

区域交通之整合- 组织与规划程序、执行与主要产品 Integration of Regional Transportation – The Regional Planning Process

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The Trend of Urbanization

城 市 化 趋 势



Global Urban Population.. 1950



Urban Population

- Greater than 75% ●
- 50% - 75% ●
- 25% - 50% ●
- Less than 25% ●

Global Urban Population.. 1980



Urban Population

Greater than 75%

50% - 75%

25% - 50%

Less than 25%



Global Urban Population.. 1990



Urban Population

Greater than 75%



50% - 75%



25% - 50%



Less than 25%



Global Urban Population.. 2000



Urban Population

Greater than 75%

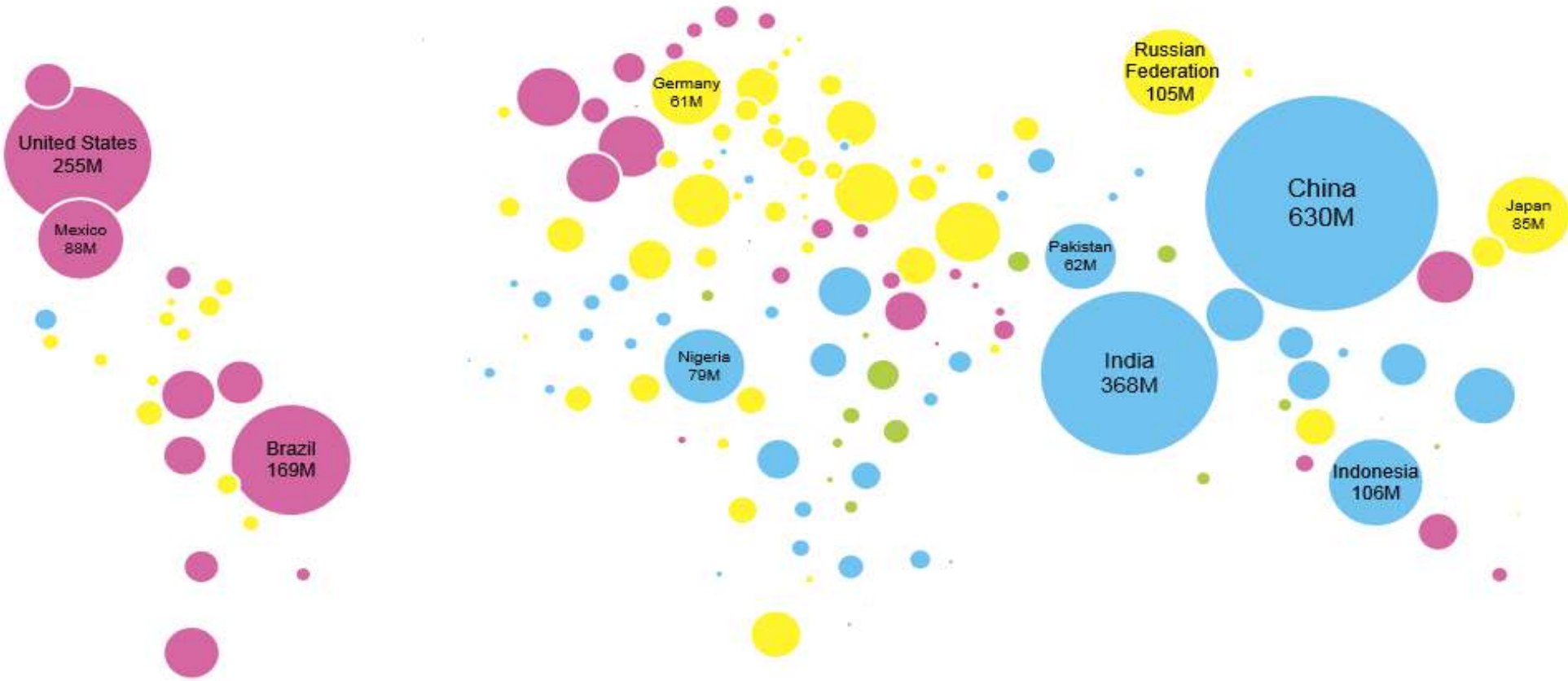
50% - 75%

25% - 50%

Less than 25%



Global Urban Population.. 2010

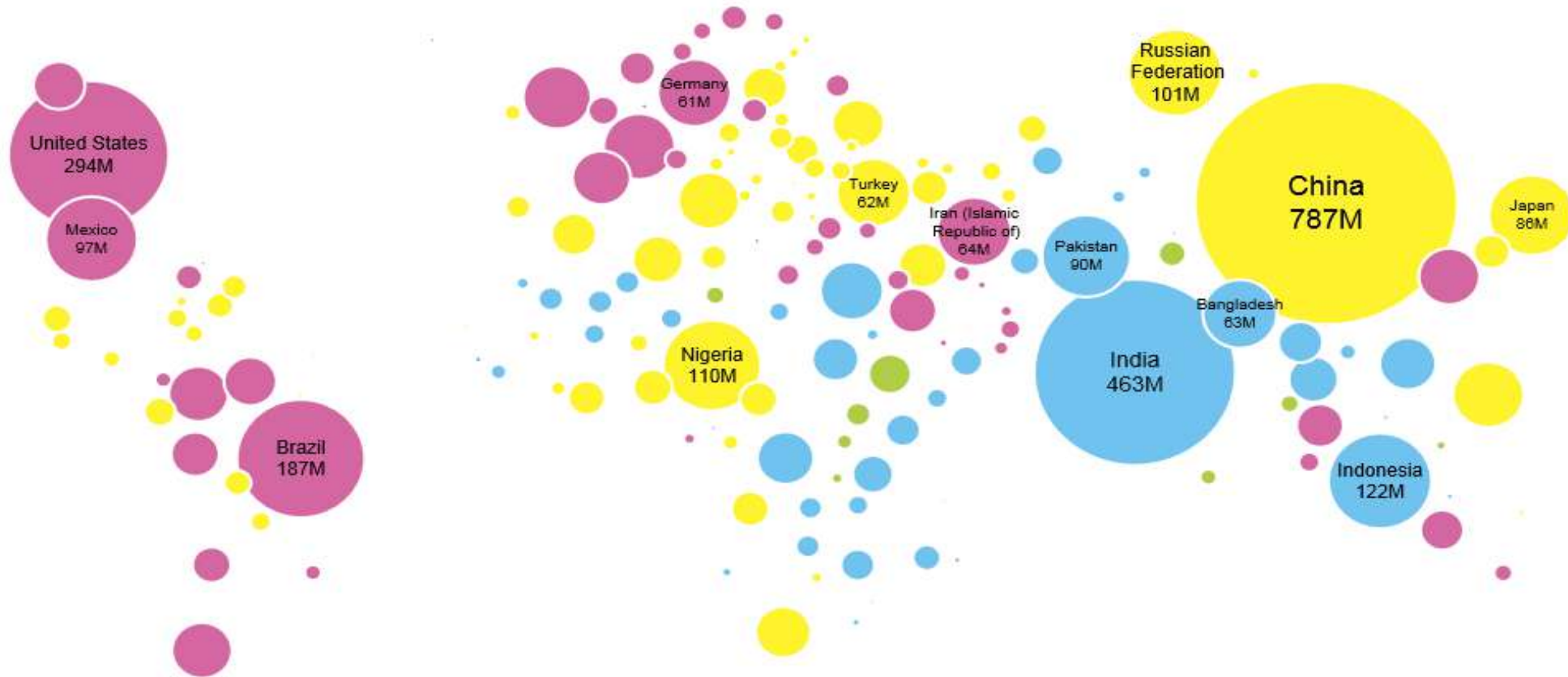


Urban Population

- Greater than 75%
- 50% - 75%
- 25% - 50%
- Less than 25%



Global Urban Population.. 2020



Urban Population

Greater than 75%

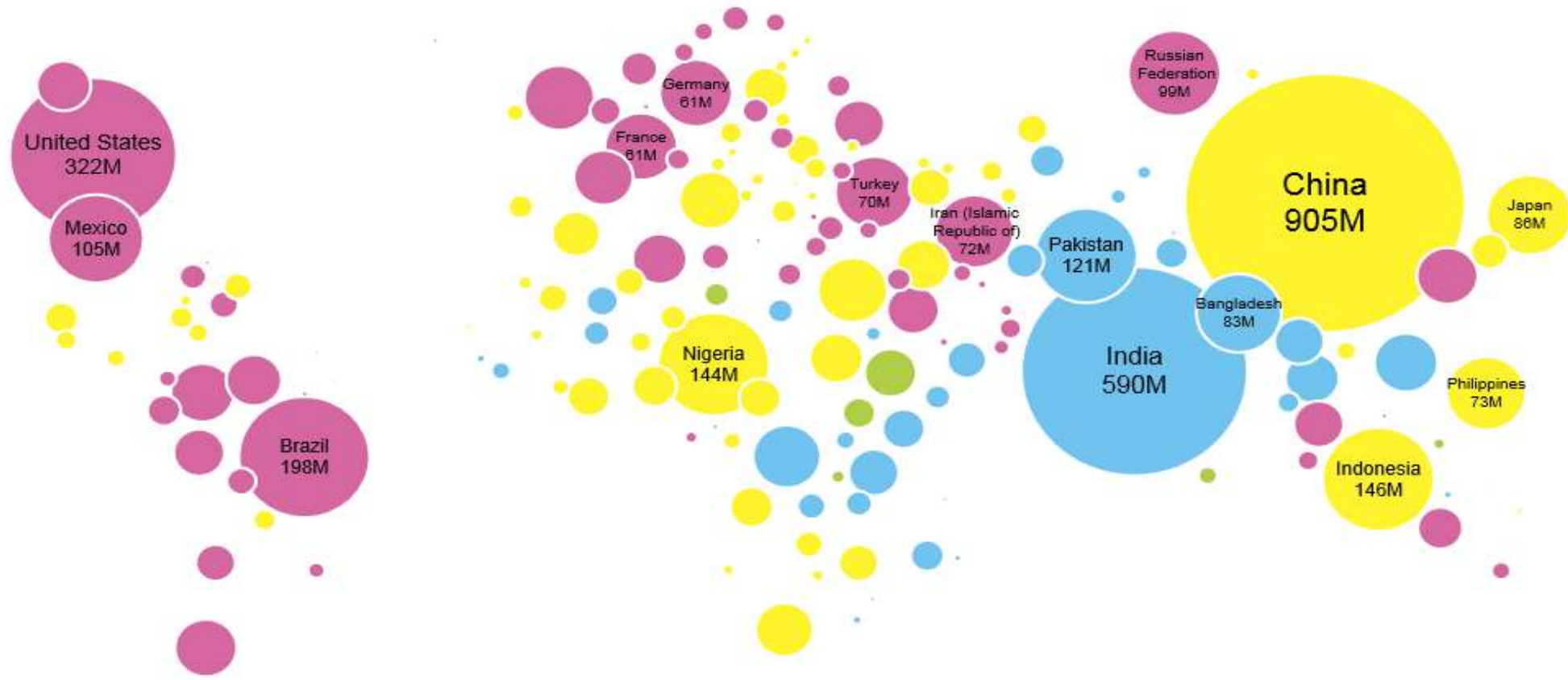
50% - 75%

25% - 50%

Less than 25%



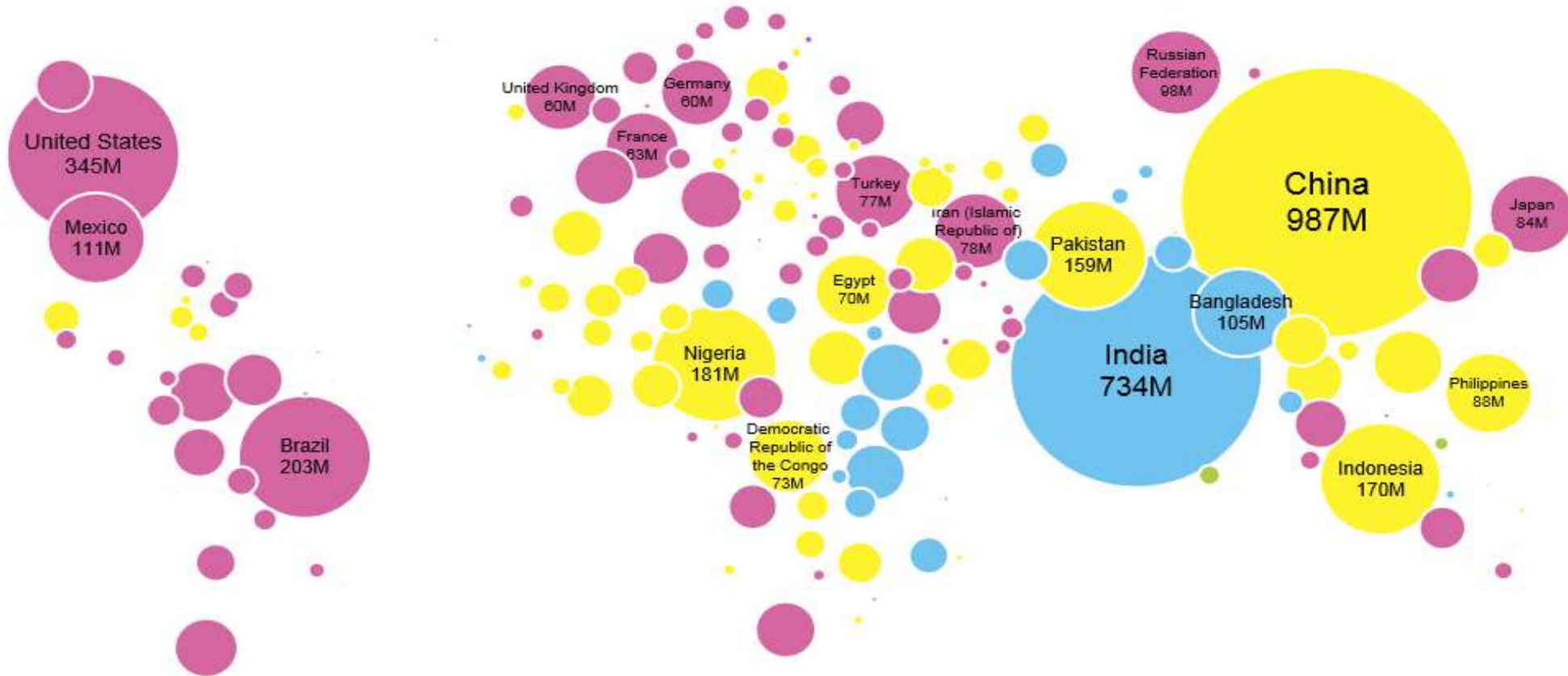
Global Urban Population.. 2030



Urban Population

