



Strathclyde Partnership for Transport (SPT)

Case Study: Environmental evaluation of subway stations

Glasgow Caledonian University (GCU) has advised Strathclyde Partnership for Transport on condensation risk factors to reduce condensation problems in stations during its significant Subway modernisation programme.

Strathclyde Partnership for Transport (SPT) had been experiencing condensation throughout the Subway system due to the volume of warm, moist air moved by trains through the tunnels meeting with colder surfaces at station concourses.

Due to a programme of station refurbishments - including Hillhead, Ibrox and Kelvinhall stations - SPT aimed to identify the potential for remedial condensation treatments and to spot opportunities for reducing condensation risk.

SPT enlisted experts on the thermal, energy and moisture properties of buildings, led by Dr Mark Phillipson of the School of Engineering and Built Environment, to monitor the environment

within stations and suggest ways of reducing or eliminating risks of condensation based on the existing and proposed design of stations.

GCU has significant expertise in the measurement and evaluation of the environmental conditions within historic buildings, working on many projects for English Heritage and Historic Scotland.

SPT Assistant Project Manager John MacDonald says: "The stations refurbishment programme has been going on for four years. This work helped to inform some of the measures which we were considering to reduce the condensation issues, including certain ventilation and doors and barriers. The study helped to confirm our findings as each station has a different environment, so it was useful to monitor the effects of the trains in different stations and implement appropriate recommendations."

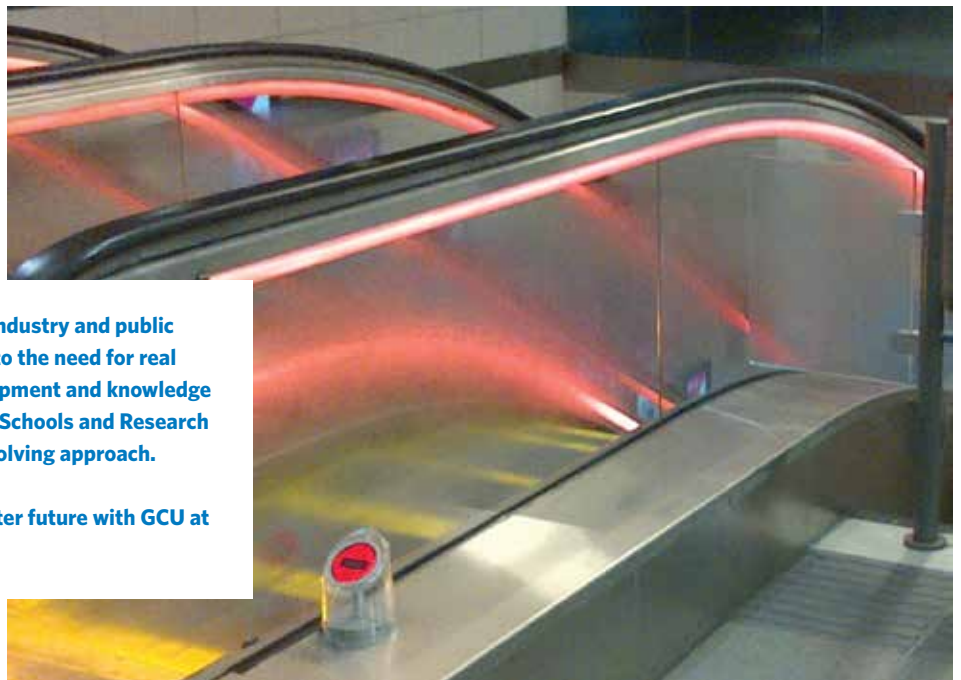
GCU is also working with SPT to convert unwanted ingress water from the subway into a sustainable heat source.

The pioneering technology will be developed over the next two years as a result of the Knowledge Transfer Partnership (KTP) between SPT and GCU and builds on SPT's existing energy efficiency strategy. The KTP programme supports businesses to access the knowledge and skills that reside within universities to improve competitiveness and productivity.

The GCU team will support SPT in developing a financially and environmentally effective method of harvesting heat from the water, allowing SPT to offer an even more efficient service and further improve customers' experience of the system.

Water in the underground tunnel has a temperature of around 14C, which is sufficient for obtaining heat. That heat will be extracted using energy efficient pumps to suck up warm water and use the heat to warm stations and nearby buildings. If successful, the technique would cut both heating and maintenance costs and reduce disruption for subway passengers.

School of Engineering and Built Environment Engineering



At Glasgow Caledonian University, we work with industry and public sector partners to ensure our expertise responds to the need for real world innovation. GCU's strategic business development and knowledge transfer teams work with academic experts in our Schools and Research Institutes to support businesses with a problem-solving approach.

Contact us to find out more about building a brighter future with GCU at www.gcu.ac.uk/business.



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