

未来城市：空间干预与数字创新

Spatial Intervention and Digital Innovation for Future Cities

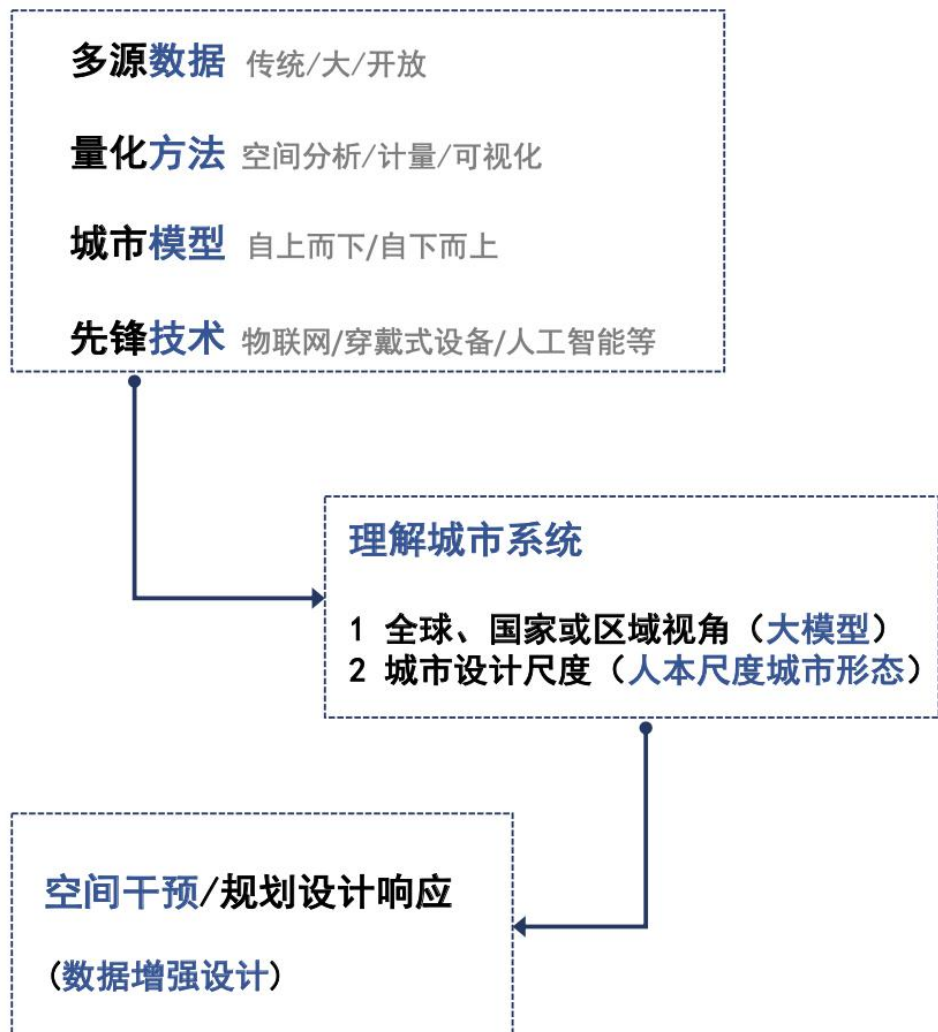
龙瀛 | 清华大学建筑学院

Ying Long, School of Architecture, Tsinghua University



从研究到创造

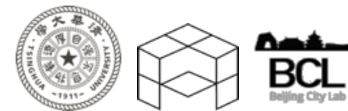
The Profile of My Lab

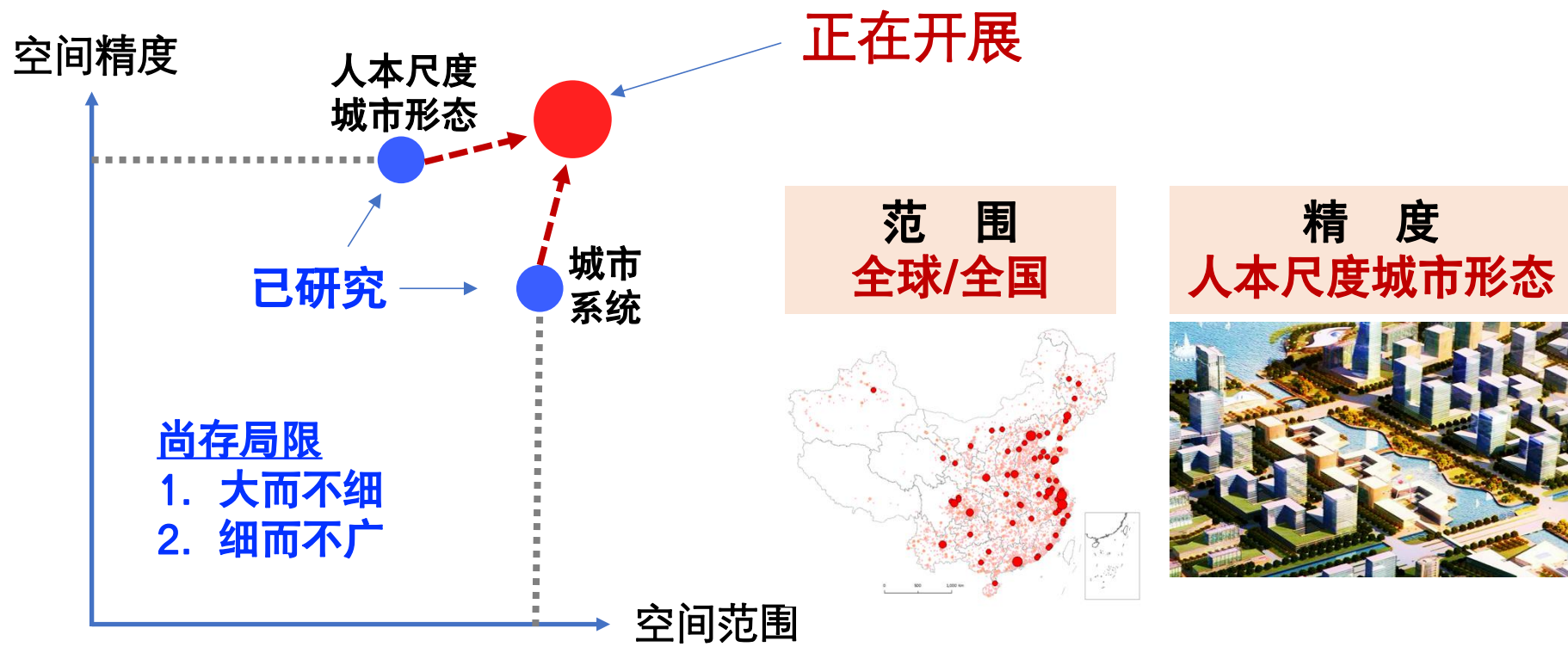


我们实验室的研究，致力于在精细化尺度关注中国每一寸国土，关注它的物质空间和社会空间，关注现实世界也关注虚拟空间，关注客观认知也关注智能创造

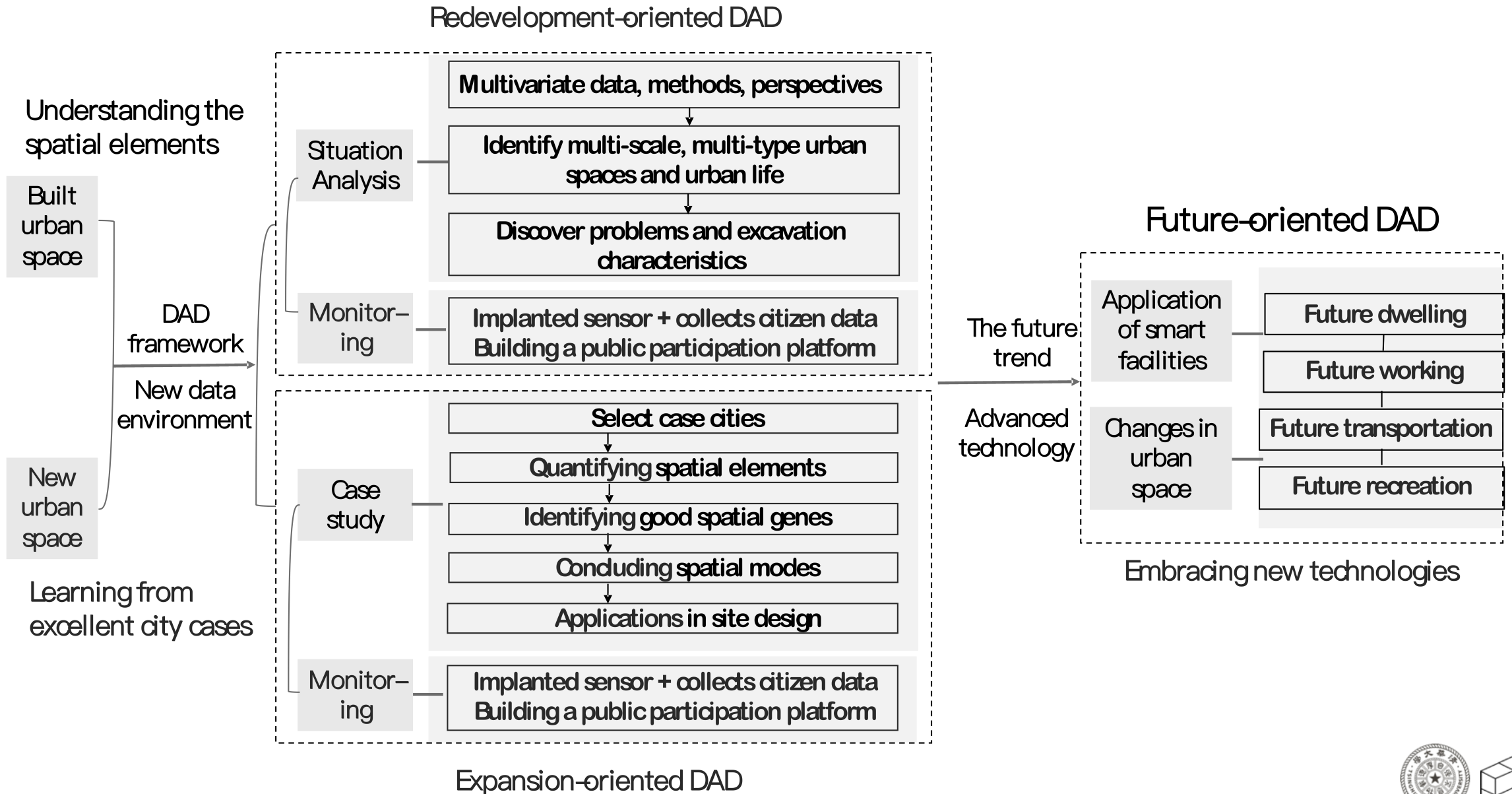
合作伙伴

互联网公司 国际组织 国家机关 城市规划院





数据增强设计 Data Augmented Design (DAD)

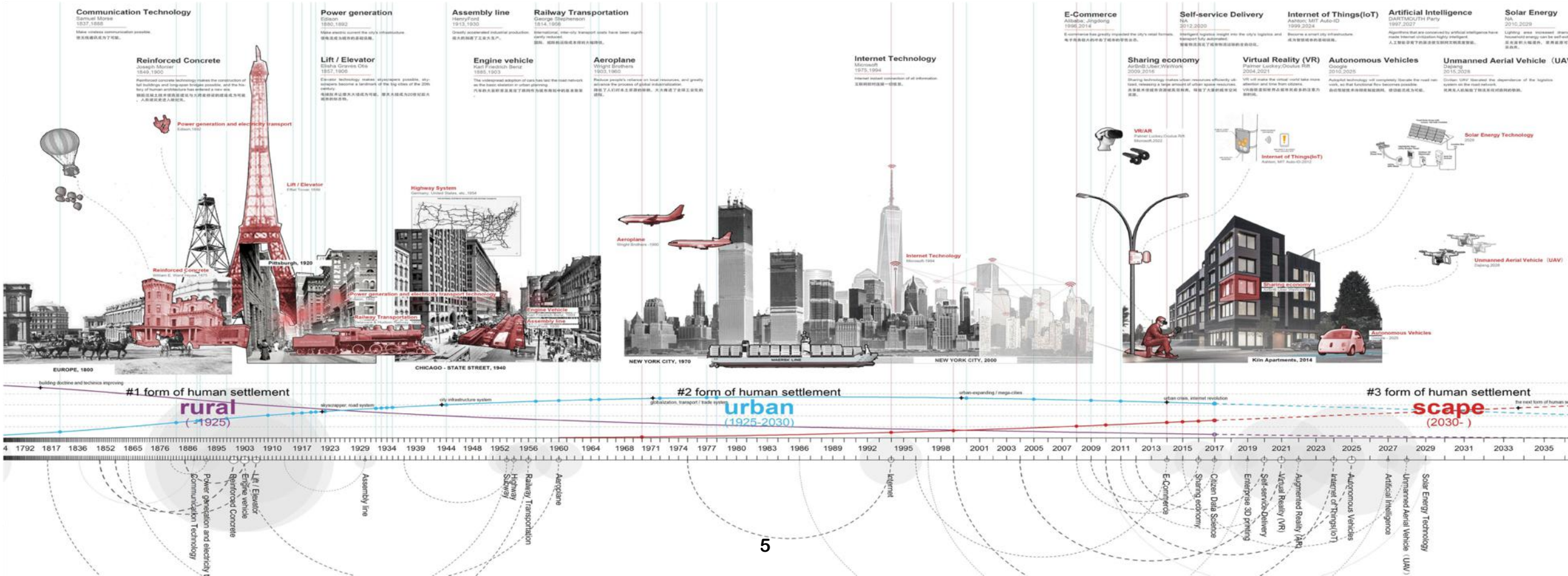


Technology's EYE

with living form's evolution

We have sorted out all the technical inventions that have made a significant impact on human settlement since 1700s and observed the evolution of human settlement for these three centuries. We came to the conclusion that human beings have so far undergone two typical types of human settlement, respectively, rural and urban. The typical difference between the two states is the maturity of the construction technology, the use of concrete, the emergence of elevators, such as the popularity of vehicles makes the road network system, the height of the building become a major urban skeleton and urban elements. And we can foresee a series of new technologies such as autonomous vehicle, smart logistics, VR, UAVs, artificial intelligence, sharing technology and so on, which have a tremendous impact on the form of human settlement, are rapidly maturing, which has accelerated our historical progress towards the next human settlement.

我们整理出了所有 1700 年以后对人居形态影响显著的技术发明，并观察了这三百年来的居形态的演变过程，得出了这样的结论：人类迄今经历了两种典型的人居形态，分别是农业人居 (rural) 和城市人居 (urban)，两种状态的典型区别是建造技术的成熟、混凝土的使用、电梯的出现、汽车的普及等使得路网、高度的建筑成为了主要城市骨架和城市元素。而我们能预见到无人驾驶、智能物流、VR、无人机、人工智能、共享技术等一系列对城市形态产生巨大影响的新技术正在迅速成熟起来，这加速了我们迈进下一个居形态的历史进程。



The fourth industrial revolution and its disruptive technologies have transformed daily life and space

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(新)城市科学:

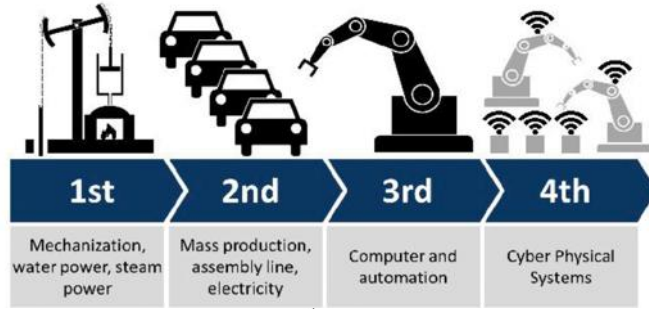
利用新数据、新方法和新技术研究“新”城市

(NEW) URBAN SCIENCE: STUDYING "NEW" CITIES WITH NEW DATA, METHODS, AND TECHNOLOGIES



1 催生新城市科学的背景

科技成果的日新月异使人们的生活方式发生了巨变,同时也影响了城市运行的各个层面。鉴于城市正在发生的种种变化,传统的城市规划设计理念与工具已无法应对新时代背景下的城市问题。然而,技术革新同时也为城市研究与实践带来了机遇——不仅促进了城市规划技术和工具的突破与创新,更在信息通讯技术快速发展的环境下,带动了数据存储、挖掘和可视化等技术的完善,赋予了人们审视城市环境的新视角^[1]。



摘要

以互联网产业化和工业智能化为标志、以技术融合为主要特征的第四次工业革命正以一系列颠覆性技术深刻地影响和改变着我们的城市:人们的思维方式从传统的机械思维向大数据思维转换,认知方式也逐渐向虚实结合的体验过渡,而我们赖以生存的城市,其资源利用、社会状况和空间利用也正经历着一系列变革。随着以计算机技术和多源城市数据为代表的新技术和新数据的迅猛发展,(新)城市科学在过去的十几年间逐渐兴起,成为一门融合了城市计算、人工智能、增强现实、人机交互等方向的交叉学科,为城市研究和城市规划带来了变革可能。目前全球范围内已涌现了多家聚焦于该领域的研究机构和多个研究项目。同时,世界各大院校也先后设置与(新)城市科学相关的学位、开设相关课程,培养更加符合新时代需求的新城市研究人才。

关键词

新城市科学;第四次工业革命;城市空间的重构与转型;大数据;颠覆性技术

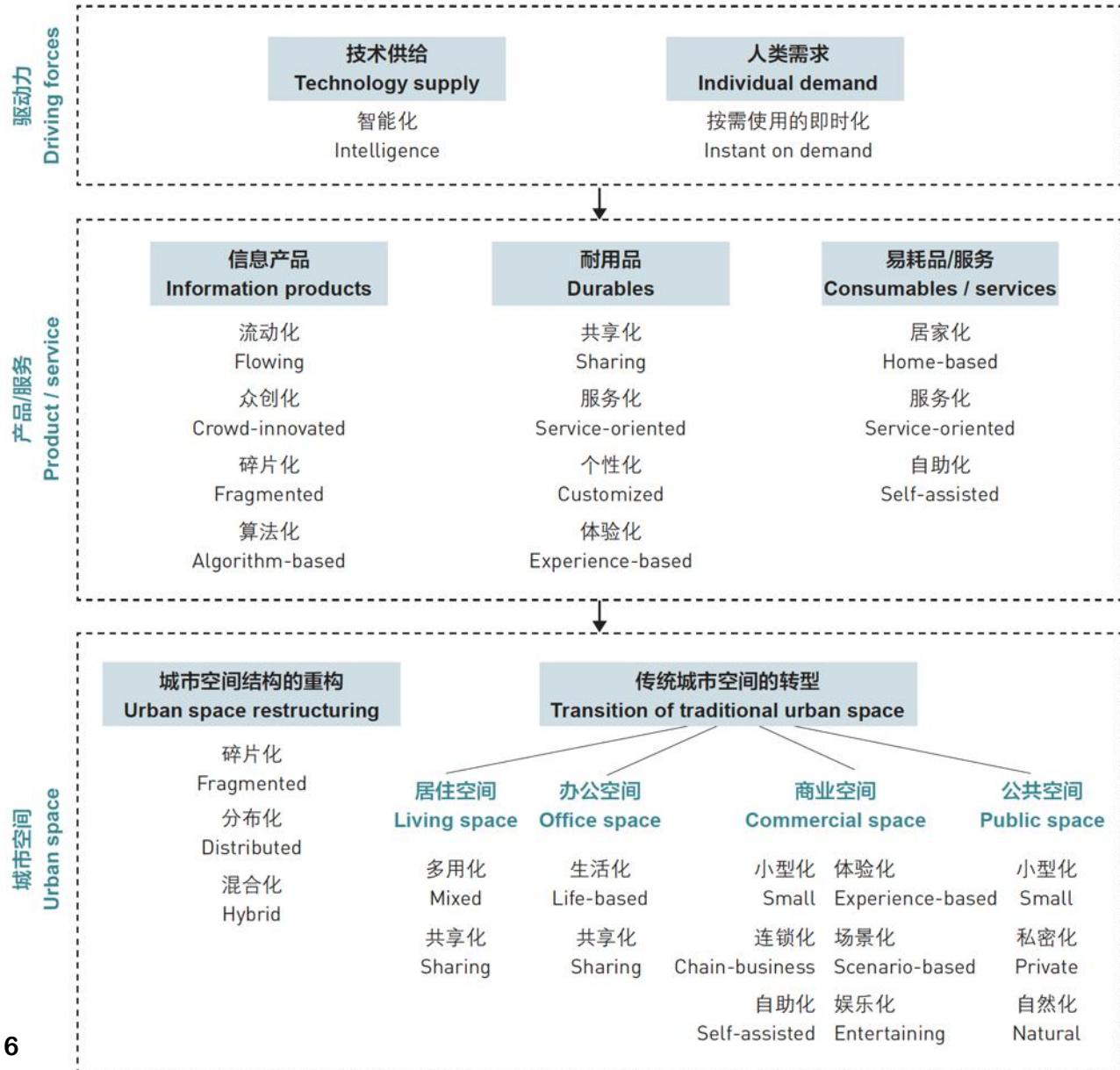
ABSTRACT

The Fourth Industrial Revolution is profoundly changing our cities with a series of disruptive technologies, characterized for the boom of Internet industries and the everyday application and wide integration of intelligent technologies. Individuals' traditional mechanical thinking has changed into a mindset based on big data, whose cognition also relies more and more on a combination of both virtual and physical reality experience. At the same time, cities, where we live, are witnessing a significant revolution in resource utilization, societal conditions, and spatial use. Along with the surge of new technologies and new data represented by computer technologies and multi-source urban data, the [new] Urban Science, as a transdisciplinary combination of urban computing, Artificial Intelligence, augmented reality, and human-computer interaction, rises over the past decade. Research institutions and programs on the [new] Urban Science are flourishing globally, and increasing related degree programs and courses are offered by colleges and universities worldwide to respond to the needs of this new era.

