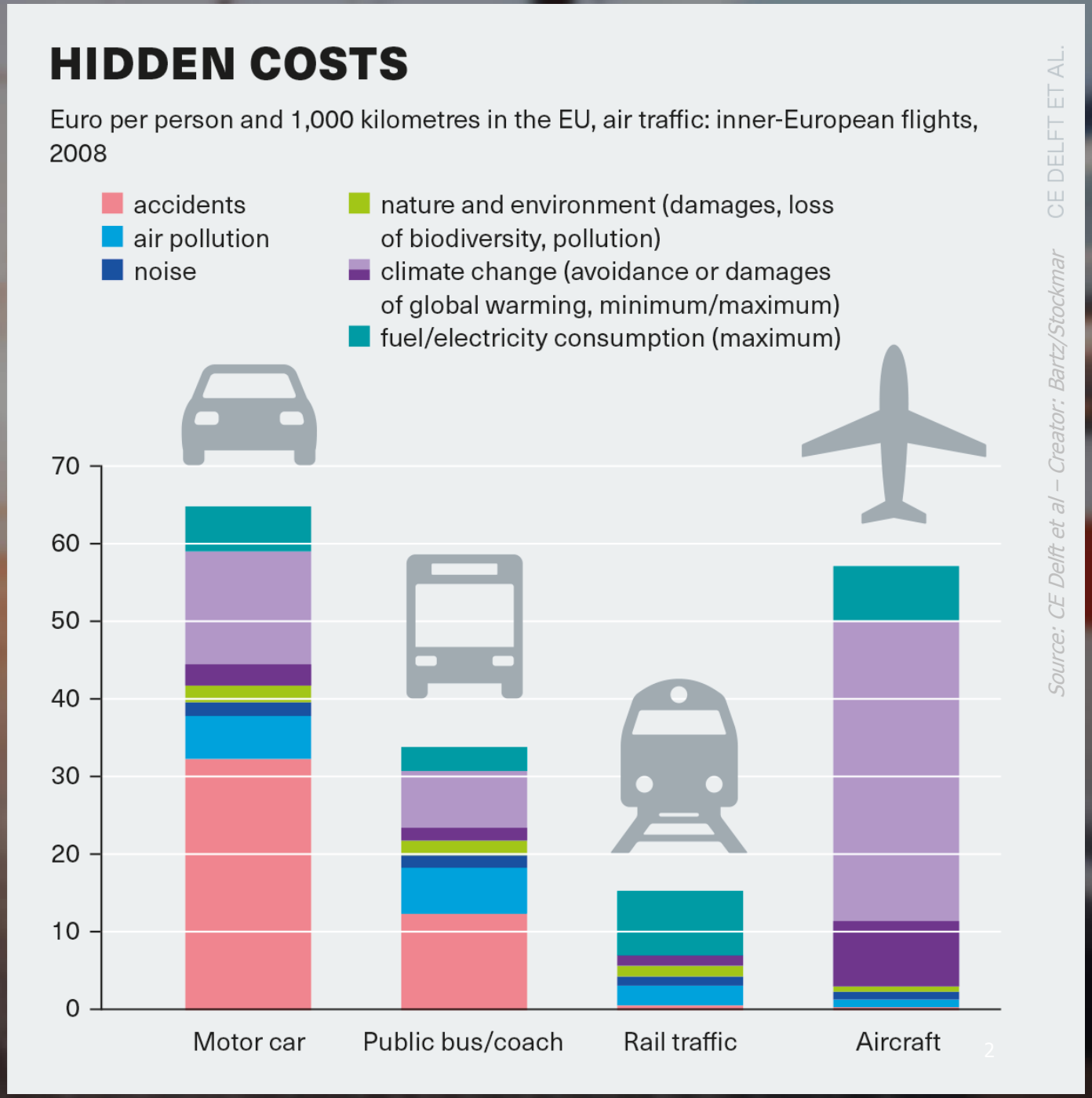
UIC Railway Asset Management
Global Conference 2019

17 - 19 April 2019
UIC Headquarters, Paris

Applying Artificial Intelligence to Enable Predictive Maintenance

The KONUX Predictive Maintenance System

Benjamin Jansen, VP of Sales at KONUX



Railway is the safest, cheapest, and most sustainable means of transportation

Our mission:

EMPOWER THE RAIL INDUSTRY TO OPERATE WITH THE HIGHEST AVAILABILITY

We combine industry knowledge with technology experience

Customers

Certifications

ISO 9001 for building predictive maintenance systems
Q1 supplier of Deutsche Bahn