- Greater than 75% ●
- 50% - 75% ●
- 25% - 50% ●
- Less than 25% ●

Global Urban Population.. 2040



Urban Population

Greater than 75%

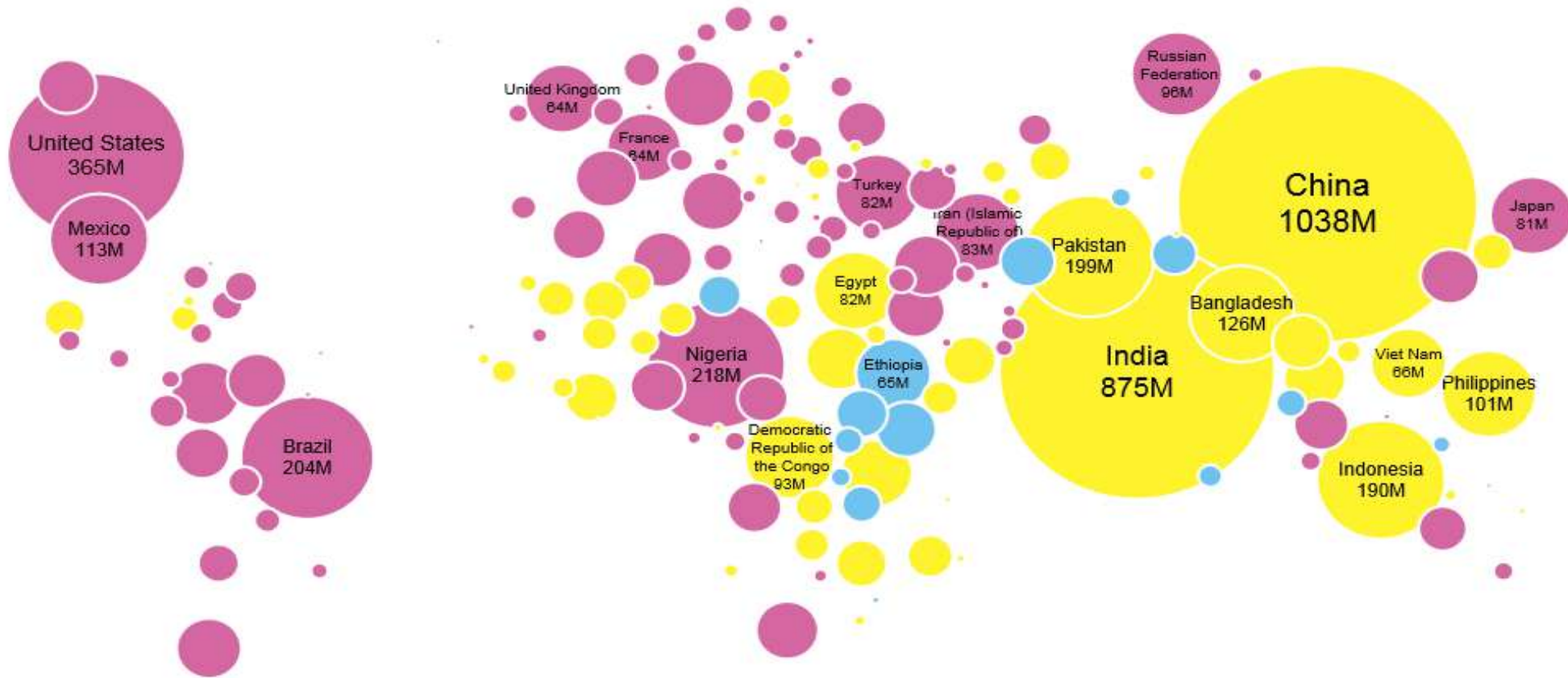
50% - 75%

25% - 50%

Less than 25%



Global Urban Population.. 2050



Urban Population

Greater than 75%

50% - 75%

25% - 50%

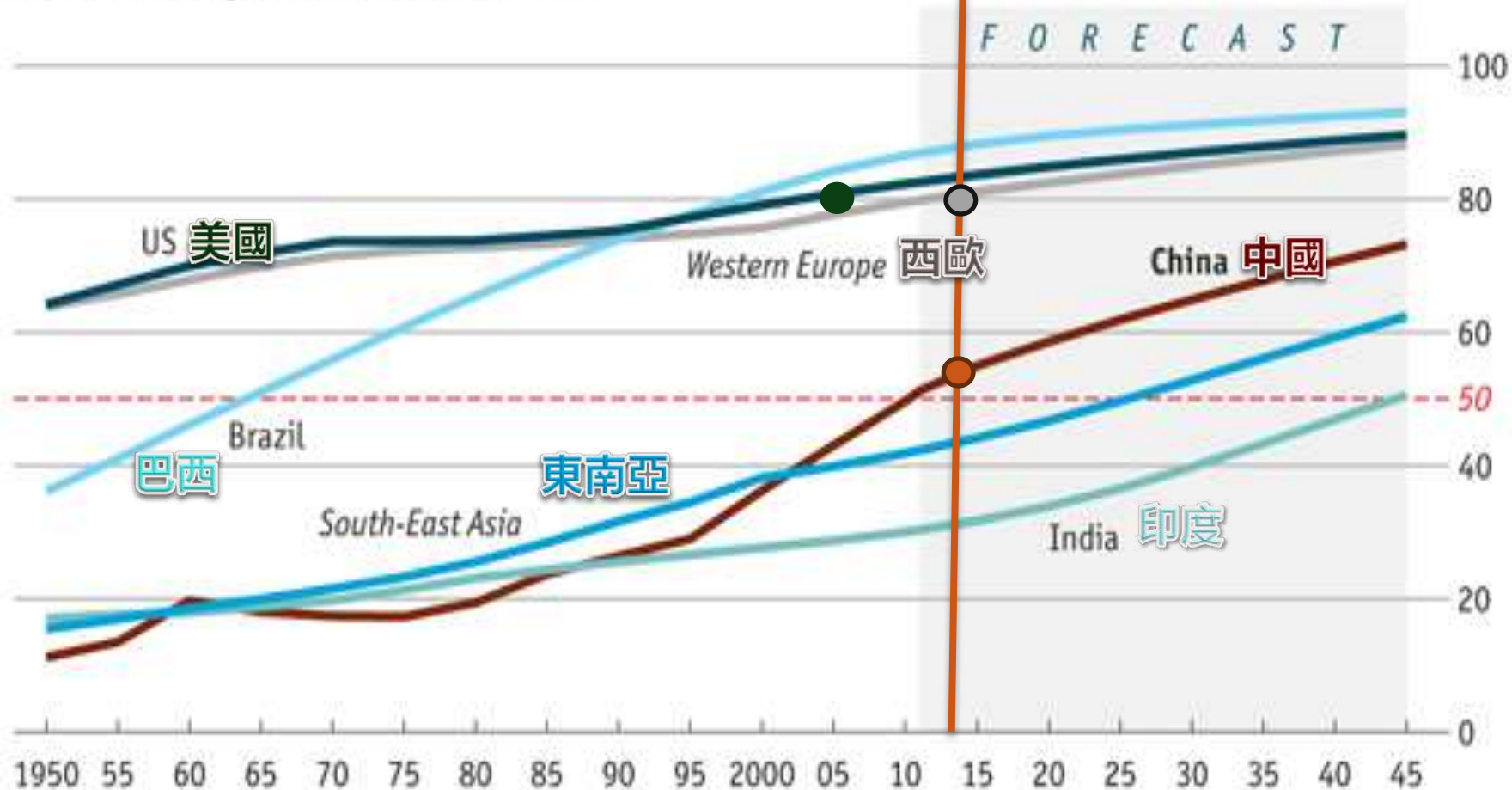
Less than 25%



全球城市化人口比.. 1950 – 2045

Urbanisation

Population living in urban areas, % of total



Sources: CEIC; UN Population Division; *The Economist*

都市人口占總人口之比例

英国城市化进程从 20% 到 40% 花了120年

United Kingdom took 120 years to urbanization from 20% to 40%



美国花了80年

United states took 80 years.

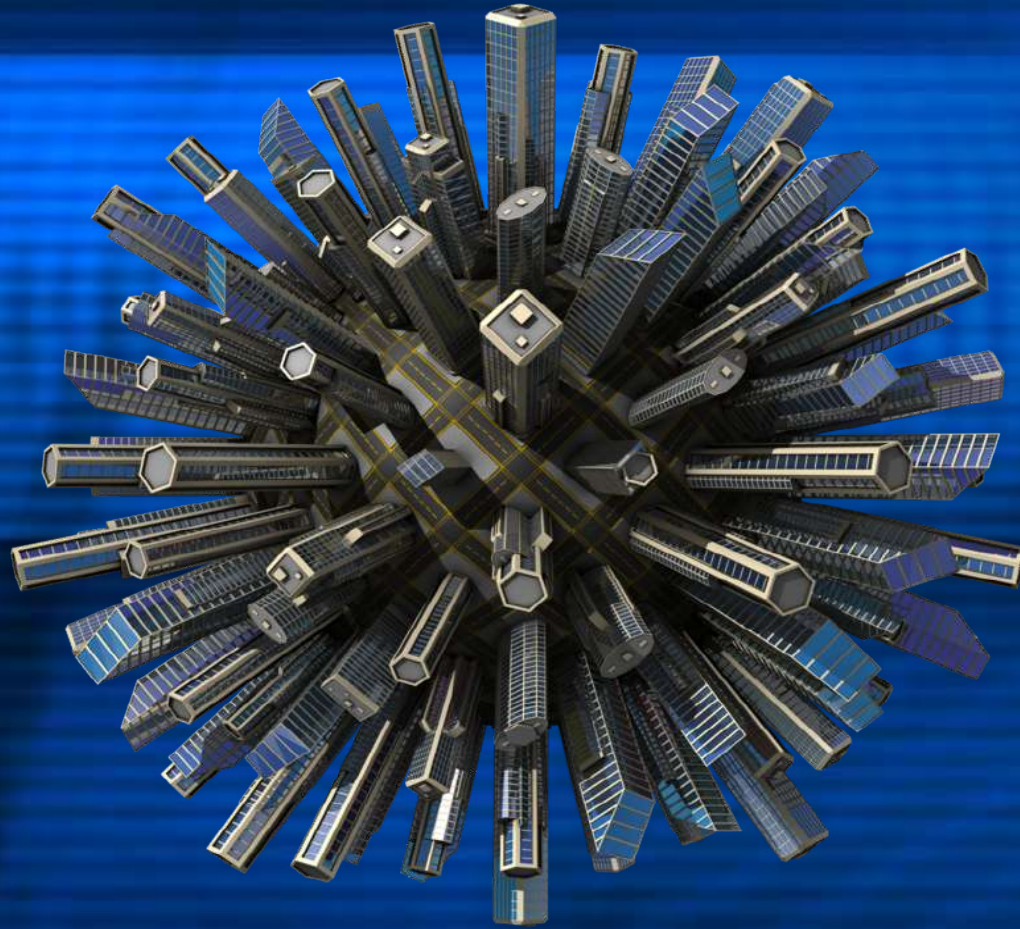


中国只花了20年

China took only 20 years.



全球的城市化进程加快, 人口、技术、服务越来越集中于城市。
*With the increase of global urbanization,
population, technology and services are getting concentrated in cities.*



- According to the 2010 Census, there were 302 cities with more than 1M population in China, while only 35 in Europe and 9 in the U.S.

中国正以每天消失100个村子的速度，快步进入城镇化
China is moving toward urbanization with a speed of
