



Government
Office for Science

 Foresight

A visual history of the future

Future of cities: working paper

Foresight, Government Office for Science

A visual history of the future

Professor Nick Dunn

Lancaster University

Dr Paul Cureton

University of Hertfordshire

Serena Pollastri

Lancaster University

September 2014

This review has been commissioned as part of the UK Government's Foresight Future of Cities Project. The views expressed do not represent policy of any government or organisation.

The authors have made every effort in the identification of copyright holders and have sought permissions throughout this report. Any copyright wrongly attributed or reproduced without permission can be addressed through contact with the report authors and liabilities will be settled. Due diligence reports have been attained for all reproductions in the proper attribution of original sources.

Contents

Foreword	4
Executive summary	5
List of figures	6
Introduction	13
1. Cities of vision	16
1.1 Summary	17
2. Representation of cities	29
2.1 Summary	31
3. Context of cities	49
3.1 Summary	50
4. Technologies of cities	63
4.1 Summary	64
5. Socialities of cities	76
5.1 Summary	77
6. Digital cities	91
6.1 Summary	92
7. UK characteristics	107
7.1 Summary	108
8. Conclusions	124
Glossary	131
References	133

Foreword

The Future of Cities project is informed by working papers that are commissioned by the [Lead Expert Group](#) and written by authors from academia and industry.

These papers highlight the key challenges and opportunities facing cities in the UK out to 2065. The Expert Group will draw upon this evidence base to develop project outputs that will be published in 2014 and 2015.

These outputs will aim to inform near-term policy making in both local and central government, which achieves desirable long-term outcomes for UK cities.

Professor Sir Alan Wilson

Executive summary

This paper is concerned with how future cities have been visualised, what these projections sought to communicate and why.

The paper is organised into eight sections. Each of the first seven sections is highly illustrated by relevant visualisations to capture the main ways in which the thematic content is evident within future cities. We present a brief summary at the end of each section to understand the key issues.

- First, we describe the relevance and power of imagined cities and urban visions throughout popular culture, a multi-disciplinary discourse, along with an explanation of the methods used.
- Second, we examine the role of different media and its influence upon the way in which ideas are communicated and also translated, including, but not limited to: diagrams, drawings, films, graphic novels, literature, paintings, and photomontages.
- Third, we interrogate the ‘groundedness’ of visualisations of future cities and whether they relate to a specific context or a more general set of conditions.
- Fourth, we identify the role of technological speculation in future city scenarios including: infrastructure, mobility, sustainability, built form, density and scale.
- Fifth, we examine the variations in socio-spatial relationships that occur across different visualisations of cities, identifying the lived experience and inhabitation of the projected environments.
- Sixth, we consider the relationship of data, ubiquitous computing and digital technologies in contemporary visualisations of cities.
- Seventh, we establish the overarching themes that appear derived from visualisations of British cities and their legacy.

In conclusion, we establish a synthesis of the prevalent patterns within and across legacies, and the diversity of visualisations, to draw together our findings in relation to overarching narratives and themes for how urban life has been envisaged and projected for the period under scrutiny.

Figure list

Figure 1: Ebenezer Howard, 'Ward and centre garden city diagram', 1902, Extract from Garden cities of to-morrow (London, 1902), 2nd ed., diagram 3 after p. 22. RIBA Library Photographs Collection.

Figure 2: Geoffrey Jellicoe, Motopia, A Study in the Evolution of Urban Landscape, 1961. Illustrated in 1960 by Arthur Radebaugh for 'Closer Than We Think'. © Tribune Content Agency, LLC. All Rights Reserved. Reprinted with permission.

Figure 3: Colin Buchanan, Illustration from Traffic in Towns, Ministry of Transport, 1963. © Department for Transport 2014.

Figure 4: Peter Cook (Archigram), Plug-in City, Overhead View, (Axonometric) 1964. Image supplied by the Archigram Archives © 2014.

Figure 5: Hans Hollein (b. 1934): Aircraft Carrier City in Landscape. Project. Perspective 1964. Unbuilt. New York, Museum of Modern Art (MoMA). Cut-and-pasted reproduction on four-part photograph mounted on board, 8 1/2 x 39 3/8' (21.6 x 100 cm). Philip Johnson Fund.

Figure 6: Jean-Paul Jungmann, DYODON flottant. Dyodon-Habitation pneumatique expérimentale Dyodon et constructions pneumatiques : annexes, 1967. Photo © Centre Pompidou, MNAM-CCI, Dist. RMN-Grand Palais / Jean-Claude Planchet.

Figure 7: Constant Nieuwenhuys, 'Symbolische voorstelling van New Babylon' (Symbolic Representation of New Babylon), Collage, 1969. © Gemeentemuseum Den Haag.

Figure 8: Albert Speer, 'Planning for the "World Capital Germania" -. Views from the planned South Station on the Arc de Triomphe to the Great Hall (north-south axis), Berlin, 1939, © Bundesarchiv, Bild 146III-373 - Sammlung von Repro-Negativen, Photo from the estate of Albert Speer.

Figure 9: Tomas Saraceno, Cloud Cities, 2011. Sketch Installation view, "Cloud Cities", Hamburger Bahnhof – Museum für Gegenwart, Berlin 2011. Photography by Studio Tomás Saraceno. Courtesy the artist and Tanya Bonakdar Gallery, New York, NY, USA, Andersen's Contemporary, Copenhagen, Denmark, and Pinksummer Contemporary Art, Genoa, Italy. © Sketch by Studio Tomas Saraceno, 2011.

Figure 10: Studio Linfors (Clouds Architecture Office), Cloud Skippers, 2009. © Studio Lindfors.

Figure 11: OMA, Eneropa, EuroGrid, Extract from Roadmap 2050: A practical guide to a prosperous, low-carbon Europe, 2010. © Image courtesy of the Office for Metropolitan Architecture (OMA).

Figure 12: World Game Institute, Buckminster Fuller (Centre), Medard Gabel (Right), Dymaxion Map for the World Game, ca. 1983-5'. © World Game Institute 1972-1993.

Figure 13: Hugh Ferriss, Chicago Tribune Tower, Howells & Hood, architects, 1925. Illustration in 'The Metropolis of Tomorrow', 1929. © Avery Architectural and Fine Arts Library, Columbia University.

Figure 14: Raymond M. Hood, Century of Progress International Exposition, 1932-1933. Ryerson & Burnham Archives, Bennett, Edward H., Collection. © Photography Brown Brothers.

Figure 15: Francisco Mujica, 100-Story City in the 'Neo-American Style', Plate CXXIV f, 1929. New York: Archaeology & Architecture Press, 1930.

Figure 16: Eugène Hénard, The Cities of The Future, published in American City, January 1911.

Figure 17: Le Corbusier, Radiant City (Ville Radieuse), 1924. © Foundation Le Corbusier & DACS.

Figure 18: Paul Rudolph, (1918-1997): Lower Manhattan Expressway, project. New York City. Perspective to the east, 1972. New York, Museum of Modern Art (MoMA). Ink and graphite on paper, 40 x 33 1/2' (101.6 x 85.1 cm). Gift of The Howard Gilman Foundation.

Figure 19: Rem Koolhaas, Asian City of Tomorrow, SMLXL, 1995, © Image courtesy of the Office for Metropolitan Architecture (OMA).

Figure 20: Pushwagner, Extract from Soft City graphic novel, 1969 - 1975, pen and ink on paper. © Pushwagner 2014.

Figure 21: Ridley Scott, Blade Runner, 1982. © Warner Bros 2014.

Figure 22: 'Viewing the World of Tomorrow model' by Bel Geddes, Futurama, New York World's Fair, 1939. © Courtesy of the Harry Ransom Center.

Figure 23: Heinz Schulz-Neudamm, (1898-1969): Metropolis, 1926. New York, Museum of Modern Art (MoMA). Lithograph, printed in colour, 83 X 36 1/2' (210.8 x 92.7 cm.). Gift of Universum Film.

Figure 24: Otomo, Katsuhiro, Akira – Destruction of Neo-Tokyo, 1982-1990, Akira vol.3 © Kodansha Publishing.

Figure 25: Oscar Newman, Nuke Proof Manhattan, Esquire Magazine, December 1969. © Courtesy of Kopper Newman.

Figure 26: Kenneth Garland, David Jefferis, Future Cities, Usborne Books, 1979. Reproduced from Future Cities by permission of Usborne Publishing, 83-85 Saffron Hill, London EC1N 8RT, UK. www.usborne.com. Copyright © 1979 Usborne Publishing Ltd.

Figure 27: ONYX, 'Parasec City', Signature Michaël B. Hinge, 1968-1970, Sérigraphie sur papier, 73.5 x 58.5 cm, Photographie : François Lauginie, Collection FRAC Centre, Orléans.

Figure 28: Gordon Cullen, 'Designs for a pedestrian precinct incorporating Old Palace Yard and Parliament Square, Westminster, London', 1941, RIBA Library Drawings Collection.

Figure 29: Kevin Lynch, Extract from *The Perceptual Form of the City*, Boston, Massachusetts, 1954-1959. Image courtesy of the MIT Archives. © Copyright 2014.

Figure 30: Lawrence Halprin, Fort Worth City Walk Map and 'Specific tasks at each location' (AAUP; published in *Taking Part: A Workshop Approach to Collective Creativity*, 1974, pp. 78–79). © The Architectural Archives University of Pennsylvania.

Figure 31: Piero Ventura, *Book of Cities*, 1st ed. Courtesy of Rizzoli Publishing, 1975.

Figure 32: Newton Fallis, *Autopia Ampere*, 1978, Graphite on Paper, 92*145cm. Image courtesy of Newton Fallis.

Figure 33: Kenzo Tange, Plan for Tokyo Bay, 1960. Tange Associates. © Photograph Akio Kawasumi.

Figure 34: Iannis Xenakis, *Cosmic City* (aerial perspective), 1963, ink on paper, 8 3/4 x 11 3/4 inches, Courtesy Iannis Xenakis Archives, Bibliothèque nationale de France, Paris.

Figure 35: Successive Works departments, and the Ancient Monuments Boards and Inspectorate, Festival of Britain aerial view, 1951. © National Archives.

Figure 36: Wenzel Hablik, *Der Bau der Luftkolonie* (Structure of a Colony Floating in the Air), 1908, Pencil, 22.5 x 18.1 cm. © Wenzel-Hablik-Foundation, Itzehoe.

Figure 37: SITE (Sculpture in the Environment, American, founded 1970) and James Wines, (1932-): *Highrise of Homes*, project, Exterior Perspective, 1981. New York, Museum of Modern Art (MoMA). Ink and charcoal on paper. 22 X 24 (55.9 X 61cm).

Figure 38: Shimizu Corporation, *Green Float*, 2004. © Image Courtesy of Shimizu Corporation, 2014.

Figure 39: Alfonso Cuarón, *Children of Men*, 2006, Courtesy of Universal Pictures. © All Rights Reserved 2014.

Figure 40: Buckminster Fuller, *Dome over Manhattan*, 1960. Courtesy, The Estate of R. Buckminster Fuller.

Figure 41: David George Emmerich, 'Agglomération (sous une coupole stéréométrique)', 1958-1960, Encre sur papier, 75 x 105.5 cm, Photographie: François Lauginie, Collection FRAC Centre, Orléans.

Figure 42: Claire Rickert, Drop City, Photograph, 1965. Courtesy, Claire Rickert.

Figure 43: City of Manchester Heliport near Victoria Station, R. Nicholas, City Surveyor. Drawn by Sidney R. Fisher, 1956. © Manchester Archives.

Figure 44: Paolo Soleri, Babel IIB, Arcology: City in the Image of Man (MIT Press, 1969). © Cosanti Foundation.

Figure 45: Jean-Louis Chanéac, 'Architecture mégalithique', circa 1964-74, Encre, crayon graphite et crayon de couleur sur papier, 21 x 27 cm, Collection FRAC Centre, Orléans, Donation Nelly Chanéac.

Figure 46: Andrea Branzi (b. 1938): Residential Park, No-Stop City, project plan, 1969. New York, Museum of Modern Art (MoMA). Ink, cut and pasted self-adhesive polymer sheet, 39 1/4 X 27 3/8 (99.7 X 69.5cm). Gift of the Howard Gillman Foundation.

Figure 47: Jack Lynn and Ivor Smith, Hawkins Brown, Studio Egret West, J. L. Womersley, Park Hill Estate, Sheffield, 'The children's play area at the south end of the site', 1961, Architectural Press Archive / RIBA Library Photographs Collection.

Figure 48: Terry Gilliam, Brazil, 1985, Embassy International Pictures.

Figure 49: Terreform 1, Urbanneering Red Hook Brooklyn and Governors Island, 2010. Courtesy, Terreform 1.

Figure 50: Walter Jonas, Intrapolis, 1958, © Stiftung Walter und Rosa Maria Jonas.

Figure 51: Mila & Jakob Tigges, The Berg, Berlin, 2009. Courtesy, Mila / Jakob Tigges.

Figure 52: Arthur Quarmby, 'Corn on the Cob', 1962, Tirage sur papier, 42 x 71 cm, Photographie: François Lauginie, Collection FRAC Centre, Orléans.

Figure 53: Massimo Scolari, The Pilot of the Labyrinth, 1978, watercolor on cardboard, 18 x 13 cm (ca. 7 x 5 in). Courtesy, Massimo Scolari.

Figure 54: Friedman, Yona (b. 1923): Spatial City, project, Aerial perspective, 1958. New York, Museum of Modern Art (MoMA). Ink on tracing paper, 8 3/8 x 10 3/4' (21.3 x 27.3cm). Gift of the Howard Gillman Foundation.

Figure 55: A Clockwork Orange, directed by Stanley Kubrick, © Warner Bros.

Figure 56: Walter Christaller, Settlement patterns in Eastern Europe, 1941. © Die Zentralen Orte in den Ostgebieten und ihre Kultur- und Marktbereiche. Struktur und Gestaltung der Zentralen Orte des Deutschen Ostens, Teil 1. Leipzig: K. F. Koehler Verlag.

Figure 57: Haus-Rucker-Co (Austria, established 1967-1992): Palmtree Island (Oasis) Project, New York, New York. Perspective, 1971. New York, Museum of Modern Art (MoMA). Cut-and-pasted printed paper with gouache and graphite and cut-and-pasted

painted paper on silver gelatin photograph on board, 19 3/4 x 29 5/8" (50.2 x 75.2 cm).
Wendy Evans Joseph Purchase Fund.

Figure 58: Still from District 9, Directed by Neill Blomkamp, 2009. © Wingnut Films Productions Limited.

Figure 59: Moisei Ginzburg and Gustav Gassenpflug VI Nemirovich-Danchenko Theater, Competition project, unexecuted, Moscow, 1933. © Schusev State Museum of Architecture, Russia.

Figure 60: Günther Domenig & Eilfried Huth, 'Überbauung Ragnitz', 1969-2001, maquette, Plastique, plexiglas, peinture, 110 x 180 x 105 cm, Photographie: Philippe Magnon, Collection FRAC Centre, Orléans.

Figure 61: Nigel Coates, 'Gamma Tokyo', 1985, Crayon graphite, collage, photomontage et pastel sur calque contrecollé sur papier, 42 x 59.4 cm, Photographie: François Lauginie, Collection FRAC Centre, Orléans.

Figure 62: Atelier Bow-Wow, Made in Tokyo Guidebook, 2001. © Atelier Bow-Wow.

Figure 63: Andrew Mahaddie, 'Cowcommon Canyon', Bletchley Brick Pits, Milton Keynes, 1973. © Homes & Communities Agency, photograph by John Donat, artwork by Andrew Mahaddie, image courtesy of Milton Keynes City Discovery Centre.

Figure 64: Balmori Associates + HAEAHN Architecture + H Associates, Public Administrative Town Master Plan, Sejong, Korea. Courtesy of Balmori Associates. © Photography Efrain Mendez.

Figure 65: Foster + Partners, Masdar Development, Abu Dhabi, United Arab Emirates, 2007 onwards. Courtesy of Foster + Partners.

Figure 66: Nicolas Schöffer and Claude Parent, Tour Lumière Cybernétique, 1973. Edition : Paris, France, Denoël/Gonthier, p.152.

Figure 67: Will Wright, Don Hopkins, SimCity, Micropolis, 1985, Maxis. © (1989 - 2007 Electronic Arts Inc (Open Source).

Figure 68: Minecraft, Markus 'Notch' Persson, 2009.

Figure 69: Marcos Novak, Mutable Algorithmic Landscapes, 2000. © Marcos Novak.

Figure 70: Zaha Hadid Architects, One North Masterplan, Singapore, 2001-2021. Courtesy of Zaha Hadid Architects.

Figure 71: Simon Elvins, Silent Birmingham, 2011, laser etched 270gsm paper. © Simon Elvins.

Figure 72: Environment Agency, Geomatics Group, Olympic Park, Point Cloud Data, October 2013. © Environment Agency copyright 2014. All rights reserved.

Figure 73: Bild Architecture, Saturation City, Melbourne, 2010. MGS, Material Thinking, Bild Architecture and Dyskors. Image production: Flood Slicer. © Bild Architecture.

Figure 74: CRAB Studio (Peter Cook, Gavin Robotham, Lorene Faure), Soak City, East London, 2004.

Figure 75: Plasmastudio & Groundlab, Flowering Gardens, Longgang City, Shenzhen, China 2011. © Plasmastudio & Groundlab.

Figure 76: Clouds, Architecture Office, Aqualta, New York, NY / Tokyo, Japan, 2009. © Clouds Architecture.

Figure 77: Anthony Lau, Floating City 2030: Thames Estuary Aquatic Urbanism, Bartlett School of Architecture, 2008.

Figure 78: Matsys: Andrew Kudless (Design), Nenad Katic (Visualization), Tan Nguyen, Pia-Jacqlyn Malinis, Jafe Meltesen-Lee, Benjamin Barragan (Model), Sietch, Nevada, 2009.

Figure 79: R&Sie(n): François Roche, Stéphanie Lavaux, Jean Navarro & Benoît Durandin, I've Heard About It, 2005.

Figure 80: Louis de Soissons, illustrated by Francis Nugent Cachemaille-Day, 'Welwyn Garden City, Hertfordshire: town plan indicating zones, road and rail communications, buildings and open spaces', 1920, RIBA Library Drawings Collection.

Figure 81: MARS Group, 'Master plan for London based on research carried out by the Town Planning Committee of the MARS Group: draft plan giving a rough impression of what the map of London would look like with ribbons of open country penetrating the city', 1942, Photomechanical Print, RIBA Library Photographs Collection.

Figure 82: Patrick Abercrombie, Forshaw's London Community map, Social Analysis, 1943.

Figure 83: Alison and Peter Smithson, Collage for Golden Lane, 1952. Photo © Centre Pompidou, MNAM-CCI, Dist. RMN-Grand Palais / Philippe Migeat.

Figure 84: Donald & Sylvia Reay, Plan for Stevenage Centre, 1951-55. University of California Regents, held by the Environmental Design Archives.

Figure 85: Bill Berrett, North Bucks New City, 'Pooleyville', View approaching the City Centre from transit, 1962. © Centre for Buckingham Studies.

Figure 86: Helmut Jacoby, MK in 1990, Aerial Perspective, Graphite, Milton Keynes Main Centre, 1974-1990, 1974. Courtesy of Derek Walker.

Figure 87: Mike Evans, Cumbernauld Town Centre, 1963, © Courtesy of RCAHMS (Royal Incorporation of Architects in Scotland). Licensor www.rcahms.gov.uk.

Figure 88: Cedric Price, 'Potteries Thinkbelt, North Staffordshire, England: View from a railbus, Longton Faculty Area' in Architectural Design Volume XXXVI, October 1966, cover page London: Standard Catalogue Co. [1966] W.A755. Collection Centre Canadien d'Architecture/ Canadian Centre for Architecture, Montréal.

Figure 89: Leon Krier, Aerial of Poundbury, Choice or Fate? 1998. Courtesy of Leon Krier.

Figure 90: Skarne Construction System, Whitfield, Dundee, Angus, Scotland, 1989. © RCAHMS (Aerial Photography Collection). Licensor www.rcahms.gov.uk.

Figure 91: Chora, Thames Gateway, Thames Gateway Map, 380mm x 1400mm, 2004-2008. Courtesy of Chora.

Figure 92: DSRNY, Granite Web: Aberdeen City, 2012. © DSRNY.

Figure 93: Kathryn Moore, HS2: A Landscape Vision for Birmingham, Hand Coloured Drawings, Layout Paper, 2012, 841 x 594mm. Courtesy of Kathryn Moore.

Figure 94: URBED, Uxcester Masterplan, Wolfson Economics Prize, 2014.

Figure 95: Taxonomy for visualisation of future cities, 2014.

Figure 96: Dominant Visual Paradigms of Future Cities, 2014

Introduction

This paper is concerned with how future cities have been visualised, what they sought to communicate and why. The aim is to identify and understand the dominant paradigms that have been portrayed in these visualisations.

The paper is an evidence based analysis of visual futures. The timeframe that this paper examines is a period spanning just over the last one hundred years i.e. from the start of the twentieth century to the early twenty-first century. The images contained within this paper all tell a story. More specifically, whilst they all have relevance to the context of urban representation or future scenarios, they are also culturally and socially important as they are reflecting points of time historically, thus reflecting cultural attitudes. In addition, the visual content of the paper facilitates connections with ideas or theories of architecture and urban design to be drawn out thematically and with respect to time.

This is important since such analysis can lead to a more future-orientated summary. By giving insight on which typologies have had the most influence on UK cities, it is possible to provide an evidence-based, future-orientated discussion on the possible legacy of the latest visualisations so we may understand where we are headed.

This introductory section sets out the purpose of the report and the methodology developed to examine the materials under review. Cities have long been the subject of imaginative projections and aspirations for better futures (Hall, 1988). Often described as the nexus for economy, enlightenment, democracy and freedom, cities have been inscribed with a transformative power for individuals, communities and society. Indeed, these very positive aspects have also been contrasted through visions wherein cities are portrayed as hellish places full of fear, despair and imminent or post-apocalyptic situations.

We therefore begin by briefly considering what a 'city of vision' is. There have been attempts by a significant number and diverse range of artists, architects, and visual designers from various fields, to imagine cities differently (Fishman, 1982; Bingham, 2013). Inherent to the majority of the visualisations surveyed is an endeavour to illustrate a change, i.e. a vision, to the contemporary spaces and lifestyles, distinct from the period of their production. The extent of this shift is evident along a spectrum of potentialities: from radical transformation of the present day to subtler and more nuanced versions of prevalent city conditions.

One of the key aspects of visualisations of futurity is their duality; they are both allusive and elusive. They typically seek to suggest how people may live, work, and move whilst never being able to be fully translated into built conditions. Even in those projects where the design was subsequently constructed in reality the subtleties and joie de vivre are lost.

A primary obstacle when conducting a survey of the existing and increasing body of material is the large number of different visualisations across a range of media. Therefore, a key task from the outset was to identify suitable categories of future cities

to establish taxonomy, albeit flexible rather than absolute, of different types. This naturally led to discussions as to what material should be included. In addition, it was important that comparative understanding could be evidenced throughout the paper by effective graphical means (Work AC, 2009). Mainstream visualisations of future cities are those known to have had considerable impact on the architecture, planning and construction of cities.

However, as well as these, careful consideration has also been given to avant-garde works that may be more marginal but no less influential (Pinder, 2005). Although many of these visualisations were never built and remained imaginary or the backdrop for a fictional narrative, this does not mean they are unworthy of attention (Jameson, 2007; Bassett et al., 2013). Their significance extends in other ways through their questioning of reality, reshaping our spatial conceptions or providing expressions of alternatives.

The power of visualisations of future cities and their ability to capture and remain in our imagination through mainstream media cannot be overestimated (Alison et al., 2007; Goodman, 2008). The echoes of such images and their ideas continue to resonate throughout history. Visualisations of future cities contribute to our social imaginary, i.e. 'the creative and symbolic dimension of the social world, the dimension through which human beings create their ways of living together and their ways of representing their collective life' (Thompson, 1984: p.6). In addition, reexamining the projections made for the future from a historical perspective can provide new insights and greater understanding of the developments and patterns that shape the present and, in turn, their implications for our future (Barbrook, 2007).

The visualisations of future cities collated in this paper were all driven by a strong impulse to transform our relationship with urban space (Mansfield, 1990; Eaton, 2002). They challenged the prevailing conditions and problems of cities of the time and sought to produce spaces conducive to different ways of living. By identifying the key factors of future city visualisations that have proved most significant and influential, it is proposed that this analysis will also establish which elements have retained a pervasive presence across different media and over time. It is therefore intended that the visions addressed in this paper will provide an important resource for catalysing and rethinking the potential of perspectives on future cities more widely.

Key to understanding the content of this paper is an emphasis on the power and agency of the images themselves (Gell, 1998; Corner, 1999; Ingold, 2007). In the projected image ideas, hopes and critique are loaded within it (Cook, 2008). The image has an agency; it carries and projects these embedded thoughts. The agency of the image sometimes has urgency reacting from present conditions.

Futurological city images are sometimes bound up from the experience of the city, or part of a wider process in which the image reduces other sensory fields, sounds, narratives, materiality and time based approaches. The images may belong to a wider chain of reaction, as part of an extended design response, social or cultural force.

Some of the image selections within this paper have been extracted from these larger documents to establish the taxonomy. An important point to realise is that these city images were not intended as passive creations, but are inextricably bound to

conceptual city thought. The images project but they also reflect, they represent wider perceptions, they feedback and also function as critical devices for the evaluation of city form.

That many of us are familiar with visualisations of future cities from mainstream media, popular culture and other less well known examples is an important factor since we are all able to read such images, even if we may have different interpretations of them (Bruno, 2002). Such images are also enduring both in the collective imagination and wider cultural context of society. This latter point returns us to the taxonomy to appreciate a holistic sense of the paper's content.

We classified the materials surveyed to identify primary elements and then recorded these individually. This was a dual process: on the one hand we organised the visualisations in relation to categories and the mode in which they have been produced, with attendant subsets of image content and production from a technical perspective; whilst on the other hand we analysed the depictions for their thematic content and which dominant elements of urban or rural life they portrayed.

Once we had collated this information, we then examined potential clusters and groupings of visualisations through shared or overlapping characteristics, image construction, and details. The results of this process are shown in the concluding section, which enables the reader to understand the nature of different visualisations of future cities in relation to one another and between the twenty-eight categories of city established through this paper. This summative graphic presents evidence of future city visions in a UK context.

These categories have also been arranged in relation to a linear timeframe as part of our synthesis in the conclusion so that the different themes can be appreciated from a conventional historical perspective. This enables six visual dominant paradigms to be understood as flows throughout the time period examined, illustrating connectivity and reoccurrence, where applicable, that will be introduced throughout the paper and discussed further in the conclusion. Such work is pressing as such a visual history gathers significant evidence for projections and conceptual thought of UK cities in the future yet no survey of this scope has been conducted to date.

I. Cities of vision

Perhaps one of the most enduring images of a new vision for urban form is the Garden City. When Ebenezer Howard began work on *Garden Cities* (1898 reissued in 1902 (Figure 1)) inspired by the novels of Edward Bellamy (Bellamy, 1888) and Henry George (George, 1879), Howard projected a concentric moralistic urban form that contained various zones of activity intersected with green routes which filtered into the New Town Movement begun after the Second World War (Buder, 1990; Hardy, 2011). The legacy of this diagram could arguably be seen in the division of town functionality of Welwyn Garden City or the extensive green infrastructure of Harlow New Town, its former water gardens, splash parks and recreational space.

The legacy of Howard required adjustments to planning concepts and thus in a developing visual history. The image reflected the urgency for new conceptualisations of the city with rapid industrialism and consumerism in the UK. This can be seen in Geoffrey Jellicoe's *Motopia* (Jellicoe, 1963) (Figure 2) with the increasing ownership of motor vehicles and the expansion of London, Jellicoe suggested a separation of transport through elevated auto ramps. Similarly with Howard the Divided City and zoning of the multitude of urban functions seemed like a viable solution to economic, environmental and social issues of cities of the time. This visualisation reflected serious transport planning concerns with the onset of the motorcar, and featured in Colin Buchanan's influential *Traffic in Towns* report for the Ministry of Transport (1963) (Figure 3).

In comparison to the Divided City of conditional planning the work of Archigram (Figure 4) sought a fluidity of adaptable and reconfigurable urban structures for Cluster Cities in the work of Peter Cook and *Movable Cities* in the work of Ron Heron's *Walking City*. These projected visions focused on the animation of the city, through mobile architectures mimicking the complexity of human relations in urban areas. These visions developed ideas of the responsive environment, which was also addressed in the *Mechanical City* of Hans Hollien in which an aircraft carrier city is placed in situ to a pastoral landscape (Figure 5). The *DIY City*, of temporary mobile architecture emerges in the work of Jean-Paul Jungmann and the UTOPIA Group through floating inflatables to which a wider populace could easily utilise given instruction (Figure 6) (Busbea, 2007).

These developments signified a new experimental architectural and urban approach projected as successional to mechanistic UK planning, reactive structures responding to the needs of the cities populace.

