

GMS3 used in various scenes



Survey of road cavity and investigation of buried pipes



Infrastructure management
(two type omnidirectional camera)



Diagnosis of river structure and coastal management



Diagnosis of bridge deck and floor beams
(rebar corrosion, hollow deck coverage)



Survey of urban area (passenger car)



Survey of narrow street (small car)



Survey of sidewalk (electric cart)



Analysis room on the exploration vehicle



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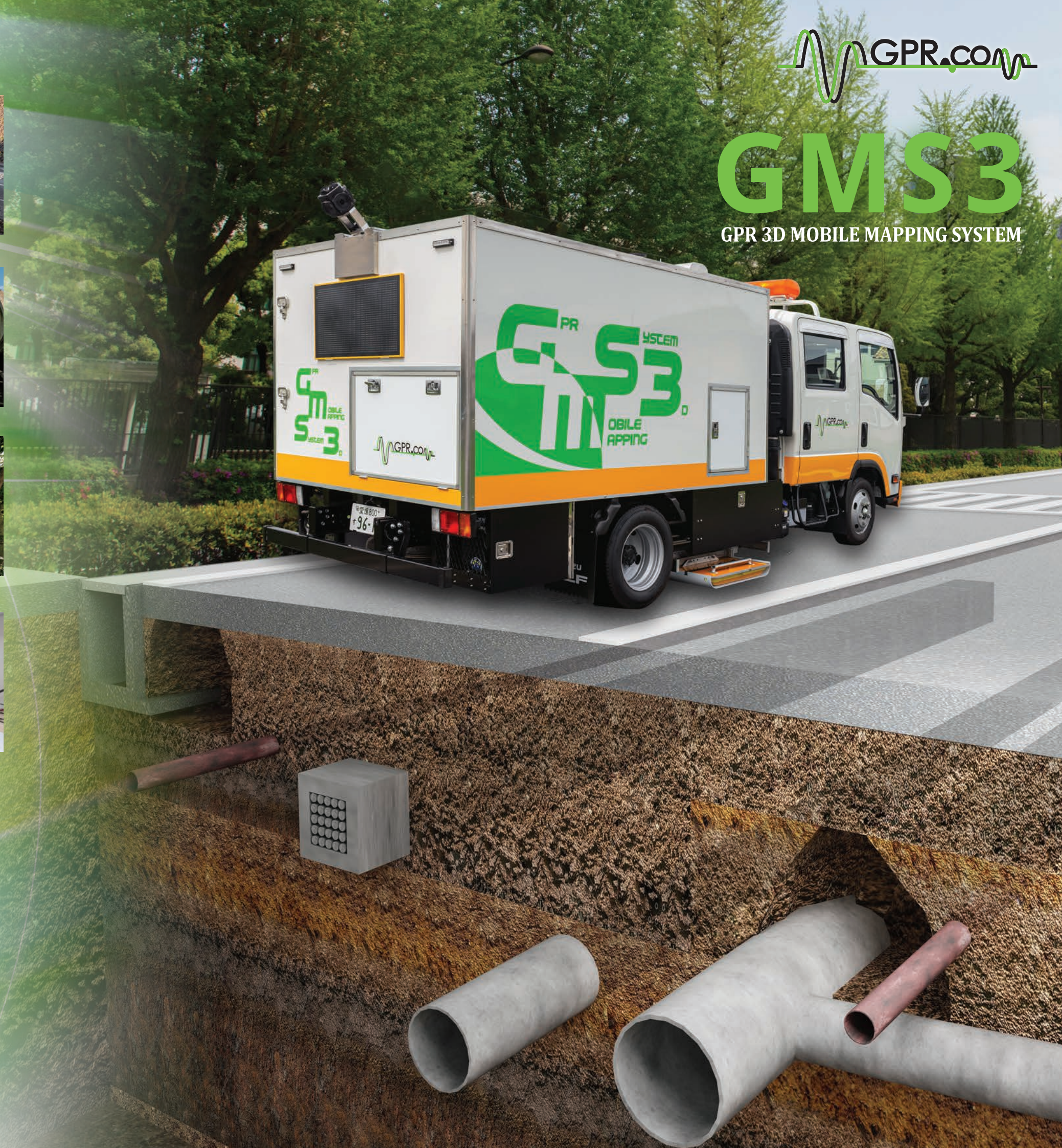


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GMS3

GPR 3D MOBILE MAPPING SYSTEM



GMS3



Ground penetrating Radar 3D mobile mapping system GMS3.
Next-generation survey and 3D mapping system that manages
terrestrial and subterrestrial data efficiently and precisely.

Three systems of GMS3

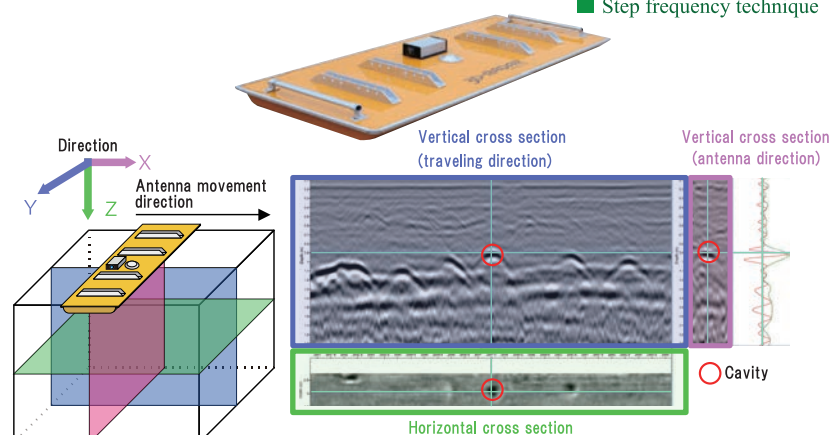
1. GMS3 can detect cavities and buried pipes under the road in 3D by ground penetrating radar.
2. GMS3 can make an accurate of terrestrial 3D map by shooting omnidirectional camera.
3. GMS3 can centrally manage terrestrial and subterrestrial 3D data.

