WeSpace 2.0 (Brief Version)

Future Cities from the Lens of Space

Second edition Jul. 2022

清華大學建筑学院
School of Architecture, Tsinghua University
BCL
Beijing City Lab
Tencent
Research Institute

This report is positioned as a collection of information, cases, and viewpoints, as well as a study to illustrate and demonstrate the possible future urban (spatial) development under the influence of emerging technologies.

Intended audiences

Governments

Designers

Scholars

Residents

Technology companies

Developers, operators

……

Main contents

- Coupling effect of emerging technology development and cities
- New urban life scenes in the near future
- The trend of urban space development in the near future
- Opportunities and challenges of urban space operation, management, and design
- Positive and negative impacts of science and technology on urban life and urban space
- New ideas for achieving the Double Carbon Goal
- ……

From WeSpace to WeSpace 2.0

2019	**Tencent Research Institute × Tencent Cloud**	**WeCity**	Technology Intelligentization Person oriented Urban support system
2020	**Tencent Research Institute × Tencent Cloud** **School of Architecture, Tsinghua University** **Beijing City Lab**	**WeSpace**	Technology + Space Generate thinking and discussion Ontology, methodology, practice
2021	**Tencent Research Institute × Tencent Cloud**	**WeCity 2.0**	New space New service New governance
2022	**Tencent Research Institute** **School of Architecture, Tsinghua University** **Beijing City Lab**	**WeSpace 2.0**	New technologies, new goals, new challenges Carbon neutrality, metaverse, and other new backgrounds Generate thinking and discussion

Wespace 2.0

01 . Background and Connotation

02 . Technology Driven

03 . Development Prospect

04 . Creative Practice

05 . Conclusion and Prospect

1 The Background & Connotation of WeSpace 2.0

■ The relationship between technological development and the reform of urban space

1760s | 1870s -- early 20th century | 1940s and 1950s | Late 20th century -- early 21st century

Industrial Revolutions	**Before the Industrial Revolution**	**The 1st Industrial Revolution**	**The 2nd Industrial Revolution**	**The 3rd Industrial Revolution**	**The 4th Industrial Revolution**
Technological development and characteristics of The Times	**"Divisions of labor"** ✓ Mainly agriculture and handicraft industry. ✓ With animal power, the workforce is the primarily productive force. ✓ With water transport, animal power for traffic power.	**"The age of Steam"** ✓ Steam is used as the new driving force to promote the mechanical revolution. ✓ It replaces mechanical production in the handicraft industry. ✓ The invention of steam-powered transport.	**"The age of Electricity"** ✓ Electricity is used as the new driving force to promote the communication revolution. ✓ Household appliances and mass entertainment related to electricity. ✓ Internal combustion engines facilitate new modes of transportation.	**"The age of Information"** ✓ Computers promote the information control technology revolution. ✓ New energy and new materials. ✓ Space technology and marine technology.	**"The age of Intelligence"** ✓ Digital technology drives the technology fusion revolution. ✓ Mobile Internet and Internet of Things. ✓ Intelligent manufacturing and artificial intelligence.
Characteristics of urban space (Adaptation and renewal)	• Walking priority. • Organized around the emperor/monarchy and religion. • Low-rise buildings.	• The emergence of factories and the rise of industrial cities. • The functional layout with employment as the core. • Increased urban density and the emergence of multi-story buildings.	• The emergence of large cities with high population density. • The emergence of the mass entertainment industry and space. • The expansion of the planar area. • Tall buildings driven by elevators.	• The emergence of megacities and metropolitan areas. • The shrinkage of some industrial cities. • The increase of tertiary industry space. • The centralized urban functional zoning.	• The redefinition of inter-city connectivity. • The migration of traditional manufacturing industry space from cities. • The increase of knowledge production space. • The distributed spatial function organization. • The emergence of smart buildings and homes.

Mixed functions, pedestrian-oriented, human space → Functional zoning, vehicle-oriented, Separation of pedestrian & vehicle → Function mixing/sharing, Mobility-as-a-Service, human space[1]

The development of science and technology is a necessary and insufficient condition for the transformation of urban space.

The policy, culture, and historical background play critical roles at different levels.

- The progress of productivity tools affects the way of production and life and the way of social organization.
- The unbalanced scientific and technological development in space impacts the hierarchy of the industrial chain of the city.
- The advancement of power technology promotes the development of transportation.
- The advancement of construction technology brings architectural changes.

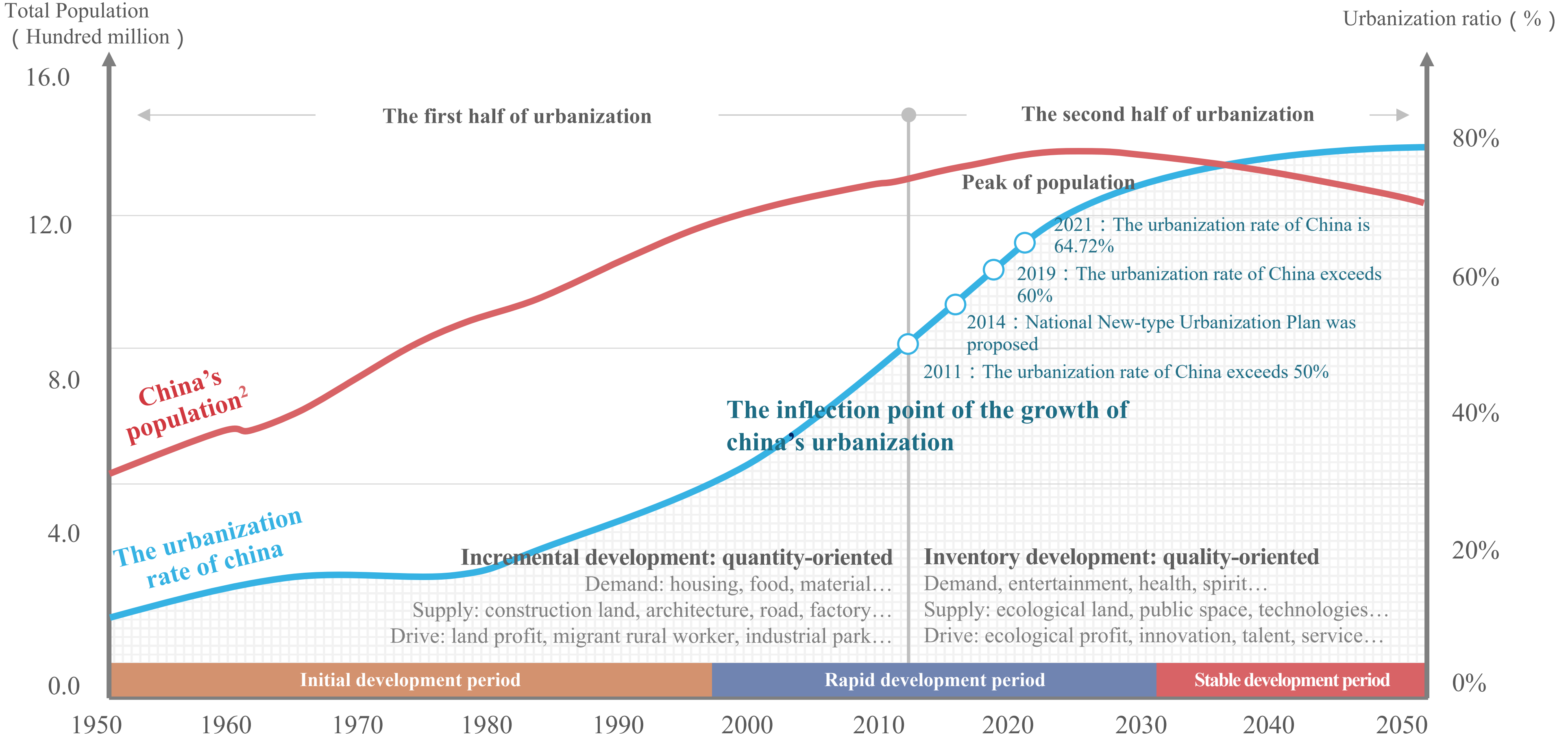
- Affects the layout and structure of the city.
- Affects the rank and size of the city.
- Affects the three-dimensional form of the city (construction intensity or spread degree).
- Affects the spatial form and function utilization form of urban architecture.

---

1. Liu Quan. The challenge of modernist planning by the approaching singularity and smart cities[J]. Urban Planning Forum,2019(05):42-50

1 The Background & Connotation of WeSpace 2.0

- **The era of new urbanization:** **Both the scale and efficiency are focused. The level and quality are improved, and the demand for refined urban management is urgent.**



Trends of population and urbanization in China from 1950 to 2050[1-2]

---

1. United Nations Population Division
2. Liang et al. China Population Forecast Report 2021 Edition[EB/OL]. https://new.qq.com/omn/20211215/20211215A0049S00.html

清華大學建筑学院 School of Architecture, Tsinghua University BCL Tencent Research Institute

1 The Background & Connotation of WeSpace 2.0

■ Background of digitalization and low carbon development

• Digital China Construction

2016.07

Outline of the National Informatization Development Strategy

Drive modernization with information technology and build a strong network country.

2016.12

The 13th Five-Year for National Informatization Plan

Put information work on an influential agenda and improve information development's integrity, systematisms, and coordination.

2019.05

Outline of digital rural development strategy

The digital countryside is not only the strategic direction of rural revitalization but also the essential content of building digital China.

2021.03

Outline of the 14th Five-Year Plan

Accelerate the digital society construction, improve the level of digital government construction, create a digital ecology, and build a digital China.

2021.06

The 14th Five-Year Plan for Cultural Development

Promote the high-quality development of the digital culture industry and cultivate and grow new cultural sectors such as online performance, digital creativity, digital art, digital entertainment, and immersive experience.

……

• Carbon Neutral Vision

2016.07

The Paris agreement

Limit the increase in global average temperature to less than 2 degrees Celsius over pre-industrial times and pursue efforts to limit the temperature increase to 1.5 degrees Celsius.

2020.09

Seventy-fifth session of the United Nations General Assembly

General Secretary Xi: "China will increase its independent national contribution, adopt stronger policies and measures, strive to peak CO_2 emissions by 2030, and achieve carbon neutrality by 2060".

2020.10

The 14th Five-Year Plan and the 2035 Vision (China)

We will accelerate green and low-carbon development and reduce carbon emission intensity. We will support localities where conditions permit us to be the first to peak their carbon emissions and formulate action plans to peak their carbon emissions by 2030.

2021.10

The 16th G20 Summit

Accelerate the promotion of green and low-carbon development and reduce carbon emission intensity. Support places with conditions to take the lead in reaching the peak of carbon emissions and develop action plans to reach the pinnacle of carbon emissions by 2030.

……

1 The Background & Connotation of WeSpace 2.0

■ Definition of concepts

- **City**：City is the distribution area of the urban landscape with high-density human settlements and developed non-agricultural activities, and it is a collection of the physical environment and various elements such as society, economy, and culture. The "city" in this report has not considered rural areas; it is not the city border based on the administrative division.
- **Space**： Space is an objective carrier that carries substances and activities. Specifically, it can be "form" or "physical environment" or administrative, entity, and functional area. The "space" in this report is more about the concept of functional area.
- **Future city:** Under different development stages, technological conditions, and social and cultural backgrounds, human beings propose targeted, predictive, and ideal urban development models for the future[2].
- **Focus:** The urban space under the influence of technology, which is more based on China, to refine the prototype and prospect the specific scene, and at the same time, some universal laws and trends are extended to discuss.

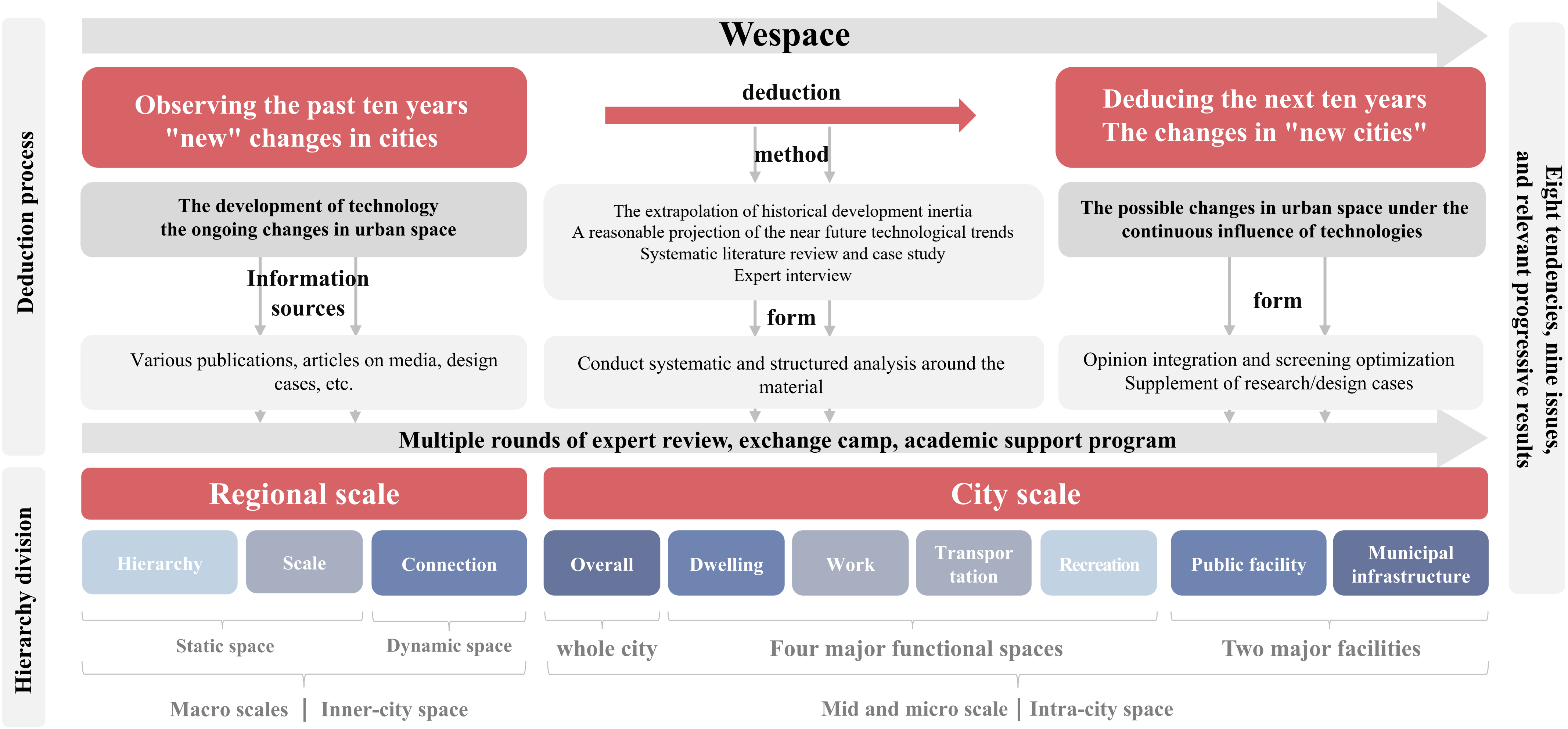
The delimitation of time span	This report focuses on **the present and the next ten years** in the near future rather than the distant future. In this report, it is suggested that the future is right at the moment.
The delimitation of deduction method	The report focuses on the laws of urban development and **carries out scenario analysis under trend deduction** rather than specific predictions of the future.
The delimitation of report purpose	The report summarizes the tendencies of urban development. It analyzes the possible spatial scenes of cities shortly to **trigger consideration and attention**, as well as in-depth research and discussion of this topic in the future.
The delimitation of application scope	The report emphasizes more on the **future cities in China**. However, part of the discussion can reference other countries due to the versatility of technologies.

---

1. Ma S., Long Y. Functional urban area delineations of cities on the Chinese mainland using massive Didi ride-hailing records[J].Cities, 2020, 97:102532
2. Zhang J, Zhang Q, Huangfu J, Li D. The "Hangzhou sample" of the future city and its planning exploration[J].City Planning Review,2020,44(02):77-86

1 The Background & Connotation of WeSpace 2.0

■ Core research methods: Backtracking and deduction



Wespace

Deduction process

Observing the past ten years "new" changes in cities

deduction

method

Deducing the next ten years The changes in "new cities"

The development of technology
the ongoing changes in urban space

Information sources

Various publications, articles on media, design cases, etc.

The extrapolation of historical development inertia
A reasonable projection of the near future technological trends
Systematic literature review and case study
Expert interview

form

Conduct systematic and structured analysis around the material

The possible changes in urban space under the continuous influence of technologies

form

Opinion integration and screening optimization
Supplement of research/design cases

Multiple rounds of expert review, exchange camp, academic support program

Eight tendencies, nine issues, and relevant progressive results

Hierarchy division

Regional scale

City scale

Hierarchy	Scale	Connection	Overall	Dwelling	Work	Transportation	Recreation	Public facility	Municipal infrastructure

Static space | Dynamic space | whole city | Four major functional spaces | Two major facilities

Macro scales ｜ Inner-city space

Mid and micro scale ｜ Intra-city space

The framework of research method

2 The Technology Drive of WeSpace 2.0

- **A series of emerging technologies appeared under the background of the fourth industrial revolution**

Artificial Intelligence

Big Data

Cloud Computing

Mobile Internet

Sensor Network and Internet of Things

Digital Twin

VR/AR/MR

Smart Construction

Robotics and Automation

Blockchain

Quantum Computing

Edge Computing

Human-Computer Interaction

Automated Driving

Network Security

Clean Energy Technologies

Neuromorphic Chip

Distributed Energy Systems

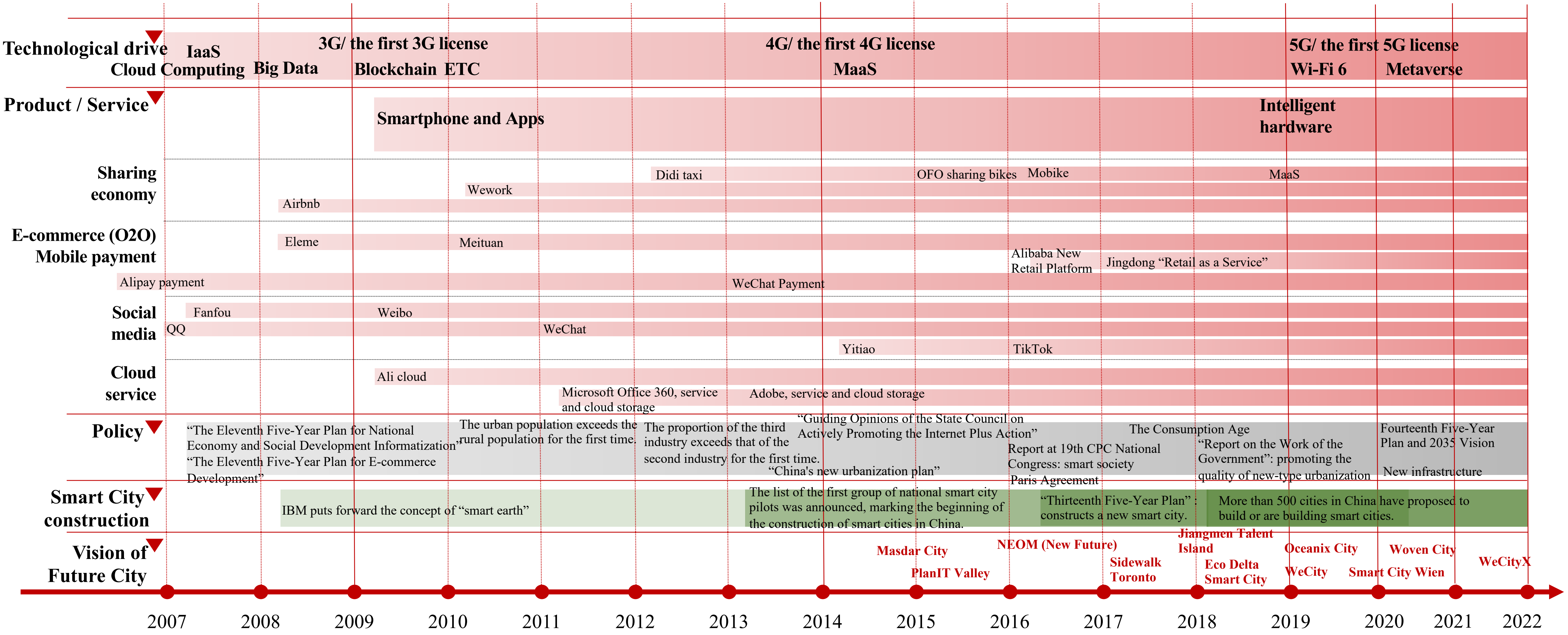
Energy Internet

Smart Water Management System

Smart Agriculture and Ecological Carbon Sequestration

2 The Technology Drive of WeSpace 2.0

- **The iterative mobile Internet technology is the main drive to facilitate the iteration at the urban product and service levels and ultimately affects all aspects, including urban construction**
  - **The development and changes of cities at different levels in the past several years**



Technological drive
IaaS
Cloud Computing
Big Data
3G/ the first 3G license
Blockchain ETC
4G/ the first 4G license
MaaS
5G/ the first 5G license
Wi-Fi 6
Metaverse

Product / Service
Smartphone and Apps
Intelligent hardware

Sharing economy
Didi taxi
OFO sharing bikes
Mobike
MaaS
Wework
Airbnb

E-commerce (O2O) Mobile payment
Eleme
Meituan
Alibaba New Retail Platform
Jingdong “Retail as a Service”
Alipay payment
WeChat Payment

Social media
Fanfou
Weibo
QQ
WeChat
Yitiao
TikTok

Cloud service
Ali cloud
Microsoft Office 360, service and cloud storage
Adobe, service and cloud storage

