

AI Cities : Digital Twin Playbook

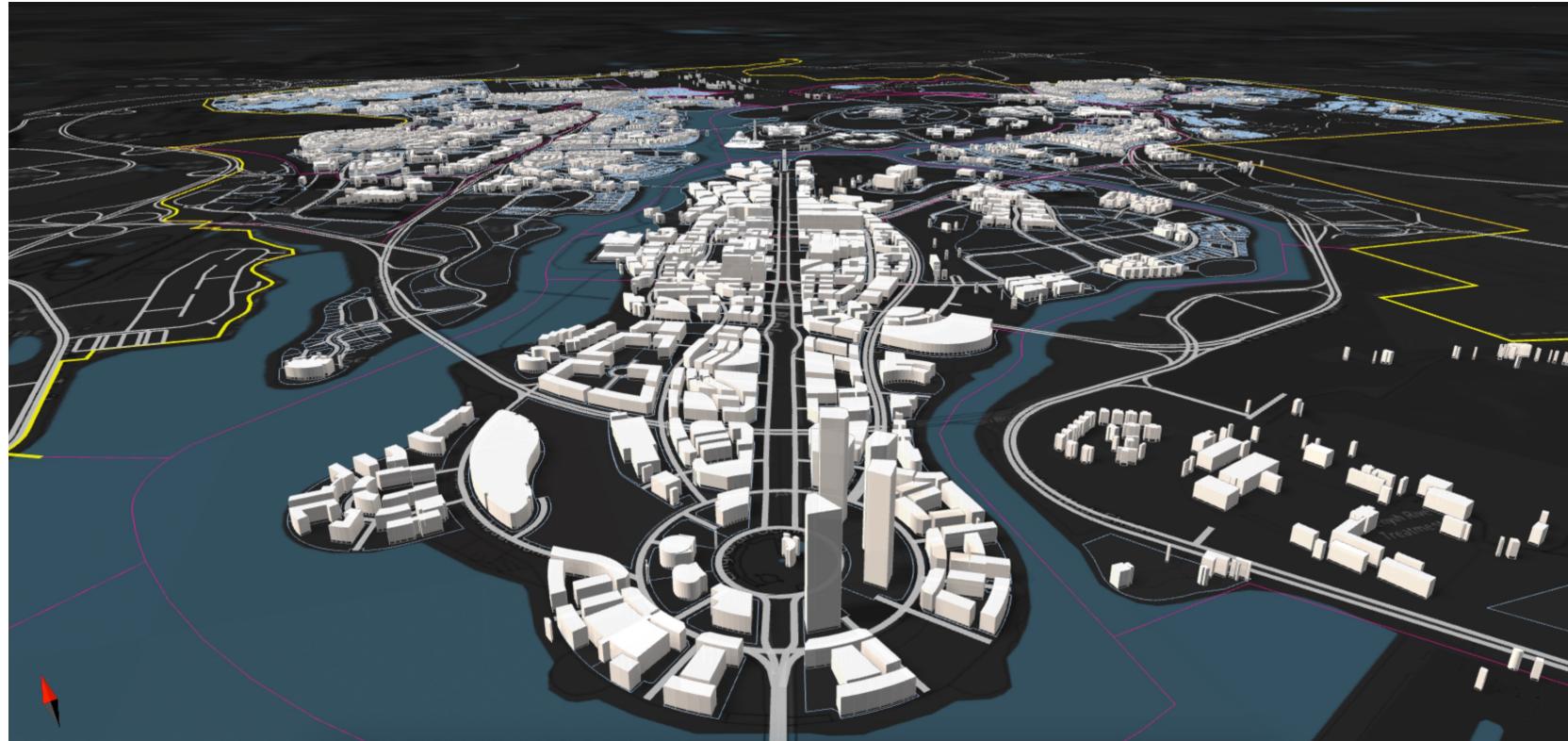
City Digital Twins

Predictive intelligence for operational and service excellence

Creating a digital twin of a city means making a virtual replica of the city using data and computing resources.

