Return to the "slow city" – Building of slow-moving system based on the situation of China

MENG GU
College of Landscape Architecture
Suzhou Institute of Construction & Communications
Suzhou international education southern district
CHINA
Meng_g15@163.com  http://www.szjsjt.com/

RONG CHEN
College of Landscape Architecture
Nanjing Forestry University
159 Longpan Road, 210037, Nanjing
CHINA
cr-nj@126.com  http://yuanlin.njfu.edu.cn

Abstract: - Ever since the arrival of post-industrial era, cars have been widely used and popularized in an unexpected degree. After experiencing excessive traffic jams, some cities in foreign countries are gradually attaching importance to slow-moving traffics. But only a few theoretical researches on slow-moving system were performed in China, yet they are lacking of a systematic theoretical support. Currently the researches in our country mainly focus on the perspective of urban traffic planning by concentrating on the slow-moving network construction, and ignore the slow-moving landscape and slow-moving facilities. Because of the lack of good coordination and corporation among these three elements, the existing slow-moving system has not achieved the desired effect. So, this paper will research from these three aspects.

Key-Words: - Slow-moving system, Slow-moving network, Slow-moving landscape, Slow-moving facility, Community way, Leisure way.

1 Introduction
After experiencing excessive traffic jams, some cities in foreign countries are gradually attaching importance to slow-moving traffics, it is of great significance to the reasonable optimization of travelling structure and the prerequisite for guiding healthy and harmonious development of urban traffic, It attempts to find ways of improving the health of communities through lowering traffic flow and its accompanying pollution and safety hazards. Recently, many scholars begun to research slow-moving system construction methods from traffic level and relevant practice in many cities, It is expected to effectively ease the conflicts between people and vehicles relying on providing independent and continuous traffic network to pedestrians and cyclists. But there is still lack of research in slow-moving landscape, slow-moving facilities and the relationship between slow-moving network and surrounding land use. Apparently in such development context, researches on urban slow-moving traffic from the point of view of an urban designer and explorations of "slow-moving cities" "oriented by human beings" are of great and important significance.

2 Slow-Moving System
2.1 Definition of slow-moving system
Slow-moving system refers to urban bicycle traffic, pedestrian system and relevant supporting facilities. Slow-moving traffic in China was firstly proposed by the Shanghai Urban Transport White Paper which was enacted in 2002, and it consists of traffics walking and cycling. The goal of slow-moving system is to eliminate the dilemma of slow-movers and meet people's demands in safety, comfortableness and freedom. According to these demands, many scholars have summarized three elements of building slow-moving system[1]: They are slow-moving network, slow-moving landscape and slow-moving facilities.
Slow-moving network: It is the structure framework of slow-moving system. The road network include cycling, walking. It is the fundamental element to provide people roads for walking and bicycling. Slow-moving landscape: It covers all spaces used by pedestrians and cyclists. The space not only includes the network itself, but also includes network’s surrounding environment. It also meets the slow-movers needs in “sight-seeing”. Slow-moving facilities: General term for all facilities which have certain functions for pedestrians and cyclists. It is to meet the slow-movers’ needs in “use”. Therefore, slow-moving network is a starting point of these three elements in building slow-moving system, and then combined with the slow-moving landscape and slow-moving facilities, together to promote the quality of slow-moving system. So, this paper will research from these three aspects (Fig.1).

2.2 Definition of Slow-Moving System

2.2.1 Shanghai

In 2007, the definition by Shanghai slow-moving System Plan contains meanings of two perspectives: firstly, "slow-moving traffic is an independent traffic means indispensable for gearing with other traffic means, and secondly "slow-moving traffic is not merely a traffic means, but also an important component of urban living system"[2]. The Plan proposes to build over 300 slow-moving cores distributed in the downtown area of Shanghai and decades of slow-moving traffic safety areas--safety islands (Fig.2). Moreover, inside the slow-moving island, by making use of the pedestrian facilities on the express ways, major and secondary ways, as well as the few non-motor vehicle ways paralleling with the major roads, a relatively independent and safe slow-moving traffic space can be offered to short-distance travel [2].

