



An investigation into the use of visualisations in the Resource Consent Process

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ABSTRACT

The use of Computer Aided Design (CAD) drawings or other static images (including photo-shop and simulations) to visualise potential future situations is common and powerful in planning processes. Its production, use and understanding in gaining planning permission in the New Zealand context is investigated through interviews with 13 architects and planners in Christchurch. The findings highlight the dilemma faced by planners in using visualisations and questions the drive for accuracy and realism in visualisations.

1. INTRODUCTION

Increasingly, visualisations or images pervade every aspect of our lives (Lange, 2001, p.179); from billboards to magazines, movies and live events. They offer almost instant information and are therefore considered an effective communication tool; as the old saying goes - a picture is worth a thousand words. Through better technology, these images appear increasingly realistic, with the promise of the concept that they portray being better able to be comprehended by the viewer (Appleton & Lovett, 2003, p. 117; Lewis, Casello, & Groulx, 2012, p. 100). However, is this sense of comprehension based on the assumption that increased realism means increased accuracy? Could an increase in realism blur the line between 'accurate' and 'idealistic' (Lange, 2001, p. 165)? Could 'realistic' images in fact mislead (Lewis, 2012, pp. 551-552) and, if so, how might the use of images affect decision-making in the planning process? This paper presents an analysis of the use of visualisations within New Zealand's land use planning process, specifically the resource

consent process through which planning permission is gained.

2. VISUALISATIONS AND PLANNING

The long history of the role of images and visualisation in planning has usually been discussed in the context of cartographic images and their power as a communicative device in decision-making processes (e.g., Faludi, 1996; Duhr, 2007). This communicative process includes both communicating to decision-makers and communicating their decisions to the public and other audiences. Visualisation, in the context of this paper, refers to the use of Computer Aided Design (CAD) drawings or other static images (including photo-shop and simulations) to represent potential future situations. These more commonly take the form of images or a series of images, with large scale projects sometimes producing flyovers (as seen in Figure 1). Although different in nature, it is probable that many of the advantages (e.g., awareness raising and concept communication) and disadvantages (e.g., utility in manipulating people and distorting facts) that have been identified for

cartographic representations of reality or design (Duhr, 2007) are applicable to visualisations.

Visualisations frequently appear during planning processes and may be considered as aiding the decision-making process by showing a future, with or without a proposed project or action. More cynically, they may be seen as an attempt to paint a more positive picture of the future of the project than might be the case. Visualisations generally accompany large scale, mostly commercial developments due to the significant cost involved in their creation, though they appear to be becoming generally more prevalent as technological costs decrease and the complexity of projects increase. The resource consent process is initiated when someone wishes to undertake an activity that is not otherwise permitted under the Resource Management Act 1991 (RMA), New Zealand's primary land use planning legislation.

Visualisations may be prepared by a wide range of people, from amateurs to urban designers, engineers, planners, and architects. Typically in the New Zealand planning processes, architects, especially landscape architects, are accepted as the experts on visual effects and prepare visualisations as part of an application for a resource consent. Resource consent planners at the local authority receiving the application are required to assess the application for its completeness, provide an initial screening of the scale and significance of impacts and determine what pathway the application will take. Implicit is that the information provided in the application enables the planner to gain a good understanding of the proposed action or project and is sufficiently accurate for an informed decision. If it is not then it is deemed incomplete and returned to the applicant. There is no legal requirement to include visualisations as part of an application, however visual effects are required to be addressed in application documents (cl.7(1)(b) of Schedule 4, RMA) and are often important parts of the consideration of effects on landscape and amenity values. The RMA process involves council planners determining the level of effects and subsequent type of

public (if any) notification based on their assessment (whether the effects of the application are more or less than minor). Usually the planners then produce a report to the person or panel that decides the application, and that report includes an assessment of the effects of the application against provisions in the plan's objectives, policies, and rules, and other relevant legislation. The views of the architects, planners, as well as the decision-makers, as to the purpose and role of the visualisation therefore appears important in the overall decision-making process. As our interest is in the perceived purpose of the visualisations provided with an application and the potential for manipulation or to focus discussion, our method comprises a comparison of the purpose for which architects perceive they are creating visualisations, and how planners interpret visualisations.