This digital version helps city planners and decision-makers test scenarios, solve problems, and improve how the city works—without affecting the real city.

Parametrically modelled digital twins, by integrating IoT, big data, and AI – can simulate and predict resource demand in response to changes, improve resilience and help recover quickly from disasters.



Digital Twinning Process

Building the digital twin in five distinct steps

01

Setting Objectives

02

Preparing the Data

03

Selecting the
Technology Stack

04

Building the Twin
Step by Step

05

Managing the Twin
Sustainably

➤ Setting the Vision
➤ Planning implementation Roadmap
➤ Determining governance Framework

➤ Deciding Services
➤ Creating Dataset Requirements
➤ Acquiring Data
➤ Curating Data

➤ Planning Technical Architecture
➤ Make Strategic Decisions
□ Build, Buy, Leverage, Partner

➤ Building the Foundation
➤ Implementing Services
➤ Scaling Services

➤ Receiving Feedback
➤ Analyzing and Improving Services
➤ Managing Data Governance
➤ Managing Data Security
➤ Managing Growth

1. Starting with a vision of the future along with finding the best means and measures to achieve it

2. Making a list of must haves and areas of improvements – e.g., traffic, public safety, poor state of infrastructure

3. Avoiding the temptation of starting with immediate pain points or whatever is available



1. Deciding on stakeholders, services, use cases and performance measures

2. Deciding on dataset requirements, methods of acquiring data, validation and curation

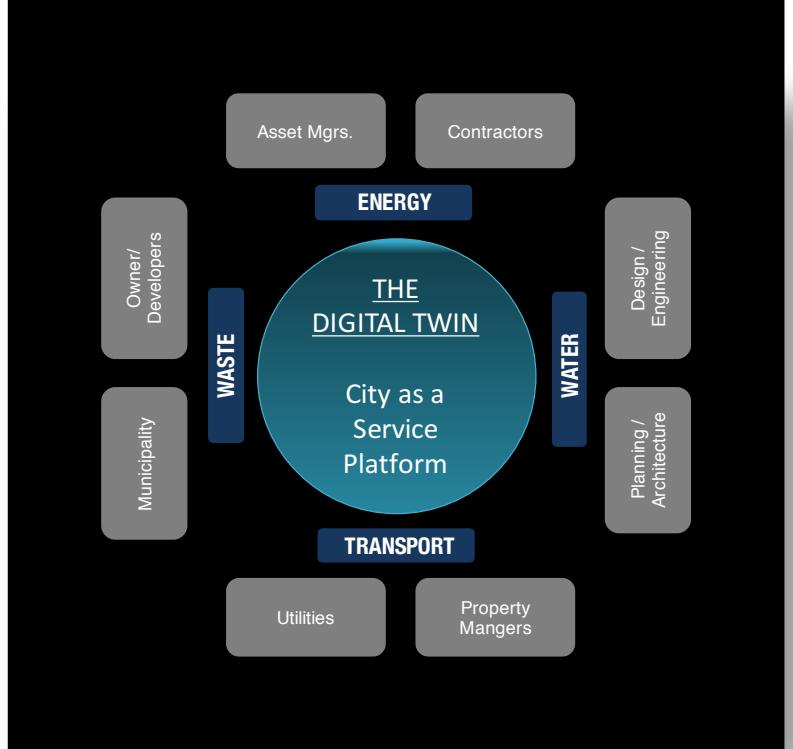
3. Choosing data sources and access methods

- City Databases
- APIs
- Edge Devices
- Web Services
- Open Data Portals
- Access Networks
- OSM
- Sensor Networks
- Mapping Firms
- Mobile Networks
- Private Data Providers

