Spectacle of the Hyper-Real: Environmental Simulation, Cybernetic Subjects, and Urban Design

ANTHONY RAYNSFORD
San Jose State University

In 2007, under the headline "Digital Mapping Captures Glasgow," the BBC reported the astonishing feat of the City Council's having digitally scanned the entire center of that city, "replicating the façade of buildings to an accuracy of 5 mm." (BBC News) The viewer is then invited see cinematic scenes of this virtual Glasgow, including a slow panning of the Beaux Arts city hall, a dizzying whirl around the tower of the Glagow Science Centre, followed by a seemingly supersonic flight along the River Clyde, reminiscent of a Star Wars battle scene. This virtual city, officially known as the Glasgow Urban Model, needs to be exceedingly accurate, the viewer is told, in order to assess the impact of new development, prepare for disaster plans, etc. However, the model seems to also have a purpose as public spectacle for those who reach its virtual realm from a distance. The BBC quotes Doug Pritchard of the Glasgow School of Art stating that the Glasgow Urban Model will "be used as a marketing tool, to boost tourism."[1] Hyper-realism, in this context becomes not just a means of objective measurements but equally a new aesthetic medium through with the city becomes defined and judged by viewers who are increasingly embedded in a combination of cinematic, architectural and web-based media. While digital technologies have increasingly granted access to virtual urban spaces – whether in the "street views" of Google Maps, reconstructions of ancient cities, or planning projects, such as the Glasgow Urban Model – few have stopped to consider the aesthetic and ideological effects of such virtual representations. Discussion instead tends to focus on the extent of their 'realism' – that is the extent to which they can or cannot adequately replicate the experience of being in or traveling through the cities represented. In fact, the technological history of this kind of environmental simulation has been closely tied to the demand for realism, a demand which itself needs to be interrogated in the context of post-World War II urban design. Like Renaissance perspective before it, contemporary environmental simulation in urban design is an exceedingly codified and artificial visual construction whose success, likewise, lies in its reassurance of a certain scientific precision and point-by-point correspondence. It is also surrounded by surprising degree of historical amnesia.

Using a few key examples, I would like to suggest that current, hyper-realistic simulations, such as the Glasgow Urban Model, have a three-part history, dating back to the 1950s when experiments at MIT first connected cybernetic models of experience to the formal aesthetics of film. At this stage, simulations remained highly diagrammatic, translating dynamic urban sequences into an array of visual media, each of which was meant to capture some aspect of the totality of the visual experience of the city. This phase was followed by an intermediate stage in the 1970s, in which computer technology became embedded within specific techniques of Hollywood special effects in order to simulate a more-or-less total environmental experience, with extraordinary levels of detail and precision. This embedding of special effects technology coincided with a populist suspicion of urban design expertise that had begun in the late 1960s and that demanded ever-wider accessibility and transparency of urbanistic representations. Realism now entailed both close, optical replications of urban experience and a type of cinematic immediacy that would be familiar to, and hence legible for a broad audience of perceiv-

ers. The final stage emerged with the adoption of CAD modeling and animation systems that gradually became spliced into and ultimately supplanted traditional film, without, however, displacing the filmic visual codes and their subjective viewpoints. Where Renaissance perspective projected a static, often universalized viewer, centered within an abstract spatial grid, contemporary digital simulations tended later to project a variable and mobile 'consumer' of urban space, a cybernetic subject of endless feedback rather than a Platonic knower of ideals. The demand for realism, also, became an appetite for the spectacular results of simulation per se. Simulated cities became sites for a new kind of hyper-reality, both in the sense of their intensely detailed duplication of the physical and in terms of their acting as increasingly autonomous substitutes for the real.

