

INTERVIEW WITH MARTIN POWELL, HEAD OF URBAN DEVELOPMENT, SIEMENS

Solving Societal Problems with Smart Cities



The world population is growing rapidly, putting urban planning under increasing pressure. Cities are facing challenges such as how to improve the environment and how to reduce the impact of congestion. The smart city concept seems to offer a solution. Reflecting the fact that smart cities are built on geospatial foundations, Intergeo – the world's largest annual trade show for the geomatics industry – chose smart city as one of its key themes. To gain insights from an urban planning insider, 'GIM International' interviewed Martin Powell, head of urban development at Siemens.

(By Wim van Wegen, GIM International)

'Smart city' is a frequently used term, but its definition is not always clear. How

would you define a smart city?

There are so many different definitions out there. Siemens wanted to be very clear about what it believes smart cities to be. And actually they are all different; every city has a very unique smart city definition and its own criteria. For example, the Ministry of Urban Development in India is very clear about what it wants to achieve. Obviously, a city like London would have a very different baseline and aspiration than Mumbai. But, in broad terms, a smart city optimises the infrastructure that it has and maximises the efficiency and services that it provides to the citizen. It uses digital connectivity between the systems and the resulting data to deliver those services and to respond in real time. So that's our core ethos at Siemens: ultimately driving efficiency, optimising the infrastructure and putting a much deeper focus on the citizen and providing services to them.

How does a city become smart?

Well, that's the big question and the one that we ask ourselves on daily basis here. We have a whole team of people in our centre of competence for cities, with 70 dedicated city directors covering the whole world. We coordinate the data they collect to come up with a unique smart city strategy for each of these cities. In fact, in some cases, we're asked to do a smart nation strategy that is founded on smart cities. For example, in Saudi Arabia, our CEO Joe Kaeser spoke with a number of senior government officials and they asked if we could prepare a smart Saudi strategy. This entails us looking at each city individually and then coming up with a dedicated strategy for each of them. We then look at if each of those cities deliver their smart solutions and what can be done to connect the cities to get even more benefit economically or environmentally – for example, by improving the airports, improving the ports, the rail systems, the roads... how the cities are connected. In Saudi Arabia they have big aspirations to increase the number of pilgrims from nine million to 30 million per year. It's already incredibly crowded – 1.5 million people go to Mecca during the hadj alone (which is one or two weeks per year). So you can imagine that each city has very unique problems to solve. It's all about the connectivity between the cities.

Telling a story is also quite key; we want government officials to support what we're doing and the kinds of technologies that we provide. They must realise that a smart city is founded on good basic infrastructure, a good basic electrification footprint. The way to optimise that is by automation – this is the 'big ticket item' for the next five years: making train systems driverless, automating traffic control systems, low-emission zones, congestion charging – all tools that enable a city to plan itself into the future. Getting people off the roads and onto public transport – we are very focused on that – and then obviously this new layer of digitalisation and optimising each piece of infrastructure, connecting them and getting even more value from them.

Do you have any innovative examples?

There are definitely immediate improvements that nearly every train station in the world could make. Here in London, whether at King's Cross, Liverpool Street or Waterloo – every morning I get off the train and I have to queue to leave the station, I have to put a ticket into a machine and then pull it out again, then I have to find my way to the station and then I go down onto the Northern Line and find out that the Northern Line is not running, so I have to go to another line...this whole process could be simplified just about everywhere. We can have entirely ticketless systems, we can have open barriers. At Munich train station there are no ticket barriers; you just get on and off trains. It's free flowing, it's much easier, it's actually less stressful for the citizen, especially a commuter that does it twice a day. We can direct people down to train stations more easily, we can cope with technology for bomb scares, for fires, for major events that could happen in these public spaces. The key to a smart city is to find local solutions within the city that are going to improve people's lives. So in my case King's

Cross station could be improved with smart technologies, better wayfinding, better information pushed to my smartphone – things that will always have a huge benefit. If the journey itself, to my office, can then also be improved, with driverless trains that are smoother and more energy efficient, that can travel closer together so that more trains can operate on the same line during rush hour, and then make the building I work in smart too – lower energy consumption, cleaner air, nicer working environment – then you've got yourself somebody who is a lot happier than before. That's how you deliver a smart city strategy; you think about your citizens, the different demographics, the different people and their needs with respect to the city and you solve those problems one at a time.

I recently read an interview with the Australian professor Chris Pettit, who said we need to put people and place front and centre when realising a vision of smarter cities. What are your thoughts on that?

I absolutely agree in terms of everything we look at, all the tools that we use to model cities. At Siemens, we have a city performance tool which can take the whole city and analyse the way it operates. Then it can run dynamic scenarios showing how different technologies could impact environmental KPIs [*key performance indicators, Ed.*] such as CO2 reduction and air quality. So we can model all sorts of technologies – both Siemens technologies and good-old classics like insulation and double glazing, all of the things necessary to deliver the smart cities of the future. All of our modelling does this, based on the needs and wants of the citizens and the objectives the city is trying to achieve. So yes, we always put that front and centre in terms of the analysis we do.

Intergeo, the world's largest geomatics trade show, has chosen smart city as key topic this year, and the event's motto is 'Knowledge and action for planet Earth'. In your view, how can the geospatial sector contribute to making cities smart?

I think it can play a huge role in helping to understand what cities – the spaces that we live, work and play in – look like. For example, the Regional Planning Association of New York is responsible for the long-term planning for New York City. This is all about understanding how people move through the city's spaces and how accessible these spaces are. If you have a deep understanding of how people use the city, where and how they move about, you can begin to plan transport networks, housing and places of work and really think much more cleverly about how the city can be used. Ultimately our cities are growing, we're urbanising at a faster rate than ever before, so the pressure is on to achieve big energy reduction targets or big improvements in air quality. And the results have to come through using these spaces more cleverly.

