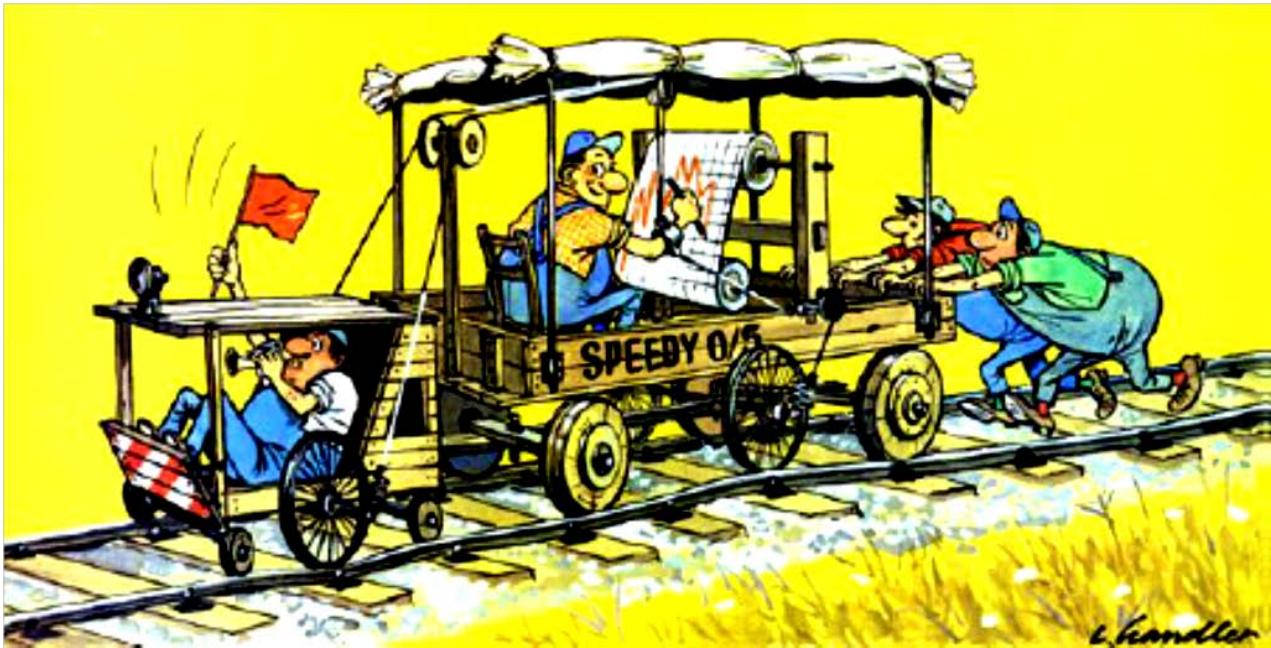


LEVERAGING DEVELOPMENTS IN MONITORING TECHNOLOGY HELP TO ACHIEVE SOUND AND HEALTHY RAIL-TRACKS FOR A MODERN “WORLD-CLASS” RAIL-SERVICE



“Track Monitoring”

Pict.: Courtesy Plasser&Theurer

By Dr. F. A. Wingler, Germany, February 2018

This article is a continuation and update of the earlier published technical Railway Papers:

<> **LEVERAGING STATUS-REPORT/AUDIT ON TRACK-CONDITION OF THE WHOLE NETWORK OF INDIAN RAILWAYS – A TOOL FOR LONG-TERM CAPITAL INVESTMENT-SCHEMES AND MAINTENANCE- STRATEGIES**

<> **LEVERAGING DEVELOPMENTS IN MONITORING TECHNOLOGY FOR OPTIMISING TRACK MAINTENANCE – Switch Monitoring and Diagnostic Systems**

<> **THE ULTIMATE GOAL TO PREVENT FATAL TRAIN-ACCIDENTS IN INDIA – VISION: “CLOSE-TO ZERO” –**

See: <http://www.drwingler.com>

LEVERAGING DEVELOPMENTS IN MONITORING TECHNOLOGY HELP TO ACHIEVE SOUND AND HEALTHY RAIL-TRACKS FOR A MODERN “WORLD-CLASS” RAIL-SERVICE

The envisaged “**WORLD-CLASS**” Rail-Service in India needs modern sound and healthy, high quality Rail-Tracks of “**WORLD-CLASS STANDARDS**”.

