

# 践行**低碳**之路      迈向国际**宜居**

——珠海应对气候变化的实践

Implementing Low-carbon Development towards International Livability:  
Zhuhai's Responses to Climate Change

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# PART 01

珠海

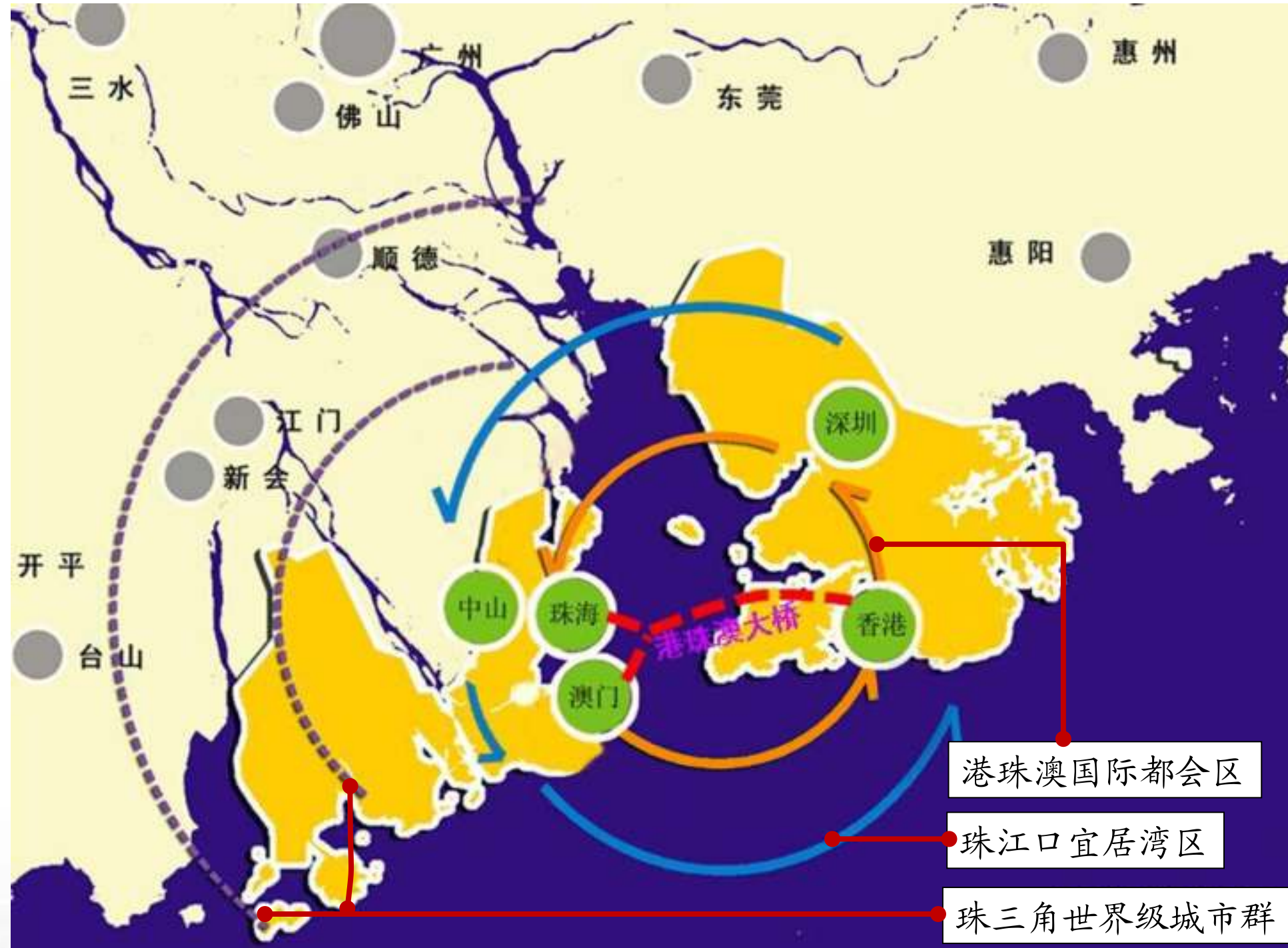
——走不一样的发展道路

*Unique development route*





# 一、特色地理区位 Unique geographical location



毗邻港澳的独特区位: (The unique location adjacent to Hong Kong and Macao)

港珠澳大桥**2017年**建成后，珠海将成为中国内地**唯一与港澳陆路相连**的城市。

**港珠澳国际都会区**和**世界级旅游休闲目的地**的组成部分。

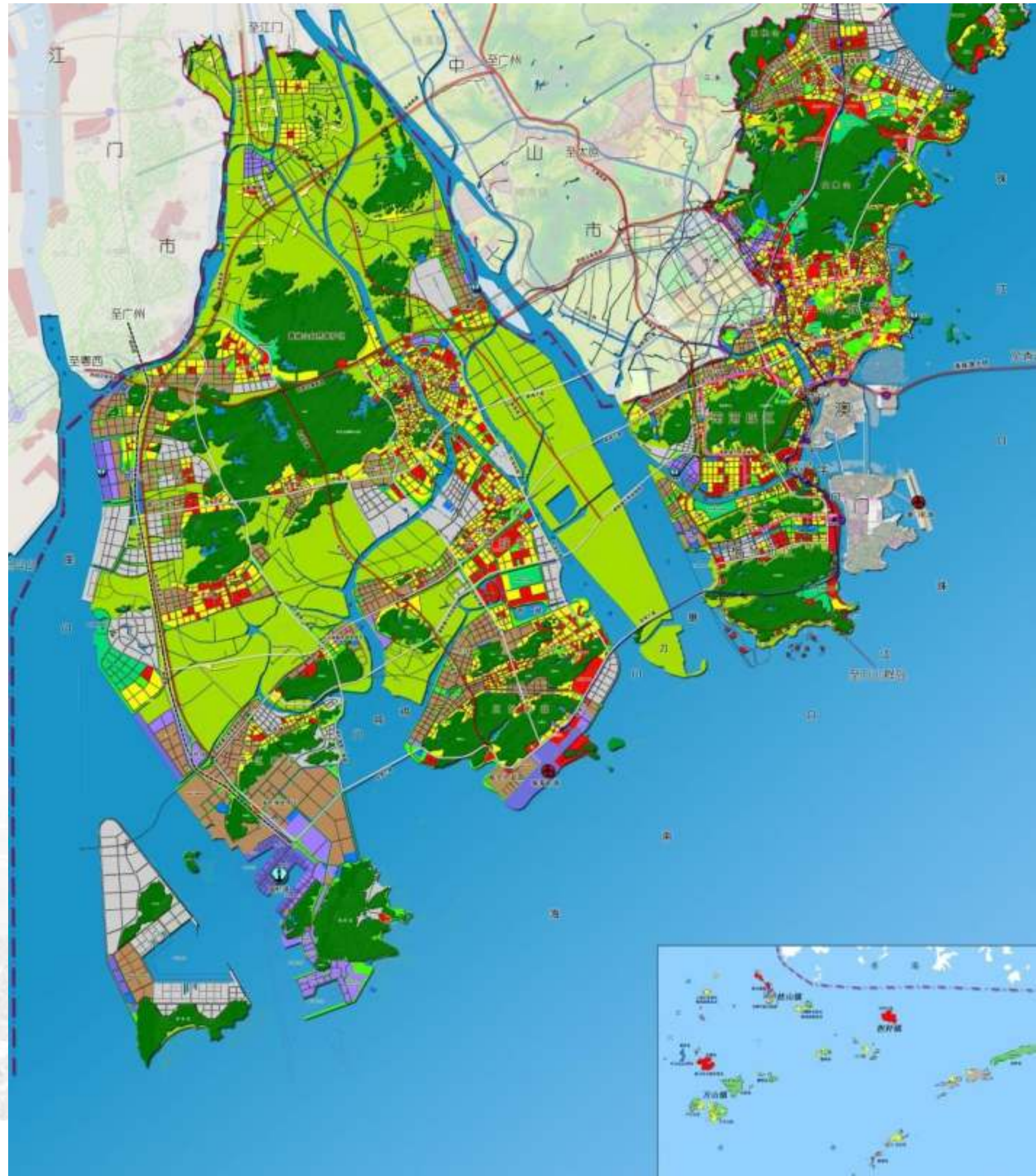
After the completion of Hong Kong-Zhuhai-Macao Bridge in 2017, Zhuhai will become the only inland city that connects Hong Kong and Macao by land; The Part of Hong Kong-Zhuhai-Macao Metropolitan area and World-class Tourism Recreation Destination consisting of Zhuhai and Macao.



## 二、科学发展历程

Scientific development process

- 市域面积 7666 km<sup>2</sup>
  - 陆地面积 1724km<sup>2</sup>
  - 海域面积 5942km<sup>2</sup>
  - 常住人口 158 万人
  - 户籍人口 107 万人
- 
- City area: 7666 km<sup>2</sup>
  - Land area: 1724km<sup>2</sup>
  - Sea area: 5942 km<sup>2</sup>
  - Permanent population: 1.58 million
  - Registered population: 1.07 million





## 二、科学发展历程

Scientific development process

自1980年成为我国首批经济特区以来，珠海始终坚持生态文明的发展理念，初步探索实践了一条经济发展与环境保护的双赢之路，为这座城市留住了蓝天白云、绿水青山，到目前为止，珠海还是珠三角**环境最好、土地开发强度最小、低端产业聚集最少的地方，也是人口密度和素质最均衡的地区之一。**

