



D-Link®

Connect the dots

Prepare for a smarter future
by facing the reality of today's
cities and factories

Smart cities and factories - the end of the world as we know it?

Despite fast technological advances in recent years, the developing world is actually evolving at a rate that most of us can cope with. That's not to say we don't look back and see the stark contrast between our former existence and the one we're experiencing today. But it does show that while dramatic change may be just around the corner, we can adapt to it, bit by bit.

The same can be said of smart infrastructures and environments. Everything around us is shifting – or about to – as a result of Internet of Things (IoT) and Industry 4.0, yet we can't predict just how far it's going to go. What we do know is that today's governments, communities and manufacturers are facing some very tough challenges that need to be addressed in our immediate future.

Our population, climate, infrastructure, working and buying behaviours are all evolving. Although it's more comfortable and less risky to just carry on as before, we cannot go back. Nor will things stay the same.

Citizens, employees and consumers have to be ready for change that will enhance our lives, without completely disrupting what we know and do. Governments and manufacturers can take confident steps to prepare for a more connected future – by developing intelligent cities and factories built on smart advances, not giant leaps of faith.

Our past:

Reinvention has brought us here

Before the IoT, there was just the plain old Internet. Before wireless access, wires tethered us. Before Industry 4.0, we embraced everything from steam power to mass-produced goods and increased automation. Before always-on connectivity, we could only access what we were given. And as with any bygone era or revolution, we accepted our reality at that time without fully understanding where it would lead us next.

Times have always changed, but the last two decades are notable for the speed at which our behaviours, lifestyles and communications have evolved through developments in technology. Yet, the rate at which some of those innovations have become commonplace is also astonishing. Being online is now as standard as talking.

The problem with this transformation is that the impact is still catching up with us, while smart technology continues to forge ahead. More of us are moving to cities, our infrastructure is no longer fit for purpose, and people want more freedom and flexibility in the way they live and work. Our environmental health also needs a serious check-up, with natural resources needing to be conserved and climate change affecting the quality of roads and buildings.

For manufacturers, end customers now expect goods to be produced and delivered faster, to a very high quality. They want choices, both in terms of the products they buy and the companies that offer them. This has also led to increased like-for-like competition, particularly as factory automation becomes the norm.

Despite budgetary and strategic constraints, the pressure is on governments and manufacturers to take strides towards smarter IoT (and IIoT) environments where interoperable systems will improve everything. However, many of these solutions are still concepts – and most of our urban, social and environmental issues are too big to solve easily.

The past is revealing

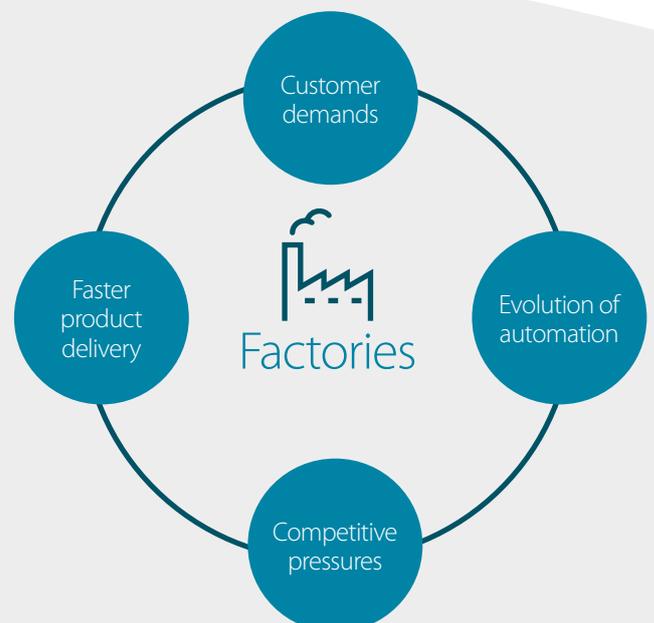
By 2050, 70-80% of us will reportedly live in cities; which is an estimated 7.2 billion people
ITProPortal / United Nations

By 2020, there may be more than 20.4 billion connected "things"
Gartner

One of the main factors affecting large cities is climate change
Smart Cities Council

80% of the world's data has only been created within the last few years
ITProPortal

What we know and cannot change



Our present:

Today's challenges are our reality

Our past has led us to where we are today, just as what we are seeing now will influence future developments. Yet when we look at the rapid rate of change that innovation has afforded us, why does it feel as though there is still a way to go before we make full use of what we already have?

