Just Improving Forensic Technology Transition.wav

Introduction [00:00:01] RTI International's Justice Practice area presents Just Science.

Introduction [00:00:10] Welcome to Just Science, a podcast for justice professionals and anyone interested in learning more about forensic science, innovative technology, current research, and actionable strategies to improve the criminal justice system. In episode one of our Roadmap to Improving Technology Transition Season, Just Science sat down with Lucas Zarwell, Director of the Office of Investigative and Forensic Sciences at the National Institute of Justice, and Doctor Jeri Ropero-Miller, Principal Scientist and Director of the Forensic Technology Center of Excellence at RTI International, to discuss a newly published roadmap that guides the transition of forensic research and technology innovations into the forensic practitioner community. During the development of new forensic technologies there are various challenges that result in products not actually being utilized in forensic laboratories. To help the community overcome these challenges the National Institute of Justice's Forensic Laboratory Needs Technology Working Group, or FLN TWG, introduced a roadmap report with action items to help seamlessly and successfully implement new forensic technologies in practice. Listen along as Director Zarwell and Doctor Ropero-Miller describe ways that forensic research products can become unsuccessful, the importance of collaboration between forensic researchers and practitioners, and the process of developing the FLN TWG Roadmap report. This episode is funded by the National Institute of Justice's Forensic Technology Center of Excellence. Some content in this podcast may be considered sensitive and may evoke emotional responses, or may not be appropriate for younger audiences. Here's your host, Rebecca Shute.

Rebecca Shute [00:01:35] Hello, and welcome to Just Science. I'm your host, Rebecca Shute, with the Forensic Technology Center of Excellence, a program of the National Institute of Justice. Transitioning research into the forensic community is critical to continuous improvement of forensic science and ultimately, in enabling just outcomes. However, this can be challenging to accomplish. On today's episode, we will discuss the efforts that the Forensic Laboratory Needs Technology Working Group took to guide the community through these challenges. This discussion will summarize insights from the recently published FLN TWG document, a Roadmap to Improve Research and Technology Transition in Forensic Science. Here to guide us in this discussion is Lucas Zarwell, the Director of the Office of Investigative and Forensic Sciences, Office of Justice Programs at the National Institute of Justice, and Doctor Jeri Ropero-Miller, Principal Scientist and Director of the Forensic Technology Center of Excellence at RTI international and coauthor of the roadmap. Welcome, Lucas and Jeri.

Lucas Zarwell [00:02:31] Hey, Rebecca, it's great to be here.

Jeri Ropero-Miller [00:02:33] Thanks, Rebecca.

Rebecca Shute [00:02:34] So this roadmap for improving technology transition evolved from discussions by the FLN TWG Research Subcommittee. Lucas, could you set the scene by helping us understand the goals of the FLN TWG and specifically what the research subcommittee was aiming to accomplish?

Lucas Zarwell [00:02:48] So the FLN TWG, right, is the Forensic Laboratory Needs Technology Working Group. And so NIJ had this really unique ability to create working groups under its listen, learn, uh, and inform type of approach. And so we have other

technology working groups that help develop our research needs. But this group, you know, its mission is really to kind of advise, assess and exchange information with NIJ and our federal partners. You know, based on the technology needs of state and local forensic laboratory. And so that, however, is very specific to, let's say, improving coordination, tech transition or standardization, also identifying localized or system wide operational gaps or impediments to adoption. This could include resource problems. Um, as we know, our labs sometimes struggle with that issue. And then, you know, finally NIJ is very interested in always increasing the capacity and quality of forensic services within this kind of landscape of increasing demand for forensics nationwide. And, you know, and NIJ we really needed kind of big thought and brain sweat to really flesh out and kind of illustrate the complexities involved in research and development in the forensic science. It's different. It's very different than many other fields. And some ways can be the same. But, you know, I think it was important to get individuals from the forensic enterprise together so we could explore this, create a helpful document to kind of synthesize all that information. And I think it was successful. I think Jeri will agree with me, um, we had some great thinkers on the subcommittee and focus group, but, you know, I just I'm going to just reflect really quick because I can't thank them personally enough for their contributions. And of course, you know, RTI Center of Excellence. So it's really a fantastic group of, you know, leaders and researchers. And if when you take a look at the guide, which I'm sure you will some point after this podcast, you can check out them. They're all listed there, um, on the first couple of pages.

