

Submissions to the 5G discussion document

600 MHz band and radio microphones

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Submissions

002 Dean Judd

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

D Judd

To whom it may concern,

My name is Dean Judd and I am a sound recordist based in Auckland.
I am writing In Response to the proposed use of the 600mhz band for the 5g use in Nz.

I would strongly protest the use of this band, it would not only cripple many sound recordists, (who work with radio microphones which fall in the 600mhz - rendering the equipment useless) but also many other people in the film and TV industry.

These pieces of equipment are large investments and cost thousands of dollars. To not be able to use this equipment and need to purchase replacements would be extremely detrimental for many self employed contractors in the industry.

Please use one of the other proposed bands and let us use the equipment we have heavily invested in.

Yours sincerely

Dean Judd

003 Joseph Veale

Good Morning,

My name is Joseph Veale and I am a Christchurch based Sound Recordist and Technical Production Manager for various festivals.

My personal work on documentary and human interest TV and film would be severely affected by losing the 600Mhz band. My highly specialised and very expensive radio microphone systems would be rendered useless if I am no longer able to use blocks 24-26.

It will also make wireless microphone systems used at the: Christchurch Writers' Festival, Christchurch International Jazz Festival, World Busker's Festivals, Electric Avenues, Rhythm and Alps Concerts and many many more; impossible to use.

These events often require hundreds of radio systems to run and losing this frequency block would seriously increase the expense of putting the shows on, which would ultimately be worn by the attendees.

Please consider keeping the 600 Mhz band for radio microphones so we can continue telling NZ stories and providing high quality entertainment of all kinds.

Thank you for your time.

Kind Regards,

Joseph Veale

004 Peter Kraan

Hi there

I wish to express my concern at the possible loss of the 600mhz spectrum to 5G.

As a sound recordist, I use radio mics on a daily basis and we have already had to undergo costly re-equipping due to the 700mhz sell off.

Losing this spectrum will diminish our ability as content creators to carry out our jobs.

I believe 4g coverage should be optimised before our country sells off new frequency spectrum.

Regards

Peter Kraan

007 Ande Schurr

Dear Radio Spectrum Management team,

As a heavy radio mic user in the 600MHz band on feature films, documentaries and live events, I would like to commend you on recognising the difficult situation we operators are in.

I appreciate the fine balance you are in as custodians of our radio spectrum. We must keep New Zealand's 5G infrastructure on par with the rest of the world.

The world for us, radio mic operators, has become difficult. We could liken it to sucking in our stomachs as we hike along a very narrow gorge. Yet, after considerable re-investment and careful allocation and management of frequencies between each other, we are just managing.

I have only just completed making significant investment in the 600MHz spectrum for a new system of radio microphones and certainly, any news that we will have to phase our gear out anytime in less than 10 years will be, I believe, a major oversight and incredibly harmful in more ways than financially.

It would show a solid disregard, and lack of care and concern for the tens of thousands of

small business owners (broadcasting outlets, freelance sound operators and houses of worship etc) who use radio mics and give New Zealanders content that inspires, entertains, informs and ultimately improves their quality of life.

It's a fact that New Zealand is a nation of small businesses, so you must show a strong determination to keep our interests in the centre of your thinking and not be swayed entirely by the arguments of the telcos.

You have documented plenty of options in the super high frequency bandwidths, in areas that we are not able to operate our radio mics in, as the range becomes quite useless to us given the shorter wave-lengths. These obstacles are overcome however by the cellular companies with, as you note, a dispersed network model.

Certainly, if 5G providers or, perhaps closer than we realise, the providers of regional wireless broadband, were to operate in any more of the 600MHz spectrum, I wholeheartedly agree that we would need to be considerably compensated to relocate once yet again.

I have faith that you will make a decision that considers all users.

Sincerely,

Ande

008 Cameron Lenart

Hi there,

I am a location sound recordist for film and TV and as such I am a daily user of the 600Mhz band for radio microphones.

The structure for sound recordist in the film and tv industry is one of owner/operator contracts meaning one must own their own equipment and hire it out as well as labor for operating said equipment. This means I have a large amount of money [] invested in my 600Mhz wireless equipment which is currently the allocated band for us to use. Changing the allocated band means re purchasing all of my wireless equipment which will come at a huge expense for a sole trader like myself and may not be financially possible

for many.

It is for the reasons outlined above I am in opposition to the 600MHz band being utilised for the 5G network.

Thanks for your time
Cameron Lenart

009 Rich Green

To whom it may concern;

I wish to make it clear that any further loss of public white space, specifically the 600MHz band, for the purpose of the future 5G roll out would prove very detrimental to the many thousands of users of radio microphones and in-ear monitors (IEMs) in New Zealand, and I wish to register strong opposition to any plan that would reduce the available bandwidth in this area.

I note that in the discussion document there is a phrase that states "The remainder of the 600 MHz band is currently unused except by radio microphones." This is roughly equivalent to saying that Auckland roads are unused except by private and commercial motor vehicles. The statement is erroneous and a nonsense.

There is also misinformation in the discussion document regarding the historic use of radio mics in the 600MHz band. Radio mics have been permitted use of this band for a very long time, between the television broadcast frequencies, just as they are in the 500 band, between DTV channels. This means that there is in fact, a very large stock of very expensive equipment for use in the 600 band, so it is simply not true to say that adoption of this band for radio microphone use is recent.

Like everyone else, I look forward to the benefits of 5G, however, serious consideration needs to be given to the consequences of revoking any more white space. ALL of the currently available space is utilized throughout the country in order to sustain the necessary number of radio mic and IEM channels required for the following industries and organizations, and I'm sure, many, many more.

- All major sporting events, including international broadcasts of All Blacks test matches, often to millions of viewers.
- All television productions.
- All film productions
- International and local touring musical acts.
- Professional and amateur theatre productions.

- Virtually every school and tertiary institution.
- Virtually every church.
- Every conference facility in New Zealand including hotels, casinos and other dedicated facilities.

It is important to note that when one refers to 'users' of the the white space, that there are both direct users, and indirect users. So in the above example of an All Blacks test match, there may be 60 -80 direct users of radio equipment such as television match officials (TMOs), referees, broadcasters, match entertainment etc, but the number of indirect users can be counted in the hundreds of thousands, and even millions, for an international broadcast audience.

If Adele performs a concert in Auckland, she may sing on just one radio mic, but there are 45,000 concert goers who are indirect users of that microphone.

This should be taken as a stark warning; if the ability of the above organizations to produce sport, entertainment and other commercial activities is severely compromised by a lack of radio spectrum, the economic consequences will be extremely serious, not to mention the loss of culture and quality of life in New Zealand.

Please feel free to contact me anytime in the above matter.

Thank you for your consideration.

Kind Regards,

Rich Green.

015 **Liam van der Werff**

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing

hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
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Regards

Liam van der Werff

016 Marcel Reinen

To: radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, we would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Thank you for your consideration of this important issue that can potentially affect many everyday New Zealanders.

Regards,

Marcel Reinen

017 Ruawai Rakena

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Regards

Ruawai Rakena

018 **Andy Tait**

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Regards

Andy Tait.

019 Steve Hartley

Hi,

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Please feel free to contact me anytime if you wish to discuss further.

Regards,

Steve Hartley

020 The Rock Factory

Hi there,

It is not just us that is affected - it is EVERY SINGLE SCHOOL in New Zealand that used wireless microphones. Every school I know uses handheld wireless microphones during assembly and headset wireless microphones with wireless belt-packs during their school shows and productions. We already had to help many of them last time this happened - and it just does my head in thinking we are going to have to do it all again. Extremely frustrating.

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Warm Regards,
The Rock Factory Office Team

021 **Tim Robinson**

Response to "Preparing for 5G in New Zealand" discussion document

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Regards,
Tim Robinson

022 **Greg Moon**

To whom it may concern,

Re: 600MHz band reallocation

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be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

Greg Moon

023 **Danny Watts**

Hi There,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. I have recently invested I've [] in new equipment that is in this band. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

Danny Watts

024 Al Seconi

Response to “Preparing for 5G in New Zealand” discussion document

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Regards,

Al Seconi

025 Mike Westgate

Response to “Preparing for 5G in New Zealand” discussion document

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I currently own 28 devices that use the 600MHz band, equipment worth [].

To replace or modify these devices would probably cause my business to close.

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Regards,

Mike Westgate

026 Gareth Ruck

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Kind regards

Gareth Ruck

027 Paul Skelton

To : Radio Spectrum Management

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers,

such as at domestic and international sporting events and international music festivals

Regards,

Paul Skelton

028 Nick Treacy

To whom it may concern,

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I respectfully request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

* Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Nick Treacy

029 Mike Pearce

radio.spectrum@mbie.govt.nz

As a current user or supplier of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio microphone users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Thank you and regards,

030 Jeff Brass

To: radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Jeff Brass

031 John McNicholas

To Whom it May Concern

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band.

Currently there are no other spectrum bands

that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current

radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals,
- * theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers,
- * such as at domestic and international sporting events and international music

festivals

My radio microphone use in this frequency is paramount for me to provide quality sound recording for Television and film in New Zealand.

Yours sincerely,

John McNicholas

032 Sai Yin Leung

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Sai Yin Leung

033 Steven Harris

Hi, I work in the film & television industry using radio mics and in-ear monitors that operate in the 600MHz band. I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I have spent a lot of money change my equipment out of the 700mhz band recently and to move again would be another expensive exercise.

The current allocation is working well with a good block of frequencies in the 600mhz band. Most of the users that moved from the 700mhz have moved into the open space that is block 24, 25 & 26.

Overseas users who have lost the 600 MHz band have a real job of coordinating frequencies in different locations whereas here if we can preserve the current block of frequencies nation wide it makes working here in New Zealand a lot easier for radio mic users.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands:

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage for Film and Television production, large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Steven Harris

034 Jason Martin

I fully support and endorse the view of the Chair of Wireless Users NZ.

There are substantial financial and operational considerations at stake for many business operating in New Zealand, both large and small.

I urge a full and considered consultation on this issue that takes full account of the consequences of any reallocation.

As a current user of radio mics that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Jason Martin

035 Shane Lee

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would

be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Shane

036 **Tim Mulcock**

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Kind regards,

- Tim.

037 **Wilhelm Voigt**

To Whom it may concern.

Dear Sir/Madam,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Wilhelm Gerhard Voigt

038 Adam Martin

To: radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

adam martin

039 Ian Masterton

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Regards,
Ian Masterton

040 Richard Flynn

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

My colleagues in the UK have faced similar issues but because the West End Theatre users pointed out that the loss of ability to use radio mics would shut down all of the big musicals worth literally billions to the national economy some licensed spectrum in the 600MHz has been reserved for radio microphone users.

Regards,

Richard Flynn

041 Emah Hira Matiu

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Regards,

Emah Hira Matiu

042 Callum Marshall

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Callum Marshall

043 Murray Tregonning

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Regards,

Murray Tregonning

044 **Jeremy Mossop**

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Jeremy Mossop

045 **Brian Cornish**

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Regards

Brian Cornish

046 **David Cooke**

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz

band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

David Cooke

047 Alex Baron

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear

monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

--

Alex Baron

048 Colleen Brennan

To whom it may concern,

I am a sole trader working in an extremely competitive industry. As a current user of radio mics that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Your proposal would directly affect my livelihood, as I cannot afford to replace my current radio mics which have cost me tens of thousands of dollars over the years. The current work climate makes things difficult enough already.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Colleen Brennan

049 Ian Robinson

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions,

??

red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

--

Ian Robinson

050 Craig Perry

I am a professional Sound Recordist and Sound Engineer working in the Film and TV Industry, as well as mixing Live Events/Music Shows and weekly House of Worship Events. I have even worked on Political Campaign Rallies and Political Party promotional videos. All of these require the use of Radio mics, which are a basic tool to enable me to do my job. The last few years saw introduction of Digital TV and reallocation of Radio spectrum. This meant for many of us, having to replace expensive Radio mics to work in the remaining spare channels. This

5G use of 600MHz band would mean there is no where for us to use, and all Radio mics, some of which we recently had to replace, would have to be replaced again, and some other spectrum found where they could operate, if there is such a thing. In the last spectrum reallocation, a coordination of all the entertainment industry reps, joined as group, so that authorities could get a meaningful understanding of all the issues involved. All the same the reasons they raised, still exist, and now we seem to going down the same uninformed track , getting rid of this 600 MHz spectrum. I have [] of radio equipment that would become redundant if this Spectrum used for 5G.

And your live Political rallies would not happen, as would not, all the events mentioned below. I have worked in an event where 30 wireless mics were used. This requires significant range of frequencies, and the full, existing 600MHz band is needed to facilitate, interference free , operation at all the varied, public gatherings using radio mics and equipment

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Craig Perry

051 Murray Tregonning & Associates (NZ) Ltd

My company would be an affected party if this frequency band is reallocated for IMT/5G

usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Murray Tregonning & Associates (NZ) Ltd

052 **Brian Laing**

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I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band, and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear

monitor usage. This would affect Movie & TV production, large scale events, concerts, festivals, theatre productions, red carpet movie premiers, and sporting events.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as in Movie & TV production, domestic and international sporting events and international music festivals.

Regards,

Brian Laing

053 Leonie Phillips

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Regards

Leonie Phillips

054 Andrew Spooner

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premieres, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Andy spooner

055 Victor Grbic

Kia ora

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, our students would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing

hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Victor Grbic

056 Sam Scally

Hi Fiona,

Further to this, we purchased new radios in the 600MHz band after the 700MHz band was made unavailable to us ~4 years ago.. It's somewhat uneconomical having to purchase new equipment every 5 years due to a spectrum being reallocated. If this spectrum is reallocated perhaps you can budget some rebates for all users that have to invest in new equipment?

