

## **InfraTalk On The Road: Melissa Batula**

### **Greg Nadeau:**

Melissa Batula, welcome to InfraTalk America and thank you so much for taking the time to do this. I was particularly interested in our getting together for a conversation because when I really when I left, Federal Highway I retired from government and started Infrastructure Ventures. We then led to the rolling out of InfraTalk America.

We specialize in advancing what we call our targeted technology sectors to state of practice. So, we have sponsors. Our premier sponsors are Trimble and a company called HaulHub Technologies, who are both very deeply involved in the technology side. Given your prior role at PennDOT, which is a focus and part of the focus of the conversation I'd love to have because you have this perspective, you had a history of involvement in the private sector, as I recall.

### **Melissa Batula:**

I did.

### **Greg Nadeau:**

Obviously, your service at PennDOT and now and now back to the private sector. So, you have a very unique perspective, I think, in how what it will take to continue to advance the digital project delivery technology and really change the way the roads and deliver projects and do business. So, beginning with that, so could you tell us a little bit about the role you played at PennDOT and the initiative that you were? I think principally in charge of advancing with your team?

### **Melissa Batula:**

Oh sure. So, I think what you're referring to is the Digital Delivery Directive 2025 is the one. So, this is really looking to move the way we delivered projects at PennDOT out of the, I'll say the 2D or, you know, the PDF world and moving it into the 3D world where that's our deliverable.

So that was the overarching goal, and it was an interesting so, you know, it comes up as well. Why was that the focus and it comes back to exactly what you said before. So, I was in the private sector prior to going to the DOT, and in that work I was doing private development work and I relied on miles or models, you know, every single day.

And I'm old enough and gray enough to remember the days when we didn't use computers for that. And everything was manual drafting. And then you have that period where you reflect back on, okay, we rely on plan sheets, profile sheets across cross sections. Sorry, my brain went blank there, but why did we do that? And the reason we did that is those through the tools we

had before we had computers, you had to break it into three different planes, if you will, to be able to create your design.

And then once you created the design, you'd simply ink it and handed over to our contractor and say, Go build this. So now we're in a modern world where most people are using those models anyhow. But then we were actually taking it back to the tools we had before we had computers and making them look the same. I mean, that's like the definition of insanity.

We have this rich data that we have and then we're taking all this extra time to dumb it down, if you will, to hand it off to our contractor when the whole point of engineering is to communicate your ideas on how this is to be built and to do it as an organic, as a form as you can, hence the models, you know.

So, it's like, how do we get to this next phase where we empower the contractor to take that as a different deliverable and move forward? So, you know, in my mind it was it was absolutely necessary. And sometimes you need a little nudge to move from that change factor of, you know, the way we've always done. It's good enough to embrace that.

And then when you start opening that up, it gets so broad because then you look at now you can have a true record of what was built, that your operations team on the maintenance side has to to rely on to know exactly what was there. And it really just makes it so much more compelling is how important it is to move into that space.

**Greg Nadeau:**

A factoid that I love to share is our our sponsor, Trimble has a global reach. And they were and they did an analysis of a project that their technology was involved in delivering in Norway. And the result was an estimated 90 to 95% reduction in change orders. I don't think there's another factoid I need to be convinced of the value of advancing a sort of full-scale digital project delivery that that's huge dollars and not just dollars.

Obviously, it's it's, it, it, it enhances the time it takes to deliver projects. So, time cost saving cost savings 95% reduction in change orders is real money. And in the context of the scale of the federal aid highway program, it could be in the long run, billions of dollars that can get reinvested into other projects. So, it's a the benefits are clear.

I think they're widely becoming more widely held. Certainly, among the state DOTs, many of them are doing some really amazing work trying to advance it. PennDOT is a great example of that. So, tell me, 2025, how are we doing in PennDOT? In Pennsylvania?

**Melissa Batula:**

They're doing actually really well. I will say that, you know, I'll caveat this in sometimes, you know what you're working with.

So, my original vision was that everything would be fully into the digital world with the exception of maybe resurfacing or something like that, lagging behind. And it has morphed somewhat. So PennDOT is taking the approach of building it pieces at a time. So, they start off with As-Builts. Then they were moving to roadway design. Now they're working on bridge pilots.

