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Four global infrastructure priorities: An interview with Roland Busch

How traffic, energy, water, and security issues will shape the future.

Rik Kirkland,
McKinsey & Company

Roland Busch, a member of the managing board of Siemens, is responsible for its Building Technologies, Energy Management, and Mobility divisions, as well as for the Asia/Australia region and the company's Corporate Sustainability Office. He joined Siemens in 1994 and has worked in several areas, including automotive, process management, and strategy. In this interview with McKinsey's Rik Kirkland, he talks about how cities can get smarter and why incremental improvement is not enough.

McKinsey: *What are the themes that will define how infrastructure evolves?*

Roland Busch: Urbanization is one key trend. More and more people are moving to cities, for good reason. Cities are the most effective and efficient way to provide the infrastructure that people need, including education, health, housing, and transport. This is a chance and a challenge. It requires new technologies, new ways of thinking, and a lot of investment.

Another important point is that while there are many differences between emerging cities and mature ones, they also have many of the same problems. So, when I'm meeting mayors and urban planners, whether it's

in Asia or Europe, we often discuss the same topics.

It starts with traffic. This is the most pressing problem of every city—how to move people and goods. Next is the need for energy. Many cities have a greenhouse gas–reduction target as well. Number three is wastewater. And number four is security. Cities are competing against one another, after all, and nobody wants to live in an unsafe city.

McKinsey: *Tell us a little about how to make cities smarter. By that, I mean using technology to make infrastructure more responsive.*

Roland Busch: Incremental infrastructure improvement will not do the trick. Think about transport. If you want to leverage the huge amount of capital that has been invested in a metro line, for example, you naturally want to get the most out of it. Intelligent systems such as control centers and trackside control equipment can help. A driverless metro system can increase capacity compared with a conventional system by 20, 30, or even 50 percent. That's because by making systems smarter, you get much more out of them.

It's the same thing with power grids. They have to be controlled and managed with the right hardware and software. If you know what the consumer is going to consume, and when and where, then you can manage the overall load much better. That has financial benefits for both grid operators and consumers.

Buildings are another example of how technology can make infrastructure more intelligent. Automation systems, sensors, and actuators can

manage buildings while saving a lot of energy and still being very comfortable. In Berlin, our engineers worked on a project with the city to cut energy consumption in more than 160 buildings by 20 percent. And they achieved their targets—with the right technology in place. That saved a lot of carbon dioxide and reduced operational costs, too.

McKinsey: *Does Siemens install the sensors or manage them?*

Roland Busch: Both. You definitely need to have more sensors so that you can generate more data. But it's more important to use that data to create value. For example, we are using management systems in buildings that not only optimize for energy efficiency but also take care of fire safety and security.

It's not about big data per se; it's about relevant data. You start by defining the problem you want to solve. What is the business case? What is the value for the customer? And then you ask: What data do we need, and how can we deploy it?

Let me give you an example. We have sensors on rail tracks that listen to each and every wheel and can determine which one is going to break or which one needs to be refurbished, say, in 500 or 1,000 kilometers. This is predictive maintenance. It improves the availability of the fleet and lowers the cost of maintenance. And you can do similar things in industry.

McKinsey: *It sounds like you need a high degree of expertise in information technology to do these kinds of things.*

Roland Busch: Yes, and that's a big challenge. We differentiate between horizontal and vertical IT. Horizontal IT refers to the systems that run on PCs. Vertical IT is about addressing the core processes of our customers. That includes our field devices and our automation devices. Vertical IT uses data that have been generated by sensors and other hardware sources. With software, you can use these data to improve your processes and future investments.

It's about how IT can optimize processes, and that's a real challenge. We have many engineers who know how to program an automation system. We have others who know IT by heart. What we

need is a blend—people who understand processes and IT. And you don't find them on the street. So we try to find them on the working level, as well as on the management level, and then we train them.

McKinsey: *Some countries are building new smart cities. What's different between working in an older city versus doing something from scratch?*

Roland Busch: In both kinds of places, the basic idea is to deploy technology as effectively as possible. Siemens is supplying the turnkey system for two [of six] driverless metro lines



Roland Busch



Vital statistics

Born in Erlangen, Germany, November 1964

Education

PhD in physics, Friedrich-Alexander-Universität Erlangen, Nürnberg, Germany

Career highlights

Siemens

(2011–present)
Member of the managing board

(2011–14)
CEO of Siemens Infrastructure & Cities Sector

(2008–11)

Head of corporate strategies, corporate-development department

(1994–2008)
Various titles

in Riyadh. This system is all new, so we can design it such that all the technologies fit together, from the rail tracks to the ticketing system. But when we were refurbishing a line in Paris and going from driver to driverless, there were certain limitations, starting with the rolling stock.

McKinsey: *How do you see the future of infrastructure?*

Roland Busch: My colleagues and I talk about industry being close to 4.0. But when it comes to infrastructure, we are at 1.0. Still, the technology is there to go for the next level or even the next one; it's just that it takes time.

Infrastructure projects are complex, expensive, and political. So I would say two things: we need higher productivity, and we need to get more capacity out of existing infrastructure.

We cannot afford to slow down the development of cities. This is where people are moving, and cities also drive the global economy. By 2025, 600 cities will generate nearly 65 percent of world economic growth, and they are growing fast. That means if countries want to grow, they have to address the state of their cities. That means urban authorities and the companies that bring technology in have to work together. ○