Regards,

Sam,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Sam Scally

057 Jason Monk

Hi There

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Jason Monk

058 Mike McMinn

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Mike McMinn

059 Scott Creighton

To: radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of

spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- As forcing radio mic users to give up the use of equipment that they have paid for, provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off. Arbitrarily revoking the contract of this frequency allocation is a violation of contract law.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Scott Creighton

060 Don Mathewson

Hi, i would like to protect below info..

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band.

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I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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hardware in direct response to the 700MHz spectrum sell-off.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Don Mathewson (sound Recordist). NZ - 27/4/ 2018

061 Kane Dickie

Kia ora

Response to “Preparing for 5G in New Zealand” discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Kane Dickie

Response to “Preparing for 5G in New Zealand” discussion document

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Regards,

Mike Kowalak

063 Eugene Arts

Response to “Preparing for 5G in New Zealand” discussion document

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

* I am a sole trader recording sound for film and TV (40 yrs) . I have re equipped with new 600Mhz devices in the recent passed years and am in no position to replace [] worth of equipment , it would literally send me to the dole cue .

Regards Eugene Arts

064 Carl Win

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

Carl

065 Karl Mooyman

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Regards,

Karl Mooyman

066 Mark Messenger

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Regards,

Mark Messenger

Hi There

I am a freelance Sound Recordist in the New Zealand Film and Television industry. Which is an industry that generates several billion dollars in the New Zealand economy each year especially in foreign films making there films here. International productions that were filmed here in the last year were Evil Dead, Adrift, The Shannara Chronicles all multi million dollar productions.

As a freelance I own my own equipment which includes a lot to wireless equipment that transmits in the 600mhz area one of the few areas left in the UHF spectrum the rest taken up by exist cell ph systems and the rest by the Television broadcasting such TVNZ and Mediaworks.

My own personal cost in equipment in this range is around []. There are many other Sound recordists like me that that have similar setups and costs.

If we were no longer able to use our equipment the costs to us would be Bankrupting and the inability to use radio mics easily in New Zealand this country will lose it's edge as one of the premiere world filming locations and the millions of dollars generated here by foreign film companies will dramatically drop.

Please leave some of the 600mhz spectrum for our use because our industry is extremely important to the economy.

Cheers
Mark Messenger

067 Louise Spraggon

Response to "Preparing for 5G in New Zealand" discussion document

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Regards

--

Louise Spraggon

068 Robert Pendergrast

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Regards,

069 Nachele Shearer

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Regards,

Nachele Shearer

070 Dianne Moffatt

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Regards,

Dianne Moffatt

071 Ash Robinson

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Regards,

--

Ash Robinson

072 Nik Williams

To whom it may concern,

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Regards,

Nicholas Williams

073 Alf Rose

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Regards,
Alf Rose

074 Debbie Sinton

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Regards,

Debbie Sinton

075 **Tony Johnson**

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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international sporting events and international music festivals

Regards,
Tony Johnson

076 Richard Bell

Dear Sirs//Madams

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands:

- a) Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- b) Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- c) Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Thank you for your consideration

Best regards

Richard Bell

077 Nigel Gordon-Crosby

I am a sound Operator who has in excess of [] on radio mic gear in the block 26 band
This would severely cripple me if Anything was to happen to the 600 band
Please do not touch thus frequency
Nigel Gordon Crosby

Sent from my iPhone

078 Phil Donovan

To whom it may concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

I currently have 10 x transmitters and 10 x receivers which could require re-blocking at a current cost of US\$375 per unit.

Others in our industry can have many more units than I have, so the cost to each operator could be quite considerable.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
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Regards,
Phil Donovan

079 John Griffin

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?-

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?-

Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

?..?

Kind regards,
John

080 Graham McArthur

Response to "Preparing for 5G in New Zealand" discussion document

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would

be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

Graham McArthur

081 Karl Saunders

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band.

Currently, there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do choose to adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie

premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Karl Saunders

082 Robert Gibson

Response to “Preparing for 5G in New Zealand” discussion document

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Robert 'Gibbo' Gibson

083 Kerry Russell

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Regards

Kerry Russell
Sent from my iPhone

084 Ron Kessels

Response to "Preparing for 5G in New Zealand" discussion document

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Regards,

Ron Kessels

085 Simon Ambridge

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Simon

086 Kevin Luck

Hi,

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

We radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently, there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Kevin Luck

087 Lisa Marshall

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Lisa Marshall

Hi there,

I know this is a copy & paste document below but it is a real concern for myself and my colleges and therefore the film & television industry as a whole.

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Regards,
Mark Williams

To whom it may concern,

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Zephir Delamore

091 Michael Keat

Dear Sir,

In response to the preparing for 5G in New Zealand discussion Document

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

Hundreds of schools around New Zealand will be affected by having to replace the radio mic systems they have in their halls and Theatres.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards

Michael A R Keat

092 **Graham Morris**

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Regards,

Graham Morris

093 **Tony Forster**

Dear MBIE,

I am not directly involved in the creation of sound communication within our industry, but I am heavily involved in the film and live performance industries — and in my work I rely heavily on communication devices, including those discussed below, in order to run these events, be they film sets or stage productions.

I am deeply concerned that it would appear that once again the practical users of our industry have not been taken into account in this new move regarding frequency allocation. I wish to add my voice to those who drafted the letter below.

Thank you for taking the time to consider the points raised.

Yours faithfully,
Anthony Forster.

To: <mailto:radio.spectrum@mbie.govt.nz> radio.spectrum@mbie.govt.nz
Response to “Preparing for 5G in New Zealand” discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Regards,

A. J. (Tony) Forster

094 James Newman for Light and Vision Co Ltd

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Regards, James Newman

for

lightandvision co ltd

095 Peter Benner

To: Radio Spectrum Management

Response to "Preparing for 5G in New Zealand" discussion document

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* Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off. This needs to be taken very seriously having just recovered from the last sell off. We service the 'not for profit' part of society like Musical theatre and having just recently, since the last frequency sell off, managed to accumulate a kit of 23 Radio Microphone units at a cost of approximately [] to our very small business. To hear that we may be going through this again is absolutely appalling.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Peter N Benner

096 Ben Vanderpoel

To Whom it May Concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Regards,

Ben Vanderpoel.

097 Mike Gailer

Hi,

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, Mediaworks TV will be an affected party if this frequency band is reallocated for IMT/5G usage.

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The loss or reduction of this band for radio mic and in-ear monitoring would seriously affect our day to day business. On recent events including two seasons of X-Factor NZ, Dancing with the Stars, and Newshub's Election coverage, we had a shortage of usable frequencies for short range radio audio linking due to the already reduced spectrum available.

If this band is lost, we will have enormous difficulty in finding solutions to our production requirements.

Kind Regards,
Mike

098 Gabriel Muller

As a current user of radio microphones that operate in the 600MHz band, I would be an affected if this frequency band is reallocated for IMT/5G usage.

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Regards,

Gabriel Muller

099 Andrew Minty

Please send this to Radio Spectrum Management by 5:00 p.m. Monday 30th April

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Regards,

Andrew Minty

100 Myk Farmer

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I work on international and domestic film and television productions in New Zealand. I have increasingly needed to use 8 or more radio channels on these productions. I have also needed to be working near other productions using the same studios, negotiating with other users to allow us to all have useable radio mic channels available. I personally spent more than [] on radio mic and in ear monitor equipment because of the 700MHz spectrum sell-off. Loosing available radio spectrum will reduce the ability of studios such as Stone Street , Kumeu Film Studios, Auckland Film Studios and South Pacific Pictures to host multiple productions at the same time. This will reduce their ability to compete for overseas productions.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events , international music festivals and large scale television and film production.

Myk Farmer.
Production Sound Mixer.

101 Don Anderson

To: radio.spectrum@mbie.govt.nz
Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Regards,

Don Anderson

103 Brooke Paterson

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Regards,

Brooke Paterson

104 Andrew Stewart

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107 Andrew Lindsay

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Regards

Cheers

Andrew Lindsay

108 Matt Oliver

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Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

We provide(hire) and operate wireless microphone and in-ear monitor equipment for a number of international level events (Fifa U20 World Cup 2015, Rugby League World Cup 2017, Vodafone Warriors Home Games, Mitre 10 Rugby Season as well as a number of local festivals) where UHF microphones are our only suitable option for range, clarity and latency. We hold over 60x Transmitters and 40x Receivers in our rental inventory. During the 700Mhz sell off we spent in excess of [] replacing equipment that was going to be illegal for future use and we are still recovering the cost on this equipment as we saw it as a long term investment. We also have sold a large number of wireless microphones to end users (over 100 in the past 3 years) who would be reluctant to change their units just because someone tells them to when chances are they will continue to operate without issue (Legality factor set aside). A lot of these end users are either individuals (Musicians), Community Groups or Churches who don't have large budgets for this kind of equipment and to them a single kit represents a major investment so to be forced to replace it prematurely (ie, prior to the end of its working life, if looked after they will often work for in excess of 10 years) will most likely cause them to either go without or operate illegally.

Regards

Matt Oliver

109 Ben Mannell

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

Ben Mannell - Audio Engineer

110 Joshua Grimsey

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premieres, and sporting events, including World Cups, World Championships and Commonwealth Games.

Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Josh Grimsey

111 Alistair Boot

Subject: Response to “Preparing for 5G in New Zealand” discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

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Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Alistair Boot

Alspix Studios

113 Dave Hurley

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I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

* Provide monetary compensation to affected users who acquired or modified

hardware in direct response to the 700MHz spectrum sell-off.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,Dave Hurley

114 Bill Brinsley

As a current user of radio microphones that operate in the 600MHz band, we would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones, [] had to be spent to replace existing systems.

If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless, again.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band.

Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Regards,

Bill Brinsley.

115 Chris Wiltshire

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Christopher Wiltshire BEngTech (Electrical) – Telecommunications Specialisation

116 Burnside School

Preparing for 5G in NZ

radio.spectrum@mbie.govt.nz

Response to “Preparing for 5G in New Zealand” discussion document

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, we would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, the Aurora Centre, Burnside High School, bought approved radios in the 600MHz band. Any change would severely restrict the use of our 18 radio mics, and those hired in for large productions.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM do not allow changes to the current frequency allocation. If you do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands, I would ask you to carefully consider the following.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie

premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Richard Wiltshire

117 Michael Cox

Hi,

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Michael

To whom it may concern,

Response to "Preparing for 5G in New Zealand" discussion document

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

James Gray

To whom it may concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of

spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Michael Cox

122 Ant Nevison

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear

monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

123 Q Theatre

To whom it may concern,

I am writing in response to the recent discussion document “preparing for 5G in New Zealand”.

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, Q Theatre would be an affected party if this frequency band is reallocated for IMT/5G usage.

Q Theatre is an independent charitable trust, operating performing arts venues at 305 Queen Street, to support the development of professional NZ performing arts. We programme our venues year round, and host wide range of clients such as Auckland Festival, NZ International Comedy Festival and Tempo Dance festival, along with over 60 other smaller independent arts companies. We simply cannot afford to re-acquire or modify existing hardware, and I certainly know that our clients would be in no position to have these costs passed on to them. Ultimately, audiences and artists would suffer, as our programming would be compromised or reduced.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Yours faithfully,

James

124 **Brigitte Yorke**

To whom it may concern,

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band.

Currently, there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do choose to adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

The use of radio mics plays a major role in the day to day functioning of all of the feature film, television shows, television commercials, music videos and short films made in New Zealand. It would literally be asking us to reinvent the wheel to reallocate the 600MHz band.

Regards,

Brigitte Yorke

127 Alistair McKinnon

To whom it may concern,

I have an interest in this discussion both as a educator (a current school principal) and as someone who is responsible for the technical systems within a 700 seat performance venue in Christchurch.

As an educator I am excited by the improvements we have seen in mobile technologies and what a provision for 5G may mean for us as users of this. I am also aware that as schools we are significant users of Radio Microphones and that some of the possible changes have significant negative impacts on this. While there are a number of questions asked in the discussion document I do not feel in a position to make a valid comment on these.

However the question of the use of the 600MHz (and in particular 622-698MHz) band for 5G is of particular concern

With my venue hat on I am a significant user of both Radio Microphones and in-ear monitor systems that currently operate within the 600MHz band. In our specific situation we were impacted by the 2015 changes to radio spectrum usage and had delayed some purchases (and had to replace some equipment) to ensure we were fully compliant with these changes. The space left in the 600MHz band above 622MHz gave us what we understood was some certainty and confidence to continue development, and to ensure that we were able to make purchases that both met the requirements and our needs. During this time period it was already clear that the USA were looking at this 600MHz band for cellular use and this was information that the Ministry of Business, Innovation and Employment should have been aware of at that stage and built into the 2015 changes if this was to occur.

As an organisation we currently have in excess of [] worth of radio microphones and in-ear systems that would be worthless if the 622-689MHz band was to become unavailable for radio microphone usage. We also have a need to purchase some more equipment in the next 3-4 months and this current consultation provides no clarity to allow us to do this with

any confidence. There are currently no other large blocks of frequencies available for this use, this 76MHz as a single block of frequencies is not available anywhere else in the spectrum. If any less than 7-10 years of lead time were to be given prior to the 600MHz band being used for cellular use I would suggest almost full cost compensation to radio microphone owners should be provided given the requirement that the ministry gave for us to move to using this band as recently as 2015 and the life expectancy of the equipment involved being reasonably long.

I would request that this block of spectrum is maintained for the use of radio microphones and similar applications to support this significant industry and the events that they support. If this is not maintained that other frequency blocks are protected with a longterm commitment to allow us to plan and have confidence in doing so.

I would also request that if this block of frequencies is made unavailable that due to the change that this would be since 2015 that the Ministry of Business, Innovation and Employment provides financial compensation to all users of radio microphone equipment within this band. It is important to note that a large amount of this was purchased deliberately in this band after or in preparation for the 2015 changes to spectrum usage.

Also if this block becomes unavailable for radio microphones blocks of spectrum need to be allocated to allow larger festival, concert and sporting events to operate the radio frequencies required, especially when multiple suppliers and users of radio microphones and in-ear monitoring systems are required to support an event. This should be a significant continuous block chosen in consultation with the industry and protected from further changes in years to come.

