



Safe & quick  
inspection

No traffic  
regulation  
required



Compliance

Inspection  
light remains  
on while  
driving

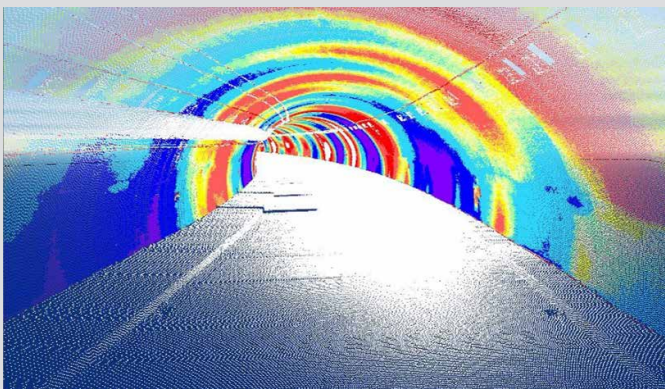


# —New Tunnel Inspection—

Vehicle dedicated to tunnel inspection

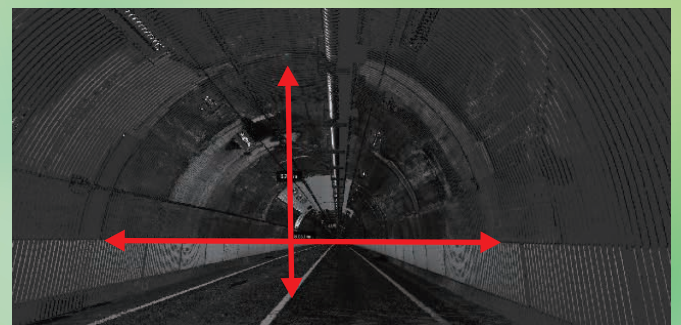
# MIMM

Through facility diagnosis, our company  
solves customers' problems and provides  
local society with "Safety and Security"



## 3D Configuration

Simultaneous measurements possible



Keisokukensa Co., Ltd. ~ MIMM ~

<http://www.keisokukensa.co.jp/MIMM.html>



# New Tunnel Inspection

Vehicle dedicated to tunnel inspection

# MIMM

Feature 1  
Safe & quick

Feature 2  
3D simultaneous measurements

Feature 3  
High accuracy

Feature 4  
Intuitive!!

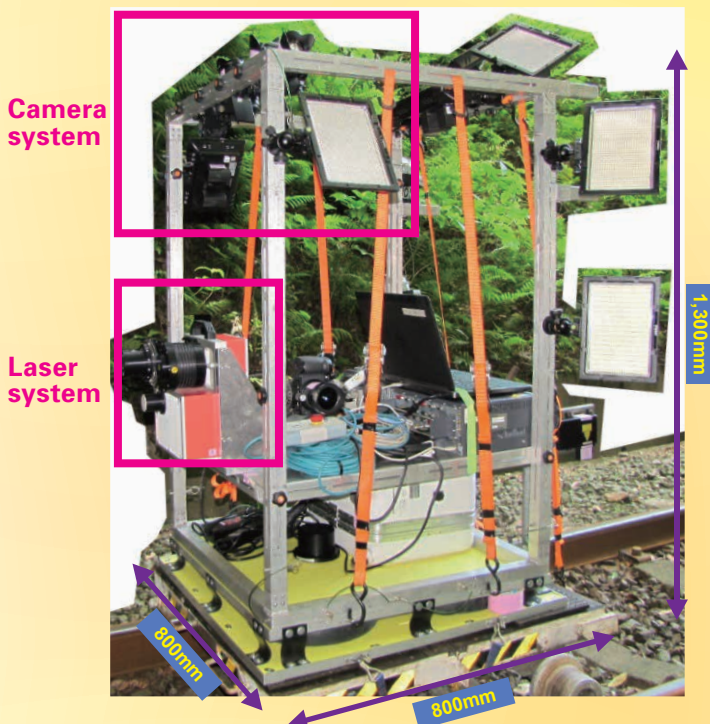


The total number of road tunnels is currently around 10,000, which extend a total distance of about 4,000 km. Our company adopts exclusive vehicles (which we call MIMM) and develops technology which enables inspecting and examining a large number of tunnels efficiently and with a high level of accuracy. MIMM allows you to capture image data and 3D laser data in one single measurement.

These images are comprehensively analyzed and a wide range of cracks (deformed states) in the concrete walls of the tunnel can be expressed visually along with any deformation. Enabling you to intuitively understand any abnormal areas, MIMM is well suited for examining tunnels.

