



A Position Paper issued by the Telecommunications Regulatory Authority  
on Regulating Fixed Point to Point Links (Public)

25 December 2017  
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Purpose: To update the Authority's position in relation to the frequency assignment and licensing of Fixed Point to Point Links (Public)

## 1 INTRODUCTION

- 1.1 The purpose of this paper is to clarify and affirm the Telecommunications Regulatory Authority's (the "**TRA**" or the "**Authority**") current position in relation to the frequency assignment and licencing of fixed point to point links in Public Telecommunications Networks ("**Fixed Point to Point Links (Public)**").
- 1.2 On 1 July 2011, the TRA and the Directorate of Wireless Licensing, Frequency and Monitoring (the "**DWLFM**") consulted on a policy document with respect to the legal framework and policy pertaining to fixed (point to point) terrestrial links in the Kingdom of Bahrain (the "**Kingdom**") (the "**2011 Policy**")<sup>i</sup>.
- 1.3 The 2011 Policy highlighted the existing legal framework at that time by reference to the relevant provisions of Legislative Decree No. 48 of 2002 (the "**Telecommunications Law**")<sup>ii</sup>. In particular, the 2011 Policy made it clear that pursuant to Articles 24 and 43 of the Telecommunications Law a frequency licence is required to operate any microwave or millimetre-wave fixed (point to point) terrestrial link.
- 1.4 This paper is a TRA position paper only. It is a general statement of the TRA's current views on this issue based upon the facts available to it. As technological innovation with regards to the deployment and utilisation of spectrum frequency bands increases, the TRA's position may similarly change and the TRA reserves its right to amend this paper accordingly.
- 1.5 The TRA may in the future choose to issue a bespoke Regulation that deals with this matter but until such a step is taken this paper shall act as an indication to licensees and relevant stakeholders as to the TRA's viewpoint on the application of the Telecommunications Law and existing regulatory framework at this time.

## 2 POSITION UNDER THE EXISTING TRA POLICY

- 2.1 The 2011 Policy stated that the use of Radiocommunications Equipment is subject to equipment approval and frequency licencing by the TRA in accordance with the requirements of the Telecommunications Law.

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<sup>i</sup> The 2011 Policy was, for a number of reasons, eventually first published in 2015.

<sup>ii</sup> Unless otherwise indicated, every defined term used in this paper shall have the meaning ascribed to it in the Telecommunications Law.

2.2 As such a frequency licence is required to operate any microwave or millimetre-wave fixed (point to point) terrestrial link (as per the requirements of Article 43 of the Telecommunications Law).

2.3 Article 43 of the Telecommunications Law states that:

*“No Person shall operate a Telecommunications Network which uses frequency spectrum in the Kingdom, or operate or use any Radiocommunications Equipment associated with such a network without obtaining a Licence therefore from the Authority.”*

2.4 The 2011 Policy also provided helpful guidance on four key issues, namely:

2.4.1 The Authority’s policy towards spectrum pricing;

2.4.2 The Authority’s policy towards developing national regulations and standards;

2.4.3 The Authority’s policy towards minimum path lengths; and

2.4.4 The Authority’s policy related to other measures designed to facilitate spectrum efficiency.

2.5 The Authority confirms that unless otherwise stated in this paper, the Authority’s views as set out in the 2011 Policy remain relevant to its current position vis a vis fixed (point to point) terrestrial links in the Kingdom of Bahrain.

### **3 CURRENT POSITION STATEMENT**

3.1 The Authority has set out below its position in relation to applications for frequency licences for Fixed Point to Point Links (Public).

3.2 The content of this paper is intended to assist licensees and relevant stakeholders in understanding:

(a) The scope of the TRA’s jurisdiction in relation to these issues;

(b) The approach the TRA will take with regards to approvals;

(c) The approach the TRA intends to take with regards to the non-payment or late payment of invoices as well as missing or incorrect information; and

- (d) The information that will be required of applicants when applying under the current regime.

