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SPEAKERS
Dave Braunstein, Georges Aoude

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D **Dave Braunstein** 05:24

Okay, and then Okay, great. All right. So George, I'm going to just kick us off with a little intro. We may record it later. But I'll do that part. And I'll welcome you, and then we'll just get right into it. Okay. Sounds good. All right. So welcome, everybody to the inaugural, together for safe roads, safer roads innovation podcast. It's great to be joined today by George Audi. He's the co founder and CEO of a company called Dirk. And George and I know each other reasonably well, we've worked together for probably about two years that right, George? Yep, yeah, so we're gonna just talk to George about what his company is doing to make the road safer. And for those of you who aren't familiar with TSR, as we call it, together, safe roads is a social business coalition. So we'd like to also call ourselves a social business accelerator, because what we are doing as a group is bringing private sector expertise, data and technologies to the road safety community, because we need help to save lives on our roads. As some of you may know, there are, you know, in excess of 1.3 million people around the world that die on the roads, and many, many more than that actually are injured. So as a group of businesses, we are trying to bend the curve on road safety, as we say. So today, we're going to be talking with George Audi, as I said, his co founder and CEO of Dirk, and so welcome, George, thanks for joining me today.

G **Georges Aoude** 07:02

Thank you for having me on this first episode. And thank you for the opportunity to talk about Dirk and and the work we're doing in this space.

D **Dave Braunstein** 07:11

Great. So while we're at it, what's what's the background behind you? What do you what city you're supporting

there?

G **Georges Aoude** 07:18

This is the city of Detroit. This is our US headquarter. And we really like Detroit. And this is where we started. So we have a lot to tell you about our rooster.

D **Dave Braunstein** 07:33

That's a great segue. So why don't you do that? Why don't you start us off by telling us a little more about Dirk and why you started the company in the first place. And you can weave into that your connection to Detroit.

G **Georges Aoude** 07:45

Definitely. So there, I started to commercialize years of research, I led at MIT, focusing on autonomous vehicles and smart cities. Broadly speaking, I was always passionate about the safety of movements. So my research was focused on initially aerospace satellites in deep space missions, and then drones with the US Navy. And then finally, as self driving vehicles became a very exciting research topic in the late 2007 2008. I was fortunate to be involved in some of these cutting edge research. And as this research started progressing, we started thinking of the future of cities and roads, not just the vehicles, and how to improve safety You need not just smart vehicles also need smart infrastructure. So this evolved into some interesting research results that I led the project sponsored by us IoT and some of the so yams, and then led to some publications and patents that I filed. And I went to the industry and worked in this space, more on the consulting and advisory side working with large companies and also startups 1000. A few years laters in 2015 2016. The patents were fully issued kind of ready for to commercialize them. And it was the right time for the technology. In terms of market timing. The vehicles were getting ready to be deployed on the roads, the big companies have some versions of vehicles that are piloting and smart cities and kind of smart infrastructures became kind of the next big need. And this was great timing, to launch Dirk and be joined by my two co founders, Carl and armour to commercialize this technology and try to improve safety. Globally speaking, the connection to Detroit is that 1016 we launched initially in Dubai, even though the three of us were in North Devon Just a year or two before when it happened that we met here. And after launching Dirk and getting the support of the Dubai government, we were invited to back to the US, which we always had very strong connections. And to specifically to Detroit, where there was a program called TechStars, TechStars. mobility, Detroit. Yeah. And you probably familiar with it, Dave. And we, we were invited, we were selected, kind of very, it's a very selective program. And with these three months we spent in Detroit, interacting with the ecosystem, whether private companies, corporate companies, with the public agencies, the Department of Transport in Michigan, and other groups in the Michigan ecosystem, we felt that Detroit is the right place to actually we base ourselves in the US. And the ecosystem itself was very supportive to launch a company like that, that has the benefit that not only with the vehicles, but also with the infrastructure players,

D **Dave Braunstein** 11:07

right? So So why don't you dive deeper into what your product vision is, and what you're up to, until definitely tell us more about how it contributes to reducing traffic crashes, injuries and fatalities? Sure,

G **Georges Aoude** 11:20

so what we're doing at Dirk is powering the future of roads for the safer and smarter road users and autonomous vehicle navigation. So what we're doing is adding intelligence to the traffic world, right, and we're doing it in a very specific way, we are adding the intelligence using existing cameras and sensors on the roads. And our dirt platform is taking this information that exists, whether it is existing sensors, existing cameras, existing Raiders, and organizing that traffic data of the world. So that we can understand behaviors, kind of analyze, understand behaviors, detect dangerous movements, but also predict dangers intense, all of this in real time at the edge to not only help municipalities kind of detect early on become much more proactive in understanding hotspots and understanding of dangerous locations and Asians patterns on the roads as but we're also helping the road users, whether it's autonomous vehicles of the future, or today's cyclists and motorcycle and regular cars, be alerted, and and prevent crashes that can be preventable.