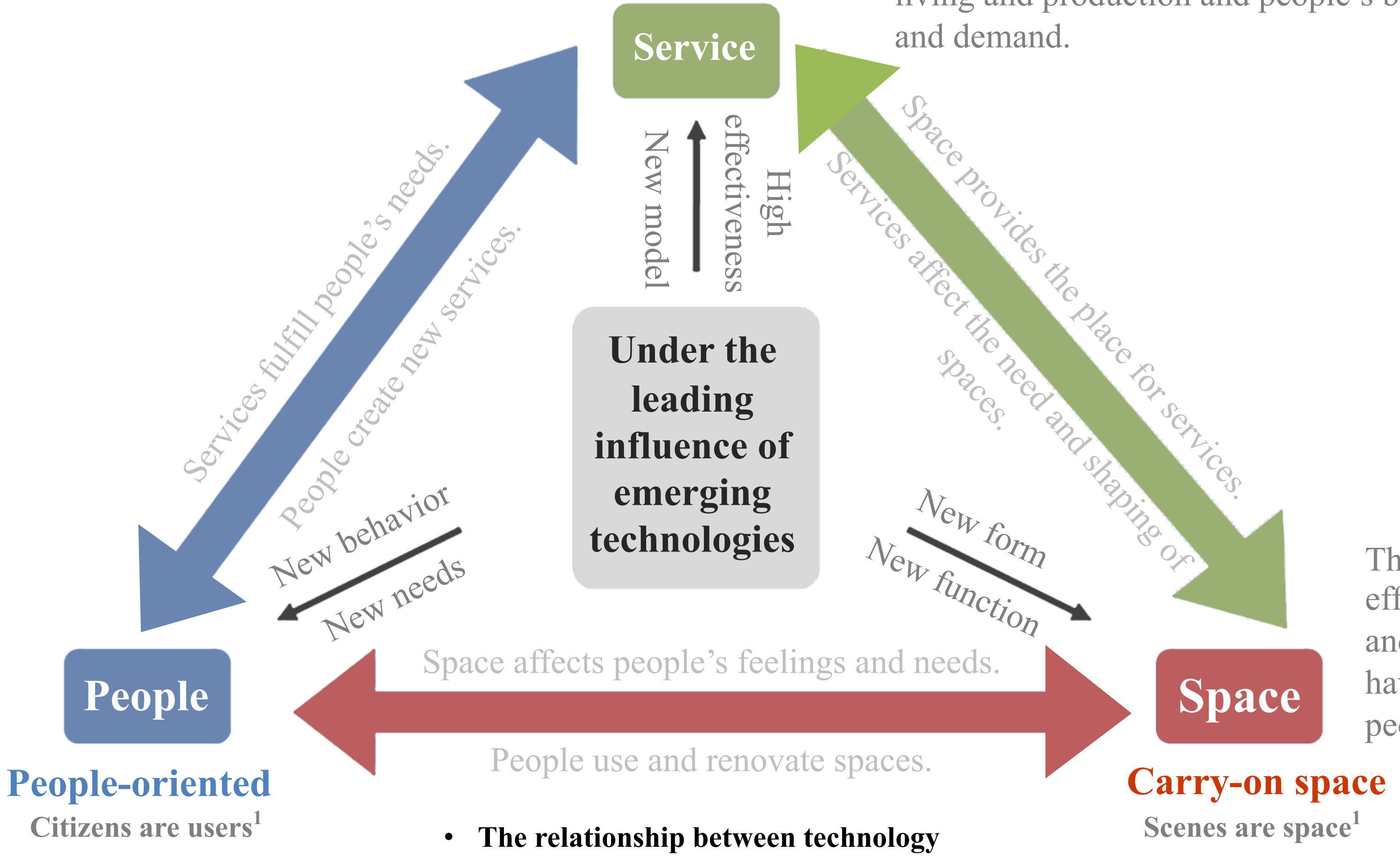
Policy
“The Eleventh Five-Year Plan for National Economy and Social Development Informatization”
“The Eleventh Five-Year Plan for E-commerce Development”
The urban population exceeds the rural population for the first time.
The proportion of the third industry exceeds that of the second industry for the first time.
“Guiding Opinions of the State Council on Actively Promoting the Internet Plus Action”
“China's new urbanization plan”
Report at 19th CPC National Congress: smart society
Paris Agreement
The Consumption Age
“Report on the Work of the Government”: promoting the quality of new-type urbanization
Fourteenth Five-Year Plan and 2035 Vision
New infrastructure

Smart City construction
IBM puts forward the concept of “smart earth”
The list of the first group of national smart city pilots was announced, marking the beginning of the construction of smart cities in China.
“Thirteenth Five-Year Plan” : constructs a new smart city.
More than 500 cities in China have proposed to build or are building smart cities.

Vision of Future City
Masdar City
PlanIT Valley
NEOM (New Future)
Sidewalk Toronto
Jiangmen Talent Island
Eco Delta Smart City
Oceanix City
WeCity
Woven City
Smart City Wien
WeCityX

2 The Technology Drive of WeSpace 2.0

■ The relationship between future urban space, people, and services



Connection is service[1]

Instant service

Service

High effectiveness

New model

Under the leading influence of emerging technologies

Services fulfill people's needs.

People create new services.

Space provides the place for services.

Services affect the need and shaping of spaces.

New behavior

New needs

New form

New function

Space affects people's feelings and needs.

People use and renovate spaces.

People

People-oriented

Citizens are users[1]

Space

Carry-on space

Scenes are space[1]

A series of new service models and effects have first appeared that match the changes in people's ways of living and production and people's behaviors, activities, and demand.

There are a series of changes in people's ways of living and production and people's ways of behavior and activities and demand.

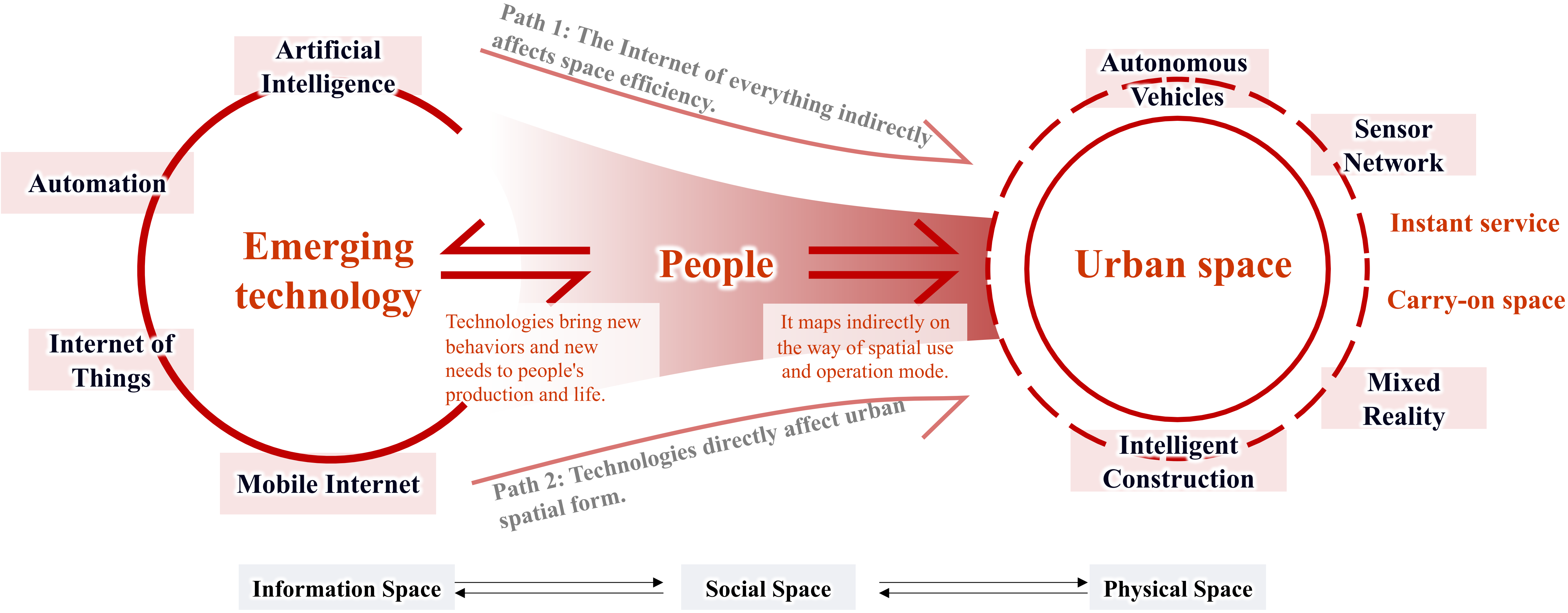
The changes in service models and effects further impact the demand and shaping of space and thus have interaction feedback with people.

- **The relationship between technology and urban space, people and service**

[1] Tencent.WeCity report

2 The Technology Drive of WeSpace 2.0

■ The interaction between emerging technologies and future urban spaces


Artificial Intelligence
Automation
Internet of Things
Mobile Internet
Emerging technology
Path 1: The Internet of everything indirectly affects space efficiency.
People
Technologies bring new behaviors and new needs to people's production and life.
It maps indirectly on the way of spatial use and operation mode.
Path 2: Technologies directly affect urban spatial form.
Autonomous Vehicles
Sensor Network
Instant service
Urban space
Carry-on space
Mixed Reality
Intelligent Construction
Information Space
Social Space
Physical Space

- The path of new technologies acting on future urban space

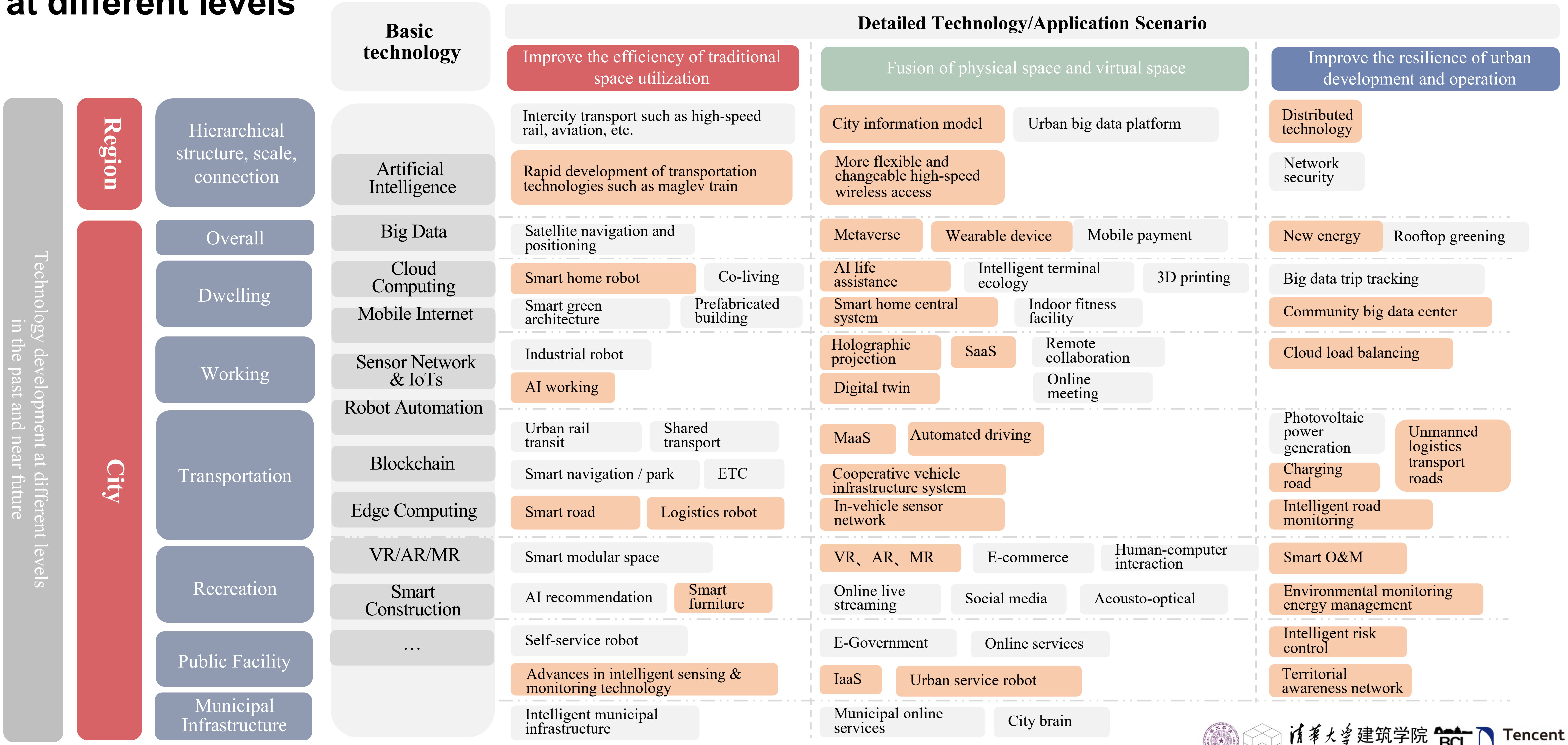
2 The Technology Drive of WeSpace 2.0

Emerging technologies further affect urban space at different levels

- **The relationship between urban space and technology at different levels**

The existing technologies in the past ten years ⬜

The emerging technologies in the next ten years 🟧



Technology development at different levels in the past and near future

Basic technology

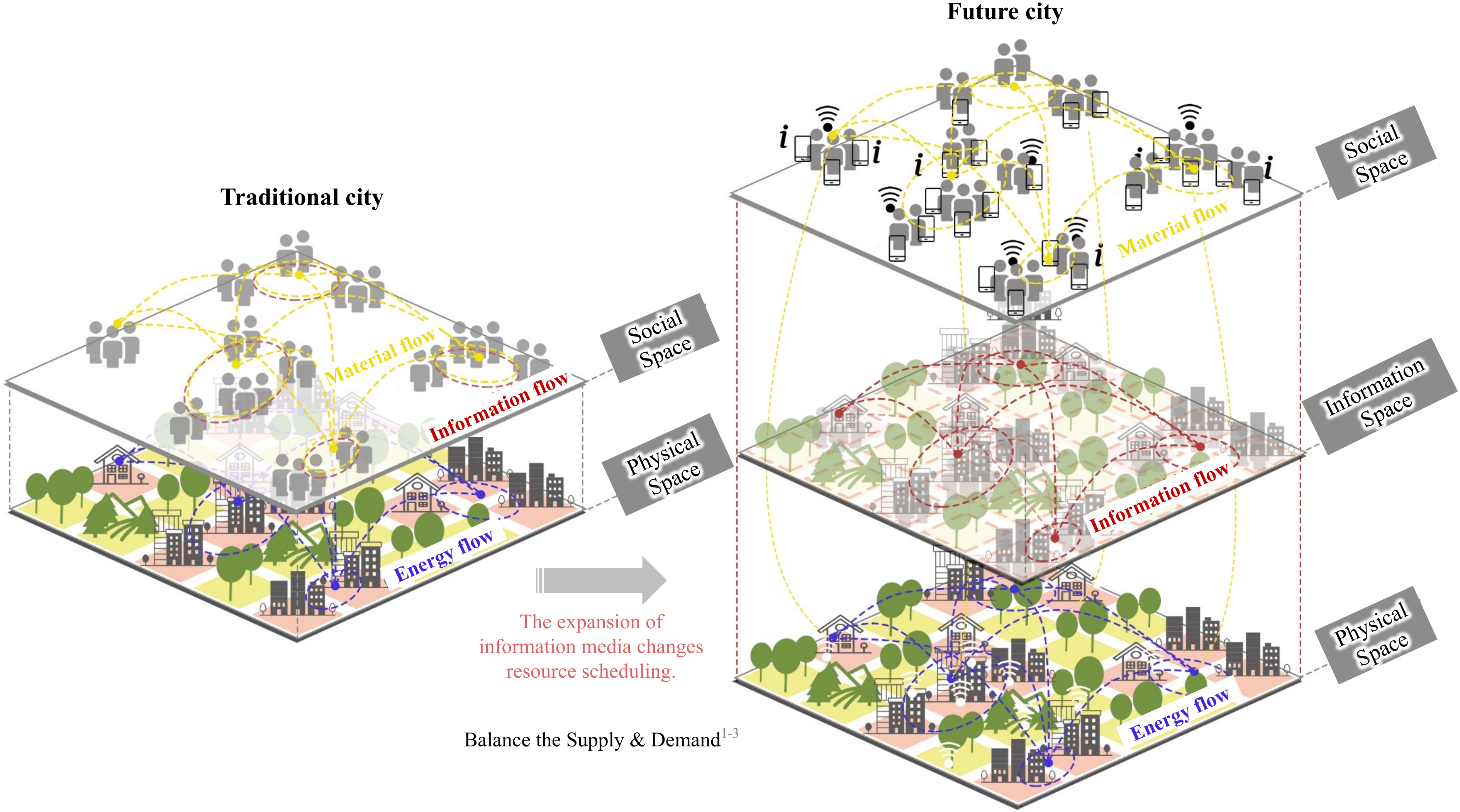
- Artificial Intelligence
- Big Data
- Cloud Computing
- Mobile Internet
- Sensor Network & IoTs
- Robot Automation
- Blockchain
- Edge Computing
- VR/AR/MR
- Smart Construction
- …

Detailed Technology/Application Scenario

		Improve the efficiency of traditional space utilization	Fusion of physical space and virtual space	Improve the resilience of urban development and operation
Region	Hierarchical structure, scale, connection	Intercity transport such as high-speed rail, aviation, etc. 🟧 Rapid development of transportation technologies such as maglev train	🟧 City information model Urban big data platform 🟧 More flexible and changeable high-speed wireless access	🟧 Distributed technology Network security
City	Overall	Satellite navigation and positioning	🟧 Metaverse 🟧 Wearable device Mobile payment	🟧 New energy Rooftop greening
	Dwelling	🟧 Smart home robot Co-living Smart green architecture Prefabricated building	🟧 AI life assistance Intelligent terminal ecology 3D printing 🟧 Smart home central system Indoor fitness facility	Big data trip tracking 🟧 Community big data center
	Working	Industrial robot 🟧 AI working	🟧 Holographic projection 🟧 SaaS Remote collaboration 🟧 Digital twin Online meeting	🟧 Cloud load balancing
	Transportation	Urban rail transit Shared transport Smart navigation / park ETC 🟧 Smart road 🟧 Logistics robot	🟧 MaaS 🟧 Automated driving 🟧 Cooperative vehicle infrastructure system 🟧 In-vehicle sensor network	Photovoltaic power generation 🟧 Unmanned logistics transport roads 🟧 Charging road 🟧 Intelligent road monitoring
	Recreation	Smart modular space AI recommendation 🟧 Smart furniture	🟧 VR、AR、MR E-commerce Human-computer interaction Online live streaming Social media Acousto-optical	🟧 Smart O&M 🟧 Environmental monitoring energy management
	Public Facility	Self-service robot 🟧 Advances in intelligent sensing & monitoring technology	E-Government Online services 🟧 IaaS 🟧 Urban service robot	🟧 Intelligent risk control 🟧 Territorial awareness network
	Municipal Infrastructure	Intelligent municipal infrastructure	Municipal online services City brain	

2 The Technology Drive of WeSpace 2.0

■ Transformation of the spatial organization under the influence of digital information


Future city
Traditional city
Social Space
Physical Space
Material flow
Information flow
Energy flow
Social Space
Information Space
Physical Space
Material flow
Information flow
Energy flow

The expansion of information media changes resource scheduling.

Balance the Supply & Demand[1-3]

Three types of flows

Material flow: logistics, people (traffic flow)

Energy flow: water, electricity, gas, etc.

Information flow: digital information

Three layers of spaces

Physical space: built and natural environment

Social space: people's socioeconomic activities

Information space: digital twin space, metaverse

Urban physical space and land use tend to be stable, but the data-driven, "flow"-based material and energy exchange will become more and more complex.