#### **4 THE APPLICATION OF THIS POSITION PAPER**

- 4.1 The TRA believes that it is important that it clearly articulates its current position with regards to the issue of Fixed Point to Point Links (Public) licence(s).
- 4.2 The Authority's position is that any received applications for Fixed Point to Point Links (Public) frequency licence will be validated by both the TRA and the DWLFM.

#### **5 FREQUENCY ASSIGNMENT AND LICENCE PROCEDURE**

- 5.1 The relevant application form to operate Fixed Point to Point Links (Public) or to modify or delete an existing point-to-point assignment, is downloadable from the Authority's website <http://www.tra.org.bh>. The Authority reserves the right to update or amend the application form from time to time.
- 5.2 The applicant should submit the application to the Authority with full details of the proposed link, including site details, equipment and antenna details as per the requirements of the application form(s).
- 5.3 The applicant should submit the application to the Authority with full details of the link as per the requirements of the application form(s). Applicants may be required to provide additional details by the Authority/DWLFM for frequency assignments.
- 5.4 In order to ensure the requisite continuity of the application process, each licensee shall appoint not more than five (5) duly authorised representatives to follow up on the status of the application with the TRA / DWLFM and receive any updates relating to the approval/rejection of the application and/or any financial matters associated with the application.
- 5.5 The Authority and/or DWLFM will validate all received applications for completeness, to ensure integrity of the data and compliance with technical and non-technical requirements.
- 5.6 The Authority will endeavour to process a valid application within 10 working days if it does not require international coordination. If the Authority receives multiple applications, the Authority may be unable to maintain this turnaround target but will provide applicants with an estimated delivery target.
- 5.7 For applications requiring international coordination, the Authority may be unable to process valid applications within the timeframes referred to in 5.6 above due to the fact

that this procedure is regulated by the Radio Regulations of the International Telecommunication Union and/or bi-lateral agreements.

- 5.8 In exceptional circumstances, when a justifiable occasion arises, an application not requiring international coordination can be given priority by the Authority over queued applications in order to achieve a very fast turnaround. Such cases might include restoration of telecommunications services in the case of a catastrophic network or service failure, or where telecommunications services are required in response to a national emergency or natural disaster, or in any other circumstance where there is a legitimate national interest served in the expedited approval of the relevant application. The Authority confirms that it will, at all times, have regard to its duties under Article 3 of the Telecommunications Law duties when deciding upon whether such prioritization is justified.
- 5.9 Once the technical evaluation is complete, the Authority will, in so far as is possible and in compliance with the timeframes set out above:
- (a) Request any additional and/or missing information from the applicant;  
and
  - (b) Request that any overdue amounts be paid by the applicant.
- 5.10 If additional and/or missing information is required from the applicant, it should be received within 5 working days of the request for additional and/or missing information being made. If the applicant fails to provide the correct details within 5 working days then the application will be automatically rejected and the same will be confirmed in writing.
- 5.11 The Authority confirms that in order for an application to be processed, any and all overdue amounts payable to the Authority by the applicant must have been satisfied. For the avoidance of doubt, the “overdue amounts” referred to in this clause cover any amounts that the Authority charges pursuant to the Schedule of Fees and any fines or penalties that the Authority may have imposed on a Licensee that become payable following the lapse of the payment terms stipulated in the accompanying invoices(s).
- 5.12 The Authority may either issue an annual or temporary frequency licence at its discretion (having at all times regards to the terms of the application received).
- 5.13 If an operator needs a copy of an original licence, a written request should be received by the Authority from the authorized person stating the applicant name, licence reference and version that is requested.

## **6 RENEWAL OF ANNUAL FREQUENCY LICENCE**

6.1 All annual frequency licences will be automatically renewed for an additional annual period unless the relevant licensee requests otherwise before 30<sup>th</sup> November of each year. Annual invoices will be issued and dispatched to licensees in January of each year.