The spate of train derailments in India is an index for the actual poor track-condition and quality of the network and an index of how un-healthy many tracks are.

Modern Monitoring Technologies help to make predictions on the Longevity of Rail Tracks, to determine the Threshold for Intervention and to evolve a **Network-Status Report** on the Health of all Rail-Routes as a tool for long-term Investment Planning and Strategy and as a basis for the leadership in making decisions. A Network-Status Report encompassing all routes will help the leadership to understand what ails Indian Railways, what the back-logs to deal with are and what the back-logs to be caught up are.

Modern Monitoring Technology helps to visualize the track to understand, when and where Maintenance and Renewal are required.

Modern Monitoring Technology helps to gather Track Quality Indexes for Predictive Maintenance.

RILA track laser 3D video measurement and mapping system mounted on scheduled running passenger trains gather regularly GPS-positioned accurate, up-to-date rail-track, infrastructure and analysis data, without disrupting the service; see www.fugro.com/rail .

Drone surveying and post data processing techniques help to capture location data for planning and intervention.

Sensors making use of Newton`s Law Mechanism, installed onboard of scheduled running trains, have become a tool for Monitoring Track-Conditions to develop Strategies and Plans for Predictive Maintenance- and Renewal-Intervention.

The modern leveraging Rail-Network Condition Monitoring Technologies produce “**Big Data**”.

“**Big Data**” is data, whose volume, scale, diversity and complexity require new architectures, techniques, algorithms and analytics to manage

it, and to extract hidden values, information and knowledges from it in making decisions and in evolving planning and strategies in order to come to right actions to be taken.

“Big Data Crunching” should not be a problem in the **“High IT Country”** India in order to convert the gathered large volume of data efficiently in information for rail-track engineering as well for track and infrastructure maintenance/renewal strategies, planning and organization. Accurate up-to-date information help to make informed decisions related to investments and operations. Data services help to deliver improved efficiencies in asset management and engineering. They bring the railway onto the engineer`s desktop enabling to analyse and extract leveraging and actionable information quickly and efficiently for actions to be taken.

"Big Data is the new oil. But just like crude oil it is valuable, and unrefined it cannot be really used".

