

# The future of Mission Critical Communications networks – is there space for LMR and Critical Broadband to coexist, or does the winner take it all?

## TCCA Critical Update Webinar

18 October 2021

View the webinar recording [here](#).

This document sets out the questions and answers from the webinar.

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Q. Part of the reason why the transition is moving slowly is that the new broadband technologies have not implemented the basic PPDR functionality as required in 3GPP Release 13, thus important features are still missing?

A. It is definitely an impact on the market. The fact that the enhancements are standardised, that they are part of the Releases from 3GPP it does not necessarily mean that they are commercially viable or available from MNOs across the world. "If it doesn't make money, it doesn't make sense" especially for MNOs. So at some point the market needs to be big enough or the demand or the transition from mission critical LMR needs to be mature enough for these MNOs to see a real return on investing in enhancing their networks to make them mission critical compliant. The transition is not going to happen today or tomorrow, it's a slow paced market.

Q. Do you think the "new hybrid area" will ever end? Do you see it as a transition period or until when do you see this era lasting?

A. I think for any future, especially for the short and medium term, we can expect the future to be hybrid. Takin the example of the analogue transformation to digital. The market is still on its way, there is still a big percentage of the market that relies on analogue so we can expect the transition to broadband to be slow. Why do we focus on why we need to pick one solution or the other – why not pick the best of both worlds and use this for as long as we need to? The question we should be asking is not which one, it is how to make the market work or interoperate together, create that economy of scale and bring the cost down with openness, with a diverse ecosystem, so that we can benefit from the strengths of both technologies – the reliability of voice from LMR and the benefits of data enhancements from broadband networks.

Q. Is the hybrid-model (e.g. TETRA + broadband) ready for standardised high level security work, in terms of data encryption?

A. The level of encryption of broadband technology is work in progress but is something that is available in the market. However we are reluctant to agree on LTE because, as users, we have only experienced a commercial view of LTE implementations. The market has security and encryption

**at the forefront of requirements not only for LTE but for 5G and 6G – so the level of encryption and protection of the data is paramount, and key elements that the standardisation bodies and manufacturers are focusing on to make sure that these solutions will fit the requirements of the market.**

Q. Do you believe that all the efforts in a number of countries across the world to replace dedicated LMR networks by MCX-based 4G or 5G solutions will be unsuccessful?! Or are you speaking of only short term when you speak about the hybrid era?

**A. I don't think the efforts across the world are necessarily aiming to rip and replace – in the short term era a lot of people understand that there needs to be a period of coexistence. There are key elements required by and necessary for mission critical users that cannot be answered by LTE alone today. So this hybrid era will be a long lasting one.**

Q. What if any insights have you gathered from research on importance of the interworking function (IWF- 3GPP compliance) by end users be they government, telco or private LTE?

**IWF is in the top three elements that will define the success of this hybrid or transition era. Most of the agencies that have already pioneered and paved the way for broadband networks are definitely putting effort into these interworking functions. The concern is that even though the standardisation is there, there isn't necessarily a technology-specific requirement how to work with a specific solution such as TETRA. We need to make sure that we don't jump into a vendor lock-in proprietary solution that will limit ourselves in the future so this is a key area that we need to pay attention to. It will impact the openness of the market that is necessary to bring that healthy collaboration of the two networks and make sure that the solutions are open and economically viable.**

Q. If a mission-critical grade data service is established with MNO(s), will budget-savvy governments accept to pay for aging LMR? How long?

**A. The whole model of MNO is one of the business models that will be enabled by this new LTE broadband era. In the hybrid ecosystem with LMR the diversification of the different business models is key. In some of the cases it will not make sense economically to run two networks so governments and agencies will have to address their real needs and match them to a business model that makes sense for them. The strength and the amount of possibilities of an open and interworking and interoperable ecosystem that allows hybrid combinations is the choices available. One solution doesn't fit all – so it could be an MNO-management, or a multiparty or a communications service provider or completely handled by the enterprise – in this case a mission-critical agency. There are multiple business models that are sprouting thanks to the power of a hybrid ecosystem.**

Q. Is the availability of ProSe and device-to-device capabilities, and the availability of devices generally, holding up the market?