We talk about driverless cars and smart parking while we're still facing traffic congestion and fewer parking spaces for growing city populations. We focus our attentions on cyber security vulnerability when people also feel unsafe on the streets. Most of us are part of the mobile population, yet cannot access Wi-Fi wherever we go. And despite the excitement around advanced robotics, manufacturers aren't always getting the most out of the machines they already have.

Although many of these developments could happen and are happening, they will only make sense if we address today's challenges. Self-driving cars won't have quite the anticipated impact if they're always stuck in traffic – and what about the impact on pedestrian safety, with more people living in cities?

That's before we consider how long it will take for the full benefits of driverless cars to be ironed out and realised, and for the population to fully embrace them. Not to mention the new set of opportunities and challenges that will arise from this new reality. But going too far down this road is when the uncertainty and complexity starts to kick in.

If a smart environment is defined as liveable, workable and sustainable, then it has to start with how we live and work now – and take us a step further, into a known and sustainable future. In many cases, this can be achieved using existing infrastructure and the IoT solutions that are already fit for purpose.

The present is happening

96% of people are unaware of smart city initiatives in their own city

YouGov and Arquiva report

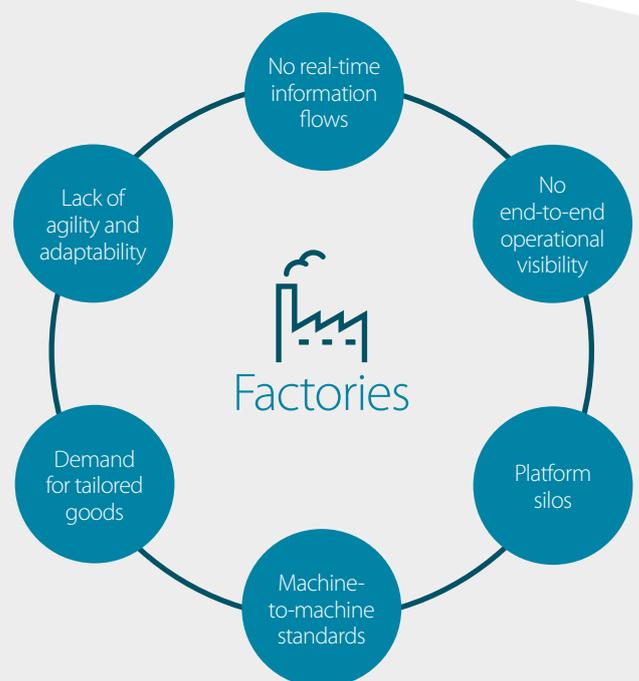
If a city like London implemented on-street smart parking management services, drivers could save 33,000 hours spent in cars looking for parking, offering indirect benefits of €870,000

Smart Cities Council

If the rise in global temperatures were to be kept at less than 2°C, 90% of road vehicles would have to make the switch to electric by 2060

Smart Cities Council

What we experience and can change



Our future:

All signs point to what's next

It's clear that looking too far ahead is not the best approach or the easiest starting point. Putting too much thought into the remote future can send governments and manufacturers down a costly rabbit hole or, at the very least, a challenging path given what we know today.

Remember the Millennium Bug, when companies checked, fixed and upgraded computers in preparation for mass failure when the clocks rolled into the year 2000? Anticipations were high and budgets were allocated to sort the problem, but very little actually happened.

The fact is that some of the smart developments being imagined will definitely happen, some might and some just won't. Others will likely turn into entirely different propositions that we haven't even considered yet. Yet, we still need to get ready for a more connected future – and there are clear signposts from the past and present to help us prepare for what's next.

With the technology and connectivity available today, we can start to manage our traffic and roads better. This will help to address the growing city population – and prepare the urban infrastructure for smart cars, which are expected to deliver large amounts of data

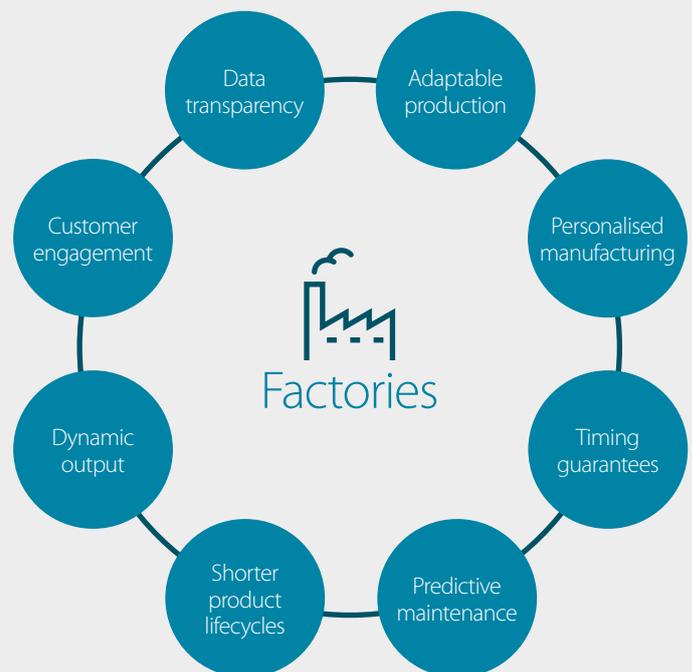
about road and traffic conditions. Imagine how much better this would be if the situation was already under control, and your car simply gave you an even quicker route to your destination?

