

## Inspection of Tunnels Using a Running Vehicle with Tunnel Lining Surface Imaging Technology

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### 1. Current Status of Tunnel Inspection

Road tunnels in Japan are required by law to be inspected visually every five years. Japanese expressway companies, which own and maintain many tunnels with a total length of approximately 1,800 km, are using vehicles with tunnel lining surface imaging technology to carry out inspections efficiently and with high accuracy. (Photo 1)



Photo 1 Taking images of the lining surface

### 2. Features of Lining Surface Image Capturing Technology

The surface image of the lining obtained by this technology is extremely accurate and can capture surface deformations such as cracks and water leakage with the same accuracy as close visual inspection.

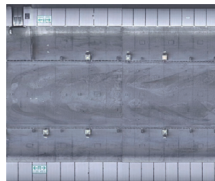


Photo 2 Surface image of the lining

In addition, the use of elevated work vehicles for close visual inspection usually requires traffic control on highways, which sometimes causes traffic jams. This causes considerable significant social impact. (Photo-3) However, the image capturing vehicle in this technology can acquire images of the lining while traveling at 80 km/h without any need for traffic control.



Photo 3 Inspection by close visual inspection

### 3. Details of Inspection Method

All tunnels are inspected once every five years, and images of the lining surface are taken. The presence or absence of deformation is then checked at the office. The scale of crack occurrence is automatically calculated using specialized software. Engineers will conduct close visual inspections onsite only in areas where deformations have become apparent. In this way, efficient and highly accurate inspections are realized, and safe and comfortable expressway services are provided.