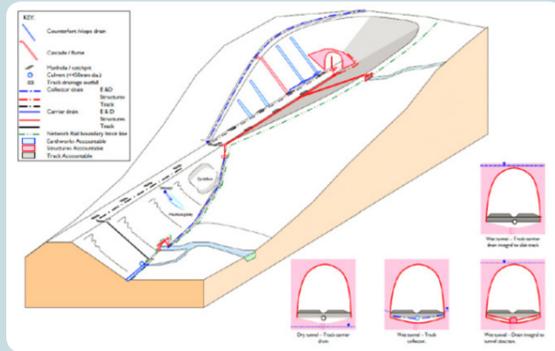


What is the situation?

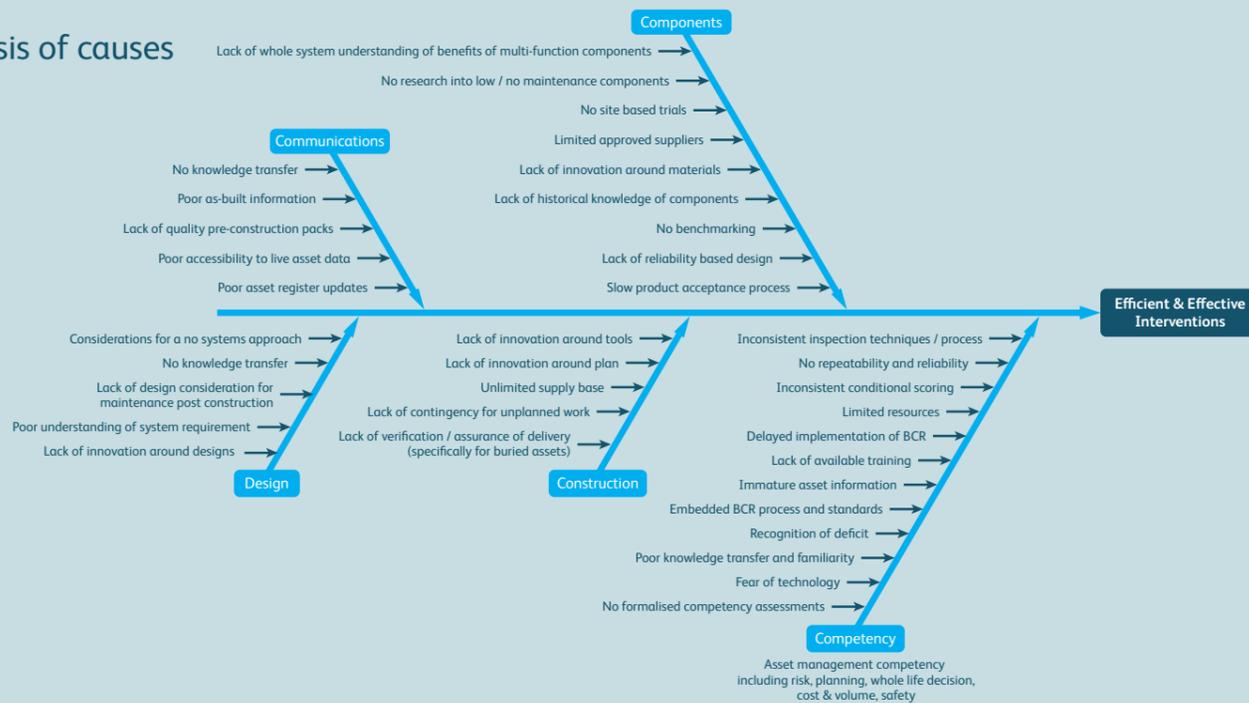


The effective control of water is essential to the safe and economic management of railway infrastructure.

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 a likelihood of earthwork failures.

Analysis of causes



Priority problems

Specific priority problems

- Lack of innovation around construction tools and methods.
- Lack of innovation with regards to use of low maintenance materials.
- Poor communication channels and update of asset inventory.

Related goals

- To benchmark against other sectors and trial innovative construction tools and methods by CP7.
- To benchmark and trial low maintenance construction materials that could replace traditional materials by CP7.
- To provide all those delivering drainage works with training and access to the My Works App for drainage as well as guidance on how to capture work and volumes delivered by CP7.

Benefits

- The use of innovation in construction methods, tools and materials will help to provide more efficient interventions.
- This will also provide workforce safety benefits, and reliability and repeatability in the works completed.

Scope

Management of the drainage system requires effective and efficient interventions throughout the whole life cycle. Timely interventions can reduce the risk of drainage and parent asset failure, providing significant cost and safety benefits.

Interventions can range in size and scope from dealing with the maintenance of one chamber to the refurbishment of a whole crest drain. However, they should be approached with a holistic view with its suitability and value measured by the performance of the whole system. Currently, the majority of interventions are delivered by traditional methods with a lack of innovation and technological advancement. There is a need to consider where technology and more novel solutions/materials could be employed throughout the construction process.

The enablers to supporting efficient and effective interventions are:

- Components.
- Design.
- Construction.
- Competency.
- Communication.



fig. 1

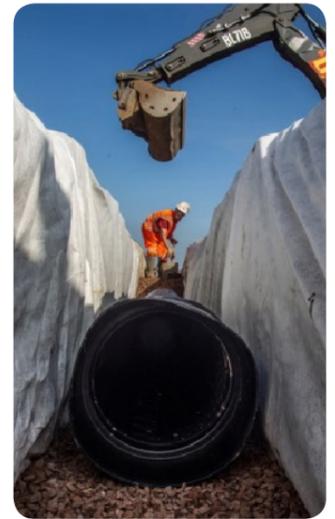


fig. 2

Providing a solution to the issues highlighted for each individual enabler (see Analysis of Causes) will allow for efficient and effective interventions.

To address these challenges it is expected that R&D actions will need to address the following aspects:

Innovation around construction tools & methods

- How can current construction methods, equipment, plant and tools be made more efficient and effective with the use of technology and innovative solutions?
- Improving construction quality and reducing construction time are desirable for all clients.
- Improvements around excavations and trenches will also increase safety by reducing risk.

Innovation with regards to use of low maintenance materials

- What low maintenance drainage materials, components and solutions exist?
- How can existing high maintenance drainage components be replaced by low or no-maintenance components with minimal disruption to the railway?
- Increasing rail capacity means that access to the railway is reduced for maintenance works.



fig. 3

Improved communication channels

- What tools are required to support the information flow between asset managers and deliverers? Timely transmission of data during the various phases of design and construction can reduce the costs of projects.

State of the art drainage designs

- How can drainage designs deliver low or no maintenance solutions with resilience?
- Best practice and world class drainage designs supported by innovative components can provide safety and performance benefits not yet realised.