So, the whole point is as they go, they learn more things that come back into how they're going to change their business. So, it's kind of building as they go, but building it in pieces. And then the next step for next year is they're going to combine everything together. So, they're going to bring drainage into the into the conversation, of course, all the utilities.

So, they'll be able to have a package that has all of that in a digital model. Now, will it be for every single project going out the door? No, but they'll have at least one project in every single district that's gone through that. And I always I always preach. They said it can't go backwards. So it can't be, oh yeah, we did a pilot and now we don't revisit again.

It was it was to build it so it's resilient and could spread to the other areas. So that was the goal and that was kind of the model that we developed on how we were going to get the whole organization there. Because you have to remember this is a huge change for everybody that touches that project along the way.

So, you do have to make sure that you factor in the culture of change into your timeframe and to give people time to adapt to that, learn the new model and see the advantages for themselves and then be able to bite into that long term

**Greg Nadeau:**

And the payback will be significant.

**Melissa Batula:**

I want to touch on that a little bit because I will say that's an area that I had a change of mentality.

Originally, I was thinking we were going to save money in design because now you're not spending time on the cutting all those sheets and making it back into a 2D. But the reality is exactly what you talked about with saving those change orders, because in reality you repurpose that time that you spent creating just drawings and repurpose it into refining the design and discovering those conflicts or those issues that are going to cause change orders.

And that's why you're seeing the reduction in in change orders is because the design has been further developed. So, it's a very interesting dynamic. But everybody knows, you know, a little

bit of savings in design is a little bit of savings in design. If if you make a little savings in construction, that's a huge that's a much bigger benefit overall.

So so you still spend the same amount of time in design, but you're going to reap the benefits when it gets into construction.

**Greg Nadeau:**

Great, great example, great case study. PennDOT is just clearly one of the national leaders in this space and watching very carefully what goes on there. I think it's very it's instructive to other states who want to make that level of commitment.

But there was a pretty ambitious goal to begin with, and it sounds like you're, relatively speaking, at the time that it's going to make

**Melissa Batula:**

They will like I said, it might have changed a little bit from starting, but it's a realistic goal. But I do have to have a shout out for Iowa and Utah because they were what I'm going to say on the bleeding edge and they are what inspired me to work with the team, to work to put out a goal that we were going to strategically work towards.

**Greg Nadeau:**

It's Iowa is, you know, certainly one of the path breakers absolute for this. And actually we had a director of of UDOT on yesterday Carlos Braceras is talking about this very subject. So yeah, they are so often an inspiring innovation for all of us across the country. So can you, can you give us a perspective now, one, your current role and what it entails and the, the your perspective on the role that the private sector plays and the partnership that is necessary with the institution to make all this work.

So just sort of start with that. What's the is the public private partnership integral to making advances in this space?

**Melissa Batula:**

Oh, it absolutely is. And I will say that, you know, being with HDR right now, they were one of the trusted advisors I went to PennDOT to look to somebody that can help me make this happen. It's really rely their strength is in their expertise, the things that they have done.

But when you step off into a new area that they've never done before, it's hard to build that. It would be like everybody trying to build their own widget, if you will, which the help of the private sector you can help make those connections. So, the teams that worked with Iowa and worked with Utah could come in and work with PennDOT to use those lessons learned from

those areas and help build it into that DOT specifically for what their needs are to be able to bring that collaboration together.

So, I think it's absolutely integral. I think it's exciting to be able to expand that bandwidth, if you will. But I will also say that it's a little bit of learning from each other to in that. And what I mean by that is as the public sector is getting ready to deliver things in 3D, well, the entire consulting community has to ramp up to be prepared to deliver it in that mechanism.

So, it's like each challenging the other. And I've seen that too. Even internally. I've been tasked with how can we bring the local team up to the point where they're there meeting that challenge, if you will. So, it's a very broad spectrum that really affects so many different areas of our industry.

