

Tunnel workshop in 深圳, China '24 (4)

# Tunnel operation of West Nippon Expressway Co., Ltd

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2024.4.19

Overseas Business Department  
Technical Development Bureau  
West Nippon Expressway Co., Ltd



# 1. Expressways in NEXCO-West

NEXCO

## [Expressway Business]

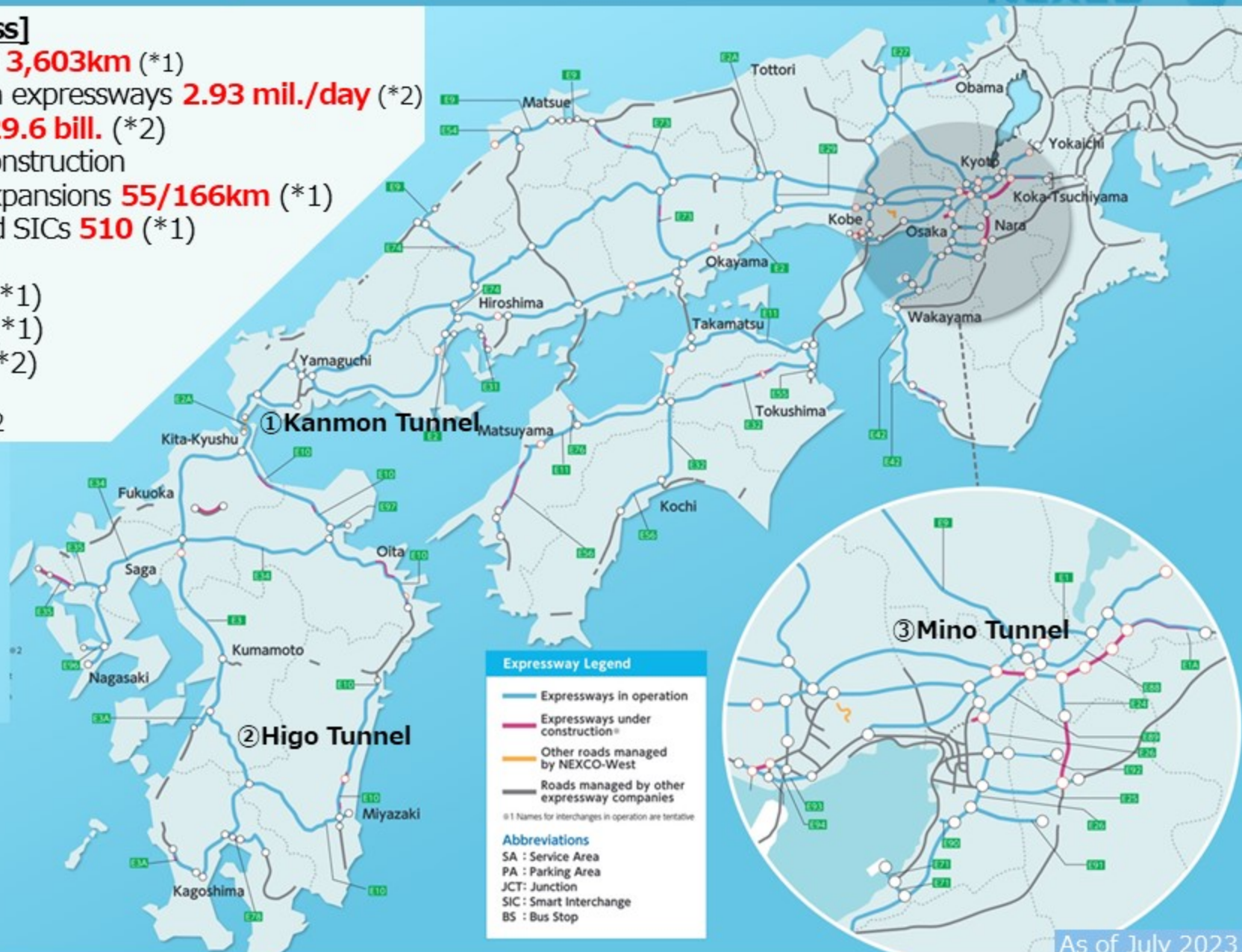
- Expressway in service **3,603km** (\*1)
- Number of vehicles on expressways **2.93 mil./day** (\*2)
- Business income **¥729.6 bill.** (\*2)
- Expressways under construction
- New routes / lane expansions **55/166km** (\*1)
- Interchanges(ICs) and SICs **510** (\*1)

