

INTRO: Welcome to Move the Era Podcast, I'm your host, Jeanne Acutanza. Big data has exploded in the last decade, especially as applied in transportation. Starting from GPS in commercial vehicles and evolving to mobile phones. When this data is fused and synthesized, it gives us real time and historical data for monitoring current road conditions, measuring performance, offering real time choices and making our roads safer, big data is helping to transform the industry. Join me as I talk with Ted Trepanier. He started his career with the Washington State Department of Transportation, and has been with INRIX, a big data fusion company, for more than a decade. He'll talk to us about big data, privacy and encouraging innovation in our public agencies.

JEANNE: We are talking to Ted Trepanier today. Ted is the Senior Director of Public Sector Services at INRIX. He was formerly employed at Washington Department of Transportation (aka WashDOT) and he's joining us today from beautiful Washington State. Welcome, Ted.

Ted: I'm so glad to be here. Thanks very much for having me on.

Jeanne: Ted, why don't you tell us a little bit about your history, and then we'll want to know a little bit about INRIX.

Ted: Sure, happy to do that. So, I'm a traffic engineer by training. I was with the Washington State Department of Transportation for 26 years and was lucky enough to do a number of different jobs there, but primarily focused on both traffic operations and then planning. So, on the traffic operations side especially, I kind of worked at each level. So, at a lower level I actually learned how to time traffic signals and went out and was actually the guy to figure out the timing plans. And then I moved up to where I managed a regional office for many years, where I had folks that did that that and designed signals and all of that and all aspects of the traffic group. And then I became the state traffic engineer and director of Traffic Operations when I was in charge of the statewide program. So, I kind of covered all of those different levels, and so on the traffic operations side, I have a deep background, but I also managed one of our regional planning offices for a time, and it was right at the time when the Growth Management Act was initiated and that's what I went and got my master's degree. So, I really kind of spent that time kind rounding out my background and focusing and bringing together this understanding between long term planning and day to day

operations so I kind of have this diverse background. And then 11 years ago now, was when I made the jump from WashDOT to INRIX. And so, at that time, it was just when connected vehicle data was becoming a thing and it was really kind of born. And INRIX was small and growing and it was an exciting time in tech so now I've kind of lived through this time in tech where not only has INRIX grown, that the available data has grown and that means, what you can do with the data has also grown and expanded and that's never been more true than now. So, the growth in the last 30 months to two years has been the biggest change since actually data became available right and so you kind of have this initiation of data and then there was growth and that allowed us to do some things but now, there's been this explosion in connected car data that just allows us to do so much more.

JEANNE: Wow. So, and I remember 10 years ago, 11 years ago, this notion of data being used that was not sourced from a public source, say detection and pavement and it really exploded. So, tell me about INRIX and what's their sweet spot, and where they are, what kind of data they provide and what's their line of business.

TED: Yeah, so it's really about everything about understanding the movement of people, and vehicles and kind of both. So again, if you look back in the early times all the data you could get in real time was really coming from connected trucks, because you have to think about the time before the iPhone and before mobile devices. And we now have units in cars, the map was downloaded with CD and that sort of thing. There was no such thing as a connected car, or an over the air update, so only the trucks that have hardwired in-fleet monitoring equipment communicated in real time. But INRIX was able to get that data in an anonymized way. So, one of the key things is that all the data that INRIX brings in, we have anonymized before it comes to us. So, we have this anonymized data stream. So, we have this data stream from trucks that allowed us to start calculating real time speeds system wide, so it was the first time, and again this was predating Google Maps - Google didn't exist yet as far as Google Maps product. So, it was the first time, there was system wide information as far as real time traffic conditions. So, that was kind of the beginning. And so then, as things, grew through time and more data became available what that meant was that the latency in system changes was reduced, the accuracy of data was increased, and then the road