In the twentieth century, the call for realism in urban design closely correlated with the rise of scientific or pseudo-scientific city plans that increasingly omitted or occluded the subjective viewpoint of the urban inhabitant. Already in the 1940's, influential architects and planners, especially in Britain and the United States had begun to react against the visual abstractions of city planning, whether in the land-use or density maps of social scientists, or in the linear axonometric renderings and aerial views of architects attempting to suggest 'objectivity.' While the editors of *The Architectural Review* commissioned architects, such as Gordon Cullen and Hugh Casson to produce "realistic" renderings that could be understood by the "man in the street," American planners, including Hans Blumenfeld, Christopher Tunnard and Kevin Lynch had begun to revive the visual theory of what Raymond Unwin had called the "street picture." Sequences of street pictures already constituted a proto-cinematic medium. Of Oxford High Street, Raymond Unwin had written, for example: "the curved road affords to those passing along it an ever changing picture, a new grouping of buildings coming into view at every point."[2] In 1949 Gordon Cullen's "Townscape Casebook," which, comparing the eye with a movie camera, illustrated a sequential panorama of the houses of parliament, showing the continuity of shifting perspectives as seen from an imaginary walk. Used as a loose substitute for the optical impression of an imaginary person on the ground, these perspectival views or street pictures became an important means for contesting mid-twentieth century practices of urban planning and design. The return to the pictorial in urban design also coincided with a revolt against the abstractions of urban representation that stripped away the multiple levels of total environmental experience, substituting mathematical notations for the subjective experience of a more immediate sense of the urban 'real.'

Those who assumed the rhetorical point of view of the observer in the street in the mid-twentieth century intended take a stand against a specialized, scientific planning, whose bureaucratic form and division of labor had failed to account the visual impacts of its frequently uncoordinated actions. Furthermore, they attempted to evoke what might, might, in fact, count as a compelling, sensuous urban experience for such an observer. The editors of the *Architectural Review* began to speak of the importance of "experience" and "immediacy" in their observations of traditional English towns, which they claimed modern architects had overlooked in their excessive concern with the technical aspects of modernity. In observing such physical details as paving stones and rubble walls, the architect could relearn how to experience the urban world as a complex unity: "Let the modern architect … experience afresh the sudden realization of how the values inherent in its textural qualities have re-occurred in walls, buildings, (and) roads, giving them a complexity and a vitality which are completely passed by in the present-day townscape."[3] Illustrating these textural qualities, they showed a series of photographs of narrow streets, variously patterned with combinations of flagstones and cobblestones. Each photograph was meant to index a thoroughgoing quality of experience, a quality thought to be increasingly absent from the contemporary urban scene. In the 1950s this sense of experiential plenitude and immediacy would be systematized and promoted by the Danish architect Steen Eiler Rasmussen, whose 1953 lectures at MIT became the basis for his most famous book, *Experiencing Architecture*. The accompanying perspectival views were only useful to the extent that they were not abstract compositions, that the viewer was projected through the picture plane and oriented to a series of legible relations in space and concrete tactile or kinetic sensations. None of these images or proto-cinematic sequences of street pictures seemed adequate to the cognitive or spatio-temporal experiences of the modern city, however.

CYBERNETIC SUBJECTS

The next step in cinematic realism in urban design would involve a technological realignment between dynamic perceivers and mobile representations. By the late 1940s, the School of Architecture and Planning at MIT had, in fact, become a center for researching the impact of technological changes on the subjective perceptions of the city. In May 1953, the chair of the architecture department, Lawrence B. Anderson, issued a policy statement, entitled "Humane Values in Modern Structure," which framed a set of research themes to be undertaken by various faculty members. The statement focused on what it called the "humane tradition," privileging the experiences and perceptions of the individual human being over the more anonymous aspects of urban functions.[4] The Hungarian émigré artist György Kepes, who joined the School of Architecture and Planning in 1944, had from the beginning been dealing with the question of subjective orientation, framing it as a crisis of the individual amidst an uncontrolled expansion visual scale and complexity in the urban environment. Kepes, saw the chaotic, visually fragmented, modern city partly as a subjective failure to assimilate such phenomena into perception and partly as an artistic failure to coordinate the city visually. A modernist in the Bauhaus tradition of Laszló Moholy-Nagy, Kepes was initially concerned with film and graphic design as tools of environmental communication.