To an extent such work responded against the emerging social failures of utopian modernist architecture which dominated the early 20th century European city form through CIAM (International Congresses of Modern Architecture) (Mumford, 2000; Gideon, 2009). Yona Friedmann founded GEAM (Groupe d'étude d'architecture mobile) as a response to CIAM. Constant Nieuwenhuys presented the idea of a *Continuous City* (Figure 10), an architectural framework to which inhabitants sculpt space to their own accord and will (Knabb, 2007).

In comparison in the work of Speer's Germania, a Spectacle City (Figure 11) of monuments is dedicated to governmental power and identity. The architecture of Nazi Germany is at odds to the aforementioned examples of participatory and unitary visualisations a more politically focused urban vision (Krier et al., 2013).

Architecturally led city solutions became enhanced through the development of a participatory discourse. The idea of the engagement of people in construction of the built environment through a manual for DIY architecture rests on a wider unitary theory of participation. Developing from the influential work of Buckminster Fuller, Operating Manual for Spaceship Earth (Fuller, 2008), in which Buckminster Fuller views the Earth as a spaceship of finite resources to which careful cultivation is required repeats in the architectural visualisations of airborne biospheres of Tomás Saraceno (Figure 8) and Studio Linfors (Figure 9) both Sky Cities and Space Cities.

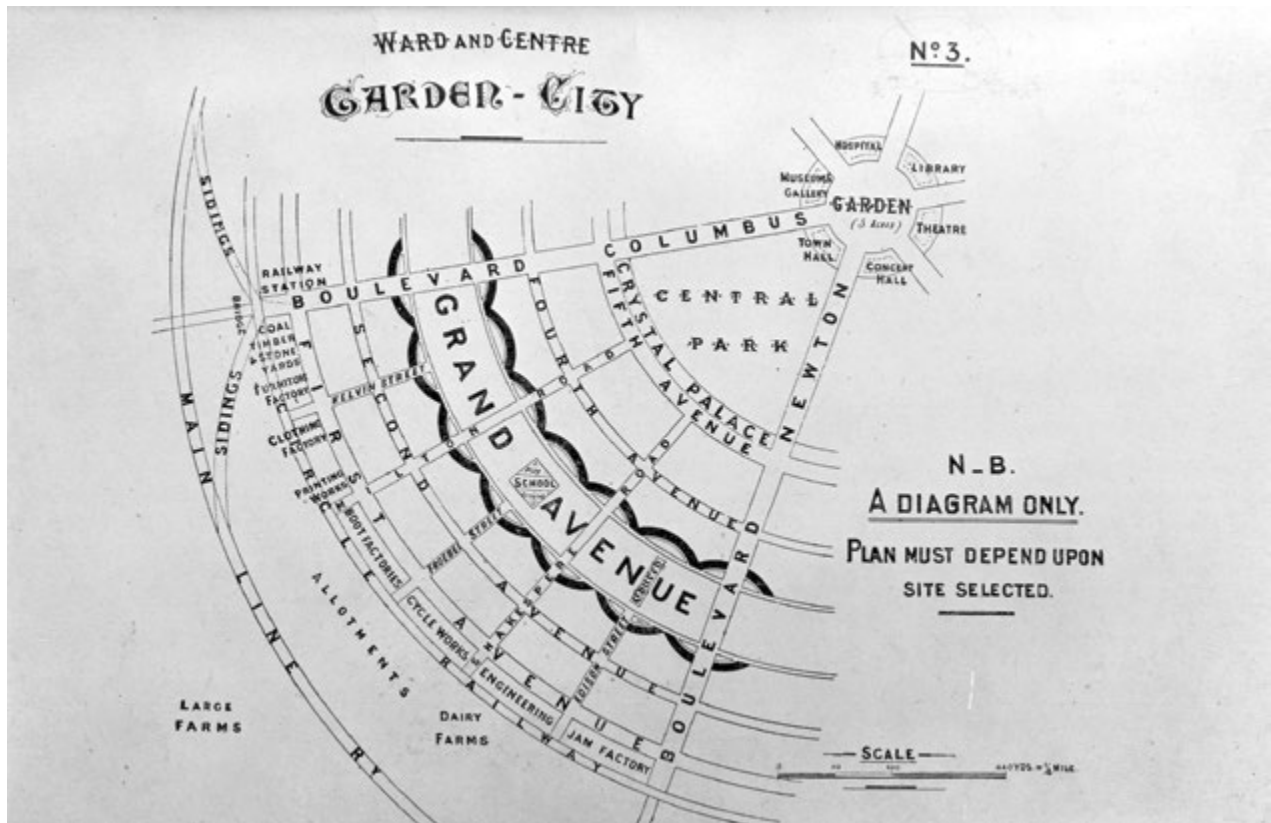
Utopian Unitary theories repeat with a European context in the work of OMA in Eneropa, (Figure 11) a European wide energy grid which owes much to Buckminster Fuller's World Game (1961) (Figure 12) a political-social-resource scenario game in which participants solve global issues and instability through participation. Arguably Influenced by Buckminster Fuller's Dymaxion Map, OMA visualise connected cities sharing scarce energy of tidal, wind, solar, geothermal and biomass resources, a Continuous City. The unitary themes have appeared in digital form through UK open data calls and the Environment Agency's remote sensing projects allowing flood assessment and risk scenario planning to name one example (Figure 72).

1.1 Summary

This first section has introduced just a small cross-section of the types of visualisations of future cities from the period under study from carefully prescriptive city forms to wider participatory and experimental urban visions. The variety of format, media, scales and level of detail therein begins to underline the extent of the paper's research and the need to be able to identify meaningful trajectories and relationships between the multitude of archive materials and contemporary examples.

However, whichever way the materials are organised in relation to their content, it becomes apparent that the future cities visions do not conveniently fit into discrete movements or episodes over time (Thomsen, 1994). Part of the reason for this is connected to the manner in which specific visualisations of future cities resonate over time through different channels of culture (Highmore, 2005) and are only partially reflective of greater concerns, attitudes and ideas concurrent in general society relative to their production.

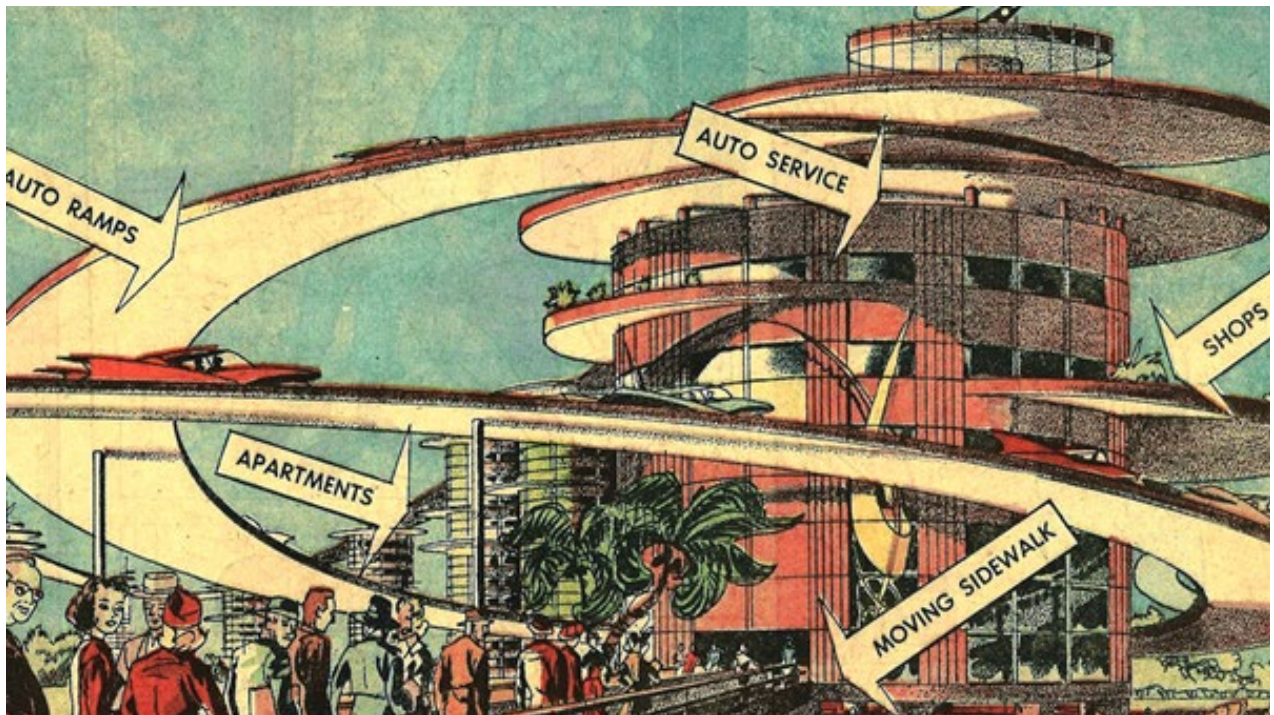
This naturally leads us toward the next section, where we will consider the various media employed to create visions of future cities.



GARDEN CITY

Figure 1: Ebenezer Howard, 'Ward and centre garden city diagram', 1902, Extract from Garden cities of to-morrow (London, 1902), 2nd ed., diagram 3 after p. 22. RIBA Library Photographs Collection.

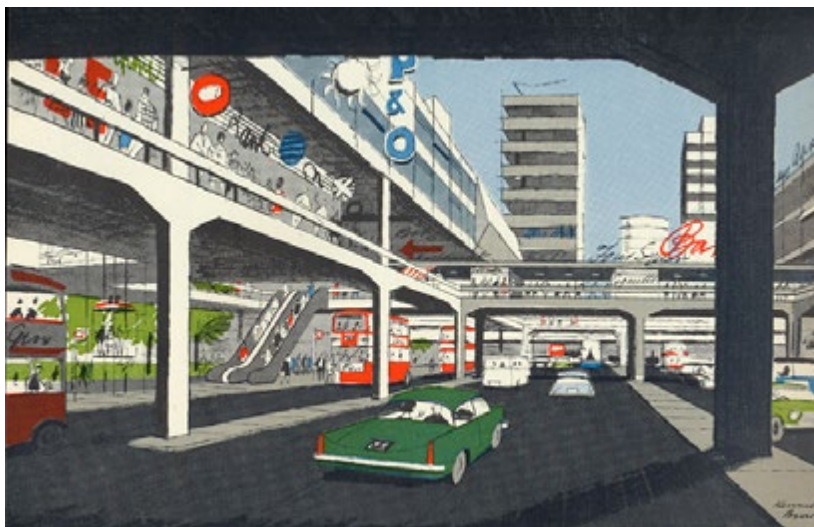
Howard sought to combine the best characteristics of city and country life with this comprehensive social vision for a hybrid landscape. Various permutations of this approach were attempted during the first wave of New Town construction between 1946 and 1960 although its principles have continued to endure, through periods of both championing and criticism, across a number of developments both in the UK and North America. Landscape Urbanism reforms notions of landscape as the medium in which the city is represented and constructed (Waldeim, 2006). Emerging from critique of modernist architecture and planning, building from the critique of Charles Jencks for a practice engaging in ecological and urban processes over time. Landscape Urbanism is a landscaping of in-between void and disenfranchised areas within American cities to have the 'ecology' restored to these voids through native seeding, an "interstitial design discipline, operating in the spaces between buildings, infrastructural systems, and natural ecologies. These were 'unseen,' residual terrain vagues" (Shane, 2004, p. 4). An example is the current Fresh Kills, landfill to park project which runs for thirty years in Staten Island, New York, by Field Operations (2003 onwards). Contrasting approaches that sought clear divide between urban and rural conditions along with high density housing were a fertile trajectory for architects and planners, for example: Le Corbusier's Ville Radieuse (1924) (Figure 17) and Paul & Percival Goodman's *Communitas 1* (1947).



DIVIDED CITY

Figure 2: Geoffrey Jellicoe, *Motopia, A Study in the Evolution of Urban Landscape*, 1961. Illustrated in 1960 by Arthur Radebaugh for 'Closer Than We Think'. © Tribune Content Agency, LLC. All Rights Reserved. Reprinted with permission.

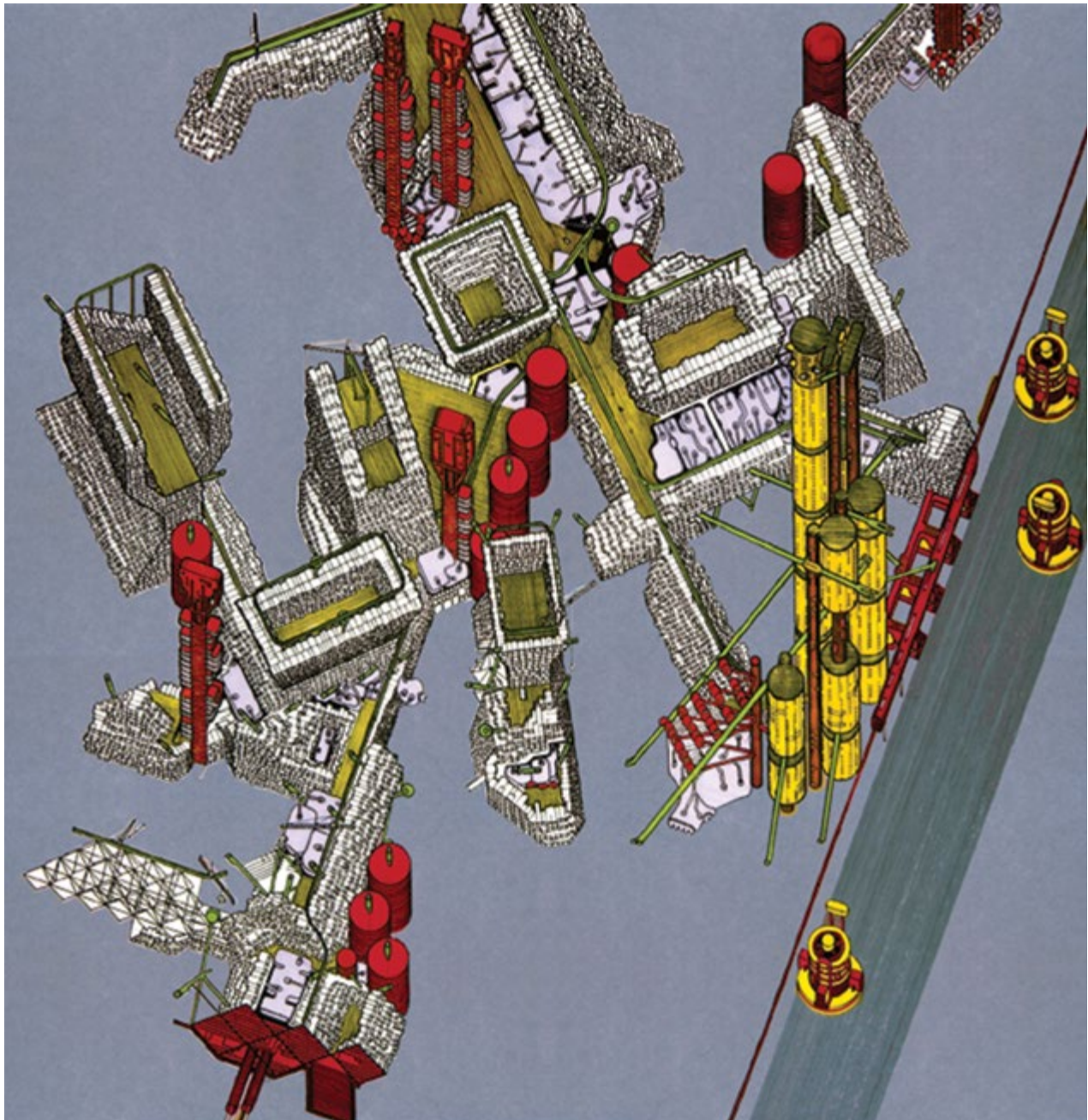
Arthur Radebaugh featured Jellicoe's ideas in a syndicated comic strip 'Closer Than We Think'. Jellicoe proposed a separation of transport creating a layered city of elevated streets for the suburbs of London. The idea of the divided city of infrastructure repeats itself in Henard (1911) Figure 16, Corbett (1913), Mujica (1930) Figure 15 and OMA (2009) Figure 11 amongst many others.



MOVING CITY

Figure 3: Colin Buchanan, Illustration from *Traffic in Towns*, Ministry of Transport, 1963. © Department for Transport 2014.

Buchanan devised a series of steps to mitigate against rising traffic and motorcar use and ownership in the United Kingdom. The report (Crowther & Buchanan, 1963) brought together several principles for transport networks including elevated separated traffic, pedestrian routes and 'environmental' areas (traffic calming and speed ramps) (SKM, 2013).



CLUSTER CITY

Figure 4: Peter Cook (Archigram), Plug-in City, Overhead View, (Axonometric) 1964. Image supplied by the Archigram Archives © 2014.

Peter Cook's proposal is a network of configurable clusters and replaceable units supplementing the city. Plug-In City, Taking the premise of Yona Freidman's Ville Spatiale (1958) (Figure 49) to a Pop Art conclusion, the project consisted of a megastructure

of adaptable, diagrid space-frames that facilitated zoning whilst promoting endless reconfiguration via the cranes at the top of each structure. Communication pipes connected the different zones to one another, with a monorail system to connect existing cities and a hovercraft route way running parallel. Part of the technological flexibility and optimism of the proposal was the inclusion of removable roads, railways and public spaces, which could be sheltered by pneumatic roofs in bad weather.



MECHANICAL CITY

Figure 5: Hans Hollein (b. 1934): Aircraft Carrier City in Landscape. Project. Perspective 1964. Unbuilt. New York, Museum of Modern Art (MoMA). Cut-and-pasted reproduction on four-part photograph mounted on board, 8 1/2 x 39 3/8' (21.6 x 100 cm). Philip Johnson Fund.

Hollein's visual is a polemic of architectural infrastructure rethinking the city as something that is mechanistic, moveable and juxtaposed with its environment. This notion of future cities as technologically determinate would characterise a number of urban visions throughout the latter half of the twentieth century such as Buckminster Fuller's Tetrahedral City (1965) and McMillan, Griffis & Mileto's Linear City (1967).



DIY CITY

Figure 6: Jean-Paul Jungmann, DYODON flottant. Dyodon-Habitation pneumatique expérimentale Dyodon et constructions pneumatiques : annexes, 1967. Photo © Centre Pompidou, MNAM-CCI, Dist. RMN-Grand Palais / Jean-Claude Planchet.

Jungmann and the UTOPIA group were interested in floating and inflatable structures like the DIY architecture of ANT Farm (1967) and Hans Rucker (1967). Fabric would not be the only material in which air structures would be visualised and constructed. The architectural technology of air structures by Dante Bini of 'Bini Domes' – inflatables with a concrete cover and survey of its possibilities by Fredric Price and Frank Newby resulted in architect Michael Godwin creating the Edinburgh Sports Dome in Malvern (1977). This work was indicative of the material experiments of the late 1960 and 1970s in architectural research. Additional connections include Coop Himmelblau (1970) who sought to expand architectures remit through radical participation and experimentation.



CONTINUOUS CITY

Figure 7: Constant Nieuwenhuys, 'Symbolische voorstelling van New Babylon' (Symbolic Representation of New Babylon), Collage, 1969. © Gemeentemuseum Den Haag.

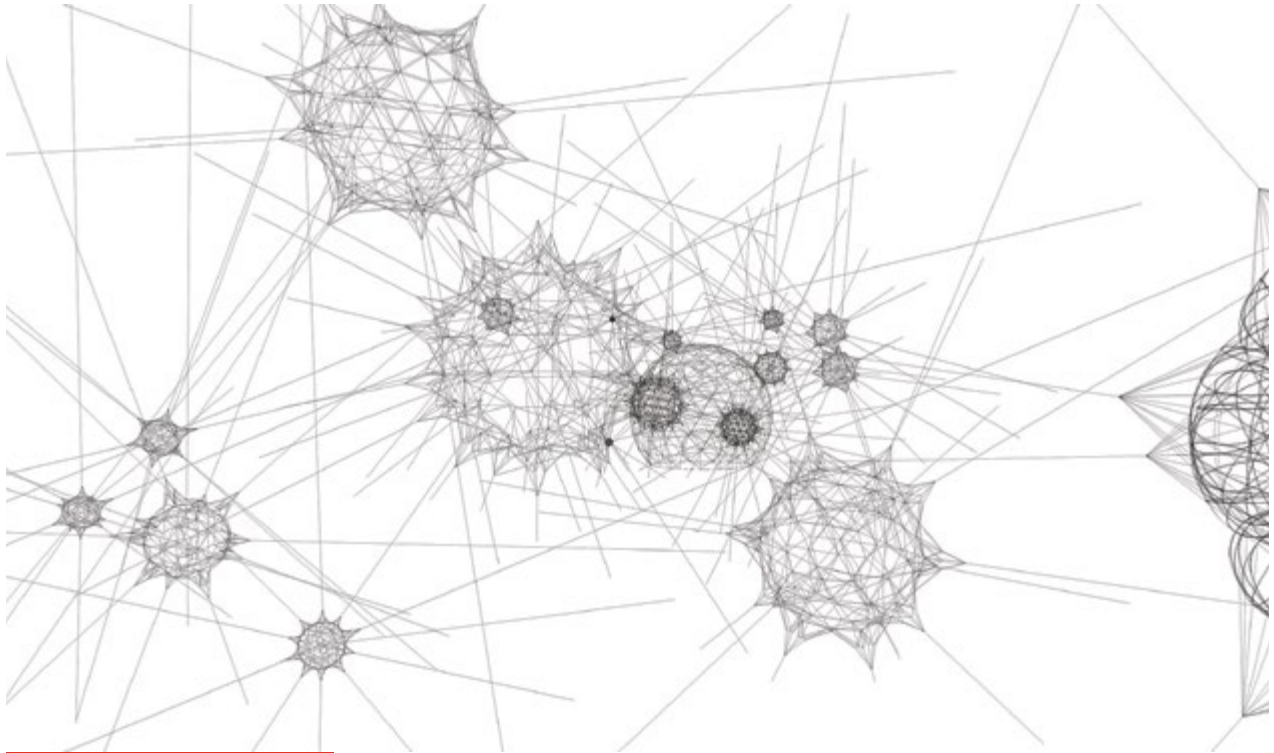
Constant's continuous vertical city, elevated by pillars, projects a fully automated city in which its inhabitants concentrate on sculpturing environment to their own accord. Reactive to post-war functional construction, Constant along with the Lettrist movement sought a focus on 'everyday' life, the routines and actions of citizens. Lettrism continued its experimental activity in the form of Psychogeography through a breakout group. As Guy Debord (1955, p.5) terms it as, "the study of the precise laws and specific effects of the geographical environment, consciously organised or not, on the emotions and behaviour of individuals." Here, Situationists opened a new graphic communication and critique of capitalist society architecture and urbanism out of a distinction of a particular undertow of psychological – geographical relief of urban centres which apparently discourage or enable certain movements and activities (McDonough, 2002, pp. 55–87). In essence, the psychogeographic work, for example *Guide psychogéographique de Paris* (1957), explicitly demonstrated a search for new modes of city representation, which would be a persistent theme of inquiry in the decades that followed.



DIVIDED CITY

Figure 8: Albert Speer, 'Planning for the "World Capital Germania" - Views from the planned South Station on the Arc de Triomphe to the Great Hall (north-south axis), Berlin, 1939, © Bundesarchiv, Bild 146III-373 - Sammlung von Repro-Negativen, Photo from the estate of Albert Speer.

Speer created a model for Hitler of Germania, which visualised the complete reconfiguration of the major historical centre of Berlin. A major axis with processional and triumphant monuments dictates the site (Krier et al., 2013).



SPACE CITY

Figure 9: Tomas Saraceno, Cloud Cities, 2011. Sketch Installation view, “Cloud Cities”, Hamburger Bahnhof – Museum für Gegenwart, Berlin 2011. Photography by Studio Tomás Saraceno. Courtesy the artist and Tanya Bonakdar Gallery, New York, NY, USA, Andersen’s Contemporary, Copenhagen, Denmark, and Pinksummer Contemporary Art, Genoa, Italy. © Sketch by Studio Tomas Saraceno, 2011.

Saraceno’s installations explore biological and sociological configurations and network relationships in biomes. The utopian visions of sky cities focus on present conditions of ecological crisis.



SKY CITY

Figure 10: Studio Linfors (Clouds Architecture Office), Cloud Skippers, 2009. © Studio Lindfors.

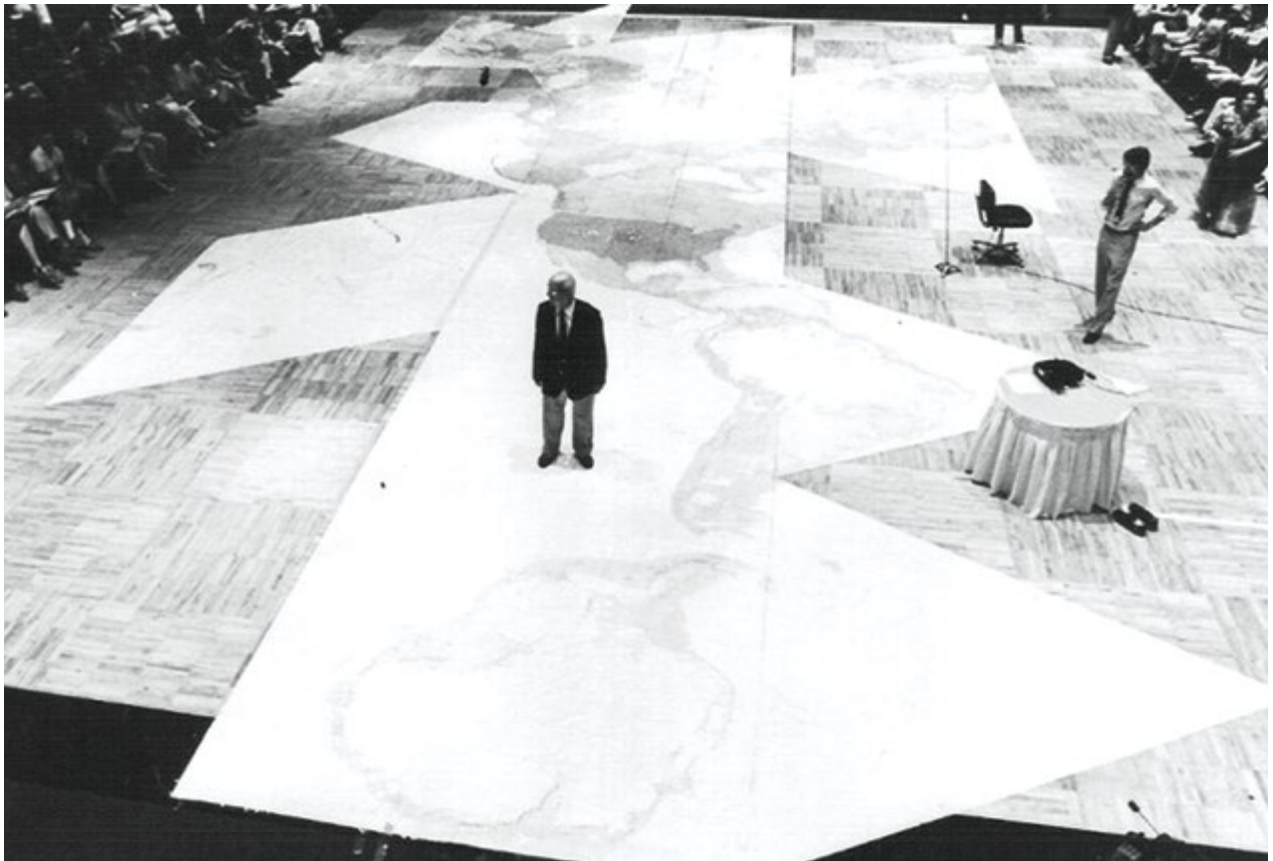
Developed as a competition entry for post-costal disaster housing, using helium balloons, communities are lifted from the devastated space and thus, remain intact. Cloud skippers harness the jet stream staying afloat following where the wind takes them. The floating city re-imagines community as it focuses on sustainability both in the air and with its fixed resources.



CONTINUOUS CITY

Figure 11: OMA, OMA, Eneropa, EuroGrid, Extract from Roadmap 2050: A practical guide to a prosperous, low-carbon Europe, 2010. © Image courtesy of the Office for Metropolitan Architecture (OMA).

The work of Buckminster Fuller and his Dymaxion Map (1943) emphasized connectivity of land mass/ beyond city/nationalistic readings. These ideas can be seen in the work of OMA and its low carbon euro-energy grid, Eneropa (2010). The inter-connected city narrative emerges.



CONNECTED CITY

Figure 12: World Game Institute, Buckminster Fuller (Centre), Medard Gabel (Right), Dymaxion Map for the World Game, ca. 1983-5'. © World Game Institute 1972-1993.

The World Game was a giant simulation in which participants solve a number of scenarios for the goal of 'World Peace'. To Buckminster Fuller this rested on the development of design science, and this could yield a process for "economic, technological and social insights pertinent to humanity's future involvement aboard our planet Earth" (Fuller 1971, p.2). Eventually commercialised and adapted, the simulation recorded some 24,000 participants over two decades (Lambert 1989). This was scenario planning on a grand scale.

