

Study on Emphases and Trend of Tianjin Urban Public Safety

Planning from the view of Bohai Rim Megalopolis

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1 Urban Public Safety Planning

Nowadays urban public safety has been an important subject of study in urban planning study. And planners realized that a safe city is very important for sustainable development. China government begins to pay more attention to urban public safety system and perfect the contents and method of traditional urban public safety planning.

1.1 Understanding of Urban Public Safety Risk Sources

Risk sources that pose threats to urban public safety are classified as natural sources, man-made sources and other sources with natural and artificial factors. The public safety emergencies fall into 4 types according to the documents issued by China---*Master State Plan for Rapid Response to Public Emergencies* in 2006 and *Emergency Response Law of People's Republic of China* in 2007.

Natural disaster. It covers drought and flood, meteorological disaster, earthquake, geological disaster, marine disaster, bio-disaster and forest and grassland fire, etc.

Accident disaster. It covers all kinds of safety accidents in industrial and mining enterprises, and trade and business, traffic accidents, public facilities and equipment accidents, environment pollution and ecological destruction, etc.

Public health events. It covers infectious diseases, mass unexplained diseases, food safety and occupational hazards, animal epidemic diseases and other events that will heavily affect people's health and life.

Social security. It mainly covers terrorist attacks, economic safety events and foreign emergencies.

Through matrix analysis of affection and relationship between urban public safety risk sources and urban planning, we confirm that all nature disaster, environment pollution and ecological destruction in accident disaster, water safety in public health events and terrorist attacks in social security have the closer relationship with urban planning, and will be our research emphasis.

1.2 New Trend of Urban Public Safety Planning

1.2.1 Non-traditional urban safety problem come forth

Non-traditional urban safety problem along with events such as "9·11", SARS, H1N1 has arose more attention. The severity of non-traditional urban safety problem lies in the unknown of its happening rules. Nowadays Chinese non-traditional urban safety problem mainly including energy safety, ecological environmental safety, water resources safety, terrorist

attacks, information system safety, population safety and city construction safety in planning area.

1.2.2 Overall safety concept should be established

With complex disaster-causing mechanism, the urban disasters have almost covered all kinds of disasters. Facing with an increasingly complex and diverse types of disaster, we should instantly advocate an overall safety concept and integrated disaster reduction concept in cities. We should establish an integrated disaster reduction system (Mayor Responsibility system) to break through the management system of single disaster (Department responsibility system).

1.2.3 Conventional disaster prevention and contingency safety system are comparably important

The developed countries, such as America and Japan, have good performance in disaster prevention and reduction, which should owe to their effective management system of integrated disaster reduction as well as the infrastructures of conventional disaster prevention. Now it is a trend to balance the activity plan and long-term goal on public safety planning.

1.2.4 Global climate change cause new trend of meteorological disaster

In the past 100 years, global climate has shown a remarkable change of warming. Climate change has been significantly affecting all aspects of the social and economic development and it has an increasingly impact on urban economic development, people's life and property, people's living, etc. The most direct consequence of climate change would be the increase of urban meteorological disasters in terms of frequency and degree. Under the background of global climate change, it is urgent to deal with urban planning problems.

1.2.5 Regional public safety problem has achieved more attention

In the past, the overall planning of disaster prevention has focused on the disaster prevention and safety of cities and towns. The scope of the disaster prevention planning also expands to whole region including not only cities and towns but also largeness rural areas after the issue of China's new Rural and Urban Planning Law in 2008. Regional public safety are getting more attentions. Since regional disasters would always bring the system to crash, we would focus on the establishment of the regional public safety system and the implementation of the overall guiding theory of regional co-ordination.

1.3 New Task of Urban Public Safety Planning

It is a new task about urban planning and construction to establish urban public safety system and emergency management system. To establish the public safety system of cities and improve the overall safety of cities, we should take the emergency management ability and the risks from urban construction into accounts at first. Therefore, the research of urban planning would face new challenges as follow.