## [Rest area Business]

- Service Areas **100** (\*1)
- Parking Areas **213** (\*1)
- Sales **¥157.7 bill.** (\*2)

\*1: as of July 2023

\*2: Performance in FY2022



# 2. Global Business

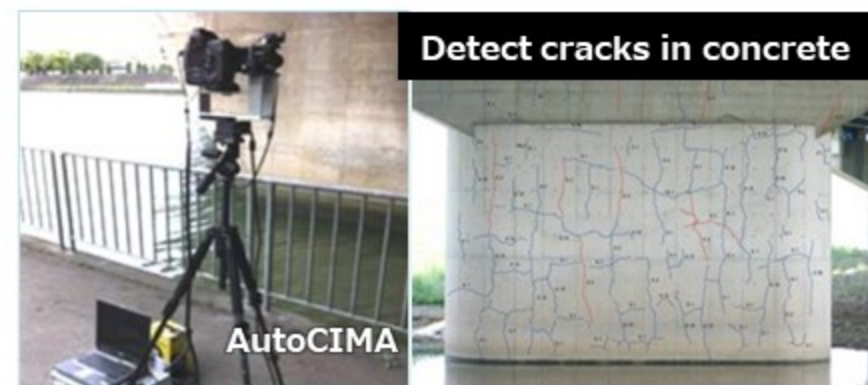
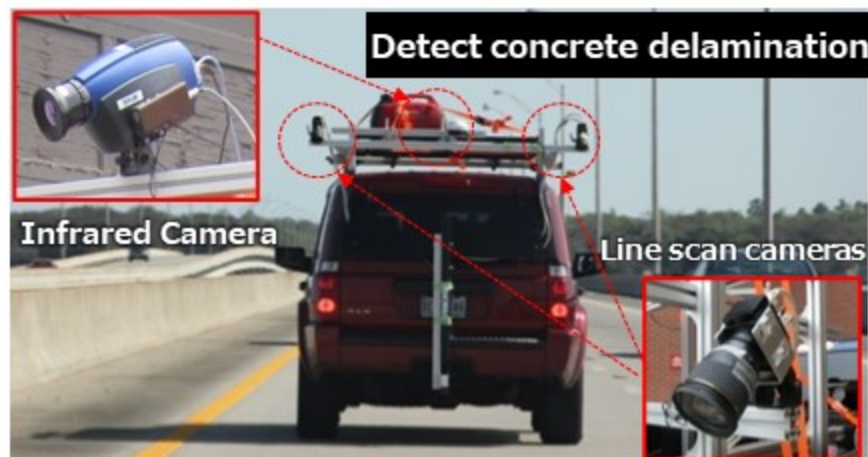


Indonesia 

**Jakarta Office**  
since July 2011

USA 

**NEXCO-West USA, Inc.**  
since January 2011

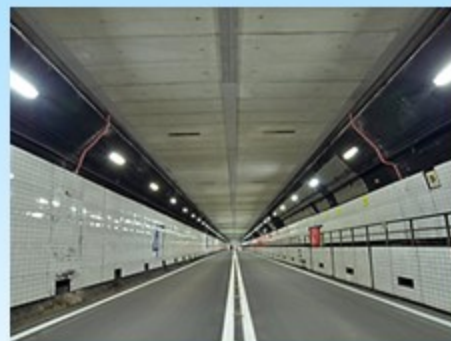


# 3. Examples of Tunnels in NEXCO-West

NEXCO

## ① Kanmon Tunnel "Undersea"

Length	3,461 m
No. of Lanes	One lane for each bound (Undivided)
Design Speed	60 km/h
In operation	1958