2. Representations of Cities

*“Every generation must build its own city”
Sant’Elia, Manifesto of Futurist Architecture, 1914*

The representation of cities is intrinsically linked to the type of media used and its context within wider culture and society (Allen, 1999; Brooker, 2002; Marcus & Neumann, 2007). As Sant’Elia’s quotation suggests cities resonate cultural sensibilities and ideologies. The translation from image to building is partially borne of the way in which the image is constructed and how it codifies information to draw in the viewer and enable them to connect to various visual cues within the image to make it legible. As such, even the most radical future visions typically reference an element of geospatial information or built form. This is the difference between the visualisation of future cities and pure abstraction. Urban life is envisaged in a number of ways across a range of media but there is not an immediately identifiable pattern between image content and method of production. By contrast, the images reflect broader attitudes toward society, and architecture’s position within it, and thus draw in contemporary ideas with regard transportation, density, and social life. In 1953, Ivan Chtcheglov’s *Formulary for a New Urbanism* proclaimed, ‘architecture is the simplest means of articulating time and space, of modulating reality, of engendering dreams’ (Knabb 2007: p.3). The text raises issues at the very core of this report. Through imaginative projection, Chtcheglov sought to explore the possibilities and nature of what cities were and how they might be envisioned through radical spatial reconfiguration coupled with social transformation. It is therefore worth examining the different modes of representation and their impact on the way in which future cities have been visualised. For example, the legibility of urban space and cities has been explored through various mapping practices (Lynch, 1960; Sadler, 1998; Brook & Dunn, 2011), as well as through an understanding of the relationship between branding and city image (Klingmann, 2007).

The depiction of future city scenarios has also been a strong, recurrent theme in fiction from the highly influential Bellamy’s (1887) *Looking Backward* and Forster’s (1909) *The Machine Stops*, via Zamyatin’s (1921) *We* and Gibson’s (1984) *Neuromancer* and the various environmental and technological apocalypses of J.G. Ballard such as *The Drowned World* (1962) *High Rise* (1975) respectively, through to early twenty-first century literary works that have examined the relationship of digital code and physical place (Hall, 2007) or the rebuilding of cities as cut and paste urbanism in an age of ecological disaster (Boudinot, 2012). As Murray Bell and Goodwin (2012) have observed, the power of creative writing and its relationship with the built environment is perhaps stronger than it has ever been. Recently, it has been used to innovative effect by Porritt (2013) to describe an imaginative yet viable post-carbon future. Oldfield Ford (2011), meanwhile, has revitalised the practice of urban walking through her series of graphic novellas, describing the socio-spatial remnants of late capitalist Britain. Furthermore, the portrayal of future cities in graphic novels has been a rich seam of illustrative speculations on urban living and built form as well as a vehicle for the retelling of social history of a city (Talbot, 2007).

Perhaps the most influential form of media through which future cities have been

communicated is film (Clarke, 1997; Barber, 2002; Webber & Wilson, 2008). The ability of the camera to move through place and space has enabled the lived experience and narratives of future cities to be highly affective, entwining cinema and built environments, whether extant or not, into a powerful interrelationship (Schwarzer, 2004; Dunn, 2013). In addition, the production of sets coupled with special effects facilitated the seemingly impossible to exist in film from the mechanistic layered city of Fritz Lang's (1927) *Metropolis* (Figure 23) to more recent interpretations of high-rise, three-dimensionally mobilised societies such as Ridley Scott's (1982) projection of Los Angeles in *Blade Runner* and Luc Besson's (1997) future Manhattan in *The Fifth Element*. Of course, not all films draw on fictional accounts of future cities with examples such as David Butler's (1930) *Just Imagine* and William Cameron Menzies' (1936) *Things to Come* taking imaginative extrapolations from the period to project their futurologies.

The emergence of the city as an industrial powerhouse in the nineteenth century led to new typologies of built form related to finance, commerce and civic functions (Berman, 1983; Willis, 1995). A notable motivator behind this new architecture was due to the evolution of building technology, especially the production of steel, which enabled large frame structures to be built. This had two direct results on construction, facilitating large-spans for warehouses and multi-storey buildings at heights and on a scale previously inconceivable. The Spectacle City, using this building technology emerges in the illustrations of Hugh Ferriss, (Figure 13) and *Crossing City* of Raymond Hood (Figure 14). This development was embodied in the skyscraper, which shifted the previously dominant horizontal emphasis of cities to a more vertical one. As a result, the development of cities as spectacles, resplendent with their own transport systems as new mobilities took shape became increasingly common. This is evident in Mujica's (1930) text on the *History of the Skyscraper* (Figure 15).

Such visions of transportation in early modernist urbanism promoted the motorcar and created Layered Cities, such as the work of French planner Eugène Henard (Figure 16) (1910). Such verticality of city space opened areas to wide infrastructural and recreational space comparatively in Le Corbusier (Figure 17) and Paul Rudolph's *LoMex* (Figure 18). Such reliance on industrialisation and mass manufacture created both utopian and dystopian visions of transport infrastructure from the layered mobility of OMA (Figure 19) and the paradoxical congested space of *Pushwagner* (Figure 20). Between these two visions urban density issues reoccur, thus giving rise to new technological solutions as seen in the cars of *Blade Runner* (Figure 21). Such density issues were previously disregarded in sprawl visions in which road infrastructure connected the city with ease in *Bel Geddes City of Tomorrow* model (Figure 22) (Albrecht & Geddes, 2012).

Ideas of authoritarian city control and defence emerge in Fritz Lang's, *Metropolis* (Figure 23) with nuclear scenarios in *Akira* (Figure 24) (1988) and *Newman* (Figure 25). In the UK context the 1965 television programme, *The War Game*, depicts a nuclear holocaust in the aftermath of soviet attack and global conflict, though it did not appear in the mainstream until 1985 (Watkins 1967). Whilst some future cities visions were deemed highly contentious, *Usborne Books' Future Cities* is representative of children's literature of future cities and technologies to which inspired further interest in questions of tomorrow (Figure 26). In *Parasec City*, the dominant narratives of future city scenarios

are critiqued in a series of posters which give no reference to the reality in which they emerged projecting a Space City (Figure 27), indicative of counter-cultural views of future cities.

2.1 Summary

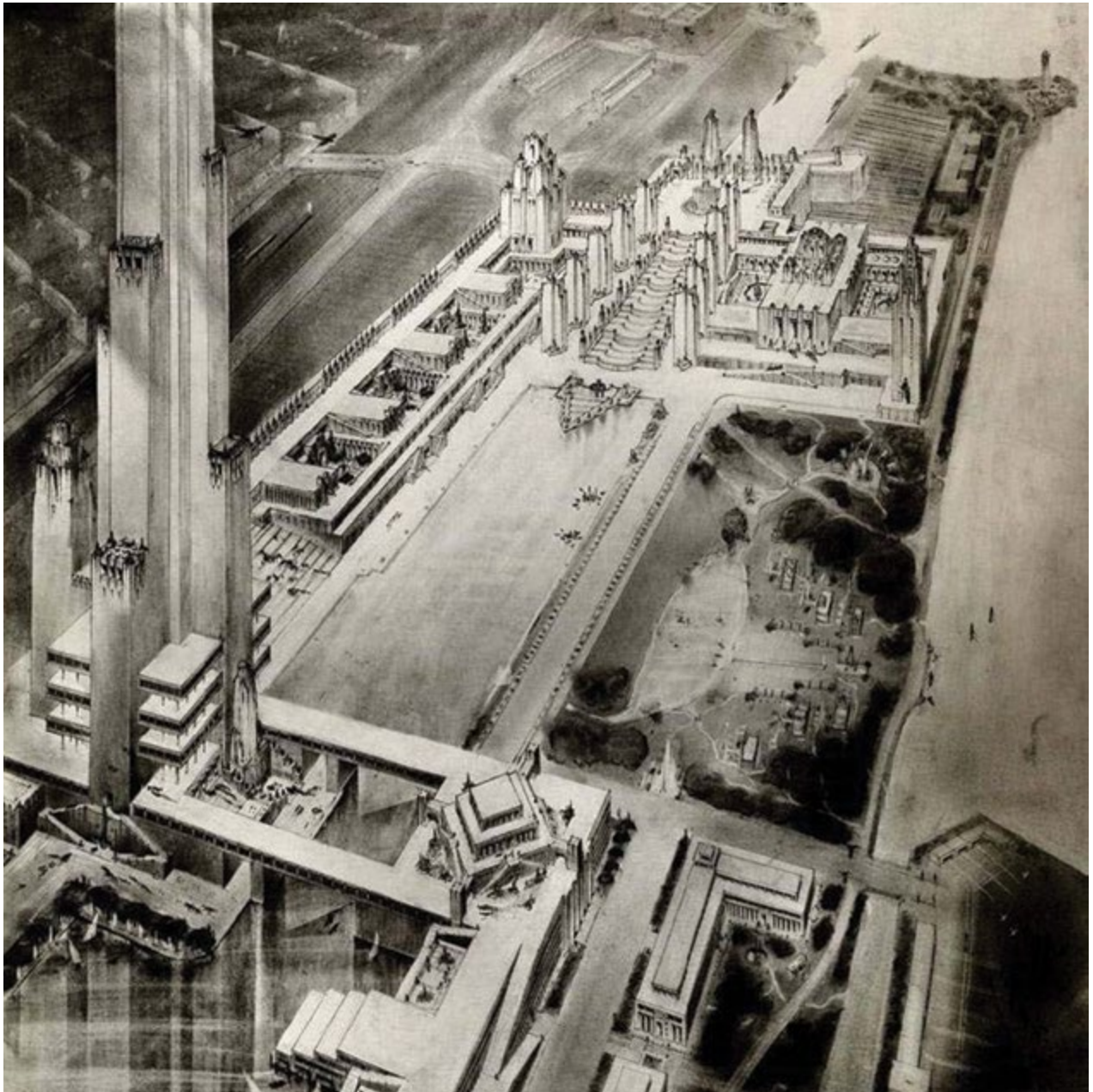
The visual representation of cities demonstrates, in some cases, the present conditions in which they formed. For example through the campaigns of skyscraper technology, utopian visions of city spaces emerge as do the implications of megastructures for new configurations of urban and rural landscapes (Banham, 1976). Automobile mass manufacture projects a layered city to which city navigation is eased or the concept of urban planning as mathematical formula as Richard Neutra's (1923) *Rush City Reformed* sought to illustrate. Fears of political unrest and protests for nuclear disarmament project dystopian futures resonant with historical reference to city spaces with defensive capability (Graham, 2010). Such representations however, cannot be understood without study in the context of the city, which in some cases can be understood through the use of smaller scale studies, new visual methods of decoding city space and projections based on existing technologies. Ultimately, there does not appear to be a direct correlation between the mode of representation and the type of city depicted, the means of communication typically reflective of its place within the broader cultural context of its day, i.e. the use of Pop Art collages in the 1960s, the emergence of photorealistic computer generated images in the 1990s etc. However, there is a discernible shift across the range of six dominant paradigms from Regulated Cities and Layered Cities, via Flexible Cities and Informal Cities toward Ecological Cities and Hybrid Cities over the time period studied, which reflect changes in attitude and wider societal concerns which are discussed further in the conclusion.



SPECTACLE CITY

Figure 13: Hugh Ferriss, Chicago Tribune Tower, Howells & Hood, architects, 1925. Illustration in 'The Metropolis of Tomorrow', 1929. © Avery Architectural and Fine Arts Library, Columbia University.

The signature dark and moody atmosphere of Ferriss' illustrations had emerged by 1920 to present buildings typically either lit up by spotlights or in a fog. The shadows cast by the architecture in his renderings were as important as the building surfaces. His work for Harvey Wiley Corbett to illustrate the implications of the 1916 New York City zoning laws formed part of the Ferriss' book *The Metropolis of Tomorrow* (1929), which would subsequently influence many visualisations of future cities across various media.



CROSSING CITY

Figure 14: Raymond M. Hood, Century of Progress International Exposition, 1932-1933. Ryerson & Burnham Archives, Bennett, Edward H., Collection. © Photography Brown Brothers.

Hood proposed skyscraper bridges located on the waterfront to accommodate massive residential complexes.



LAYERED CITY

Figure 15: Francisco Mujica, 100-Story City in the 'Neo-American Style', Plate CXXIV f, 1929. New York: Archaeology & Architecture Press, 1930.

Mujica's research into the history of the skyscraper visions a super grid in which the buildings are set-out. Referencing Corbett and Ferris also later repeating in Rudolph (1972) (Figure 18) and OMA (1995) (Figure 19).

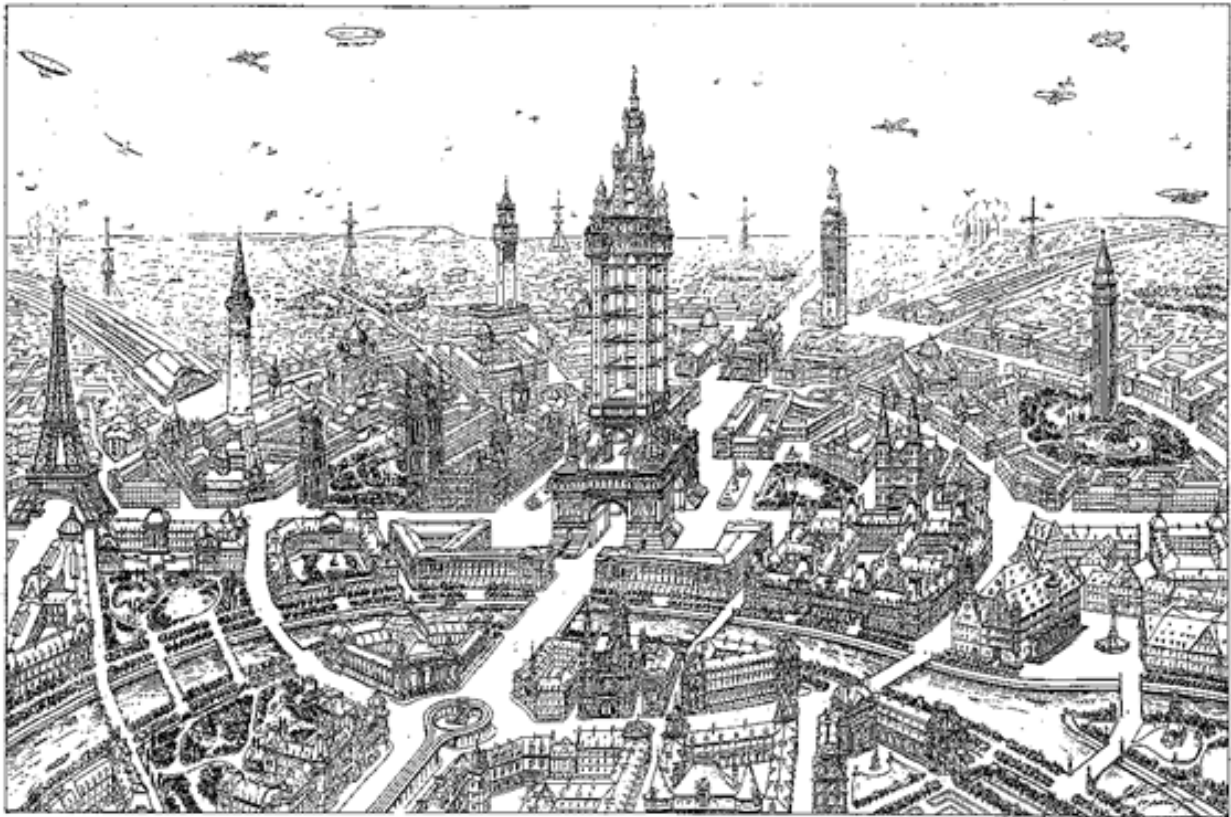


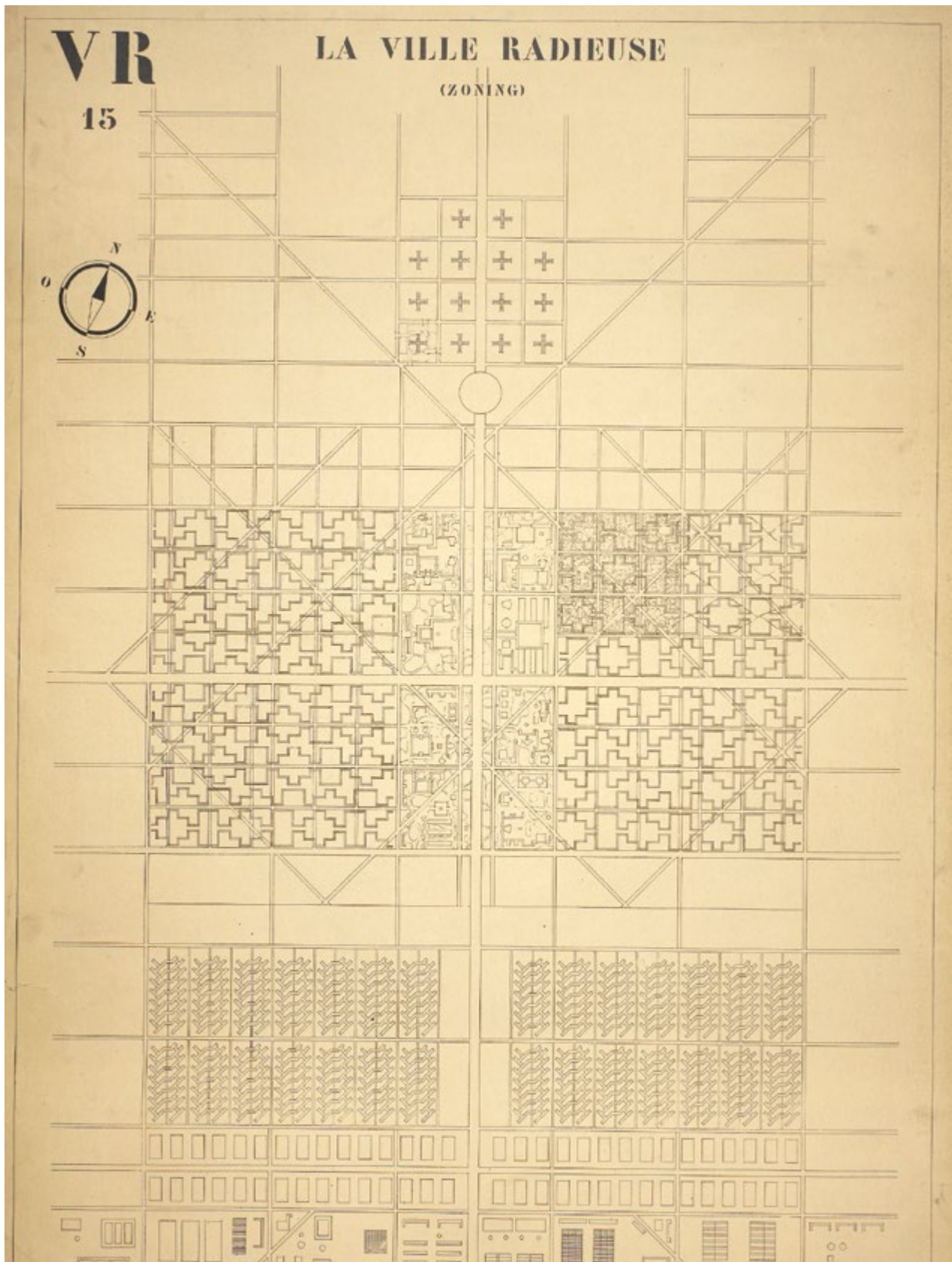
FIG. 1.—UNE VILLE DE L'AVENIR: VUE A VOL D'AEROPLANE.

MECHANICAL CITY

LAYERED CITY

Figure 16: Eugène Hénard, *The Cities of The Future*, published in *American City*, January 1911.

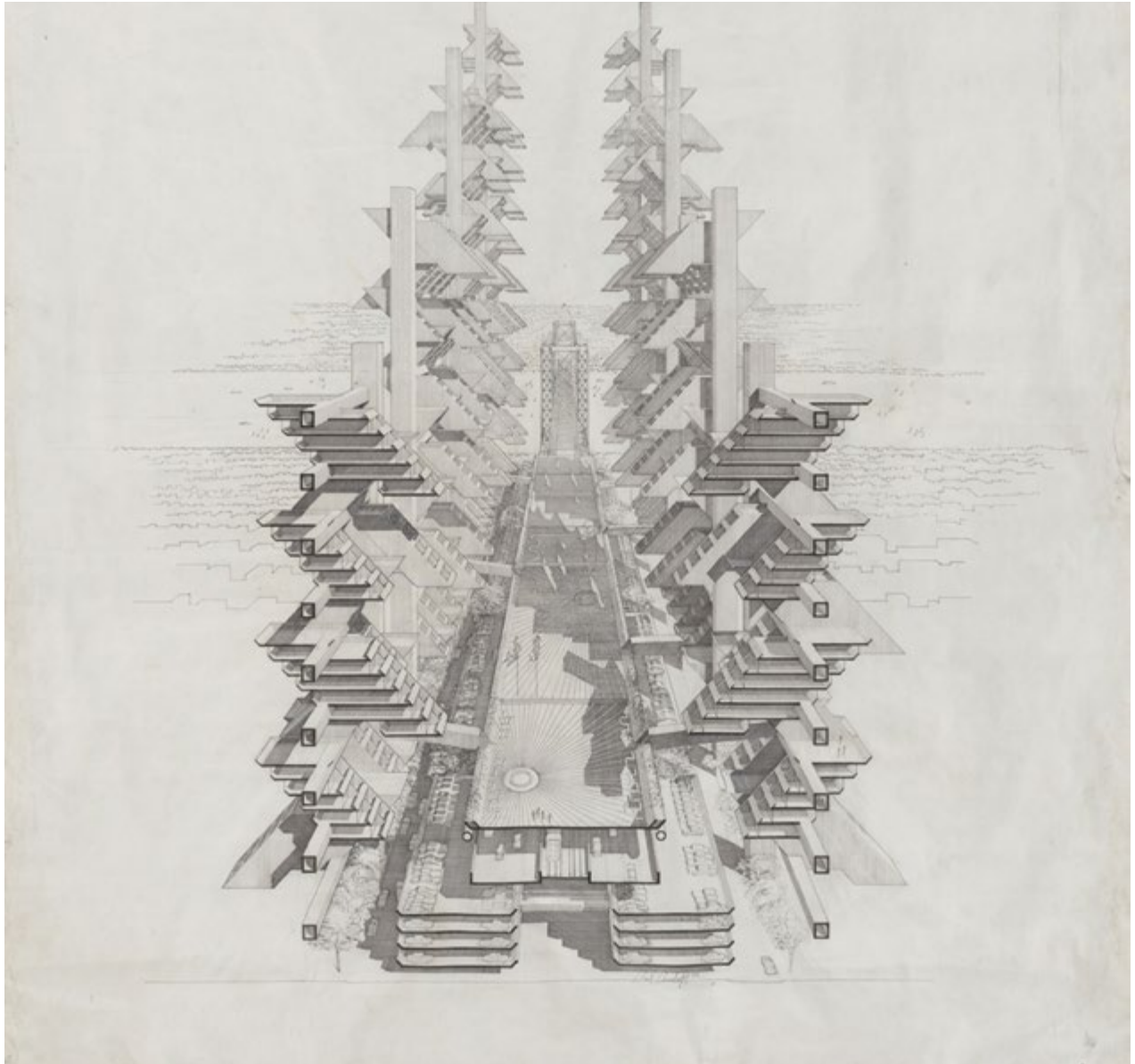
Eugène Hénard's proposal of a two tier street system develops upper separated levels for pedestrian and vehicular access and underground levels for services and waste disposal. Connected to a central super tower in the city, Hénard's design centralises and zones the space. The super tower communicates and coordinates with all of its arterial feeds as seen in Fritz Lang's *Metropolis* (1927) (Figure 23).



DIVIDED CITY

Figure 17: Le Corbusier, Radiant City (Ville Radieuse), 1924. © Foundation Le Corbusier & DACS.

Le Corbusier's vision translates with near clarity in the Alton East 1952-1955 & Alton West 1954-1958, housing projects in Roehampton, London (Colquhoun, 2008). Block housing appears in parkland setting, Corbusier uses verticality to cater for a larger population, elevated from nature for picturesque landscape paradoxically spread in the city.

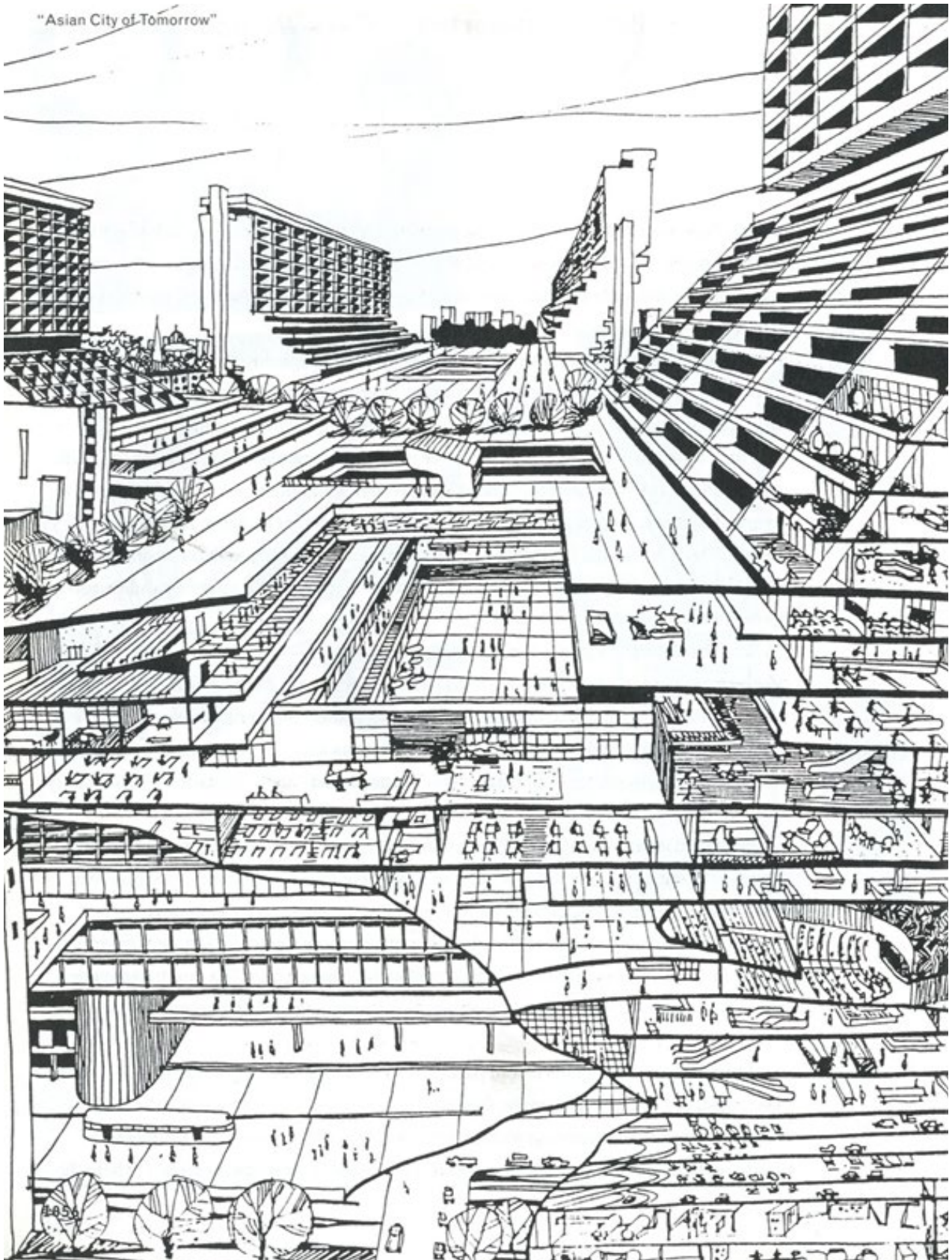


HORIZONTAL CITY

Figure 18: Paul Rudolph, (1918-1997): Lower Manhattan Expressway, project. New York City. Perspective to the east, 1972. New York, Museum of Modern Art (MoMA). Ink and graphite on paper, 40 x 33 1/2' (101.6 x 85.1 cm). Gift of The Howard Gilman Foundation.

Rudolph's drawing for the LoMex proposes to integrate transport infrastructure with more socially connected higher levels of monorails and people movers (Rudolph, 2008). Predominantly focused on the automobile, Rudolph integrates parking lots at various levels, like Pushwagner (1969) (Figure 20).