It was disappointing to only discover about the opportunity to make this submission and to be able to read the associated discussion document in the last 24hours, for this consultation to have meaning it needed far more publicity than it received. The result of this at least appears to be consultation in name only....

As indicated in the discussion document there are other options than the 600MHz band that allow 5G services to be provided. I would submit that these are more appropriate for the NZ market and we should maintain (and protect) the 622-698Mhz band for Radio Microphone usage.

Regards,

129 Henry Norton

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Following this law change we have invested heavily in legal systems, and actively encouraged and assisted venues to do the same.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Henry Norton

131 Entertainment Technology New Zealand

Entertainment Technology New Zealand Inc is an organisation representing 280

entertainment / events personal from across New Zealand. We see massive problems and costs for our members if the 600 MHz band was reallocated for IMT/5G usage. We are talking an impact on everything from the small community sports and arts groups, conference to the major sports and entertainment events, all of which use microphones and in ear monitors.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

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ETNZ would welcome the opportunity be to of any assistance to the review process.

Kind regards

133 Vern Talbot Broadcast Engineering Ltd

It is acknowledged that each new technology increases the demand on spectrum, to the point where some existing spectrum uses must be squeezed or moderated.

This company has been involved in owning and operating radio microphones for use in broadcasting, events and stage sound.

Rechannelling the company's radio microphones has been a major expense and disruption we are still recovering from. Use of the 600MHz band has not been assured, but to operate radio microphones, 600MHz has been the only option offered.

This disruption has been felt by others in the industry, and the cost has been passed on to consumers.

This is not the time to consider another move to make room for 5G.

It is essential to the stage sound, event and broadcasting industries, that radio microphone users are considered legitimate spectrum users and a permanent spectrum home found. It would seem logical that the replanning of the 600MHz band in the near future, allows for radio microphone use on a permanent basis.

134 Kaveh Sharifian

To whom it may concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Kaveh Sharifian

135 Shaun Logan

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz

band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

This would basically be a financial end to my business as a sole trader, with an estimated reinvestment in excess of [] in equipment. I could absorb this any way.

Regards,

Shaun Logan

Thank you for the opportunity to comment on the consultation document.

Q5. Do you agree that the 3.5 GHz band is the top priority for allocation for IMT/5G?

I'm not able to comment on the technical suitability of the 3.5GHz band for 5G but I support it's use on the basis that it is not in the 600MHz band

Q7. Do you agree that the 26 GHz band is a high priority for allocation to IMT/5G in New Zealand?

I'm not able to comment on the technical suitability of the 26GHz band for 5G but I support it's use on the basis that it is not in the 600MHz band

Q14. Is there a need for more sub 1GHz spectrum for IMT/5G?

600MHz should not be considered IMT/5G unless adequate, viable UHF spectrum is made available for radio microphone and IEM usage. Should IMT/5G require sub 1GHz then 800 and 900 MHz spectrum allocations need to be considered.

Q15. If so, how should we deal with radio microphones in the 600 MHz band?

Professional radio microphone and IEM systems using both digital and analogue RF techniques require the use of 470 to 700 MHz spectrum to obtain reasonable range in all working environments due to the propagation characteristics of this band. Human body absorption also impacts on effective output power of body pack systems and best transmission performance for these applications only occur in the 470 to 700MHz range. Other considerations include the requirement to adhere to professional audio specifications for the creation of original production content along with low latency (4ms or less) for live applications.

Significant growth in the use of professional radio microphones and IEM can be expected for TV and film content production along with live entertainment events such as concerts, sports and theatre.

In the Auckland area, the current DTV channels allocation from 510 to 622MHz comprises of primary transmissions interleaved with significant infill transmissions that result in this spectrum being unsuitable for professional use. The only viable spectrum for radio microphones is 502 to 510MHz and the 622 to 698MHz.

Having created a dense usage of DTV in Auckland in the 500MHz band without any consideration for professional radio operation, the viable options for RSM to deal with radio microphone spectrum requirements are:

- 1) to allocate a significant proportion of the 600MHz band aside for professional radio microphones use. Given that this spectrum is where most of the professional wires microphone investment has occurred, an allocation in this band will provide no disruption to the users of this spectrum
- 2) Free up all of the 470 to 502MHz spectrum for radio microphone usage. Given the cost of shifting existing users of this spectrum to new services, this option is unlikely to be practical.
- 3) Examine the future requirement of UHF DTV transmissions as internet technology provides consumers with increased streaming services. There may be an opportunity to reduce the number of DTV multiplexes in the next 10 to 20 years that will free up 500MHz spectrum for radio microphones
- 4) Additionally, allow for professional radio microphone usage in the 4G 700MHz guard band and any 600 MHz 5G guard bands if they eventuate. This would provide small but usable spectrum windows.

About Production Sound Ltd

Production Sound Ltd provides location audio recording services for both feature film and television drama production. Production Sound Ltd supplies up to 14 radio microphone channels and 3 IEM channels (with 20 receivers). Current replacement cost of this equipment is in the range of [].

141 Russell Fricker

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Russell Fricker

142 Jason Parlour

To whom it may concern,

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Sincerely,

Jason Parlour

To whom it may concern

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. Other bands such as 2.4GHZ are already overcrowded and experience tells me that it is almost impossible to use this band for radio microphones.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

David Elsbury

Dear Sir/Madam,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

I have worked within the film and television industry for the past 11 years and there are but a hand full of jobs that we have not required radios mics for. They have been used in every

terrain from dense bush to studios as the only form of communication which preparing and filming. They are one of the most invaluable tools within our set life. Film work is based around flawless communication and radio mic are able to provide that. Not to mention the huge impact they have on the health and safety of our industry. With crews often spread over large areas, we can always feel safe in the knowledge that if anything happens we can use our radio mics to get immediate assistance. I had the unfortunate experience of nearly being attacked on Karangahape road whilst filming at around 3 am in the morning and I was able to radio for immediate help and had people by my side in less than a minute - due to the size of the shoot if I was yelling for help no-one would have heard me.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band.

Currently, there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do choose to adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Mareena King

148 Doug Boyd

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless again.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Regards,

Doug Boyd

150 Lindsay Gordon

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz

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Lindsay Gordon

154 Brad George

Dear Sir / Madam

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

I currently use Radio Microphones in the 614 MHz - 640MHz range that I have invested a substantial amount of money in for my livelihood. There are many of us that work in the Film&TV industry and also Event production that rely on this frequency band being available to us. In an industry already stretched having to replace gear as mentioned would put many

of us out of business.

Regards,

Brad George

155 Grant Sanderson

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Grant Sanderson

156 Tim Jenkins

Dear Sir

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz

band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premieres, and sporting events, including World Cups, World Championships and Commonwealth Games.

Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

Tim Jenkins

157 Rich Burrige

Good morning,

I feel I must write to express my extreme concern over any chance the 600Mhz GUL license might not be renewed in 2020 and that part of the spectrum sold of for 5G use.

As one of the largest radio mic retailers in the country we had first hand experience of the huge financial impact the 700Mhz sell of had on our customer base, many of whom are not for profit organisations. So the impact was not only felt by them but by the members of the public that rely on those organisations. Just as an example we are the chosen supplier to all the [] and they had to replace a huge number of radio mics, I'd estimate in the region of [] worth, so that had a massive impact on their budgets that would have been spent working with those people in the lower socio-economic bracket. Because of the

overlap in DTV in many of their centres such as Auckland and Wellington it wasn't possible to supply enough replacement wireless mics to cover the numbers needed with replacements in the 500Mhz band so the only option was to use those in the 600Mhz band. If the 600Mhz band were sold off in 2020 and they were forced to once again replace all their radio mics again, within only 4 years of purchasing new ones, the financial implications would be huge. And frankly in my mind a very unfair move by the Govt when there are several other more viable options for 5G use.

This is just one example of the customers we work with on this issue, other customers include small community groups and theatres who pretty much had to spend their entire annual budget to replace their radio mics last time. To have to do that once again within such a short space of time is very unfair.

I would therefore have to insist that if there was any consideration of the selling off of the 600Mhz band then this would have to include a very fair a deserved buy back scheme for any wireless mics sold to those organisations due to the 700Mhz sell off. This would cost a considerable amount to the Govt, and could well stretch into millions of \$\$, but this is simply the only fair way this could be carried out due to the short space of time since these people have been forced to replace their wireless systems due to the 700Mhz sell off.

The only other option that would be suitable for our customers is if there were enough bandwidth left in the middle of the 600Mhz band to allow the use of at least 8 wireless systems without any intermodulation issues, as that is the average number of wireless systems our customers have running.

Yours sincerely

Rich Burridge

158 **Shawn Bayliss**

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

160 **Malcolm Hogg**

Response to “Preparing for 5G in New Zealand” discussion document

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Regards

161 Russell Williams

Response to “Preparing for 5G in New Zealand” discussion document

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Kind Regards

Russell Williams

162 Mark Storey

To Whom it May Concern

I am a freelance sound recordist in the New Zealand television industry. A number of my colleagues have independently sent an identical email regarding the possible loss of use of

radio spectrum.

I have some independent comments to make on this matter.

Please be aware that screen production is absolutely reliant on the availability of radio spectrum. Most of the people you see on your screens every day are wearing microphones (hidden or not) connected to radio transmitters. Capturing their voices at all, let alone at a quality acceptable for broadcast, is often possible only when such transmitters are worn. These radio transmitters are made by American, European and Japanese companies and operate over a limited range of frequencies e.g. divisions of the range 470 - 691 MHz. Furthermore it is only a few years since radio microphone users were required at considerable expense to replace transmission systems that operated above 700 MHz. Additionally many of the frequencies below the 600MHz range are unavailable. For this reason, many of us have invested in equipment that operates between 614 and 691 MHz.

While we understand the importance of telecommunications services, the public also consumes screen production and attend live events. New Zealand is rightly proud of its ability to attract international production, but in many cases our securing an international production comes down not to our mountains and rivers so much as our ability to provide tax breaks, crew and facilities. Making radio spectrum in the 600 MHz range unavailable is removing an extremely important facility.

Sincerely,

Mark Storey

163 Jonathan Owens

To Whom it may concern

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Regards

Jonathan Owens

164 James Campbell

Response to “Preparing for 5G in New Zealand” discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Regards,

James Campbell

166 Jason Buckley

To Whom it may concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Thank you for your time on this matter

Kind Regards

Jason Buckley

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Kind regards,

Glenn Dixon

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

169 **Gordon Prier**

Dear Sir,

As a current supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and

international sporting events and international music festivals

Regards,

Gordon Prier

170 **Phill Adams**

To: <mailto:radio.spectrum@mbie.govt.nz> radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Phill Adams

171 Peter Magness

Dear Sir / Madam

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be a greatly affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. This is particularly the case in Auckland.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards

172 Scott MacKenzie

Response to "Preparing for 5G in New Zealand" discussion document

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Regards,

Scott

173 Kevin Krippner

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--

Regards

Kevin Krippner

174 Dave Mills

Hello,

As a current user of radio mic's and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Regards,

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Best Regards

Stu Clark

Dear MBIE. It is with concern that we learn there is yet another potential spectrum change. I

represent a voluntary sport organisation that use microphones most weekends.

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

NEIL RITCHIE.

177

Tim Hyndman

Response to “Preparing for 5G in New Zealand” discussion document

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Any decision to move radio mic users out of the 600MHz band will cost me personally in excess of [] to replace equipment, never mind the daily stress of trying to find available radio channels in an already crowded spectrum.

Regards,

Tim Hyndman

Response to “Preparing for 5G in New Zealand Discussion Document”

Pacific Audio Visual Ltd welcomes the opportunity to comment on the Preparing for 5G in New Zealand Discussion as a supplier of Radio Mic products into the New Zealand market.

The discussion document outlines the 600MHz band as a candidate band to be reallocated for 5G/IMT usage. Radio mic users would be affected to varying degrees should this frequency band be reallocated. The vast majority of our customers operate their radio mics in the 600MHz band. Pacific AV has deep concerns for our members to reliably use radio mics and in-ear monitors on large scale events due to the lack of available spectrum in alternative frequency bands.

Radio microphone users are still recovering the cost of moving from the 700MHz band, two years ago, the 600MHz band appeared to be a safe haven when re-allocating frequencies as the 500MHz band has limited spectrum available in metropolitan centres, in particular Auckland where there are many locations within range of the Waikarua transmitter and one or more of the infills.

The concerns expressed in WUNZ’s submission to RSM’s 5 year plan haven’t been addressed. See <https://www.rsm.govt.nz/projects-auctions/completed/draft-outlook-2017-2021/folder-submissions-received/WUNZ%20Spectrum%20Outlook%20Submission>

We are also mindful of the fact that the current GUSL for radio mics that operate in the 622-698MHz spectrum expires on 11 March 2020. Pacific AV would like reassurance that the GUSL will be renewed to allow the continued usage of radio mics in this band.

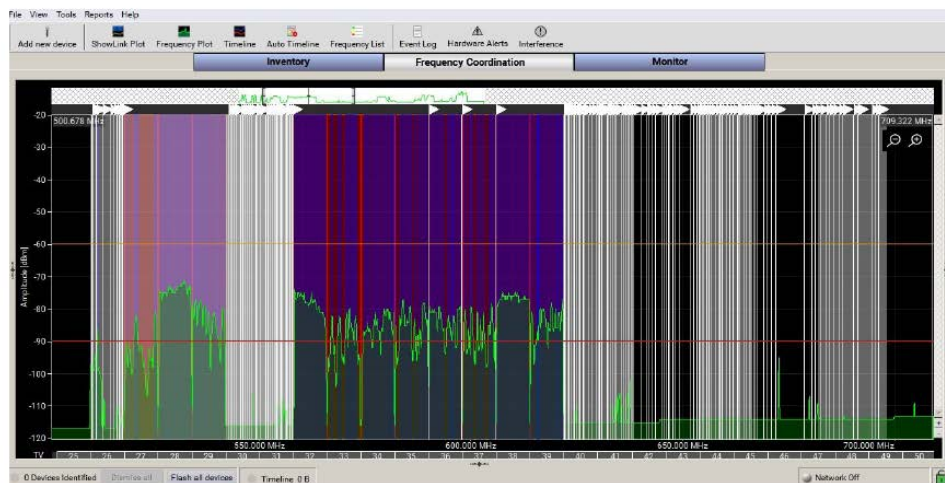
Content is King so who would be affected by a reduction in available RF spectrum for Radio Mics?