You could also add outdoor wireless access points to powered fixtures that already exist, such as street lamps or light fittings, to save on energy – and still bring seamless, city-wide Wi-Fi connectivity to the mobile population. This, in turn, will also open up opportunities to bring citizens and visitors real-time updates on traffic, travel, events and much more.

Focus on meeting the immediate needs of citizens, employees and consumers to form the foundations of your smart environment. Across infrastructure and industry, the key considerations are transparency, safety, personalisation and productivity. Everyone has to be able to get to where they are going, do (more of) what they are doing, have what they need and understand what's going on.

This list is not exhaustive and there are many exceptions. However, if the concept is still just a concept and the smart solution is a challenge we've yet to understand, almost everything else – the longer-term future – is still unwritten.

What we expect and can prepare for





The future is unfolding

The mass of data that will be generated through increased connectivity is where governments and manufacturers will find quick wins. Continually analysing information gathered in the present can influence developments in the future – revealing patterns that lead to cost savings and short-term efficiency gains, which can be scaled up at a later date.

However, data cannot be shared if systems cannot work together. This can also lead to silos of information, which do not provide the full operational and business picture, making it much harder to glean valuable insights that you can share and learn from. Changing the way you collect and use data is a great way to streamline processes and join up your thinking.

The near future is not a time for assumptions or educated guesses. With so much speculation and change, it's important to understand what's needed to create better solutions, and tie this back to your management systems for more informed planning and decision-making.

Having granular control over real-time data and turning it into intelligence is your opportunity to become more proactive, predictive, productive and responsive – and grow along with changing needs as our smarter future unfolds.

With 7.2 billion people connected more than ever before, the numbers and size of available data will be incredible

ITProPortal

By 2020, 10% of smart cities will use streetlamps as the backbone for a smart city WAN

Gartner

Through the power of algorithmic analyses, data can drive all processes, detect operational errors, provide user feedback, and, when gathered in enough scale and scope, can be used to predict operational and asset inefficiencies or fluctuations in sourcing and demand

Deloitte

Conclusion:

Connect the dots to a smarter future

Given the buzz around smart cities and factories, it's easy to think big and imagine the possibilities, which may well turn out to be our connected realities. Yet, like any future, it will be an evolution, not a revolution. For now, the smartest plan is to see what's already in clear view and on the horizon. Start small and manageable, before scaling up down the line.

There are some clear advances you can make today that will deliver immediate benefits and continue to pave the way towards further smart developments – fully connecting where we are with where we're going next.

If you're a government agency, your town or city will require urban sensors, smart beacons and IP cameras to help improve traffic monitoring and management, and the surveillance of public areas. You can share the same equipment for different applications, to help you get the most out of your budget. And because you can network them back to your central systems, you can collect, analyse and continually learn from the data being generated.

If you're a manufacturer, creating a live link between machines, sensors and mobile devices will give you a single view of your product and process data. By making this data accessible to relevant systems and staff, you can increase responsiveness and reduce inefficiencies before productivity is affected. This level of awareness and control will have an immediate impact on output – and give you the added data intelligence needed to adapt to change.

Each of these advancements rely on industrial – or hardened – switches, which can be deployed on factory floors and in roadside cabinets that provide power. They can also withstand the extreme temperatures, vibrations and shocks expected in outdoor or rugged environments.

Seamless connectivity from D-Link

Create an intelligent infrastructure that connects people, processes and data. D-Link is the reliable choice for network connectivity that will transform your smart city, automated factory or wireless outdoor environment.

We're known for our high-quality enterprise switches. So when you combine these with our Industrial Ethernet switches, you benefit from one seamless network that maintains data flow from the factory floor to the office – or right across your city, from the very edge to the control centre.

With high network availability in extreme conditions, you can rely on system uptime to increase productivity, real-time video surveillance for public safety, and wireless connectivity that meets citizen demand for services and access to information.

With D-Link, you won't just prepare for a smarter future. You'll succeed.



Find out more
eu.dlink.com/industrial

D-Link[®]

For a smarter, more connected future