

DEPARTMENT OF CIVIL, ENVIRONMENTAL
& GEOMATIC ENGINEERING

CENTRE FOR TRANSPORT STUDIES



UCL



INDUSTRIES

The What, Why & How of PEARL

What is PEARL?

PEARL (Person-Environment-Activity Research Laboratory) is a unique facility to explore the ways in which people interact with their environment. It is a massive space – around 4,000m² and 10m high – in which we can create life-sized environments – a railway station, high street, town square – under controlled conditions, so that we can examine how people interact with the environment and other people in these types of places. We can change the profile, type and material of the floor, simulate lighting of any colour and intensity, create sound from the tiniest bird song to the most massive explosion, include other senses, such as smell, and much more.

Why PEARL?

Much of our understanding about how cities work is based on a lot of assumptions about how people respond to, use and act in the environment. Many of these assumptions are based on experience over many years and are valid in general, but often the models we use just don't represent what actually happens. PEARL enables us to study in detail how people actually interact with the environment and each other, by enabling us to test detailed differences in the environment – such as space, colour, lighting, sound – under controlled conditions, so that we can obtain rich data for use in the design of real urban systems.

How can we use PEARL?

PEARL allows the public, researchers, regulators, implementers and others to see, hear, smell, feel and try out for themselves what operation and design ideas would be like, so cutting the cost of trying out new ideas by testing them in the laboratory before trialling them for real on-street. We can help designers work out how people will respond to their designs, for example, of trains. Sometimes we need to instrument people with sophisticated systems, such as eye trackers, accelerometers and motion detection systems, so that we can track how they move around the environment.

Types of Industry Projects

Redesigning Hearing Aids

One of the major complaints of people who use hearing aids is the difficulty of hearing conversations in a restaurant. So we set up a restaurant experiment to establish the effects of different levels of conversational noise in a restaurant on people who use hearing aids. In the experiment they were invited to have lunch in small groups with audiologists and hearing aid designers. We showed how a person with hearing difficulties first reduced their involvement in a conversation and then ceased to participate at all as the background noise level increased. We then discussed the experiment outcomes with people who use hearing aids, audiologists, and hearing aid designers, in order to set out the users' needs in terms of what hearing aids need to be able to do to make 'going to a restaurant' a more comfortable experience.



Figure 1. Restaurant simulation



Figure 2. Testing footway surfaces

Improving urban mobility

We are involved in a number of projects concerned with helping make moving around the city easier, particularly at the pedestrian-environment interface. To make walking a more comfortable and attractive option, we are exploring the use of footway surfaces which better support the feet. The aim is to not only increase the amount of exercise and its associated health benefits, but reduce the number and impact of stumbles and falls in the longer term.

How PEARL supports Industries

Real-world Research

PEARL supports industries by applying our human-environment research to real-world scenarios. Our research is as complex as human interactions themselves, ranging from the built environment (architecture, engineering, planning), to the health sciences (neuroscience, psychology, physiology) and social sciences. We then apply these various strands of knowledge to industry to determine how to make products and processes work better for society as a whole. If you are wondering whether your product needs to evolve, be reconfigured, or potentially be replaced, we are here to advise.

Simulating future impact

Our ability to simulate life-scale environments means that we can test the impact of your design proposal before you make your mark on the world. Whether it is a piece of architecture or engineering, or simply a new way of doing things, we can simulate potential user interactions so that you make it the best you can for future users.

Showcasing to the world

PEARL can also help you make the impact you deserve by demonstrating it to the world, whether it be to stakeholders, the general public or future clients and potential investors. Our laboratory-come-theatre space not only provides you with the space to display it, but the possibility to create a more realistic environment in which to showcase its operation, including lights, sounds and smells.

Supporting innovative enterprise

We can also arrange access to PEARL for suitable start-ups and innovative enterprises working in the people-environment sphere. This can enable you to demonstrate your great ideas and test your work for clients. Get in touch if you think we can help you grow.