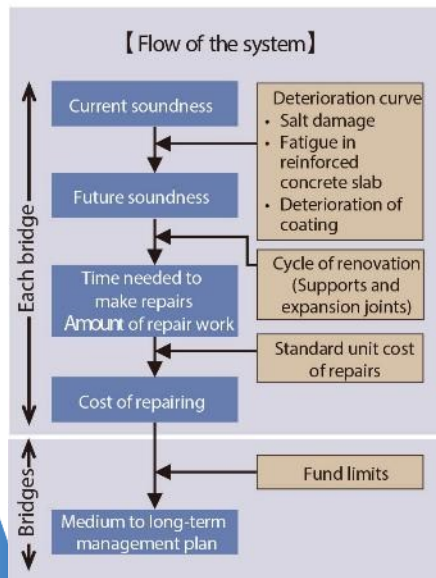


Asset Management

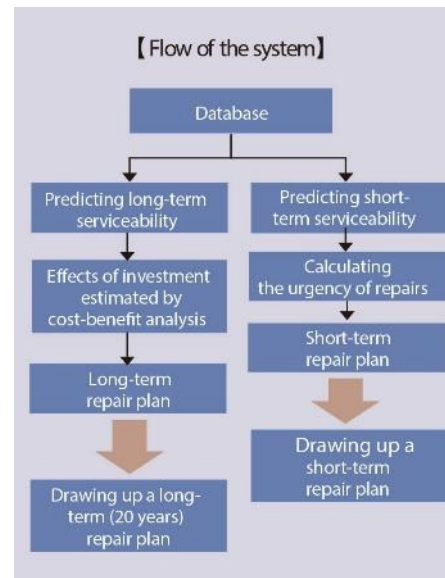
Development of road asset management

The Bridge Management System (BMS) and the Pavement Management System (PMS) are being developed to predict future deterioration of structures and to ultimately extend their lifetime by extending the time until renovations are needed and reducing the total costs of maintenance and renovation.

■ Overview of a Bridge Management System



■ Overview of Pavement Management System



■ Percentage of bridges older than 50 years



Judgment category IV (urgent measures should be taken)

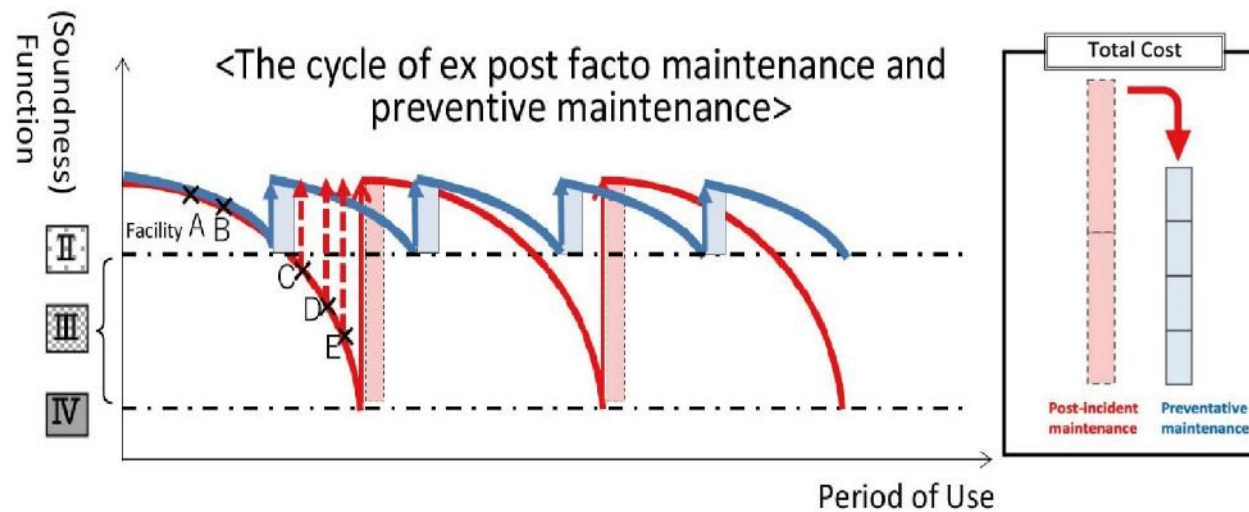
The percentage of infrastructure facilities that are more than 50 years old is increasing at an accelerating rate.



