



中国交通减灾韧性规划的经验与面临的挑战

The Experiences and Challenges on Planning and Developing of Disaster Resilient Transport
Infrastructure in China



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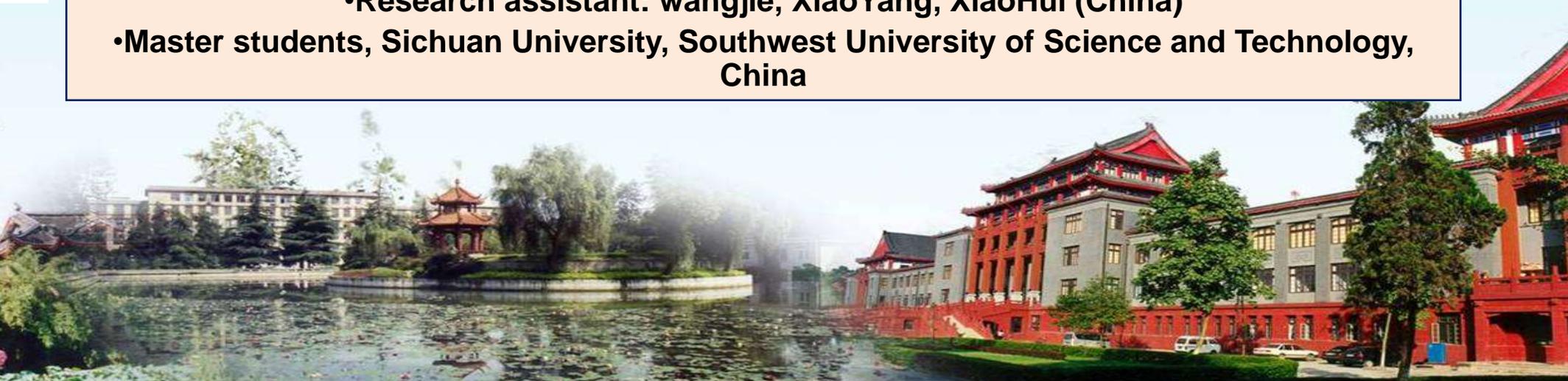
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目錄



中国的城市交通问题

The problem of urban transportation in China



中国交通的可持续发展
Sustainable development of China's urban transportation

智慧城市，智慧交通和智慧出行
Smart city, intelligent transportation and travel wisdom

武汉市交通可持续发展综合评价研究
Comprehensive Evaluation of Wuhan Urban Traffic Sustainable Development



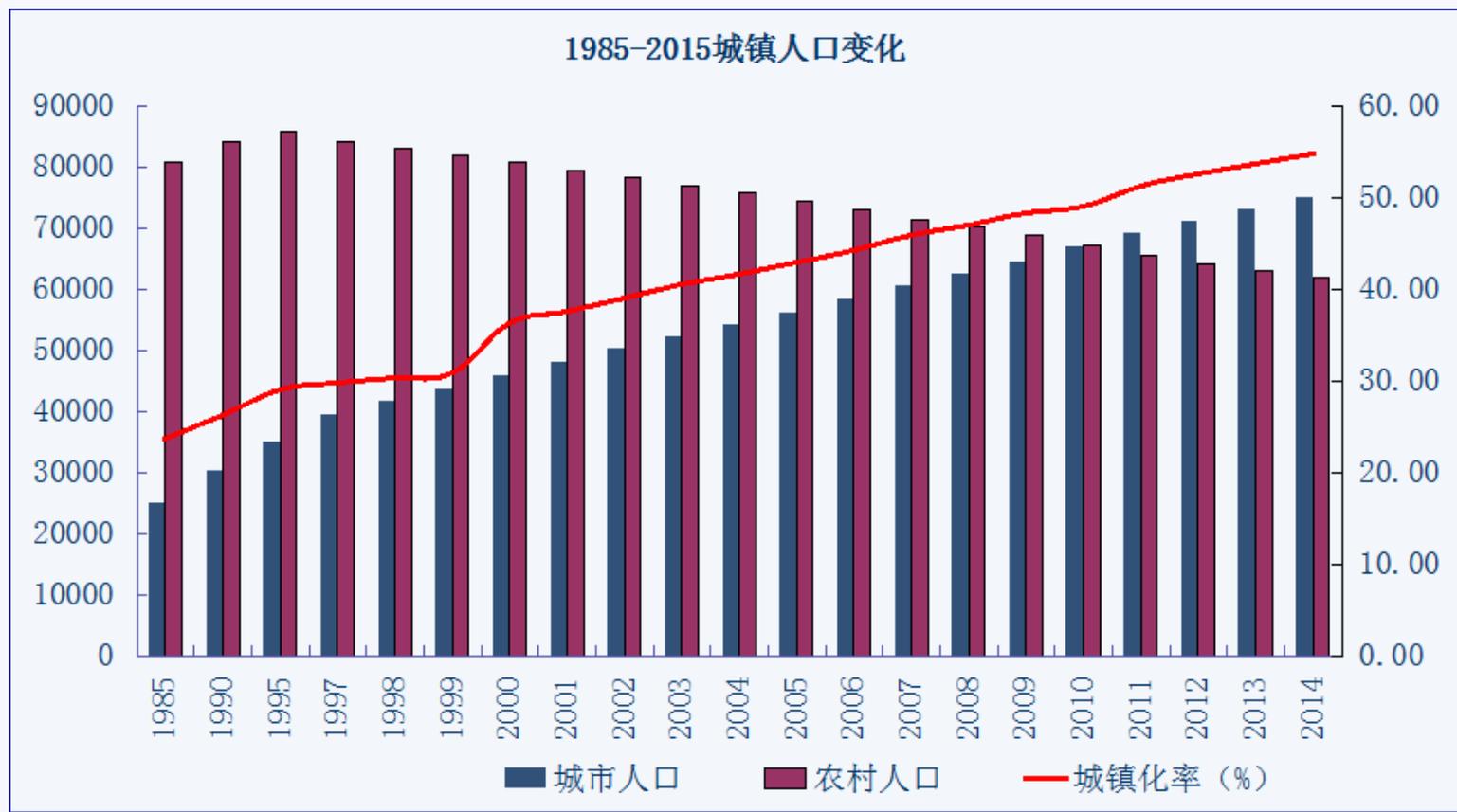


Urbanization in China

Urbanization Overview



Chinese urbanization process in recent years



From the urban-rural structure, China's urbanization rate has continued to rise, grew more than 50% in 2011. At the end of 2014 China's urban resident population of 74,916 people (accounting for 54.77%), 1805 million increase over the previous year, the rural resident population of 61,866 people, reduce the 1095 people. This surface of Chinese society has ended up in rural society as the main body of the era, into urban society as the main body of the era.

Note: Data from the Statistical Yearbook, since 2015 the data will come out after going in October 2014 so that only statistics.



目前，中国的32个大城市（百万人以上）中，在人均道路面积方面有27个城市低于全国平均水平；20世纪和90年代中后期，上海等城市中心区在交通高峰期50%的车道上小时饱和度达到95%，而且在高峰期超过了70%的饱和度，平均车速下降到每小时10公里。可以说，各城市政府已经意识到了交通问题的严重，而且也成为了各地民众关心的焦点问题。虽然在2000年以来，国家公安部、建设部联合实施道路交通“畅通工程”，但是没有产生明显的效果。全国大中城市普遍存在着道路拥挤、车辆堵塞、交通秩序混乱的现象。概括起来，目前我们城市交通主要呈现出下列特点和问题：

At present, China's 32 cities (millions of people above), has 27 cities in per capita road area is lower than the national average level; And 90 s of the 20th century, Shanghai and other areas of the city in the rush hour traffic lane hours saturation of 95%, 50% and the peak of more than 70% of the saturation, average speed dropped to 10 miles per hour. It can be said that the city government has been aware of the serious traffic problems, and also become the focus concern of people everywhere. Although since 2000, national ministry of public security, ministry of construction joint implementation of road traffic "open project", but there is no obvious effect. A common national large and medium-sized city road, vehicle congestion, traffic chaos phenomenon. In summary, the current our city traffic problem and presents the following features:

1、城市规模逐步扩大，运输压力沉重。

The city gradually expand the scale, heavy transportation pressure

2、机动车增长加快，道路容量不足。

Motor vehicles accelerated growth, insufficient road capacity.