1. Wang P. First principles of cities and digital transformation [J]. Future City Studies, 2022(01):76-78
2. Wu T, Gong P, Li Y. Future Cities as a system of systems: Its concept, mechanism and creation[J]. Chinese Science Bulletin, 2022,67(01):18-26
3. Long Y, Zhang E. Three ways to promote urban research and practice with emerging technologies: From the perspectives of city laboratory, new city, and future city[J]. World Architecture, 2021(03):62

2 The Technology Drive of WeSpace 2.0

■ From the limitations of traditional spatial systems to future urban spatial models

Limitations of traditional spatial systems

Spatial dimension	**Structural dimension**	**Functional dimension**	**Management dimension**	**Energy dimension**	**Spatial interaction**
Three-dimensional space	Restricted by geographical location	Simple and segregated function	Low frequency planning	High energy consumption and high urban carbon emissions	Lack real-time feedback and interaction

Future urban spatial models

Spatial dimension	**Structural dimension**	**Functional dimension**	**Management dimension**	**Energy dimension**	**Spatial interaction**
Four-dimensional space	More flexible and convenient[1]	Scattered but mixed function[2]	High frequency management Exchange time for space[3]	Low-carbon sustainable development	Space sharing and adaptive feedback[4]

1. Dadashpoor H, Yousefi Z. Centralization or decentralization? A review on the effects of information and communication technology on urban spatial structure [J]. Cities, 2018, 78: 194-205
2. Wang J, Zhen F. Study on the impacts of information and communication technologies on urban fragmentation and planning strategy[J]. Urban Planning International, 2015, 30 (03): 66-71
3. Batty M. Inventing future cities [M]. Cambridge: The MIT Press, 2018
4. Long Y, Zhang E. Smart urban planning under the framework of data augmented design[J]. City Planning Review, 2019, 43 (08): 34-40+52

2 The Technology Drive of WeSpace 2.0

Future urban spatial model under the influence of emerging technologies

Future Urban Spatial Model

Digital infrastructure — Interface between physical and virtual space — Spatial interaction, sharing and adaptive feedback

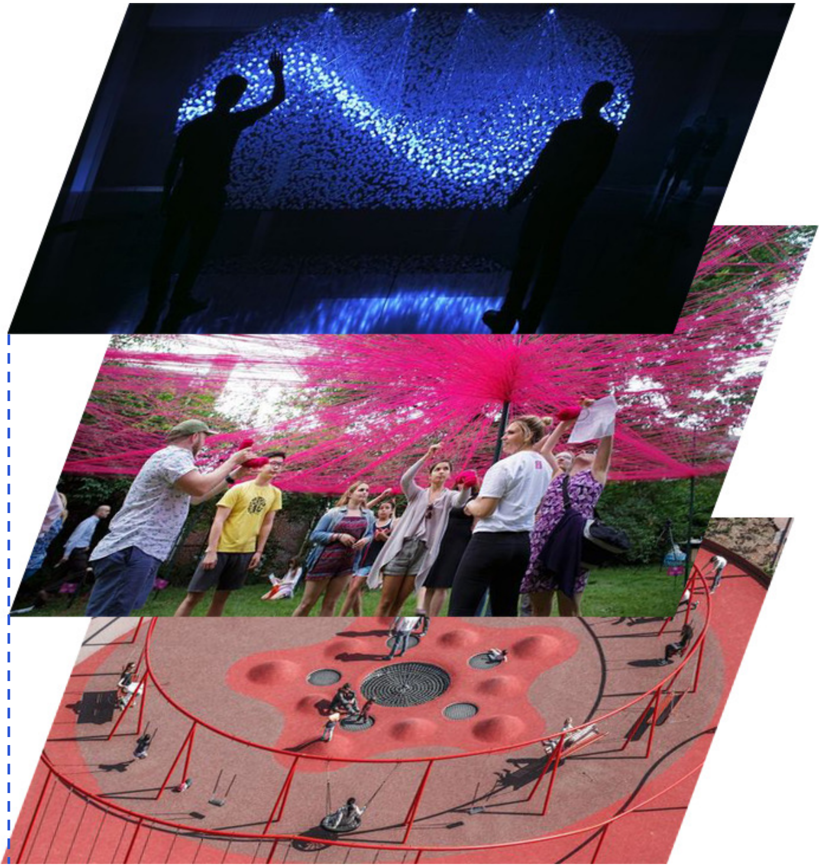
+

Virtual space — Virtual place making — Construction of digital infrastructure and metaverse

+

Physical space — Spatial intervention and enhancement — Urban functional space: Dwelling, working, transportation, recreation, and service

Online activities interact with offline activities, physical space and virtual space are coupled



- **Schematic diagram of future urban space model**[1]

---

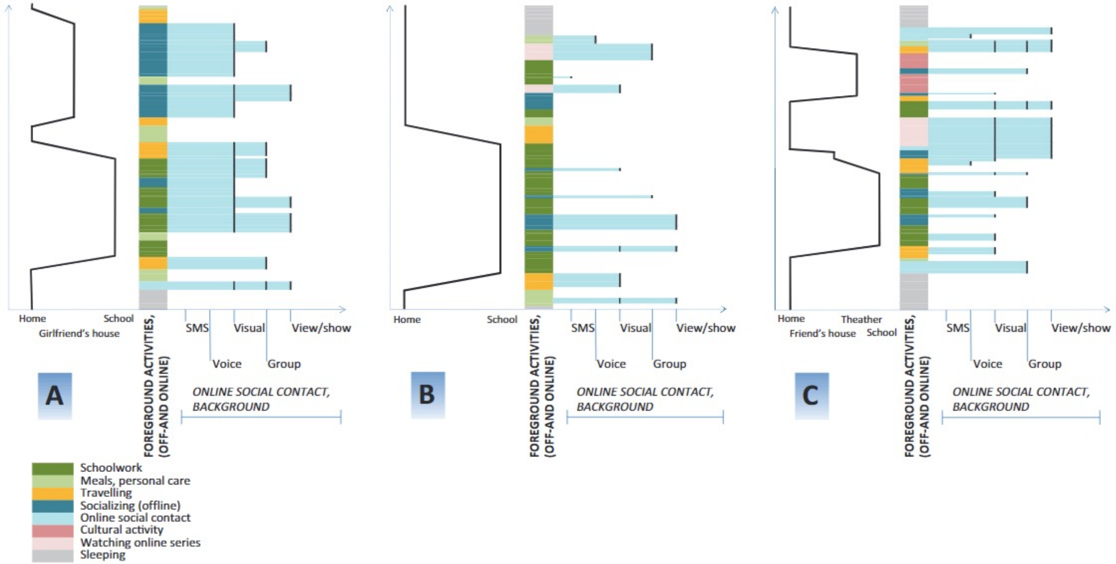
1. The pictures on this page are from cnet.com, etc.

3 The Development Prospects of WeSpace 2.0

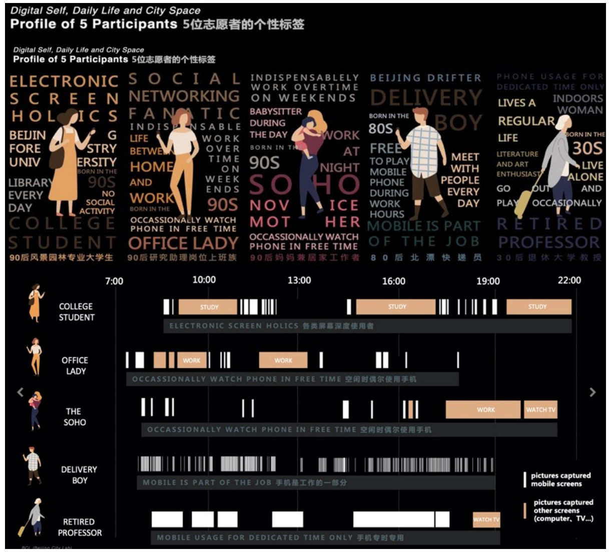
■ Reform begins with each individual in cities

- Digitalization of activity forms: Individuals are digitized, and their behaviors are transferred from offline to online, presenting online and instant characteristics
- Increased spatial and temporal flexibility: individual time use is fragmented; daily activities are increasingly enriched and get rid of superficial linear relationships with specific places
- The digital self comes in many forms: technological development provides tools for people to understand themselves and digitize their daily lives.

The 47th Statistical Report on the Development of Internet in China shows that by December 2020, the number of Chinese netizens reached 989 million, with the Internet penetration rate reaching 70.4%. The number of mobile phone netizens in China reached 986 million, and the proportion of netizens using mobile phones reached 99.7%[1]。



Typical strategies for managing background and foreground activities[2]



Wearable device experiments, face-to-face social activities, indoor and outdoor space use[3]

---

1. CNNIC. The 47th Statistical Report on the Development of Internet in China . http://www.gov.cn/xinwen/2021-02/03/content_5584518.htm
2. Thulin E, Vilhelmson B. Bringing the background to the fore: Time-geography and the study of mobile icts in everyday life [M]//Ellegård K. Time geography in the global context. London; Routledge. 2018
3. BCL. Digital Self. https://www.beijingcitylab.com/projects-1/42-digital-self/

3 The Development Prospects of WeSpace 2.0

■ The main tendency of future urban space with the drive of technologies

Blurred boundaries

1

Intra-city and inter-city/Different functional space/ Online and offline Boundaries dissolve

With the development of transportation, the differences within and between cities have shrunk, and the boundaries have dissolved. With the popularity of fragmented time and online working and life, the spatial boundaries of different activities are blurred. In addition, the boundaries between online and offline activities have also melted with the in-depth application of the Internet and the IoTs, and online and offline activities have been further integrated.

Flexible and free

2

The form is no longer required to follow the function

With the influence of the Internet, urban life has had more freedom, and the connection between the form and function of urban space has begun to weaken. Activities carried by areas in the same form have greater flexibility. Even if the space does not change, the functions it takes can be changed at any time. The form no longer follows function.

Adjacent distribution

3

People-oriented function and service aggregation

With the continuous enrichment and maturity of online working, learning, entertainment, etc., people's willingness to travel has declined, even if travel costs have been reduced. The importance of individual peripheral functions has increased, and the phenomenon of the aggregation of people-centered functions and services will become more prominent.

Spatial experience

4

The Disintegration of spatial entity functions and improvement of scene experience

As the container of activities, urban physical space will no longer have the designated functions, and the mixed-type space use will increase dramatically. There is a surplus in the urban physical space, and the space-experienced form of space use will give a new connotation to the old space.

Energy-saving and efficient

5

The digital operation of space

Under the influence of mobile Internet, cities have shown the characteristics of operationalization. Space may not change, but how the space is used will vary. The digitalized operation will improve space usage efficiencies, such as sharing and customized recommendations.

Virtuality and reality integration

6

Digital innovation augments space design

Space has a hysteresis effect and uses flexibility. Even if the form of space is not changed, it can still carry new activities. However, recent space design forms that conform more to human demand will inevitably emerge. The design of digitalized space will manifest the characteristics of physical and virtual space integration.

- The "information function" of the city is replaced by internet information, and the behavioral choice with spatial search as the core has been changed by individually customized algorithms.
- The development of the "knowledge economy" industry does not rely on physical space, as well as the maturity of the logistics industry from production to consumers promotes a more flexible way of living and production.
- The functional layout and structure with space as the core develop towards the direction with people as the core (the functional embodiment).

3 The Development Prospects of WeSpace 2.0 / *Region Scale*

■ The introduction of region: Hierarchical structure, size and connection

Region

Hierarchical structure

- **The tendency that urban clusters are the main spatial organization models is evident:** In the future, the central cities will be regarded as the core of aggregations to promote the development of the neighboring cities and towns. Between large, medium, and small cities and villages, there will be a division of labor and cooperation based on function and balanced coordination.
- **Poly-centric and networked urban system:** The eastern, central, and western regions have presented polycentric-center and networked development in terms of form and function. Urban agglomerations have formed and strengthened continuously. The level of the central cities is high and shows a functional division between cities.
- **Small and medium-sized cities without obvious location advantages are faced with risks:** the population continues to gather in the metropolitan area, making the cities with poor location advantages and insufficient economic development potential face the crisis of population loss, economic downturn, and deterioration of spatial quality.

Scale

- **Population and resources are concentrated in urban agglomerations and metropolitan areas:** The central cities are continuously focused while dispersed to the surrounding cities. The node cities and micro centers develop cooperatively.
- **The new polarized centers have emerged, and the hierarchical differences have increased:** On the one hand, developed megacities (clusters) have been increasingly powerful and enriched. In addition to the continuous development of municipalities, the era of solid provincial capitals is about to come. On the other hand, the rest of the cities seek "characteristic" development, or some have shown shrinkage. The gap between cities may be faced with an increasing tendency.
- **The long-term disequilibrium is evolving to equilibrium:** Under the combined effect of technology diffusion laws and historical inertia, the disequilibrium between regions and within urban agglomerations may become more obvious in the short term in the future, there will be a transition from disequilibrium to equilibrium in a long time.

Connection

- **Hierarchy of city networks and the level of urban node structure formed apparent mapping relationship:** rank higher networks form radial structure with central cities as the core, and median networks include reticular structure based on the relationship between the central city and others, the development of urban agglomeration axis or economic concentration areas have specific instruction function.
- **Urban connectivity is more intense:** The concepts of intra-city and inter-city are blurred. The physical and virtual connectivity between cities is more efficient. Functional connectivity has surpassed geographic proximity and become urban development’s essential driving force. The sense of physical space existence is diluted, and the importance of digital space acquisition is further enhanced, constituting the urban cluster e-commerce network.
- **The flow of elements is more frequent:** The cross-city commuting cost has been reduced. The inter-city collaborative work has been popularized. The separation of employment and residence has spread to the regional scale and may become a norm.

3 The Development Prospects of WeSpace 2.0 / City Scale

■ The overview of the city: spatial structure on the city scale, functional organization, and land use

City Scale	Spatial structure	Hierarchical structure	• **Polycentric networked development:** The spatial organization within cities may be the community formal structure and forms more dispersed networked and polycentric small clustering form. The central areas and marginal areas of cities show different functions.
		Scale	• **Agglomeration and diffusion:** In the future, urban agglomeration will be the form of clusters with small centers. The urban agglomerations may be liberated from traditional location and transportation patterns, and they will be more flatly, evenly, flexibly arranged, and even scattered to the suburbs. • **Polarized and flat:** On the one hand, with the rapid development of technologies and the transformation of the urban economy, there will be new growth centers such as innovative industrial clusters represented by the digital economy, artificial intelligence, and biotechnology. On the other hand, the spatial organization will be more flexible and tends to be distributed, flat, and scattered within the city. • **Even and uneven development:** Due to the differences in the popularity of technologies in different city regions, the digital divide will be further deepened. In the short term, cities may show specific uneven development and then change to even development.
		Connection	• **Connectivity:** The urban transportation network has been increasingly improved, the spatial and temporal distance has been reduced, and the range and radius of people's activities have been expanded. The various functional areas of cities are mutually connected through a perfect public rail transit system and flexible point-to-point unmanned driving method. At the same time, visual enhancement and cloud service have made virtual connections more intensified.
	Functional organization and land use	Functional transformation	• **Functional transfer:** The function of urban space has undergone significant changes. In particular, with the breakthrough of transportation technology, transportation space has been transformed into green space, public open space, public service facilities, etc. • **New functions derived from the low-carbon lifestyle:** The changes in technological development and human needs have enriched the space's functions and resulted in the update and changes of the spatial functions. The space tends to be shared, compound, service, online and offline integration, and operationalized. Most new functions have affected urban carbon emissions to a certain extent.
		Functional restructuring	• **Functional centralization and decentralization:** The significant impact of transportation centers, schools, and shopping centers will be reduced. The spatial distribution of residence and employment will be more flexible and flatter. The problem of Home-Work Separation and traffic congestion will be alleviated to a certain extent. • **Functional mixture and fragmentation:** Cities have transformed from clear functional zoning to mixed reconstruction. They tend to take the living space as the center, and spaces for employment, working, and recreation are mixed, coordinated, and organized. And there will be more fragmented spaces generated.
		Development mode	• **Mixed development:** From "large-scale land use" to "refined land use." At the same time, the proportion of urban land use has changed. For example, public spaces such as green spaces, streets, etc. have increased while traffic space areas have decreased.

3 The Development Prospects of WeSpace 2.0 / City Scale

Future Urban Residence 2.0

A New Future Powered by Technology

Smart home centers, robots, and other technologies combined with the Internet of Things and AI: make the living space a human-oriented full-scene agent.

3D printing construction, assembly, and other construction technologies: improve the level of customized manufacturing of living space and its internal facility elements.

New Phenomenon of Individual Change

Demand-driven individual change: such as home service, home movement, home vegetables, and other new living phenomena emerge.

Changes in residential pursuit: residents are more interested in the quality of living space and service and the connection between family and community.

Location Structure Change New Trends in Functional Reorganization

Spatial evolution: The influence of traditional geographical location on residential space is weakened with the application of information technology, while the formation of different residential communities accelerates spatial alienation.

Sharing and fragmentation of space: improve the utilization efficiency of living space and meet more immediate living needs.

New Ideas of Operation Management

Future community: Take the community as the basic unit to improve the level of public services such as government affairs, medical care, and shopping.

Community management: Intelligent access control, intelligent parking lot, intelligent express cabinet, and other smart home equipment to improve management intelligence and efficiency.

New Opportunities for Dual Carbon Target

Online services: Online home services provide people's functional needs, reduce travel activities, and contribute to energy conservation and emission reduction.

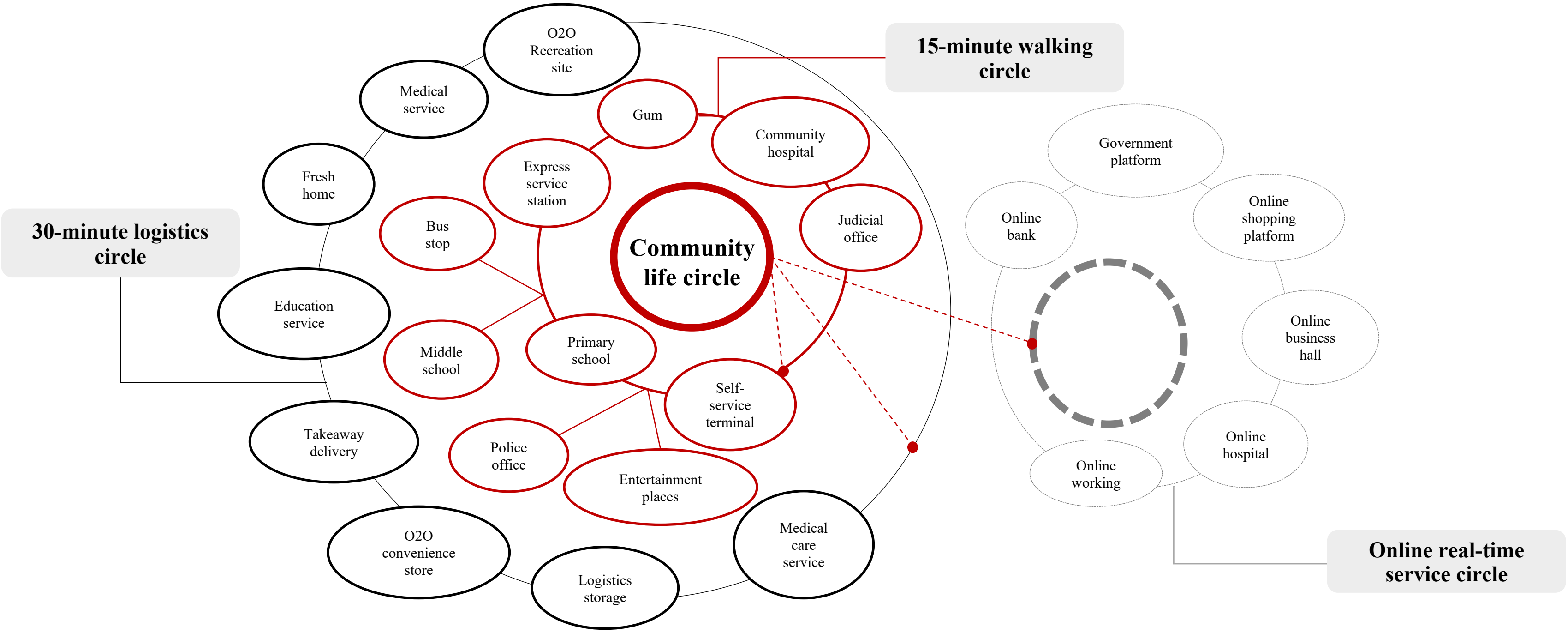
Modular prefab construction: Prefabricated buildings can significantly reduce carbon emissions during building materials' production, construction, demolition, and recycling phases.

3 The Development Prospects of WeSpace 2.0 / City Scale

Dwelling: Hybrid · Sharing · Online

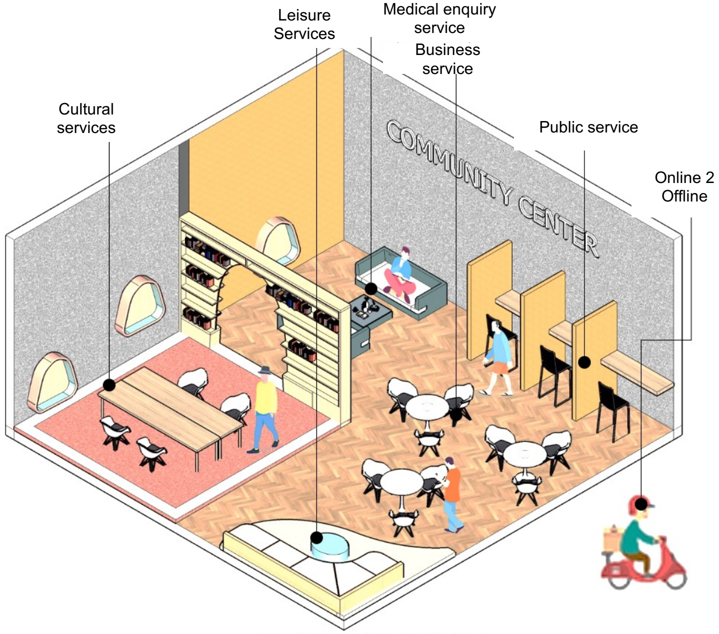
- Individual needs and service changes: People can enjoy the "online" and "instant" door-to-door services at home, and various needs such as shopping, working, learning, and medical care can be fulfilled at home.
- Residence-centered, online and offline integration: Human activities have transcended the spatial scale constraints to a greater extent under the support of information technology. A community living circle that integrates offline walking accessibility and online service convenience have been formed[1]. Offline conditions still affect online service supply to a certain extent[2].
- Distributed and micro-centered life service units: Smaller and more diversified life service units appear under the influence of a fast-paced lifestyle.

15 minutes online and offline life circle



O2O Recreation site
Medical service
Gum
15-minute walking circle
Community hospital
Fresh home
Express service station
30-minute logistics circle
Bus stop
Community life circle
Judicial office
Education service
Middle school
Primary school
Self-service terminal
Takeaway delivery
Police office
Entertainment places
Medical care service
O2O convenience store
Logistics storage
Government platform
Online bank
Online shopping platform
Online business hall
Online hospital
Online working
Online real-time service circle

Community integrated service unit[3]



---

1. Qiang NIU, and Shuai YI et al. New Concept and Approaches to the Reconfiguration of Service Facilities of Online and Offline Community Life Circle: A Case Study of Wuhan. [J] Urban Planning Forum. 2019(06):81-86
2. Qiang NIU, Yurong ZHU , Pan WANG , Zhongtai GU , Shuai YI. Onlineization of Community Life Circle and Its Key Influence Factors:A Case Study of Typical Communities in Wuhan[J]. Urban Development Studies,2021,28(05):111-118
3. Beijing Urban Laboratory. Topic of future city of Heihe territorial space planning

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Dwelling: Hybrid · Sharing · Online

- Shared living space: Shared living space may become a standard development mode in the future, including shared rooms and shared houses; Personal residence becomes a shared product of housing + service + lifestyle.
- Multi-functional mix: The living space is transformed from a single function to a compound function space. The development of individuation and independence is presented by people seeking services to people seeking services.
- Future community management mode: Take the community as the primary management unit to improve the level of public services such as government affairs, medical care, and shopping.

