

Connected Motorcycles and safety: What to expect in the coming years

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Host: Riccardo Matesic, motorcycle journalist and riding instructor

Guests: Hennes Fischer (Connected Motorcycle Consortium) and Antonio Perlot (ACEM)

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About the speakers

Riccardo Matesic is a motorcycle journalist and riding instructor. Motorcycles have been part of his life for as long as he can remember. He hosts the Motor Skills Podcast, usually in Italian and occasionally in English when guests are international.

Hennes Fischer is a mechanical engineer who has worked for Yamaha Motor Europe in product planning and in research and development for the past decade. He has been actively involved in the Connected Motorcycle Consortium (CMC), contributing to research on connected and cooperative systems. He is also a journalist and a former racer.

Antonio Perlot is the Secretary General of ACEM, the European Association of Motorcycle Manufacturers.

Transcript

Riccardo Matesic

Imagine riding your motorbike, your handlebar suddenly vibrates. You glance at your display. A car is about to cross your path. You can't see it yet, but the system can. This is not science fiction. This is something we could have on our motorcycles in just a few years. We are talking about C-ITS, Cooperative Intelligent Transport Systems.

Why we are so interested in this topic today: as a journalist, I wrote a lot about C-ITS, but as a riding instructor, I have already had to change the way I teach fundamental skills like braking, because of technologies like ABS. Now we might be facing another major shift, one that could change not just how we ride, but how we think while riding.

Today we are talking about this with Hennes Fischer. Hennes is a mechanical engineer who has worked for Yamaha Motor Europe in product planning and in research and development for the past decade. He has been actively involved in the Connected Motorcycle Consortium, contributing to research on connected and cooperative systems. He is also a journalist and a former racer. Hi, Hennes. Welcome.

Hennes Fischer

Hi, Ricardo. Nice to talk to you.

Riccardo Matesic

And we also have with us today Antonio Perlot, Secretary General of ACEM, the European Association of Motorcycle Manufacturers. Hi, Antonio. Welcome.

Antonio Perlot

Hello, Riccardo. Nice to see you.

Riccardo Matesic

I'm Riccardo Matesic, a motorcycle journalist and riding instructor. Motorcycles have been part of my life for as long as I can remember. This is the Motor Skills Podcast, usually in Italian, but occasionally in English when I have international guests. Welcome, and enjoy the episode.

Hennes, let's start from the basics. Where are we today with C-ITS for motorcycles? How close are we to seeing these systems in real-world riding?

Hennes Fischer

Well, it will still take a couple of years. One car manufacturer, Volkswagen, in fact, has already introduced early versions of connectivity in the latest car model range. But for motorcycles, of course, the challenges are different than for cars, and we are now working in different consortia to align with car manufacturers, with the infrastructure, with other vehicle manufacturers such as tractor or truck manufacturers, even the bicycle area. We are looking at it to harmonise the requirements and standards, and to make sure that the system works for every vehicle. That is the challenge we are having.

Riccardo Matesic

Okay, how many consortia do we have? As you said, you are working on many different consortia.

Hennes Fischer

Yeah. We are involved as CMC in ETSI. So ETSI is the European Telecommunications Standards Institute that takes care of everything that goes wireless over the air, so we need to be involved because they are defining messages.

Then as individual OEMs we are members of the Car-to-Car Communication Consortium. This consortium is driven by automotive companies, and it says car-to-car. It started with the biggest car OEMs. They defined standards. We are now, since almost 10 years, involved from the motorcycle side and work closely with them.

And then there is another consortium called 5GAA, which we are also involved with on a consultancy basis as individual companies. And I am pretty keen on saying we also work with infrastructure now, so road authorities that introduce and implement C-ITS. By the way, there are already in several cities across Europe traffic lights that can already receive and send messages to vehicles, so it is in an early stage, but it is rolling out.

Riccardo Matesic

Okay, I was the first to talk about the CMC, but I didn't say what the CMC is. CMC is a consortium born around 2015 on the initiative of BMW [and other manufacturers]. Am I right?

Hennes Fischer

Correct.

Riccardo Matesic

And you have worked since 2015 in CMC. What is the aim of CMC?

Hennes Fischer

Well, it is a consortium that does standardisation, so talking with stakeholders outside the motorcycle industry, and I just named a few of the consortia we are working with. And also internally we try to harmonise the system that will, at the end of the day, be on motorcycles.

The reason is very simple. Our main focus is safety. So we have to make sure, regardless of what bike you ride, whether it is a BMW, a Yamaha, or a Honda, that the systems have similar behaviour, and that riders intuitively understand what the system is doing and telling them. And that needs to go across the range of all manufacturers, basically.