3、路网不合理，交通管理水平低下。

Network unreasonable, poor traffic management.

4、公共交通萎缩，出行结构不合理。

Public transportation atrophy, travel irrational structure



2

The problem of urban traffic in China

- 去年全国交通死亡人数超过20万人
- National traffic fatalities last year more than 100,000-200,000 people

Urban problems induced by the crisis

- **Large-scale natural disasters:** earthquakes, storms and floods, sandstorms, heat and cold
- **Large-scale fires:** fires underground facilities, high-rise buildings, large public places
- **Hazardous materials disasters:** a city gas, high-pressure gas, gunpowder, drugs, chemicals, public places leakage poisons
- **Traffic Event:** railways, roads, aircraft, ships and the like;
- **Radioactive substances:**
- **Problems municipal facilities:** breathe, broken hot, water, power, communications network problem, underground engineering accident
- **Group Mobility:** events, marches and other protests
- **City economic crisis:** the bubble economy, financial crisis,
- **Public health crises:** infection, poisoning.
- **Evoked:** secondary disasters, coupled disaster, derivative disaster
- **Crisis:** the Emergency Decision improper handling may become a crisis

Urban Crisis type overview (based on different incentives)

| Incentives | types | Crisis illustrates |
|----------------------------|------------------------------------|--|
| Nature | Natural crisis | Earthquakes, tsunamis, fires, floods, storms, hail, landslides, avalanches, snowstorms, thunderstorms, landslides, volcanic eruptions, drought, ground subsidence, ground fissures, etc. |
| Man <i>Accidental</i> | Technical Crisis | Fires, explosions, accidents, building collapses, hazardous materials, gas, waste (water, air, material) pollution, radiation accidents (including nuclear explosions) |
| Man <i>Deliberately</i> | Social Crisis | War, civil strife, acts of urban violence and riots, terrorism, hostage-taking activities in the air and at sea, hostage-taking, murder and other human intentional disruptive behavior |
| <u>Natural + man</u> | Ecological Crisis Health Crisis | Extinct rainforest destruction of the planet, species Various epidemics, mass infection |

China's public security and emergency management is facing serious situation 2009

China is in the industrialization and urbanization, rapid development period, a variety of traditional and non-traditional risks of natural and social contradictions Mingled, public safety and emergency management situation facing more serious.

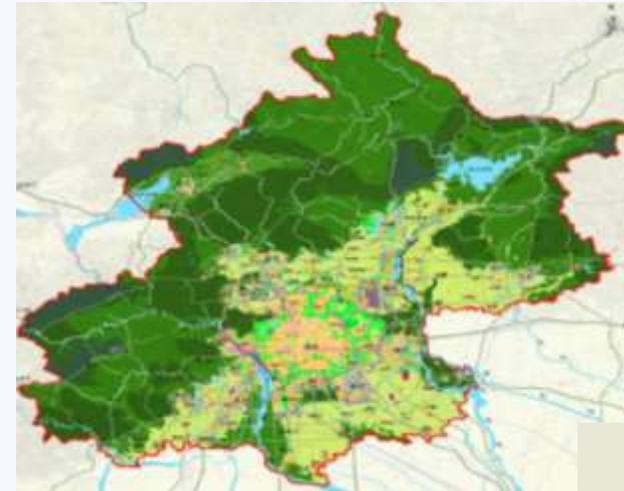
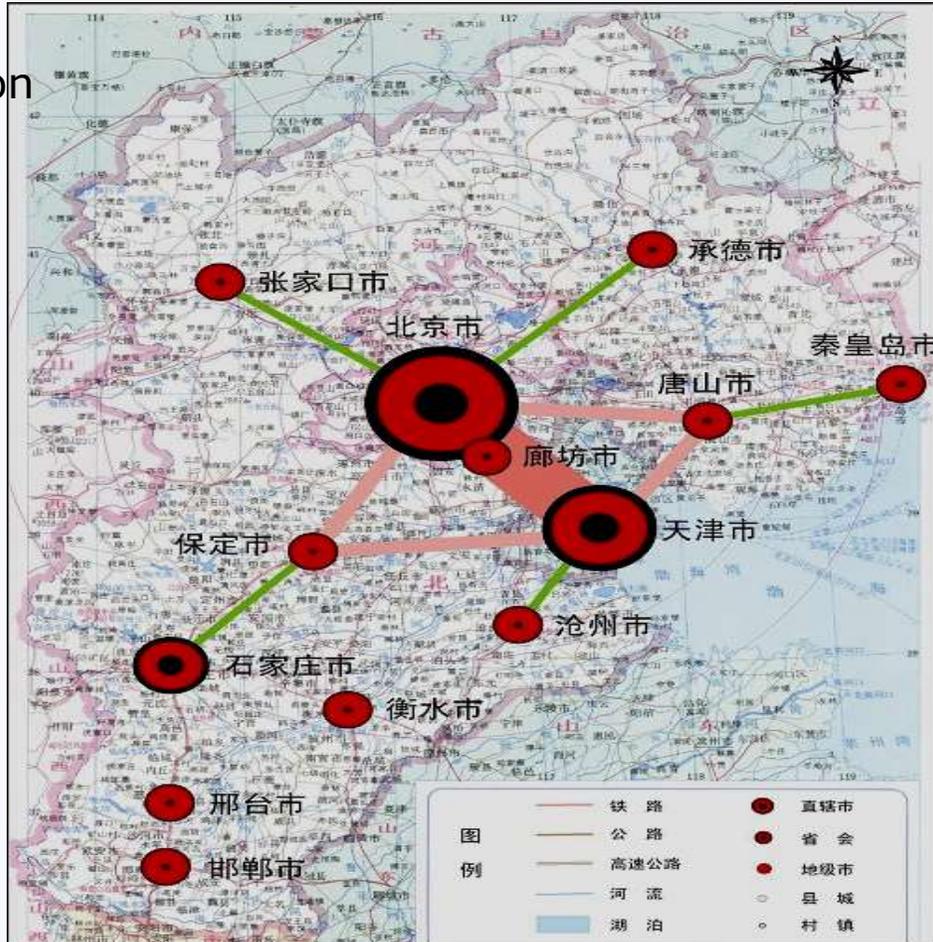
- 1. Natural disasters in multiple frequent period.** China is one of the world's worst natural disaster countries, many kinds of disasters, wide geographic disproductive base security, some local and corporate responsibility is not implemented, the regulation is not in place, the total production of high security incidentstribution, high frequency of occurrence, resulting in heavy losses. Especially in recent years, the frequency of extreme weather events, the strong earthquake was active posture, natural disasters and their derivatives, secondary disasters and dangers of sudden increase further aggravated.
- 2. Production safety situation is grim.** China's rapid economic development, energy, resources, transportation, long-term tight supply, coupled with weak, serious accidents when there is occur.
- 3. Public health event prevention difficult.** Public health emergencies and the impact of incentives were tested strong international features, the new global hair over 30 kinds of infectious diseases have been discovered in China half. When the group of major epidemics and diseases of unknown causes have occurred, with the increase of population flows and accelerate the flow velocity, increase disease prevention and control more difficult, more severe losses. Food and drug production and management of market disorder, a serious source of pollution, weak regulatory and other issues have not been fundamentally resolved.
- 4. Social Security is facing new challenges.** China has entered a critical stage of reform and development, the complex relationship between the various interests, safeguard social stability and arduous tasks. National security situation facing more complex and challenging. Significant impact and all types of emergencies that may arise on the current international financial crisis, there must be fully prepared

risks and crisis situation in Beijing .