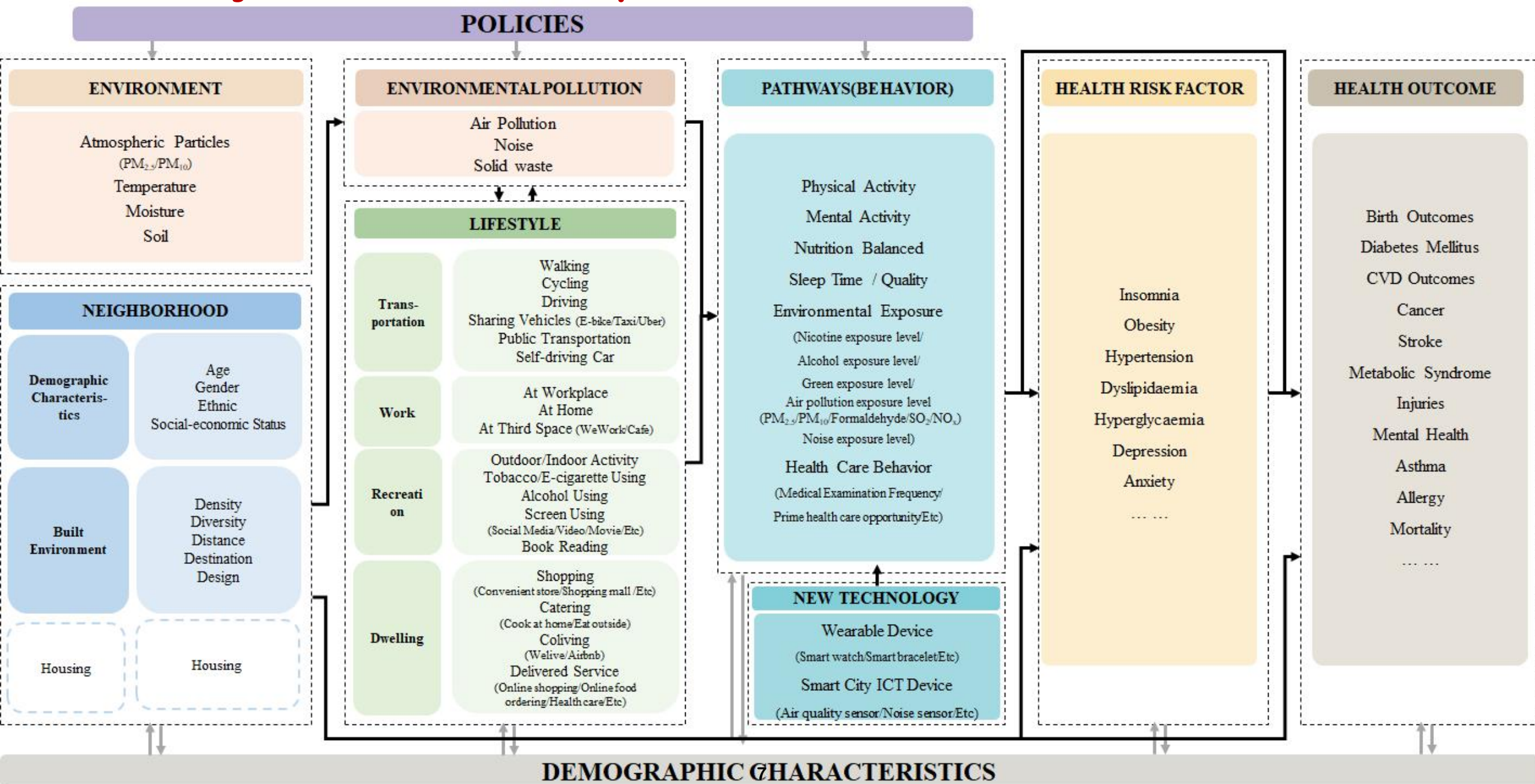
KEY WORDS


New Urban Science; The Fourth Industrial Revolution; Urban Space Restructuring and Transition; Big Data; Disruptive Technology

编辑 田乐 翻译 田乐 史肖杰
EDITED BY Tina TIAN TRANSLATED BY Tina TIAN SHI Xiaojie



New lifestyle and behavior in space





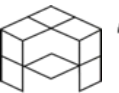
6.5 h

Average mobile phone screen time for Tsinghua students (n=500)

Screen Time: How Much is Too Much? A vast analysis tackles a defining question of the digital age. (Nature 2019, 565, 265-266)

10⁴

Each video post in Tik Tok attracts so many attentions averagely.



浮生记录第四篇 | 针对大数据与未来城市的新50条松散思考（于2019年末）

龙瀛 北京城市实验室BCL 6 days ago

本次推送为龙瀛的个人浮生记录系列第四篇，延续原【浮生记录】 / 【浮生记录】续篇 / 【浮生记录】第三篇，在其基础上补充了新的50条个人对大数据、未来城市和城市科学等的观察、思考与认识。

（再次说明，这一共194条浮生记录都是个人感想，绝非严谨科学研究判断，欢迎用批判的眼光看待）





How to achieve future cities?

**Scientifically understanding the present and the past is not enough.
We can create/invent them!**

Future Cities 未来城市

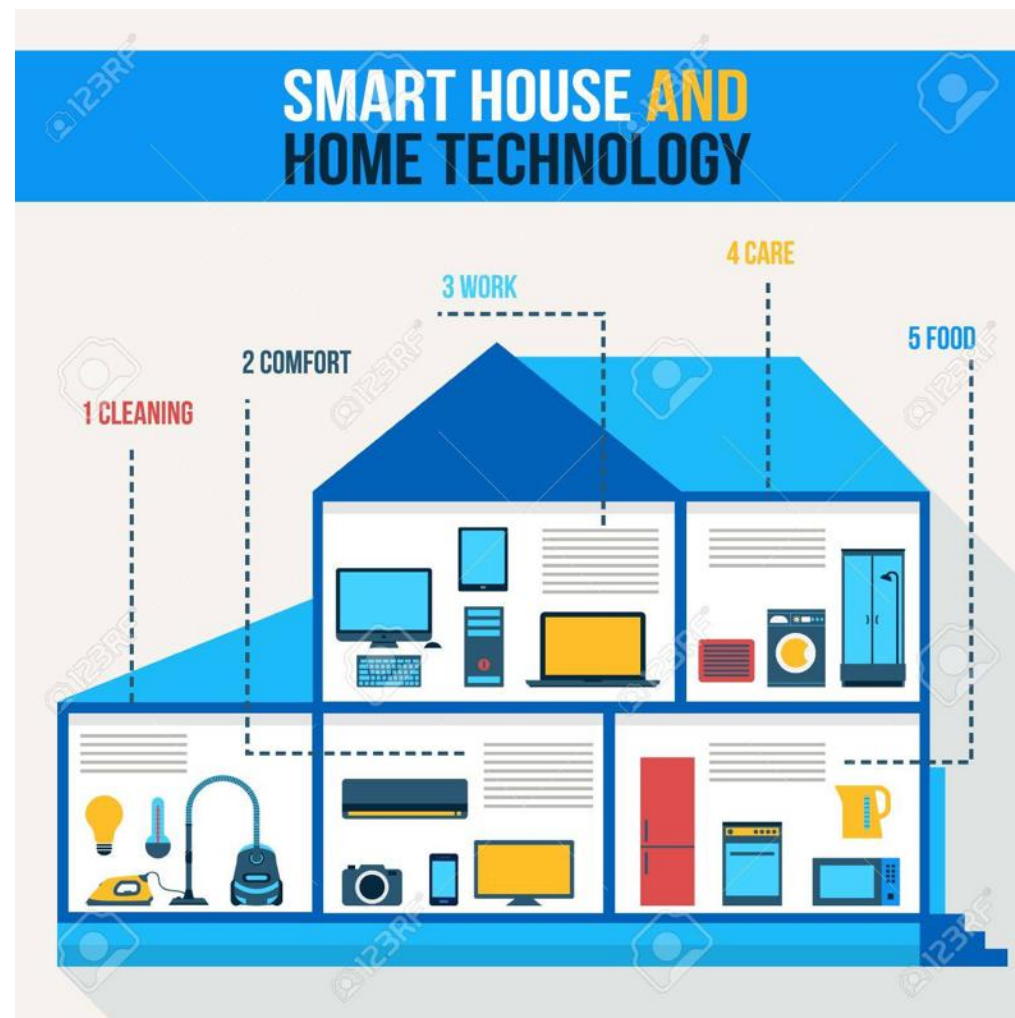
Nature 认识论 | **Methodology** 方法论



Advances in smart self and home



Smart self

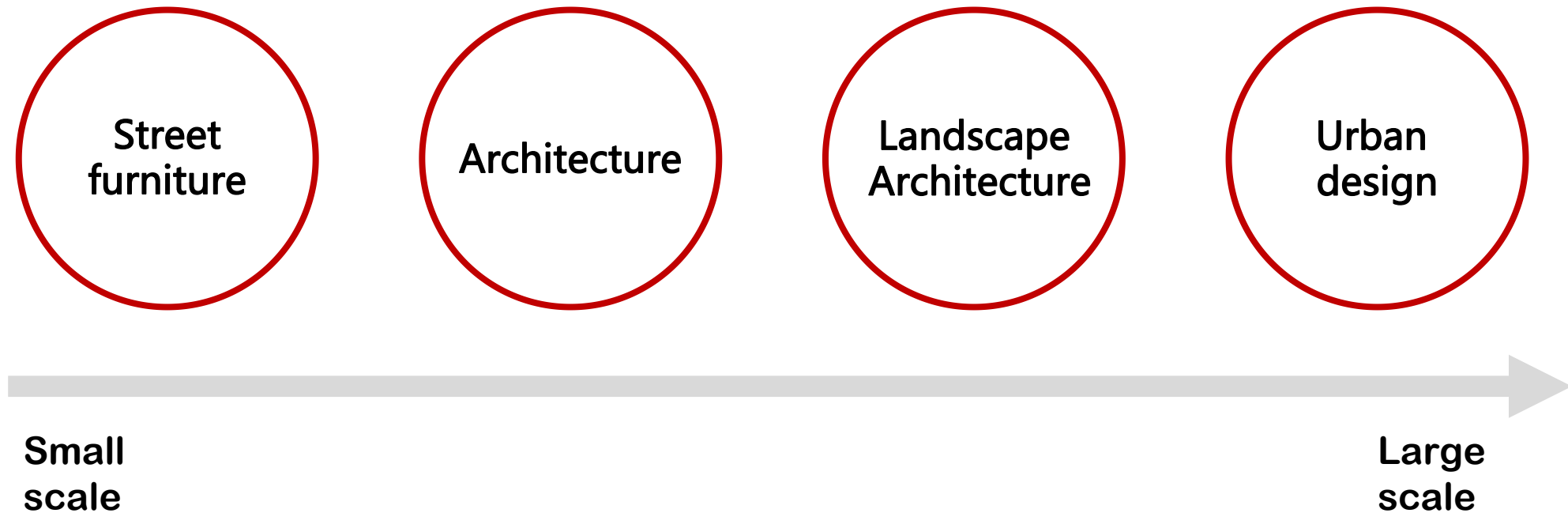


Smart home

However, smart for urban space especially public space in cities is still very limited !



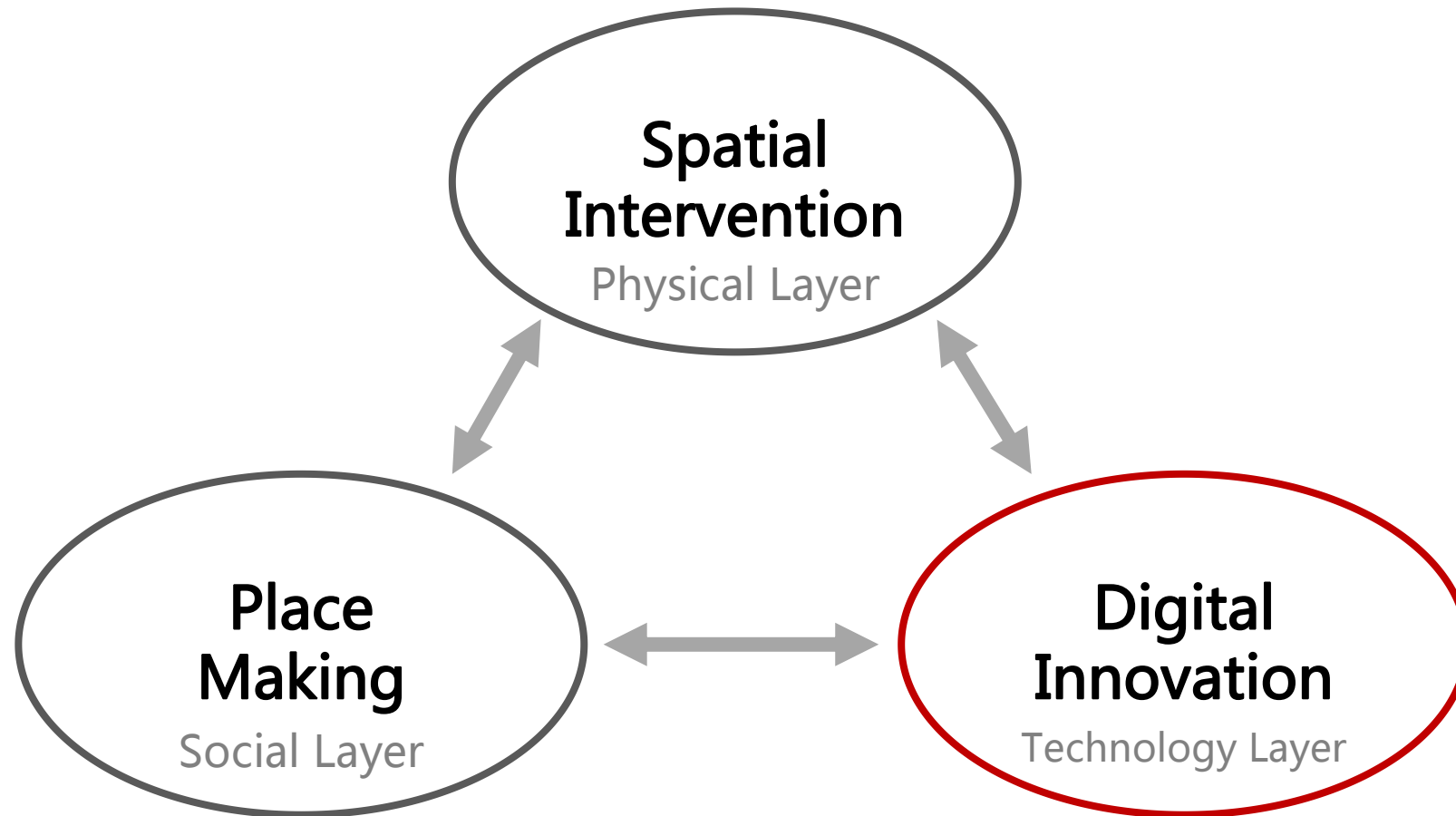
Conventional, we heavily rely on spatial intervention to create city space



Theory



My philosophy is SI is not enough for creating future cities (city space)



Definition of Digital Innovation (DI)

Digital technologies that can be combined with spatial intervention or beyond physical space for improving quality of physical and social space.

Two strategies for dealing with the over hot condition in a train car:



Spatial Intervention (SI)

Digital Innovation (DI)

Spatial Intervention and Digital Innovation (SIDI)

01

Solve existing

- Space is not flexible enough
- Space use is insufficient
- Waste of resources

02

Adapt to changing

- Interactive facility
- Flexible space usage
- Timely help and convenience

03

Promote future public

- Participation
- Vitality
- Sustainable development goals

SIDI here

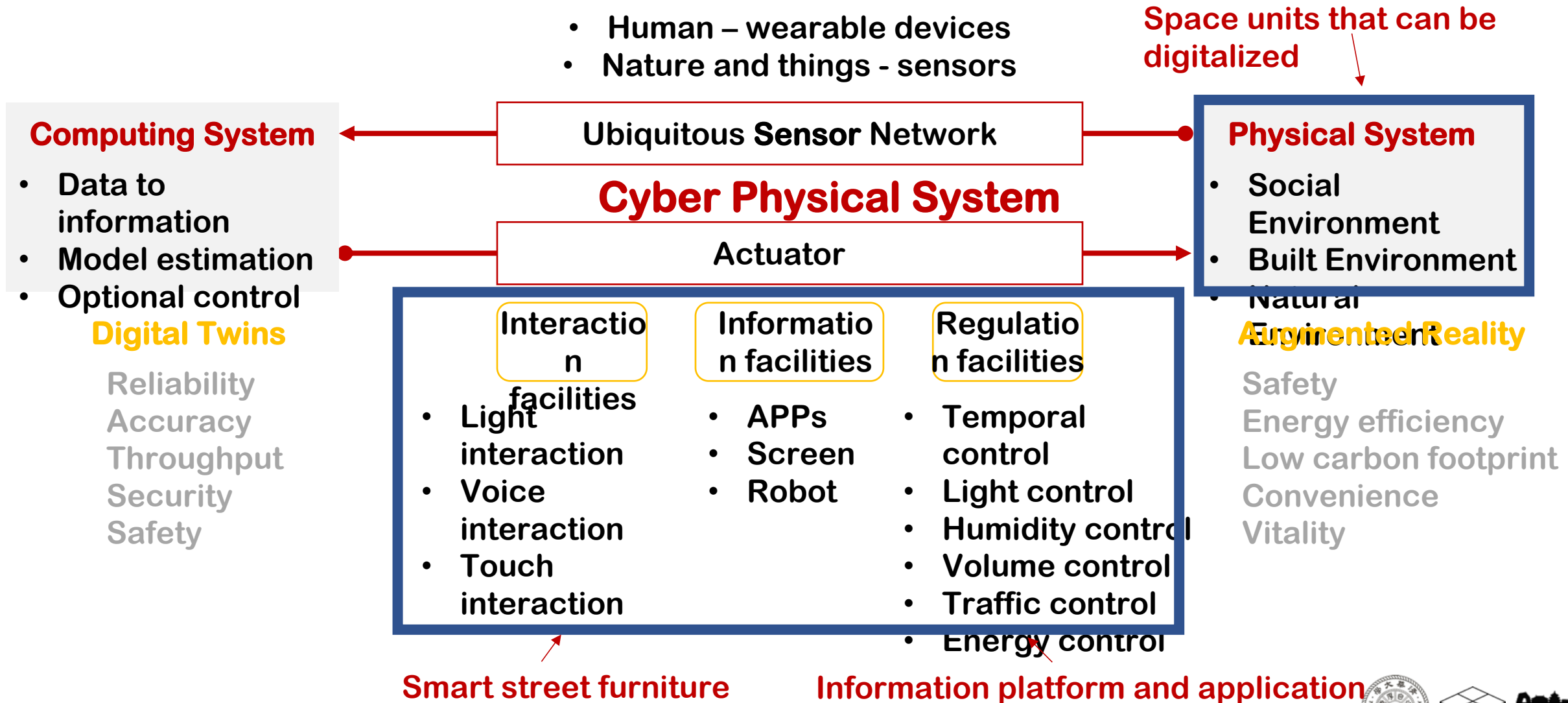
From smartly designing to designing smart (public) space



