Expressway Maintenance - 3
Smart Maintenance Highway (SMH) Concept
고속도로 관리 - 3
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The basic characteristic of an SMH is constant monitoring as the basis for solving a variety of problems in local infrastructure management.

As part of this effort, to secure the long-term safety and security of road infrastructure, ICT and mechanization are introduced under the management of engineers to form a comprehensive maintenance framework. This framework streamlines, enhances and boosts the reliability of support management and upgrading.

One aim is to introduce an infrastructure Management Center (tentative name) linked with the Road Traffic Control Center by FY2020.

### Background
- Aging expressway assets: The Long-term Maintenance Examination Committee was formed in November 2012 and tabled its final report on January 22, 2014.
- Agencies at various levels launched into concerted deliberation in the wake of the Sasago Tunnel collapse on the Chuo Expressway in December 2012.
- The year 2013 was positioned as “Year One for Infrastructure Maintenance,” and the national government carried out a series of comprehensive measures on this front.
- For the East Nippon Expressway Company, streamlining and enhancement of support management and upgrading have long been vital and urgent issues.

### What is SMH?
- Making inspection records available on mobile terminals
- Development of coaching methods and skill improvement programs
- Support system for reporting local conditions (e-SSS)
- Optimization of inspection by enhancing a position recognition system

### Schematic view of key ICT and links
- Monitoring of bridges (Damage and cracks of girders, etc.)
- Checkups for bridges
- Unmanned Air Vehicles (UAVs)
- Multifunctional facility measuring “Hakaaru (lit. measuring)”
- Human resource development at the Technical Training Center (TTC)
- Support for damage assessment by image analysis
- Early understanding of site information using the filming system of emergency helicopters
- Monitoring of slopes (slope displacement and movement, etc.)
- Survey of the hollow cavities behind the lining surface of existing tunnels
- Monitoring of pavement (road surface conditions)
- Infrastructure management center

### Schematic view of SMH concept upon completion
- Database of inspection and repair histories, various elements
- Monitoring by measurement vehicles of deterioration and damage (Light sensor, Laser scanner)
- Road-surface condition (Tunnel/surface of concrete lining)
- Laser scanner (Uses laser light to scan wall surfaces)
- Deflection sensor
- Data logger
- Infrastructure Management Center
- Office PC Server
- Database server
- Big Data processing
- Soundness evaluation and analysis/Deterioration forecasting and analysis
- Plans and expense forecasts for support and upgrading
- Development of coaching methods and skill improvement programs
- Support for damage assessment by image analysis
- Early understanding of site information using the filming system of emergency helicopters
- Monitoring of slopes (slope displacement and movement, etc.)
- Human resource development at the Technical Training Center (TTC)
- Support system for reporting local conditions (e-SSS)
- Optimization of inspection by enhancing a position recognition system