## **7 TEMPORARY FREQUENCY LICENCE**

7.1 A temporary frequency licence may be issued for a period up to 11 months. Frequency licence fees will be charged according to the relevant Schedule of Fees as may be amended from time to time.

7.2 Temporary licences are not renewable and will terminate automatically upon the expiry of their term.

## **8 DELETION OF ASSIGNMENTS**

8.1 The Authority's position is that the deletion will be effective within 6 working days from date of receipt of a valid deletion request of Fixed Point to Point Links (Public) and all rights and obligations stemming from such an assignment will cease as of the effective date.

## **9 FREQUENCY MANAGEMENT**

9.1 The Authority is of the opinion that frequency assignments require strict controls in order to maximise the utilisation of this critical resource and to optimise the re-farming process in certain bands (if such re-farming process is deemed necessary).

9.2 As such, the Authority has set out below those frequency bands in which frequency assignments will be limited or in which no new assignments will be permitted.

9.3 The Authority is of the current opinion that the restrictions set out below should remain in place until at least 2020 (although the Authority reserves its right to review the situation with regards to frequency assignments and to update the below in accordance with the powers conferred on it by the Telecommunications Law).

9.4 The Authority confirms that in the event that one or more of the following frequency bands (namely 24.5-26.5 GHz, 31.8-33.4 GHz, 37-39.5 GHz, 40.5-43.5 GHz and 74-76/84-86 GHz) is identified for IMT, a migration plan could be established for Fixed Point to Point Links (Public) to vacate one or more of the afore-mentioned bands.

9.5 In addition, the Authority states that no new assignments will be permitted in the following frequency bands: 39.5 - 40.5 GHz, 48.5-50.2 GHz and 51.4 -52.6 GHz.

9.6 Frequency users are encouraged to make use of alternative frequency bands and apply in the manner indicated above.

## 10 **NATIONAL REGULATIONS AND STANDARDS**

10.1 All equipment that is planned to be deployed must be type approved in accordance with the Type Approval regulations of the Kingdom. Users are encouraged to use equipment supporting spectrally efficient high order digital modulation techniques, especially for higher capacity systems.

10.2 The Authority has provided, at Annex 1 to this paper, details of the Radio-Frequency channel arrangements for fixed point to point links that the Authority and the DWLFM requires applicants to have regard to, with reference to the relevant International Telecommunication Union (“ITU”) recommendations and standards or other channel arrangements applicable in the Kingdom.

10.3 The DWLFM will undertake frequency assignment for all point-to-point links based on the technical parameters of requested links, preferred channels or sub-bands by applicant and with regard to the compatibility with other frequency assignments.

## 11 **MINIMUM PATH LENGTH**

11.1 The choice of frequency bands for Fixed Point to Point Links (Public) depends principally on path length and traffic capacity. To preserve spectrum in the lower frequency bands for longer path length, high-capacity links (which can be accommodated only in these bands), the Kingdom operates a Minimum Path Length (“MPL”) within the Kingdom to select the appropriate frequency band for a given link.

11.2 The MPL permitted in each frequency band is listed in Annex 2. Any applicant wishing to install a link shorter than the MPL will need to provide more detailed justification in writing. Permission to deviate from the MPL will be at the discretion of the DWLFM. In the interest of fairness, it is considered necessary to apply these limits to all users.

11.3 The MPL requirements set out at Annex 2 will apply to both new assignments and existing assignments. Operators are advised to have regard to the MPL requirements set out in Annex 2 should there be any change to an existing point to point link (for example in case of any changes to stations at either end of the link, e.g. - a change in modulation technique, data rate or channel bandwidth, or a change in the height of antenna, type of antenna, etc.).