Siemens is looking to make its mark in the smart city space of tomorrow, and the company slogan is 'Ingenuity for life'. What is Siemens' objective?

We have always seen cities as a key part of our strategy. For the past five years we've had a dedicated team looking at how to tackle some of the big problems in cities. Cities can respond quite quickly, lessons can be learned – which helps in making national policies. At Siemens we are very keen to help come up with the solutions and answers to these sorts of problems. 'Ingenuity for life' can mean whatever you want it to mean. For me, the Siemens objective here is about a sustainable future for cities – making infrastructure investments that are going to work for the long term, that will allow people to get to work more quickly without being on crowded trains. And it's about being able to do all this using less energy while keeping the energy flowing to our houses and buildings. The other meaning of the slogan for me is solving the very problems that we're seeing in cities like Beijing, Moscow and Riyadh: really poor air quality as a result of controllable emissions, transport emissions, the build-up of gas in our buildings and boilers. We want to help cities overcome this and really improve the quality of their air. Over 5,000 people die prematurely every year because of poor air quality in London alone. We have modelled London with our modelling tool and we're actively working with the Mayor's Office, the Greater London Authority and Transport for London to come up with solutions that will tackle such problems. So in this case 'Ingenuity for life' is very much about preserving people's lives.

Smart cities are often associated with high costs. Is that assumption correct?

No. We are very active with the Smart Cities Mission in India, the government-led initiative to develop 100 smart cities across India. The amount of public funding is relatively small but the government is setting up some very interesting investment vehicles to allow the private sector to invest via public/private partnerships. The government is pushing through the projects that make financial sense, i.e. low capital costs, high return. For example, in the case of retrofitting of public buildings, the savings made on energy pay for the work to be done. So this is all about thinking what you can do with small amounts of money for quick wins, what you can do to leverage private-sector finance for longer-term or difficult projects, and just building that sequence together. Government backing, as is the case in India, gives the private sector – companies like Siemens – the confidence to go there, to invest and to get behind such initiatives. And it's proving very successful; we've already won our first Swiss challenge tender under the smart city programme, so we're very pleased with that.

This year marks 200 years since the birth of Werner von Siemens, founder of the Siemens company. Would he be a passionate smart city evangelist?

That's a great question – Werner von Siemens actually invented the smart city! He brought the very first electric street lighting to London. Back then, his vision was this: the smart city is one that enables people to travel, to live, to turn the lights on, to have a better quality of life than they had before, and to communicate. This is everything you hear in a smart city definition today, and Werner von Siemens was doing it 160 years ago.

There are many cities across the globe with poor urban planning. How can those cities be made smart?

There are indeed many examples of poorly planned cities, ones with huge areas of inner-city slums, relatively poor transport connections, relatively poor supplies of energy, water and so on. I think places like this have been approached quite badly historically, also by the multilateral banks and by organisations like UN-HABITAT. They tend to try to move people into better communities rather than focusing on improving the existing communities without moving them. One example of what can be done is in Medellin, where the government built a cable car to connect the favela to the city centre. The beauty of this is that it's low-cost transport infrastructure. It enabled people who previously couldn't access the job market in central Medellin to get jobs, earn money and improve their homes. This has also led to the emergence of community groups that are now trying to improve the quality of water, directing government funding towards improving basic sanitation and basic water services, in other words making incremental improvements to the quality of life. I think this is very key, rather than trying to come up with some amazing solution that tries to transform a city, like in Rio de Janeiro by moving everybody and building brand-new communities – that's just unrealistic. The best way forward is to incrementally improve people's lives as in the example I just mentioned, and that's true anywhere. Here in London, if you can make my journey to work five minutes quicker I'm very, very happy. I think

this is what we often forget; if we can just incrementally improve people's lives by making smart decisions using smart technology to help people access the job market or access basic services, then we're going to make a really big difference in many of these cities.

What's your message for members of the geomatics industry regarding the smart city concept?

The combination of technologies and good city spatial planning makes up the smart city concept. Over the last 20 years, the geomatics industry has provided city planners with invaluable geospatial data that has helped them understand the environmental, social and economic profiles of buildings, streets and entire neighbourhoods. Smart cities, with their endless source of live sensors, will simply accelerate the process. I see the geomatics and smart cities technology industries providing mutual co-benefits. Processing this vast amount of geo-linked information is the next frontier in good city planning, helping city officials diagnose and predict current and future urban phenomena.

Martin Powell

Martin Powell has global responsibility for the Urban Development practice in the Siemens Centre of Competence Cities. This involves working with mayors and leaders providing advice and support to cities as they strive to meet tough economic, social and environmental targets and looking at economic and technical models of delivering solutions at scale. Prior to this, he was the environment advisor to Mayor of London Boris Johnson, responsible for policy in water, waste, air quality, energy, climate change mitigation and adaptation and biodiversity. Powell was also the executive director for the design and delivery of the City of London's environmental programmes. As managing director of Cambridge Management & Research he was also a special advisor to the C40 Cities Group under the chairmanship of former Mayor of New York, Michael Bloomberg. An engineer, Martin Powell built his career working with organisations to structure their projects, programmes and project management approach. He is an editor of several books including *Better Cities*, *Better Life* and, most recently, *Smart Cities – Cities in the Digital Age*.

<https://www.gim-international.com/content/article/solving-societal-problems-with-smart-cities>
