

InfraDoctor®

**The system for supporting infrastructure maintenance
utilizing GIS and 3D point cloud data.**

<https://www.infradoctor.jp>



Metropolitan Expressway Company Limited



Shutoko Engineering Company Limited



ELYSIUM



AERO ASAHI CORPORATION

InfraDoctor[®] is a core technology of “i-Dreams[®]” which is an advanced administration system using by Metropolitan Expressway Group.

2018 Received the top prize in the 20th National Land Engineering Awards.

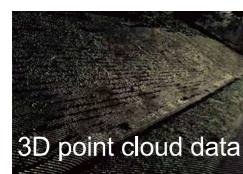
2017 Received the Minister of Internal Affairs Award and Communications Award in the 1st Annual Infrastructure Maintenance Awards.

InfraDoctor[®] is forging ahead with utilizing ICT in civil construction projects and construction management oversight at various other worksites.

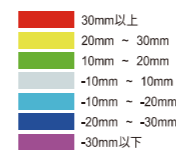
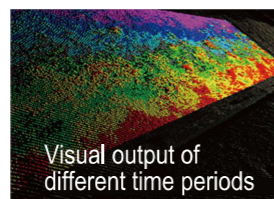


Road structures InfraDoctor®

- Detects deformation by inclination and movement of structures
By using 3D point cloud data from two different time periods, InfraDoctor® can confirm deformation and movement.

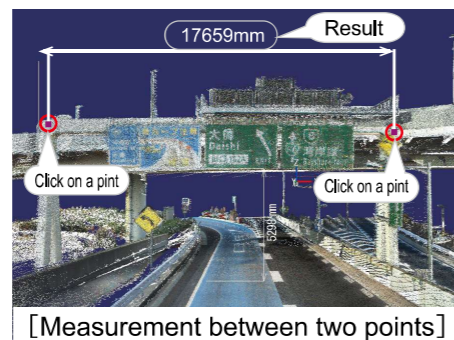


Periodic survey



● 3D measurement

3D point data has accurate three dimensional coordinates (X, Y and Z coordinates) which eliminates the need for traditional traffic control when surveying or inspecting busy road or rail systems.



Example; a large train vehicle simulation



Drive safety simulation [before]



Drive safety simulation [after]



● Simulation in 3D point cloud data

● Confirming of special vehicles

By using InfraDoctor®, special 3D vehicle models can be rendered into 3D point cloud data.

Clients can provide any 3D vehicle models to be included in the InfraDoctor® (additional cost applied).

Thus, you can simulate various work vehicles weather can be available on the work site. This function supports you to make effective preparing.

● Simulate a driver's view point

InfraDoctor® can simulate a driver's view from different vehicle positions.

The image on the upper shows a high driving position view. The lower shows a low position, in which a car cannot be seen in the merging lane.

Special vehicle path simulation

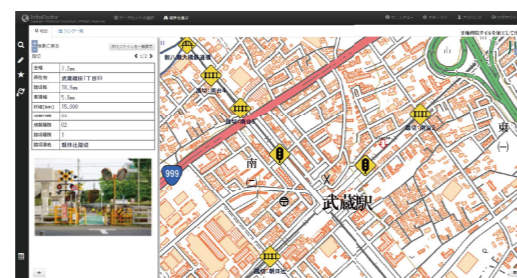


Simulate a driver's view point



Railways InfraDoctor®

The Deformation Detection system within InfraDoctor® can also be utilized for railways. It has been shown to be especially useful in the inspection and maintenance of railway tunnels.



[Ledger data image with GIS]

InfraDoctor® provides for the efficient management and searching of ledger data through its interface with GIS.

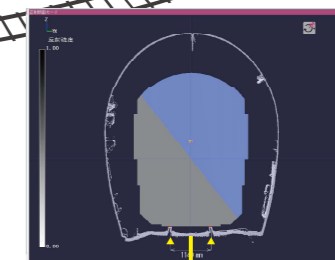
● 8K video technology to detect cracking is now in development.



