

National Education Series for Geography Teachers: (3) Smart City and Sustainable Development in Shenzhen & its Implications for Planning and Development in Hong Kong

Speaker: Professor NG Mee-kam

Vice Chairman, Department of Geography & Resource Management
Director, Urban Studies Programme
The Chinese University of Hong Kong



Date: 19 April 2023 (Wednesday)

I. Shenzhen's urban development and planning: an overview

News and videos of Shenzhen

40 years of opening up: Shenzhen's transformation seen in 10,000 photos

https://news.cgtn.com/news/3d3d414d306b6a4d31457a6333566d54/share_p.html

Welcome to Shenzhen, China's Tech Megacity

<https://www.youtube.com/watch?v=lcrfk6OoZlw>

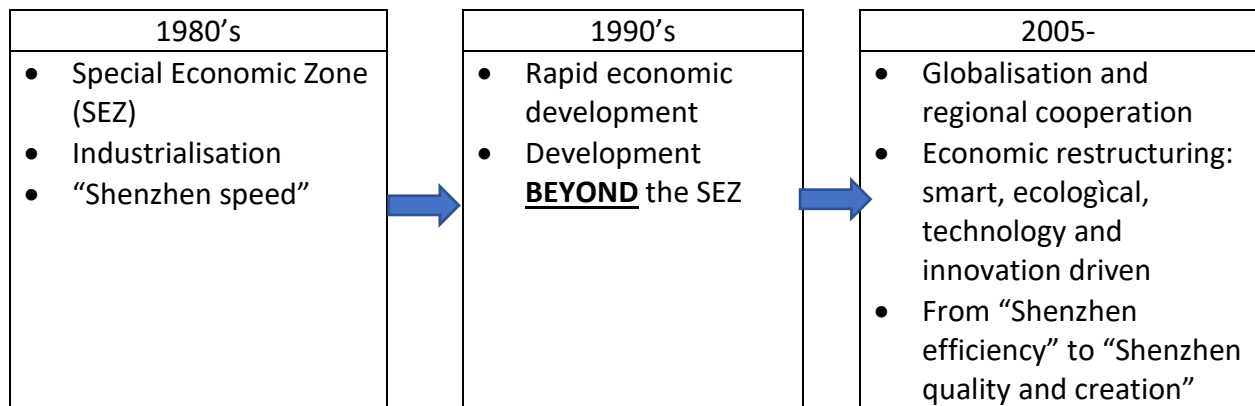
The People's Republic of The Future

<https://www.youtube.com/watch?v=taZJblMAuko>

Administrative map of Shenzhen

<https://shenzhenshopper.com/wp-content/uploads/2016/06/sz-districts.jpg>

A. Development stages



1. 1980's

1982 THE FIRST MASTER LAYOUT PLAN

- 1980: population only 30,000 (SZUBP & CAUPAD 1986, p.2)
- 1982, the First Master Plan
 - Shenzhen Special Economic Zone (SSEZ): 327.5 km²
 - Industrial development, then commerce, trade and tourism
 - Provided the basis for subsequent planning

1986 THE SECOND MASTER PLAN

- Developed urban area: 123 km²; population, 0.4 million, ½ permanent, ½ transient
- By 2000: total urban permanent dwellers: 0.8 million and transit population: 0.3 million
- Clustered developments driven by state-owned companies → powerful stakeholders
- 18.4 km² of industrial zones for electronics, light industry, building materials, machine building & textile

LAND MANAGEMENT REFORMS

(SZUPDC & SCB, 1990, pp.47, 72)

- Ju WANG, deputy Secretary-General of the SZ Municipal People's Government:

'At a time when land was used free of charge in other Chinese cities... the SSEZ... raise loans from banks for the construction of urban infrastructure facilities, leaving more benefits with enterprises and investors and give the market and investment environment much time to develop and improve...'