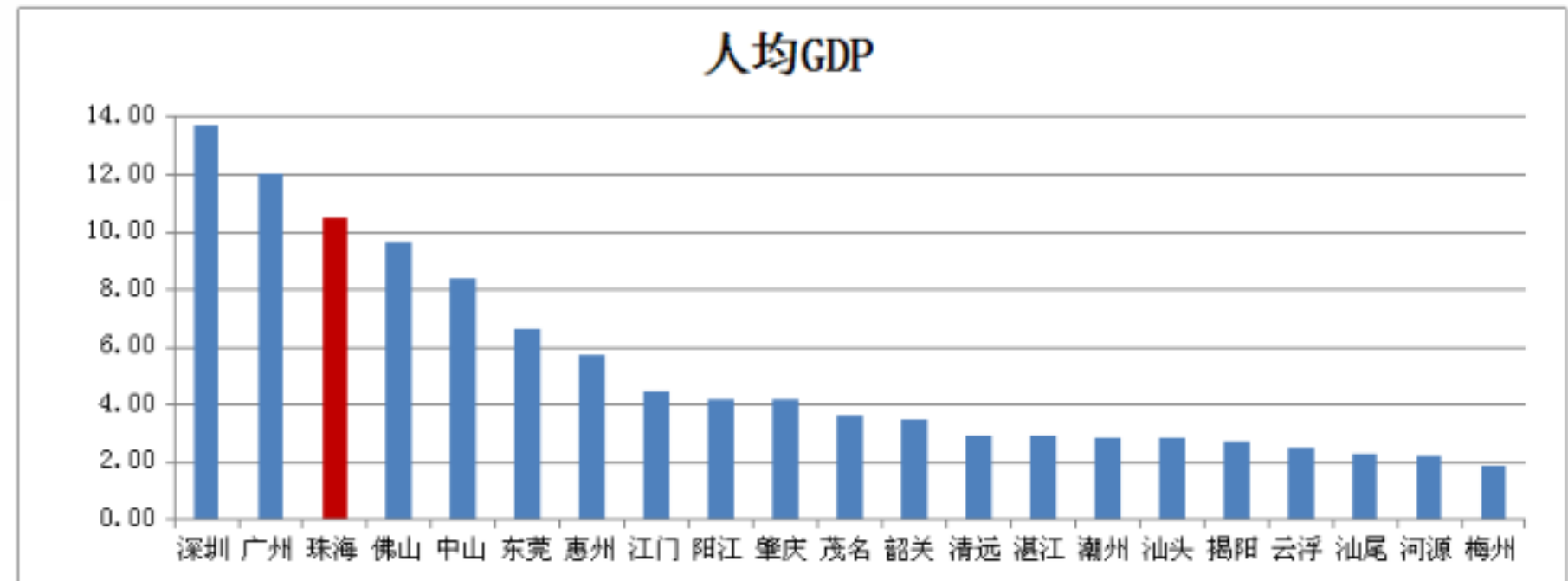
A win-win way of economic development and environmental protection;

A place in Pearl River Delta with:

- the best environment
- the lowest intensity of land development
- the weakest cluster effect for low-end industries
- one of the most balanced in terms of population density and quality area

人均GDP约**1.71万美元**，全省排名**第三**。（统计2013年数据）

Per capita GDP around 17100 dollars which ranked third in Guangdong Province .（2013）



经济发展与环境保护的双赢之路



情侣路浪漫风情海岸带

### 三、优势气候环境 Climate environment advantages

- 全年空气质量优良天数比重大

Account high ratio of annual good air quality days

2013年全年空气质量优良天气数为321天，比例**90%**，优秀天气数为150天，，占全年比例约41%。

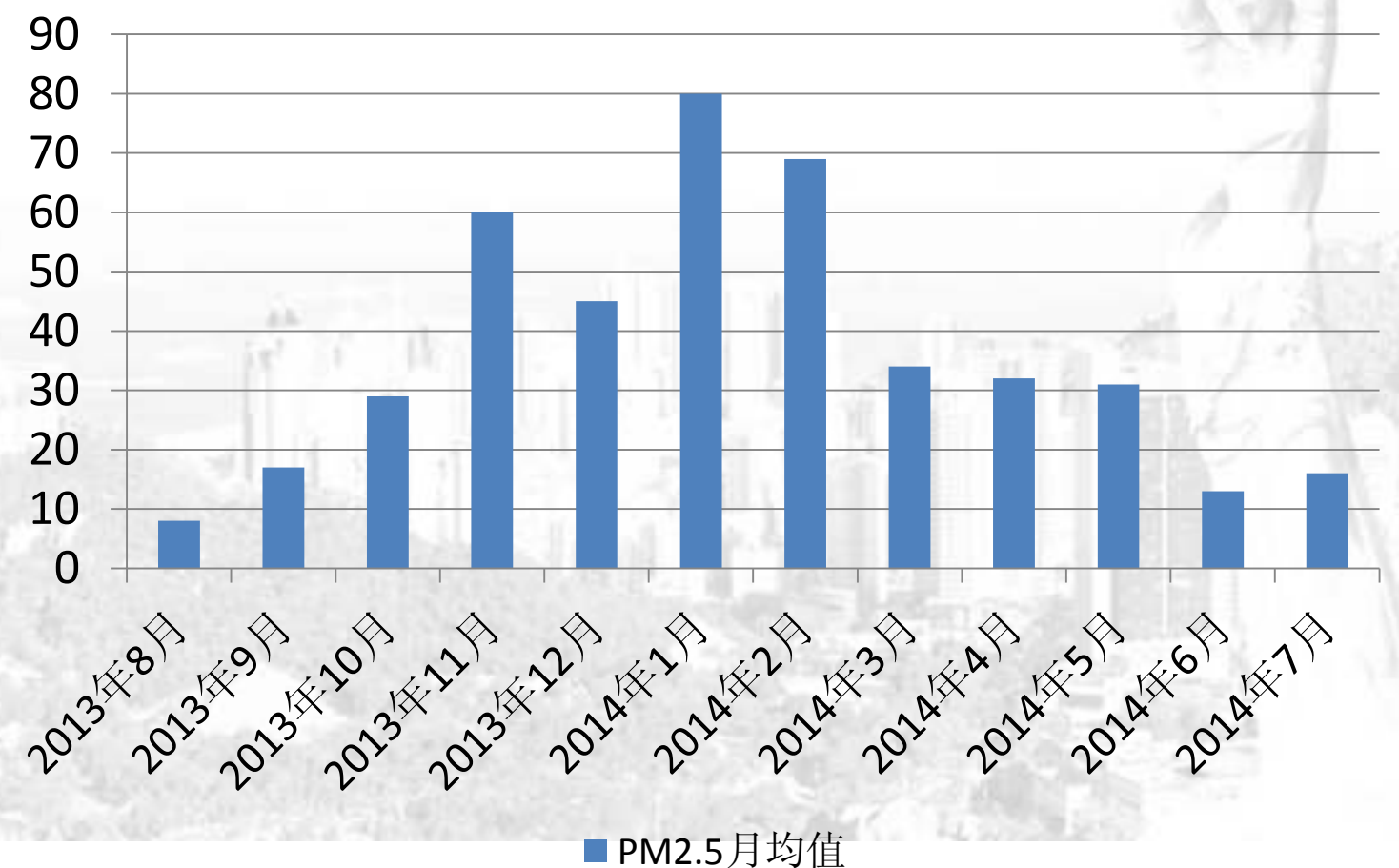


- PM2.5整体较低

Comparatively low PM2.5 index

近一年PM2.5平均值为36（其中低PM2.5为8，最高为80

**空气质量指数排名全国前列。**



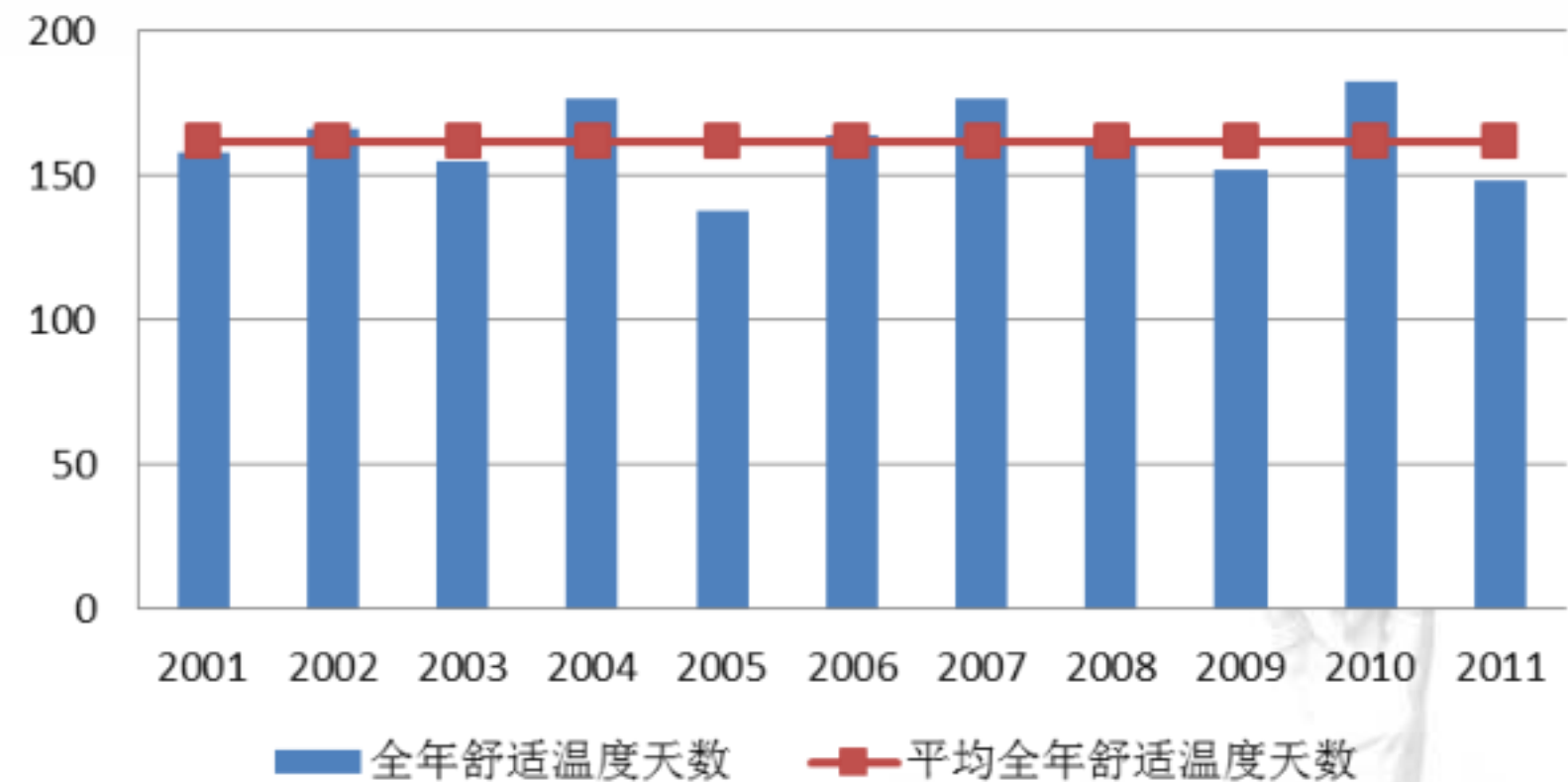


### 三、优势气候环境 Climate environment advantages

#### ● 舒适温度气候天数多

- Many days with fine weather and comfortable temperature。

近10年全年舒适温度 ( $15^{\circ}\text{C} \leq T \leq 25^{\circ}\text{C}$ ) 天数



#### ● 全年极端温度天气数量少。

Least annual extreme temperature days

年平均**仅3天**会出现 $35^{\circ}\text{C}$ 以上的高温，出现过的极端最高气温是 $38.7^{\circ}\text{C}$ ；  
年平均**仅2天**会出现 $5^{\circ}\text{C}$ 以下的低温，出现过的极端最低气温是 $2.5^{\circ}\text{C}$ 。

