Protecting Vulnerable Road Users Through V2X

Nitin Dahad (00:00):

This is the NXP Smarter World Podcast. And I'm host Nitin Dahad, editor at Embedded.com and EE Times. Today, we'll be talking about the efforts to protect vulnerable road users, which is a focus of NXP's activities at this year's ITS World Congress in Hamburg, Germany. Today I'm joined by Huanyu Gu product marketing manager for ADAS at NXP and Katja Legner of ADAC. Welcome.

Katja Legner (00:32):

Welcome. My pleasure.

Huanyu Gu (00:34):

Thank you, Nitin.

Nitin Dahad (00:34):

Now over to you, Huanyu. There are different flavors of V2X. Maybe you can tell us what you mean by V2X in this instance.

Huanyu Gu (00:42):

Certainly Nitin, thanks for the question. So I'm talking about, actually 802.11p technology also known as DSRC, or ITS-G5 here in Europe. It is derived from the ubiquitous WiFi standard, but optimized for application in automobiles and high speed dynamic vehicular environment. It is actually the only production proof in V2X technology available today. And along the deployment of V2X and 802.11, Europe is clearly a global leader with a long list of completed and ongoing activities and projects.

Nitin Dahad (01:20):

So do you see that V2X and as you say in this instance, we mean 802.11p is gaining traction.

Huanyu Gu (01:26):

Oh, certainly. Yes. And this is probably interesting for many people to hear, because for many, this is behind the scenes and there are some updates here to share with you today. We do see actually growing traction of V2X across different regions. And this is particularly the case in Europe, but also Singapore and Korea for Asian countries are catching up as well. Singapore, for example, decided to adopt 802.11p for its second generation electronic growth pricing systems a few years ago. And the deployment of the system will be started before the year ends. Korea is another latest example. And end of August, the ministries of the Korean government reached an important agreement to start deploying the 802.11p technology along the national highways, while continuing to evaluate other VTX technologies.

Nitin Dahad (02:22):

So you've covered Asia. What are the current developments that you're seeing taking place across Europe? Maybe we start with vehicles first.

Huanyu Gu (02:28):

How we see that is the continuous rollout of 802.11p based VTX technology in series production cars like, those from Volkswagen, encourages many other players and stakeholders to invest and also deploy the V2X technology. So the initiatives taken by the General German Automobile club, ADAC is an excellent example. And furthermore, we may expect first serious production trucks equipped with the technology to hit the road in 2023 to further reduce the road casualties here in Europe.

Nitin Dahad (03:00):

Obviously V2X, as I understand, also involves infrastructure. I suspect that's being rolled out in parallel. Can you tell us a little bit more?

Huanyu Gu (03:07):

That is absolutely right. So the V2X enabled vehicles alone without smart infrastructure will not unleash the full potential of the technology. So the roads and infrastructure operators are making important contributions for expanding the C-ITS implementation in Europe. In this regard C roads coordinates the rollout of the technology on the infrastructure site in 18 European countries. And 6,000 kilometers roads are already equipped with V2E enabled roadside units. And, Austria is clearly actually leading with its nationwide deployment, which started actually in 2020 and is expected to complete in 2022.

Nitin Dahad (03:53):

So there's some good activity there as well. One of the indicators of future development is testing. Are there any examples of testing go on with V2X that you can talk about?

Huanyu Gu (04:02):

Yeah. I Think here again, you're absolutely right, needing on the importance of the pilot projects. So pilot projects, they continue to emerge and play a key role in a smaller skill deployment. Testing the new use cases and applications, but which may one day actually turn into a full scale rollouts. And one example is the German city of [inaudible: 00:04:24]. And there, all traffic lights and fire trucks are equipped with V2X roadside and onboard units from the company called Wireless, integrating an ex piece V2X chipset. So the fire trucks actually can request and traffic lights to synchronize with their passage to proceed through their destination without traffic delays. So consequently rescue teams get to emergency sites faster and can potentially save more lives. Probably another example, is the Ensemble project co-founded by the European union and NXP is a participant of this project.

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And together with all other OEM, technology supplier, and knowledge partners in the project, we have been testing 802.11p for truck platooning, with trucks from seven major manufacturers. On September the 23rd, the project successfully tested and deployed the multi-brand platooning technology based on one crossband common solution. And this is an important step towards fully connected, automated driving, while providing improvements in traffic safety, fuel economy, and logistic efficiencies. So all in all, we see a solid re tweaks foundation based on the readily available and proven 802.11p technology has been established here in Europe. And I think such a foundation is key to many current development activities and will remain key to driving continuous C-ITS expansion.

Nitin Dahad ():

Very good. That sounds quite impressive. Huanyu, thank you. Now I'm going to turn back to, Katja. Tell me ADAC, for those around the world, who are not familiar with ADAC. Tell us a little bit about the organization.

Katja Legner ():

With Over 21 million members, ADAC is the largest automobile club in Europe with headquarters in Germany. And ADAC is one of the key advocates for society's concerns about mobility. And acknowledging its members vast variety of mobility needs, ADAC offers customized products and services, so that they can have easy and safe mobility in everyday life.

Nitin Dahad ():

So let's focus on Germany. What's the current state of safety on German roads?

