“The Research Chairs scheme has provided practical and mentoring support that has helped to establish the UK as a leading country in the application of analytical tools and methods to optimise decisions relating to railway infrastructure.”

Dr Andy Kirwan, Head of Asset Management Development, Network Rail

In 2009, Network Rail established a partnership with the Royal Academy of Engineering to appoint Professor John Andrews as Research Chair for infrastructure asset management at the University of Nottingham.
Collaboration with academia plays a vital role in Network Rail’s approach to research and innovation. “The pace and diversity of technology and analytic developments requires multi-disciplined collaborations, which academia is best able to provide,” explains Dr Andy Kirwan, Head of Asset Management Development at Network Rail. The appointment of Professor Andrews as Research Chair has enabled the development of mathematical models and decision support processes that assist maintenance across a broad range of Network Rail’s assets.

Professor Andrews’ research contributes towards the development of cost-effective maintenance strategies supporting Network Rail’s ambitious modernisation programme. “Our collaboration provides access to current tools and techniques and develop them in a rail environment to solve real problems at the earliest stage,” says Dr Kirwan.

The Research Chair has enabled Professor Andrews to understand the scale and diversity of Network Rail’s assets: from track systems to tunnels and stations. This has led to insights into how these systems fail and degrade and the development of optimisation algorithms for predictive models that help with controlling these processes. “New data is becoming available along with new digital technologies,” Professor Andrews explains. “This, combined with the rail industry’s long-term development strategy, is leading to new requirements for the next generation of asset management models.”

These numerical methods are helping to form the basis of Network Rail’s future asset management modelling developments. “They have also been adopted by Shift2Rail, a high-value EU rail research programme,” explains Dr Kirwan. “This is one of several ways in which we hope to continue working together.”

The Research Chairs and Senior Research Fellowships scheme aims to strengthen the links between industry and academia by supporting exceptional academics in UK universities to undertake user-inspired research that meets the needs of industrial partners. Awards are co-funded by the Royal Academy of Engineering and the industry partner and last for five years.