The expert view: converging the natural and the artificial

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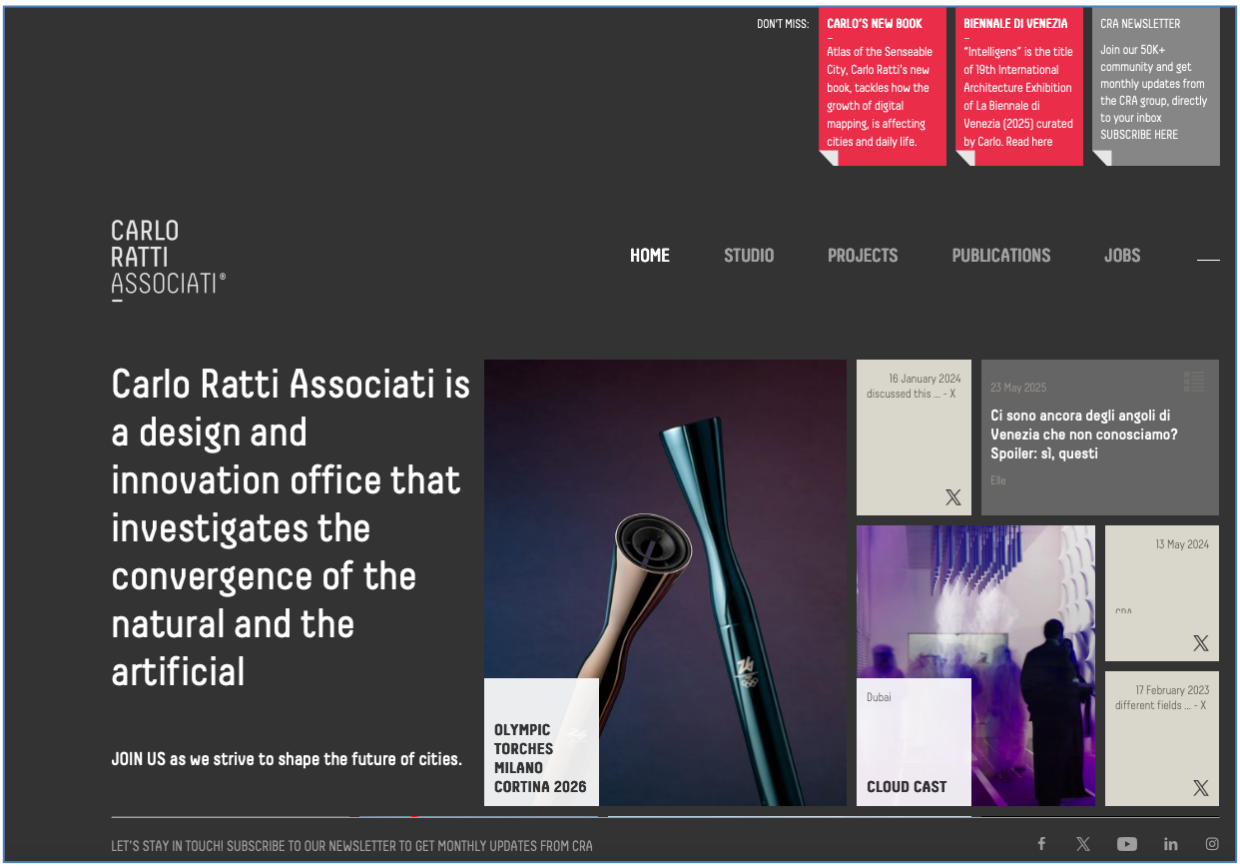
Interviewee: Carlo Ratti – Founder, Carlo Ratti Associati

November 2025



Carlo Ratti Associati website (image reproduced with permission by Carlo Ratti)

Carlo,

Thank you for making the time to discuss your work to bring together the natural and the artificial worlds to create great cities and towns. I know you talk and work with many people around the world on how to make cities and towns thrive.

Could we start this interview with a brief outline of yourself and the services that you and your team provide? I really like your design for the Milano Cortina 2026 Olympic and Paralympic Torches, by the way.