coverage was increased. So, when it first started it was just like the interstate system, only the roads that were the interstate and the highest volume roads had data. Well now, there's data down to the collector arterial level and the product back then was all about real time speed monitoring. Then the next layer became on using the history of that. So, where INRIX calculates the speed on every signal of the road every minute, we have saved that result, since the beginning of time. So, the planners discovered this treasure trove of historical data that they could understand historical congestion patterns from real data not model data and so they started to use that. So, the next evolution of product was really the historical data. And then analytics on top of it to make it easier to use, right, to put this data on everybody's desktops and make it as easy as running Facebook to run a query to actually get historical performance metrics. And so, that was an evolution. And of course, since that time we've layered on things like incidents and congestion alerts, and there's a whole series of safety services. There's this suite of services around that, danger slowdowns, and being able to publish agency road closures, road rules, and this entire suite of things, too much to go through in a just a few minutes, but you could go to the website and kind of look at the INRIX IQ suite now, it's really extensive. So that's kind of the evolution. Now some of the newer things related to the movement of people, and vehicles that goes back to the same kind of GPS points that we were creating real time speeds. A few years ago, the density, and actually, the requests from our clients, led us to launch a trip path data, where we would actually take the GPS points and rechain them into observed trips, and so not only could we see the speed of the road in real time and historically what the speeds were, we would actually have an observation. It's like a floating car speed, so we'd be able to see where the trip began, where it ended, and what path the vehicle took, but also the speed of every link, you know, that vehicle crossed. And so that gave us another level of insights, both from understanding origin destination, there's a lot of use cases like model calibration that require OD data, being able to do, in the modeling lingo, select link analysis where you say okay, I just want to understand the trips that are going down a certain road. And so now you can do a real world select link analysis and say okay, now I want to see the trips path and just the trips that have traveled on this road. And then now during COVID especially an understanding of how they change. So, if we have some sort of change on the system, or some sort of change in society. How have the path changed? How has the travel through my

neighborhood changed? All of those things are now in the data set, where, you know, if you look back five years ago, that kind of data did not exist.

JEANNE: For our audience I want to mention why that's important and what they might have experienced over the last ten years. I remember when WashDOT would publish a "What time to leave for Thanksgiving" because they have all this information that said, here's the best time to go to grandma's house. And that was very charming and funny, but it started to give this real time, real information that people started to use. I think this whole notion of all the data that started to become much, much richer. I'll just never forget being stuck on the 520 floating bridge that goes across a lake and being stuck in a queue. I couldn't back up and I couldn't go forward, but there was a sign above us that said the bridge is going to be closed for half an hour. So, it's just having that information, knowing how long things are going to take, giving people greater expectations, and an understanding of what's going to happen and then telling them what's going to happen to them. Like an accident ahead, or giving people's slower speeds, all that information makes us more aware and in my case on the bridge we just turned our cars off. Everybody on the bridge in their cars off, and a bunch of people got out of their cars because they knew they were going to be stuck there for an extended period of time. My kids, I got them something to eat. We're on one of our kid trips. Anyway, just that evolution and then now, one of my first jobs was traveled and manned forecasting which is trying to figure out what is going to happen 20 years from now based on land use, but that, what you were just talking about, travel pattern origins and destinations gives us so much richer and more realistic information, and post pandemic who are essential workers are and that of those tools maybe are not that useful anymore for projecting traffic. So, I think one of the things that I wanted to ask you about is, what did the pandemic information tell us and how did people adjust or use that information?

TED: So, I think the first thing that folks are using the data for is just literally to understand the scope of the change and kind of how close we are back to where things were. It's kind of like when will things be back to normal you hear folks say that a lot, and I think many people in the transportation industry, believe a couple things. So one, that it's going to take some time for things to return to any semblance of normal. And two, things are never going to be exactly the same as they were. So, you kind of put it in the vernacular of the kids in the backseat on

