

Case Study of Bus Rapid Transit Bridges in Xiamen, China

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Summary

Because of its superior efficiency, environment-friendly and aesthetic value, Bus rapid transit (BRT) system has grown to be an emerging urban public transport system in recent years. Based on the study of Xiamen BRT, the first viaduct bus rapid transit system in China, the numerous technical features of this system have been studied, such as load model, bridge type selection as well as span arrangement. Meanwhile, the design of ancillary facilities and some new construction methods have been discussed. As a significant part of urban landscape, the coherence between bridges and environment has been fully taken into account during the bridge design process. Moreover, on the basis of the static and dynamic field testing, the actual operation state and dynamic performance of this series of bridges have been analyzed. The paper also discussed the feasibility on the new concept for shifting the BRT bridges from rapid transit to light rail in long-term.

Keywords: Bus rapid transit (BRT); viaduct; design parameters; finite element (FE) analysis; field load testing.

1. Introduction

Bus rapid transit (BRT), which derived from Curitiba in Brazil, is a new type of high-capacity public transport system. With its low cost, low pollution, high efficiency and comfort travelling environment, it has been widely promoted and applied around the world and other Asian cities in recent years. Xiamen BRT, the first viaduct bus rapid transit system in China, has come into service in September 2008.

Xiamen BRT line 1 starts at the first wharf and ends at Xiamen new railway station (see Fig.1), with a length of 32.96 kilometers. There are a total of 22 stations on BRT line 1, including 16 elevated stations, 1 elevated garage, 4 ground stations and 1 underground station.

What is unique about Xiamen BRT line 1, compared with the usual, is that all the lines have taken the type of viaduct bridge, and the elevated driveways as well as stations are established within the 4-meter-wide greenbelts in the middle of the existed roads, which greatly reduces the space occupied on the ground (see Fig.2). In addition, Xiamen BRT line 1 is applied as the high-capacity bus system in the near future and supposed to be upgraded to be the light rail transit in the long-term, considering the economic and reasonable utilization of channel resources. This kind of design is also the first case in China.



Fig.1: Layout of BRT line 1

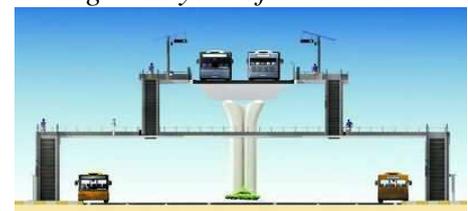


Fig. 2: Graphic of BRT viaduct