

Intelligent Secure Edge

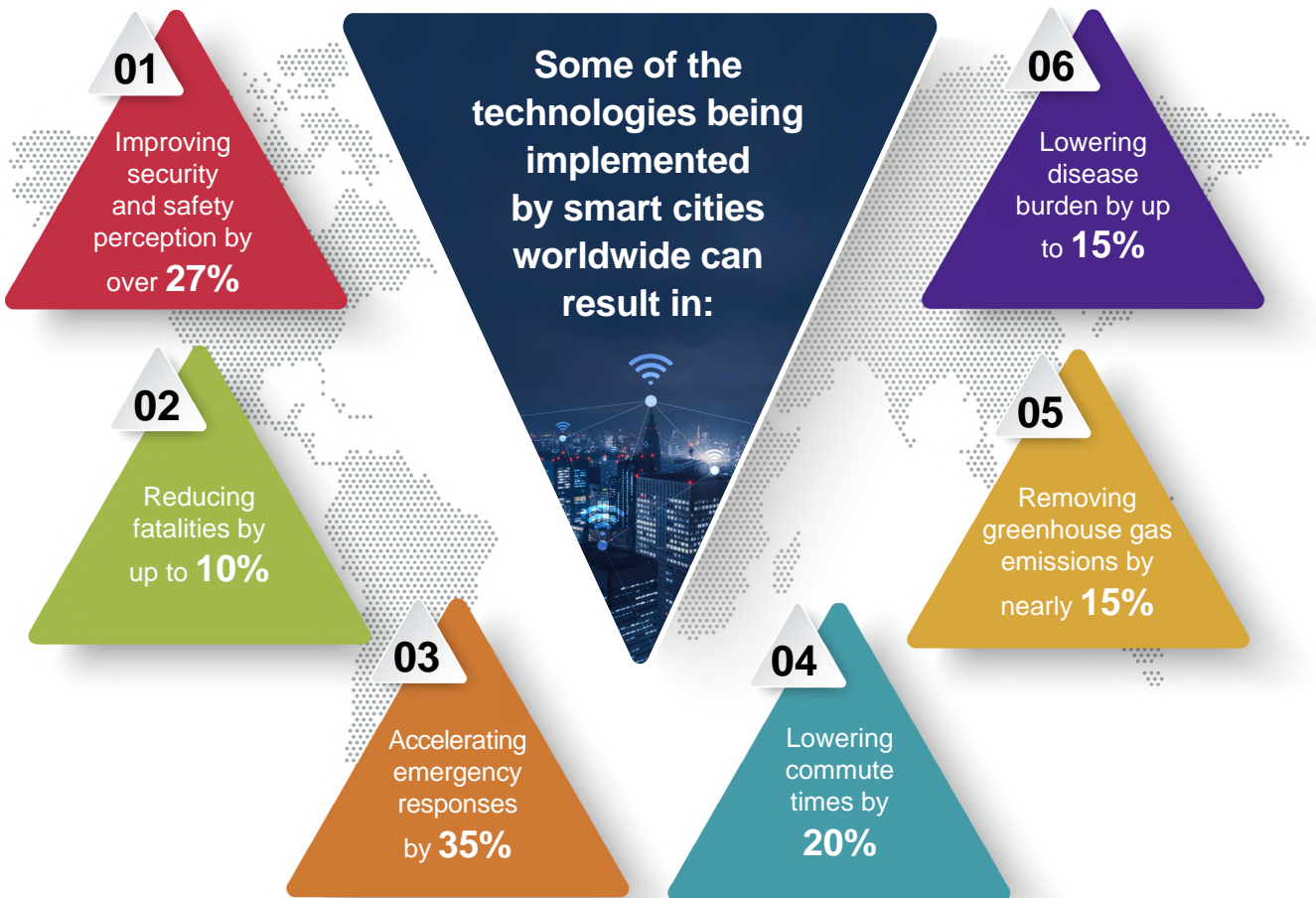
for Smart Cities



Rapid urbanization and growing population has been overburdening cities. Additionally, citizens are increasingly expecting their cities to be safe, clean, and offer convenience in their daily lives. There is considerable thought and effort being invested by governments and authorities globally, to achieve this. However, challenges like rising crime, increasing pollution, traffic congestion, and overburdened public infrastructure are making this an uphill and expensive battle. Next-generation technologies, like 5G, AI, Edge,

and cybersecurity among others, can help. There is already a significant number of smart cities being developed leveraging these technologies.