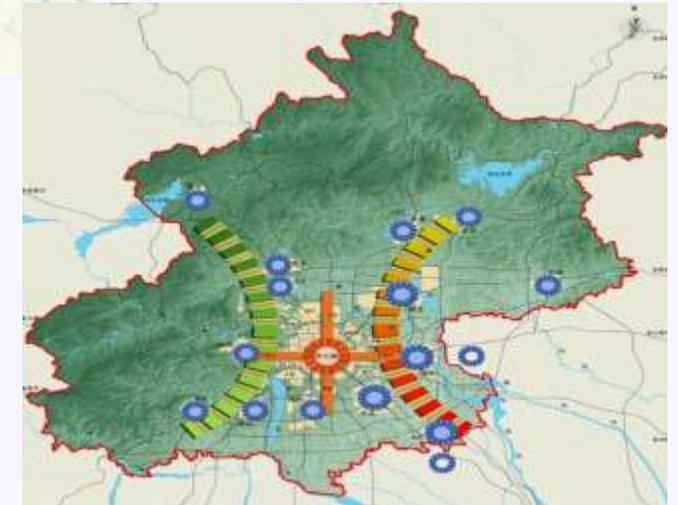


Area: 16410km²
 Plain: 6338km², 39%
 Mountain: 10072km², 61%

Area location
 of Beijing



Two axis, two with
 development strategies

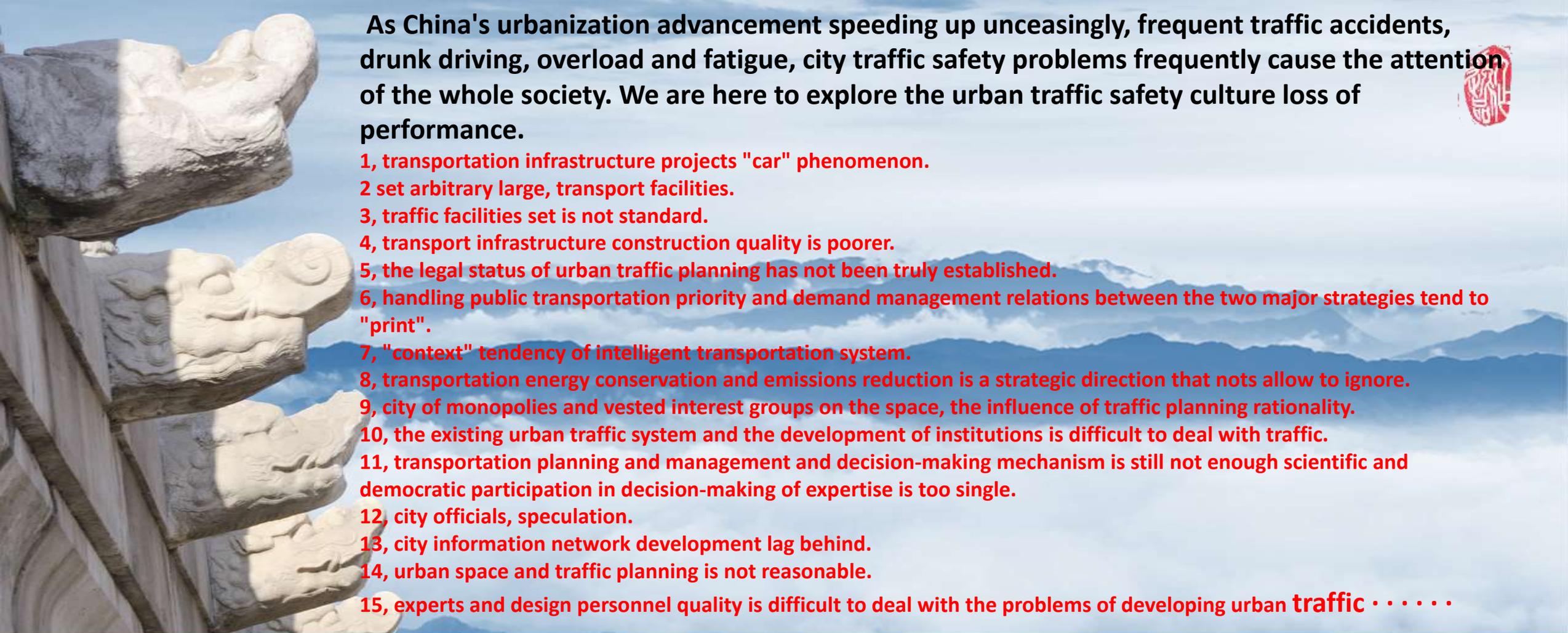


11 kinds of causal factors should focus on prevention during Beijing's "Eleventh Five-Year"

1. **Major criminal cases and unexpected terrorist attacks:** a large number of floating population and the influx of all kinds of unidentified persons
2. **Group petition major events:** the demolition due to urban residents, rural area of compensation, enterprise payment of wages and other economic disputes and other issues
3. **Major infectious diseases:** SARS, influenza, meningitis and human bird flu, plague, anthrax, cholera, etc.
4. **Traffic accidents and other lifeline systems:** water, electricity, gas (such as Shaanxi to Beijing gas pipeline gas), heat
5. **Underground space accident:** a large number of underground construction and use of underground space
6. **Urban industrial disasters:** from all over the city's numerous hazardous chemicals hazards, other provinces and the transit of dangerous goods transport vehicles, medical hazardous waste and radioactive contamination potential
7. **Major weather disasters:** Urban winter snowfall caused traffic congestion, narrow tube effect windy spring weather due to urban construction caused by the irrational, the summer flood and debris flow hazards in urban areas caused by stagnant water caused by secondary hazards
8. **Fire:** a large production enterprises and commercial facilities (such as large supermarkets), high-rise buildings; eight districts have 2,972,100 square meters flammable, easy to drain and easy collapse of dilapidated cottage.
9. **Major animal and plant diseases:** foot and mouth disease, mad cow disease, highly pathogenic avian influenza and forest pests, harmful plants invasion.
10. **Information security incidents:** the Information Security and flight delays caused by high-tech crime, bank online transactions blocked and important computer information loss caused by a virus and so on.
11. **Earthquake:** Beijing is located in a high seismic intensity area VIII

Beijing's Fangshan District of risk and safety issues (4 categories, 13 categories, 49 kinds) and regional risk regionalization

| | |
|---|---|
| <p>natural disaster</p> | <p>Floods and Droughts:Floods, droughts; Earthquake Disaster:Earthquake</p> <p>Geological disasters: mudslides, landslides, mining subsidence; meteorological disasters: a low, icy conditions, heavy rain, thunder and lightning weather</p> <p>Forest fire: forest fire</p> |
| <p>Accident Happened</p> | <p>Accident: dangerous chemicals, nuclear and radioactive contamination incident, mining accidents, construction accidents, special equipment accidents, road traffic accidents, roads and bridges, fire, gas accident, supply, drainage accident, heating accidents, power accident, the communication line accidents and communications facilities, air defense engineering accidents, travel accidents;</p> <p>Environmental pollution and ecological damage accidents: environmental emergencies and ecological damage accidents.</p> |
| <p>Public health events</p> | <p>Major infectious diseases: plague, anthrax, cholera, SARS, influenza and other</p> <p>Major animal and plant diseases: foot and mouth disease, highly pathogenic avian influenza, brucellosis, rabies, etc.</p> <p>Food safety and occupational hazards: group food poisoning and occupational poisoning</p> |
| <p>Social security incidents</p> | <p>Major mass incidents: District exempted school group events, major group petition events, public places trouble event</p> <p>Major criminal cases: a major terrorist incidents and criminal cases</p> <p>Foreign emergencies: Foreign Public Emergencies</p> |



As China's urbanization advancement speeding up unceasingly, frequent traffic accidents, drunk driving, overload and fatigue, city traffic safety problems frequently cause the attention of the whole society. We are here to explore the urban traffic safety culture loss of performance.

- 1, transportation infrastructure projects "car" phenomenon.
- 2 set arbitrary large, transport facilities.
- 3, traffic facilities set is not standard.
- 4, transport infrastructure construction quality is poorer.
- 5, the legal status of urban traffic planning has not been truly established.
- 6, handling public transportation priority and demand management relations between the two major strategies tend to "print".
- 7, "context" tendency of intelligent transportation system.
- 8, transportation energy conservation and emissions reduction is a strategic direction that not allow to ignore.
- 9, city of monopolies and vested interest groups on the space, the influence of traffic planning rationality.
- 10, the existing urban traffic system and the development of institutions is difficult to deal with traffic.
- 11, transportation planning and management and decision-making mechanism is still not enough scientific and democratic participation in decision-making of expertise is too single.
- 12, city officials, speculation.
- 13, city information network development lag behind.
- 14, urban space and traffic planning is not reasonable.
- 15, experts and design personnel quality is difficult to deal with the problems of developing urban traffic

2

The problem of urban traffic in China



In recent years, the effect of urban disaster to the people's production and life and all the losses resulting from the increasing, urban disaster prevention and mitigation problem is becoming more and more widely attention. As the basis of urban disaster prevention and mitigation work, has been the city urban comprehensive disaster prevention and mitigation planning related departments at all levels on the agenda.