LOVEJOY BAKERS

Portland Pearl Community: A concentrated blend of residential and commercial. The block should provide both living and abundant commercial and leisure facilities[1].

Shared kitchen/dining room

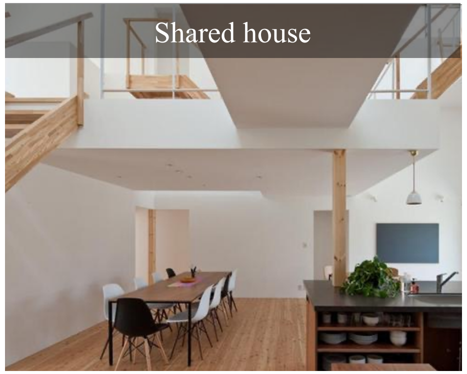
Common areas (such as kitchens, bathrooms, living rooms, and laundry) are shared with tenants.

Shared living room

Yan Jing Lane: A small community that mixes living, working, culture, eating, drinking, and playing

Shared room

Multiple people (no social connections) share a bedroom.



160 ㎡ of split-level design 3 men and 4 women share the house, male and female bathroom[2]

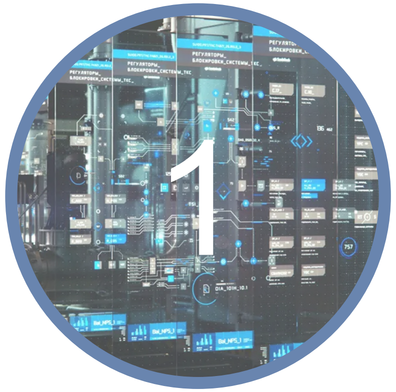
Shared apartment

Stey Shared Apartment in Beijing, each person, rents a single room, and when out, the private space can be re-rented by the business.

1. Liangyoufang. https://baijiahao.baidu.com/s?id=1681593770467626854&wfr=spider&for=pc
2. The landscape of China. http://www.landscape.cn/architecture/10580.html

3 The Development Prospects of WeSpace 2.0 / *City Scale*

Future Urban Work 2.0



A New Future Powered by Technology

Holographic projection augmented reality, remote cooperative office, and other technologies: the choice of future office forms and office spaces will be more flexible.

AI office, industrial robots, and other technologies: office efficiency increases, and the office will focus on more creative and dynamic parts to create value.

New Phenomenon of Individual Change

Flexible and mixed office: flexible choice of a variety of office models further improve office efficiency, to the "individual as the center," work people-oriented gradually change.

New industrial clusters: workplaces based on the fourth industry, such as innovation clusters, knowledge-based work, creative work, digital work, etc.

Location Structure Change New Trends in Functional Reorganization

New innovative industries are clustered in space, and telecommuting space is dispersed: Telecommuters are more inclined to migrate to suburbs with lower housing prices, while low-density and distributed office has become a long-term strategy for enterprises.
Office space sharing and function mixing: Office space will integrate more diversified functions to meet the new needs of the new era of office.
Office space is fragmented and specialized.

New Ideas of Operation Management

Intelligent operation management: Office facilities further improve intelligence and interaction; users can directly participate in the operation management process.

Application assisted management: Wechat group, small program, Tencent conference, enterprise Wechat, etc., distribute information efficiently to employees and improve the management efficiency of work.

New Opportunities for Dual Carbon Target

Telecommuting: Telecommuting can reduce carbon emissions from commuting. As a result of occupying smaller office space, the carbon emissions of the original office building are further reduced.

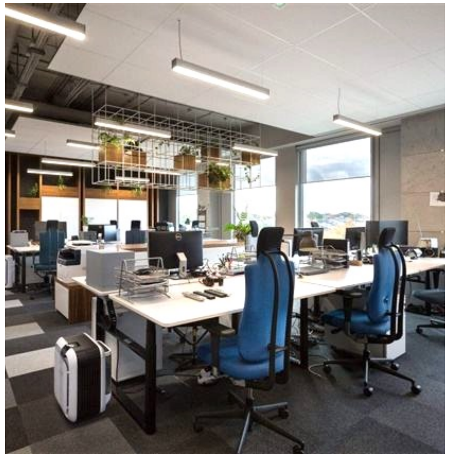
Campus office: Work parks with high density, functional mix, and convenient public transportation can reduce carbon emissions.

3 The Development Prospects of WeSpace 2.0 / City Scale

Work: Flexible · Sharing · Innovative

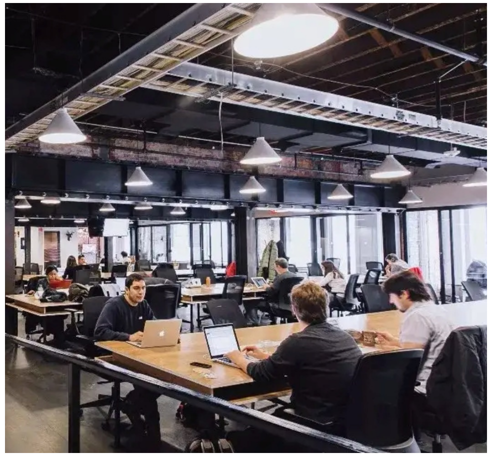
- Workspace tends to be online and intelligent: mobile internet and other technologies make office form more efficient and flexible[1].
- A variety of office modes coexist: traditional office, home office, shared/co-working, third space office, and other flexible options coexist, symbolizing the gradual shift from "office-centered" to "individual-centered" and "people-centered work"[2].
- Flat distribution of space: telecommuting promotes the relocation of office space from urban centres to the suburbs and tends to flatten the distribution in the city, more around the place of residence[3].
- Innovation industry clustering: innovation elements will reshape and optimize the spatial structure of the area; innovation industry space tends to be clustered and distributed in combination with scientific research institutions and higher education institutions[4].

Traditional office



Work from home

Shared work / Co-working



The third space office

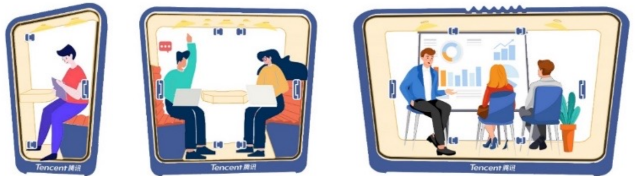
---

1. Tencent Research Institute. https://mp.weixin.qq.com/s/vk1D9efAho397k1XEJKh2A
2. 36 Krypton.https://mp.weixin.qq.com/s/cZ0LYR3Xc-LmDejygVAZBg
3. Helminen V , Ristimki M . Relationships between commuting distance, frequency and telework in Finland[J]. Journal of Transport Geography, 2007, 15(5):331-342
4. Xiaohui Yuan. A Study on Future-oriented Innovation Space Report. https://mp.weixin.qq.com/s/XZz4rnMs0M1Tacp4BT-bzw

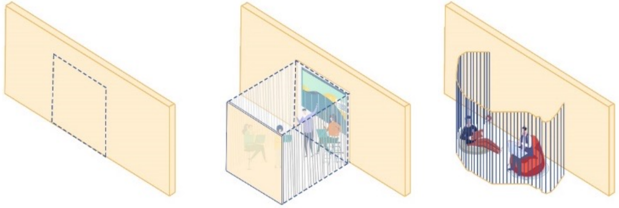
3 The Development Prospects of WeSpace 2.0 / City Scale

■ Work: Flexible · Sharing · Innovative

- Co-working space: on the one hand, co-working space has become a standard in the community, and on the other hand, traditional office space is facing decline, and some of it has been transformed into shared/short-term rental or even different functions.
- Diverse spatial functions: the office space has developed from a single dimension to a multi-dimensional development, and more space units with a mixed development of employment and living/service/recreation functions appear, presenting a variety of flexible combinations.
- Commercialization and specialization of the third space: office cafes, study rooms, libraries, shared office spaces, etc. designed for office workers are more abundant.



Mobile conference booth



Flexible partition

WeWork Co-working office space on Weihai Road, Shanghai. Various types of work support areas for games, sports, food, etc. are increased, creating social, professional, and creative spaces[1]

---

[1] gooood. https://mp.weixin.qq.com/s/PMKcPJMM2iRC21mZGDyUwg

3 The Development Prospects of WeSpace 2.0 / City Scale

Future Urban Transportation 2.0

A New Future Powered by Technology

Unmanned: Sensing its environment and navigating without human action.

Smart logistics: full-chain distribution of unmanned logistics above and below ground.

Digital travel service: Overall route planning, traffic regulation, and guidance through the Internet of Things, big data, and artificial intelligence.

New Phenomenon of Individual Change

Shared mobility service: Shared use of motor vehicles, bicycles, or other vehicles to complete a trip.

Compound transportation function: The single transportation function that unmanned driving liberates the transportation space becomes compound leisure.

Location Structure Change New Trends in Functional Reorganization

Three-dimensional transportation facilities: integrated operation planning of travel services; three-dimensional traffic connection and further use of underground space.

Modularization of urban structure: The urban space will be decomposed into more homogeneous micro-units, the units will be divided into standard modules in space, and the road grades will disappear.

New Ideas of Operation Management

Flexible right-of-way: Unmanned automation will give the street a shared right-of-way division over time, and the street will return to people.

Intelligent traffic facilities: The traffic sign system is intelligent, and traffic management realizes global perception, real-time monitoring, timely warning, and smart management.

New Opportunities for Dual Carbon Target

Driverless and shared transportation reduce carbon emissions by reducing overall motor vehicle travel and traffic congestion.

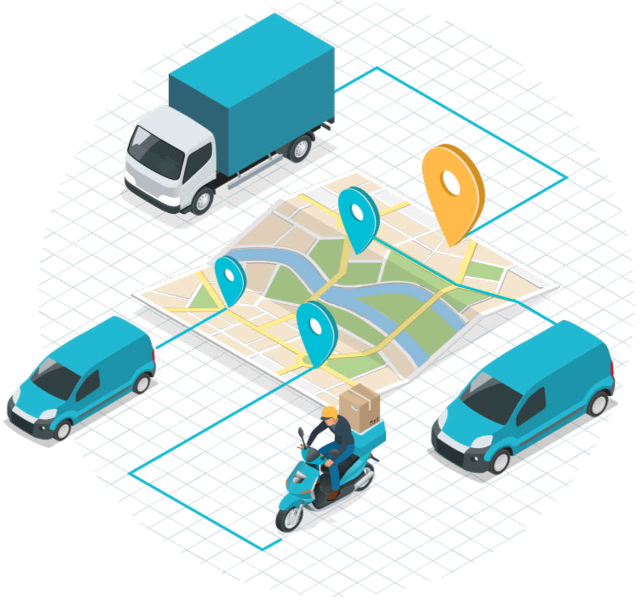
However, the effect of carbon emissions from the perspective of the whole life cycle remains to be studied.

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Transportation: Flat · Sharing · Digital

- Modular small block organization: the future urban space will be decomposed into more homogeneous micro-units and standard modules, which will be connected by a flat driverless road system[1].
- Smart logistics and city last-mile logistics: unmanned three-dimensional logistics transportation system on the ground, underground, and in the air.
- Three-dimensional facilities: integrated operation planning of travel services such as aviation, bus, subway, rental, and shared bicycles; above-ground and underground, three-dimensional traffic connection between buildings and buildings; logistics and express lanes are moved to underground, making further use of underground space and urban gray space.

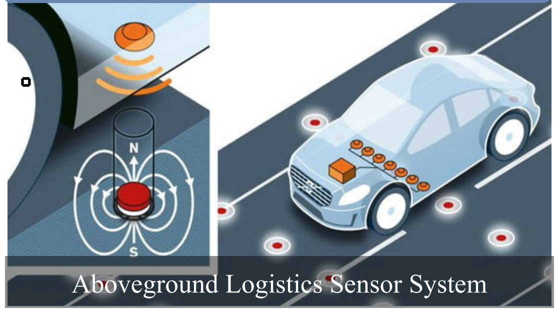
Last mile logistics



Driverless logistics transport vehicle

Small Logistics Transportation Robot

Driverless logistics transportation channel



Aboveground Logistics Sensor System

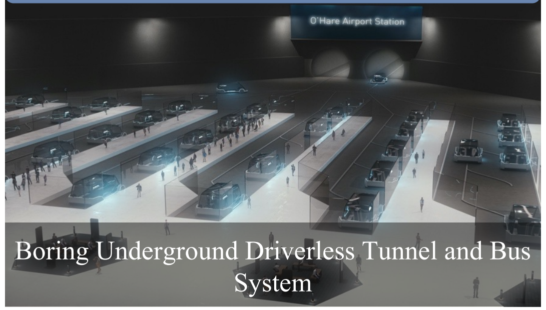
Drone delivery

Meituan UAV Low-altitude Logistics

Three-dimensional facilities

Guangzhou Transit-Oriented-Development Transportation Hub Complex

Underground driverless traffic, parking



Boring Underground Driverless Tunnel and Bus System

Underground logistics

Xiong'an Underground Logistics System

---

1. Xiaofeng XU , Ding MA. A Preliminary Study of the Impact of Unmanned Technology on Urban Space: A Case Study of Lin-gang Special Area of the China(Shanghai) Pilot Free Trade Zone[J]. Shanghai Urban Planning Review, 2021

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Transportation: Flat · Sharing · Digital

- Mobility, service and travel algorithmization: IoT, big data, artificial intelligence help transportation.
- Shared travel: Combined with shared travel methods, shared bicycles, shared electric vehicles, and other micro trips solve the last mile problem and contribute to the sustainable development of cities[1].
- Combination of transportation functions: Unmanned vehicles become an extension of space, and a single-dimensional transportation space expands into a multi-functional intelligent mobile space for retail, medical, and office.
- Intelligent operation management: The traffic sign system is innovative, and digital facilities such as intelligent curb, parking guidance system, intelligent parking, intelligent navigation, and intelligent floor lock appear, and traffic management realizes global perception, real-time monitoring, timely early warning, and smart management.

Driverless vehicle

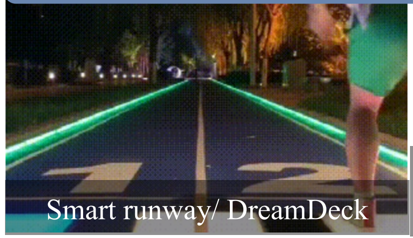
Mobile service: Means of transportation | Car rental service | Purchasing service | Express logistics | Takeout delivery

Mobile space: Pop-up shop | Office | Game rome | Coffee Shop | Urban farm | Medical station | Hotel

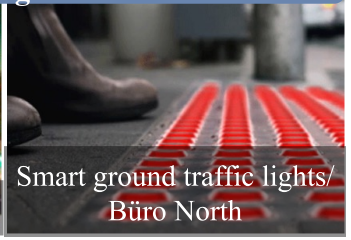
Shared electric vehicle

Shared parking

Intelligently guide people and vehicles to adapt to tidal changes[2]

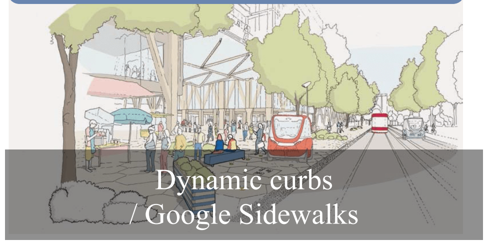


Smart runway/ DreamDeck



Smart ground traffic lights/ Büro North

Dynamic Safety Curbs



Dynamic curbs / Google Sidewalks

---

1. Abduljabbar R L, Liyanage S, Dia H. The role of micro-mobility in shaping sustainable cities: A systematic literature review[J]. Transportation research part D: transport and environment, 2021, 92: 102734.
2. Beijing Urban Laboratory. Top100 Architecture Firm Digital Transformation Case Sorting

3 The Development Prospects of WeSpace 2.0 / City Scale

Future Urban Recreation 2.0

BLOG
SEO
1
social media

A New Future Powered by Technology

Social media/e-commerce/third-party platforms, etc.: Substitute, supplement, promote and redistribute time and space to offline activities.

VR, AR, MR, and other mixed reality technologies, acoustooptical technology/human-computer interaction: Create a more immersive space atmosphere.

New Phenomenon of Individual Change

Consumption shift: from a single category to refined multi-category consumption; cultural circles are diverse, consumption is constantly upgraded, and it is shifting to more scenarios and channels.

Online/offline fusion perception interaction: The metaverse has become the second artificial world, and the future will usher in the expansion of digital dependency enhancement virtual advanced.

3
美好每
Bancolor
CLEAR THE AREA

Location Structure Change New Trends in Functional Reorganization

Space compounding: The traditional commercial space is upgraded, integrating the Internet celebrity check-in place, leisure and entertainment.

The influence of network location: "The fragrance of wine is not afraid of deep alleys."

Virtual digitization of space: People's sense of digital dependence is strengthened, and the space is virtual and digitized.

形成智慧绿道大脑
实现综合全面管理
4

New Ideas of Operation Management

Park construction participation and crowdsourcing data:
The mobile APP provides feedback on the surrounding space environment’s positive and negative evaluations and renovation suggestions. Crowdsourcing feedback and interaction gradually creates a future space that better meets the needs and expectations.

Tencent腾讯
低碳星球
BL PLANET
5

New Opportunities for Dual Carbon Target

OMO model: Shifting part of the online delivery demand to offline, alleviating traffic congestion and reducing fuel consumption and carbon emissions.

Intelligent management methods: Improve outdoor comfort while utilizing clean energy (wind and solar energy).

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Recreation-consumption: Online-Merge-Offline · Fragment · Compounding

- Online, virtual/metaverse consumption: Online consumption penetrates people's clothing, food, housing, and transportation, transforming from offline to online and offline integration[1-2]. In the future, consumption methods will be upgraded, self-service and virtual consumption methods will be popularized, and people will enjoy the five-sense experience of physical shopping at home.
- OMO, Online-Merge-Offline: Provide convenient life services based on location and equip personalized logistics and distribution warehouses around the community[3].
- The influence of network location: the revival of the street-facing business model based on AR experience, the algorithm and evaluation have changed the location and demand of commercial space[4], and the golden horn and silver edge grass belly[5] turns to the fragrance of wine and is not afraid of deep alleys.

Fresh food service for Supermarket + Takeaway		Fresh food service for warehouse of communities
Takeaway APP Self-built platform VR virtual consumption	Online	Takeaway APP Self-built platform VR virtual consumption
Physical supermarket experience Multiple functions such as catering Logistics and warehouse Community logistics cabinet	Offline	The main warehouse. A front storehouse of a community/community service station. Community logistics cabinet
Logistics vehicle Delivery man Drones, robots	Logistics	Logistics vehicle Delivery man Drones, robots

Alibaba FRESHIPPO

Yonghui Super Species

JD.com 7fresh

Meituan Elephant Fresh

Daily Fresh

Ding dong shopping

Meituan grocery shopping

Pupu supermarket

---

1. Nik Werk.The B2B International Survey into Consumer Smartphone Trends [EB/OL]. https://www.b2binternational.com/publications/what-business-to-business-market-researchers-need-to-know-about-smartphones-in-online-surveys.
2. Xiaoqing He, Jiaying Lin,Xiangwei Meng, Jingtao Ma, Chong Xu,Xiao Chen, Siyan Xu, Silei Yang. Construct a complete picture of smart retail -- 2018 Smart Retail White Paper[J]. Scitech in China,2018(07):63-70.
3. Niu B, Mu Z, Li B. O2o results in traffic congestion reduction and sustainability improvement: Analysis of "online-to-store" channel and uniform pricing strategy [J]. Transportation Research Part E: Logistics and Transportation Review, 2019, 122: 481-505.
4. Fan Zhang, Jinyan Zu, Mingyuan Hu, Di Zhu, Yuhao Kang, Song Gao, Yi Zhang, and Zhou Huang. Uncovering inconspicuous
5. Places using social media check-ins and street view images[J]. Computers, Environment and Urban Systems, 81:101478, 2019

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Recreation-consumption: Online-Merge-Offline · Fragment · Compounding

- Space fragmentation: commercial space tends to be fragmented, with more small commercial facilities appearing[1-2].
- Space compounding: traditional commercial spaces continue to upgrade their scene functions, integrating Internet celebrity check-in places, leisure and entertainment, and coffee drinking[3].
- Unmanned offline business: intelligentization of commercial spaces such as unmanned convenience stores and unmanned supermarkets is further popularized.
- Offline business transformation: the transformation of offline business spaces of different scales. Large-scale commercial spaces develop comprehensively, while small-scale commercial spaces provide convenient living services[4].

Space Fragmentation

ORDER
BRIGGO

Future full self-service coffee shop

COS
Super CP
PUSH

Diversified unmanned vending machines appear in every corner of the city, and sales are no longer limited to food and beverages

Space Compounding

Prada opens pop-up market in downtown Shanghai

Muji's first "fresh food complex store" in Shanghai

Unmanned Space

WeChat unmanned pop-up store, open the store door by scanning the WeChat applet, you can enter the selection of consumer goods, identify the goods through the electronic label and scan the code to pay, then you can leave the store

JD.com unmanned supermarket accelerates retail layout, experimenting with unmanned supermarkets and smart delivery robots.

超级试驾
天猫 TMALL.COM
Ford

Tmall car unmanned vending machine, after the appointment for a test drive, is successful, the user can take away the test drive model after identifying the face information.

amazon go grocery
NOW OPEN

Amazon Unmanned Supermarket realizes leaving the store without scanning "item-recognize action-recognize products subject to action-item is associated with user list/user."

