

# Measuring Quality of Street Space and Its Temporal Variation: an empirical study in Dongsi historical district

*Sub-Theme 2: Identity/Heritage*

## **Shihui LI**

Tsinghua University, School of Architecture, Haidian District, 100084 Beijing, China  
e-mail: lishihui13@mails.tsinghua.edu.cn

## **Zhuo YANG**

Tsinghua University, School of Architecture, Haidian District, 100084 Beijing, China  
e-mail: itchcover2013@foxmail.com

## **Xiao LIANG**

Tsinghua University, School of Architecture, Haidian District, 100084 Beijing, China  
e-mail: 2990054116@qq.com

## **Linyi ZHENG**

Tsinghua University, School of Architecture, Haidian District, 100084 Beijing, China  
e-mail: zhenglinyi123@126.com

## **Ying LONG**

Tsinghua University, School of Architecture, Haidian District, 100084 Beijing, China  
e-mail: ylong@tsinghua.edu.cn

### **Abstract**

*As a primary public space in city, street not only bears the important function of commerce, but its spatial quality is also highly influential on districts' cultural styles and features. Under the circumstances of rapid commercialization in China recently, one significant responsibility of urban planning is exactly to handle the relationship between commercialization and historical district protection.*

*Focused on an empirical study on Dongsi historical district in Beijing, this article builds an evaluation mechanism of streets' spatial quality and guidelines for street interface design based on theories like "Time-Space-People" model. With the application of big data such as multi-temporal and multi-angle Street View images and POIs, it is feasible to evaluate the status quo and the variance of spatial quality of streets in Dongsi, and its relationship with the commercialization occurring in such a historical district.*

*The conclusions drawn from the measuring methods mentioned above are as follows: on one hand, generally the status quo of streets' spatial quality in Dongsi is good, though the score varies with different streets (or synonymous Hutongs), and the interface of commerce varies with different types of operation. On the other hand, the streets in Dongsi see an obvious change in the interface between 2013 and 2016, whose range of change is even larger than the average range of whole Beijing, yet the effective changes are relatively rare, indicating the necessity of guidelines for street interface design. Moreover, among the different kinds of street interface, commercial interface is the one with the largest range of change and the most effective changes.*

*The expected results of this article is to summarize the condition of spatial quality of streets in Dongsi historical district and to further develop some systematic guidelines for street interface design, which can not only be applied to Dongsi itself but also to other historical districts. Therefore, it will guide the orderly introduction of commercial activities into historical districts while maintaining its unique cultural style and features.*

Keywords: historical district protection; spatial quality of streets; temporal variation; quantitative research; guidelines for street design