

1 FROM TIDAL FLAT TO HIGH-TECH HOMES

→ SONGDO, SOUTH KOREA



Built on reclaimed land close to South Korea's Incheon International Airport, Songdo International Business District has been designed to showcase the latest progress

in cutting-edge urban technology and sustainable design. Many of its buildings are LEED-certified, 40% of the city is green space and a network of pipes takes household waste directly from homes

to a processing center for sorting and recycling. Throughout the city, sensors monitor traffic, altering signals to prevent congestion and helping to control the public transport systems.

2 SMART HOUSING

3 CONNECTED LIVING



How Smart Can a City Get?

High-tech metropolises are being built from the ground up. But what's it like to live in one? Take a glimpse into Chantal's life in South Korea's Songdo IBD – then jump halfway across the world to see how an older city like Vienna is smartening up.

BY **Janet Anderson**

PHOTOS BY **Jun Michael Park**

THE SCREEN IN HER APARTMENT tells Chantal F. that today will be cloudy, traffic in the city is running well, pollution is low, the elevator is working and the family's energy consumption is on track. If she needs it, the screen connects her directly to the building caretaker, the local medical services or the council. She can look up recipes or join an exercise class from her own living room.

Chantal lives with her family in Songdo International Business District (IBD) in South Korea, a city that has grown from nothing in a few short years and is now described as one of the world's smartest cities. Every home in Songdo is fitted with a similar screen. Called a telepresence unit, the idea is to provide a new way to deliver education, health care and government services directly into people's homes.

In Songdo, nearly every aspect of life is digitally networked (see box p.52). Currently home to around 36,000 residents, its developers, Gale International, consider it "the model →

4
DIGITAL
INNOVATION

2 REDUCING THE COST OF LIVING

→ SMART HOUSING

The Homenet automation system enables residents in all of Songdo's apartments to control lighting, air-conditioning and ventilation from a digital control panel, monitors use and compares it with others on the grid. Tracking actual consumption helps raise awareness, change behaviors, reduce energy consumption and lower the cost of living.



for next-generation cities." Chantal and her family moved here from Germany, two years ago, to an apartment in a 47-story, glass-clad building. On one side, they look out over the brand new city and its green spaces; on the other, over empty land where building work is just beginning. "Songdo is changing rapidly, even in the short time we have been here," she says. "Coming from old Europe, I had to adjust to living in a place that is so new. In less than 11 years a whole functioning city has arisen."

Screens play a big role in the lives of Songdo's residents – in people's homes, outside on the streets and buildings and, of course, on smartphones. "You can get help anywhere," says Chantal. "You never feel alone. At the press of a button there is always someone to talk to." Meanwhile at the U-Life Center – the city's nerve center – a wall of screens streams real-time footage from CCTV cameras located throughout Songdo, monitoring everything from traffic to crime. "If a child got lost here, they would be spotted quickly," says Chantal.

Smart initiatives like these have been on the rise in cities around the world. "We have been talking about smart cities for some time. Now we are seeing them being implemented. Cities are starting to take the first steps to actually realize

something," says Thilo Zelt, partner at Roland Berger and author of *Smart City, Smart Strategy*, a survey of smart cities around the world that ranked Vienna at the top.

MANY OF THE SMART INITIATIVES BEING TESTED are aimed at solving the usual problems of daily urban life – traffic congestion, pollution, crime, the high cost of living – but today, cities face new challenges as well. Over half of the world's population already lives in urban areas, with that figure predicted to rise to 70% by 2050. The strain on infrastructure and the environment cannot be ignored.

"To meet today's challenges, cities have to be more efficient with resources, more adaptable and more resilient. Smart solutions can help squeeze more efficiency out of the system," says Léan Doody, who is the smart cities lead at professional services group Arup. Globalization brings yet another pressure – it means cities increasingly compete with each other to attract talent and investment. "Technology can play a role here too, in economic and social development and helping cities to differentiate themselves," she says.

Take Barcelona – the city has decided to turn itself into a platform for businesses to experiment in urban technology. It is home, for example, to Worldensing, a tech company that has pioneered the use of the internet of things to design parking management and traffic monitoring solutions. In Rio de Janeiro, one part of the city's smart strategy is a community warning system. The new Rio Operations Center monitors conditions across the city in real time, enabling the authorities to respond more effectively to natural disasters like flooding while also bringing down crime rates – all of which makes the city more attractive to tourists and investors.