Because the city traffic system of disaster prevention disaster relief capacity directly affect all kinds of natural disasters and man-made disasters caused by the severity of the loss, as a result, urban traffic system planning of disaster prevention and reduction must be incorporated into the urban comprehensive disaster prevention and mitigation planning.

Urban transportation system of disaster prevention and mitigation planning should include content, general idea and technical route:

One, the urban traffic system planning should include the content of the disaster prevention and mitigation

- 1, the present situation investigation and analysis
- 2, planning objectives and principles
- 3, planning scheme

3

The urban traffic system, disaster prevention and mitigation planning framework and method of research



2、城市交通系统防灾减灾规划的总体思路与技术路线

The general idea and technical route of urban transportation system Disaster Prevention and Mitigation Plan

(1) 总体思路 General idea :

首先对城市现状交通系统的防灾减灾情况进行全面、系统的调查与分析，据此把握城市交通系统在防灾减灾能力上存在的问题或缺陷；以此为基础，提出城市交通系统防灾减灾规划的目标与原则；在此目标与原则指导下，分别进行灾时交通组织策略，交通系统防灾救灾通道系统规划并提出设计、建设及管理等方面的要求，灾时交通管理与控制系统规划，防灾减灾框架下交通系统的建设与管理要求，交通系统防灾减灾规划得以充分实施的保障措施等内容研究。

First about the present situation of urban disaster prevention and reduction of traffic system to conduct a comprehensive and systematic investigation and analysis, on the basis of grasping the urban traffic system in the existing problems in disaster prevention and mitigation capacity or defect; On this basis, the paper puts forward the goal of urban traffic system planning of disaster prevention and reduction and principles; Guided by the goals and principles, respectively to prepare traffic organization strategy, transportation system of disaster prevention disaster relief channel system planning and design, construction and management, traffic management and control system when a disaster planning, disaster prevention and mitigation traffic system under the framework of the construction and management requirements, traffic system are fully implemented in disaster prevention and mitigation planning research of security measures.



3

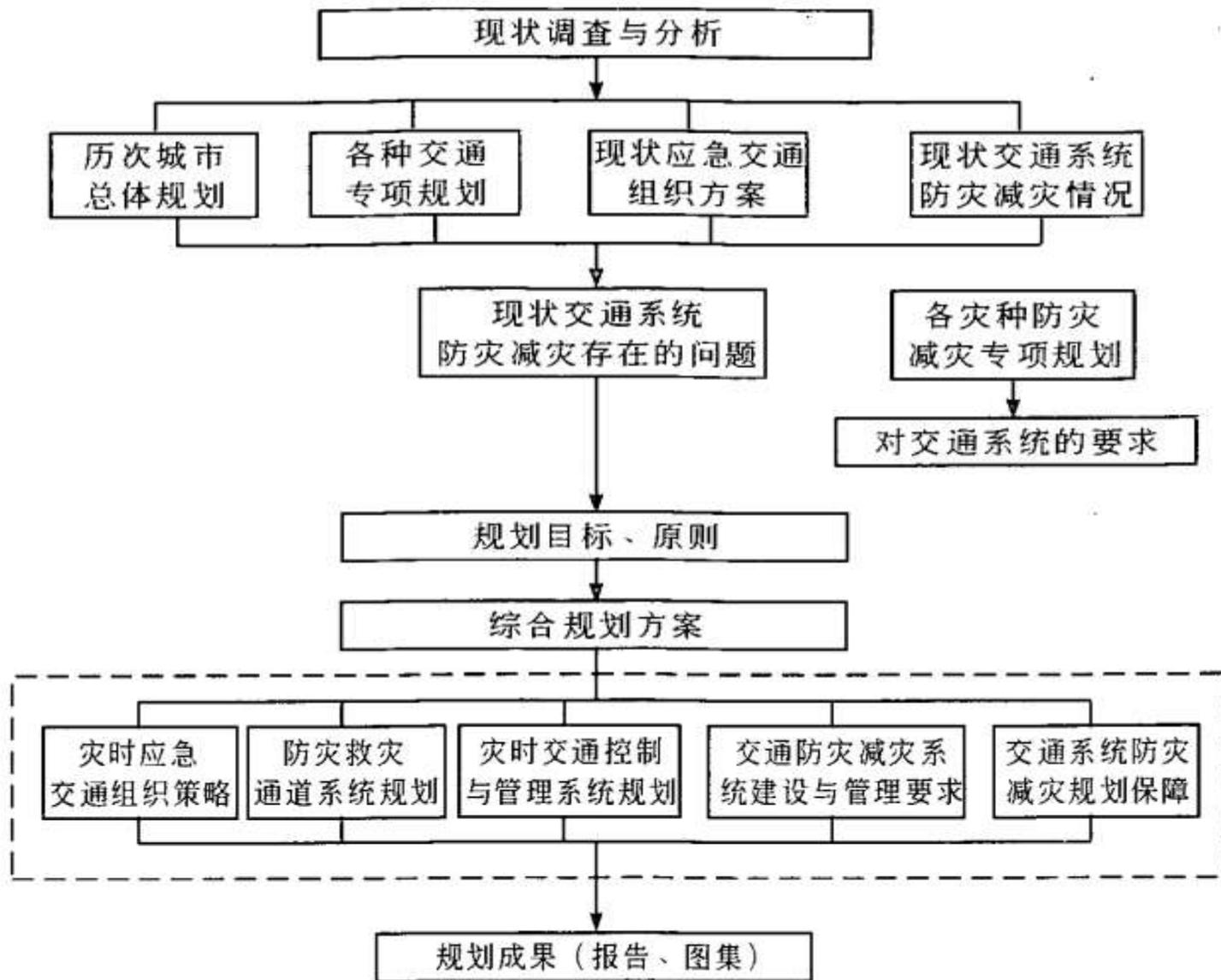
The urban traffic system, disaster prevention and mitigation planning framework and method of research



3

The urban traffic system, disaster prevention and mitigation planning framework and method of research

(2) The urban traffic system of disaster prevention and mitigation



Second, the key points of urban traffic system planning of disaster prevention and reduction and the method

1, the planning principles

- (1) on the properties of various kinds of natural disasters or man-made disasters and scale, hierarchical traffic system planning of disaster prevention and reduction;
- (2) fully around the road traffic system, urban road and highway, rail transit system (subway, light rail and the suburban railway, etc.), aviation and shipping system and so on various transportation subsystem of traffic system planning of disaster prevention and reduction;
- (3) considering the disaster of traffic demand and characteristic, pay attention to traffic facilities and other facilities of mutual cooperation and coordination between disaster prevention and mitigation, and improve the transport ability of disaster mitigation;
- (4) the combination of macro, meso and micro. Pay attention to the macro layout structure in transportation system, highway interchange nodes to improve transportation system reliability and strain capacity, when a disaster in the construction and management to improve traffic facilities disaster ability, reduce the damage degree of the disasters occur traffic facilities;
- (5) pay attention to traffic facilities layout optimization of urban disaster prevention and mitigation. In transport infrastructure, including roads, Bridges, hubs) should be considered in the layout of traffic facilities and ZaiHaiDian (belt), hazard distribution points, emergency shelter, emergency aid agencies (e.g., fire station, hospital, etc effectively.



