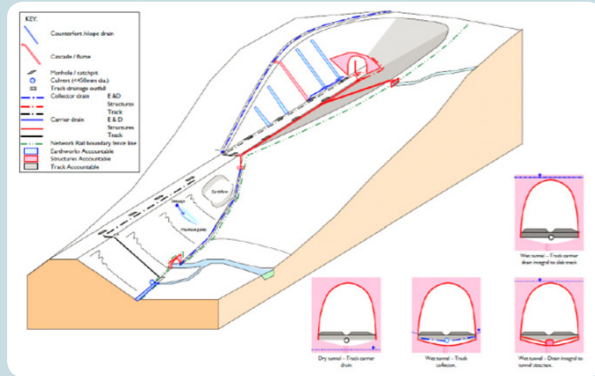# Understanding Drainage System Capability

NetworkRail

What is the situation?

The effective control of water is essential to the safe and economic management of railway infrastructure.

Drainage has an important role in reducing the degradation mechanisms caused by water; such as the long-term softening of materials that form the track support system and earthworks.

Neglect of the drainage system can have significant cost and safety implications for the parent asset; such as delay minutes, poor track geometry, line closures and the likelihood of earthwork failures.

Analysis of causes

Priority problems

Problems

- Incomplete and immature asset inventory.
- Capturing condition and location information.
- Insufficient tools and datasets to manage, view and map drainage as a system.
- Unable to measure the capacity of a drainage system.
- Insufficient datasets and models to calculate the past, present and future demands on the system.

Related goals

- To complete the asset inventory so that 95 % of assets are within Ellipse by CP7.
- All assets should have condition and GIS location information by CP7.
- Drainage systems identified and mapped on Geo-RINM or equivalent platform.
- Capacity of individual systems recorded in asset register.
- Complete demand analysis of each system.

Benefits

- Enabling proactive drainage management, to target maintenance and intervention activities at the most high-risk locations and in a timely cost-effective manner.

Scope

The effective management of a drainage system requires a complete understanding of its capability. This is based upon a holistic approach in which drainage is viewed and managed as a system from the infall to outfall, rather than as individual components.

A full understanding of the system capability is dependent on the knowledge of:

- A complete and accurate asset inventory.
- Location, condition, and performance data.
- A measure of the capacity of the system.
- Current and future demand.
- Competency.
- Systems approach.

A better understanding of these key components, alongside the enablers to capture the necessary data will allow for the drainage system capability to be measured.
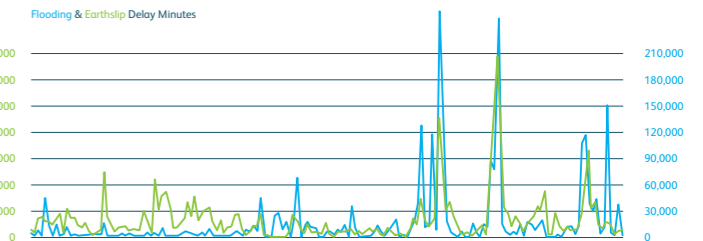
To address these challenges it is expected that R&D actions will need to address the following aspects:

Incomplete & immature asset inventory

- What tools and processes are required to achieve a complete asset inventory?
- How can the data with the asset inventory be maintained and managed in the most effective manner?
- Considerations should be made on the accessibility of the data and systems required to manage the workflow.

Capturing condition & location information

- What tools and processes are available to capture asset data efficiently and safely?
- Considerations should be given as to how these tools/processes will integrate with current systems e.g. Ellipse.

Measurement of the capacity of a drainage system

- What tools and processes are needed to measure the capacity of a drainage system?
- How can we locate and measure the capacity of difficult to access or buried assets?

Data sets & models to calculate the past, present & future demand on the system.

- What datasets and tools are available or need to be developed to calculate the past, present and future demand on a drainage system?
- How can these datasets be integrated with existing processes and systems, supporting the management of drainage assets decision making progress?

Tools & datasets to manage, view, map drainage as a system

- How can we map and view drainage as a system?
- Tools and datasets are required for the management of drainage from a holistic systems approach. The developed tools should support the decision-making process and allow for scheduled interventions. Providing cost and safety benefits over the whole life of the system.