Although there has been research on using visualisations to assist assessments of the visual natural character of lands and seascapes (Froude 2011, chapter 8) and public preferences for particular types of coast (Thomson, 2003), there is little research relating to the effect of visualisations on the resource consent process. In fact, there is little agreement on how visualisations should be used and interpreted within the planning process (Baird, 2014), especially in New Zealand. This was highlighted in a debate in *Planning Quarterly*, the New Zealand Planning Institute's main publication for communicating activities, innovations, methods and ideas to professional planners. In an article in March 2007, Coggan (2007, p. 26) exudes excitement at the potential of visualisation technology within the planning process - 'there is no question that it is realistic and accurate', adding that people can 'take the visuals to the survey point and see for themselves that the base data is an accurate reflection of what they can see with the naked eye' (p. 26). However, in the following *Planning Quarterly* (June 2007), Carrie (2007) urges restraint when applying visualisation technology, noting there needs to be caution regarding 'the appropriateness of the technology ... and any reliance that the Court or planning profession

might place on its validity' (p. 29). This raises questions as to whether those using the improved technology for generating images are providing realistic information that can be relied on by decision-makers or whether a growing reliance on the technology is actually exacerbating the potential manipulability of planners, decision-makers and, if publicly notified, the community.

The potential for confusion between visualisation and reality is highlighted by the New Zealand Institute for Landscape Architecture's (NZILA's) Best Practice Guideline 10.1 for visual simulations (visualisations). On its opening page, under a series of before and after photographs and simulations, it states boldly that 'Visual Simulations can *accurately* portray in a *realistic* manner and in a realistic context, a proposed change or modification in the landscape' (NZILA Education Foundation, 2010, p.2, emphasis added). The guide subsequently states that visual simulations are 'not real life views' (p.3), but continues to repeat the words 'accurately' and 'realistic'- thereby adding weight to both those concepts and the perception that good quality visualisations deliver 'reality'. The courts appear also to expect accurate and realistic visualisations to aid them in their decision-making and have not been persuaded by visualisations that do not accurately portray the reality of a view, but when a visualisation is obviously poorly portraying reality (e.g., apparent pixelisation), decision-makers may set them aside (e.g., *Tram Lease Ltd v Auckland Council* [2015] EnvC 133). If, however, a visualisation is not obviously inaccurate it might be unwittingly accepted as accurate¹.

This is not to suggest that there is necessarily a deliberate attempt to mislead. If they do mislead, it may just be a consequence of how visualisations have evolved. Before

computer generated images, visualisations were unmistakably hand-drawn and therefore, 'can't be mistaken for anything but illustrations' (Xie, 2013). Images were justifiably understood as ideas, not reality (Faludi, 1996). But as technology has improved, better, cheaper visualisations are possible and subsequently there is greater potential for application or misapplication of visualisations (Lewis et al., 2012, p. 89). The increased use of computer technology and its capacity means every aspect of an image can be artificially contrived. As Xie (2013) describes it, 'adding beautiful furniture ... picking a flattering angle that's hard to physically photograph ... to producing lighting conditions that only exist in a fantasy world', and finally 'inserting trees or hip young people doing yoga'. Other factors such as sky colour, angle, use of transport, style and the context shown are all decisions made or assumed by the designer (Bressi, 1995, Wissen et al., 2008, Halbur & Haugh, 2010). Smallman and St. John (2005) argue that these decisions may, in fact, be subconscious - that it is not intended to deceive (p. 12). However, deception is possible.