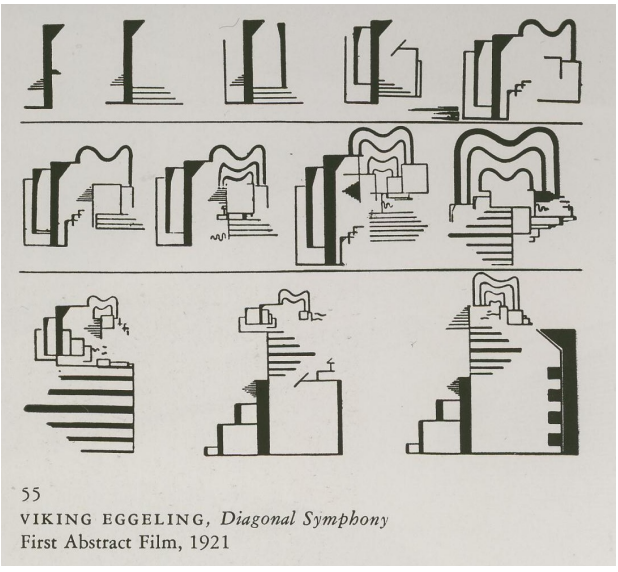

Figure 1. Viking Eggeling, "Diagonal Symhpony," 1921, in György Kepes, *The New Landscape*, 1956.

When Kevin Lynch began to collaborate with Kepes in the early 1950s, one their central experimental projects involved the recording and representation of dynamic urban sequences, using a combination of photographs, Gestalt-inspired sketches, and film, each of which had different kinds of limitations. Film, at first, seemed to hold the promise of abstracting the visual tempo of the modern metropolis, simulating its optical motion while also reducing its optical noise through abstraction. Kepes had long been interested in the experiments of Hans Richter and Viking Eggeling, two artists who had been involved in the Zürich Dada movement around 1920. Using both film and scroll paintings, Richter and Eggeling had attempted to transform the language of abstract art into a sequential syntax, a temporal art form in which earlier images informed responses to subsequent images. (Figure 1.) In an essay that Richter wrote for Kepes' 1965 anthology, *The Nature and Art of Motion*, Richter reflected back on the mnemonic coherence of the scroll paintings. "This particular sensation, capable of being expressed only by the scroll painting, lies in the stimulus in which the remembering eye receives by carrying its attention from one detail to another, indefinitely so that a phase-sequence is built in."[5] In order for the memory sequence to be coherent, there had there had to be a structure of continuity and change, establishing relationships between seen and remembered forms. It was this cognitive and visual chain of successive impressions that began also to suggest an analogy between film and the cybernetic metaphor of urban sequences, now thought of as chains of visual information or data, either coherent or chaotic.

At MIT in the 1950s, the convergence of cybernetics and social science had begun to radically shift previous aesthetic assumptions concerning environmental perception. Modernist models of a universal, collective subject, corresponding with an "organic" model of urban form, began to be replaced by a more dynamic, relativized subject, framed by cybernetic models of "feedback loops" and sociological notions of cultural pluralism. In a manner that foreshadowed contemporary notions of neuroplasticity, perceivers were increasingly understood as situated between the pathways of personal or cultural memories and the constructions of new meanings within an ever-changing cityscape. Rather than architects and planners imposing what they thought would be good for urban inhabitants, they now had to investigate how different people

actually perceived the built environment around them. In their initial grant proposal to the Rockefeller Foundation, dated October 7th, 1953, Lynch and Kepes asserted that, "in a country which has entered the 'age of the consumer,'" the visual qualities of the urban environment would have economic consequences as people increasingly began to choose structures and neighborhoods according to their desired ways of life.[6] Therefore, it was important to understand the perceptions of different potential demographic groups. Part of their proposal, never fully carried out, was to have investigated consumer preferences in the architectural design of residential areas. Nothing could have been further from the ideals Sigfried Giedion's high modernist convictions, which demanded the moral and aesthetic leadership of an artistic inner circle.

For both Lynch and Kepes, one of the main purposes in adapting cybernetic theory to urban design in the 1950s was to address what they and others considered to be the 'visual chaos' of American cities. They attributed this apparent chaos to the rapid pace of technological change that had produced a patchwork of old and novel buildings; decaying urban districts and empty lots; the explosive expansion of the urban periphery; and a new profusion of lights, advertisements, motorized traffic and urban freeways. Cybernetic and cinematic code suggested two complementary solutions to the phenomenon of visual chaos. In cybernetic terms, films could become diagnostic tools for uncovering the patterns or lack of patterns in urban stimuli. In cinematic terms, the dynamic motion of and through cities could be visualized as sensuous analogs of coherent data sequences. Theoretically, the sequential stimuli of the city could be made more orderly and coherent by analyzing and then altering the visual connections between one urban frame and the next, with the frame being analogous to one perceptual moment in a walk or drive through a sequence of urban spaces. By 1955, Kepes was already envisioning a technology of dynamic simulation, using a combination of film recording and animation. By, for example, adding or removing pieces of a city, or subduing the background buildings to "to record only the accented highlights of the moving motor cars or other mobile elements."[7] Not only might film record the dynamic visual effects of the city, but it might also project future effects and isolate visual variables. Urban inhabitants, by this model, were increasingly thought of, not as collective actors within urban space, but as roving individuals having more or less coherent or pleasurable experiences. Individualized, cinematic pleasure in moving through the city, in fact, became a primary goal of urban design in this line of research.