---

1. Jing Wang, Feng Zhen. Study on the Impacts of Information and Communication Technologies on Urban Fragmentation and Planning Strategy [J]. 国际城市规划, 2015, 30 (03): 66-71.
2. mini.eastday.com
3. www.sohu.com
4. https://www.beijingcitylab.com/projects-1/47-understanding-commercial-districts-with-meituan/

3 The Development Prospects of WeSpace 2.0 / City Scale

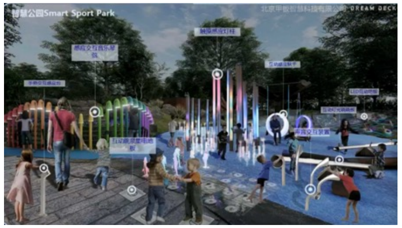
■ Recreation-entertainment: Experiential · Virtual · Digital

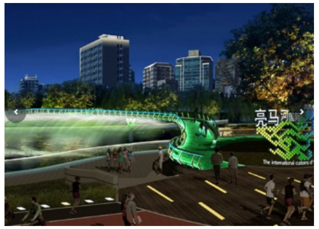
- Online recreation and entertainment: online tourism, online exhibitions, online concerts, 360° "free perspective" sports events enrich individual leisure and entertainment modes, and people pursue the quality of travel and novel sensory experience[1-3].
- Space experience: The digital facilities enable public space to provide people with a personalized interactive experience and enhance their attractiveness. In the future, “offline space+ interactive facilities,” “offline space+ live broadcasting,” and “offline space+ AR/VR” will become new trends.
- Virtual digitalization of space: The proposal of AR and Metaverse strengthens people‘s sense of digital dependence. The space is characterized by virtual digitalization, which will usher in the future virtual advanced expansion of digital dependence enhancement.

Offline space + digital interactive facilities

Digital Waterside Pavilion
/Carlo Ratti Associati

Interactive bubbles
/UNSENSE


Interactive facilities
/DreamDeck


Light and waterscape interaction
/DreamDeck

Immersive, interactive display facilities
/MIT SENSEable City Lab

Gravity fountain interaction
/DreamDeck

Interactive projection facilities
/DreamDeck

TOP100 designs of public space of architecture firms are integrated with more interactive experience facilities[4]

Offline space + AR/VR/live broadcast

AR's Transformation of Chongqing Jiefangbei Space Atmosphere[5]

1. https://new.qq.com/omn/20210212/20210212A0328P00.html
2. https://new.qq.com/omn/20220527/20220527A094J200.html
3. https://tv.cctv.com/cctv5/
4. Beijing Urban Laboratory. Top100 Architecture Firm Digital Transformation Case Sorting
5. https://zhuanlan.zhihu.com/p/69473574

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Recreation-entertainment: Smart · Diverse · Natural

- Smart and market diversification: smart fitness equipment, APP, and other demand-driven space market increases. The scenes are more segmented.
- Mixed space functions: smart furniture, energy devices, and other digital tools can improve the public space utilization rate of public space[1-2] and transform offline public space from single to diverse functions.
- Naturalization of space: Technology brings about the implementation of the eco-city concept, and through smart means to strengthen management capacity[2], the city returns to sustainability, and people return to nature.

Outdoor intelligent shared space

Intelligent outdoor seating/rest kiosk

Shared Multifunctional Meeting Room/DreamDeck

The public space is equipped with shared activity space for offices, meetings, gatherings, and education. The glass wall with adjustable transparency enables indoor and outdoor switching anytime to meet different user needs.

AI interactive fitness device

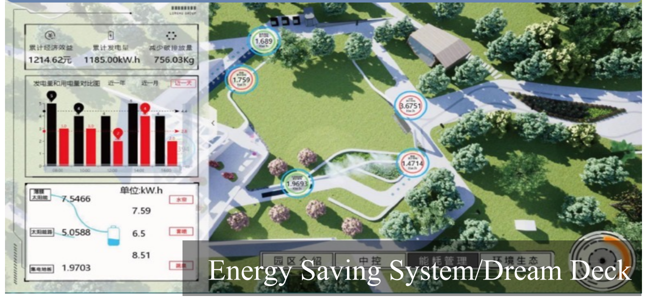
选择一个热身项目
扎马步
5
结束
AI interactive fitnes device[2]

Smart screen

Guide fitness activities

With the help of AR, the interactive screen can simulate the corresponding sports scene and encourage people to exercise all over the body. At the same time, the interactive screen can also guide the exercise.

Environmental Monitoring & Management


Energy Saving System/Dream Deck

Footprint Energy/Umbrellium

Pavegen, a London project, has created a patent for flooring technology that converts the kinetic energy generated by a pedestrian's footsteps into electricity and data.

1. Zhang Enjia, Long Ying. Spatial Intervention, Place Making and Digital Innovation: Design Transformation under Disruptive Technology [J]. Planner, 2020, (21): 5-13.
2. Beijing Urban Laboratory. Top100 Architecture Firm Digital Transformation Case Sorting]

3 The Development Prospects of WeSpace 2.0 / City Scale

Future Urban Public Facilities 2.0

A New Future Powered by Technology

Online education/medical/conference, etc.:
Provide timely service online/remotely.

Artificial intelligence technology:
More accurate identification of demand to achieve service supply and demand matching.

Smart Technology
FOR YOUR HEALTH
2

New Phenomenon of Individual Change

Remote/Online Services:
It enables people to get services anytime and anywhere and reduces the constraints of geographical space.

Digital Information Management:
The establishment of personal information databases such as digital medical treatment and education.

Location Structure Change New Trends in Functional Reorganization

Modular and hierarchical facility system: Online technology turns the traditional infrastructure system to decentralization, and the service level of grass-roots facilities is improved.

Mixed and flat facility services: the centralized large-scale service facilities are reduced, and the same services can be enjoyed at home.

New Ideas of Operation Management

Intelligent management:

Intelligent fitness equipment, APP, and other demand-driven intelligent living space and intelligent operation and management appear.

New Opportunities for Dual Carbon Target

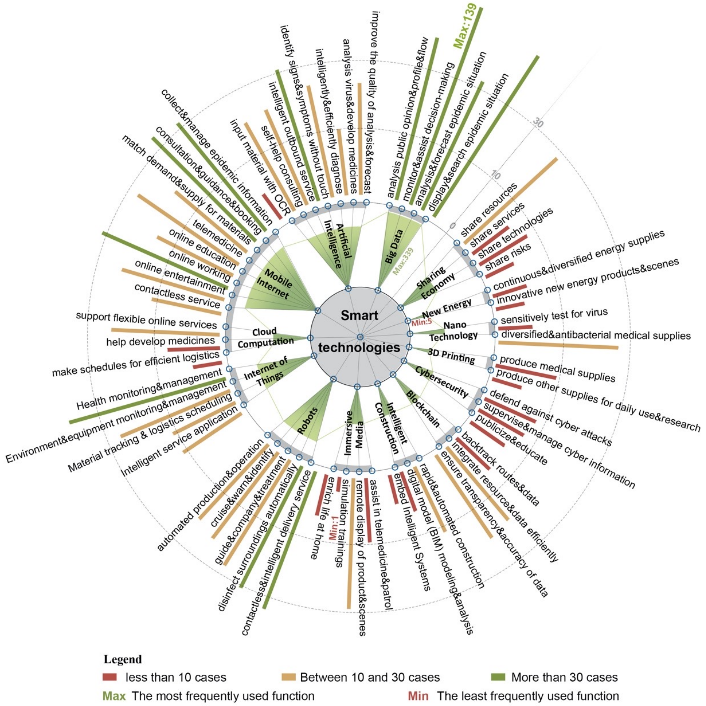
Online education, online medical treatment, online government affairs, and other ways:

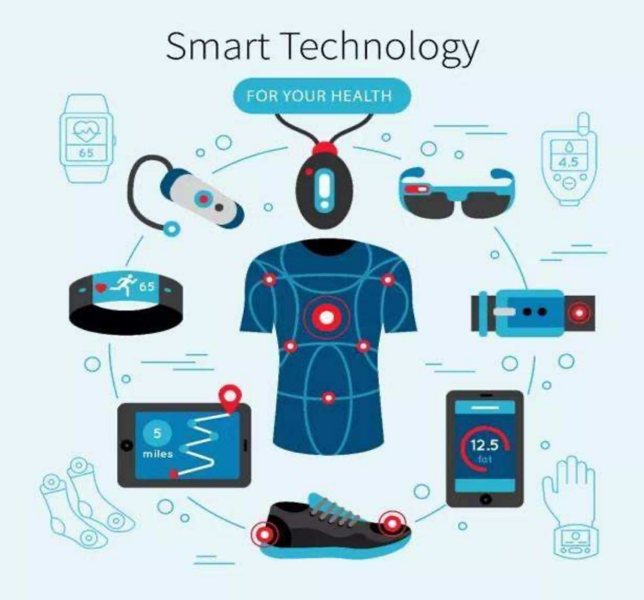
It reduces the need to go to physical places and thus reduces carbon emissions to a certain extent.

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Public Facilities-medical treatment: Flexible · Grading · Smart

- Online and offline integration and awareness education: traditional hospitals and clinics are transforming into online and offline integration, providing home and remote services for patients and the elderly.
- Flexible diagnosis and treatment space: a flexible and variable medical treatment space with real-time data collection and flexible movement appears to support timely and effective response to a public health emergency.
- Hierarchical diagnosis and treatment system and process optimization: a hierarchical diagnosis and treatment space system of “comprehensive and specialized hospital medical care — community medical care — home medical care — mobile medical care” is formed, and community-level medical services are increased[1].

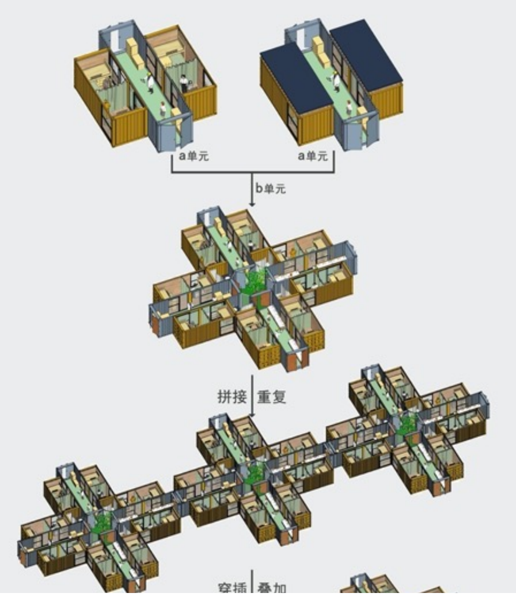




Detect

- Breathing
- Blood sugar
- Temperature
- Pressure
- Moisture

Daily testing of wearable medical products such as smart thermometers, smart bracelets, smart watches, and smart rings



Modular Fabricated makeshift hospital Design[2]

Main Application of Smart Technologies in COVID-19 pandemic Response[3]

---

1. https://www.statista.com/topics/3128/national-health-service-nhs-uk/#topicHeader__wrapper
2. https://m.weibo.cn/1254344660/4471596348036295
3. Li W, Long Y. Smart technologies for fighting against pandemics: Observation from China during COVID-19 [J]. Transactions in Urban Data, Science, and Technology

3 The Development Prospects of WeSpace 2.0 / City Scale

Public Facilities-education: Online-Merge-Offline · Smart

- Online and intelligent education: online teaching (MOOC), multimedia teaching, and other modes are innovated, online and offline are combined, and future education is gradually becoming more intelligent.
- Space scale and location: less centralized large-scale education space, fragmented learning centers, and education space closer to residence[1].
- Mixed space function: single space turns into teaching area + non-learning area + public space, equipped with virtual simulation laboratory and 3D printing room.
- Smart Education Platform: National Smart Education Platform[2], Virtual Teaching, and Research Office[3], leading the modernization of education with high-level education informatization.

Wilmeth Center for Active Learning, Purdue University[4]

There are 27 classrooms in the active learning center, each designed around active learning. Students can move freely in the classroom instead of simply listening to the lecturer. Classrooms, libraries, regular education, and collaborative and informal learning spaces are intertwined and integrated throughout the building.

Intelligent teaching	To build a teacher-centered teaching platform with diversified tools, personalized teaching, and diversified content, including teaching equipment, intelligent evaluation, intelligent teaching assistants, intelligent scientific research, etc.
Intelligent learning	Construct a learner-centered lifelong learning platform with process evaluation, personalized program, and autonomous learning, including online classroom, AI learning, immersion learning, and science and technology quality education
Intelligent management	With ubiquitous resources, convenient operation, and personalized matching, a digital governance platform centered on managers is constructed, including intelligent school affairs, intelligent educational affairs, intelligent offices, and intelligent decision-making.
Smart space	With situational awareness, intelligent recognition, and self-adaptation, we can break the data island and build a people-oriented education space, including smart security, energy-saving control, environmental monitoring, and so on.
Intelligent service	With a standardized system, open ecology, and personalized supply, we will build a user-centered service platform, including one-code access, open community, one-stop platform, personalized assistant, etc.

Tencent WeLearning Intelligent Education: Governance System for Future Education[5]

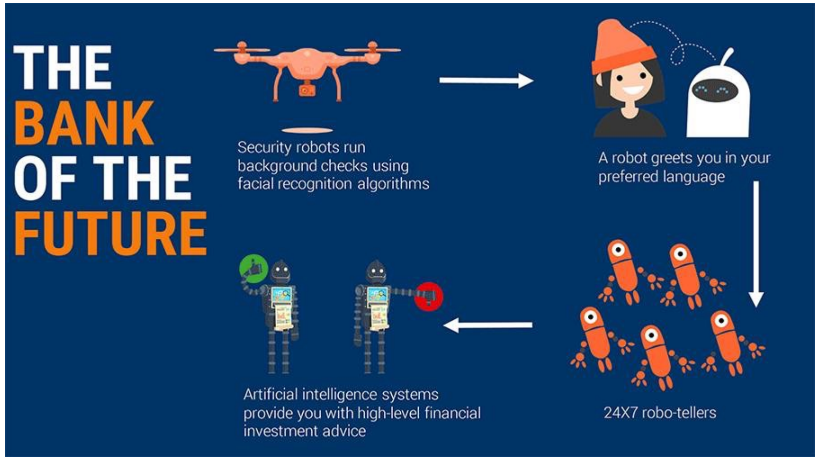
---

1. https://mp.weixin.qq.com/s/RtdVs2_BBcAbzLq-1THRzg
2. National Smart Education Platform officially launched [J]. Modern Educational Technology, 2022, 32 (04): 1.
3. http://www.moe.gov.cn/s78/A08/tongzhi/202107/t20210720_545684.html
4. https://www.purdue.edu
5. https://mp.weixin.qq.com/s/K_Da2cirSfJX_h4TO2QLAg

3 The Development Prospects of WeSpace 2.0 / City Scale

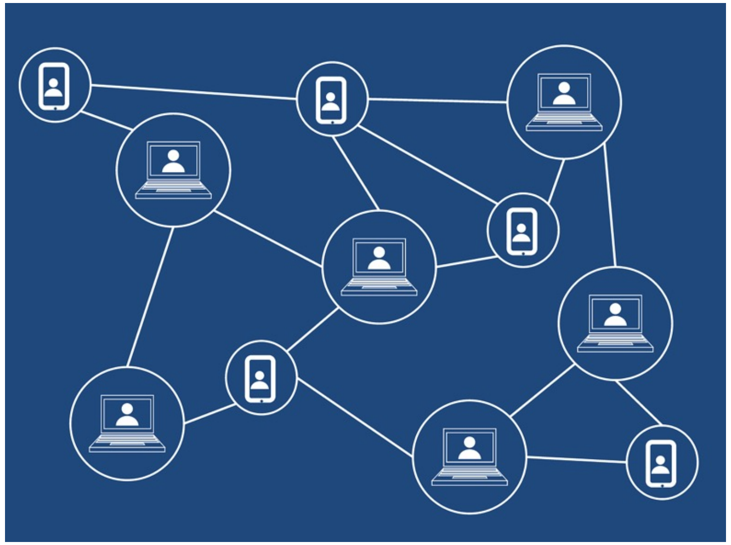
■ Public Facilities-finance: Mobile · Online

- Mobile payment: Face recognition payment, fingerprint payment, and other mobile payment methods are popular, and blockchain-based payment methods such as Bitcoin no longer rely on a third party.
- Space scale and location: the number of physical bank outlets is reduced, and the location is more arranged around the community.
- Online and intelligent spatial functions are transformed into services and developed from online to intelligent, and more unmanned banks[1] appear.


THE BANK OF THE FUTURE
Security robots run background checks using facial recognition algorithms
A robot greets you in your preferred language
Artificial intelligence systems provide you with high-level financial investment advice
24X7 robo-tellers

Transformation of bank outlets with intelligent operation[2]

Mobile Payment Creates a "Cash-Free" Society[3]



With blockchain as the underlying technology, based on decentralization, using a distributed database composed of many nodes, financial transactions can be achieved without banks, third-party payment platforms, etc.

---

1. https://research.szltech.com/wp-content/uploads/2020/09/2021%E5%8D%81%E5%A4%A7%E9%87%91%E8%9E%8D%E7%A7%91%E6%8A%80%E8%B6%8B%E5%8A%BF.pdf
2. Unsplash.com
3. Pixabay.com

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Public Facilities-government affairs: Online · Flat

- Online government services: government services are transferred from offline to online, and the 24-hour "non-closing" service capability is upgraded through self-service and online processing of "One Netcom."
- Space scale and site selection: The government service space will distribute to the community, and more convenient community government affairs centers and 24-hour self-service government service stations will appear.
- Online and intelligent space function: the government office hall has changed from an offline entity to an online and smart one and is no longer entirely dependent on physical space.

请进行人脸识别
下午好！
残疾人证业务
补贴申请
个税减免

- Face swiping registration
- E- document processing
- Daily services processing
- Featured service area
- One key to move cars
- ...

- "Yueshengshi" app provides palm-top livelihood services for urban individuals.

- More than 200 services can be handled anywhere in the country.
- Special services such as cultural tourism, marriage and childbirth, disability assistance, and justice, etc.
- Small and micro enterprises / self-employed service area
- ...

"Guoshengshi" app creates a government affairs service hall exclusively for individuals.

基盛万科智慧政务站
24小时 Hour
24H
出入境自助办证机
(电子通行证)

Jisheng Vanke Intelligent Government Service Station is the first 24-hour intelligent government service station[1] with a "three in one" function built in Panyu District, Guangzhou.

1. https://www.163.com/dy/article/DJKUM7T80514T956.html
2. Tencent Research Institute. Supplementary Case Materials

3 The Development Prospects of WeSpace 2.0 / City Scale

Future Urban Municipal Infrastructure 2.0

A New Future Powered by Technology

New infrastructure: 5G infrastructure, AI, industrial Internet, big data center, ultra-high voltage, new energy charging, inter-city high-speed and rail transit, and other new infrastructure focus on the production factor of data, presenting the complementary integration of digital infrastructure and traditional infrastructure.

New Phenomenon of Individual Change

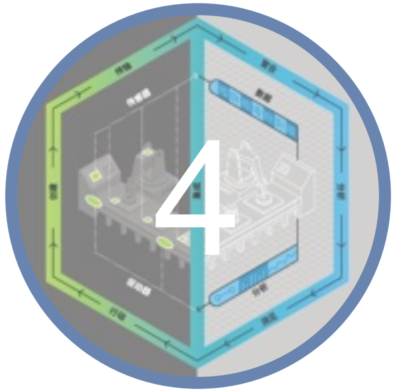
The whole network era: With the improvement of network infrastructure, the increase of terminal penetration, and the implementation of 5G innovative applications, the 5G era is coming.

Popularization of new energy vehicles: Under the background of Double Carbon, new energy vehicles are gradually popularized, and their ownership is increasing yearly.

Location Structure Change New Trends in Functional Reorganization

Intelligence of traditional facilities: perception network serves emerging industries and intelligent decision-making.

The infrastructure of digital facilities: the standardization of the operation of urban facilities, resulting in the emergence of new species of urban operators; It presents a market-oriented trend and may be jointly constructed and operated by various subjects.



New Ideas of Operation Management

Perception of built-up environment elements: Integrating new infrastructure will lead to real-time data feedback, abnormal monitoring and early warning, intelligent management, implementation of built-up environment elements, and crowd activities.

New Opportunities for Dual Carbon Target

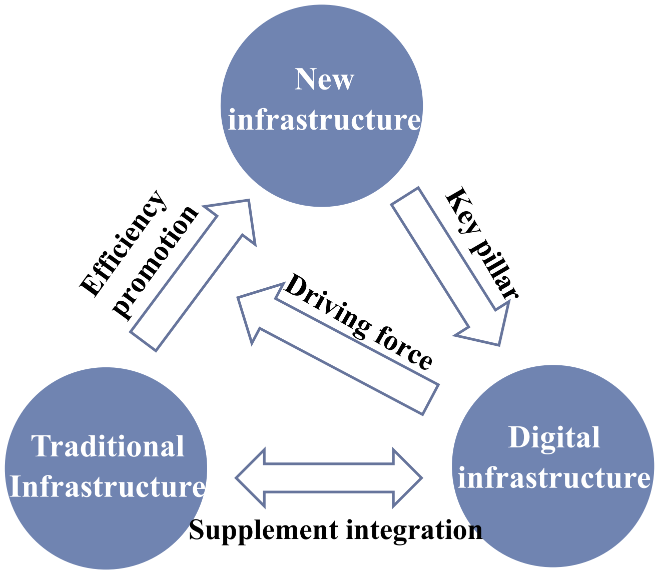
Reduce carbon emissions: Compared with traditional infrastructure, the carbon dioxide emissions in the production process of new infrastructure are reduced by 7.24%.

Regulate and control carbon emissions: to get real-time data feedback on the built environment elements and crowd activities, real-time grasp of energy consumption data for effective regulation, and reduce carbon emissions.