Board & advisers

Dr. Dieter Wilhelm
f. Board Knorr-Bremse

Andy Bechtolsheim
Co-founder SUN Microsystems

Heinrich von Pierer
f. CEO Siemens AG

Dr. Sören Hein
f. VP Technology Infineon

Dr. Volker Kefer
f. Board DB AG

Dr. Greg Papadopoulos
f. CTO SUN Microsystems

Awards & recognition

Technology Pioneer

IoT and sensors

German Digital Prize

#1 in Europe for Cyber-Physical Systems

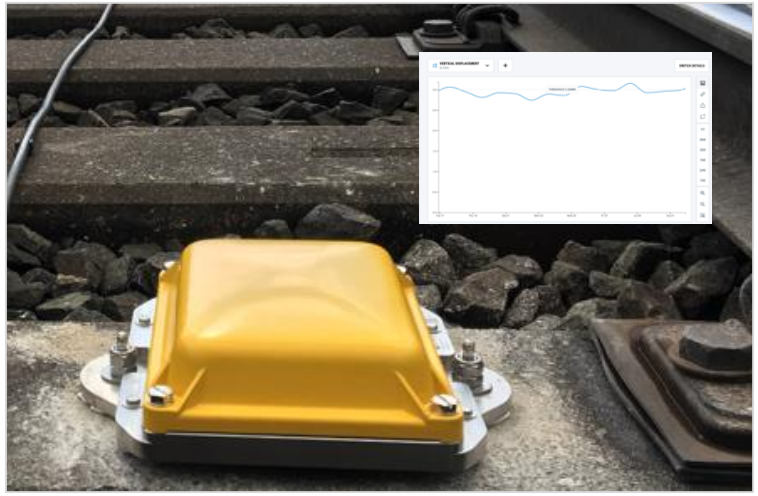
German Mobility Prize

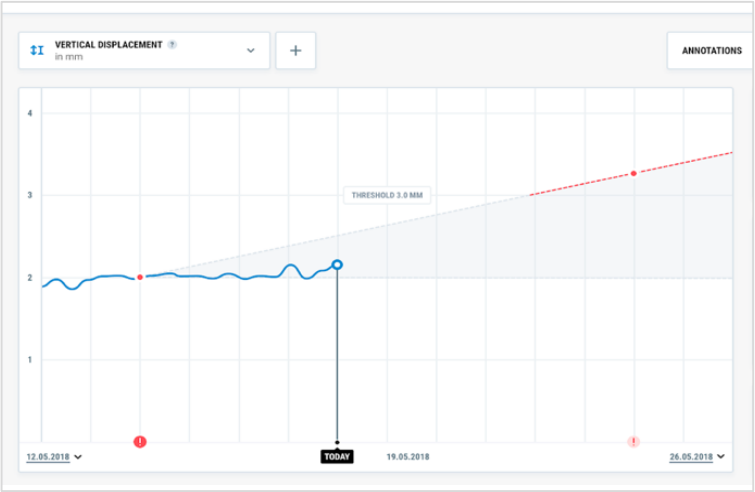
AI 100

DIGITALIZATION STARTS WITH A QUICK WIN

KONUX

”Going digital” requires a paradigm shift





Scheduled Manual Checks

Single measurements on the track provide a snapshot of the current condition

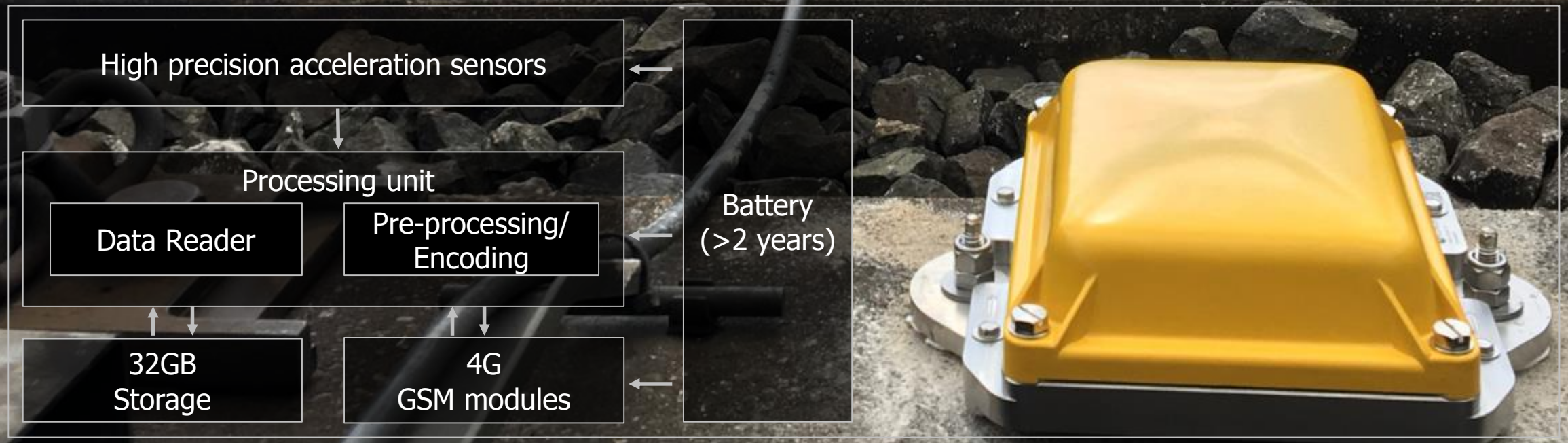
Continuous, Autonomous Monitoring

Continuous measurement enables daily **monitoring and trend detection** from the **comfort of your office**