## ② Higo Tunnel "Longest"

Length North bound	6,331 m
South bound	6,340 m
Design Speed	80 km/h
In operation	Provisionally (one tube for both bounds, undivided) in 1989
Completion	(two tubes, 2 lanes for each tube) in 1999



## ③ Mino Tunnel "Latest Technologies"

Length East bound	4,997m
West bound	4,982m
No. of Lanes	Two lanes for each tube
Design speed	100 km/h
In operation	2017

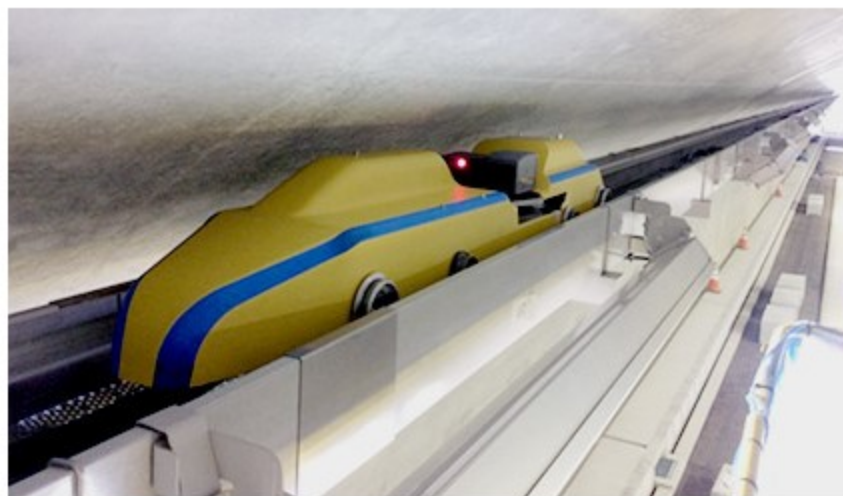


# 4. Technologies of Tunnel O&M ( 1 / 4 )

Enhance surveillance capabilities with **robots** and **cameras**

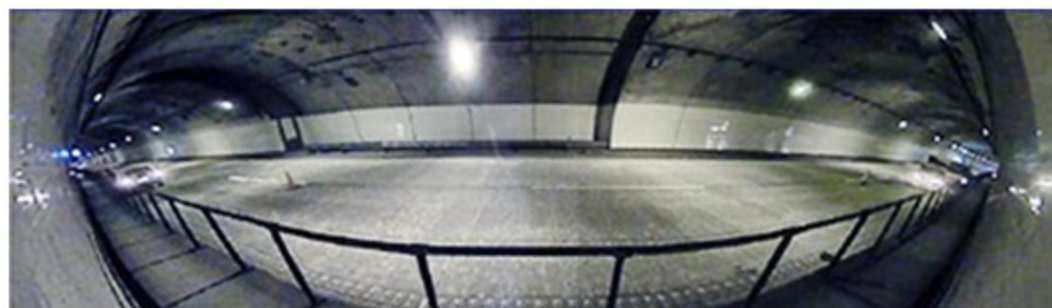
## (1) Mobile robotic camera

- immediate dispatching to the location of an accident (by 20km/h)
- Linked to the fire alarm push button or emergency phone hook-up to enable taking close-up footage of the incident/subject.



## (2) Binocular monitoring camera using image synthesis technology

- Combines and processes video from two consecutive cameras to provide a 180-degree field of view.
- Linked to fire detectors and emergency telephones for quick and detailed situation assessment.

