

**4<sup>TH</sup> INTERNATIONAL CONFERENCE  
FOR SUSTAINABLE MOBILITY  
& IRF ANNUAL CONFERENCE**  
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## Maintenance for Sustainable Road Infrastructure

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Fédération Routière Internationale  
Federación Internacional de Carreteras

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[www.irfnet.ch](http://www.irfnet.ch) | [www.adm.co.ma](http://www.adm.co.ma)



# Urban Expressway Management since 1962





# “Toward More Advanced Expressway Service”



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# Hanshin Expressway in Morocco



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## Technical Collaboration on highway management with ADM (MOU signed on July 2015)

- Bridge & road maintenance
- ITS
- Tunnel management
- Expert exchange





# Maintenance as a tool for Sustainability



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- High standard road itself is safer and cleaner road
- Keep road assets in good shape and using them for a long time indirectly leads to sustainable society >>>

## MAINTENANCE

- Road = human body, Maintenance = health care

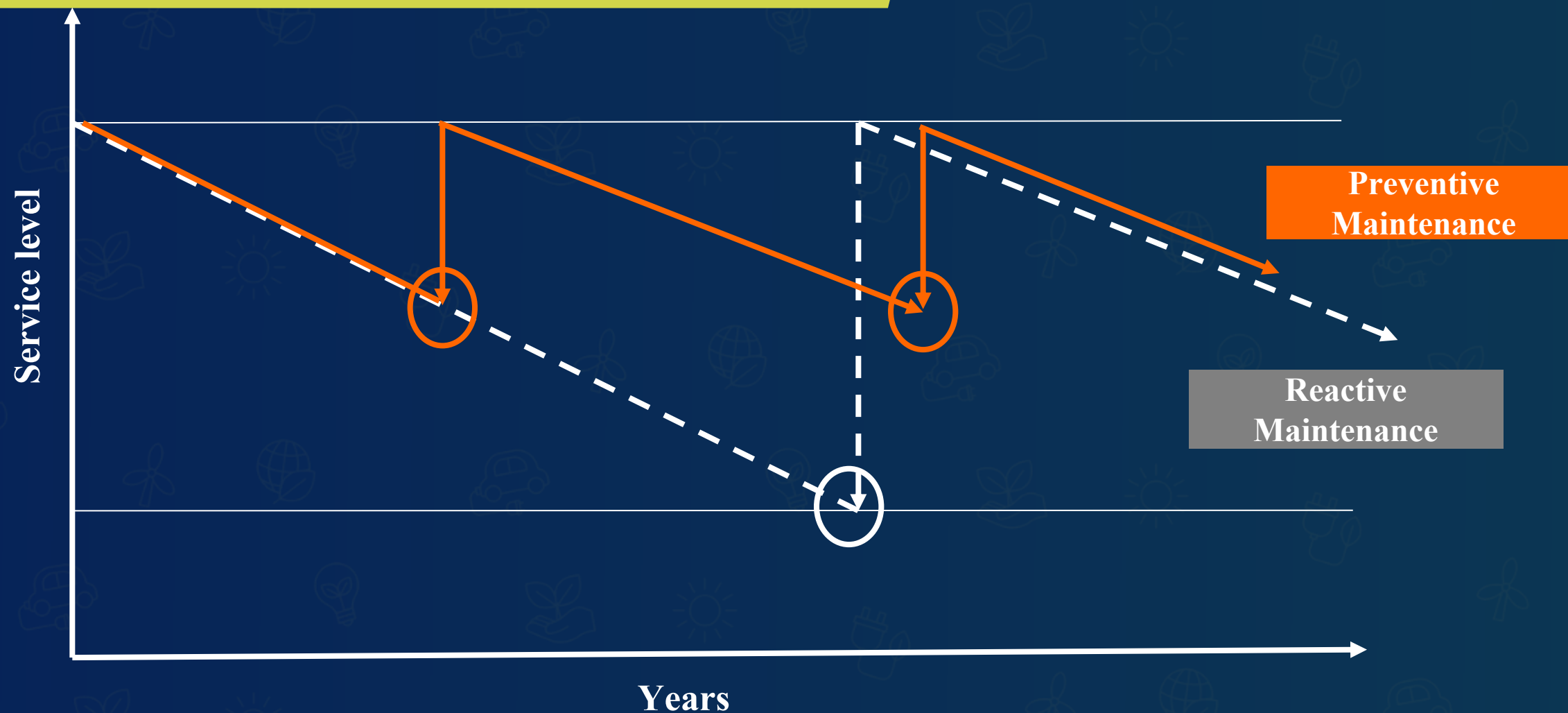


# Better maintenance is Preventive Measures



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# Damage Factors of Roads



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- Asphalt: traffic, drainage
- Earthwork: Geology, natural disaster
- Bridge: Aging, construction failure, traffic, natural disaster