- 1987: the Government borrowed 670 million yuan for capital construction, with annual interests amounting to more than 50 million yuan... land use fees collected was only 50.2 million yuan when the differential land rents amounted to nearly 100 million yuan
→ opportunity ripe for improving the land management system
- 1987: First transaction of land use right → 1998: The Provisional Ordinances on Land Management of SSEZ → initiated a land revolution in China
- 1988-89: 298.5 million yuan (US\$7.358 million) was collected by leasing land-use rights
- 1989: the SZ Municipal Planning Bureau, the SZ Municipal Land Bureau and the SZ Capital Construction Office jointly formed the Shenzhen Municipal Construction Bureau

2. 1990S: Rapid economic growth outside SSEZ

- Baoán County turned into Baoán and Longgang Districts → farmers → urbanites
- Before that: towns were industrialised and urbanised through foreign investments → fragmented development led by individual towns → rapid economic growth in Shenzhen

THIRD SHENZHEN MASTER PLAN (1996-2010)

- 1993, incorporation of the rural county into the city → urbanising the rural areas
- 1996: PRD Economic Zone Urban System Plan—coordinated sustainable development
- 'Singapore's environment and Hong Kong's efficiency' (SZMG 2000 Preface)
- Socio-economic development strategy
 - **Positioning**: regional financial centre, information hub, commercial and trade centre, logistics and tourism and hi-tech development and production base, bridging domestic and international market and realising cooperation and coordinated sustainable development in Hong Kong and PRD
 - **Economic development strategy**: hi-tech production, logistics, finance, information and new commercial and trade service industries, urban agriculture
 - **Social development strategy**: control population, enhancing population structure, raising people's quality, nurturing modern city culture
 - **Environmental development strategy**: strictly controlling various types of pollution; effectively controlling use of green field site, conservation of natural and built heritage
 - **Socio-economic development**: socialist market reforms, people's quality of life, perfecting urban functions to become socialist world city

Land	2,020km ²
Population	3.355 million
Developed land	299.5km ²

Developable land	234km ²
Population	2005: 4.2 million 2010: 4.3 million
Urban construction land	2005: 425km ² 2010: 480km ²
Protection of agriculture land	200km ²
Protection of water resources	565.98km ²
Cluster buffer areas	68.43km ²

- Agricultural protection zone
- Ecological sensitive areas
- 1997: Planning standards and guidelines
- 1998: Urban Planning Law was enacted

TWO DEVELOPMENT REGIMES (SXUPLAB & UPDISZ, 2005, p.31)

- Land within the SEZ: belonged to Government units
- Land outside the SEZ was governed by towns with little central coordination
 - The towns had to rely on **housing (small property housing)** and land development to grow
 - District-level Governments lacked funding and human resources to control and manage → environmental degradation

3. 2000s: Issues and challenges

- Population structure
 - Need to further restructure the economy to boost economic efficiency
 - China's accession to World Trade Organization → end of 'special' status of the SSEZ
 - End of 'second line' in **2010** → full integration of the two districts with the SSEZ → Shenzhen Municipality
 - Four key constraints:
 - **Shortage of land**
 - **Water shortage (70% supply from outside the city)**
 - **Energy shortage**
 - **Exceeded the carrying capacity of the ecological environment**
- **Necessary to reframe the mode of development**

- Smart sustainability as a pathway towards further growth: use less resources, including land; leap-froging the development process; maintaining competitiveness...

II. Sustainable and Smart Development and Planning in Shenzhen

A. Central-Provincial-Local policy Nexus

- 1984-: Protection of the living and ecological environments
- 1986-: Central government encouraged the import of advanced technology and high-tech Industries
- 1987: Huawei was set up with only six employees and RMB24,000 registered capital (Wen, 2020, p.30)
- 1993: Central government encouraged development of privately owned technology enterprises
- 1993: Shenzhen started to develop SUPER-GIS
- 1994: China's Agenda 21 and commitment to sustainable development
- 1990s-: nature conservation zones, high-tech industrial development
- 2000s-: technology, human resources, ecological civilisation

B. Planning for Smart Sustainable Development

- 2005: Shenzhen 2030 (development strategy → sustainability turn)
- 2005: Shenzhen Digital City Management Programme
- 2008: Shenzhen National Master Plan for Innovative City (2008-2015)
- 2010: Shenzhen Fourth Master Plan 2010-2020 (statutory)
- 2011: Shenzhen White Paper on National Low-carbon Ecological Demonstration City (2011-12) (involves changes in rules and regulations)
- 2011: Smart Shenzhen Planning Outline (economic growth strategy)
- 2018: Master Plan for Building a Smart Shenzhen (economic growth strategy)
- 2021: Draft Territorial Spatial Master Plan (2020-2035)

