



The logo features the letters 'II' in a bold, blue, sans-serif font. To the right of the 'II' is a stylized icon of railway tracks, composed of black lines, enclosed within an orange square frame with rounded corners. Below the 'II' and the icon, the word 'insight' is written in a grey, lowercase, sans-serif font. To the left of the 'II' is a graphic element consisting of several parallel orange diagonal lines of varying lengths, creating a sense of depth or a stylized 'I'.



**INTELLIGENT  
INFRASTRUCTURE**  
DELIVERING THE DATA-DRIVEN RAILWAY





# Introduction to insight



# An overview of insight

## What is insight?

**insight** is a web-based system that will support engineers across Network Rail.

It utilises enhanced analytics capabilities to allow for **predictions to be made on when assets will deteriorate past a particular threshold**, providing maintenance teams with more intelligence to effectively manage and prevent these faults from occurring.

## A decision support tool...

**insight** is a **decision support tool**; it is **NOT** there to make decisions for engineers or do their job for them. Therefore, any intelligence provided in the tool, can be acted on if the engineer deems it appropriate. This does not replace existing standards and therefore any predictions made by the tool do not override compliance timelines.

## Not the final product

It is also important to note that **insight** will continue to be enhanced over time. Therefore, what is in use now, **is not the final product**. It is the first iteration of the tool, with increased capability being provided by an agile programme.

# II track workstream - mission objectives

*“The goal is to move maintenance teams, across all Routes, away from reactive working methods towards more **precise, proactive and predictive** methods”*

## The challenge maintenance teams currently face...

Track maintenance teams currently work in a reactive world. They have little visibility on the rate at which their assets are degrading and therefore often, only intervene once a defect requires an urgent response.

By working reactively, maintenance teams often have to respond to faults in scenarios with:

- Tight deadlines
- Reduced access
- Reduced resources and equipment

This can often have the following impacts :

- **Reduced effectiveness of interventions**
- **Repeat service affecting failures (SAFs)**

## How can insight support?

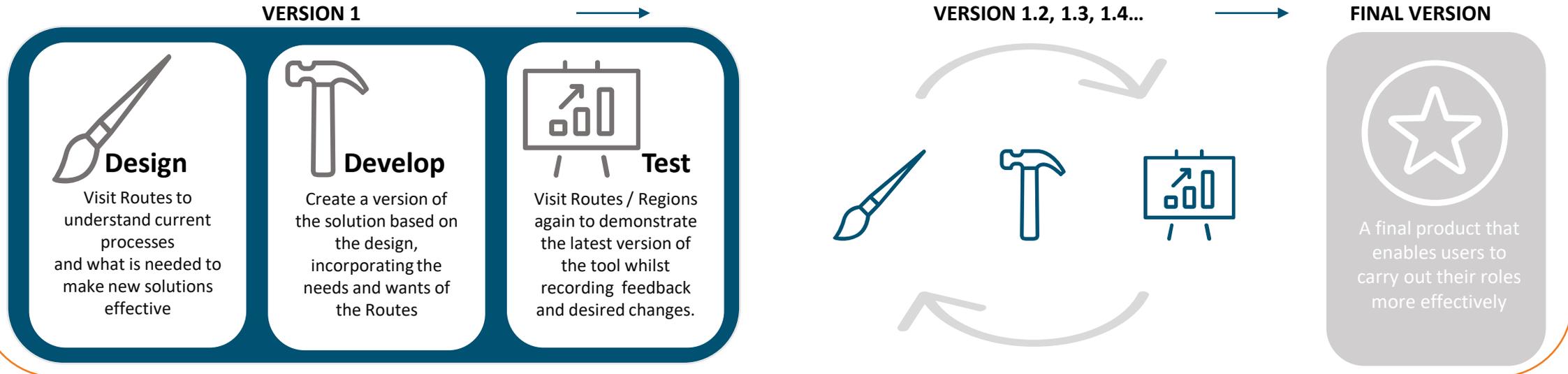
The track workstream are providing a decision support tool that utilises degradation rates, amongst other things, to predict when defects (or their precursors) will occur.