4. Using AI tools to clean and complete the datasets

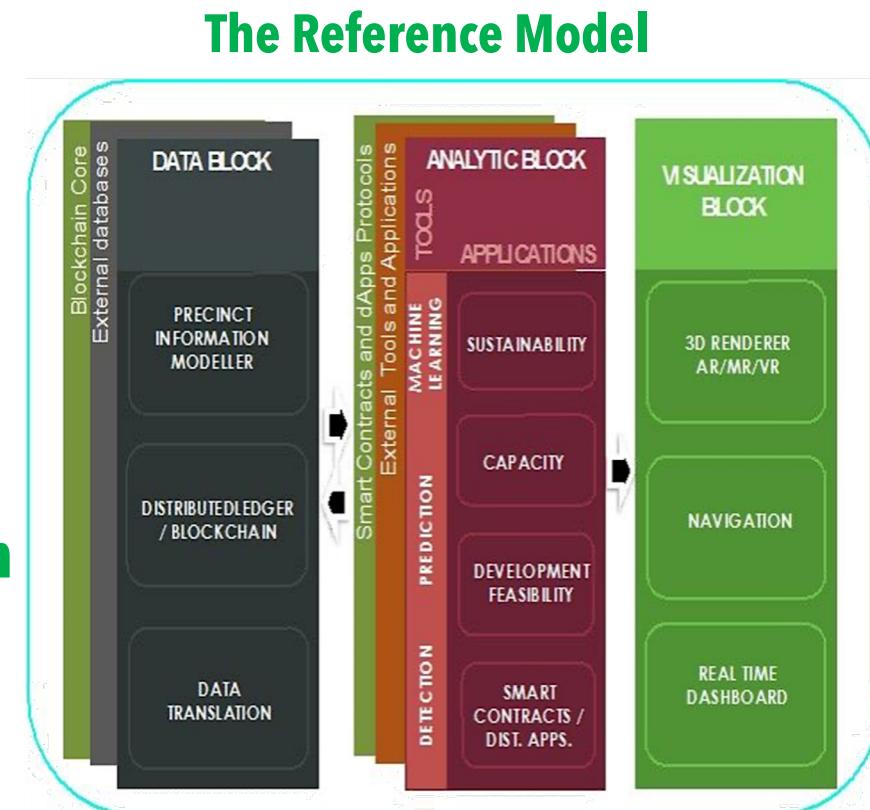
5. Adopting standardization

- ISO 37120 suite of standards



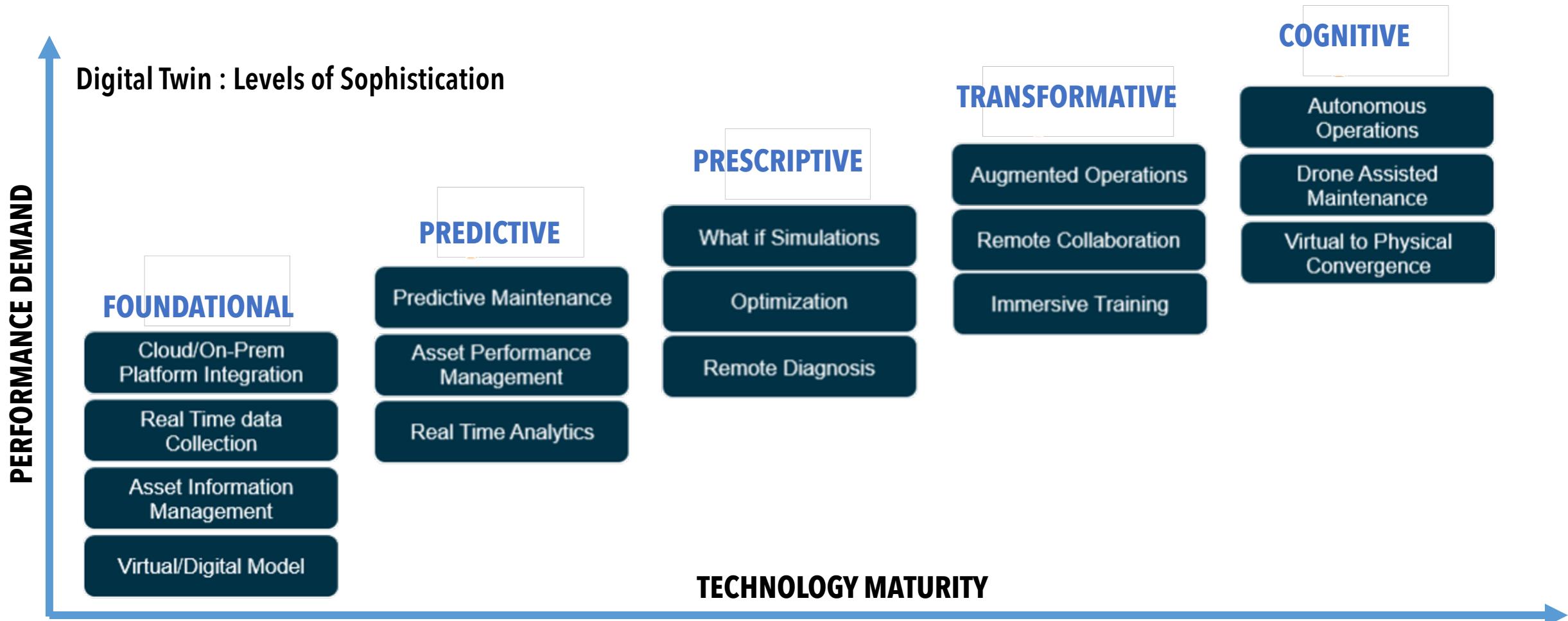
- Data
- Analytics
- 3D Visualization

The three pillars of digital twinning technology architecture



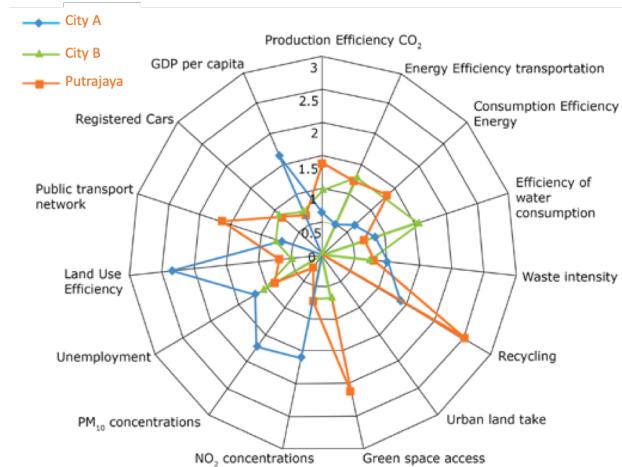
Actions

1. Architecting the solution with the three pillars
2. Making **strategic decisions** on technology stack
 - Build, Buy, Leverage, Partner



Adopting a Culture of **Continuous Improvement** – enabled by the digital twin platform

1. Performance Benchmarking with other cities – facilitated by the platform



2. Citizen Centricity through feedback, feasibility analysis and reporting

Citizen Survey

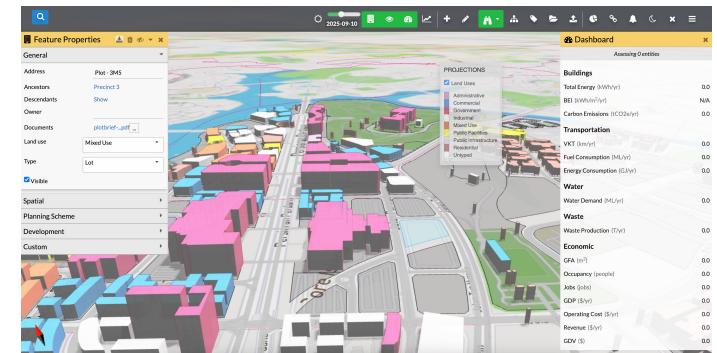
130 High safety and security for citizens
129 High quality health and education
116 Efficient public transportation
117 Quick connectivity within the city
103 Smart Mobility
60 Public Hospitals
106 Connected Community
107 Connected Government
59 Water Management
126 Easy access to high efficient public and consumer services
55 Water Quality: Lakes and Rivers
110 Recycling and reduction of waste
105 Smart Living (Digital Services)
109 Introduction of renewable and clean energy
125 Attractive to international businesses
113 Air quality monitoring
121 Higher number of private sector jobs
43 Telecommunications Infrastructure (ICT, Wi-Fi, Fiber optics)
66 University Level Education
136 Efficient local governance
54 General Cleanliness of Streets
131 A diverse vibrant community and society
111 Green transportation
58 Use of Clean and Renewable Energy Technologies