1. Seven Development Strategy

i. Regional development strategy

- Cooperation with PRD
- Cooperation with HK

ii. Economic strategy

- Upgrading

- Diversification
- Core & sustained competitiveness
- Specialised production zone
- Minimising energy, land & material consumption

iii. Spatial development strategy

- Linking E-W, N-S
- Enhancing core, developing both wings
- Enhancing existing stock & reclaiming for more

iv. Ecological development strategy

- Ecological control line
- Rehabilitating and nurturing natural ecology
- Enhancing environmental protection

v. Social development strategy

- Exploring reforming population management system
- Developing education and cultural industries
- Building service oriented governments

vi. Infrastructure strategy

- 3-D regional transportation networks & hubs
- Global information hub
- Public safety & resources provision mechanism

vii. Economising city development

- Reframe development concept
- Reframe growth model
- Enhance spatial patterns

2. Shenzhen Digital City Management Programmes (2005)

- Covering the **whole of SZ**
- **Six categories**: utilities, road traffic, city environment, landscaping, housing, and land and related facilities
- **Five aspects**: city environment, publicity and advertising, construction management, emergencies, street order
- Building a **unified integrated information platform** of urban management

- **Shenzhen Digital City Management Pilot Management Leadership Group**: practically involving all government bureaux and districts, with two working groups on **technology development** and **comprehensive information census**

3. Shenzhen National Master Plan for Innovative City (2008-2015)

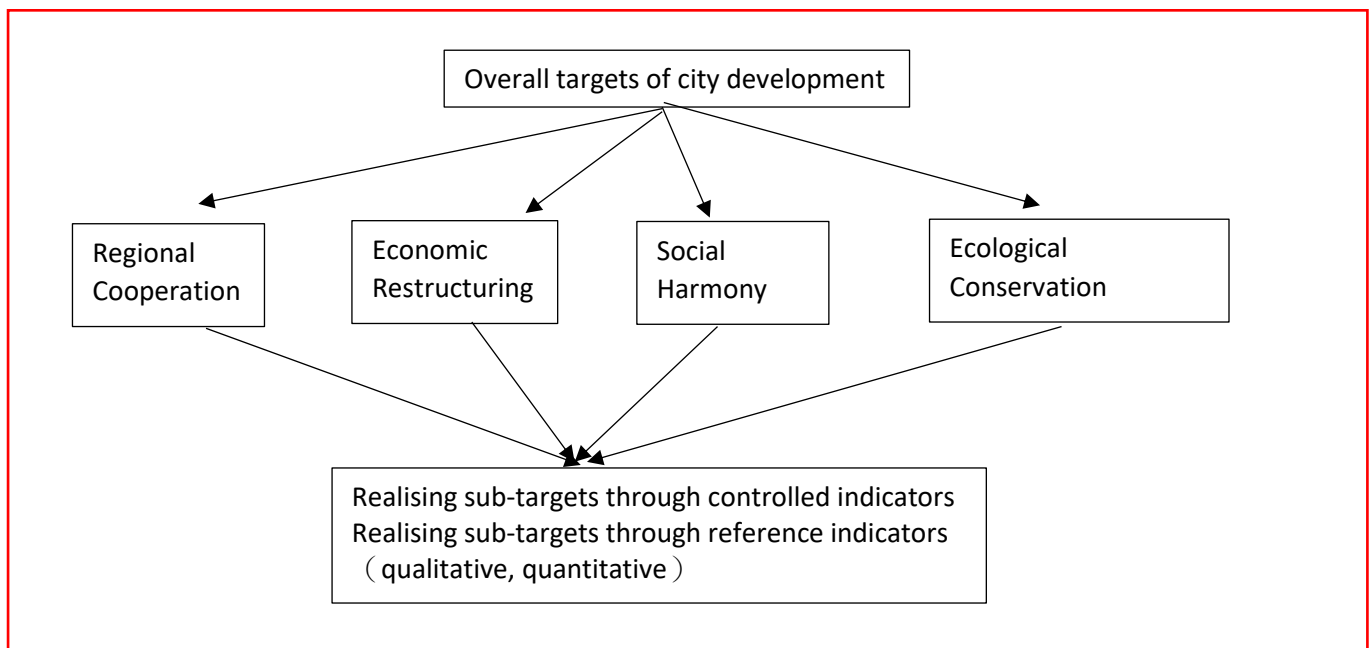
- SZ, a window of national reform... ‘**innovation as the lifeline and soul of development**’, a national high-tech industrial base and intellectual property demonstration city
- High-tech industries: **32.5% of GDP** (2007); R&D investment in GDP: **3.3% (2007)**
- Cultivate and expand a number of innovative small and medium-sized enterprises and innovative intermediary service institutions, independent innovation with regional impacts
- Established the **SZ National Leading Group for Innovative Cities**, including all relevant government bureaux; **SZ National Committee of Experts** (domestic and overseas experts)
- Talent support