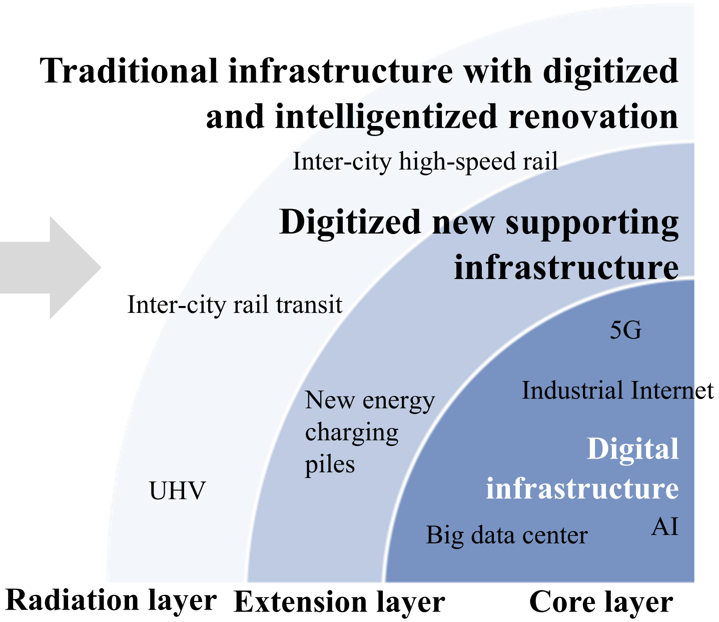
3 The Development Prospects of WeSpace 2.0 / City Scale

■ Municipal Infrastructure： Smart · Sensing

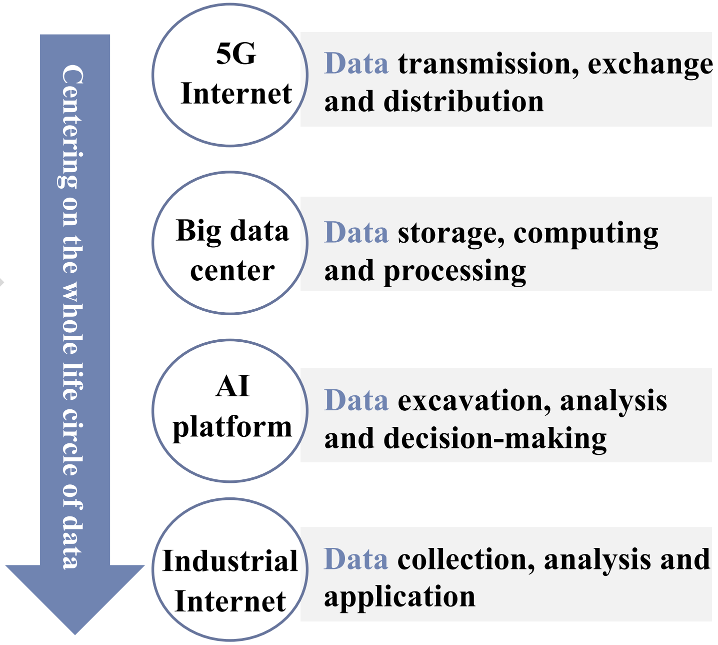
- New infrastructure: The new infrastructure centers on the production factor of data and shows the complementary integration of digital infrastructure (core) and traditional infrastructure (radiation)[1]. It includes the introduction of new-generation infrastructures, such as digital infrastructure, as well as the transformation and upgrading of conventional infrastructure
- Popularization of new energy vehicles: Under the background of carbon peaking and carbon neutrality goals, new energy vehicles are gradually popularized, and the number of owners is increasing year by year
- Intelligent management of digital facilities: Improve the intelligent operation and management level of multi-scenario and multi-application facilities.
- Digital and intelligent transformation of traditional infrastructure: Through traditional urban spatial elements superimposed on new infrastructure to realize the shift from local perception to urban global perception network


New infrastructure
Efficiency promotion
Key pillar
Driving force
Traditional Infrastructure
Digital infrastructure
Supplement integration

The relationship between new infrastructure, digital infrastructure, and traditional infrastructure


Traditional infrastructure with digitized and intelligentized renovation
Inter-city high-speed rail
Digitized new supporting infrastructure
Inter-city rail transit
5G
New energy charging piles
Industrial Internet
UHV
Digital infrastructure
Big data center
AI
Radiation layer
Extension layer
Core layer

Three levels of new infrastructure


Centering on the whole life circle of data
5G Internet
Data transmission, exchange and distribution
Big data center
Data storage, computing and processing
AI platform
Data excavation, analysis and decision-making
Industrial Internet
Data collection, analysis and application

Digital infrastructure with new production factors as the core

---

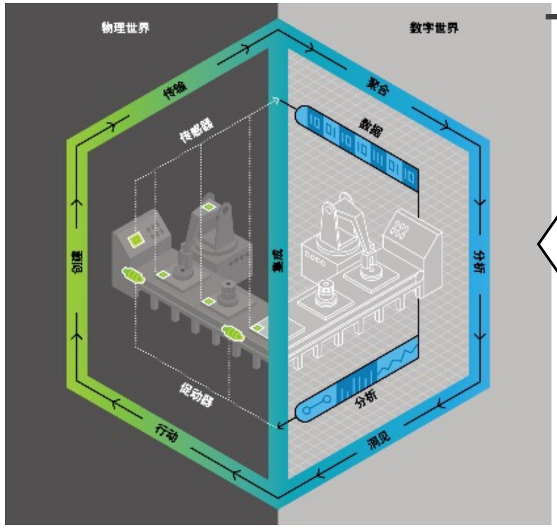
[1] National Industrial Information Security Development Research Center. Step into the New Infrastructure (I) New infrastructure: Digital infrastructure as the pillar [EB/OL]. 2020. https://mp.weixin.qq.com/s/P5jnHK1msQFd-_J8HWl2kg

3 The Development Prospects of WeSpace 2.0 / City Scale

■ Municipal Infrastructure： Smart · Sensing

- The popularization of new digital infrastructure: Convenient and accessible service circle built with various robots and supplementation of information digitalization city municipal facilities can be further tested and explored. Specific services include guided reception, interactive displays, glass cleaning, special assistance, etc.
- Digital and intelligent transformation of traditional infrastructure: Based on the digitization of conventional municipal service facility systems, sensors, and monitoring platforms are superimposed to realize the shift from local perception to urban global perception network.
- Digital facilities become infrastructures: Standardizing urban municipal facilities operations to generate new species of urban operators.

Digital twin



Digital twin serves all aspects of urban planning, construction, operation, management, etc.

City operators

Internet company
ICT company
Developer
Property service company
...

+

Government

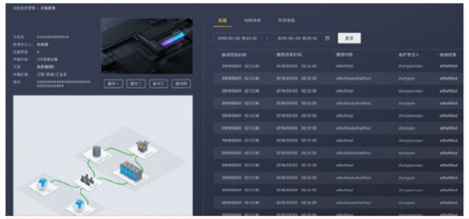
Various departments

Urban application service system

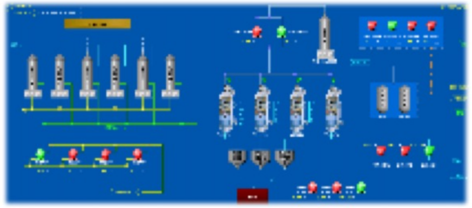
Logistics management system
Government affairs service system
Transportation management system
Environmental protection management system
Sanitation service system
Retail management system
Community service system
...

京东物流供应链产业平台部
助力各级政府
即刻搭建
应急物资供应链管理平台

Informationized and intelligentized supply chain platform [2]



Automatic alarms for equipment and facilities problems and failures, predictive maintenance, and proactive maintenance suggestions



Real-time monitoring and diagnosis of energy consumption and load and active push of optimization measures

---

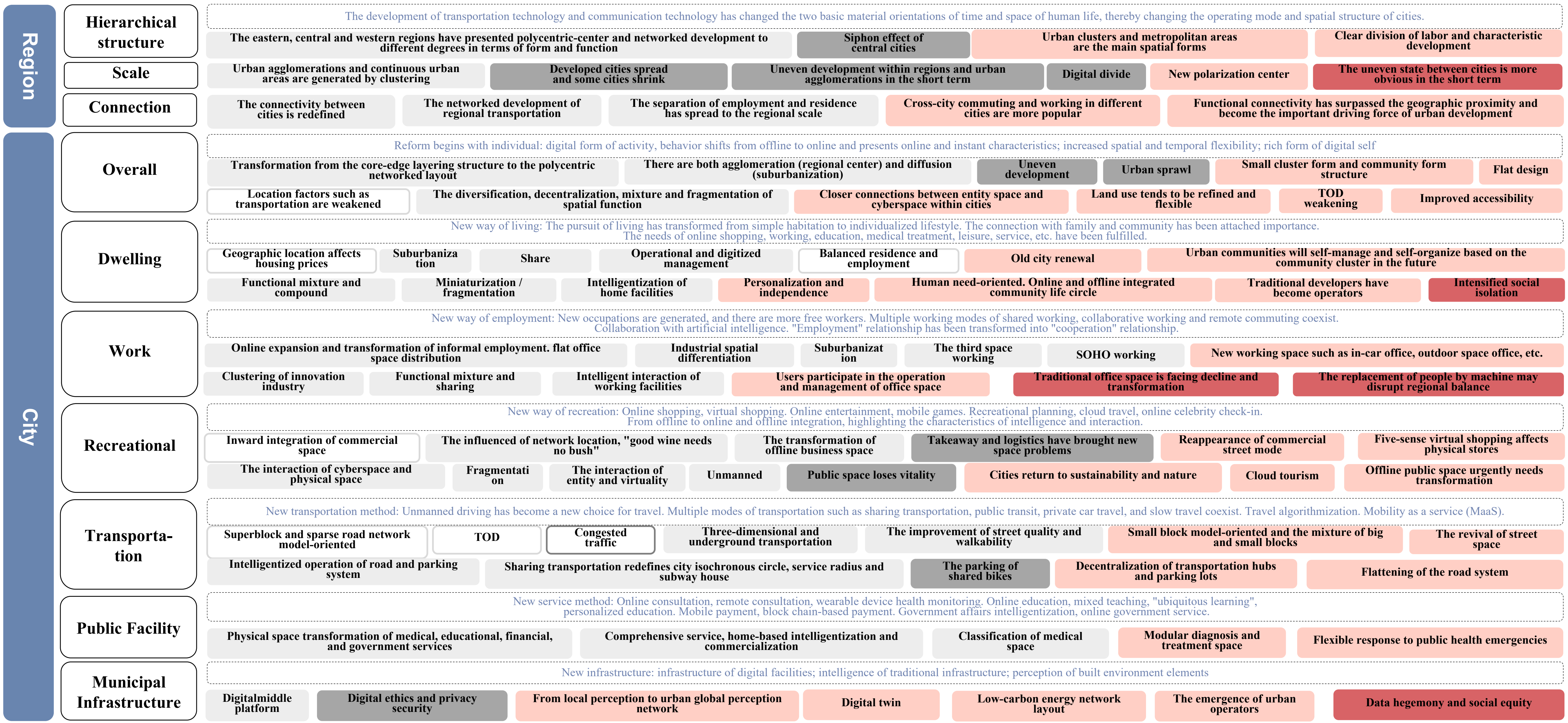
1. Deloitte. 4.0 with digital industrial twin manufacturing luxury [EB/OL]. 2017. https://www.djyanbao.com/report/detail?id=2730130&from=search_list
2. Jingdong. Hubei emergency supplies platform for supply chain management [EB/OL]. http://www.cidf.net/n1/2020/0414/c429159-31673179.html 2021.

3 The Development Prospects of WeSpace 2.0 / City Scale

Reduced changes positive negative
On-going changes positive negative
The changes in the way of living
New changes in the future positive negative

Summary

The past ten years – The next ten years The ongoing changes and potential changes in cities (space)



Region

Hierarchical structure

The development of transportation technology and communication technology has changed the two basic material orientations of time and space of human life, thereby changing the operating mode and spatial structure of cities.

- The eastern, central and western regions have presented polycentric-center and networked development to different degrees in terms of form and function
- Siphon effect of central cities
- Urban clusters and metropolitan areas are the main spatial forms
- Clear division of labor and characteristic development

Scale

- Urban agglomerations and continuous urban areas are generated by clustering
- Developed cities spread and some cities shrink
- Uneven development within regions and urban agglomerations in the short term
- Digital divide
- New polarization center
- The uneven state between cities is more obvious in the short term

Connection

- The connectivity between cities is redefined
- The networked development of regional transportation
- The separation of employment and residence has spread to the regional scale
- Cross-city commuting and working in different cities are more popular
- Functional connectivity has surpassed the geographic proximity and become the important driving force of urban development

City

Overall

Reform begins with individual: digital form of activity, behavior shifts from offline to online and presents online and instant characteristics; increased spatial and temporal flexibility; rich form of digital self

- Transformation from the core-edge layering structure to the polycentric networked layout
- There are both agglomeration (regional center) and diffusion (suburbanization)
- Uneven development
- Urban sprawl
- Small cluster form and community form structure
- Flat design
- Location factors such as transportation are weakened
- The diversification, decentralization, mixture and fragmentation of spatial function
- Closer connections between entity space and cyberspace within cities
- Land use tends to be refined and flexible
- TOD weakening
- Improved accessibility

Dwelling

New way of living: The pursuit of living has transformed from simple habitation to individualized lifestyle. The connection with family and community has been attached importance.
The needs of online shopping, working, education, medical treatment, leisure, service, etc. have been fulfilled.

- Geographic location affects housing prices
- Suburbanization
- Share
- Operational and digitized management
- Balanced residence and employment
- Old city renewal
- Urban communities will self-manage and self-organize based on the community cluster in the future
- Functional mixture and compound
- Miniaturization / fragmentation
- Intelligentization of home facilities
- Personalization and independence
- Human need-oriented. Online and offline integrated community life circle
- Traditional developers have become operators
- Intensified social isolation

Work

New way of employment: New occupations are generated, and there are more free workers. Multiple working modes of shared working, collaborative working and remote commuting coexist.
Collaboration with artificial intelligence. "Employment" relationship has been transformed into "cooperation" relationship.

- Online expansion and transformation of informal employment. flat office space distribution
- Industrial spatial differentiation
- Suburbanization
- The third space working
- SOHO working
- New working space such as in-car office, outdoor space office, etc.
- Clustering of innovation industry
- Functional mixture and sharing
- Intelligent interaction of working facilities
- Users participate in the operation and management of office space
- Traditional office space is facing decline and transformation
- The replacement of people by machine may disrupt regional balance

Recreational

New way of recreation: Online shopping, virtual shopping. Online entertainment, mobile games. Recreational planning, cloud travel, online celebrity check-in.
From offline to online and offline integration, highlighting the characteristics of intelligence and interaction.

- Inward integration of commercial space
- The influenced of network location, "good wine needs no bush"
- The transformation of offline business space
- Takeaway and logistics have brought new space problems
- Reappearance of commercial street mode
- Five-sense virtual shopping affects physical stores
- The interaction of cyberspace and physical space
- Fragmentation
- The interaction of entity and virtuality
- Unmanned
- Public space loses vitality
- Cities return to sustainability and nature
- Cloud tourism
- Offline public space urgently needs transformation

Transportation

New transportation method: Unmanned driving has become a new choice for travel. Multiple modes of transportation such as sharing transportation, public transit, private car travel, and slow travel coexist. Travel algorithmization. Mobility as a service (MaaS).

- Superblock and sparse road network model-oriented
- TOD
- Congested traffic
- Three-dimensional and underground transportation
- The improvement of street quality and walkability
- Small block model-oriented and the mixture of big and small blocks
- The revival of street space
- Intelligentized operation of road and parking system
- Sharing transportation redefines city isochronous circle, service radius and subway house
- The parking of shared bikes
- Decentralization of transportation hubs and parking lots
- Flattening of the road system

Public Facility

New service method: Online consultation, remote consultation, wearable device health monitoring. Online education, mixed teaching, "ubiquitous learning", personalized education. Mobile payment, block chain-based payment. Government affairs intelligentization, online government service.

- Physical space transformation of medical, educational, financial, and government services
- Comprehensive service, home-based intelligentization and commercialization
- Classification of medical space
- Modular diagnosis and treatment space
- Flexible response to public health emergencies

Municipal Infrastructure

New infrastructure: infrastructure of digital facilities; intelligence of traditional infrastructure; perception of built environment elements

- Digitalmiddle platform
- Digital ethics and privacy security
- From local perception to urban global perception network
- Digital twin
- Low-carbon energy network layout
- The emergence of urban operators
- Data hegemony and social equity

3 The Development Prospects of WeSpace 2.0 / City Scale

Summary of regional and city-scale carbon implications and impact paths:

Positive effect of carbon emission reduction

Negative effect of carbon emission reduction

		Carbon implications and impact paths	
		Positive effect of carbon emission reduction	Negative effect of carbon emission reduction
Region	Overall	Polycentric inter-city structures help promote work-housing balance and reduce commuting Orderly inter-city structure eases traffic congestion and reduces heat island effect Inter-city rail transit links reduce overall regional carbon emissions	Carbon emissions increase with city size
City	Overall	High compactness improves site accessibility and reduces commuting High compactness protects peripheral green space and increases carbon sink Tight connection and compact layout improves resource utilization Decentralized and flattened functions reduce unnecessary travel	Higher urban complexity reduces infrastructure and public transport accessibility Higher complexity creates traffic congestion by causing longer travel times and slower speeds
	Dwelling	Shared living improves resource utilization and space performance Shared living raises residents' awareness of energy conservation Shared living reduces energy use per capita Work-residential or commercial-residential mix improves accessibility	Shared living increases travelers' carbon footprint Shared living promotes people's consumption of surrounding facilities and other resources Shared living model may spur residents to generate additional spending
	Work	Telecommuting reduces commutes and congestion Potential savings of telecommuting in vehicle fuel and road maintenance, etc. Potential savings in teleworking such as vehicle fuel and road maintenance Telecommuting promotes work-housing balance and reduces commuting	Reduced commutes to work will likely bounce back to travel for other purposes Telecommuting requires larger home space, resulting in a rebound in operational carbon emissions Telecommuting requires larger home space, resulting in a rebound in operational carbon emissions
	Transportation	Digital information services and intelligent transportation systems achieve "economic driving" Autonomous driving combined with shared mobility can increase road capacity and reduce traffic congestion Autonomous driving could reduce structural weight of vehicles	Autonomous driving combined with shared mobility inspires potential ride-hailing crowd There are empty mileage in shared travel services The maintenance cost of shared vehicles in the whole life cycle is high Advantages diminish when automation penetration is low
	Recreational	OMO shopping reduces offline travel Miniaturized facilities have lower carbon emissions during both construction and operation phases Automate last-mile delivery to reduce travel and improve efficiency Online leisure reduces unnecessary travel More green spaces increase urban carbon sinks	Unmanned terminal distribution under the full transportation cycle may increase carbon emissions Unmanned terminal distribution under the full transportation cycle may increase carbon emissions
	Facility & Infrastructure	Online services reduce carbon emissions from commuting Online services reduce carbon emissions from building operations Perception of built environment elements, real-time adjustment of energy consumption Electrifying car travel reduces carbon emissions	The infrastructure of digital facilities, the power demand is currently large

3 The Development Prospects of WeSpace 2.0 / City Scale

The positive externality of technological development to future urban space

Improve the efficiency of traditional space utilization

Using information technology and the Internet platform gives full play to the optimization and integration role of the Internet in allocating production factors and improving the efficiency of traditional space utilization.

Expand new virtual space scenarios

The significant enrichment of digital life enables existing activities to be digitized and, at the same time, will breed new types of activities and their forms and scenarios.

Fuse real space and virtual space

Platform operation, human-computer interaction, digital twin, and other technologies integrate physical space with virtual space, and online and offline interaction forms are more abundant.

Improve the resilience of urban development operations

Under the influence of flexible and free digital space, the inflexibility of space has greatly improved its resilience, and its ability to face various disasters and crises has been improved.

Reduce energy consumption and carbon emissions

Online activities reduce unnecessary travel, energy-saving automatic transportation reduces energy consumption and carbon emissions, intelligent operation management monitors and adjusts energy consumption in real-time, and exchanges information for energy savings.

The negative externality of technological development to future urban space

Increase social isolation and residential segregation

The Internet promotes community building, and the isolation between different groups is more serious, further exacerbating residential segregation.

Increase spatial inequality

In the global digitalization process, the digital divide created by the development of the digital economy will increase spatial inequality. In the short term, the disequilibrium between regions and urban agglomerations may become more obvious, and the gap between cities may face an expanding tendency.

Generate an algorithm-driven space crisis

Resource allocation, flow, and space operations that depend on algorithms will also be subject to algorithms. There is the possibility of over-reliance or even being bound by algorithms, as well as a data privacy crisis.

Accelerate the surplus of physical space and urban shrinkage

Artificial intelligence, intelligent manufacturing, etc., accelerate the transformation of industrial production, some traditional physical space functions disintegrate, space appears surplus or withered, and local urban shrinkage or overall shrinkage accelerates.