Rebecca Shute [00:04:48] Yeah. Thank you so much for that context. Definitely a lot of technical firepower, uh, behind this group, which, uh, really drove the development of a fantastic document there. So in this document, we acknowledge the opportunities as well as the realities of forensic science R&D. And we also mentioned that many of these research products fall into a Valley of Death, which is a term commonly used in the innovation world. Jeri, can you help us understand what that term means?

Jeri Ropero-Miller [00:05:15] Sure. So Valley of Death is a phenomenon where mature, innovative technologies may not reach implementation. When we think about how technology can shift into practice, especially in forensic sciences. We are really any kind of science. We first start with what are those needs or those pain points? And those needs and pain points quickly build research questions that move us into R&D. And then following R&D, we have testing and evaluation of that technology, then validation of the technology and then really moving it into implementation first with the few early adopters and operational laboratories, and then with the many, so that it really spreads throughout the community. And when we think about Valley of Death, we really have two places where that tends to occur for the laboratories, the forensic laboratories, versus during the testing and evaluation stage right before it moves to that validation with those early adopters, or that one forensic science service provider that is really ready to step out and help us pull that technology through. And then in the other Valley of Death is definitely moving to the many. You know, you can get 1 or 2 that can make it happen, but really trying to get everyone to widely adopt that technology.

Rebecca Shute [00:06:34] Thanks, Jeri really helpful there. So what's really driving these Valleys of Death in like the forensic community? So ultimately what are the challenges here?

Jeri Ropero-Miller [00:06:42] Sure, I can give a few in no particular order and then ask Lucas to jump in first as Lucas talked about communication. You know, if you don't have communication, these Valley of Deaths will happen. So communication is very important,

especially when you're moving from the researcher to the practitioner because if you have misalignment here, then the research is not going to be able to move down that cyclic pathway. And so that's very important. Also if the researchers and the practitioners are speaking a different language, or a researcher is trying to do something that's not really practical or can't be operationalized and that doesn't get communicated back in some type of feedback loop, then you have that stall of that innovation being able to move through the process. Um, another thing that can be very important to this cyclic success of technology transition is really just prioritization of research and development. When you look at the forensic laboratories, they really are having to prioritize usually or in most cases, case work. But having those thought leaders, having those decision makers, having the laboratory directors being willing to put the research and the development and method validations as a priority too. To be able to move to more efficient technologies is very critical to this whole process. And as always, uh, validation is technically challenging. So it's not something that, you know, all scientists in the laboratories want to embrace usually have those few that really get giddy over doing the validation, and those are the ones that we have to tap into to help us move those technologies into a place where they've been developed far enough, and they can ultimately move into a case where and then, you know, the thing that we try not to mention, but it is a reality for all of us, it's really the funding, um, whether that's at the state, local, federal or even at, you know, just the money to invest in R&D is always critical to the process. And I'll ask Lucas if there's any that I may have forgotten that he wants to jump in.

Lucas Zarwell [00:08:55] I think you had a lot of, um, I, I would totally agree. I think one of the biggest challenges, you know, as operational labs, having the time to work with researchers and to make those priorities. And so I'm just kind of reiterating what Jeri was talking about. But, you know, you really have to rethink kind of culture when it comes to, I think, forensic science and forensic science research, because the community does need to be involved, because eventually we're going to have to use these technologies on casework. And then the best way to do that is to evaluate how they're performing in a laboratory. You want to make sure that it's a good fit. And I also think one of the challenges is that thinking differently is not always part of the forensic science enterprise. We do as I think of the practice, look for newer technologies and and better ways to operationalize and reduce our backlogs. But we don't always look for new ways of doing things. And part of that, I think, is the challenges that we have in court with new technology, you know, making sure that something can survive a court challenge and that it's got a great scientific foundation. And that could be considered even if it's a newer practice that it, you know, is validated and will withstand a defense challenge. I think those are realities and why laboratories might be slow to adopt something that could be very helpful and, you know, productive for their lab.

Rebecca Shute [00:10:18] Certainly a lot of challenges and realities there. And, you know, altogether a good impetus for why we created this document. So, Jeri, I'd love to kind of get back to the development of this document. Could you walk us through the development process? Who was involved? And really, what was the goal of this document?