Carlo: *Thank you, Gareth. My work embraces teaching, research, and design. Teaching takes place at MIT and the Politecnico di Milano.*

Most of the research happens at the MIT Senseable City Lab, which explores cities through the new lens of ubiquitous data. Finally, in terms of design, our office—CRA–Carlo Ratti Associati—applies those insights to real-world projects, from urban master plans to temporary installations. You can see this as different ways to tackle the built environment: through the production, application, and sharing of urban knowledge.

And thank you for your kind comment about the Olympic Torch.

Gareth: Thanks for this overview, Carlo.

You mention the MIT Senseability City Lab, which I know you are a director of, and which is an entity that seeks to understand and describe how cities are changing, with labs in Amsterdam (SCA), Dubai (SCD), and Rio de Janeiro (SCR) – each addressing urban challenges relevant to their context.

I am aware that the labs (all locations) conduct a wide range of projects in different fields. The Lab database is a good source of information about this work, with descriptions of projects that demonstrate interlinkages between nature, the built environment and socio-economics. Does the work of the labs influence national, state and urban policy making and planning approaches around the world, and perhaps how businesses think through their offerings to cities as well?

(Here's a link to the Newsletter sign-up page for people reading this interview)

***Carlo:** Since the Covid-19 pandemic, we have started working more as a network, with outposts across different continents. In addition to the ones you mentioned, we now have labs in Seoul, Singapore, and Milan. The reason was precisely what you mentioned—to make our research more informed by local contexts and therefore more applicable.*

Over the years, we have seen many examples of our research influencing both urban policy and business practices. In terms of policy, our LIVE Singapore! project, now around 15 years old, helped inspire Singapore's Smart Nation initiative. In terms of business, we could look at our HubCab project, in which we explored mathematically the potential for ride-sharing taxis in New York City to reduce congestion and emissions. That project led to the first collaboration between MIT and Uber and contributed significantly to the launch.

Gareth: Thanks for this context and these examples, Carlo.

Given your experience of working on different types of urban projects and initiatives around the world through your design and innovation office and the MIT Senseability City Lab, are you seeing any trends and commonalities that support and drive an approach to achieve good integration of the natural world and the artificial world of the built environments we create in our cities?

Carlo: *Yes. I think we are moving from centuries that tried to separate humans from nature to one that is trying to reconnect them. The most interesting urban innovations today blur the line between the natural and the artificial.*

The most direct way is to bring nature inside our cities. For instance, at the CapitaSpring tower in Singapore, we integrated a 30-metre-high vertical garden within the building structure—showing how nature and density can thrive together.

But there is another aspect: learning from the logic of nature. Cities are beginning to behave like living systems, with energy, data, and materials circulating through feedback loops. This shift marks a cultural change as much as a technical one. An example is Hot Heart in Helsinki, a system of floating basins that store renewable energy while serving as public spaces.

Both projects show that rather than separating the natural and the artificial, they can cohabit—transforming that divide into a source of resilience.

Gareth: Thanks for these really interesting architectural examples, Carlo. What cities would you say are currently leading lights about making the linkage between the natural and the artificial worlds in the urban context a reality, which perhaps other cities can and should learn from (in their own context)?

Carlo: *I would say that Milan and Singapore are currently among the cities leading the way in how to blend the natural and the artificial worlds.*

Gareth: The term “Nature-based Solutions” is used quite a lot in “urban circles”. Where do you see the role of Nature-based Solutions within the scope of linking together the natural world and the artificial world for cities and towns?

Carlo: *As we were saying, the goal is not only to plant more trees—it is to learn from how nature organises itself: circularity, regeneration, mutualism. At the Venice Biennale, we are exploring this through the idea of “natural intelligence.” Nature-based Solutions are part of the broader conversation about designing with, rather than against, nature.*

Gareth: The way you have curated the 19th International Architecture Exhibition at the Venice Biennale is very thought-provoking, Carlo.

I’m an advocate of involving everyone as best we can in how we evolve the urban places where we live and work, using principles such as those set out by Gil Peñalosa, Founder of 8 80 Cities and Cities 4 Everyone, which starts with citizens being the experts of their local areas to be listened to before any ideas and concepts are drawn up.

