Station Innovation Zone
Year 4 - Challenges

This year, we have two challenge categories (**Station Weather Resilience** and **Interchange Anxiety Reduction).**

Please note that within the **Station Weather Resilience** challenge, there are two sub-challenges.

Further details on the challenges can be found below – we advise you read through this extensively.

Challenge One - Station Weather Resilience:

We are looking for innovations that help reduce surface condensation issues at stations to reduce slips, trips and falls by station users. Solutions may provide (parts of) a solution that predicts, and/or prevents, and/or responds to surface condensation.

This challenge has two sub-challenges.

Active Prevention Challenge

Active solutions for minimising and preventing floor surfaces reaching 'dew point' temperatures and creating condensation or 'sweaty slab' due to atmospheric conditions within open public areas – with a specific focus on the requirements within railway stations and listed buildings.

This can be explored through implementation of measures on the floor surface, building or utilising and modification of station cleaning machines etc.

Specific: Design, develop, and trial an innovative solution that reduces, avoids or quickly and effectively addresses condensation and resultant slip risk in high-footfall areas of a railway station.

This is of general interest across infrastructure organisations but creates specific issues when required without compromising heritage integrity within Grade 1 and Grade 2 listed structures.

The solution must be able to minimise the risk and likelihood of condensation.

Measurable

- Describe how you intend to demonstrate a reduction in ‘condensation events’ due to the proposed active system. Also indicate how you intend to track potential reduction of associated reported slip incidents or near-miss events in the test area during the trial.
- Collect user feedback to understand the influence of the solution on people's perceived safety and aesthetics.
- Achieve a solution that has minimal aesthetic or fabric issues.

Achievable

- Utilise available materials, sensor systems, coatings, or modular designs suitable for temporary or reversible installation.
- Ensure compatibility with station operations (e.g. easy to clean, minimal maintenance).
- Ensure compatibility with asset owner requirements (fabric integrity and maintenance, corrosion potentials etc.)
- Health and Safety requirements for materials and application.
- Railway requirements for materials and application (including working ‘on or near the line’, overhead line equipment (OLE) etc.)
- Engage with the asset owner and conservation officer to ensure design proposals are compliant with listed building restrictions - the aim is to achieve no objections from planning authorities and Historic England for implementation.

Relevant : Improving issues caused by surface condensation at stations supports Network Rail and station operators in fulfilling legal and ethical duties under the Health and Safety at Work etc. Act 1974, the Equality Act 2010, and heritage protection obligations, while improving customer experience and reducing liability risk.

Passive Prevention Challenge

Solution for slippery floor surfaces within Railway Stations – with a specific focus on the requirements within listed buildings

Specific: Design, develop, and trial an innovative floor safety solution that reduces slip risk in high-footfall areas of a railway station.

This challenge is of general industry interest but creates specific issues when required without compromising heritage integrity within Grade 1 and Grade 2 listed structures.

The solution should test to uncover whether it meets or exceeds minimum Pendulum Test Value (PTV) standards for slip resistance as defined in UK HSE guidelines.

As per HSE guidelines, PTV Standards to Meet:

- Wet conditions: PTV ≥ 36 (Low slip risk)
- Dry conditions: PTV ≥ 40 recommended (Very low slip risk)

Measurable

- Describe how you intend to demonstrate a reduction in reported slip incidents or near-miss events in the test area during the trial period.
- Describe how you intend measure whether the solution achieves and maintains PTV ≥ 36 in wet conditions during independent floor surface testing (using the TRL Pendulum Test) across at least 90% of treated surfaces.
- Collect user feedback to understand the influence of the solution on people's perceived safety and aesthetics.
- Achieve a solution that has minimal aesthetic or fabric issues.

Achievable

- Utilise available materials, sensor systems, coatings, or modular designs suitable for temporary or reversible installation.
- Ensure compatibility with station operations (e.g. easy to clean, minimal maintenance).
- Ensure compatibility with asset owner requirements (fabric integrity and maintenance, corrosion potentials etc.)
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- Railway requirements for materials and application (including working ‘on or near the line’, OLE etc.)
- Engage with the asset owner and conservation officer to ensure design proposals are compliant with listed building restrictions - the aim is to achieve no objections from planning authorities and Historic England for implementation.

Relevant: Improving issues caused by surface condensation at stations supports Network Rail and station operators in fulfilling legal and ethical duties under the Health and Safety at Work etc. Act 1974, the Equality Act 2010, and heritage protection obligations, while improving customer experience and reducing liability risk.

Challenge Two - Interchange Anxiety Reduction

Recent research conducted at Bristol Temple Meads shows that interchange anxiety occurs due to the experience of rushing when needing to change from one train service to another. Rushing also occurs when the allocated platform is changed.

Specific: Design, develop, and trial an innovative solution that reduces interchange anxiety by addressing at least one of:

- Helping passengers to get to their train on time feeling more relaxed, prepared and in control
- Reducing conflicts for those moving directly to another platform with those dwelling on the platform or in the subway or those moving more slowly and unhurriedly

Measurable:

- Demonstrate for those passengers that experience the solution a reduction in anxiety and measure the positive impact on their overall station experience.
- Describe how you will demonstrate a reduction in rushing for services for those interchanging between trains (departing from different platforms).
- Describe how you will demonstrate a reduction in trips and falls (and near misses) from passengers rushing.

Achievable: Solutions may wish to consider:

- Physical innovations at the station (such as novel uses of light, sound, sensors, other visual stimuli); and/or
- Digital solutions (including augmented reality) that are within scope (see out of scope below).
- Also in scope are solutions that look to change passenger behaviour in the station to reduce interchange anxiety.

Out of scope:

- Wayfinding apps and other digital wayfinding solutions including digital maps *
- Solutions that do not fully consider inclusion and accessibility

- Solutions that do not consider the different influencing factors that cause interchange anxiety - see "Railway Station Interchange case studies" [1]

Relevant: Recent research highlighted interchange anxiety for those changing services at Temple Meads. This will support the rail industry to make moving between trains safer and improve passenger experience at stations. This is relevant to all stations where passengers commonly interchange between services.

** Network Rail have recently reached a five-year agreement with Whoosh for their real-time information platform. Network Rail selected GoodMaps as its delivery partner and awarded a national contract to provide inclusive digital wayfinding at all of their mainline stations from April 2024.*

Things that are out of scope:

- Innovations that have already been seen or tested at UK rail stations.
- Innovations that do not support Network Rail in the delivery of its priorities.
- Innovation typologies already tested or used at Bristol Temple Meads, including:
    - LIDAR crowd monitoring solutions
    - British Sign Language screens
    - Wayfinding apps for indoor spaces
    - Journey Assistance apps/platforms
    - Neurodiverse passenger assistance apps
    - Rentable office pods
    - Carbon capture panels
    - Computer vision inspection software for hazard prediction
    - VR assisted staff training programmes

Further information

For more information about Network Rail priorities, read more about the Control Period 7 delivery plans here.

[1] https://cp.catapult.org.uk/report/researching-interchange-at-bristol-temple-meads/