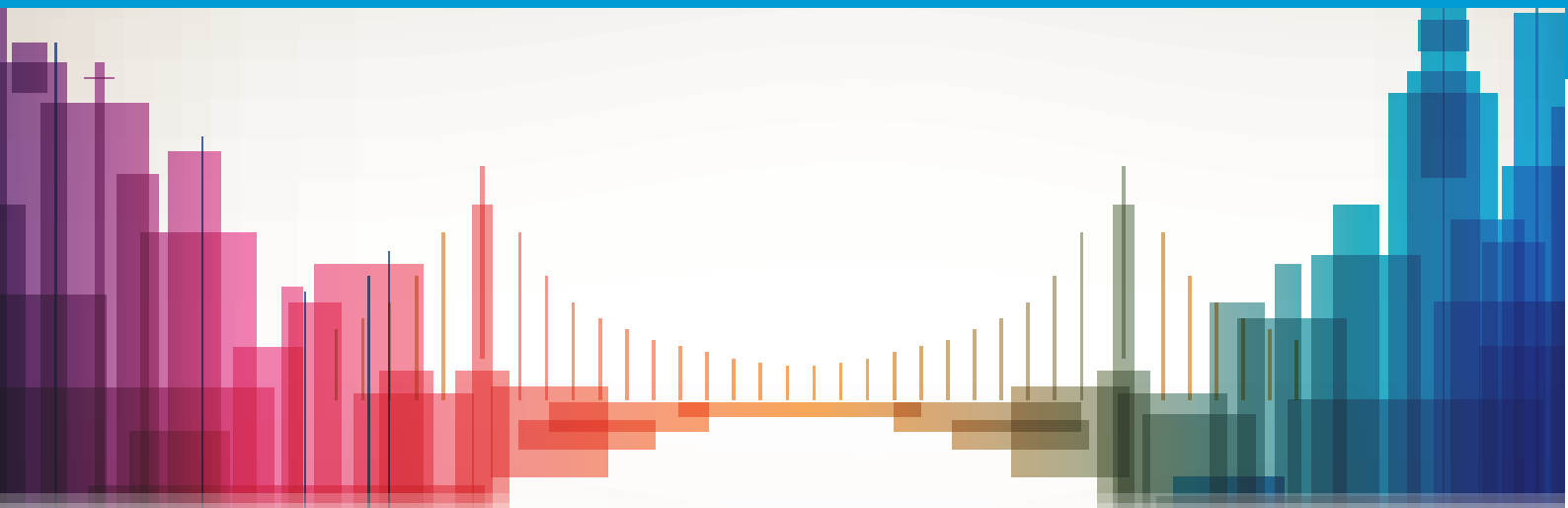


# Hong Kong, China

## Case study of the U4SSC Guiding principles for artificial intelligence in cities



Convention on  
Biological Diversity



UNITED NATIONS

ECLAC



Food and Agriculture Organization  
of the United Nations



United Nations  
Economic Commission for Africa



UNECE



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WORLD  
METEOROLOGICAL  
ORGANIZATION



# Hong Kong, China

**Case study of the U4SSC  
Guiding principles for artificial  
intelligence in cities**

## Foreword

This publication was developed within the framework of the United for Smart Sustainable Cities (U4SSC) initiative.

## Acknowledgments

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## Disclaimer

The opinions expressed in this publication are those of the authors and do not necessarily represent the views of their respective organizations or U4SSC members. In line with the U4SSC principles, this report does not promote the adoption and use of any smart city technology. It advocates for policies encouraging responsible use of ICTs that contribute to the economic, environmental, and social sustainability as well as the advancement of the 2030 Agenda for Sustainable Development. The study conducted in this report is based on extensive literature review and voluntary written contributions from stakeholders.

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## 1 Introduction

Hong Kong is a city and special administrative region of China. It is a major global financial centre. The Government published the Smart City Blueprint for Hong Kong in 2017, to build Smart Mobility, Smart Living, Smart Environment, Smart People, Smart Government and Smart Economy.

## 2 Background & context

Artificial Intelligence (AI) has become one of the key technologies in the implementation of Hong Kong's smart city strategy. It has been adopted to tackle three challenges in Hong Kong, namely climate change, an ageing population, and the overall city management.