D   Dave Braunstein   12:39

Right, so there's, there's sort of an element of that. Where are we calling it these days v2 X the vehicle to everything, including pedestrians and cyclists and the like. That's what your vision is?

G   Georges Aoude   12:54

Exactly, yeah, we see the future of roads to be connected, you see that autonomous vehicles or smart vehicles on their own, are not going to solve our road safety problems. As you said, there are more than 1.3 million road fatalities every year in 10s of millions of serious injuries. And we believe that the infrastructure has to play a bigger role. And the infrastructure could be smarter on its own, and could also be smarter by communicating with the road users smarter on its own is providing this intelligence back to the road owners and operators. and communicating is what you're referring to is how can use v2 X to actually alert these road users and mainly the vulnerable road users from imminent dangers that they cannot see just from their own eyes, or the sensors of their of their vehicles.

D   Dave Braunstein   13:47

And, and vice versa, right? It's it's vehicle operators who are or they can be commercial or passenger vehicles or just citizens that are going to have the ability to receive a message about about an imminent crash that could avoid an injury or fatality.

G   Georges Aoude   14:06

Exactly. One of the interesting use cases we're solving is you're approaching a vehicle intersection sorry, and your cars is equipped, you are a good driver, you're you're stopping at the red light. And now it's your time to go. It's green, but someone is running the red light opposing direction, the infrastructure can see this danger can even predict it, and then communicate to you in real time. So that you have a one or two second heads up which can make a huge difference.

D   Dave Braunstein   14:35

Yeah. So it sounds like there are a lot of stakeholders, a lot of users. So what's the business model? How are you actually putting this into practice? Who do you partner with? Is it a b2b model? Is it a b2b to see model is it a b2b to G model, the business the business the government what's what's the How are you actually getting this into communities.

G Georges Aoude 15:01

So, we have matured into have two main offerings. And the first offering, which is a direct insight is a can think of it as a B to G model, we work with municipalities, we are leveraging their existing assets or new assets in terms of sensors and traffic systems. And we are providing them our software as a license. So we provide different software that run either on the edge or on the cloud or on premise that analyzes will provide real time insights into the traffic. And this model is very innovative for the traffic business, but very standard for you know, the technology world, as depends on the number of sensors and intersections and different modules you're providing your your software, costs will nicely increase or decrease depending on your budgets and requirements. Yeah, and this is, as I said, this is for road owners and operators now for the direct sense, which is our connected vehicle solution. This is where we are working today, with a number of automotive players, even though we're deploying it on the infrastructure. Today, really, it's in pilot mode. And publicly, I can say we're working with emotional in Las Vegas, with working with Denzel and Ohio, and other also automotive OEMs. Around the US, and there who is funding those pilots or the OEMs automotive players, because they're preparing for that next wave, and of how to use smart infrastructure, data, and how to incorporate them to make their car safer, right longer. So today, we are really selling that solution directly to them. And in some cases, some of the cities, Yogi's are also adding these capabilities as well to prepare for that next wave of of technologies. So in this case, it's either b2b with automotive players, or a B to G with the government, and in some cases, really how to how that will scale is the question, what are some of the players going to together funded? Or is it going to be the government that will invest, but then, you know, charge some sort of licensing? back to what affairs? That's I think so the question, again, I don't think this is what should be all focused at the moment, given that eventually, when value is created, how to actually cover costs will become much easier. But we should be focusing more on the value creation, I think at the moment.