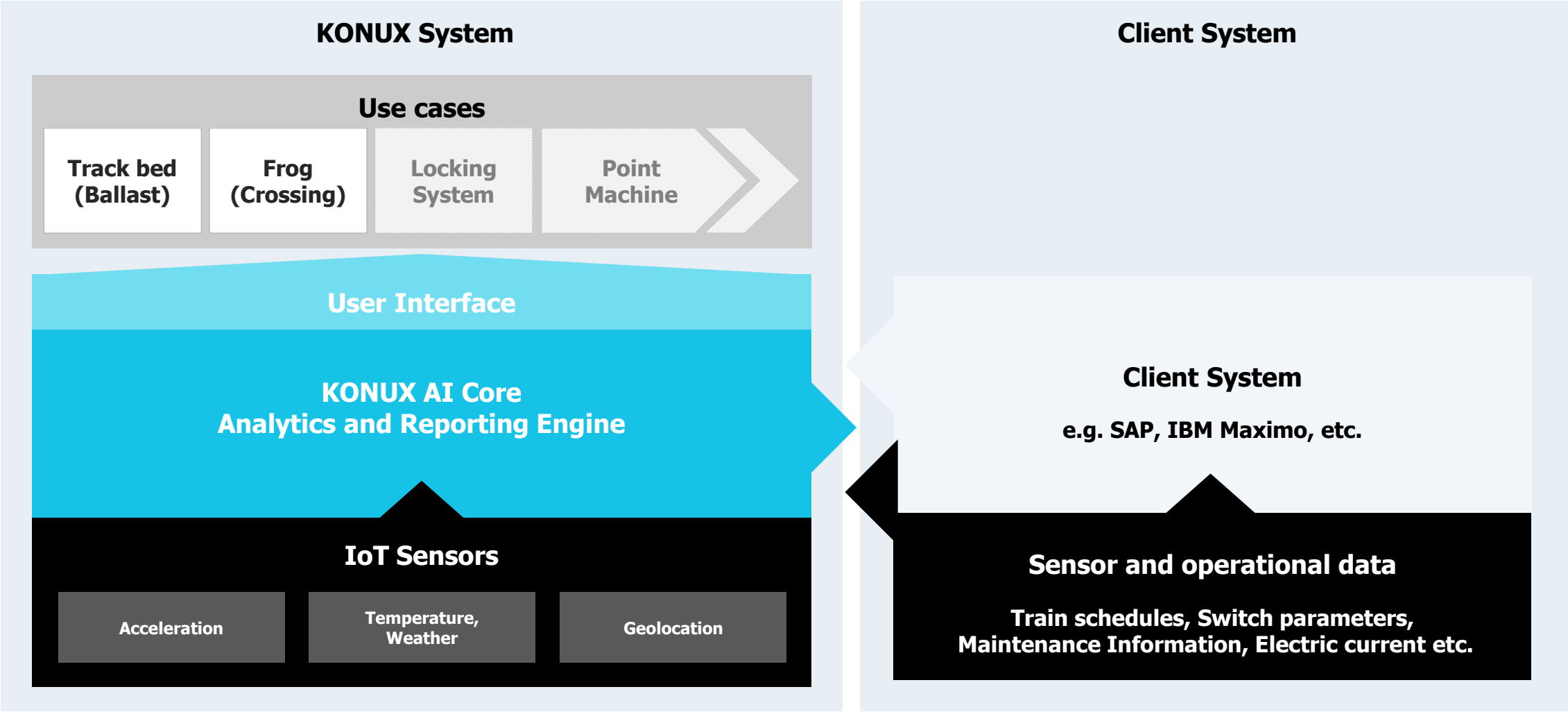
Predictive & Prescriptive Maintenance

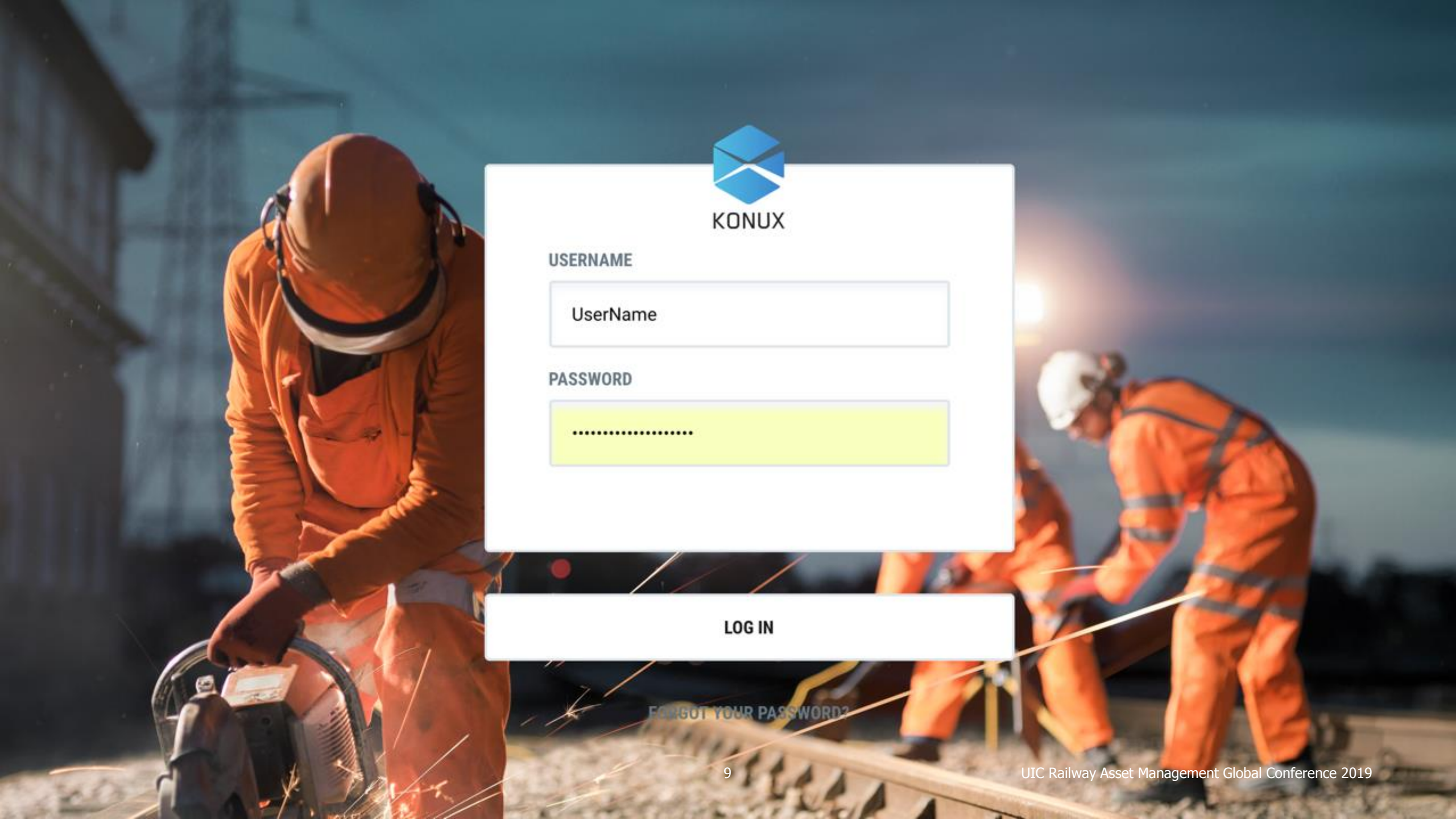
Machine learning **models** enable the **prediction of critical conditions** and **recommendation** of the **appropriate maintenance measures**