**Greg Nadeau:**

And the change is happening before our eyes and the pace of it. All of technologies, one of our premier sponsors, and they've really been the leader in expanding E-ticketing, which essentially for our listeners, E-ticketing is essentially the digitization of the the construction materials supply chain delivery system. That's about as simple as I can make it. But basically it's paper tickets being and the transformation to a to a digital platform where all the data that that is incorporated in those paper paper tickets is now digitized and available for applications. We haven't even determined yet.

So, data is becoming a real value, an asset to state DOTs, which I believe in time could become a revenue source because that data has value. And so, the whole process of this conversion of this transformation has benefits that we haven't even realized yet simply because the data is so valuable. Your thoughts?

**Melissa Batula:**

Yeah, I mean, that is a perfect example. I mean, as the public sector has so much information, but it's making that accessible and making it usable, you just hit it. You know, these materials, slips, inserts. We've been getting those from the beginning of time. I even have a stack sitting on my dresser. Don't ask me why. But from when I was in the private sector a long, long time ago.

But I think that's a case in point, too. I should've never had those slips, but there they are. They had no value to anybody. Where if you put that forward into where you can target to that particular asset, you geo spatially locate it. Now I can down the road if we find out that, you know what you know Super Pave is a good example.

We all bought in on super pave and those early goes we had some really rough time with performance of that. If you fast forward say we find something similar out of things we're building right now today in say, ten years down the road that become problematic, we will have

that digital information to be able to pull up what sectors of our highways were built with whatever that is that later becomes a problem.

And to be able to really watch those areas and their performance and be able to adapt accordingly. That's why I get so excited because I think it's really going to show its usefulness as time goes on. You know? And we identified those issues.

**Greg Nadeau:**

In one of the pieces we produced one of the info docs on E-ticketing. I was actually interviewed for the piece myself and I recall the the line was paper tickets are where data go to die, you know, and our videographer were producing the piece.

We're at this asphalt plant in New Hampshire, I think it was or Massachusetts. Pardon me for forgetting that. And he found these five freight trailers sort of in the back of the lot somewhere, opened the doors and they're filled ten high all the way deep with file boxes and written on the file box was destroyed. 2025. Literally the visual manifestation of where data go to die.

So, it was it was a great visual illustration of how you're taking something that is completely wasted, a cost to storing it, maintaining it. In California, they've got warehouses full of paper stacked up and not all tickets, but it's a cost. And so you're obviously eliminating paper from the process. But more importantly, we're harnessing that data and as you said, finding ways, you know, and the industry side, the software companies, the troubles of the world are all working to to come up with solutions on how to take that data and do something with it.

And that's going to be an ongoing process, a very vibrant industry, lots of companies looking at lots of different mousetraps and solutions. So it's an exciting I said it's an exciting time to be in infrastructure.

**Melissa Batula:**

Absolutely a great time to be in transportation. We're really seeing this emergence of all of them really just fantastic.

**Greg Nadeau:**

So and HDR, of course, is one of the leading firms involved in the advancement of, of of technology in so many ways.

And one of the areas that they and others focus on is the development of open standards. The there are I mean of multiple AASHTO committees, there's a pooled funds study that that I know MILSAP'S very involved in. So many of these respects are in HDR and they are it's I guess what I'm after is from the standpoint of timing, the Federal Highway produced a study that essentially is the road map, or certainly presented as the road map for BIM for infrastructure.

We won't get too much into BIM and the terminology. There are all kinds of terminologies thrown around this business. By and large, it's the roadmap suggested it would take ten years to achieve state of practice, which was based on the state of practice at the time. I think the study was probably done a couple of years ago at this point.

So, and my reaction to it was we can do better. And I actually spoke with the authors of the study and had this conversation and said and I think the reaction was, of course you can do better. It's a question of resources and commitment and the challenge. And this'll sort of tap into your experience of leading a state DOT.

The workforce issue, the challenge they're facing in recruiting and retaining the kind of expertise that they're probably going to need to oversee the vendor contracts, the relationships with those vendors, helping develop the digital program in its entirety. Well, your experience with that workforce is a challenge for every institution, certainly, But specifically, one is digitizing going to give you a recruitment tool to bring that generation of employees in?

Is that something they're going to need to see? Are we going to completely fail with workforce development if we don't sort of look at it as a as a strategy? Your thoughts?