Perception issues are exacerbated by the potential lack of direct connection between the creator and the viewer (Sheppard, 2001, p. 188). This is exemplified in understanding how the public interact with visualisations. The public only has the visualisation and the immediate context for points of reference unless they are involved in the process through either consultation or as a submitter. If neither, then they are one step removed from the process, and they have no ability to question or respond when images do not reflect the eventual reality. Their perception is distorted because of distance (Rabie, 1991, p. 57; Levy, 1995, p. 345).

¹ It has been stated by the courts generally that the need for accuracy is 'self-evident' in an assessment of environmental effects provided with an application. If an inaccuracy in that assessment is sufficient to have materially affected the decision then the conditions of a consent can be reviewed and if the adverse effects of the activity are 'significant' the consent can be

cancelled (*New Zealand Wind Farms Ltd v Palmerston North City Council* [2013] NZHC 1504). In practice, to achieve a cancellation (or even a review) is likely to involve substantial court action and costs. If an inaccuracy is not obvious it may be hard to argue that the adverse effects are significant even if they have materially affected decisions on notification or submissions.



Figure 1. Contrasting images of the riverfront. Top left: an image from The Terrace website (2014). The remaining two images are frames from a CCDU video (2014).

The Terrace development in Christchurch (a nearly completed post-2011 earthquake development that required planning permission) provides a useful example. The Terrace is situated along Oxford Terrace and before the earthquakes this was a popular bar and restaurant area. The Terrace is a development project that involves building three buildings for mixed use along the Avon River. The images reproduced in Figure 1, show three different visualisations of The Terrace, one by the promoter (downloaded from its website in 2014) and two that are from a flyover produced by the Christchurch City Development Unit's (CCDU's) Avon River Precinct development (2014). The visualisations serve similar purposes of portraying what the future appearance of this area will be, however there are obvious differences in the style of the images as well as the actual appearance of buildings and their context. Even in the two images from the one CCDU flyover video only seconds apart, there are two different riverscape developments shown as if it was the one seamless development. Having three images displayed together as in Figure 1 enables direct comparison and thereby alerts the viewer to their more obvious artificial nature.

When looked at individually and in more detail, it is notable that none is of a day of inclement weather, but otherwise there are few visual clues that might act as reference points for a viewer to assess the representativeness of the view as typical or otherwise. In fact, any information on the degree to which such images represent the average probable daily scene at a particular representative time of day or season is not provided, nor is there an explanation for differences in greenery and other features. An unrealistic luminous glow or halo-like 'shininess' permeates one of the images in which people appear transparent making it obvious that one image is clearly more artistic than the others. However, by contrast this also adds a greater sense of reality to the other images, which are, in fact, just as simulated.

Granted, these images are given the caveat 'artistic impressions only', however this comment cannot undo the impression created on the viewer, which is clouded by the distance of the viewer from the project/design brief. Their perception of the development, based on these images, may significantly influence their decision to engage in any decision-making process. For the audience, the purpose of an image as well as the designers' assumptions

(even subconscious) may remain unknown (Lewis, 2012, p. 562-563).

This example highlights the openness of the landscape in which visualisations operate. Smallman and St. John (2005) describe this developing visualisation 'landscape' as being like the 'wild west'. Other authors (Kidd 1998, Wissen et al., 2008), have suggested different ways to provide structure and confidence in the use and interpretation of visualisations. One of the most cited examples is Forester's (1982) framework for assessing visualisations. This is based around the key concepts of being comprehensive, trustworthy, legitimate and accurate. To be comprehensive, images need to be a clear and reliable representation of the project, while to be trustworthy implies a need to be transparent in the production process. Legitimacy relates to the rationale of the visualisation through disclosing information assumptions, and accuracy is a measure of its realism (which is difficult to define, as described above). These elements together form a broad framework for understanding the effectiveness of visualisations.