See: Diego Galar: RAILWAYASSETS: **A POTENTIAL DOMAIN FOR BIG DATA ANALYTICS;**

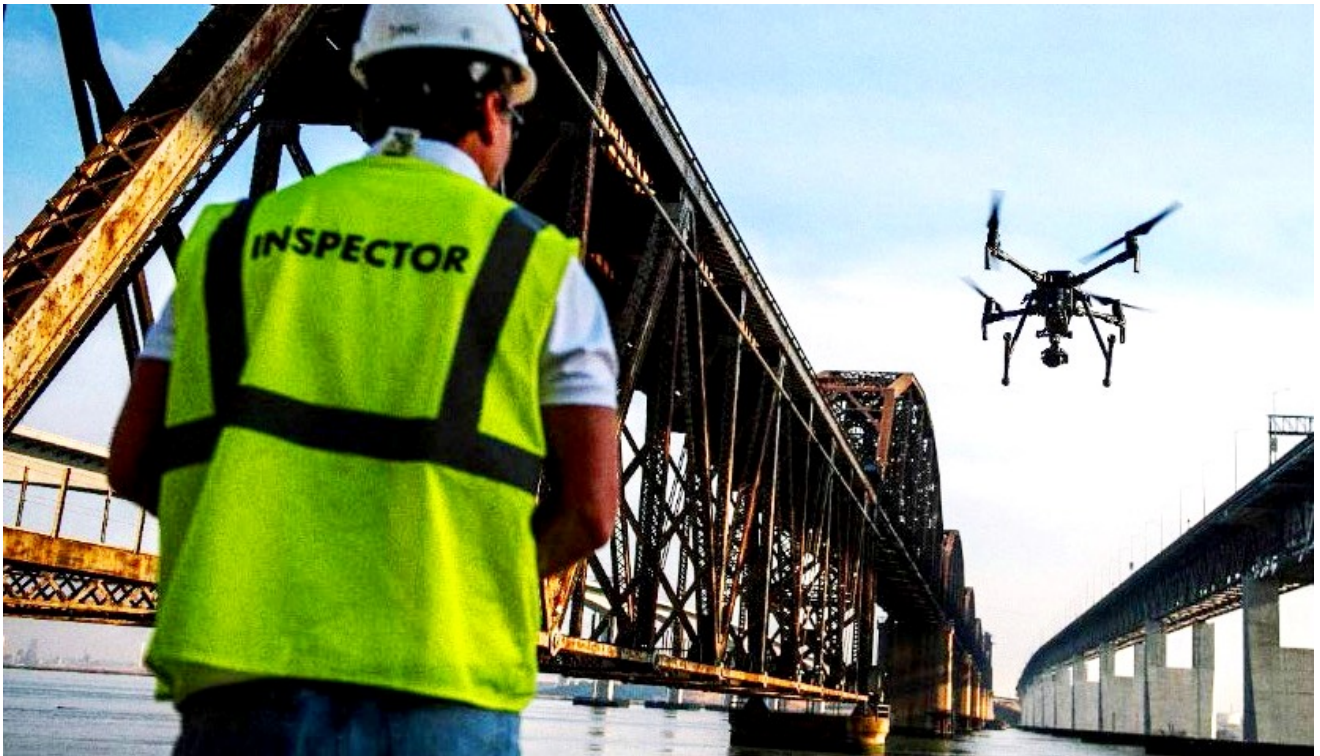
https://www.researchgate.net/.../282507618_Railway_Assets_A_Potential_Domain_fo.

PICTURE GALLERY



FUGRO-RILA Track System mounted on scheduled Passenger Train in UK for GPS positioned 3D Laser Video Scanning and Mapping; see

www.fugro.com/rail



“How America's top Railroad learns to fly” , Surveillance by Drone; Pict. from Union Pacific *INSIDE TRACK*, INNOVATION, 12.05.2017



