



Fraser Davidson, Smarter Cities Lead, IBM
UK&I, www.ibm.com

“Smarter” cities are reducing their carbon emissions

And improving the quality of life

In the past two years, our planet reached an important milestone: for the first time in history, the majority of the world’s population resides in cities. This shift from a rural concentration of people to an urban one took tens of thousands of years to achieve – and now it’s accelerating at rapid speed towards unprecedented urbanisation. In the UK, around 80% of the population already live in urban areas, compared to a world average of just over 50%, which is expected to increase to 70% by 2050.

In order for cities to reduce their carbon footprints, greater importance should be given to factors that immediately impact a city’s CO₂ emissions, such as the type and quality of the energy supply and infrastructure, the energy efficiency of physical infrastructure such as buildings, and the energy use of its transportation systems and traffic congestion. It’s estimated that lost productivity and energy use due to traffic congestion adds up to one to three percent of the world’s Gross Domestic Product.

People want to live in cities where there’s a high quality of life. All these demands are placing a huge strain on city infrastructures and the planet’s resources. We need a “smarter” approach to sustain our cities’ prosperity by applying advances in technology, a better understanding of how systems work, and how they are interconnected to one another.

City infrastructures that deliver vital services — such as transportation, healthcare, education, public safety, energy and water — must sense and respond intelligently and in a coordinated way to the needs of their growing populations.

According to a recent study by IBM’s Institute of Business Value, “A Vision of Smarter Cities: How Cities Can Lead the Way into a Prosperous and Sustainable Future,” city leaders need to think about three things in order to transform their region into a “smarter” city. They are:

- **Assemble a team:** City administrators need to work seamlessly across their own organisational boundaries and partner effectively with other levels of government in order to tackle issues that require significant collaboration among city, state or provincial leaders, along with national levels of government. In addition

to formulating new policies themselves, cities must be able to articulate challenges they may face when policies are made elsewhere.

- **Think revolution, not evolution:** Building a next-generation city requires a municipality to be more than focused or efficient. City leaders need to look at systems, most of which are interconnected, and enable people and objects to interact in entirely new ways. These systems can use instruments to analyse and report on the exact condition of individual parts, such as city traffic systems that re-route vehicles around automobile accidents. By using “intelligent” systems, cities can respond to changes quickly and accurately, along with the ability to better predict and plan for future events.
- **Target all city systems, not just one:** The interrelationships between the various systems operating in a city mean that while cities obviously must prioritise their challenges, solving problems in just one system is not a viable long-term option. A holistic strategy that looks at all of a city’s systems, and builds in system-wide feedback mechanisms, is a better way to deliver sustainable prosperity to its citizens.

Work has begun in cities in the UK and around the world.

The cathedral city of Peterborough is at the forefront of developing smarter systems as it prepares to expand its population to 200,000 by 2020. Already one of the UK’s leading environmental cities, city officials plan to maintain their lead by introducing new technologies capable of understanding and connecting city-scale systems. New technology can now sense, analyse and integrate data, enabling the city to respond intelligently to the needs of citizens living and working in Peterborough.

The cities of Singapore, Brisbane and Stockholm are all working to reduce both traffic congestion and air pollution through intelligent transportation solutions, including predictive tools to route vehicles around traffic accidents.

Cities around the world, including several in Italy, the island of Malta and the state of Texas



are using “smart” electric meters and instruments to make their power grids more stable, efficient and ready to integrate renewable energy sources and electric vehicles.

Rotterdam will adopt a monitoring and forecasting system for smarter management of water and energy to create the first “Smart Delta City:” a city that uses real-world, real-time information to manage infrastructure and operations related to the effects of climate change in an ever-changing, complex natural water system.

In New York, almost 80 percent of CO₂ emissions come from heating, cooling and providing electricity to buildings, which is more than double the U.S. average. New York wants to reduce greenhouse gas emissions from city-owned buildings by 30 percent within the next eight years and by 30 percent from all buildings by 2030.

China is spending the equivalent of billions of dollars to introduce high-speed trains and expand its rail network, adding 25,000 miles of track between now and 2020. The goal is to move people and goods in a transportation system that can fuel economic development without adding more automobile or truck traffic. China expects to have more high-speed passenger rail than the rest of the world combined in the next five years.

These solutions and many more are making a real impact today, the first step towards creating a true smart city.

If we’re really going to see meaningful change, city by city, we need to encourage stronger collaboration between governments, business, academia and city residents and groups. Each organisation offers strengths in solving challenges. We can work together. And we must.