



**BOMA BEST**  
BUILDING CERTIFICATION  
PROGRAM

# Building cities of the future

Supporting the development of smart sustainable cities

APRIL 2024

**BOMA**  
Canada





# URBANIZATION IS INCREASING AT AN UNPRECEDENTED RATE



**Half of the world's population now live in urban areas**  
Which account for 4.4 billion people worldwide

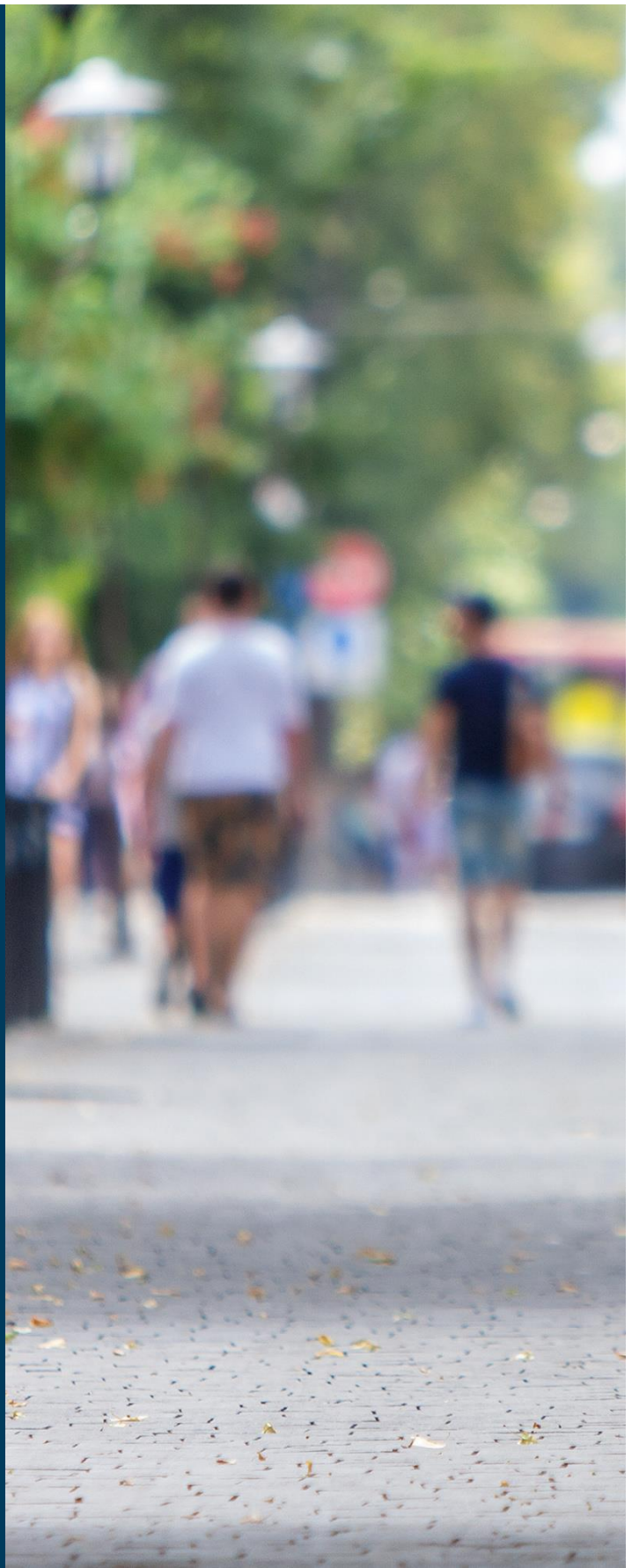
**More than 80% of the global GDP**  
Is generated in cities. Urbanization can contribute to sustainable growth.

**7 out of 10 people worldwide**  
Will live in cities in 2050 as the urban population will more than double its current size.





# HOWEVER, THE SPEED AND SCALE OF URBANIZATION BRINGS CHALLENGES





# URBANIZATION ALSO POSES SIGNIFICANT IMPACT ON OUR ENVIRONMENT



**78%**  
of the world  
energy is  
consumed by  
cities



**60%**  
of global CO<sub>2</sub>  
emissions  
produced by  
cities



**50%**  
of global waste  
come from  
cities







# SMART CITY INNOVATION IS DRIVEN BY THE INTERSECTION OF SOCIAL, ENVIRONMENTAL AND ECONOMIC CHALLENGES

**By 2050**

Smart city investments are expected to double to \$820 billion from \$410 billion in 2020.