3. METHOD

This research used a qualitative approach, interviewing (face-to-face) seven architects and six planners in Christchurch (see Baird, 2014, for further details of the interviewees and the images used). The interviews followed a semi-structured approach with pre-circulated questions to help lead the conversation. The issues identified in the theory, encapsulated in Forester's (1982) framework, shaped the questions for first the architects and then the planners. These questions focused around key ideas, such as the perception, context and intended audience of visualisations and the use and awareness of composition techniques. The architects were interviewed first with the discussion focused on a visualisation they had been involved in creating. These visualisations were static images and, overall, five images were discussed. These images were not discussed in terms of specific consents, but rather in general terms. The planners were interviewed afterwards, discussing their perceptions of the same visualisations. This enabled a comparison

between how architects develop images and how planners interpret them, as well as if the way in which images were prepared affected the planners' assessment of effects. The discussion also examined how architects perceive planners will interpret the images and vice versa. As the sample size is small (a total of 13 interviewees), and is only of Christchurch practitioners, which might reflect a regional 'school' of thinking or approach, no attempt is made at statistical analysis. To maintain anonymity of the respondents, the responses are grouped generally under the title of the representative group: 'Architects' or 'Planners' (see Baird 2014, for a more detailed presentation of individual anonymised responses).

4. RESULTS

Architects interviewed generally considered that visualisations are composed with the clients in mind, not the public, planners or decision-makers. Architects said they believed that planners understand how images are developed and are not influenced by good design. In fact because of this, some, not all, architects said they made consent application images with elements of the original client-oriented images removed or diminished to make them more 'objective'. Architects said they generally composed images using a sunny day, from street view and eye height; though they varied in their approach to context, transport, and landscaping. The individual architect's responses were not consistent on how to prepare visualisations and how important context is; for example, some architects include neighbouring buildings for reference while others exclude them as they consider these would detract from the proposal. Architects described images as being accurate with artistic elements and any manipulation was unintended in 'trying to show the building in the best possible light ... you do massage a bit with some artistic license'.

Images were seen as helpful insofar as framing the debate. Architects agreed that visualisations have become increasingly popular as well as increasingly complex. Interestingly, if a visualisation was specifically

created for a consent, architects would downplay elements and remove additional information to provide more 'objectivity' to assist the decision-making process, or as one architect put it 'we put enough detail in it to get it approved'.

Planners said that the architects' visualisations were developed with their client in mind, but contradictions were evident in the planners' responses. They understood that images contained artistic elements and that accuracy is not as important early on (when they are first encountered in a resource consent process). Planners would follow up any differences between the plan and visualisation and vice versa, to ensure accuracy. This suggests that accuracy was considered important and that planners may have been asking for detail that might have been removed to be brought back in, or new material added.

Planners considered context as the most important element as it helped them understand the environmental effects and provided reference points. Planners were unsure what architects considered important in the image and were less aware of compositional techniques used by architects (e.g. the use of a sunny day and views from eye height), but were aware that 'it is always the nice fancy cars' in the visualisation. When asked, planners agreed that images could potentially influence their and the public's perception, but they considered that the images are beneficial in understanding the application. They also agreed that visualisations are becoming more common and increasingly complex, which can make them confusing, and that more information could help minimise these negative effects.

The planners and architects accepted that images are subjective, but said that they are still beneficial in communicating and initiating dialogue. Their responses indicated that they did not consider subjectivity necessarily meant the images were not credible representations of reality. Context, however, was a key element that differed between the two groups. Furthermore, planners said they do not fully

understand the image-generating technology though accepted that this is probably beyond their role. As one planner said 'I trust the architect to provide technical and professional advice'. So while they understood that visualisations could be manipulated and that they were not cognisant of many of the ways in which this might be achieved, planners continued to accept and use them.

5. DISCUSSION

This research shows that visualisations are at least initially prepared for a client's benefit, and not for assisting planning assessments². This gives rise to a paradox. Planners are not certain of the degree to which they can rely on the images provided. Consequently, it could be argued that the visualisations should be treated as nice additions to resource consent applications, but nonessential. However, without visualisations it would appear difficult for planners to assess visual effects for notification decisions, and the public's and decision-makers' subsequent consideration of the potential effects of the development would also be more difficult. Despite their awareness that visualisations can be manipulated planners agree that images are useful for comprehending a proposal. Consequently, an understanding by planners of the technology and assumptions and an agreed approach to context and composition may be necessary for visualisations to be legitimately and appropriately used by planners.

