# Episode 5 Nicole Badstuber and Christine Foster

**Speaker Key:**

FC        Fiona Cannon

MP       Maggie Pagano

NB       Nicole Badstuber

CF       Christine Foster


FC       This podcast is supported by Lloyds Banking Group. Hello, and welcome to the fifth episode of the Agility Mindset Podcast. I'm Fiona Cannon, the Director of Responsible Business, Sustainability and Inclusion at Lloyds Banking Group and the Director of the Agile Future Forum.

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MP       And I'm Maggie Pagano, business journalist, who's working with Fiona on this series of interviews.

FC       In today's episode, Maggie and I speak to Nicole Badstuber who's a researcher at UCL specialising in transport policy. There are some fascinating insights into things like commuting, which we're certainly going to have to think about from an agility perspective. We also talk to Christine Foster who's the Managing Director for Innovation at The Alan Turing Institute who brings us up to speed on artificial intelligence and how it's set to revolutionise the world of work.

MP       Today I have with me Nicole Badstuber who's an expert in urban transport, studies at UCL and has been looking at how agility and working practices are affected in the transport system, and how indeed we can improve transport and people's commuting hours which are extraordinarily high. People are changing the way they work, they're being more agile and flexible. What sort of impact is that having on the transport system?

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NB       Well, if we look at London, for example, the biggest impact what we can see at sort of flattening the peak was in the seventies when they stopped clocking in and clocking out, and since then the sort of shape of that curve in the morning has not really changed; it's only been going up. So the number of people using the system has been going up, but actually when they use the system, that's

pretty much the same. The biggest change was in the seventies and, unfortunately, a lot of these work practices haven't had the effect that we would've hoped and part of that is because of other commitments that you have throughout your day.

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For instance, childcare is a big one that drives when you can go to work and when you leave the house, and even though people know there's a lot of campaigns about, well, please don't use the train from 8-10 at Clapham Junction because that's the busiest, that's the most convenient for a lot of people because they're dropping off their kids at school or they're doing some other errands. And so, unfortunately, whilst it has meant that some people were opting to not work one day a week, it hasn't flattened the peak which is the most expensive part of the transport system.

MP      Now, your research has looked at London, Boston and New York I believe and looking at the governance of these cities. Is trying to change these peak hours allowing people to be more agile? Is that a big focus of theirs? Is it something they're all working on?

NB      I think here in London where we have one transport authority looking at all of the modes in an integrated way, that lends itself much better to thinking of those quite holistic problems in an integrated way. So, for instance, your drop-off to school could be by walking or cycling and then coordinating that with where you can pick up the train to get into work. The systems in Boston and New York I think are a little behind what we are here in London; they're still dealing with big infrastructure problems.

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MP      Well, it's good to hear London actually being ahead of other places for a change. Now, Nicole, there was a recent study done of 34,000 workers across all UK industries by the University of Cambridge and various private companies looking at the impact of commuting on mental health, well, health overall, productivity, home working and so forth, and it showed some quite surprising results.

One of them being that about a third of all commuters are more likely to suffer from depression, 37% more likely to have financial worries, and another 12% had work-related stress, so that's sort of nearly 50% showing some downside, if you like, to commuting. Is there anything we can do to help that, or is it just part of modern-day life?

NB      So the mode that you use to travel affects the sort of disbenefit on your mental health. So walking and cycling, active travel in general is actually seen as an uplift to your mental health, so if we can encourage more people to take that as an option to commute, then I think that could help lift the mental health of all those people commuting, or at least negate those negative benefits.

Of course if you're in a crowded tube train or commuter rail train, that will have much worse mental health disbenefits. So things that we could do there is try and reduce the demand or run more services, but all of those things are really expensive. So the peak is the most, the thing that is governing what, how large a system's capacity needs to be, and increasing a system's capacity is the most expensive thing.