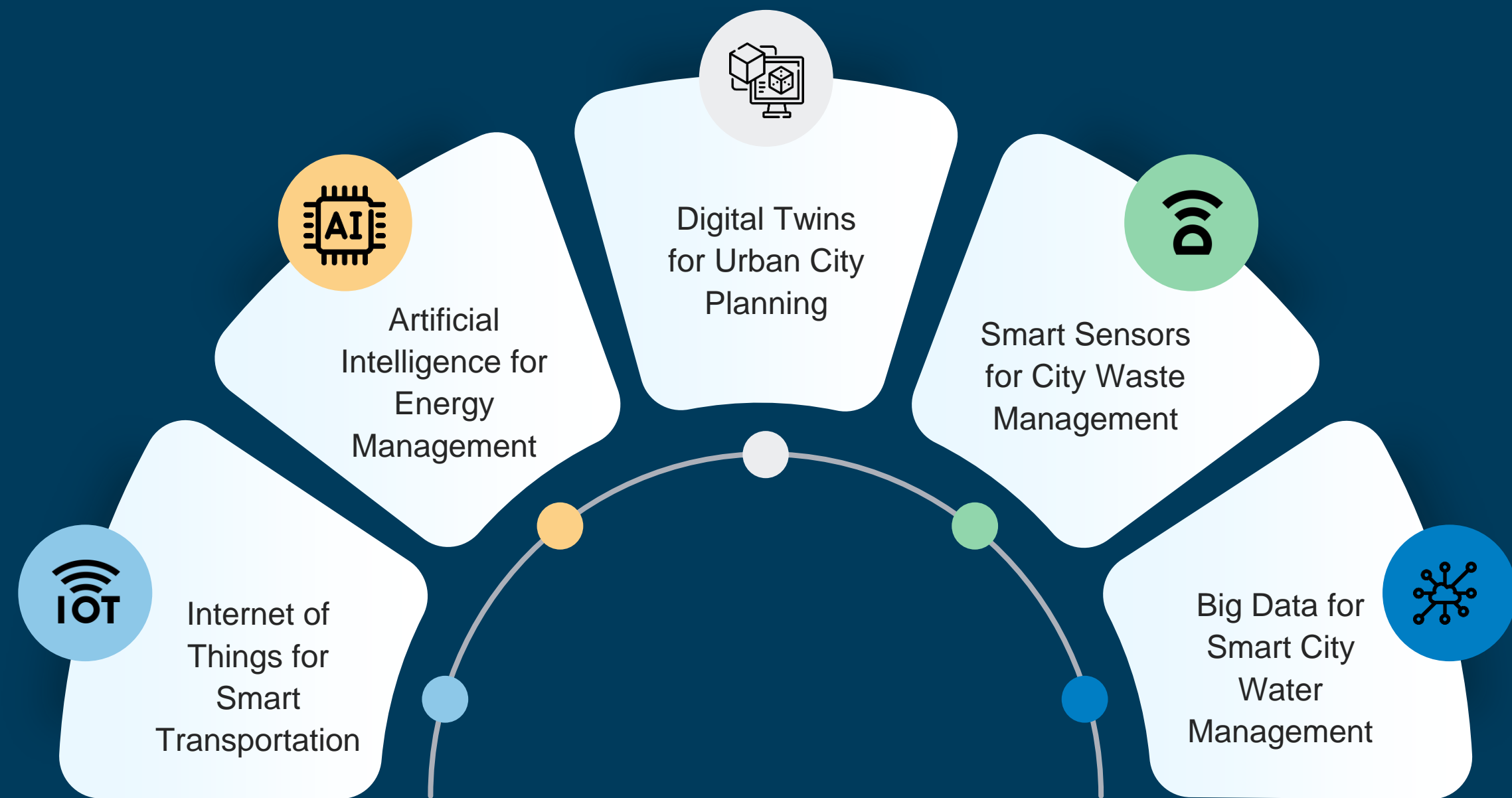
**\$300 B**

Global market for smart city technology estimated to grow to over \$300 B by 2032.