2

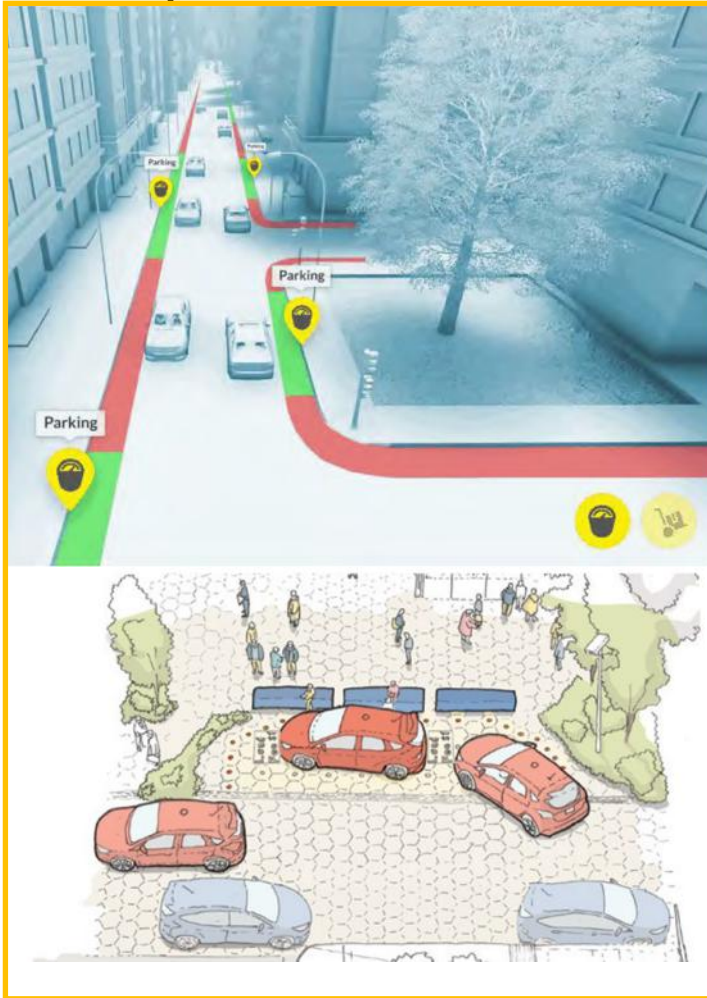
Methodology

Technologies/components of DI



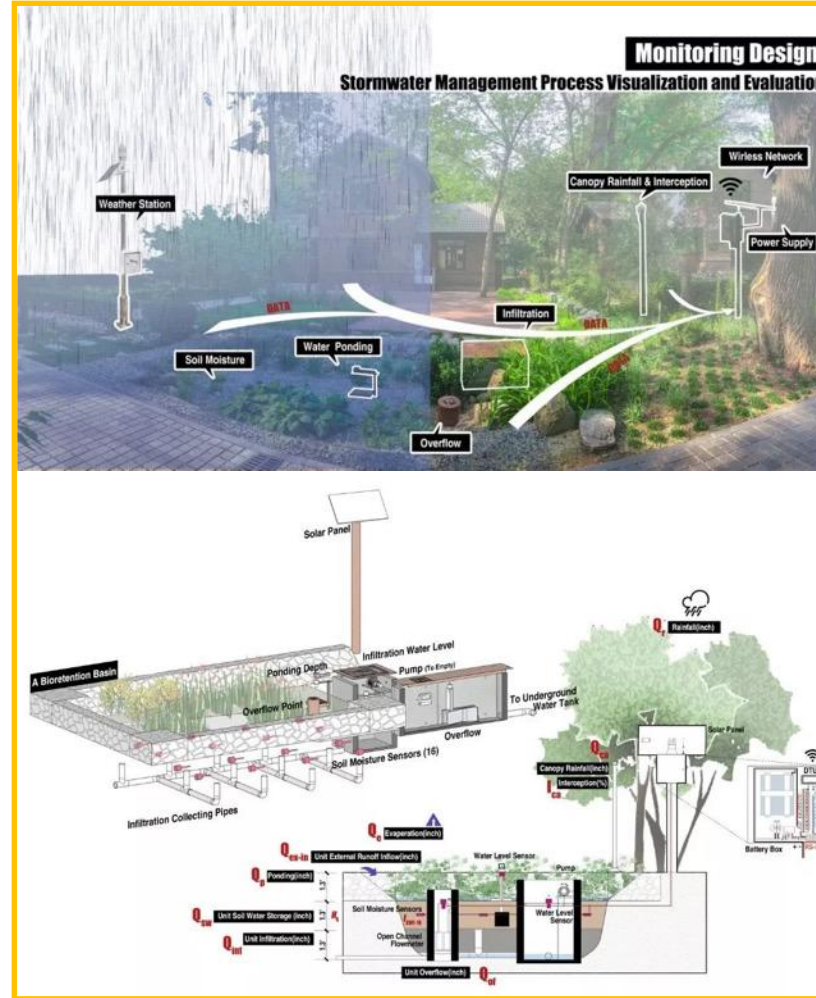
Space units that can be digitalized

- Boundary and guide



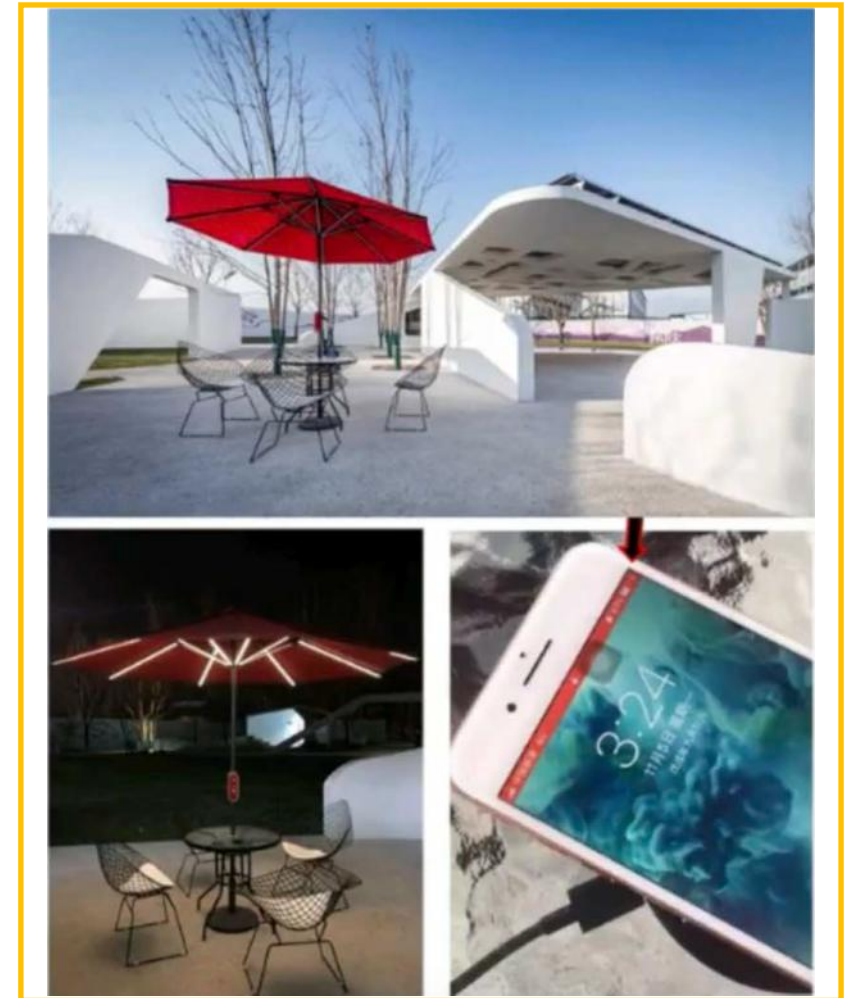
Smart transportation system

- Monitoring and management



Smart landscape system

- Space sharing and dynamic facade

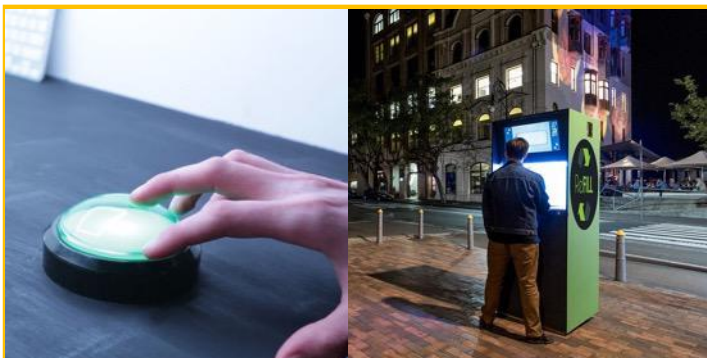


Smart square system

Smart street furniture

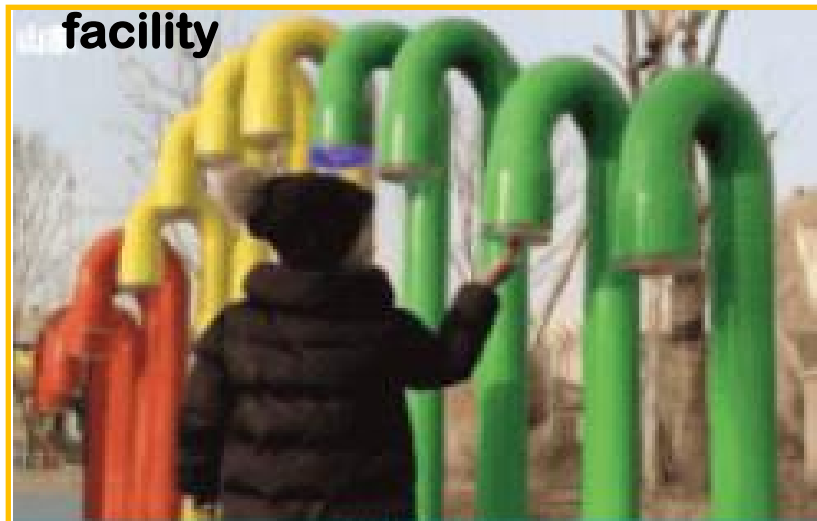
High demand

- Smart infrastructure



Trash can | Advertising screen

- Interactive entertainment facility



Sound interaction | Light interaction

- Smart structure



A new form of expression

Information platform and application

- Apps



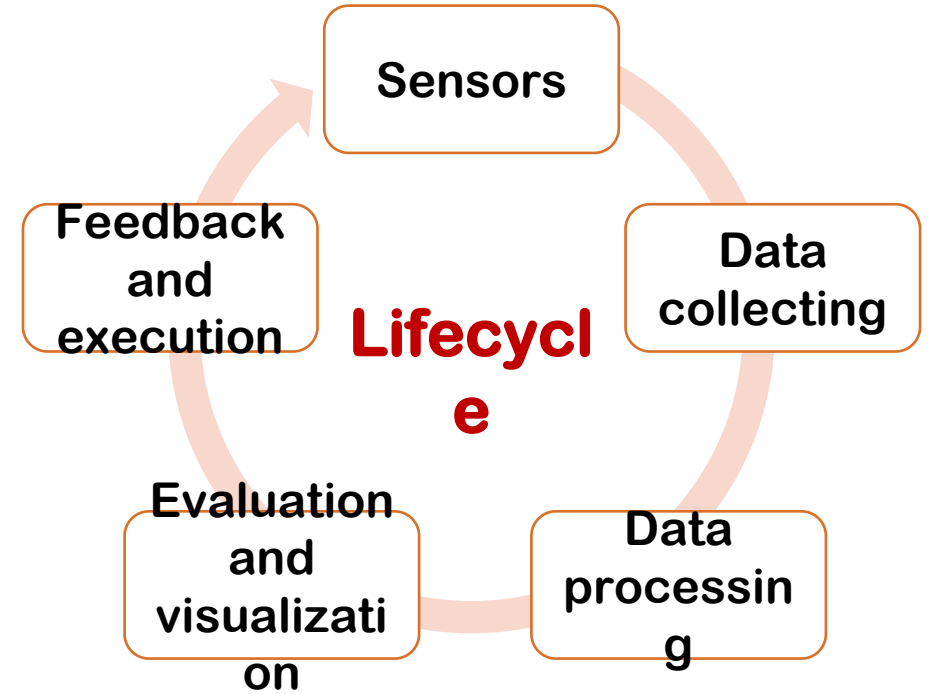
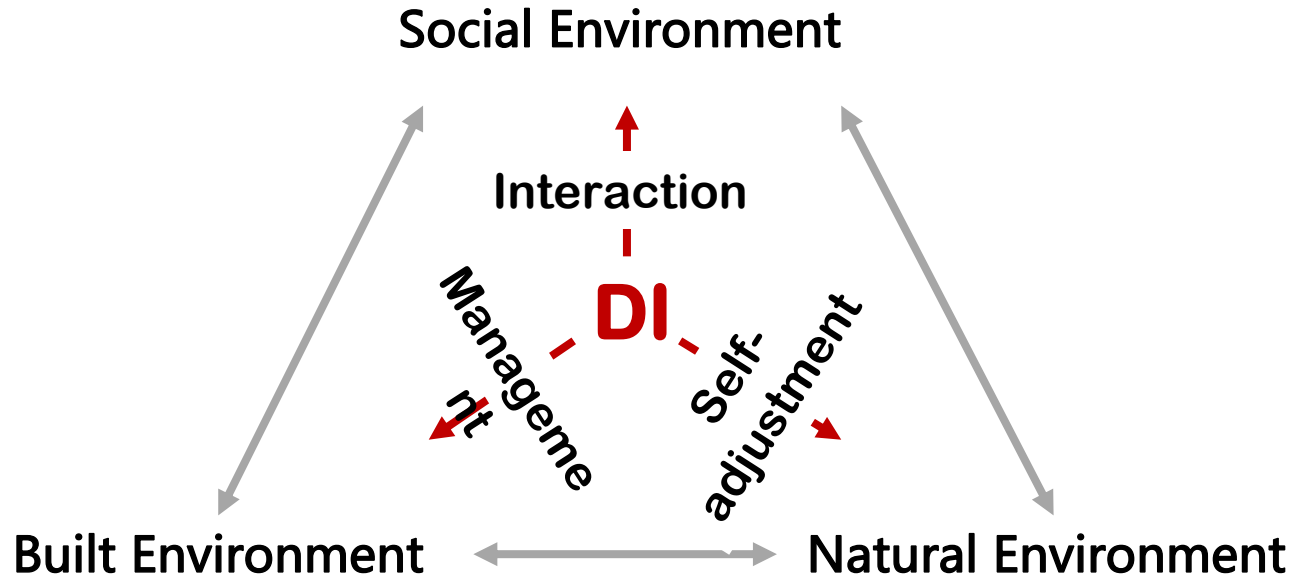
- WeChat applet



- Mixed reality



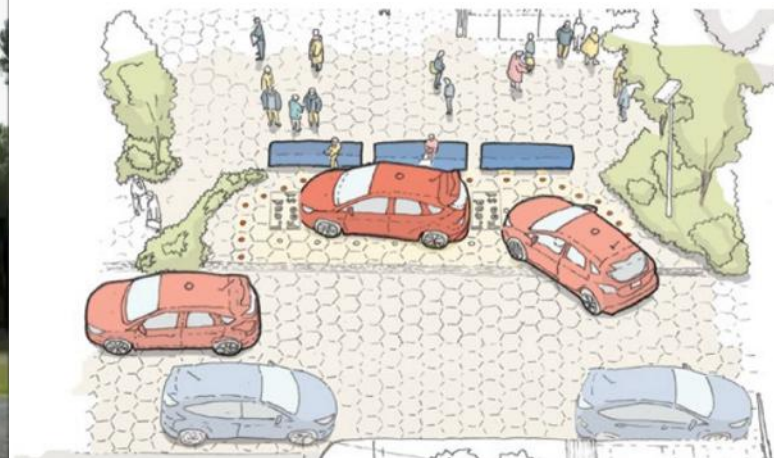
How does DI generate effect?



- Interaction



- Management



- Adjustment



The relationship between technology and space

1 Interact

- Human and nature
- Human and space
- Nature and space
- Offline and online

2 Augment

- Safety
- Comfort
- Perception
- Happiness

3 Replace

- Boundary
- Signal light

4 Supply

- Wi-Fi
- Charging
- Information
- Advertisement
- Guide

5 Active

- Event making
- Public participation

6 Diversify

- Mixed function
- Flexible function



Performance of DI + SI



Green / environment friendly

- Greenery
- Energy saving
- Recycling



Flexible

- Space
- Time
- People



Entertaining

- Relax
- Display
- Interaction



Equal / accessible

- The old
- Children
- The disabled

Scenarios of applying SIDI



- **Only SI: Traditional design**
@ High Line Park



- **Only DI**
@ Fuzhou



- **Both SI and DI**
@ Shanghai



TAKE OUT

美好每一天

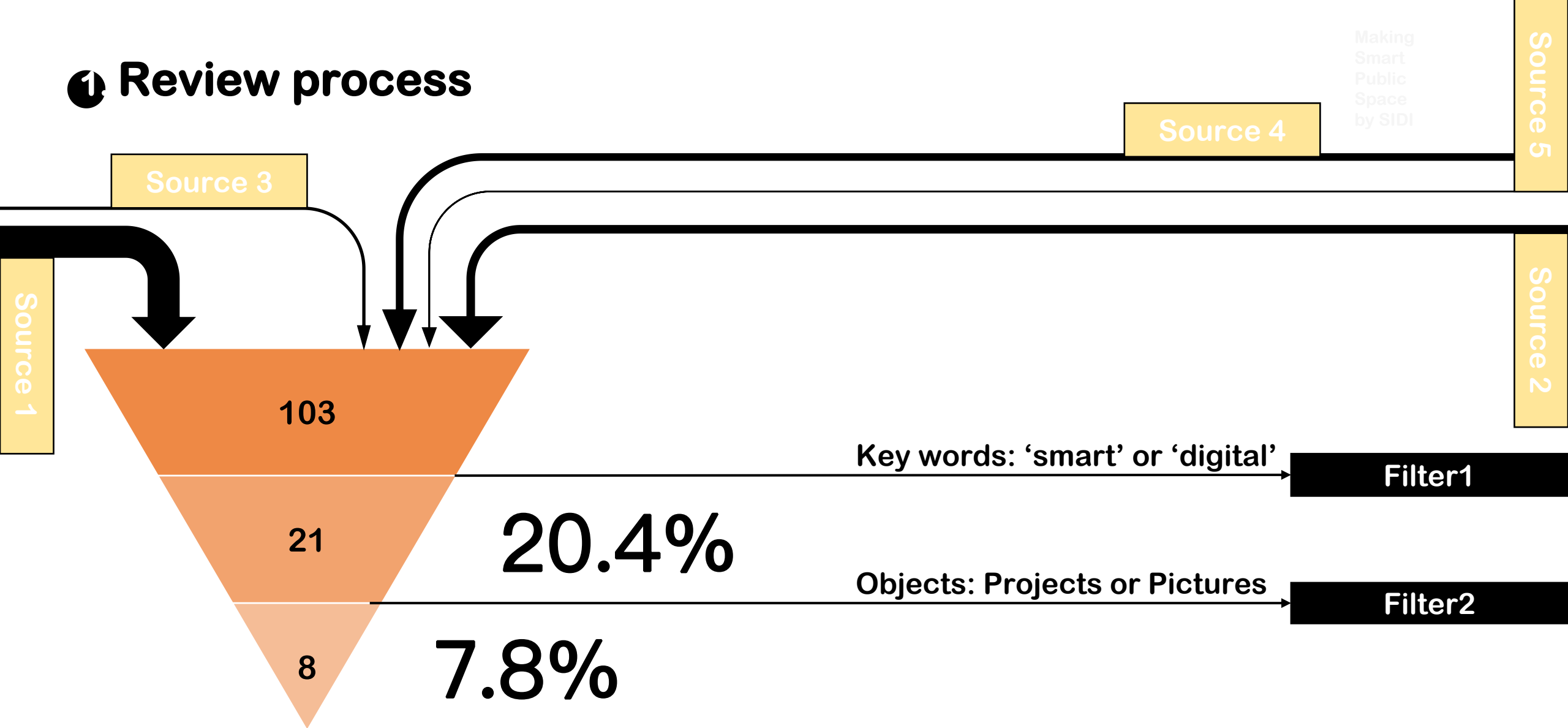
Bancolombia

CLEAR THE AREA

3

Existing Practices

1 Review process



Numbers of companies

- Source 1 <https://architecturequote.com/blog/100-best-architecture-firms-in-the-world/>
- Source 2 <https://www.bdonline.co.uk/wa-100>
- Source 3 research Institutes and technological companies
- Source 4 Domestic design companies
- Source 5 Twitter



USA	1. Aecom
USA	2. Gensler
USA	3. IBI Group
USA	4. HOK
Japan	5. Nikken Sekkei
Hong Kong	6. HKS
USA	7. Perkins & Will
Singapore	8. STV Architects
South Korea	9. Samsa Architects & Engineers
UK	10. Foster & Partners
Canada	11. Stantec
USA	12. HDR Architecture
Singapore	13. BSP Architects
Hong Kong	14. PATA Architects
Sweden	15. Sweco
UK	16. Atkins
Australia	17. Woods Bagot
USA	18. Jacobs
USA	19. Skidmore Orange & Merrill
USA	20. Cannon Design
South Korea	21. Heonoo Architects & Planners
USA	22. Parkus Eastman
Germany	23. GMP
USA	24. Leo A Daly
Japan	25. Nihon Sekkei
South Korea	26. Kwanon Architects & Engineers
USA	27. Gensler
Sweden	28. Tengbom
USA	29. Kohn Pedersen Fox Associates
Australia	30. HEDJ
USA	31. HOK
USA	32. BDP
Japan	33. Kume Sekkei
USA	34. ATP Architects & Engineers
UK	35. HOK
Sweden	36. White Architects
USA	37. DLR Group
Australia	38. HKS
USA	39. Cox Architecture
Hong Kong	40. Leigh & Orange
Germany	41. Hent Architects
Australia	42. HOD-ORF
USA	43. STV Associates
UK	44. KEO International
USA	45. Zaha Hadid Architects
USA	46. ZGF Architects
UK	47. Arup Associates
USA	48. Enery
UAE	49. Dezan Architects & Engineers
Spain	50. ACXT-IDOM
Thailand	51. GMP
India	52. Architekt Huber Contractor
France	53. Valdes & Paire
Hong Kong	54. Wing Fung & Partners
USA	55. Arup HOK
UK	56. Chapman Taylor
South Korea	57. Gensan Architects & Partners
Canada	58. Hill Architects
Japan	59. Shimizu Architectural & Engineering
Norway	60. LNK Architects
Hong Kong	61. Capita Symonds
Hong Kong	62. Ronald Lee Partners
Denmark	63. Broadway Mifflin
USA	64. CF Moller Architects
UK	65. Allies & Morrison
USA	66. Skidmore Orange & Merrill
Australia	67. GHD
Mexico	68. OVA & Asociados
Vietnam	69. Archtype Group
Japan	70. HKS Japan
Denmark	71. Henning Larsen Architects
USA	72. Langdon Wilson International
France	73. AS Architecture Studio
England	74. Japan-Egypt Architects
USA	75. Wilson Associates
France	76. Winzola & Associés
Japan	77. Stone Sakai
Norway	78. Ramboll Architects & Planning
UK	79. Sheppard Robson
Philippines	80. Aedes
India	81. CP Khatwani
USA	82. Huber & Stern Architects
USA	83. PageSoutherlandPage
Australia	84. Sinclair Knight Merz
USA	85. Project CMR
UK	86. HOK
UK	87. Populous
Singapore	88. Space Matrix
UK	89. TP Bennett
UK	90. HOK Architects
UK	91. Aulick Flinn Robinson
Philippines	92. Palata Associates
Australia	93. Home Sherry
India	94. Bhagyanagar
France	95. AIA Architectes Ingenieros Associes
Australia	96. Thomas Albert Architects
UK	97. Joffrey
NL	98. UN Studio
Hong Kong	99. 10 Design
CA	100. Diamond Schmitt Architects
USA	101. HOK Architects
USA	102. HOK Architects
USA	103. Hucklebee
NL	104. FABRICations
Italy	105. Carro Ratti Associati
USA	106. Umbrellium
USA	107. Google Sidewalks
China	108. DreamDeck
USA	109. MIT Senseable City Lab
France	110. IFSTARR
Australia	111. Buro North