Jeri Ropero-Miller [00:10:38] Sure. So this document was created using, again, an innovative industry type concept. Uh, we really wanted to, with this document, create what is called a forensic innovation ecosystem. And with this, it was trying to take all the players that could contribute to technology being successfully implemented and let them know what their role is in the whole process. So whether it's a forensic science service provider, the leaders at the laboratories, academic leadership, also the researchers themselves, one

that many times it's gotten is the industry. Industry is also critical to helping us with that. And then the conveners and enablers, such as the professional associations that host many of our conferences where we talk about these research efforts and the technology itself, or even the Forensic Technology Center of Excellence. It's a convener and enabler. And all of these being able to, with this document, talk to action items that each one can take, their role, see themselves in this ecosystem and how they can not only help themselves contribute to it, but what they can do to help the other roles be able to be successful in their component. So just again, allowing everybody to see the big picture of this forensic innovation ecosystem. But that wasn't enough. In addition to having the FLN TWG subcommittee that was made up of the researchers and practitioners, we really wanted to look at an even higher level perspective. So the FTCOE, along with the subcommittee, held several virtual facilitated discussions where we asked certain roles within that ecosystems to have those conversations with themselves and then also inviting different types too in that conversation. So, for example, having the researchers and the forensic scientists come together to speak about a particular pain point or something that was successful for them that they have now implemented just to have those conversations. Because a lot of times that's something that we're going to necessarily talk about when we're at a meeting. So just trying to be a little more proactive with that.

Rebecca Shute [00:12:58] Certainly able to get a wealth of diverse perspectives and leverage this virtual facilitated sessions in our post-Covid world. So you had mentioned, you know, one of the key goals of the report was to provide real action items that different members of the community could take. And, you know, honestly, we wanted to be able to recommend that readers see themselves and go find themselves in the document. But we also had some high level key takeaways and action items stemming from this document. Jeri, could you walk us through a couple of these high points?

Jeri Ropero-Miller [00:13:32] Again, hitting on just a few points because there is a wealth of knowledge in this document. But to give you some examples, first and foremost, there has to ultimately need to be that mindset shift that Lucas talked about for not only the forensic science service providers, but academia too, for them willing to go outside of their normal daily interactions that they have for this and reach out to those other components of the ecosystem and have those conversations. It's not an easy conversation to, like, start, but you have to have that mindset shift to be willing to be proactive and being an instigator of those conversations. That's very important to the whole process. Another thing that I think is very important is the fact that the research infrastructure for RDTNE and validation and adoption needs to be community wide, that it's not a linear approach, it really is cyclic, and each component needs to be helping each other. They need to form partnerships. And the partnerships need to, you know, happen before a particular technology is something that either side is thinking about. If you have those partnerships already in place, then the conversations are going to happen, and something that you weren't necessarily thinking about in that conversation is going to make that lightbulb go on. So I think that that's important as well. You know, every single time you ask a question, Rebecca, today, I think both of us, Lucas and I are going to speak to that communication because it's just something that doesn't happen often enough. And those feedback cycles for each one of those pieces it's very important. Um, and then finally, I just think that the effective partnerships again, it's sometimes you can have a partnership, but a lot of times people don't know how to necessarily build those partnerships. And so I think the forensic science community in general needs to look at building more resources to help with those partnerships. We're just getting started in that. And I think that we can learn a lot with what we put in place and starting that conversation to build more resources.

Lucas Zarwell [00:15:40] Yeah, I mean, Jeri, I think the other thing, too is, you know, when we the word communication, uh, is very, very important. But the benefits of creating a document like this is that we're really trying to reach, you know, everybody that's part of the community. So, you know, not just the laboratory leaders, but also researchers, um, industry members, as Jeri had mentioned. You know, we really want to think of it kind of like a prism, like breaking of light across a spectrum, and that everybody in the community and the way this document is designed, you know, everybody in the community can kind of take this and see how they would play a, you know, a unique role, right? So it puts them in that process and helps lead them to that culture shift. You know, I know as a former lab director and that leaders in general are very, very, very busy people. So but I mean, anyone in the laboratory can take this document and be a leader themselves and kind of up communicate and say, hey, you know, what about this idea? You know, maybe we can be part of this as well. Let's try to reach out to some universities in the area. Let's try to connect with some researchers. Let's ask some questions of our staff. You know, so how can we prioritize that? Um, and I think that that communication is critical to kind of start thinking about, you know, what's next in forensic science, right? And, um, no one knows that better than the researchers and laboratory practitioners themselves. And so I think this kind of document really help paint that picture for everyone and start those conversations. Those conversations can start like day one.