Large events

A major event such as an All Blacks Test Match, can require up to 70 frequencies for radio mic usage in the 600MHz band. Such high demand requires the use of the entire 76MHz bandwidth in the 600MHz band. The equivalent amount of available spectrum does not exist in the 500MHz band at Eden Park or at QBE Stadium in Albany. New Zealand Rugby Union’s ability to continue to host All Blacks games in Auckland’s Eden Park would be severely compromised.

In Auckland we have as little as 24MHz of clean spectrum available to us in the 500MHz band (the rest is unusable because of strong DTV transmitters). If currently unused DTV transmitters commence broadcasting, the available spectrum reduces to 8MHz. In stark contrast, we have available at any location in New Zealand, 76MHz of clean spectrum in the 600MHz band. If we lose this 76MHz without having an alternative, we cannot meet the RF demands of the such events.

This graphic shows the frequency used across the day during the Auckland City Limits Festival 2018 at Western Springs. The final count of frequencies across all stages was around 160. On the graph you can also clearly see how strong the active DTT channels are at that location as well as the lack of available white space in the 500MHz band.



Similar density of DTT transmissions in the 500MHz band is also prevalent in other parts of Auckland, Hamilton City, Tauranga, Wellington and Nelson.

Usage of radio microphones is burgeoning, so we need more spectrum to cope with this.

Film and Television Production

Film and television production is reliant on radio microphones and IFB equipment for programme creation. Radio microphones are used extensively in news production, reality television, documentaries, drama, soaps, feature films.

Media Organisations

Technology has forced traditional print media organisations to now introduce video content on their websites, so they too are regular users of radio mics. There is greater usage and potential of conflict of frequencies when all the various media organisations arrive at the location of a significant news event. Such organisations are naturally unable to preplan their movements, so the requirement for them to have nationally available spectrum is vital.

Education

Tertiary institutes and schools rely on radio microphones for a range of activities from lectures through to school productions and sports days. There are thousands of schools and universities around the country, all with many radio mics that get used on a daily basis.

Stage Production

The days of the lyric theatre and the cabled handheld microphone have long gone and most productions use radio microphones in ever increasing numbers. A modern performance could not do without them.

Smaller operators

There are many small companies that rely on radio mics as a source as income, such as small rental companies and conference venues. They use radio mics as a regular part of their daily business.

Value to Community, Financial and Cultural

There have been a large number of Festivals and Events that use radio mics over recent times, including some massive concerts which added a lot of money to the local economy, these include:

Ed Sheeran, Paul McCartney and the Foo Fighters.

http://www.nzherald.co.nz/entertainment/news/article.cfm?c_id=1501119&objectid=12034766

Auckland's mega summer: Music stars and sport make \$13.1m for the regional economy

The Lions tour 2017, attended by almost 350,000 people, estimated TV audience was approximately 10 million viewers in New Zealand and over 230 million international viewers. Furthermore, nationally, the tour contributed \$194m to the GDP and created 2507 jobs.

Vodafone Music Awards, broadcast and viewed on TV / online by ??? people

Christmas in the Park, turnout of 50,000 in Christchurch, 90,000 in Auckland, viewers of the broadcast: ??? people

Laneways Festival Auckland: 13,000 people

ACL festival Auckland: 25,000 tickets

WOMAD festival, New Plymouth: A completely sold out Saturday put the site at capacity with 12,500 audience members and 17,000 people in total (including all of the workers, artists and vendors).

LIVE TV

Nielsen's New Zealand Multi-Screen Report (October 2017) <http://www.nielsen.com/nz/en/insights/reports/2017/kiwis-and-live-television-keeping-it-real.html> shows that consumers are continuing to watch broadcast TV and 90% of this viewing is spent watching live content. On average, 77% or 3.1 million Kiwis (aged 10+) watch broadcast TV each week and live viewing was the dominant viewing behaviour across all age groups. These all use radio mics and would be affected by any spectrum changes.

All of these large events need a large RF spectrum to accommodate radio microphone and in-ear-monitoring usage. International guest, artists and media rely on available spectrum, too. From our perspective; 600MHz is already established, suppliers have functioning equipment. It is a spectrum band that is used in wide parts of the globe, and therefore compatible with international guest's equipment.

SUBMISSION Q&A

Q5. Do you agree that the 3.5 GHz band is the top priority for allocation for 5G?

A5. Any wireless user of the 600MHz spectrum would prefer other allocations are used.

Q7. Do you agree that the 26 GHz band is a high priority for allocation to 5G in New Zealand?

A7. Any wireless user of the 600MHz spectrum would prefer other allocations are used

Q14. Is there a need for more sub 1GHz spectrum for IMT/5G?

A14. As there is no plan for radio microphone users to go elsewhere, nor who would pay for such a migration Pacific AV would like to see it preserved for the current use for radio microphones and radio in-ear-monitoring.

Q15. If so, how should we deal with radio microphones in the 600 MHz band?

A.15

- Allocate contiguous spectrum elsewhere. Manufacturers are unlikely make systems specifically for the New Zealand market. For example, equipment made for use in North America are likely to work between 470 MHz and 608 MHz. However, 470 MHz - 502 MHz is not licensed for General Users here as it is allocated for other uses. European manufacturers will use the 600 MHz band for some time. Companies supplying equipment for use in USA include Shure, Sennheiser, AKG, Lectrosonics, Audio Limited. All are represented in New Zealand.
 - Make as much as possible of 470-510 available for RF mic use (align with USA).
 - Allow access to spaces and guard bands in the existing spectrum.
 - Consider how a licensing system might allocate spectrum for professional users in specific blocks whereas smaller users such as churches and gyms have a General User Licence elsewhere. We are aware that these bands can only be given to us in bits and we need to use it within the legal framework and stay away from blocked parts.
 - Compensation for investments made in equipment in the 600MHz range within 5 years of the spectrum being reallocated. Thus, someone buying a system today would know their investment was good for five years minimum even if parts of the spectrum are available for licensed users.
-
- Spark has recently been awarded streaming rights for the 2019 Rugby World Cup. Telecommunication Companies need to be aware that should they wish to venture into local sports production rights, then they'll need to use radio mics to create the content.

[Rural broadband]

Q34. Which alternative bands may be suitable for regional allocation? Why?

A34. NOT the 600MHz as it is not vacant. Festivals like Ohakune Mardi Gras, Rythm'n'Vines/Alps, Splore etc. will need this spectrum if there is no adequate alternative. Same applies to rural sporting events, especially if broadcast.

Q41. When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?

A41. 600MHz: hopefully never, at least not in the next 15-20 years or until radio microphones and the like naturally migrated to different options. Technology going forward and all.

Summary

Pacific AV Ltd is concerned that the Government is not making enough allowances for Radio Mic usage. The change made to the 700 MHz band a few years ago caused massive costs to a large number of companies, individuals as well as voluntary organisations such as churches and clubs. To have another change so soon will have a massive financial impact on all of them.

In addition, if the 600MHz spectrum was made unavailable, there is literally no where to go for radio mics as the 500MHz is already jammed with DTV in large blocks, making it particularly difficult to run multiple channel systems.

We urge the government to seriously consider the potential impact that reallocating the 600MHz band will have on a very important part of the NZ economy.

Thanks and regards,

179 Ernie Gebauer

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Our religious organization had to spend 10's of thousands of dollars to comply with the last

Government change and my rental business also spent thousands. There was also a considerable cost to schools, local clubs, pubs and community groups!

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

--

Kind Regards

Ernie Gebauer

181 David Stewart

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a continuous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
David Stewart

182 Maurits Roos

Response to “Preparing for 5G in New Zealand” discussion document

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Maurits Roos

183 Neil Turner

To: <mailto:radio.spectrum@mbie.govt.nz> radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

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I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Neil Turner

This response relates particularly to the Discussion Document questions 1, 15 and 16.

As a current user and supplier of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio microphone users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently, there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

As a specialist supplier to the non-profit and religious sector, I would point out that this sector, in particular, is ill-equipped to make another forced “fork-lift upgrade”, and the response of many of my clients will be simply to do without such systems. The immediate consequence of this will be an immediate degradation of service to the many hearing-impaired and disadvantaged persons to whom my clients provide social welfare services (and in extreme cases may even lead to cessation of service provision entirely).

At another level, removing capacity to operate relevant equipment in the 600MHz range may cause some of my clients to lose their ability to comply with their obligations under the Building Code and Disabilities Code. Compliance with these may involve providing Hearing Augmentation systems and the audio source for such systems will be a microphone. In many cases, the functional and logistic requirements of the service being delivered dictate that this microphone should be a wireless device. Loss of 600MHz systems may require not only replacement or modification of the microphone but may require replacement and/or modification of the entire Hearing Augmentation system, possibly requiring extensive associated building works.

The benefit of such social and potentially intangible services provided by the non-profit sector is not as easy to quantify as the glamour entertainment sectors of Music, Sport and the Arts. However, the social and economic benefits of the sector are not inconsequential.

I request on behalf of my non-profit clients, that Radio Spectrum Management adopt the following recommendation as a guiding principle of re-planning NZ spectrum;

* Ensure that sufficient usable spectrum, preferably in the existing 600MHz band, is preserved for radio microphone and in-ear monitor usage at the community level for educational, health-related and social good purposes by non-profit and religious entities.

I also request that Radio Spectrum Management carefully consider these comments and the following recommendations should you resolve to reallocate the 600MHz band and therefore require current radio microphone and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

* Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

* Ensure that sufficient usable spectrum is preserved for radio microphone and in-ear monitor use at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events. This provision should make allowance for the fact that multiple users and/or suppliers are operating concurrently at some of these events types.

Regards,

Peter Lane,

185 Stephen Utting

To: <mailto:radio.spectrum@mbie.govt.nz> radio.spectrum@mbie.govt.nz

Response to "Preparing for 5G in New Zealand" discussion document

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

Last time this happened, it cost my company [] to upgrade our uhf microphone systems, many churches in the Waikato area had to do the same

Any further changes I would like to see the following:

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events international music festivals, the national Fieldays in Hamilton

Regards,

Stephen Utting

186 Nathaniel Grigg

To: <mailto:radio.spectrum@mbie.govt.nz> radio.spectrum@mbie.govt.nz

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- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

187 Mark Corbett

Response to “Preparing for 5G in New Zealand” discussion document

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I request that RSM carefully consider the following if they do choose to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Mark Corbett

To Whom it May concern,

As a sound contractor to many major hallmark events in the Waikato region we would find facing this process again very frustrating. We are the sound contractors at Mystery Creek for NZ's massive Fieldays agricultural event held annually. At this event over a large land area are we would use MANY radio mics in this band and would be seriously affected. Similarly we provide sound at many sporting fixtures of National and International level and have a reputation/brand of delivering sound quality at the uppermost level. The very last time the industry was put in this position our company absorbed somewhere in the region of [] in terms of replacement radios for commercial use. We simply cannot continue with this ongoing stress and drain on our resources seemingly at the whim of spectrum management

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand..

We request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

* Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Thank you

As a current user and supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

I am totally OPPOSED to the prospect of having to AGAIN go through a similar change of frequency band whereby our hardware becomes virtually worthless. With the 700MHz band sell off it directly cost our business many 10's of thousands of dollars to reinvest - in equipment that we thought would last us a long time. We are a small business and that sort of cost represents years of work and saving to pay for the equipment that we NEED just to do our job. It was a cost that had NO business advantage to us - so was effectively a FINE just for being in this industry! I am bitter about the last sell off and lack of compensation and if it were to happen again without compensation I seriously think I would walk away from the industry.

It is currently already difficult to have large numbers of wireless microphone systems operating simultaneously in a single venue - such as for Theatre productions where 25+ systems need to be used. The arts and entertainment industry relies on the extensive use of wireless equipment - so what are we to do if there is no longer enough spectrum available to do a show well? Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide FULL REPLACEMENT monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

- Provide an adequate length of time to allow for the transition of professional users into any newly allocated frequency band/s

Regards

Richard Howey

194 Matt Coplon

Dear Sir / Madam,

Response to “Preparing for 5G in New Zealand” discussion document

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Additionally, this is the second time that allocated spectrum has been removed from the entertainment industry. Only 5 years ago we had to replace perfectly good RF equipment because the goal posts moved. Now it's happening again, and to be frank the financial costs are devastating to a business, and as far as I can see should be unnecessary.

Thank you for your consideration.

Matt Coplon

196 John Lynch

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

John Lynch

198 Fraser Satherley

To: radio.spectrum@mbie.govt.nz
Response to "Preparing for 5G in New Zealand" discussion document

Hello,
I am a location sound recordist and have been in the industry for over 20 years. I have experienced all manner of RF environments globally and locally.

I am head of sound department for top New Zealand domestic shows as MKR and master chef / house wives of Auckland and many other notable multi track location / drama and reality series.

While in the UK I was the sound engineer for BBC Dragons Den and the speaker .

I have over [] invested in location radio mics .
The latest receiver racks bought 18 months ago at the cost of [].

I am independent sole operator and this has been 20 years of build up and risk all on myself and family.

The 600MHz range is where a my radios sit.
This not only allows for reception through all of New Zealand Locations's but also a integrated continuity of equipment supplied from other sound recordist and free lancers.