Firstly, the existing traditional system of disaster prevention and reduction would turn to integrated safety system of urban public.

Secondly, we need to conduct the design and construction of urban planning in terms of the demand to establish sound social warning mechanism, emergency mechanism and social mobilization system, and improve the disposal of emergency and public safety.

Thirdly, enhance the integrated and full management of urban planning. Turn single disaster management to integrated disaster management and crisis management; Turn the safety prevention of cities to the full management covering prevention, emergency response and reconstruction; Turn the operation of a single system to the overall system.

Fourthly, under the public safety planning process implement the regional coordination and urban-rural integration theory, and expand the perspective and thought in drawing up the public safety plan.

2 Bohai Rim Megalopolis Development and Tianjin Urban Public Safety Trend

2.1 Bohai Rim Megalopolis Development

The rapid expansion of urban megalopolis have become an overwhelming space phenomenon in the era of economic globalization and information, and the megalopolises all over the world have gradually become the larger metropolis area and city groups. Urban megalopolis has also become the main form of towns in China. Bohai rim megalopolis is entering the integrated development period of strategy with Pearl River Delta and Yangtze Delta, which is constituted by Beijing-Tianjin-Hebei area, Shantung Peninsula and Central-Southern Liaoning Province.

As a channel for northern China to conduct its opening up, Bohai Zone is the gateway for opening up to the outside world in the north of China and plays an important role in connecting the south and the north, as well as the east and the west, and also in participating the global economy competition and cooperation, especially in Northeast Asia area. Under the support of national strategy and policy, it is necessary and possible to shape up integral and huge world-class urban megalopolis.

Bohai rim megalopolis research scope including 2 municipalities (Beijing, Tianjin) and 3 provinces (Liaoning, Hebei, Shandong) with land area 522,000 km² and Sea area 95,000 km². Bohai rim megalopolis has population of 240 million in 2011 which occupy 17.8 percent of China and GDP of 10.1 trillion RMB in 2010 which occupy 25.3 percent of China. Now this megalopolis is in its increasing period and it is important to establish a comprehensive region public safety cooperation mechanism as soon as possible.



Figure 1: Bohai rim megalopolis research scope

2.2 Bohai Rim Megalopolis Public Safety Trend

2.2.1 Region has more important economy status

Bohai rim megalopolis has taken great advantages of gathering a large number of cities such as Beijing, Tianjin, Dalian and Qingdao. With the national strategy of opening and developing Tianjin Binhai new area, Bohai regions have developed so rapid that it becomes the most potential area in eastern China. Therefore, the public safety of Bohai regions would play a significant role in developing national economy and maintaining national safety and stability.

2.2.2 Region has strategic status of public safety in China

Bohai rim megalopolis is located in the junction of north, northeast and eastern China, to Japan and Korea and in the central areas of Northeast Asia. Taking the advantage of technology and manufacturing, Bohai Zone have created a mode of economic growth which is characterized by self-innovation and enhancing the content. As an engineer to turn China from "power" to "great power", Bohai Zone leads the industry upgrade of "Three North" areas and the key to realize regional development as a whole. In addition, as a strategic zone around Beijing, Bohai rim megalopolis not only should undertake an important economy function, but also maintain the regional safety and stability. Therefore, Bohai rim megalopolis would easily be attacked by terrorists and wars whether from politics or economy perspectives.

2.3 Tianjin public safety trend from the view of Bohai rim megalopolis

At present, the overall situation of Tianjin public safety is stable. With an analysis of the disaster sources due to Tianjin's geography and climate environment, geological factors, ecological factors and the city itself, the potential natural disasters of Tianjin include drought, flood (including storm tide), earthquake and other disasters which derived from the above

disasters. Among them, flood (including storm tide) and earthquake belong to emergency disasters. The rescue is difficult, and it needs to enhance the prevention of disasters in case of no disasters.