Sometimes, an “urban diagnostic” (I’m not seeking to sound technocratic here!) can help with a review, as I have discussed with people in Arup and UN-Habitat. Do you see examples of good citizen engagement working to help link the natural world and the artificial world?

Carlo: *I agree with your principles. While I am still rather sceptical about generative AI, I think one of its positive effects could be improving participation in architecture. Let me give you an example.*

We have been testing this idea with a project exhibited in Venice together with the Mayor’s Office in Naples. On the outskirts of the Parthenopean city, the Vele di Scampia stand alongside legendary housing experiments like Pruitt–Igoe in St. Louis and Robin Hood Gardens in London—grand architectural visions that ended in demolition. Immortalised globally as the backdrop of Netflix’s Gomorra, the Vele have long symbolised social failure. Could they now point the way forward?

Unlike those other cases, which were fully demolished, part of the Naples complex—the Vela Celeste—is set to remain and undergo a radical renovation. Stripped of its internal partitions, it is being reimagined not through top-down architecture but via an innovative participatory design process enhanced by generative AI. In the past, community participation was limited by the difficulty laypeople faced in translating their ideas into drawings. That is now changing. In Naples, through a city-supported digital platform, residents share memories, ideas, and visions that generative AI tools continuously convert into architectural sketches—from shared courtyards to new entrances, from terrace gardens to neighbourhood Fab Labs.

AI alone will not solve urban inequality. But combined with traditional public engagement, it can revive agency and imagination in neglected neighbourhoods—and perhaps lend new meaning to Churchill’s famous words: “We shape our buildings, and thereafter they shape us.”

Gareth: Your example of how generative AI can be used to support public engagement in urban place design and how we can fire our imagination makes me think of a discussion I have held with Ed Finn, Director of the Center for Science and the Imagination at Arizona State University, about how we can make greater use of our imagination.

People can be uncomfortable about change to where they live. How can we address fears people might have about how their local area might evolve, for example to add more nature or cycle lanes to it? Is it feasible for city and municipal teams to organise large-scale discussion campaigns, such as citizen-led forums in places where people already gather for activities, from community centres to schools (not asking them to “please turn up at city hall” at 8pm), to discuss what an equitable and integrated society looks like, and what good change could look like for their local area?

Carlo: *Change does not feel threatening if it is bottom-up and evolutionary. The forums you mention are great places to start that conversation—but sometimes that conversation can also begin simply by sharing data with people.*

Here is one example. A few years ago, with our Treepedia project, we created maps of urban trees in many cities around the world, down to the street level. After we made the results public, we were inundated with emails from residents comparing neighbourhoods and using our data to support their requests to city hall. Sharing data can be the first step toward informed participation.

Gareth: Thanks for the point about the value of good data to help bring people together to agree how to change and improve their cities and towns, and local areas. Related to the MIT Senseable Cities Lab Treepedia project, which I know lists tree canopy data of many cities, I have seen how some cities such as London publish data about their "green cover" (something I have mentioned in my September 2025 Urban 2.0 Newsletter edition).

Continuing on the theme of change and linking this to systems thinking, how important do you think it is that we focus on "compact city principles" to ensure we have thriving, green and resilient urban places? We know that if we can live with each other and be close to core amenities and services (whether we call this design a "15-minute city", a "compact city" or something else), we can lead healthy lives in a healthy community. Whilst urban planning and zoning is often slow to adapt and change, is this a good aspiration to have, in your view (perhaps it depends on context)?

Carlo: *The 15-minute city, initially proposed by my colleague and friend Carlos Moreno, offers great promise—the idea that most daily needs can be met within a short walk or bike ride from home. In many ways, it is nothing new; it reflects the traditional neighbourhoods that shaped European cities for centuries.*

For the first time, at the MIT Senseable City Lab, together with our Harvard colleague Ed Glaeser, we used big data to analyse the 15-minute city. We used anonymised cell phone location data for 40 million Americans to measure how often residents within one neighbourhood carried out essential trips within a quarter-hour timeframe. The results showed that people automatically construct their lifestyles around 15-minute walks if amenities such as parks and grocery stores are available within that radius. In other words, if we build it, they will come.