Perception networks and sensors have been deployed in Hong Kong to collect real-time data to monitor energy use and to engage in disaster preparation. These facilities have also been used to improve the safety of elderly people and to provide continuous links with the community. In addition, there are some attempts at delivering robotic assistance to support the elderly. In terms of city governance, the city directed its efforts into improving public participation and traffic conditions with the support of AI-based technologies.

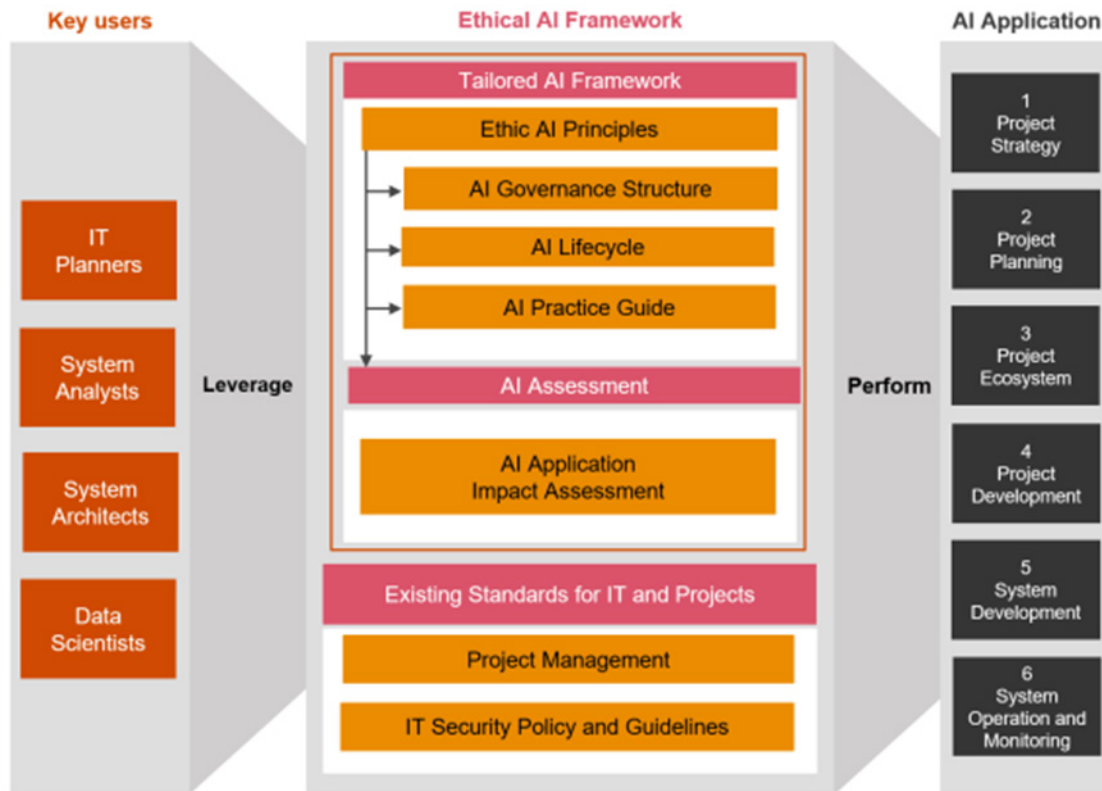
To facilitate the healthy development and use of AI in Hong Kong, several government departments and independent organizations have formulated and launched guiding principles for AI.

## 3 AI principles in the city

### 3.1 AI principles (adopted by the city)

The Office of the Government Chief Information Officer issued Ethical AI Framework in September 2022 (Figure 1).

Figure 1: Overview of ethical AI framework



The framework set out twelve ethical AI principles.

### Two fundamental principles are as follows:

- Transparency and interpretability: This aims at ensuring explainability, transparency and provability; and
- Reliability, robustness, and security: This aims at ensuring that AI applications behave as intended, from training data to final output, over prolonged periods of time.