However, the analogy between film as cybernetic code and the optical-mnemonic experiences of the city had itself already proved to be problematic. It turned out that the eye was much less like a movie camera than often supposed. In the "Experimental Seminar in the Visual Form of the City" Lynch had begun in the fall of 1951, participants were asked to record their optical impressions of various existing urban spaces in Boston and Cambridge. As physiological optics had already described it in the 19th century, participants discovered, not a passive sequence of visual impressions but an active shifting of visual attention in response both to movements of the body and to objects that drew attention in the peripheral field. Summarizing one of the discussions, Lynch described both the usefulness and the limitation of the camera analogy: "In most cases the individual receives his impression of the city from small bits, as a sequential series of images, loosely composed. The photograph may often falsify the true impression received by the eye, since the photo has a frame, a static quality, and lacks the small-area focus."[8] When walking through the city, visual attention seemed to be pulled in many different directions rather than along a linear path. Lynch noted the "chaos of detail in the city and the constant exercise of selectivity by the individual."[9] Unlike the movie camera, the eye did not construct a sequence of continuous frames but shifted from one detail to the next as static or ephemeral shapes entered the peripheral field of view. It was precisely this shifting, unstable quality of visual perception in the modern city that early 20th century avant-garde artists had sought to capture through techniques, such as pictorial fragmentation and photomontage. Lynch and Kepes, however, were equally determined to heal such fragmentations and disconnections. They were also dealing with a new set of visual issues, specifically related to the post-war building boom, the beginnings of urban renewal, and the increasing dominance of the automobile.

CINEMATIC SIMULATIONS

In this context, and despite the obstacles, both Lynch and Kepes continued to pursue a cinematic representation of the city that would be adequate to subjective urban experience. However, while Kepes

attempted to control the informational chaos by abstracting and selecting only certain kind of visual 'data,' Lynch turned towards those urban experiences that were as close as possible already to the cinematic. The optical experiences of pedestrians turned out to be the least like the continuous shots of movie cameras, while the experience of automobile travel, particularly for the front passenger who could actually enjoy the scene, seemed to be the closest approximation. In the early 1960s, Lynch collaborated with his former student now colleague at MIT, Donald Applyard to conduct a series of driving experiments, published in 1964 as *The View from the Road*. Here, the passenger tended to mainly face forward in a passive, seated manner while being presented with a linear sequence of views of urban and landscape forms as they approached frontally and then passed to either side in the peripheral vision. This type of commonsense analogy between automobile travel and cinematic sequence, then allowed Lynch and Appleyard to make prescriptive statements for what might constitute good or bad urban design on the basis of a sequential grammar of visible forms.

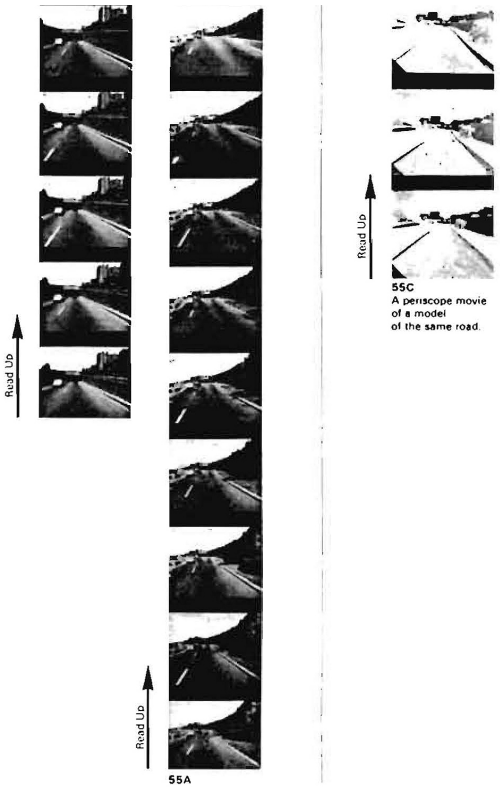

Figure 2. Filmed road compared with periscopic model sequence, from Appleyard, Lynch and Myer, *The View from the Road*, 1964.