Part of our study focused on New York, where a 1961 zoning code, looser in some neighbourhoods than others, created ideal conditions for a natural experiment. The findings were striking: if the city permitted more commercial development, 15-minute amenities would naturally emerge. So, we can see that 15-minute cities historically arose from deregulation: since people like having short commutes and enjoy interesting neighbourhoods, free markets create them.

However, we also found a real downside to the 15-minute city and one that its supporters should pay attention to: greater segregation. Residents of poor neighbourhoods, if they only visit nearby places, are less likely to encounter economic diversity. This is of grave concern because economic success depends on residents' ability to travel across the city and find new opportunities.

As our co-author, professor Glaeser, writes: "I am very worried that a focus on enabling upper-middle-income people to walk around in their nice little 15-minute neighbourhood precludes the far larger issue" — improving mobility for those in poorer areas.

This is not to say that close amenities are intrinsically bad for lower-income people: on the contrary, they're vital. But the 15-minute city must be paired with investment in transport between neighbourhoods. That means neither cycle paths nor roads for the motorists, Sunak has decided to champion, but unglamorous, affordable buses and metros.

Gareth: I really appreciate the context to the analysis you have undertaken with colleagues, Carlo. It links back to our earlier point about the importance of good data to inform decision-making, and your point about market-led creation reminds me of discussions I have had with the urbanist Alain Bertaud. I have also focused on transportation and how it should link to all of society 15-minute city principles in my June 2025 Urban 2.0 Newsletter edition.

Your book published in 2023, the Atlas of the Senseable City which is co-authored with Antoine Picon explores how the growth of digital mapping, spurred by sensing technologies, is affecting cities and the lives of people that live in them. Appreciating the linkages to the MIT Senseability City Lab and this book's title, what was the driver behind writing this book? I wonder whether this type of mapping can help with citizen engagement we discussed just now.

Carlo: *The Atlas grew out of two decades of research at the Senseable City Lab—it was a way to assemble our visual output and trace the threads connecting our work. More importantly, it aims to democratise that knowledge: when citizens can see their city through data, they can help shape it, as we were saying a moment ago.*

Gareth: Linked to our discussion point about using good data, part of my work focuses on how we can avoid disasters from happening (I co-lead an initiative called Disasters Avoided), including in urban contexts, which includes using and sharing good data about hazards and vulnerabilities and recognising that they exist to different degrees around the world (such as extreme weather, floods, wildfires, earthquakes, landslides and others).

Do you have any thoughts on how linking the natural world and the artificial world can help us avoid disasters in cities and towns?

Carlo: *In summary, if we learn from natural systems—using wetlands as flood defences, mangroves as storm barriers, trees as cooling infrastructure—we can turn vulnerability into climate resilience.*

Gareth: I'd like to talk about another aspect of thriving urban places now – urban art. There are some good examples of urban art that demonstrate the value of linking the natural world with the artificial world. Do you have any views on the power of urban and street art to support vibrant cities and towns?

Carlo: *Urban art can be a powerful agent for change. It forces us to look at urban spaces with new eyes and often restores a sense of bottom-up expression. We are using it in a large urban regeneration project in Turin—Corso Palermo—which will host what is likely to be the world's most extensive graffiti.*

Gareth: For a city or a locality that isn't currently focusing on linking the natural world with the artificial world, what is your advice for why they should do so, and how they can get started?

Carlo: *First, start from local conditions. There is no one solution for all. Second, listen to citizens and how they would like to open their city to nature. Third, use data to create a culture of observation—because cities that observe themselves are the ones that evolve.*

Gareth: Finally, do you have any views on how linking together the natural world with the artificial world can align city / municipal masterplans with global frameworks that exist such as the Sustainable Development Goals (the SDGs) and the Sendai Framework, both of which have five years left until they will be updated, in 2030)?

Carlo: *I would say that linking the natural and the artificial worlds is not only aligned with these frameworks—it is their essence.*

Thank you very much for your time to discuss practical placemaking, Carlo.
I look forward to seeing how your work to support urban environments around the world continues to evolve. I am a subscriber to your Newsletter, by the way (here's the link to sign up to it for readers).