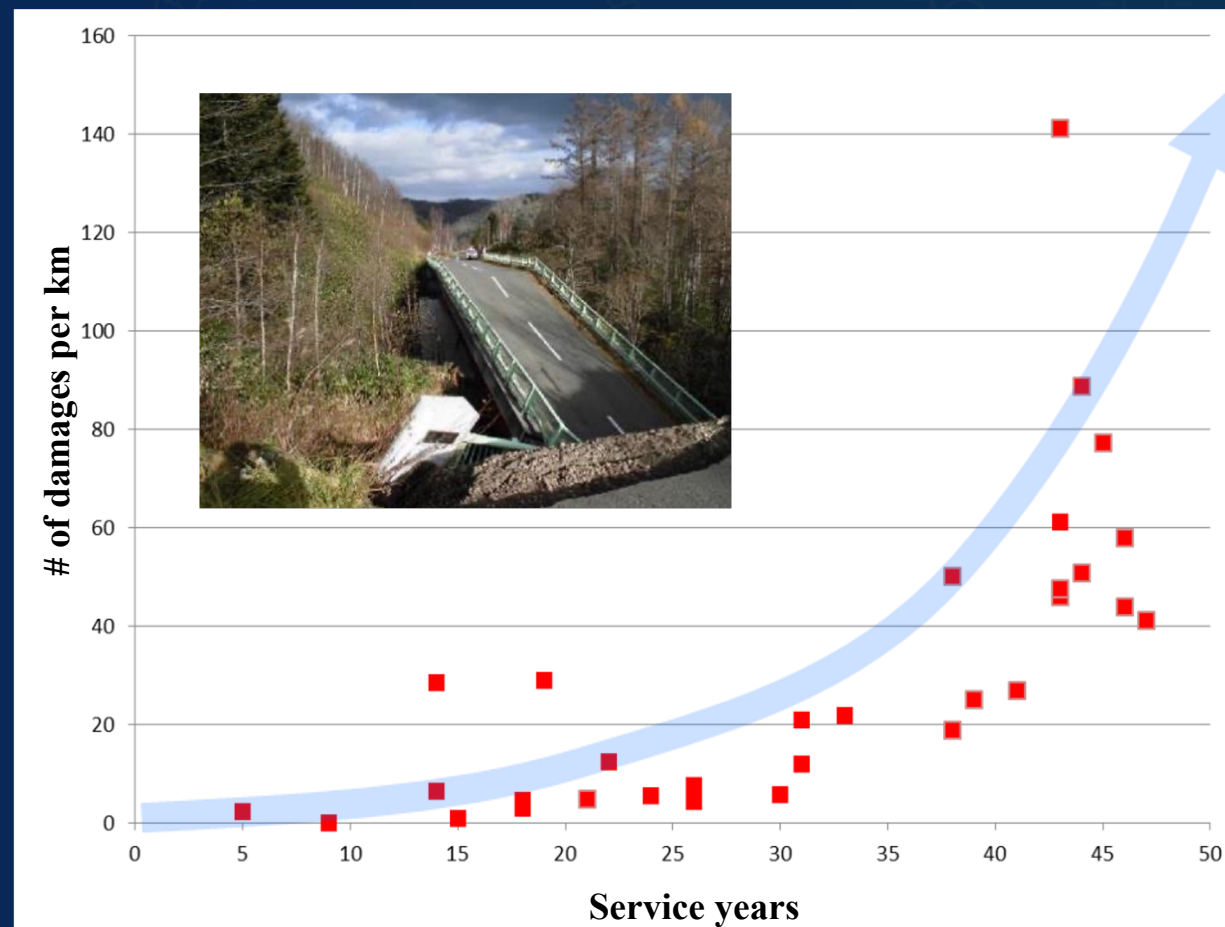


# Maintenance is Inevitable for Aging



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# Maintenance is for Sustainability and...