USA	1. Aecom	@AECOM
USA	2. Gensler	@gensler design
USA	3. IBI Group	@ibigroup
USA	8. HOK	@HOKNetwork
Canada	11. Stantec	@Stantec
USA	12. HDR Architecture	@HDRarchitecture
Sweden	15. Sweco	#sweco
UK	16. Atkins	@atkinsglobal
UK/USA	18. Jacobs	@JacobsConnects
USA	19. Skidmore Owings & Merrill	@SOM Design
USA	24. Leo A Daly	@LeoADaly
Sweden	28. Tengbom	@tengbom
USA	29. Kohn Pedersen Fox Associates	@KohnPedersenFox
Australia	34. ATP Architects & Engineers	
USA	46. ZGF Architects	@ZGFArchitects
UK	47. Arup Associates	@ArupGroup
Spain	50. ACXT-IDOM	@IdomGroup
Denmark	71. Henning Larsen Architects	@HLArchitects
UK	79. Sheppard Robson	@SheppardRobson
UK	87. Populous	@Populous
NL	98. UN Studio	@UNStudio Arch
NL	104. FABRICations	@FABRICations nl
IT	105. Carro Ratti Associati	
UK	106. Umbrellium	@umbrellium
USA	107. Google Sidewalks	
China	108. DreamDeck	
USA	109. MIT Senseable City Lab	@SenseableCity
France	110. IFSTARR	

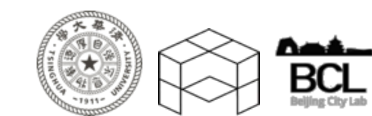
2 Profile



29 Companies

103+8

21+8















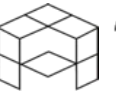
2 Profile

97 Projects

12 Countries

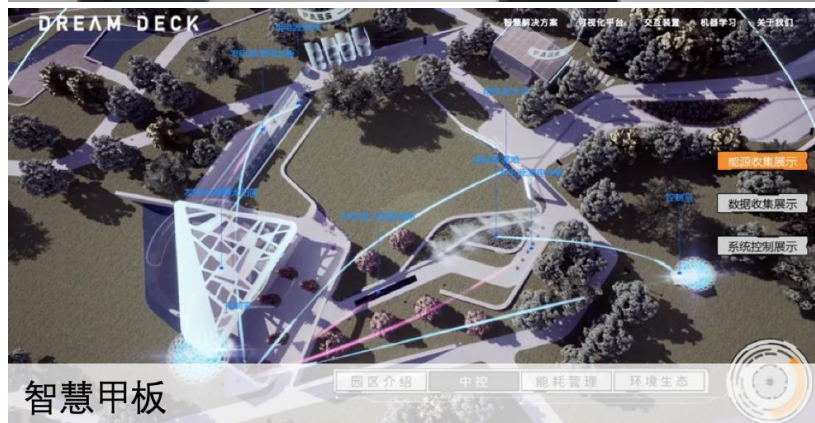
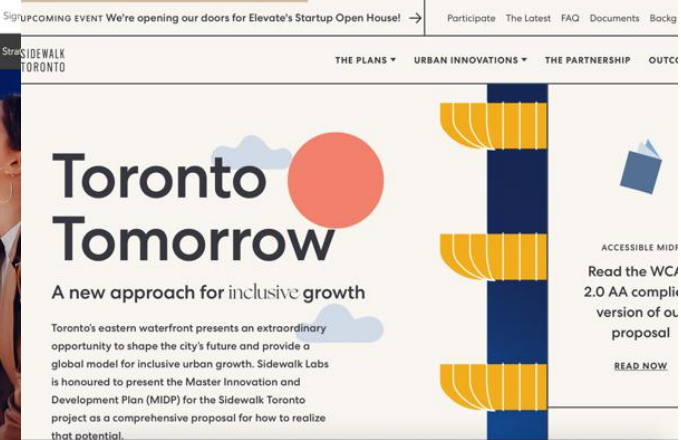
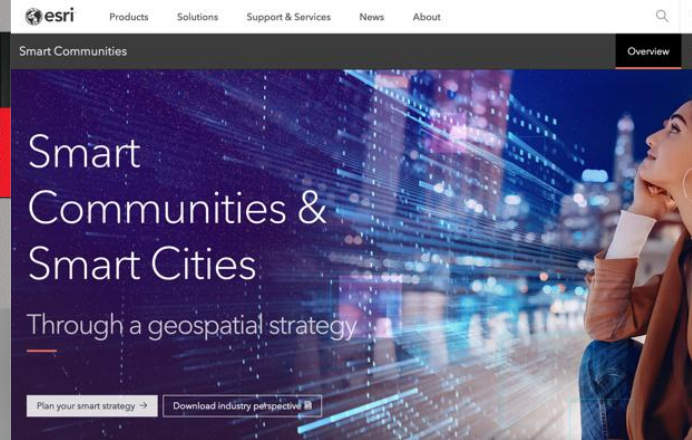
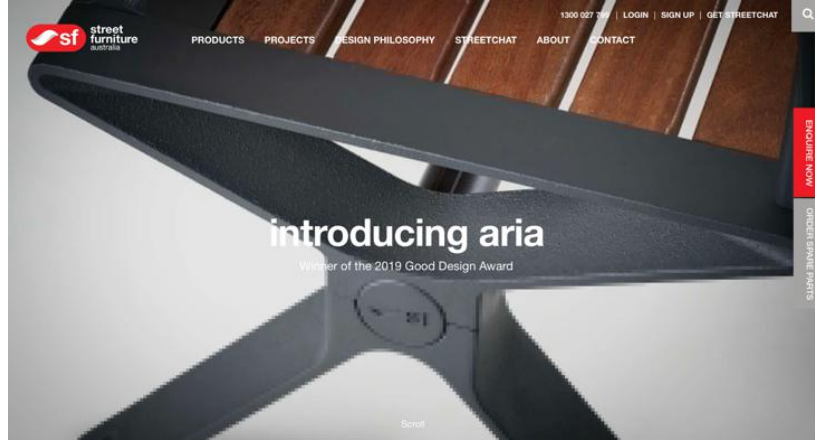
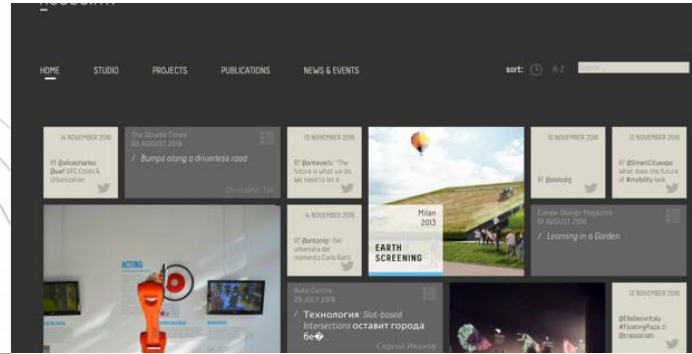


Country		Company	Project
USA		11	14
GBR		6	14
AUS		1	1
SWE		1	1
ESP		1	1
NED		2	13
DEN		1	1
CAN		1	1
AUT		1	1
ITA		1	10
CHN		1	9
FRA		1	1



Emerging agencies on the planet

UNSENSE
The arch tech company founded by UNStudio



Space units that can be digitalized

Boundary and guide system

Umbrellium



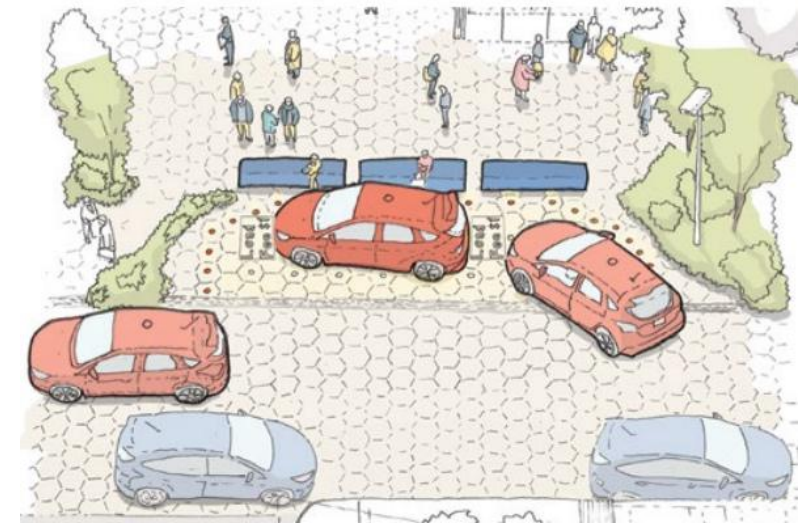
- **Footstep energy**
Pavegen is a start-up from London that has created a patented flooring technology which converts the kinetic energy from footsteps into off-grid power and data.

SWARCO



- **Green wave**
This bike lane in Copenhagen uses a “green wave”: a signal coordination system, shown here through green pavement lights, that helps cyclists safely maintain higher speeds for longer distances.

Sidewalk Toronto



- **Dynamic curb**
The dynamic curb can be designated as a passenger pick-up or drop-off zone through lighted pavement, then easily converted into pedestrian space during low-traffic periods.

Space units that can be digitalized

Monitoring and management system

Carlo Ratti Associati

智慧甲板



- **EARTH SCREENING**

In the same way as self-driving cars are expected to revolutionize urban mobility, advanced robotic technologies are reshaping agriculture, with a new wave of innovations helping us to better respond to local terrain conditions.

- **Energy saving system**

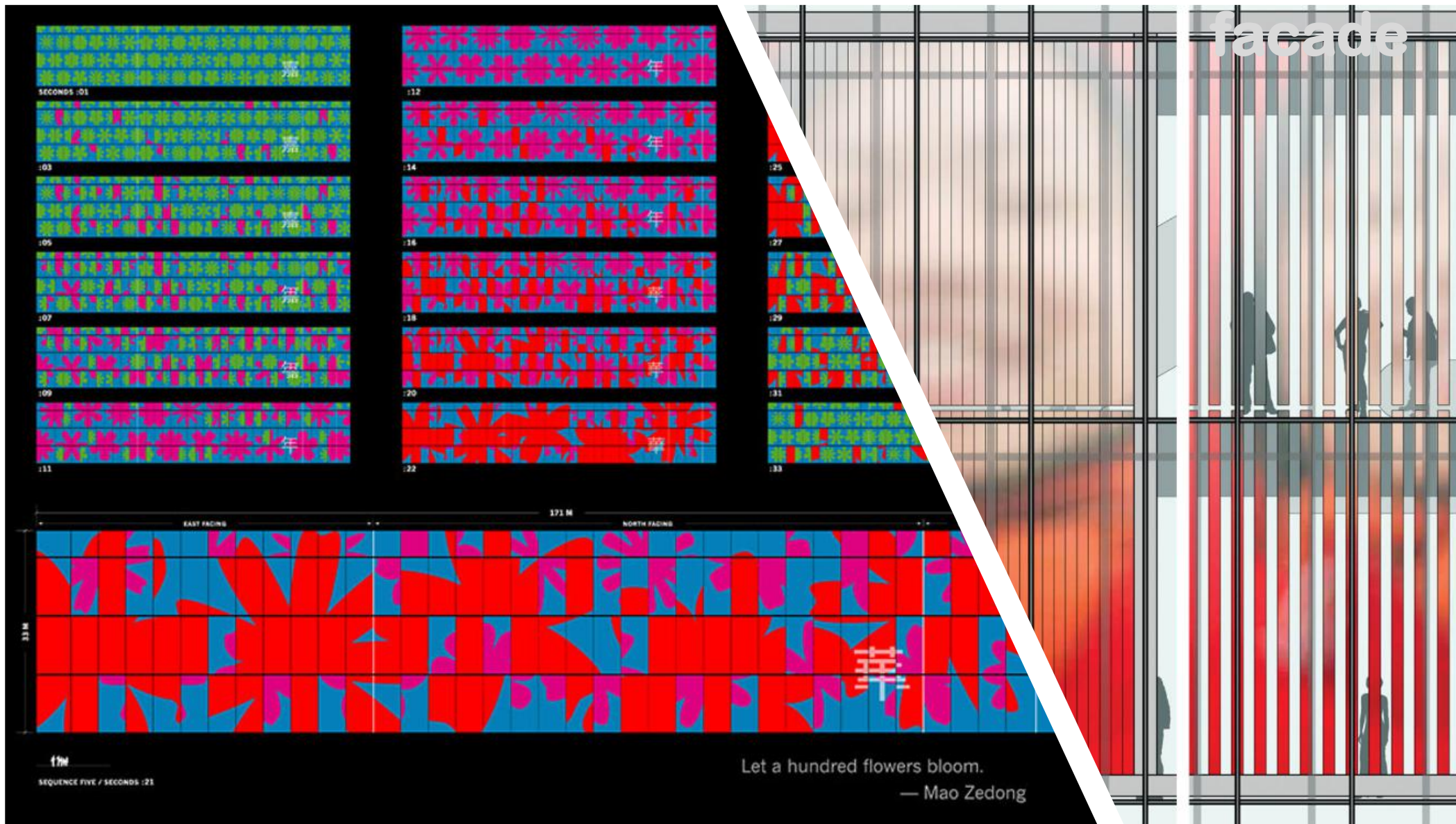
Monitoring the environment and automatically adjusting landscape facilities.

Space units that can be digitalized

Space sharing and dynamic facade

SOM

- Dynamic façades made of 148 rotating panels are controlled by coding programs



Smart street furniture

Smart infrastructure

UNSENSE



- **S-Park**

S-Park is the world's first system that lets bicycles generate electricity. The technology gives a further sustainable dimension to this modal choice already much admired by many Amsterdammers.

Street Furniture



- **PowerMe tables**

There will be PowerMe tables that allow for General Purpose Output, USB and wireless charging and inbuilt power monitoring, park tables with charging feature and ash cylinders with a temperature sensors.

智慧甲板



- **Ai Robot**

Language guide, campus introduction, environment awareness, one-click alarm.

Smart street furniture

Interactive entertainment facility

Carlo Ratti Associati



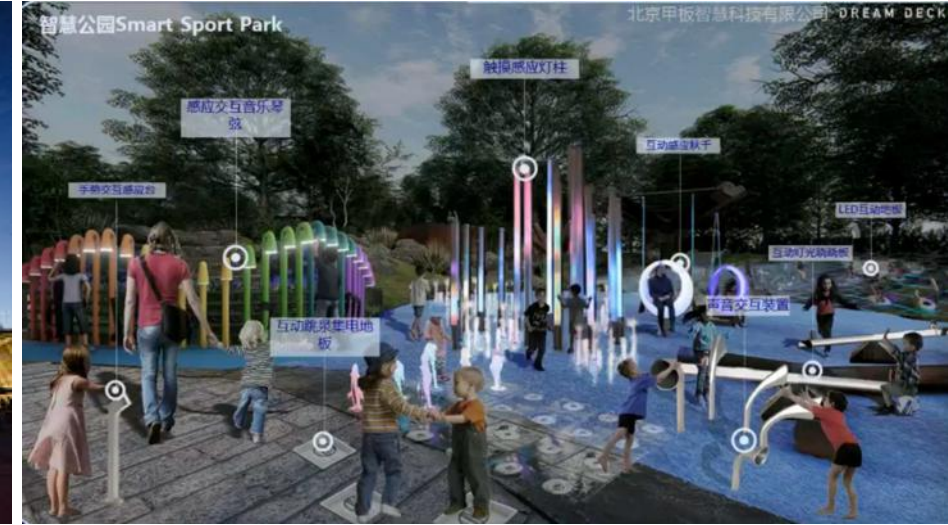
- **Digital Water Pavilion**
An interactive structures made of digitally-controlled water curtains.

UNSENSE



- **The Burble**
Night-time event and spectacle for thousands of people. Dramatic interactive Burble structure (usually for one night, or longer periods if necessary). Custom interactive app and/or twitter integration.

智慧甲板



- **Interactive facilities**
A wide range of interactive facilities make the space more vibrant.

Smart street furniture

SOM

- Light Design & Space

Smart structure



4

Our Practices

专业组报名
即将截止
小伙伴们准备好了吗?
2016上海城市设计挑战赛
SHANGHAI URBAN DESIGN CHALLENGE



2016上海城市设计挑战赛

2016 SHANGHAI URBAN DESIGN CHALLENGE

赛事介绍
Content

我要报名
Registration

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报名截止时间

专业组 2016/8/15

公众组 2016/9/15



上海城市设计挑战赛
SHANGHAI
URBAN DESIGN
CHALLENGE

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2016挑战赛
The Competition of 2016

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空间数据传感布置

顶层作为观光塔，形成衡复历史街区的新地标。

中层作为数据处理与研发的创新中心，鼓励创业团队入驻

广场立设置电子屏幕，显示人迹地毯搜集并动态更新的数据，并结合VR装置，增强历史体验

在衡山路-乌鲁木齐南路铺设结合灯槽照明的人际数据交互感知地毯，动态搜集人流与车流的多种数据，包括流量、路径，并结合wifi探针的用户画像和摄像头的人脸识别功能

塔立面采用交互照明装置，人际地毯上人流越大，塔身越亮。即使远在几千米外也能感受到衡复中心的活力程度

人群特征
Human

空间品质
Health

环境健康
Health

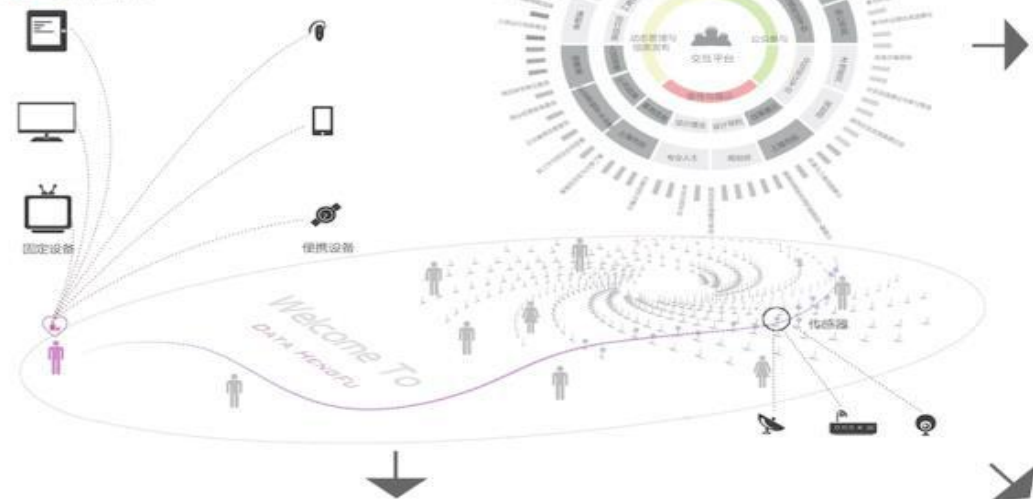
- I** 网络数据
微博心情、景区评价、消费点评、交通拥堵、OD路径
- W** WIFI探针
微博心情、景区评价、消费点评
- F** 人脸摄像头
用户画像，测度年龄、性别、常去地、消费偏好等
- C** 人迹地毯
综合搜集行走于街道地毯上人群车辆流量、停留时间、路径、行人面貌等信息，并通过交互装置进行互动
- P** 停车APP
根据停车软件动态找寻衡复历史街区停车位，利用市场手段疏导高峰停车问题，实现精细化管理
- B** 自行车APP
根据自行车租车软件促进衡复历史街区绿色出行，并对自行车骑行者路径追踪，辅助优化慢行交通体系
- S** 街景采集器
周期性更新街景采集照片，实现计算机自动化街景分析功能，对街道物质空间环境进行动态评价
- G** GIS信息采集器
用地混合度、底商密度、路网密度、临近设施分布等
- T** PM2.5测表
监测建筑场地、街道和开放空间的空气污染
- V** 声光热测表
监测主要街道、绿地、公园的环境舒适度