the trip it's like, "Are we there yet?". I think the two questions folks have is, "Are we there yet?" But then it is also going to be, "Where are we?" because when we get there we're not going to be where we were when we left, and it's going to be different. And the whole Zoom culture that has emerged, and the work from home culture. One of the things I throw out to folks that everybody kind of resonates with is, if you've shown that you can productively work from home, then, do you need to be at work, at 8, so there's a question of do I need to go to work at all, and I think a lot of folks say well gee yes, I need to go in, but maybe like two or three days a week. So, you hear a lot of folks talk about there's going to be some level of telecommuting well okay if I can do some level of telecommuting, is there a reason for me to ever jump out right at the most congested hour of the day. Why would I not choose that time to be a telecommuter? And I will travel to the office at 9:30 instead and we'll set our meetings kind of accordingly. And everybody kind of starts nodding their heads yes, yes that makes good sense, I think that's what we'll do. So, obviously, what that means is that if I look at the trips on an interstate route post-pandemic, I'm going to see different trip patterns. So, one of the things I say to folks is that do expect the most congested roads to return to being the most congested roads, because there's a phenomenon we refer to as latent demand that is quite real and just because somebody doesn't make a trip during the peak hour, doesn't mean that somebody else won't jump in there and take that capacity, because there was a trip that somebody would have made but for the congestion. And this is the most prevalent on the most congested road. So, the roads that were the most congested are going to return the soonest, and you already are seeing that in many of the patterns where there's significantly congested roads becoming congested already again. And yet, if you look at a downtown core, you'll see many of the downtown cores where travel is 30 or 40% below what they were pre pandemic. And so, I'm looking at travel coming out of the neighborhoods and seeing it at 70-80% of pre pandemic, but you're looking at the downtown core, and you're seeing like only 60% pre pandemic. It's like, okay, we have different trip patterns. The only way that happens is you have different trips being made than pre pandemic. And so, the data now helps us kind of understand two things, it helps us understand what's going on, but it will also understand when the shifting has kind of stabilized. So that will tell us where we are, or that we we've arrived. Then we can look around at those patterns and compare them because

we've got the data. We can compare them to the pre-pandemic patterns and see where we are. We'll know when we've arrived and then a separate analysis will tell us where we are, and what kind of decisions that means for transportation planners. What kind of new model calibrations do we need to make? What kind of new assessments as far as trip generation rates, and all of those things that we talk about as traffic engineers. Which one of those assumptions that we've held dear for so many years need to be adjusted in this new world that is going to be the post COVID world that we live in.

Jeannie: How do people get your data? I suspect it's on my phone and everywhere, being used by media and news. How does that data influence the world and travel?

TED: So, a number of ways. I'll talk about three different primary sectors and then there's a lot of smaller ones, but the primary one that a lot of folks think about, and I'll talk about my world first, that's a public agencies, so the public sector. So public sector consumes our services as subscriptions now. Almost all of our data we've put in an easy-to-use tool sets, and there's tools geared at operations to help make decisions in real time, it's all about real time traffic and incidents and road closures. And then there's this historical treasure trove of data that helps planners. And now we've launched, because, again, the density of the data and the high frequency waypoints signal analytics, so the ability to understand operations that at the intersection level and the just signal timing. And so, there's this entire suite of tools available to public agencies, and they basically subscribe to these now almost everything is an annual subscription that we deliver through the web. And these different groups within the public agencies consume that data and more effectively manage the roadway, more effectively retime the signals, or more efficiently conduct long term planning or development assessments, all of those things that public agencies do, they can use INRIX data to do those things. And it's really reduced the need for a couple things: deployed detection of equipment to understand what's happening the road, or go out and do special studies, you mentioned going out and doing traffic counts. Well, we can hand people traffic counts now. You tell us what road you want it on, we'll just give it to you, so there's that - the public agency subscription. Then, there is media. So, the real time broadcasting traffic consumption and understanding that traveler information. So, we produce out to the media or through mobile applications. You