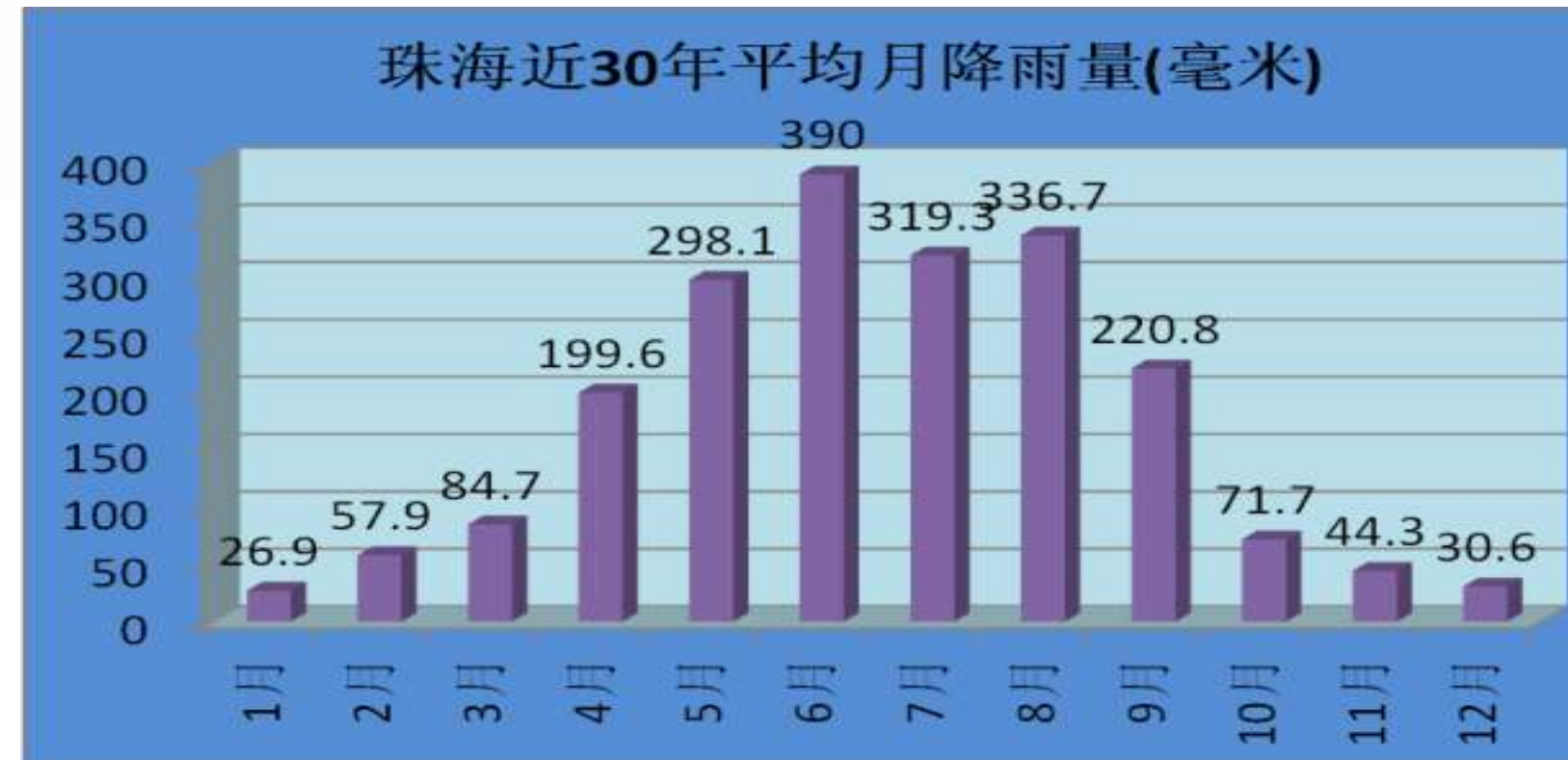
### 三、优势气候环境 Climate environment advantages

#### ● 降雨充沛

Rich rainfall

珠海年平均降雨量2080.6毫米。

Average annual rainfall of Zhuhai is 2080.6 mm.



#### ● 太阳能/风能等可再生资源丰富

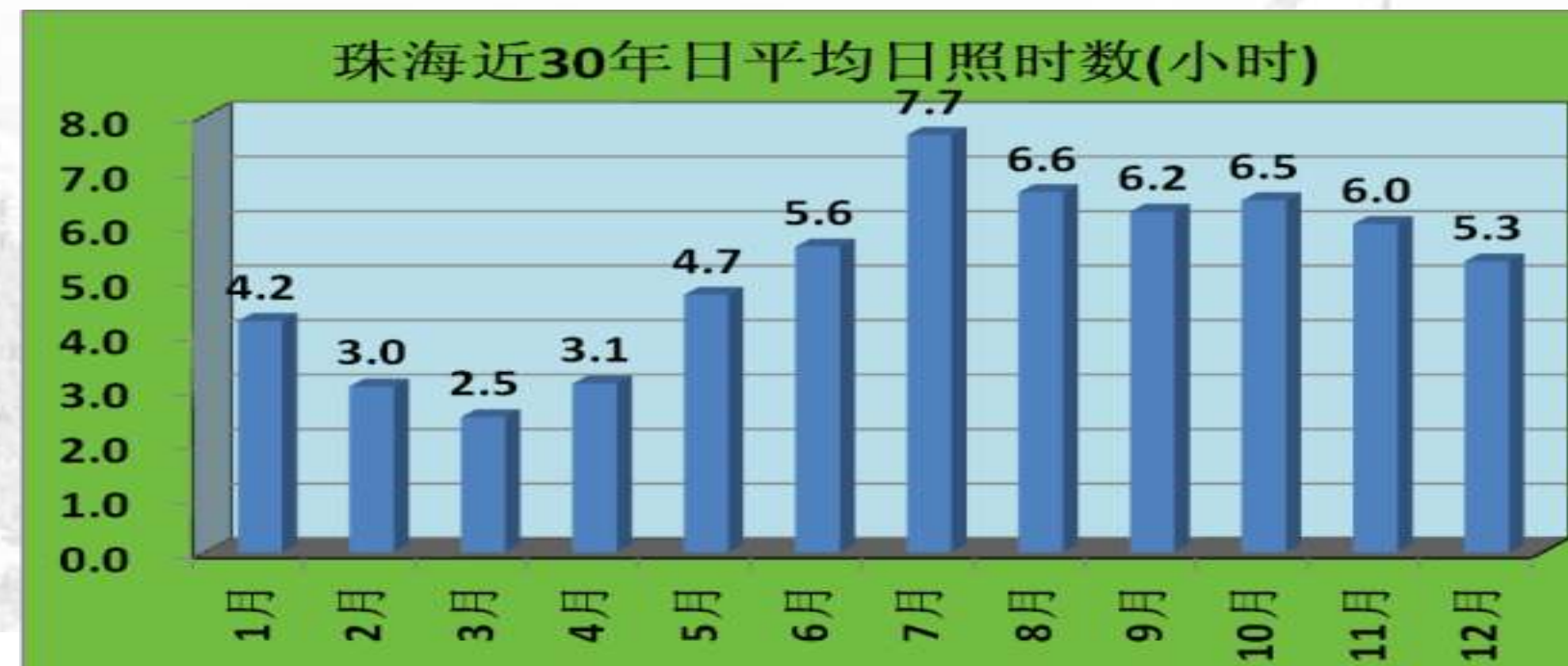
Abundant renewable resources such as solar & wind

日照充沛，太阳能资源丰富。

平均每天有5.1小时日照。

Abundant sunshine, abundant solar energy resources.

An average of 5.1 hours of sunshine a day.