Often in my team there are up to 6 other operators all supplying 4-6 channels of RF radio mics in this 600MHz range ..
So EVERYONE is compatible .. ie ever operator can tune in on any contestant at any time at any location.
Often up to 30 contestants all on individual transmitters.
600 MHz needs to be keep whole so this amount of radios can be used together without intermodulation or disrupted work flow.

This is a competitive advantage that we (Nz) can offer incoming productions !
A coordinated slice of frequency with relevant equipment to maximise rf in this space ...

If the 600MHz range is lost or fragmented ...
Live events and live tv ... live monitoring on recorded shows (ie control room , IFB or IEM)...
will become Very cost prohibitive or not able to happen.

The solo freelance can not afford to re invest in equipment that won't be compatible with larger shows or won't cover ALL regions of NZ...
They will be priced out of the market .
Eliminating the small operator and only the larger operations / multi national companies can afford this.

I agree will all stated below but also add that this is an opportunity to unify and cement

space for film / TV / arts / electronic media / entertainment ...
HUDGE Industry that employ thousands of people ...

Let's move to make Nz RF organised and with it be a huge asset and competitive advantage
..

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Regards,

Fraser Satherley

199 Ray Ward

To Whom it May Concern

Subject: Preparing for 5G in NZ

Response to "Preparing for 5G in New Zealand" discussion document

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

We have already just spent another [] on B Band 600MHz wireless in the past monty and our investment in radio mics in this frequency are over 150K.

Regards,

Ray & Brenda Ward

200 Luke McIndoe

To: radio.spectrum@mbie.govt.nz

Subject: Response to "Preparing for 5G in New Zealand" discussion document

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless,

requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless again.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

I trust you will take my feedback into account when considering this proposal.

Luke McIndoe

203 Andrew Alexander

To Whom it may concern

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Andrew Alexander

214 **Beka Livick**

To whom it may concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Beka

215 John Charlton

Response to “Preparing for 5G in New Zealand” discussion document

As a current specifier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

One of my clients uses a large number of radio microphones in this band, having had to recently purchase new equipment due to the closure of adjacent frequencies.

These are used in an outdoor setting over a wide area, and higher frequency units would not perform as well, if at all, due to absorption by foliage etc.

The installation includes external antennas and other equipment that would have to be replaced if they could no longer use the 600MHz band.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved in the 600MHz band for existing users of radio mics and in-ear monitor usage at open air venues and large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved in the 600MHz band for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals, to avoid interference between systems.

Regards

John Charlton

219 Lisa Fahrenberger

Lisa Fahrenberger
133 New Windsor Road
New Windsor
Auckland 0600

30 April, 2018

Response to “Preparing for 5G in New Zealand Discussion Document”

I welcome the opportunity to comment on the Preparing for 5G in New Zealand Discussion Document.

As a professional audio technician specializing in RF coordination for radio microphones and in-ear-monitoring on large scale events discussing the 600MHz band as a candidate band to be reallocated for 5G/IMT usage affects my work very much.

Apart from the fact that a lot of owners of radio kit for audio transmissions are still recovering from the loss of the 700MHz spectrum, I am more concerned about available spectrum.

So before I go to answering the relevant questions in the discussion paper let me outline why I think it is important not to include the 600MHz spectrum in the roadmap to 5G.

Large events

That is basically it. Large scale events contribute immensely to the economy. They create income for a number of industries (apart from the obvious wider event industries), including hospitality, tourism, transport. They create jobs, short- and long term. They create visibility for New Zealand and a positive image of our can-do attitude. They bring people together.

All large scale events that I have ever worked on rely on radio microphones and in-ear-monitoring (or IFB as broadcasters call it). They are broadcast, some of them internationally. They attract media from all over the planet. They almost always have an entertainment portion with more or less well known artists. They almost always have large stage areas and short changeover times that make cabled microphones very difficult to use.

I have been doing RF coordination for a number of large scale events in New Zealand and

worked on a couple more. These include the Rugby World cup Opening ceremony, the Cricket World cup Opening ceremony, the All Blacks homecoming in 2015, the Americas Cup team homecoming last year, a number of major Festival in the last 6 years (Big Day Out, Auckland City Limits, Laneways, WOMAD, Parachute), the Vodafone New Zealand Music Awards, Coca Cola Christmas in the Park, the Lions Tour and more.

From all of these experiences I can tell you that these events need available spectrum to work as well and flawless as they have been in the past. I'm happy to provide you lists of requirements for UHF frequencies for some of the events I worked on to show how prevalent the use of wireless audio gear actually is.

Now you might say: But there is all of the 500MHz!

Sure. Have you tried to operate a radio microphone on top of a strong DTV transmitter? It does not work.

Currently there are 24MHz available to us if you are in an area with strong DTV on both main transmitter and infill. If Sky decides to use their 2 currently free channels it will shrink down to 8MHz.

In stark contrast we have available at any location in New Zealand, 76MHz of clean spectrum in the 600MHz band. If we lose this 76MHz without having an alternative we can not meet the RF demands of those large scale events.

Now to visualise, this graphic shows the frequencies used across the day during the Auckland City Limits Festival 2018 at Western Springs. The final count of frequencies across all stages was around 160. On the graph you can also clearly see how strong the active DTV channels are at that location as well as the lack of available white space in the 500MHz band...

Similar density of DTT transmissions in the 500MHz band is also prevalent in other parts of Auckland, Hamilton City, Tauranga, Wellington and Nelson.

The Ministry of Business, Innovation and Employment manages this site:

<http://www.majorevents.govt.nz/> <http://www.majorevents.govt.nz/> "New Zealand Government works in partnership with the event sector to support New Zealand's growing reputation as an attractive destination for major events of global significance."

Again, all of these large events need a large RF spectrum to accommodate radio microphone and in-ear-monitoring usage. International guest, artists and media rely on available spectrum, too. From my perspective; 600MHz is already established, suppliers have functioning equipment. It is a spectrum band that is used in wide parts of the globe, and therefore compatible with international guest's equipment. Look at it like you would look at other parts of the infrastructure to accommodate these events. You need hotel rooms. You need public transport. You need RF spectrum for audio transmissions.

Some numbers:

- The Lions tour 2017, attended by almost 350,000 people, estimated TV audience was approximately 10 million viewers in New Zealand and over 230 million international viewers. Furthermore, nationally, the tour contributed \$194m to the GDP and created 2507 jobs. Depending on the match the RF channel count for audio was at 70-85, across all local suppliers, media, broadcast and match officials, including our international guests.
- Vodafone Music Awards, broadcast and viewed on TV / online. RF channel count for audio including red carpet media: 84
- Christmas in the Park, turnout of 50,000 in Christchurch, 70,000 in Auckland, viewers of the broadcast: 300,000 people. Audio RF channel count: 46
- Laneways Festival Auckland: 13,000 people, 63 audio RF channels across the festival at pre-planning.
- ACL festival Auckland: 25,000 tickets, close to 160 frequencies across the festival over the day.
- WOMAD festival, New Plymouth: Sold Out at 12,500 tickets and 17,000 people in total. 85 audio RF channels across the festival site.

Thanks for reading, please don't hesitate to contact me with questions.

The for me relevant questions in the discussion paper:

Q5. Do you agree that the 3.5 GHz band is the top priority for allocation for 5G?
A5. Any wireless user of the 600MHz spectrum would prefer other allocations are used.

Q7. Do you agree that the 26 GHz band is a high priority for allocation to 5G in New Zealand?

A7. Any wireless user of the 600MHz spectrum would prefer other allocations are used

Q14. Is there a need for more sub 1GHz spectrum for IMT/5G?

A14. As there is no plan for radio microphone users to go elsewhere, nor who would pay for such a migration WUNZ would like to see it preserved for the current use for radio microphones and radio in-ear-monitoring.

Q15. If so, how should we deal with radio microphones in the 600 MHz band?

A.15

* Allocate contiguous spectrum elsewhere. Manufacturers are unlikely make systems specifically for the New Zealand market. For example equipment made for use in North America are likely to work between 470 MHz and 608 MHz. However 470 MHz - 502 MHz is not licensed for General Users here as it is allocated for other uses. European manufacturers will use the 600 MHz band for some time.

Companies supplying equipment for use in USA include Shure, Sennheiser, AKG, Lectrosonics, Audio Limited. All are represented in New Zealand.

* Make as much as possible of 470-510 available for RF mic use (align with USA).

- * Allow access to spaces and guard bands in the existing spectrum.
- * Consider how a licensing system might allocate spectrum for professional users in specific blocks whereas smaller users such as churches and gyms have a General User License elsewhere. We are aware that these bands can only be given to us in bits and we need to use it within the legal framework and stay away from blocked parts.
- * Compensation for investments made in equipment in the 600MHz range purchased after 2015 and within 5 years of the spectrum being reallocated. Thus someone buying a system today would know their investment was good for five years minimum even if parts of the spectrum are available for licensed users.

[Rural broadband]

Q34. Which alternative bands may be suitable for regional allocation? Why?

A34. NOT the 600MHz as it is not vacant. Festivals like Ohakune Mardi Gras, Rythm'n'Vines/Alps, Splore etc. will need this spectrum if there is no adequate alternative. New Zealand's stunning rural scenery is used as a backdrop for feature films and drama such as the recent Mission Impossible, The Hobbit, Lord of the Rings and more. Similarly coverage of rural sporting events, especially if broadcast will be jeopardised.

Q41. When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?

A41. 600MHz: hopefully never, at least not in the next 15-20 years or until radio microphones and the like naturally migrated to different options.

Best regards,

--

Lisa Fahrenberger

220 Lakeside Sound & Light

To: radio.spectrum@mbie.govt. <mailto:radio.spectrum@mbie.govt.nz> nz
 Response to "Preparing for 5G in New Zealand" discussion document - A SIGNED
 SUBMISSION IS ATTACHED.

As a current user and supplier of both radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following IF they do adopt to reallocate the

600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

* Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards

221 Matt Mard

To whom it may concern,

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international

sporting events and international music festivals

Kind regards

Matthias Mard

223 Amisha Jeram

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Misha

224 Danny Champion

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Thank you,

Danny Champion

225 Riverlea Theatre and Arts Centre

Over the last 3-4 years we completed a transition to radio microphones using the 600MHz band from various models of VHF and UHF devices. This was at a considerable expense of more than [], a significant expense for a charitable organisation.

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Best regards,

Mark Perry, Riverlea Theatre committee member (20 years)

on behalf of:

Riverlea Theatre and Arts Centre



30 April 2018

Radio Spectrum Management
Ministry of Business, Innovation and Employment

Response to “Preparing for 5G in New Zealand Discussion Document”

NW Group welcomes the opportunity to comment on the Preparing for 5G in New Zealand Discussion Document.

The discussion document outlines the 600MHz band as a candidate band to be reallocated for 5G/IMT usage. We as a prolific radio mic user would be affected should this frequency band be reallocated; we operate the majority of our radio mics in the 600MHz band. We have deep concerns for our ability to reliably use radio mics and in-ear monitors on the events we are involved in due to the lack of available spectrum in alternative frequency bands.

Radio microphone users are still recovering the cost of moving from the 700MHz band, three years ago, the 600MHz band appeared to be a safe haven when re-allocating frequencies as the 500MHz band has limited spectrum available in metropolitan centres, in particular Auckland where there are many locations within range of the Waiaatarua transmitter and one or more of the infills.

We are also mindful of the fact that the current GUSL for radio mics that operate in the 622-698MHz spectrum expires on 11 March 2020. We would like reassurance that the GUSL will be renewed to allow the continued usage of radio mics in this band.

In Auckland open air we have as little as 24MHz available to us in the 500MHz spectrum (the rest is unusable because of strong DTV transmitters). If currently unused DTV transmitters commence broadcasting, the available spectrum reduces to 8MHz. In stark contrast we have available at any location in New Zealand, 76MHz of clean spectrum in the 600MHz band. If we lose this 76MHz without having an alternative we cannot meet the RF demands of the events we supply and work on.

We have invested about NZD 300,000 into equipment that operates in the 600MHz band since we were informed that the 700 MHz will no longer be available to us. This is a significant investment for us.

There are two main issues we would like to highlight: loss of available necessary spectrum and loss of significant investment if the 600MHz spectrum would be reallocated.

Please see below the impact radio mic usage has on the wider community and our detailed answers to the relevant questions in the discussion paper.

With kind regards,

The Impact of the use of radio mics on the larger community.

Large events

As a technology supplier for large scale events we and the events we supply would be severely affected.

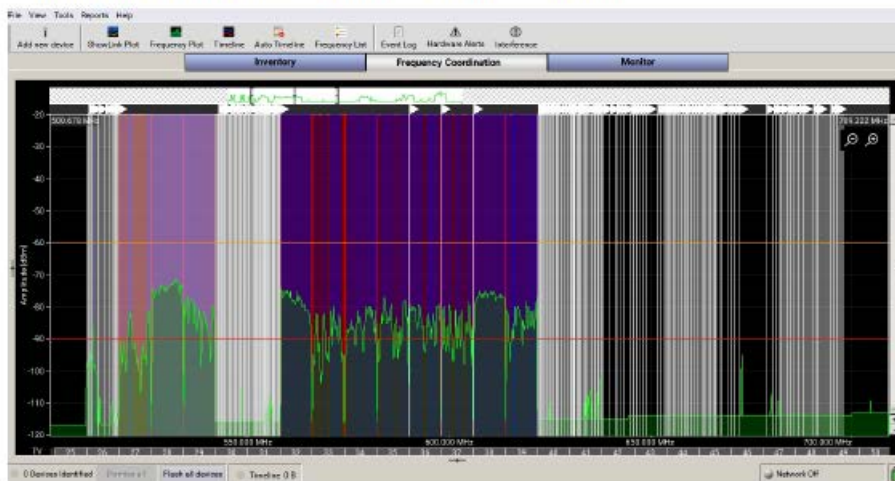
Just some figures on some of the events we were involved in in 2017/2018

- A major event such as an All Blacks Test Match, can require up to 70 frequencies for radio mic usage in the 600MHz band. Such high demand requires the use of the entire 76MHz bandwidth in the 600MHz band. The equivalent amount of available spectrum does not exist in the 500MHz band at Eden Park. New Zealand Rugby Union's ability to continue to host All Blacks games at Eden Park would be severely compromised

Note: Spark has recently been awarded streaming rights for the 2019 Rugby World Cup. Telecommunication Companies need to be aware that should they wish to venture into local sports production rights, then they'll need to use radio mics to create the content

- The Lions tour 2017, attended by almost 350,000 people, estimated TV audience was approximately 10 million viewers in New Zealand and over 230 million international viewers. Furthermore, nationally, the tour contributed \$194m to the GDP and created 2507 jobs. The average channel count for radio mics and IEM was 75-80 channels across all suppliers, media, entertainment and broadcast.
- Auckland City Limits Festival 2018. The festival was attended by 25,000 people and featured international artists such as Grace Jones and Beck. The final count of frequencies across all stages was around 160, with the majority of the 500MHz band being unusable due to strong DTV transmitters.