can see our data in a number of different mobile apps and so there's that kind of consumer side. And then enterprise group. It's really businesses that are using mobility information to make business decisions. So, now there's a group of primary users, originally, like advertisers and real estate marketers. So, if you think about billboards, as an example. Understanding how much traffic goes by a billboard is how they traditionally sell rates. But if you think about how fast the traffic is going by the billboard, you can think about how long people have to view the billboard and that's another variable that can be introduced with data, but now you can actually look at the trip patterns and make a judgment of the demographics of the people that are passing a billboard, and that might be a factor. And what kind of ad you place on the Billboard and that sort of thing. So, there's a lot of information that can go into that. So, the advertising group people, if they're thinking about marketing a parcel of property, might want to locate a new fast-food restaurant or a new coffee shop or whatever, understanding, who's driving by a parcel, not just the volume, but again the patterns of trips, and how they pass parcels. So, the enterprise group uses that information but also financial services. One of the things that we have published in one of our traffic scorecards many years ago is that traffic activity is a leading indicator of economic activity So, if you're in a recession, you will see the bottom of that recession in the rebound of traffic before it gets reported in the economic numbers. So, there are folks like hedge funds that look at traffic data, because again, we can give them some insight as to what's going to show up in their economic numbers before it shows up in the economic numbers. So, there's a number of groups there that can look at that data as well.

JEANNE: Well, look even looking at parcel data and parcel delivery. I'm sure all of the Amazon information has changed dramatically, and how often deliveries are made to neighborhoods. And I think that's also an economic indicator of how well people are doing or not doing. Are you using the information and how can this information used? I started to see some information you use to look at the impact to essential workers, or how essential workers have been traveling and also social equity. Any thoughts on that on some of those demographics that have been used?

TED: So, when you get down to the fine details and some of those demographics, this is where this this balance between preserving anonymity and our desire to

understand every little nuance, and so some of that does kind of get washed away, because we do require by design, that we not be able to associate a trip with a user. So, we can look at origin destination patterns and you can look at the census level data, which again they take care to make sure the census tracts and blocks are big enough to have some level of anonymity within that, but each census tracking block has a demographic profile. So, you can kind of assume that the travel of trips from that group have that profile in general. So, we can make general assumptions that across a group of travel or across a certain road where the OD's are associated with certain zones, there will be certain profile. But when you get down to trying to identify what this means for the movement of essential workers versus some others, that gets much harder. So, certainly you can circle a zone that includes a hospital and see what the patterns are associated with being a big hospital, but you wouldn't necessarily be able to differentiate travel between visitors to the hospital versus patients, and the doctors and nurses, because those are all going to be anonymized trips. Now how that data was used a lot during the pandemic, and used in big cities, like New York did a lot of work on this, we have a product that we call VISITS that is really about looking at where people came from that are actually visiting the certain location at certain times. So, it uses mobile application data to, again, you can circle a zone and say, of the people that are visiting in this zone where did they come from? So, your social equity question kind of triggered this thought for me, because one of the things that people look at is, visitors to a food bank. Where did they come from, and how has that changed? And one of the things that can help you understand is, are we well serving this community, are people having to travel essentially like too far, or traveling a long way, or further than they used to, which might be an indicator that you need to open up another center, and that sort of thing. You can see the demand here is high, but it's like how far people coming to get here. And the same things with hospitals and neighborhood medical centers, is okay, how have the visiting patterns to this location change during the pandemic and how are they changing over time can help you understand again how that facility is serving the community, and whether or not you might want to think about making some adjustments to that.

JEANNE: Is most of your information vehicular, or now that we that we have cell phones...can you distinguish by mode?

TED: So, most of what INRIX does is vehicular but not all, so we do have data that, again, is just about understanding the movement of people that are independent of mode and we are collecting data and sorting data out for other modes like walking and bicycling and transit being the primary ones where you're separating it off. This is where the services that we are working on building, so right now most of our products are built around understanding the movement of vehicles and it's still how most people move around. There's a tremendous interest in other modes, but understanding the movement of people, and understanding that buses are on traveling the same roads when do you throw that in there, it really is the majority of understanding this system, but there are pieces that we need to understand related to bicycle and pedestrian travel and I think one of our primary focuses will be on the safety implications and understanding conflict points better and be able to make that kind of information available. So, it's definitely out there, and there's other big data companies that have more of a focus on that area. I think that when I think about INRIX, I do think we are the predominant provider of vehicle movement information and I think we have honestly the best information available related to vehicle movement, but we absolutely understand that there is a bigger picture, and we need to pull that in and we are working on that. That's where the state of the practice is right now. Certainly, folks can get that information. And I do think that as agencies or businesses who are looking out and think about the questions they have, and the information they need to answer that, shouldn't always try to find one place to get all of their answers. I don't think there's anything wrong with saying, "I want to get my vehicle data from INRIX because they have the best vehicle data. And then I'm going to go over to another company that has pedestrian applications, or bicycle applications and can give me really good bicycle data. And I'll get my bicycle data from them because they have the best bicycle data. I'll put those two things together." I don't think there's anything wrong with that. I actually think that's a best practice at this point.