3

The urban traffic system, disaster prevention and mitigation planning framework and method of research

The urban traffic system, disaster prevention and mitigation planning framework and method of research

二、城市交通系统防灾减灾规划要点与方法

2、规划要点与方法

- (1) 灾时应急交通组织策略的制定
- (2) 防灾救灾通道系统规划
 - ① 防灾救灾通道的功能、分类及规划方法
 - 1) 救援通道
 - 2) 避难通道
 - 3) 特殊隔离通道
 - 4) 替代性通道
 - ② 防灾救灾通道的级别
 - 1) 城市级防灾救灾通道
 - 2) 区级防灾救灾通道
 - 3) 社区级防灾救灾通道

The key points of urban traffic system planning of disaster prevention and reduction and the method



2, planning, key points and methods

- (1) when a disaster emergency traffic organization strategy formulation
- (2) the system planning of disaster prevention disaster relief channels
 - (1) the function of disaster prevention disaster relief channel, classification and planning method
 - 1) relief channel
 - 2) the means of escape
 - 3) special isolation channel
 - 4) alternative channels
 - (2) the level of disaster prevention disaster relief channel
 - 1) the level of urban disaster prevention disaster relief channels
 - 2) district disaster prevention disaster relief channels
 - 3) community level of disaster prevention disaster relief channels



③ 防灾救灾通道的形式 Disaster relief in the form of channels

1) 地面防灾救灾通道 Ground disaster prevention and relief channel

2) 地下防灾救灾通道 Underground disaster prevention and relief passage

3) 空中救援通道 Air Rescue channel

4) 水上救援通道 Water rescue channel

(3) 灾时交通管理与控制系统规划 When disaster Traffic Management and Control System Planning

(4) 防灾减灾框架下的交通系统建设与管理要求 Transportation system construction and management requirements under the framework of Disaster Prevention and Mitigation

(5) 交通系统防灾减灾规划实施的保障措施与政策 Transportation system planning and implementation of disaster prevention and mitigation and policy safeguards

3

The urban traffic system,
disaster prevention and mitigation planning
framework and method of research





City traffic sustainable development planning

From a historical point of view, is the concept of sustainable development in environmental problems threaten to human survival and development, the traditional development model restricted economic development and social progress, people after reflections on traditional development mode innovation.

Since the 21st century, sustainable development has become an important category in the field of economics and sociology. When making development strategy, the pursuit of sustainable development to become a trend of the international community, the sustainable development as a new concept of development to get a global consensus. Traffic system is one of the major infrastructure, is the development plan, improve the basic factors of economic growth and people's life. Therefore, also should be sustainable development in terms of transportation. Sustainable transport development is built on the concept of sustainable development, with less resources and environmental costs to improve transportation efficiency and service level, to meet the current social development needs, provide guarantee for the sustainable development of the whole social economy. Were considered in this kind of traffic development in the guarantee of its own development at the same time, also can satisfy the sustainable development requirement of social and environmental system, in order to achieve traffic dynamic coordination between the internal and environment. It has the following features:
The traffic development and ecological environment protection and land use.

Combination of transportation planning and traffic demand management;

Transportation system can meet the current requirement of social and economic development, support the development of the city, and leave room for the sustainable development of the future.

4

Sustainable development of China's urban transportation





The principle of traffic sustainable development

1, the principle of environmental bearing capacity

Principles of environmental carrying capacity refers to the pollution of the environment system absorbs the purification ability. Traffic sustainable development must abide by "the emissions of pollutants may not exceed environment absorbing ability" principle.

2, the principle of resource consumption rate

Natural resources can be divided into renewable resources and non-renewable resources. To use of renewable natural resources speed should be maintained in the regeneration rate limits; For non-renewable resources, its use depletion rate should not be more than seek as a substitute, the rate of renewable resources. This requires transportation departments must improve the efficiency of resource use, energy saving, the use of advanced technology, avoid the energy crisis.

3, the principle of fairness

Users of transportation activities benefited by transportation, rather than transport users have suffered damage caused by environmental degradation, it is very unfair. From the inter-generational relations point of view, in order to promote economic development in the modern age, people consume a large amount of transportation activities, will be serious environmental damage consequences for future generations, it is not fair.

4, value principle

Priceless resources value or low prices led to the excessive use of unchecked, this is the price of error. Transportation sustainable development must follow "the environmental costs are real economic costs" principle. The environmental costs into the cost of transportation, assigned to the user.

5, the principle of coordination

Traffic sustainable development of target just rely on transport policy is difficult to achieve, must with other policies, such as science and technology policy, fiscal and financial policy, land use policy and environmental policy), the combination of coordinating role, to receive good effect.

4

Sustainable development of China's urban transportation





城市交通可持续发展规划理论体系框架:

- 1、城市交通系统可持续发展规划目标确定方法
- 2、面向可持续发展城市交通规划的调查内容及方法
- 3、面向可持续发展的城市总体交通结构优化
- 4、高度信息化条件下的城市交通需求预测理论
- 5、城市交通信息系统时空资源消耗分析理论
- 6、城市交通系统能源消耗与环境影响分析理论
- 7、可持续发展的城市交通系统供求分析理论
- 8、面向可持续发展的城市交通网络布局方法
- 9、面向可持续发展的城市交通系统综合评价
- 10、城市交通系统可持续发展保障体系



Urban transportation planning theory of sustainable development system framework:

- 1, the urban traffic system sustainable development planning goal determination method
- 2, for the sustainable development of urban traffic planning research content and method
- 3, for the sustainable development of the overall urban traffic structure optimization
- 4, highly informationization theory under the condition of urban traffic demand forecast
- 5, the urban traffic information system resource consumption of time and space analysis theory
- 6, the urban traffic system energy consumption and environmental impact analysis theory
- 7, the sustainable development theory of supply and demand analysis of urban traffic system
- 8 and facing the sustainable development of urban transportation network layout method
- 9, and the comprehensive evaluation of the sustainable development of urban transportation system
- 10, the urban traffic system security system of sustainable development



4

Sustainable development of China's urban transportation



The essence of wisdom city is at the right time to provide accurate information, make public, urban management and service providers can make better decisions, enhance their quality of life of urban residents and the overall sustainability of the city.

Wisdom of sustainable cities to encourage, to change the political, energy, travel and waste behavior; And by changing the urban infrastructure (energy), land use and transportation system to promote sustainable urban planning and urban management structure.

The integration of traffic, environment and land use planning is a necessary prerequisite for sustainable development. Wisdom is the core part of wisdom urban traffic, is the integration of the planning, implementation, one of the important means of sustainable development. Compared with the traditional transportation, intelligence traffic more friendly to the environment, the service frequency, site location and route of coverage and more elastic. Among them, the intelligent transportation system is the core technology of traffic wisdom. It by integrating the traffic data and the establishment of intelligent and adaptive traffic management system, provide the dynamic for traveler, accurate and real-time travel information (such as weather, traffic, public transport, the departure time, parking information and other special problems, etc.), improve the efficiency of residents. At the same time, the intelligent transportation system can also improve the traffic system, optimize the transport operator decision making, improve the urban traffic efficiency and traffic demand management efficiency, and reduce the management cost, etc. In general, the intelligent transportation system is the urban traffic low carbon development mode and direction, is to solve urban road construction and the effective ways to supply and demand contradiction between vehicle growth.

春秋







Urban transportation as an important points of urban social economy activity, plays an important role in city development. Wuhan city is located in the middle of our country, traffic location is superior, has been "tong street of nine provinces", but in recent years, with the rapid development of economy, vehicle ownership has reached thousands of vehicles, the current traffic demand and supply to meet growing, bring a series of problems, in order to guide the wuhan city traffic sustainable development planning and development, is of great significance.

Wuhan has always been a "nine provinces through my official" said, is one of the ten major railway hub, the main foreign main Beijing-Guangzhou route, Wu3 da4 line, HanDanXian, and Beijing-kowloon link. Waterway shipping comprehensive ability is located in the top of the inland cities, it is important to land and sea transport hub. Is given priority to with 107, 316, 318 and 106 national road, highway road network extending in all directions formation, highway mileage of 2826.5 km. Wuhan tianhe international airport is in central China aviation hub. With the further development of social economy, the growing population, status, social interaction between city and city and economic and trade is becoming more and more frequent. Particularly in the rise of central China such a big background, the wuhan city facing unprecedented opportunities for development, and urban traffic as supporting the main infrastructure, urban vitality in wuhan plays a more and more important role in social and economic development.