D Dave Braunstein 17:39

Yeah, I like that. I like that. That's a I mean, these are, I think, you know, TSR is a tech optimist organization, right, we believe that technology deployed responsibly is really going to help us we know there are plenty of examples where technology's actually, you know, you know, is not actually helping us on our roads. But in this case, clearly, we have to, you know, push harder to create value from these kinds of things, because these are on the right side of the the safety equation. So it sounds like you're working from two different angles, both the vehicle operators and OEMs, as well as the municipalities and, and other public sector

G Georges Aoude 18:22

entities. Exactly. There are a few other also stakeholders that will come into play, they are already engaging with them, insurance payers, obviously make it become very interesting as we are scale scale and scale further, now fleet fleet companies, the receivers of this intelligence coming from the infrastructure also are very interested in through TSR. In the past, we've made some great connections there. So I think as we start scaling, and providing infrastructure presence, the consumer of this data could be other stakeholders beyond just you know, the 20 flavors.

D Dave Braunstein 19:03

Yeah. Yeah, I like that idea, too. You know, that at TSR. You have a lot of members who are large fleet operators, whether that's a PepsiCo or an anhyzer, Bush and Anheuser Busch InBev, or UPS or others, and certainly the technology companies that serve them in the telematics space or fleet management space. They're some of the organizations that are really pushing the envelope on connected vehicles, so they're out ahead. I like that idea that

you can work with them. And certainly, you know, we would, we'll continue the conversations with you to try to pursue that. So tell me Can you just speak a little more about the some of the tougher problems you're trying to solve? Like it's, it's, I do want to hear about some of the the quote unquote low hanging fruit to but tougher problems that you guys are working on that you think could really make a difference. I

G **Georges Aoude** 19:56

think one of the tough problems we were working on, I think That's why very few people actually are trying to attend to is how to bring this direct sense that I described earlier. The ability to detect track and predict produces behaviors in real time to the edge of computer vision advancement is on the cloud. And what you don't see is you have very powerful cloud computing that can run in a very heavy model. And in some cases, slow models and slow in the safety world is seconds, right? It's slow. So what we need to do, and what we have been able to crack and continue to kind of work at is how to be able to run these very safety critical models and systems on the edge on the road, and be able to really detect and predict an alert within milliseconds, yeah, because as you're alerting a cyclist or a driver or autonomous vehicles, you know, one or two seconds is too late, you have to be able to alert within milliseconds, so that you can predict someone jaywalking, before they become in the middle of the road. Right. And this ability to do this at the edge in a very accurate way with very low false positive, high performance is, you know, one of the hard problems we're working at and continue to kind of focus on. Yeah. Well, it's

D **Dave Braunstein** 21:20

certainly worth going after, I mean, and can you for maybe some of the people who are less technical, we talked about the cloud, and you talked about the edge? What just in layman's terms, what do you? How would you describe edge computing?

G **Georges Aoude** 21:35

Sure. So Cloud, I think we know, most of us are familiar with cloud, right? most applications are hosted on the cloud, meaning that in our world, you have a camera that's looking at the intersection, the feed, the video from the camera goes is uploaded, to the internet to the cloud, the calculations, the analysis is happening on the cloud. And then there is some analysis results, that's then you know, shown on a dashboard or pushed back to potentially a fleet that's driving around. But that's really not real time it's happening on the cloud has a delay, it goes up to the cloud, go back from the cloud to the users, it takes few seconds. Because there are latency and communication latencies in the cloud itself, and, and so on, so forth. The Edge device in the traffic world, and especially, especially in our business is when that system is really on the roads at the intersection next to the camera. So it's at the edge of that really ecosystem. And you can think of it as a powerful computer, very similar to what you see within a company's vehicles that's sitting on the interior, and the intersection is typically in an enclosure with the traffic cabinet. And it's connected directly. Why not? Why the see through a wire to the camera, so there's no delay of communication, the video feed goes directly into this edge computer, the calculations are happening on the spot. And then the alert goes from that edge computer directly through some sort of V to x to the surrounding vehicles. Yeah, so you're minimizing latency to the minimum of latency, you're also allowing data communication between that edge computer and the surrounding vehicles without having to go up and down from the cloud.

D **Dave Braunstein** 23:24

Right. Okay. Yeah, that that was a good explanation. I think that easy to understand that. So how does this solution talk a little more about pedestrians and cyclists? For example? What's the vision for how pedestrians and cyclists,

you can actually be seen by this equipment at the edge? And your movements can alert others to those movements? But how about receiving alerts? Are you planning on alerting pedestrians and cyclists to imminent danger as well? How does that how does that work?