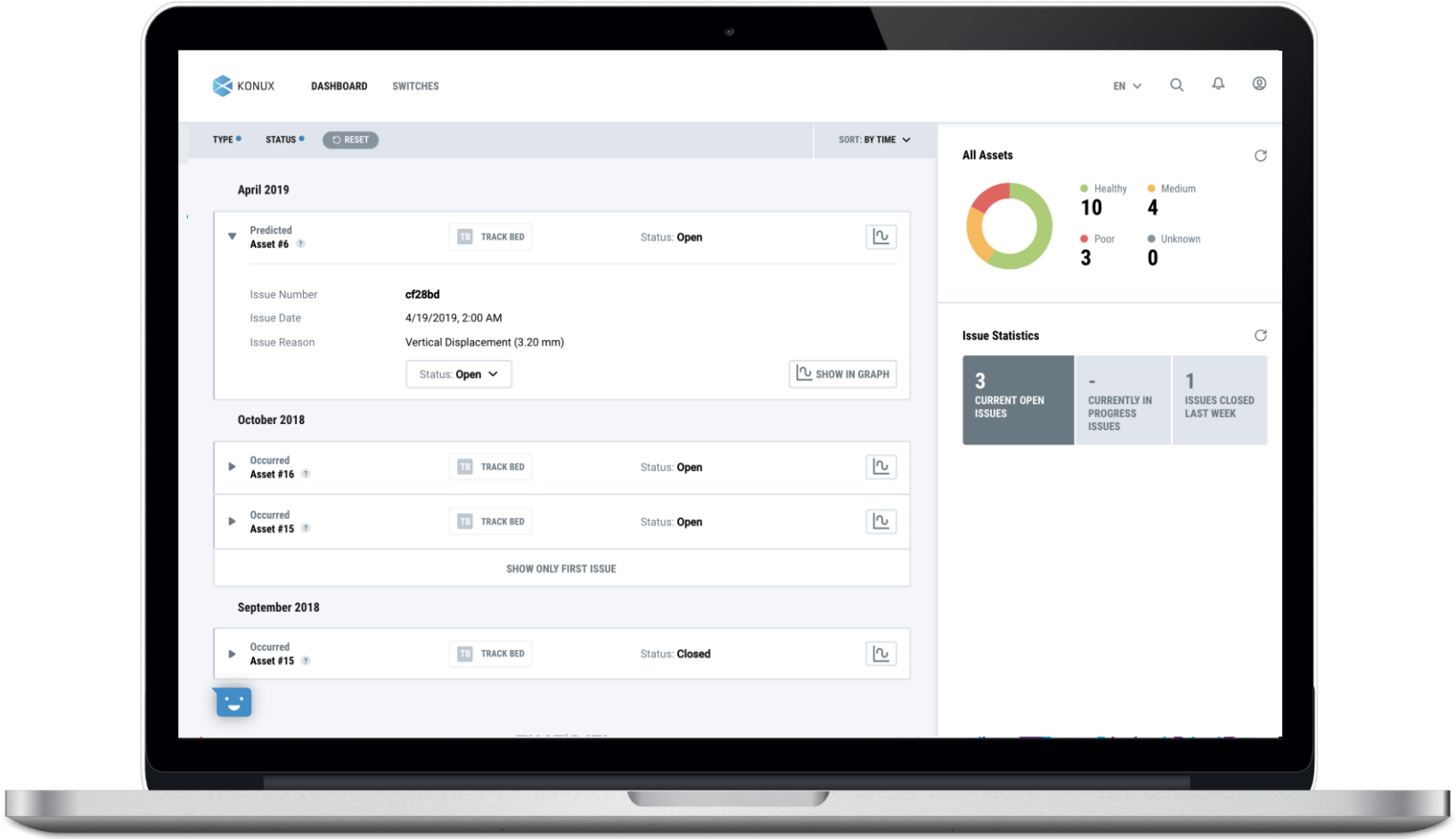
The KONUX hardware is autonomous, maintenance free and can be installed within minutes



The KONUX Predictive Maintenance System




KONUX
USERNAME
UserName
PASSWORD
LOG IN
FORGOT YOUR PASSWORD?