Innovation of Development Mode	Innovation of Institutional Mechanisms
<ul style="list-style-type: none"> • Ecological: resource saving and environmentally friendly • Ecological transformation of traditional industries • Green enterprises, buildings, schools communities, homes • Multi-dimensional development, optimizing economic structure to overcome resource constraints • A ‘Digital City’ 	<ul style="list-style-type: none"> • Coordination of industrial and technology and science policies • Encourage enterprises to invest in R&D • An intellectual property trading platform • Promote open and fair public sharing of innovation resources • An appraisal system to assess government’s support of innovation and service innovation
Scientific, Technological & Industrial Innovation	Social and Cultural Innovation
<ul style="list-style-type: none"> • Strengthen basic R&D Capabilities • Develop institutions of higher learning and research institutes • Deepen cooperation in industry, science and research, key laboratories, research centres etc. • An innovative platform system to provide scientific & technological literacy, standards etc. • Innovative financial services system • Strengthen cooperation with Hong Kong 	<ul style="list-style-type: none"> • Government-led and socially participated science & technology undertakings • Enhance public scientific literacy • Diversification of the contents of social public services • A sustainable social insurance system • Flexible system of land transfer • Construction of new universities, research institutions, public technology platform construction

4. Fourth Shenzhen Master Plan (2010-2020)

Guiding Principles

- Exploring a way to pursue **economic restructuring and sustainable development** under resource constraints
- Based on the concepts of **'Environment First'** and **'Building the City on Ecology'**, integrate socio-economic development with resource and environmental conservation
- Raise the profile of the city in regional and national development in order to face global challenges and opportunities
- Better serve Hong Kong under the 'One Country Two Systems' policy
- **Use master planning to integrate public policy functions and urban development**



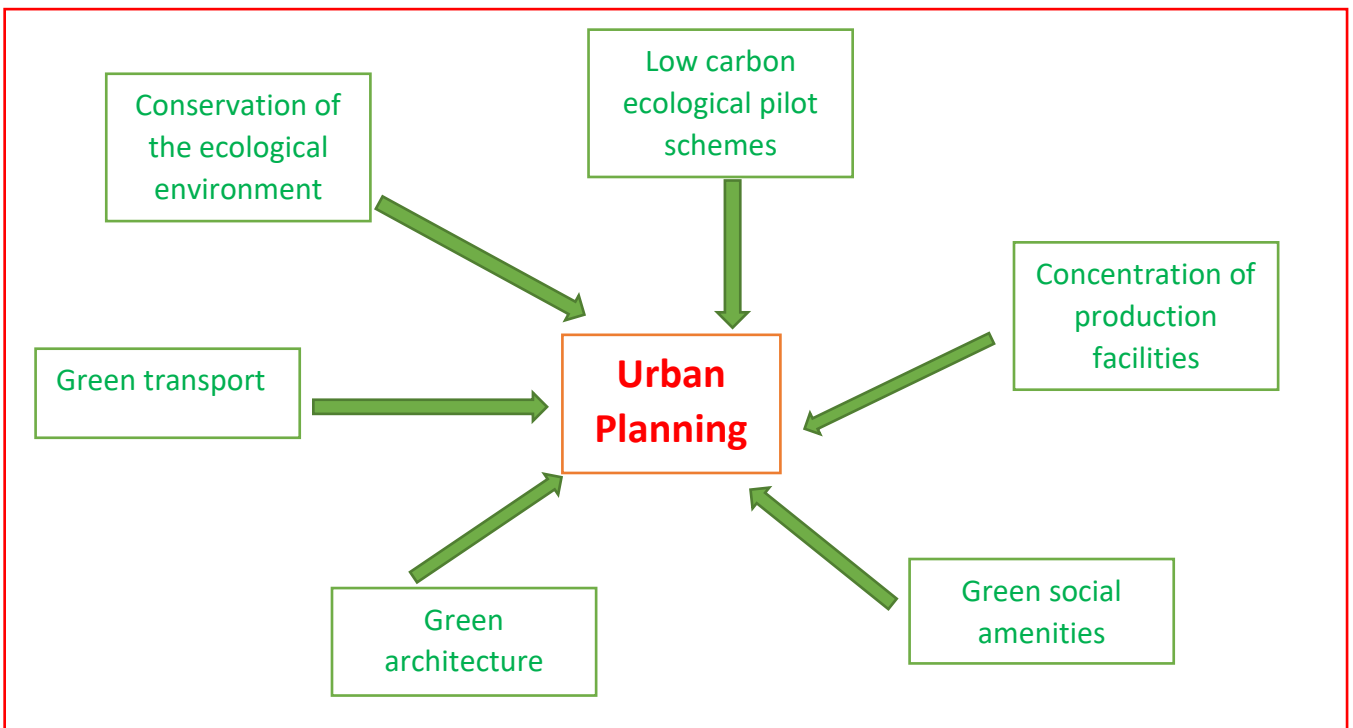
The Plan:

- 2010: The SSEZ was expanded to the entire city of Shenzhen
- Shenzhen's change of development ideology:
 - From **Shenzhen Speed** to **Shenzhen Quality**
 - From **Shenzhen Manufacturing** to **Shenzhen Creation**
 - From Manufacturing Industry-led to **Service Industry-led**
 - From Economic construction to **Social Construction and Management**
- **Smart sustainable development** as a strategy to phase out manufacturing industries and to develop higher value-added service-oriented industries (de Jong, Wang and Yu, 2013, p.101)
- Strict control over new land uses
 - **No go area**: within the ecological control boundary where no development could take place without prior approval
 - **Restricted area**: within the ecological control boundary but outside the no go area

- **Suitable area**: land outside the ecological control boundary minus the built up area
- **Built-up area**
- Ecologically functional zones
 - Forest coverage 50% by 2020, 12% of total land for nature conservation zone and communities

5. Shenzhen White Paper on National Low-Carbon Ecological Demonstration City (2011-12)

- **Concentrated urban development**: efficiently concentrate urban development in nodal areas so that carbon emission can be cut at source;
- **Urban renewal and mixed use development**: Promoting urban renewal, development intensity, mixed and vertical uses to economise on land uses;
- **Working and living place**: Promoting life-work balance;
- **Transit-oriented development**;
- **Ecological baseline**: Enhancing the protection of the city's ecosystem and sustaining the city's ecological baseline through forward looking urban planning; &
- **Green buildings and infrastructure**: R&D, control and monitoring of life-cycle development (Prologue).



Aspects	No.	Indicator	Historical value (2009)	Current value (2012)	Target (2015)	Target (2020)
Economic restructuring	1	GDP construction land (m ² /RMB10,000)	12.10	7.28	<8.5	<3.5
	2	GDP Energy consumption (tonnes of coal/RMB10,000)	0.53	0.45	<0.398	<0.366
	3	GDP water consumption (m ³ /RMB10,000)	22.30	16.51	<=19.4	<=17.3
Enhancing the environment	4	Greening ratio (%)	45.00	45.06	>=45.5	>=50.0
	5	Coverage of natural conservation areas (%)	0.47	7.93	>=8	>=9
	6	Smoggy days (days/year)	115	77	<=33	<=130
	7	Hazardless treatment of domestic waste (%)	94.3	95.13	>=95	>=100
Livable city	8	Mixed land uses in new development (%)	-	24	>=20	>=30
	9	Per capita social amenities (m ²)	-	4.03	4.4	5.0
	10	Use of public transport in motorized transport (%)	47	54.5	>=56	>=65
	11	Intensity of urban heat island effect (°C)	-	1.17	<=2.5	<=2.0
Economising resources	12	Net plot ratio in developed area	0.85	0.95	>=1.0	>=1.0
	13	The actual proportion of land supply in the stock of land (%)	-	>50	>50	>50

Aspects	No.	Indicator	Historical value (2009)	Current value (2012)	Target (2015)	Target (2020)
	14	Proportion of green buildings among new government buildings (%)	-	32.6	>/=60	>/=80
	15	Use of grey water (%)	40.17	52.85	>/=30	>/=30
	16	The rate of solid waste turned resource (%)	42.9	35.43	>/=70	>/=75

Source: SUPLRC, 2013, p;39

- In order to meet these targets, over 90 rules, regulations and policies have been changed or developed. For example, changes in the planning standards and guidelines; building codes regarding green buildings; use of water; waste handling...