## 12 OTHER MEASURES TO FACILITATE SPECTRUM EFFICIENCY

- 12.1 High gain antennas should be utilised wherever possible in order to minimise radiation in directions other than in the bore-sight of the antenna. The use of antennas with poor performance is discouraged.
- 12.2 In the assignment process cross polar discrimination is also taken into account; a link is therefore licenced with a specific linear (horizontal (H) or vertical (V)) antenna polarisation, unless the applicant requests a specific linear polarisation.
- 12.3 Service availability is the mean propagation availability used to determine the overall link budget. In general, permitted levels are 99.9%, 99.99%, 99.995% and 99.999%. The use of protected (duplicated) equipment is generally a requirement for availability levels greater than 99.99%.
- 12.4 Space diversity or “hot standby” facilities may be required in certain circumstances to achieve the required service availability level.

## 13 PAYMENT OF FEES AND INVOICES

- 13.1 Invoices issued with regards to new applications will be calculated in accordance with the Schedule of Fees in force at the time of the application. The Authority clarifies that, in accordance with the current Schedule of Fees, upon the assignment of a frequency(ies) in the 70/80GHz bands, a fee of BD 1,000 is payable. No credit note will be issued if the link is deleted (this statement is only valid for the current in force Schedule of Fees and the position may be amended in due course).
- 13.2 Upon receipt of an application, the Authority will prepare and process the required invoice, whereupon the Fixed Point to Point Link(s) (Public) invoice will be sent to the applicant for payment thereof.
- 13.3 Licence fees associated with Fixed Point to Point Links (Public) are payable in advance prior to issuing the licence. Once the invoice is issued, the applicant has 15 working days to make the payment. If payment is not made, any new application made by the applicant will be subject to the provisions of paragraph 13.5 below.
- 13.4 As set out above at paragraph 5.11 the Authority’s position is that in order for new applications to be approved, all overdue amounts must be paid in full by the applicant.
- 13.5 The Authority’s position in relation to new applications is that upon receiving a valid application, the applicant will be allowed 5 working days to pay any overdue amounts owing to the Authority, which is to be paid in cleared funds into the Authority’s nominated account (bearing in mind that some payments needs 3 working days to be

cleared in the bank). Should the aforementioned amounts remain unpaid within that timeframe, then the new application will be rejected by the Authority.

- 13.6 Whilst the Authority will endeavour to issue all invoices and/or credit notes expeditiously (in accordance with the applicable timeframes), issuance may be delayed in certain months due to financial closings.

#### **14 THE ONGOING OBLIGATIONS OF LICENSEES/APPLICANTS**

- 14.1 It is also important that regulatory authorities (be that the DWLFM or the Authority) have access to all Radiocommunications Equipment (in the case of the Authority in accordance with the provisions set out at Article 77 of the Telecommunications Law).
- 14.2 It is the licensee's responsibility to provide access to Radiocommunications Stations or Radiocommunications Equipment in case of an emergency immediately or without any delay if access is required for inspection or other related aspects.
- 14.3 It is the licensee's responsibility to provide, upon request, a copy of the frequency licence(s) with all technical details for the Radiocommunications Station(s).
- 14.4 In order to facilitate the identification of frequencies deployed at Radiocommunications Stations, the site identity number provided by the licensee shall be clearly visible at all stations. In the case of a shared installation, the site identity numbers of all licensees shall be clearly visible.
- 14.5 Licensees shall ensure that electromagnetic radiations from Radiocommunications Stations or Radiocommunications Equipment are within the limits set by the International Commission on Non-Ionizing Radiation Protection ("**ICNIRP**") and shall ensure that it complies with any future radiation emission standards which may be set by the ICNIRP, or have been or will be adopted in the Kingdom.
- 14.6 With regards to the technical performance of its Radiocommunications Equipment or Radiocommunications Stations, the Authority confirms that its position is that it is incumbent upon licensees to inform the Authority as soon as it is aware of any and all alterations in circumstance that may cause a licensee to be in breach of the terms of any of its licences (including any individual, class of frequency licence) or the Telecommunications Law and wider regulatory framework.