信息交互平台设计

衡复区数据增强设计更新信息交互平台架构模式图

为了更好的展现规划成果，同时贯彻鼓励公众参与的理念，结合基地内布置的各种传感器，衡复区特构建集信息发布、公众参与及宣传展示三位一体的交互式信息平台，为不同的利益主体创造信息交流与共享的渠道。为政府管理、地区宣传和社区营造服务，实现信息的即时收集、发布与分析反馈，为衡复区的自适应更新创造条件。



交互平台二维码

A3街道社区更新平台 <http://shanghaihengfu.comingsoon.com/>

更新方式选择

尊敬的住户您好，请填写房屋相关信息

徐汇区 建国西路585号
 85平方米
 房屋地址500米
 两居室
 民国时期建筑

请您选择更新方式

- 我想参与公共空间更新
- 我想参与特色风貌展示
- 我想参与社区活化更新
- 我想参与商业改造更新
- 我不想参与更新，我只看看
- 我想静静

改造风格选择

请您选择您期望房屋改造后的风格

- 现代风
- 小资风
- 商务风
- 传统建筑风

上一步

下一步

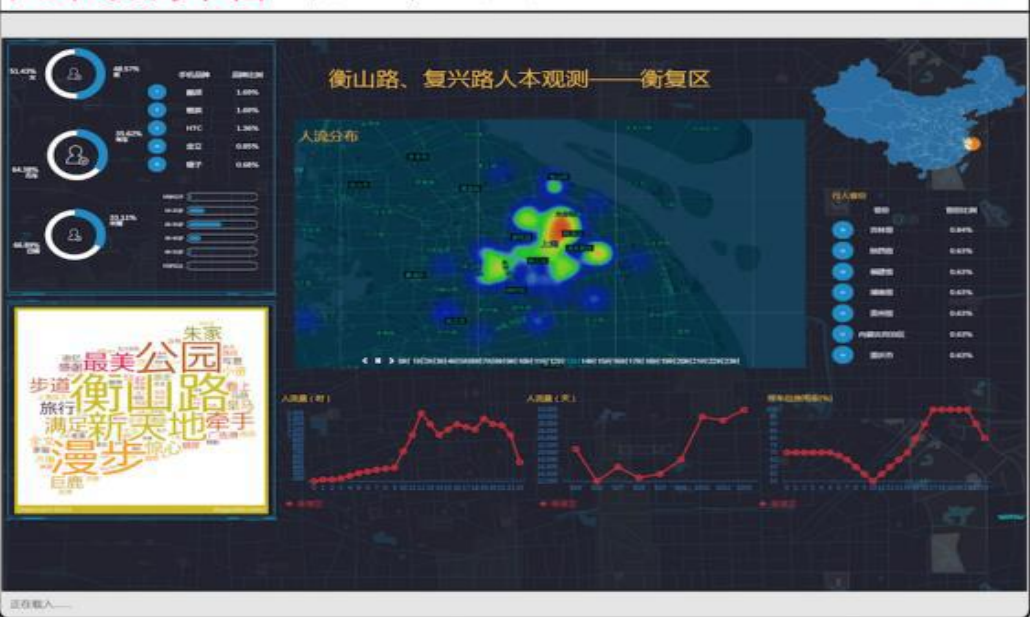


社区更新参与

- 交往空间
- 步行道
- 慢行步道
- 运动设施
- 自行车道
- 开放空间



人本观测平台 <http://datav.aliyun.com/share/f67017a29c4d434c5ee2a5a648eb4c0>



衡复规划设计方案 <http://shanghaihengfu.jimdo.com/>

DATA 基于数据增强设计的历史文化街区自适应更新设计

AUGMENTED METABOLISM OF HENGFU

数联衡复 优活代谢

上海市都市设计研究院衡复区方案交互展示平台

基本信息 前期分析 设计导则 设计策略 公众参与

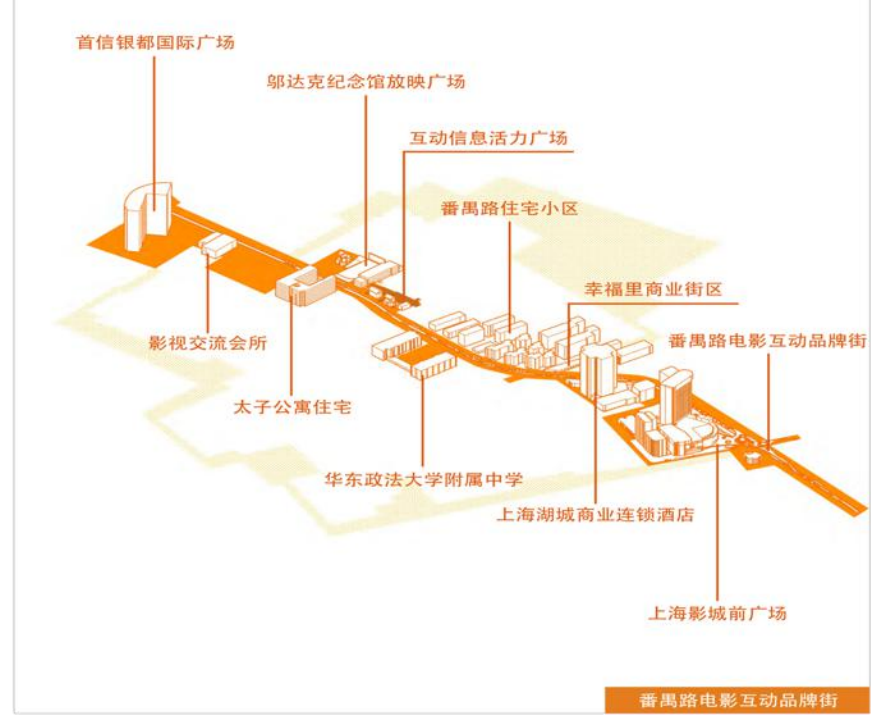
方案简介 Brief Introduction

本方案的核心主题为大数据背景下基于虚拟平台空间维度的自适应历史街区新陈代谢式设计，探讨存量优化和历史街区保护中的数据增强设计（data augmented design）和数据自适应设计（data adaptive design）范式。方案以街道空间作为串联开放空间线性系统的载体，通过量化评估对现有街道进行划分，并提出空间设计导则，在空间设计过程中植入不同的虚拟数据平台基础设施，对于不同类型的空间，明确不同的指标体系方式和周期，并通过虚拟平台指标空间评估分析



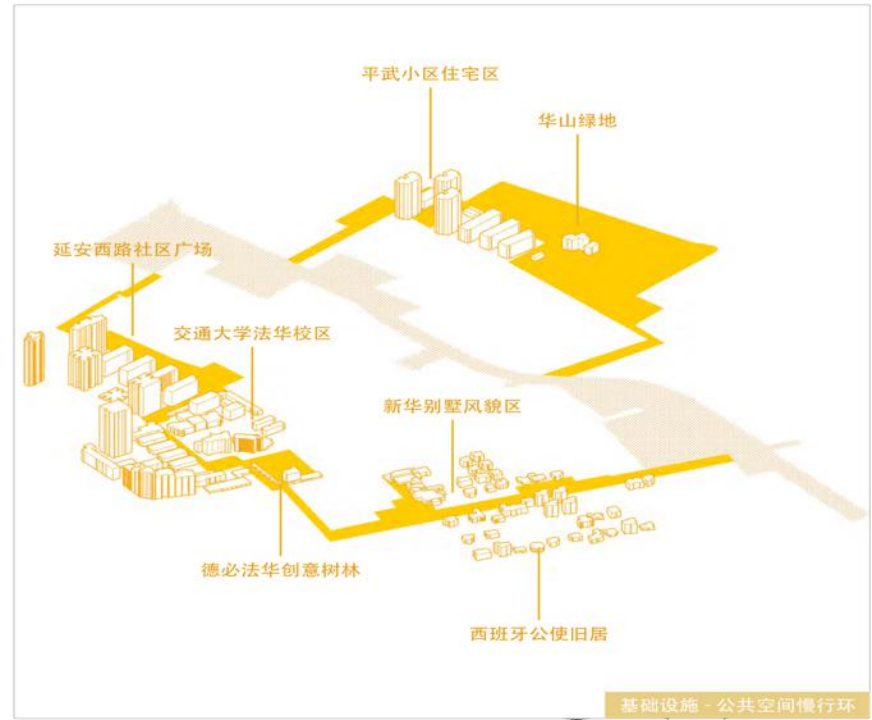
北
0 50 100 200 400

- ① 上海影城前广场
- ② 新华别墅风貌区
- ③ 西班牙公使故居
- ④ CHINA SHOW
- ⑤ 德必法华创意树林
- ⑥ 交通大学法华校区
- ⑦ 延安西路社区广场
- ⑧ 孙科故居
- ⑨ 首信银都国际广场
- ⑩ 邬达克纪念馆放映广场
- ⑪ 互动信息活力广场
- ⑫ 华山绿地
- ⑬ 幸福路商业街区
- ⑭ 番禺路影视互动品牌街



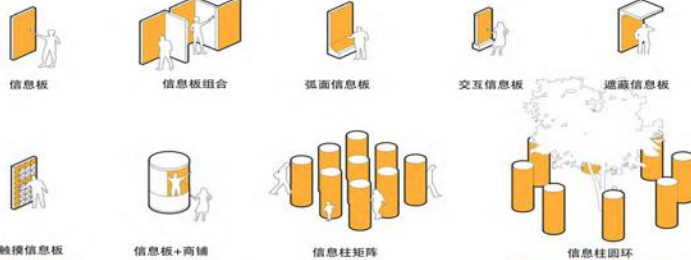
- 首信银都国际广场
- 邬达克纪念馆放映广场
- 互动信息活力广场
- 番禺路住宅小区
- 幸福里商业街区
- 番禺路电影互动品牌街
- 上海影城前广场
- 上海湖城商业连锁酒店
- 华东政法大学附属中学
- 太子公寓住宅
- 影视交流会所

番禺路电影互动品牌街

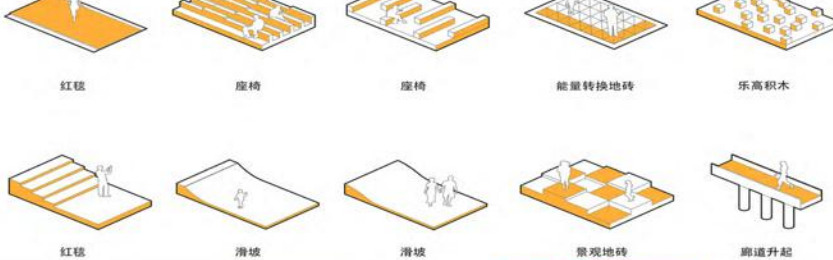


- 平武小区住宅区
- 华山绿地
- 新华别墅风貌区
- 西班牙公使旧居
- 德必法华创意树林
- 交通大学法华校区
- 延安西路社区广场

信息板类



地面装置类



附属装置类



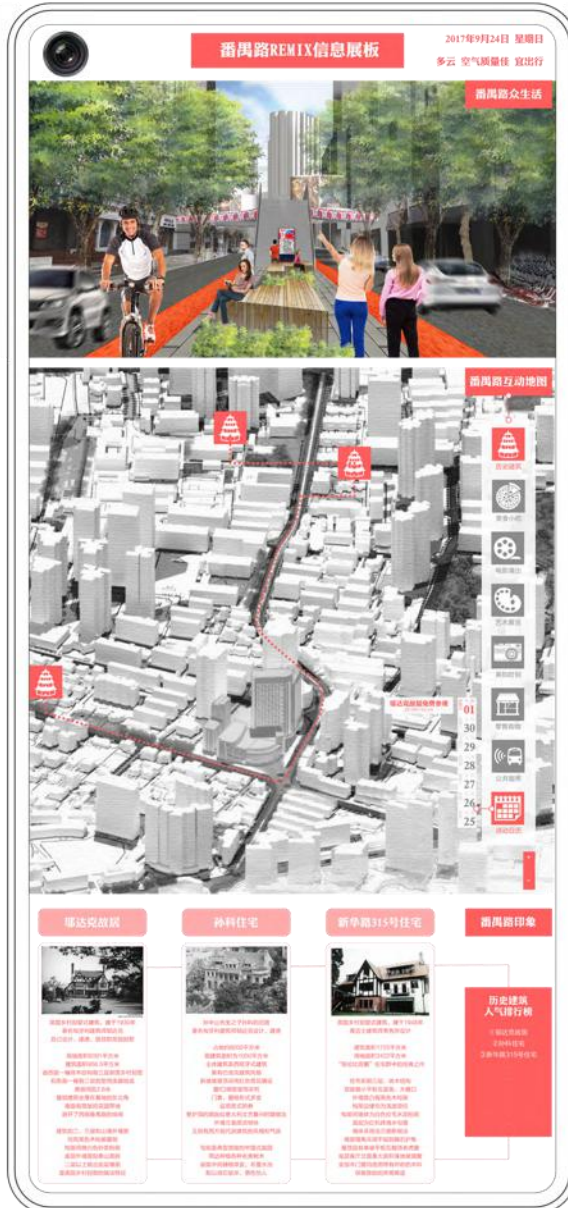
普通道路剖面将被整改，将现有的位于道路两侧的非机动车道空间归整到道路中部，在道路中部创造“人行+骑行”空间，植入多种功能的空间装置，营造普通道路的公共活动中心。

上海影城前，中心道路将升起为步行平台，直通上海影城二层，并植入电影宣传功能。鄂达克故居前，地面下沉为电影广场，方便居民、游客进行公共观影及其他户外活动。

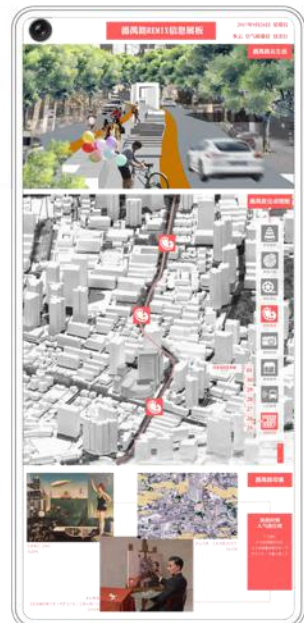




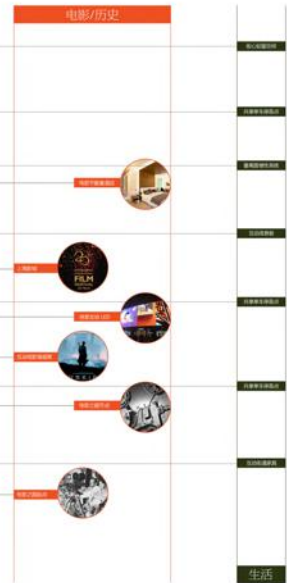
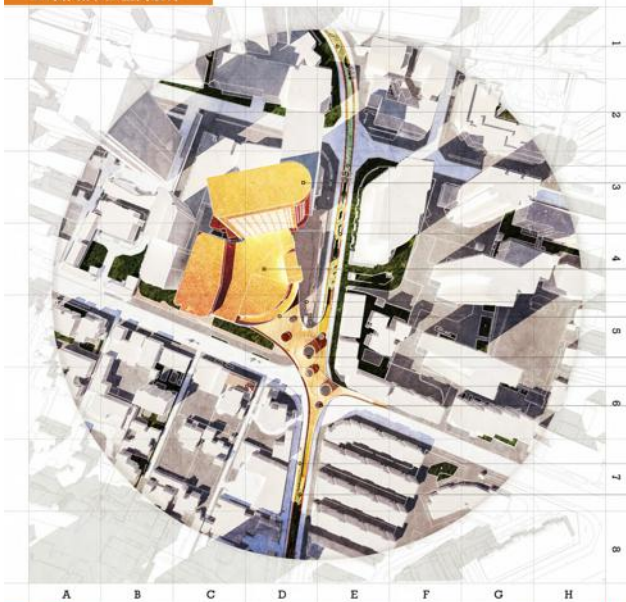
街道数据采集互动信息板