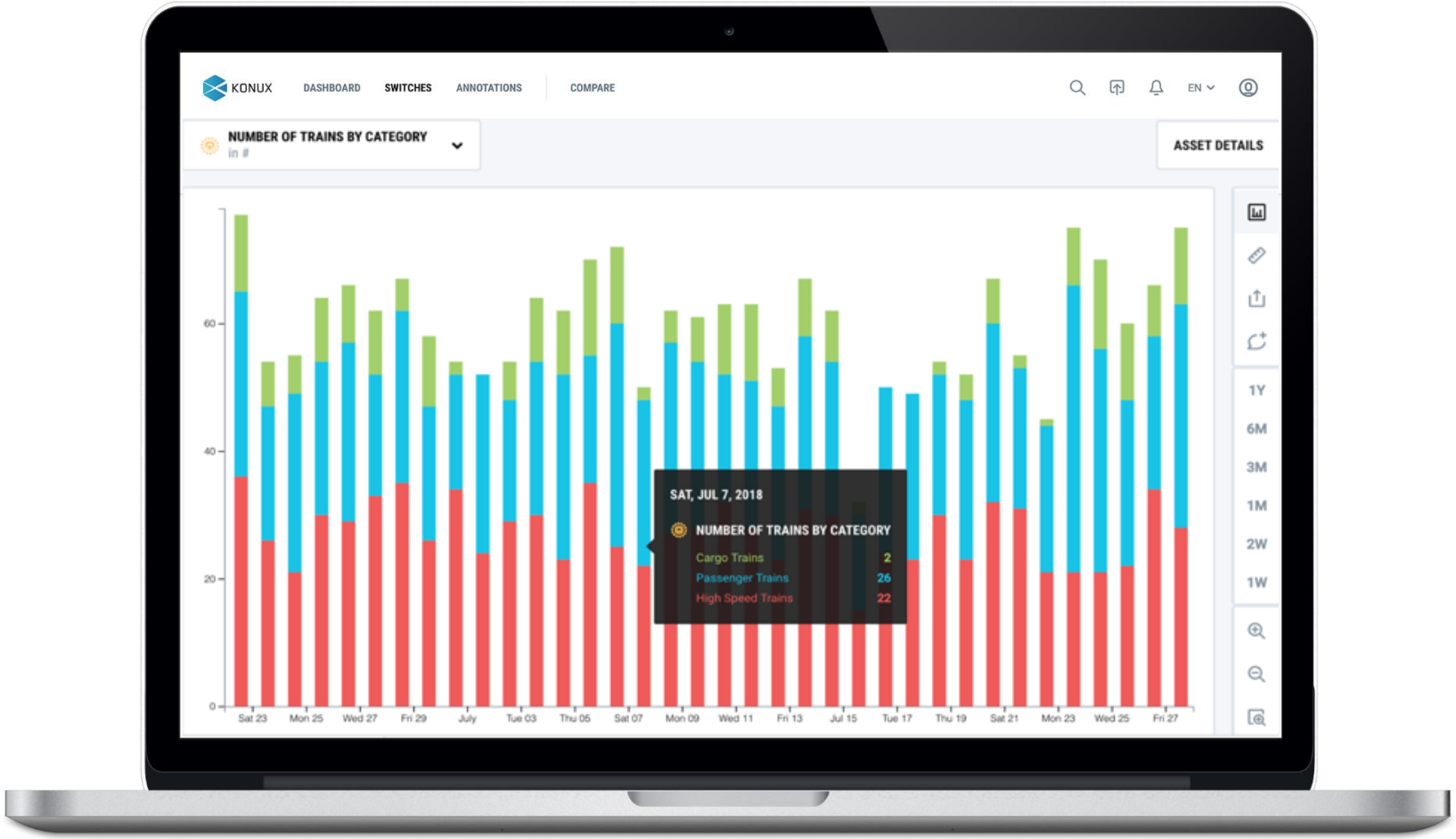
Dashboard: Stay on top of your most urgent issues

Issue list

- Ensure your maintenance actions have the highest impact on availability
- Easy and convenient workflow

Personal overview

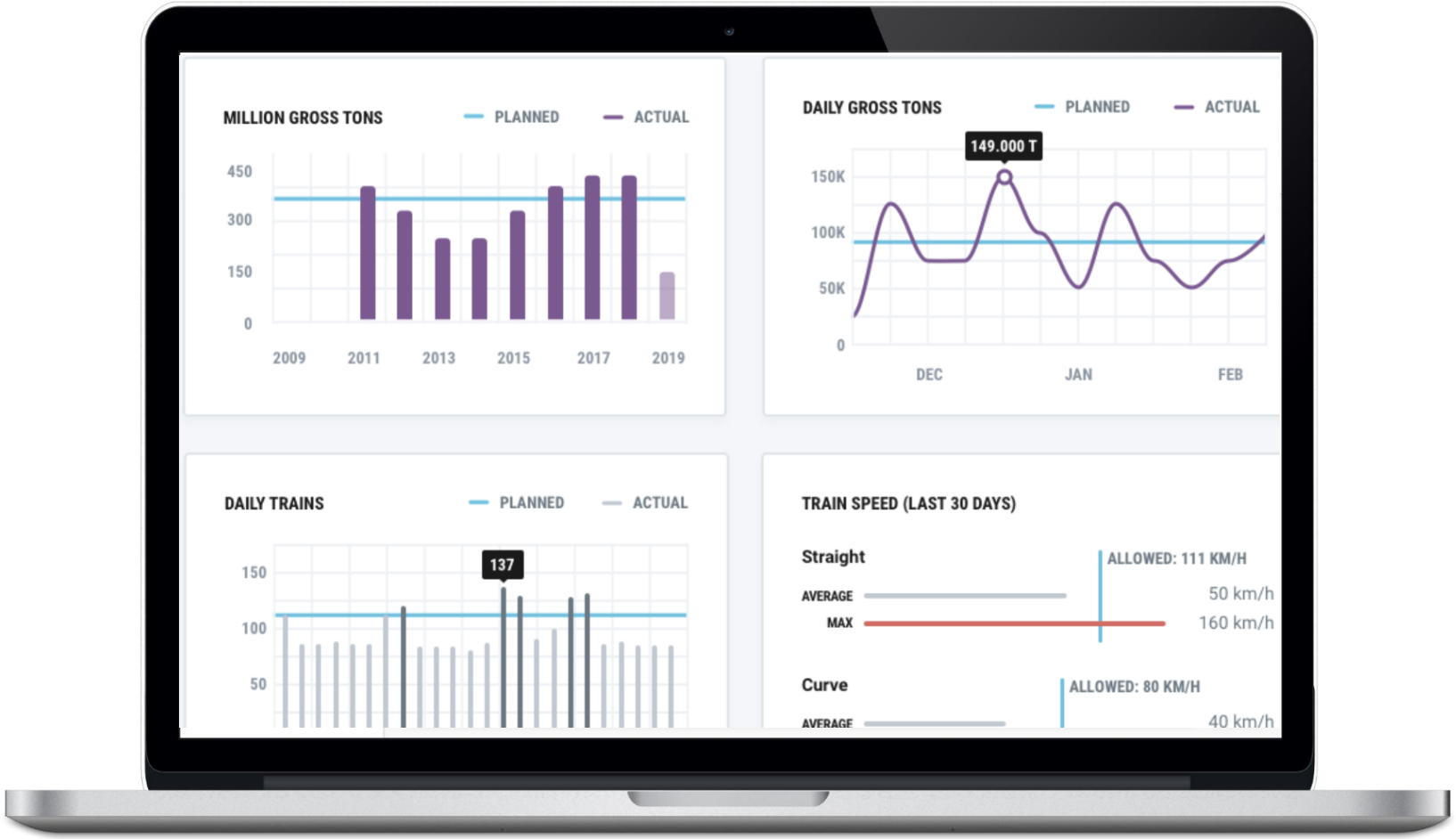
- Keep an overview of the state of your switches



