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10 ways AI can connect Smart Cities

1 Only use **what you need, when you need it**

Sensor technology can be utilised in street lighting so that it's only activated on-demand. This removes unnecessary electricity usage.

Driving around trying to find a car park can use up fuel and churn out unnecessary carbon emissions. Using computer vision technology, sensors can alert drivers where city parking is available. These same sensors can identify traffic volume and optimise traffic signal controls at intersections.[1]

AI-powered gamification has the power to encourage lower energy consumption, like an app that challenges utility customers to modify certain behaviours to preserve energy.

2 Advocate for **Advanced Air Mobility**

By using AI and simulations to predict traffic patterns and weather, the airspace can be redesigned to enable more efficient flight routes that reduce fuel burn and carbon emissions.

Digital twin technology can use live data to anticipate how weather conditions will impact air traffic delays. This enables air traffic managers to optimise their network controls, improving efficiency and reducing the impacts of delay to passengers and businesses.[2]

> **FACT** Deloitte's Optimal Reality solution was used by an air service provider to enable a more efficient aviation network. The application could deliver up to a 33% reduction in air delays. Read more.

3 Optimise **traffic flows** and **urban planning**

AI can be utilised to increase the schedule reliability and route efficiency of public transit while monitoring for driving violations. Reporting illegal activity in real time can reduce the number of delays caused by cars illegally parked or driving in specified transit lanes.

Computer vision technology can be used to detect potholes and streets that need to be updated for speed control or parking options.

AI-enabled autonomous waterborne transport can complement an existing public transport system. Shortcuts over waterways minimises road traffic congestion, reduces travel distance and makes a city more connected.[3]

> **FACT** One company has developed an autonomous traffic management platform to automate complex processes and support public service vehicles like buses and police cars. Read more.

4 Involve citizens on their **climate impact**

Smart screens can be installed in city accommodation, informing residents on everything from outdoor pollution levels to household energy consumption performance.

Computer vision surveillance can detect actions such as littering and illegal waste disposal. This holds individuals and cities accountable for their actions.

Data on energy utilisation, traffic and pollution levels can be analysed and leveraged to predict usage patterns. Making this data available to residents enables households and businesses to learn and modify their energy consumption.

5 Put **safety** first

Computer vision technology can be used across spaces with high-human traffic to detect weapons and help authorities act proactively against criminal activity or dangerous situations.

AI sensors can be used in assets such as traffic lights to ensure they are operating at optimal levels. These sensors can then trigger an alert if the asset is showing signs of malfunction before it breaks.

Machine learning models enable more accurate risk assessments based on historic and live data. This can allow for more informed decision making when finalising infrastructure safety measures.

> **FACT** Dubai conducted a Smart City project involving monitoring bus drivers for signs for exhaustion and fatigue, which contributed to a 65% reduction in accidents. Read more.
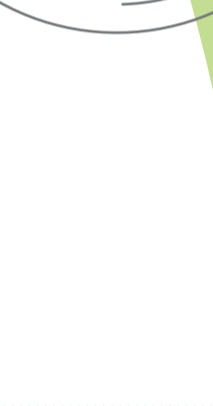
6 Promote accuracy in the project design and planning

AI can help to overcome setbacks by incorporating more accurate historical project data and geospatial data into future project plans.

Machine learning can be leveraged in project management software to allow for better planning and the optimisation of resources and processes. This can reduce errors and manage workflows across multiple sites for real-time resource allocation.

> **FACT** As more people migrate to urban areas, cities are likely to see more change in the next 30 years than the last 100. Read more.
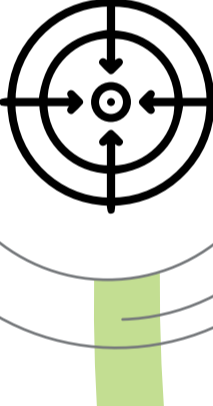
7 Ensure **infrastructure resilience** and **sustainability**

New Edge AI technologies can analyse live data collected through 3D sensors on everything from climate factors to structural elements. This can help to improve decision making on how best to maintain a structure and maximise its lifespan.[4]

Machine learning models can create reports based on historical and project data that can indicate the likelihood that a given project will fail. This can minimise unnecessary costs, minimise waste and ensure that all completed projects are done so efficiently.