G   Georges Aoude   24:01

This is a good question. In the initial phase, we have alerting the drivers. Okay. And, and this is for many reasons. One is usually safety systems in vehicles are a core to the vehicles themselves, right. And being able to mandate and potentially scale the deployment of those in vehicle antennas that we're receiving others from the infrastructure make more sense in terms of adoption and scaling. So what we're doing today is you're you're basically crossing you're a pedestrian or you're a bike, a cyclist or you're on a scooter. And we're using cameras from that are located in key locations that can see well and consider what we call vantage point. So we can see 360 you can see the full view of intersections will not block and if you pick an example of an intersection, you're approaching and you have a A kid crossing just in front of a bus and the driver has a occluded you, you cannot see that kid crossing. And for whatever reason that kid might be just jaywalking crossing when they're not supposed to cross. And the system itself is able to see this, this person, this kid from that very good vantage point, and then analyze and detect that there is a danger because that kid is on a path that will most likely conflict with you as a driver, and will then send an alert to the drivers within milliseconds, that will be shown in their vehicle. If it's an autonomous car, it's immediately integrated with the planner and the navigator of the vehicle. And that's this information becomes what we call a off board perception. So it's basically the perception outside the vehicle, how the infrastructure is merging and sending what it sees and what it's actually predicting. You as a driver autonomous vehicle, and with that capability, then you will slow down. If you're close enough, if you're far enough, they can calculate that, you know what I'm, I'm far from that intersection. I don't need to alert the driver. But if you are in a what we call collision path or a complex path, then something will be done to alert you as a driver, or to make a change to the production informed autonomous car and the autonomous car will make its own change to its path. Now back to your question, why aren't we alerting the pedestrian or the vulnerable users themselves this will come and this will come as more 5g phones and you know 5g wearables will be available on the market. Today, the 5g will talk about phones that are mainly 5g connected to the cloud itself 5g connected to the surrounding area. As we start having more 5g kind of really in that same environment that they tried. The same alerts can also go to the pedestrians, the cyclists, the scooters directly, and kind of multiply the effect of these alerts alerting the drivers also alerting the vulnerable abusers and increasing the chances of avoiding a potential crash.

D   Dave Braunstein   27:11

Yeah, I gotcha. So some of it has to do with what we carry around in our pockets today are used as recycling isn't necessarily suited from a hardware standpoint to actually receive a low latency alert right now.

G   Georges Aoude   27:27

Correct. And also, I think another point, as you're kind of summarizing here, we cannot expect every kid or an elderly to be crossing to have a 5g phone even in the future, right? So the vehicle parts you can mandate. And this can become a feature that has to be in the vehicle for safety reasons. And I think, as a nice add on, or a kind of another layer of safety and redundancy. The more adoption we have within the end users and the road users, the higher the chances of actually improving road safety brothers.

D   Dave Braunstein   28:02

Got it? Got it. Yeah, so Okay. So it sounds like there are a lot of dependencies here To be honest, right? But that's not probably anything new to you. You got a lot of things that have to come together. So what makes you optimistic that you guys can make a difference with all these players, you have to stitch together? And like, tell me more about why you, you feel like you guys can make a difference.

G   Georges Aoude   28:31

Great question. For the dependencies are actually real the ones you mentioned, however, our approach is about breaking these dependencies. So initially, we started with the expense, which is the connected vehicle use cases that we are talking about, or just talked about. However, as we started engaging with the different players of the ecosystem, we saw a clear opportunity today to make a difference by focusing on one side of the equation, the infrastructure, smart infrastructure side of it. And this is where that insight came to life. Because we saw that even without alerting the end user, there is so much that can be done. If we just take all this data that today could be captured, but it's not captured. All these data, feed the camera video feed that you can catch it from the cameras, some of them already deployed on the roads, and try to organize, analyze and extract important insights from what these cameras see. And states state agencies and cities like m dot Michigan yo T and the city of Detroit gave us access early on to the roads to actually not just have these hypotheses, but also extract these insights and get that feedback and see how we can continue improving those insights. And what they told us immediately is you helping us become proactive rather than reactive agencies. In the past, we knew that there are crashes. And we will wait for the crash reports it takes a year or so to get these crash reports do the analysis, it takes another six months, you're at least 18 months plus, before you have any idea what happened on on this time of day at this, you know, specific location. And usually, the information we have is dependent and limited what's in the inside the crash report, right? It's very late to actually be, you know, to do any changes that can really impact the root cause. And by that time it came out 24 months later, that behavior might have changed, lead,

