

**Design Methodology of Wireless Sensor Networks with Consideration  
for Installation and Operation Costs**

Akio HADA    Ryuji TSUCHIYA    Kenichi SOGA

Attention has been called to the condition monitoring system of railway structures using wireless sensor network (WSN) from the viewpoint of its maintenance. WSN can continuously collect data from the sensors deployed at railway structures, which will decrease risks caused by leaving unusual state of structures above for a long time. The cost-effectiveness of WSN deployment is a key to the success of this monitoring system and therefore must be evaluated and optimized through mathematical modeling approaches. In this paper, we have studied a design method for minimizing the total cost of a WSN used for monitoring railway structures.