(As of March 31, 2025)

Efficient management of road assets

- Medium- to long-term cost reduction through preventive maintenance



Deterioration due to salt damage



Bridge inspection example



Collapsed slab due to fatigue



Deterioration due to an alkali aggregate reaction

History of maintenance activities for aging road

■History of the road asset management

2003: Recommendations for management and renewal of road structures
"Early preventive maintenance can reduce total cost"

2004: Notice of National Guideline for Periodic Bridge Inspection (for national road bridges)
Prescribes specific inspection procedures

2013: Called "The First Year of Infrastructure Maintenance Era"

2013: Amendment of the Road Act Inspection standards were legislated with clear perspectives of preventive maintenance

2007: Break of diagonal truss of Kisogawa Ohashi Bridge over National Highway Not 23



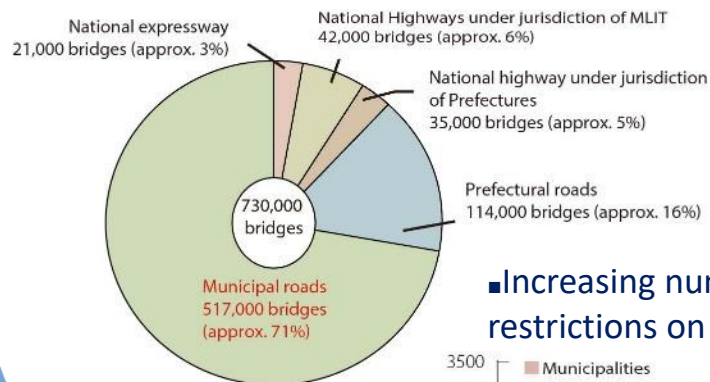
Note: embedded part of diagonal truss in concrete

December 2, 2012:
Sasago Tunnel Ceiling Collapse

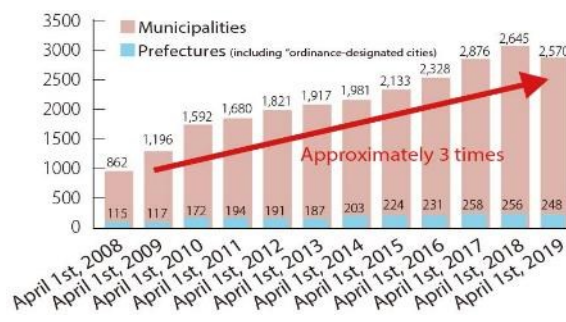
December 7, 2012:
Order of urgent inspection of road tunnel facilities
Jet fans, lighting and other