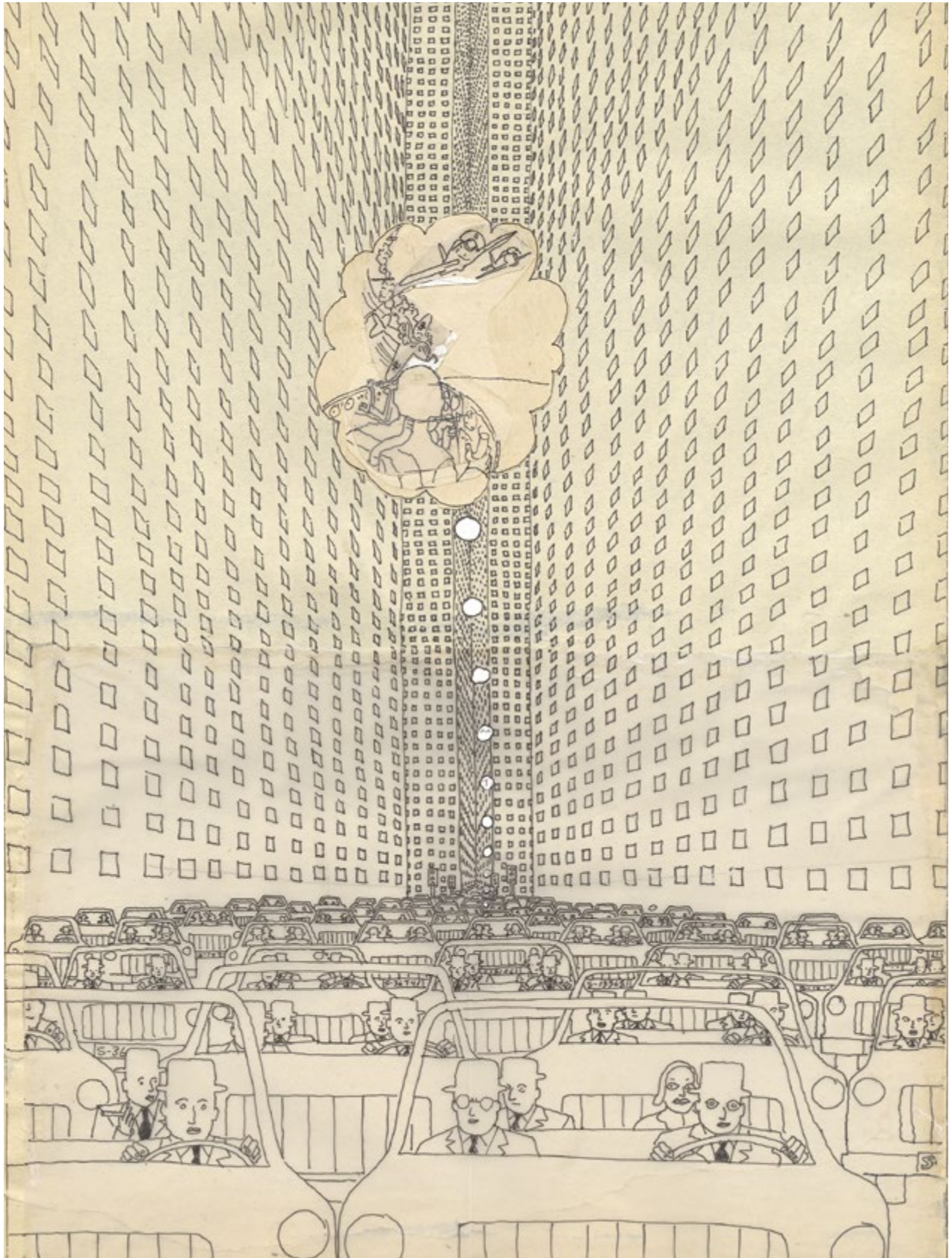
"Asian City of Tomorrow"



LAYERED CITY

Figure 19: Rem Koolhaas, Asian City of Tomorrow, SMLXL, 1995, © Image courtesy of the Office for Metropolitan Architecture (OMA).

Such layering of city form traces rationalised city planning principles and utopian modes of city organisation, with Howard (1902) the Garden cities is a zoned horizontal space (Figure 1), in OMA such zoning appears vertically, like Henard (1908) (Figure 15), Hood (1950) (Figure 14) Rudolph (1972) (Figure 18), such a strong early modernist city narrative reforms into dystopian models of future cities partly informed through rising critique of the socialites of the city developed by Jane Jacobs (1961).



WASTE CITY

Figure 20: Pushwagner, Extract from *Soft City* graphic novel, 1969 - 1975, pen and ink on paper. © Pushwagner 2014.

Pushwagner's drawings project the rampant societal consumption that Paolo Soleri philosophises (1969) (Figure 44); everyone has their material desires, everyone has a car. This pictorial novel describes the standardized daily life in an Orwellian, dystopian city. With a satirical view Pushwagner perceives the life of a family in a top-down organized city (Spira & O'Donnell, 2012). The novel visualises more serious concerns for environment, and like Soleri, it comments on urban organisation and transport infrastructure.



VICE CITY

Figure 21: : Ridley Scott, Blade Runner, 1982. © Warner Bros 2014.

The highly influential aesthetic of the future city depicted in this film recasts the Los Angeles of 2019 as high density, neon-lit landscape akin to Tokyo (Scott, 1982). The city backgrounds designed by Syd Mead also included the flying cars, Spinners, which in addition to being driven as ground-based vehicles can take off vertically, hover and cruise using jet propulsion. The dark, brooding and claustrophobic atmosphere of the city in the film would prove popular with those creating near-future scenarios and be replicated in many subsequent films including *Batman* (Burton, 1989) and *Ghost in the Shell* (Oshii, 1996). The theme of the 'other' being run down as criminal management control was more brutally pursued in the 'Judge Dredd' comic strip, created by writer John Wagner, artist Carlos Ezquerra and editor Pat Mills, which has run in the British science fiction anthology *2000AD* since 1977. The hardware and cityscapes Ezquerra illustrated were far more futuristic than the near-future setting originally intended; in response, Mills set the story further into the future. Dredd is the most famous of the Street Judges that patrol Mega-City One, charged to instantly convict, sentence, and execute offenders. So powerful is his image and character's recognition that his name is sometimes invoked over similar issues to those explored by the comic series, such as the police state, authoritarianism, and the rule of law.



SPECTACLE CITY

Figure 22: 'Viewing the World of Tomorrow model' by Bel Geddes, Futurama, New York World's Fair, 1939. © Courtesy of the Harry Ransom Center.

Participants at the General Motors 'Futurama' exhibit were orbited on motorised seating around a diorama of America in 1960, crafted by Bel Geddes. The onset of the automobile promotes a super road infrastructure navigating the new verticality offered by skyscraper technologies and heights (Albrecht & Geddes, 2012).

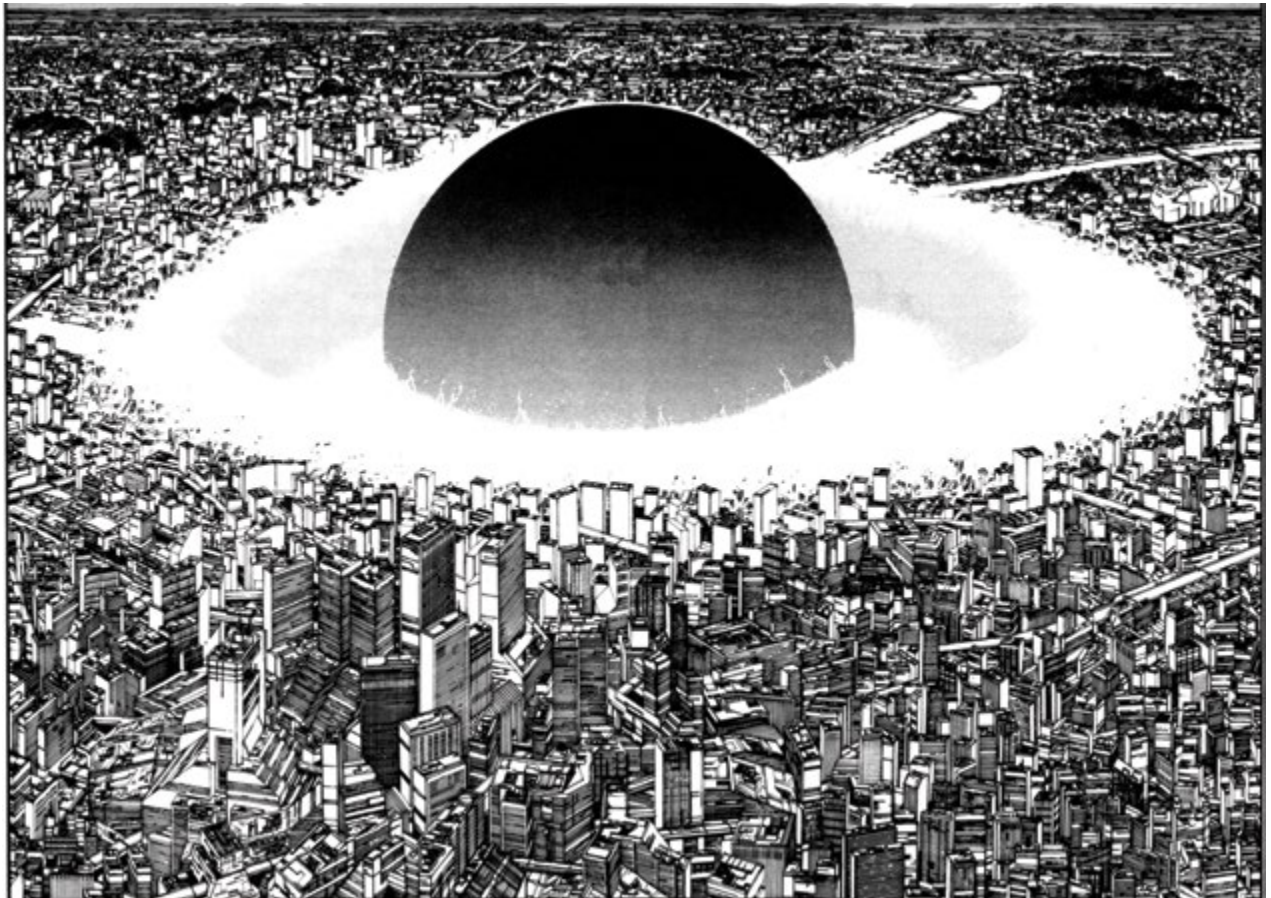


MECHANICAL CITY

LAYERED CITY

Figure 23: Heinz Schulz-Neudamm, (1898-1969): Metropolis, 1926. New York, Museum of Modern Art (MoMA). Lithograph, printed in colour, 83 X 36 1/2' (210.8 x 92.7 cm.). Gift of Universum Film.

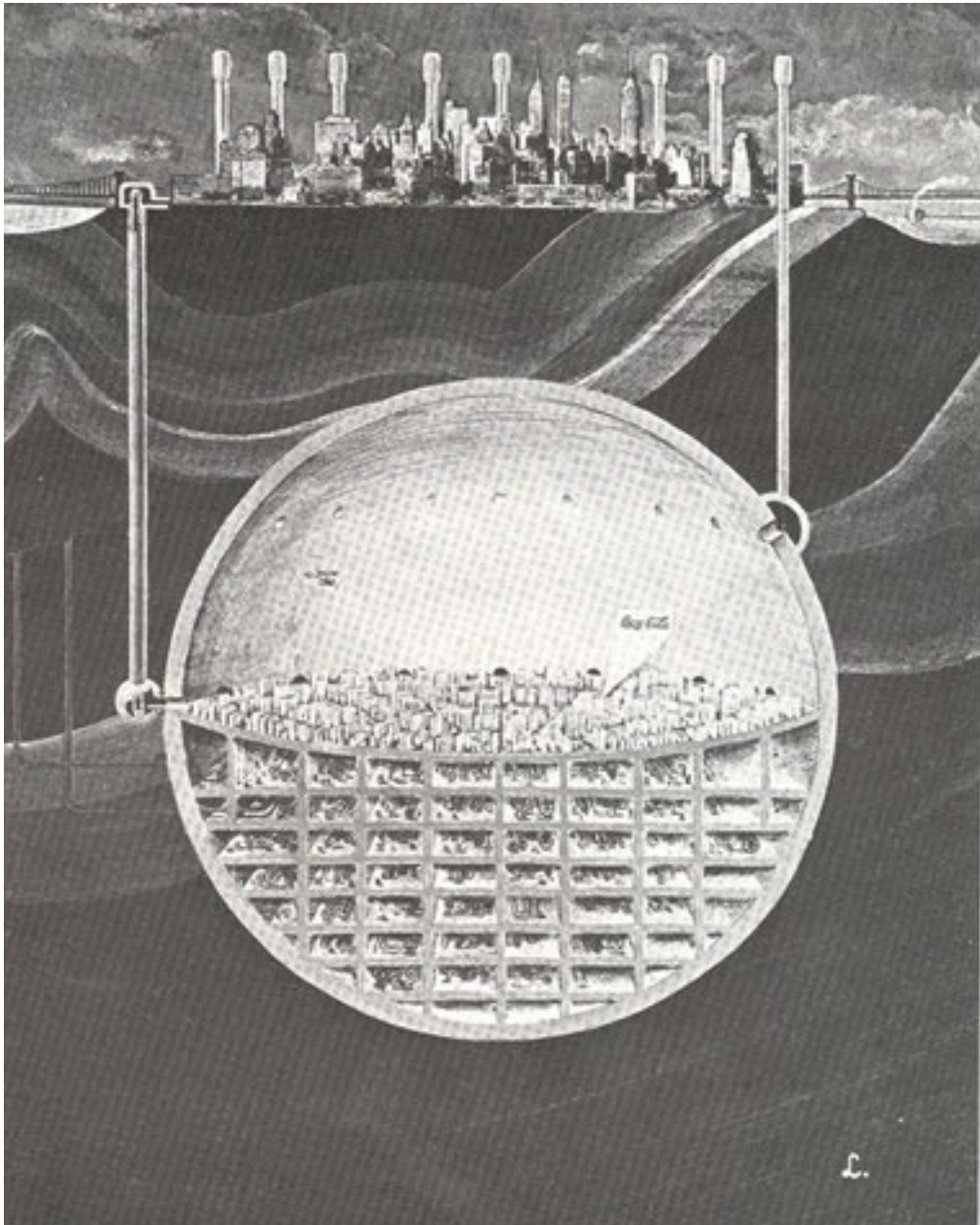
The Weimar dystopian urban vision of Metropolis presented an automated city of hierarchy and control reflecting on rapid city industrialisation and its future possibilities.



CYBER CITY

Figure 24: Otomo, Katsuhiro, Akira – Destruction of Neo-Tokyo, 1982-1990, AKIRA
Katsuhiro Otomo / MASH • ROOM / Kodansha .Ltd.

The Akira manga series and animation begins with a silent mushroom growing in force in Tokyo in 1988. Projecting thirty-eight years later the comic depicts a cyberpunk gang reminiscent of Gibson (1984) and Blade Runner (Scott, 1982) Akira's focus is on Government created genetically modified children with telekinetic power. The cyberpunk city presents a visual of a jarring mechanistic and biological combination of Tokyo's inhabitants.



UNDERGROUND CITY

Figure 25: Oscar Newman, Nuke Proof Manhattan, Esquire Magazine, December 1969. © Courtesy of Kopper Newman.

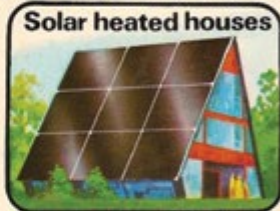
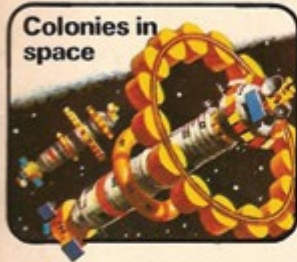
The architect and spatial planner Oscar Newman's spatial defence theory proposed utilising nuclear warheads to clear massive underground space for the city in its theoretical extremity, ironically to protect Manhattan from nuclear attack. Newman presents an underground honeycomb layer of function which mimics the layers of the upper city. Newman's city projection resonates with nuclear disarmament a protest that repeats in Stanley Kubrick's *Dr Strangelove* (Kubrick, 1964). Newman's work focused more on community planning. He proposed environmental design strategies for safer neighbourhoods. The theory followed that crime prevention could be minimised if individuals have a stake in their communities, this could be achieved through closed streets, residents policing and other design and planning modes (Newman, 1973).

THE WORLD OF THE FUTURE

FUTURE CITIES

HOMES & LIVING INTO THE 21ST CENTURY

KENNETH GARLAND & DAVID JEFFERIS

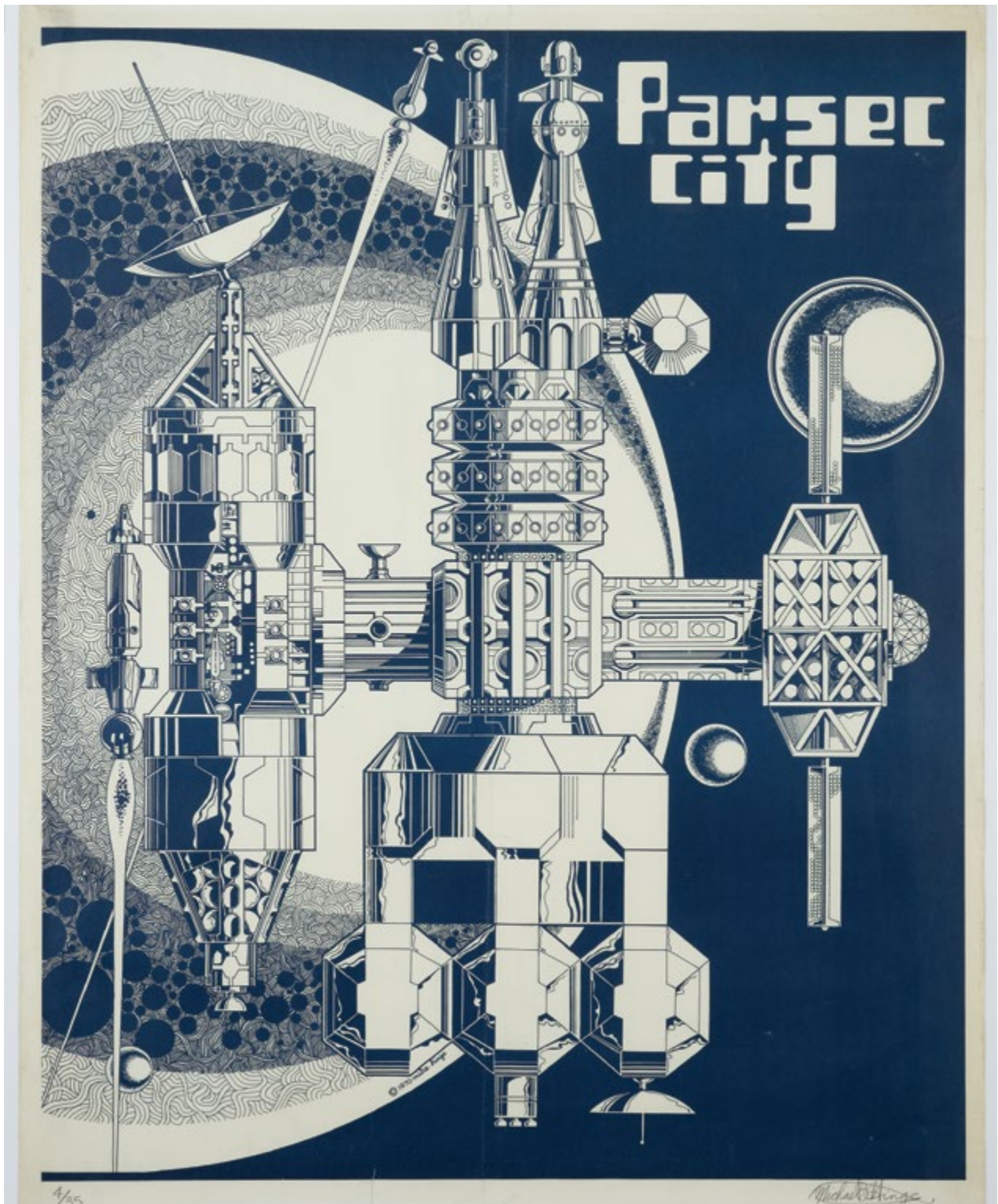


USBORNE HAYES

SPACE CITY

Figure 26: Kenneth Garland, David Jefferis, Future Cities, Usborne Books, 1979. Reproduced from Future Cities by permission of Usborne Publishing, 83-85 Saffron Hill, London EC1N 8RT, UK. www.usborne.com. Copyright © 1979 Usborne Publishing Ltd.

Indicative of children's publications and fascination with science fiction and technological projection, Usborne Books' Future Cities was indicative of the fascination of young audiences with cities of the future.



SPACE CITY

Figure 27: ONYX, 'Parsec City', Signature Michaël B. Hinge, 1968-1970, Sérigraphie sur papier, 73.5 x 58.5 cm, Photographie : François Lauginie, Collection FRAC Centre, Orléans.

Parsec City is a large poster collection for the ONYX collective that, in a similar manner to Ant Farm (Lewallen & Seid, 2004), created free form architectural visions without constraint, projecting visions dismembered from their present conditions.

3. Contexts of Cities

“Culture is a powerful means of controlling cities. As a source of images and memories, it symbolises ‘who belongs’ in specific places. As a set of architectural themes it plays a leading role in urban redevelopment strategies” (Zukin 1995, p.1).

To understand the context of cities sometimes involves creating images of the whole of the city space such as in the work of Spiro Kostof (Kostof & Tobias, 1999), or to make observations of specific city characteristics, cultures (Norberg-Schulz, 1980; Thrift, 1996) or its digital landscape (Boyer, 1996). The context of cities and the subsequent visualisations sometimes function as a heuristic - a mode of operation for problem solving and testing. In some cases, this involved projecting city visions based on initial or smaller scale technologies. Thus, the context of cities in visualisations relies on the establishment of a method of understanding its form, prior to visual analysis and projection. The context of cities can be understood in two modes, visualisations which seek to examine its characteristics, both cultural and social and visualisations which seek new city forms based on existing technologies or concerns.

The visually preferential townscape theory of Gordon Cullen signified a concern with UK place identity and the genius loci a Collage City (Figure 28) (Cullen, 1995). Townscape Theory was a particularly British method of understanding sites and as a general urban development framework, located on the humanist and picturesque principles of Gilpin and Price. This UK based specific work sought to find new ways of generating cities through visual and psychological composition, which was critiqued by the Smithsons and Reyner Banham. London Southbank is an interesting basis to see on the one hand thorough townscape principles and on the other a beacon of Brutalism.

Understanding the context of the city relied upon inventing new visual fieldwork to understand such space, Kevin Lynch utilised mental maps correlated from the inhabitants to give a representational view of city form a Cognitive City (Figure 29) (Lynch, 1960). These visual preferential modes did little to incorporate a more phenomenological approach to understanding city space but were important in creating design guides for practitioners.

The search for modes to decode the city was important. A form of Lynch’s approach was utilised by The School for Advanced Urban Studies, which was commissioned by Milton Keynes Development Council to gather public’s perceptions of Milton Keynes in the 1970s (Bishop 1984; Monchaux 1984) (Figure 85). Similarly Lawrence Halprin’s Taking Part approach (1974) (Figure 30) developed perceptions of the city as participants recorded their experiences through set walks. These perceptions were then collected in order to find commonality of city experience. Halprin’s work contributed greatly to the development of community planning in America, work that would become mandatory in planning processes.

Such work was not limited to specialist practitioners as in the case of Piero Ventura who sought to illustrate for children the bustling life and character of multiple cities (Figure 31). The growing urban field of walkability studies and its images promotes future cities

that maintain human scale dynamics and navigation. These studies and images also influence the research base of urbanism and health.

Whilst some visualisers attempted frameworks for understanding space, city space was also projected from specific technological invention, giving new context to the visualisation of the city. The city vision of Autopia Ampere for example a Floating City, was projected from the discovery of Biorock™ material technology which was found to build and repair artificial coral reefs in Jamaica and Indonesia (Figure 32) (Cureton, 2013). Kenzo Tange's Tokyo Bay (Figure 33) set its spinal infrastructure on the basis of land reclamation as the only development scope for Tokyo a Water City. For Xenakis musical experimentation informs an architectural mega structure for five million inhabitants (Figure 34) a Haptic City. Hugh Casson's planning of the Festival of Britain, 1951 sought a celebratory exhibition of UK technology and culture a visualised temporary architecture as an agent for London regeneration, a Temporary City of optimism and progression for Britain (Figure 35).

The context of city space was drawn from a variety of sources in the work of Wenzel Hablik; geological studies provide the imaginative feature for a Floating City (Figure 36). In the work of James Wines, New York skyscraper identities are inverted to provide heterogeneous living spaces a Vertical City (Figure 37) (Wines, 1988, pp.161–165). In Shimizu Corp's Green Float the visualisation seeks to address climatic issues through the provision of a Floating City space, which is self-sustaining (Figure 38). Whilst these works project technological solutions Children of Men (Cuarón, 2006) is a dystopian film of societal collapse (Figure 39).

The contexts depicted within these visualisations makes connections with existing city conditions and extends their possibilities. The projection can be traced back, revealing the scope and focus of concern. The visualisation and context of cities traces the agency of the image to an original tangible source. These sources are sometimes contemporary issues that have been visualised in order to problem solve, as in the case of this paper, the infographic (Figure 95, 96) establishes dominant city paradigms that emerge from the visual juxtaposition of elements.

3.1 Summary

The context of cities has been composed of two modes. First, the establishment of a visual framework in which to decode the city form and secondly to project from existing conditions, materials or technologies. These two modes have certainly assisted in the dominant city paradigms of Regulated Cities, Ecological Cities and Flexible Cities, which are reliant on the survey of city conditions and the availability of resources for mitigation. These contexts are intertwined with sociological concerns, just as Le Corbusier sought an elevation from the perils of early industrialisation in Ville Radieuse (Figure 17) these ideas filtered into a UK context through Alton East 1952-1955 & Alton West 1954-1958, housing projects in Roehampton, London (Colquhoun, 2008) Gordon Cullen (1995) sought a human scale balance to city elements and transportation, Townscape theory, bringing humanistic experiences to UK urban design. In other cities the context involved more radical solutions including the dissolution of architectural identity through the establishment of matrixes acting as containers for individualised architecture. Another

such radical visualisation includes the abandonment of settlements in favour of utilising the sea for floating cities.

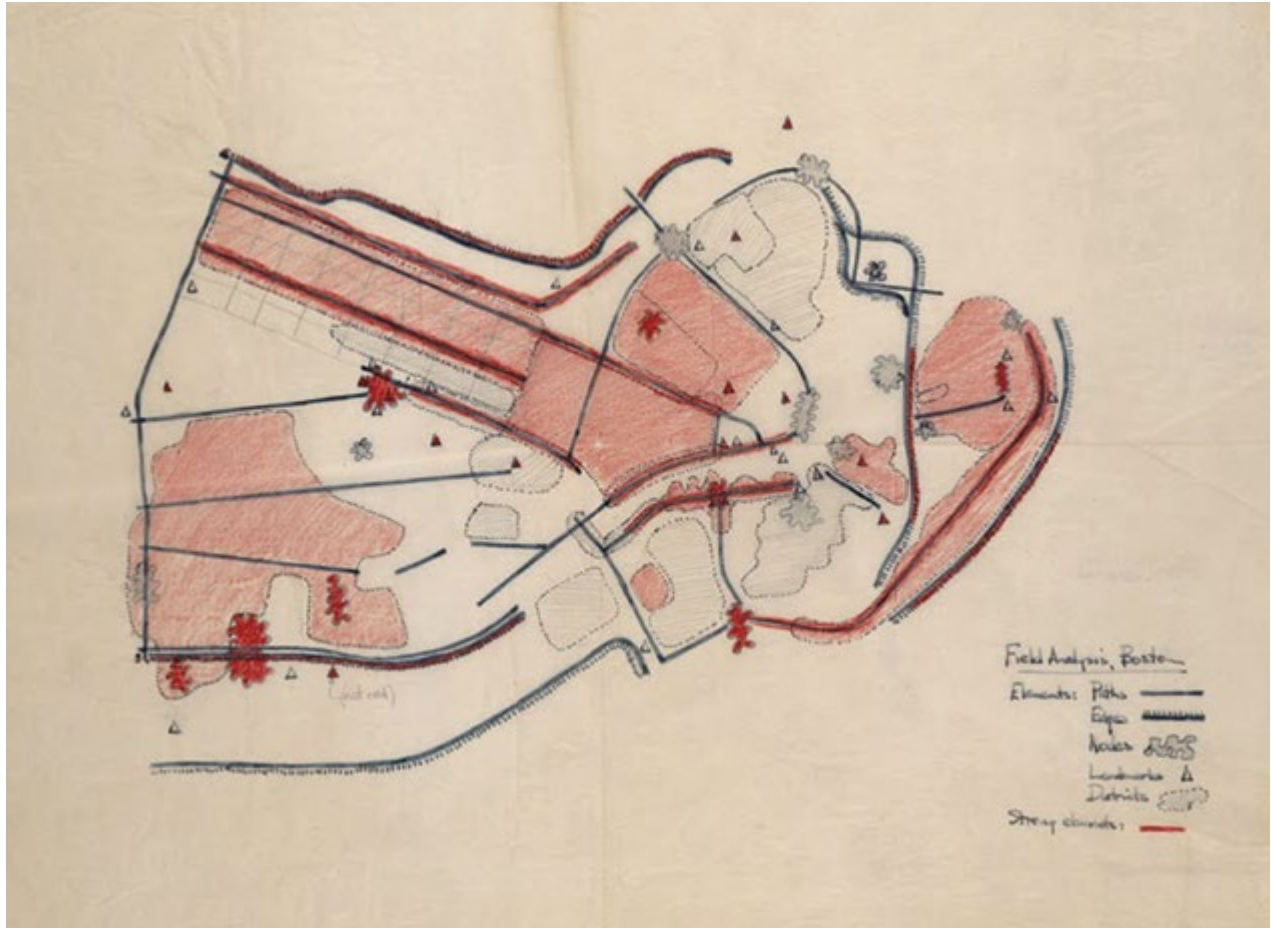
The context of the visualisations frequently matters more than the actual drawing themselves. The image embodies a range of ideas of the cities we have and the cities we need. Relationships between urban and rural areas vary depending on the degree of integration with the surroundings, with the latter typically addressed as a designed landscape within the overall depiction of a future urbanism.