## 四、重要荣誉称号 Honors and awards

城市中国计划：可持续发展综合第一

中国社科院：中国宜居城市排名第一

中国竞争力研究会：中国十佳宜居城市第一

联合国改善人居环境最佳范例奖

国家环境保护模范城市

中国十佳和谐可持续发展城市

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- The Urban China Initiative (UCI): Ranking first in terms of Urban China sustainability Index
- Chinese Academy of Social Sciences (CASS): Ranking first in terms of livable city competitiveness in China
- China Institute of City Competitiveness (CICC): Ranking first in terms of the top ten livable cities in China
- Dubai International Award for Best Practices to Improve the Living Environment
- National Environmental Protection Model City
- One of the China top 10 harmonious sustainable development cities





# PART 02

实践:

——用低碳生态应对气候变化

*Responses to climate change with Low carbon ecological strategy*





# 应对气候变化实践 Responses to climate change

划定生态控制红线      建立全市生态**安全格局**；  
构建**绿色交通**系统      实现低碳零碳便捷出行；  
推行**绿色建筑**标准      营造自然怡人居住载体；  
施行L I D 开发模式      打造会呼吸的**海绵城市**。

Draw Ecological Red Line, Establish urban ecological security pattern;  
Contruct green transport system , Achieve low-carbon convenient travel;  
Impel green building criteria, Construct natural pleasant living room;  
Implement LID development model , Creat a breathing sponge city。







# 划定生态控制线 建立全市生态安全格局

Delineate ecological control red line

Establish the city's ecological security pattern

## □ 划定生态控制线

Definition of Ecological Red Line

## □ 保护红树林

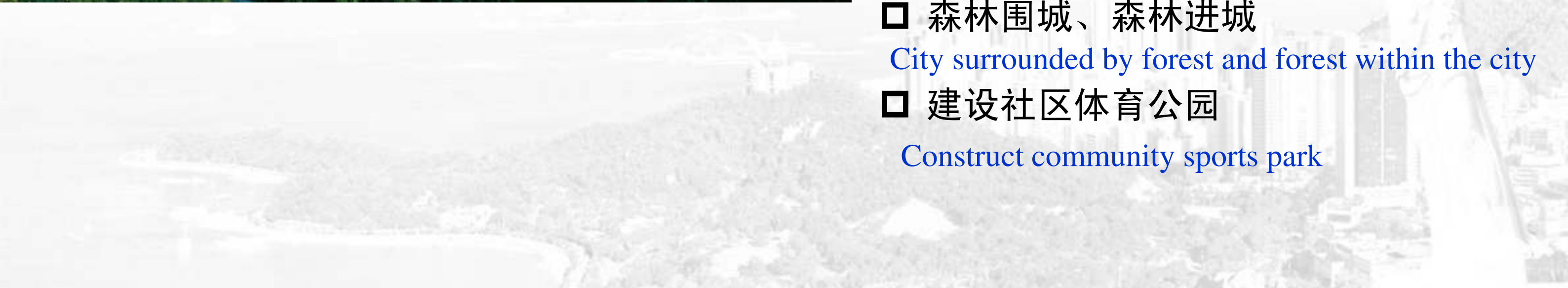
Protect mangrove

## □ 森林围城、森林进城

City surrounded by forest and forest within the city

## □ 建设社区体育公园

Construct community sports park





划定生态控制线      Definition of Ecological Red Line



**一屏一带**：基于“五桂山 - 黄杨山 - 古兜山”区域绿核所形成的珠海**北部绿色屏障**，与由滨海岸线所形成的**南部生态保护带**。

**二片多核**：以莲洲生态保育区和孖髻山——乾务——红旗——平沙基本农田保护区形成两大重要的**农田生态基质**，和众多自然山体形成的生态绿核。

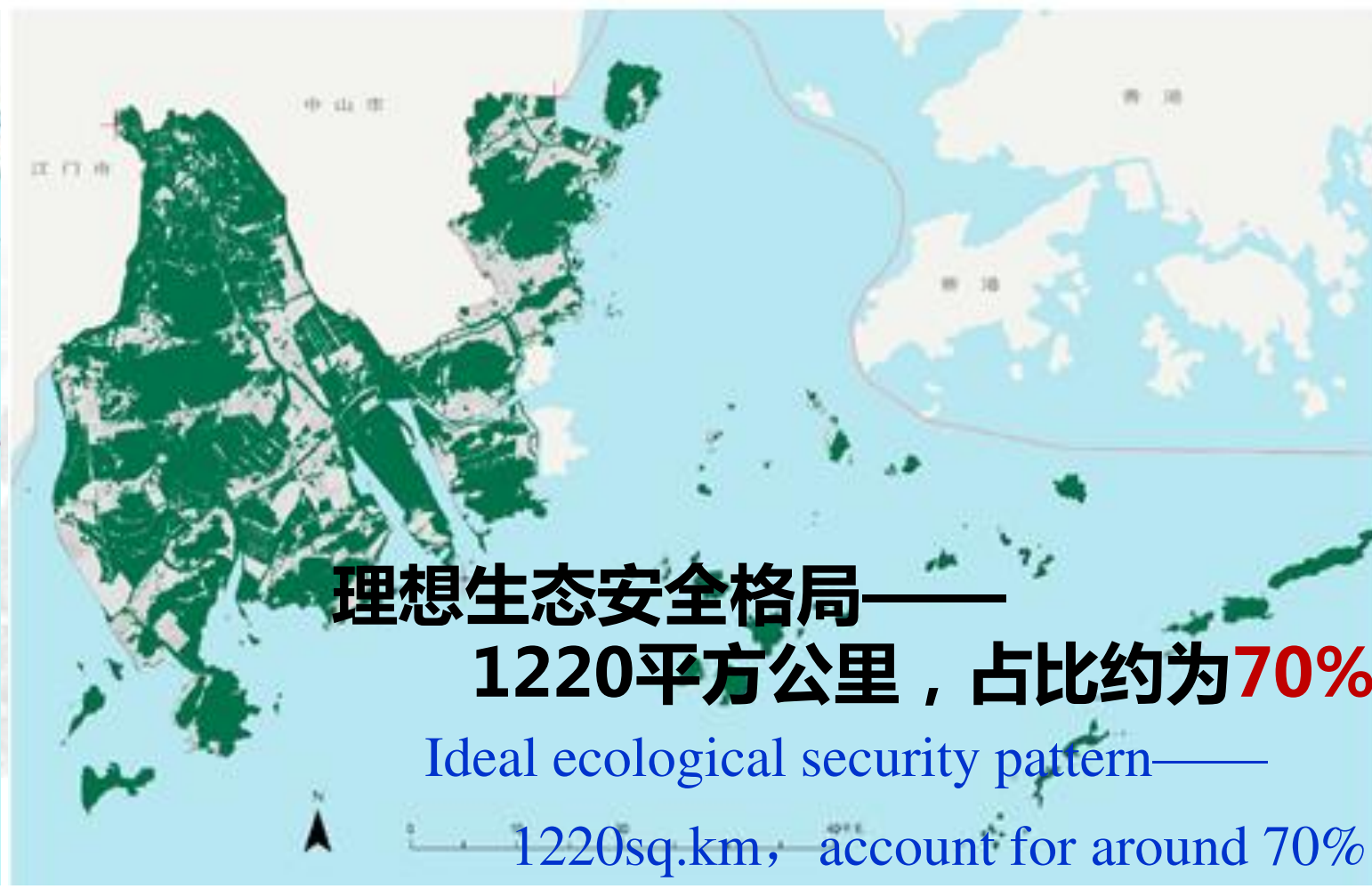
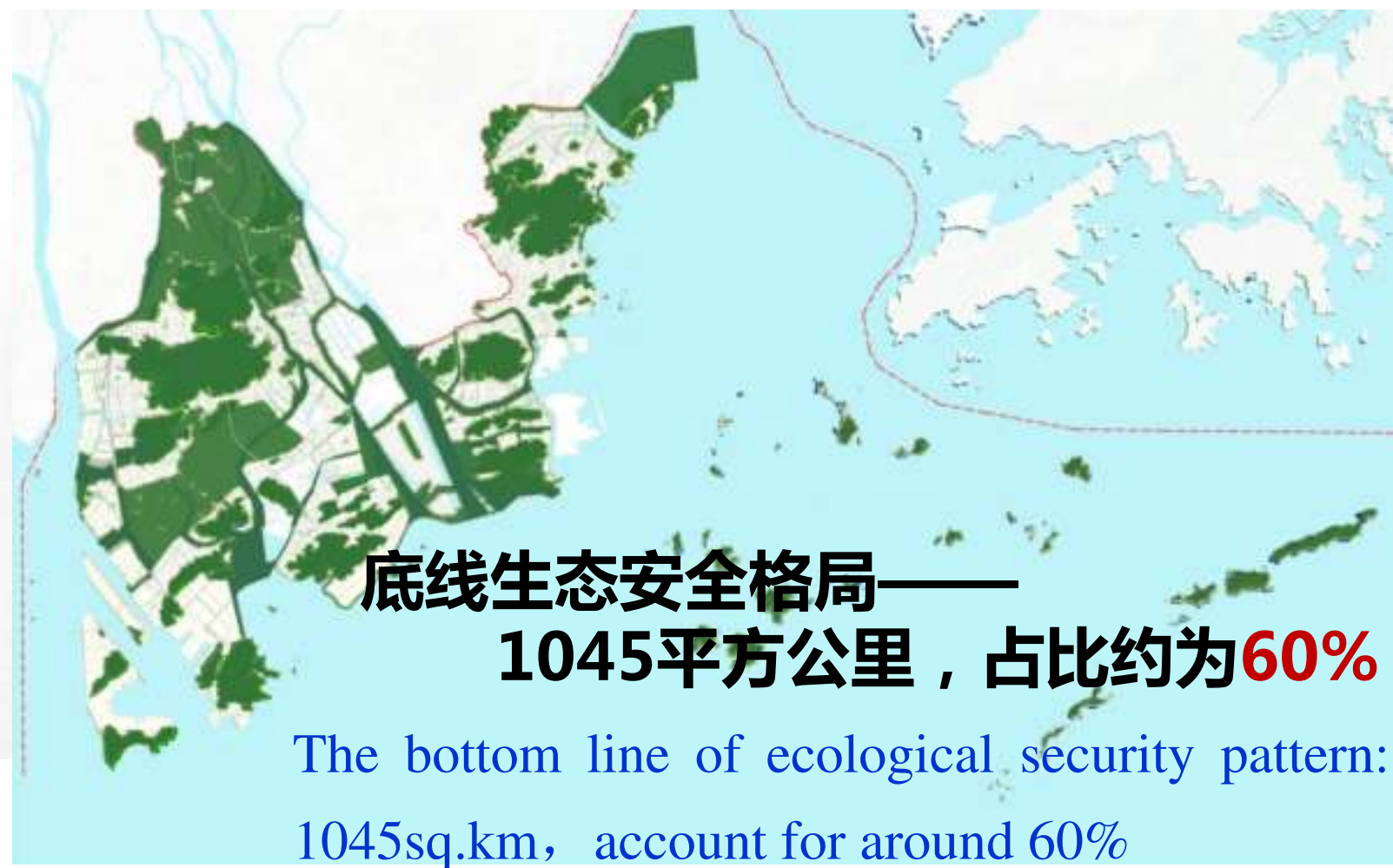
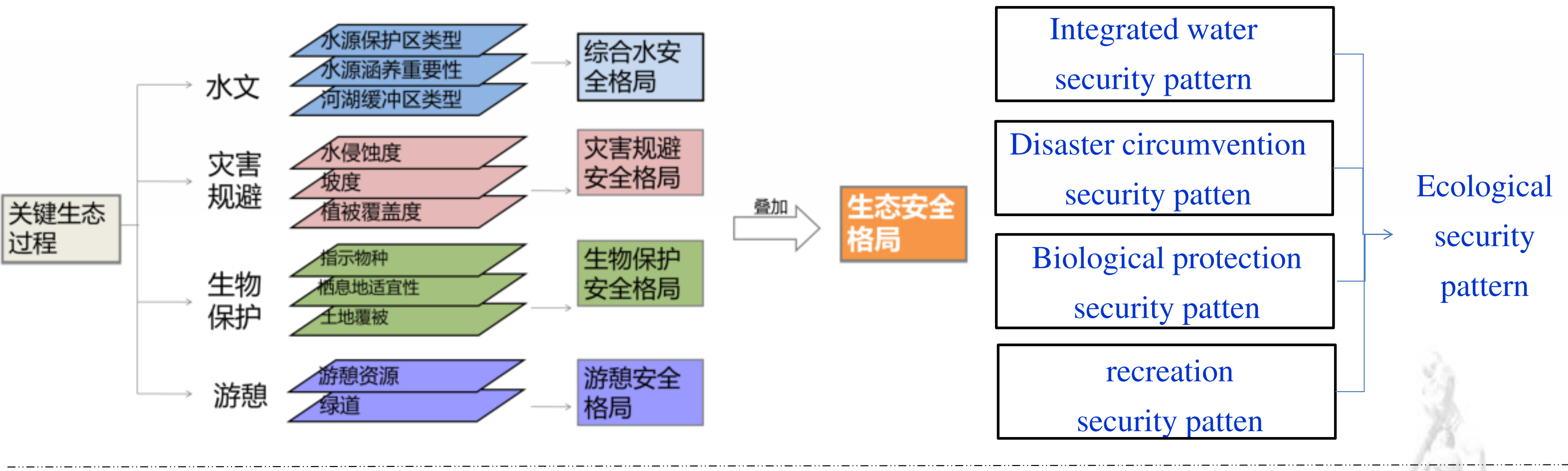
**水网纵横**：由磨刀门水道、虎跳门水道、洪湾水道、鸡啼门水道、黄杨河、天生河、白龙河等河道所形成的联系区内各生态斑块的廊道体系。

