

Adopting "Safety 2.0" to Construction Work

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Mountain tunneling repeats the cycle of drilling, loading, shearing, spraying, erection of steel supports, and rock bolting. The work is divided into three categories: work with heavy machinery only, work with people and heavy machinery, and work with remote operation of heavy machinery. Each area is divided into dangerous and safe zones for safety control, but the final safety control depends on human judgment. Recently, with the advancement of information and communication technology (ICT) has made information sharing between people, objects, and the environment possible to ensure safety. This concept is called "Cooperative Safety," and the technological aspect that supports this concept is called "Safety 2.0" (Fig. 1). In mountain tunneling, work areas are zoned according to time and space, and the positions of people and heavy machinery are digitally monitored (relative position detection and image analysis). Safety 2.0 technology, such as alerts that can be recognized by humans and machines and immediately shutting down heavy machinery, is implemented to prevent contact accidents (Fig. 2). In this way, we believe that Safety 2.0 technology can enhance the wellbeing of the people working there by realizing safety and security through the cooperation of people, machines, and the environment.

※ Ref. Masao Mudoaidono, "Safety and Assurance for the New Era: Safety 2.0 and Cooperative Safety," Hitotsubashi Business Review 2019 WIN, pp.8-17, Toyo Keizai Inc. (Dec. 2019).



Fig. 1 Outline of Cooperative Safety

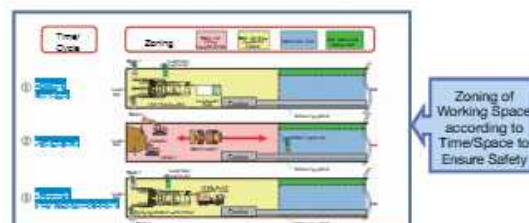


Fig. 2 Zoning Sample of Working Space for Tunnel Construction