2.2.2 Hangzhou

In 2008, Hangzhou has adopted Hangzhou Slow-moving Traffic System Plan and formulated a development strategy of giving priority to
development of public traffic: slow-movers first, advocating slow-moving traffic means, implementing "separated ways for fast and slow moving traffics" on the basis of safety, efficiency and equity (Fig.3); consummating the integrated travel means of "public traffic plus slow moving". [3].

The research methods in these cities are mostly taking pedestrian ways and non-motor vehicles as the framework of the slow-moving networks to divide cities into different areas that are connected by slow-moving plus public traffic. Yet the ultimate goal is to release the traffic pressure and to measure the effectiveness and reasonability of slow-moving system by safety and accessibility. Despite the truth that the construction of the framework of slow-moving systems has built, few citizens can truly use them because the plans remain in the stage of traffic construction, and failed to incorporate the landscape design.

3 Building of Slow-Moving System

3.1 Slow-moving network construction

Slow-moving network construction is from inside out and step by step: firstly, establishment of slow-moving network which depend on different traveling features; then according to the different type of slow-moving network give detail section design of path, and combine with the surrounding natural resources such as rivers, green land to create leisure slow-moving routes; and finally optimization of the design at the joints of slow-moving traffic and motor vehicle ways [4].

Slow-moving way can be generally divided into commuting way and leisure way. Based on the division and functions of slow-moving area as well as the traveling means, some strategies are given for planning.

3.1.1 Commuting way

The construction of slow-moving commuting network should be directed by the space distribution required by commuting between work place/school and residences. It should connect the main residential areas, school area and work area and avoid crossing expressways and trunk roads with full consideration of gearing with public traffic, offering agreeable and convenient slow-moving ways to the surrounding residences and enhancing the proportions of slow-movers while going to school or workplace. Based on the commuting distance and the traveling types analyzed in the above table, commuting ways can be categorized into three types: firstly slow-moving corridor: connect the various functional areas and main serves, secondly, slow-moving passage, serving the middle and long-distance slow-moving traveling; thirdly slow-moving collector-distributor way, meeting the demand of short-distance traveling, and oriented by rail transit stations and public facilities to gear with public traffic. No matter what type of slow-moving commuting way it is, it should meet the following design principles: Function-oriented, non-stop and convenient; Safe and continuous, well-connected to form a network; Convenient access, give priority to public transport.

3.1.2 Leisure way

Leisure way should combine with natural resources such as green land and water systems. Slow-moving leisure way can be built along the green belt land shape to provide places of entertainment and leisure to slow-movers. In accordance with the functions, leisure ways can be divided into long-distance slow-moving network for fitness keeping and short-distance slow-moving network for daily relaxation. Long-distance leisure network primarily serves slow-moving activities for recreation and fitness, thus are built along the waterfront green area. Short-distance leisure network mainly serves the purpose of daily walking and strolling, thus are built along open spaces such as rivers, green land, parks and squares.

3.2 Slow-moving landscape design

In light of the analysis in the preceding chapter, we can conclude that slow-moving ways can be divided into commuting and leisure ways, therefore construction of slow-moving landscape can also be classified as street landscape and natural landscape accordingly. This chapter will propose different landscape design methods as per these two types of slow-moving ways.

3.2.1 Street landscape

Street landscape refers to the landscape in the space along the slow-moving ways and aims at fusing slow-moving with urban life, and allowing people to feel the charm and interest of slow-moving space. In order to meet the above requirements, street landscape should be characterized in the following features: good accessibility, and no influence on the connectivity of slow-moving ways; attractive and appealing, including the multi-functional streets
along the slow-moving ways, diversified building surface with proper colors, and street plazas etc.[5]. Through the above requirements, slow-movers can be provided with diversified visual contacts. Their requirements in shopping and going to world can also be satisfied, while their needs in entertaining, relaxing and exercising can also be met as well. Therefore, this chapter will discuss slow-moving landscaped design from these perspectives [6]:

**Street landscape with mixed functions** (Fig.4)
**Color design of street buildings**
**Design of building facades at ground floor**
**Natural and ecologic slow-moving landscape**

3.3 Building of slow-moving facilities
3.3.1 Bicycle parking facilities
A good slow-moving system should provide a lot of parking options to cyclists, “from short stays to long stays, from on street parking to highly protected parking within parking structures and finally bicycle parking that can be placed in buildings that promote bicycling, educate and inspired for bicycling topics” [6]. In order to invite more people to use cycling, we should provide a positive cycling-environment, make people not only have a secure parking place, but also provide convenience to cyclists, so bicycle parking facilities should always be placed where people are and where people want to go. So, we should give slower-mover a safe and convenient location (Fig.5).

