

Access, Set Up, Pack Up & Possessions

What is the situation?

The aim of a possession is to provide a safe, traffic-free worksite for maintenance activities to be carried out; such as remedial works, inspections, routine maintenance and planned renewals. Planning a possession requires early booking and is a significant coordination task, which at a high level requires consideration of the possession location and limits, access points, required duration and safe systems of work.

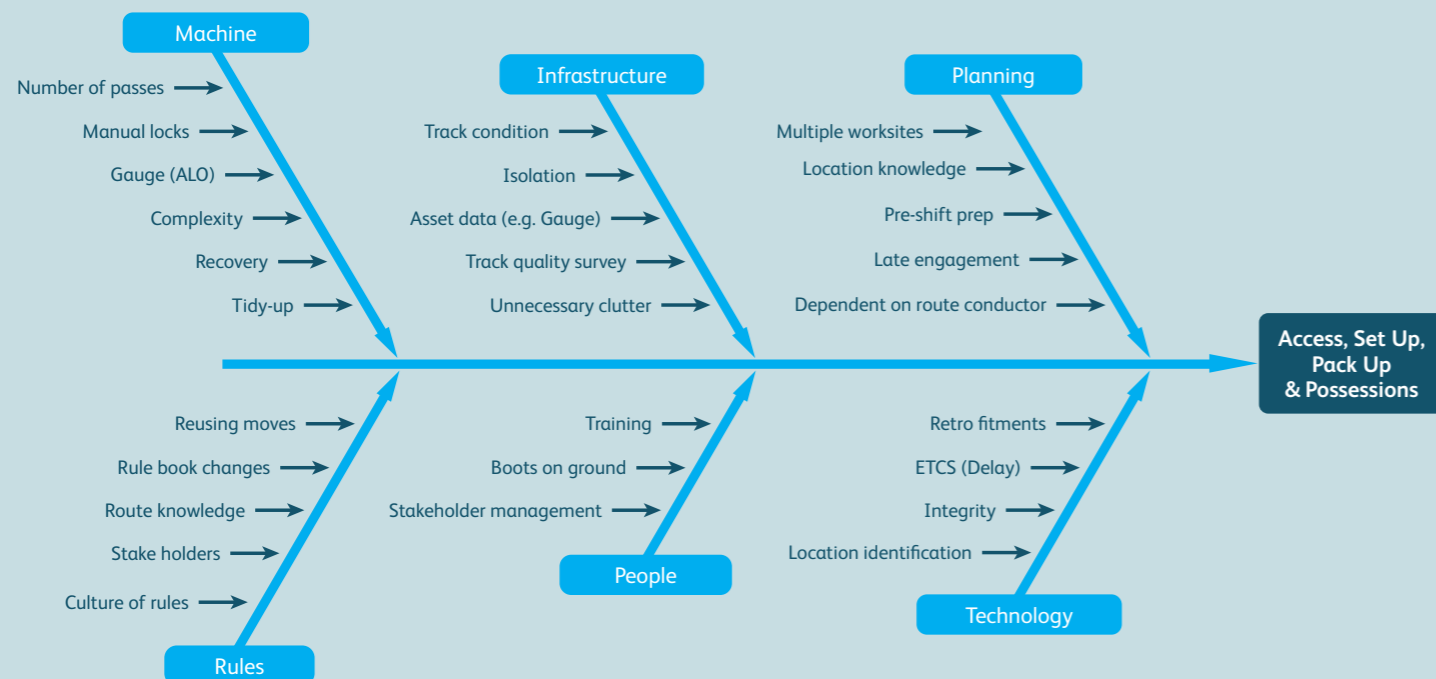
Possessions for engineering trains allow them to complete complicated maintenance which may require multiple passes and combined work with other engineering trains. Maintenance staff can also get off the machine for inspection or manual tasks. But with increasing traffic and reducing availability of possessions, being effective and efficient in accessing, setting up and packing up is vital not only to reducing the maintenance costs, but also to ensure work is completed safely and traffic is not delayed.

Possessions result in planned disruption which is difficult to manage but can also result in unplanned disruption which is very problematic. Delays from engineering trains is one of the biggest causes of delay minutes. Unplanned disruption can occur due to many reasons; machine faults, access issues, staff planning, wrong engineering train arrangement all of which demonstrates the complexity of planning possessions and likelihood of success.

Getting staff and equipment to the worksite on time and effectively and minimising the travelling distance are critical requirements for an efficient engineering access. The restrictions to this are mutual points for road and rail, number of staff and the type of equipment. Engineering trains usually start in sidings which can be in remote locations due to available sidings being occupied during large possession works. This makes timetabling and planning difficult to ensure the engineering trains reach the worksite at the correct time and in the correct formation.

Engineering trains also require significant set up and pack up time when they reach the worksite, leading to inefficient use of infrastructure capacity. For some engineering trains this is a very involved task requiring several staff and procedures. Preparation work also needs to be done at the site to dig ballast, mark cabling, isolation etc. which further requires infrastructure capacity.

Analysis of causes



Scope

The overall scope of the challenge is to optimise Access, Set Up, Pack Up & Possessions.

Although some improvements have been made in the problem areas identified they have been restricted to newer engineering trains and have not had consideration to the problem in its entirety. There is a requirement to develop solutions to planning, procedures and design of engineering trains such that possession efficiency is increased or even the requirement for possessions is eliminated, delivering infrastructure maintenance work with minimal disruption and costs.

Priority problems

Specific priority problems

- Planning of engineering trains, access and possessions is a complicated and multifaceted task.
- Machines require significant intervention and time to set up and pack up. Manual track quality surveys post machine shifts required.
- More compatibility of engineering trains to operate on diverse infrastructure routes.
- Staff required off the machine increasing requirement for safety processes and procedures increasing time in start-up and hand-back.

Related goal

- Streamlined planning of engineering trains with flexibility to adapt to changing requirements.
- Simple deployment of engineering trains and increased use of technology.
- Engineering trains being able to conduct maintenance work alongside running trains and on live AC/DC infrastructure.
- No boots on the ground.

Benefit

- Completion of planned maintenance when intended, reducing disruption to traffic.
- More infrastructure maintenance time.
- No infrastructure preparation work required saving infrastructure capacity.
- Increased staff safety

Specific research needs

- Investigate the possibility to plan possession in different ways. Development of planning tools for engineering trains which consider multiple scenarios, location and the type of work to ensure minimal impact to infrastructure traffic and capacity.
- Develop a way to have a better overview and availability of the necessary resources. Investigate cause and effect in last-minute planning.
- Design and development of new generation engineering trains with automatic deployment, track surveying technology and no requirement for staff on infrastructure, increasing possibility of infrastructure maintenance work without possessions.
- Development of engineering trains with low failure probability and simple recovery procedures.
- Research better methods of contractual managing of engineering trains to reduce risk of non-availability or poor performance.

Expected impact & benefits

- Reduce possession related cost due to engineering trains.
- Effective planning methods for engineering trains.
- Reduce putting staff in high risk locations, increasing staff safety.
- Increase productivity of engineering trains within possessions.
- Increase efficiency of engineering access for engineering trains.