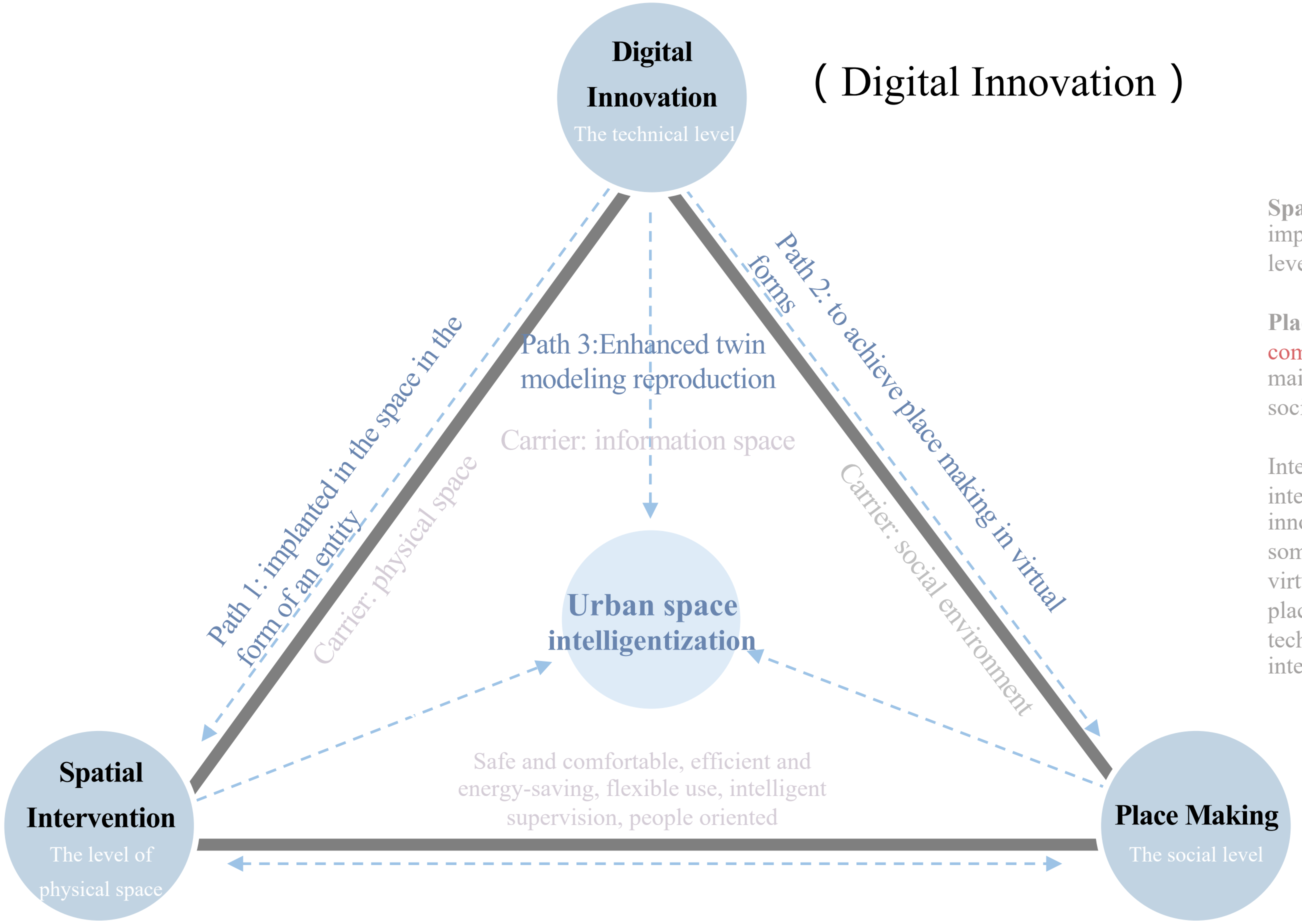
Elimination of personality and loss of preferences that lead to people's activities and choices in space

Algorithms will also limit space usage and personal activities that rely on algorithmic recommendations, and personalized choices and preferences will gradually disappear.

4 The Creation & Practice of WeSpace 2.0

■ Future-oriented creation:

Spatial Intervention, Place Making, and Digital Innovation



(Digital Innovation)

Digital Innovation
The technical level

Path 3:Enhanced twin modeling reproduction

Carrier: information space

Path 1: implanted in the space in the form of an entity

Carrier: physical space

Path 2: to achieve place making in virtual forms

Carrier: social environment

Urban space intelligentization

Safe and comfortable, efficient and energy-saving, flexible use, intelligent supervision, people oriented

(Spatial Intervention)

Spatial Intervention
The level of physical space

Place Making
The social level

(Place Making)

The concepts of spatial intervention, place making, and digital innovation[1]

Spatial intervention is committed to the creation and quality improvement of the built environment from the physical space level, and it is the core of the built environment design.

Place making is committed to promoting people's communication in the built environment from the social level, maintaining daily life, and enhancing the richness of functions in social life.

Integrating **digital innovation** at the technical level with spatial intervention and place-making is crucial. For example, digital innovation technologies can be integrated into physical spaces in some physical forms, such as the Internet of Things, etc., or some virtual forms, such as apps or information platforms, to promote place-making. It is also expected to use innovative digital technology to enhance spatial intervention and place-making interaction.

---

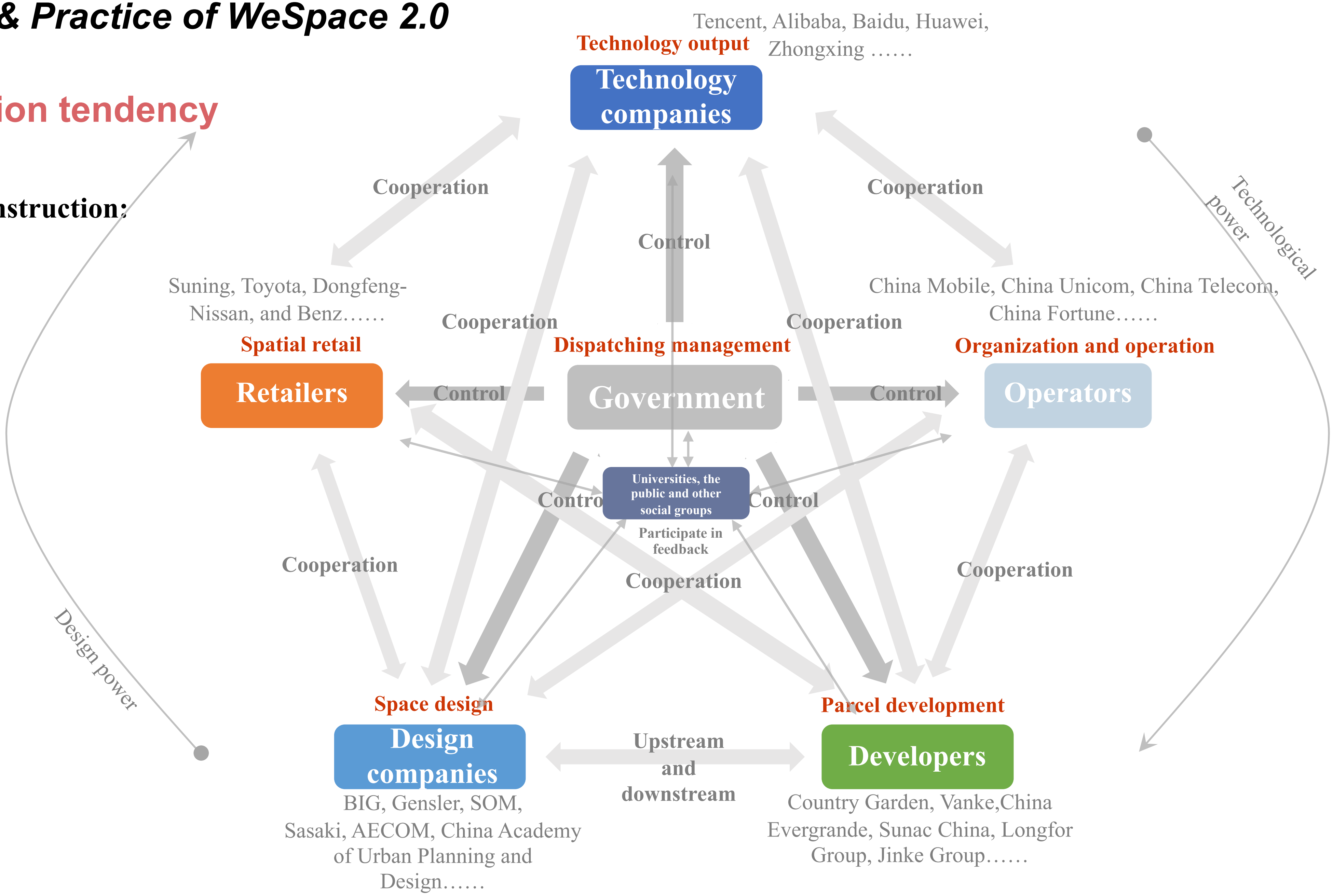
1. Enjia Zhang, Ying Long. Spatial Intervention, Place Making and Digital Innovation: Design Transformation Driven by Disruptive Technologies[J]. Planners,2020,36(21):5-13

4 The Creation & Practice of WeSpace 2.0

Transformation tendency

The concept of construction:

From the
simple design to
beyond design



Technology output
Tencent, Alibaba, Baidu, Huawei, Zhongxing ……
Technology companies

Cooperation
Cooperation
Control
Technological power

Suning, Toyota, Dongfeng-Nissan, and Benz……
Spatial retail
Retailers

Cooperation
Dispatching management
Cooperation
Government

China Mobile, China Unicom, China Telecom, China Fortune……
Organization and operation
Operators

Control
Control

Universities, the public and other social groups
Participate in feedback
Control
Control

Cooperation
Cooperation
Cooperation
Design power

Space design
Design companies
BIG, Gensler, SOM, Sasaki, AECOM, China Academy of Urban Planning and Design……

Upstream and downstream

Parcel development
Developers
Country Garden, Vanke,China Evergrande, Sunac China, Longfor Group, Jinke Group……

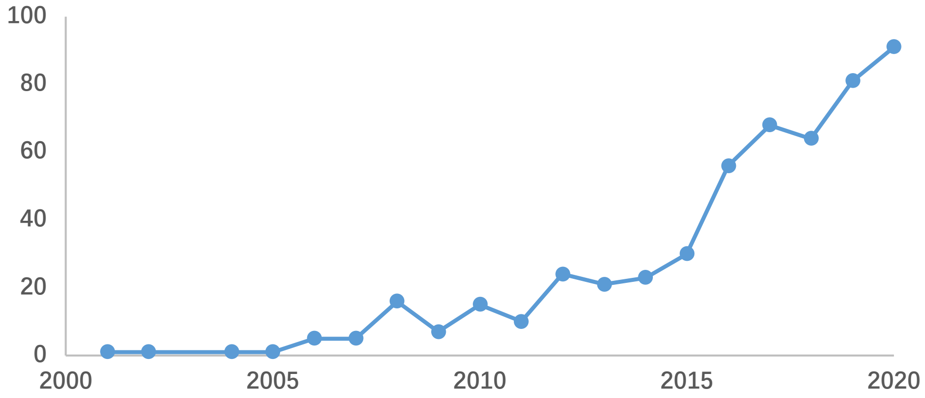
Several major forces involved in the construction/design of future cities

4 The Creation & Practice of WeSpace 2.0

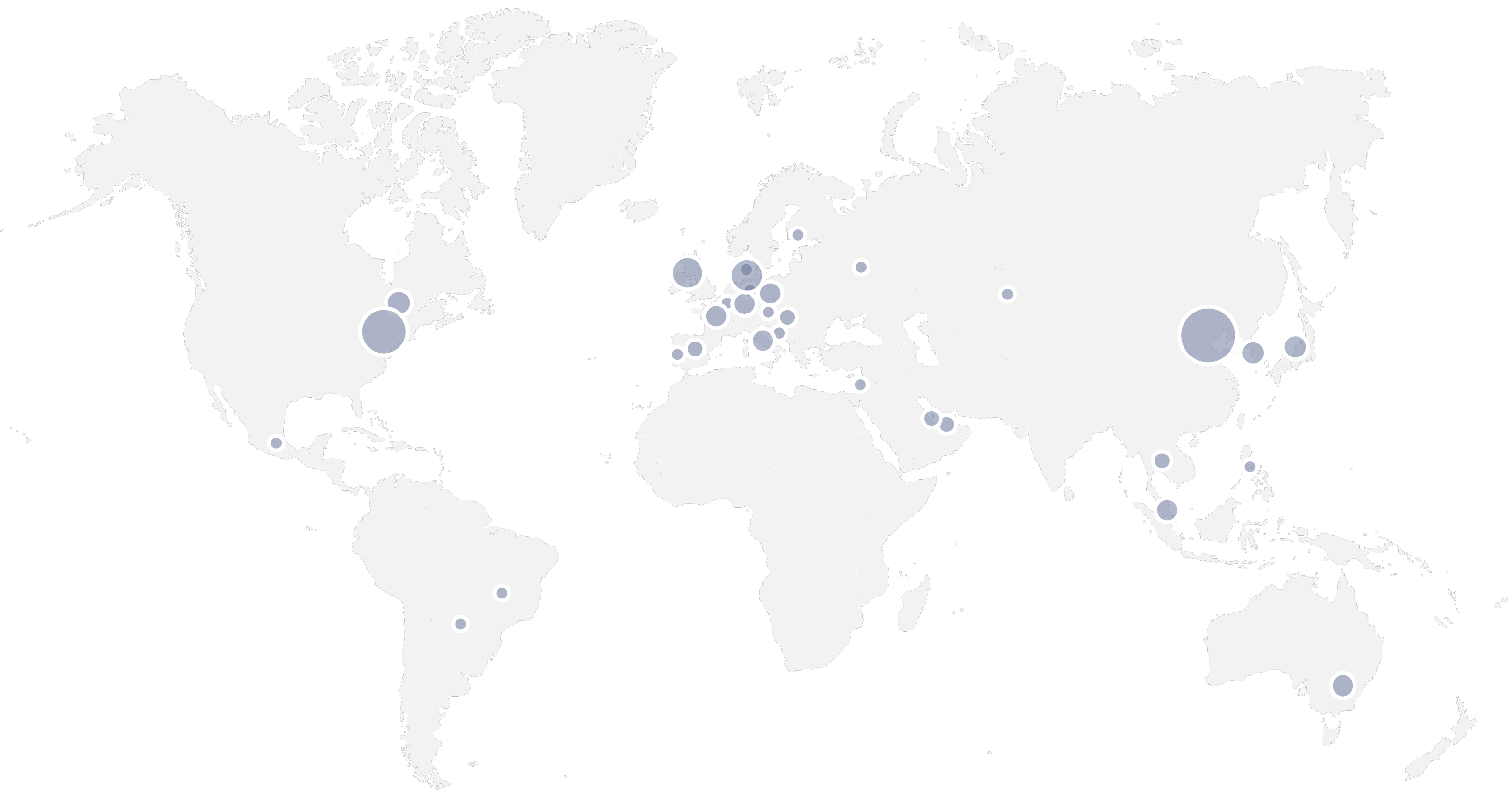
■ Transformation tendency

Taking the future public space design as an example: a systematic case study [1]

Combining smart technology with traditional space design has gradually become an unstoppable tendency worldwide.



Evolution of the number of cases presented in different years



The country distribution of the project cases (mark the capital, the size represents the number of cases)

Project country	Number of cases
China	144
USA	116
U.K.	47
Netherlands	39
Australia	28
Japan	25
Korea	19
Italy	19
Canada	16
Singapore	12
……	……

39 countries

594 projects

---

1. SRT Project of Tsinghua University (Case Study and Summary of Urban Spatial Intelligence, 2021-2022)

4 The Creation & Practice of WeSpace 2.0

Design company

Transformation

- Intelligent, digital transformation within design firms
- Design companies actively cooperate with technology companies and other cutting-edge power empowerment

Tendency

Design firms are directly involved in creating and responding to the design of future urban spaces and continue to play a central role in this. With the development of new technologies and the resulting changes in people's needs for space use, design firms are beginning to focus on using new technologies to combine digital innovation with traditional spatial interventions and place-making to meet people’s activity needs better and to achieve adaptive and energy-efficient functions that enhance the efficiency of space use and management and improve spatial vitality.

Related Representative Ideas & Cases[1]

Smart Park
AECOM
FLOAT NYC
Gensler
IBI Mobility+
IBI Group
Smart Mobility
HOK
Virtual Infrastructure
Stantec
Auditon
HDR Architecture
Smart Solutions
Sweco
Digital Reality
Atkins
Smart Mobility
Jacobs
Light Cell
SOM
Smarter Design
Leo A Daly
Smart Functions
Tengbom
KPFui
KPF
Integrated Planning
ATP Architects & Engineers
Ecosystem
ZGF Architects
The GreenPix media wall
Groundbreaking concept integrating sustainable and digital
Arup Associates
Creative Digital City
ACXT-IDOM
Acoustical Design
Henning Larsen Architects
Diagonal
Sheppard Robson
The future of sports
Populous
A10 ring road
UNStudio
Earth Screening
Carlo Ratti Associati
Ground-level traffic lights
Büro North
Xiong'an
China Academy of Planning

---

1. SRT Project, Tsinghua University (Survey and Summary of Urban Spatial Wisdom Cases, 2021-2022)

4 The Creation & Practice of WeSpace 2.0

Technology company

Transformation

- Technology companies strengthen cooperation with the government and actively participate in the construction of the city of the future
- Technology companies strengthen cooperation with design firms and actively participate in the intelligent operation of urban spaces

Tendency

Technology companies provide a constant source of technological empowerment for the creation of future urban spaces. On the one hand, they participate in the top-level design of future smart cities from top to bottom, deepen and expand the organizational structure and application scenarios of emerging technologies, and on the other hand, they actively cooperate from bottom to top to expand the platform service ecology, to better match the real needs of urban residents with people-oriented technology for good.

Related Representative Ideas & Cases[1-2]

Future City WeCity

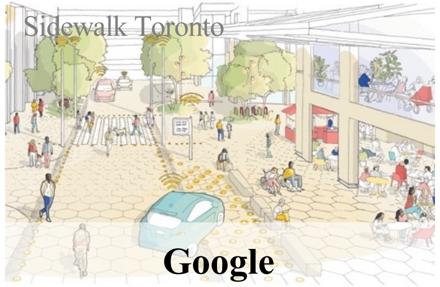
Tencent

Smart New District

Alibaba

CloudSmart Future City

Baidu



Sidewalk Toronto

Google

Footstep energy

Umbrellium

Smart Street Transformation

DreamDeck Deck

---

1. International Business News South Guangdong Business News. https://mp.weixin.qq.com/s/6o6wm3NLiLChmfGKswhU0Q; Planning China. https://mp.weixin.qq.com/s/QUTDKpv_qqobeAgfhBFdiQ.
2. Baidu AI. https://mp.weixin.qq.com/s/GWCnlNoRMUTJgT7pTjKwSQ; Beijing Urban Lab. Top100 Architecture Firm Digital Transformation Case Study Compilation (with reference collection at the end of the article)

4 The Creation & Practice of WeSpace 2.0

Developer

Transformation

- Developers are transforming from a single development space to a development support service model
- Change in developer positioning from real estate developer to (urban) operator

Tendency

Developers are involved in the **market development and utilization of future urban space**. Still, with the further slowdown in residential demand, developers are beginning to focus on future urban space, further improving the quality of product support services and innovating service models to match the need for more integrated and operational living space in future cities.

Related Representative Ideas & Cases[1-4]

City in the Sky
Vanke

Forest City
Beyoncé

Unitech Center
Sunac China

Qingdao Longhu
Longhu

---

1. Real Estate Observer. https://mp.weixin.qq.com/s/cPMe2RL5VpwNPncIgAZihA
2. Beyoncé. https://www.bgy.com.cn/news_details.aspx?id=9976811
3. Unitech will. https://mp.weixin.qq.com/s/7tBKTRefvVjAnlv4w-fleMQ
4. Qingdao Longhu. https://mp.weixin.qq.com/s/KI61rEti5DsYHjaU9oZOBQ

4 The Creation & Practice of WeSpace 2.0

(space) Retailer

Transformation

- Retailers are gradually facing the opportunities and challenges of service scenarios and models brought by emerging technologies
- Retailers are starting to think outward from the industry itself about new service scenarios and models for future urban spaces

Tendency

Retailers are involved in constructing different **ecological application scenarios in** the future urban space. Traditional retailers are facing the dramatic market impact brought by emerging technologies, so they tend to use their deep understanding of specific service scenarios, combined with the application of emerging technologies, to bring empowerment, timely explore **innovative service application scenarios**, **improve service effectiveness and experience**, and flexibly respond to changes in market demand brought by technology.

Related Representative Ideas & Cases

Smart City Project in Small Town, USA
Audi

Weaving City
Toyota

Suning Future City
Suning

Nissan Smart City
Oriental Nissan

4 The Creation & Practice of WeSpace 2.0

Operator

Transformation

- Traditional operators are actively involved in digital transformation iterations
- Social forces such as developers are changing to operators in a broad sense

Tendency

Operators are involved in the planning, organizing, and managing of the future urban space. With the development of emerging technologies and the digital development of future urban space and resource elements, **everything can be operated,** and the city (space) becomes the most extensive operation product. Different social forces are competing and collaborating in the operation and management of the future urban space.

Related Representative Ideas & Cases[1-4]

Shanghai Zhangjiang
China Unicom（Shanghai）

Future Cities
China Mobile

Ready City
城市概览
一流的城市服务
模块化和可重复使用的功能
Vodafone

Jiashan Industrial City
China Fortune Land Development

---

1. WoBaoBao. https://mp.weixin.qq.com/s/BoRH9RG9wQe0P2OBIGRB_g
2. MobileLabs. https://mp.weixin.qq.com/s/P3DpeUD3fEmGtS6bKTculA
3. CAICT, China Academy of Information and Communications Technology. https://www.sohu.com/a/257950523_297710
4. Huaxia Happiness. https://mp.weixin.qq.com/s/QyenffM0rvblRxS1ZyLu2A

4 The Creation & Practice of WeSpace 2.0

Government (multi-participation)

Transformation

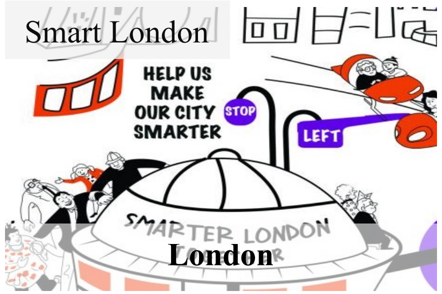
- Transforming Government to Digital Government
- The future of urban space is created with government-led participation and collaborative governance with multiple social forces

Tendency

The government is involved in the macro control of the future urban space and coordinates the active participation of different social forces in the city's construction. The traditional efficient single government-led urban space construction model is increasingly influenced by emerging technologies and is changing to a **collaborative model of multi-faceted construction.** Technology companies and other social forces are actively involved in the collaborative governance process with the government from their professional perspectives.