This will allow maintenance teams longer to plan interventions making it more likely that the most effective intervention option can be delivered in the most efficient way. This can help to prevent service affecting failures, as well as ineffective and repeat maintenance activity

# II track workstream – delivery approach

## How are II track delivering capability?

This approach will ensure the Routes become an extension of the development team by continuing to shape insight



## Why are we delivering it this way?

By delivering capability in small chunks and not delivering the whole capability in one go, Routes can start to test and validate the tool early on rather than only getting visibility of the tool at the end of the programme. This early validation and iterative development, will avoid the pitfalls experienced in previous programmes where tools have been developed in isolation over a long period, meaning when the tool is deployed it no longer meets the needs of end-users. It will also allow us to be agile and respond to feedback, as necessary, if priorities change or feedback dictates.

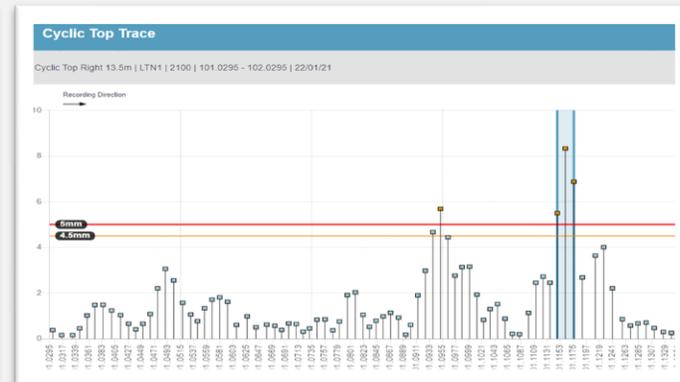
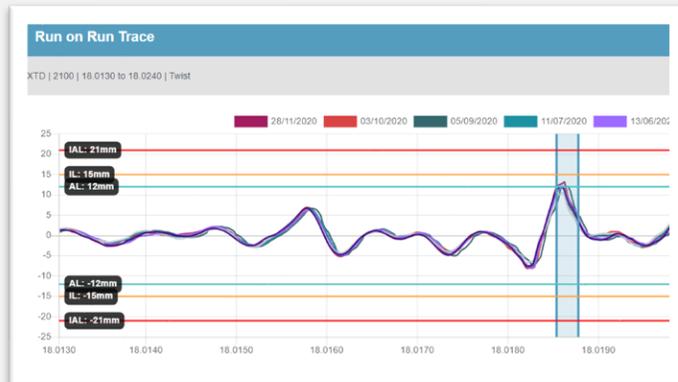
# What is in this first release of insight?

## Track geometry

This **insight** release focuses on **track geometry**, as well as an **inbox** that helps users manage the predictions made by the tool.

### Track geometry and cyclic top dashboard

The main body of this release is the track geometry and cyclic top prediction functionality. Where threshold exceedances are predicted by the tool and degradation charts shown to allow for closer inspection, Maintenance Teams can see how track condition is deteriorating, when they need to intervene and prioritise their activity accordingly.



### Actions inbox

The Action inbox allows maintenance teams to manage and respond to predicted faults. It is there to support the easy navigation of the tool and will support the earlier planning of maintenance activity.

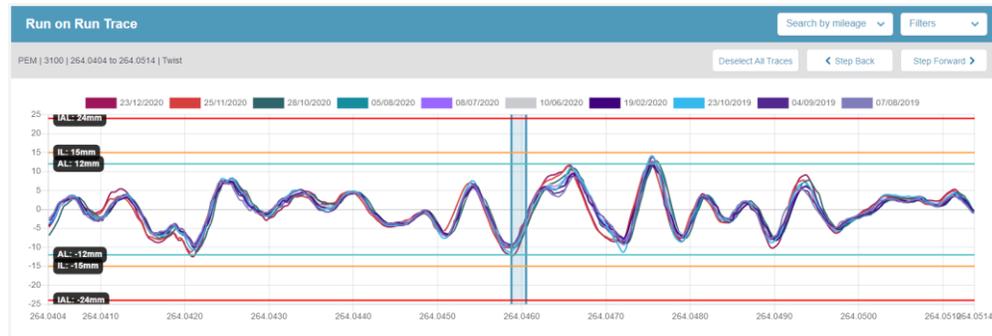
ACTION TYPE	DESCRIPTION	SOURCE	PRIORITY	CATEGORY
Track Geometry Pre-Alert Faults	Track Geometry Faults for Tonbridge Track SM	Measurement Train Run...		Defects
Track Geometry Pre-Alert Faults	Track Geometry Faults for Tonbridge Track SM	Measurement Train Run...		Defects
Track Geometry Pre-Alert Faults	Track Geometry Faults for Tonbridge Track SM	Measurement Train Run...		Defects

To reiterate, this is not the final version of the tool, therefore users feedback is absolutely key to help us to continue to improve it.