D   Dave Braunstein   30:38

printing public health data in which takes a whole other layer of of work, right to get to the hospital data. Exactly. on that. So it's Yeah,

G   Georges Aoude   30:47

I hear you so that the idea is why wait until you have a crash? Why wait until you have a deadly event? Why can't we use this data, like a lot of this analytics that happened in other domains, and predict and kind of from this analysis? Where are the potential that is what we call hotspots. And one great proxy is looking at near misses or near crashes? Yeah, and yeah, and if you understand that, this right turn is dangerous, and you having a lot of near misses with between pedestrians and vehicles, something could happen and might become a deadly location. So what can you do with just looking at this understanding the root causes, and then allowing the road owners and operators to prioritize these locations and help them prioritize their investments by saying, look, in this, you know, one location, you have those two spots, and these are the top three reasons why this is happening. And by the way, if you take that example, for your next 100, intersections, we can help you then prioritize the risk between those 100 and kind of sold them. So you can focus on your top 10 most dangerous intersections. And within these intersections, focus on the root causes. So just by being proactive, you are already helping with road safety, right? Without even alerting the end user, you're kind of solving the problem from the from the beginning, from the from its root causes.

D   Dave Braunstein   32:11

Yeah. So it's a safe systems approach to be proactive about revision zero, if you want to use that term. be more proactive about it, and design, infrastructure and design road systems that are more forgiving, that will reduce near misses, which then reduces crashes, injuries and fatalities. That's the thing. Yeah, we are huge fans of that same thinking at TSR. We're definitely you know, we're on the lockstep with advancing the analytics of this. So it's great to hear that you're making progress in that that area as well, especially near misses, we would we are actively trying to work to engage the community around us to have them adopt these new analytics. So that's, that's incredible. So what is your woody? When do you expect that some of this these great innovations, whether it's the analytic side of things, or whether it's the would you call it off for perception? Yeah, the sense of a perception for perception, it's a new term for me, I love that that's really makes a lot of sense as opposed to a das and onboard systems. This is awkward. That's a great term to pick up on. When you expect to start deliver some value in these movies. You're still working in Detroit, where else you working? You know, how are those things going? How are you delivering value to the community right now.

G Georges Aoude 33:45

So we've actually discussed both the direct insight that I we talked about now, the different analytics for near misses. darphin is a big one, but we're seeing also value from other types of safety incidents where the jaywalking event, illegal, kind of maneuvers, illegal u turns that sometimes are systematic, and you kind of understand really the root causes behind them. And these are scaling with cities, especially now with the latest administration, there is a big focus on supporting infrastructure. So we are already winning some some projects and we mentioned Michigan recently in a California, also in Nevada and few other places around the US we live in more than 10 cities, whether it's in commercial projects or in a pilot phase. Okay, the direct sense the question of when we will see value from it. I would say we're already seeing value and the way we are extracting value today is through pilots with the automotive partners. So we have a public project in Las Vegas with motion and today motional is powering the Lyft autonomous vehicles so when you're in Vegas, in New York or a Lyft vehicle, you have an option to choose a self driving option. And that motion code is already driving around talking to traffic lights, or getting the signal phase and timing on really understand the phase, it's the green is dread, it's not really relying on its incentive for these infrastructure input. And now, we are adding the Dirk offer perception to its route. So we're in couple of location, a couple of locations, and we will be scaling hopefully, as we we show the value to the to motional, which is, which is a big fan of this concept when this partnership, and eventually kind of the cities, the city and the riders. The way to scale further is obviously to align ourselves with the scaling of these deployments. So as motional and other partners are entering a new markets, and as they are ready to go beyond their one corridors or specific district to the next phase, which is, you know, multiple corridors, larger districts that will naturally scale and only add value, and in many case, enable the faster scaling of safe automatic deployment by having the infrastructure support and demonstrate that to the city. City counterpart, you know, we done it on this district, we did it in this on this corridor, we showing you how we can maintain this level of safety. Now we want to scale and we want to use the same formula at scale vehicle, plus infrastructure and other potentially components. So we believe that we can help by creating that ecosystem that demonstrates a certain level of safety and readiness to scale. Right to get the buy in and support of the government stakeholders.