COLLAGE CITY

Figure 28: Gordon Cullen, 'Designs for a pedestrian precinct incorporating Old Palace Yard and Parliament Square, Westminster, London', 1941, RIBA Library Drawings Collection.

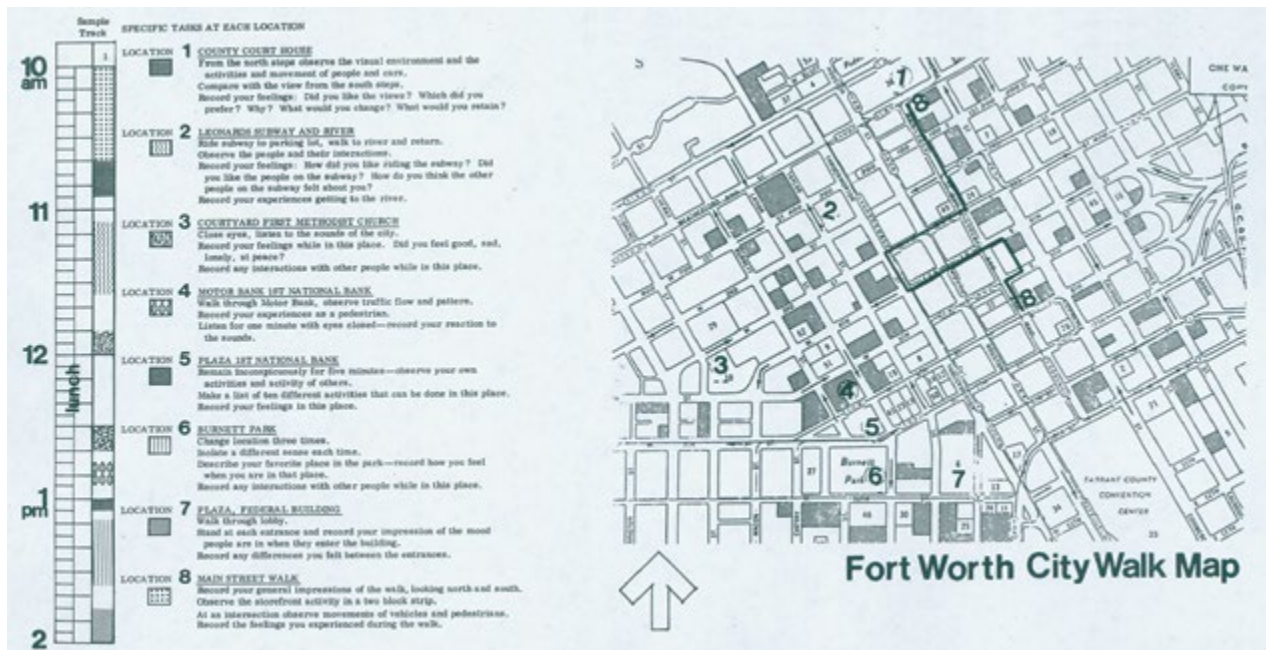
Cullen was an influential urban designer known for 'Serial Vision' a townscape visual mode of urban study, depicting human scale transition and effect in various urban patterns emphasising the genius loci. Cullen like Jane Jacobs (1961), Jay Appleton (1975) Phillip Thiel (1997) and Lawrence Halprin (1963) (Figure 30) use notation systems to describe the condition of the participant and their view of the city.



HAPTIC CITY

Figure 29: Kevin Lynch, Extract from *The Perceptual Form of the City, Boston, Massachusetts, 1954-1959*. Image courtesy of the MIT Archives. © Copyright 2014.

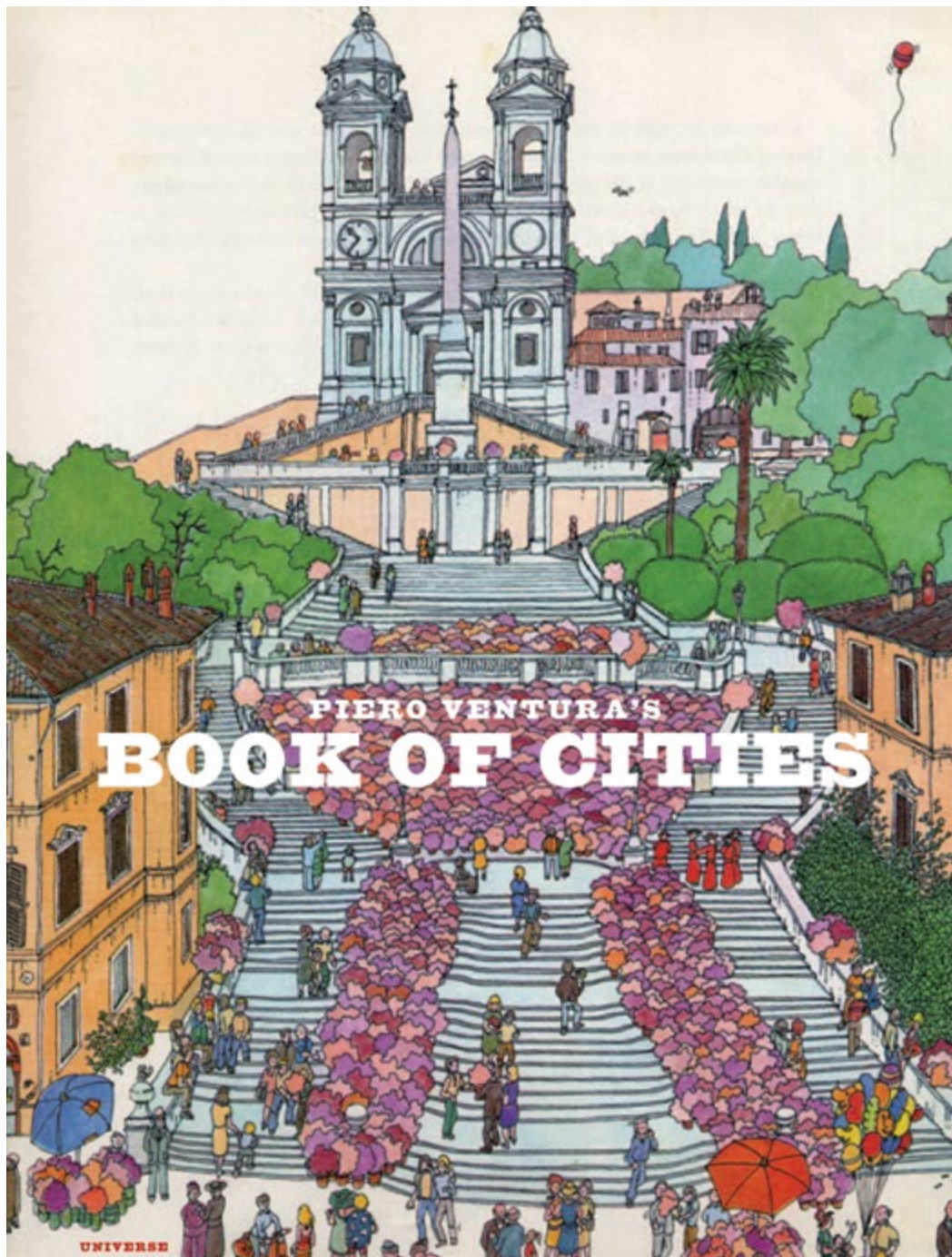
Lynch considered the visual information collected by city inhabitants and the mental maps formed. Using this information a representation of the city can be formed. Lynch is indicative of the development of environmental psychology and the visualisation of wayfinding and geography of the city as seen in the work Debord (1955) or Christian Nold (Harmon, 2003).



HAPTIC CITY

Figure 30: : Lawrence Halprin, Fort Worth City Walk Map and Score (AAUP; published in *Taking Part: A Workshop Approach to Collective Creativity*, 1974, pp. 78–79). © Lawrence Halprin Collection, The Architectural Archives, University of Pennsylvania.

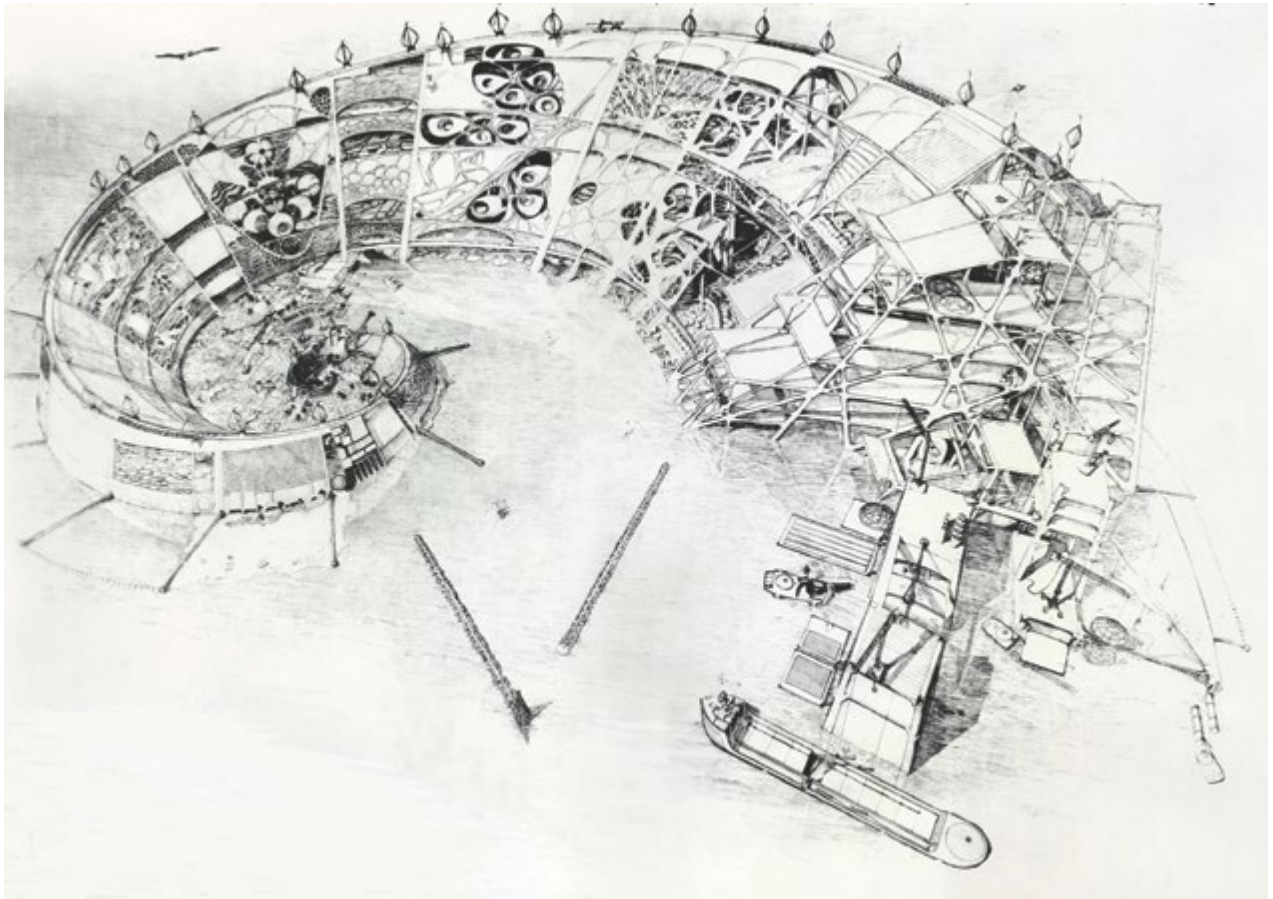
In Halprin's movement notation score participants are asked to describe and record their impressions of plazas and parks with specific tasks and time durations. The results are then compared and evaluated for similarity and experience of the city. This works sets and references a social practice, a performance in which the participant defines their relationship a two with place. These signs and complex symbols represent the code of the space, a code that is recoded in paper form and compared. These comparisons allows the study of the iterations and similarities of the participants; a sort of participatory urban rhythm.



COGNITIVE CITY

Figure 31: Piero Ventura, Book of Cities, 1st ed. Courtesy of Rizzoli Publishing, 1975.

Ventura's illustrated children's book depicts everyday life and social scenes across a range of cities from London to Hong Kong. Exploring eighteen different cities, their work places, transportation and entertainment the text is indicative of urban sketching and its perceived ability to capture people and street level urban dynamics.



FLOATING CITY

Figure 32: Newton Fallis, Autopia Ampere, 1978, Graphite on Paper, 92*145cm.
Image courtesy of Newton Fallis.

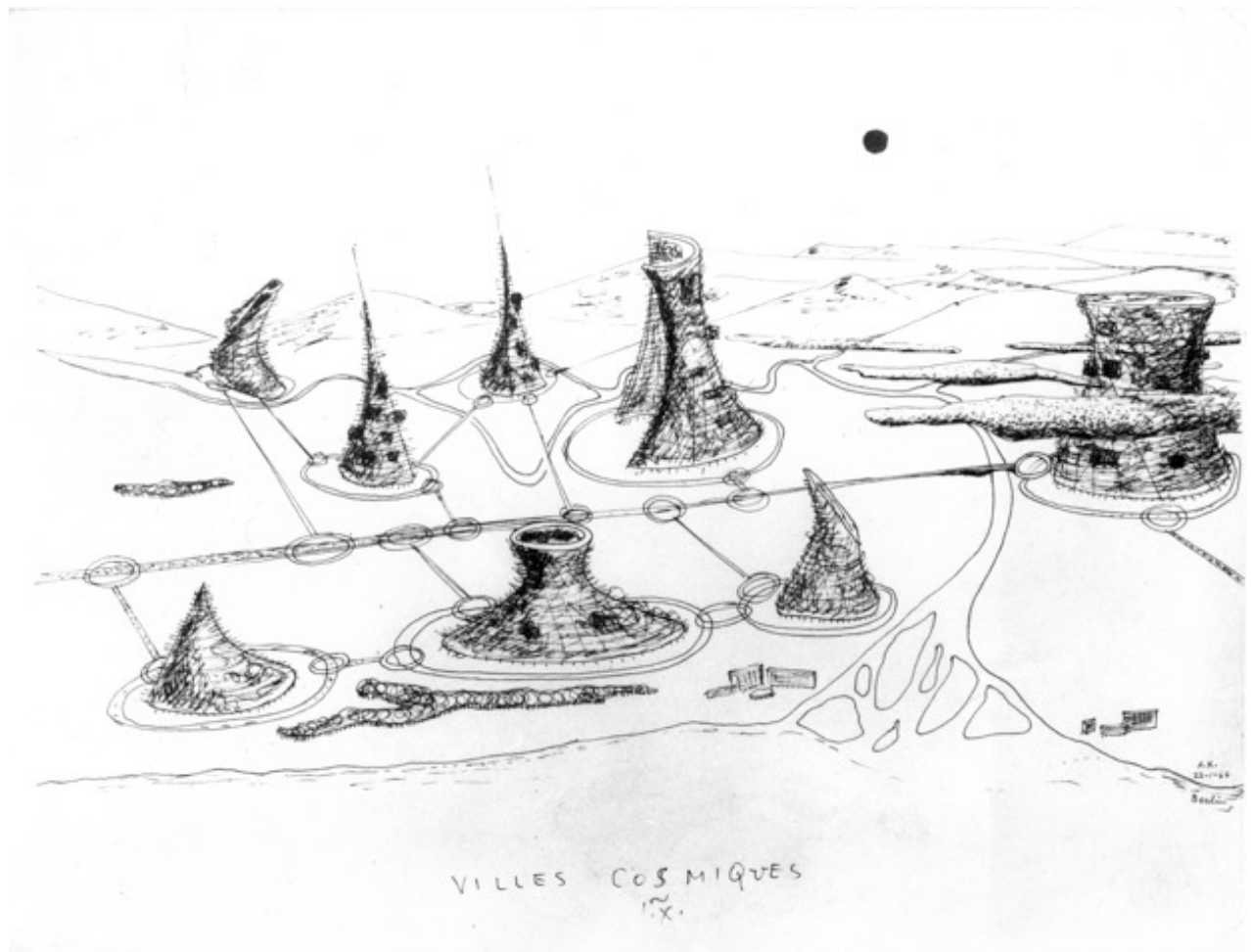
Autopia Ampere was the idea of the late seascape architect Wolf Hilbertz, with the coral scientist Dr Thomas Goreau, invented Biorock™ a mineral accretion technology which fast grows coral and repairs damaged reefs (Goreau 2003). Given the technological potential, Autopia was seen as a city grown from the sea which utilised cybernetics to evolutionary expand and support its inhabitants.



WATER CITY

Figure 33: Kenzo Tange, Plan for Tokyo Bay, 1960. Tange Associates. © Photograph Akio Kawasumi.

This ambitious proposal for a huge expansion to Tokyo was developed along Metabolist principles, using a central and infrastructural spine across the bay. Tange's intention was for the civic axis of business and government to be based along the spine and housing districts would grow perpendicular to it with connection to the core by a monorail system (Lin, 2010).



HAPTIC CITY

Figure 34: Iannis Xenakis, Cosmic City (aerial perspective), 1963, ink on paper, 8 3/4 x 11 3/4 inches, Courtesy Iannis Xenakis Archives, Bibliothèque nationale de France, Paris.

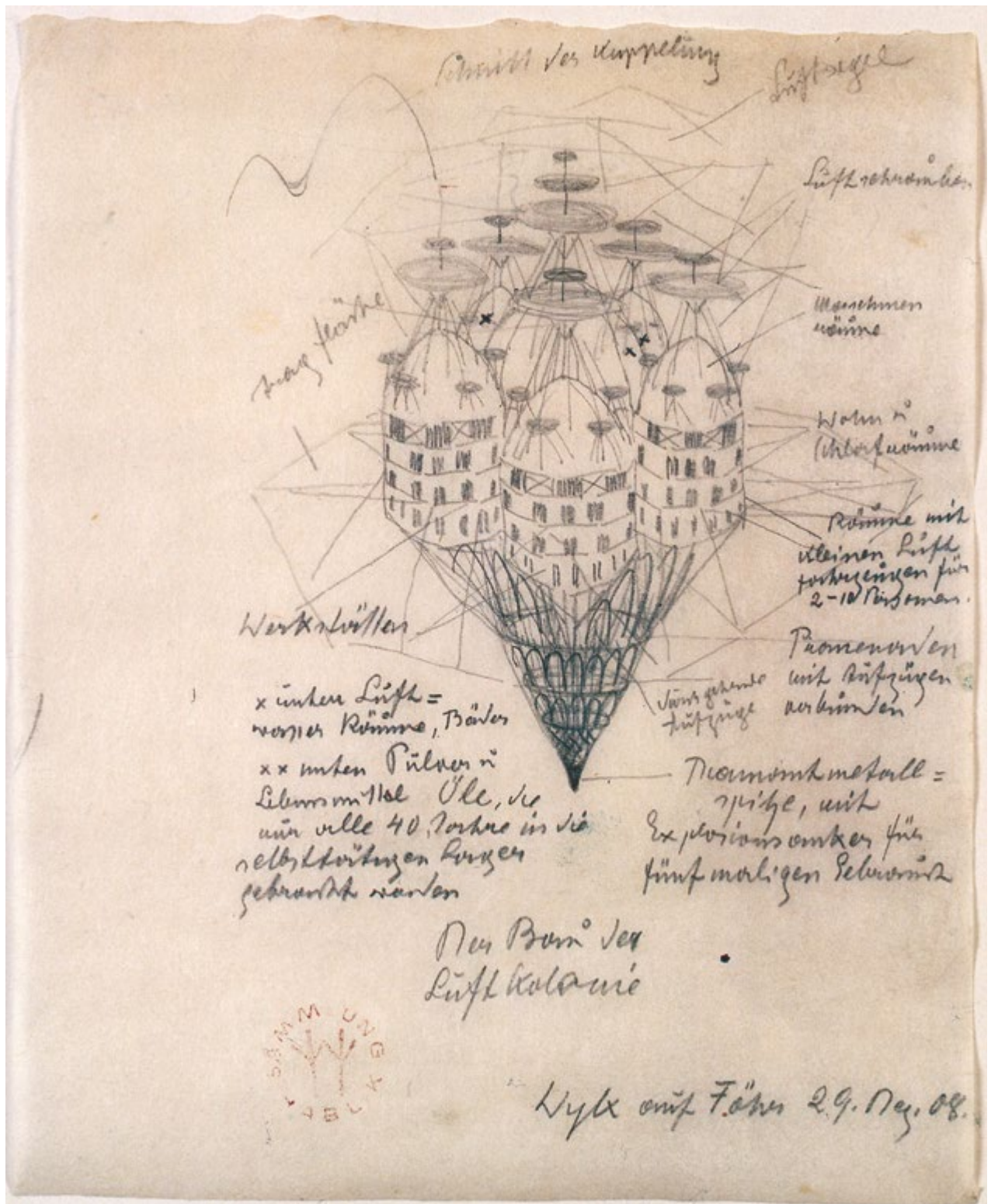
Iannis Xenakis, musician, engineer and architect, employs a series of experimental drawings that compose and score out installations and designs. In *Cosmic City* Xenakis draws an urban plan for five million inhabitants, like that of Paolo Soleri (1969) (Figure 44), fantastic super massive organic towers surrounded by wide unfettered landscape.



SPECTACLE CITY

Figure 35: Successive Works departments, and the Ancient Monuments Boards and Inspectorate, Festival of Britain aerial view, 1951. © National Archives.

Casson both a writer and architectural illustrator, was adept at human scale city views. The Dome of Discovery, London Southbank, to which Casson was director of architecture, was iconic of post war urban optimism and the embrace of modernist practices developing from the continent. Gordon Cullen also wrote of the planning principles for Southbank. Illustrated here, the festival complex literally brings light, colour and energy to the drab, post-war context of London, reinvigorating the Thames River in the process.



FLOATING CITY

Figure 36: Wenzel Hablik, Der Bau der Luftkolonie (Structure of a Colony Floating in the Air), 1908, Pencil, 22.5 x 18.1 cm. © Wenzel-Hablik-Foundation, Itzehoe.

Hablik informed by geology drew imaginative projections of floating cities similar to Laputa in Gulliver's Travels and later in the work of Hayao Miyazaki and Studio Ghibli.



VERTICAL CITY

Figure 37: SITE (Sculpture in the Environment, American, founded 1970) and James Wines, (1932-): Highrise of Homes, project, Exterior Perspective, 1981. New York, Museum of Modern Art (MoMA). Ink and charcoal on paper. 22 X 24 (55.9 X 61 cm).

Wines using a steel matrix in which villages are layered and dwellers shape the space to their own accord. Wines' project critiques the singularity of high-rise structures and presents a matrix of housing choices that evolve without planning (Wines, 1988, pp. 161–165).



WATER CITY

FLOATING CITY

Figure 38: Shimizu Corporation, Green Float, 2004. © Image Courtesy of Shimizu Corporation, 2014.

Green Float, concept developed by Shimizu Corporation, is an environmental island on the equatorial Pacific, a floating city on the ocean based on the idea of a city scale integrated ecosystem which utilizes advanced environmental technologies around the world to achieve a carbon negative system. The island employs the floating-type structure built at the sea with a bonded honeycomb structure from Magnesium alloy structural materials refined from sea water. The city is adaptable and expandable, which grows like a lily floating on the water, thus the city becomes rhizomatic. The environmental island vertically fulfils multiple needs from work, residence, a plant factory to recreation.



VICE CITY

Figure 39 Alfonso Cuarón, Children of Men, 2006, Courtesy of Universal Pictures. © All Rights Reserved 2014.

Almost the antithesis of Casson's Festival of Britain painting (Figure 35) this film, based on a P.D. James novel of the same name, depicts the context of a near-future Britain of 2027 wherein most of the world's societies have collapsed, all foreigners have been declared illegal immigrants and are rounded up by British military forces to be deported. This nihilistic extrapolation of last twentieth century urban conditions to depict a repressive regime has been pursued in numerous dystopian films including: *Dark City* (1998), *Code 46* (2003) and *V for Vendetta* (2006).

4. Technologies of Cities

“We are in pursuit of the new idea and vernacular language that could coexist with the space capsules, the computers, and the throwaway packages of an atomic/electronic era.” - Warren Chalk, Archigram 3, 1963.

In the UK, Archigram led the way for a newly-conceived, pop-art, technocratic collage for the future of cities that as Sadler (2005) has described suggested the dissolution of buildings. This reflected the increasing consumer society of post-war Britain, taking many of its cues from America: where household chores could be eased with modern appliances, personal mobility became widespread through cars, leisure time and do-it-yourself culture had evolved following the ‘make do and mend’ attitudes of the war years; so why not be able to buy your own house kit like an item from a supermarket? The service layers and infrastructures that appear in the visions of the latter decades of the twentieth century echo Reyner Banham’s (1984) thesis that architecture should integrate technology with human needs and environmental concerns. Similar values and perspectives were reflected internationally across various avant garde collectives such as Ant Farm in the US, Groupe International d’Architecture Prospective (GIAP) in France (Figures, 42 & 50), and Archizoom (Figure 46) and Superstudio in Italy (Lewallen & Seid, 2004; Busbea, 2007; Coles & Rossi, 2013).

Across this period a new optimism established new dominant visual paradigms for city space. Developments in building technology and codes acted as an agent to reform the city and establish these new dominant visual paradigms. The biome of Buckminster-Fuller based on Geodesic maths sought to rehouse Manhattan financial district to enable continuous operation and operation, a Trading City (Figure 40). David George Emmerich projected a dome framework for a polyfunctional habitat, a Cluster City (Figure 41). Influenced by Buckminster Fuller’s geodesic domes, Drop City projected an alternative city space of artisan living non-hierarchical space, a Collage City (Figure 42). Each example gave rise to new building form that would have a lasting impact on building technology. Future mobility was also visualised in transportation terms, evidenced in the future views of Manchester navigated by Helicopter, Manchester Helliport (Figure 43) visualising the possibilities of Sky Cities. Transportation and infrastructure was as much joined to the visual technological impulse.

These projections often envisaged city space of a vast time space. The work of Paolo Soleri (2001), sought a radical overhaul of urban sprawl by creating ecological mega structures limiting development, a habitat controlled Cyber City (Figure 44) (Soleri, 2001) whilst also establishing a urban laboratory in Arcosanti, Arizona to test his ideas. Similarly, concerns with habitation and ecology in the work of Chanéac, develops mobile cluster habitats completely reconfigurable (Figure 45). The repeatable pattern and Continuous City of Archizoom (Figure 46) is at stark contrast to the mega structure of Park Hill, Sheffield by Jack Lynn and Ivor Smith who were influenced by the Le Corbusier and the Smithsons (Figure 47). Terry Gilliam’s retro future film Brazil projects an Orwellian city in which the main protagonist cannot distinguish reality. Brazil is a highly disorientating city space; spatially the duct laden interiors and large-scale voids act to reinforce a feeling of incarceration in which a bizarre narrative takes place (Figure

48).

Such complexity of city form in comparison is posed as a more focused and realisable research question in the work of Terreform 1. Terreform 1 presents city visions that seek mass participation of citizens and disciplines in designing cities called urbanneering, a Smart City (Figure 49). The urbanneer is someone from any discipline who seeks to affect urban processes and their work engages in city experimentation and education. In the work of Walter Jonas' Intrapolis depicts dense superstructures as a constraint to urban sprawl, a Crossing City (Figure 50). The introverted funnel maximises landscape space and creates an interior community. Such architecturally led social conditions sought a radical revision to the uncontrolled city that Jonas foresaw.

The agency of building technology is not the only driver for city form, both in terms of the data sets that offer possibilities for infrastructure and city management but also in the ability of a digital city layer. Such visions to establish city identity using a technological impulse materialise in a simulation of a super mountain. The Berg (Figure 51) a massive central virtual mountain in Berlin, purely existing in the digital realm, acts as a symbol of the city character through its fanbase and belief in its simulation; the Berg acts as a monument which usually takes up space in other cities.

In comparison smaller scale technological experimentation in Quarmby's projects on biomorphism and green architecture utilised new technologies for the establishment of bio centric living and habitat. Whilst not a city scale, it presents possible future living scenarios, a Vertical City (Figure 52). Quarmby's green architecture work resulted in a number of sheltered houses in the United Kingdom. Such work, whilst technologically innovative, also reflects the ability of technology to create earth walls and free form, sprayed concrete structures, and revive the historic tradition of earth houses, particularly prevalent in Scotland. This mode of realised and projected habitats, projects a housing form reflective of its surroundings. Housing form is only a part of a city but designs of spaces for people demonstrate both sociological and societal concern of the city.

4.1 Summary

The relationship between technology and context of the city is intertwined. What is evident from the examples is the extent to which material experimentation and architectural lab cultures project from specific findings to more developed and open ended speculations. However, the relationship of these experimental cultures and built form with the complexity of the city remains difficult to gauge. Intentions within this section evidence more open morphometric architecture compared to early architectural modernism; the Layered City and Garden City that sought city stability (Hall, 1988). The technologies of the city projected in the visualisations sought new paradigms for the city in which it became more mobile, integrated with local site conditions and topography. This enabled further participation and developed its relationship with nature establishing the dominant paradigms of Ecological Cities, Informal Cities and Flexible Cities. These projections from contemporary conditions, by implication, have radical configurations on social structure and interrelationships for city spaces.