街道数据采集互动信息板



上海影城节点空间设计

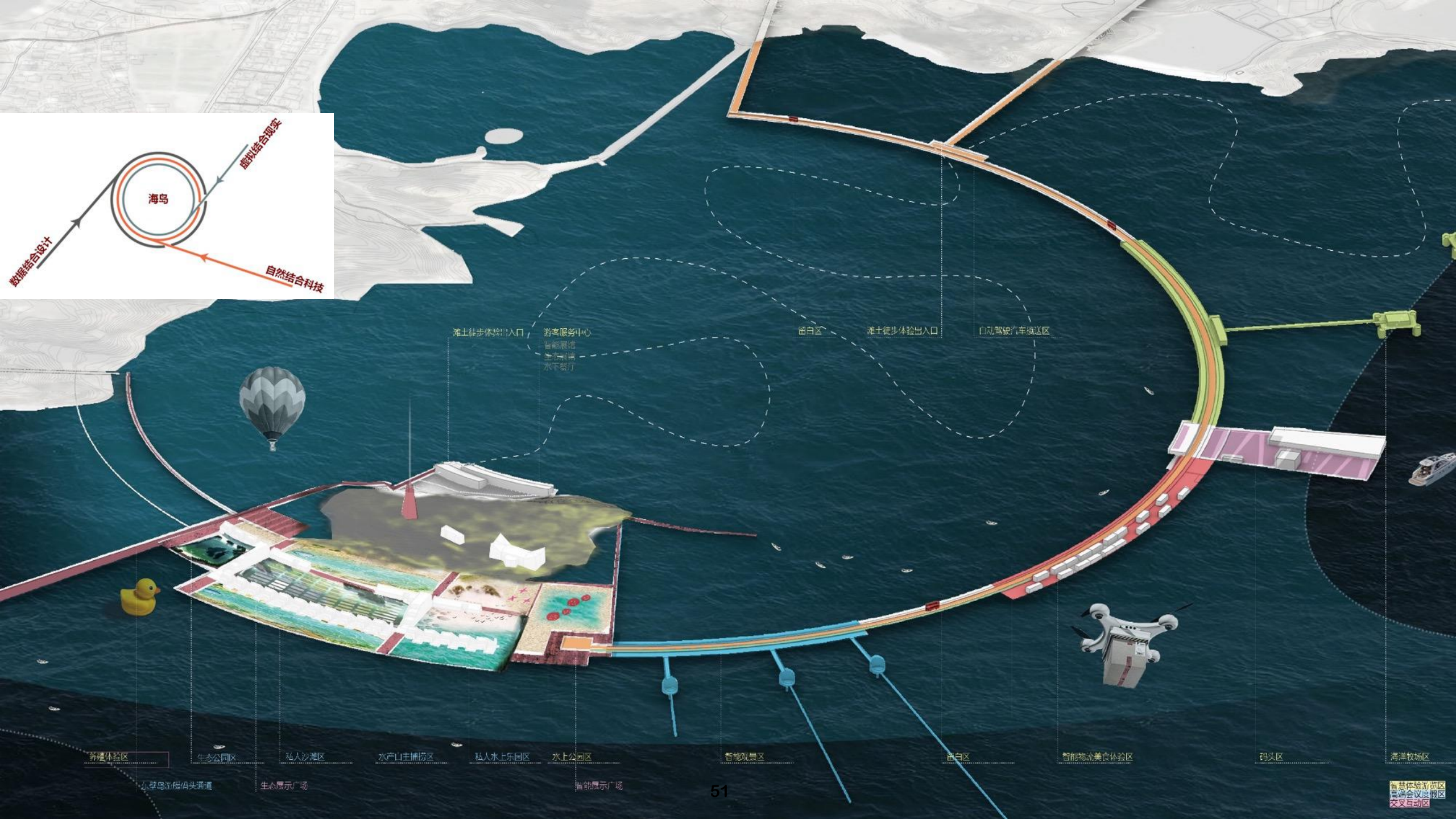


城市设计重要节点



鄂达克故居节点空间设计





海岛

虚拟结合现实

自然结合科技

数据结合设计

游客服务中心
智能展馆
智能咖啡
水下餐厅

留白区

滩上休闲体验出入口

自动驾驶汽车试驾区

养殖体验区

生态公园区

私人沙滩区

水产自主捕捞区

私人水上乐园区

水上公司区

智能观景区

留白区

智能物流美食体验区

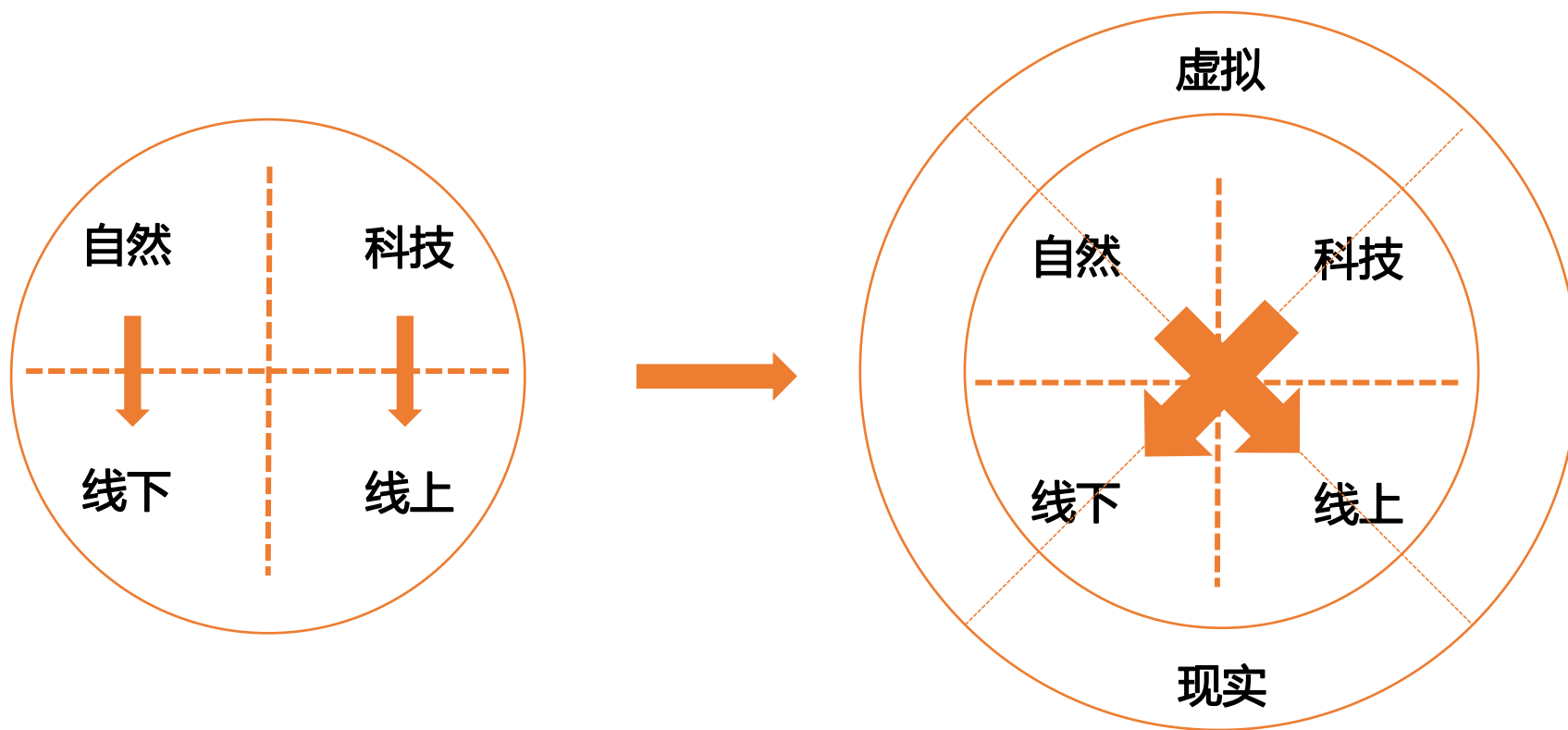
码头区

海洋牧场区

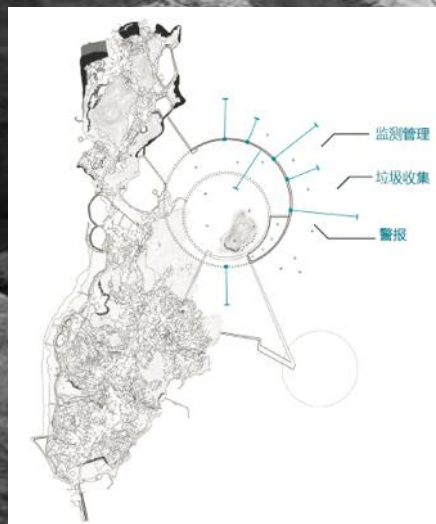
公共岛游船码头通道

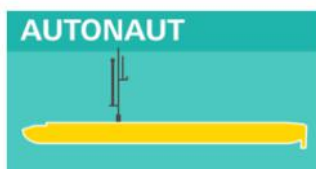
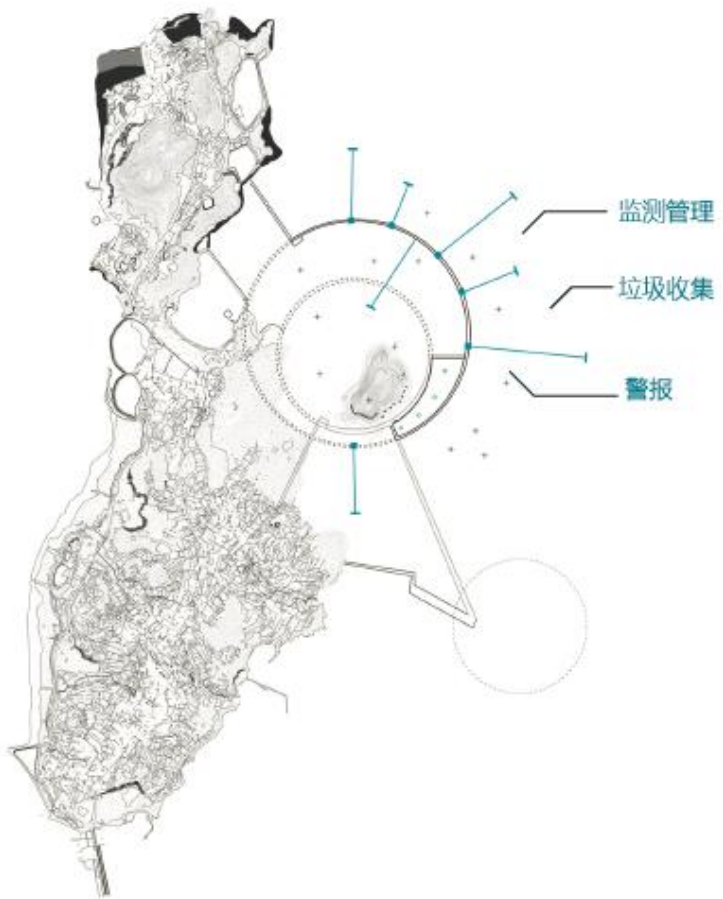
生态展示广场

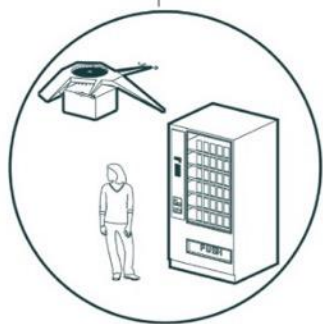
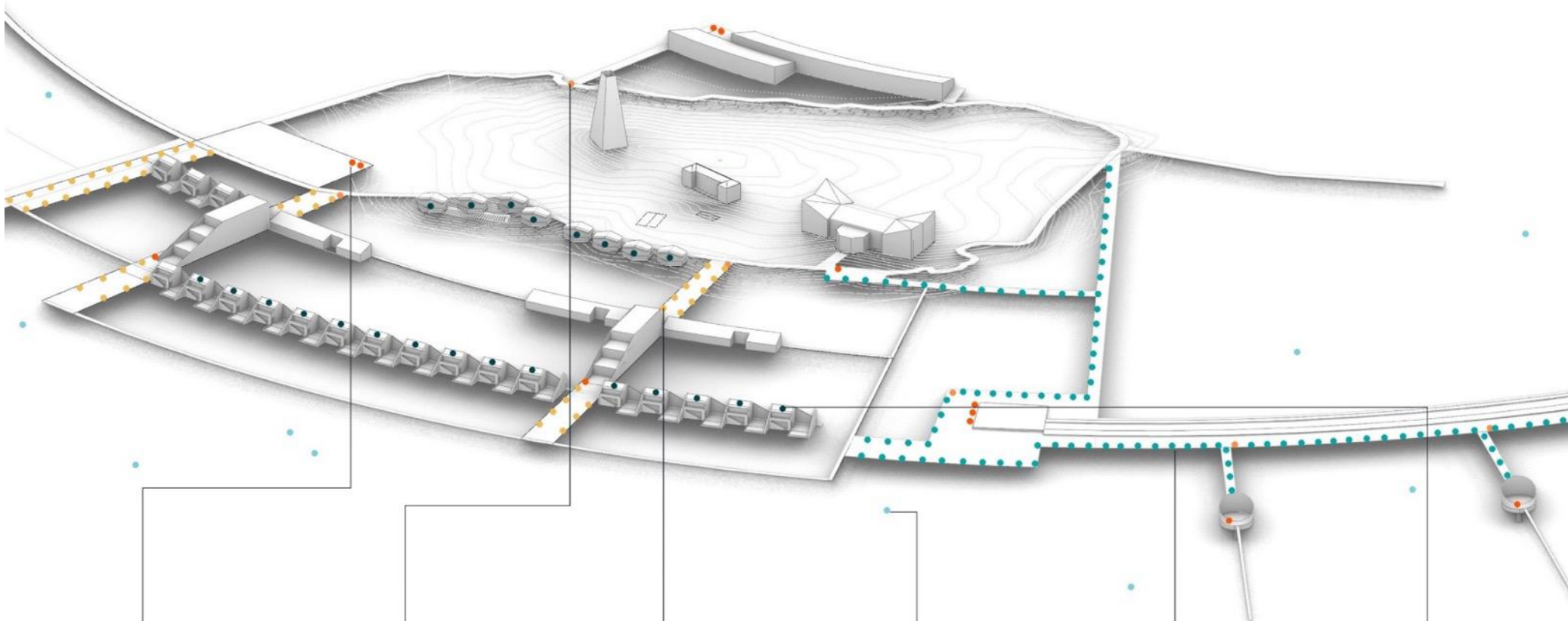
智能展示广场











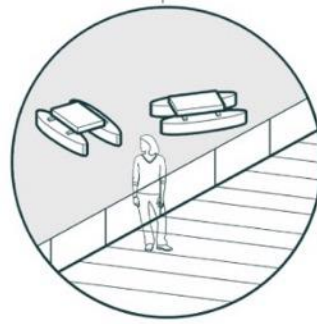
A.自动售货&无人机配送



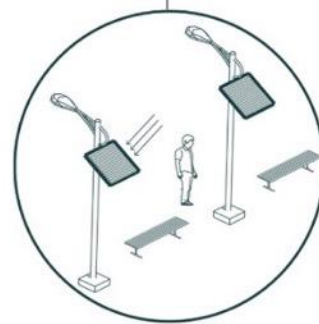
B.智慧垃圾桶



C.智慧路灯



D.海漂垃圾收集

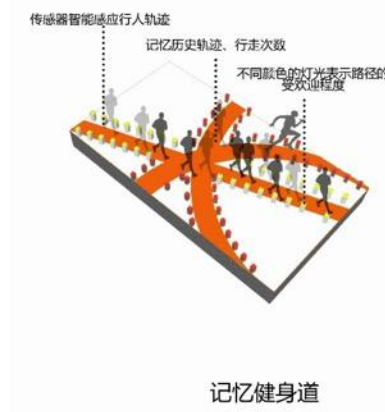
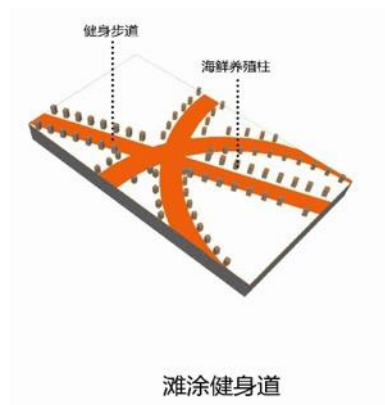
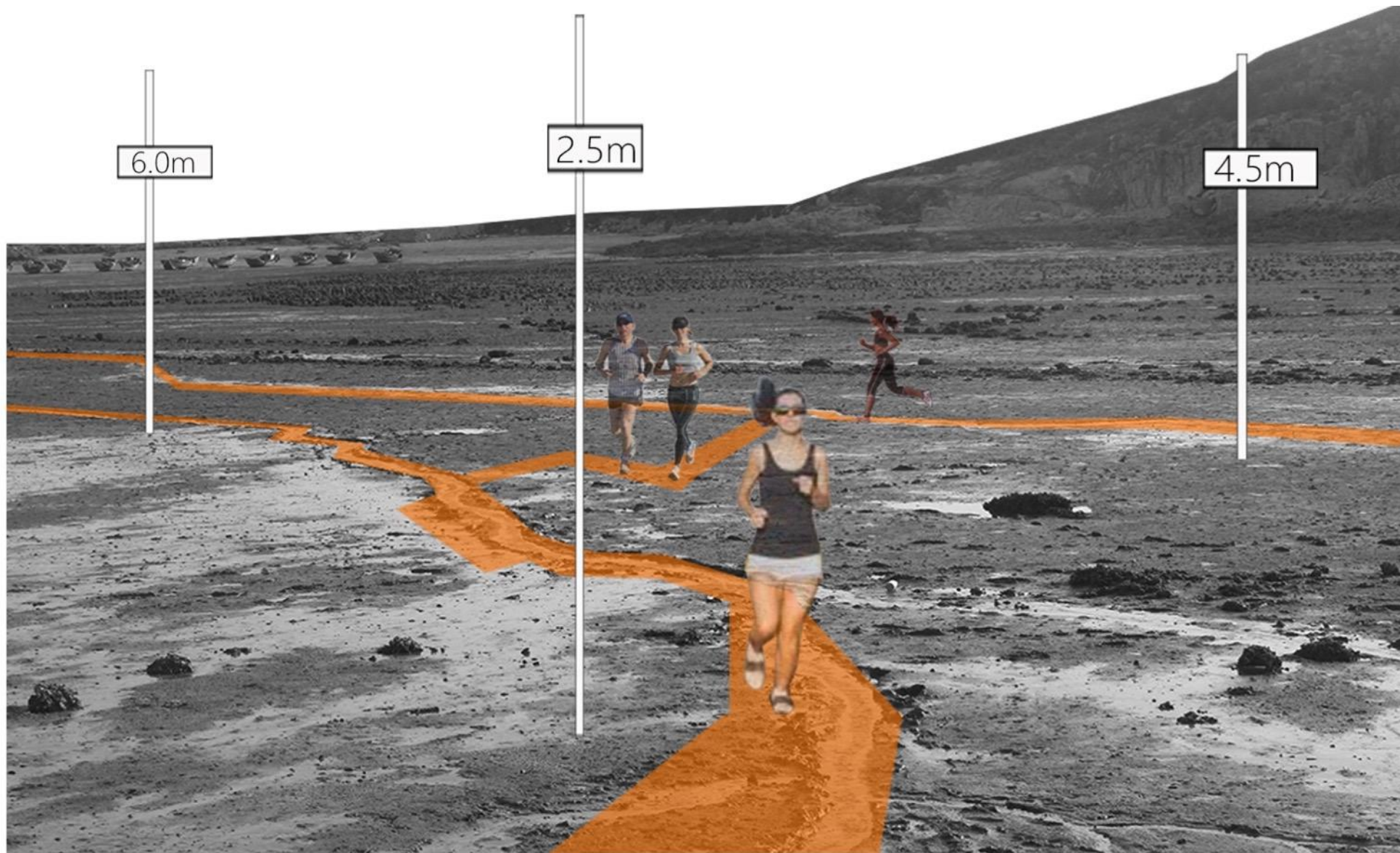