Mapping City Excellence to Priorities



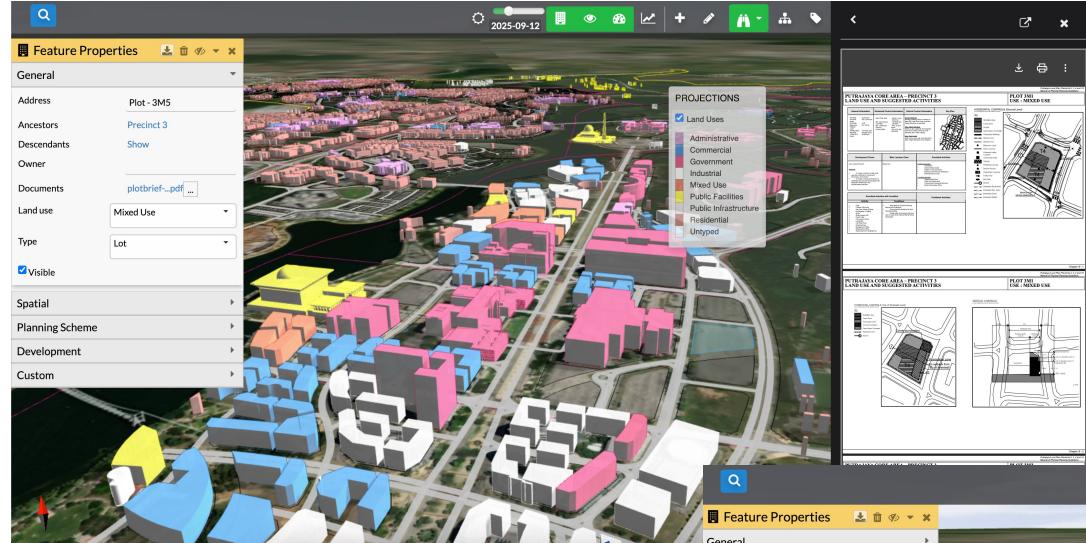
Project Feasibility Simulation and Reporting



