

## **Study On Vibration Characteristics Of Structures Adjacent To Road Tunnel**

**Wei LU, Wanpeng ZHANG, Weihua HU, Jun TENG**

Vehicle-induced vibrations of road tunnels will cause structural vibration and even resonance, while the vibration frequencies and energies of vehicle-induced vibration will be attenuated by the transmission through the surrounding formation (underground or aboveground). Hence this study focuses on the transmission law of ground vibration under traffic load in road tunnels and the vibration characteristics of structures adjacent to road tunnel. A three-dimensional model was established considering the whole transmission process using co-simulation method. The analysis scenarios included the vibration amplitude and frequency of traffic load simulated by different vehicle load and speed, the transmission process factors such as soil composition and tunnel burial depth, the motivated structural factors such as its structural systems and the distances from road tunnel. Different working conditions were given to analyze the transmission law of vibration on ground and the vibration characteristics of structures adjacent to road tunnel due to changes of the above parameters. Ultimately the field vibration measurement tests of Tanglang Mountain Tunnel and Xinwu Tunnel were carried out to verify the feasibility of the proposed method.