Source: Forbes; Guidehouse



# LEVERAGING EMERGING TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT







# HOW CITIES ARE USING DIGITAL TECHNOLOGIES TO SOLVE REAL WORLD PROBLEMS



## Smart Traffic Management in Toronto, Canada

Toronto uses artificial intelligence to modernize traffic management. Smart Traffic lights adjust timing based on real-time conditions, reducing congestion and improving overall traffic flow.



## Smart Waste Management in Yokohama, Japan

Yokohama has implemented smart waste management systems to optimize collection routes and reduce operational costs. IoT-enabled sensors installed in waste bins monitor fill levels in real-time, allowing authorities to schedule pickups more efficiently.



## Smart Water Management in Lima, Peru

The city has implemented smart water management initiatives. Remote sensors and IoT devices are deployed throughout the water distribution network to monitor water flow, detect leaks, and optimize usage.





# BUILDINGS PLAY AN IMPORTANT ROLE IN SMART SUSTAINABLE CITIES

- Buildings are not just structures; they are the building blocks of smart, sustainable cities.
- Buildings contribute to about **30-40% of global greenhouse gas emissions**. Their energy consumption, density, have a strong influence on sustainability.
- Recognizing the pivotal role of buildings is essential for creating resilient, livable, and sustainable cities of the future. On average, people spend approximately **90% of their time indoors**.
- Leveraging smart technologies within buildings can lead to transformative changes in urban sustainability.





# HOW CAN DIGITAL TECHNOLOGIES SUPPORT SUSTAINABLE DIGITAL TRANSFORMATION IN BUILDINGS



## Artificial Intelligence

**Optimizing Energy Efficiency:** AI algorithms analyze data from IoT sensors to optimize energy usage, adjusting HVAC systems and lighting based on occupancy patterns and external conditions, leading to reduced energy consumption.



## Internet of Thing

**Predictive Maintenance:** IoT sensors monitor equipment health in real-time, detecting potential issues before they occur.  
**Occupant Comfort and Well-being:** IoT sensors monitor indoor air quality, temperature, and lighting levels.



## Digital Twin

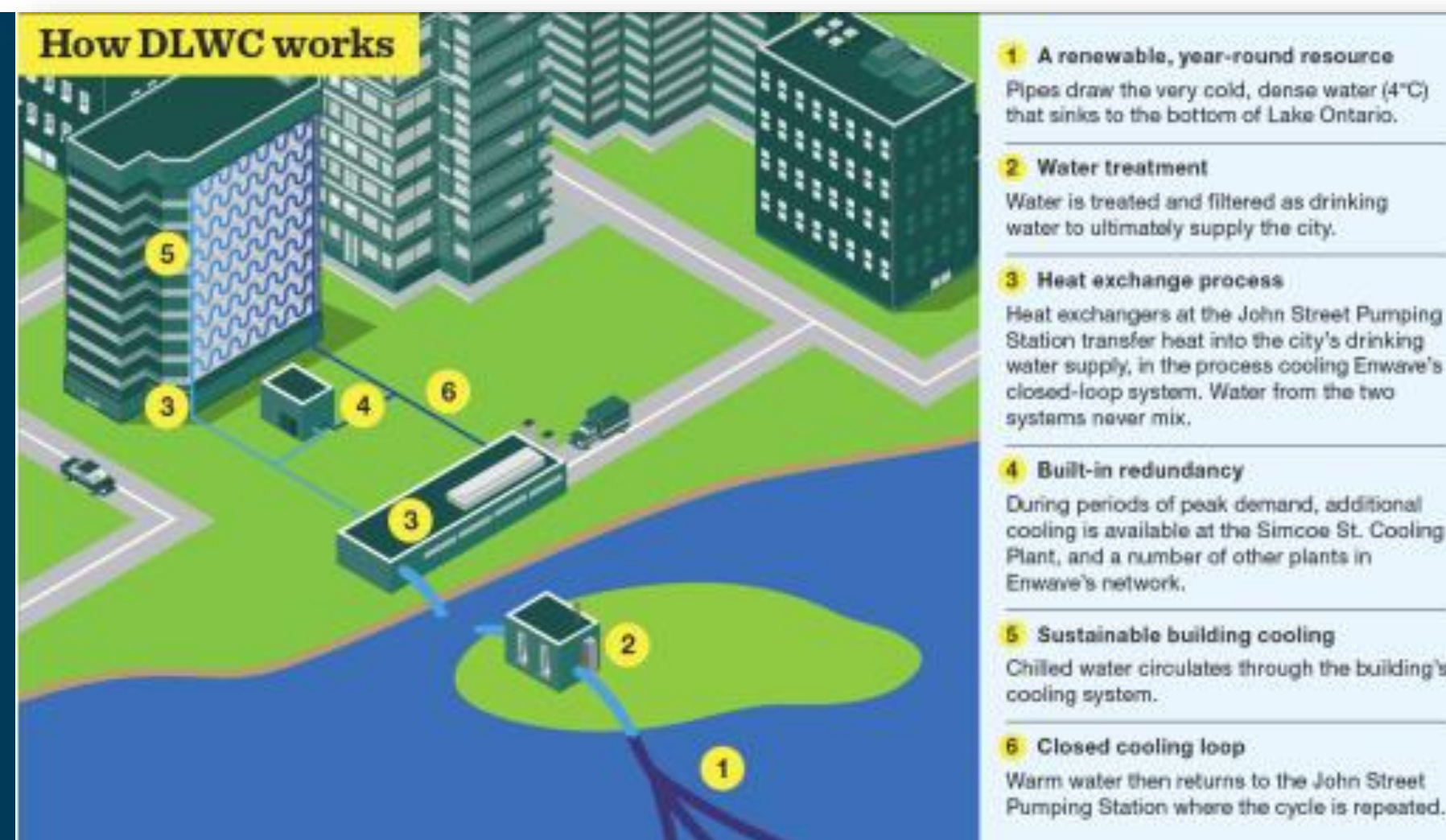
**Resource Management:** Digital twins create virtual replicas of buildings, allowing for real-time monitoring and simulation of resource usage. This enables better resource management, such as optimizing water usage and waste reduction strategies.



