Humanized Design of Traffic Environment Management in Historical Urban Area -- In the Case of Traffic Calming Strategy in Shanghai

Fei Zhou
Shanghai University of Engineering Science, 201620, Shanghai, China.
Email: sapphire_fz@hotmail.com

Keywords: Traffic Calming; Historic District; Traffic Environment; Urban Governance

Abstract: Traffic calming is an advocate for the return of the road space to pedestrians. It adopts practical design and other approaches to enhance safety for motorists, pedestrians and cyclists. This study aims to discuss the safe and harmonious environment for the transportation in Historical and Cultural Cities, especially the historic streets in historic district of the city. In this study, we selected the Sinan Road historic block in Shanghai as the survey area and analyzed the people’s activities and road traffic situation etc. to clarify the traffic calming feasibility of the historic district in the Chinese cities. Traffic calming is a concept and also is a kind of behavior consciousness. The historic city and historic district of China not only need to keep the historical context, cultural background and architectural style, but also need to create a safe and good living space and a civilized and orderly traffic environment in the city.

1. Introduction

As one of the Historical and Cultural Cities, Shanghai has promulgated the regulations and rules for the protection of Historical and Cultural Districts and Excellent Historical Buildings in 2003, and has delimited 12 Historical and Cultural Districts in the central city (Figure-1). Among them, there are 64 “First Class Landscape Roads” have been selected as “never widen streets” which will maintain the width of the original road, and strictly control the height, volume, style and distance of the buildings along the street line.

“Calm” traffic on residential streets, major traffic calming techniques include modifying intersections or roadway channelization to motivate motorists to (1) drive slower or (2) stop using residential streets as bypasses. By lowering speeds and/or discouraging through traffic, the number of crashes can be decreased and pedestrian safety can be enhanced. [1] Traffic calming is the support for the return of the road space to pedestrians. It takes advantage of physical design and other measures to improve safety for motorists, pedestrians and cyclists.[2, 3] It aims to encourage safer, more responsible driving and potentially reduce traffic flow. In many European countries and Japan, urban planners have a lot plans for traffic calming, including narrowed roads and speed humps.[4] In recent years, with the development of the city, the historic district has gradually become a new landmark in the city's tourism, but also increased the traffic pressure and traffic safety in these areas. However, as many historic streets have been identified as the “never widen streets”, the traffic situation is impossible to be changed from the city planning or construction, but only to guide and manage by the policies and measures. Therefore, the traffic calming is the one of the managements to governance the traffic environment in the urban historic district.

Some previous researches have been mainly focused on the urban residential areas or school campus roads in Chinese cities,[5] however, there is almost no research on the traffic calming strategy in the historical and Cultural areas, especially the “never widen streets”.

This study aims to discuss the safe and harmonious environment for the transportation in Historical and Cultural Cities, especially the historic streets in city's historic district. In this study, we selected the Sinan Road historic block in Shanghai as the survey area and analyzed the people's activities and road traffic situation etc. to clarify the traffic calming feasibility of the historic district in the Chinese cities.
2. Traffic calming strategies and devices

Engineering measures of traffic calming include physically altering the road layout or appearance to actively or passively impede traffic by means of increasing the cognitive load of driving. Measures such as speed humps, chicanes, curb extensions, living street and shared space type schemes are included. Europe, North America and Japan have good examples.

(1) Europe

Europe is the continent with the most urbanization in the world: currently, more than 80% of its population lives in towns and cities. Meanwhile, the usage of cars in Europe is growing. In Europe, a overwhelming majority of citizens are calling for changes to promote modes of transport which are more respectful of their environment. [6]

Vauxhall Cross, London, England. Transport planners have adopted the philosophy of traffic evaporation to win support for London’s first fully integrated public transport hub at the Vauxhall Cross interchange in the south London Borough of Lambeth. Initial computer modelling indicated that excessive congestion would occur providing that traffic volumes across critical stop lines at the junction were reduced by 20%, the reduction was considered necessary to provide the space and capacity required for the proposed interchange. Vauxhall Cross experiences some of the highest peak period traffic volumes in London, 9000-10000 vehicles per hour.

The “Vauxhall Cross Project” is an integral part of a planned transport-led urban regeneration scheme, the Vauxhall Cross Capital Challenge. The core aim of the strategy is to redress the dominance of car traffic, making it easier to travel in central London by bus, underground and rail, and at the same time, to regenerate the local environment via local enhancement in order to attract micro and macro investment to the area. The project, which will provide a fully integrated transport interchange, will involve a new covered bus station with direct pedestrian access to the railway and under base stations. The scheme also includes comprehensive safe, surface level pedestrian crossings, dedicated cycle facilities, improvements in lighting and general environmental upgrading.

(2) United States

Many U.S. cities have developed a master plan for neighboring traffic calming. And these are more than just “speed bumps.” Engineers have a slew of street re-designs in their repertoire that can force drivers to restrict the speed. For example, Chicago Department of Transportation (CDOT)’s Traffic Calming Program is designed to make residential streets safer for drivers, pedestrians and bicyclists. The program adopts several roadway engineering tools to “calm” vehicular traffic by making it slow down and move more safely. There are five tools, ① Street speed humps, ② Alley speed humps, ③ Curb bump-outs, ④ Traffic Circles and ⑤ Cul-de-sacs. Tools for Safer Streets

---

Figure-1 Historical and Cultural Districts in the downtown of Shanghai

Source: Made by author
describe the variety of pedestrian safety tools that will make Chicago’s streets safe for its youngest and oldest pedestrians. Creativity and innovation will be achieved by completing this with the aim to develop unique solutions throughout Chicago.