Rebecca Shute [00:17:04] Lucas, that's a really great segue into the question. How might the forensic community use this document? Uh, you had mentioned, you know, as a communication tool. I think that's a a wonderful way to to disseminate. And with this document, obviously, we don't want it to be a white paper that gathers dust on the shelf. We want it to be living. We want it to, you know, spark change. What other ways, uh, would you envision the forensic community using this?

Lucas Zarwell [00:17:29] Oh, gosh. I mean, I think about it in a way of, you know, how can I look at this and alter, you know, the structure of my lab, like, do I need to what kind of actions could I take to help move myself in a direction or, you know, the organization in a direction that's more benefit to the enterprise as a whole? Like, can we dedicate resources or, you know, can we even create, you know, positions within the bureaucracy that the laboratory has to be able to bring on individuals who focus specifically on research or publication fellowships, grad students, even internships, you know, what can a leader do? And I think this kind of document helps that practitioner in that respect. And then I think on the other side, you know, industry can take a look and say, well, what roles could we play? And, you know, we're interested in developing something. What are the challenges for me as a or our industry or our private company going into this and recognizing those when the document like this, it's almost like a transparent door, you know, you can see right through it and you can start to see gears inside and try to figure out, you know, what you've got to start doing to form those relationships, to help bring those ideas to fruition or knock down those challenges, so to speak, so broadly. But there's so many to this process that it's important. I think that's why this document really works, just because it really is a map to all this process. You know, Jeri, I don't know if you have additional thoughts on that.

Jeri Ropero-Miller [00:18:48] I mean, I couldn't agree with you more on those points. And, you know, this document, even though we brought many types of perspectives in it wasn't something that, quite honestly, was organic and easy to put together. It was a long process to kind of get what you would consider, you know, possibly even being common sense type things like speaking. If you have communication, it can only make things better. But I think that this document really puts in black and white terms, you know, the importance of each one of these groups picking up on what they might do. And it doesn't

have to be big grandiose ideas, really, just small steps. If everybody, you know can contribute to those small steps. And the next thing you know, this will be very organic for us to get through. It will be like just going in the laboratory and doing casework after we've been doing casework for ten years. So very hopeful that this just really starts the dialog for everyone to participate.

Rebecca Shute [00:19:51] Jeri, I'm glad you said that out loud, that this was a difficult process because it really was it's challenging, you know, understanding the root causes and getting to next steps that are actionable for the community is really challenging. And, uh, you know, it's a privilege to be one of the first thoughts leaders in this space for the forensic community, and something I'm certainly proud of for this document here. So back to some of these action items. One of the first and foremost areas we described as critical to improving tech transition is enabling leadership buy in on both the academic side and on the forensic laboratory side. Jeri, could you walk us through the importance of this? Like, why is buy in on both the academic and lab leadership side important? What value does this bring?

Jeri Ropero-Miller [00:20:33] You cannot get through this process without buy in from the leadership in both academic in the laboratory side, embracing it and opening the doorway. For you to be able to do it, they have to be able to see the importance. They are the ones that are going to be fighting for this to happen in whether it's their, you know, university or whether it's their operational lab. And if they can't voice that, if they can't justify it, then, you know, this whole process just won't be in existence. It's going to be something that's done, you know, possibly after hours and only then if money is, you know, made available for it. So again, you have to have the leaderships there willing to take on the responsibility of being able to open those doors so that we can walk through them and get this very important work done.

Rebecca Shute [00:21:24] Thanks, Jeri. Uh, Lucas, anything to add?