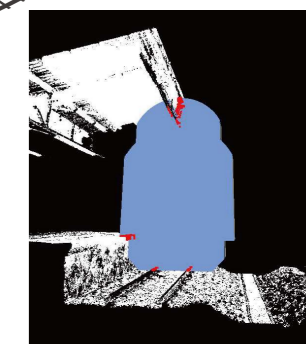
A trial was conducted to detect cracks in concrete. The trial confirmed the system was able to detect cracks as small as 0.15mm wide. This trial was the first of its kind in the world.

● Periodic inspection function is now in development

- Automatic detects a track-center distance(*1)
- Automatic decision a construction gauge(*2)



Example image (*1)



Example image (*2)

Airports InfraDoctor®

InfraDoctor® can be utilized to efficiently inspect airport runways. Its Deformation Detection System provides a significant enhancement compared to traditional inspection methods.



[3D point cloud data survey utilizes MMS on the runway]

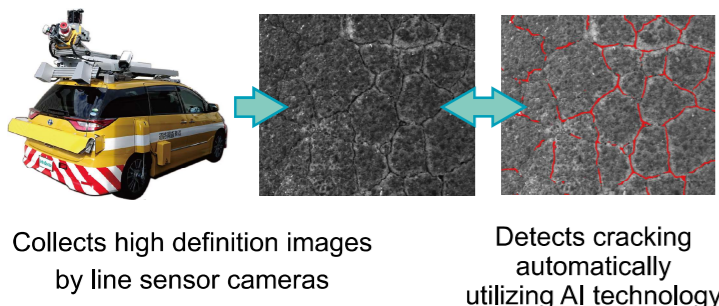


[Visual output of the runway from 3D point data]

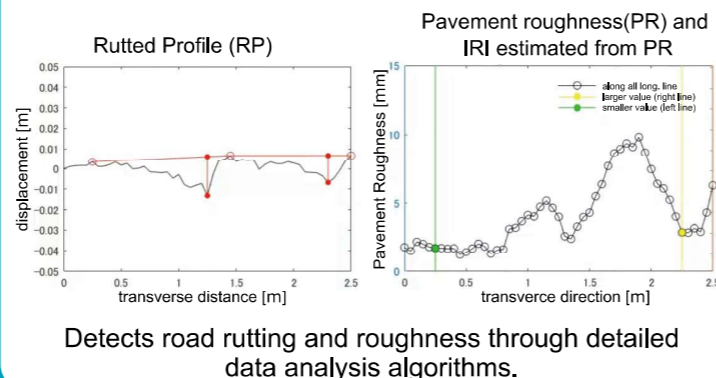


New analysis of road surface deformation utilizing InfraDoctor®

Automatic analysis of cracking utilizing AI technology.



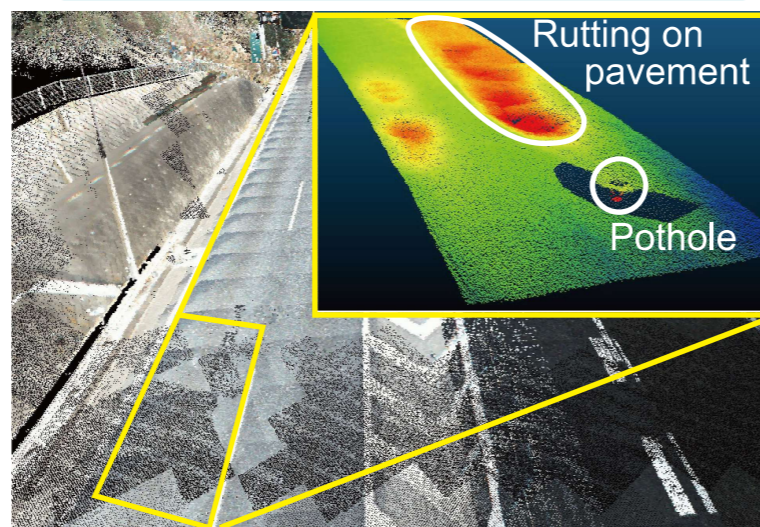
Automatically detects roughness on road surfaces utilizing 3D point cloud data.