### Ten general principles are as follows:

- Fairness: In a fair manner, without favoritism or discrimination and without causing or resulting in harm;
- Diversity and inclusion: Promote by understanding and respecting the interests of all stakeholders impacted;
- Human oversight: Human intervention should be dictated by the level of the perceived severity of ethical issues;
- Lawfulness and compliance: Act in accordance with the regulatory regimes;
- Data privacy: Data protection from collection to use;
- Safety: Ensure physical safety and mental integrity of mankind;
- Accountability: Be responsible for the moral implications of the use and mis use of AI applications.
- Beneficial AI: Promote common good;
- Cooperation and openness: Establish a culture of multistakeholder open cooperation in ecosystems; and
- Sustainability and just transition: Put mitigation strategies in place to manage potential system impacts.

These principles are derived from the United Nations Universal Declaration of Human Rights and the Hong Kong Ordinances. The principles act as guidance when designing and developing AI applications.

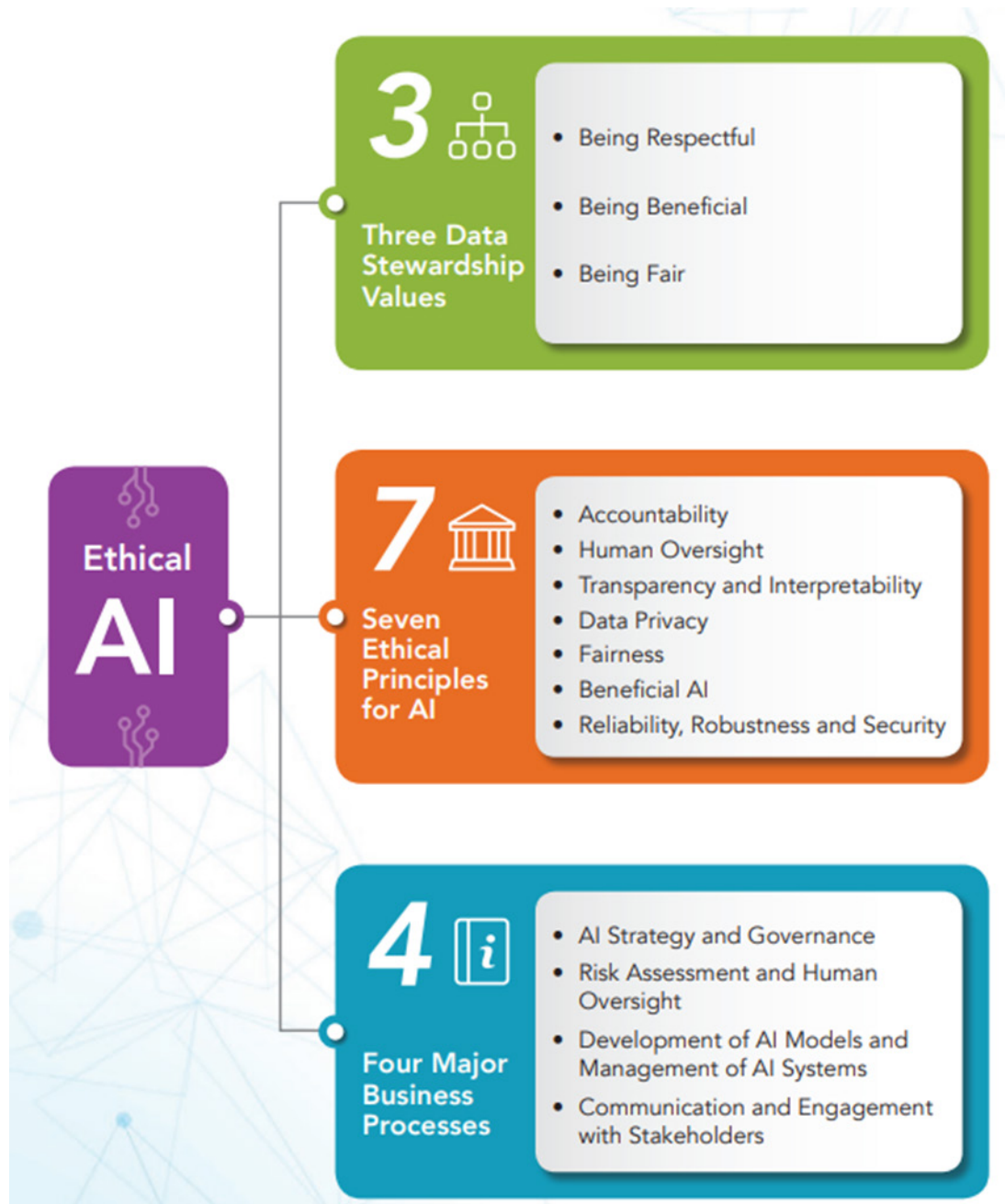
The Office of the Privacy Commissioner for Personal Data (PCPD) has also issued the Guidance on Ethical Development and Use of AI in August 2021.