Riccardo Matesic

Okay, you had a meeting, if I remember correctly, one month ago in Germany, at the Würzburg Institute.

Hennes Fischer

The workshops are actually a regular event within CMC to create and evaluate projects, report progress and also talk about the challenges. The last workshop, which was held at the Würzburg Institute for Traffic Sciences, they are a member of CMC.

The big project for this year is a simulation to evaluate the performance of C-ITS and the efficiency for motorcycles. As usual, it is a use-case-defined approach where we look at the most relevant accident scenarios. And we need to define, for example, how much GNSS positioning accuracy influences system performance. We look at other parameters like radio range, shielding of motorcycles by buildings or other vehicles. Speed and trajectory will have a significant influence. And we want to look at this and define better what parameters need to be at what level or at what value in order to avoid these accidents.

Again, the aim of this project is to understand the relevance and influence of the overall performance of a C-ITS system on motorcycles.

Riccardo Matesic

From a rider's perspective, what kind of info will we receive on our motorbike? Are we talking about collision warnings, road hazards, traffic conditions? How far can this go?

Hennes Fischer

Well, maybe I have to explain what C-ITS, in our understanding, is. It is a short-range communication that goes directly between one vehicle and another vehicle, so there is no

third party involved. Of course, there are cloud information systems, but for safety, we look at this direct communication.

This means we look at the most critical accident scenarios, and that is intersections, that is the left turn, and these are lane-change scenarios and forward-collision scenarios. In this case, for example, if a car crosses your path, you are riding on your bike, there is a crossing, and a car which you may not be able to see, because it is hidden, or the motorcycle is hidden, then there will be information given to both the car driver and the motorcycle rider, saying be careful, there is a car in your neighbourhood, or a motorcycle is approaching, and then we expect the rider or the car driver to take action. Those are the scenarios we are working on at the moment.

Riccardo Matesic

Do they talk also to the infrastructure in the future, to get the rider information about a dirty road or accident queues?

Hennes Fischer

Yes, the infrastructure is involved in the discussion, particularly in the Car-to-Car Consortium, where we directly, as I mentioned before, talk to road operators. And their systems give information to motorcycles. They can do it in two ways.

One is direct communication, so you get information directly, for example, that there is a traffic jam, or that there is some event on the road, could be an accident, or an offload from a truck or something like that.

The other technology is to put it in a cloud, and then from the cloud information, other vehicles could get the information. These are the two ways we are looking at.

Riccardo Matesic

But this is a second step. The first milestone is to have vehicles connected to other vehicles.

Hennes Fischer

Correct.

Riccardo Matesic

How do you expect C-ITS to change rider behaviour? Will it make riders more aware, or risk making them less attentive to the riding?

Hennes Fischer

Well, I remember many, many years ago when we introduced ABS systems. It was the same discussion you are having. People saying, "Yeah, but then they will take more risk because they can brake as hard as they want", whereas other people said, "Well, it will simply increase safety because you cannot fall down because of a blocked front wheel." You know how it developed. Nobody is discussing anymore whether ABS will have somebody riding more dangerously. It is simply not the case.

And I think we can compare this with C-ITS. It is an assistant system that helps you to realise where critical situations are, but still the motorcycle rider himself is responsible for his actions. And therefore I would dare to say that the risk awareness and the risk-taking of riders, if they have such a system, will not have any difference to what they do today.

Riccardo Matesic

Maybe it's just social media, but I still see many riders who don't trust electronic systems on their bikes. For some, it even feels like a matter of pride, as if using electronics somehow makes them less skilled. You know motorcyclists very well. Do you think we'll see the same reaction with C-ITS?

Hennes Fischer

It is the same resistance. And as you say, I am a rider myself, and I still enjoy touring with my friends. And when we sit at the coffee table, of course we discuss motorcycles and technologies, and it is a very controversial topic amongst my friends. But that is why you need to understand what the system can do and not do.

What is clear is that people do not want systems which overrule their behaviour, and if you see the public reactions on some of the systems that are mandatory for cars since last year, you know what I'm talking about. And also our discussions show that systems that assist the rider are appreciated if riders understand the behaviour of the system.

Riccardo Matesic

Yes, I agree.

Hennes Fischer

Maybe I can add one more point.