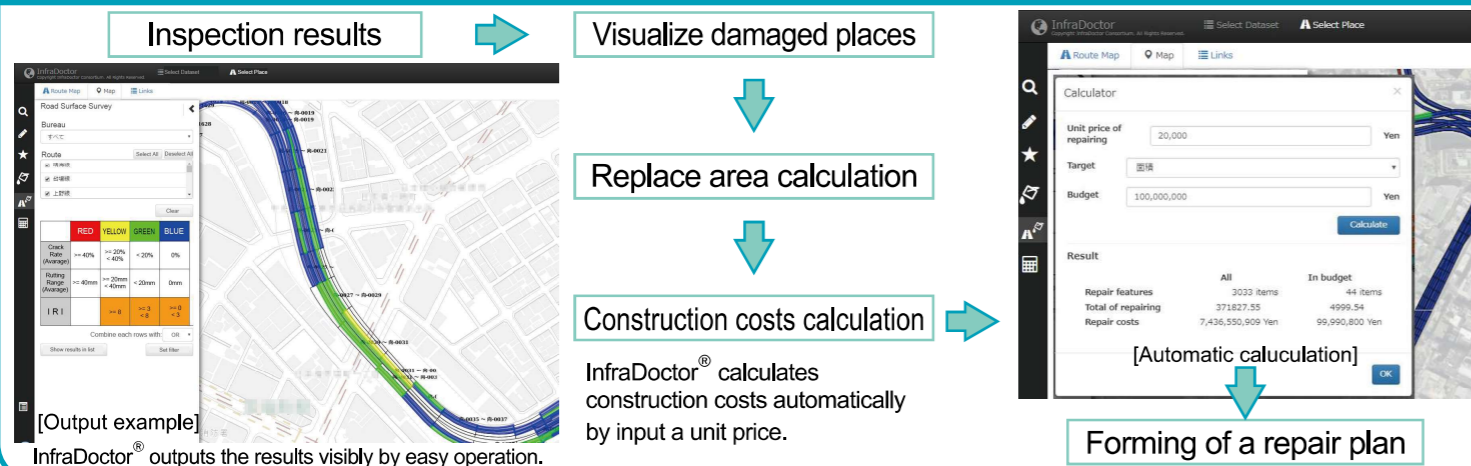
Visual output from 3D point cloud data analysis.

The analyzed results enable comparisons utilizing the InfraDoctor® ledger function.

3D point cloud view (high level boosted 5 times).

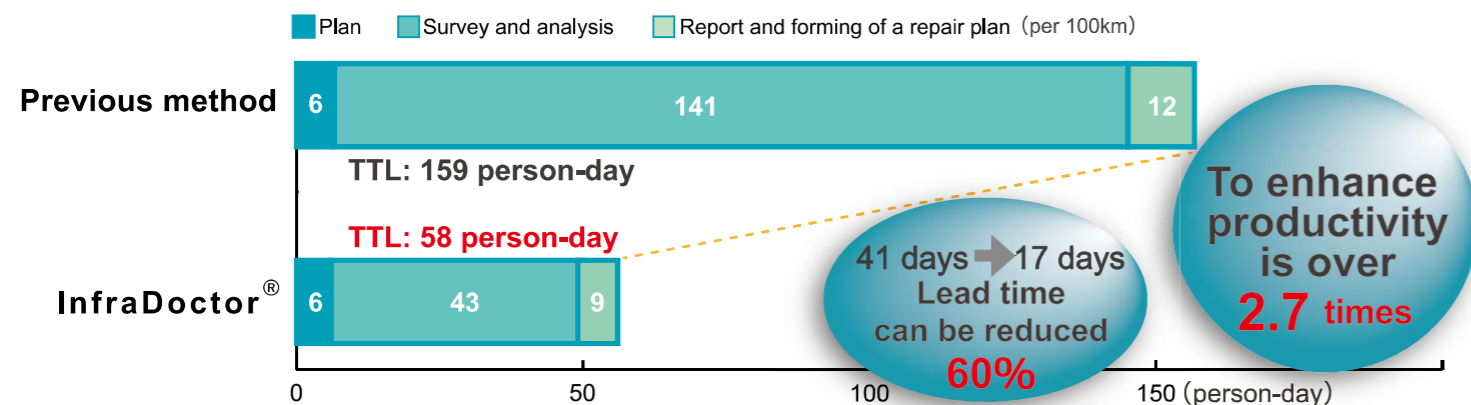


The system automatically outputs the inspection results.