# LEVERAGING TECHNOLOGY FOR ENERGY EFFICIENCY IN BUILDINGS

## Deep Lake Water Cooling (DLWC)

- DLWC set out to transform the way in which buildings are cooled, in order to reduce the environmental impact while providing value to the city and fostering economic development.
- Three DLWC pipes extend along the base of Lake Ontario and draw water that supplies cooling to buildings.





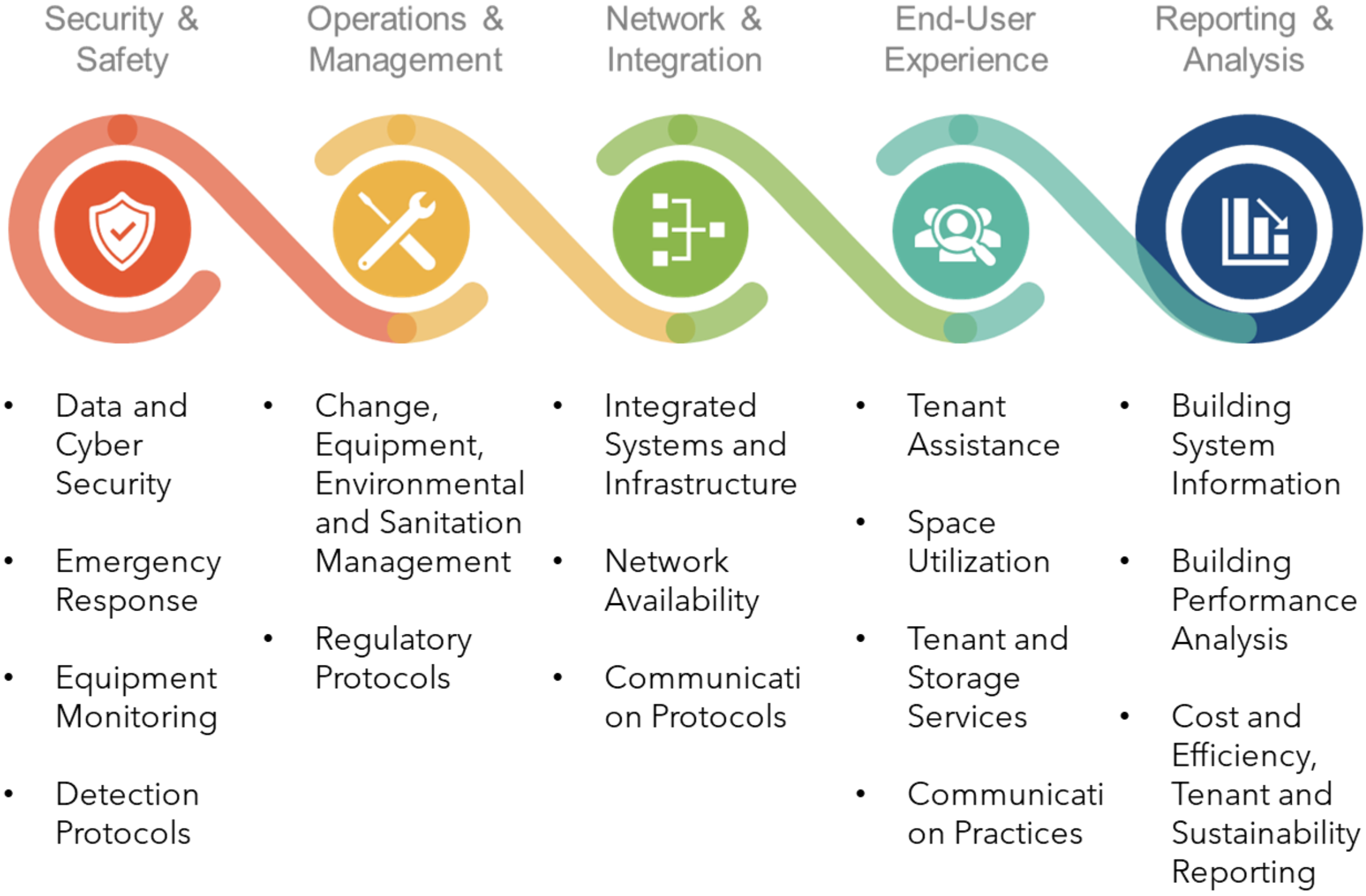
# HOW CAN STANDARDS AND CERTIFICATIONS SUPPORT A SUSTAINABLE DIGITAL TRANSFORMATION







# INDUSTRY STANDARDS: FOCUS AREAS FOR SMART BUILDINGS



Source: BOMA BEST Smart Buildings





# INDUSTRY STANDARDS: FOCUS AREAS FOR SUSTAINABLE BUILDINGS



## Energy & Carbon



- Assessment, Planning
- Benchmarking, Tracking & Monitoring
- ECMs and CCMs
- O&M Optimization
- Controls, Lighting
- Demand Management, HVAC Efficiency
- Envelope Performance

## Water



- Assessment, Planning
- Benchmarking, Tracking & Monitoring
- WCMs
- Water Hazards

## Indoor Air Quality & Hazards



- IAQ Assessment
- Ventilation & Exhaust
- Filtration
- Renovation & Construction
- Refrigerants
- IAQ Hazards

## Accessibility & Wellness



- Accessibility
- Thermal Comfort
- Visual Environment
- Acoustic Performance
- Equity & Inclusivity
- Occupant Experience

## Custodial & Waste



- Procurement
- Custodial Maintenance & Operations
- Custodial Assessment
- Waste Audit & Measurement
- Waste Management
- Renovations & Construction

## Resilience & Site



- Site Irrigation & Features
- Climate Hazards & Risks
- Climate Planning & Vulnerabilities



# STANDARDIZATION AT THE INTERNATIONAL LEVEL

ITU-T Study Group 5



Sets International Standards for Climate Action and Sustainable Digitalization

ITU-T Study Group 20



Sets International Standards for IoT and Smart Sustainable Cities



# INTERNATIONAL INITIATIVES THAT SUPPORT SMART SUSTAINABLE BUILDINGS GLOBALLY



The United for Smart Sustainable Cities serves as the global platform to advocate for public policy and to encourage the use of ICTs to facilitate the sustainable digital transformation of cities.



## U4SSC Key Performance Indicators for Smart Sustainable Cities







# DRIVING TOWARDS THE SUSTAINABLE DEVELOPMENT GOALS

International standards and industry certifications aren't just about ensuring quality; it's about fostering innovation and sustainability.

They serve as the foundation upon which smart sustainable cities can flourish, accelerating us towards the realization of the Sustainable Development Goals, one building and city at a time.







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# Thank you!

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