Supervision and geographical Data Acquisition Services with Drones by

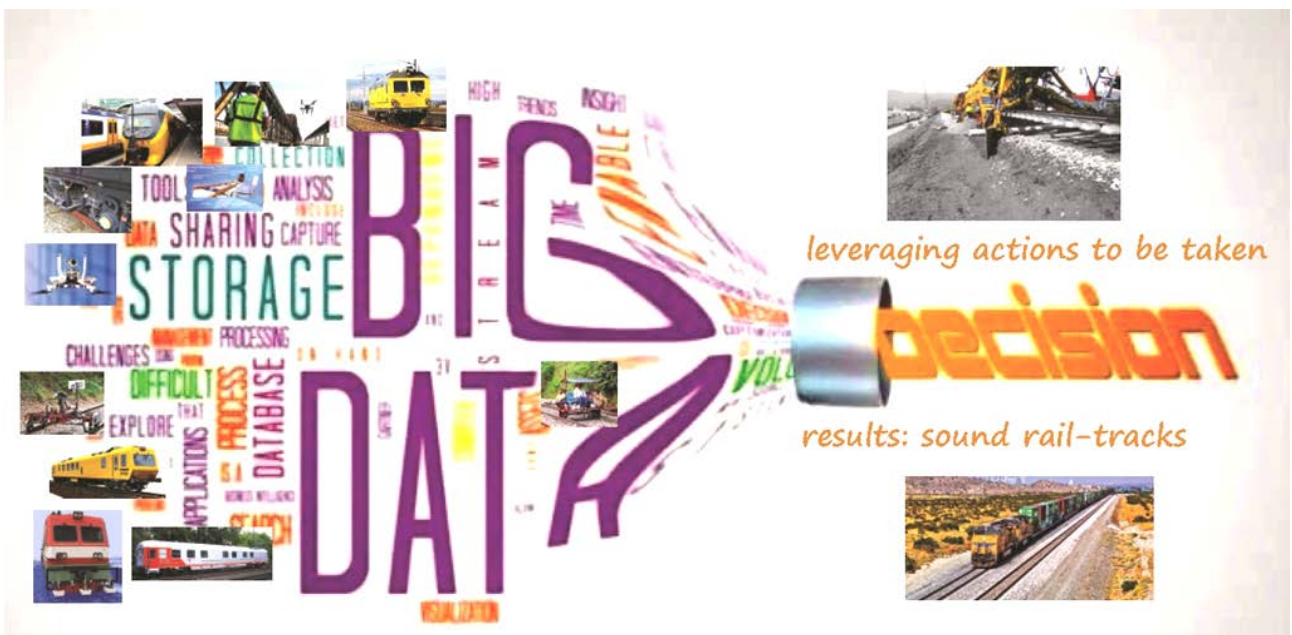
SIGMA RAIL, Spain **see:**

https://www.uc3m.es/ss/Satellite/.../New_system_uses_drones_to_monitor_railroads

and J. Lopez, Sigma-Rail: UAVs support ERTMS Deployment in Railway Gazette International, February 2018, page. 50.



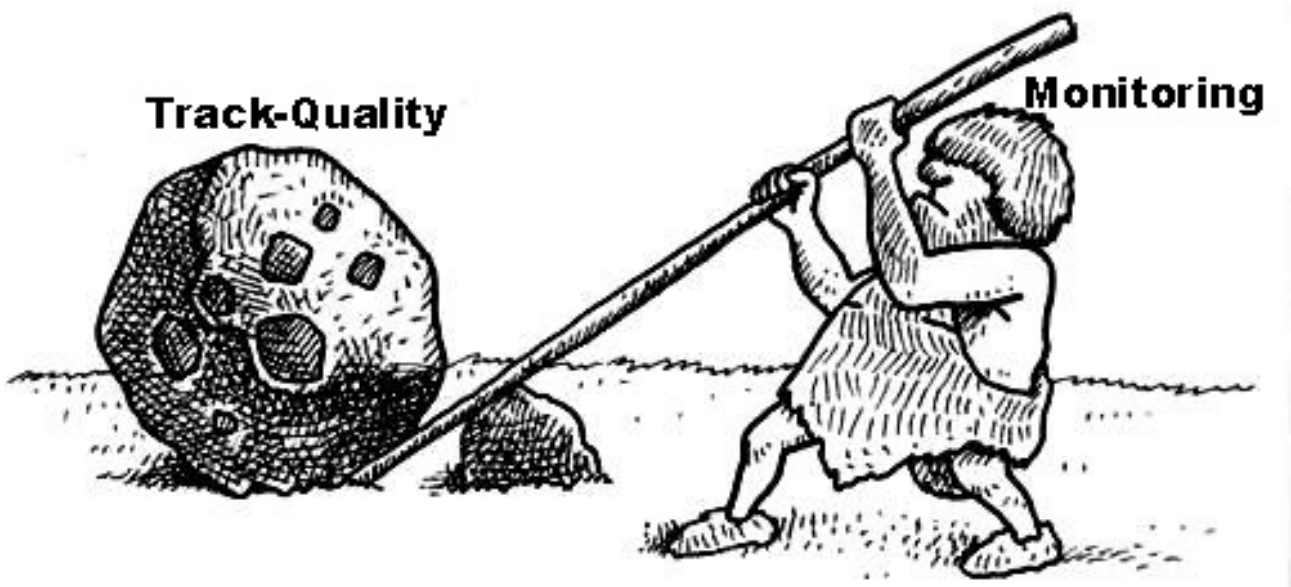
Mining Data retrieved from TELVIC RAIL Sensors installed onboard Bogies of scheduled running Belgium Passenger Coaches with the Objective of developing a predictive Maintenance Tool; see: Research aims to develop predictive maintenance tool - Railway Age <https://www.railwayage.com/analytics/research-aims-develop-predicti...>



"BIG DATA CRUNCHING"

OUTLOOK

Let's hope that in consequence of the deployment of “**Leveraging Developments in Monitoring Technology for optimizing Track, Bridge and Tunnel Maintenance**” there will be in future “**Close-To-Zero**” train-derailments on account of unsound and un-healthy rail-tracks.



“LEVERAGING”