Lacking such knowledge, it appears that when a specific visualisation is created and included as part of a resource consent application, planners have a healthy level of scepticism that they rely on to hinder any attempt at manipulation. Xie's (2013) fears about the potential manipulability of every aspect of a visualisation is seemingly diminished by the lack of reliance on images that accompany resource consents and the preparedness to seek clarifications. However, as they still lack that technical knowledge of how the visualisations can be manipulated, when seeking clarifications and further

² This represents the difference between what Faludi (1996) refers to as the private domain in

which architects usually operate and the public domain in which planners work.

information planners remain susceptible to subtleties that lie within the images that shape their overall impression of a project. The responses from the interviewed architects indicate that they may be overestimating planners' understanding and ability to see through, what one architect described as, 'the flashy stuff' in visualisations. Lacking this awareness, architects may not make the production process sufficiently transparent.

This research suggests that the potential gains in the use and effectiveness of visualisation may not be through better technology, but better understanding of the means of producing visualisations; that a search for a common framework for projects and their visualisation would be better than the pursuit of more accurate images. Agreeing or stating, for example, the point of view used, a realistic sunlight angle, inclusion of important contextual buildings and appropriate (anticipated) use of people and cars provides the planner with a better understanding of the visual effects and overall impact of the project. An agreed framework might reduce the need for the present iterative approach between architects and planners, improving the efficiency of the process. Care would be needed to ensure that such a framework reduced, rather than reinforced, the element of manipulation present in statements such as including only sufficient detail 'to get it approved'. The NZILA's Best Practice Guideline might form a basis for such an agreed framework, although the extent to which the Guideline's current emphasis on accuracy and realism should be encouraged over more obviously artistic representations should be a matter for careful consideration

While manipulability within the resource consent process may be minimised by the above steps, the question of how images may affect public understanding, being one step removed from the process, still remains. The public interaction and understanding of the visualisation process and how this might influence their engagement in planning processes would be a useful area of potential future research.

6. CONCLUSION

The increasingly sophisticated and complex technology available for visualisations has considerably increased the potential for seemingly accurate and realistic portrayals of present and future realities. To the extent that planners, decision-makers and the public might be influenced by such portrayals, visualisations remain powerful and there is scope for manipulation by those preparing them. At present, planners are caught in the dilemma of recognising that visualisations have utility in their decision-making processes, while being equally aware that the visualisations presented to them may be misleading or insufficient for them to have confidence in their use for assessing visual effects. This results in an iterative, interactive process between planner and architect that influences decisions on public notification, but might also be characterised as inefficient. The extent to which the resultant visualisations may influence decisions by the public and others, if notified, to engage in the planning process is unknown. The differences in depiction of the CCDU (2014) riverscape in Figure 1, for example, probably would be addressed in a resource consent process by the planner. Whether or not these differences are noticed and understood by the general public, and how these might influence the way in which they become involved in the resource consent process, is an open question. This places a considerable burden on planners in making decisions where images have been used to promote projects to the public and created expectations that may not be met in reality.

We suggest that clearly artistic visualisations remain important reminders to an audience to exercise caution in their reliance on the visualisation for understanding the actuality of the effects of a proposal. Architects overestimate the understanding planners have of visualisation techniques and their use. Planners need to become more familiar with the ways in which visualisation techniques are and can be used. At present, planners may be over-reliant on the architect's professional integrity which leaves planners open to misconceptions, deliberately

promoted or accidental. In particular, there is a need for transparency about the assumptions underlying and the decisions made as to what to include and exclude from a visualisation and the compositional techniques employed.

We conclude that a drive for accuracy and realism obfuscates the fact that visualisations are only partial and simplified representations of realities, current and future. This will not be solved through increased technological capability and sophistication in visualisation.

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