**Melissa Batula:**

Yep. No, I am so glad you brought this up and I was going to immediately challenge you. You say you bring it up as a challenge and I see an opportunity because again, as in everything, you have to rethink how we've been doing it.

It's, it's, you know, we're changing what we're doing, not necessarily the end result, but we're totally changing how we go about that process. And while we're doing that, we need to totally rethink how we've been staffing and what that means. And, you know, you ask yourself what really bothers you or what do you see those long-term concerns?

You know, what keeps you up at night? And for me, it was on the construction side. You know, at the end of the day, and I'll come back to the, you know, the shortage of the designers. But we need people that are out actually out there in the field building these. And how do we have construction as being a industry or a career that somebody is interested in moving into.

And this is where I get really excited because now you bring the digital tools out and you start seeing, you know, you look at this virtual reality where you're actually envisioning these models that are now the deliverable in the field and you start seeing that joysticks start taking over for the, you know, the steering wheel, if you will.

So, these kids that are growing up in a very digital world playing video games that are in a very virtual reality type world, and they see them using that as a skill set that they can bring to their jobs in the construction industry. That's why I think where we really have some really strong

recruitment tools. And just real briefly, on the design side, I think we have opportunities there to, you know, go into the tech schools and get a little less rigid on what we're looking for for that piece of paper, if you will, and focus more so on those skill sets that we're trying to bring into the workforce.

So, I see it as a huge opportunity to try to really recruit the workforce of tomorrow, and that's where I think it's going to happen to really be able to to make those career as successful in the future.

**Greg Nadeau:**

And the demographics suggest the workforce of tomorrow is going to have to include in a big way women.

**Melissa Batula:**

Absolutely.

**Greg Nadeau:**

And, you know, the demographic just don't live without that. We're in big trouble. And the the percentage of engineering school students that are women is still ridiculously low thoughts. How is this going to help? Is it that sort of the digital world going to help persuade more girls, young women, to begin to pursue a career in civil engineering or related disciplines that DOTs need?

**Melissa Batula:**

I'll be honest in and of itself. No. No, I don't think that's going to move the needle. But I think we have the tools we need to start that reeducation process, if you will, early on. I think what's happening is you're moving. You're losing a lot of young women in the middle school age and they immediately think, civil engineering and construction, that's a guys thing, you know what I mean?

And they're not even thinking of it. And I think that comes across as unconscious bias from teachers, from parents in a lot of different ways. So, I think the bigger task at hand is to try to go after those students. Now, maybe it's going into the schools with digital delivery tools to show them this is the cool stuff we do.

Yeah, so maybe that's your connection, but we have to get to them earlier and we've got to really fight that unconscious bias that's going on with, you know, to be able to get women more comfortable working in the field. And I'll say one other one, it's it's making it a comfortable place for them to be. And that's something I'm certainly passionate about.

I've been very successful in my career working with a pretty much, you know, male dominated industry. But my job is to make it easier for the next generation coming up so they don't feel they have to change themselves to fit in. And it's really welcoming and gives them that sense of belonging. That's the bigger challenge I think we have.

**Greg Nadeau:**

Are we doing enough? I mean, I was a main private train station when I was Deputy. We were doing a lot of work to educate, go into the schools, but I don't think we have the kind of message that you just described that exists today, but it is that bias that existed certainly then and continues to exist. But how do we attack that? Are we doing enough actually state by state or even on a national level?

**Melissa Batula:**

I think we're getting there. You know, are we doing enough? Of course not. We're never doing enough. You know, I mean, there's always things we want to do more. You're seeing such more I say a focus on STEM. And I think there's a lot more honest conversations that are having with our young woman.

I know is that that's something I really push. If I go on to talk to Steam days or STEM days, whichever you want to call it, I'm very frank, You know, it's like you're going to have some hard hardships. You know, this isn't an yeah, you can do everything and it's going to be easy. I think you're setting women up for fail to do that.

I'm a big proponent as a leader. You share your failures because that's going to be a lot more impactful. Than telling them how great your life is because they can't relate to that. They're like, yeah, but my my life's never going to go that way. So, I think it's all of us getting more honest with ourselves and being willing to share that.

