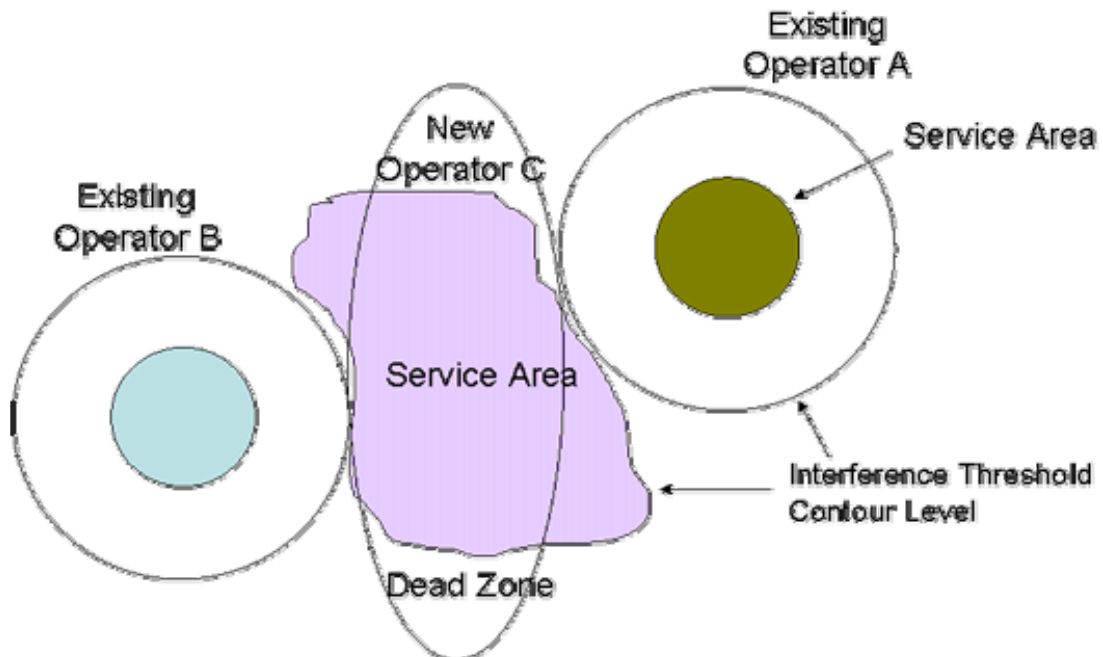
**Q. 7. In your view is Option 5 a workable solution to address the issue of dead zones? If yes what constraints, if any, should apply? If no what difficulties do you foresee. Please give reasons for your answer.**

#### 4.6 Option 6: 'Map Based' FWALA licence

Option 6 proposes that ComReg develop a framework to allow the licensing of 'map based' FWALA licences using the exact deployment and coverage details of the application. This would be a 'non-standard' FWALA application which ComReg would only consider using on a limited basis in dead zone areas.

Under option 6, the service area and interference contour area are the same. The boundaries of the service area / interference contour of the FWALA licence are set on the basis of a map generated from a radio propagation planning tool (see Figure 6 below). The maximum permitted Field Strength (dB $\mu$ V/m) at the Interference Contour boundary for this licence would be the standard FWALA threshold limits, as outlined in Table 2 above.

For example, an applicant would submit an application to ComReg for a particular area stating the transmitter power, antenna characteristics and site parameters that they intend to use in order to provide a service. Using that information, ComReg would undertake an analysis using the ITU.R P.452 propagation model to see if the interference threshold contour is exceeded at the edge of the proposed service area. If the interference threshold contour level is exceeded then the transmit power will be reduced until the interference threshold contour is reached and the application can be licensed using the adjusted parameters.



**Figure 6: Illustration of 'Map Based' FWALA licence**

This Option may prove unattractive to the applicant if the adjusted power levels required by ComReg make the service area commercially unattractive. Given that the service area is not as strictly defined as with the existing licences it may also prove difficult to ensure licence compliance.

**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.**

#### 4.7 Summary

Each of the options presented in this section have various advantages and disadvantages.

ComReg's preliminary view is that Options 1, 2 and 3 are the most feasible and least complex solution to implement as they build upon the existing FWALA licensing process. Options 1 and 2 will increase the area where FWALA services can be deployed, while Option 3 can be used to obtain a licence in a 'dead zone' area. Combining Options 1, 2 and 3 may prove the most effective method of eliminating 'dead zones'.

ComReg notes that Option 4, 5 and 6 may have limited appeal. However, ComReg is of the view that the benefits from introducing a 'non-standard' FWALA licensing process may not be sufficient to outweigh the drawbacks associated with a more complicated licensing process and licence compliance regime.

As clearly stated, the list of options presented in this section is not exhaustive. ComReg welcomes any additional suggestions not discussed in this paper.

**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 (dB $\mu$ V/m) limits at the Interference Contour need to be revised? If so, please provide technical details to substantiate alternative levels.**

## 5 Submitting Comments

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 9 November 2006 to 15 December 2006 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.

## Appendix B – Consultation Questions

### List of Questions

**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.**

**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 while still maintaining the existing interference threshold contour and field strength? Where possible please support your view with practical data or examples.**

**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.)**

**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.**

**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.**

**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.**

**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 your answer.**

**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.**

**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? 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 (dB $\mu$ V/m) limits at the interference contour need to be revised? If so, please provide technical details to substantiate alternative levels.**