A key feature of many visualisations of future cities is an attempt to communicate

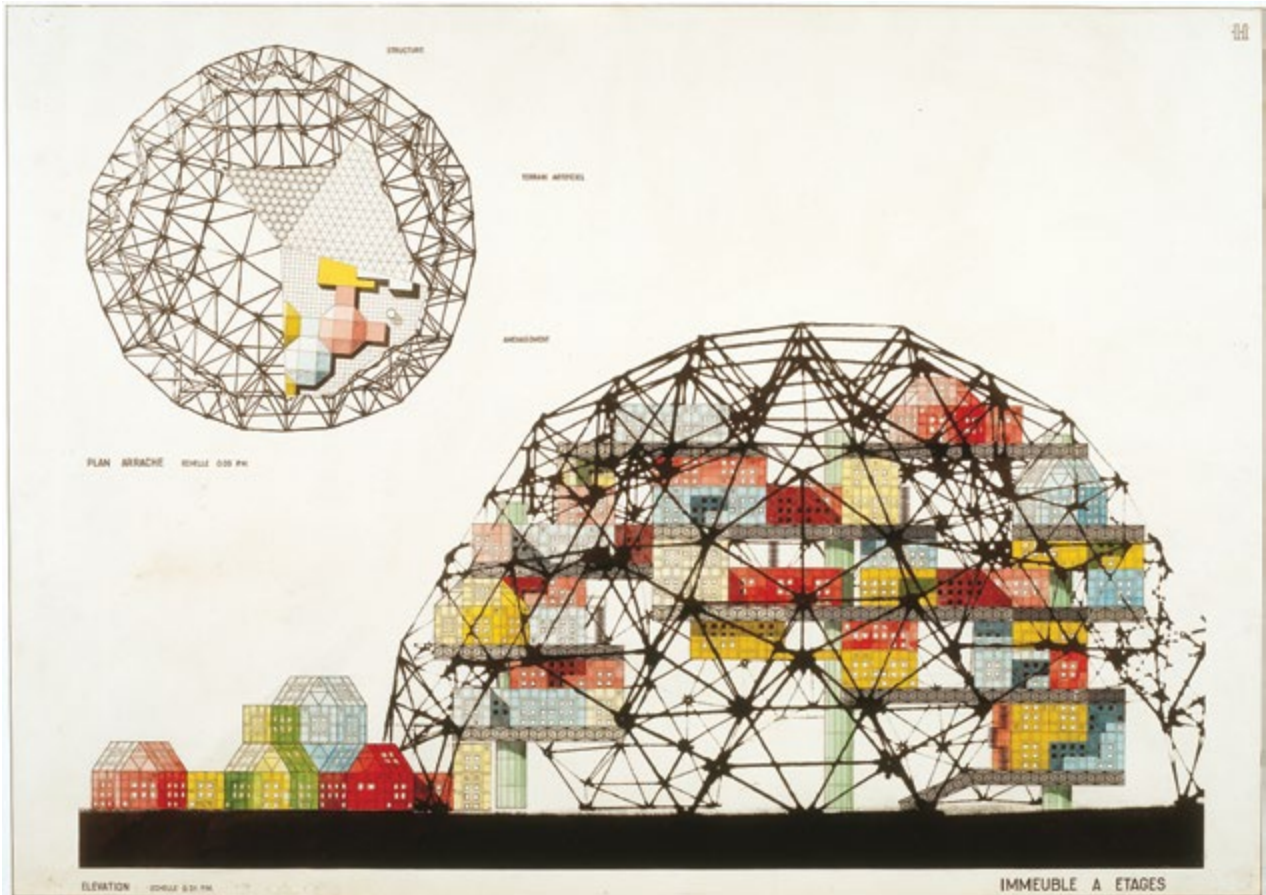
various forms of mobility both human and technological. In some cases this is achieved through a straightforward reordering, usually via separation, of current methods i.e. pedestrians, cars, trams etc. all given their own level. However, extrapolation of ground-based traffic systems is also a recurrent theme of future cities wherein flying vehicles, usually car-like, feature regularly (Figures 10, 16, 21). This idea first appears at the start of the twentieth century parallel to the development of skyscrapers so that flying vehicles are a logical means of accessing and moving around the vertical city. It is an enduring and provocative notion that has captivated numerous designers throughout the last hundred years and continues to find a basis in recent representations of future cities.



TRADING CITY

Figure 40: Buckminster Fuller, Dome over Manhattan, 1960. Courtesy, The Estate of R. Buckminster Fuller.

This project was one of Fuller's numerous domed visions for sustainable living. Seeking to address the wasteful nature of city life, the dome would maintain a stable climate and prevent exposure to the elements, enabling citizens to continue their lives without disruption.



CLUSTER CITY

Figure 41: David George Emmerich, 'Agglomération (sous une coupole stéréométrique)', 1958-1960, Encre sur papier, 75 x 105.5 cm, Photographie: François Lauginie, Collection FRAC Centre, Orléans.

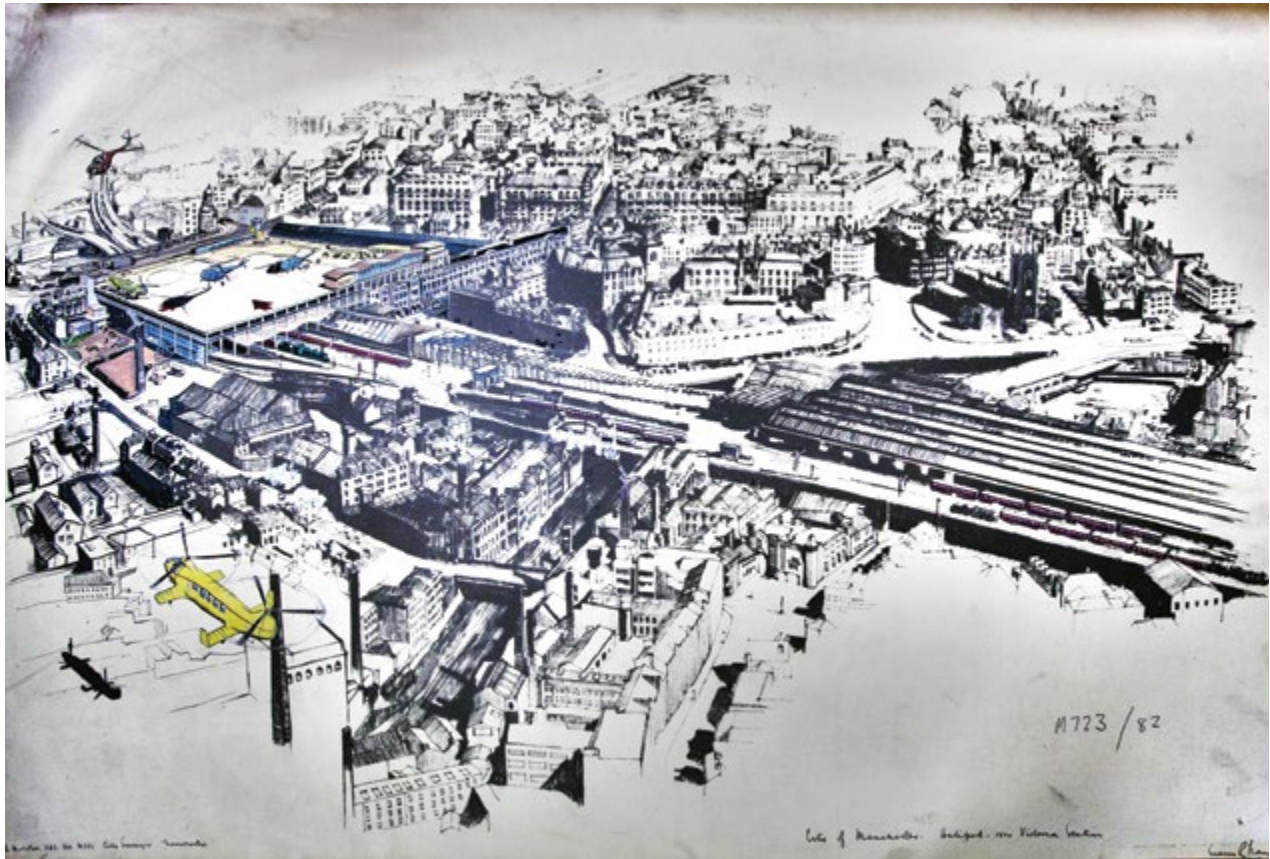
The structural tensegrity, developed by Konrad Wachsmann (1961) and Buckminster Fuller, was developed by Emmerich for polyfunctional organic habitats. Emmerich participated in CIAM. The possibilities of new material constructions offered inherent flexibility, to say that architecture was seen as a motive force of numerous ever-changing dynamics in one place.



COLLAGE CITY

Figure 42: Claire Rickert, Drop City, Photograph, 1965. Courtesy, Claire Rickert.

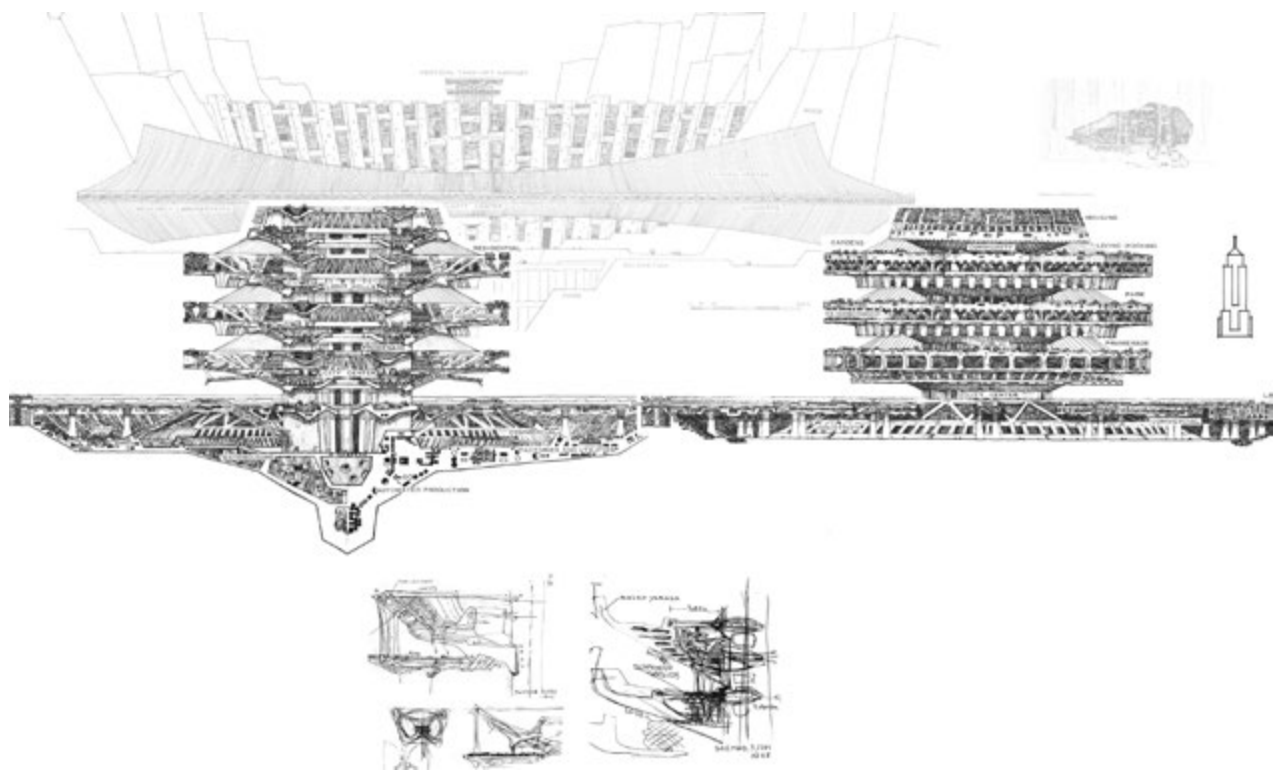
Drop City was an international commune set in Colorado lasting eight years. Utilising geodesic principles and tensegrity, the artisan inhabitants set a 'city' principle of non-hierarchical living and built domestic domes. Buckminster Fuller gave the inhabitants a Dymaxion award for their homes. Drop City inspired further communes and counter-culture living sites.



SKY CITY

Figure 43: : City of Manchester Heliport near Victoria Station, R. Nicholas, City Surveyor. Drawn by Sidney R. Fisher, 1956. © Manchester Archives.

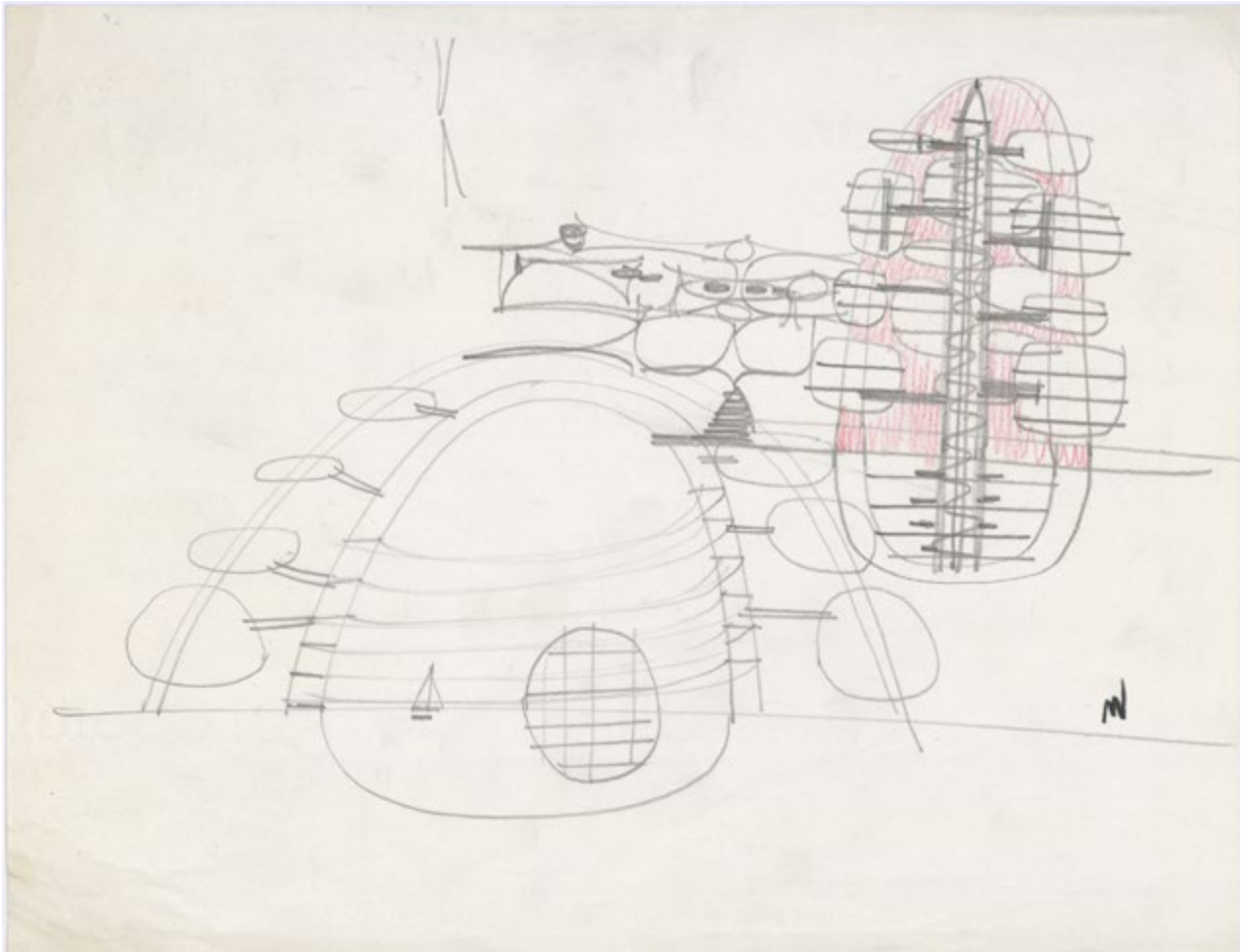
This perspective drawing is taken from an elevated position, further reinforcing the new layer of mobility afforded by the proposed addition of helicopters for quick journeys around the city centre. The addition of hand-drawn elements and gouache colour bring a vibrancy to the printed, preexisting black and white image of the city, illustrating the extensive technological change and new consumerism of the period.



CYBER CITY

Figure 44: Paolo Soleri, Babel IIB, Arcology: City in the Image of Man (MIT Press, 1969). © Cosanti Foundation.

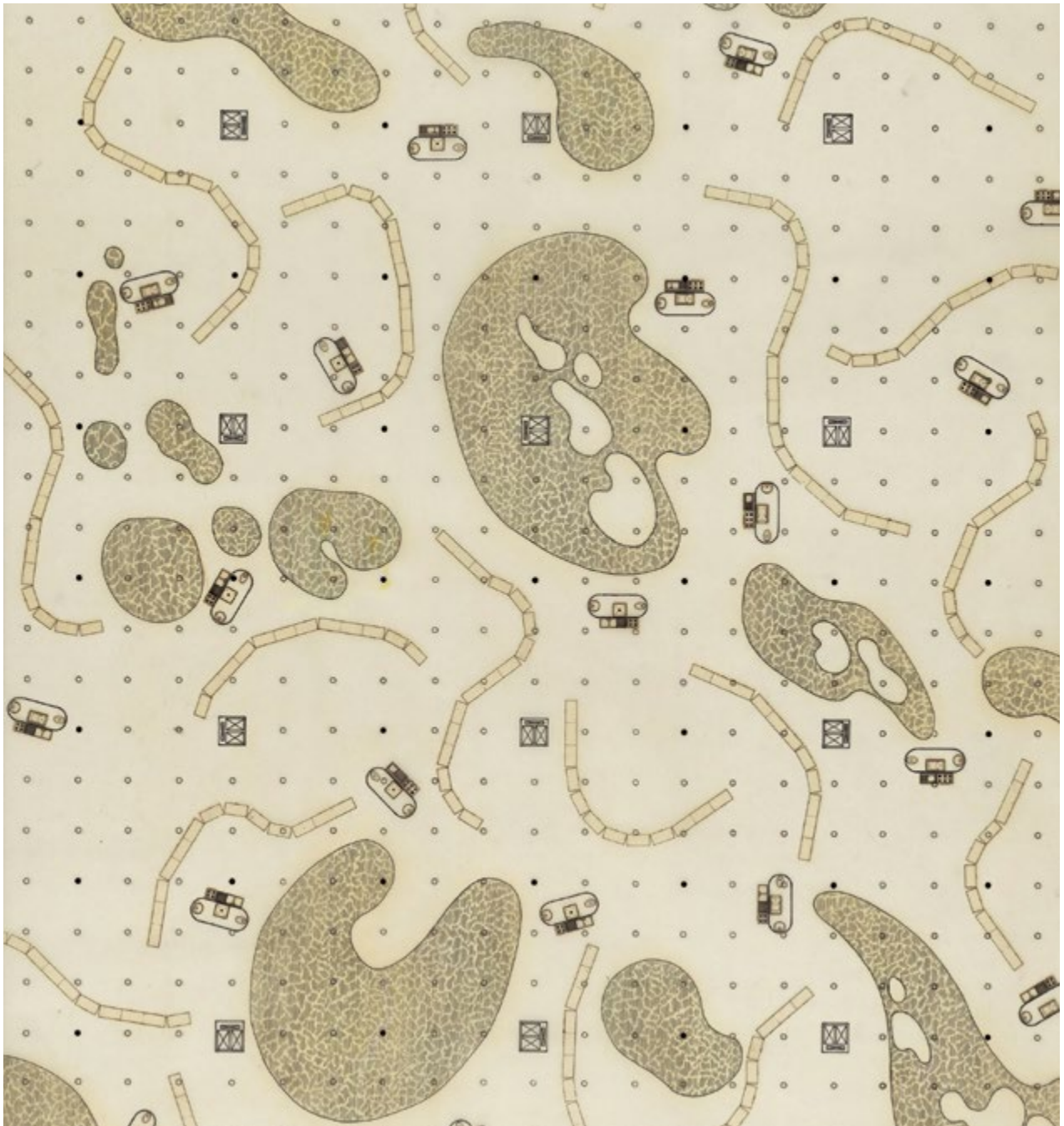
Soleri visualises the idea of arcologies or ecological architecture – this is the definition of urban structures so dense as to host life, work, education, culture, leisure and health for hundreds of thousands of people per square mile. This miniaturized city is intended as an anti-consumptive force and a city form that is the only choice compared to pathological sprawl and environmental destruction. BABEL IIB Arcology is designed for a population of 520,000, and a density of 662/hectare, with a height of 1,050 meters. Vertical shafts carry a vertical transportation system. Anchored to the shafts are the platform-grounds of the city: at the periphery, are residential spaces; in the medial belt, gardens and waste processing plants; toward the center, civil facilities and work. The top platform-ground is for cultural institutions: schools, labs, studios, theaters, libraries. At the ground is a system of parks, gardens, and playgrounds which altogether make up a hyper structure.



CLUSTER CITY

Figure 45: Jean-Louis Chanéac, 'Architecture mégalithique', circa 1964-74, Encre, crayon graphite et crayon de couleur sur papier, 21 x 27 cm, Collection FRAC Centre, Orléans, Donation Nelly Chanéac.

Chanéac proposed living movable cells for living that can be adapted to the environment whilst also accommodating a high density populace. Chanéac ideas resonate in the work Hablik (1908) (Figure 36) Soleri (1969) (Figure 44), Quarmby (1962) (Figure 52) and MVRDV's China Hills project (2009).



CONTINUOUS CITY

Figure 46: Andrea Branzi (b. 1938): Residential Park, No-Stop City, project plan, 1969. New York, Museum of Modern Art (MoMA). Ink, cut and pasted self-adhesive polymer sheet, 39 1/4 X 27 3/8 (99.7 X 69.5cm). Gift of the Howard Gillman Foundation.

Proposed as the ultimate consumer-driven urban landscape, the project is an instrument of emancipation via its blankness and featurelessness, allowing us to be anyone anywhere and anytime. The future city illustrated here questions the traditional and prevalent view of urban form and growth by taking the spatial logistics of the supermarket and factory to create an infinitely repeatable pattern of anonymous structures.



CONTINUOUS CITY

Figure 47: Jack Lynn and Ivor Smith, Hawkins Brown, Studio Egret West, J. L. Womersley, Park Hill Estate, Sheffield, 'The children's play area at the south end of the site', 1961, Architectural Press Archive / RIBA Library Photographs Collection.

With reference to Le Corbusier, and the Smithsons, principles of layered architecture and sky walks materialised in the Brutalism of Park Hill. Subject to degeneration, has been part retrofitted by Urban Splash.



CYBER CITY

Figure 48: Terry Gilliam, Brazil, 1985, Embassy International Pictures.

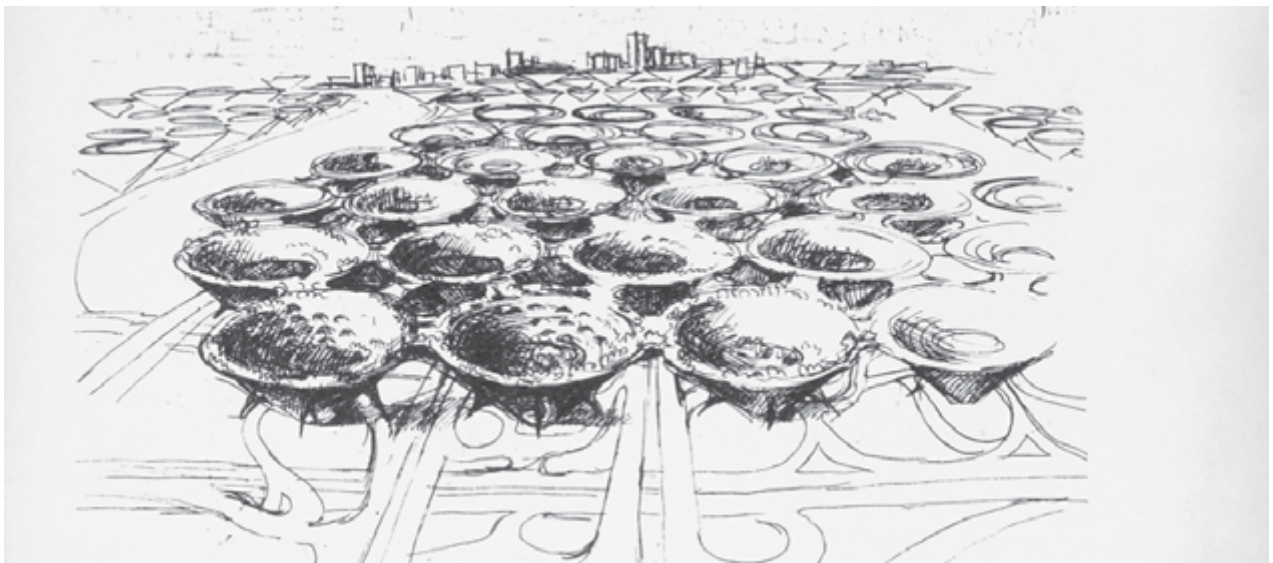
Part contemporary critique of high-tech architecture Pompidou Centre and the incoming Lloyds Building, Gilliam's film attunes bureaucracy and consumerism taken to the point of absurdity, coupled with wanton service layers that result in the demolition of an apartment in order to be 'fixed'. The pressure on space and services in the modern future city is pushed to the extreme where fantastical dreams offer the protagonist the only respite.



SMART CITY

Figure 49: Terreform 1, Urbaneeing Red Hook Brooklyn and Governors Island, 2010. Courtesy, Terreform 1.

Using unsolicited feasibility studies and master planning for cities, the non-profit multidisciplinary research team functions as urbaneeers. Terreform 1 present multi-layered sustainable city visions with community involvement.



CROSSING CITY

Figure 50: Walter Jonas, Intrapolis, 1958, © Stiftung Walter und Rosa Maria Jonas.

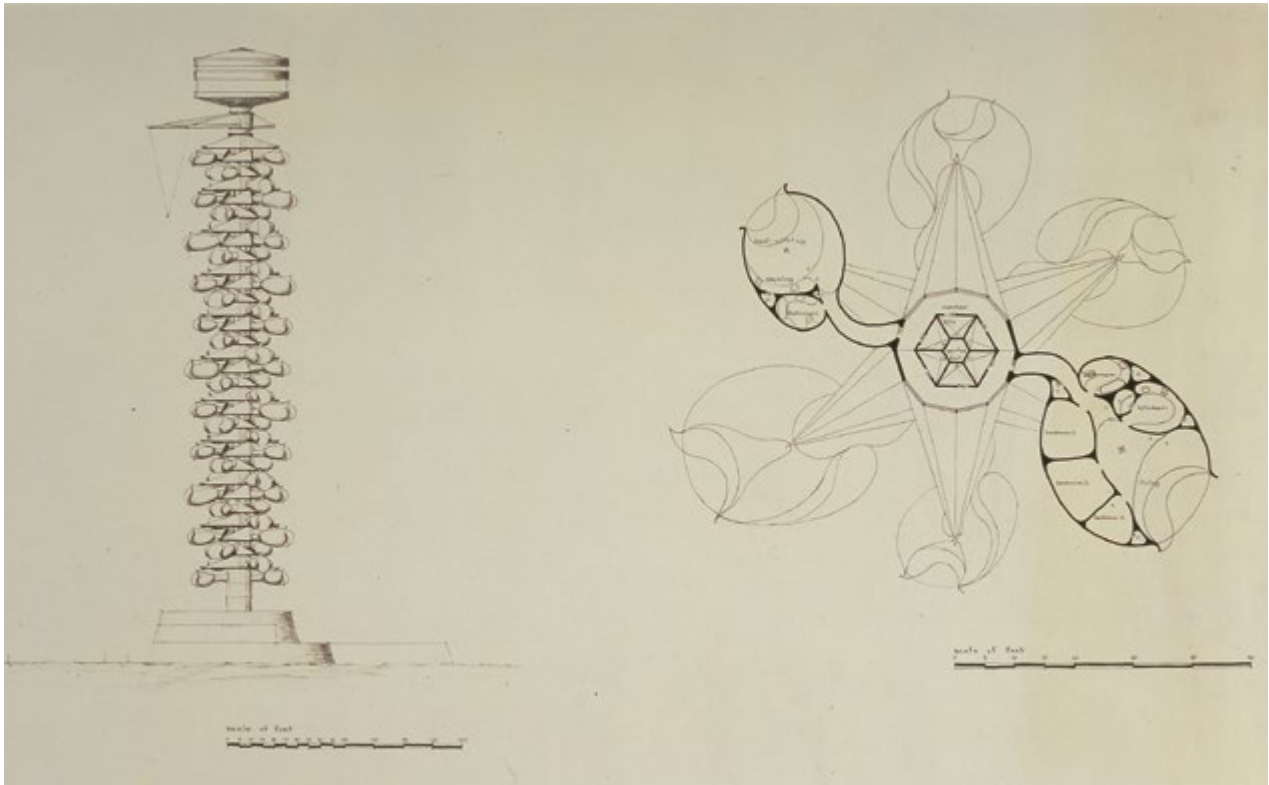
Working against a perception of turbulent urban development, Intrapolis is a city inverted in which homes and living space are located in the funnel forms and services located on the outer layer. Jonas formed GIAP with Yona Friedmann (Figure 54) and Ional Schien in 1967. The idea of using superstructures as a constraint to urban expansion appears more vehemently in the work of Paolo Soleri (Figure 44).