Lucas Zarwell [00:21:27] When I when I think about the importance of buy in, you know, once we get buy in then we can look at, like I mentioned, changes in structure, we get people initiating actions and we get people making research and development and evaluation, and they're part of that, you know, a priority. And then we start to get more awareness. Right. And as we get that awareness, then it sort of leads to celebration. Like here we are, we're doing this. Everybody's part of the process. It's more widespread, you know, where are the successes? And we know I mean, Jeri mentioned at the very beginning, the Valley of Death, quote unquote, is a very real thing. And we have to accept that tech can fall into the area. So that's why I think the communication is really important. And to get to the part where we're celebrating those advancements, it might seem like a long road. I think with buy in from both the academic and the lab leadership, it's a shorter road than we think.

Rebecca Shute [00:22:16] Lucas, your your perspective has been really helpful in this roadmap process, especially as the NIJ has been developing its own forensic science strategic plan. So how does this roadmap align with the NIJ strategic plan?

Lucas Zarwell [00:22:29] That's a very, very good question. So yeah, you talked about perspectives. And I think that, you know, forensics in general, I think in the U.S., we're in a very reactionary environment where labs are scrambling to reduce backlogs and provide quality work. In some cases, we're kind of re-engineering a train that already left the station, and we're trying to fit wheels on it while it's moving. And don't get me wrong, it's it's

a really good train. It runs really well. But we've been doing things fairly similar for a very long time. In terms of our strategic plan, so the NIJ forensic science research plan that we put out, I think people should go check it out if they haven't already. It's up on NIJ.gov. Shameless plug. Of course. I think people kind of wanted to see a priority list of what needs to be worked on in forensics, but there's so many challenges and just not enough time. What I think this particular initiative focuses on, it's really two priorities in that plan, and one of them is the strategic priority four which is to create a, uh, cultivate a diverse, highly skilled forensic science workforce. And let me tell you why I think this applies is because as scientists, you know, we build scientists through experience and research. And so we're always trying to make sure that we're meeting objectives that can kind of advance that workforce. And so one of those objectives, as a kind of foster the next generation of forensic science researchers. Right? And to do that, you've got to have projects. You've got to have academic institutions and laboratories that are involved in projects. So students who are learning and coming out of undergraduate experiences are getting, you know, graduate and post-graduate opportunities to do research, not just, you know, the applied science, but actually do research in a laboratory. And then, you know, then the other thing is part of that objective is to kind of facilitate research within public labs. You know, NIJ does have specific solicitation that kind of addresses tries to address that need. Um, but we know that this kind of plan will help promote partnerships with academia and cultivate possibly researchers working within the workforce, within public labs, because we can't do this work in a vacuum. We we have to work with public laboratories who understand the needs and the challenges and are still willing to opt to use certain technologies. And then I think the other two point is when we think about advancing the scientific workforce, we have to think that individuals who are trained in science, trained in research, understand evaluation, understand method validation, you know, they make good science and they make great leaders, and they're able to articulate why that technology is important and how it's applied in a court of law. And so by creating more of a science based school of thought or culture to research, we are actually adding forensic scientists to the workforce who can help develop the staffing needs and the leadership needs in the field. And the other thing I think is when we think about coordinating across a community of practice. So our fifth priority and our strategic plan, I just talked about the fourth, but the fifth one, it's really that coordination across the community of practice. And so one of the objectives underneath those priorities is to basically kind of facilitate information sharing. And you know, that's what this kind of roadmap does is it forces that communication and that information sharing. You know, I think I've heard multiple times that organizations have different priorities in terms of what they're invested in. In terms of technology, I mean, you could take a Department of Homeland Security or the Department of Defense or NIJ. And, you know, we all have different customers, or research that is produced. You know, we're NIJs constantly trying to develop technologies that will help the practitioner in the field. And that's kind of where we do a lot of work. But that goes, you know, from basic research to, you know, more R&D, to evaluation. So we have a long lineage of doing that. But in the strategic plan, you know, that coordination. And again, that kind of falls back to the work between the public lab and the researcher, but also with industry or with academia at large, with policy makers, that information sharing is very important to the success of forensic science research, I would argue, as well as NIJ.

Rebecca Shute [00:26:44] Lucas, there's a lot of great ways to talk about the importance of the forensic innovation ecosystem, and certainly great to see that there's there's a lot of alignments with the roadmap and the strategic plan. So, Jeri, working as part of the FTCOE, we have an opportunity to respond and kind of help affect change, uh, based on some of the action items in the roadmap. So in your opinion, how might the FTCOE respond to and align with these action items?