1 GROUND PENETRATING RADAR (GPR) 3D Ground Penetrating Radar system

This system detects cavities and underground objects up to 3m (depending on soil type and water content) in 3D by using multi-channel radar with multiple transmitting and receiving antennas. Since the antenna unit are movable between the wheelbase of the exploration vehicle, it slides freely to left and right. This helps to produce the 3D map of the entire of the road, including shoulder.

Registered on New Technology Information System (NETIS)
as the most advanced technology for getting subterrestrial 3D data

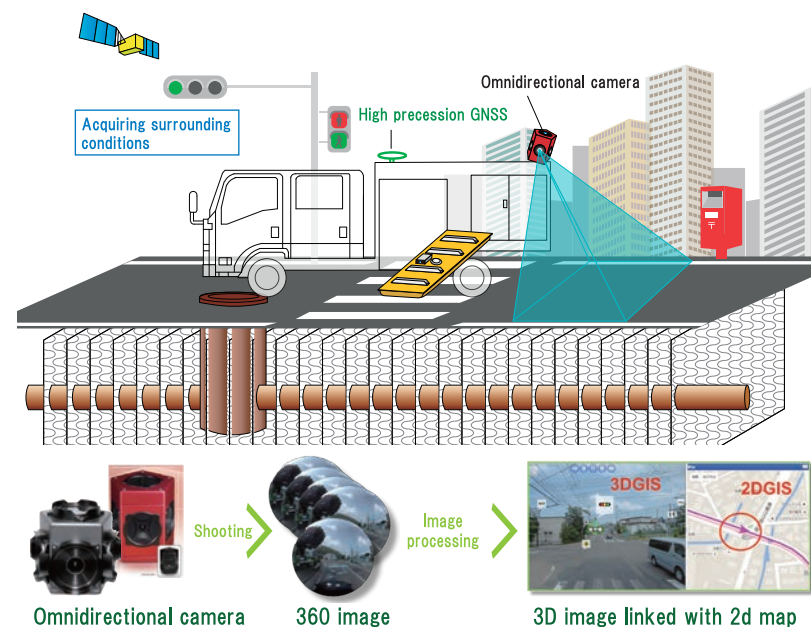
- Real 3D method
- Step frequency technique



Underground three-dimension means acquiring data of the vertical cross section in the antenna movement direction (X) and the vertical cross section in the antenna channel row (Y), and obtaining the horizontal cross section depth of the ground (Z) just like CT scan. Horizontal slices improve analysis accuracy because the buried pipe looks like a continuous line and the cavity looks like an independent circular shape.

2 Omnidirectional Camera Mobile mapping system

Three-dimensional data can be measured with high precision without installing IMU or laser, with a simple system that shoots with one or two omnidirectional cameras. The obtained three-dimensional data have accuracy for mapping scale of 1/500 as defined by the public surveying operation regulations. Ortho images can be created with relative accuracy, even in places where GPS signal is not captured, it is also possible to locate highly accurate positions using ortho images.

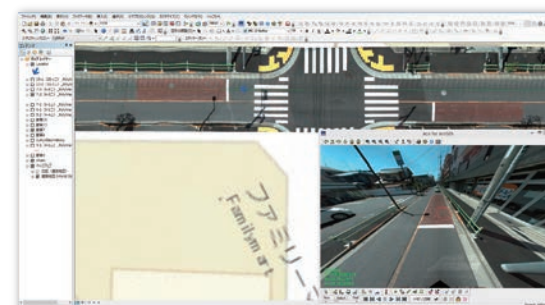


- ① Obtain coordinates
- ② Measures length and height
- ③ Create ortho image
- ④ Detect road cracks

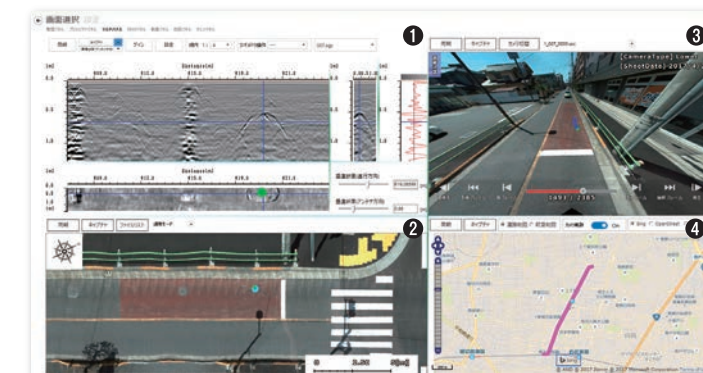
3 Unified management of terrestrial and subterrestrial data

The subterrestrial information of the 3D ground penetrating radar system and the terrestrial information of the mobile mapping system are synchronized at the GPS time and can be managed in one unit.

A high-precision database centrally managed by three-dimensional coordinates is excellent in location identification. Furthermore, work such as distance measurement between features is not necessary. Therefore, the survey efficiency dramatically improved.



3D GIS application that can be used as an extension of ESRI's ArcGIS®



Using designated viewer software (GMS3 Viewer)
① Subterrestrial 3D image ② Ortho image of road ③ Omnidirectional video
④ The map information can be linked and manage at the same time.
Different style of data output is possible including ledger.

Three-dimensional geographical information system can store and manage data in conjunction with GIS software such as ArcGIS etc. it can perform visual management and follow-up survey with no correction, and can be used as a management ledger base for local governments.