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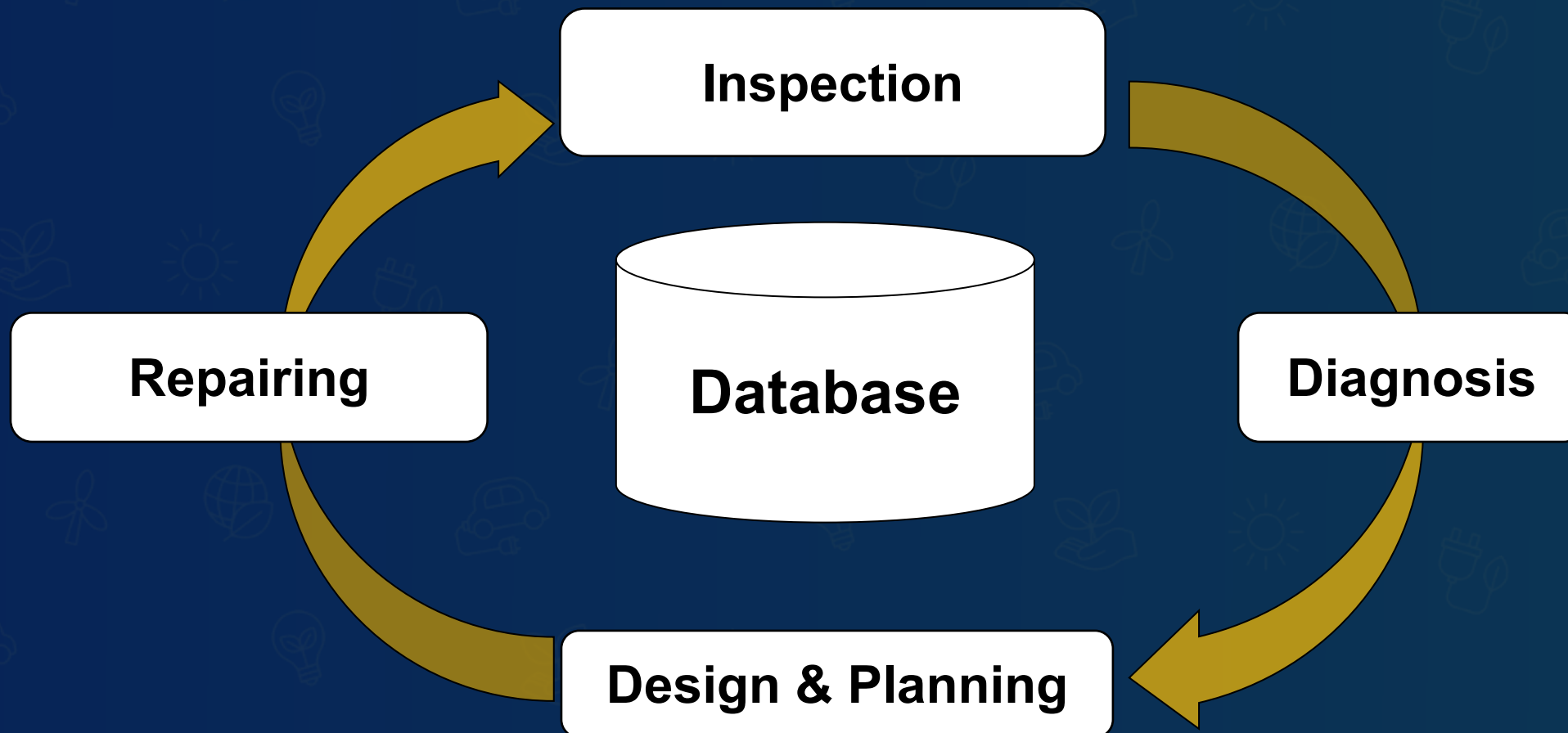
- Maintenance is a total engineering
- Maintenance is experience (data)
- Maintenance is local
- Maintenance is advanced technology
- Maintenance is business

# Maintenance is a Total Engineering and Experience



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# Maintenance is Local



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- Ninja-tech inspection technology
- Skill transfer and qualification scheme

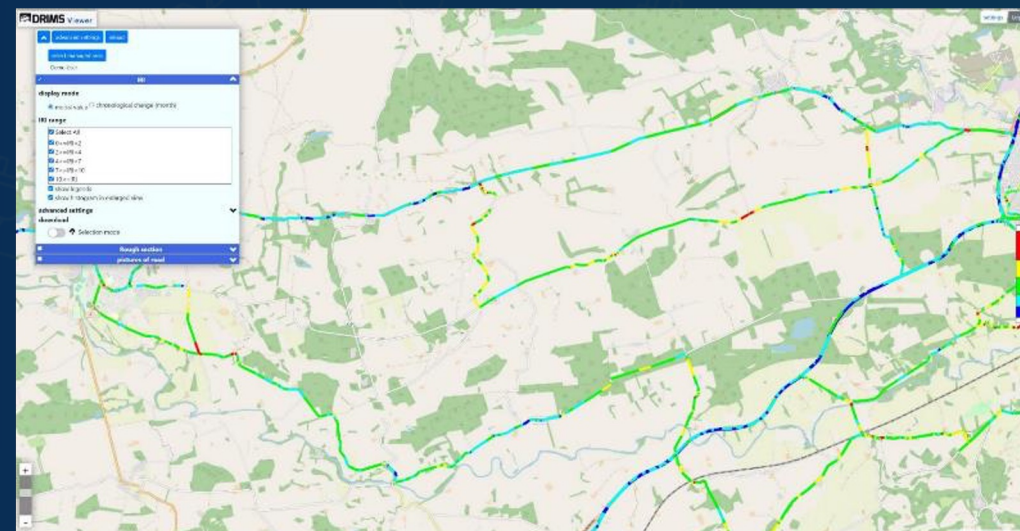


# Maintenance is Advanced Technology



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- IRI measurement by iPhone application
- Pavement condition mapping
- Database on cloud service
- Image analysis by AI deep learning



# Maintenance is Advanced Technology



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- Drone inspection of slopes
- Photo mapping
- Tracking earth movement and landslide detection



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# THANK YOU!

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