"Data means that we know more about our environment and about the consequences of what we do."

Carlo Ratti, Director of MIT Senseable City Lab

"THE APPROACHES VARY GREATLY and the interpretation of the concept itself differs from city to city," says Zelt. "Some see it as sustainable urban development, some see it more narrowly as smart solutions for energy and mobility. I believe the key is that smart city strategies should be comprehensive – not just isolated digital solutions."

Carlo Ratti, director of MIT Senseable City Lab in Boston, USA, and founder of design and innovation office Carlo Ratti Associati in Turin, Italy, believes a lot can be gained by using the real-time data generated by cities. "Data means that we know more about our environment and about the consequences of what we do," he says. Trash Track, a project his team ran in Seattle, tagged individual items of domestic refuse and followed them as they moved through the sanitation system. "We learned that the simple sharing of information through visualizations can promote behavioral change," says Ratti. "People involved in the project were able to follow their trash and this led some of them to embrace more sustainable consumption choices."

Not every city has the benefit of starting from scratch. It is more usual to have to find ways to introduce new technology into existing infrastructure. This requires good leadership at the political and civil service level, according to Doody. "It's not well understood yet how to do this. Unlike land use planning, which we've been doing for over 100 years, we haven't established processes yet – we're still in pioneering days." Yet one thing is clear – it requires participation from all the stakeholders to devise and implement a successful smart strategy. "Citizen involvement, stakeholder dialogue, and public-private partnerships are important," says Zelt. "The biggest error for

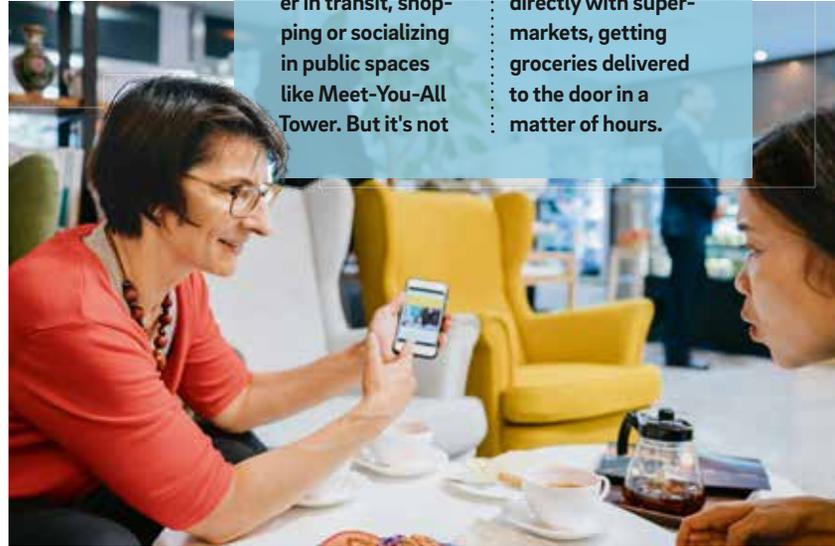
3 CITY LIFE, MINUS STRESS

→ CONNECTED LIVING



Citywide free Wi-Fi means Songdo's residents are always connected – whether in transit, shopping or socializing in public spaces like Meet-You-All Tower. But it's not

just people that are connected. Refrigerators communicate directly with supermarkets, getting groceries delivered to the door in a matter of hours.



cities is to try to do this on their own. They should especially engage with local industry, bring them to the table from the start." An equally important factor for success is consulting and engaging with citizens – like Vienna, for example, which has involved its residents from the beginning, making it more likely that they get political support to push through disruptive changes. [See interview on p. 56]