D Dave Braunstein 36:54

Got it? Okay, so we're back to the government and potentially, you know, whether it's the new administration or you know, down the road, other administrations that want to endorse smart infrastructure, that that's going to be something it sounds like that's going to help to accelerate your path to helping the communities, right. So what other things are going to help you to scale? What are some of the things that like, if there's somebody listening to this and says, I want to I want to help? This is a wonderful solution. Who is the person that you want to reach through this

interview? and say, you know, talk to me, because, you know, I can use your help, you know, realizing value sooner, and TSR certainly is one of those organizations, but who else? And what's going to help those buyers to realize value from your solution?

G Georges Aoude 37:45

So going back to kind of your comment, yes, it is government. But we know that also the private sector can help an investment through, you know, accelerating those timelines. So first of all, on the government side, I think we are engaged to many for rethinking citizens states, whether in Michigan, in Nevada, in Ohio, and in California, in Dubai, as well. And we want more of those, right, we want those who actually believe that the future of roads have to be smarter, more connected, ai powered, to improve safety. And, you know, we are always looking for more decision makers do t directors mayor's believe, the same vision that we believe in terms of the private sector, we talked about the thumbs up players, obviously, they're, you know, we're a big fan of motion partners, but also we're looking to, to be deployed, and have presence and support the scaling of as many partners as possible. So we are not exclusive to any of our partners. And this is very important for us to be able not only to scale, but also for our impact to be beneficial across a city across a country. And we are, you know, always open and ready to talk to other partners in the automotive automotive industry to help provide our solutions to the broader the broader ecosystem.

D Dave Braunstein 39:19

Great, yeah. Okay, that's helpful. So it's helpful for me personally, as I think about ways TSR can help you but also, for anybody listening, they fit into those groups you just described, and hopefully they're going to reach out to you to to learn more about how to partner so

G Georges Aoude 39:37

and if I may just add one thing, Dave, is that our approach is, as I mentioned, I'm talking about number of partners. It is really with partners, we don't believe their core anyone else can solve road safety at a meaningful level. So we are working with a number of IPS players We are engaging publicly with cash and Siemens and also ikana, light and other big RTS players. And I believe this is something very important that we believe in Dirk is we need to have joint offerings and a joint approach as we are tackling this, these big problems. Yeah, and understand how we can add value to each other, right? In many cases, you have big players that already have provided a lot of value to the cities. And now they're looking to upgrade the software, add AI analytics, like wonder can provide. And I think we need to really be smart about how we complement each other so that we move forward faster.

D Dave Braunstein 40:42

Yeah, that's very important, especially when lives are at stake. Right, we need to move forward faster, for sure. So sort of, you're almost implying that through partnerships in an ecosystem that there are standards may be emerging that would allow this ecosystem to operate more efficiently. Maybe I know if efficiency is the right word. But is that part of this too, are you trying to establish a formal standard or de facto standard for this kind of infrastructure related communication, and then, you know, whether it's you or somebody else has a robust ecosystem of partners that can help our cities to become safer.

G Georges Aoude 41:26

The good news is that these standards and protocols already exists. So in v2, x space, we have standards for long time, there was a debate between the call the communication medium is a dsrc, or cellular v2 X. Yeah, and obviously, we're seeing at least in the US, it's going more towards the cellular v2 x side. But the underlying standards are there. What has been missing in the past is commitment from the government, and with also the automotive partners, that these kind of safety connected vehicle applications will be kind of mandated, will be needed, because there are investment that needs to be to be done individually with the automotive players as well within the government. And I believe a mandate could accelerate the path forward. And we as you all know that we're close to a mandate at the end of the worm administration, for various reasons, we know that the stall for the kind of mandating every vehicle to have the 2x antennas, I believe mandates can only accelerate this towards, you know, it goal that we're all looking, we're looking forward to have, it's where every vehicle has these connected antennas, these 5g antennas, and, and looking just in the US, now we are behind, right, because this stalling and debates around which communication to use has put us behind. And we need somehow to kind of catch up and amend that could be a great way. Otherwise, the support three investments and the infrastructure will definitely help can be in a kind of alternative, instead of having a mandate actually supporting with investments, so that both the private and public sector are kind of catching up and accelerating forward.

