

Design of the urban transport infrastructure and its impacts

Nick Tyler
University College London

Background/Context

Workpackage 6 set out to explore the relationship between the design of the urban infrastructure and the ways in which this might affect the ability of people to use it. Understanding the principles used by the people who put the urban environment together on a day-to-day basis would help to establish how design is seen in practice and how the outcomes – good and bad – might arise. This in turn would give the basis for establishing the means to be used for testing existing practice and proposed schemes in terms of their delivery of accessibility. Two key concepts need to be investigated in this process. The first is that of the Capability Model (Cepolina & Tyler 2004) which sets out how the interactions between the individual and the environment should be considered. Secondly, the concept of decision making under conditions of bounded rationality (Jones 2001) provides a sound basis for analysing how the design and implementation decisions are taken in practice.

The Capability Model is an advance on both the Medical and Social models of disability and as such provides the base for any assessment of urban infrastructure in terms of its ability to deliver accessibility. The Medical model sees a disability as the result of a set of medical conditions (which may or may not be ‘medical’ by cause or in nature). Thus ‘curing’ or treating the medical condition resolves the disability. The Social model rebuts this approach by stating that the disability arises, not from the individual at all, but from the failure of the environment (where ‘environment’ is taken to mean everything beyond the individual) to accommodate the individual’s needs. One outcome of the use of the medical model is that the logical thing to do is to place people in institutions, where the (medical or other) treatments necessary to deal with the condition can be handled more easily. The logical outcome of the social model is that the environment needs to be changed to meet the individual’s needs so that the individual can function in society instead of exist inside an institution. The difficulty with both models is that they ignore the individual both in terms of their needs and their responsibilities. The Capability Model states that accessibility is the intersection of the individual, the activities they wish to pursue and the environment in which these activities take place. The extent to which something is accessible is therefore the outcome of consideration of the desires of the individual, the capabilities required by the environment and the capabilities provided by the individual: if the provided capabilities are ‘greater’ than the required capabilities, the activity is accessible; if not, then it is not – until the inequality is resolved. The capability model allows for that resolution to be obtained by an adjustment to either the environment or the individual or both.

Key Advantages and Supporting Methodology

The scoping study intended to seek out and determine the means by which the main study would be able to proceed, so it took the form of an exploration of the basic concepts rather than one in which new concepts would be discovered. When combined with work being conducted on other projects, it was possible to clarify the way in which these approaches would be useful in the main study.

The result of applying the Capability Model to urban infrastructure and systems is that it forces the planner/designer/implementer to think about the interactions between people and environment in the context of the activities they wish to undertake. To see how possible this would be it was necessary to establish just how the implementation of a project involving urban infrastructure operates. To do this a workshop was set up in which planners, designers and engineers were brought together to design a particular facility in a particular urban area.

The participants were drawn from the Social Services, Education and Transport departments of Hertfordshire County Council and the London Borough of Camden. The flavour of the workshop was such that it was seen as a training day; however the performance of the participants was under review by the research team throughout the day.

The participants were split into two teams (each mixed between the two authorities) and given a wide range of information about the area around a potential community facility which they were asked to design. This information covered the physical, social, political, economic, demographic and cultural characteristics of the area. In addition, they were given a number of rules. They had a budget for the scheme which was subdivided into expenditure headings. They could apply for an increase to the budget on the basis of a case presented to the research team. They could also have one interview with the local politicians and one with the local community.

The outcome of the workshop was that it was very clear that by default, the teams both split down discipline-based decision-making lines. Each discipline with the team attempted to solve its own problem: the highway engineers saw the problem as one of traffic management, whereas the social services people saw it as a problem of ensuring access to the building. The teams then set out to try and solve the set of different problems. However, when applications for increased funding were turned down, it became clear that by co-operating, they could obtain enough resources from the available budget to design and implement the scheme. To achieve this, they each had to realise that the disciplines each had something to offer each other.

The research team investigated these outcomes to determine how the decisions could be made in order to achieve this level of co-operation. The main obstruction to the co-operation model was that the disciplines each operated within their own set of rules, which largely excluded the other disciplines. This also tended to lead towards the use of predefined solutions which had to be squeezed into the reality in order to fit. The main difficulty was thus that people defined the problem in terms of their own discipline, whether or not there was a problem at all. They felt comfortable with this because they could provide a solution to their problem. However, there was no thought about whether there was a problem at all. Thus there was a predisposition to

solve a problem whether it existed or not. The analysis suggests that this is because each discipline approaches the issue using a logic which is internal to that discipline. This logic defines the questions to be asked and the way in which the answers are understood and interpreted. However, it presupposes that the logic is relevant to the issue at hand. Once the participants were redirected to think about the desired outcome instead of the perceived problem, they reviewed the issue in terms of achievement of the outcome instead of resolving a problem and they set about determining the drivers and constraints associated with the outcome. This enabled them to identify the compromises that would have to be faced – most of which were multidisciplinary in nature and thus required a multidisciplinary approach to solution. This changed the way the teams worked together: instead of being a team of different technical skills, they became a unit of thinkers and designers facilitating the drivers while dealing with constraints and compromises in order to achieve the outcome.

Each discipline had its own 'logic' which it brought to the problem. However there was no common logic which defined the bounds of the problem for all the participants. Put in other words, the participants started by assuming that there is a single logical rationality which applies to decisions in this area and that this overall logic somehow accommodates the individual logics based on the individual disciplines that they brought to the process. By acknowledging that the overall rationality does not exist, the question is then to understand the discipline-based rationalities to determine how they each made decisions and to apply these to the overall decision process. These rationalities are bounded by determining issues such as subject knowledge and area of influence. It was therefore clear that the way to influence the development of accessible urban environments is to study these rationalities to learn how they can be adapted to embrace each other more easily in the face of a lack of a unifying overall rationality which had been wrongly assumed to exist.

Project Plan Review

It had been planned to hold a second workshop to build on the results from the first. However, this proved impossible within the time constraints. This did not affect the overall outcome of the work because the analysis of bounded rationalities and the associated theoretical work was necessary prior to revisiting the decision making process with a newly designed experiment. These methodological experiments are being conducted in the course of another project at UCL.

Research Impact and Benefits to Society

This is a scoping study and thus is not intended to deliver benefits to society as such. The outcomes of this study enabled the research team to frame the approach to the research in the main project and this can be seen in the design of the two core projects P2 and P3 (and, more particularly in the design of the plus projects). However, the thinking developed in this process has been extended in the course of other areas of research, including the study of the cognitive issues involved in the light of decision-making in multidisciplinary contexts.

Further Research or Dissemination Activities

The main further work derived from this scoping study will be seen in the main study. As mentioned above, the research has been taken up in other areas. These include the study of the ways in which thinking works in a multidisciplinary environment and research is underway about the ways in which bounded rationality affects the way in which people plan journeys for example.