Here is a screenshot of the RF frequency coordination for Auckland City Limits, the DTV channels being very obvious, also the fact that there was not much spectrum left:



- Vodafone Music Awards 2017, broadcast on TV and online. The channel count including red carpet media was at 84.
- Coca Cola Christmas in the Park, attended by over 70,000 in Auckland and over 50,000 in Christchurch. The TV broadcast is viewed by over 300,000 on television. RF channel count 46.
- Laneways Festival Auckland: turnout of 13,000 people, 63 channels at the pre-event-coordination.
- WOMAD festival, New Plymouth: A completely sold out Saturday put the site at capacity with 12,500 audience members and 17,000 people in total (including all of the workers, artists and vendors). RF channel count across the festival: 85.

A recent article in the NZ Herald highlights the economic impact of larger music events and concerts.

http://www.nzherald.co.nz/entertainment/news/article.cfm?c_id=1501119&objectid=12034766

"Auckland's mega summer: Music stars and sport make \$13.1m for the regional economy
Kiwis can expect some big names to grace Auckland stages this year, after a performance-packed summer that included four artists' concerts injecting \$19.4 million to the regional economy. Ed Sheeran, SIA, Sir Paul McCartney and the Foo Fighters concerts alone saw 104,670 visitors attracted to Auckland and a visitor spend of \$29.5 million."

None of these events would have happened the way they did without radio microphones and wireless in-ear-monitoring.

The Ministry of Business, Innovation and Employment manages this site:

<http://www.maiorevents.govt.nz/> "New Zealand Government works in partnership with the event sector to support New Zealand's growing reputation as an attractive destination for major events of global significance."

Again, all of these large events need a large RF spectrum to accommodate radio microphone and in-ear-monitoring usage. International guest, artists and media rely on available spectrum, too. From our perspective; 600MHz is already established, suppliers have functioning equipment. It is a spectrum band that is used in wide parts of the globe, and therefore compatible with international guest's equipment.

Corporate Events.

Halberg Awards, Steinlager Awards, Cricket Awards, Netball Awards, ANZAC Day Dawn Service, Sky City NYE Event, Spark conferences, all request radio microphones.

Community Events, schools, churches.

Religious events such as Festival One or the Equipper's SHOUT conference rely heavily on radio microphones and wireless in-ear-monitoring. (Festival One: 53 RF channels. Shout: 42 RF channels)

We regularly supply large Radio microphone kits for schools to be able to perform their bigger musicals and theatres, pantomimes and talent shows with the appropriate equipment.

Most of our clients in this sector own their own stock of radio microphones and will find it hard to transition yet again.

For us relevant questions in the discussion paper:

Q5. Do you agree that the 3.5GHz band is the top priority for allocation for 5G?
A5. Any wireless user of the 600MHz spectrum would prefer other allocations are used.

Q7. Do you agree that the 26GHz band is a high priority for allocation to 5G in New Zealand?
A7. Any wireless user of the 600MHz spectrum would prefer other allocations are used

Q14. Is there a need for more sub 1GHz spectrum for IMT/5G?
A14. As there is no plan for radio microphone users to go elsewhere, nor who would pay for such a migration, we would like to see it preserved for the current use for radio microphones and radio in-ear-monitoring.

Q15. If so, how should we deal with radio microphones in the 600 MHz band?

A.15

- Allocate contiguous spectrum elsewhere. Manufacturers are unlikely make systems specifically for the New Zealand market. For example equipment made for use in North America are likely to work between 470 MHz and 608MHz. However 470MHz - 502MHz is not licensed for General Users here as it is allocated for other uses. European manufacturers will use the 600 MHz band for some time.
Companies supplying equipment for use in USA include Shure, Sennheiser, AKG, Lectrosonics, Audio Limited. All are represented in New Zealand.
- Make as much as possible of 470-510 available for RF mic use (align with USA).
- Allow access to spaces and guard bands in the existing spectrum.
- Consider how a licensing system might allocate spectrum for professional users in specific blocks whereas smaller users such as churches, schools and gyms have a General User Licence elsewhere. We are aware that these bands can only be given to us in bits and we need to use it within the legal framework and stay away from blocked parts.
- Compensation for investments made in equipment in the 600MHz range after 2011 and within 5 years of the spectrum being reallocated. Thus someone buying a system today would know their investment was good for five years minimum even if parts of the spectrum are available for licensed users.

[Rural broadband]

Q34. Which alternative bands may be suitable for regional allocation? Why?

A34. NOT the 600MHz as it is in our view not vacant. Rural event technology suppliers, schools and other community organisations likely own hardware operating in the 600MHz band. Larger visiting events would also want/need to use this range.

Q41. When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?

A41. 600MHz: hopefully never, at least not in the next 15-20 years or until radio microphones and the like naturally migrated to different options.

229 SKY Television

Preparing for 5G in New Zealand Response to Discussion Document dated March 2018.

SKY Network Television is grateful for the opportunity to provide a submission on the Preparing for 5G in New Zealand Discussion Document.

Any questions on this submission may be addressed to:

[], Director of External Affairs []

SKY notes that the 600MHz frequency band has been identified as a candidate band for IMT/5G services. SKY can only assume that should the 600MHz frequency band be redeployed, then Radio Spectrum Management would expect all affected radio microphones users to migrate to other frequency bands which

are currently assigned for radio microphone usage.

The other frequency bands allocated for UHF radio microphone usage are:

- 502-510MHz (Under Short Range Device Regulations)
- 510-606MHz
- 814-824MHz (Under Short Range Device Regulations)

SKY's key concerns should the 600MHz band be redeployed for IMT/5G usage are:

- **Insufficient clean spectrum (white space) available in the 500MHz band to successfully operate radio microphones**
- **Impact to sporting organisations, events and event promoters to be able to produce and deliver a high quality event to their in-stadia fans and domestic and international broadcast audiences**
- **Value of any monetary compensation**
- **Management of spectrum for radio mic usage**
- **Threat from Television White Space Devices**
- **Current 600MHz band licence expiry and notice period**

Insufficient Clean Spectrum Availability

Currently there is no other usage in the 600MHz band, so 76MHz of white space is available at all locations in New Zealand for radio mic usage. In the aforementioned 500MHz band, there is varying density of UHF Digital TV Transmissions; as a result, the amount of white space available can be as high as 64MHz, **but in some key geographical locations as little as 8MHz of white space would be available for radio mic use.**

This drastic reduction of white space at the locations and venues listed below will jeopardise the successful delivery to in-stadia fans and to local and global view audiences of both domestic and international sporting and entertainment events in New Zealand.

The affected locations are:

Albany - OBE Stadium

- Only 16MHz available**
- DTT occupies 518-606MHz from the Waiatarua & Pinehill TX sites combined

Auckland – Eden Park

- Only 16MHz available**
- DTT occupies 518-606MHz from the Waiatarua & Sky Tower TX sites combined

Auckland – Mt Smart Stadium

- Only 8MHz available**
- DTT occupies 510-606MHz from the Waiatarua & Remuera TX sites combined

Hamilton – FMG Stadium

- Only 24MHz available**
- DTT occupies 526-606MHz from the Te Aroha & Hamilton TX sites combined

Hamilton – Seddon Park

- Only 24MHz available**
- DTT occupies 526-606MHz from the Te Aroha & Hamilton TX sites combined

Tauranga – Bay Park

Only 24MHz available

DTT occupies 526-606MHz from the Te Aroha & Kopukairua TX sites combined

Nelson – Trafalgar Park

Only 8MHz available

DTT occupies 510-606MHz from the Botanical Ridge & Mt Campbell TX sites combined

SKY acknowledges that at times there are some DTT channels within the 500MHz band that are not currently active. Radio mic users still need to treat a licensed but unused TV channel as active as they are not notified when a DTT transmitter is to be made active.

Impact to SKY Network Television, Sporting Organisations, Events and Event Promoters

SKY would be both directly and indirectly impacted by any such redeployment. There are numerous organisations that are critical to the delivery and running of these types of events. Other users such as Unilateral TV Broadcasters, Radio Broadcasters, Venue Entertainment, Corporate Hosting and Referees/Umpires all heavily use the 600MHz band for radio mics. There is a high level of cross delivery that happens between the various suppliers and users, therefore it requires **all** these multiple suppliers and users to deliver their relative service to ensure the event as a whole is successfully delivered.

At a major All Blacks game at Eden Park all of the 76MHz spectrum in the 600MHz band is used by the 5-7 different supplier or user groups who in total use between 30-70 radio mic transmitters. The 600MHz spectrum is often occupied to capacity by such usage. The available 16MHz of white space in the 500MHz band is not enough to fulfil the individual demands of all these users.

Another factor that also needs to be considered is the need for frequency separation between radio microphones and in-ear monitor (IFB) transmitters, so a wide spectrum band is required.

Organisations and events that will be affected by lack of available spectrum or white space for radio mic usage?

New Zealand Rugby Union

- o All Blacks Matches, Lions Tours, Super Rugby and Mitre10 Cup Finals
- o Referee & TMO Communications, Venue Entertainment, Corporate Hosting, TV & Radio Broadcast

World Rugby

- o International 7's and Rugby World Cups
- o Referee & TMO Communications, Venue Entertainment, Corporate Hosting, TV & Radio Broadcast

New Zealand Rugby League

- o Kiwi's Test Matches, Domestic Premiership
- o Referee & Video Referee Communications, Venue Entertainment, Corporate Hosting, TV & Radio Broadcast

NRL

- o NRL Premiership Games
- o Referee & Video Referee Communications, Venue Entertainment, Corporate Hosting, TV & Radio Broadcast

- New Zealand Cricket**
 - o Black Caps Internationals, Domestic Cricket including T20's
 - o Stump Mics, Venue Entertainment, Corporate Hosting, TV & Radio Broadcast
- America's Cup**
 - o World Series, Challenger Series, America's Cup Match
 - o Venue Entertainment, Corporate Hosting, TV & Radio Broadcast
- New Zealand Football**
 - o All Whites Internationals, Domestic Premiership
 - o Venue Entertainment, Corporate Hosting, TV & Radio Broadcast
- Football Federation Australia**
 - o A-League
 - o Venue Entertainment, Corporate Hosting, TV & Radio Broadcast
- **International Triathlon Union**
 - o ITU Triathlon World Champs
 - o Venue Entertainment, Corporate Hosting, TV & Radio Broadcast
- Any other sporting, entertainment or international event that takes place at or around the above locations, including World Cups, World Championships and Commonwealth Games***

Compensation

SKY uses UHF radio microphones in the 600MHz frequency band to create the content across our network and various delivery platforms. SKY along with SKY owned, Outside Broadcasting Ltd (OSB), have an inventory of approximately 80 radio mics in the 600MHz band. OSB are also a major provider of services to both domestic and international 3rd party broadcasters and program makers.

It should be noted that a considerable number of these radio mics were acquired in response to the redeployment of the 700MHz band and no compensation was offered at that time.

Should the 600MHz frequency band be redeployed, then monetary compensation to reacquire new equipment would be of no real value if there is insufficient spectrum to operate in an alternative frequency band.

Licensing

Radio microphone usage in New Zealand is covered under General User Licences, where all users are treated equally, with no one user having more usage rights than any other user. It should be noted that currently there is no official regime for radio mic frequency co-ordination at high profile sport events where there are multiple suppliers and users. Much of the co-ordination has been done voluntarily without any official mandate and relies on the goodwill of all users to comply with the suggested frequency allocation. The potential scarcity of available clean spectrum is likely to create a hostile environment amongst users who would all be competing to use the same narrow portion of spectrum.

SKY's usage of radio microphones is a highly itinerant, so at times the same set of

equipment is used in 4 different cities in New Zealand in the space of 4 days. Our ability to use radio mics anywhere in New Zealand alongside other users is critical. New Zealand is also highly reliant on radio microphones that are made for overseas markets. We already have a few band allocations that do not align with commonly available equipment, so getting equipment modified to suit New Zealand Regulations is manufacturer dependant.

New Zealand importers currently do not import equipment that extends outside of licensed frequency bands. For example, the equipment available for usage in the 502-530MHz band is not able to be imported as the transmitters extend down to 470MHz. The manufacturer of this hardware hasn't indicated plans to modify units purely for the New Zealand market.

Major users such as SKY should be provided approval to import any such equipment on the condition that frequency usage is contained within the licensed bands.

Television White Space Devices

The 500MHz band is also allocated for use by Television White Space Devices (TVWS). Under current regulations, these devices do not currently refer to a centralised database of frequencies used, therefore the co-existence of radio mics and TVWS devices could be problematic in the future. A central database; which TVWS devices must regularly reference, needs to be established by the RSM to avoid disruption to radio mic users. Major users of radio mics must also have the ability to add in usage information into this database.

Current 600MHz band licence expiry and notice period

SKY notes that the current GUSL for UHF radio mics in the 600MHz band expires on 11 March 2020. All radio mic users need to know if this GUSL is to be renewed beyond this date.