New product

# MIMM Compact Measurement System



## Features

- (1) **Compact**, but equipped with a **laser and camera system** which enables **simultaneous measurements**
- (2) **On-site assembly** is possible when conducting measurements
- (3) Measurements are possible using the **portable battery**



Railway tunnel



Water supply canal

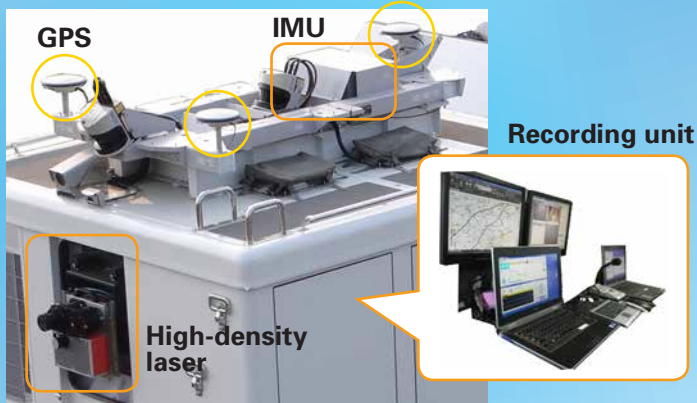


Carried by a light truck



# MIMM 2 Measurement System Outputs

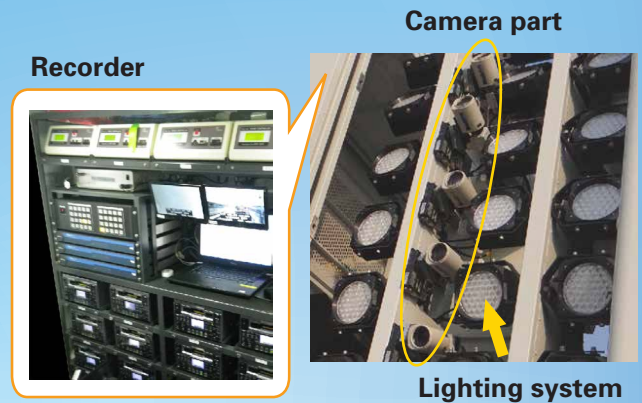
## MIMM laser measurement technology



### Main specification

- GPS (3 units), IMU (Inertial Measurement Unit), camera and high-density laser scanner are integrated to comprise one unit.
- 3 GPS units capture the vehicle position with a high level of accuracy, which enables the 3-dimensional space of roadway surfaces and surrounding areas to be measured with a high level of accuracy, within 10 cm of absolute accuracy and within 1 cm of relative accuracy.

## MIMM image measurement technology



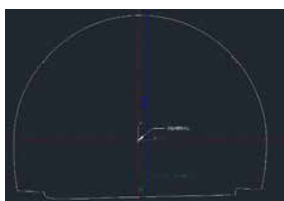
### Main specification

- Consists of a lighting system, a camera that captures the standard tunnel wall in high-resolution images of 2 mm/pixel and a recorder that records captured images continuously.
- The camera can be quickly adjusted for any shape of tunnel by combining with an electric universal head in order to film high-definition images at the optimum angle.

## (1) Laser measurement output

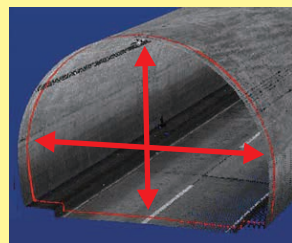


**Group of points in a tunnel**  
CSV format, coordinates and GPS time



**Section DWG**  
Cut the section every 20 m

### - New analysis -



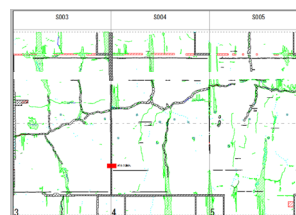
Analyze a group of points in the tunnel and measure the **dimensions of their relative positions**

Compared with current analysis, provides **low-cost, simple and intuitive** results.