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So, for instance, here in London building Crossrail which will increase rail capacity within London by 10% is costing £15 billion and that is mainly to target that high transport demand in the peak and in particular in the morning. In the evening, the peak is slightly flatter and more spread out from about 3pm to 10pm, but in the morning we really have really high peaks, especially around 8:15 to 8:45 when people are rushing in the office to get there for the 9am. So even though practices have been to try and make it more flexible for people to come in, say, between 8am and 10am, we still see a high peak around the 9ammark.

MP      Nicole, what we've seen particularly in large cities like London and Manchester, is the revival and the gentrification of urban areas into sort of like little villages, and I was thinking actually it's rather like London was in the 19th century. We had lots of villages and then it slowly all joined up and now, in a sense, it's all going out again. What could companies do to help workers perhaps stay local in their villages? Is there more shared working? Do we need new working spaces, transport? How would that work?

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NB      Something they could do is set up an outpost of their main headquarters or their main working offices in these urban villages. So, for instance, here in London it could be somewhere like Stratford. I think a challenge there is often people dealing with sort of sensitive data or sensitive information. That is something to work on, how to make it a space that maybe you would be using with other people or other companies, but how can you still work in a safe way.

That's something that I think you could do. You could have special departments, special sectors within the office. But, yes, generally, you know, making it available, getting office space, hiring office space and seeing, encouraging people to work there some of the week.

MP      Yes, that's a very good point about the security. I guess, though, as we become more advanced with data encryption and so forth, that will sort of follow naturally, won't it?

NB      So going back to these sort of urban villages, something we could do is create places where people could come in and work at their own villages who have

some of the facilities of meeting rooms, or even part of your team that you're working with. Especially with larger companies that may be the case, and that would reduce the necessity to travel all the way into the city centre and you would still have a lot of the benefits that you have from working face-to-face and communicating with your colleagues, but would reduce the travel demand in some respects.

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Transport demand is a derived demand. No one's travelling for travel's sake. They're travelling for whatever they need to do at the destination and so if we think about how can we, you know, build homes or how can we build workplaces where we reduce travel demand, on the whole we'll be reliant on very much the same infrastructure, and what we need to think about is how can we use it most efficiently.

MP      Lovely. Thank you so much. That was fascinating.

NB      Thank you very much for having me.

FC      Maggie, I thought that was a very interesting interview that you did with Nicole because I think all of these things are reinforcing the need to think differently, aren't they, and that if we're going to be able to see agility as a reality, really we need to think about how we travel. And of course it reinforces the point that most organisations are still set up on this nine to five, five days a week commute into the centre of town.

        So that factory mentality in a sense, and that really needs to change. So this systemic change that we need in organisations, we also need in transport, too. And it just strikes me as odd that we're not thinking enough about local hubs and the benefits that that can bring to local communities if people are living and working in their local area.

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MP      Yes, absolutely. It's sort of fundamental, isn't it? I mean, if you can't get to the doctor's surgery or you can't take your child to childcare between eight and nine, it sort of locks you into that, as you say, nine-to-five cycle. So we've got to be very radical about how we think about it, and what's also bizarre is that nudge economics with different pricing systems hasn't really worked. The line that I come in on, before ten o'clock is £40, after ten o'clock it's £17. You would think that would be a really big, have a huge impact, but it clearly hasn't. So I think people have got to coordinate and work together to try and shift these cycles.

FC      Yes, and as Nicole was saying, if you've got childcare or you're dropping your kids off at school, actually you are going to go in before ten, aren't you?

MP      Yes, you've got to.

FC So actually there is this whole piece around, how do we look at our education system as well as our transport system?

And the other point I thought that was interesting was this whole issue about what the education system looks like and, again, with that we still have six weeks holidays in the summer, all of those kinds of things that we know cause problems for working parents potentially. But also, just how do we manage our education and what are we preparing our children for in terms of the lifelong education that they need as well?

MP No, they're huge challenges, and of course at the other end we've got to get people out of all the big cities, out of London. Somebody very wittily said the other day, Dick Whittington would still come to London today, and even though, as we saw with Andy Myers, they've done a fantastic job in Glasgow and York, Manchester, all our great northern cities are increasingly more efficient, but we still need to get the rail network. I mean, it can take four hours to cross from Liverpool to Hull. I mean, it's insane, so we need some really big thinking and it's got to really be at government level.