DIVIDED CITY

Figure 51: Mila & Jakob Tigges, The Berg, Berlin, 2009. Courtesy, Mila / Jakob Tigges.

The Berg is a multi-layered infrastructure project proposed at Tempelhof airport in Berlin, Germany. Intended as a unitary design idea engaging the populace, rather than a specific city work. The 1000 metre man made mountain acts as an alternative symbol to skyscrapers and city identity. The Berg is a simulation of architectural monuments defining city identity.



VERTICAL CITY

Figure 52: Arthur Quarmby, 'Corn on the Cob', 1962, Tirage sur papier, 42 x 71 cm, Photographie: François Lauginie, Collection FRAC Centre, Orléans.

Using lightweight plastics and modular systems, Quarmby, part of GIAP researched mobile architecture (contemporaneous with the work of: Ant Farm, Jungmann and Cedric Price to name a few). As early as 1970 Quarmby announced 'Green Architecture' and biomorphism. Whilst not designing at city scale, Quarmby's work presented new living conditions projected from technological developments.

5. Socialities of Cities

“Participation and activity are essential factors in a city. One can be a passive spectator in the enjoyment of other arts, but the essential characteristic of the city as an art form is that it demands participation” (Halprin 1963, p.193).

An important feature of many visualisations of future cities is their liveability, i.e. how do people appear to live in the city, how are they interacting, socialising etc. and what is their relationship to the built environment and transport. In some cases, the visions are notable for their absence of people either as a result of global catastrophe or hermetic and capsular existence. Furthermore, in those depictions of urban life and social behaviour there are democratic, equitable, vernacular and courteous scenarios as well as examples of evidencing division, inequality and volatility. These visions are also intertwined with contextual and technological scenarios.

These variations can be seen in Massimo Scolari’s work, which questions architectural representation between real physicality and habitation and imagination, a Desert City (Figure 53) (Scolari et al., 2012). Such a dream city space is markedly different to Yona Friedmann’s architectural infrastructure which supports a poly nucleic habitat, a Crossing City, which creates a dynamic between individualised identities and whole city identities (Figure 54). Friedmann’s work championed individual freedoms for constructing spaces to their own image whilst maintain environmental responsibility. Such visions of social relations have appeared dystopian in Kubrick’s Clockwork Orange, a Vice City, (Figure 55) set prominently on the Thames Mead estate, South East London, designed with elevated walkways, brutalism and vertical living, now subject to urban regeneration. Further futuristic scenes were shot at Friar’s Walk in Aylesbury another modernist development (1967) but were omitted.

Walter Christaller’s work based ideas of Crossing Cities, that cities are connected economic agents and tend to form in specific geometrics that service other areas (Figure 56). Called ‘Central Place Theory’, Christaller attempted to evidence reasons for city and town distribution and scale and concluded that cities form was largely economic. Such work diagnosing urban patterns has been developed, though it is based on a geometrical static of place. In comparison, Hans Rucker’s DIY Cities function as temporary mobile architecture; in this case Palm Tree Island alters perceptions of space through a temporary dome oasis (Figure 57). Spatial socialities of apartheid feature based on District Six, Cape Town in the sci-fi film District 9. Social integration is deemed but impossible and the city is divided by xenophobia of the stranded alien visitors (Figure 58). Ginzburg’s Palace of the Soviets, creates a sociality of Vladimir Lenin’s communist politics and monument to government (Figure 59) which leaves little space for polyfunctional uses. Like Speer’s Germania (Figure 8) Ginzburg creates a politicised space.

Domenig and Huth’s megastructure Space City figures architecture as a social agent through a giant frame mesh in which dwellers shape its interiors (Figure 60). Whilst such megastructures make space for complex social relations, Nigel Coates Ecstacity (2003), devised a method for city representation and its heterogeneous spaces; a contemporary

urban drift and collection of the visceral in collage (Figure 61) (Coates, 2003). In comparison Atelier Bow-Wow creates city typologies and investigates peculiar micro spaces of cities for transformation (Figure 62). The studio seeks to create social and interactive spaces even from the most minimal of site.

Andrew Mahaddie's Cow Common Canyon, based on a brownfield site, links the city of Milton Keynes through a monorail to a recreational space, which caters for various leisure pursuits; whilst also creating an iconic colossus to which the space can be identified from great distance (Figure 63). Originally visioned as a 'Forest City', Milton Keynes based on a grid system derived from urban theorist Melvin Webber, would devote twenty percent of each grid square to green space. Such monumentality and city vision can be seen in a renewable vision of a zero city – a zero waste city by Diana Balmori (Figure 64) in which the city functions as an ecosystem (Balmori & Conan, 2010, pp. 206–214). Such work on Ecological Cities also emerges in Foster & Partners Masdar development (Figure 65).

5.1 Summary

The visualisations of the social structures of cities have revealed certain organisational forms that give rise to utopian and dystopian modes. This is most evident post World War Two, in which a utopian modernist optimism, later developing into visual critique, as in the case of the Thamesmead estate in a Clockwork Orange (Kubrick, 1971) (Figure 55) or the singularly politicised space of Ginzburg (Figure 59). Socialities depicted range from relatively pictorial illustrations of civic life toward less humane characteristics wherein the city portrayed emphasises segregation, controlled or chaotic environs that lack details of inhabitation. Urban life may be celebrated, subsumed or entirely stifled depending on the nature of the project, with the less fantastical visions for cities keen to demonstrate their civility rather than a dystopian setting. Indeed, as Doreen Massey (1994: p.163) has observed, “for amid the Ridley Scott images of world cities, the writing about skyscraper fortresses, the Baudrillard visions of hyperspace . . . most people actually still live in places like Harlesden or West Brom.”

Perhaps, therefore, the most obvious issue when examining future city visions with regard social life is the typical lack of people. This is often borne of the image construction itself, for example: wide perspectives or aerial views that seek to communicate the overall urban schema rather than a more human-scale view. One possible explanation for this is that the level of reconstruction and scale of new developments required was so significant after world war two that architects, designers and artists often sought embody and communicate a holistic vision rather than a street-scale one. However, there is an identifiable thread of more civically and socially engaged visualisations which in recent years have become more pronounced as it is understood that the street-level urbanism promoted by Bentley et al. (1985) is a vital part of what constitutes good quality urban conditions.

The dominant city paradigm of the period was the Layered City. Some of these megastructures failed to adapt to the particular set of British socialites evident in Cumbernauld town centre or Harlow New Town and its inward facing spatial plan. However this specific period gives rise to new social relations and an interest in the

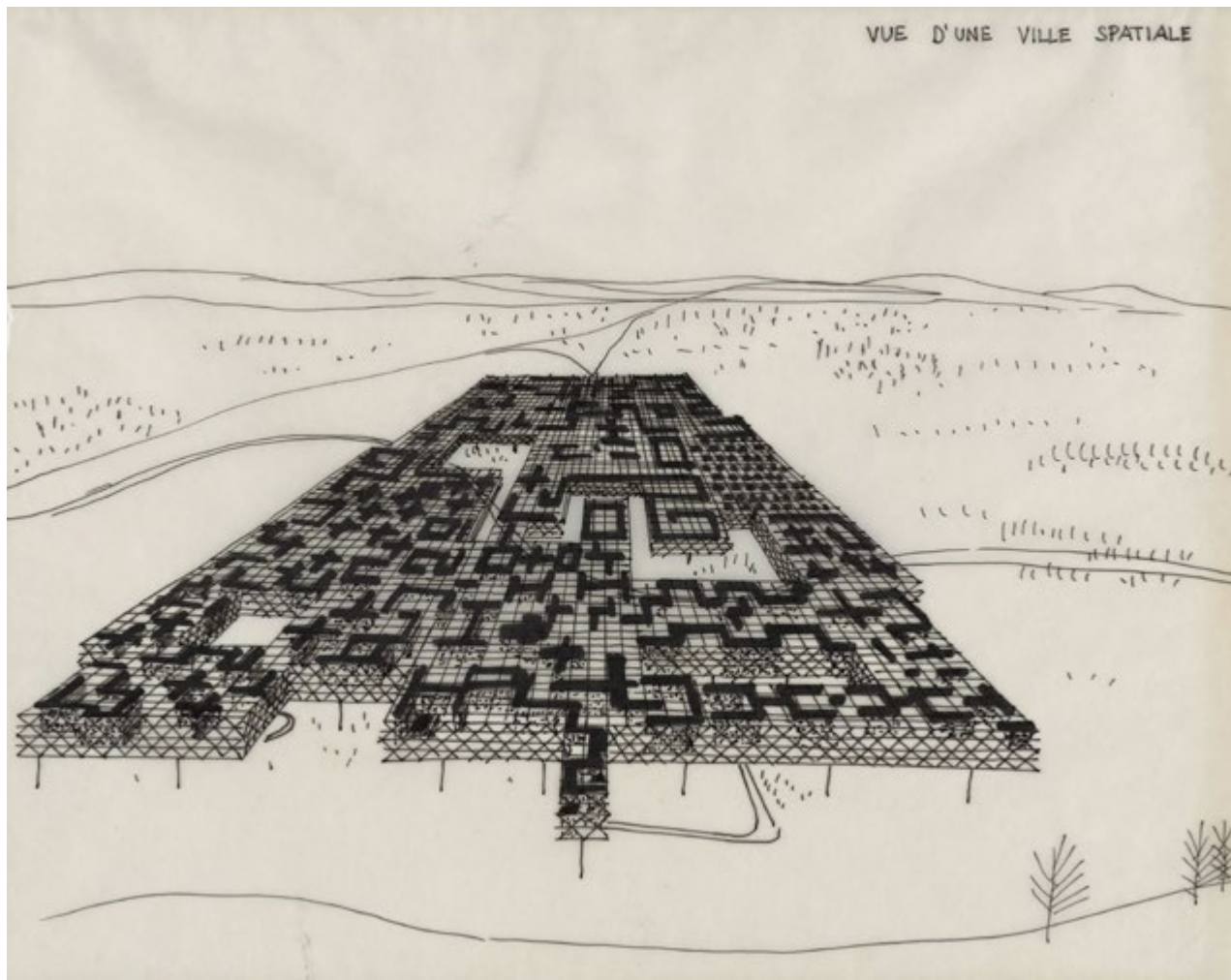
visualisations of more Hybrid and Ecological Cities, which create space for the various layered sociological geographies that take place.



DESERT CITY

Figure 53: Massimo Scolari, The Pilot of the Labyrinth, 1978, watercolor on cardboard, 18 x 13 cm (ca. 7 x 5 in). Courtesy, Massimo Scolari.

Scolari's paintings question the relationship between the physicality of architecture and the representation of architecture. In the city context, Scolari presents monolithic architecture set within vast expanses navigable by air.



CROSSING CITY

Figure 54: Friedman, Yona (b. 1923): Spatial City, project, Aerial perspective, 1958. New York, Museum of Modern Art (MoMA). Ink on tracing paper, 8 3/8 x 10 3/4' (21.3 x 27.3cm). Gift of the Howard Gillman Foundation.

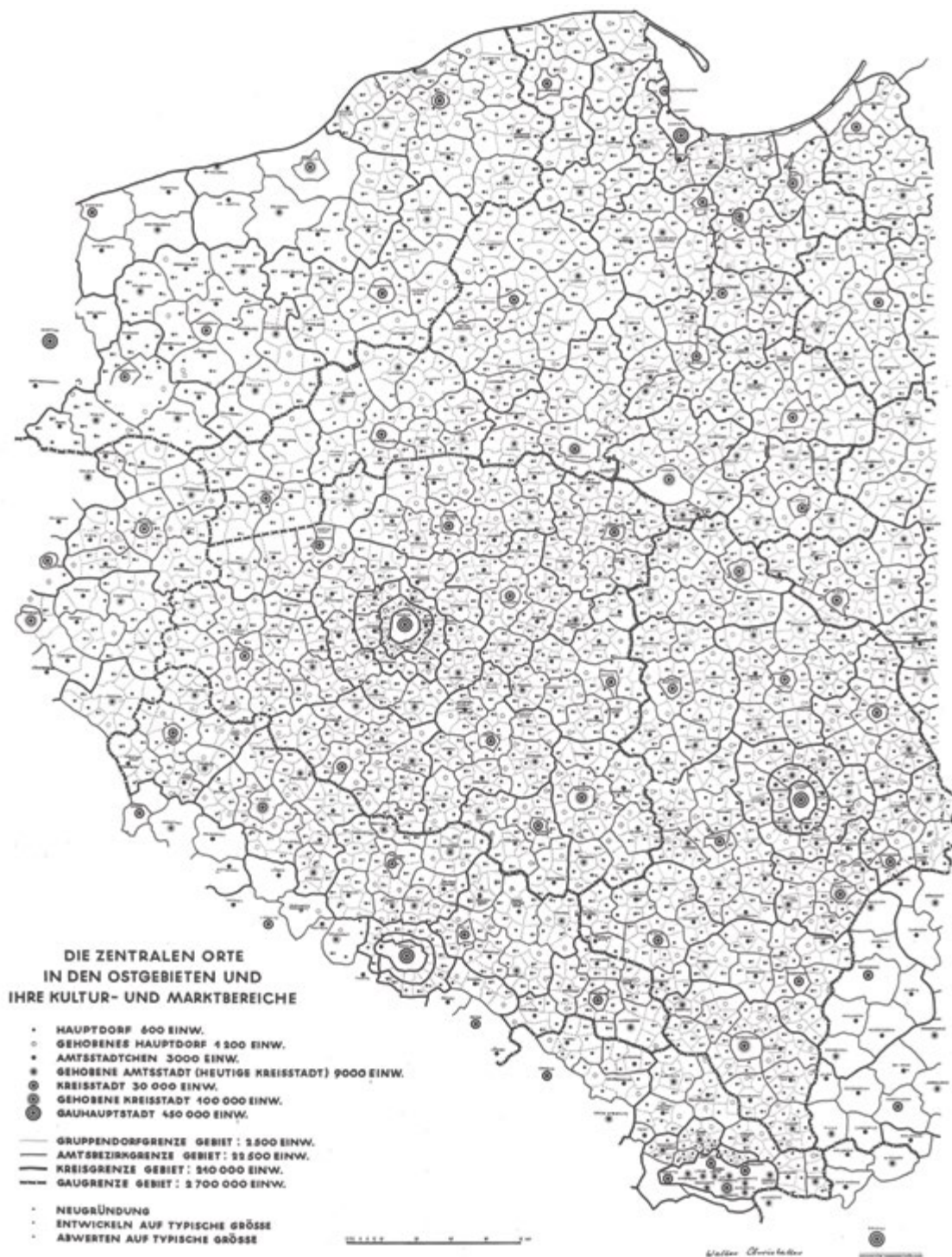
Friedmann projected city visions of a framework architectural mega structure to which the inhabitants customised. Friedmann was connected to Emmerich (Figure 41) and the work has close proximity to Constant's New Babylon (Figure 7). Friedmann's fixed infrastructure supports a mobile architecture and reflective citizen identity.



VICE CITY

Figure 55: A Clockwork Orange, directed by Stanley Kubrick, © Warner Bros.

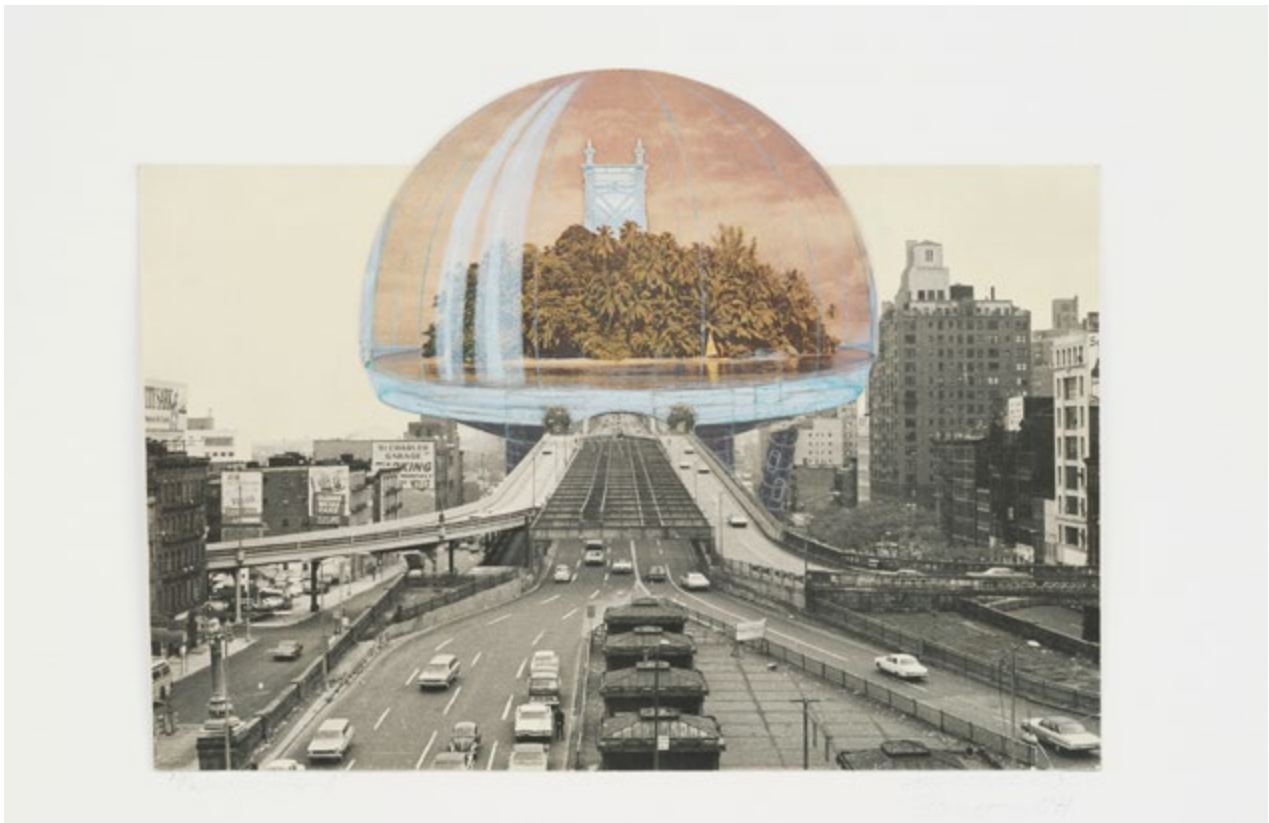
A Clockwork Orange (1971) presents a dystopian view of social upheaval and gang violence and delinquency. The backdrop of political and psychological rehabilitation of the gangs after a series of crimes sits between the Huxley's (1932) Brave New World and Orwell's (1949) 1984 control narratives.



CROSSING CITY

Figure 56: Walter Christaller, Settlement patterns in Eastern Europe, 1941. © Die Zentralen Orte in den Ostgebieten und ihre Kultur- und Marktbereiche. Struktur und Gestaltung der Zentralen Orte des Deutschen Ostens, Teil 1. Leipzig: K. F. Koehler Verlag.

Christaller's contribution to Central Place Theory (1933) created the conception of networked cities rather than single entities. The theory and visualisations change our understanding of the city as settlements that provide services to surrounding areas.



DIY CITY

Figure 57: Haus-Rucker-Co (Austria, established 1967-1992): Palmtree Island (Oasis) Project, New York, New York. Perspective, 1971. New York, Museum of Modern Art (MoMA). Cut-and-pasted printed paper with gouache and graphite and cut-and-pasted painted paper on silver gelatin photograph on board, 19 3/4 x 29 5/8" (50.2 x 75.2 cm). Wendy Evans Joseph Purchase Fund.

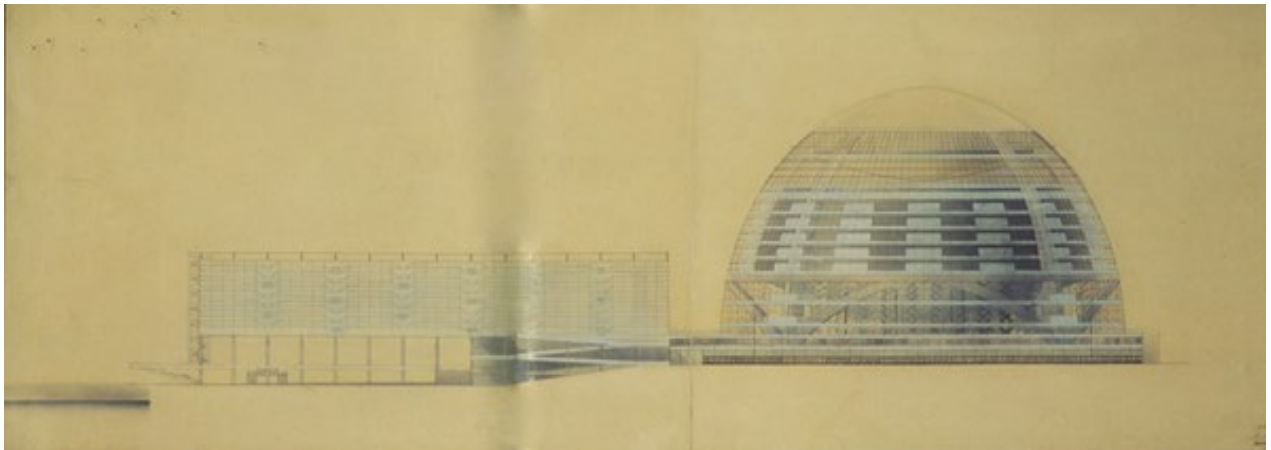
This project is emblematic of their work, exploring the performative potential of architecture through installations and happenings using pneumatic structures or prosthetic devices that altered perceptions of space.



DIVIDED CITY

Figure 58: Still from District 9, Directed by Neill Blomkamp, 2009. © Wingnut Films Productions Limited.

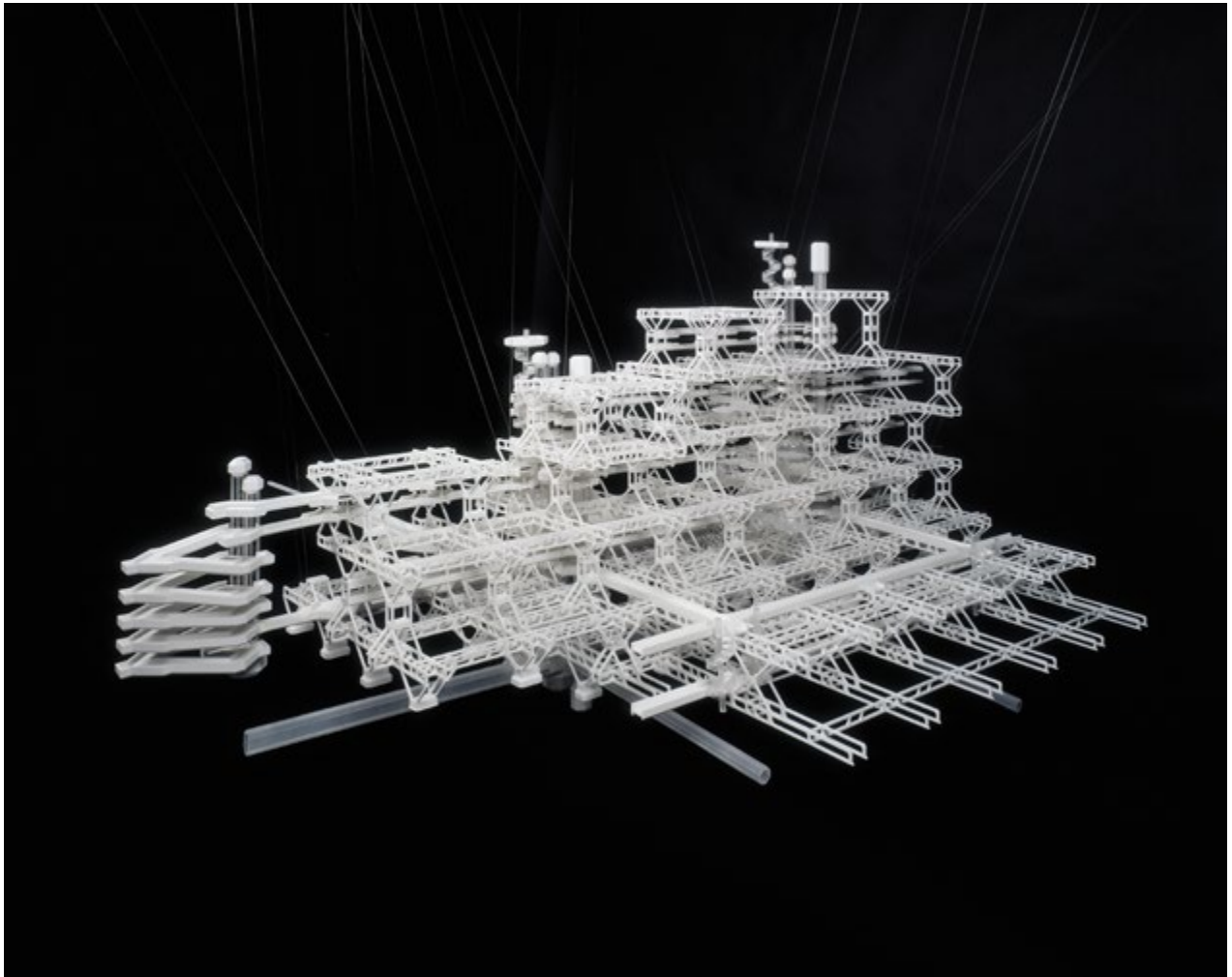
Set in an alternate 1982, the film combines an allegory for apartheid with special effects to emphasise the significant differences in social status between the humans and aliens and the inability of bureaucratic systems to address this (Blomkamp, 2009).



VERTICAL CITY

Figure 59: Moisei Ginzburg and Gustav Hassenpflug VI Nemirovich-Danchenko Theater, Competition project, unexecuted, Moscow, 1933. © Schusev State Museum of Architecture, Russia.

Ginzburg created a proposal for the Palace of Soviets, notably Le Corbusier and Gropius, produced an entry. The palace was the centre piece for a masterplan for Moscow monumental modernist architecture as state apparatus.



SPACE CITY

Figure 60: Günther Domenig & Eilfried Huth, 'Überbauung Ragnitz', 1969-2001, maquette, Plastique, plexiglas, peinture, 110 x 180 x 105 cm, Photographie: Philippe Magnon, Collection FRAC Centre, Orléans.

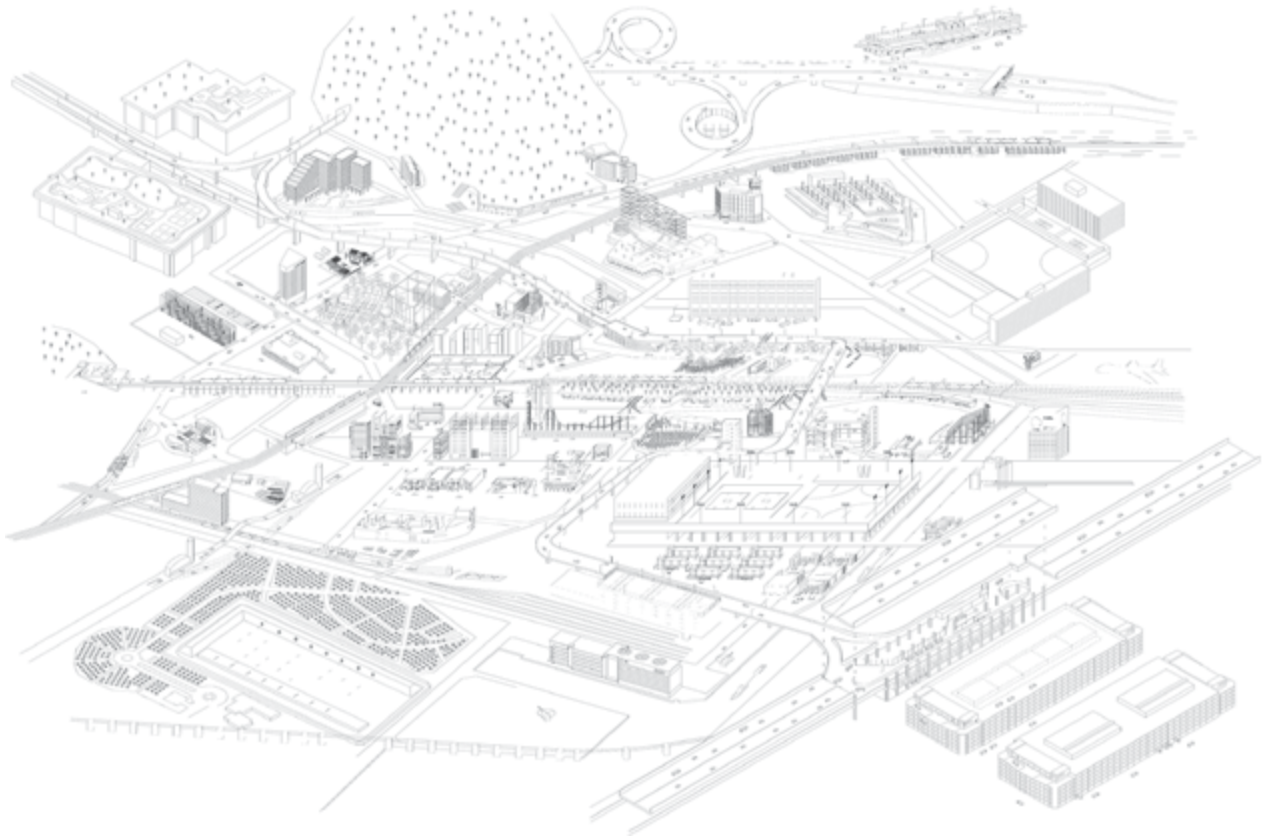
Günther Domenig Eilfried Huth and win the contest Urbanism and Architecture in Cannes with a proposed megastructure developed in 1963 for the city of Ragnitz Austria. Überbauung Ragnitz is a megastructure project, which constrains urban sprawl and provides a framework for social relations. This expandability, modularity, and freedom of city planning is realised through the open frame.