Current maintenance activities for aging roads activities

■Number of bridges by road type



■Increasing number of traffic restrictions on local roads



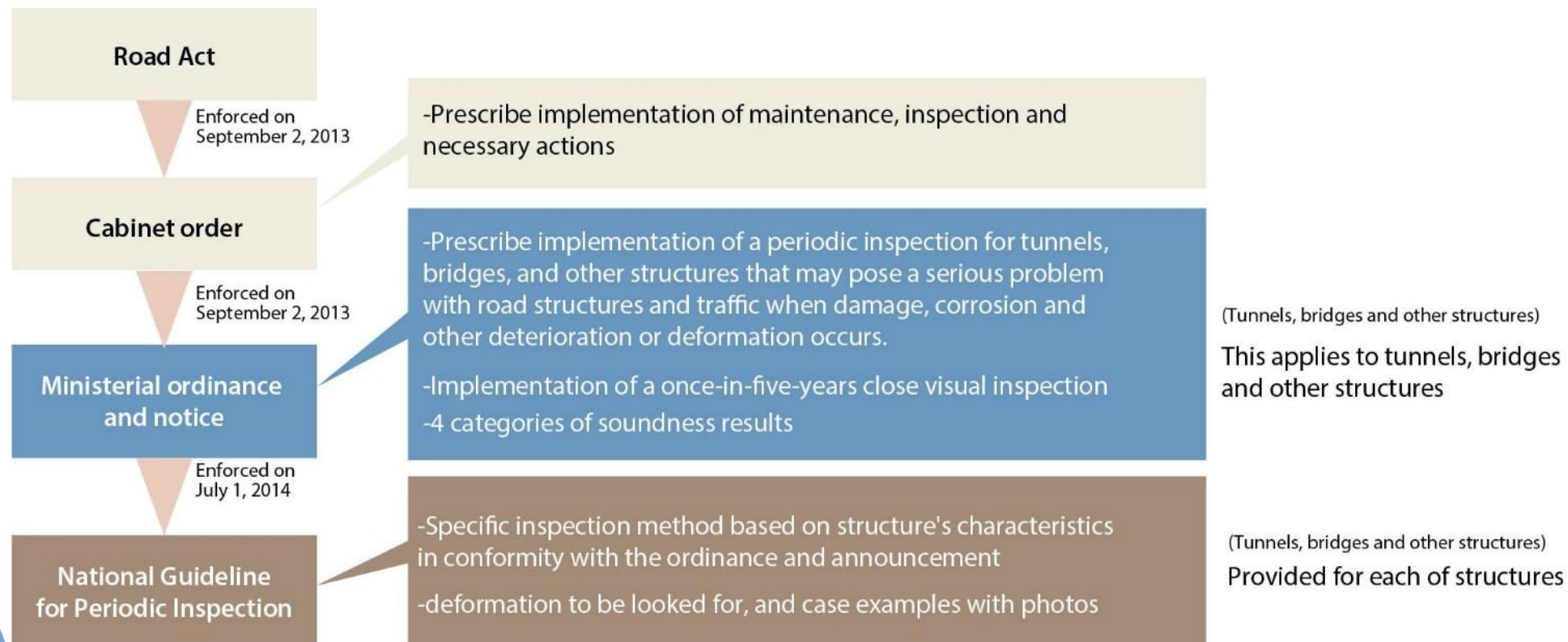
■Serious damages on a bridge



37-year old Miharashi Bridge (on Shinyamashita 8th municipal road) was found damaged.

Standards for statutory inspection

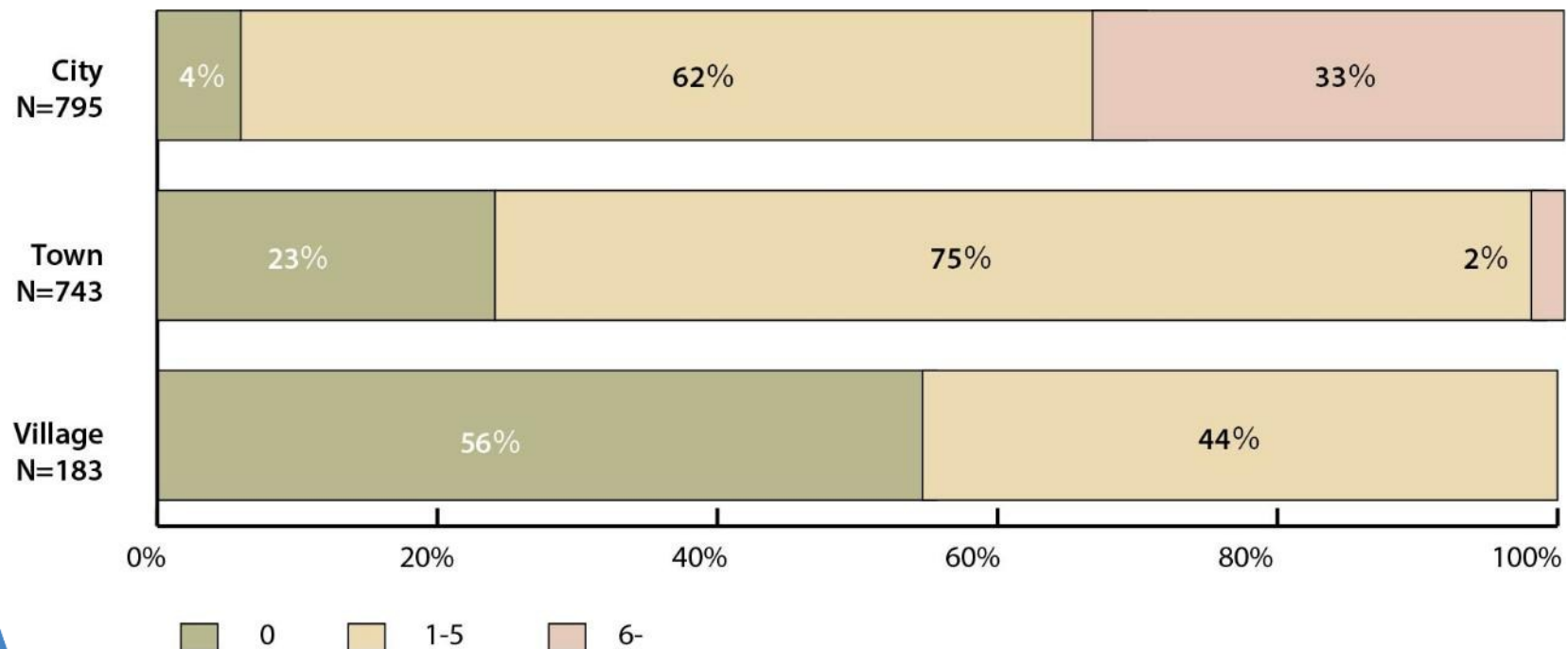
■ Legal system of the inspections



Maintenance by Municipalities (Technician and Inspection Method)

23% of towns and 56% of villages in the country have no civil engineering technicians for bridge maintenance in their workforce.