The details of this analogy, however, proved considerably more problematic. To address what they called the "sense of reality" from a subjective point of view, they began to experiment with various artificial means of simulating reality through cinematic techniques, including fixing the camera to a moving car and attaching a camera to a mobile periscope moving through a scale model. (Figure 2.) They also became concerned by line between the artifice of film-making techniques and what they supposed might be some 'neutral' simulator of the driving experience. While the fixed camera was clearly not realistic, in so far as it produced a flattened but also tunnel-like effect with no peripheral vision, manipulating the motion of the camera to simulate visual scanning seemed to introduce a new level of aesthetic judgment and filtering: "These techniques require a skilled operator, and must perforce select the visual elements and interrelations to be shown. The result is a work of art (whether good or bad), which has already interpreted the scene."[10] This obsession with a hypothetically neutral version of cinematic realism had two main causes. First, and most obviously, they wanted these simulations to be able to project some version of truth in relation to the future impact of urban design on everyday observers rather than a seductive but misleading representation of that impact. Second, they did not assume that everyone saw the urban environment in the same way. Architects and planners, who had been taught to see in certain ways might interpret the environment entirely differently from other groups or individuals. Thus, the realism had to be visually accessible to a general audience but also sufficiently close to the experiential equivalent that testing the films on groups would be equivalent to testing their reactions to the city itself. This concept was fully in line with earlier calls for realism to overcome the alienating abstractions of experts and professionals. However, it did not address the degree to which popular understandings of the 'real' were already coded by film.

The satisfactory simulation of urban sequences would, in fact, require a much greater level of artifice and technological sophistication than either Lynch or Appleyard had imagined in 1964, and it would emerge at the creative overlap between Silicon Valley and Hollywood that emerged in the early 1970s. In 1973, Donald Appleyard, now at U.C. Berkeley and psychologist, Kenneth Craik, announced their joint development of an assessment apparatus for urban design, the Environmental

Simulation Laboratory (ESL). Constructing this device involved bringing in John Dykstra, an industrial designer who had become known in Hollywood for his highly realistic special effects, using small, mobile cameras and scale models to replicate the visual experiences of floating or driving through full-scale environments. Dykstra would go on to work for George Lucas and is perhaps best known today for the mesmerizing battle scenes in Star Wars. At Berkeley, however, he was commissioned to make a simulation so realistic that viewers would hardly be able to distinguish it from a drive through the same environment on which it was modeled.

Figure 3. Still from 16mm film footage, ESL, late 1970s, simulation of suburban Marin County.

Filling an enormous room the ESL consisted of a physical scale model of extraordinary miniaturization and detail, replicating everything from the shapes and colors of individual tree specimens to the lettering on store signage and the texture of gravel, all carefully lit in simulation of sky and sunlight. Everything that would have been abstracted in typical architectural model was here rendered as carefully as a Victorian miniature room because nothing could be discounted in terms of its potential visual impact. An operator then manually guided a tiny camera above the simulated roads along a specified path. The path would then be recalculated and smoothed out by a computer controller that would then approximate the mechanical smoothness of automobile driving. (Figure 3.) New camera shots were introduced, after viewers reported feeling disoriented or dizzy, to simulate turning one's head to anticipate a turn in the road, a realistic artifice that was subsequently recycled back into Hollywood. Unlike earlier spectacles, such as Norman Bel Geddes' Futurama, the ESL did not presuppose any kind of mass audience who might be persuaded by bird's eye views of an ideal automobile-centered future. Rather, spectators were presumed to be subjectively pluralistic and politically divided. They were brought down into the scenes, immersed in them as individual subjects, in order to discover their social perceptions as 'consumers' of urban space. In fact the official description of the ESL mirrored the psychology of the commercial focus group: "The investigators will examine how travelers describe the environment they notice in it, what they recall of it, how they feel about it, how they evaluate elements in it, and how they mentally organize its subareas and features."[11] Also unlike the Futurama, the ESL did not have its own explicit urban design agenda. Rather, it re-presented the representations of various architects and planners, in a new medium which, because of its similarity to popular film and television, was supposed appear almost unmediated to a general audience. Viewers were supposed to experience the models as though they were completed buildings in the existing cityscape. In this way, the ESL was meant to be a perceptual bridge between architects or planners and various projected 'users' of the buildings or spaces.[12]