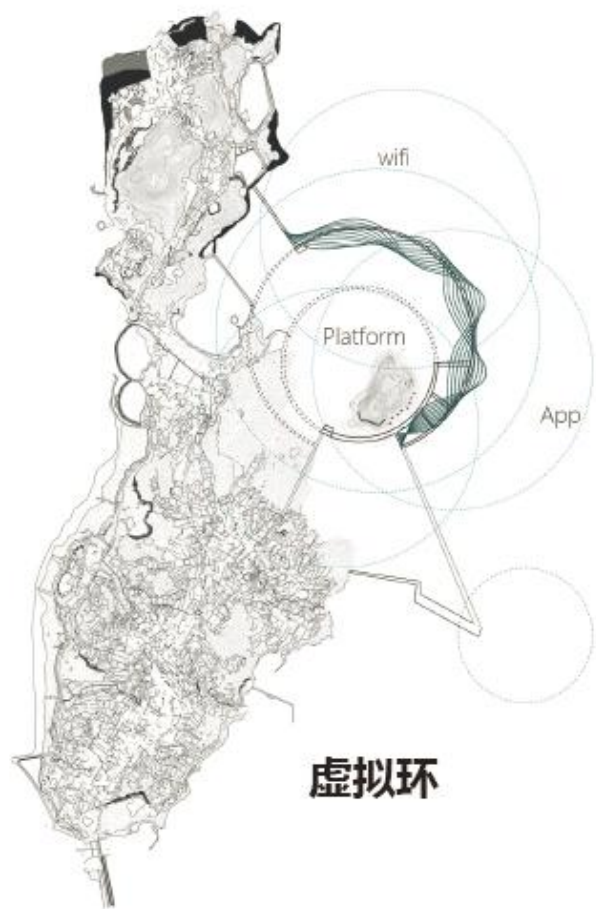
E.太阳能路灯



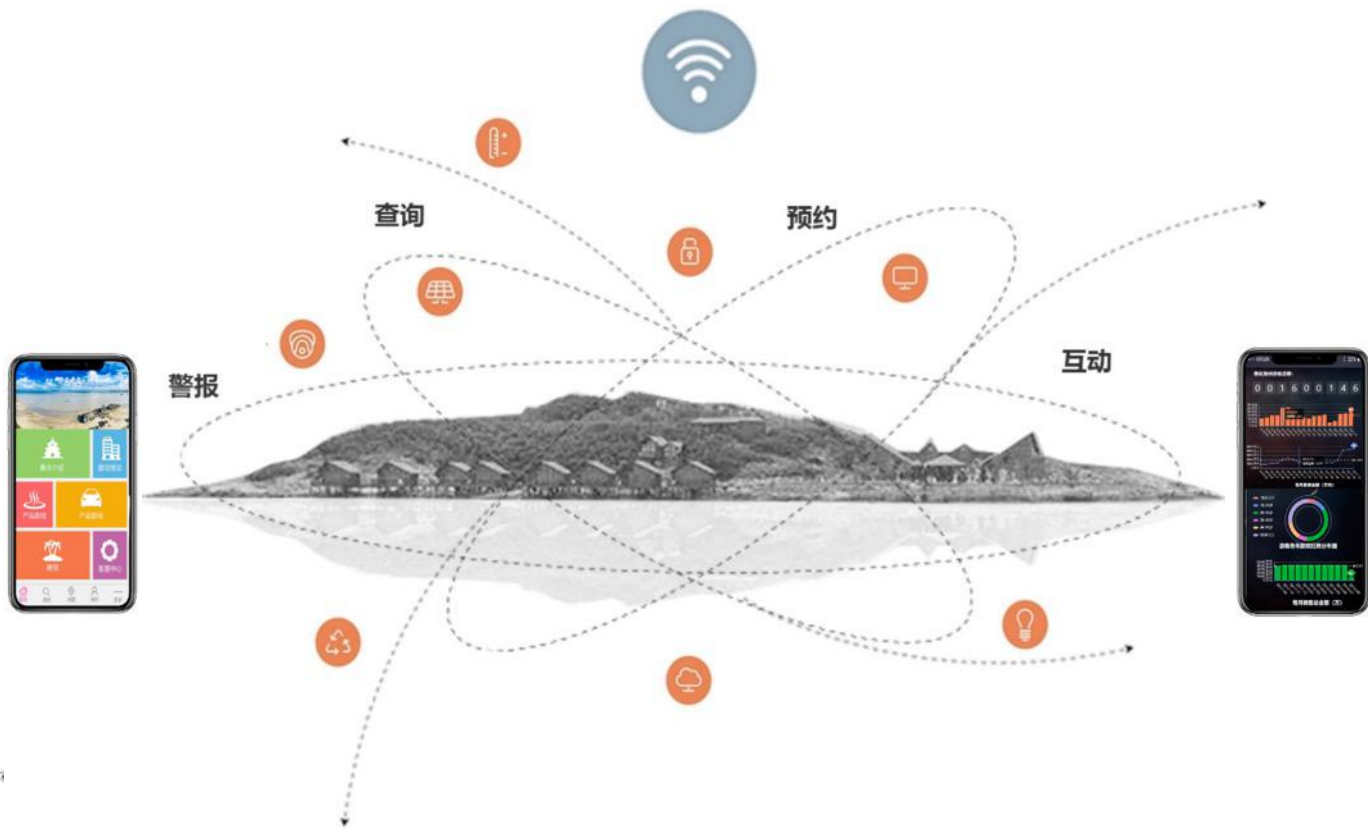
F.智慧家居

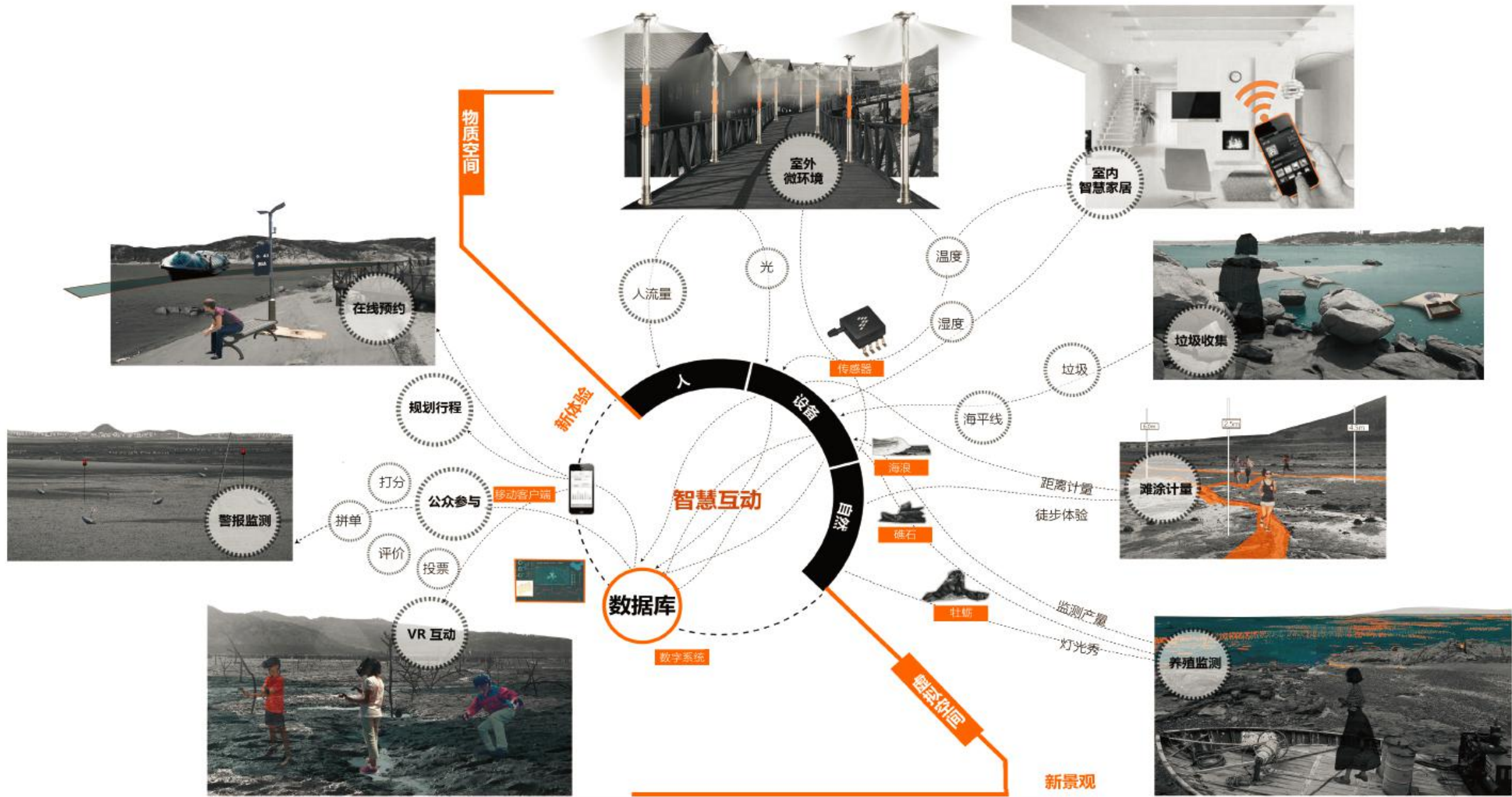




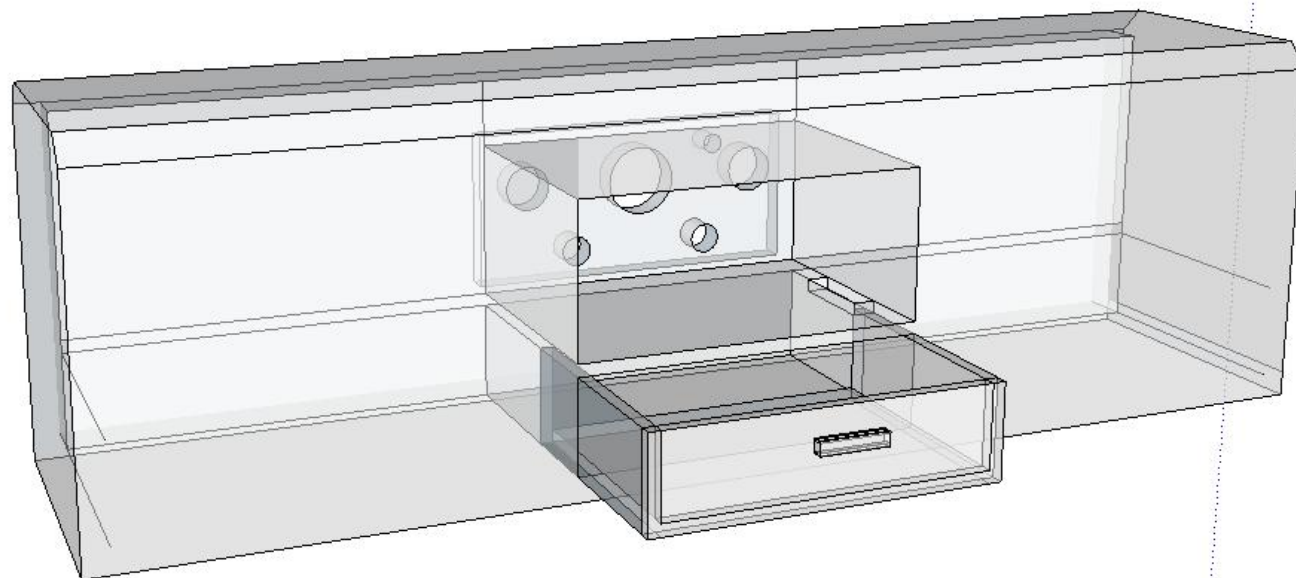
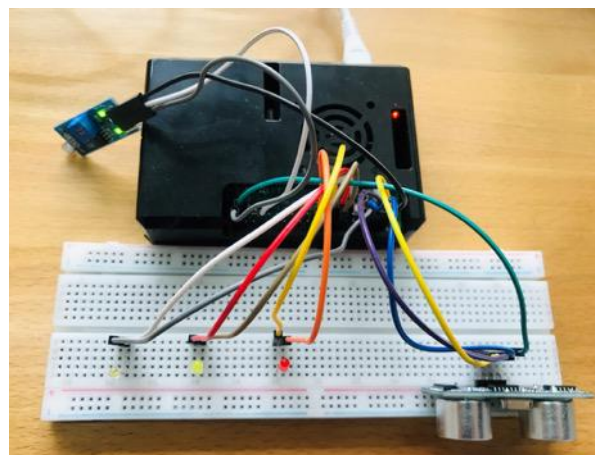
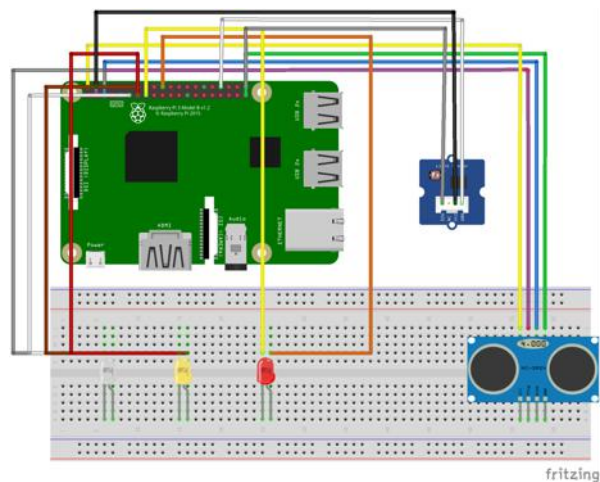


虚拟空间体验
中心平台控制
客户端操作





Smart curbstone 路缘石 as the basic unit of smart cities



Smart Ground Lighting

light-on-demand solution

As soon as a sensor detects human presence, the neighbouring lights brighten up to a pre-defined level. They will be surrounded in a safe, warm circle of light. By adopting this solution, you can prevent the overwhelming waste of electricity that occurs when the lights burn for nobody, without affecting the citizens' comfort.



By Day



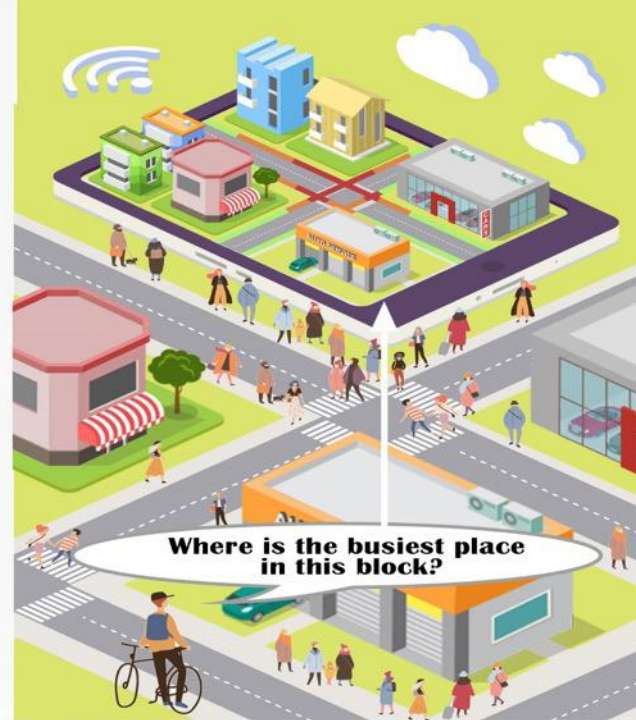
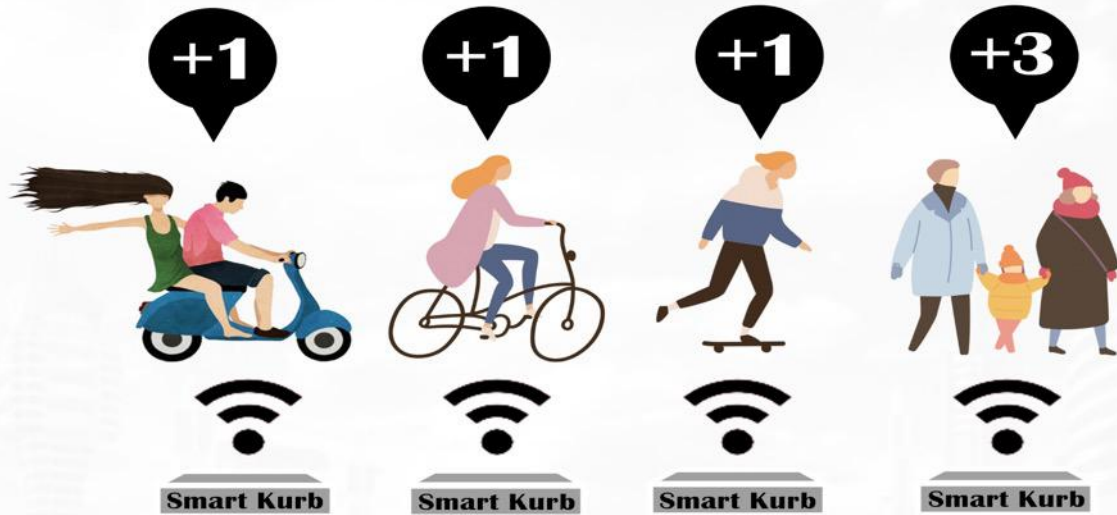
By Night

Smart Traffic Flow Counting

Real-time traffic flow counting

Smart Kurb is equipped with ultrasonic sensors, which can count the number of pedestrians and non-motor vehicles passing by.

The detection range is 4 meters and the detection angle is 15 degrees.

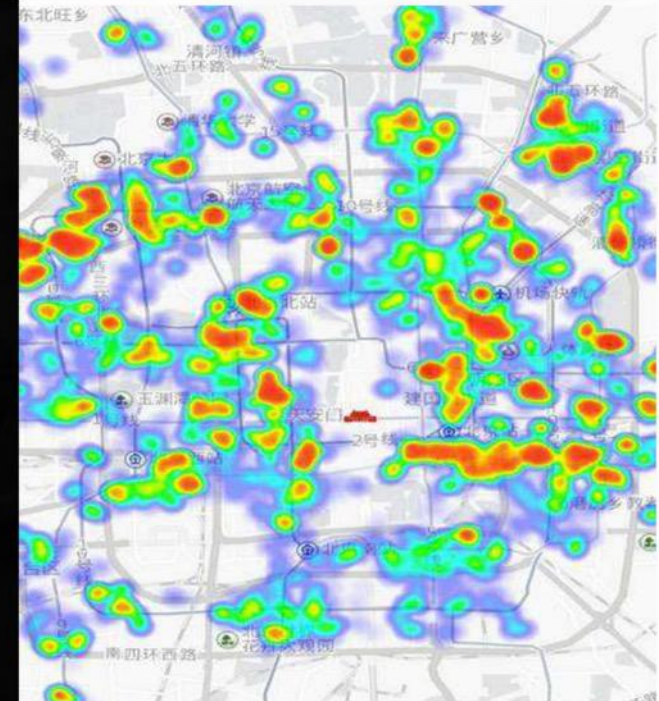


Check Ped-Bike Street Congestion

Users including cyclists and pedestrians can use smartphone APP to view real-time slow traffic data collected by Smart Kurb and then determine destination and route.

Ped-Bike Street Heat Map

For urban managers, real-time Ped-Bike street maps obtained from smart kurb can be used to analyze Street vitality and congestion.



Smart Parking Management

Real-time parking monitoring solution

Compared with traditional parking, Smart Kurb parking can help drivers locate parking spaces accurately in advance and assist parking.

For urban managers, illegal parking can be managed in real time remotely.



Searching for Parking Space

Users can check which section of the road can be parked on their mobile phones and locate the vacant parking space accurately.

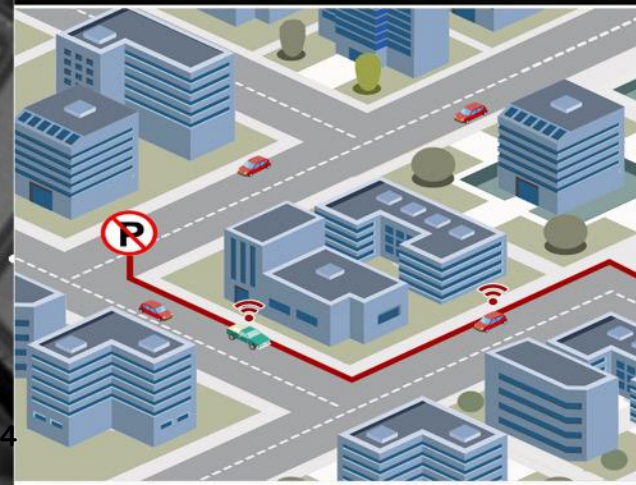
Vehicle-to-Infrastructure cooperation

Help users to park.
When the vehicle is too close or too far from the Kurb, it will be reminded.



Illegal Parking Management

Urban managers can see remotely whether illegal parking exists in the parking-prohibited area and deal with it in time.





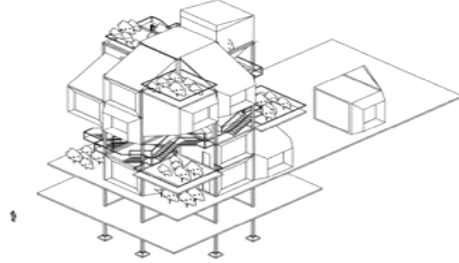
**NEXT FORM OF HUMAN SETTLEMENT
#END**

THE NEXT FORM OF HUMAN SETTLEMENT

Module

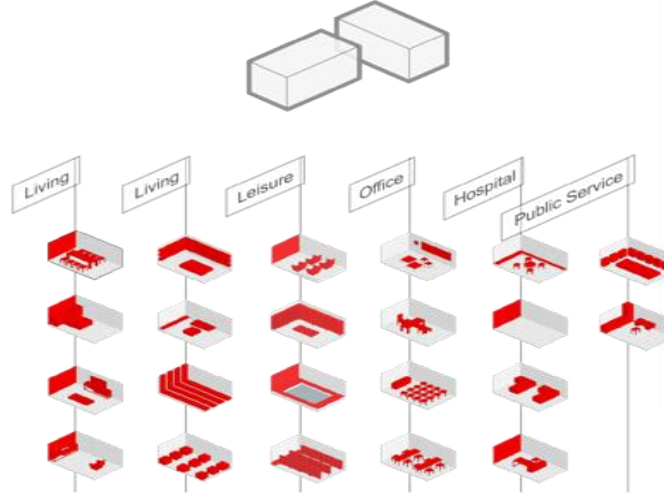
along with different forms of human settlement

HOME



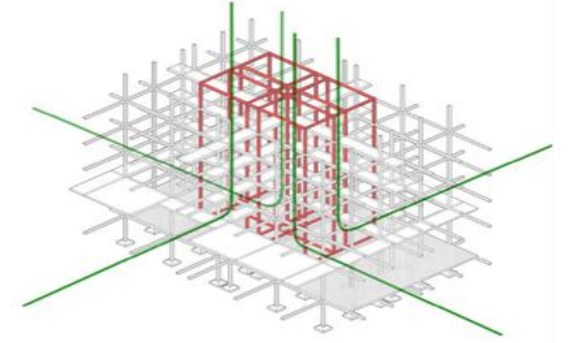
FUNCTIONAL CUBE

A Cube = 3m*5m*3m



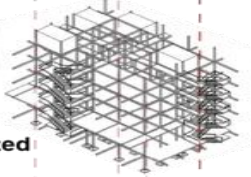
Living	Leisure	Office	Hospital	Public Service
Bedroom	Movie	Personal	Nursing	Public Service
Bathroom	Gym	Group	Medical Care	
Working Room	Library	Ease Zone	Personal Clinic	
Dining Room	Expo	Small Meeting		
Living Room	Dancing	Large Meeting		
Garden	Commercial	Forum Hall		

THE STRUCTURE OF THE MODULE

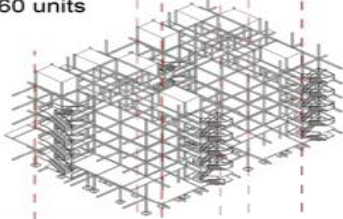


HUB

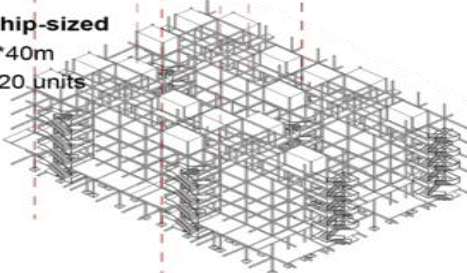
Neighbor-sized
25m*20m
for 80 units



Community-sized
25m*40m
for 160 units



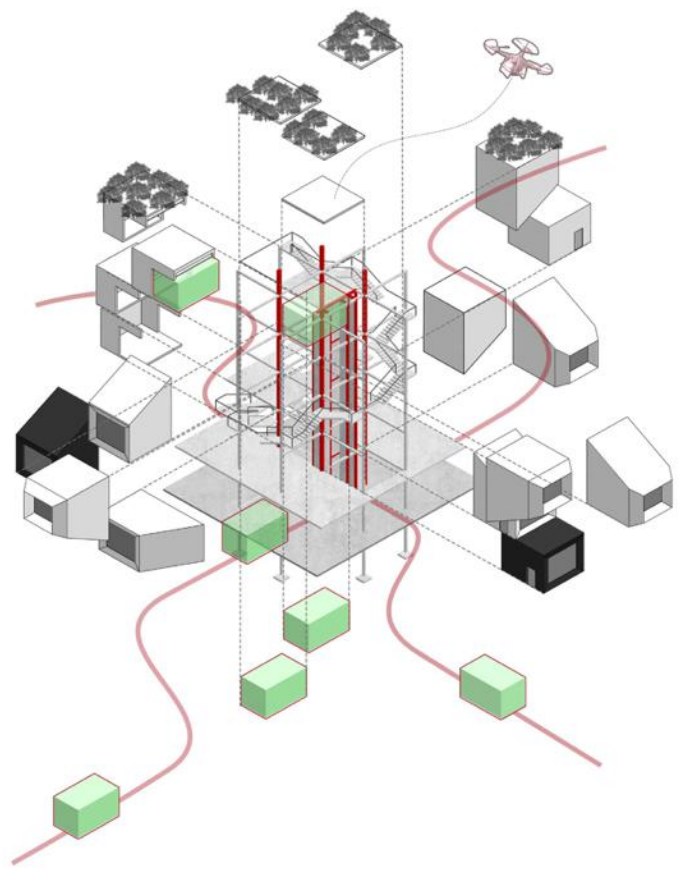
Township-sized
50m*40m
for 320 units



We assume that in the future, the living environment supporting by the new technology, for instance, UAV and self-driving cars, will be more flexible and humanity. People won't be able to tremendous travel or transport to the destinations anymore. Instead of using modules, most of the function would be directly transport to where people need. As a result, standardized and detachable Functional Cubes have been designed to carry various functions, while the fixed module, which is divided into two types. One is Hub which is designed to be a collection center. The other one is Home, the module where people lives in.