FC Certainly it's got to be at a UK level for sure. In the interview that we did with Phil Smith, former CEO of Cisco, he mentions of course some of the work that they did in Cisco where they do the shared hubs with other companies actually in local areas and how successful that is, both from the organisation's perspective but also from an employee perspective as well, so more thinking in that space is absolutely needed.

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MP So I'm delighted to be joined today by Christine Foster who's the Managing Director for Innovation at The Alan Turing Institute. The Alan Turing Institute is the UK's national institute for data science and artificial intelligence founded in 2015. Thank you for joining us today, Christine. We're really delighted to be able to have the opportunity to talk to you about the topic of AI, artificial intelligence. And before we get into that, perhaps it would be really useful I think for our listeners just to understand a little bit about what your role involves because it's a kind of really interesting new area, so it'd be interesting to understand what you do in your day job.

CF So, first of all, The Alan Turing Institute is the national institute for data science and AI and that means that we're engaged in the fundamental research around the conceptual advances of this new science, of data science and artificial intelligence. On top of that, we're also looking to apply that research and those findings to real-world use cases and make sure that it has the greatest benefit to the economy, to society, the UK as a whole. We also drive the training and

growth of the next generation of data scientists and data science leaders in both the academic sector and also in the business sector, and then also we're involved in thought leadership and advising policymakers.

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And so my piece of it, my role as Managing Director for Innovation, is applying the research to real-world use cases. You can get many definitions of data science, machine learning, artificial intelligence. Many of them will involve Venn diagrams, arguments about types of code use, you know. You can get a long, long way away from any kind of helpful definition because it's a new science and a new set of related technologies and so of course it's harder to define.

MP      I mean, we're at the tipping point, aren't we? We were talking about this earlier, at a tipping point in terms of this new digital revolution that in the same way as we were when the Industrial Revolution came in, and it is about that adapting and using, moving forward to the future, but in a way that works for us. So it sounds like, from your perspective, that AI is a benefit, not something to be afraid of.

CF      At the Turing we don't take the passive stance that it'll probably be a benefit and it'll be okay. To make the point, we're actively working on the ways to make sure that artificial intelligence can be adopted responsibly. There are many researchers not just in the stem fields of computer science and mathematics and statistics, but also researchers on the social sciences, law, ethics, philosophy, economics who are very interested in these kinds of questions.

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And so there's an incredibly rich vein of research around fairness, transparency and ethics of AI with a view to not stopping progress but actually the opposite; we need some of these questions to be answered satisfactorily so that we know these can be adopted responsibly. So one of the really interesting projects that our researchers are doing is in partnership with a company that's building the first 3D printed bridge.

MP      Wow.

CF      So, one, it's a feat of engineering because the bridge is printing itself from one side to another, so you can imagine this, you know, little machine sintering along.

MP      Kind of like sci-fi, isn't it?

CF      It's great, it's wonderful, and it was supposed to be an art piece originally but one of our strategic partners, Lloyds Register Foundation, said, you know, we could make this a bridge that could be walked on and could, you know, and could actually be used. So right now it's touring as an art installation, but it's going to be installed over a canal in Amsterdam and people are going to be able to walk over it. But, more importantly, from the advances in technology and AI point of view, or at least I think more interestingly is it's loaded with sensors and the sensors are throwing off a big data stream into this digital twin that we're building.

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And so, again, when you get to this idea of, how is this bridge going to fare, well, we're not asking the question in general over time, over, across a lot of different bridges, the old way engineering was done. We're actually saying specifically this bridge is encountering these kinds of vibrations, these types of temperature changes, and all of that's being modelled in a computer. So the understanding, what's happening outside and inside, and whether it's safe or not, and how long it's going to be safe for, and if you get three hurricanes in Amsterdam, which we never do, but…

MP      Who knows with climate change.

CF      Exactly. But, again, these questions of things that are so uncertain and so unpredictable, at least capturing that it's happening and then what to do about it, and you can kind of very quickly see that you get to a personalised maintenance plan for a given bridge.