Jeri Ropero-Miller [00:27:11] So this is building on the fact that, you know, the FTCOE, is NIJs Forensic Technology Center of Excellence, and we are all about helping with that strategic plan and helping with tech transition and technology transfer and supporting research, all those component. And so the FTCOE is a convener and enabler. We have that role of connecting and facilitating communication among practitioners and researchers and industry within forensic science. And we will continue to bridge and make sure that those Valleys of Death are not happening in the forensic research transition, by encouraging those mindset shifts that need to happen so that people are willing to invest in the necessary resources and improve their communications and look for partnerships, and just all in all, stay engaged in this whole process because it needs a lot of effort. You know, it's not something that you can do, you know, once, once a year and the you got to stay on top of it. And the FTCOE will also continue to create resources like this roadmap. I invite everyone to, uh, look at the FTCOE we we actually have a web page specific for researchers, um, for translation. And of course, with the operational laboratories to try to look at, um, exactly what this roadmap is all about. So we can help with that. And we are also within the community, we can help all of the other community members take those small steps towards fostering the collaborative partnerships that are needed or creating opportunities for RDTNE. Um, and going beyond those presentations that are very important are those publications that are very important. We have to do dissemination and awareness well beyond those traditional means. And so we are there to help remove the barriers for tech transition and help with those outcomes and being able to definitively show ourselves, our leaders, policy makers, what are the outcomes that are great impacts for the effort that we are going to put into it.

Rebecca Shute [00:29:26] This fantastic conversation. But any last parting words about the document and its impact?

Lucas Zarwell [00:29:32] Well, clearly check it out because I think that's important. But my parting thought is share. Share what you've read, share the idea of it or the concept. You know, if you're in a conversation about research, be like, hey, you know, I think the Center of Excellence published an interesting roadmap we should probably take a look at it. I think for me, I'd like to continue this type of work with the center. I don't know what the next step is, but I think this was a very important first step. And to have the FLN TWG supported, you know, they're very important group at NIJ. And so they have them behind this and to have them generate this is a is a significant step forward for research in forensic science. Jeri?

Jeri Ropero-Miller [00:30:10] Yeah, I like the idea of sharing not only after you read, but sharing with others. But I was going to get to the point of the feedback piece. So even with this roadmap, it's something that we haven't seen before. And while we engaged in a lot of conversations to kind of put it together, I know there are going to be thoughts or concepts or stories to our experiences that we did not capture in this roadmap. So I invite everybody, if you have any of those, to be part of that feedback loop, and let the FTCOE know, because part of this is we didn't just create this roadmap or this white paper to end here, part of what we are planning to do with, uh, the FLN TWG and with NIJ and those that will be adopters of this roadmap with us, is to really start looking at how it has changed, how things are doing, and how action items are being taken by the different communities and the different roles. And we're not going to be able to do that documentation, we're not going to be able to do that impact or be able to measure that impact if we don't hear back from you. So this really is your roadmap and just share with the experiences that as you move on after reading it. I hope that there's a nugget for you

and everybody in your laboratory, whether it's academia or whether it's industry or whether it's in your operational lab. I hope everybody has a nugget or two that they can build on.

Rebecca Shute [00:31:43] I feel like it's only fitting to end on some action items, right? Lucas and Jeri, thank you so much for your time discussing your experiences today. It's really been a pleasure talking with you.

Lucas Zarwell [00:31:51] Thank you. I appreciate that it was really nice to have this conversation. I always like hanging out with Jeri and talking about this stuff. And you, Rebecca.

Jeri Ropero-Miller [00:31:58] Same here. Rebecca and Lucas, we talk about this kind of in smaller groups, but to be able to podcast and, you know, start the conversation here. I hope that when people see us out and about, it will spark further conversations. So thank you.

Rebecca Shute [00:32:14] If you enjoyed today's episode, be sure to like and follow Just Science on your platform of choice. For more information on today's topic and the FLN TWG roadmap, visit forensicCOE.ORg. I'm Rebecca Shute, and this has been another episode of Just Science.

Introduction [00:32:30] Next week, Just Science sits down with Henry Maynard and Cleveland Miles to discuss enabling research partnerships. Opinions or points of views expressed in this podcast represent a consensus of the authors, and do not necessarily represent the official position or policies of its funding.