3.3.2 Public bicycle rental facilities
Public bicycle rental facilities is a good supplementation to the slow-moving traffic tools and extends the starts and terminal ends of public traffic service. Public bicycle rental facilities should be built as per the following principles:
1. Give a systematic consideration to the rules of rail transit, BRT and normal public traffic, waterway traffic to optimize the whole public traffic system.
2. Combine with critical traffic nodes, such as rail transit exchange sites, bus stations, pedestrian shopping area, tourist attractions, etc.
3. Be in harmony with the land use and surrounding buildings, take no influence on the surrounding buildings and well gear with the cycling way inside the slow-moving system.
4. Economical use of land and keep the bicycles in order. The following sites are preferred to be rental place: main entrance and exit of residential area, inside large communities, main entrance and exit of scenic spots and schools, and major traffic stations etc..

3.3.3 Pedestrian crossing facilities
The pedestrians crossing facilities can be divided into plane crossing facilities (like zebra crossing) and 3D crossing facilities (like overcrossings), yet their design should insist to the following principles:
**Principle of security**: Crossing facilities are built for eliminating or at least alleviating the conflict between pedestrian and vehicles on one hand, on the other hand providing a safer crossing choice for vulnerable groups including the old, kids, the
disabled and so on. **Principle of convenience:** The type, site and interval distance of crossing facilities can be determined based on the convenience degree of street crossing. They should well coordinate with the entrance or exit of residential communities, bus stations and the entrance or exit of business area. **Principle of comprehensive use:** crossing facilities is not only an important traffic space, but also a kind of public space which can be utilized comprehensively. In particular, 3D street-crossing facilities can be combined with commercial development and advertising to make the slow-moving space more diversified and interesting.

### 3.3.4 Setting of zebra crossing

Setting of crosswalks should also take the motor vehicle users and pedestrians' safety and convenience into consideration. First of all, settings of pedestrian crossing should give consideration to the whole road, based on which the number of zebra crossing can be determined. Besides, the planning of pedestrian crossing facilities should well coordinate with

### 4 Conclusion

Based on the existing theoretical conclusion, detailed design methods are concluded in this essay. Under the guidance of construction principles, traffic network division and organization strategies, slow-moving landscape design thought and slow-moving facilities construction requirements are proposed. Taking slow-moving network as the foundation and backbone of the whole construction, commuting slow-moving ways and leisure slow-moving ways are generated--route organization and cross section design, followed by network optimization, slow-moving node construction--the detailed design of crossroads and pedestrian crossing facilities.

Slow-moving landscape design thought is related with slow-moving network design through building street landscape, creating special artificial landscape and using natural landscape skillfully. As for the street landscape design, through mixed function construction, street charm can be reinforced. Moreover, color and facet design of street buildings can reinforce visual effect.

Moreover, special artificial landscape can bring dynamic landscape to slow-moving ways. Enhancement of the fun of slow-moving landscape is mainly preceded from theme landscape and historical cultural landscape. Skillful use of existing natural landscape should be in consistence with the original landforms, combining with the natural water body with protection of the existing vegetation landscape. Slow-moving facilities should meet humanized requirements, comply with the principle of beautiful appearance and agree with the characters of construction sites. Slow-moving facilities should not only be qualified in safety, comfortableness and accessibility, but also comply with the principle of beautiful appearance, that is, to pay attention to diversification and unification, color and materials, rhythm and rhyme, symmetry and balance. Finally slow-moving facilities should agree with the characters of construction sites in order to make slow-moving facility to be a beautiful landscape of cities.

### References:


