Inspired infrastructure

The secret to hitting a moving target is to aim slightly ahead of its trajectory. Stakeholders in infrastructure design, construction, and management face a similar challenge in working to develop cities capable of sustaining us tomorrow.

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At the inaugural meeting of the Global Infrastructure Initiative in 2012, we added our voice to those calling for a focus on infrastructure development. It remains one of the most pressing concerns of our age. The world's population is projected to reach nine billion within the next 40 years. By 2050, 64 percent of the population in the developing world and 86 percent of the population in the developed world are likely to be living in urban centers. These urban centers are already feeling the weight of shifting demographics, while being battered by increasingly volatile weather patterns and challenged by limited natural resources.

To create environments that are economically viable and able to withstand these unprecedented challenges, we need to develop the right infrastructure in the right way. The right infrastructure fulfills multiple objectives; requires a coordinated, long-term approach; draws on the expertise of many; and above all is sustainable. Whether starting from scratch, rebuilding, or upgrading existing networks and structures in well-established cities, stakeholders that address these four areas will succeed in developing the right infrastructure in the right way.

Consider what the Malaysian government is doing with what used to be the country's main airport. Subang Skypark is being converted into Asia Aerospace City (AAC), a world-class hub for the aerospace industry. As lead consultant and master planner on the project, Atkins has to address

multiple objectives while ensuring this new city is sustainable for the long term. We must take into account numerous factors—including the ebb and flow of local populations, changing weather patterns, and the economic viability of the design. AAC will be designed as a smart city and include a convention center, state-of-the-art research and development facilities, integrated office suites, academic campuses, and residential areas. The government agency responsible for education and entrepreneurship hopes AAC will attract global aerospace-engineering services to the region.

Infrastructure development and design requires a coordinated, long-term approach. Governments must put policies in place now to protect cities' environmental, economic, and social fabric. And the industry must work together to support these policies with infrastructure that is fit for the 21st century. Qatar offers a case in point: its national-development strategy plans to deliver more than $65 billion in infrastructure by 2016. The work will include diverse projects—roads, bridges, highways, railways, and ports—and require a coordinated effort. To make this happen, the Ministry of Municipality and Urban Planning created a central planning office that acts as an anchor for all major infrastructure schemes and creates solid links among engineering contractors, consultants, and various departments of government. Atkins's role in this endeavor is multifaceted: we need to be innovative designers, influencers, and good partners, keeping an eye on the long-term vision throughout.

Major infrastructure development in established cities creates challenges that would be impossible to solve without drawing on the expertise of a range of technical specialists. For example, the new east-west rail link through central London, Crossrail, has the potential to redefine the way the city moves. But weaving 42 kilometers of tunnels through a maze of existing underground sewers, foundations, chambers, and lost watercourses is no easy feat. Getting the most out of this project and creating something truly sustainable requires tapping into the collective expertise of all engineers, government agencies, and contractor partners. At the same time, experts must maintain a clear view of the project's long-term goals: increasing investment opportunities through over-site development; putting more people within easy reach of the city, which is fundamental to the business case; adding extra capacity and cutting journey times; running more comfortable, energy-efficient trains; and creating strategic transport hubs. By breaking out of our silos, we as an industry can work together to create integrated solutions and measures for future proofing our cities.

How do we future proof our cities? How does the industry take the lead and emphasize the clear link between sustainable thinking and economic development? By promoting and delivering sustainability in everything we do, no matter the size or type of project. Consider the pollution challenges facing some cities in China. While experts may be tempted to seek out major infrastructure solutions to the problem, more sustainable alternatives exist. Smart solutions can be used to address inefficiencies in the manufacturing sector. A more energy-conscious and efficient manufacturing process could help reduce air pollution and revitalize the sector in China.

An exciting collaboration among UK Trade & Investment, leading academics, and industry representatives from the United Kingdom and China is one such alternative. These parties are working together to analyze Chinese factories' energy and water consumption and identify savings opportunities. They will offer a variety of recommendations—from replacing lighting to

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installing submeters, upgrading motors or kilns, and reusing water. The collaboration is still in the pilot phase, but experts anticipate that factory owners will realize savings within 12 months and return on investment within five years. Thousands of facilities have been identified as possible participants in the next stage of this program. Factories and pollution are not new challenges, but the key to unlocking their sustainable potential is the development of easy-to-install, low-cost technology. What's more, this example illustrates the power of innovative investment models and shows that sustainability efforts can pay for themselves by addressing existing inefficiencies. This concept is already maturing in other parts of the world, such as Germany and the United States.

Cities can foster innovation and improve standards of living, but only if we ensure their future. Future proofing our cities means anticipating problems and finding solutions before the problems materialize, which cannot be achieved by working in isolation. This demands an unprecedented level of imagination and cooperation among engineers, scientists, planners, policy makers, and other experts from across the built and natural environment. And it means we must look beyond our immediate goals to what lies ahead, if we are ever going to hit our target.

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