And then I think they'll feel more comfortable walking into that knowing they don't have to be perfect. You know, it's a very strange dynamic, but I think we are getting there. We're building the networks. You know, WTS does a fantastic job, are really trying to build that pipeline. So so I'm very hopeful that we're getting there. I really am.

**Greg Nadeau:**

That's encouraging because it's essential to how we're going to sustain our ability. You know, if we're fortunate enough to replicate the investment levels that we achieved with IJIA in reauthorization in three years, the continued demand on these institutions and their their ability to retain and attract, you know, the new age workforce is is going to become it's going to become central

**Melissa Batula:**

But it's going to help push it too because we think there has to be room for everybody because we need everybody. We can't just do it in one sector anymore.

**Greg Nadeau:**

I wish I could do this all day. I'd love to, but we can't. So, I'll start to try to bring this home. In this way we're putting out we call it our overarching question of the day. I don't know what I'll change it, but we might. But basically the overall question we're asking is how do we move innovation in the Federal Aid, Federal Aid Highway Program? And I should say innovation and technology.

We have the Everyday Counts initiative, which I'm very proud of and passionate about. And it's been going now it's on its third administration. So that's a good sign. But largely because the states really embraced it and it kind of became their own. And we have State Transportation Innovation Council (STICs). As a matter of fact, PennDOT certainly in the years I was there, was held up as the really the example of what to do with the STIC.

Not only are you setting up your own sort of regional innovation days, but you were promoting innovations that were beyond Every Day Counts (EDC). You had a whole set of your own, and I'm not sure if that time frame, I think it does dovetail with your service. So, you know, there's yeah, that's a great example of a very specific program that was designed to help accelerate the deployment of really test proven tested but underutilized innovation.

Are there other ways is, you know, what can we do to advance and impact that culture or help create the culture of change? I think EDC did a lot to help that along. Certainly, when I began now, I don't know how many years ago, 2009, when I began at Federal Highway versus by the time we left, the EDC seemed to really reinstitute that culture of innovation in many states that that in their own words, they kind of lost it because innovation takes work, takes investment, takes attention and reprioritizing.

**Melissa Batula:**

Takes risk.

**Greg Nadeau:**

You just said the magic word takes risk. So how do you mitigate the risk? How do you I mean, you know, our philosophy at the time, which I was top down, bottom up, you've you can't simply say, you know, in issue an edict from on high and what they you need to get the buy in from those front-line project people who live with it day in and day out.

Plus they know the most about it. They have insight, they have analysis that could be good, that would be beneficial to the senior management. So the combination of top down collaboration will help mitigate that risk. Your thoughts?

**Melissa Batula:**

I'd add one more to it, and this is one I'm very passionate about and I think is sometimes missing. And you see it at the federal level, in the state level. The state level as well.

We talk about risk and in my opinion, to make innovation work, you've got to have leaders that were willing to not only promote innovation but take any responsibility when it doesn't work. So that frees up the staff that are trying to be innovative to do that without fear of, you know, serious repercussions. So, you've got to have that that again, that leadership, the willing to state step in and say, I've got you guys is back no matter work what.

If it doesn't work, we'll find a new way to do it. But be comfortable with that. It can vary. You know, it can be very risky at that point, but you need that level of buy in. And I kind of challenge the same with the Federal Highway. You know, if we want to push innovation, you have to accept that, you know, for every one right way to make a light bulb, there might be 99 that aren't there.

So how do we adapt to that while still promoting innovation? Copying from each other is one thing, but you do need somebody to be a Utah or an Iowa to be out on the leading edge and help incentivize them to do that.

**Greg Nadeau:**

Well said. And the opportunity to get your perspective, which again, is quite unique, the experience you've had and what the good news is you continue to serve even in your private sector capacity, the work that you and colleagues and other firms are doing to help advance digital technology is really going to change everything.

And we can see it. We can see it happening before our eyes. So thank you for the work you're doing. Thank you for your service and thank you especially for the time off to make this conversation.

**Melissa Batula:**

Thank you very much great. Appreciate it. I enjoyed it.