**A. ProSe or direct mode is one of the key questions that every single LMR user considering the transition to LTE or broadband has in mind. The fact that the coverage of a firefighter going into a basement or the power of the LTE devices - can they really cope with the lack of connectivity? Will the users in the field be able to connect regardless of their situation and will they be covered by the technology? Sometimes this is what's keeping the key procurement processes from deciding from one technology to another and that's why we are seeing the hybrid device ecosystem growing as fast as it is. I don't think it's a barrier for the transition or coexistence of the market – hybrid devices are there to bridge the transition and that limitation of the new technology, and it is clear that the market is aware of that and vendors are making more and more options available.**

Q. Maintaining an LMR and an LTE/5G-based MCC mobile network is costly. Two networks are always more expensive than one. Why should authorities and enterprise spend that much OPEX to maintain both?

**A. The economy and the total cost of ownership (TCO) is one of the key items that any stakeholder will have to take into account. We are not saying that both technologies are always the answer. We are advocating for a very dynamic ecosystem. In some cases it will make sense to keep two technologies, in some cases it will make sense to just keep one. Depending on the use case and the requirements of that particular user group, we need to assess what makes sense. For someone like an enterprise mission critical user group it might make sense to only have one single network that can handle not only the mission critical connectivity but also the connectivity of IoT systems and other non-mission critical elements, that is the convergence that will drive down the TCO. We advocate that by opening up the ecosystem and creating a more dynamic business model that is not just restricted to one or two options, the TCO can be brought down, so we will not see the TCO levels that we are used to when there was only one way to operate a mission critical network.**

Q. Do you think that mission critical networks have to use dedicated private networks (as LMR legacy systems) or use commercial networks?

**A. It's all about how diverse the model is – there are cases where a commercial network will make sense. It may be a private core – there are cases when RAN sharing will make sense, cases where dedicated systems make sense, and cases where a hybrid model will make sense. There are areas where a dedicated network can operate and when that is not available a fallback into commercial networks is also a possibility. There is not one solution that fits all, it's all about the openness of the market and understanding the specific requirements of the user group. The beauty of this new shift is that it has shaken the market to question whether a dedicated network is really necessary or can we optimise the investment for a higher return. Both have benefits.**

Q. What can drive the faster evolution of 3GPP standards and adoption of mission critical private broadband by customers instead of LMR?

**A. The key driver for any industrial vendor or standardisation body is volume of scale. We are used to the mission critical market being very niche, very customised for a few selected users. That's**

because sometimes we were focused on such specific requirements from a group that we were not leveraging the weight of the big numbers that come from industry; verticals that are also in need of these mission critical capabilities of the network. When the industry makes sure that it leverages that demand from the big groups, the vendors will see the potential and if it makes money, it makes sense, for the vendors and for the whole industry. So the idea is to bring the big numbers, the whole ecosystem together and understand the diversity but also the common areas where multiple numbers and big numbers can benefit from these enhancements of the standard and the consequence adoption in the market.

Q. In which cases does it make typically sense to keep both technologies?

A. A good example would be where ProSe is definitely needed where it would make sense to rely on a tried and tested voice network from LMR for those situations that are common in the environment in which for example public safety firefighting emergency systems operate. Unfortunately, there isn't at the moment a way for LTE to match the services of an LMR solution to replace it completely. But the benefits and enhancements it brings are unquestionable. The beauty of a hybrid ecosystem is that there is no need to only rely on only one. The technology today enables the users to get the benefits from both. The question shouldn't be 'which one do we pick'? – rather 'how do we make sure that these networks are fully interoperable, how do we bring the demand up and bring cost down'?

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***Additional comments from webinar audience:***

- *Lack of implementation is one problem - another problem is that important features are yet not specified in 3GPP (like Callout).*
- *AES-256 is yet not implemented in MC-PTT ... it's proprietary implemented in P25 and DMR, and FirstNet deviates from 3GPP with proprietary implementation (status July 2021).*