## 15 THE AUTHORITY'S POSITION ON ITS RESPONSIBILITIES

- 15.1 The Authority wishes to ensure that the Kingdom's policy with regards to frequency assignments is held to the highest standards of international best practice. As such and when necessary, the Authority and/or DWLFM notify and register its Fixed Point to Point Links (Public) assignments into the Master International Frequency Register ("MIFR") of the ITU. Licensees may be required to assist the Authority in this process.
- 15.2 The Authority confirms that it will take all appropriate measures to ensure that all used frequencies in the Kingdom are registered and licenced and will take the appropriate legal actions set out under the Telecommunications Law and wider regulatory framework against any licensee not following the requirements set out by law.

## 16 APPEAL OF ANY DECISION OF THE AUTHORITY

- 16.1 Where a party feels aggrieved by any decision or action of the Authority in relation to the matters covered within this paper, the Authority's position is that the aggrieved party may appeal to the Authority in writing stating the grounds for the appeal. This appeal process is without prejudice to a party's rights to appeal under the Telecommunications Law or the other laws of the Kingdom.
- 16.2 The Authority's current position is that for such an appeal to be valid, it should be made within 30 days of the decision.
- 16.3 The Authority will review the basis on which it arrived at its decision to determine whether or not the decision was made in accordance with the applicable laws and the duties of the Authority.
- 16.4 The Authority will endeavour to communicate the outcome of the review to the aggrieved party in writing within 20 working days of receipt of the appeal.

## 17 CONCLUSION

- 17.1 The Authority believes that in due course it may benefit from the promulgation of a bespoke Regulation that confirms the position of the current policies and position adopted by the Authority.
- 17.2 Until such time, the Authority confirms that the content of this paper is to be treated by licensees as setting out the Authority's confirmed position with regards to its current Fixed Link Policy.

**ANNEX 1**

**RADIO-FREQUENCY CHANNEL ARRANGEMENTS FOR FIXED POINT TO POINT LINKS**

<b>Sub-Band (GHz)</b>	<b>Frequency range (GHz)</b>	<b>Recommendations ITU-R F Series / Others</b>	<b>T/R Spacing (MHz)</b>	<b>Channel separation (MHz)</b>	<b>Relevant International Regulations and Recommendations</b>	<b>Remarks</b>
L6	5.925- 6.425	383, Annex 3	260	40; 20; 10; 5		
U6	6.425-7.125	384	340	80; 60; 40; 30; 20; 10; 5		
L7	7.125-7.425	385	161	56; 28; 14; 7		
U7	7.425-7.900	385, Annex 4	245	56; 28; 14; 7		
L8	7.9-8.4	386, Annex 3	266	28; 14; 7		
U8	8.4-8.5	386, Annex 2	119	14		Uni-directional only, shared with MOBILE (Wireless Camera)
11	10.7-11.7	387, Annex 4	530	56; 28; 14; 7		
13	12.75-13.25	497	266	56; 28; 14; 7; 3.5; 1.75		
15	14.4-15.35	636	490	56; 28; 14; 7; 3.5		
18	17.7-19.7	595, Annex 4 & 5	1010	220; 110; 55; 27.5; 13.75; 7; 3.5; 1.75	See Note (1a)	