(3) Japan

Since ancient times, “road” is a place where people gather “community”. On the basis of traffic calming, Japan combines the traffic condition of the cities to form the “community zone” philosophy of traffic safety. In order to ensure the safety, comfort and convenience of the area, various forms of traffic calming are used in almost every Japanese city. The residential area and the surrounding pedestrians are ensured, and the speed of traffic is limited by means of restricting the speed of traffic. The steps such as separation of vehicles and coexistence of walking cars ensure the safety of pedestrians.

3. “Never widen streets” in historical and cultural districts

City Landscape Protection Road (street and lane) of Shanghai is divided into four levels which is clearly marked by the historical and cultural features of the central city, as approved by the people’s government of Shanghai. It is including the first level buildings and greenings along the sides of the Road (street and lane). In September 2007, 144 protection roads were confirmed in 12 historic areas of the central city, of which 64 road were protected as the “First Class Landscape Roads”.[7]

These 64 “First Class Landscape Roads” are called “never widen streets” with Shanghai's style and features, which are distributed in 9 historical and cultural areas. These 64 “First Class Landscape Roads” retain the width and related scales of the original road, and strictly control the height, volume, wind, space and so on.

4. Feasibility of traffic calming strategy in “Never widen streets”

In the Hengshan Road - Fuxing Road Historic Area, Sinan Road is one of the 64 “never widen streets”, begins from Middle Huaihai Road to Taikang Road, and intersects with six roads of Nanchang Road, Gaolan Road, Xiangshan Road, Middle Fuxing Road, Jiande Road and Jianguo Road. (Figure-2)

At the threshold of twentieth century, the Shanghai municipal government started the investigation and research on the protection of the Sinan Road. In this historical block, “Sinan Mansion” is the only project to preserve the old villa houses in the center of Shanghai. Since 2010, this block has become a residential, commercial, catering and tourism coexistence area. Although the motor vehicle and non-motor vehicle of Sinan road and Middle Fuxing Road are one-way streets, there is often some reverse driving bicyclist. In the survey, we found that some motor vehicles did not decelerate automatically when they concentrated in the intersection. (Figure-3)

According to the case analysis, traffic calming serves as the reduction in traffic speeds or traffic volumes in a residential neighborhood to provide the residents an feasible level of comfort, safety, and livability, and it is suitable for narrow roads or life road with less traffic.

So, it is possible to use the traffic calming measures at the intersection of Sinan Road and Middle Fuxing Road, in order to remind the motorists and non-motor vehicles to pay attention to the pedestrians and slow down. Because the traffic calming devices generally include changes in installation of barriers, or installation of other physical features for reduction of traffic speeds or cut-through traffic in the neighborhood, while without impacting other neighborhood areas, and the original width of the street will not be affected. On the other hand, as the traffic calming is the combination of major physical measures to reduce the negative effects of motor vehicle use, change behavior and perfect conditions for residents, pedestrians, tourists and non-motorized street users.

According to the transportation condition of Sinan Road, it is suggested that a “Warning Sign” can be set up at the intersection of the Sinan Road and Fuxing Road, and the marking of “Bike Lanes” and “No Retrograde” need to be signed on both of Sinan Road and Middle Fuxing Road with the color paving. Furthermore, it is also necessary to set up “Speed Limit” and “Stop Parking”
sign on both sides of the “Sinan Mansion”, especially in the frequent traffic accidents section, such as the entrance and exit.

![Image](image.png)

**Figure-2** Feasibility analysis of traffic calming measures in Sinan Road

Source: Made by author

![Image](image.png)

**Figure-3** Vehicle converse running, Fuxing Road (Left) and Sinan Road (Right)

Source: By author

**Conclusion**

Traffic calming is a concept that advocates the return of road space to pedestrians. This study purpose to explore the safe and harmonious environment for the transportation in Historical and Cultural Cities, especially the historic streets in historic district of the city. Basing on analysis of the traffic calming case in Europe, United States and Japan, we selected Sinan Road in Hengshan Road - Fuxing Road Historic Area as an example, combined the existing traffic problems in the area, and investigated the feasibility of traffic calming in the historic district of the city.

Since there are many historic streets have been identified as the “never widen streets”, the traffic situation is hard to be changed from the city planning or construction, but only to guide and manage by the policies and measures. Therefore, the traffic calming is the one of the managements to governance the traffic environment in the urban historic district. According to the survey, we found that both vehicle drivers and bicyclists did not slow down when they crossed the intersection.

So, traffic calming is a concept and also is a kind of behavior consciousness. The historic city and historic district of China not only need to keep the historical features and cultural background, but also need to create a safe and good living streets and a civilized and orderly traffic environment.
in the city. In the future, how to make the concept of traffic calming really implement in Chinese cities, it still needs continuous learning and guidance from the government policy level.

Reference


