An interview with: Andrew Maher

By Idil Gaziulusoy

Andrew Maher is Region Leader of Arup University. Previously he established Digital Innovation at Arup and developed new ways of working, delivering and communicating services using the latest technological capabilities. He leads Arup's corporate R&D function in the region focusing on development of innovation strategy and foresight. Between 2002-2007 he was a Research Fellow at Spatial Information Architecture Laboratory at RMIT University. In addition to architecture, Andrew has a background in business and foresight.

Andrew Maher was interviewed as part of the "Visions & Pathways 2040" project, about the future of Australian cities.

Andrew, please tell me how your work relates to the future of cities.

Andrew Maher (AM): 10 years ago, in Arup, we were probably around 4 thousand people globally; now we're about 13 thousand people. Previously we focused on buildings but we observed that in the past ten years the main growth has been outside of the buildings group and mostly around urban planning, transport systems, economics, disciplines like that. We've been thinking about what that means. This year our annual design book is entitled "Stories about Designing Cities" and strategically we see our work is in cities and we think about the future of cities a lot.

You also have a foresight background. Can you open up how Arup foresight links to the work on cities?

AM: We package those two together. We have our ongoing learning, our research, and foresight work. The knowledge sharing component and all of our skills communities, are based around our various disciplines. There's about 45 of those. They all fit under this umbrella which is the internal university called the Arup University. Foresight is one of those things and it fits nicely with research. We do research for "new", which might be 3 to 5 years. Then we do research for "next", which is

20-40 year horizon Foresight team looks at where we can see aspects of the future and pull those things together including user stories of the future.

You're obviously doing a lot of thinking about the future of cities. If you imagine now that we are in 2040 and the city we're living in is radically low carbon and resilient, what does it look and feel like?

AM: I would think personally that it might not look a lot different to what we have today because our building stock lasts for so long. One of the things we've been thinking is that by 2040 autonomous vehicles should be prevalent. So the way that we occupy our road systems and the way that we use our transport networks will radically change and that will have major impact on what we use the spaces within our cities for. How we power our transport systems may radically change and we're doing some work with people that are looking at large scale solar research. They're looking to see if they can augment power to trams through solar. So, I think by 2040, rather than everybody individually having solar cells all over the place, we will have in conjunction with that large-scale generation of renewable energy. We've just finished a research project with the University of Melbourne on the Internet of Things collaborating with the City of Melbourne. Lots of things

will become connected and a whole lot of new services will be offered for better utilisation of current infrastructure. Some people in Arup have been talking about the systems within buildings and the possibility of manufacturers putting the components they supply on lease agreements. Would you get a different set of behaviours if the systems in buildings were retrofitted and owned by a company and they would be monitoring and maintaining them all the time. This is an example of an application of the coming instrumentation of the built environment and the industrial internet of things that will have significant implications on becoming low-carbon in cities.

You talked about autonomous vehicles. What kind of a role do you think autonomous vehicles will be playing in 2040 in terms of making it low carbon and resilient?

AM: I think with autonomous vehicles it's still very much around how they're powered and so not powering them through the burning of fossil fuels would be very important. We think that there won't necessarily be fewer vehicles but there might be different vehicles for different types of things. So little delivery vehicles or drones delivering and doing certain types of things. The vehicles will more efficiently use the current set of roads and some of the interesting questions that will come out of that is if all of these vehicles understand where they're going and how best to move through the city and how to be routed through then what happens to pedestrians for example. How do you interact with them? And also that goes for cyclists too. So I think there's going to be a whole bunch of really interesting questions that come up as more systems need to be developed and integrated.

Do you think that autonomous vehicles will play also a major role in human transport?

AM: Yeah. I'm really looking forward to them. I don't particularly like driving. If I can dial up a car and have it there waiting for me when I need to go somewhere and then it goes off and does it's own thing and another car comes along and picks me up when I'm finished, I'd be more than happy. So, it's not an ownership model; there could be a model in which vehicles will be available when and where you need them.

Looking at the signals, what kind of jobs and new skills will we need by 2040?

AM: What skills we will be attaining by 2040 fascinates me, especially as a parent. In terms of the people who work at Arup we're completely changing the workplace at the moment. Completely. I think most workplaces are similar to when I was a graduate 20 years back and yet there has been large scale changes within society, especially around how we communicate. I mentioned earlier the research we were doing with the City of Melbourne and the University of Melbourne on the Internet of Things. It was really challenging to install these little devices in the city. It was difficult to get power to them. They are potentially difficult to maintain. Some devices broke down quite a lot…So you start think to think, well, who are the people that are going to go around and monitor these things and install them? So here are two sorts of people we will need. There'll be people who develop processes for automation applying new sorts of skills that they're learning. But also, we still have silos of information and one of the things that I think are going to be really important is how we connect those silos together. And on the existence of silos, we're going to need to have people who navigate those silos, collect, integrate and communicate knowledge in forms applicable to increasingly more interconnected systems. So, I cannot tell you about job titles but there'll be specialists who make new things and who look after new sorts of things that we will need and there'll be generalists who are going to be able to tell the stories and connect.

Are there any particular barriers that you see for a hopeful future to emerge?

AM: A few years ago, I may have articulated a dystopian view of the future for you but I've completely changed my thinking. I think we will use resources much more efficiently. There will be amazing new occupations and skills. Completely new disciplines will emerge and I think I'm going to look at it in 2040 if I'm around and be amazed. One of the things that really concern me at the moment though is the lack of opportunities for the younger people to engage with software. Building things, prototyping things and also programming. Because we need to provide people with those sorts of skills and from a very young age. I think access to capital is an interesting one as well because while there're things like Kickstarter and all that sort of thing, generally developing an appetite for risk with respect to investment in Australia will be a challenge.

What are the three most important disruptive forces at the moment that will change the cities towards becoming low carbon and resilient?

Ubiquitous computing, sharing economy and large scale energy storage.

Andrew, thank you so much for your time.