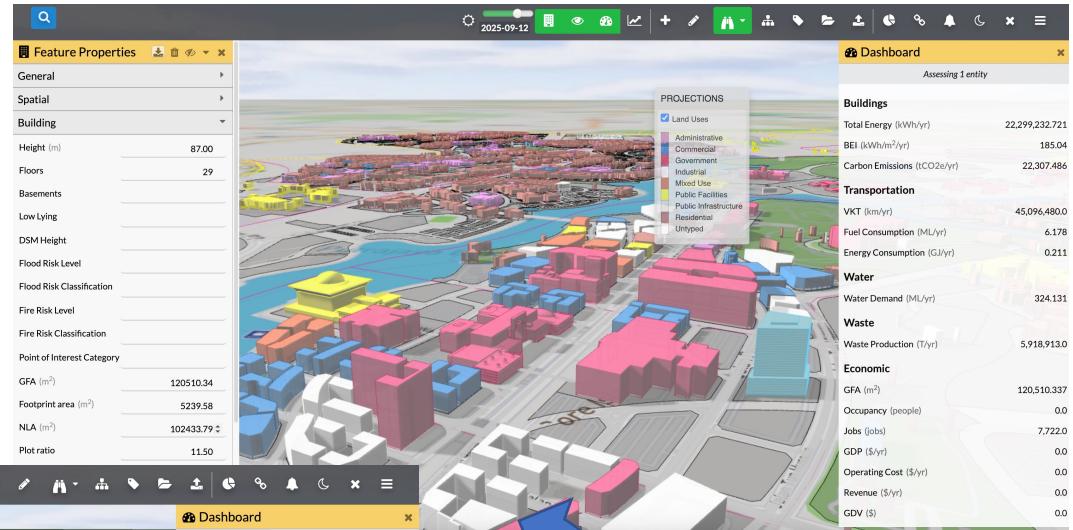
AI Cities Use Case - Putrajaya

Developments feasibility simulation and analysis – using parametric modelling

1. Selecting an empty plot of land



4. Saving final parameters and incorporating results



2. Checking Urban Design Guidelines associated with the plot



3. Adjusting Development Parameters

About AI Cities Initiative

An acceleration initiative for cities to adopt and harness AI technologies in optimizing city efficiency and improve Rakyat's quality of life.

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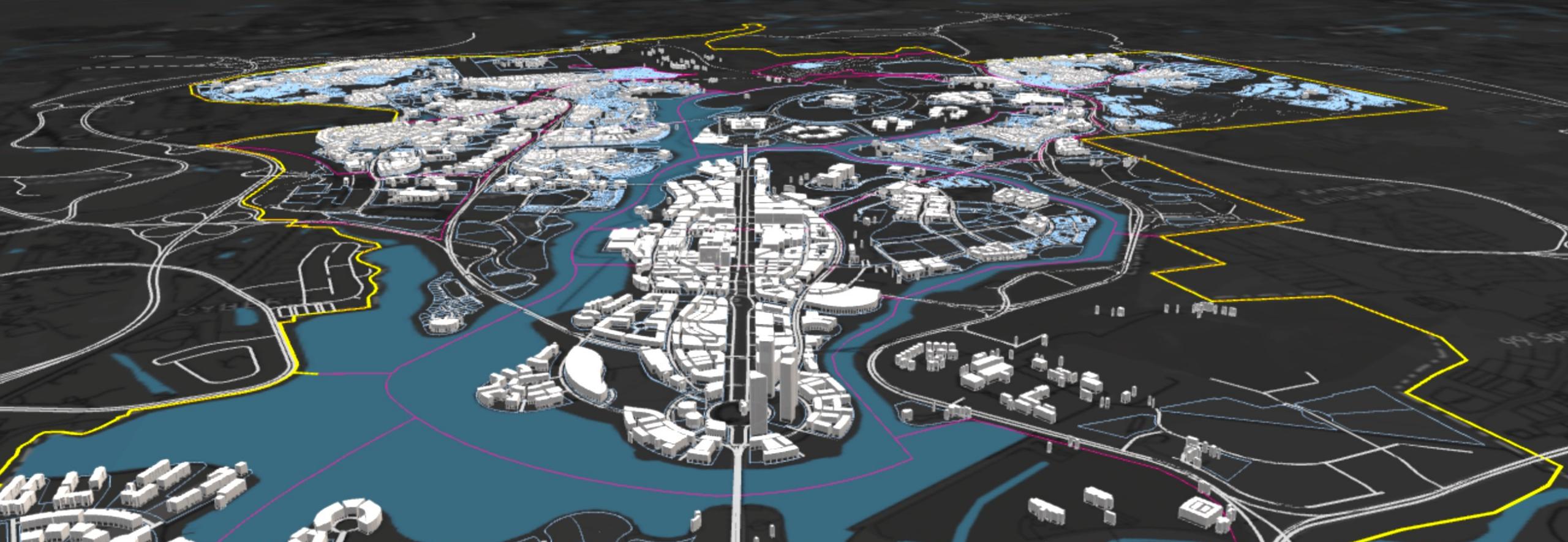


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Technology Partner



Urbanetic.io/twinworks



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