■ Number of bridge maintenance engineers in the workforce by types of municipal governments



(As of May 2024)

Road Maintenance Panel

■Composition of the Panel

Institutional framework

- Regional Development Bureau (under MLIT)
- Municipalities (prefectures, cities, towns and villages)
- Expressway Companies (NEXCOs, Tokyo Metropolitan Expressway, Hanshin Expressway, Honshu-Shikoku Bridge Road, designated urban expressways)
- Road Public Corporation

Roles

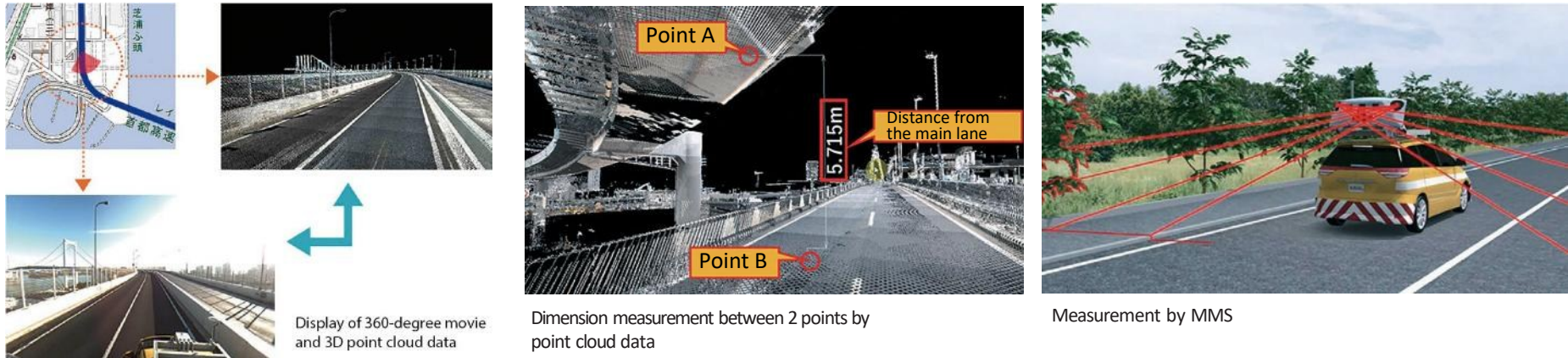
1. Facilitate training and presentation meetings for standards.
2. Facilitate training and presentation meetings for standards.
3. Organization, evaluation and publication of current inspection and repair work.
4. Assistance for area-wide lump sum ordering of inspection work
5. Technical assistance and other



Photo of the Panel (Nara Road Maintenance Panel on February 3, 2016)

New technologies and “InfraDoctor” (Infrastructure Doctor)

■ Basic features for GIS and 3D point cloud data

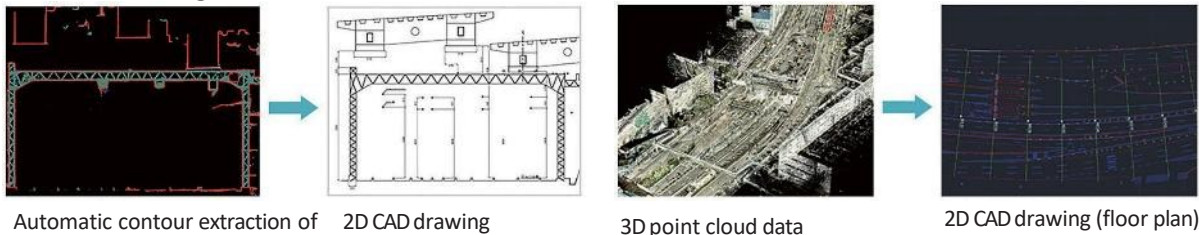


■ Management and search features for GIS records

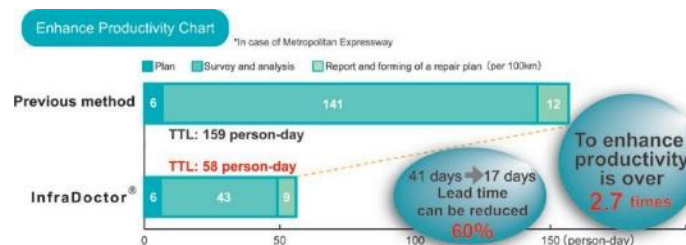
Easy-to-use search system for management/inspection result records that meets needs of administrator