The guidance provided three data stewardship values (being respectful, being beneficial, and being fair), seven ethical principles for AI (accountability, human oversight, transparency and interpretability, data privacy, fairness, beneficial AI, and reliability, robustness and security) and four major business processes (AI strategy and governance, risk assessment and human oversight, development of AI models and management of AI systems, and communication and engagement with stakeholders), as shown in Figure 2.

- **Accountability:** Organizations should be responsible for their actions and be able to assess and address the risk of AI adoption.
- **Human oversight:** The option of human intervention should always be provided.
- **Transparency and interpretability:** Organizations should demonstrate accountability and protect individuals' rights, freedom and interests by ensuring transparency and interpretability.
- **Data privacy:** Effective data governance should be ensured.
- **Fairness:** Unjust bias and unlawful discrimination should be avoided.
- **Beneficial AI:** Benefits of AI should be provided to human beings, businesses and communities.
- **Reliability, Robustness and Security:** The AI system should be reliable, resilient and protected.

The guidance is not mandatory. The Office of the Privacy Commissioner for Personal Data (PCPD) is an independent statutory body set up to oversee the enforcement of the Personal Data (Privacy) Ordinance.

Figure 2: The structure of the guidance on the ethical development and use of AI in Hong Kong





### 3.2 AI principles enablers (adopted by the city)

The Guideline on Ethical Development and Use of AI provides a self-assessment checklist for users to establish and adopt AI principles. It involves in several aspects, including: AI strategy and governance, risk assessment and human oversight, development of AI models and management of AI systems and communication and engagement with stakeholders. Data Protection Principles has also been illustrated in this document. The principles cover the entire life cycle of the handling of personal data, including purpose and manner of collection, accuracy and duration of retention, use of data, data security, openness and transparency, and access and correction.

### 3.3 AI principles governance mechanism (adopted by the city)

The Ethical AI Framework provide guidance to IT planners, system analysts, system architects and data scientists to understand ethical AI principles and practices, initiate discussions on the impact of AI, adopt standardized practices and terminology, and perform AI assessment. Table 1 contains an example.

**Table 1: Example of AI principles governance mechanism for users**

IT Planners and executives	Project strategy	Practical guide to establish AI strategy and to ensure AI principles are embedded.
	Project planning	Practical guide along with the risk gating criteria to ensure ethical AI requirements are met and impacts are assessed.
	Project ecosystem	Practical guide to evaluate existing technology landscape and deploy third party AI applications.
System analysts, system architects and data scientists	Project development	To ensure data validation, documentation, biased data, data privacy, etc. are considered for ethical AI.
	System development	To ensure AI principles are adopted in the deployment of AI applications.
	System operation and monitoring	To ensure actions including escalation, continuous review and compliance checking are considered.

### 3.4 Policy instrument for AI principles (adopted by the city)

Despite the Ethical AI Framework and the Guidance on Ethical Development and Use of AI, the Hong Kong Monetary Authority issued the High-level Principles on Artificial Intelligence in 2019. It provided principles on the governance, application design and development, and ongoing monitoring and maintenance of AI applications for banks.

The Authority also launched Consumer Protection in respect of Use of Big Data Analytics and Artificial Intelligence by Authorized Institutions in 2019. It indicated four guiding principles: governance and accountability; fairness; transparency and disclosure; and data privacy and protection. These principles are provided to the banking industry to benefit the banks, customers and to foster the healthy development of big data and artificial intelligence.

## 4 Conclusion

Hong Kong has underscored several AI principles recently. Most of them include an AI assessment helping organizations to identify the gaps in the adoption of AI and to provide guidance to harness the deployment of AI applications in a responsible and ethical way. Hong Kong has also issued the AI principles for specific industries such as the banking industry.