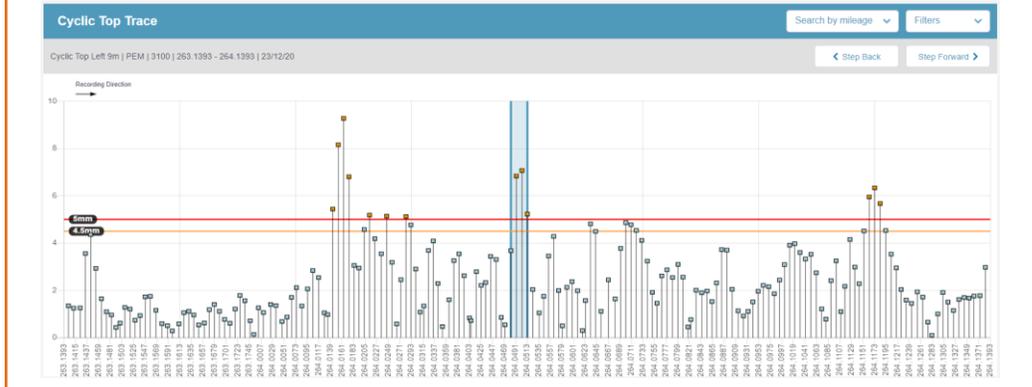
# What does insight give users?

**insight** is a first for Network Rail and the wider rail industry. By aligning trace data automatically, users have the ability to predict when a threshold exceedance will occur and when they need to intervene. **insight** gives you:

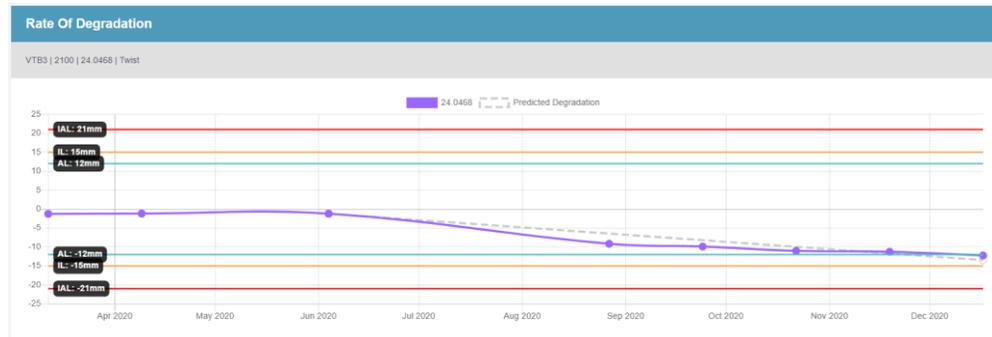
## Automatically aligned track geometry traces