On the other hand, after 9.11 attacks, terrorist attacks which aim to attack metropolises now have gradually become the key research of urban public safety. Bohai rim megalopolis takes the key strategy as the co-built of world-class cities by Beijing and Tianjin and focusing on the development of coastal areas. Tianjin and Beijing would bear responsibilities for various urban functions of world and own ports and coastlines at the same time. It is more likely for Tianjin to face terrorist attacks whether from perspectives of politics, economy or culture. Therefore, Tianjin must play a significant role in maintaining national safety and lifeline system. And public safety planning of cities based on the traditional integrated prevention planning of single city, should establish system from regional perspective and guide Tianjin to build a safe city under the new national strategy.

3 Consideration of Bohai Rim Megalopolis Public Safety Regional Cooperation and Coordination Mechanism

3.1 Establishing Co-Coordinating Committee of Regional Public Safety Led by Central Government and Relevant Departments

Joint Chiefs of Mayor is a relatively mature coordinating institution in Bohai areas, which is a semi-official organization based on the voluntary join of urban governments. Since its establishment in 1986, it has established 16 regional cooperation organizations to manage the enterprises, talents, housing, energy-saving, tourism, information, media and hospitals. The institution has promoted the deep cooperation in specific fields and improved the trade cooperation and exchange around Bohai areas. However, Joint Chiefs of Mayor don't give enough attention to the public safety problems in Bohai rim megalopolis and don't coordinate well in terms of the potential problems that pose threats to public safety such as the regional traffic channel, regional resources and environment and industrial division. Therefore, standing by strategic height of national development and on the basis of Joint Chiefs of Mayor, we should actively promote the establishment of co-coordinating committee of public safety in Bohai areas led by central government and relevant departments, and provinces and cities. The institution takes the responsibility for the draft of special guidelines of public safety and ensures the public safety of the whole areas, while encouraging professional non-official or non-profit organizations to participate the regional public safety planning.

3.2 Establishing Megalopolis Public Safety Planning Frame in Strategic Level and Key Guidelines in Special Safety Area

Regional public safety has been involved in many fields, but apart from the prevention and reduction of disasters, most fields don't have relevant guidelines or technical regulations. Therefore, from strategy perspective of region, it is essential to make special guidelines or technical regulations. These guidelines would not only lay foundations for the draft of comprehensive planning of urban public safety in the future, but also provide basis to

implement urban and regional governance. Since regional public safety is involved in the benefits of a number of cities and departments, we should focus on the upgrading of the overall prevention ability and emergency response ability, on the advantages and shortcomings of cities in terms of bearing the public safety responsibility, and conducting the analysis of the keys and trends of public safety planning in urban megalopolis to reach consensus with various cities with strategically thought. Public safety guidelines, taking the interest of all parties into consideration, should be characterized by clear division of labor, activity plan and implementation measures to ensure its effective implementation. We should establish the public safety planning for urban megalopolis in strategic level and develop framework of safety planning, and in the process cities will be regarded as an independent and equal individual to participate and implement the planning. On the basis of consensus of regional development, each city should establish public safety guidelines based on the their own features and key problems, such as passage evacuation, ecological system, co-coordinating the water resources and industrial patterns, and focus on the regional safety problems faced by urban megalopolis in the process of development.

3.3 Emphasizing Public Safety Coordinating Planning in Coastal Area

The waters of Bohai rim megalopolis include Bohai Sea and the Yellow Sea by the east of Liaoning and Shandong Peninsula. It covers 95,000 km² and is the common resources of Bohai areas. Water can carry a boat, and also can overturn it. The safety of waters is the focus of urban public safety plans in Bohai areas. Bohai areas has showed a trend of coastal development, since among the 7 national regional plans, 5 plans have given heavy attentions to its development⁹. Therefore, a sustainable and healthy development of Bohai areas would affect the national strategy. And we should focus on the threats of public safety that coastal cities would face .In terms of port and harbor planning, the development of harbor industrial zone and protection of marine ecosystem, we should propose space cooperation plans and public safety mechanism in a higher level. Taking the development need of society, economy, environment and safety into account, we should coordinate the development of regional environment content, the functions of port and traffic system, make economical use of space resources and coastlines, and protect the marine ecosystem. Thus we can avoid the public safety events and achieve the overall and long-term benefits for city's development.