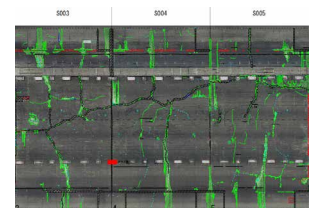
## (2) Image measurement output



**Filmed development image**  
jpg-format, at every single span

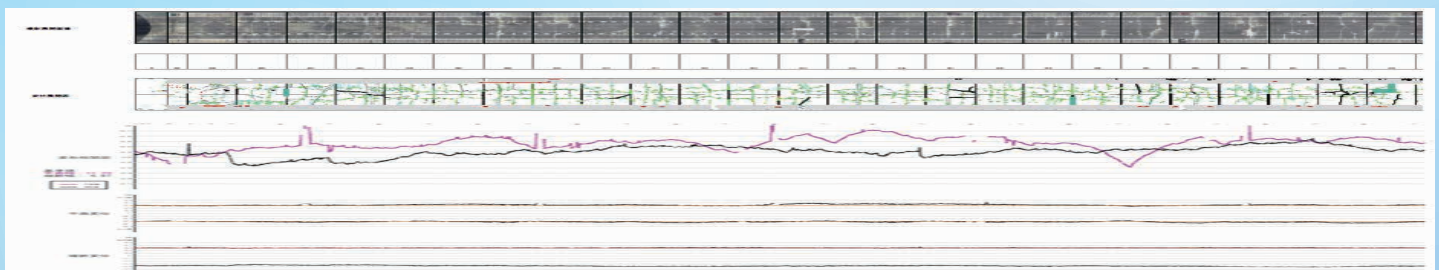


**Deformation development plan**  
View using CAD software  
(dwg format also available)



**You can have an accurately designed detailed inspection and repair plan!**

**(1) + (2) Record the shape dimensions and the deformation of the entire tunnel, for age management**



# - New Development -

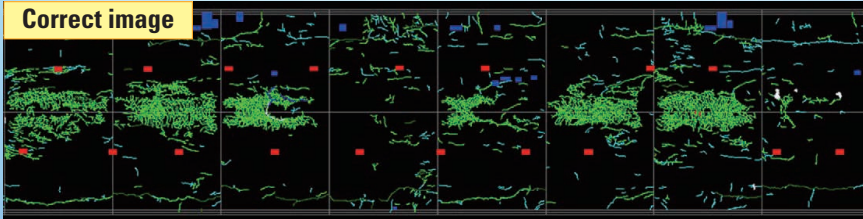
## No. 1 Automatic extraction using AI learning

Automatically extract cracks and objects from images

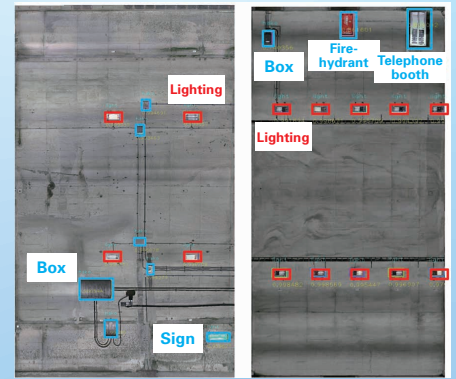
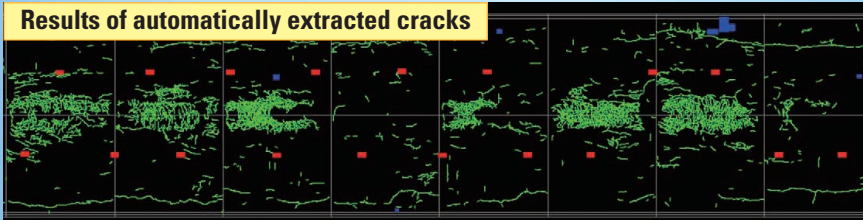
Development image



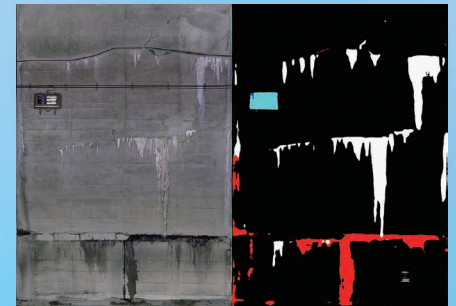
Correct image



Results of automatically extracted cracks



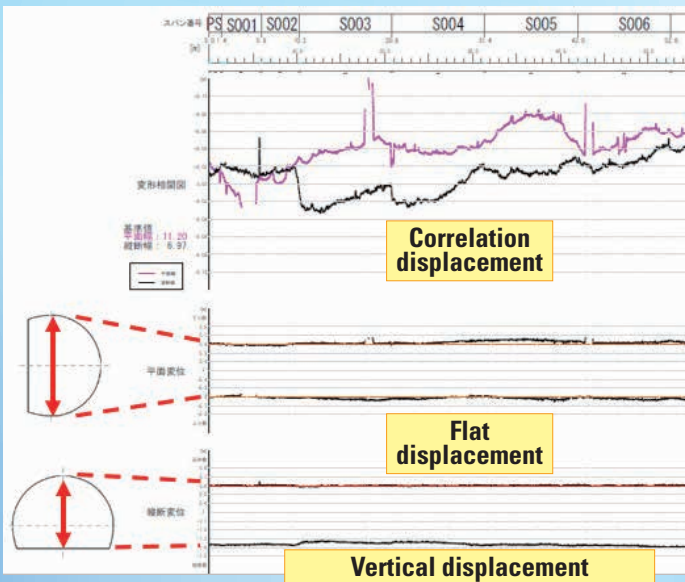
Results of extracting objects



Result of extracting water leakage and free lime

## No. 2 Point group analysis to measure section displacement

Output tunnel displacement (vertical, horizontal) on a graph

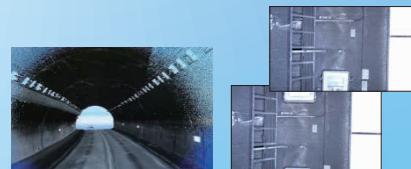


## No. 3 Composite support software of images

Compound images from multiple cameras using a semi-automatic process



Process concept



MIMM laser and image data



Composite image

Contact



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