D Dave Braunstein 43:34

Yeah. Okay. So there's definitely a level of involvement from the public sector that's really going to help and mandate of some sort or, yeah, okay. Well, you know, that's not necessarily easy. The, you know, I think we both know that. But, you know, I think we can be hopeful that road safety is being elevated with the new infrastructure bill, you know, reading that more carefully, myself, and having others interpret it for us that there is a significant maybe not enough money, but a significant amount of money being dedicated safe roads for all where I think this applies. Yeah, so. So I think we're heading the right direction, let's let's keep pushing, right? We got to keep pushing to make this a priority for our communities. I think they they do want it right. It's just the question, make sure we clear the deck so that we can do the right thing to deploy these technologies. So so maybe we could just wrap with what's next? How can you spend in the next 12 months so that you know when we talk the next time, you can say hey, Dave, this is I am even more excited than I was before we talked, you know, last summer, let's say tell me tell me where we're going to be 12 months from now and, and let's finish on a high note.

G Georges Aoude 44:58

Definitely, definitely. And Maybe before I quickly answer this question, I would say so and the new administration. And the bill that you're talking about will be important. I wrote a few articles the last few weeks. Also my thoughts on how to make sure we investing in in the right places, obviously, the we need to advance infrastructure, we need to build bridges and roads. But we want to make sure we're also adding the technology, not just for dirt, to add the technology, but to actually be able to catch up right and improve safety rather than just creating more roads and potentially more congestion, right. So technology has to be at the core of the design of these very large projects to achieve what they're intending to achieve. In terms of what in the next 12 months. Next well, what we'll be focused on what will be kind of exciting for us and for dirt dock where we are gearing up to two large projects, two deployments, one in Michigan and one California, we're now in design phase for next 12 months we'll be implementing. One of them is a 65 intersection corridor in Michigan will be one of the largest connected and smart corridors in the US. So we're very excited for deploying it. They're turning it live and and starting to see the benefits that scale as a company, we haven't seen it I think very few properly call it coders out there are folks on safety insights, and also have at the same time connected vehicle applications, something very similar also in California, different weather, different environment, very similar. Some similar projects, I can't announce the city, the name of the city, but hopefully we'll announce it soon. In California as well, we'll be deploying 35 intersections, in a very a prime area where we will be looking at also reducing crashes, understanding how the insights will be will help our partner to become much more proactive and prepare for the future of connected vehicles. So for for us is our two big projects

we are excited to have. And we're also very excited to grow our presence and grow with partners grow with distributors, and see how these large investments will benefit smaller companies like Dirk to deliver fasil on their mission.

D Dave Braunstein 47:40

Right. So so if I could just paraphrase, it sounds like hundreds of intersections are going to be benefiting from Dirks technology, and insights in the next 12 months. And, you know, maybe in the 12 months after that, it'll explode to 1000s of intersections, because it's I think if the and that's just the US centric view, right, but you've got to get to 1000s, if not 10s of 1000s of intersections where these conflicts happen to make a difference. So, you know, kudos to you for taking on something that that you know, was rooted in your research years and years ago, and now getting this close to the market and now deploying to hundreds of intersections, that's phenomenal. You know, and, and, you know, we're here to help. And I hope that through this podcast, we're going to, you're going to read some new audiences and other people that are going to they're going to help this to get into more communities, and we can really prove value and and eliminate those crashes, injuries and fatalities that are so horrifying. And just we can do better.

G Georges Aoude 48:52

Thank you know, I appreciate and I appreciate DSR supports were part of your program in 1009 2020. We appreciate all the introductions that you've made and the support you've made on the ground. I'd say just to kind of end, we are focused on road safety everywhere. We started with intersections because more than 40% of crashes happen around or series cars happen around intersections. And now we're looking into also highways into not just the intersections and there are a lot of big challenges wrong with driving very serious issues that we are seeing everywhere. And I believe that with the new technologies, new sensors with this new push into deploying technology, on the road, with autonomous vehicles, that's another reason why to invest and deploy the latest technologies. Hopefully we're going in the right direction. But we need to start seeing some numbers go down. Yeah, this will require a very big effort from everyone. Yeah,

D Dave Braunstein 49:58

well, we're here. You're here. We know there are others out there, let's let's keep building this big family of road safety practitioners, people who want to get out there and change the dynamics on the road. So, again, kudos to you, George and your and your founders and keep up the great work and we will keep this conversation going and we will do more than just talk about it will actually, you know, start to really make a difference out in our communities.

G Georges Aoude 50:28

Thank you very much. All right. Thanks, George. Thanks.