A Green barrier and a ecological protection zone;  
Two pieces of ecological framland zones and mutiple green cores;  
River network.



□划定生态控制线

Definition of Ecological Red Line





## □保护红树林      Protect mangrove



横琴红树林



鹤洲北红树林

结合珠海城市滨海的特点，维护滨海生态林带和生物链；

重点打造淇澳岛红树林、横琴红树林，并将生态保护与生态休闲相结合。

According to the characteristics of Zhuhai as a coastal city, maintain the coastal ecological forest belt and biological chain;

Focus on creating Qi'ao Island mangrove and Hengqin mangrove, combined ecological protection and ecological leisure.



### 淇澳红树林湿地公园（红树林约700公顷）

规划定位：以红树林为特色的综合性城市生态保护地和旅游目的地，将成为珠海市湿地公园的典范。现为省级湿地公园，拟升级为国家级自然保护区。



## □森林围城、森林进城 City surrounded by forest and forest within the city

加快森林围城、森林进城的工作步伐，积极创建“**国家森林城市**”，截止2014年7月我市共计：

- 1、生态景观林带221.1公里；
- 2、森林碳汇造林0.31万公顷；
- 3、乡村绿化美化示范点20个；
- 4、森林公园22个。

To speed up the pace of work in creating the city surrounded by forest and forest within the city, actively construct a "National Forest city" (As of 2014 July)

221.1 kilometers of ecological landscape forest ;3100 hectares of the forest carbon sequestration afforestation;20 demonstration villages of green landscaping;22 forest park.



生态景观林带



乡村绿化美化及森林进工业园区



森林碳汇



凤凰山森林公园效果图



## □建设社区体育公园 Construct community sports park

组织编制了《广东省社区体育公园建设指引》，目前已发行。

Guangdong Province Community Sports Park Guildline.

目前全市共规划127处社区体育公园，面积共计113.13公顷。其中已完成65处，正在建设9处，拟计划开展53处。

Totally planning 127 community sport parks, 65 of them have been built completely.

结合新型城镇化建设工作，将公园修在社区、修到居民家门口，取得市民广泛好评。

To Combine with new urbanization, building sports parks near the citizens' living community, creating a high-quality environment for sports activities.







# 构建绿色交通网 实现低碳零碳便捷出行

Implementing Green transportation

——low-carbon\zero-carbon transportation

□ 常规公交

Conventional public transit

□ 有轨电车

Tram

□ TOD开发模式

Transit-oriented Development

□ 公共自行车租赁系统

Public bicycle rental system

□ 绿道

Green way



## □常规公交 Conventional public transit

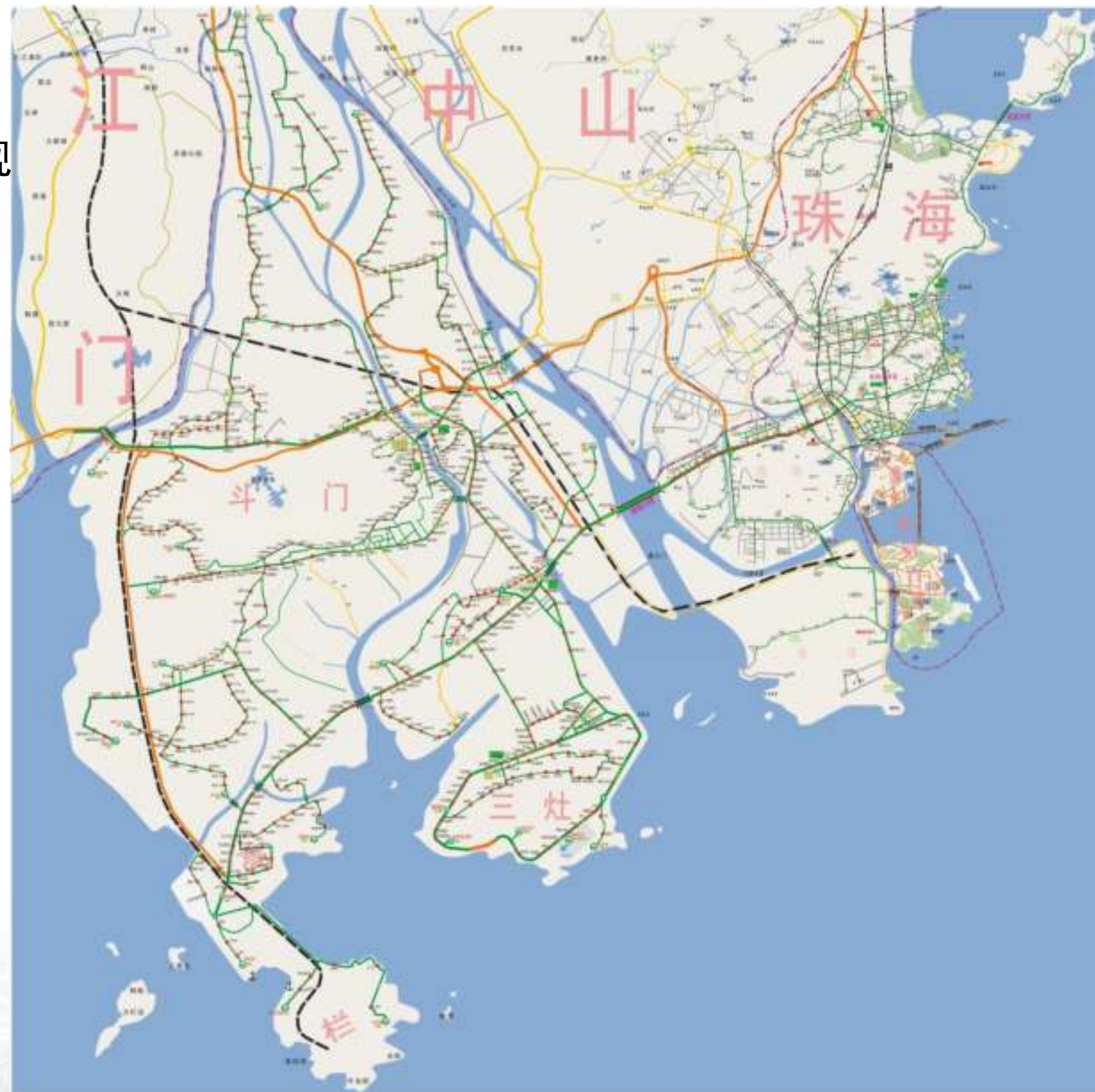
目前总计公交站点**2272个**，公交线路**123条**常规线路和**99条**高峰专线（2013年统计）。

发展目标：

- 到2020年，实现“**4520**”的目标：
  - 4：全市慢行交通方式占居民全方式出行结构的40%；
  - 5：城区内步行5分钟到达公交站；
  - 20：全市干线公共交通运营速度达到每小时20公里。
- **2017年**，全市实现公交车清洁能源化率**87%**，**2020年实现100%**。

Totally 2272 bus stations, with 123 routines and 99 peak line.

- To achieve the goal of “4520” by 2020:
  - 4: The non-motorized transportation modes account for 40% of traveling structure of residents;
  - 5: It will cost 5 minutes to walk to the bus station within the city proper;
  - 20: The running speed of the public transport at the main line reaches 20km/h.
- 87% application of clean energy buses will be realized in the main urban area by 2017, and 100% by 2020.