WUHAN CITY

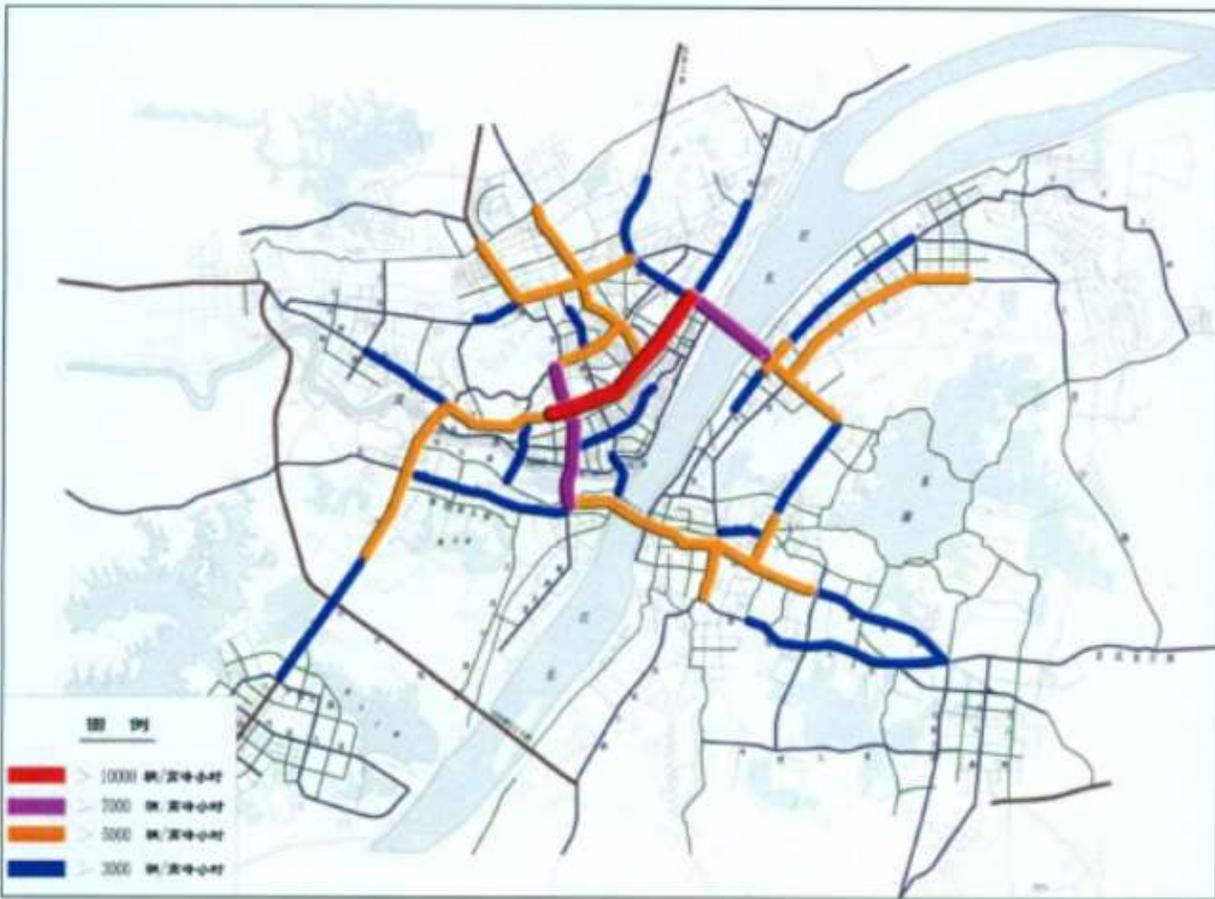


图 2.5 2007 年主要路段交通流量布局图
图片来源:《2008 年武汉市交通发展年度报告》

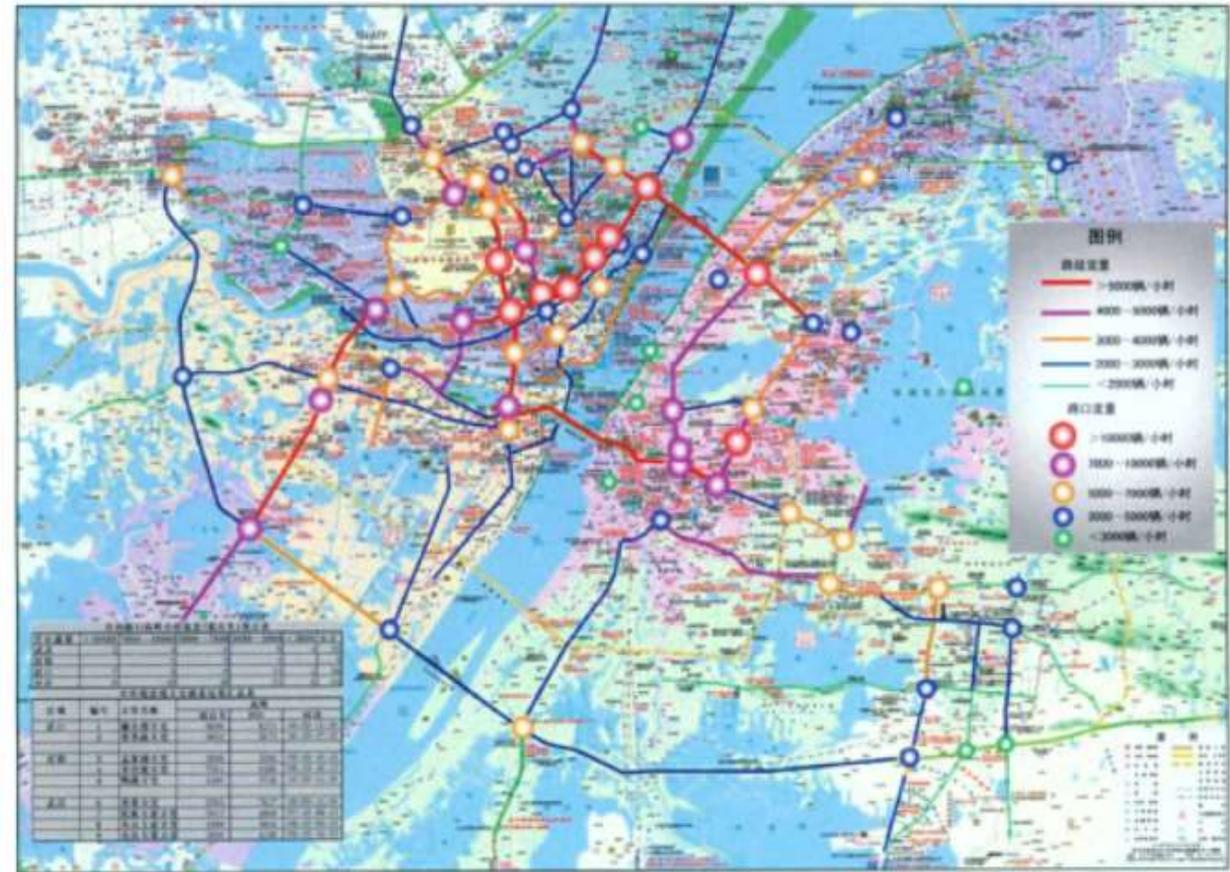


图 2.7 2007 年武汉市主要交通路口交通流量图
图片来源:《2008 年武汉市交通发展年度报告》



growth, the wuhan city traffic problem is increasingly serious, became a hot issue of public concern. Mainly for road traffic infrastructure construction lag, lags far behind the growth of traffic transportation structure is unreasonable, cause serious human city bus inefficient transportation problem, motorised traffic violation phenomenon is widespread in automobile exhaust and noise pollution is serious, in the top spot in a variety of environmental pollution problems in wuhan, a major environmental pollution. In order to solve the current traffic problems, must explore the sustainable development of urban traffic road, make the urban traffic development and economic and social development needs and resources and environment capacity, establish the sustainable development of urban traffic system. This article will take the sustainable development theory as the guide to city traffic geography, based on the theory of sustainable development of urban traffic planning evaluation of wuhan city traffic sustainable development level and position, analysis of wuhan city traffic sustainable development, discusses its reason, formulate implementation countermeasures for the sustainable development of wuhan city traffic, to resolve the current wuhan serious traffic problems is of great significance.