Smart cities leverage a connected ecosystem of digital technologies to gather data from multiple locations to derive insights and streamline city operations. These insights can be contextualized to drive better decision-making and improve city operations, the environment, and safety in public places.



Globally, the smart city market is projected to grow at a CAGR of 20.5%, from USD 1.19 Tn today to USD 2.51 Tn (2025).

Source: McKinsey, IIoT World, IMD.org

TECHNOLOGY CAN HELP CITIES GET SMARTER



Improved operations

- Public safety and security incident management
- Environmental quality monitoring and reporting (air, power, water)
- Traffic signals, flow and parking management
- Imagery-based system for monitoring utilities and parking

Preventive



Digital monitoring

- Electronic monitoring systems to keep a tab on low-risk offenders
- Smart parking sensors to guide drivers to empty spots
- Aerial imaging to assess condition and response for remote assets

Pre-emptive



Cognitive and predictive response

- Vision and acoustic sensors to identify and alleviate traffic congestion
- Image and facial recognition for cognitive support to rapid-response teams
- Citizen apps. to accelerate collaboration, insights and response

Predictive



AI/ML enabled with real-time insights

- AI/ML/DL techniques to assess historical and future scenarios to recommend proactive response
- Assigning risk scores to eliminate human bias
- Intelligent Edge with Vision AI to reduce latency
- WiFi 6 and 5G/LTE to enable ubiquitous and high-speed connectivity

Prescriptive based

INTELLIGENT SECURE EDGE (ISE) FOR SMART CITIES

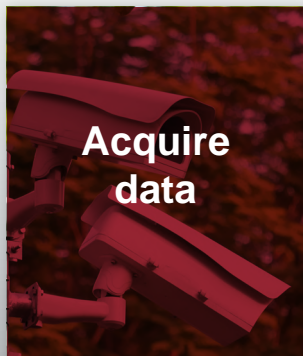
The **Intelligent Secure Edge (ISE) for Smart Cities**, built by HCL IoT WoRKS™ using Intel technologies, is a collaborative platform that brings together citizens, communities, and authorities as a virtual network, powered

by Artificial Intelligence, Edge, Wi-Fi 6, 5G, and other next-gen technologies – to drive proactive responses powered by real-time insights.

ISE VALUE DRIVERS

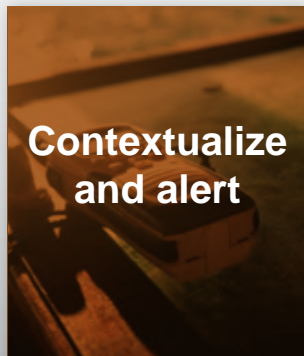


ISE SOLUTION OVERVIEW



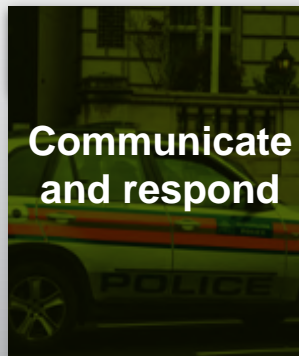
Acquire data

- Detects incidents like gunshots, weapons, and other situations of interest
- Families and communities share data/identities and notify authorities of potentially unsafe situations
- Collecting data from other sensors and systems like traffic signals, street lighting, utilities, city emergency services, etc.



Contextualize and alert

- AI at Far-Edge contextualizes video and audio analysis to recognize situations and generate contextual and real-time alerts
- Citizen and city data is leveraged to contextualize sensor data into prioritized alerts
- Remotely initiate AI at Near-Edge to consolidate data from multiple sensors to track people or vehicles in real-time
- Citizens augment contextualized alerts using mobile apps to assist first responders with additional information



Communicate and respond

- Information from all sources are analyzed and integrated into control room operations
- Dispatched or nearest first responders receive the contextualized and augmented data stream on their devices
- Total response time can be significantly improved with AI-assisted incident prioritization



Analyze and generate insights

- A historical data (sensor and contextual) repository is provided as an archive for forensic evidence
- Use ISE AI/ML platform to derive and analyze the repository for complex patterns to generate deeper insights
- Leverage continual insights to improve strategic decisions impacting operational efficiencies and sustainable quality of life

- **Follow-me feature** provides digital surveillance from Point A to B for individual's safety
- **Interconnected** home and city applications for families and safety personnel **builds cooperation** for timely, proactive crime prevention
- Total solution is **highly cost-effective**. WiFi-6 topology offers **up to 98% cost savings** over traditional connectivity

ISE IS A ONE-OF-KIND SOLUTION IN THE MARKET

ISE is an Intel® IoT Market Ready Solution (Intel® IMRS).