□有轨电车 Tram

## 建设目标：30/30/30时空圈目标

构造中心城区内部30分钟时空圈——提升东部桥头堡交通品质；

打造中心城区为中心的市域30分钟时空圈——西部中心城、北部唐家、南部横琴30分钟互达；

以鹤洲为中心大珠海市域30分钟时空圈——鹤洲至外围组团30分钟互达。

到2020年建设完成8条有轨电车，总长共计129.6km；  
到2060年建设完成10条有轨电车，总长共计173.9km。

Target: 30/30/30mins network

30mins access to the whole central area;

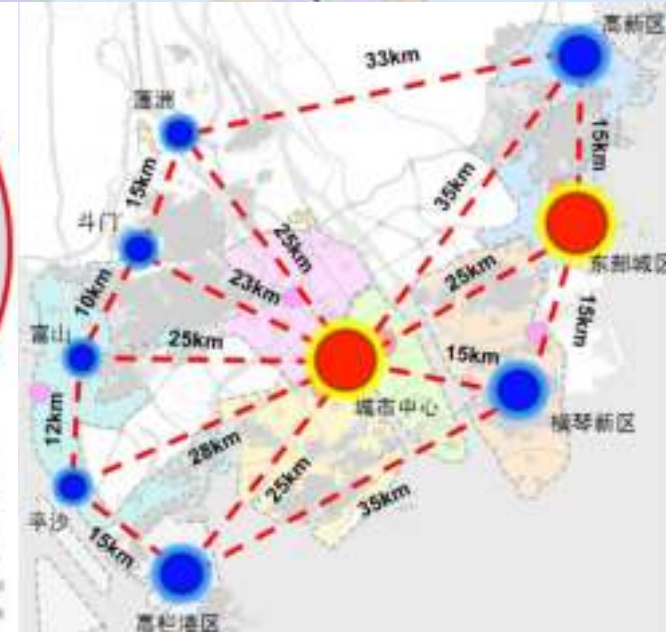
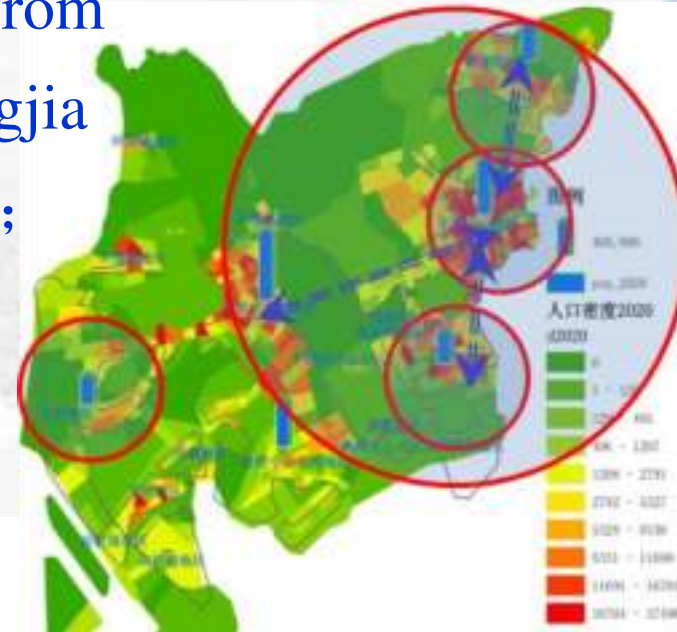
30mins access to the central area from

## Western central City\Northern Tangjia

Town\sourthern Hengqin new area;

30mins access to Hezhou from its

## Peripheral area.





□TOD开发    Transit-oriented Development

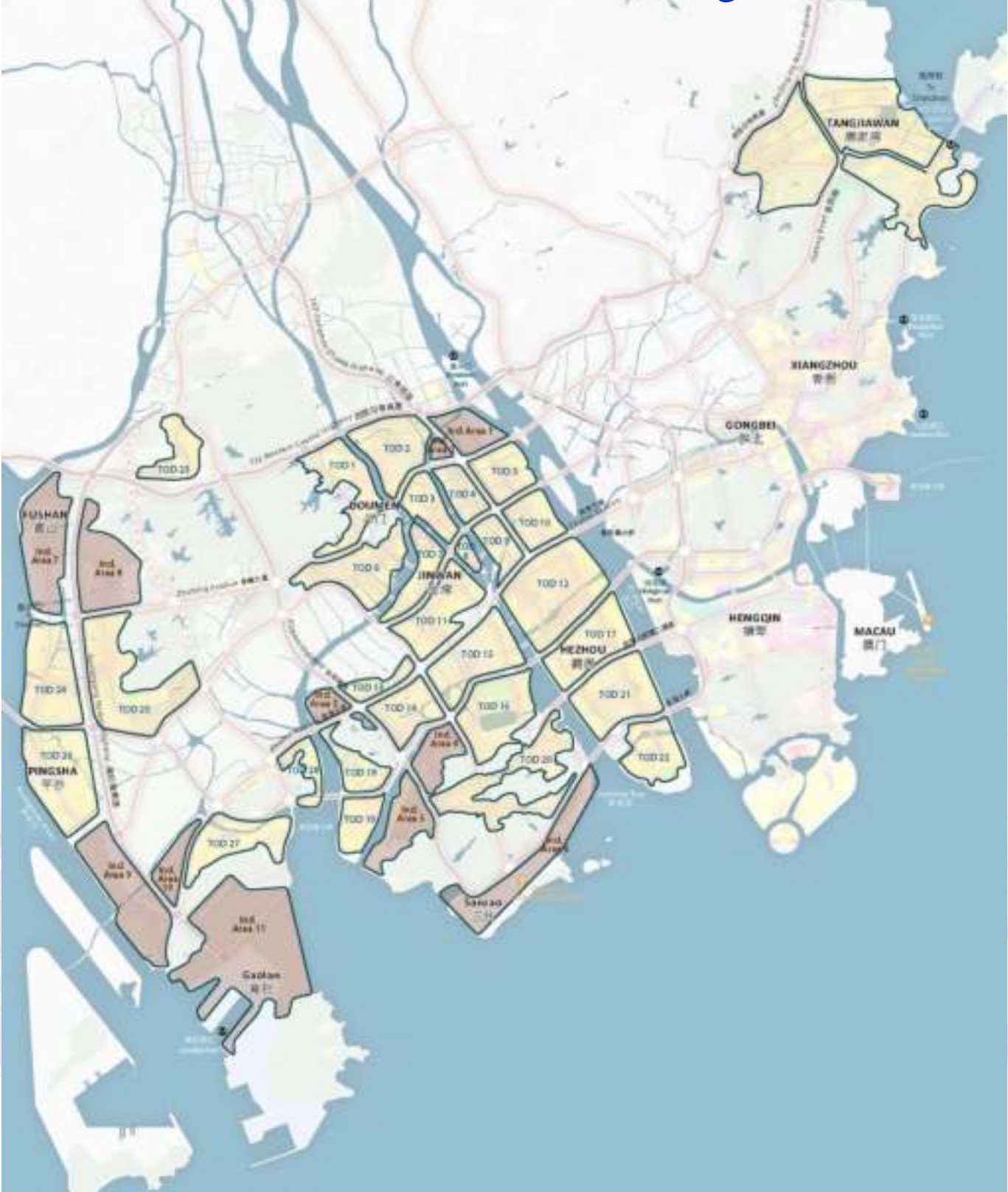
按照TOD理念进行新城新区的规划建设，东部城区开展上冲TOD小镇、**珠海北站TOD新镇建设试点**、西部生态新区按照TOD理念规划28个TOD片区。



以“单向二分路、小街区”的技术手法进行珠海北站TOD新镇的规划建设。

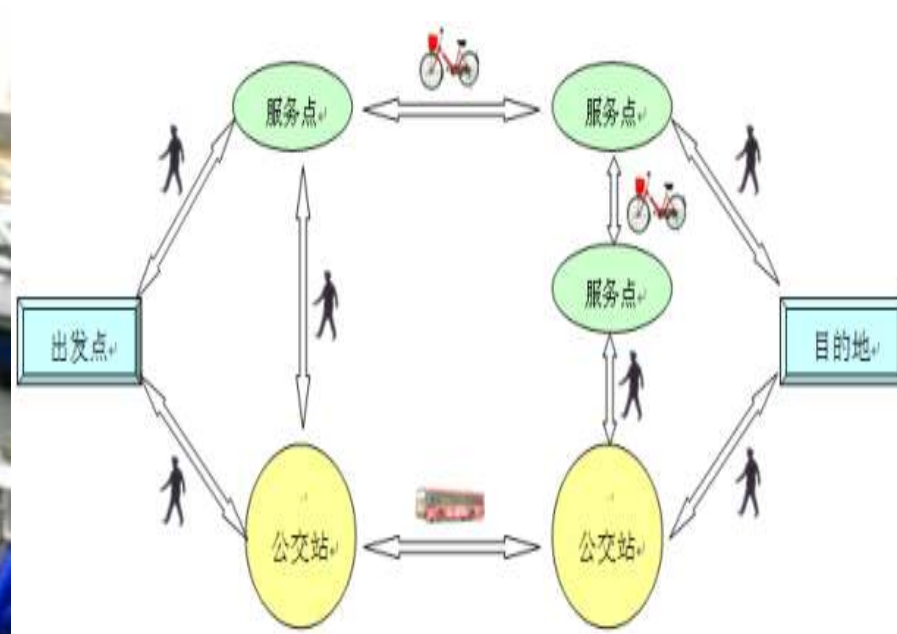
Implementation of the TOD new town construction planning on Zhuhai North Railway Station by utilizing 'One-way binary way, small blocks' technical means.

According to the concept of TOD, shangchong&Zhuhai northern station are choosen to be the pilot area of TOD,meanwhile, 28 TOD districts are defined in Western Ecological New Area.





## 公共自行车租赁系统 Public bicycle rental system



大力推进公共自行车租赁系统的建设，已实现中心城区自行车布点基本全覆盖；

一期已建成195个点，投入4740辆公共自行车；

租用率达2.4万人次/天，办卡人数超过10万）；

45%的公共自行车与公交站点衔接，有效的解决了公交的“最后一公里”问题。

- The center city has basically achieved full coverage of bicycle rental stop.
- At the first phase, 195 points are established, and 4740 public bicycles are utilized.
- The leasing rate reaches 24000 person-time/day, and more than 100000 persons apply for the cards.