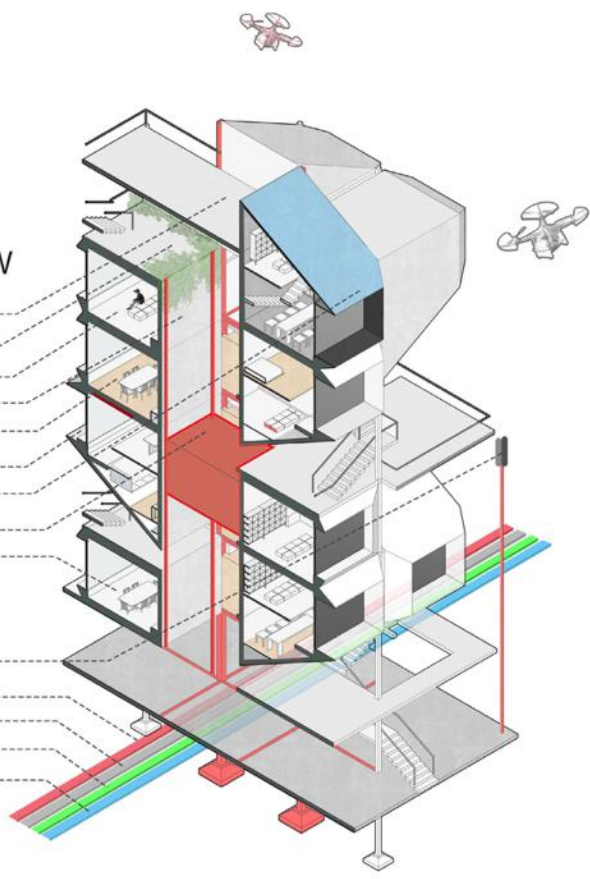
我们设想未来的人居环境因应技术，所有功能都可以借助无人机、无人驾驶而作流动，人不再需要大量长途跋涉或借助交通工具来移动至目的地，而是藉由模块将功能，直接传达至人的居住地。因此设计了标准化、模块化的 Functional Cubes，以承载各种功能，以及固定的模块，其中又分以作为移动模块集合中心的 Hub，和人类的居住单元 Home。

Architecture



SECTIONAL VIEW

- UAV receiving station
- Green balcony
- AR experience room
- Function flow shaft
- Restaurant kitchen
- Leisure Balcony
- Solar panels
- Functional Box
- SOHO
- Internet of Things sensor
- Information Flow
- Drain
- Strong electricity
- Heating



Architecture Concept

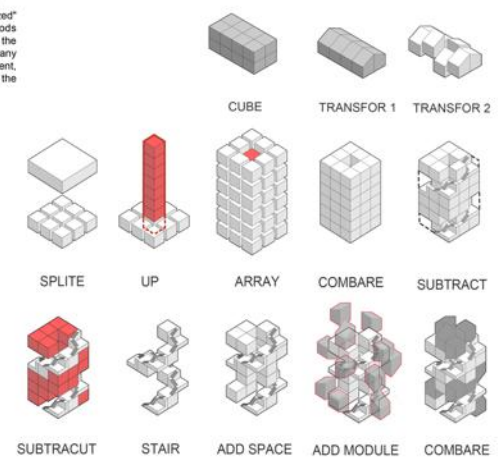
Mountains and mountains is a major feature of Guizhou region, the traditional local architecture will be based on different geographical and hydrological reasonable "growth" to form a unique geographical and cultural landscape.

In this architectural design, we use the "traditional" architectural language of "sloping roof" in combination with the concept of "modularity" to freely combine the spaces and deepen the design to form the unique "Karma Stewart" image.

The building itself will also be reasonably "metabolized" according to the different needs of different periods to maintain the status quo and meet the needs of the times while promoting the national culture in city. Many scholars began to focus on sustainable development, low carbon, the relationship between the city and the

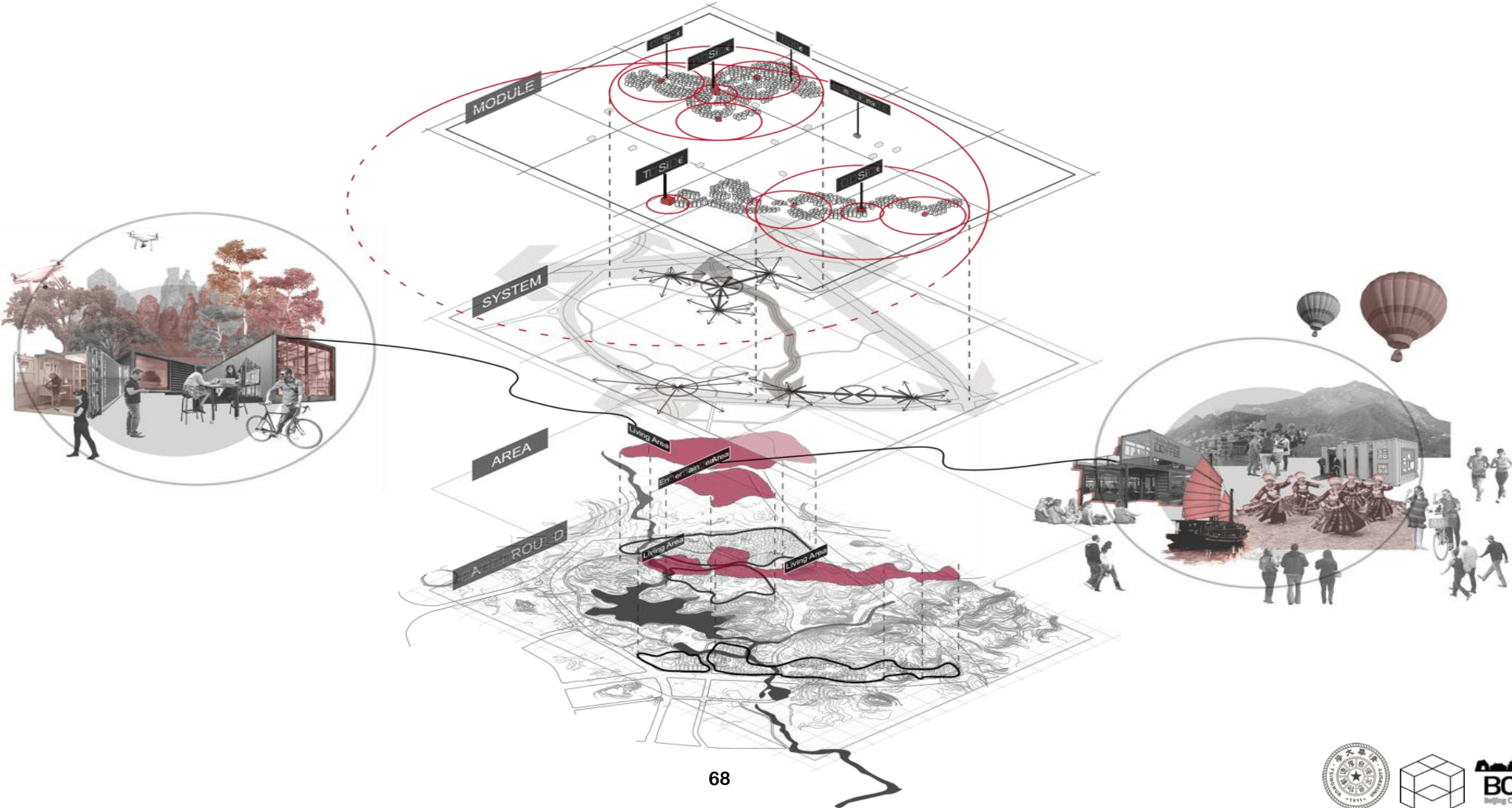
奇山峻岭是贵州地区的一大特色，传统的当地建筑会根据地理和人文的不同合理的进行“生长”，形成独一无二的地域人文风貌。在本次建筑设计中，我们将运用“模块化”这一“传统”的建筑语言，与“模块化”的概念相结合，将空间自由组合，并深化设计，形成贵州当地独具特色的“福斯特”形象。

建筑本身也会根据不同时期的不同需求进行合理的“代谢”，以不变应万变，在满足时代需求的同时，弘扬民族文化。



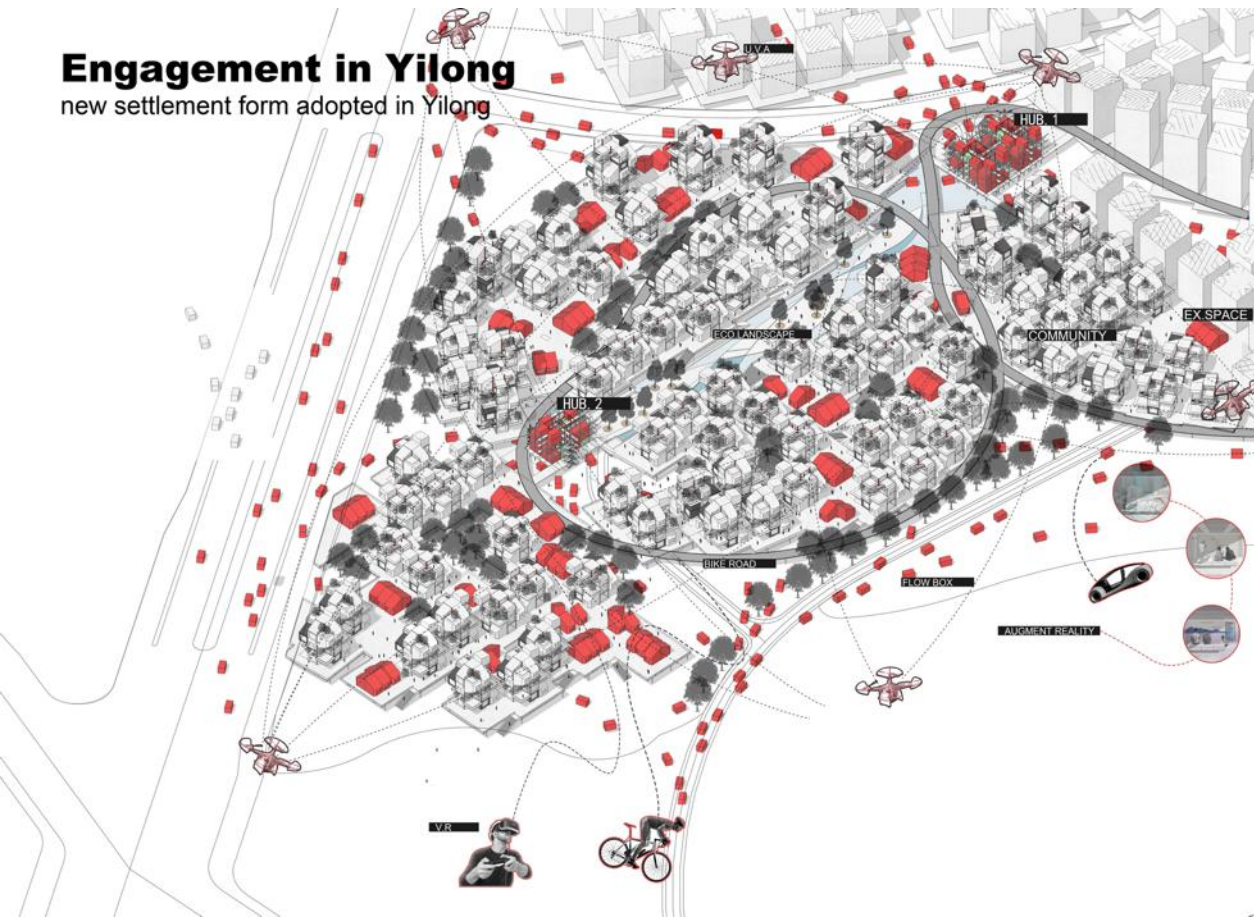
Layout

along with different forms of human settlement



Engagement in Yilong

new settlement form adopted in Yilong



Design Sketch

a daily perspective in future Yilong





智能晴雨棚，使用该空间作为集会空间时，如果紫外线过强可以打开



智慧城市应用场景 微型空间改造

智慧·微集会

夜间可以放映电影

通过手机二维码扫码通过门禁，临时访客也可以获取限时有效的通行二维码

智慧升降会议桌

收集雨水，智慧灌溉

通过手机APP或网上平台可以预约该空间



智慧·微健身

智慧城市应用场景
微型空间改造



智能晴雨棚，检测到雨水时，自动开启

共享健身盒子

垂直绿化

行人检测器，可与手机连接，记录使用者跑步时长与距离

紫外线、空气质量、空气湿度等显示器

智能座椅，可以将太阳能转为电能，为手机充电、为座椅蓝牙音响供电

智慧跑道，当使用者跑步经过时，会形成不同颜色，同时可以收集动能转为电能



01 北京智慧应用现状

02 智慧应用应用场景

PART 1.1



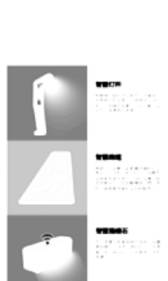
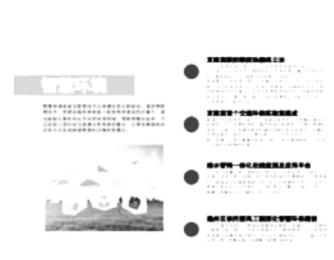
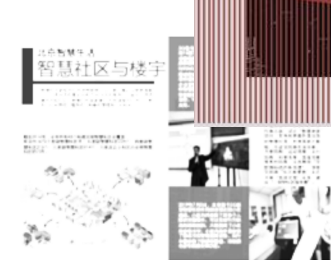
Table with 3 columns: Year (2015, 2016, 2017) and Smart Application categories.



PART 1.2



PART 1.3



6 am

8 am

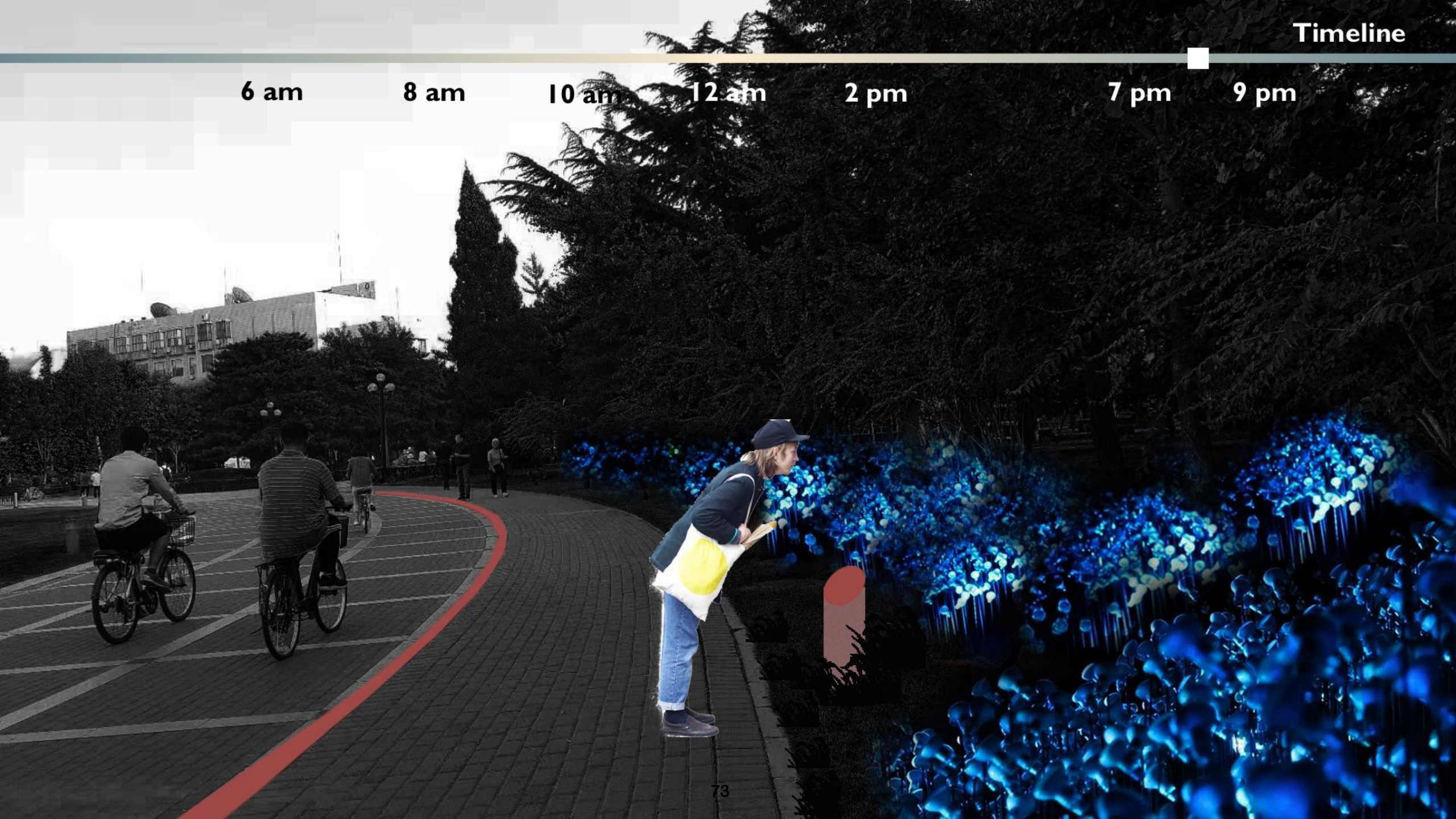
10 am

12 am

2 pm

7 pm

9 pm



6 am

8 am

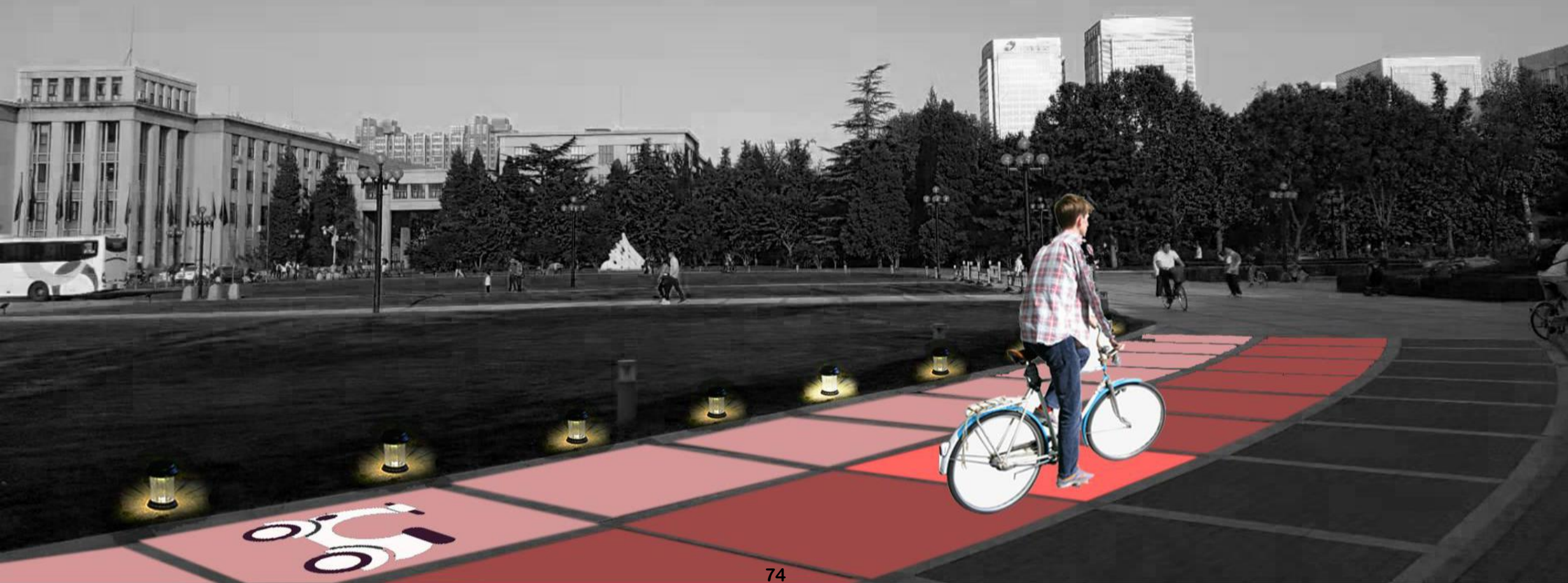
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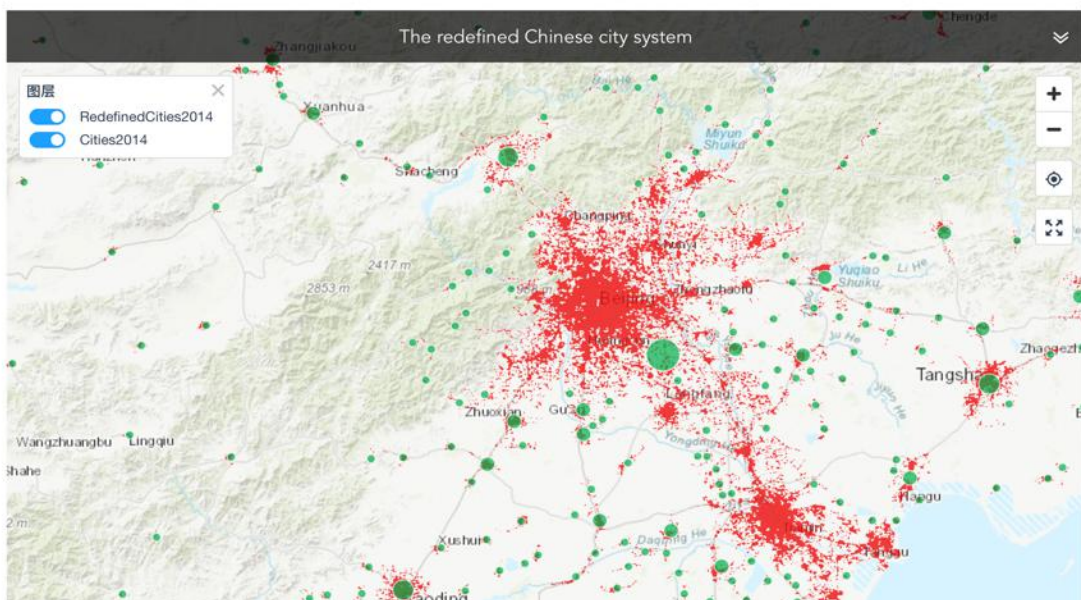
2 pm

7 pm

9 pm







THANK YOU



<https://www.beijingcitylab.com>