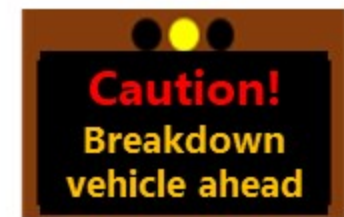


# 4. Technologies of Tunnel O&M (2 / 4)

## Incident notifying system using image processing of video image

Using **AI image processing** technology, the system detects traffic incidents such as disabled vehicles, falling objects, and traffic jams.

Provide information on the variable message signboard(VMS).



Prompt response of dispatching a service vehicle to the incident



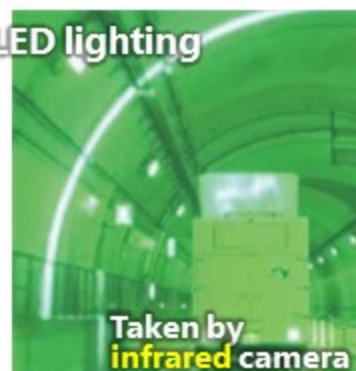
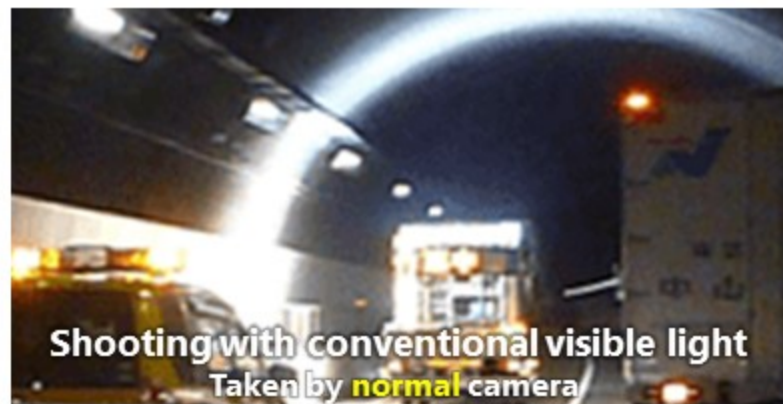
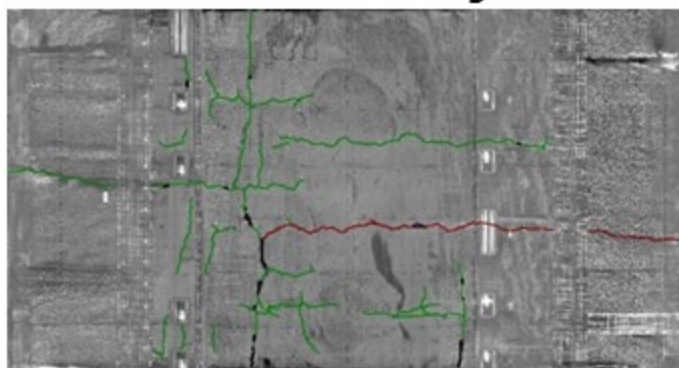
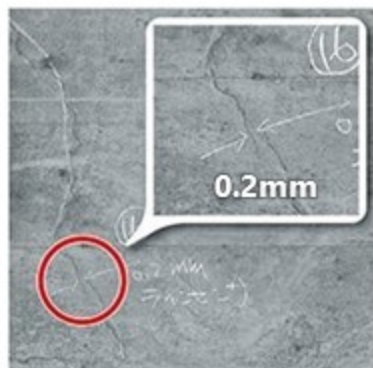
# 4. Technologies of Tunnel O&M (3 / 4)

## Tunnel lining inspection system (eQ-Doctor T)



- Series of photos of Tunnel lining surface taken at speeds of up to **100 km/h**
- **Near-infrared LED** lighting, which is **invisible** to drivers and prevents distraction of drivers.
- Crack widths down to **0.2 mm** can be recognized.
- Cracks can be **automatically** extracted.