## □绿道 Greenway

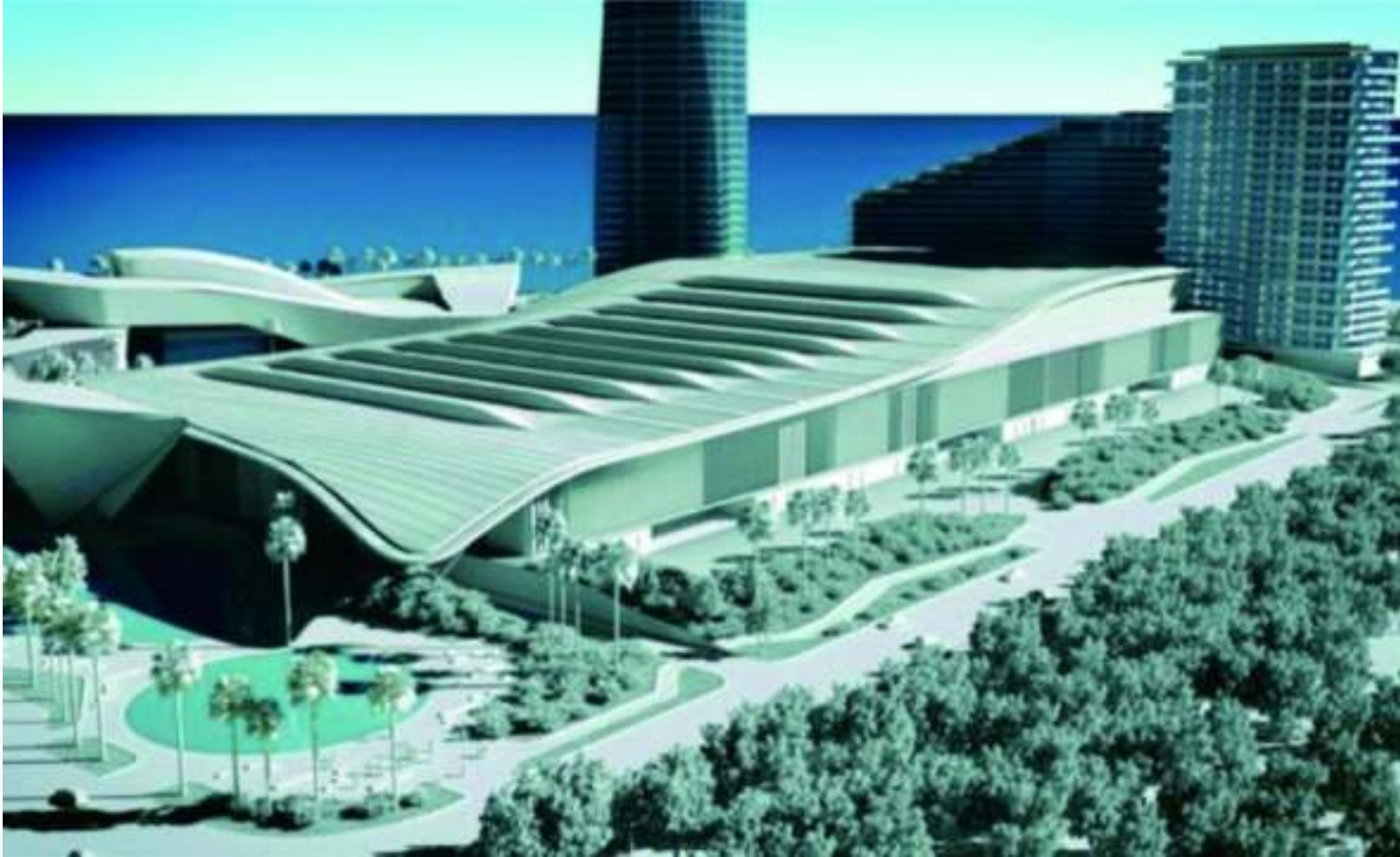


加强绿道网建设，培育健康低碳的出行和休闲方式；规划绿道总长1003.02km，已建成600km。

- Strengthen the construction of the greenway network, cultivate a healthy and low carbon travel and leisure way.
- 1003.02km length green channel is planned to be built, 600km has been completed.







# 推行绿色建筑 营造自然怡人居住载体

Implementing Green Building

## □ 绿色建筑相关规划标准推行

Implementing green building planning & the standard

## □ 绿色建筑案例

Green building cases

## □ 建筑节能案例

Energy-efficient building cases

## □ 建筑节能技术

Energy-efficient building technology

## □ 既有建筑节能改造

Remodeling of energy-saving for existing building



## □绿色建筑相关规划标准推行

Implementing green building planning & the standard requirements

- 制定绿色建筑规划及相关政策、技术标准，营造良好的绿色建筑发展环境，包括：

Formulate Green building planning and its supported policy & technical code

《绿色建筑发展专项规划》

《珠海市绿色建筑管理办法》

《珠海市太阳能热水系统与建筑一体化技术设计和验收导则》

《珠海市太阳能热水系统与建筑一体化设计标准图集》

《珠海市绿色建筑技术导则》

- 创新控制性详细规划的编制，将绿色建筑、绿色市政、绿色交通的控制要求落实到相应的控制性图则。

Create a new control planning technical method : Implement Green building & Green municipal facilities & Green Transportation into control planning.



## □ 绿色建筑实践 Green building cases in Zhuhai

积极推行绿色建筑实践，推广绿色建筑的舒适和健康的惠及范围。

### Implementing Green building cases



珠海市博物馆和城市规划展览馆



十字门会展商务组团一期标志性塔楼



万科魅力之城

- 要求大中型政府投资及新开发项目需达到绿色建筑二星标准，大中型公共建筑要求达到至少绿色建筑二星标准。如万科魅力之城、万科城市花园、珠海十字门中央商务区会展商务组团一期标志性塔楼等。

Large and medium-sized Government-invested & Newly developed projects should achieve at 2 Star of green building at least.

- 以上冲TOD小镇、珠海北站TOD新镇和横琴新区作为集中试点地区，全面落实绿色建筑、绿色交通、低冲击开发的建设发展要求；重点突出保护生态环境，规划建设雨水、中水收集系统。

Fully implementing green building\green transportation\LID requirements in Shangchong TOD area\Zhuhai northern station TOD area and Hengqin new area. Especailly highlight pretection of ecological enviroment , rainwater and reclaimed water collection system.



## □ 建筑节能案例

Energy-efficient building cases

**东方墅低碳节能示范项目**运用了地源热泵技术、光电建筑一体化技术、光伏水泵技术、毛细血管顶棚辐射制冷技术、毛细血管地板采暖技术、全热回收新风技术、除湿技术、断桥铝合金门窗技术、隔热涂料技术、屋顶绿化技术、厨房垃圾直排技术。该项目的节能率达到75%。

The demonstration project of Orient Villa's low carbon and energy conservation utilizes the technologies of ground source heat pump, building integrated photovoltaics (BIPV), photovoltaic pump, blood capillary ceiling radiation refrigeration, blood capillary floor heating, total heat recovery and primary air, dehumidification, broken bridge aluminum alloy door and window, insulating mold coating, roof greening and kitchen waste direct exclude. The fractional energy saving of this project reaches 75%.



东方墅低碳节能示范项目实景图



## □ 建筑节能案例      Energy-efficient building cases

**珠海斗门人民医院**采用水源热泵中央空调系统，这项技术通过物理换热换取水中的冷热能，不仅满足全院夏季制冷、冬季供暖、日常供生活热水的需求，还实现零污染，零排放。

Zhuhai Doumen People's Hospital utilizes water source heat pump (WSHP) central air condition system. This technology gets cold and hot energy from water through physical heat transfer, not only meets the requirements of refrigeration in summer, supply heating in winter and provide hot water in daily life of the whole building, but also achieve the goal of zero pollution and release.

**心海州项目**48万m<sup>2</sup>，全面采用地源热泵系统、真空垃圾运输、垃圾自动化处理、同层排水系统和能耗监控系统。The project cover an area of 480,000 m<sup>2</sup>, full use of ground source heat pump system, vacuum waste transportation, garbage automated processing, with layers of drainage systems and energy consumption monitoring system.



珠海斗门人民医院节能示范项目效果图



心海州项目效果图



## □ 建筑节能技术 Energy-efficient building technology

积极开展**光伏发电技术**在海岛、住宅建筑中的应用，目前已建成的光伏发电项目有：万山岛、东澳岛文化中心及综合楼光伏建筑一体化为电网改建工程、仁恒星园、丽珠制药工业园屋顶太阳能光伏工程、珠海格力电器股份有限公司太阳能光电建筑一体化应用（首期）示范工程、伟创力珠海工业园太阳能光伏电站项目等，已建成的光伏发电总装机容量超过80兆瓦。计划未来三年全市光伏发电总装机容量力争达到300兆瓦。

Actively promoting the application of photovoltaic power generation technology in the island and residential house. In the next three years, the city's total installed capacity of photovoltaic power generation is strived to reach 300 MW.



丽珠制药工业园屋顶太阳能光伏工程



仁恒星园屋顶太阳能光伏工程



## □ 既有建筑节能改造 Remodeling of energy-saving for existing building

至2005年开始，我市通过合同能源管理方式对学校、医院、酒店、大型公共建筑等一批既有建筑进行节能改造，其中珠海市酒店的节能改造率达50%以上。

Since 2005, the city has renovated a number of existing buildings such as schools, hospitals, hotels and large public buildings. At present there are over 50% of hotels have been renovated by energy saving technology in Zhuhai.