AI generated simulations can determine the resilience of an infrastructure system by analysing how past events (i.e. natural disasters) could impact structures. This enables project teams to identify areas that need preventative measures.

> **FACT** Buildings utilise 40% of global energy, 25% of water and 40% of resources. Residential and commercial buildings alone consume approximately 60% of the world's electricity. Read more.
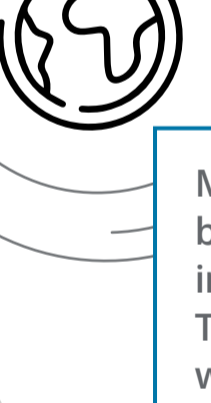
## 8 Remove and reduce **waste** and unnecessary **cost**

AI enhanced sorting systems can automate and speed up the identification of recyclable materials. This increases capacity for recycling companies and enables more a more accurate recovery rate.[5]

Smart water and waste management, enabled by AI, can detect leaks and trigger waste-collection before it's required.

Responsive devices enabled by AI are able to temporarily stop consuming energy when demand and prices increase.[6]

> **FACT** In 2017, Australia used its first deployment of rubbish bins that were outfitted with sensors and solar compactors. The sensors monitored the fill-level rates, temperature and fullness of the bins. Once bins were 80% full, the waste collectors were alerted, and data was sent to a waste management dashboard to provide analytics. Read more.
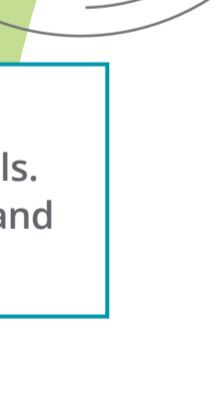
9 Respond with **agility** to **complex health events**

AI can detect and recognise individuals in urban public spaces. By analysing people's movement trajectories, city planners are able to identify high-risk areas and redesign structures to make them more pandemic proof.

Surveillance systems integrated with AI technology can detect masks in large crowds. This can trigger alert to be sent to individuals or health authorities when mask compliance is not being met and there is a health risk.

Face-recognition and sensor technologies are minimising the need for touching surfaces and human exposure. This can be seen in airport security and telemedicine with the remote monitoring of patients to reduce risk.

10 Smart city, **smart government**

Governments can more easily respond to citizen complaints through AI integrated platforms that alert the appropriate resource teams when a complaint is posted on social media.[7]

Digital identification enabled by AI allows citizens to have a single app for all public services. By streamlining processes, such as registering a vehicle or renewing a licence, governments are able to provide a more efficient and accessible customer experience.[8]

> **FACT** Smart cities have the potential to boost the economic development by over 5 percent and deliver at least USD 20 trillion in additional economic benefits by 2026. Read more.

Get in touch

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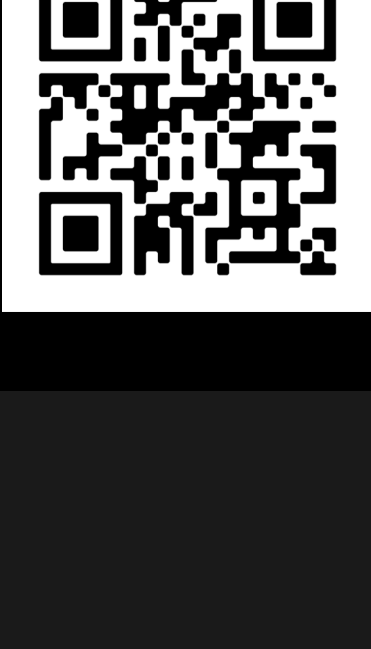knuttall@deloitte.com.au
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