disappearing 100 villages per day

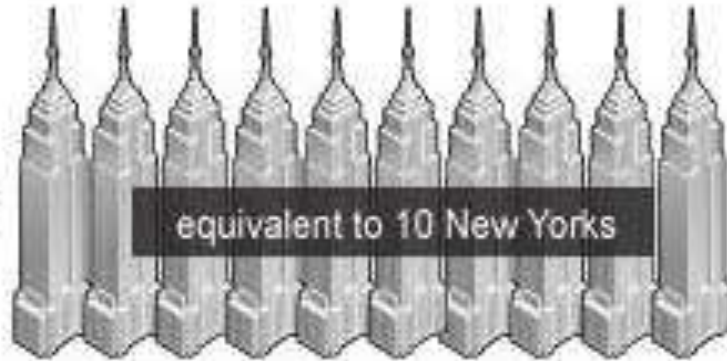


到2025年，中国将建造5万座高楼，相当于10个纽约市。
By 2025, China will build 40 billion square meters floor space,
50,000 high rise buildings, equivalent to 10 New York Cities.

CHINA

40

billion square meters of floor space needed over the next two decades



equivalent to 10 New Yorks



or the area of Switzerland

到2030年，中国将有170个城市需要地铁系统

By 2030, 170 Chinese cities need a subway system. China will build 28,000 km subway and 5 billion square meters roadway.



Beijing Subway No 1 Line
北京地鐵一号线

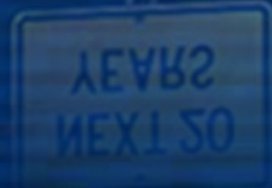


Beijing Subway No 4 Line
北京地鐵四惠地铁站

全球化和城市化测试了城市的极限

Globalization and Urbanization test the limitation of cities

- The continuous increase in globalization and urbanization has tested the limits of city's health, power, security, and transportation infrastructure.



高速经济增长和城市化 Rapid Economic Growth and Urbanization





growth 成长

Challenges & Strategies

都市圈面临的挑战与因应策略

『成长』将决定一个城市的未来

Growth will determine the future of a city



Regional Development in the U.S.