JEANNIE: I think you guys have been at it the longest and have been really sifting and sorting with the understanding of how to sift and sort data in a large volume way, so I think that you guys really have a long handle on it, plus you've been answering questions for a really long time, but I know there are other data providers out there that are collecting different types of data. And you're right,

it's a great way to consider looking across the data. For example, I know, University of Washington was looking at all of the trip patterns for transit riders and that was in and of itself, a data thorny product, just understanding where people were getting on the bus and getting off the bus was very interesting and challenging and had to address some of the data privacy issues as well. So, any thoughts about surveillance, and privacy as an issue on streets?

TED: So, it's certainly talked about a lot and what's interesting is that we get a lot more questions from agencies, than you ever get from people, individuals, I think, but it is something we're very mindful of and think the industry in general is mindful of that. And obviously in Europe they have passed the whole suite of laws that GDPR regulations related to the private use of consumer data, maintaining privacy. And, so, we from the very beginning, at INRIX, again every time we went out and got a new source of data from the very beginning, there was in the agreement a clause that would detail how the data would be anonymized before it would be sent to us so that we could be certain that our products were based on anonymized data. The one exception to that is our own mobile application, which is like any other mobile app provider, we have to manage our own user base, and we keep their data private and the personally identifiable information separate from the data points that comes from it. So, we think about it a lot, and certainly as the data has expanded it continues to be more and more in discussions and I think as folks get...as all vehicles become connected and people understand that everybody is carrying a personal tracking device in their smartphone, people are thinking about it more and more and you see, Apple, they've certainly been in the news a lot, how they've made changes inside of applications. Some app providers don't even like all the changes that Apple is making because there's a struggle between the value of the data, versus the anonymity of the data. All of those things that are going on in our society right now. So, we're just mindful of it, we just make sure that we provide is always an anonymized product. One of the things that's really helpful in that regard, is the fact that we make a lot of the services available as a web-based application. So, you have an application that says give me an origin destination matrix and doesn't require you to understand the details and of each individual to get that matrix. So, providing those tool sets allows folks to basically have the value of the data without having to worry about having personally identifiable private information.

JEANNE: There's a privacy screen in all of this.

TED: Yes.

JEANNE: What's the what's going to be coming up next for big data? You mentioned almost a logarithmic shift in what you can develop and prepare because of connected vehicles.

TED: Kind of what's right in front of us, the next thing up, is this whole analysis down at the signalized level, understanding each turning movement, and that includes things like traffic counts and turning counts. So, there's been a lot of work that engineers have had to go through to get good counts on roadways that big data is going to be able to provide and that's already starting and underway. The way things will work in data is that there's an entry level product that has a certain level of coverage and a certain level of accuracy and then it just increases over time. And that's one of the things that I kind of pointed out to folks a lot and you'll want your listeners to think about most is that this industry is moving really fast. And it's like if you made an assessment of what you could do with data, say two years ago, that assessment is worth nearly nothing today. And if you make an assessment today, it's going to be worth nothing, two years from now. So, if you have a use case, you need to talk with somebody current to understand what the state of the practice is, and what data can provide for that. So, counts and individual movement and everything origin destination all kinds of movement data across all modes is certainly going to be...is starting to come...well, it's there now and so what we will do is we will become richer and more accurate, cover more details with higher levels of precision and that's what you will see. And then there's going to be a lot of safety applications that are starting to come online. So, you mentioned being stuck in a queue and being able to look up at the sign. So, we have, with a partner, launched a highway emergency link platform that allows agencies to send alerts to everybody's phone, just like an amber alert, but specifically geared toward being able to send alerts to people stuck in a queue. So, you mentioned, like being stuck on a bridge for hours. Well, there have been times where people in the storms in the Midwest have been stuck on freeways for days. And one of the primary things, as you noted, is that people want to know if they're stuck in a snowstorm on a freeway, they want to know, 'Am I going to be here an hour, two hours, or two days?'... it makes a difference. And so now, there