4 MORE INNOVATIVE, MORE ATTRACTIVE

→ DIGITAL INNOVATION

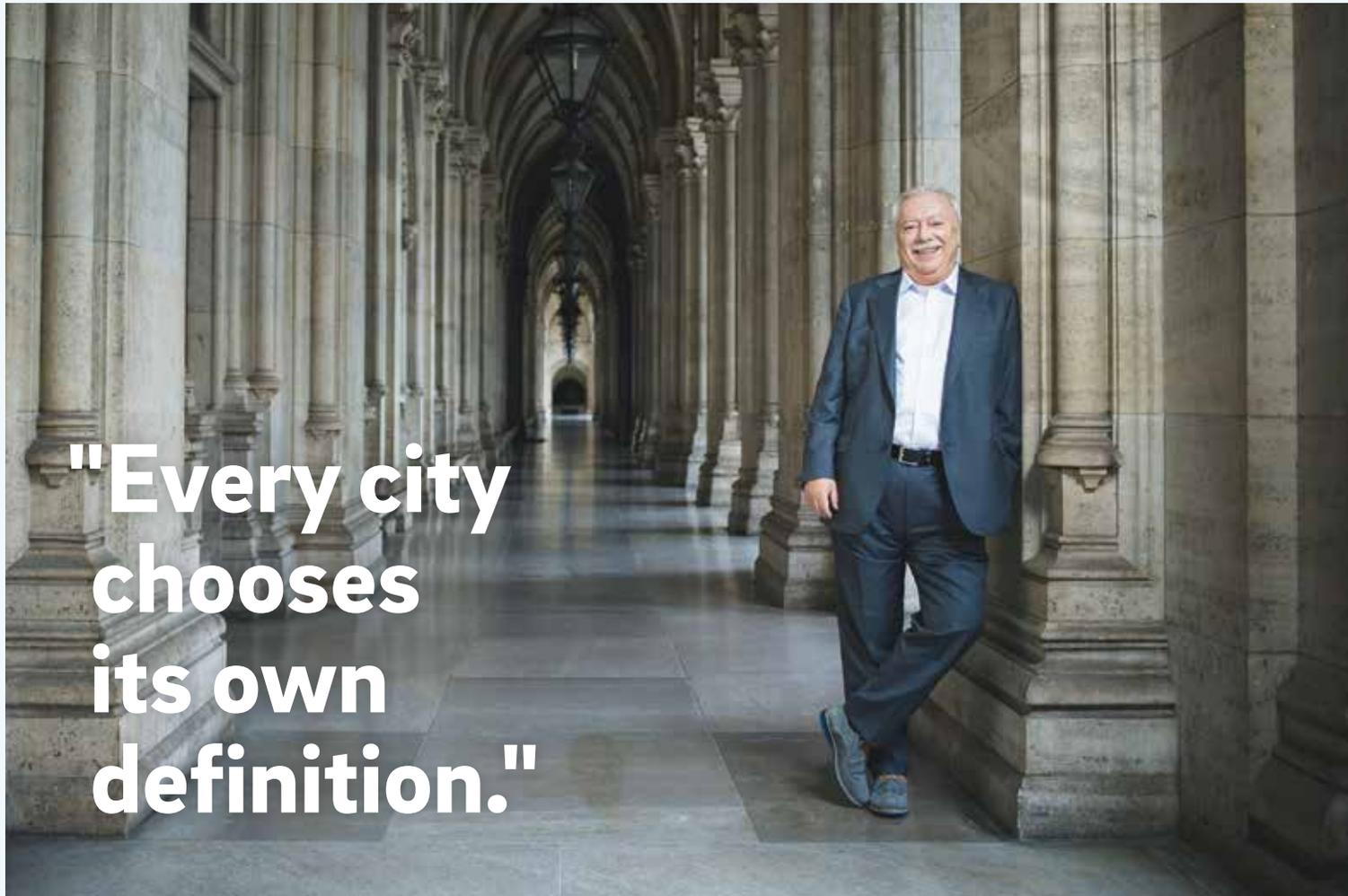
Cisco's Global Center of Excellence in Songdo drives digital innovation by bringing partners,

customers, government and startups together to co-create solutions across every aspect of city life.



The pitfalls of avoiding this advice become clear as you listen to Chantal. "At first we found the screen entertaining. But it is all in Korean and we often don't know what we are doing. We had ceiling lights going on at 4am." The family has slowly cut out the technology they feel they don't need. "Some of it is practical, but we don't like to feel too dependent on it," she says. For example, she has dispensed with the smart refrigerator, preferring to do the shopping herself.

A more fundamental issue for Chantal is the presence of so many screens. "It's annoying that you can't switch off the screen in the apartment and the presence of so many cameras makes you feel you are always being watched," she says. On the other hand, she sees the positive side too: "You can leave your bag on a bench, go for a coffee, and it will still be there when you get back. I think as long as technology is used to manage the city better, it's a plus." ■



"Every city chooses its own definition."