The Benefits of Regional Planning

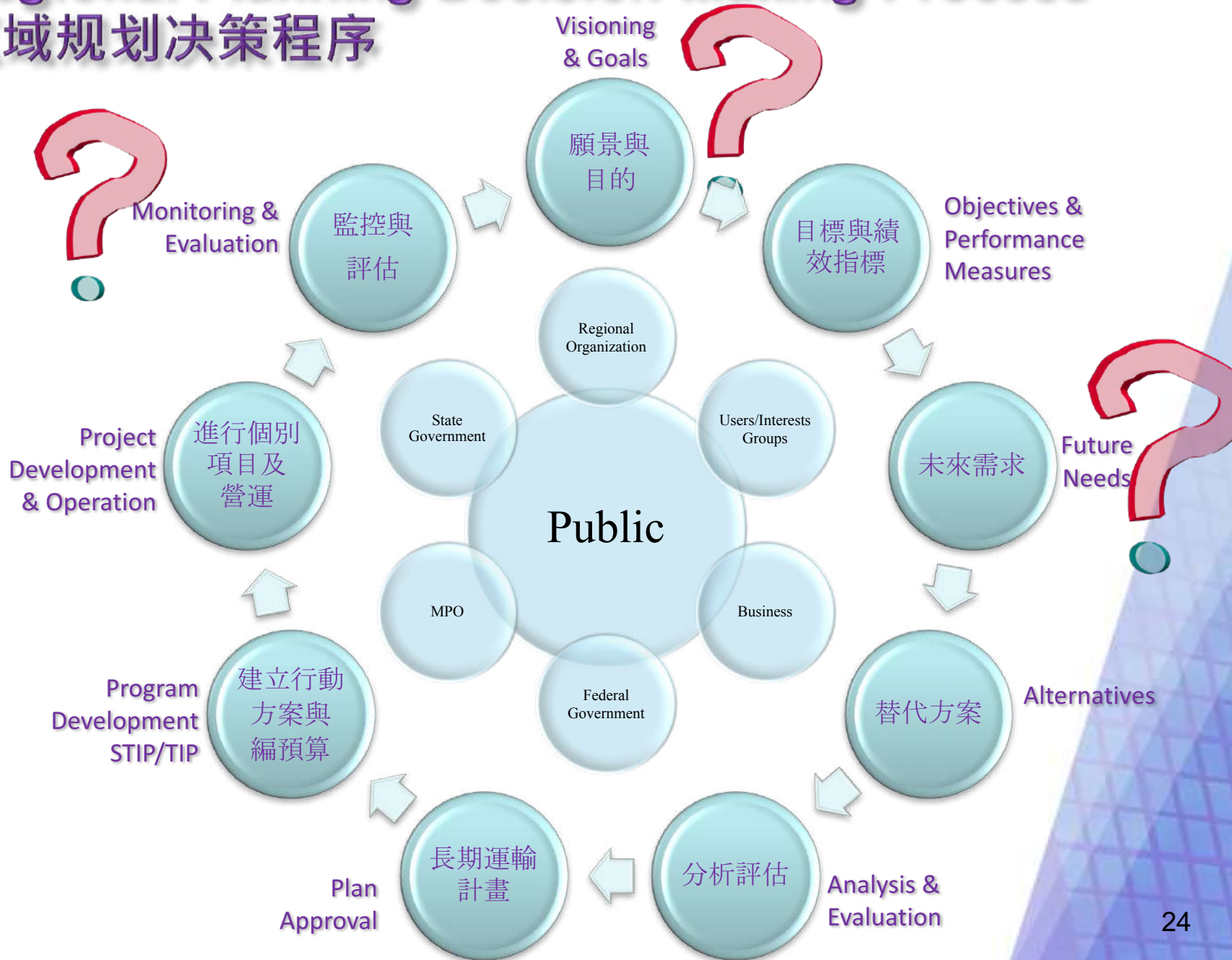
美国区域发展背景.. 区域规划的好处

- 許多區域性的問題(如空氣品質、交通運輸、洪水、經濟發展等)只有從區域的角度才能有效地規劃治理
- Many regional issues (such as air quality, transportation, flood, economic development, etc.) can only be effectively planned and governed from a regional perspective.
- 經濟規模
- Economies of scale
- 共享基礎建設
- Sharing Infrastructure
- 經濟發展
- Economic development
- 生活品質
- Quality of Life



Regional Planning Decision-Making Process

区域规划决策程序



Metropolitan Planning Organization

MPO 都市圈规划组织

- A transportation policy-making and planning body with representatives of local, state & federal government and transportation authorities . MPO is a platform for **continuing, comprehensive, and cooperative**, or “**3-C**” transportation planning and decision-making process in the U.S.
- 一个由联邦，州及地方政府和交通部门代表组成的交通决策与规划组织。 一个接受美国联邦资金补助，执行合乎**持续的,全面的,合作的**规划原则的城市规划平台。

都市圈规划组织背景 MPO Background

- 都市圈规划组织(MPO)是依据美国联邦法23 第134条款,为超过 50,000人的都市化地区规划并计划交通基础设施实施方案
- Metropolitan planning organizations (MPOs) are regional agencies charged under 23 US Code § 134 to plan and program transportation infrastructure in urban areas with more than 50,000 people.
- MPO 建立于都市化地区 (UZAs),它的范围由每十年一次的人口普查决定。都市化地区内的所有的土地面积,连同未来二十年所有预计将成为城市化的土地,必须纳入MPO规划区域。截至2009年, 484都市化地区内有385个法定MPO。
- MPOs are established for urbanized areas (UZAs), which are defined by the Census Bureau after each decennial Census. All of the land area inside a UZA—along with all land are projected to become urbanized in the next twenty years—must be included in the planning area of an MPO. An MPO is not required for each UZA. As of 2009, 385 MPOs have been designated for 484 UZAs.

都市圈规划组织背景 MPO Background

● 1962年联邦资助公路法案规定：

- 1965年7月1日后, 在105条款下, 部长将不会批准任何50,000人口以上都市区的任何项目, 除非他认为这种项目是建立在符合(3C)持续、全面的、由州和地方政府联合执行的交通规划程序基础上。
- 另外, 此法案限制了1.5%的规划和研究资金只能用于这些目的。如果不用于规划和研究, 地方将失去这笔资金。此前, 州可以要求这笔资金用于建设方面。这个条款**为交通规划建立了一个永久的、可保证的资金来源**。另外, 此法案规定州可以将另外的0.5%的资金用于规划和研究。

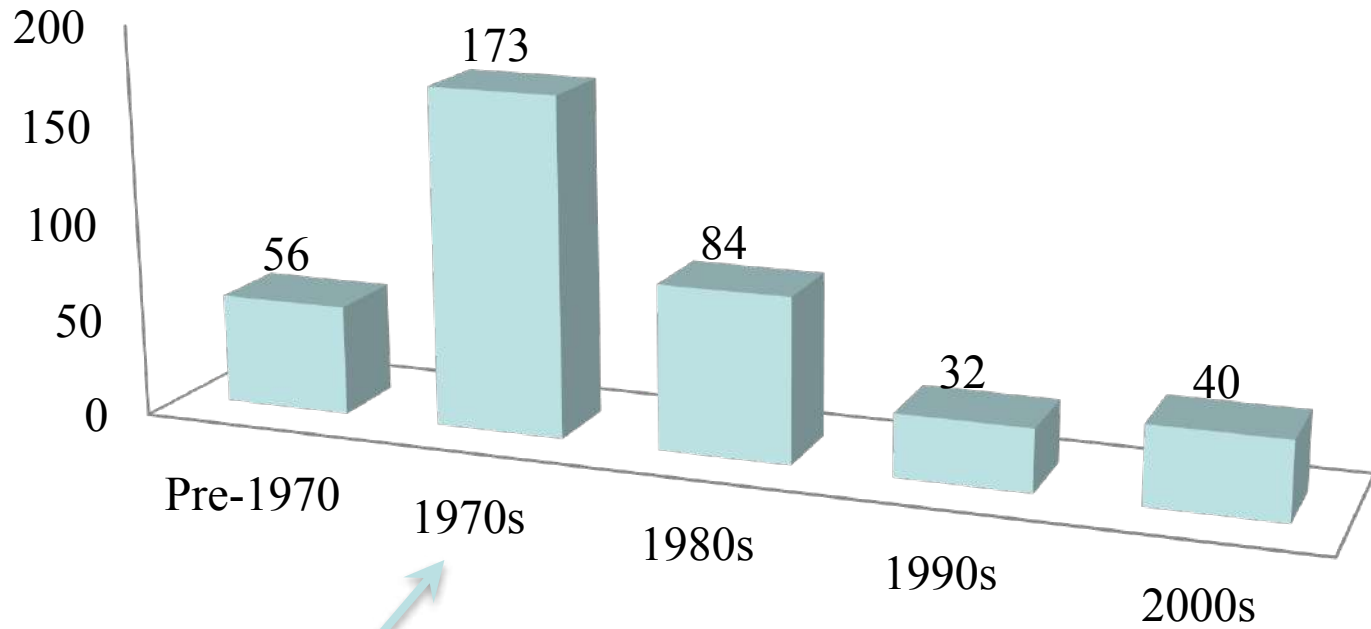
● 1962 Federal aid Highway Act

- After July 1, 1965, under section 105, the DOT Secretary **will not approve any project in urbanized area with more than 50,000 population**, unless he considers that such projects are **built on a (3C) continued, comprehensive, cooperative transport planning procedure**.
- In addition, the Act limits **the 1.5% of planning and research funds can only be used for these purposes**. If not used for planning and research, local agencies will lose the money. State can use the funds on construction projects in the past. This provision **established a permanent, guaranteed funding source for transportation planning**. In addition, this Act required **States provide 0.5% funding for planning and research**.

都市圈规划组织背景 MPO Background

- 依据美国人口普查局1950年普查开始使用的定义,美国的城市化地区在是指由至少有**每平方英里1000名居民(386.1人/平方公里)** 人口密度连续的普查街廓组群,与任何围绕着这一核心具有密度至少**每平方英里500居民(193.1人/平方公里)**的普查街廓组群。
- 城市化地区的划定,**不考虑政治上的边界**。
- Urban areas in the United States are defined by the U.S. Census Bureau as contiguous census block groups with a population density of at least **1,000 inhabitants per square mile (386.1 /km²)** with any census block groups around this core having a density of at least **500 inhabitants per square mile (193.1 /km²)**.
- Urban areas are delineated without regard to political boundaries.

都市圈规划组织背景 MPO Background



■ Number of MPOs formed in different time period

1973 Federal Aid Assistant Act

Metropolitan Planning Organization: Required Documents

都市圈规划组织法规要求的文件

MPO接受联邦资金来执行合乎**持续的,全面的,合作的,或3C规划原则的规划程序**。MPO的核心工作是通过五至七个法规要求的文件。

1. **都市圈运输计划或长期运输计划(MTP,RTP或LRTP)** 指导本地区至少在未来二十年的愿景。
2. **统一规划工作方案(UPWP)** 描述MPO的规划预算。
3. **交通改善实施方案(TIP)** 包括一系列在五年内兴建的工程项目。

MPOs receive federal funds to perform a planning process that **is continuing, comprehensive, and cooperative, or "3-C."** At the core of MPO operations are the adoption of five to seven documents required by statute.

1. Metropolitan Transportation Plan (MTP), Regional Transportation Plan (RTP), or Long Range Transportation Plan (LRTP). ... includes long term and short term strategies and actions to develop a multimodal transportation which can move people and goods effectively
2. Unified Planning Work Program includes planning work, supportive planning research, and a public participation plan
3. Transportation Improvement Program (TIP) includes a series of projects with workable funds to implement in the next five years.

Metropolitan Planning Organization: Required Documents

都市圈规划组织法规要求的文件

根据联邦法律,有些MPO还需要执行其他的任务。

- 在200,000人以上的都市化地区必须完成一个**壅堵管理程序/系统(CMP或CMS)**。
- 在不符合空气质量标准地区内的MPO也必须执行RTP 及TIP的**空气质量达标分析**。MPO也可能需要执行其它由州法规定的工作。
- MPO也可能需要执行其它由州法规定的工作。

Some MPOs are required to perform additional tasks under federal law.

- MPOs in urbanized areas with 200,000 people or more must complete a **Congestion Management Process/System (CMP or CMS)**.
- MPOs within areas that do not meet air quality standards must perform **conformity analyses** to accompany their MTP and TIP. Additional duties may be assigned to an MPO by state statute.
- MPO may also implement other work required by State law.