The basic method of study

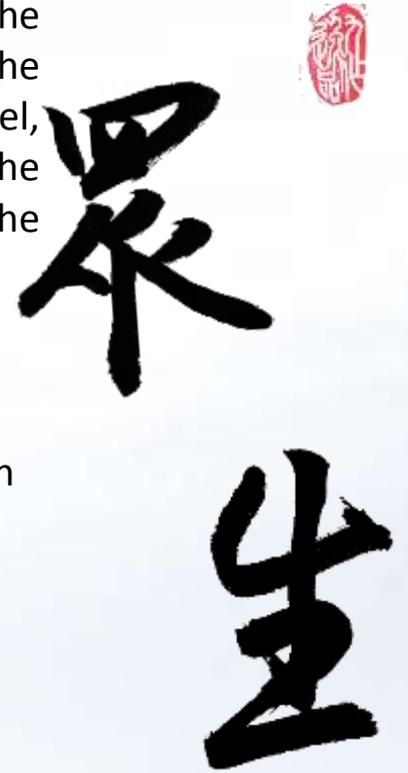
Guided by the theory of sustainable development, on the theory of sustainable urban transportation planning and traffic geographical foundation, using the method of GIS analysis and evaluation of wuhan urban traffic system and the layout, at the same time establish a population, resources, environment, economic, social and traffic of the comprehensive evaluation index system, scientific evaluation of wuhan city traffic sustainable development level, combined with the problems existing in the wuhan city traffic sustainable development, put forward the countermeasures for the sustainable development of wuhan city traffic, to solve the play an important role in the sustainable development of wuhan city, for urban traffic planning and government decision-making reference.

The main research content for the following four parts:

- (1) GIS software is used to analyse the current situation of wuhan city traffic
- (2) the traffic sustainable development index system is established
- (3) using analytic hierarchy process (ahp) and the weighted linear legitimate for sustainability evaluation of wuhan city traffic
- (4) find out the problems and countermeasures are put forward

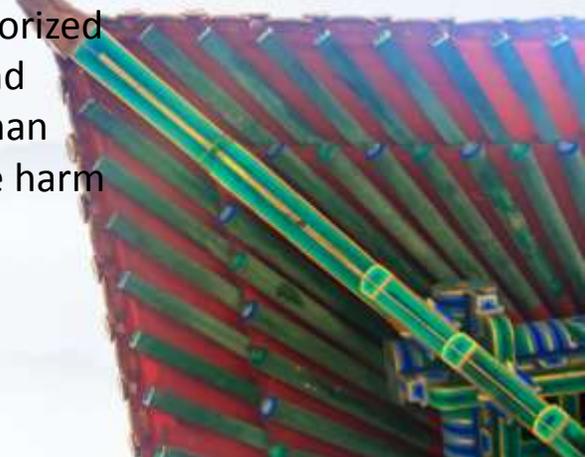
Wuhan city traffic sustainable development problems:

For wuhan, with the simultaneous separation and balanced development, scattered layout, depended on both sides of the Taiwan is also the national transport hub and regional central cities, thus river-crossing transportation inside and outside, downtown traffic and city traffic problem is vital for the entire transportation system of wuhan wuhan is the long-term solution to the development of traffic. With the development of wuhan economy, motorized progress rapidly, according to relevant statistics show that wuhan has begun to enter the car era, traffic demand increases rapidly, how to balance the traffic has become a big problem in the current supply and demand. Wuhan environmental problems brought by the traffic also nots allow to ignore, air pollution and traffic noise do more harm to the whole city environment, for the sustainable development of wuhan city is a big negative impact.



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Comprehensive Evaluation of Wuhan Urban Traffic Sustainable Development



Central congestion problem:

Traffic congestion is a big city in the process of urbanization, modernization and motorization, a city disease can not be ignored, especially the three towns of wuhan liangjiang isolation of such pattern, to a certain extent, adding to the heavy traffic. Wuhan district, with the high density of population and jobs, land development intensity big, traffic attraction and radiation ability, such as traffic flow concentration characteristics, it put forward higher request to the traffic. The wuhan central existing road network system is unreasonable, all levels of road imbalance central area and peripheral area of the lack of connection between rapid evacuation routes roads function is a well-defined, besides traffic function, urban main road often function both "commercial" although developed the central branch network, but due to the downtown parking supply and demand imbalance, branch exists serious phenomenon of roadway taking-up parking encroachments and other business presence is also very serious, the branch utilization rate is not high, unable to form tongda auxiliary system, the traffic is too focused on the main road, lead to traffic jams.

Challenge: the urban traffic development facing transformation and innovation

"1 + 6" new town development need traffic transformation

For many years, the spread of wuhan city as the core to the peripheral type extension, nearly five years the average land increment of 28 square kilometers, the urban ecological environment worsening and traffic operation, the further optimization of urban functions and severely restricted. According to the overall urban planning, wuhan is building downtown "1 + 6 new city group" new pattern of city, reduce the urban construction and population density, increase the green space, open space and major public service facilities, cultivate and promote urban service function. Relying on the important traffic corridor, form "to the main nuclear, multi-axis sweat" open space structure.

Improve integrated transport hub construction requirements

As approved by the national comprehensive transportation hub research pilot cities, wuhan foreign traffic radiation ability needs improvement. Achieve the goal of building national comprehensive transportation hub city, built for the world to further gateway hub airports, further build jiang dahai of inland river shipping center, to further strengthen the countrywide public rail transport system.

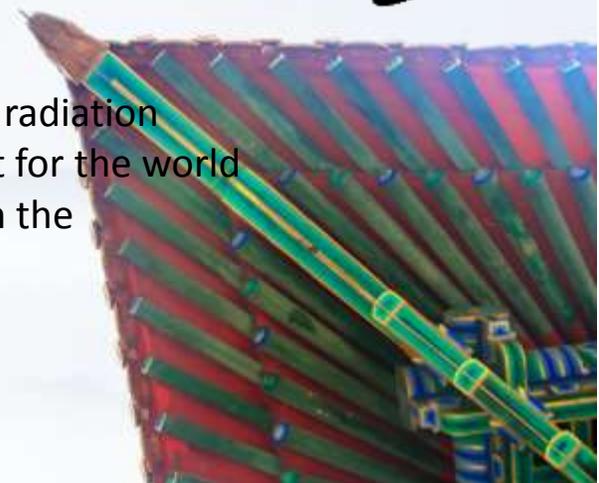
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Comprehensive Evaluation of Wuhan Urban Traffic Sustainable Development



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Various traffic system builds overall acceleration

In recent years, wuhan social economy maintained steady and fast development momentum, the public need to differentiation, personalized gradually. Need to further optimize the urban space, to build a perfect and reliable comprehensive transport system.

Transport infrastructure development test

Since 2009, the speeding up of motorization, private car is given priority to the motor vehicle continues to increase at an annual rate of more than ten units. Development at home and abroad experience has shown that in the face of rapid development, rely on to build road system is difficult to meet, need to explore the sustainable development of traffic facilities construction direction and the way to travel to guide policy.

Green environmental protection need intelligent transportation

In the global energy increasingly scarce, under the background of environmental capacity decrease, build a "resource-conserving and environment-friendly society" become inevitable. As experimental zone "two type society" construction, must build low carbon, green traffic system. Take powerful measures, reasonable guide vehicle growth, cut a car trip, intelligent management measures, improve the operation efficiency.

Planning the forerunner, accelerated the construction of integrated traffic system into shape

In recent years, wuhan has completed a series of traffic planning and research work, and gradually build a macro, meso and micro three levels, relatively perfect system of urban transportation planning. In this system under the guidance, in wuhan, a large number of programs have been compiled and respectively in the city and state approval.

1 hour traffic circle formed in an all-round way

Use in wuhan city wu nine, HanDan, Shanghai han rong and beijing-guangzhou route in the formation of rail network within the city circle, accelerate the construction of wuhan to xiaogan, huangshi, ezhou, huanggang, xianning, such as four inter-city railway, to build modern inter-city rail transportation network; Built eight city expressway, establish the central region is the most convenient "one shot four wire ring 13" skeleton highway network, formed 1 hour traffic circle.