La Trobe University in Melbourne, Australia, is a CMC member, in collaboration with the Department of Transport and Main Roads in Queensland and the Transport Accident Commission, together with iMOVE, that is also an Australian project. They conducted tests with hundreds of motorcycle riders last year. The tests were conducted in a simulator and at a test track to evaluate C-ITS functions in real circumstances. It was an award-winning project, by the way, in Australia.

And they defined two key factors for C-ITS. First, riders want to know where the hazard is. They prefer directional warnings. Second, warnings need to be triggered in situations where they help the rider.

Most appealing, even to sceptical riders, were change-of-road-surface and blind-intersection warnings. That is what I was just talking about, intersection accidents. Then the forward-collision warning, for example, at [50] kilometres an hour, gave the riders an additional 8.5 metres to react. That doesn't sound a lot, but in fact it is a lot. At intersection use cases, where the rider was not able to anticipate the hazard, meaning he didn't see the car, the reaction distance doubled from just 15 metres without a warning to 30 metres with C-ITS alerts. So in that sense, the system performs.

And let me quote one rider who participated in this test. He said: "Many times there were hazards that are still hidden or pose a risk. I find that the system gives me a great, much-needed **sixth sense** when it comes to such hazards."

Riccardo Matesic

Okay, I'd like to involve Antonio in this discussion. Antonio, what's your opinion about these systems?

Antonio Perlot

As an industry, we see these as really the next stage in motorcycle safety. There has been a lot of work done in CMC over the last 10-plus years, and the accident scenarios that Hennes has been mentioning, as well as all the technologies that are likely to be available on motorcycles progressively, I think it brings new possibilities, which are going to make a fundamental difference in the future. And this is what we want to achieve.

If I say also, from the position in traffic of motorcycles, very often motorcycles are left behind, meaning that they are not necessarily taken into account in mobility policies. In this case, we are really trying to achieve that this happens, de facto via these technologies, being able to establish a dialogue between motorcycles and the rest of the vehicles on the road, so that this is not going to be the case in the future, that we can manage to get this integration.

This is awesome. As a rider, obviously, I see this as a huge opportunity to improve. And I think all this requires simply training, to be adapted, understanding of the system. Indeed, as Hennes is saying, you need to know what the system is doing. Motorcycles are becoming more and more complex, there is more and more electronics, but they are there for a reason. And importantly, the rider needs to know what is able to be achieved by the system, and also what are the limitations of any system, so that it doesn't create any over-reliance on the system itself.

Riccardo Matesic

But do you think there will be resistance from motorcyclists?

Antonio Perlot

Well, this is a good question. There is an issue, probably, of, it's a generational issue. So riders that have been riding for many years, this applies to any field, but also to motorcycling, they will be less inclined, and they will see these as added complexity on the product that probably they don't feel is needed. Younger riders might feel that it is easier to approach motorcycling because of these systems. So it is all about generational change, and I guess with time they should become, of course, more accepted, as with anything.

Riccardo Matesic

Yes, I agree about the generational issue. But I notice here we are three people, not so young, but we all love C-ITS.

Antonio Perlot

Yeah. If I may, Ricardo, just a thought, or a question to Hennes, and I'd like to hear also your point of view, Ricardo.

We look at motorcycling, and it is one word, motorcycling, but there are so many different ways to use motorcycles, so many types of vehicles, ranging from small-displacement scooters to big touring machines or sportbikes. And clearly the people that are using these different products, they themselves have a completely different profile.

So I think that the biggest challenge, or maybe it's not even a challenge, it's the reality, is that we cannot really expect that all the systems would be suitable or available on any kind of vehicle. These will have to be completely tailored depending on the purpose of the bike, and the rider will have different expectations depending on the bike he's choosing and the systems that are fitted on it. So I think this is a fundamental element to keep in mind. I don't know, what are your views?

Riccardo Matesic

Sure. And we will have to work to help motorcyclists know the new systems, to have faith in the new systems. Hennes, as I already said, I had to adapt my training to ABS. And now when I have a pupil with an old motorbike without ABS, I have to think about how I teach to brake without ABS, as it is not in my habit now. I'd like to ask, with C-ITS, will we need to rethink rider training again?

Hennes Fischer

Yes, for sure. Motorcyclists need to understand how the system works. And that is also a task, next to the communication of the OEMs. Also a task in rider training. They need to understand what the system can do, and even more, what the system cannot do.

Riccardo Matesic

We have to teach also these.

Hennes Fischer

Yeah. When it comes to C-ITS, there is also one important topic that needs to be communicated in rider training. We will have several years where we still have many vehicles without C-ITS. And of course, if the vehicle cannot communicate, you don't know about it.