Enhance Productivity Chart

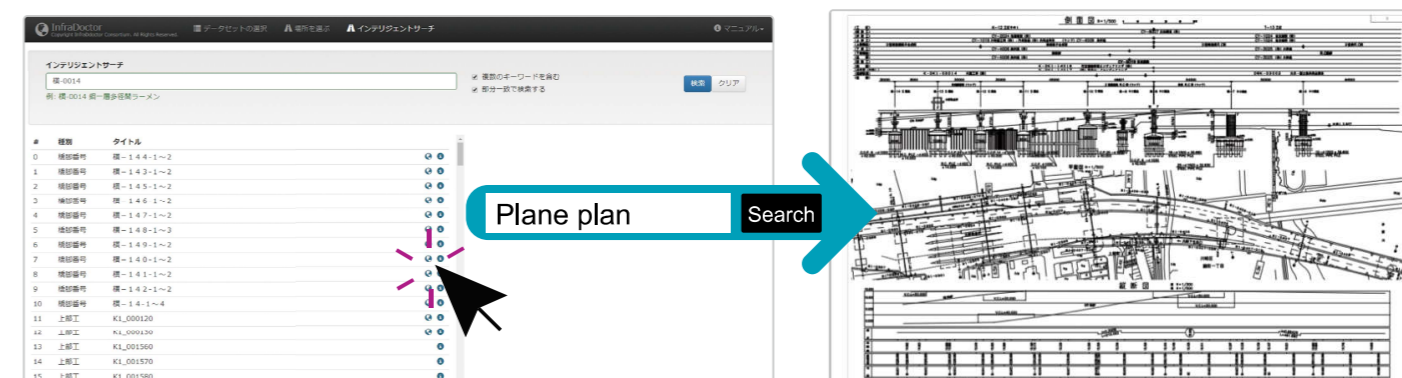
*In case of Metropolitan Expressway



Ledgers X InfraDoctor®

Function of various ledgers on intelligent search

For road maintenance work, the ledger function requires data on road structures, appendages and any underground structures. InfraDoctor® provides efficient management of ledger data by linking GIS and 3D point cloud data.



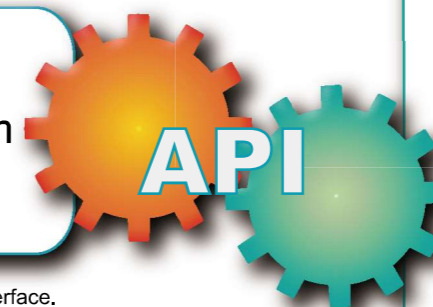
The Ledger function

InfraDoctor® provides an efficient search function which is capable of searching through huge amounts of stored data.

Conventional System X InfraDoctor®

InfraDoctor® allows for connectivity with conventional systems.

Conventional System



*API means Application Programming Interface.

InfraDoctor®

- 3D point cloud data viewer
- Omni directional video viewer
- Allows efficient works
 - * Measurement with 3D point cloud data and simulation
 - * Inspection work
 - * Construction Information Management
 - * Deserter prevention and reduction

Data converted from paper ledgers can be quickly searched utilizing InfraDoctor®



NETIS [New Technology Information System of Ministry of Land, Infrastructure, Transport and Tourism] #KT-170012-A
Patented Technologies : #6465421, #6503500, #6284240, #6590653
Registered trademark : InfraDoctor® as #5758002

InfraDoctor® software service provided by LLP
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The three companies; Shutoko Engineering, Elysium, and Aero Asahi manage the InfraDoctor® software service provided by LLP.