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Comprehensive Evaluation of Wuhan Urban Traffic Sustainable Development

30 minutes "open project" gradually perfect

According to the "within 30 minutes unblocked project" in wuhan city, wuhan will implement the "30 minutes to downtown, 60 minutes in city" goal. As yangluo changjiang river bridge is built, completed outer ring road and third ring, as well as second ring hankou quickly network transformation completed, basically achieved through third ring road, smooth, the construction of the second ring.

Rail transit construction to speed up the pace

In recent years, compiled a series of rail transportation in wuhan city planning projects, effectively guide the sustainable development of urban rail transit. As of November 2015, wuhan metro has been put into operation line 1, line 2 and line 3 and line 4, a total of 96 stations, operating mileage of 123.4 km. The opening of the wuhan metro line 4, contact marks formed in wuhan three towns "workers" glyph of metro network, three big wuhan, hankou, wuchang railway station have more convenient transfer between channels. At the same time, theory-oriented and optimized continuously, the public transport system service level improved significantly.

Perfecting green transport system

Spirit of "people-oriented", vigorously promote "low carbon, environmental protection" in wuhan city green transportation, green, environmental protection public bike system construction in full swing. At the same time, "one ring, two belts, six pieces of the commuter, sports, leisure and tourism and other functions the greenway network system startup, slow traffic system constantly improve, the sustainable development of the traffic to be implemented.



New national urbanization plan (2014- 2020)

Chapter XIX strengthening and innovative urban social governance

- **Section III : innovation and social security comprehensive**

Establish a sound source control, dynamic coordination, emergency response interrelated, social security comprehensive management mechanisms for mutual support. Innovation dimensional Social Security Protection system, improve governance, promote multispectral urban management functional integration, encourage social forces to actively participate in social security comprehensive management. Timely issues affecting people's social security safety issues, strengthen security complex on the city's public order and management of the site. Streamline law enforcement institutions, improve law enforcement and service levels. According to the management network to increase efforts to accelerate the improvement of the Internet Governance leadership system, to ensure that national network and information security.

- **Section IV: improve disaster prevention and relief system**

Improve the urban emergency management system, strengthen disaster prevention and reduction capacity building, strengthening administrative accountability and accountability. Focus withstand typhoons, floods, dust storms, snow, drought, earthquakes, landslides and other natural disasters, improve disaster monitoring and early warning systems, strengthening urban fire, flood control, drainage in flood, earthquake relief and other facilities and rescue capacity building, improve the urban building disaster fortification standards, reasonable layout and construction of emergency shelters, public buildings and facilities to strengthen emergency refuge function. Improve public emergency plans and emergency security system. Strengthen disaster analysis and information disclosure, to carry out public risk prevention and first aid education, the establishment of catastrophe insurance system, the role of social forces in emergency management.

Big city traffic congestion problem is the city sustainable development and the problem of urban production and life.

During the period of "much starker choices-and graver consequences-in" with the improvement of people's living standard, the rapid growth of private cars will lead to more intensified the contradiction between supply and demand of road traffic, urban traffic is faced with more pressure.

Development of intelligent transportation system become the consensus of countries all over the world to alleviate urban traffic congestion problem! Intelligent transportation system can maximize the play to the efficiency of transportation infrastructure, improve the operation efficiency and service level of transportation system, provide the public with efficient, safe, convenient and comfortable travel service, to become the foundation of developing modern transportation. To speed up the construction of intelligent transportation systems (its) applications, will improve the city traffic service level, promote the construction and development of the international metropolis.

In addition, also faces many challenges: traffic resource utilization and environmental protection in the field of application of key technologies and advanced applicable technology, key technology of transportation management information research, technical standards and specifications research new technologies, traffic resource conservation and environmental protection

China's urban transportation sustainable development opportunities and challenges

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沪宁高速公路 (扩建后)



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In 2014 the development of intelligent transportation in China:

The Internet giant crossover network, layout of transportation market, preliminary set up and comprehensive transportation system that meet the needs of big department system and mechanism, ETC the speeding up of the networking, electronic police new standard GAT496-2014 formal implementation, and so on.

Internet giant layout car connected to the Internet

Last January, tencent to launch its first focus on driving safety and green travel driving companion APP; In July, alibaba wholly owned buying gold. At the same time reach the cooperation intention with China north industries group, a joint venture beidou operating service company, the registered capital of 1 billion yuan; In September, alibaba and Czech suitable cooperation agreement, jointly build can use pay treasure to the all kinds of products to parking fees payment environment; In October, millet technology with 84 million yuan do navione directed to raise equity. Internet giant monkey enclosure, layout car networking market in succession, the car network become the focus of the Internet giants to expand the network data entry field.

New standard electronic police GAT496 effect - 2014

China's electronic police new standards on December 1, the red light automatic recording system common technical conditions of the GA/T 496-2014 standard "version of the official start of the implementation, instead of the revision on May 1, 2009 promulgated the GA/T496-2009 version.

According to the standard, the overall application of electronic police, converged on the video. Followed by the application of high-definition cameras, standard explicitly request 2 copies (vehicle to leave the position of the stop line) can clearly identify the plate; Finally, the trend of application level is crossing, standard extension function in the last one is about the function of traffic detection, and clear about the electronic police camera with signal communications standards.

China's urban transportation sustainable development opportunities and challenges

Fourth generation beidou/GPS navigation chip developed successfully

China successfully developed the fourth generation of high-performance beidou/GPS navigation chip, positioning accuracy is 2.5 meters, capture, tracking sensitivity sensitivity performance index has reached the international leading level.

ETC nationwide network to speed up the process

So far, China ETC system the number of users has exceeded 14 million. 2015 will implement the basic networking ETC in 29 provinces, the main toll station ETC coverage reached 100%, the future will be set up perfect and thoughtful customer service system, timely launched WeChat, weibo and the mobile client application, give full play to the positive role of the Internet, for the vast number of ETC users to provide diversified services. The coverage area of 14 provinces ETC ETC networking reached 52000 km highway, close to half the total mileage of the national highway; 6659 built the ETC lanes, with a proprietary customer service outlets, 718, 5504 network of cooperation agent, and all kinds of service terminal nearly 18000 units; Development ETC, 9.09 million users.

Big department of transportation to establish in our country Promote transportation service

In March 2014, the ministry of transport has been basically in place, responsibility and organization establishment adjustments formed shall be administered by the ministry of transport of national railways, civil aviation administration of China, national post office transport sector management structure pattern, preliminary set up and comprehensive transportation system that meet the needs of big department system and mechanism, which will promote the Chinese various effective connection and service integration of the transportation, and will greatly promote the development of intelligent transportation in China.



China's urban transportation sustainable development opportunities and challenges

Public traffic card to the national network

Published by the ministry of communications has about comprehensive's opinions on deepening the reform of transportation, the comprehensive transportation system, transportation system of modern market system, toll roads, modern transportation services in the areas of reform will be a breakthrough. For the universal concern of all social problems such as toll roads, taxi, opinions are mentioned. "Opinion" according to the ministry of communications research framework for intelligent traffic development, implementing E T C, public transport IC card such as the national network.

Big dipper "5 words" issued and implemented, and promote industry development

On July 1, by the ministry of transport, ministry of public security, state administration of production safety supervision and management of the distribution of the dynamic supervision and management measures for road transport vehicles (order) 5 2014 formally implemented, this is the ministry of communications after "a guest of the two crisis" to another transport vehicle safety control measures. In accordance with the relevant provisions, tourist buses, chartered buses, more than three class line buses and vehicles transporting dangerous goods shall be installed in front of the factory standard satellite positioning device, heavy truck and semi tractor shall conform to the standard installation before they go out of satellite positioning device.

Beidou system formally incorporated into IMO global radio navigation system

21 November 17 solstice, the international maritime organization (IMO) maritime safety committee 94th meeting in London, England, review by the recognition of beidou satellite navigation system of navigation safety circular, marked the beidou satellite navigation system officially became part of the global radio navigation system, obtains the international legal status for Marine applications. This is the first time Chinese beidou satellite navigation system standard system of international organization endorsed.

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China's urban transportation sustainable development opportunities and challenges



謝謝 

Thank you



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