Switch Usage: Know your true usage 24/7

Adapt cycles of inspection based on the actual usage of the asset to achieve higher availability and save costs

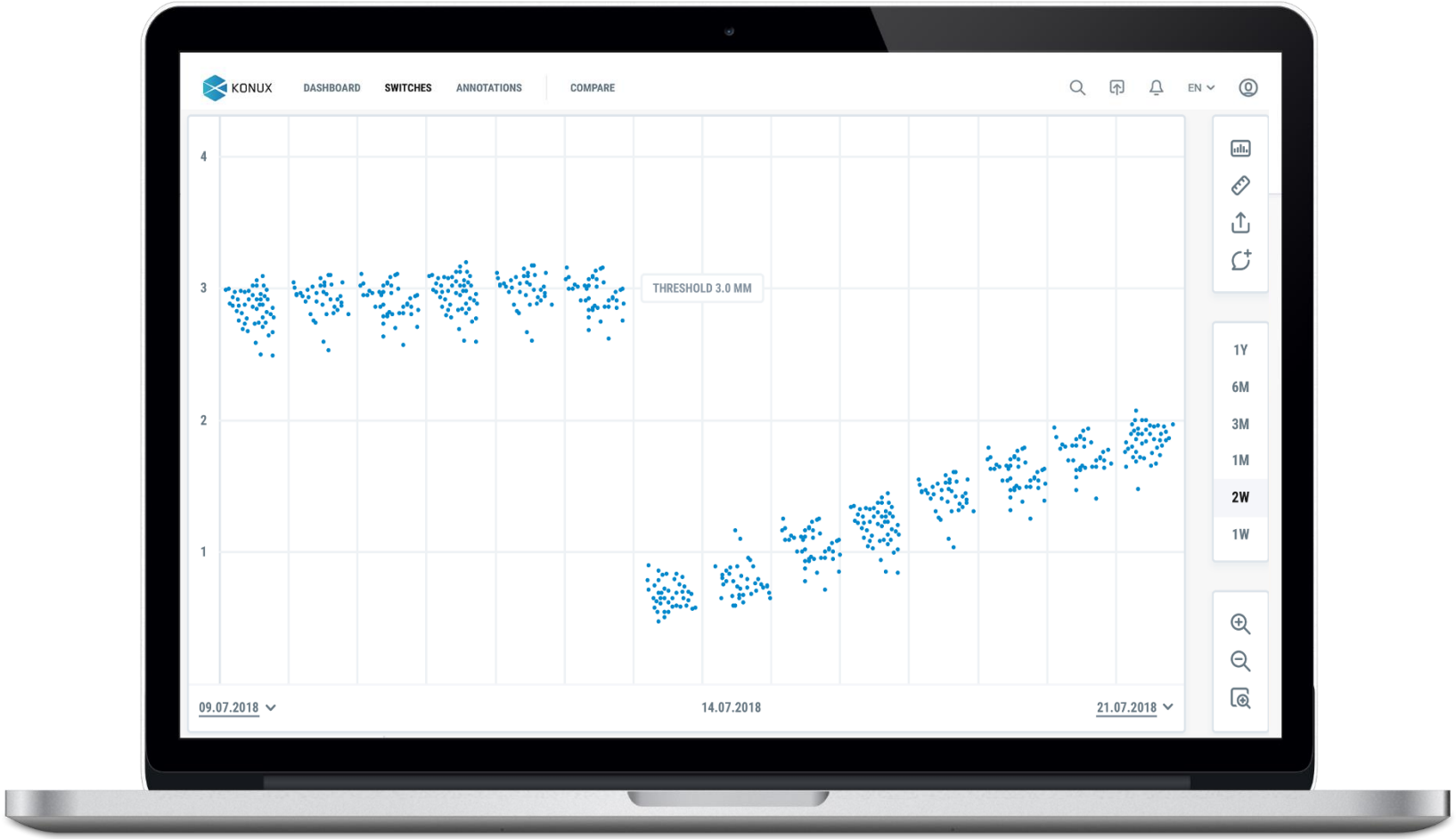
- Compare **actual vs. planned** usage
- **Train classification**: cargo, passenger, highspeed
- **Better strategic planning** & optimized use of resources



Switch Load: Know the true usage of your switch

Always know how your switch is being used to timely adjust planning of inspection, maintenance or replacement.