Related Representative Ideas & Cases[1-4]

Kashiwa Ye Smart City
Japan


Smart London
HELP US MAKE OUR CITY SMARTER
STOP
LEFT
SMARTER LONDON
London

Future City Practice Area
Hangzhou

East New District
Chengdu

---

1. Kashiwa Smart City. https://kashiwanoha-smartcity.com/cn/concept/whatssmartcity.html
2. Smart London. https://www.london.gov.uk/what-we-do/business-and-economy/supporting-londons-sectors/smart-london/smarter-london-together
3. Zhang Jingxiang, Zhang Qin, Huangfu Jiaqun, Li Dy. The "Hangzhou sample" of the future city and its planning exploration[J]. Urban Planning,2020,44(02):77-86
4. Chengdu Release. https://mp.weixin.qq.com/s/OknSLHYk9cAhy6OZuhFIJw

4 The Creation & Practice of WeSpace 2.0

Public

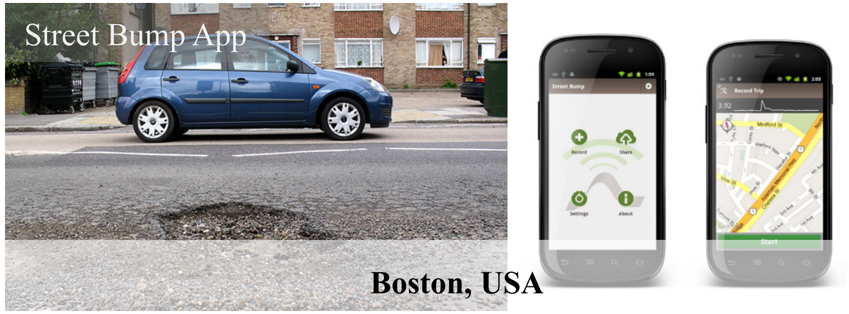
Transformation

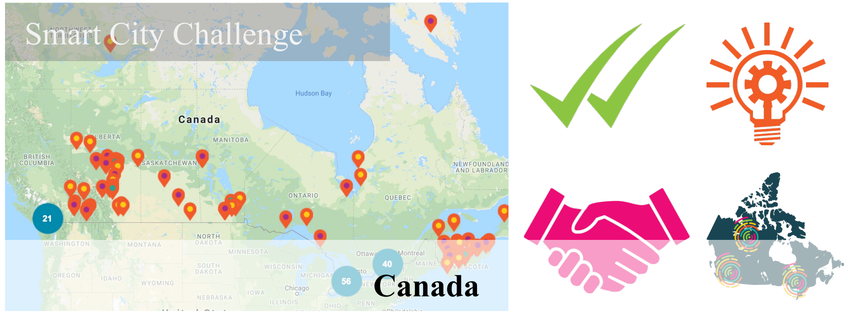
- New technologies move toward a more human-centered and segmented direction
- The demand for private customization will increasingly be identified and captured

Tendency

As the core part of the "people-service-space" chain, the public will use more **diverse social media and participatory platform tools to** express more personalized needs and opinions, thus enriching the future direction of urban space wisdom construction. The public's participation and feedback will improve the information feedback network system for the government-led spatial practices of all parties.

Related Representative Ideas & Cases[1]





---

1. Long Ying et al. Future Cities: Spatial Prototypes and Realization Paths[J]. Urban and Regional Planning Research

4 The Creation & Practice of WeSpace 2.0

Summary: The overall process of urban planning and design empowered by technology

Overall Planning Stage

Phase I

- Form an expert group (Urban Design, Technology Consultant, Infrastructure Department).
- Research about technology and space development tendencies and site requirements.
- Determine overall objectives and form preliminary urban design plans.

Specialized Planning Stage

Stage 2

- The expert group leads the professional team.
- Conception about elements /facilities/products and costs, and their requirements for space layout, supporting infrastructure, and operational systems.
- Build a technology development mechanism from test to push wireless.

Multi-Party Engagement Stage

Stage 3

- Operations Group/Resident Co-creation Camp (Internal team).
- Design Competition (External Team).
- Special teams for screening and integration.

Integration and Adjustment

Stage 4

- Design fusion (space-based fusion/system-based fusion).
- Formation of detailed design task letter and spatial schematic (by the expert team).

Refinement and Implementation

Stage 5

- Refinement of spatial design teams and management operating system.
- Infrastructure (energy, IoT) team's fine coordination.
- Implementation on the ground, operations management, and continuous updates.

5 The Conclusion & Prospect of WeSpace 2.0

■ 8 tendencies of future urban space:

Epistemology

Tendency I The spatial and temporal freedom of individual work and life is improved

- The office is not limited to a fixed time and place but more creative and dynamic to create value. The residence is more in pursuit of living quality and service quality, as well as the connection between family and community
- The Internet of everything brings diversified and self-oriented lifestyles

Tendency II Future urban spatial organization and development mode transformation

- Spatial form no longer follows functions, and functions and services centered on people are more concentrated
- Urban development tends to be fine development and mixed functions
- Living, office, transportation, and other spaces will have more complex and shared functions to meet more immediate and diverse needs and improve the efficiency of space utilization
- At the city level, on the one hand, innovative industrial clusters will become a new growth pole of the city; on the other hand, employment space will be flat, transportation centers and shopping centers may be weakened, and service space will sink to communities

Tendency III The deep integration of virtual space and physical space

- The algorithm-centered Internet virtual space takes over the information search function of the urban physical space, and the urban crack/debris space gets new attention opportunities and values
- The sense of the existence of urban physical space has been diluted, the purpose of acquisition of digital space has been further enhanced, and the traditional physical space is facing remodeling and transformation

Epistemology

Tendency IV The solution of old problems and the emergence of new issues in urban space

- The combination of technology and space is expected to solve the problems of urban traffic congestion, environmental pollution, energy waste, carbon emissions, and other issues for a long time, and make the city return to sustainability
- In the context of the new round of the "digital divide," more discussions should be conducted on social issues such as gentrification, social segregation, wealth gap, and privacy security in the process of urban development

Methodology

Tendency V Data-driven future urban space research

- The super-big data based on the Internet of Things in the future urban space will provide more refined and large-scale data support for urban research

Tendency VI The coexistence of the old and the new in the urban space, the urban collage of different times

- As a container, urban space has great flexibility in use. The space remains the same, but people's use of the space changes. At the same time, new spatial forms will be born, and the old and new spaces will coexist

Praxial

Tendency VII Urban space use and community management and operation

- The comprehensive intelligence of urban space elements makes everything operable and gives full play to mobile Internet's optimization and integration factors. Cities will become operable products
- Self-organized communities continue to emerge under the Tendency of liberalization and personalization, and traditional real estate developers also favor theme communities with different emphasis under the influence of Internet thinking

Tendency VIII The urban space technology layer overlay takes digital innovation as the core

- The future design of some urban spaces needs the superposition of technical layers. Spatial Intervention, Place Making, and Digital Innovation will be more feasible and practical methods to create a better-built environment in the future

5 The Conclusion & Prospect of WeSpace 2.0

■ 9 issues of future urban space:

Epistemology

Issue I The overall evolution Tendency and characteristics of urban space in the future

- Can future cities be predicted/how they can be better predicted?
- Where and to what extent will the future urban space change be reflected?
- How many cities does the vision of open urban space ultimately apply to?

Issue II Patterns of future urban spatial organization

- What is the future city’s grade, scale, structure, and development mode?
- Will the urban space in the future be more differentiated or more homogeneous?
- What will be the future of the rural-urban relationship?

Issue III Carbon emissions from all aspects of urban life in the future and their impact paths

- How to guide new technologies to play an appropriate role in future urban spatial carbon emission reduction?
- How does the carbon reduction path achieve a smooth transition between old and new technologies?

Issue IV Impact and challenges of new technologies on future urban space

- The role of new technologies in the future urban space
- The impact of new technologies on the future of urban space: Efficiency, quality, and vitality
- Under the new technology, new urban space and new spatial organization relationships emerge
- The challenges of future urban social equity, sustainable development, and carbon emissions under the application of technology

Methodology

Issue V Under the background of the application of new technologies, the cross-regional collaborative path, and the mechanism of the future urban space

- Do metropolitan areas, solid provincial capitals, and existing administrative boundaries affect urban space development?
- How do we use emerging technologies to achieve the cross-regional synergy of urban development more efficiently?

Issue VI The matching and fusion mechanism of urban physical space and digital space

- The development of online space has many impacts on offline space. How will physical space cope with the future opportunities and challenges brought by disruptive technologies?
- What is the balance between physical and virtual space in the future city?
- Faced with the continuous iteration of technology, how can the relatively backward urban space adapt quickly and flexibly?

Issue VII Data ecological construction in the future urban space (Collection, use, sharing, protection, governance)

- The challenge of data/technology hegemony to urban spatial justice and social equity
- How to build a better urban data ecosystem in the future?

Praxial

Issue VIII Future-oriented urban space design and creation methods

- How can emerging technologies make urban space development more humane?
- In the future, how to combine emerging technologies to revitalize withered urban Spaces or decaying cities?

Issue VIIII Future urban digital space construction and operation model

- Who will pay for the future urban space, and how will government and enterprise cooperate?
- Is it necessary/how to form a unified standard paradigm for future urban creation?
- How will future urban planning and construction meet the needs of the new era?

5 The Conclusion & Prospect of WeSpace 2.0

The main contribution of this report:

Contribution I

The influence of science and technology development on urban space is reviewed, and the development scenario of urban space in the future is prospected

- This research report combs the macro, medium, and micro effects of disruptive technological development on urban space since the Industrial Revolution and the guiding role of disruptive technological development on the ideal city model. It then obtains the regular characteristics of urban development, which provides the basis for this report to focus on the frontier Tendency of current scientific and technological development and look into the near-future urban space scenario.

Contribution II

Review the new technologies that are or may have a profound impact on urban space, and summarize the main tendencies of future urban space driven by technology

- This research report explores the driving forces of future urban spatial change from the perspectives of technology supply and human demand. Sort out the impact of emerging technologies on space at different levels. Based on the transmission chain of "technology-driven, product-service-spatial transformation," this paper discusses the reconstruction and transformation of urban space caused by emerging technologies and summarizes eight main tendencies.

Contribution III

To look into the possible development scenarios of inter-city and intra-city functional Spaces and facilities and their positive and negative externalities in the future to trigger further discussion and research

- This study summarized the development of the regional level, grade, size, and contact tendencies, explored the future city life, work, leisure, traffic space, and public service facilities, the development Tendency of municipal infrastructure in technology-driven, summarizes the positive and negative externalities, and the new phenomenon, new technologies of urban discusses the path and the benefit of the influence of carbon emissions, It aims to trigger more in-depth discussion and research on the future urban space.

Contribution IV

A wealth of design, construction, and operation cases are arranged to demonstrate the diverse possibilities of future urban space creation practices

- Through the accumulation of rich cases and systematic arrangement, this research report fully demonstrates the imagination and practice of different creative subjects for the future urban space scene. It provides a unique perspective for understanding the latest progress of multi-disciplinary research on the future urban space to stimulate more diversified in-depth thinking and analysis.

5 The Conclusion & Prospect of WeSpace 2.0

■ Some limitations of this report:

Limitation I

Under the background of science and technology development, the influence of the second industry in space is limited

- Based on the current development Tendency, this report predicts that the tertiary industry space will dominate the future industrial space within the city. In contrast, the secondary industry space will move out from the urban core area. Therefore, this report does not discuss too much the specific impact of scientific and technological development on the secondary industry (manufacturing) space (such as machine replacement). And the effect of large-scale intelligent manufacturing industry development, traditional industry transformation, and industrial migration in different regions on people's production and lifestyle, employment opportunities, etc.

Limitation II

Consideration of other factors affecting future urban spatial development is limited

- This report is mainly based on the present urban space scene under the influence of technology development Tendency and path dependence are near-future scenarios that may occur. Still, technology is the future driving element of the evolution of urban spatial development of human society, economy, policy, culture, values, and ecological development. Also, a lot of influence on the urban space. This report focuses on the perspective of technical deduction and does not systematically analyze and deduce the other factors. There is still room for improvement in the rigor and systematization of the chain and logic of deduction.

Limitation III

The predictability of future urban space itself is limited

- The future is based on creation rather than prediction. On the one hand, summarization and derivation based on empirical tendencies often fail to predict the occurrence of events such as "black swans.” On the other hand, due to the complexity of the city itself, interventions based on the goal of solving the problem may also create new problems. These unexpected events will produce many "butterfly effects,” which will have an unpredictable impact on the future urban space. This report only puts forward some existing cognition, summarizes relevant urban space scenes, hoping to attract wider attention and discussion, and carries out diversified communication, discussion, and in-depth research through the subsequent open research plan.

Limitation IV

There is insufficient attention and discussion on the living conditions of different people in different cities

- This report focuses more on related cases and practices in first-tier and second-tier cities and, to some extent, ignores other cities with relatively backward development. At the same time, this report lacks a discussion on the living conditions of different groups of people, especially vulnerable groups, which leads to the fact that the content of this report is not applicable to all cities in the next ten years, nor can it adapt to the lifestyle of all people. Therefore, more studies are needed to discuss the possible development states of different cities and groups in the future and explore the future spatial forms that adapt to people with different lifestyles and cities.

5 The Conclusion & Prospect of WeSpace 2.0

The application of new technology and (future) urban space in urban planning, construction, management, and design

- **Research and exploration of future urban spatial development will respond to important national policies, strategies, and guidelines in the form of practice**

Data support

Theoretical analysis and deduction

Space planning and design

Smart operation and management

In December 2012, the Ministry of Housing and Urban-Rural Development issued **the Interim Measures for the Pilot Administration of National Smart Cities,** pointing out that building smart cities is an important measure to implement the Party Central Committee and The State Council's policy on innovation-driven development, promoting new urbanization and building a moderately prosperous society in all respects [1].

In December 2015, the Central Urban Work Conference put forward the requirements of **Ecological Restoration and Urban Repair**, which pointed out the direction for the development and construction of Chinese cities during the transition period and was a necessary action to control "urban diseases" and improve human settlements [2].

In March 2017, the Ministry of Housing and Urban-Rural Development issued **the Urban Design Management Measures**, aiming to improve the level of urban construction, shape urban features and characteristics, promote urban design work, and improve urban planning and construction management[3].

In May 2019, the Ministry of Natural Resources issued **the Notice on Comprehensively Carrying out National Spatial Planning**, which pointed out that the formulation of national spatial planning should be fully initiated to realize the "integration of multiple plans," implement economic, social, and industrial development goals and indicators, and provide spatial guarantee for the implementation of the national development plan. We will promote the adaptation of the pattern of economic and social development, urban spatial layout, and industrial structure to the carrying capacity of resources and the environment[4].

In April 2020, the National Development and Reform Commission issued **the 2020 New Urbanization and Urban-rural Integration Development Key Task**, adhered to the new concept of development, speeding up to promote the town as the core and quality as the guidance of the new urbanization strategy, and improve the mechanism of the urban sustainable development system, improve the quality of urban development. The new smart City Initiative will be implemented to support cities' healthy and efficient operation and rapid and intelligent response to emergencies[5] .

In September 2020, the General Office of the Ministry of Natural Resources formulated the Guidelines for the Compilation of Master Plans for Municipal Territorial Space (Trial). It is proposed that major thematic studies on territorial space planning should be strengthened, including but not limited to :(1) study the impact of population size, structure, distribution and population mobility on space supply and demand and countermeasures; (2) Study the effects of climate change, water and soil resources, floods and other natural disasters on space development and protection and countermeasures; (3) To study the impact of major regional strategies, new urbanization, rural revitalization, scientific and technological progress, industrial development on regional spatial development and countermeasures; (4) Study the impact of transportation system and information technology on regional spatial development and countermeasures; (5) To study the problems and countermeasures of public services, infrastructure, public security, risk prevention and control and other support systems; (6) To study the spatial strategies of economical and intensive use of construction land, urban renewal, land consolidation and ecological restoration; (7) Study the spatial characteristics of natural landscape and artificial environment, the preservation and inheritance of historical culture and other spatial forms and quality improvement of spatial countermeasures; (8) To study the spatial strategies for the revitalization and development of cities with resource depletion and population contraction; (9) To comprehensively study the planning and implementation of safeguard mechanisms and related policies and measures.

In May 2022, the General offices of the CPC Central Committee and The State Council issued **Opinions on Promoting urbanization Construction with county towns as important Carriers**. They are proposed to promote digital transformation, new infrastructure construction, and the smart county's development. We will promote the large-scale deployment of fifth-generation mobile communication networks and build high-speed optical fiber broadband networks. County towns will operate under the control of one network, promote IOT applications and the intelligent transformation of municipal public facilities and buildings, and deploy sensing terminals such as smart electricity and water meters. Government services are provided in one network to facilitate business handling, taxation, certificates and licenses, and administrative permits. We will promote universal access to public services and the digitalization of resources such as schools, hospitals, and libraries.

……

(Some national policies, strategies, or guidelines)

Future development of new technologies should **comply with the relevant policy concepts and guiding ideology and** consider the positive into the national spatial planning and urban design **practice framework**, strengthen the technical application of top-level design and macro guidance, thus creating a more scientific, sustainable and to local to provide a high quality of future urban space development positive guidance and orderly.

1. Ministry of Housing and Urban-Rural Development of the People's Republic of China. https://www.mohurd.gov.cn/gongkai/fdzdgknr/tzgg/201212/20121204_212182.html
2. People.cn. http://cpc.people.com.cn/n1/2015/1223/c64094-27963704.html
3. Ministry of Housing and Urban-Rural Development of the People's Republic of China. https://www.mohurd.gov.cn/gongkai/zhengce/zhengceguizhang/201704/20170410_763796.html
4. Ministry of Natural Resources of the People 's Republic of China. http://gi.mnr.gov.cn/201905/t20190530_2439129.html
5. National Development and Reform C ommission. https://www.ndrc.gov.cn/xxgk/zcfb/tz/202004/t20200409_1225431.html

5 The Conclusion & Prospect of WeSpace 2.0

Technology for healthy and sustainable development of urban space in the future

- **Fully guide technology to the good and its positive effect on the future urban space, timely assessment and early warning of potential negative impacts of technology, and calm potential technological risks**

“User-oriented, science and technology to the good” ——Tencent
“Make it easy to do business anywhere” ——Alibaba
“Make the complicated world simpler through technology” ——Baidu
“Integrate global information and make it accessible for the benefit of all” ——Google
“Technology that benefits everyone is truly powerful” ——Apple

……

（The mission, vision or values of some tech companies）

During the development and application of science and technology, potential problems such as the violation of ethics and values by technology, the imbalance between the inheritance of technology and culture, and humanistic care are **inevitable**.

People are on the scale of technology. All sectors of society should jointly face various new problems brought by new technologies and new applications, seek consensus and explore solutions, **promote the positive role of new technologies in human society and urban space**, identify and avoid the adverse effects brought by technology, and **oppose the evil effects of technology**. We advocate that all technological forces in society have a social well-being perspective rather than a simple user perspective and jointly promote the healthy and sustainable development of social and urban space in the future. Through the reasonable guidance of technology, **every city, every space, and everyone will ultimately benefit.**

■ Principal member of the joint research group

School of Architecture, Tsinghua University

Long Ying : Tenured associate professor/Ph.D supervisor, School of Architecture, Tsinghua University
Founder /Executive director of Beijing City Lab

Li Wenzhu : Assistant Researcher, School of Architecture, Tsinghua University

Liang Jianing : Master student, School of Architecture, Tsinghua University

Li Weijian : Master student, School of Architecture, Tsinghua University

Wu Qizheng : Master student, School of Architecture, Tsinghua University

Zhang Enjia : PhD student, School of Architecture, Tsinghua University

Zhao Huimin : PhD student, School of Architecture, Tsinghua University

Li Wenyue : Assistant Researcher, School of Architecture, Tsinghua University

Wang Xinyu : PhD student, School of Architecture, Tsinghua University

Ma Yue : PhD student, School of Architecture, Tsinghua University

Tencent Research Institute

Liu Qiong : Deputy secretary General of Tencent Research Institute
Director of Industrial Research Center

Zhou Zhenghua : Head of Tencent Research Institute Planning center

Liu Jinsong : Senior expert of Tencent Research Institute

Wang Peng : Senior expert of Tencent Research Institute

Yuan Yuan : Senior expert of Tencent Research Institute

Liu Moxian : Senior researcher of Tencent Research Institute

Li Ruilong : Senior researcher of Tencent Research Institute

Xu Yiping : Senior researcher of Tencent Research Institute

Note: Some pictures in the report may have copyright problems. If there is any infringement, please contact ylong@tsinghua.edu.cn

WeSpace 2.0 Future Urban Space 2.0

(Full Chinese version 199 pages)

1. WeSpace 2.0 Background and Core
2. WeSpace 2.0 Technology Driven
3. WeSpace 2.0 Development Prospect
4. WeSpace 2.0 Creative Practice
5. WeSpace2.0 Conclusion and Prospect

Scan the QR code to jump

See links for details：

https://www.beijingcitylab.com/projects-1/48-wespace-future-city-space/

For more information,
please pay attention to the official public account

Beijing City Lab, BCL

Tencent Research Institute

For more information：

https://www.beijingcitylab.com/projects-1/48-wespace-future-city-space/

Format of reference:
Beijing City Lab and Tencent Research Institute. WeSpace 2.0 · Future Urban Space 2.0. 2022.07.

Contact: ***ylong@tsinghua.edu.cn***