Regional Planning Process: Major Products

	Who Develops?	Who Approves?	Time Horizon	Content	Update Requirements
UPWP	MPO	MPO	1 or 2 Years	Planning Studies and Tasks	Annually
MTP	MPO	MPO	20 Years	Future Goals, Strategies, and Projects	Every 5 Years 4 years for nonattainment and maintenance areas
TIP	MPO	MPO/ Governor	4 Years	Transportation Investments	Every 4 Years
LRSTP	State DOT	State DOT	20 Years	Future Goals, Strategies, and Projects	Not Specified
STIP	State DOT	US DOT	4 Years	Transportation Investments	Every 4 Years

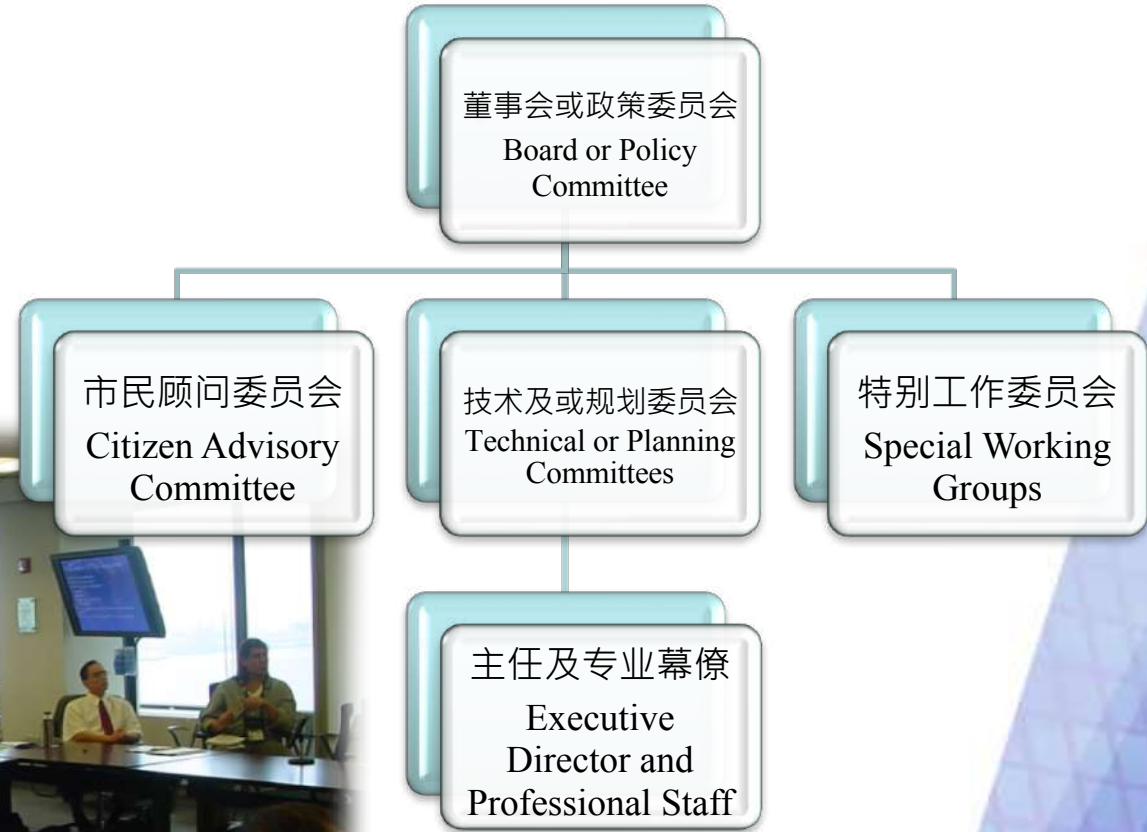
Five Core Functions of a MPO

都市圈规划组织的五个核心功能

- **Establish a setting** 建立一套公平有效的都市圈决策机制: Establish and manage a fair and impartial setting for effective regional decision making in the metropolitan area.
- **Evaluate alternatives** 评估都市圈可选择的方案: Evaluate transportation alternatives, scaled to the size and complexity of the region, to the nature of its transportation issues, and to the realistically available options. (These evaluations are included in the Unified Planning Work Program or UPWP).
- **Maintain a Long-Range Transportation Plan (LRTP)** 维持一个都市圈长期运输计划: Develop and update a long-range transportation plan for the metropolitan area covering a planning horizon of at least twenty years that fosters (1) mobility and access for people and goods, (2) efficient system performance and preservation, and (3) quality of life.
- **Develop a Transportation Improvement Program (TIP)** 建立一个都市圈交通工程改善计划: Develop a program based on the long-range transportation plan and designed to serve the area's goals, using spending, regulating, operating, management, and financial tools.
- **Involve the public** 公众参与: Involve the general public and all the significantly affected sub-groups in the four essential functions listed above.

MPO Governance

MPO治理: 都市圈规划组织结构



MPO Board or Policy Committee

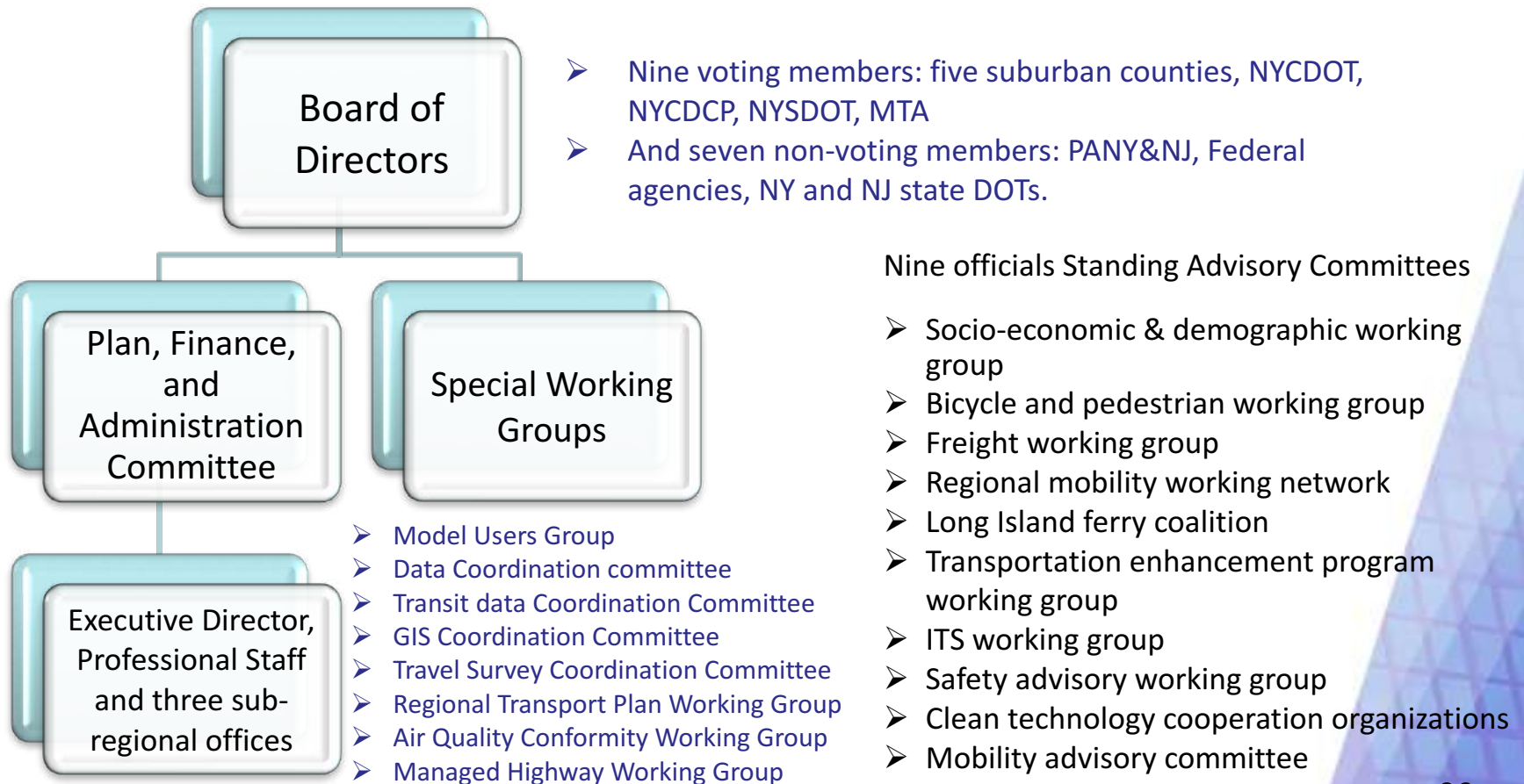
MPO治理：董事会或政策委员会

- 是MPO的最高决策部门,包括地方政府民选或任命官员、不同运具的代表、州政府代表(交通厅及环保厅)、以及不具投票权的委员,如联邦交通部不同部门代表及商会。
- 除了少数例外(如奥瑞冈州波特兰市),并非由选举选出。
- 联邦法并没有规定MPO董事会的组成、非投票成员、顾问委员会、及董事会成员的投票权力。
- MPO Board is the decision-making body of a MPO, comprised of **elected or appointed government officials, representatives of different modes, State government representatives**, and **non-voting members**, such as Federal agencies and Chamber of commerce.
- Other than a few exceptions (Portland, OR) the Board members are not elected.
- Federal law does not require the composition of MPO Board, non-voting members, Advisory Board, and voting powers of the Board members.

New York Metropolitan Transportation Council .. Organization Structure

纽约都市圈规划委员会 .. 组织结构

- Designated by NYS Governor in 1982 as the MPO for the NY Metropolitan area.
- Board of Directors is made up of elected or appointed government officials.