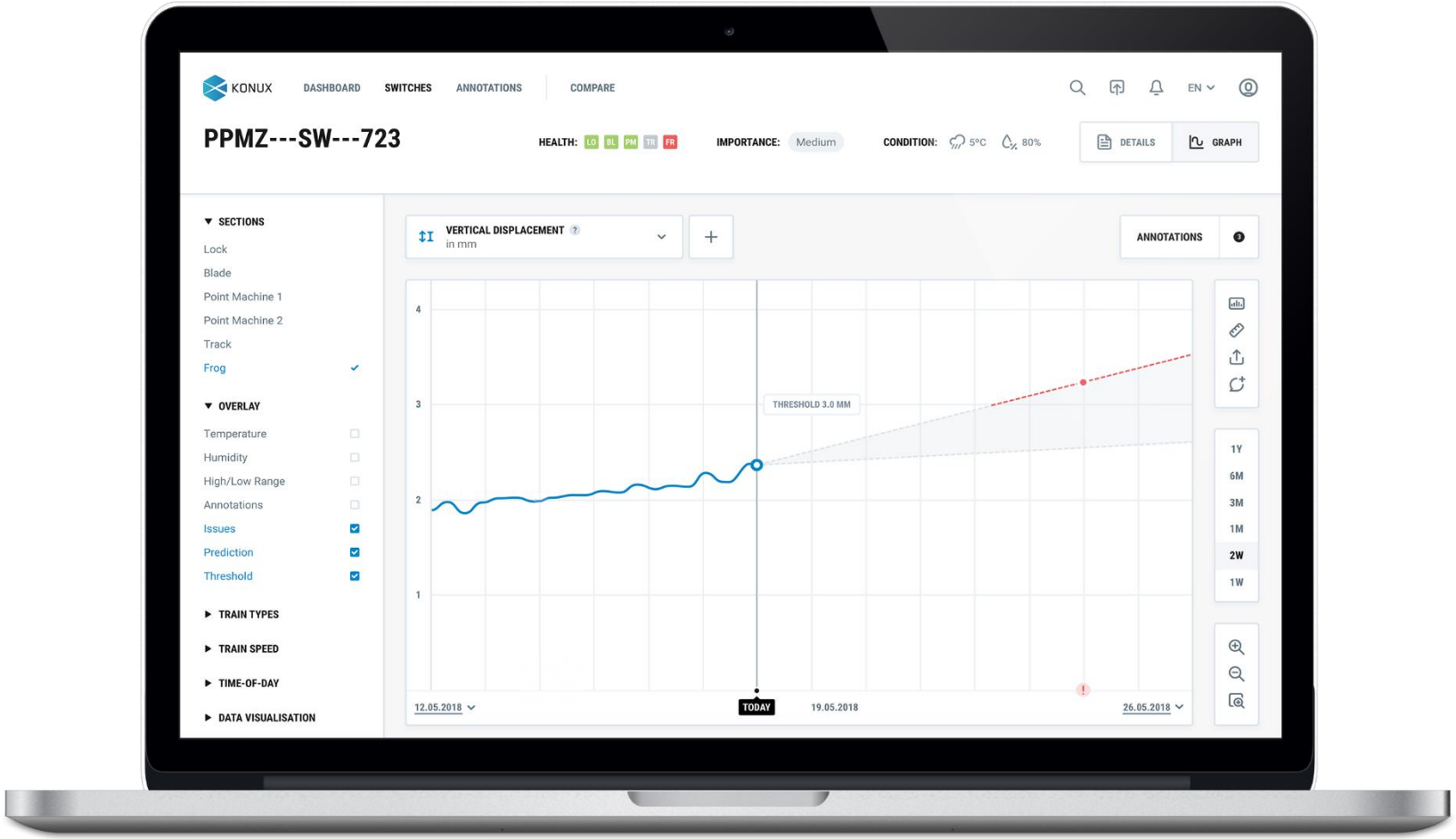
- Detect 100% of all trains
- Compare actual vs. planned load
- Detect and avoid unnecessary speed restrictions to improve availability



Maintenance Validation: know what works best for your assets

Verify and monitor the quality of performed maintenance

- **Immediate** effect **validation**
- **Compare** the **impact** of maintenance actions
- **Avoid failures** as a result of ineffective maintenance