MP      Yes, and presumably can take action quicker because you're getting data that's saying, this is happening, or it's shifting or whatever it may be, and you're able to make those changes quicker. So, in a sense, the bridge becomes safer because you're getting all the data through on a regular basis. That potentially means that, you know, your role as a leader in a business going forward is in a sense to pull together all of those experts or people with knowledge. That may be technical knowledge, but it may be innovation and creativity and all of those kinds of things.

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So your role as a leader is not to know all the answers necessarily, although, you'd need to have an understanding of what's going on, but it is much more that kind of networked sense it feels like, doesn't it, now rather than I'm the leader, I know all the decisions. You'll still have some of that, but not in the same way as it is right now and that feels very different to the way we operate today in organisations.

CF      Yes. I mean, when I worked at American Express, I had two-thirds of my team in New York and one-third of my team in Gurgaon in India and it wasn't only a location and offshoring; there was actually slightly differing roles, some that were easier to do remotely and some that were required to do right at the headquarters, and those kinds of classic things.

        And I think you think about exactly these kinds of network teams, you can very easily see these kind of porous borders between kind of the core full-time team with the domain expertise of the industry, you know, some people who are maybe a little bit further away from the day-to-day physically or just expertise wise but bring in something else that's quite useful.

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        And kind of alongside that, you know, some very narrow AI, incredibly useful in certain contexts, and then this kind of notion of many businesses are talking open innovation. You know, a couple of businesses that it's their core to do, something like chat bots. You're going to look at that altogether and you say, well, that is actually sort of the team of the future and the idea that it's in the walls of the bank or out of the walls of the bank, it's starting to not matter as much.

MP      Yes, exactly.

CF      And so I think that is the challenge for leaders which is, well, how do you know?

MP      What people are doing. So you said that the financial services sector has grasped this and starting to look at it, although it still feels very new, as you say anyway. Are there other sectors that need to be looking at this that maybe haven't started looking at it yet? Are some sectors further ahead as well and some further behind at this point?

CF      So at the Turing Institute we've chosen to focus our challenge areas in areas where we think there's the greatest impact but also that may not necessarily be as well served by the private sector. So, there are so many wonderful use cases in, say, media. You know, ecommerce and recommendation algorithms really fuelled a lot of, right, a lot of this?

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MP      Yes. No, absolutely.

CF      And gave everyone else the idea that it was actually possible to do this. So we won't particularly be focusing in that area, but we've taken the bottoms up interest from the researcher community that's multidisciplinary, creative,

wild, varied and heterogeneous, as you'd expect, and really pulled it in together, our big research challenges.

And so there are eight of them, they're named on our website, but one of them in particular is around revolutionising healthcare. So there are optimisation techniques regularly used in probably your call centres, probably in how you land an airplane, you know, a bunch of airplanes at an airport, all these kinds of things that could very easily be applied into the health sector of, how do you handle acuity, you know, through A&E stores and yet haven't really made that leap.

And in some ways it's because the decisions are, they're more important, but in other ways isn't that the point, that we should be using the most cutting-edge techniques to make some of the most important decisions we make as a society and not just as an economy?

MP      Yes, absolutely.

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CF      And so that's one area where we're focusing on and in particular we have a partnership with ECL hospitals, ECLH, on a wide variety of use cases. Some of them are things about diagnostics and imaging and kind of that recognition of anomalies in a scan and then, like I said, some of them are much more operational, the way your business already runs, but that those vendors, those solutions haven't made their way into every sector.

MP      Christine, one of the things obviously that we've been looking at through the work that we've been doing is the demands of the 24/7 culture that's been, that seems to be with us right now, be it as a consumer and even some examples of companies able to work around, that follow the clock around, if you like. Now, on one level, therefore it feels like agile working is really essential to be able to kind of manage that, and what's your view on how AI can support that so that you don't actually create something where people are having to work 24/7? And is there some benefit in AI and be able to support more agile working?