Of course, there are ideas on how to make this easier. Maybe I can talk about this. This idea, it's called collective perception. That means equipped vehicles by means of camera will see other vehicles in critical situations, and then communicate this to connected vehicles. So even if a car that is not connected does something, or enters an intersection and a motorcycle is coming, it might be that another car or the infrastructure is recognising that and sends information to the motorcycle. But these are just ideas at the moment.

What I'm trying to say is, in the training you have to explain that. So people need to learn that this is not an automatic rescue parachute that works in every condition. It is an additional help.

Riccardo Matesic

Yes, this is important. As we will need a lot of time to improve the infrastructures, or to have new vehicles, you can come across crosses with cameras and information, and also across many crosses without information. You have to think about that.

Talking about industry collaboration, the Connected Motorcycle Consortium brings together competitors, so they collaborate, cooperate. Or is there someone who prefers to do part of the research by himself without involving other industries?

Hennes Fischer

Yeah. The principle of CMC was to put competition aside for this kind of safety system and work together. Because C-ITS can only work if you cooperate. That means if we use the same messages, the same methods, we look at the same situations. So you need this collaboration.

So in CMC, when it comes to C-ITS, we work together, of course. Every OEM, at the end of the day, needs to decide what kind of supplier, what kind of system actually will be in the motorcycle. That is outside of the CMC scope.

Riccardo Matesic

What can we realistically expect to see on production motorcycles in the next three to five years?

Hennes Fischer

It is difficult to forecast an exact date. But if you look at what is happening outside our industry, you can see a movement towards implementation of C-ITS, particularly in the car domain and in the infrastructure domain. And motorcycles will certainly not be the first ones to have C-ITS, but when we have enough cars equipped on the road, we will be part of this system.

And maybe just to give you a rough idea: the rating system for cars, Euro NCAP rating safety of cars, they are discussing now to include C-ITS in their rating scheme from 2029 or 2030 onwards.

Riccardo Matesic

Okay. Is there anything we haven't touched on that you think riders should really understand about this technology?

Hennes Fischer

Yeah. One important topic. My friends always say, "Yeah, but if it's connectivity, messages go over the air. What about my data? Do others see my data?" They don't, because the direct communication system is an ad-hoc system. So the motorcycle exchanges data with

the relevant cars in the neighbourhood, and already a second or two later, your data is obsolete, because you may have changed speed, you turn to the right, your vehicle is somewhere else. So the data you are actually exchanging cannot be read by others. And as I said, even if it could be read by somebody with a device next to the road, the data is basically obsolete as soon as he receives it.

Riccardo Matesic

Antonio, would you sum up, closing this interview?

Antonio Perlot

Yeah. Well, thank you, Riccardo. What I can say is, as an association, we clearly saw this already in 2015 as being a very promising field. And we have been following this, making sure we can, on the one hand, provide also high-level information also to the rest of the members in ACEM, so that the whole of the membership is aware of the steps that are taken by CMC, not in detail, but they know what is going on, what the general direction is.

And the other important thing for us as an association is that we can also represent and support the communication that CMC is doing towards the European institutions. And as Hennes was mentioning, also Euro NCAP, there is an interest, I would say, in general, in technology and safety for motorcycles, to improve the information that the users have about the benefits and the limitations, of course, of systems. And we want to support that.

So, as I said in the beginning, we see these developments as the next stage in motorcycle safety. The vision is to have, I would say, ideally at the horizon 2030 already some systems on the market. And clearly we hope that that would be the case. And again, tailored depending on the different usages that they will be meant for. This is going to be very important. So yeah, we are very optimistic, we are positive, we support the CMC work, and also when it comes to standardisation here at ETSI level, because of course a lot of work still needs to be done here. Yeah, so that's all from me.

Riccardo Matesic

Hennes, do you want to say something more?

Hennes Fischer

Well, I only can say I hope that with all the complex developments we have in C-ITS, because we need to talk to many stakeholders, vehicle manufacturers, infrastructure, legislators, and so on, that we come at the end of the day to a process that enables us to implement it in the way we want it: safe, easy to understand for motorcyclists, and easy to handle.

Riccardo Matesic

Okay. I thank Hennes Fischer and Antonio Perlot for being with us today. Thank you, Hennes. Thank you, Antonio. Bye, bye.

Hennes Fischer

Thank you. You're welcome. Bye.

Antonio Perlot

Bye, bye.

Riccardo Matesic

That's it for today. If you care about real-world riding skills, you can find more on [Motoskills.it](https://www.motoskills.it). Thanks for listening, and see you in the next episode. Ciao.

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