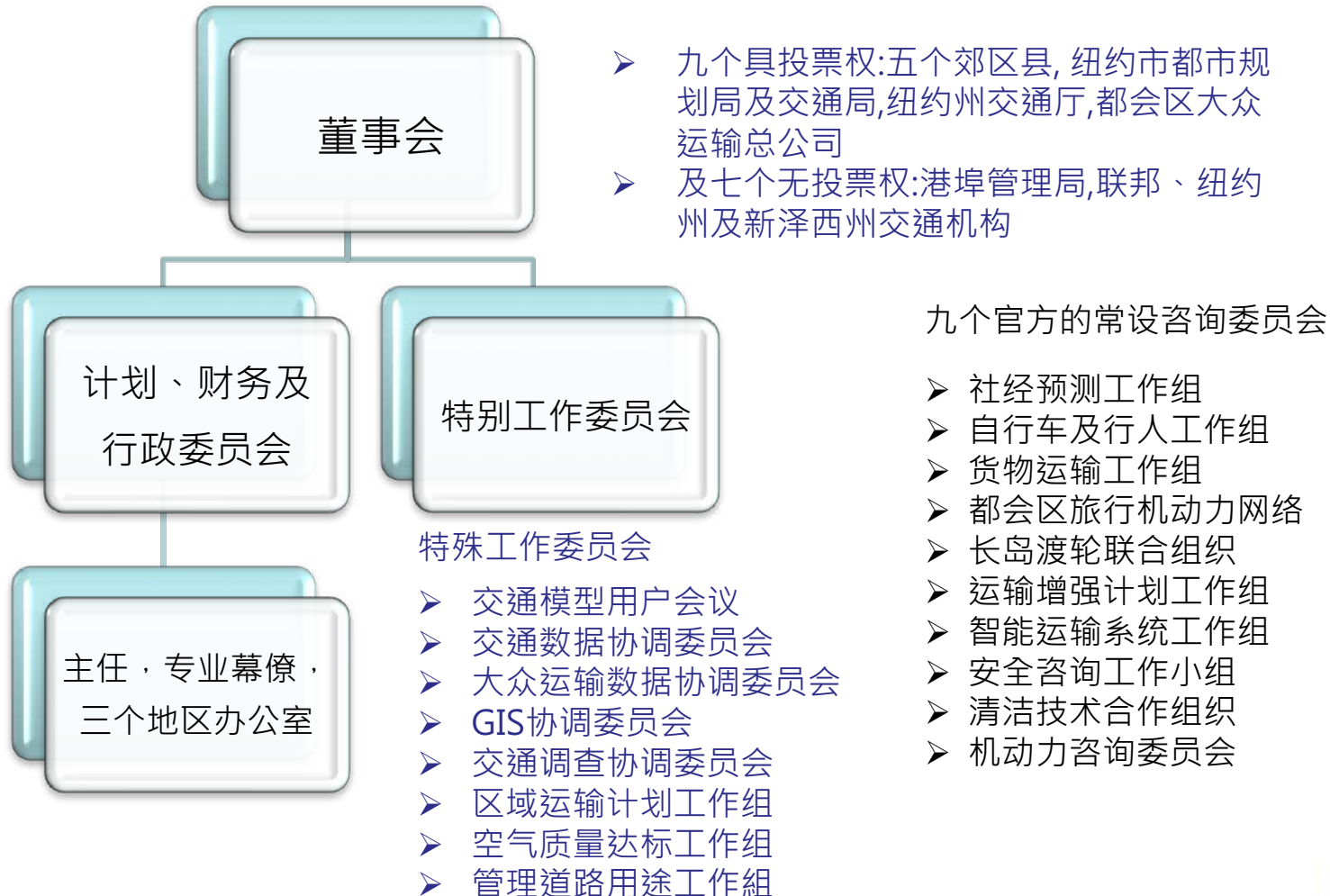


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New York Metropolitan Transportation Council

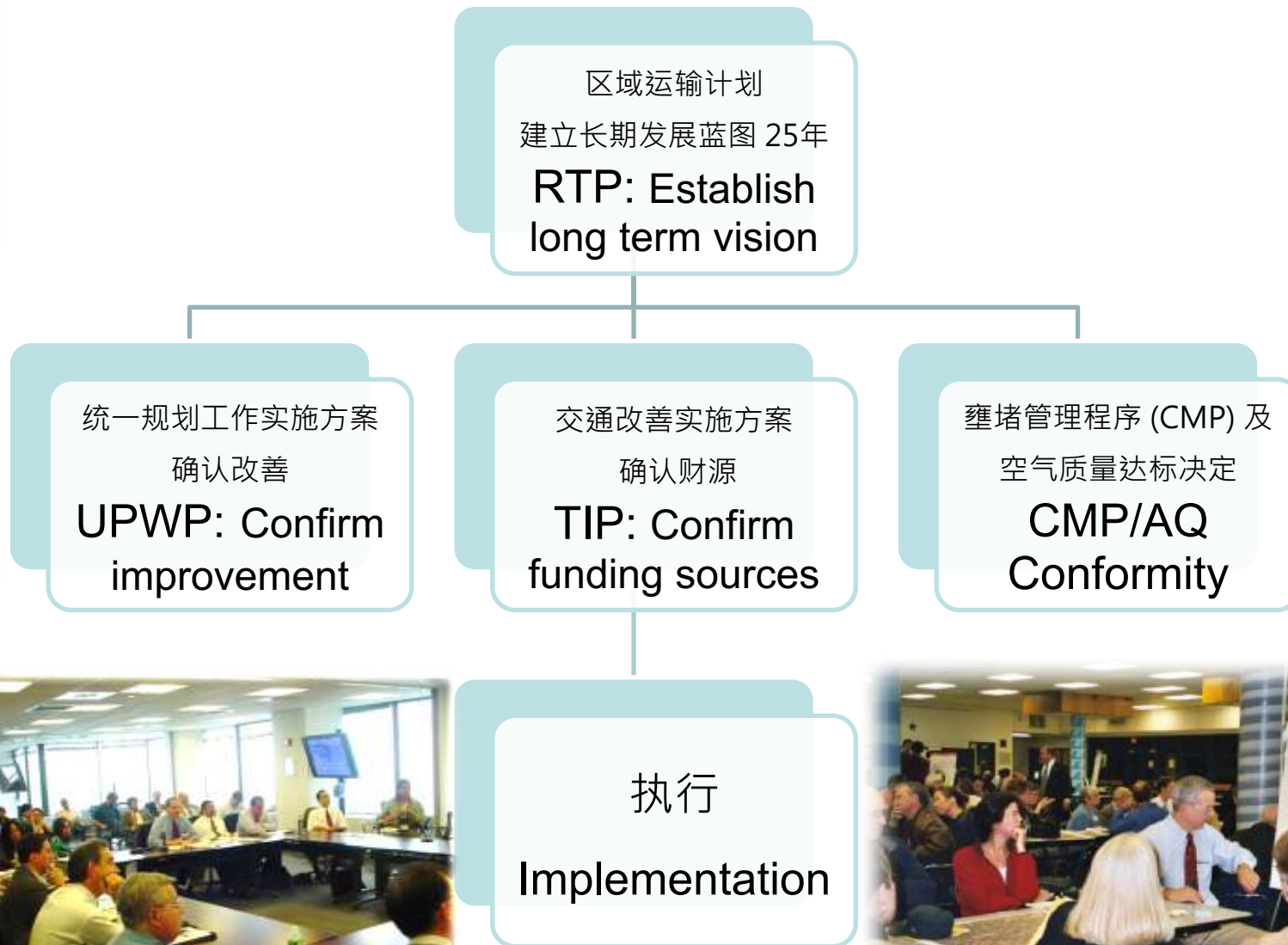
纽约都市圈规划委员会 .. 组织结构

- 由纽约州州长于1982年指定为纽约都会区的MPO
- 董事会由的民选或政府机构负责人组成



New York Metropolitan Transportation Council .. Planning Process

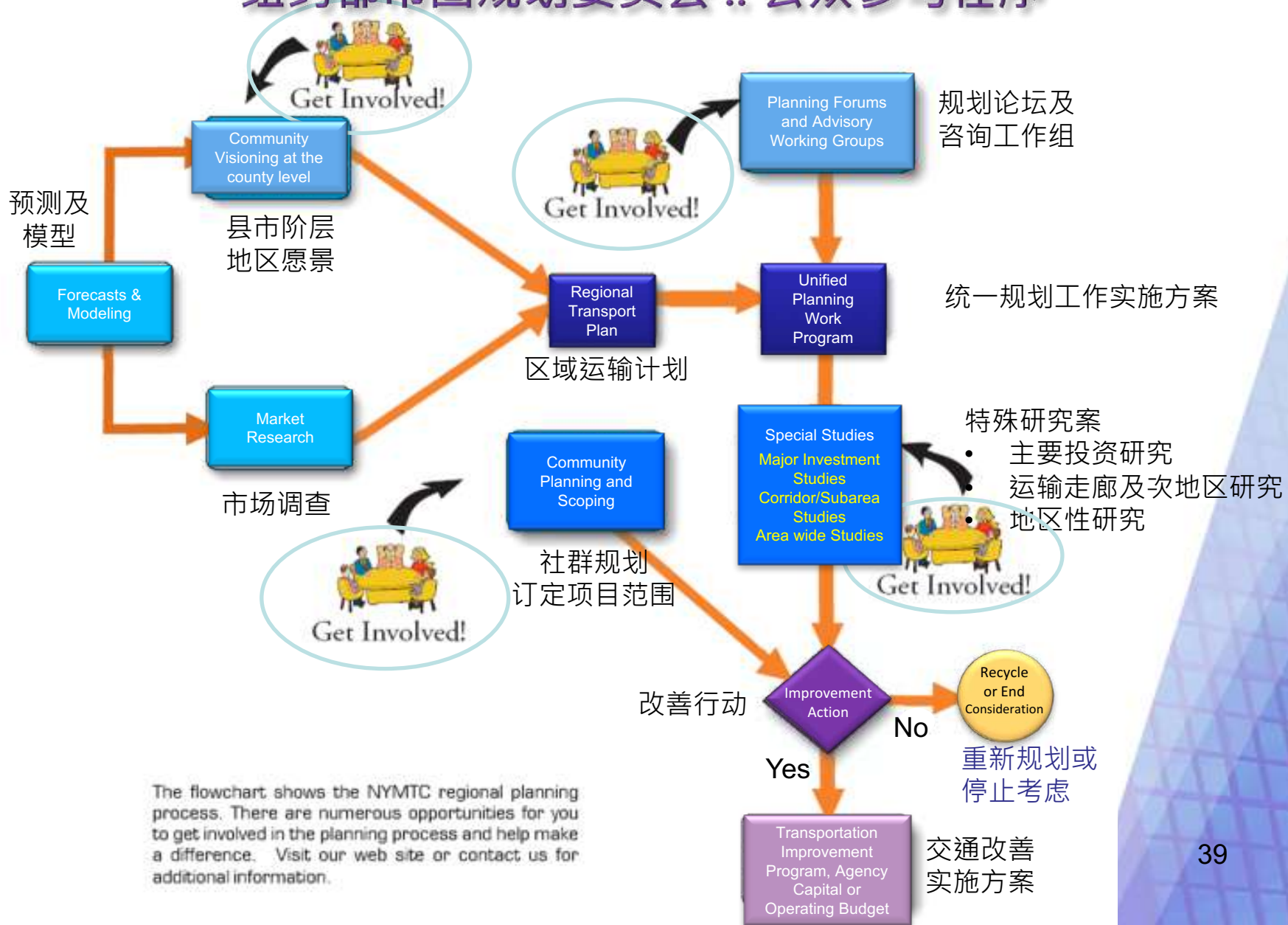
纽约都市圈规划委员会 .. 规划程序



New York Metropolitan Transportation Council ..