are tools where you can send people that information right to their phone, and you can give that tool set to a public agency. It's a new tool for DOT's to be able to communicate out to drivers. And it has a two-way capability. So, it actually has a messaging capability where somebody could actually reply and say, "Hey, I've got this situation going on in my car." So, you have these different levels, where you have somebody having a heart attack, they can call 911. But if you've got 1000 cars trapped in a queue, you don't want everybody calling 911. You want to be able to have a second-tier level of dialogue with those folks. So those kinds of tool sets are available. Alerts for wrong way drivers, alerts for back of queue, pushing warnings into big trucks that traffic is stopped ahead is something that we just launched that I don't think a lot of folks know about yet. And so those kinds of services are what is up next.

JEANNE: And as consumers, we've come to expect immediate gratification in all kinds of information. But I have to admit that when I was stuck on the bridge, not only did I feed my kids, but I got my laptop out, because I knew I'd be there for a really long time. And what I noticed about myself, personally, was that my anxiety fell to nothing, because I knew we were going to be there for an hour and instead of having my kids say, "When are we going to get there?" we have a lot of certainty. So, I think that's a really useful and helpful piece of information. Anything else going on at INRIX?

TED: I think we've talked about most things that are right in front of us. Again, the pivot to making all of these types of data available as services is a big focus right now. And then it is just expanding the services. We can't even really cover everything in a half an hour as far as what we're doing and so one of the things, I would encourage folks to do is to call or check the website. And if anything piques your interest please reach out. We love to chat with folks, and I think there's a hesitance to do that these days, we live in this browsing the web, and I Google things and people will Google for three hours instead of making a five-minute phone call to assist somebody. We've got folks to answer those questions. Because the industry is moving so fast, I really just encourage folks to do that. That's what I do for a living, is bringing folks up to speed on the possible as it relates to public services. And we've got folks that do the same across all of the different product groups, so I encourage folks to do that.

JEANNE: So, Ted, you've always been an innovator, and that's part of the reason that you ended up at INRIX because you were always pushing the envelope on data, but what got you to be doing some of these really innovative things within a state agency and then how do we encourage people to do that.

TED: Yeah, it's one of those things, I was lucky when I was at WashDOT, they were really looking for leaders that would make things better. We had this passion for public service. People really don't always perceive agencies maybe as having that passion, but inside of agencies, and in some agencies more than others, and like I said my time at WashDOT was filled with leadership that really rewarded people that were making changes that were positive, and sometimes it didn't appear such and so those are hard to defend politically, but we kind of had this philosophy at that time in the leadership that lets do what's right and then defend our position by standing on that ground. Because, number one, you're making the right decision...number two, you feel good about standing on that ground, and number three, sooner or later, people will see it. So, again, it could be hard sometimes in the short term, and especially the media cycles the way they are right now and the headlines and all of that and getting beyond the headlines, it's like, let's do the right thing first. So that fit me personally and that's why I grew because that's what fit the department really well is that we want to make the roads safer. We want to do...if there's an application that can make the roads safer, then let's try it and let's do it. And one of the challenges, of course, is that not everything works. And sometimes things work very well, but it's hard to see. And so those are all challenges, and we would do those things, and every once in awhile you'd have to defend a failure, and those are hard, but we would take those risks. On balance, though, it mattered, and it worked. I'll give you one anecdote from myself personally, is that these summits with the state patrol where we would brainstorm things to work on in the coming year, and a state patrolman had been to Europe and he had seen these white dots on the road, and you might remember this "Two Dots to Safety" campaign. The idea was that you would paint these dots on the road where there would be high-speed traffic, but then also some congestion, and you tell folks to keep two dots between you and the car in front of you, it's safe following distance, and train people on safe following distance. So, we put some down on Interstate 5 along Olympia and put up these signs – there were these signs explaining two