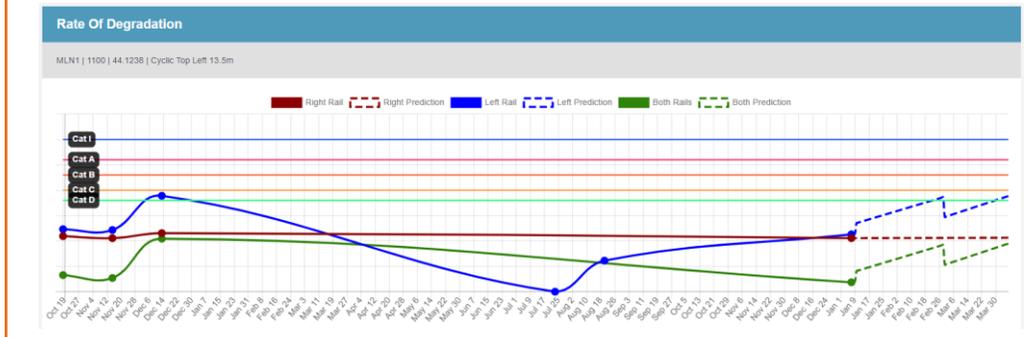
## Visualising cyclic top faults



## Predicting track geometry threshold exceedances



## Predicting cyclic top threshold exceedances



# What will this mean for users?

Ability to prioritise track geometry faults



Confidence to plan work earlier



Improved investigation and analysis of faults



Fewer repeat faults



Improved access planning



Ability to group interventions

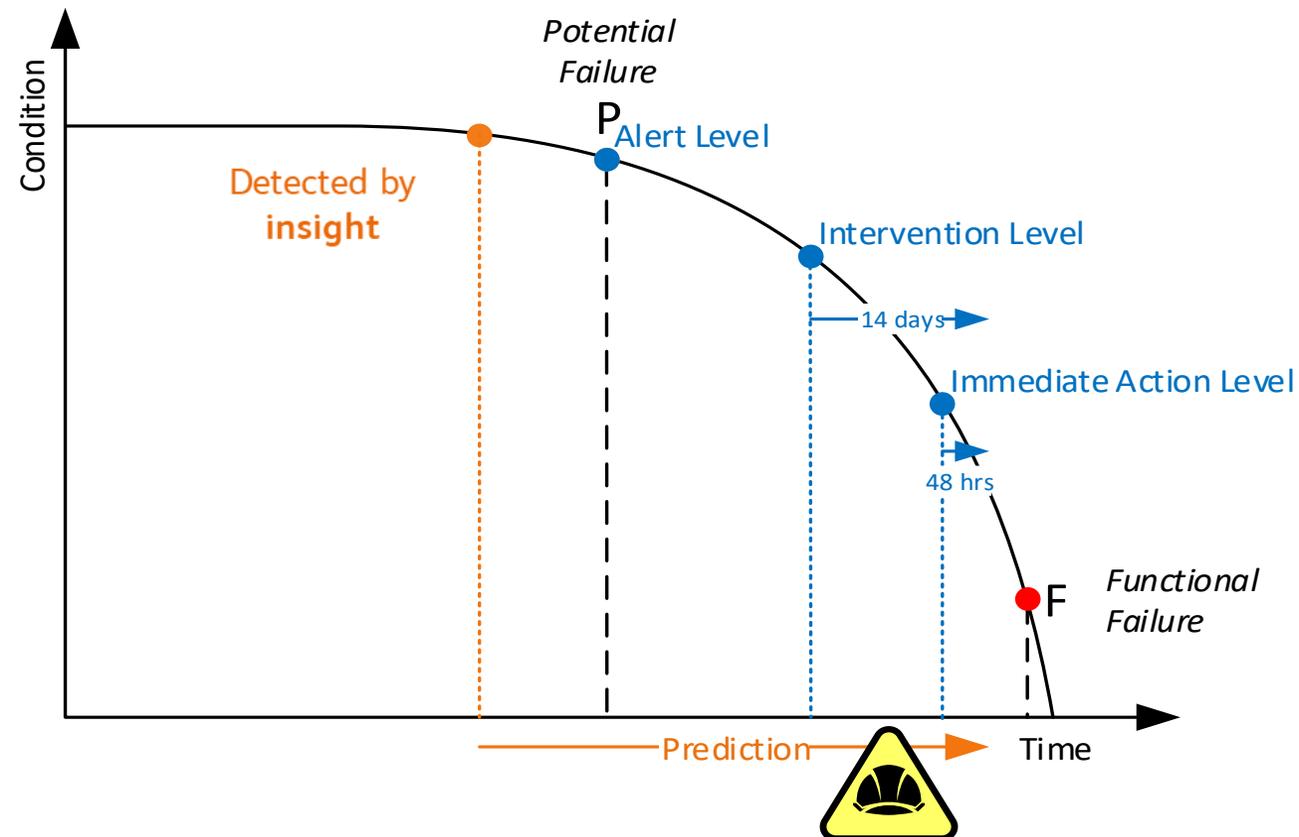


# How does **insight** support earlier planning of maintenance?

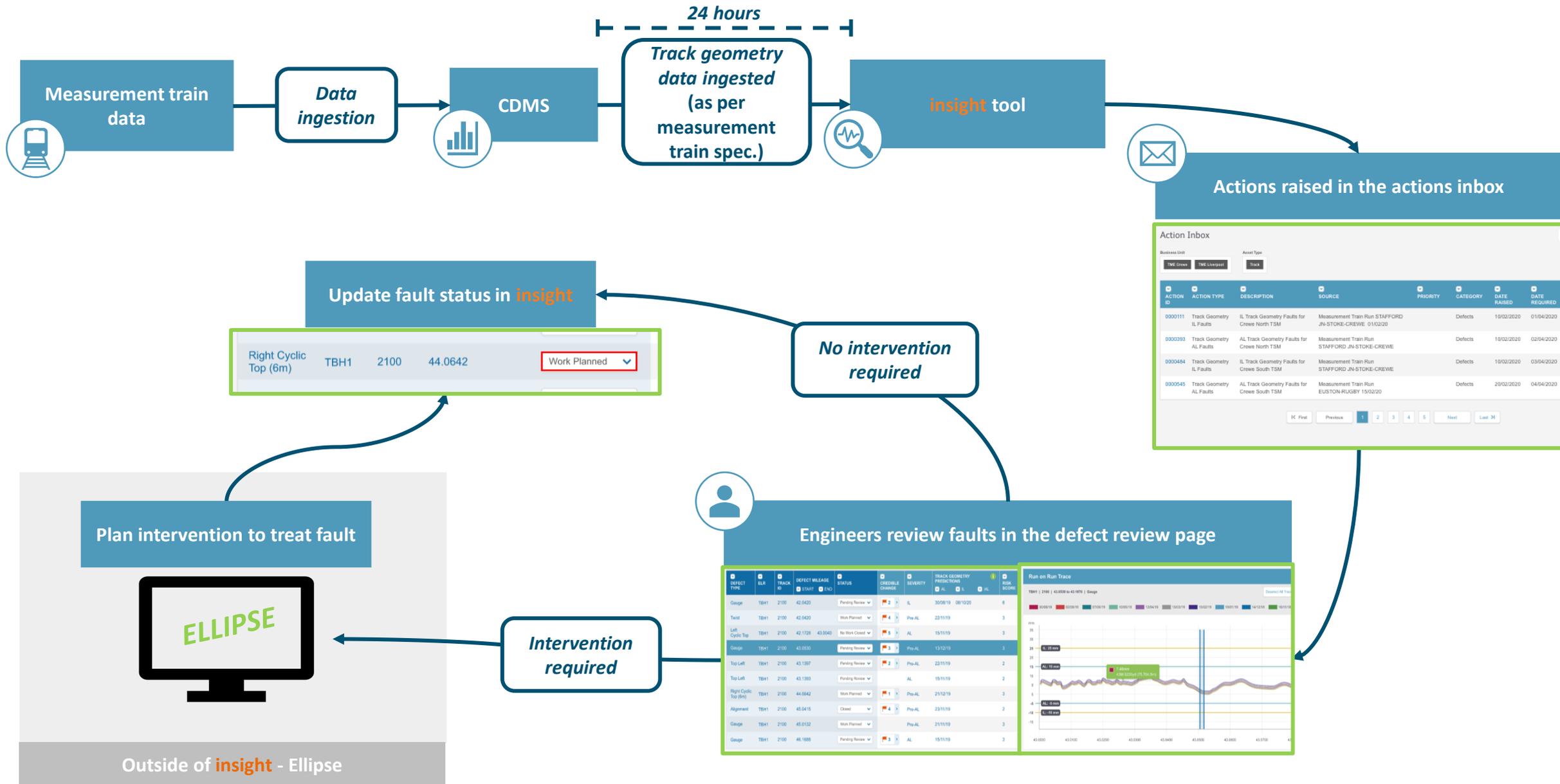
One key objective for **insight** is to **move maintenance planning earlier, moving it further up the P-F Curve.**

By providing predictions for when track assets will cross a particular threshold, track engineers will have longer to plan their interventions, allowing them to:

- Get the access and resources they need to carry out the optimal intervention
- Prevent a fault from occurring (where possible)
- Group interventions to make possessions more effective



# How does *insight* work?



# Outcomes of **insight** – pilot tracking

## What are the impacts of insight?

Earlier planning of interventions



Measures

**Ellipse data** – Labels in extended text of Ellipse show us what severity faults are being planned at

**Survey data** – Anecdotally, can you plan your interventions earlier?

Reduction in service affecting failures (SAFs)



Measures

**FMS and trust data** – Track during and, most importantly, after pilot to see the impact of **insight**

**Survey data** – Anecdotally, will **insight** help to reduce future SAFs?

Reducing repeat faults and increasing optimal fixes



Measures

**Survey data** – Anecdotally, do you get the notice you need to plan the best intervention first

**Repeat faults** – Ultimately track the impact of **insight** and whether there is a reduction in repeat faults

Increased possession optimisation



Measures

**Survey data** – Anecdotally, can you group and fix lower level faults in possessions?

Eventually this will be tracked using Ellipse data