珠海度假村酒店



珠海市人民医院



珠海百货广场





# 施行低冲击开发 打造会呼吸的海绵城市

Promotion of Low-Impact Development Mode

——Build the sponge-type city

## □ 探索低冲击开发模式

Explore Low-Impact Development Mode

## □ 保护湿地资源

Protect wetland

## □ 横琴综合管沟

The comprehensive pipe trench in Hengqin



## □ 探索低冲击开发模式 Explore Low-Impact Development Mode

**规划先行：**编制珠海市水专项规划，融入低冲击理念；

**标准、政策保障：**制定低冲击开发技术标准，科学指导我市开发和建设；加快研究建设海绵型城市的政策措施；

**试点应用：**推广开展环境友好的低冲击示范城区和示范项目建设海绵型城市；在横琴新区、西部生态新城等重点开发地区，以及美丽海湾建设、香炉湾沙滩修复整治等重点工作中率先推行低冲击开发模式，因地制宜建设低冲击设施。

- Prepare the special water affair planning in Zhuhai;
- Formulate LID technical standard and the policy of implementing sponge-type city;
- Integrate the philosophy of low impact into the urban water security assurance, water ecology protection, water resource utilization, and urban development and construction. Take the lead in promotion of low-impact development mode in the key development areas such as Hengqin New Area and Western New Ecological Town, as well as the key projects such as the construction of the Beautiful Bay and the rehabilitation and renovation of the sand beach in Xianglu Bay, construct the low-impact facilities according to the circumstances, make use of the energy-saving technique, green energy, green building, and green public projects, and build up the energy-saving, environmental-friendly and low-impact demonstration downtown and demonstration project.



## □ 保护湿地资源 Protect wetland



淇澳湿地地公园



华发水郡省级湿地公园



斗门水松湿地



磨刀门湿地



白藤湖湿地——人工湿地



横琴红树林湿地

结合珠海水网纵横的内河特点，建设湿地公园，保护自然本底，维护生态安全格局，同时也为市民提供休闲健身场所，建立人与自然的亲密关系；湿地总面积为18.91万公顷（其中自然湿地15.46万公顷，占湿地总面积的81.78%，人工湿地3.45万公顷，占湿地总面积的18.22%）。

Based on the characteristics of Zhuhai's river network, to construct wetland park, protect natural base, maintain ecological security pattern, and provide open spaces for citizens, create intimate relationship between people and nature; The total wetland area of 189100 hectares (154600 hectares of natural wetlands which account for 81.78% of total wetland area, 34500 hectares of artificial wetlands which account for 18.22% of total wetland area).



## □ 横琴综合管沟      The comprehensive pipe trench in Hengqin

- 横琴新区综合管沟：将供水、供气、排污等各类公共设施管线集中收纳在公用管沟内，节约土地资源，为发展预留空间，建立全岛中水回收利用系统，通过集中收集、处理和利用中水，最大限度提高中水利用效益。
- 下沉式绿化带。

The comprehensive pipe trench in Hengqin New Area integrates pipelines for public facilities including water supply, gas supply and drainage into a common service tunnel, saving land resources and reserving space for future development.



横琴新区综合管沟



横琴新区下沉式绿化带



# PART 03

未来

——从中国最宜居走向国际宜居

*From the Most Livable City in China to an International Livable City*





一、总体思路  
Overall thought

实施新型城镇化战略, 建设  
国际宜居城市

实现

六个珠海

- 国际珠海  
— 打造港珠澳国际都会区
- 活力珠海  
— 提高城市竞争力和文化软实力
- 生态珠海  
— 严格保护可持续生态环境
- 美丽珠海  
— 优化紧凑均衡的城乡空间
- 智慧珠海  
— 提升智能化服务管理水平
- 幸福珠海  
— 完善人本共享的公共服务

支撑

三个一

- 制定一项国际宜居城市行动计划。
- 构建一套国际宜居城市指标体系；
- 创建一个宜居城市规划体系；

Implementation of  
New Urbanization  
Strategy and  
Construction of  
International  
Livable City

International Zhuhai  
Dynamic Zhuhai  
Ecological Zhuhai  
Beautiful Zhuhai  
Smart Zhuhai  
Happy Zhuhai

- A livable city urban-rural planning system;
- A set of international livable city index system;
- An international livable city action plan;



二、工作重点      Priorities

□建立一个宜居城市城乡规划体系      Build a livable city urban-rural planning system



建立以《珠海城市概念性空间发展规划》为**统领**；以《珠海市城市总体规划》和《横琴总体发展规划》为**主体**；以环境宜居规划和控制性详细规划为**抓手**；以专项规划和幸福村居规划为**基础**的宜居城乡规划编制体系。

Zhuhai will establish an urban-rural planning formalation system featuring the overall urban planning , guided by the Conceptual Spatial Development Planning of Zhuhai, with the supports of the planning of environmentally livability and the detailed regulatory plan, and based on special planning as well as happiness village planning.



推行一套国际宜居城市指标体系 Construct a set of international livable city index system



按照突出重点、国际接轨、体现特色、树立标杆的原则：

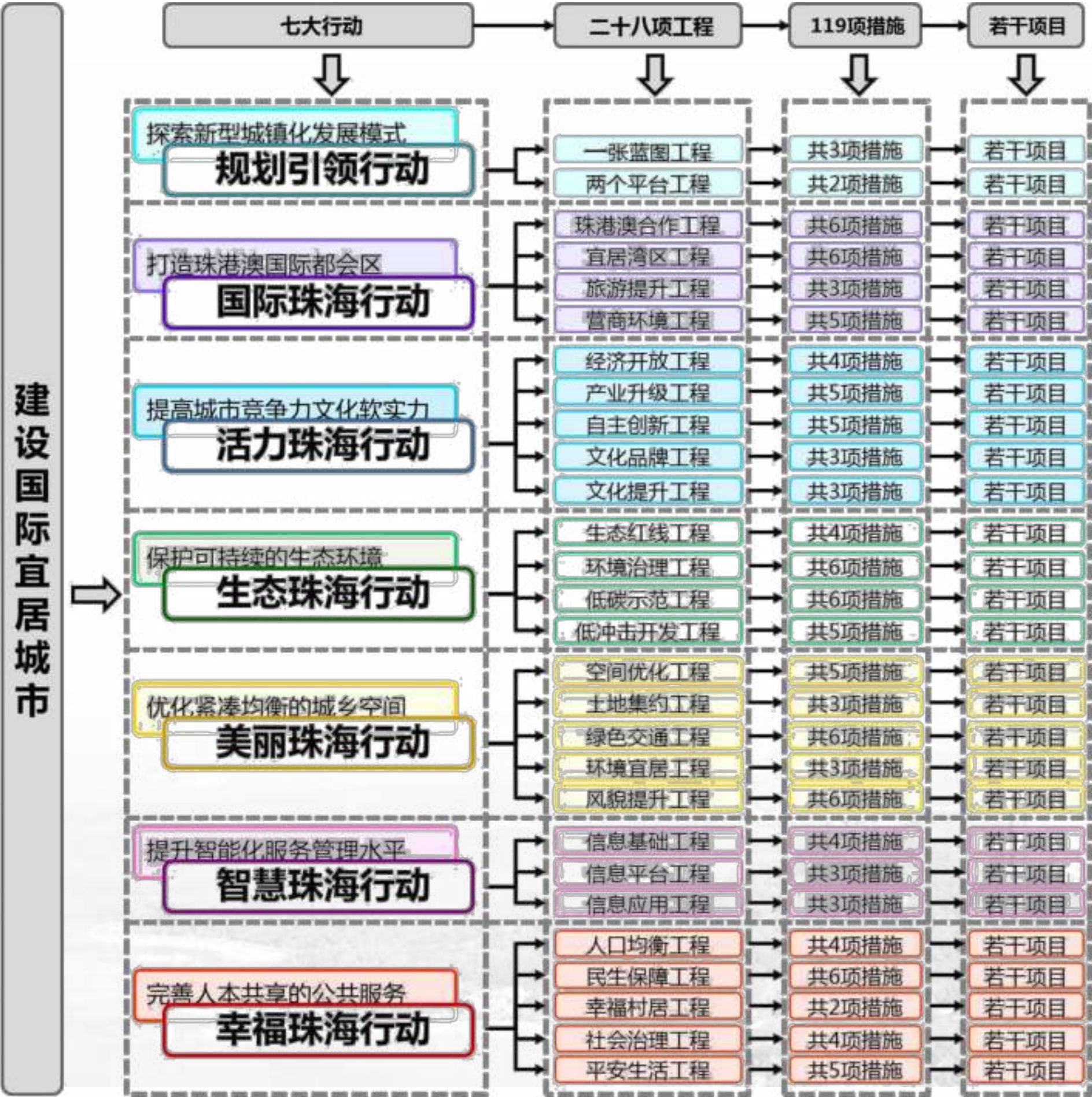
从人文国际多元、空间紧凑宜人生态安全持续、出行绿色通畅、服务优质共享、资源低碳集约、价值创新公平等七大类构建指标体系。

In line with the principles that focus on key points, be geared to international standards, embody with local characteristics and establish benchmark:

The construction of the index system according to seven aspects of targets: diverse culture, compact and active space, safe and sustainable ecological system, smooth and green transport, high quality public service, low-carben and intensive resources utilization, innovative and equal value.



制定一个国际宜居城市行动计划 Formulate an international livable city action plan



落实《中共珠海市委 珠海市人民政府关于实施新型城镇化战略建设国际宜居城市的决定》、《珠海建设国际宜居城市指标体系》的开展“规划引领、国际珠海、生态珠海、美丽珠海、低碳珠海、智慧珠海、幸福珠海”等七大行动、二十九项工程，将建设国际宜居城市的目标细化到具体的行动计划中。

Implement Zhuhai ‘s development targets by initiating seven key actions including 'Planning Guided, International Zhuhai, Ecological Zhuhai, Low-carbon Zhuhai, Smart Zhuhai, Happy Zhuhai' and twenty-nine projects.



# 珠海正在朝着……

## 国际、活力、生态、美丽、智慧、幸福的宜居城市

- Towards a International&Dynamic&Ecological&Beautiful&Smart&Happy City



中国第一个国际航展

——中国国际航空航天博览会

The First China International  
Aviation&Aerospace Exhibition

中国第一个F1标准国际赛车场

——珠海国际赛车场

The First China F1 standard  
Internation Circuit

中国第一个国际马戏节

——长隆国际马戏节

The First China International  
Circus Festival





国际沙滩音乐节

Zhuhai Beach Music Festival



北山国际音乐节

Beishan Music Festival



横琴长隆海洋王国

Hengqin Chimelong Ocean Kingdom





# 第十届·中国国际航空航天博览会

——2014年11月11-16日

The 10<sup>th</sup> China International Aviation&Aerospace Exhibition

Nov.11-16,2014,Zhuhai

## 欢迎各位莅临和指导 谢 谢！

Thank You For Your Attention !