Katja Legner ():

Well, there is a great number of cars equipped with driver assistance systems. Moreover, occupant protection is insured almost across the board with belt tensioners and airbags. Also, pedestrian protection and cyclist protection is making inroads and the focus is on mitigating the consequences of an accident.

Nitin Dahad ():

And what trends are you seeing? I think you mentioned one or two of those already, but what other trends are you seeing?

Katja Legner ():

There's only so much you can get from the technologies so far, even more airbags in a car do not make much sense. So Car-to-X and... If I might say, we prefer Car-to-X, since the C for car is more recognizable to German speakers than the V for vehicle. So Car-to-X might be the solution for better road safety.

Nitin Dahad ([07:33](#)):

Okay. And how do vulnerable road users fit into this picture?

Katja Legner ([07:38](#)):

Well, measures to protect this category of road users are still in their beginnings. Many vehicles still off a little front end pedestrian protection. And the recognition features built into pre crash systems, for instance, to identify cyclists also have their limitations.

Nitin Dahad ([07:55](#)):

Okay. Thank you. Now you have a collaboration with NXP. What's the challenge you're seeking to address with the collaboration.

Katja Legner ([08:02](#)):

ADAC would welcome a common standard accepted by the manufacturers. Furthermore, equipping all new car models with Car-to-X would be very helpful in ensuring improvements in road safety. Because only if many vehicles are equipped with Car-to-X can warnings be transmitted to significant numbers of road users.

Nitin Dahad ([08:24](#)):

Okay, thank you. And what would be the solution to... Tell us how it works and how the technology works? For example.

Katja Legner ([08:28](#)):

Car-to-X is based on the capability of a vehicle to spot danger points along the road, and also to transmit the information to all cars in its direct vicinity. For this to be effective, preferably, all vehicles need to be equipped with Car-to-X technology. It enables them to transmit and receive warnings. And so become direct beneficiaries of the technology. Then in ADAC's view, road safety would be best served if all new vehicles would be equipped with Car-to-X. And for a start, ADAC decided to equip four of its road patrol vehicles with PW land-based Car-to-X. And with these vehicles, we aim to gain our own insights early on. Also, we wish to send the signal that, for us this technology is a milestone in accident prevention. These are the reasons for us to be among the first users. And now, NXP shows a first sample of Car-to-X integrated in a light bar.

([09:32](#)):

And this type of light bar with yellow surrounding warning lights is installed on ADAC road patrol vehicles. ADAC is going to use Car-to-X intensively and deliberately deploy the vehicles equipped with the technology in Car-to-X pilot areas. We hope to gain essential insights from that to support our decision making in view of the future deployment of Car-to-X and finally across entire fleet of ADAC road patrol vehicles.

Nitin Dahad ([10:03](#)):

Okay. And this will be the light bulb be shown at ITS World Congress this year. Is that right? Okay. And are there any future plans for the pilot?

Katja Legner ([10:10](#)):

As I said, we try to get insights and collect data. And from that on we will see how fast and quick development goes for the rest of the fleet.

Nitin Dahad ([10:22](#)):

And now, let's talk to Huanyu again, about ITS World Congress. Huanyu, what were you showing this year at ITS World Congress?

Huanyu Gu ([10:29](#)):

As many know probably, NXP has been fostering and promoting the V2X technology for many years, and have enabled the first rollouts of the V2X technology in production cars with the General Motors in 2017, and Volkswagen in 2019. And at the ITS World Congress in Hamburg next week, NXP and partners have made a further step to showcase advanced V2X application scenarios for collision free mobility that will benefit road users beyond just the car drivers and will put a special focus on protection of vulnerable road users, such as bike, bicyclists, or even pedestrian. Besides the light bars from the ADAC utility vehicles, visitors will be able to see, for example, smart V2X enabled electric bike prototype from the premium German bike manufacturer, [inaudible 00:11:20] and V2X enabled scooter from the service provider Voi, V2X enabled cargo e-bike and also traffic. And all these V2X enabled devices can talk to each other in the same language of 802.11p. And together they will weave an invisible safety rep. This is how we call that.

([11:41](#)):

And during the ITS World Congress, visitors would also will have the chance to join city of Hamburg's demos tours, to experience and ex piece V2X technology live, such as the V2X enabled Metro bus line, number 26, with the new type of hazard warning systems resulting from the BD move project, or the Greenfield transport project, where container trucks running in the Harbor area of Hamburg may make priority requests to the traffic lights to reduce making stops and consequently reducing carbon emission. And so here probably comes my personal favorite, the automated vacant parking garage at Hamburg's iconic Elbphilharmonie concert hall. Enabled by NXP's V2X chip set solution. So in the future, visitors can get out of their car in front of the parking garage and the car will proceed to a vacant parking lot by self, fully autonomously. My recommendation will really be to just come and visit this year's ITS word Congress and the NXP both and get your own firsthand impression of how the V2X technology and technologies in general will bring not only convenience to our daily life, but more importantly, make us all traveling safer.

Nitin Dahad ([12:56](#)):

On that note, I think is a good note to end on. So, Huanyu and Katja, thank you very much.

Katja Legner ([13:02](#)):

Thank you very much for having me.

Huanyu Gu ([13:04](#)):

Thank you for having me here. And it's beyond pleasure.

Nitin Dahad ([13:06](#)):

That was the Smarter World Podcast with me, Nitin Dahad. Thanks for listening and see you next time.