Radio mic users were also afforded 5 years notice to vacate the 700MHz spectrum. Similar notice would need to be provided, should the 600MHz band be redeployed, to allow users to effectively budget and plan their future requirements.

Recommendations

RSM needs to ensure that adequate clean spectrum is available for radio microphone users to be able to deliver uninterrupted services for events such as those listed above. This needs to be achieved by either:

- a) preserving the 600MHz band for radio mic usage
- b) licensing other frequency bands with sufficient bandwidth that conforms to hardware available from major radio mic manufacturers

RSM needs to review licencing arrangements for events that require high usage of radio mics. An end user licence and frequency co-ordination service; such as the PMSE licencing used in the United Kingdom needs to be implemented here in New Zealand. Users such as SKY and OSB need to know they have guaranteed spectrum available to confidently use radio mics

RSM needs to introduce a centralised database that Television White Space Devices must regularly poll to avoid frequency conflicts with radio mics

RSM need to provide reassurance that the GUSL for the 600MHz band will be renewed beyond the current expiry date of March 2020 and provide adequate notice if the 600MHz band is redeployed for IMT/5G usage.

SKY thanks Radio Spectrum Management for the opportunity to provide our input and we are happy to discuss further any points raised in this document.

232 Cathal Mcdonagh

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Cathal Mc Donagh

233 Mark Watson

Response to "Preparing for 5G in New Zealand" discussion document

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235 Sound Techniques Ltd

Response to “Preparing for 5G in New Zealand Discussion Document”

Sound Techniques wishes to comment on the “Preparing for 5G in New Zealand” Discussion Document

Sound Techniques imports and distributes two brands of radio microphones, Lectrosonics Inc and Audio Ltd, and is a reseller of other brands such as Sennheiser, Shure and AKG. It also rents radio microphones. Its clients include independent sound mixers for film and television, broadcasters, tertiary institutes, schools and other users. Business will be seriously affected if the 600 MHz band was reallocated to 5G or rural broadband. Two years ago it managed to move clients from the 700 MHz band and is aware of the cost involved. In Auckland there is limited spectrum available as there are many locations within range of the Waiatarua transmitter and one or more of the infills. Sound Techniques is concerned that the current GUSL for radio mics which operate in the 622-698MHz spectrum expires on 11 March 2020. It needs to reassure its clients that the GUSL will be renewed to allow the continued usage of radio mics in this band and have a clear idea of where radio microphones may operate in the future. Clients will expect to be compensated for any hasty changes to the 600 MHz band.

Regarding the specific questions

Q14. Is there a need for more sub 1GHz spectrum for IMT/5G?

A14. As there is no plan for radio microphone users to go elsewhere, nor agreement as to who would pay for such a migration Sound Techniques would like to see it preserved for the current use for radio microphones and radio in-ear-monitoring.

Q15. If so, how should we deal with radio microphones in the 600 MHz band?

A.15

- • Allocate contiguous spectrum elsewhere. Manufacturers are unlikely make

systems specifically for the New Zealand market but the 600 MHz band is in use elsewhere such as in Australia.

Even equipment made for use in North America will work between 470 MHz and 608 MHz. However 470 MHz - 502 MHz is not licensed for General Users here as it is allocated for other uses. European manufacturers will use the 600 MHz band for some time.

Companies supplying equipment for use in USA include Shure, Sennheiser, AKG, Lectrosonics, Audio Limited. All are represented in New Zealand.

- • Make as much as possible of 470-510 available for rf mic use (align with USA).
- • Allow access to spaces and guard bands in the existing spectrum.
- • Consider how a licensing system might allocate spectrum for professional users in specific blocks whereas smaller users such as churches and gyms have a General User Licence elsewhere. Sound Techniques is aware that users of a fragmented spectrum must operate within the legal framework and stay away from blocked parts.
- • Compensation for investments made in equipment in the 600MHz range. Systems Sound Techniques supplies cost upward of \$4,000 + GST each. For a simple sound mixer's location recording kit four radio microphones would be a minimum
- • Spark has recently been awarded streaming rights for the 2019 Rugby World Cup. Telecommunication Companies need to be aware that should they wish to venture into local sports production rights, then they'll need to use radio mics to create the content.

Rural broadband

Q34. Which alternative bands may be suitable for regional allocation? Why?

A34. Not the 600MHz as it is used nation-wide by radio microphones. Festivals like Ohakune Mardi Gras, Rythm'n'Vines/Alps, Splore etc. will need this spectrum until there is an adequate alternative. New Zealand's stunning rural scenery is used as a backdrop for feature films and drama such as the recent Mission Impossible, The Hobbit, Lord of the Rings. Similarly coverage of rural sporting events, especially if broadcast will be jeopardised.

Q41. When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?

A41. 600MHz: as far off as possible, until current radio microphones have outlived their use, technology has advanced to allow different blocks of spectrum to be used and users can afford to migrate to new technology and spectrum.

Please address any questions or comments to:

[], General Manager,
Sound Techniques

To: radio.spectrum@mbie.govt.n <mailto:radio.spectrum@mbie.govt.nz> z

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards
John Devery

239 **Graham Wallace**

Response to "Preparing for 5G in New Zealand" discussion document

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Graham Wallace (Senior Sound Operator TVNZ)

240 **George Chandler**

Dear Sir/Madam

Below is my Response to “Preparing for 5G in New Zealand” discussion document which has been shared among our community of industry staff.

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Regards,
George Chandler

242 Phil Simmonds

Hi

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Phil Simmonds

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment illegal and useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will again be rendered useless.

We are a small company working for the arts industry. This is very much something we do for love, not money. We consistently provide significant discounts to schools and community groups, enabling them to present a high quality of performance.

We will not be able to afford to replace our wireless equipment again in the foreseeable if the frequency band is reallocated.

This will have a direct impact on the school and community performances in Auckland, and their ability to afford to perform at all.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Thank you

--

Sam Mence

247 Kathryn Osborne

To who it may concern

The Q Theatre performance space that I work for constantly uses radio microphones for its performances, conferences, dinners and awards ceremonies and if the 6000MHz band was reallocated for IMT/6G usage the we would be affected. Q Theatre has already funded the changes that were required when the 7000MHz spectrum was removed in 2015 and we would struggle to fund further changes to our equipment if required. It is really hard to fund rise for something that you have already paid for once.

Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand and for touring shows this is a problem.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

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Yours sincerely

Kathryn Osborne

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- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Faustine

Response to “Preparing for 5G in New Zealand Discussion Document”

Wireless Users New Zealand (WUNZ), on behalf of its members, welcomes the opportunity to comment on the *Preparing for 5G in New Zealand Discussion Document*. Our membership consists of a cross section of suppliers, broadcasters, tertiary institutes, live sound engineers, film industry sound mixers and other radio microphone and in-ear monitor users.

The discussion document outlines the 600MHz band as a candidate band to be reallocated for 5G/IMT usage. Radio mic users would be affected to varying degrees should this frequency band be reallocated. The vast majority of our members operate their radio mics in the 600MHz band. WUNZ has deep concerns for our members to reliably use radio mics and in-ear monitors on large scale events due to the lack of available spectrum in alternative frequency bands.

Radio microphone users are still recovering the cost of moving from the 700MHz band, two years ago. The 600MHz band appeared to be a safe haven when re-allocating frequencies as the 500MHz band has limited spectrum available in metropolitan centres, in particular Auckland where there are many locations within range of the Waiatarua transmitter and one or more of the infill transmitters.

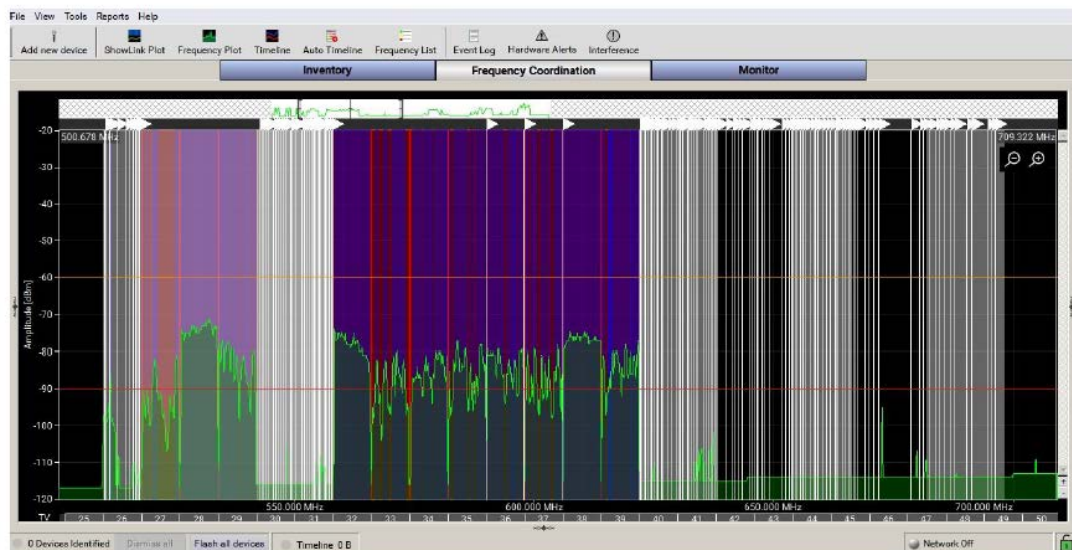
The concerns expressed in WUNZ's submission to RSM's 5 year plan haven't been addressed. See <https://www.rsm.govt.nz/projects-auctions/completed/draft-outlook-2017-2021/folder-submissions-received/WUNZ%20Spectrum%20Outlook%20Submission> WUNZ is also mindful of the fact that the current GUSL for radio mics that operate in the 622-698MHz spectrum expires on 11 March 2020. WUNZ seeks reassurance that the GUSL will be renewed to allow the continued usage of radio mics in this band until concerns about alternative frequency bands are suitably addressed.

Large events

A major event such as an All Blacks Test Match, can require up to 70 frequencies for radio mic usage. Such high demand has required the use of the entire 76MHz bandwidth in the 600MHz band. The equivalent amount of available spectrum does not exist in other current bands allocated for radio mic usage.

The RSM has indicated in the past that the 500MHz band would probably suffice for radio microphone usage, but there simply isn't the available clean spectrum in this band. New Zealand Rugby Union's ability to continue to host All Blacks games in Auckland would be severely compromised.

In Auckland open air we have as little as 24MHz of clean spectrum available to us in the 500MHz band (the rest is unusable because of strong DTV transmitters). If currently unused DTV transmitters commence broadcasting, the available spectrum reduces to 8MHz. In stark contrast we have available at any location in New Zealand, 76MHz of clean spectrum in the 600MHz band. If we lose this 76MHz without having an alternative we cannot meet the RF demands of events.



This graphic shows the frequencies used across the day during the Auckland City Limits Festival 2018 at Western Springs, which is very close to Eden Park. The final count of frequencies across all stages was around 160. This clearly illustrates how strong the active DTT channels are at that location and the lack of available clear spectrum in the 500MHz band.

Similar density of DTT transmissions in the 500MHz band is also prevalent in other parts of Auckland, Hamilton City, Tauranga, Wellington and Nelson.

Other large or major events

Vodafone Music Awards, broadcast and viewed on TV, online and by several thousand

attendee's at the venue. RF channel count for audio: 84
Christmas in the Park, turnout of 50,000 in Christchurch, 70,000 in Auckland, viewers of the broadcast: 300,000 people. RF channel count: 46
Laneways Festival Auckland: 13,000 people, 63 audio RF channels across the festival at pre-planning.
Auckland City Limits festival Auckland: 25,000 tickets, close to 160 frequencies across the festival over the day.
WOMAD festival, New Plymouth: A completely sold out Saturday put the site at capacity with 12,500 audience members and 17,000 people in total (including all of the workers, artists and vendors). 85 audio RF channels across the festival site.
Again, all of these large events need a large bandwidth of spectrum to accommodate radio microphone and in-ear-monitoring usage. International guest, artists and media rely on available spectrum, too. From our perspective; 600MHz is already established, suppliers have functioning equipment. It is a spectrum band that is used in wide parts of the globe, and therefore compatible with international guest's equipment.
The usage of radio microphones is burgeoning.

Film and Television Production

Film and television production is reliant on radio microphones and IFB equipment for program creation. Radio microphones are used extensively in sports production, news production, reality television, documentaries, drama, soaps, and feature films.
Spark has recently been awarded streaming rights for the 2019 Rugby World Cup.

Telecommunication companies need to keep in mind that should they wish to venture into local sports production rights, then they'll need to use radio mics to create the content.

Media Organisations

The advance of technology has forced traditional print media organisations to introduce video content on their websites, so they too are regular users of radio mics. With greater usage there is also greater potential of conflict of frequencies when all the various media organisations arrive at the location of a significant news event. Such organisations are naturally unable to pre-plan their movements, so the requirement for them to have nationally available clear spectrum is vital.

Education

Tertiary institutes and schools rely on radio microphones for a range of activities from lectures through to school productions. Many of these operate on limited budgets and cannot afford to buy new equipment on a regular basis.

Stage Production

The days of the lyric theatre and the cabled handheld microphone have long gone and most productions use radio microphones

Value to Community, Financial and Cultural

Recent report from ATEED Auckland Major Events Strategy

"Auckland's mega summer: Music stars and sport make \$13.1m for the regional economy"

http://www.nzherald.co.nz/entertainment/news/article.cfm?c_id=1501119&objectid=12034766

The Lions tour 2017, attended by almost 350,000 people, estimated TV audience was approximately 10 million viewers in New Zealand and over 230 million international viewers.

Furthermore, nationally, the tour contributed \$194m to the GDP and created 2507 jobs.

Depending on the match the RF channel count for audio was at 70-85, across all local

suppliers, media, broadcast and match officials, including our international guests.