Public Participation

纽约都市圈规划委员会 .. 公众参与程序



The flowchart shows the NYMTC regional planning process. There are numerous opportunities for you to get involved in the planning process and help make a difference. Visit our web site or contact us for additional information.

Planning Forums and Advisory Working Groups
规划论坛及咨询工作组

Unified Planning Work Program
统一规划工作实施方案

Special Studies
Major Investment Studies
Corridor/Subarea Studies
Area wide Studies
特殊研究案
• 主要投资研究
• 运输走廊及次地区研究
• 地区性研究

Recycle or End Consideration
重新规划或停止考虑

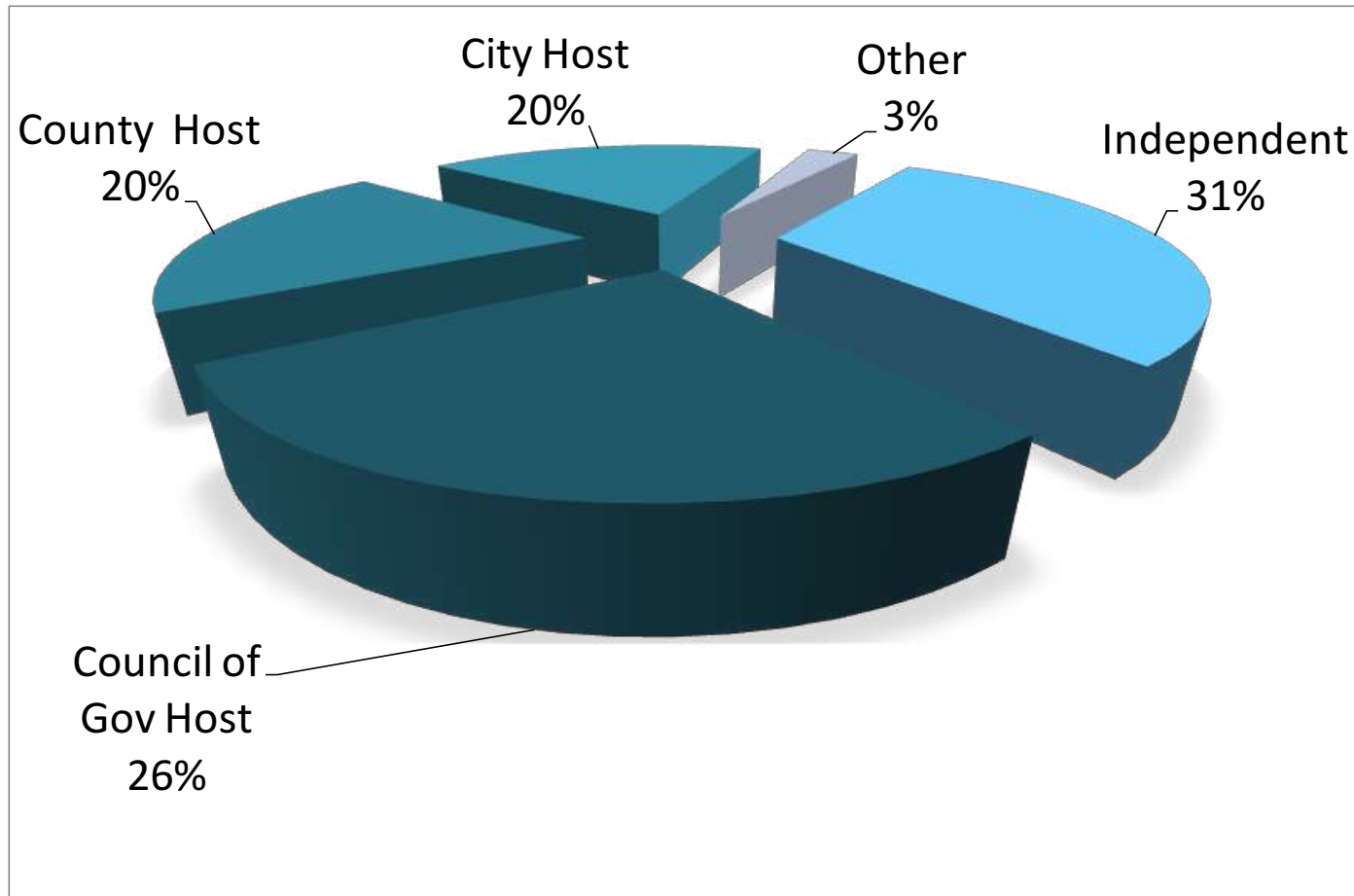
Transportation Improvement Program, Agency Capital or Operating Budget
交通改善实施方案

MPO Governance: Technical Committee and Professional Staff

- Most MPOs have a Technical Committee composed by **technical staff from member agencies**, working with MPO staff and provide recommendations of budget, projects, analysis and research to the Board.
- Each MPO has **a group of dedicated staff**, responsible for monitoring and managing planning process to ensure the compliance with Federal requirements, **collecting and sharing data, forecasting socioeconomic development, developing and applying models, AQ conformity analysis, and public participation.**
- Most MPOs have special purpose committees as the platform for stakeholders to discuss related issues.

MPO Governance: Management Structure

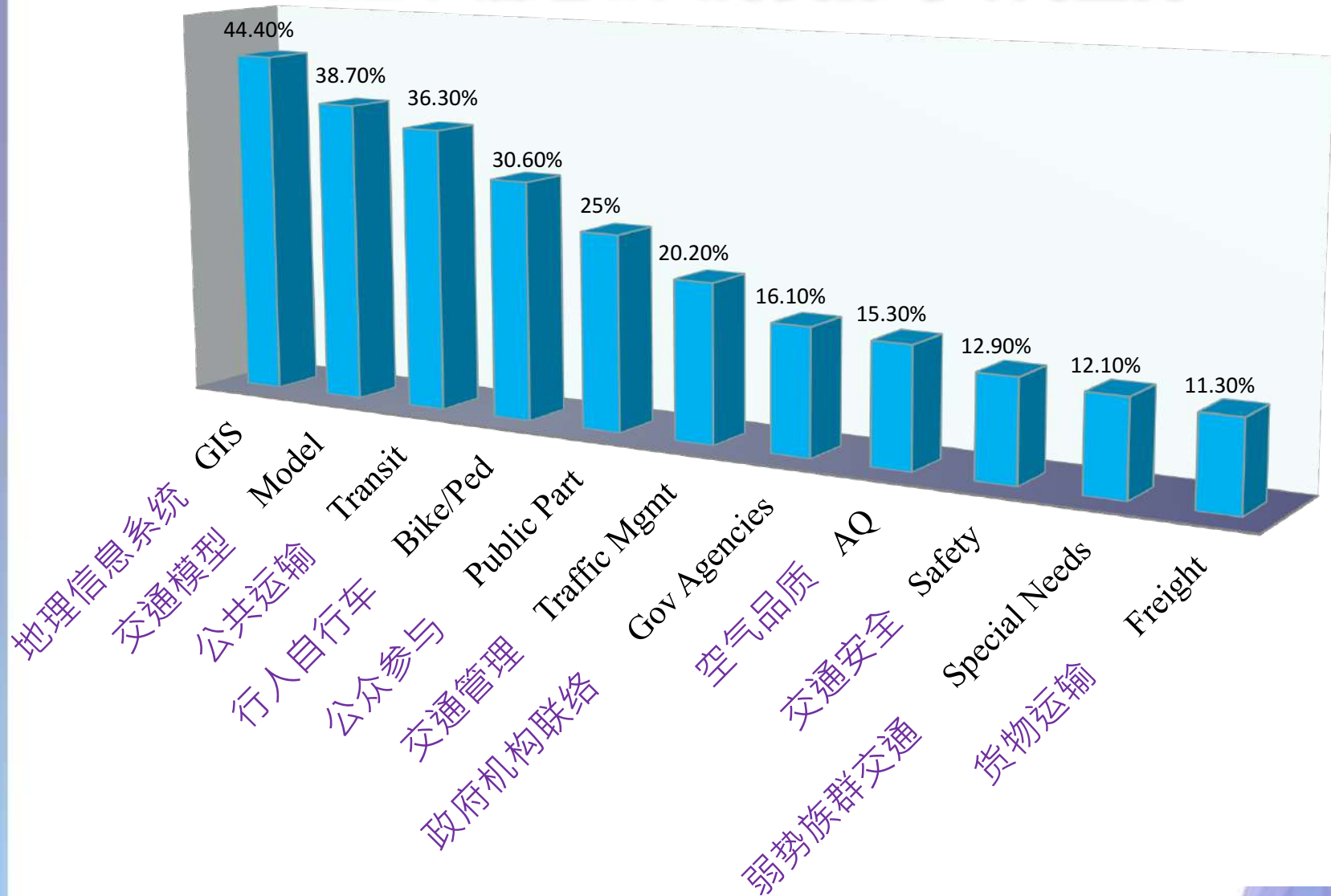
- 69% of MPOs have hosting agencies, 31% MPOs are independent.



- Other hosting agencies include SDOT, University, Transit Company, etc.