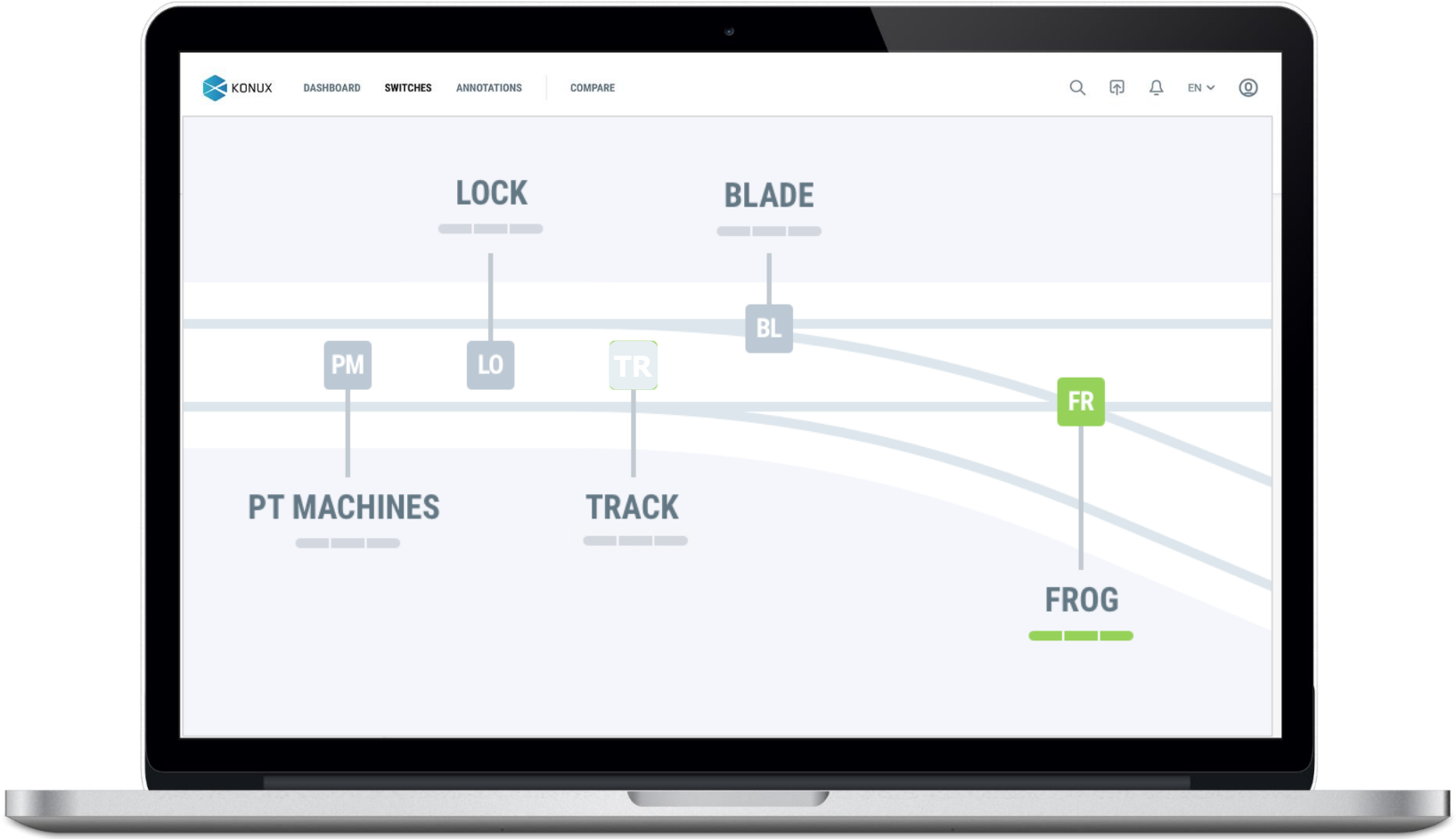


Trackbed forecast:

See and prevent failures

Our AI Core predicts how the trackbed condition will develop and notifies you when actions need to be taken.

- **90 days** outlook
- **Machine Learning** powered prediction with an average **90% hit rate**
- **Continuous improvement** of prediction accuracy



Frog Health: Optimize grinding and welding

Plan grinding and welding measures where they are needed to avoid failures and extend the life of your frogs

- Detect **90%** of **plastic deformations** on frogs
- **Trend analysis**
- Warning **notifications**

We deliver actionable insights, easier

Digitize the infrastructure
through automated 24/7 condition monitoring

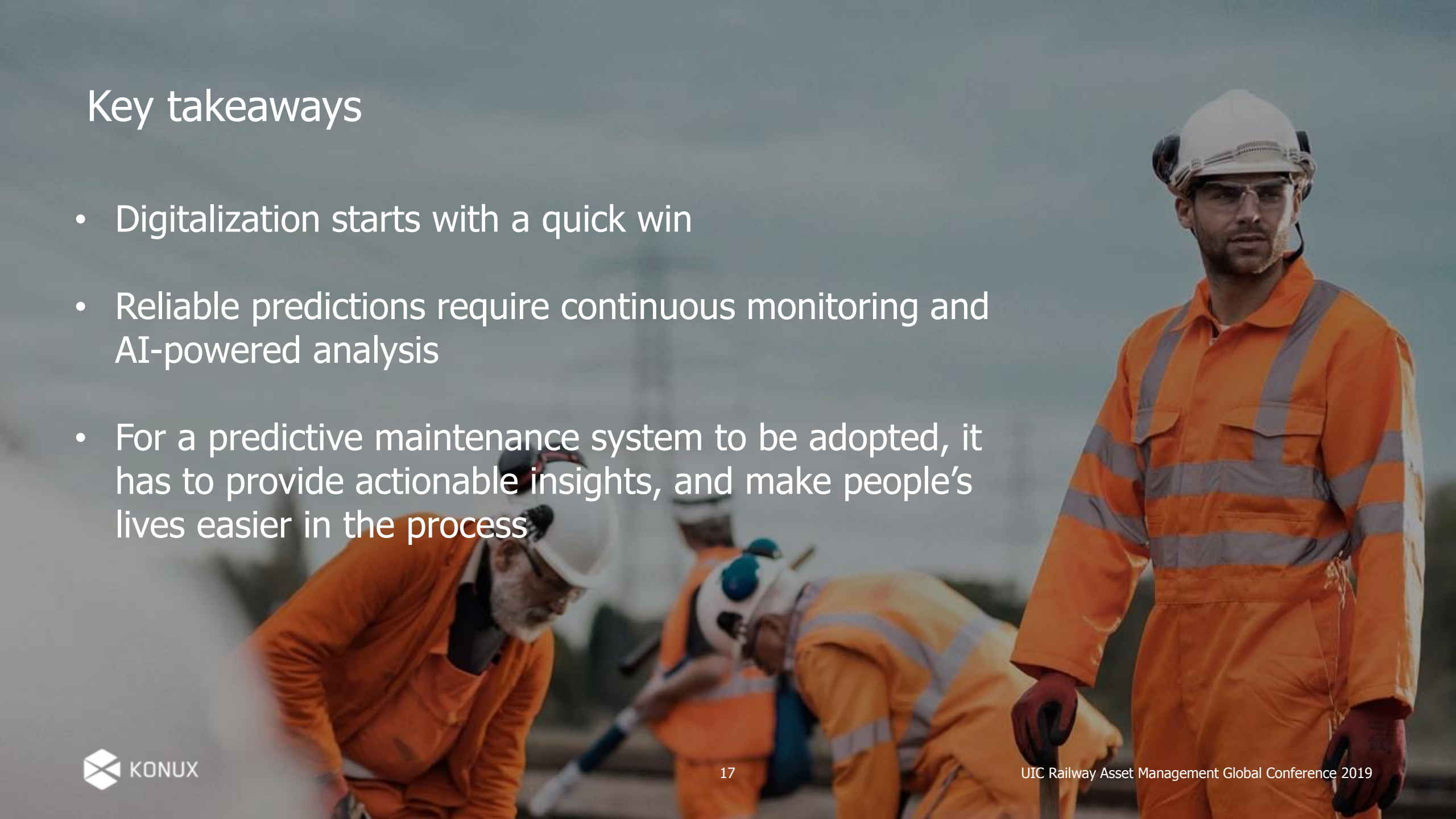
Improve availability
through early warnings of critical conditions and targeted maintenance

Reduce maintenance costs
through condition based effective maintenance actions

Increase asset lifetime
through condition based and targeted maintenance & quality assurance of conducted maintenance activities

Key takeaways

- Digitalization starts with a quick win
- Reliable predictions require continuous monitoring and AI-powered analysis
- For a predictive maintenance system to be adopted, it has to provide actionable insights, and make people's lives easier in the process



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