HYPER-REALISM AND SPECTACLE

In practice, however, environmental simulation has had a much more ambiguous function within urban design, particularly as its cinematic codes have become more and more intertwined with digital media and digital dissemination. In 1985, Peter Bosselmann, one of Appleyard's original collaborators in the ESL project was commissioned by a citizen's group in New York, which opposed high rise development, to objectively assess the visual impact of skyscrapers on Manhattan's Upper West Side. The group then spliced spectacular images from the ESL into a highly polemical and alarmist film, narrated by Paul Newman and entitled "No More Tall Stories." Far from producing the ground of neutral assessment, the hyper-realism of the footage, sutured into the sensationalistic narrative, had a powerful propagandistic effect. Although this kind of manipulation was later prevented by new legal language that specifically protected footage from the Berkeley Lab as intellectual property, the techniques had by then become widely available to those with the means to pay for equipment and technicians, and the technology itself had become increasingly digitized and in-

dependent of bulky, physical models. Moreover, the hyper-realism of the cinematic method lent itself perfectly to a kind of seamless blending into various forms of popular media, ranging from Hollywood spectacles to interactive learning tools.

The replacement of physical models and film by digitally scanned environments and digital renderings have further widened the scope for hyper-realistic spectacle, whether in the form of animated films that are choreographed in order to produce particular effects of motion, or interactive spaces controlled, in the manner of games, through a set of rules by which users move through the space. Although potentially neutral banks of visual and spatial information, the models, in practice, need to be organized in particular ways in order to simulate the effects of the real and reach a general audience, where they can be consumed as digital, cinematic media. It is here that urban design most fully joins with the logic of *Jurassic Park*. The pleasure in watching *Jurassic Park* derives, not from being fooled that the dinosaurs are somehow real, but rather in the spectacle of their hyper-real artificiality, a simulation enjoyed for its own sake. The same might be said of the increasing proliferation of hyper-real, digital urban models. Such models have, in fact, become independent objects of fascination because of their elaborate artifice and the types of aesthetic experience they offer. It still remains to be seen how these simulated cities will filter our perceptual responses to the physical cities that we still inhabit.

ENDNOTES

1 "Digital Mapping Captures Glasgow," BBC News, Monday, 14 May 2007, http://news.bbc.co.uk/2/hi/uk_news/scotland/glasgow_and_west/6651775.stm

2 Unwin, Raymond, *Town Planning in Practice* (London: Ernest Benn, 1932 [1909]), 260

3 "Texture and Colour," *The Architectural Review* 107 (January 1950): 45

4 Anderson, Lawrence B., memorandum dated May 13, 1953, "Humane Values in Modern Structure," Kevin Lynch Papers, MC-208, Box 3, Boston Image, folder 3, p. 1

5 Richter, Hans, "My Experience with Movement in Painting and in Film," in György Kepes ed., *The Nature and Art of Motion* (New York: George Braziller, New York, 1965, p. 146

6 MIT Center for Urban and Research Studies, The Three-Dimensional Urban Environment, Draft Research Proposal, October 7, 1953, Rockefeller Foundation Archive, Box 375, folder 3330

7 Kepes, György, notes dated 3/22/55 Kevin Lynch Papers, MC-208, Box 3, Boston Image, p. 5

8 Lynch, Kevin, "Brief Summary of Sessions – Experimental Seminar in the Visual Form of the City," (Cambridge: Kevin Lynch Papers, MC-208) Box 3, Boston Image

9 Lynch, Kevin, "Brief Summary of Sessions – Experimental Seminar in the Visual Form of the City," (Cambridge: Kevin Lynch Papers, MC-208) Box 3, Boston Image

10 Kevin Lynch and Donald Appleyard, *The View from the Road* (Cambridge: MIT Press, 1964) 20

11 Appleyard, Craik, et al, *The Berkeley Environmental Simulation Laboratory: Its Use in Environmental Impact Assessment*, Working Paper No. 206 (Berkeley: College of Environmental Design, February 1973) 2

12 Peter Bosselmann, *Representation of Places, Reality and Realism in City Design* (Berkeley: University of California Press, 1995) 200-201