

DEPARTMENT OF CIVIL, ENVIRONMENTAL
& GEOMATIC ENGINEERING

CENTRE FOR TRANSPORT STUDIES



UCL

PEARL

Person-Environment-Activity
Research Laboratory



CITIES

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.

Our Design & Research Projects

Some examples of our work

NHS Barking Riverside Healthy New Town

PEARL is the research base for the Barking Riverside Healthy New Town project, an initiative by the NHS to demonstrate how a vibrant young community can meet health needs in the context of ageing and dementia. As Barking Riverside develops into a thriving community of 10,800 homes, PEARL will be there to ensure that the needs of the people are met through our public engagement programmes. The Barking Riverside development will provide PEARL with a semi-controlled exterior environment to support our community-driven research and teaching. This unique combination of laboratory and on-site research will allow us to identify and monitor the community's health objectives and improve it accordingly.



Figure 1. NHS Barking Riverside Healthy New Town project



Figure 2. New bus stop kerb design in Brighton

Bus stop design in London and Brighton

In this project involving bus stop design in London and Brighton, we introduced a new design of kerb which allows the bus to be steered by the kerb as it approaches the bus stop. This means that the bus can stop very close to the kerb so that it is not necessary to use a ramp for wheelchair users to board the bus, and it is much easier for older people to step onto the bus. PEARL is working on enhancing this approach to create more accessible infrastructure.

How can PEARL help our Cities?

Real-scale Environmental Simulations

PEARL's ability to simulate urban environments at 1:1 scale means that we can model, observe and analyse human behaviour under controlled conditions, in response to various types of stimuli, including lighting, acoustics and smell. We can analyse parameters of existing environments or test the impact of new interventions.

People-Environment Interactions

Involving real people in our experiments allows us to observe how they interact with others, as well as the street, vehicles and different kinds of space. This is changing the nature of research, from psychology to neurology, as well as informing our approach to design.

Augmented Reality

PEARL also supports other types of simulation such as augmented reality. This allows us to try out new types of transportation, such as autonomous vehicles, before their potential implementation.

A new 'Urban Theatre'

PEARL's 600-seat 'theatre' provides you - the community, stakeholders, decision-makers and regulators - with a glimpse into the future as you watch different urban design scenarios unfold. This allows you to experience it, rather than simply look at it on paper.

Embracing public participation

Everyone is invited to PEARL to participate in the design of our urban environment, as we aim to design more inclusive and equitable cities which support the desires and needs of all its inhabitants, while being socially and environmentally responsible. Whether you are curious about the possibilities, or have some ideas to share, come and have your say on what your future city should be like.