To ensure the successful adoption of AI principles, it is important to set out guidance from high-level values to ground-level practices. Additionally, it is necessary to be developed after considering relevant international agreements, instruments, and other practices.

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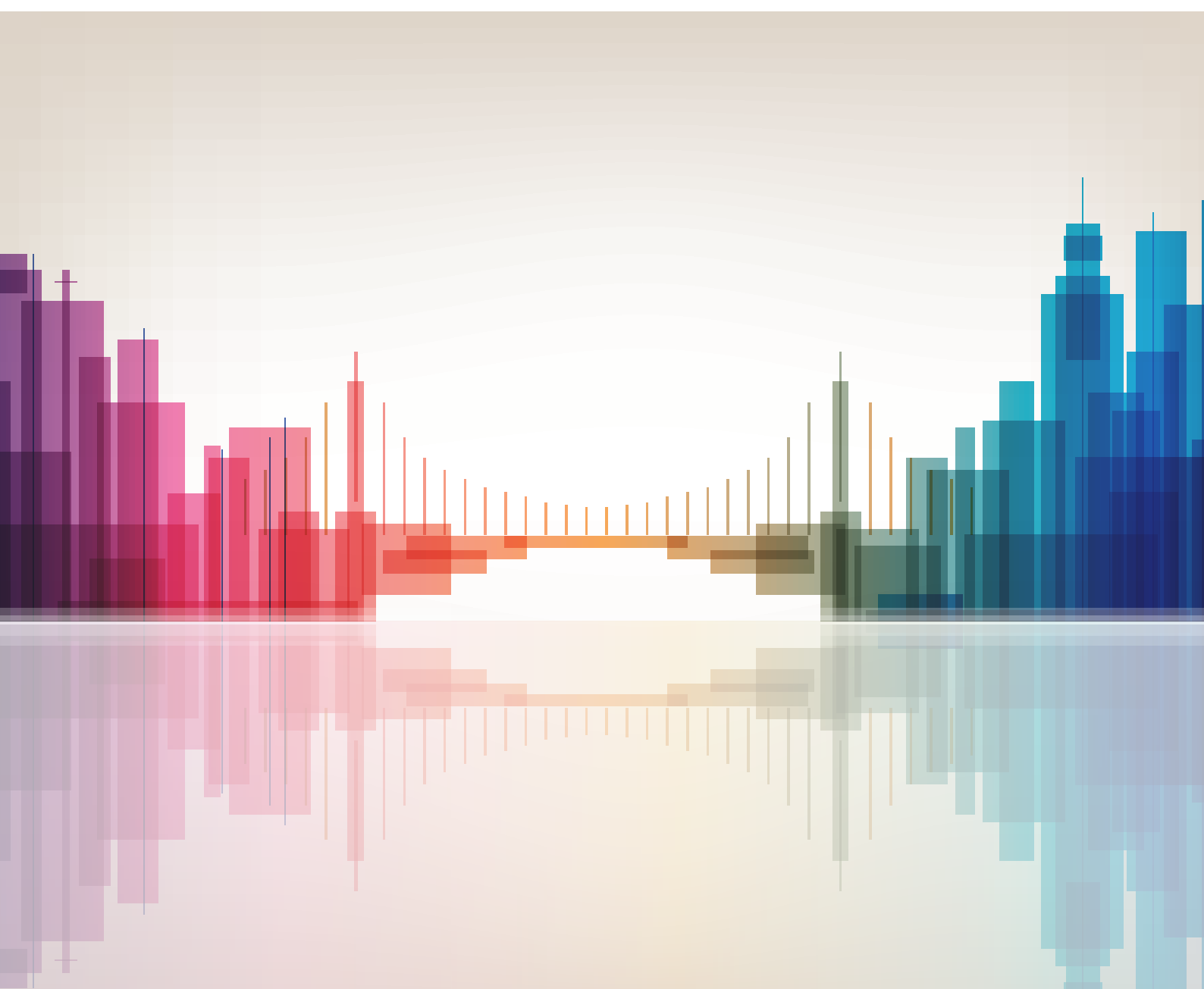












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