6. Smart Shenzhen Planning Outline (2011-2020)

- **Basic principles:**
 - Government coordination and market operation
 - Resource consolidation and collaboration
 - Leading standards and integrating innovation
 - Based on people's livelihood and promoting industry
 - Step by step with key breakthrough
- **Development goals:**
 - Building a well-functioning information and communication technology infrastructure
 - A public information service support platform for the efficient integration of information resources
 - A number of mature and efficient applications for urban management and people's livelihood services
 - Mastering a number of key core technologies and standards with independent intellectual property rights
 - Cultivating a number of industrial clusters with international Competitiveness
 - Building an international leading information and communication technology infrastructure environment

- **Main tasks:**
 - Management optimization and operation enhancement: overall planning of top-level design and information engineering, unifying data standards, promoting coordinated operations, converging networks, platforms and centres etc. → **'SZ Cloud Computing Service Centre'... low carbon development**
 - Strengthening infrastructure, enhancing urban environment: **a multi-sphere 'SZ Cloud' system...** intelligent transformation of existing urban infrastructure such as highway, underground pipeline etc.
 - Establish a public platform and improve the support system → **intelligent SZ public service support platform**
 - Promoting industry innovation and optimizing industrial structure

7. 2018: Master Plan for Building a Smart Shenzhen

- By **2020** to achieve **'Six One'** development goals:
 - One plan for comprehensive understanding;
 - One number for the whole of SZ
 - One click to know the overall situation
 - One system for mobility and Accessibility
 - One stop for innovation and entrepreneurship
 - One screen to enjoy life smartly

8. 2021: Draft Territorial Spatial Master Plan (2020-2035)

- **Contents**
 - Pioneering and demonstrating: strategic Positioning
 - Regional cooperation: engine of GBA
 - Spatial planning: beautiful SZ layout
 - Ecology first: sustainability pioneer
 - People-centred: well-being benchmarks
 - Driving innovations: high quality development
 - Terrestrial and marine planning: marine central city
 - Place-making
 - Infrastructure support: accessible, smart and resilient city
 - Focus on implementation: improve spatial governance capacity
- **By 2035:**
 - Population: 19 million
 - Developed area: 1,105 sq.km. (out of 1,997 sq.km.) (55.3%)
 - Strategic Spatial Development Strategy:

- Higher quality of sustainable development through strengthening the **centre for innovation**
 - Higher efficiency of intensive development through **allocating spatial resources precisely**
 - Realising fairer harmonious development through providing **more equitable public services**
 - Realising more sustainable development through **protecting and restoring the natural ecosystem**
 - Realising safer healthy development through **protecting urban resources**
- Ten short-term actions
 - GBA Connect
 - One Million Degree Places
 - Urban Farming
 - Linking Mountains & Sea
 - Ecological Restoration
 - Blue Ocean Power
 - Industrial Security
 - Home Sweet Home
 - Quality Public Transportation
 - Cutting Carbon Emission

III. Lessons for Hong Kong

A. Implications for Hong Kong and Beyond

- SZ Municipal Government: **important mission (from Central Government); impossible constraints** (power stakeholders within and beyond the former SEZ)?
 - The importance of **planning**
 - At the turn of the century: SZ lost her special status as a SEZ and it also faced **‘four constraints’** (land, water, energy and ecological)
 - The **integration of the rural county into districts** of the Shenzhen Municipality—while the ‘urbanisation’ process has not completed, the efforts are commendable
 - Starts with **a vision**, encourages inter-sectoral collaboration and experimentation
 - The pursuit of high-tech and smart city development to tackle resource constraints and economic growth bottleneck → **smart sustainable development as a ‘growth strategy’** → Ecology-based, people-centred, smart economic-growth
 - **When there is a problem, finds a solution** through first a pilot experiment and then adaptation and implementation
 - Lots of experience in **inter-departmental and inter-sectoral collaborations**
 - **Innovation spirit**: not just **hard technology** but also **soft ones** such as policies, governance etc.
 - **SMARTIE** (Specific, Measurable, Achievable, Realistic, Timely, Inclusive, Equitable) **KPIs**— built also into the assessment of government officials
- Since SZ2030 in 2005, SZ has extended its desire to collaborate with **Hong Kong** in furthering the development of the **GBA -> Dynamic spatial planning** as an effective tool to ‘build on strengths, overcome weaknesses, exploit opportunities and blunt threats’ over time