3.4 Emphasizing Supervision and Assessment of Regional Public Safety Planning and Guidelines

Strict supervision and assessment should be established in terms of the implementation situation of urban megalopolis planning and public safety guidelines approved by state, especially in cooperation and coordination aspects related to public safety fields. Regular supervision, inspection and assessment should be established, and the results should link to the special fund of various development projects.

4 Study on Emphases of Tianjin Urban Public Safety Planning from the View of Bohai Rim Megalopolis

4.1 Establishing Ecological System of Regional Integration

(1) An ecological pattern of regional integration and pilot projects for ecological compensation have been conducted in Jixian Mountain, the "Qilihai-Dahuangpu" marsh and the "Tuanbo-Beidagang" marsh. It is also an important part of the security system of ecological safety in Bohai rim megalopolis.

(2) We attempt to establish the ecological compensation mechanism by the Luanhe-Tianjin water diversion project, and take market method of compensation such as the transfer of water rights and paying for the water resources. And we also actively explore the compensation method of technological projects, help to develop pollution-free ecological industries in upper water resources of Hebei by taking advantages of technology and fund, and finally achieve the balance between development and protection. At last, we will explore the safeguard mechanism for regional public safety.

(3) We should perfect the monitoring and feedback mechanism of water quality in Haihe River, control the water quality of trans-boundary Rivers, and collaboratively manage the pollution resources in villages and cross-regional watercourse. We should improve the river pollution control by taking Haihe River as the breakthrough point and protect the regional water.

(4) We should protect the coastlines of Bohai Gulf, optimize the coastal industry distribution with policy and market control, cut the total amount of emissions in waters and prevent the environment deterioration and ecology unbalance in coastlines to achieve the safe use of sea.

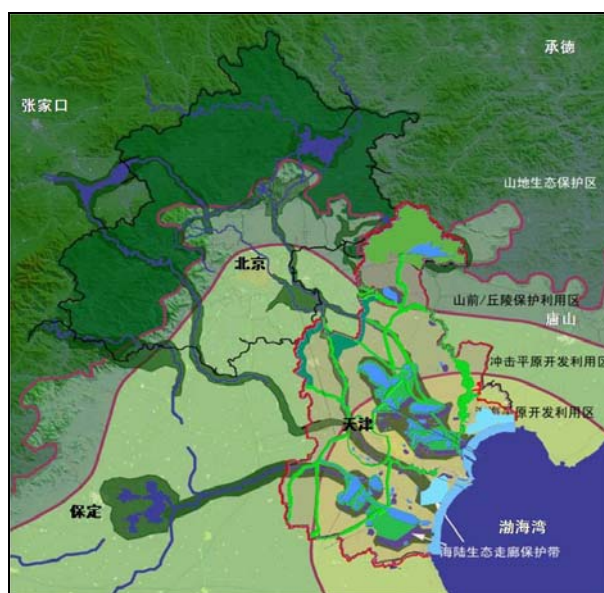


Figure 2: ecological pattern of regional integration

4.2 Improving Regional Carrying Capacity of Water Resources and Environment

Water shortage is the main bottlenecks to restrict the development of Tianjin and Bohai areas, and the public safety hazard that Bohai areas would face in the future. Water shortage would be increasingly prominent under the city's rapid development and the investment of a large number of great and good projects in high level. Therefore, from the perspective of regions, we should focus on the development strategy of Tianjin water resources in urban planning of public safety. We should vigorously promote the desalination and take full account of the relations between development and protection to realize the integrated development and comprehensive utilization of the water resources such as surface water (including transferred water), groundwater, desalinated water and resurgent water. And in the process, we should conduct water-saving at first, focus on urban and rural security of water supply, and take full account of the carrying capacity of water resources and environment.

