

Prof. Chan introduced the maintenance of Taiwan's highway maintenance, particularly, on bridges and slopes:

"The bridges of Taiwan are in a typical multi-hazard situation. They face typhoons, earthquakes, scarring, and even traffic overloads. The inspection and monitoring of bridges need to be carried out in a very frequent manner. The landslide occurred in northern Taiwan in April 2010 affected the area estimated over 22,000 m² and the total mass was estimated to be over 20,000 m³. It took almost two months to recover the function and service of the freeway."

"The National Freeway Bureau (TANFB) was established in 1970 to start the first National Freeway projects. Freeway #1 started service in 1978 in the west corridor of Taiwan. Design, maintenance, and management of the bridges and slopes are based on specifications and manuals. The most recent updates and amendments were done in 2011 by the authority."

"General and annual contracts for inspection works may include routine inspections and special inspections for particular incidents, such as after major earthquakes or typhoons. Nondestructive techniques or detailed inspections usually have to be conducted."

"Scouring is a very important issue for bridges in Taiwan. Major tasks may include routine inspection and maintenance, riverbed cross-section measurement, and coordination between the bridge authority in river authority. Changes of a riverbed cross-section are a critical issue to result in erosion of pier. The changes of a river's watercourse can also be enormous threatening the safety of the bridge."

"The bridge management system is composed of a database for general information on bridges and a number of modules that enable the system to perform various functions for maintenance and management including a statistics and analysis module, an inspection data processing module, a repair cost estimation module, a maintenance record module, and a GIS analysis module."

"The management system for slopes of the national freeway provides comprehensive inspection and monitoring. The primary monitoring system was established in 2010 at more than 200 slope sites. A comprehensive inspection was done in 2011 and provided safety evaluation reports. A lifespan maintenance and management system was established in 2012. The slope monitoring system incorporates various types of instruments, data transmission modules, and a control system that may deliver action orders when necessary."

"In recent years a full lifespan management system for freeway slopes has been developed. The significant points include a comprehensive history and traceability system, automation of data processing, a graphical interface, and real-time monitoring. One of the very important functions of the system is to provide early warning in particular situations through automation and real-time monitoring. Most other sectors of infrastructure were done with management systems similar to this operated by the National Freeways."