dots for safety with a picture on it, and the next day traffic was backed up for miles. One of the things we hadn't anticipated is how much room people would give between them and the car in front of them and obviously that impacts capacity, and if you've got a road that's near capacity, when you trip over and move from free-flow to force-flow, everything just breaks down. So, we had these breakdowns...it was a mess! So, we are out there covering these dots up and taking down the signs and it was a spectacular failure! So, the media is on us and the radio, so I went on the radio telling folks that this is what we did, this was the intention, it didn't work, and we're really sorry, but I want you to think about something before you call up, and I'm willing to take calls from anyone who wants to call, think about this. Washington state has one of the lowest fatality rates in the country, and we don't accomplish that if we don't do new and progressive things, and so we try new things, and if we try new things that means that not everything is going to work. So, some of things we try don't work, and we learn from it and we move on. But, if we stopped trying new things, we won't have the lowest fatality rate in the country...ok, I'm ready to take your calls. And the phone doesn't ring at all...no one is calling. So, yes, you need to take risks and you need to push the envelope. One of the things that's hard right now is finding a champion for change in agencies because there's so much media spotlight, there's so much political pressure, there's so little reward for change and there's such turnover at agencies. It's one thing to show folks there's a new and better way, it's another thing to find a person that's willing to grasp that new and better way and give it a try because it's not in their job description. We need to get to this place where people want to make positive change in whatever regard, whatever the responsibility is for agencies and then reward that.

JEANNE: It is very cultural, and I bet you're very much missed in the agency. I'll ask this one last question. The recent traffic fatalities data is out. I'm sure everybody's noticing that in the last year 2020, was this anomaly year where fatalities went up after decades of declining. I think the kind of information that you have is going to be helpful for agencies to decide how to get to Vision Zero, what happened and how to bring those accidents down...

TED: Yeah, we're getting a lot of interest in folks wanting to understand speed profiles. We're moving beyond just understanding typical speed. So, you can do a screen scrape off of Google or whatever, or even look at our old real time speeds

and it gives you an average speed on a segment for a minute, but that doesn't tell you what percentage of the traffic was going faster than 80 miles an hour. So, if I'm trying to figure out yes, the spike in fatalities, I think everybody in the industry has their attention. So, we really need to figure out a couple things. So, one, what caused that? There's a lot of speculation that reduced congestion and increased speeds was behind that. So, the next question is, is that going to come right back down as things return to normal? Will fatalities return to normal, or is there going to be some something lingering there? And so, again, data can help us figure those things out and those things have not been figured out yet. This is kind of the problem that's right in front of a lot of folks right now. And I also think it's one of these issues where the answer doesn't lie in a single data set. The answer lies in the intersection of some data and understanding and looking at not just the fatalities but also the severe injury crashes and the type of the crash and intersecting that with what changed in the way people were traveling in that area. So, there's a number of things to look at there that would really decode this issue to help us get to Vision Zero. I'm a personal believer in Vision Zero, and I worked on it hard when I was WashDOT, and I'm excited we're bringing some stuff to market related to safety at INRIX as well. I think we are on the right path. But it is due to a lot of hard work by a lot of folks and figuring out what's behind this spike is something absolutely we need to be working on.

JEANNE: I wholeheartedly agree. I think part of the travel patterns that changed in that people aren't traveling every day and they've been home and they don't have the normal robust driving patterns so it's new. Maybe they're more distracted. So, I'm sure there's a lot of different factors. I appreciate your time today and I'll have your contact information, how to get a hold of Ted at INRIX and some information in the show notes. Thanks for your time today.

TED: Thanks very much for having me on, I really enjoyed it.