(1) We should make use of the advantages of seawater desalination in Tianjin; provide more water resources for surroundings to alleviate the widespread water shortage problems in Bohai areas.

(2) Build an industrial chain of "thermoelectricity-desalination-salt manufacturing with concentrated seawater-the extraction and use of chemical resources on seawater", develop seawater desalination technology, promote a series of new measures and new technology of seawater desalination in the river estuary, promote the use of clear energy and recyclable energy to achieve energy-saving goals and reduce the impact of desalination on ecological environment.

(3) Under the development of the non-traditional water resources such as recyclable water and seawater, we would further enhance and perfect the use and management of traditional water resources, and increasingly support the Tianjin water resources by inter-basin water transfer project.

4.3 Improving Regional Sharing and Linkable Traffic and Communications Network

In the planning, we establish high level traffic and communications network in the city, from city to city and from region to region, and create various methods to realize the space rescue and evacuation in case of emergencies due to different reasons. The road network structure in emergency regions would have direct impact on the draft of evacuation plans, the efficiency of evacuation in case of emergencies and the disposal of emergencies. Starting from the integrated development of Bohai rim megalopolis, Tianjin's emergency transportation system guided by the world city by Tianjin and Beijing, will realize the building and sharing of the infrastructures.

At present, Beijing-Tianjin corridor enjoys good traffic conditions, which includes BTT expressway, Jingjin expressway, Beijing-Tianjin intercity railway, Beijing-Shanghai high-speed railway, Jingshan railway and Beijing-Tianjin highway, but obviously lack of channels in edge of north and south district. To improve the overall capacity, we should enhance the traffic corridor with the built of the second airport of Beijing which connects to

Tianjin Nangang, Jinghai and Langfang by the south and has only one traffic route---Tianjin-Shanxi highway that connects to 112 highways. And we should strengthen the contact between Beijing airport and Baodi, Hangu, and strengthen the direct traffic links.

4.4 Establishing Public Safety Management System based on Regional Cooperation and Coordination

(1)The shift of public safety management from single disaster management to full management covers the draft of integrated strategy, policy, disasters management plan, arrangements and support system of resources.

(2)The risk management of public safety should run through the whole process of the disasters. In case of no disasters, we should conduct daily risk management, namely prevention and preparation; during the disasters, we conduct emergency risk management, namely, emergency and rescue. After the disasters, we conduct crisis risk management to restore and rebuild the city.

(3)Public safety management places much emphasis on management integration of different parties (government, civil society, enterprises, international world and international organizations) to shape a mechanism of integrated leadership, cooperation, and sharing interests and responsibilities. It includes the integration of organizations, information and resources.

(4)Public safety management should shift from pure crisis management to risk management, and combine with daily public management of government.

(5)For effective management of public safety, government should establish integrated performance indicators of public safety management. We should keep an eye on the occurrence and change of disaster risks, and provide full inspection to public safety management departments in terms of their purposes and methods, and the performance of staff and the main departments.



Figure 3: traffic corridor of Tianjin and Beijing district

Endnotes

① The 7 national regional plans within Bohai rim megalopolis include opinion of *Tianjin Binhai new area development* by State Department, agreement of *Zhongguancun independent innovation model district* by State Department, agreement of *Shenyang economic district for new industrialization reform and test* by State Development and Reform committee, development planning of *Liaoning coastal district*, development planning of *Caofeidian recycling industrial park*, development of *Yellow river delta efficient ecological economy district*, development of *Shandong peninsula blue economy district*.

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