Sub-Band (GHz)	Frequency range (GHz)	Recommendations ITU-R F Series / Others	T/R Spacing (MHz)	Channel separation (MHz)	Relevant International Regulations and Recommendations	Remarks
23	21.2-23.6	637, Annex 1	1232	112; 56; 28; 14; 7; 3.5	See Note (1b)	
	(22.0-22.6) paired with (23.0-23.6)	637, Annex 2	1008	112; 56; 28; 14; 7; 3.5		
26	24.5-26.5	748, Annex 1	1008	112; 56; 28; 14; 7; 3.5		
L31	31.0-31.3	746, Annex 6	140	28; 14; 7; 3.5		TDD and FDD
U31	31.5-31.8	746	140	28; 14; 7; 3.5		
32	31.8-33.4	1520, Annex 1	812	112; 56; 28; 14; 7; 3.5		TDD and FDD
36	36.0-37.0	749, Annex 2	462	112; 56; 28; 14; 7; 3.5	See Note (1c)	
38	37.0-39.5	749, Annex 1	1260	112; 56; 28; 14; 7; 3.5		
40	39.5-40.5	749, Annex 2	462	112; 56; 28; 14; 7; 3.5		
42	40.5 – 43.5	2005, Annex 1	1500	112; 56; 28; 14; 7		
49	48.5-50.2	ERC/REC 12-11, Annex 2	884	112; 56; 28; 14; 7; 3.5		
52	51.4-52.6	1496, Annex 1	616	56; 28; 14; 7; 3.5		
56	55.78-57.0	1497, Annex 1	616	56; 28; 14; 7; 3.5	See Note (1d)	TDD and FDD
60	57 – 66	1497, Annex 2	----	2500;.....100; 50	See Note (2)	TDD and FDD.
70/80	71-76 paired with 81-86	2006, Annex 2 part 3	10000	4500; ..... 500; 250		TDD and FDD
94	92-94 / 94.1-95	2004, Annex 1 & 2	1500	300; 200; 100; 50		TDD and FDD

**Note (1):** In accordance with ITU Radio Regulations 2016 the following limits shall be taken in to account when deploying fixed point to point links and ensure that it complies with any future revisions or have been or will be adopted in the Kingdom of Bahrain.

- a- In the frequency band 18.6-18.8 GHz the carrier power to the input of antenna shall not exceed -3dBW.
- b- In the frequency band 21.4-22 GHz stations shall not exceed a power flux-density of -120.4 dB (W/(m<sup>2</sup> · MHz)) at 3 m above the ground of any point of the territory of neighbouring countries for more than 20% of the time. In calculations, the most recent version of Recommendation ITU-R P.452 should be used.
- c- In the frequency band 36-37 GHz, the maximum elevation angle is 20 degrees, the maximum transmitter power at the input of antenna is -10 dBW or -7 dBW if ATPC is used.
- d- In the band 55.78-56.26 GHz, the maximum power density delivered by a transmitter to the antenna is limited to – 26 dB(W/MHz).

**Note (2):** In accordance with annex1 of the ECC Recommendation (09)01 Edition January 2009, the use of fixed wireless point to point systems in the band 57 - 64 GHz may be provided within the technical parameters stated below to provide coexistence with other services (e.g. Intelligent Transport System);

- Maximum EIRP +55 dBm
- Minimum antenna gain +30 dBi
- Maximum transmitter output power +10 dBm

An additional limit on the transmit output power density (-10dBm/MHz) in the 59 - 64 GHz can be implemented to support the deployment of wideband systems (i.e. bandwidth higher than 100 MHz) by consequently limiting the maximum transmitter output power for narrow band systems (i.e. bandwidth lower than 100 MHz) below that of the maximum (+10dBm) allowed in the 59 - 64 GHz band. This limit will not apply for implement narrowband systems in the band.

**ANNEX 2**  
**MINIMUM PATH LENGTHS**

Band (GHz)	Capacity Minimum Bit Rate (Mbit/s)		MPL (km) <sup>3</sup>
L6 & U6	Low	<140	16
	High	>140	16
L7 & U7	Low	<140	15.5
	High	>140	9.5
L8 & U8	Low	<140	15.5
	High	>140	9
11	Low	<140	11
	High	>140	7
13	Low	<140	9.5
	High	>140	5.5
15	Low	<140	9.5
	High	>140	5.5
18	Low	<140	4
	High	>140	2
23	Low	<140	4
	High	>140	2
26	Low	<140	3
	High	>140	2
28	Low	<140	2
	High	>140	1.5
L31 & U31	Low	<140	2
	High	>140	1.5
32	Low	<140	2
	High	>140	1.5
36	Low	<140	1
	High	>140	1
38	Low	<140	1
	High	>140	1

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<sup>3</sup> MPL rule does not apply in frequency bands above 39.5 GHz