CF      Well, I guess the nice thing about AI and automated decision-making is actually that they're computers, and so the idea that kind of working around the clock, I don't think anybody would have any moral issues with making a computer work around the clock. There's actually a lot of good, you know. Any good CIO would say, well, that's actually how we do that, that's actually how most systems are set up in many places. And so the fact of them being, whether they're, you know, just processing transactions or making decisions, now, that maybe feels a little bit different, right?

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And I think that's the question people ask, do I need to be kind of on call for all these decisions that are being made? Well, probably not, right? There are probably some very practical system implementations that have something, like, you know, these batch things are run overnight just as they traditionally are and any kind of anomalies or any kind of marginal decisions, if you will, they could be held over until an appropriate kind of sociable workhour for the appropriate review, if that's what the process is.

There's a really good piece of work done by the US Navy from the seventies about the kind of human and computer to human and system interaction. They brought all these terms of human in the loop, human out of the loop, human on the loop that we all use very casually now. But I would suggest to the listeners who are interested to go back and look at it, the fundamentals were very good and they remain very relevant even today.

And so when I think about implementing an algorithm in production in a system, I think about the end in mind. So in my prior life of being in the private sector I think about the end in mind, exactly when we'd want to be making decisions and when we'd want to be turning it off, right?

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MP      Yes.

CF      And so if you start there and you say, well, what is the amount of human intervention versus automated decision-making and when would we want to do it, I think these things can be designed really not just responsibly for the decisions that they make, but responsibly towards the workforce and really kind of honour the, whatever it is, the working model people are interested in. Right now they probably focus much more on the nine to five and that, and probably many good CIOs make the mistake of thinking that the workday is only nine to five and on those weekdays.

But just think about the kind of possibilities of fragmenting across more hours of the week and all of that. Again, it's kind of these good systems that help with the kind of human computer interaction that are going to help us allow good decisions to be made 24/7 and customer service to be available 24/7 without encumbering workers with these unreasonable expectations. I think we can have it both ways.

MP      Yes, and so…

CF      I'm being so optimistic.

MP      That sounds good.

CF      But, yes.

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MP   Yes, and that's the point, isn't it, I guess, that we're going to need agile working to respond to all the things that are going on, but actually AI can support that in terms of it being a good thing and to the benefit of the individual as well as the organisation and not adding more burdens because it does free up… I mean, that goes back to where we started, isn't it, this kind of concept of the robots taking over, taking the jobs. Actually, what they potentially are doing is freeing us up to be able to work in a way that fits the lives that we want to live and allow us to do the other bits that at the moment it feels like robots aren't able to do, which has to be a good place to finish.

CF   Yes.

MP   So thank you very much, Christine. That's been a really fascinating conversation about AI and the implications for us in the business world, so thank you for taking the time to join us today.

CF   Thank you for having me.

FC   Maggie, I think one of the implications for me from that piece with Christine about AI is, again, just how line managers are going to have to manage differently going forward.

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I mean, traditionally, today you have this system where the line manager is the expert, if you like, has a team of people underneath him, but it feels like we're going to be moving to a much more networked way of operating and that's going to require a different way, a different mind-set obviously for line managers.

MP   Yes, absolutely, and whilst there's huge benefits, aren't there, a lot of the repetitive factory type process jobs will go, leaving people hopefully to be more creative, which in itself begs another question about how people plan their careers, what they study. I mean, it's difficult enough to plan ten years ahead, but if people are going to live so much longer and with all of the new thinking processes that are emerging, we're going to have to look totally differently at how we educate people.

FC   Indeed. In fact, one of the pieces of work that we did at the Agile Future Forum was to talk to business schools and what do the business leaders of the future need to be thinking about, and many of them are now adding thinking about agility into their programmes which I think will be important but, as you say, there'll still need to be kind of like this lifelong education piece, won't there? So, you know, the world of work is changing so rapidly and none of us I think really know exactly what's going to happen.

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However, next time in the next episode we are joined by Andrew Scott who's the co-author of The 100-Year Life and Andrew has done a lot of thinking about this and so does have some thoughts around what the implications of that will be. And so he'll talk about some of the themes from his book, about the consequences of living longer for businesses and employees, and the demands that this will create for the economy.

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