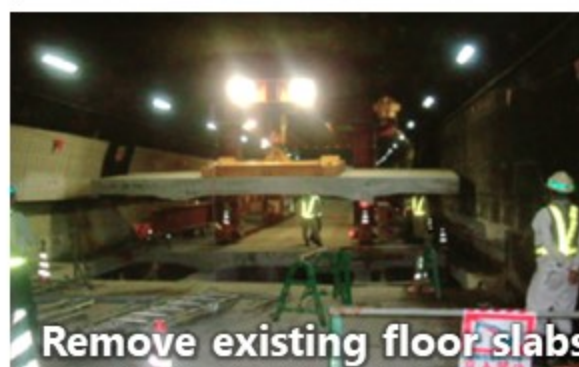
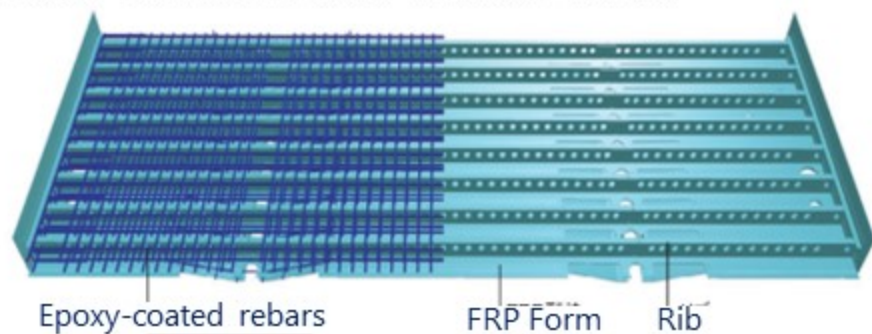
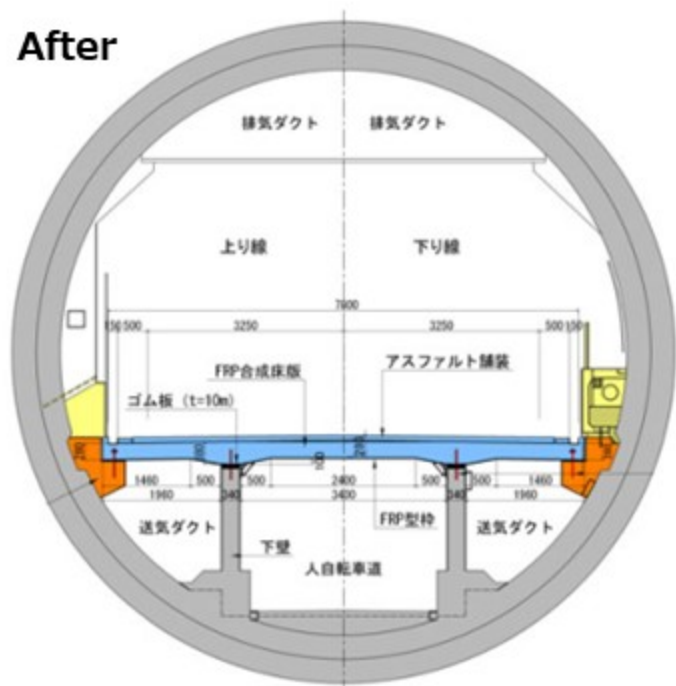
Cracks on the surface of lining concrete



# 4. Technologies of Tunnel O&M (4 / 4)

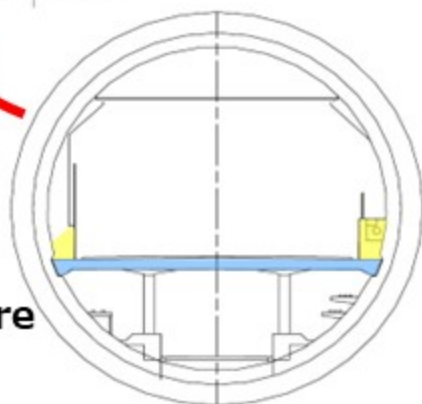
## Introduction of FRP floor slab in Kanmon Tunnel for floor slab replacement works

After



Colored parts are reconstructed

Before







***Thank you for your  
attention!***