



## The Scheme Design of ‘Bi-Speed Bicycle Viaduct’ Demonstration Line

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### Abstract

The bicycle viaduct is an effective method to solve the contradiction between the rapid development of urbanization and low carbon. In this paper, a 4.8km long viaduct was designed between the Happy Valley and Phoenix Peak park of Chengdu, China. The standard sections of the whole viaduct adopt steel box girder and Ultra High Performance Concrete (UHPC) precast beam with 30m spans and 5.5m widths of bridge deck (single). And the UHPC connection plate is used to replace the traditional mechanical telescopic device to realize the continuous bridge deck between the ends of the simple beam, which embodies the concept of ‘green bridge’. This line focuses on the design of three nodes, which includes the five towers cable-stayed bridge, the double deck arch bridge across the Fu River and the continuous beam bridge in leisure area. The three bridges enrich the bridge modelling, reflecting the application of aesthetics in the bridge. The whole traffic is based on bicycle, which adopts separation traffic with double speed of fast and slow speed and can be used for sightseeing and travel. This design highlights the people-oriented, can ensure traffic safety and achieve a ‘safe travel, green travel’. Therefore, the viaduct is an effective means to solve the disharmony between the urban development and the environment.

**Keywords:** Viaduct, Green, UHPC, jointless bridge, precast assembly, bi-speed.

### 1 Introduction

In recent years, with the continuous development of social economy, people's living standards have been constantly improving. But the increasing urban traffic has hindered the development of the city. Such as traffic congestion, traffic accidents, noise pollution and air pollution caused by automobile exhaust emissions, and so on.

Urban problem is the surface of various contradictions in the process of urban development. It has various forms, or inappropriate combination of elements, or structural imbalance, or poor functioning. [1] The following are two main aspects of the characteristics:

(1) The traffic environment was deteriorated and the conflict between motor vehicles and non-motorized vehicles was serious.

(2) The passenger traffic was unreasonable.

To solve these problems, many countries have adopted corresponding measures. For example, restrictions on the rapid development of private cars, including purchase, limit line and a series of methods. And advocate ‘green transportation, green travel’, to take public bus, subway, light rail and tram, and so on.

Bicycle traffic is a kind of ‘green traffic’, which has the characteristics of convenience, flexibility, no energy consumption, no pollution, strong