Simple computer visualisation:
Three examples in planning practice

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Abstract

This paper will present three case studies illustrating the use of simple computer visualisation models in planning practice within the City of Adelaide, Australia. These case studies demonstrate that computer visualisation is possible at the planner's desktop using simple models to examine planning issues.

Introduction

The promise of three dimensional (3-D) urban modelling lies in several areas: better communication, greater certainty and better decision making by planning participants which in turn may lead to better urban environments. In pursuing this promise researchers have made choices in method and approach which have limited the fulfillment of computer generated visualisation in routine planning practice. In a joint project between the Adelaide University and the City of Adelaide, Australia, I have been investigating an approach using simple geometric computer models in several areas of planning.

Case Study 1: Gay's Arcade

The internal refurbishment of a local heritage listed retail arcade led to the City of Adelaide's heritage department taking a proactive role to promote the reinstatement of historic fabric. The architect's vision was a significant departure from the original design and there was resistance to considering the original. Rather than express their views verbally the planners felt a visual representation would have greater impact and influence. They wanted to compete with the architect's vision on the same terms.

The two designs were modelled so that the arcade's management could explore both and provide them with confidence in their final decision. The modelling was undertaken with the aim of only depicting the minimal amount of information necessary to convey the concept. Using photographs and drawings, a model was constructed to two levels of detail. The 'block' version taking 12 hours while the 'shaped' version took 40 hours.

On presenting the model to the arcade's management, the comparison between the two ideas brought a variety of results. The model was a crucial part of the discussions, making the planners dealing easier and taking the politics out of the

equation. It focused attention on the design issues rather than who suggested them. From viewing the model it became obvious that neither design addressed the tunnel like entrance to the arcade. A major revision of the final design to solve this was not inexpensive but considered a far better result. The original design was not taken up but elements of it were incorporated in the final design. The planners were pleased with the end result as the final design did not preclude future reinstatement and the modelling had given them a positive way to advocate preferred change.

The case study highlighted a number of difficulties as well. The comparison between the architect's developing design and the original design was a point of contention. The board of management was expecting the model to show them more detail of their architect's scheme when there was no more. The use of images trapped expectations in the pictorial paradigm—participants looked for the pretty picture. Using modelling as a tool for exploration rather than image making was a new concept. The representation of the interior caused concern in the 'block' model as it was considered too simple, making it resemble the 1960's renovation of the arcade. The use of colour created confusion as one participant mentally assigned materials to certain colours and had to be assured that the colour was purely arbitrary.

Overall the 'shaped' version of the model provided a powerful tool to negotiate a positive outcome for the arcade. It allowed the applicants to explore a range of possibilities. From a modelling technique viewpoint the 'shaped' version caused myself concern because the detailing of the roof caused the time scale to blow out. While Gay's Arcade highlighted that detail is important in heritage cases, it is a matter of representing that detail simply as shown on the shopfronts rather than the roof.

Case Study 2:
A Major Public Building

Using the Council's geographical information system (GIS) database of 2-D building footprints, kerb lines and contours, a 3-D context model was created to explore the options for a major new public building. Located on the corner of the city's central square, its construction will have a significant impact on the amenity of the area.

Taking four hours to create with an additional two spent on detailing the adjacent public building, the model became the focus for a series of 'what-if' scenarios to help explore the urban design guidelines being developed by the council. As the model consisted of simple blocks representing the square and surrounding buildings, the speed of direct interaction with it was acceptable for use in meetings with the client group and council members. This allowed alterations to be made in response to the discussion and the resultant affect instantly available.

Used primarily as a vehicle for discussion the model kept discussion focused on urban issues. On presentation to the elected members, they were able to clearly see the impacts of various options. Potential Street closures, alterations to pedestrian routes and approaches to the building from around the square were discussed and examined visually. The overshadowing implications for adjacent resident areas were clearly demonstrated, illustrating existing overshadowing and resultant changes.

While the direct use of the model allowed the designers greater interactivity, the council presentation relied on static images thus limiting the examination of the options. This can be considered in both positive and negative ways. The model had the effect of reducing the political interactions and as one Councillor commented, more intelligent discussion resulted.

The lack of experience with the model being altered interactively meant that full advantage of this ability was not taken up. The image focus of existing modelling use will take time to embrace the accessibility of simple modelling. Also a temptation for participants is to ask for more information to be modelled than required. While the whole square was modelled only one quarter of it was used in the discussions, the corner where the proposed development was to occur.

Case Study 3:
Gilbert Street Townhouses

Located in the Southwest corner of Adelaide, the Gilbert Street development consisted of twenty townhouse allotments, each to be individually sold. As the subdivision created an intimate community, coherence of design, overlooking and overshadowing were significant issues. The potential for contextual considerations to be forgotten by applicants led to planners modelling the development to assist in assessment.

Using the City's GIS again, a 3-D context was set up to receive the incoming designs. Planners took a proactive role in encouraging owners to have preliminary ideas modelled to obtain early feedback on issues. The site model took 3 hours while each individual townhouse took 1.5 hours. This time the models included window and door depressions, balconies and roof profiles. This was found to be easily understandable by the lay participants.

Interactivity directly with the model was used to discuss issues with designers, builders and owners. This interactivity took the focus off image and onto the 3-D impact of the proposal. Participants could choose view locations and obtain those views quickly onscreen. This transparency gave the process credibility with the applicants. They could query anything and get an answer. Some participants used this to plan their designs while others used it to check the impact of their designs and their neighbours'.

The model became the vehicle for positive negotiations with the participants, in some cases generating neighbour to neighbour discussion on the respective design impact. With issues clearly illustrated the planner no longer had to depend on participants having similar mental images of the 3-D result. The virtual context also meant that the site analysis was easily accessible to all. Formally manual paste-ups of elevations would have been the only way of getting an impression of the streetscape in routine practice. Importantly the model provided a way for the planner to check overlooking issues and that the proposed solutions worked.

While the modelling provides the planner with a powerful tool, especially in the struggle for adequate information, it still does not provide the evaluation. That comes from the planner and applicants can still disagree with that evaluation. The planners felt overall that the modelling gave them the edge in discussions. The ability to model the townhouses progressively meant that the undertaking was manageable in day to day practice.

Conclusion

From the three areas of heritage, urban design and design control these case studies demonstrate that modelling has a powerful impact on traditional practice. By carefully looking at what is represented in a model and how, simple models can be constructed for use in routine practice. Whereas Gay's Arcade represents the more resource intensive end, Gilbert Street has achieved a balance that is acceptable to planners and other participants both in terms of representation and time to create.

Simple, low realism models have the potential to become powerful tools in development planning and control of our urban environments. By

taking the emphasis off realism and image making, 3-D visualisation allows:

- direct interaction with the model in lieu of static images
- the construction of models within the tight time frame of development assessment
- better communication between all participants with clearly illustrated ideas
- more critical analysis of the impact of the proposal on its context.

With simple 3-D computer visualisation, everyday use of modelling in planning practice can be a reality.

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