■ Further sophisticated management and advanced features

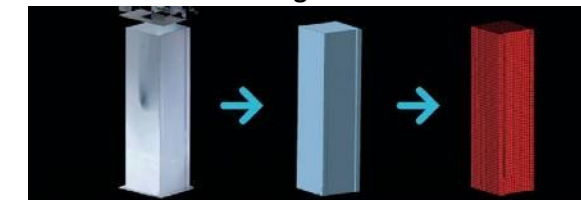
2D CAD drawing feature



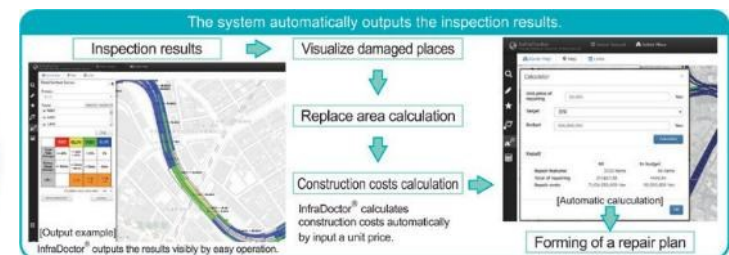
Analysis of road surface deformation system



3D CAD model drawing feature



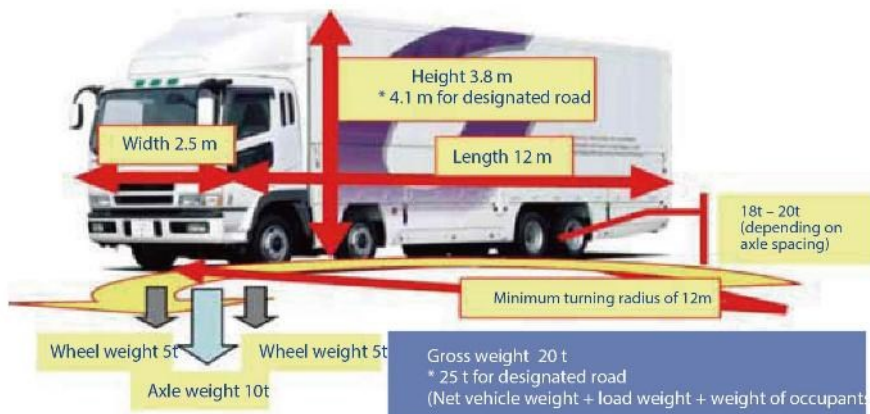
Creation of an FEM model from 3D point cloud data



Road-related systems in Japan

■On general roads

General limit (upper limit) of vehicles according to Article 3.1,
Vehicle Size and Weight Restrictions



Typical overweight or oversize vehicle types



■On expressways

Dimension and weight limits for specified vehicles on expressways are more lenient than the limits on general roads

Specified vehicle types

combination vehicles	Length
Semi-trailer	16.5m
Full-trailer	18.0m



Distance from the foremost axle to the rearmost axle	8m or more	9m or more	10m or more	11m or more	12m or more	13m or more	14m or more	15m or more	15.5m or more
Gross weight	25t	26t	27t	29t	30t	32t	33t	35t	36t

Approval system for transporting abnormal loads

Road administrators are authorized to permit the drivers of vehicles that exceed the size or weight limits to use the road, but only after the road administrator examines the vehicle's structure and cargo and determines that there are no alternatives. In these cases, the road administrator will put certain conditions in place to protect the roads and to prevent any potential danger to other road users. Road fatigue, which is caused by oversize or overweight vehicles, can have a significant impact on roads and pavement. In order to utilize our road stock effectively in the future, it is important to ensure the road structures are properly maintained.

■Enforcing regulations



Instructive enforcement



License plate recognition device

Stopping unauthorized vehicles

1. Instructive enforcement

Drivers are told to pull over at “instruction stations”, where vehicle weights and sizes are measured. If the vehicle exceeds the size or weight limits, the drivers are ordered or warned to reduce the weight and size of the vehicle by splitting the cargo.

2. Weigh-in-motion (WIM)

A WIM device automatically measures a vehicle's gross weight. If the vehicle is over the weight limits, the WIM system then determines if the overweight vehicle has a permit by accessing the database. Based on the results, repeated violators will be given an instructive warning.

■ Weigh-in-motion device