MPO Governance: Special Tasks

MPO 治理 .. 人力资源与专门业务



MPO Major work and Issues

MPO 主要工作及规划议题

- 空气质量(达标程序)
- 壅堵管理程序
- 财务规划及编列预算
- 货物移动
- 土地使用与交通整合
- 系统性能指针
- 规划及环境连锁关系
- 公众参与
- 安全及保安
- 系统管理及营运
- 科技在规划的应用(模型,智能运输系统,地理信息系统、可视化)
- 民权及环境正义
- 交通资产管理
- Air quality conformity analysis
- Congestion management procedure
- Financial planning and budgeting
- Goods movement
- Integration of land use and transportation
- System Performance Measures
- Connection between planning and environment
- Public participation
- Safety and security
- Technology applications in planning (model, ITS, GIS, visualization)
- Civil rights and environmental justice
- Transportation asset management

MPO Major Planning Issues: Air Quality

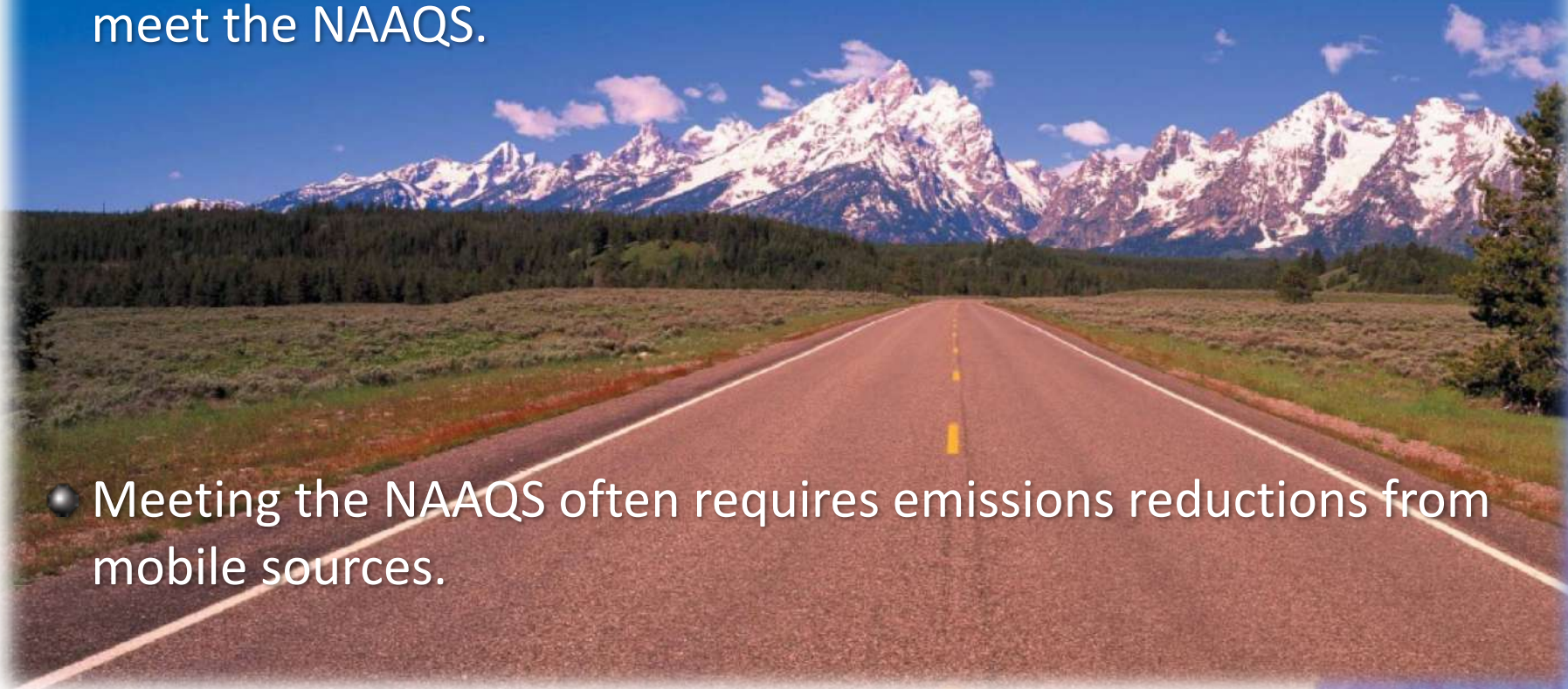
How do we solve the traffic congestion while improving air quality?

我們如何在解決交通擁擠的同時，改善空氣品質？



MPO Major Planning Issues: Air Quality

- Transportation conformity is a way to ensure that Federal funding and approval are given to those transportation activities that are consistent with air quality goals.
- It ensures that these transportation activities do not worsen air quality or interfere with the "purpose" of the SIP, which is to meet the NAAQS.
- Meeting the NAAQS often requires emissions reductions from mobile sources.



Transportation Conformity & Pollutants

运输达标规划程序及污染物

运输达标规划程序应用于
四项空气污染物

- 臭氧
- 一氧化碳
- 二氧化氮
- 可吸入颗粒物

Transportation conformity applies to
the following criteria pollutants:

- ◆ Ozone,
- ◆ Carbon monoxide (CO),
- ◆ Nitrogen dioxide (NO₂), and
- ◆ Particles with an aerodynamic diameter less than or equal to 10 microns (PM-10).

CAA Requirements

美国洁净空气法案的要求

根据美国洁净空气法案，区域运输计划(RTP)、运输改善方案(TIP)以及个别项目不能：

- 产生新的空气质量标准违规；
- 增加现有违规的发生频率或是严重性；或是
- 延误达到国家空气质量标准。

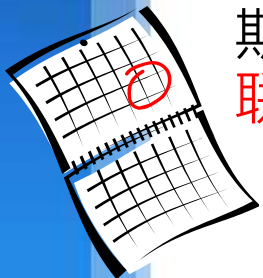
According to the CAA, transportation plans, programs, and projects cannot:

- Create new NAAQS violations;
- Increase the frequency or severity of existing NAAQS violations; or
- Delay attainment of the NAAQS.

Transportation Conformity Requirements

运输达标规划程序的要求

- 每隔三年，每一未达标准的地区必须展示其移动污染源的目前及未来年的空气污染分析都合乎州执行计划的**污染预算**。
 - 空气污染分析必须使用环保署的**空气污染模式**及**最佳可得到的交通数据**(车辆行车里程，车速，车种混合比例等)。
 - 任何地区不能展示能够合乎州执行计划的空气污染预算，则进入『**权利中止**』期，同时**大部分该地区的联邦补助款也停止拨款**。
- Every three years each maintenance area must demonstrate **“CONFORMITY”** by showing that the mobile sources meet the SIP budget for the current and future analysis years
 - The analysis must use the EPA Emissions model and the best transportation data (VMTs, speeds, vehicle mix, etc.) available
 - An area not able to demonstrate conformity goes into “LAPSE” and **most federal money stops**



Regional Planning & Governance

区域规划与治理

- 区域规划组织(MPO, COG, RPO)的组织型态因地制宜，并没一个有最好的安排模式。
 - MPO有关的联邦法案有很大的弹性。
 - 区域内的居民、工业、经济、及文化，会成长、变迁、衰退；地方政府的大小及影响力会随时间变迁；MPO组织也会随着人员的职位改变、领导人离职、及科技的进步而改变。
 - 一个健康的MPO必须要定期的检视组织结构及人力资源
- The type of Regional Planning Organizations (MPO, COG, RPO) need to adapt to local conditions. There is no best arrangement.
 - Related Federal laws provide great flexibility.
 - Residents within a region, industry, economy, and culture, will grow, change, or decline; the size and influence of local government will changes over time; MPO organization will also change with personnel changes and the advancement of technology.
 - A healthy MPO must regularly view the organizational structure and human resources.

Lessons Learned Opportunities & Challenges

区域治理的机遇与挑战..美国经验总结

- 一个全面性、合作性、连续性 (comprehensive, cooperative and continuing (3-C) planning process)的规划程序对一个城市的整体城市发展是否有利?
- 道理很简单，如何执行才是真正的挑战！
- Is a comprehensive, cooperative, continuity (3-C) planning process favorable for the integrated transportation planning of urban development in China?
- The reason is simple, how to 额 implement is a real challenge!



Lessons Learned

Opportunities & Challenges

区域治理的机遇与挑战..美国经验总结

- 从区域规划的角度，评估可选择的改善方案；
 - 持一个区域性长期运输计画以及一个区域性交通工程改善执行方案以达到区域共享愿景；
 - 建立区域交通规划及决策资讯中心；
 - 由区域交通资料仓库(Data Warehouse)为基础，使用现代化的分析工具及社经、交通需求预测模型，预估各种政策、计画和专案对地区交通的冲击，可使决策者作出对涉及到运输系统投资和政策较理性(知情)的决定。
- Select improvement alternatives from a **regional planning perspective**.
 - Maintain a **regional long range transportation plan** and a **transportation improvement program** to achieve regional shared visions.
 - Establish a **regional data center** for transportation planning and decision-making.
 - **Use proper analytical tools** to forecast and evaluate the impacts of policies and projects, so the decision-makers can make informed decisions.



Lessons Learned Opportunities & Challenges

区域治理的机遇与挑战..美国经验总结

- 缜密的长期规划：对未来的社经发展，就业结构，人口增长，人口年龄结构，家庭组成，交通需求量，运具选择等因素应有充分及合理的预估；
 - 对未来的发展作出全面的布局，并利用交通与土地使用的互动，积极地引导发展；
 - 协调个别地区的规划及交通投资计划，配合都会区的策略发展目标。
- **Careful long-term planning**: the future socio-economic development, employment structure, population growth, age structure, household composition, travel demand, mode choice and other factors should be adequate and reasonable estimates;
 - **Utilize the interaction between transportation and land use**, to actively guide the development;
 - **Coordination of sub-region's planning and transport investment projects**, to comply with the regional development strategies and goals.



International Futures

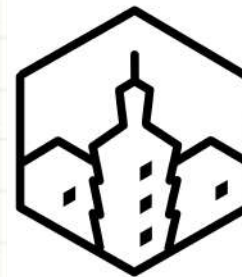


Lessons Learned Opportunities & Challenges

区域治理的机遇与挑战..美国经验总结

- 交通建设对空气污染的影响做一个定期总体性的分析；
 - 地区智慧运输系统区域架构及整合战略之制定与定期修正；
 - 地区交通规划、管理及工程人才的系统性训练；
 - 公众参与程序：包括一般公众和所有被交通政策与建设显著影响的群体；
 - 团队协同，注重程序。
- Analyze the impacts of transportation investment and policies **on air quality, GUG and energy consumption**;
 - Develop and update **regularly ITS Regional Architecture and strategies**;
 - **Systematic capacity building** for planners, engineers and administrative professionals;
 - **Public participation** : involve public and all the groups that are impacted by transportation policies and programs;
 - **Team work & collaboration**. Focus on process.





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