"Smartening up" an established urban area poses more than a few problems, but Vienna is up for the challenge. Mayor Michael Häupl explains how the Austrian capital is uniting players from across municipal areas with a holistic approach called Smart City Wien. The goal? To raise the quality of life for Vienna's citizens through sustainable, innovative action.

INTERVIEW CONDUCTED
BY **Janet Anderson**



Michael Häupl

Michael Häupl has been Mayor of Vienna since 1994 and involved in city politics since the 1980s. After studying biology and zoology at the University of Vienna, he worked as a research scholar at Vienna Natural History Museum.

When you set out on the Smart City Wien strategy in 2011, what was your vision?

Even before the term "smart city" came up we had already accomplished a lot in urban development, housing construction, transport, environmental protection, supply, disposal and much more. That was our starting point. But first of all, we had to be better and more ambitious in many areas.

Secondly, we had to be flexible, yet still know where we wanted to go. The Smart City Wien framework is a long-term umbrella strategy for 2050. The vision is that Vienna will significantly reduce the amount of resources the city consumes while maintaining social cohesion and continuing to offer a very high quality of life to all its inhabitants.

How has becoming a smart city changed the lives of Vienna's citizens?

The Viennese can rely on the fact that the city administration is focusing on social aspects and also on involving the population. We work together with all stakeholders to ensure that

the excellent quality of life in our city is maintained at the highest level for everyone – no one should be left behind. We must try to promote a gentle yet effective transition to renewable energies, advance public transport and maintain sufficient green spaces in the city so that everyone who lives here can continue to feel comfortable in our city.

What have been the biggest challenges in the introduction of smart solutions to an existing infrastructure, and how have you overcome them?

We live in the age of the Fourth Industrial Revolution. New innovations are launched nearly every day to simplify urban life. In Vienna, we have a highly reliable infrastructure. But we also want to improve it and ensure that we maintain its existing quality while keeping up with the times and allowing for the best quality of life in the future as well. This, of course, takes a lot of effort.

How important is cooperating with private-sector partners in providing smart services? What is the best way to manage these relationships?

Strong cooperation determines the success of the Smart City Wien initiative. It makes planning even more ambitious and inspiring. The framework strategy runs up until the year 2050 because the changes in the energy, mobility and building sectors cannot be achieved overnight. We're paying particular attention to working with companies and enterprises from Vienna as well as business partners, research institutions, science and other fields. This is an overall strategy operating under the theme: "Find clever solutions to complicated problems."

How have you involved Viennese citizens in the process of choosing and developing these smart projects?

A smart city gives its citizens the opportunity to participate in planning processes and improvements. This cannot, of course, be the case for all projects, which is why we want to consider all interests in the planning processes. However, our main concern is that no one should be left behind. There is a risk of keeping disadvantaged groups out of these processes. To avoid this, we offer both online and offline participation. For example, citizens can now send complaints or requests to the city administration quickly, intuitively and without mandatory registration using a new app called "Sag's Wien." It was developed through an open, online and offline process with the population.



SMART VIENNA

→ A QUICK LOOK

The Smart City Vienna strategy includes initiatives in many sizes and shapes. Citizens' solar power plants, run by the city-owned energy provider Wien Energie, give locals the chance to invest in community-funded green energy. Aspern Seestadt is a mixed-use development taking shape on the edge of the city. It combines intelligent design with sustainability and challenges developers, architects and engineers to come up with new ways of doing things.

Cities produce immense amounts of data and many smart solutions are built on capturing and using that data. How do you deal with concerns about privacy?

This is a very important issue in all our projects.

Data protection and data security have become increasingly important in our information society, in particular for the administration and public trust in our services. Every person has the right to keep their personal data secret. Also, personal data may not be collected or passed on without a sufficient statutory basis. We take this topic very seriously in the development of all our services and projects where we apply new possibilities and technologies.

What advice would you give to a similar city starting out on this journey?

Every city chooses its own definition of a smart city and defines its own priorities in solving the problems. The diversity and uniqueness of every city is a great asset and may lead to very different approaches to the subject of the "smart city." From my point of view, the strong cooperation and involvement of all stakeholders is crucial for implementing such a strategy. This requires more effort and time in the beginning, but is worth it many times over during the process of implementation. ■