Intel® IMRS offer intelligent connectivity, exceptional performance and manageability, and a reliable roadmap to transform citizen well-being through intelligent insights.

Unparalleled connectivity:

Intel® Smart Edge with LTE / 5G / Wi-Fi 6 enabled to process data real-time and initiate actions.

Provides high-speed connectivity without additional infrastructure needs and costs – enabling the city to monetize the public Wi-Fi services.

Power of AI on Edge:

Power of Vision-processing at the Far Edge using advanced AI/ML techniques.

Real-time data analysis is performed by the AI engine on the video and sound data streams – delivering contextual insights to improve public health and safety.

Pre-integrated end-to-end solution:

HCL developed pre-integrated, performance-tuned, configurable solution of hardware and software elements, and Wi-Fi 6 enables large scale rapid deployment at a fraction of the cost. The solution leverages DECoDe – a device ecosystem management solution by HCL IoT WoRKS™, to monitor and manage devices and sensors remotely, along with AIOps to deploy end-to-end managed services.

ISE IS BRINGING THE POWER OF ECOSYSTEM TOGETHER



ABOVE AND BEYOND – ADDITIONAL USE CASES FOR INTELLIGENT SECURE EDGE

01



Traffic management and response system

02



Safety in educational campuses

03



Government and legislative facilities

04



Events, conferences and stadiums

05



Correctional facilities

06



Smart parking at large venues

07



City lights operations and maintenance

08



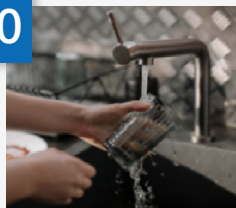
Transportation hub

09



Customs and border protection

10



Water quality and flood control

Intelligent Secure Edge can help build a safe and sustainable smart city of the future powered by innovation, collaboration and next-gen ecosystem partnerships. This means ensuring a fulfilling, safe and high quality of life for its citizens.

AFTER ALL, A SMART CITY IS A PEOPLE'S CITY.



ABOUT HCL

HCL Technologies (HCL) empowers global enterprises with technology for the next decade, today. HCL's Mode 1-2-3 strategy, based on its deep-domain industry expertise, client-centricity and entrepreneurial culture of Ideapreneurship™, enables businesses to transform into next-gen enterprises.

HCL offers its services and products through three business units: IT and Business Services (ITBS), Engineering and R&D Services (ERS) and Products & Platforms (P&P). ITBS enables global enterprises to transform their businesses through offerings in the areas of applications, infrastructure, digital process operations and next-generation digital transformation solutions. ERS offers engineering services and solutions in all aspects of product development and platform engineering. P&P provides modernized software products to global clients for their technology and industry-specific requirements. Through its cutting-edge co-innovation labs, global delivery capabilities and broad global network, HCL delivers holistic services in various industry verticals, including Financial Services, Manufacturing, Technology and Services, Telecom and Media, Retail and CPG, Life Sciences and Healthcare, and Public Services.

As a leading global technology company, HCL takes pride in its diversity, social responsibility, sustainability, and education initiatives. For the 12 months ended September 30, 2021, HCL had consolidated revenue of \$10.82 billion. Its more than 187,000 ideapreneurs operate out of 50 countries.

ABOUT INTEL

Intel (Nasdaq: INTC) is an industry leader, creating world-changing technology that enables global progress and enriches lives. Inspired by Moore's Law, we continuously work to advance the design and manufacturing of semiconductors to help address our customers' greatest challenges. By embedding intelligence in the cloud, network, edge and every kind of computing device, we unleash the potential of data to transform business and society for the better. To learn more about Intel's innovations, go to newsroom.intel.com and intel.com.