Nielsen's New Zealand Multi-Screen Report (October 2017)

<http://www.nielsen.com/nz/en/insights/reports/2017/kiwis-and-live-television-keeping-it-real.html> shows that consumers are continuing to watch broadcast TV and 90% of this viewing is spent watching live content. On average, 77% or 3.1 million Kiwis (aged 10+) watch broadcast TV each week and live viewing was the dominant viewing behaviour across all age groups.

The Ministry of Business, Innovation and Employment manages this site:

<http://www.majorevents.govt.nz/>

“New Zealand Government works in partnership with the event sector to support New Zealand’s growing reputation as an attractive destination for major events of global significance.”

WUNZ’s response to related questions raised in the discussion document.

Q5. Do you agree that the 3.5GHz band is the top priority for allocation for 5G?

Any wireless user of the 600MHz spectrum would prefer other frequency bands are used for 5G/IMT usage.

Q7. Do you agree that the 26GHz band is a high priority for allocation to 5G in New Zealand?

Any wireless user of the 600MHz spectrum would prefer other frequency bands are used for 5G/IMT usage.

Q14. Is there a need for more sub 1GHz spectrum for IMT/5G?

As there is no definitive plan for the allocation of alternative clear spectrum for radio microphone users, WUNZ would like to see the 600MHz band preserved for the continued use of radio microphones and radio in-ear-monitoring.

Q15. If so, how should we deal with radio microphones in the 600 MHz band?

- Renew the GUSL that is currently set to expire in March 2020, until a more defined plan is announced and owners are given adequate time to re-equip.
- Allocate contiguous clean spectrum in another frequency band equivalent to the bandwidth being reallocated to 5G usage and provide 5 years for owners to transition.
- Ensure that any new band allocations for radio mics aligns to equipment offered by the major radio mic manufacturers. Manufacturers are unlikely to make systems specifically for the New Zealand market. For example equipment made for use in North America is likely to work between 470MHz and 608MHz. However 470MHz - 502MHz is not licensed for General Users here as it is allocated for other uses. Companies supplying equipment for use in the USA include Shure, Sennheiser, AKG, Lectrosonics, Audio Limited. All are represented in New Zealand but most rely on stock factory released equipment.
- If possible reallocate the 470-502MHz band for radio mic use to align with USA
- Allow some usage of radio mics in guard bands within the existing spectrum.
- Provide compensation to affected owners of radio mics for investments made in equipment in the 600MHz range within 7 years of the spectrum being reallocated. Thus someone buying a system today would know their investment was good for seven years minimum or they are compensated accordingly.

Rural broadband

Q34. Which alternative bands may be suitable for regional allocation? Why?

The 600MHz also used extensively at key rural locations. Festivals like Ohakune Mardi Gras, Rythm'n'Vines/Alps, Splore etc. will need this spectrum if there is no adequate alternative. New Zealand's stunning rural scenery is used as a backdrop for feature films and drama such as the recent Mission Impossible, The Hobbit, Lord of the Rings and more. Similarly broadcast coverage of rural sporting events, could be jeopardised.

Q41. When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?

WUNZ hopes that demand for the 600MHz band for 5G usage is low for at least the next 5-10 years. Until that time we are hopeful that newer technology radio microphones are proven to be reliable and are available in alternative frequency ranges.

On behalf of all radio mic users, WUNZ is eager to discuss with Radio Spectrum Management any of the points raised in our response.

257 Michael O'Connor

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

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- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Mike O'Connor

259 Haresh Bhana

To: Radio Spectrum Management
Radio.spectrum@mbie.govt.nz
Subject: Preparing for 5G in New Zealand
30 April 2018

Thank-you for the opportunity to respond to the discussion document on “Preparing for 5G in New Zealand”

My response is specific to the indication in the document that the 600MHz band is a candidate for use for 5G services.

I have been a radio mic user for over 30 years in the television broadcast industry and have witnessed the increase in usage of radio mics throughout this period. Over the years I have been actively involved in co-ordination of radio mic frequencies for almost all televised sports and entertainment events in New Zealand.

I became involved in the co-ordination of frequencies back in 2001. In the months prior to this there were numerous frequency conflicts between the various users at sporting events. The TV broadcaster, the supplier of referee communications, the radio broadcaster and venue PA would all independently test their equipment in isolation in the hours before the game commencing, and then suddenly in the 30 minutes prior to the game, users would find one of the other users on matching or conflicting frequencies, resulting in a scramble to change frequencies either before or during the event. Eventually we all realised the need for somebody to co-ordinate our frequency usage, and I took on this role voluntarily, as I was one of the few audio engineers that would travel to sports events across New Zealand.

I also recall advising the RSM at that time of what I was doing. Although I was thanked for taking an interest in the usage of the spectrum, I was also told that I had no regulatory authority over any other users, so would need to rely on goodwill of other users. Thankfully that goodwill has lasted for the past 17 years.

As indicated I have been performing this role mostly voluntarily for all these years. I sought voluntary payment from some of the radio mic owners to help cover costs incurred to purchase the coordination software, which was around USD\$500, but largely my time and effort has been for no regular reward.

The introduction of Digital Terrestrial Television (DTT) and the loss of the 700MHz band created a few challenges, and although some large events or events where multiple users are present have been difficult to co-ordinate, I have been able to accommodate all user requests.

Very few people notice when radio mics perform well, but when radio mics fail or perform poorly during an event, then a lot of people notice that. In the broadcast and entertainment markets the reliability of radio mics is essential and there is little room for failure. At some sporting events the inability to reliably use radio mics or a failure of radio mics can either stop the game or affect the performance of match officials, cause discomfort or anxiety to in-venue spectators as well as affect the quality of television and radio broadcasts. Typically, at sporting events, radio mic receivers are placed up to 200m away from the source of the transmission, so RF receive levels are often low, therefore it is imperative radio mic users are offered clear spectrum to operate in.

Losing 76MHz of clear spectrum from the 600MHz band for radio mic usage, would make co-ordinating frequencies at some events virtually impossible, as there is just not the equivalent free spectrum in any other frequency band currently available. Although the Digital Television Usage Table shows up to 64MHz of free spectrum available in the 500MHz band at each DTT site, there can be as little as only 8MHz available at some of the major locations in New Zealand due to infill transmitters in

cities such as Auckland, Hamilton, Tauranga, Wellington and Nelson. This would affect a lot of events held in these cities.

This spectrum plot below is an actual scan taken at Eden Park in October 2017. It shows DTT occupying most of the 500MHz spectrum. Currently DTV channels 30 & 31 are unused, but these are still licenced to a user so could be reactivated at any time.



Some major events where I have co-ordinated radio mic frequencies include, All Blacks Test Matches, Super Rugby, Rugby 7's, Rugby Junior World Championship, NRL Premiership, NRL 9's, Addington Cup Week, Vodafone Music Awards, Hobbit Red Carpet World Premiere, Netball World Championship and My Kitchen Rules. Some of these events have required anywhere up to 100 frequencies. An All Blacks game regularly uses in excess of 40 frequencies, so trying to fit that usage into the 500MHz band is impossible with current hardware. There is debate that even with the latest digital technology, it is still not possible to cater for such usage. It would also require every user to acquire such hardware, but cost of ownership of that hardware is extremely high.

These large events provide major economic benefit to New Zealand. Although the RSM may regard radio mic users as secondary users of the UHF spectrum, radio mic users play a highly important role to make these events successful.

With the lack of available spectrum, it would also be impossible for anybody in my position to rely on goodwill of other users to comply with restrictions or denial of usage. We are already close or at a

point where either the RSM or an appointed agent/organisation is required to manage the co-ordination and compliance of frequency usage at such events.

I strongly suggest that the RSM carefully consider the implications of reallocating the 600MHz band for 5G usage without first offering radio mic users equivalent usable spectrum in alternative frequency bands. Any new frequency bands reallocated for radio mic usage would need to align to frequency bands of equipment offered in offshore markets.

I invite further dialogue with the RSM to outline historical usage of radio mics at sporting events to help with this critical decision making process.

Once again thank-you for the opportunity to respond.

Kind regards
Haresh Bhana

264 Alistair Lambie

To: radio.spectrum@mbie.govt.nz

Subject: Response to "Preparing for 5G in New Zealand" discussion document

As a current user and supplier of radio microphones and in-ear monitors that operate in the 600MHz band, we and our customers would be affected parties if this frequency band is reallocated for IMT/5G usage.

After the changes that removed the 700MHz spectrum from use by radio microphones and in-ear monitors a number of our clients had to replace existing radio microphones. The majority of our clients are non-profit organisations and the replacement represented a substantial amount of their capital expenditure budget, in some cases more than the annual total. The expectation at the time was that this would solve the problem for at least 10 years. We have supplied around 70 units in the last 2 years and use around 30 units ourselves.

We have noted that it is difficult to use the 500MHz band for wireless microphones and in-ear monitors in the larger metropolitan areas as DTV saturates the spectrum in the channels they use unlike Analogue TV which had space available within the channels.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I also note that while the US has reallocated the 600MHz band there are a number of other bands available to US users that are not available to NZ users.

I request that RSM consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands:

- Provide monetary compensation to affected users who have to acquire new equipment if the 600MHz band is reallocated. It should be noted that it is not usually possible to modify this equipment to work in other bands.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals.

Regards, Alistair Lambie

266 Herr Molloy

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment illegal and useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will again be rendered useless.

We are a small company working for the arts industry. This is very much something we do for love, not money. We consistently provide significant discounts to schools and community groups, enabling them to present a high quality of performance.

We will not be able to afford to replace our wireless equipment yet again in the foreseeable if the frequency band is reallocated.

This will have a direct impact on the school and community performances in Auckland, as well as wider community groups we work with in regional New Zealand, and their ability to afford to perform at all.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM commit to the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands:

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage

at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

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Thank you for taking the time to read this.

All the best,

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Molloy

268 Audio Visual Hire

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

273 Mike Nelson

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Mike Nelson

276 Chris Holdaway

To whom it concerns;

Please note the submission statement below which mirrors our businesses concern over this matter.

Our trading name is Sound Hire Solutions, the legal entity name is C J HOLDAWAY

We currently operate / hire 12 radio mic units in the 600 MHz band, and are about to buy two more higher end units that will cost us []

We do installations, and The Picton Pavillion have 4 radio mics, the Blenheim Bridge club has 2 radio mics, St Mary's Catholic Church have 2 radio mics, and most churches, , clubs, & venues have 1 - 4 radio mics in use, mostly in the 600 MHz band.

I am a past Vice President and Haed of Dept for Sound of Blenheim Musical Theatre Inc, which replaced 12 body radio mic units that were in the 700Mhz band only three years ago.

If the 600 MHz band becomes unavailable, we will be seeking financial compensation for our own business, and also our clients.

Thank you

To: radio.spectrum@mbie.govt.nz

Subject: Response to "Preparing for 5G in New Zealand" discussion document

As a current user of radio microphones and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. After the 2015 changes to spectrum usage, where the 700MHz spectrum was removed from use for radio microphones and in-ear monitors, this rendered our equipment useless, requiring expensive replacements to be purchased. If the 600MHz band is re-allocated, all of our radio microphone equipment will be rendered useless.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Chris Holdaway

285 Patrick Duncan

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Patrick Duncan

286 Murray MacFadyen

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Murray MacFadyen

287 Andrew Guest

Dear Sirs

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

We have recently invested significantly in new equipment operating on this band, and would be significantly disadvantaged if this were removed.

We request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Rgds

Andrew Guest

288 Jonathon Roberts

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

This also effects our costing for schools with school productions limiting the availability for microphones available for kids some missing out, or making it more costly for them.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz & 600MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

--

Jonathon Roberts

Response to “Preparing for 5G in New Zealand” discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Kyle Telfer

As a current user of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

In the last change of frequencies for radio mic's and in-ear devices my business had to scrap and replace about [] to [] worth of perfectly good working gear.

For a small business this is a major expense that was difficult to budget for.

If we are adversely affected financially again , I will expect some form of compensation .

David G Dingley

295 **Tony Parkinson**

I am a sound recordist working in the already marginal market in Wellington.
You have already imposed a large loss of money on me by rendering my 700 mhz radio mics useless .

I am disgusted that you could even consider carving up the 600 mhz band as well.
Stop it, right now.

Response to "Preparing for 5G in New Zealand" discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.

* Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards, Tony Parkinson.

296 Alexander Gramse

Dear Sir/Madam,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

--

Alexander Gramse

To whom it may concern,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Marie.

Marie Aekins

To Whom It May Concern

Re: Response to "Preparing for 5G in New Zealand" discussion document

As a current church user of radio mics that operate in the 600MHz band, we would be an affected party if this frequency band is reallocated for IMT/5G usage.

We would be among those radio mic users who would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

David Smith

301 Jonathan Harry

Hi There,

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.

- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,
Jonathan Harry

302 Jake Slaney

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage. I will be traveling to New Zealand for permanent residence at the end of this year, bringing with me tens of thousands of dollars in 600MHZ band equipment.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand. I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- * Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.
- * Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals

Regards,

Jake Slaney

Response to “Preparing for 5G in New Zealand” discussion document

As a current user or supplier of radio mics and in-ear monitors that operate in the 600MHz band, I would be an affected party if this frequency band is reallocated for IMT/5G usage.

Radio mic users would lose 76MHz of nationally available spectrum from this 600MHz band. Currently there are no other spectrum bands that appear to offer this same amount of spectrum as a contiguous available block nationally throughout New Zealand.

I request that RSM carefully consider the following if they do adopt to reallocate the 600MHz band and require current radio mic and in-ear monitor users to re-acquire or modify existing hardware to alternative frequency bands.

- **Provide monetary compensation to affected users who acquired or modified hardware in direct response to the 700MHz spectrum sell-off. (This includes our business at considerable expense)**

- **Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at large scale events, such as concerts, festivals, theatre productions, red carpet movie premiers, and sporting events, including World Cups, World Championships and Commonwealth Games.**

- **Ensure that sufficient usable spectrum is preserved for radio mic and in-ear monitor usage at events where there are multiple users or suppliers, such as at domestic and international sporting events and international music festivals**

Kind regards

Lynette Dew