MEDIA CITY

Figure 61: Nigel Coates, 'Gamma Tokyo', 1985, Crayon graphite, collage, photomontage et pastel sur calque contrecollé sur papier, 42 x 59.4 cm, Photographie: François Lauginie, Collection FRAC Centre, Orléans.

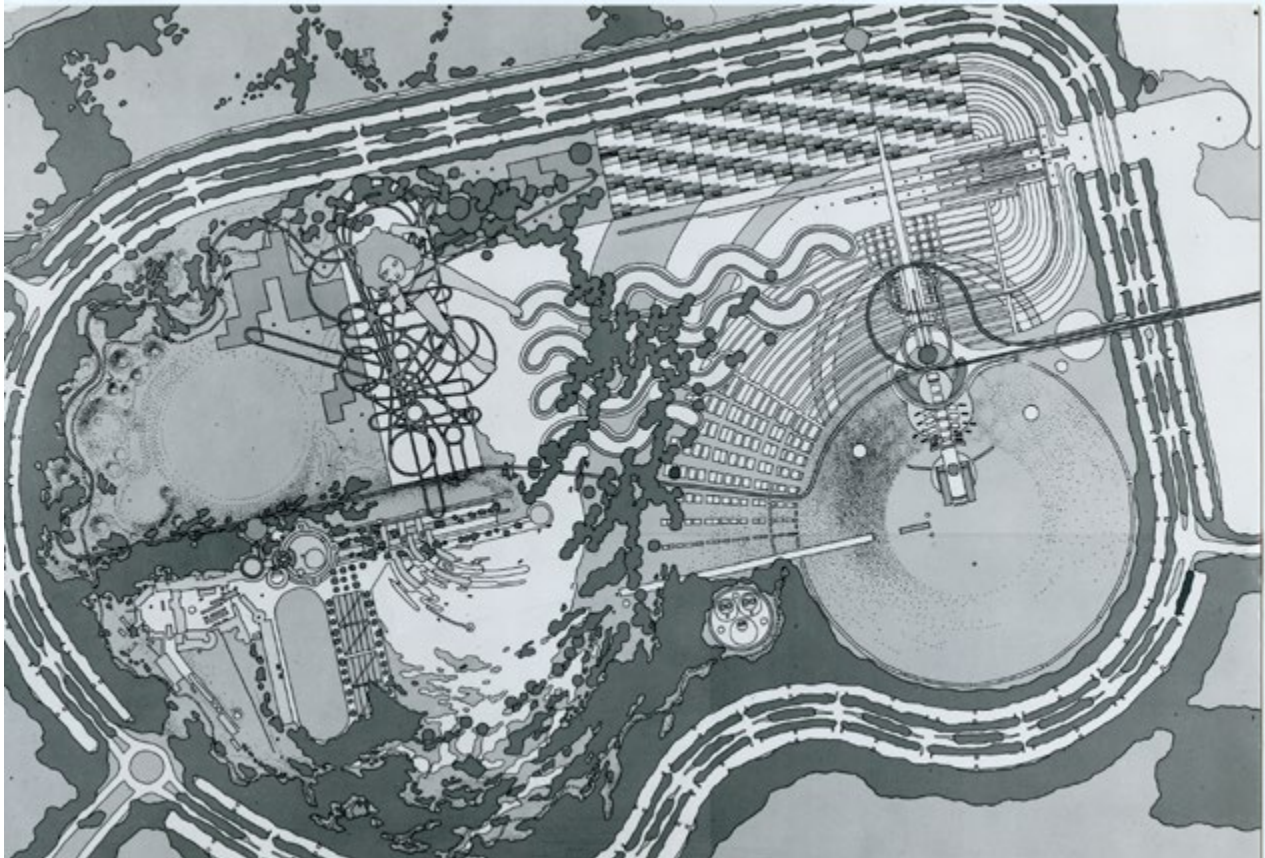
Coates' interests in the representation of wider scales of living in built environments morphs in the digital collage reflecting the complexity of competing information and experiential navigation of cities. Ecstacity is an imaginary city collaged from multiple spaces, like Calvino's (1974) *Invisible Cities*.



COLLAGE CITY

Figure 62: Atelier Bow-Wow, Made in Tokyo Guidebook, 2001. © Atelier Bow-Wow.

Atelier Bow-Wow's research focuses on the micro environments of city spaces and their evolution over time. Such work focuses on utilising small awkward urban spaces and creating social spaces – “it is not people who creates space, but social spaces that use people to bring themselves into being” (Kaijima et al., 2001, p.251).



MEDIA CITY

Figure 63: Andrew Mahaddie, 'Cowcommon Canyon', Bletchley Brick Pits, Milton Keynes, 1973. © Homes & Communities Agency, photograph by John Donat, artwork by Andrew Mahaddie, image courtesy of Milton Keynes City Discovery Centre.

Mahaddie's theme park design for Milton Keynes located at a former brick pit, between rail lines, linked by Monorail. The monorail would connect to a parking boulevard, from which offshoots pedestrian routes, bus routes, and escalators to the parks feature. The site is organised on the premise of some climate control, allowing 24 hours operation. The most intensive areas are to the north of the canyon, and the quieter areas are on the south edge. Mahaddie's Media City provides leisure and recreational facilities with a specific city identity featuring a giant colossus woman.



LAYERED CITY

Figure 64: Balmori Associates + HAEAHN Architecture + H Associates, Public Administrative Town Master Plan, Sejong, Korea. Courtesy of Balmori Associates. © Photography Efrain Mendez.

Balmori's landscape urbanism uses a park as roof to organize the plan for all the individual ministry buildings (Balmori & Conan, 2010).



WASTE CITY

Figure 65: Foster + Partners, Masdar Development, Abu Dhabi, United Arab Emirates, 2007 onwards. Courtesy of Foster + Partners.

This city design seeks to combine state-of-the-art technologies with the planning principles of traditional Arab settlements to create a desert community that aims to be carbon neutral with zero waste. The city is intended to be the first modern community in the world to operate without fossil-fuelled vehicles at street level. As such, a number of its design principles are based on street-level urbanism, ensuring that the city encourages walking via shaded streets and courtyards along with a maximum distance of 200 metres to the nearest rapid transport links and amenities. Similar schemes, such as Arup's Dongtan Eco-City, Chongming Island, Shanghai, (2005 onwards), also reflect the combined approach of a walking based, sustainable living strategy, with ambitions to harness renewable energies and have zero waste.

6. Digital Cities

The profound effects of digital technologies upon our cities have been debated widely, whether to point toward radical restructuring of, or new relationships with, our urban environment (Mitchell, 1995 & 2004; Shepard, 2011). However, despite the blurring of physical place and digital space, a convincing hybrid has yet to fully emerge. Indeed, the emergence and increasing rhetoric surrounding the potential of Smart Cities i.e. those places that can mobilise their knowledge infrastructures (social, environmental, intellectual and technical) with agility and adaptability may suggest a new trajectory for future cities. To date, the degree of discourse considerably outweighs the application and it remains to be seen whether the smart city futures shown at various conferences and exhibitions such as the Shanghai World Expo held in 2010. will have traction or become twenty-first century updates of Futurama at the New York World's Fair of 1939. The affordances of design software capable of handling complex geometry and high-end CGI visualisations, as well as the increasing fidelity in geographical representation has meant that translation or implementation into the real world need not impede spatial exploration of future cities. Furthermore, the algorithmic processing capability of computation to provide adaptive design (Frazer, 1995) has led to various projects that seek to evolve form and structure in emulation of the evolutionary processes of nature.

Virtual space has created new layers to which city participation takes place. Early development by Gordon Pask in cybernetics (dynamic system control), emerges in the work of Nicolas Schöffer and Claude Parent, a Mechanical and Cyber City (Figure 66). Such control systems were envisaged to liberate competing complex city systems. That very complexity emerged in early form as a computer game and engaged audiences on the problems of urban planning in the game Micropolis later SimCity (EA Games), developed by Will Wright (Figure 67). This development has further transformed in computer game design where players previously occupied scenarios, they are now able to fully engage with an open world platform such as Minecraft, created by Markus Persson (Figure 68) in which they have considerably more freedom to build entire cities and civilisations from the bottom-up.

Marcos Novak's exploration of algorithmic architecture developed the idea of a fluid, ever shifting Cyber City (Figure 69). The use of algorithms, as a generative design tool within parametric modelling software, has afforded architects, such as Zaha Hadid, to develop 'parametric urbanism' proposals, often providing a radical landscape based on interconnections across various scales of the city, such as the One North Masterplan for Singapore (Figure 70). This shifting representation, reflected in the increasing city data sets, and in the work of Simon Elvins showing the soundscape of Birmingham, its quiet and noisy areas (Figure 71). The multivalent nature of city datasets, also known as big data, is enabling work, such as that of the Geomatics Group (Figure 72), to conduct accurate scenario planning for various sectors and stakeholders. The rise in big data and its potentialities emerges in Saturation City (Figure 73), a speculative city configured to adjust to fluctuating sea levels. Digital simulation allowed the development of a number of climatic scenarios and adaptable architecture as seen in Crab Studio's Soak City (Figure 74).

Such digitisation also allowed the connection to urban forms, a chorography of a multitude of spatial practices, as seen in Flowering Gardens by Groundlab & Plasmastudio (Figure 75). The proposition and testing of extreme climatic scenarios creates new city forms, as in the case of the Clouds Architecture Office (Figure 76) in which the automobile is rendered obsolete and replaced by canal systems and dirigibles in Aqualta, a Floating City. In the London Thames Estuary scenario, Anthony Lau (Figure 77) projects Floating Cities through retrofitted ships as a response to flooding.

In comparison, the scarcity of fresh water of the Desert City creates an underground city by Matsys (Figure 78) in which biomes and vast caverns support a water reserve and multi-layered habitat. Matsys vision owes much to Frank Herbert's novel *Dune* (Herbert, 1965), but also to E.M Forster's *The Machine Stops* (Forster, 1909) in which an underground cell architecture controlled by a super computer provides all the needs of the cell inhabitants. This techno fanaticism is an interesting visualisation and call for connectivity to natural form. It is perhaps best characterised by the work of experimental offices such as R&Sie(n), who used advanced digital tools to question fundamental relationships between object and context through their projects such as *I've Heard About It* (Figure 79).

6.1 Summary

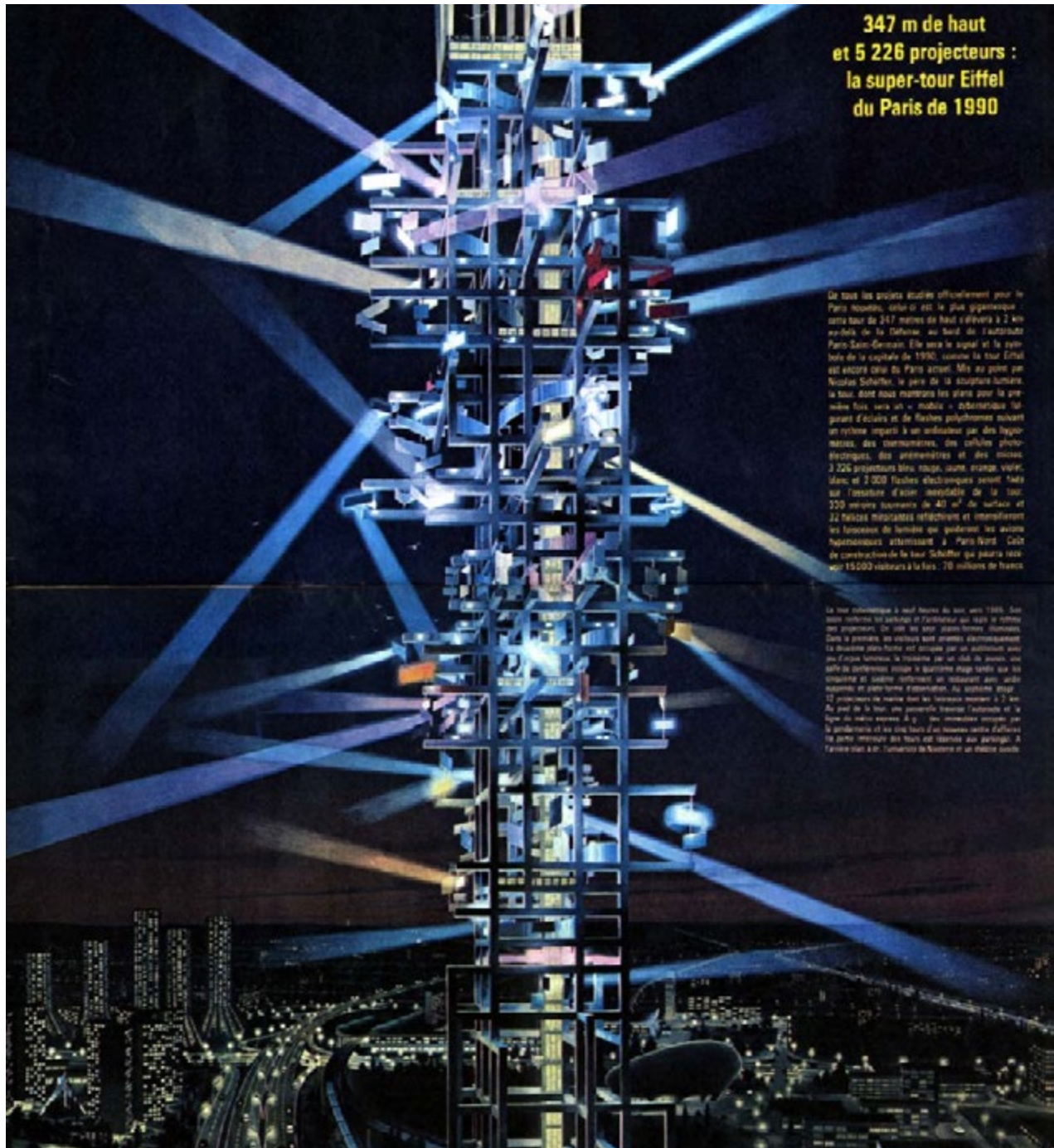
The visualisation of digital cities has been reliant on technological invention in which to simulate ideas, create virtual scenarios. The continuous growth of computational ability and data processing has allowed the testing of climatic scenarios evident in more contemporary visualisations. This mode of concern resonates in the Ecological City paradigm, informed by both technologically informed science fiction and the dissolution of architectural research, to more open frameworks and scalar concerns.

The increasing stores of environment data, and participation and manipulation of this data has allowed users to create city scenarios with limited training. This, in some aspects, has enabled a more democratic participation in city planning and policy, emphasised in the recurrent Hybrid City motif of merging the virtual with the physical. Digital cities often make reference to the software and hardware of computer technologies, with augmented reality layers and spatial details derived from desktop, tablet or smartphone interfaces. In other visualisations, the smooth fluidity of the future cities depicted, infers the ubiquity of computing as a support mechanism.

Furthermore, because of their method of construction, i.e. Computer-Aided Drawing coupled with photorealistic rendering packages, a common feature of digital cities is the sophistication and level of detail of the images themselves. Since they have largely been produced in the last twenty years such visualisations reflect the increased visual literacy of society in general through our continued exposure to CGI in films and computer games, combined with user-friendly access to vast amounts of visual material through the Internet that is no longer geographically bound.

However, an emergent trajectory for future cities when considering digital technologies may lie in the translation to code. At present, the majority of work being conducted by architects and designers naturally concerns itself with exploring the boundaries of

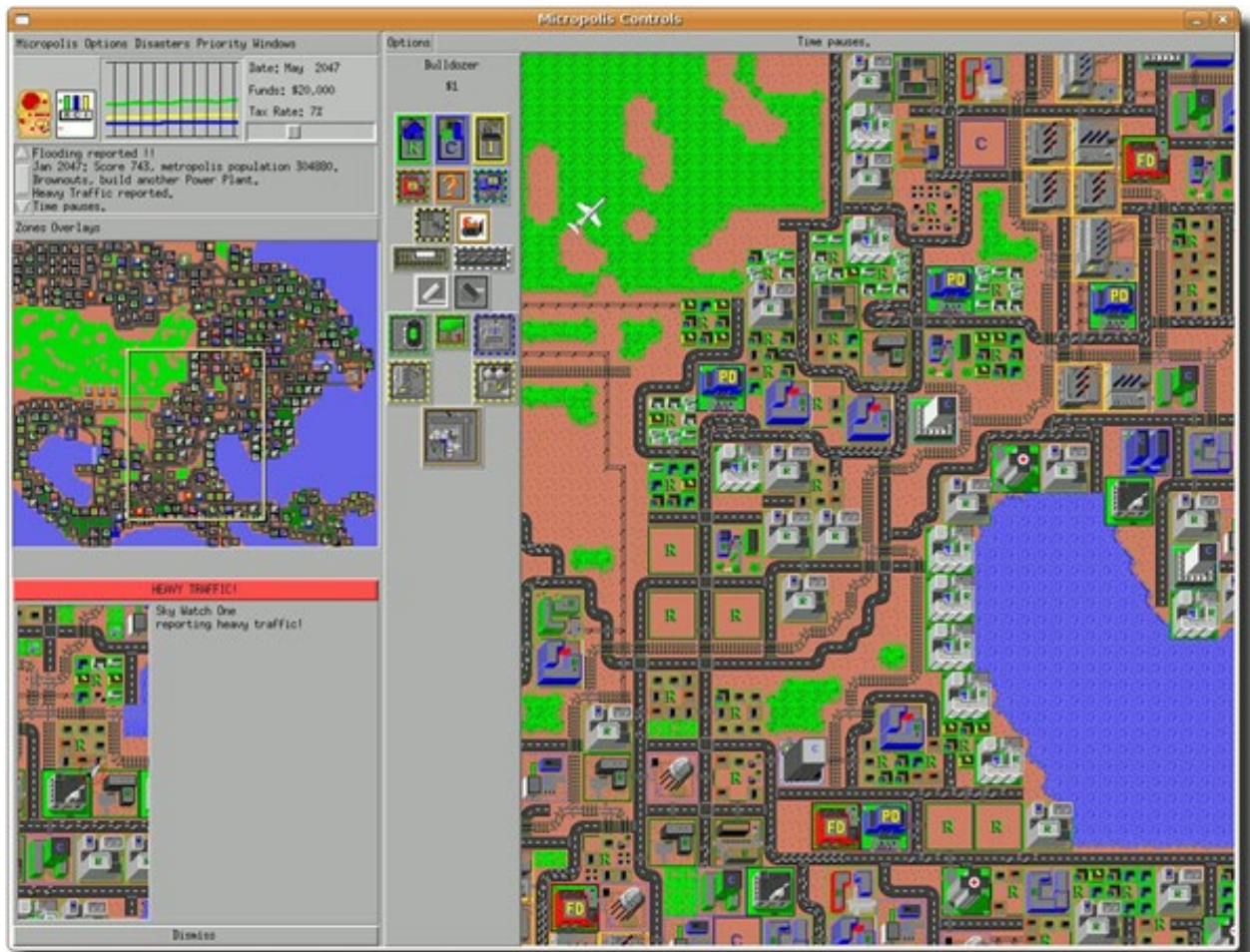
generative structures. For example; biological processes, such as morphogenesis, being used to influence design iterations, or photorealistic renders that bring visual cursors from computer games and software platforms and weave them with built fabric. A different opportunity is evident whereby building codes themselves are translated into computer scripts to provide predictive models so we might better understand the conditions that will produce the future city.



MECHANICAL CITY

Figure 66: Nicolas Schöffer and Claude Parent, Tour Lumière Cybernétique, 1973.
Edition : Paris, France, Denoël/Gonthier, p.152.

Schöffer & Parent developed cybernetic sculptures and proposed a cybernetic tower for Paris. The tower would be self-networking and create adjustable climates. Essentially a responsive animated building which runs analogously to the work of Cedric Price (1962) and Gordon Pask.



CYBER CITY

Figure 67: Will Wright, Don Hopkins, SimCity, Micropolis, 1985, Maxis. © (1989 - 2007 Electronic Arts Inc (Open Source).

Micropolis later developing into Sim City EA, was a real time city planning game which allowed the design of dream cities or the reconfiguration of real life cities, such as Tokyo or Rio De Janeiro. Compromising eight city scenarios, Micropolis challenged the user to solve poor city planning practices and fix the 'city' system managing taxes, immigration, infrastructure and many other factors. Subsequent games, such as Minecraft (2009) (Figure 68), continue scenario city gaming traditions, and have been adapted to city planning and community consultancy.



Figure 68: Minecraft, Markus ‘Notch’ Persson, 2009.

Minecraft is an open world video game, where the level design deliberately enables players to roam freely through a virtual world, and have considerable freedom in deciding when and how to approach objectives. Initially created by Markus “Notch” Persson until 2011, and subsequently developed by Mojang, the game offers two primary modes of play: survival or creative mode. In the former, players are required to obtain resources to maintain health and nourishment. In the latter, players have an unlimited supply of resources and experience, with no health or hunger, and are even able to fly.

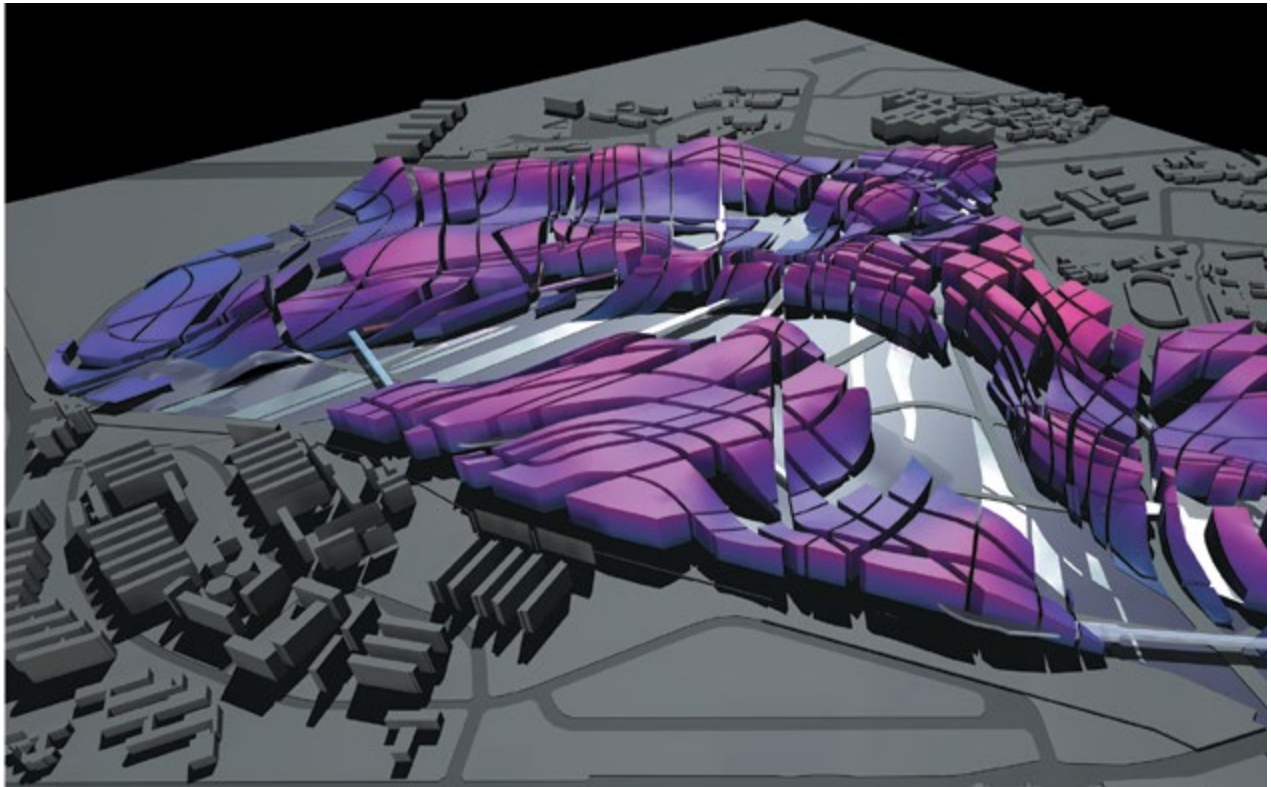
It is the creative and building qualities of the Minecraft that have become particularly renowned, as players make constructions using textured cubes in a 3D, procedurally generated world. This has led to many players being able to create their own cities, some based on existing global locations, others extrapolating from current urban models and forms, whilst some have produced highly imaginative future cities. The important aspect here is the level of authorship with which a player has the freedom to create new environments.



CYBER CITY

Figure 69: Marcos Novak, Mutable Algorithmic Landscapes, 2000. © Marcos Novak.

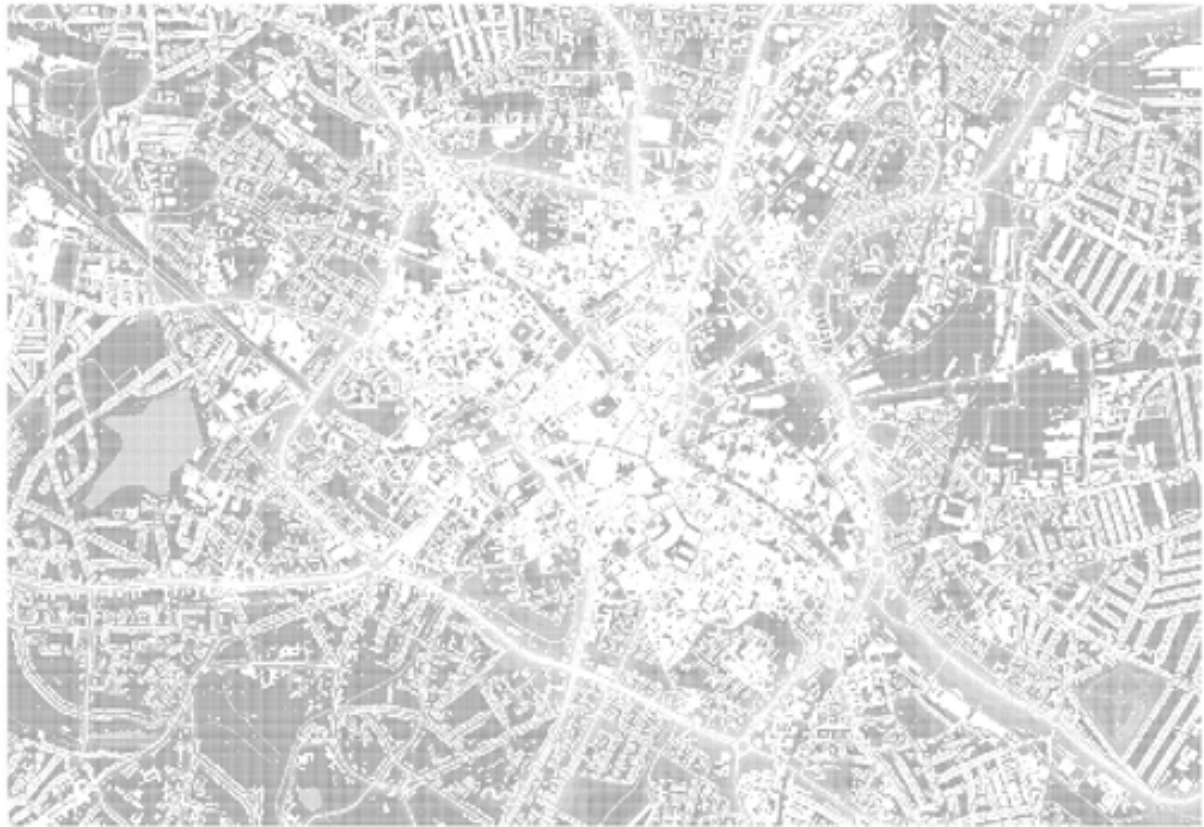
Influential to digital representations of cities, William Gibson's *Neuromancer* (1984) spawned a number of films and particularly informed early architectural graphic representations and experiments. Marcos Novak explores 'the liquid architecture' of cyberspace (termed coined by Gibson) this can be seen as understanding forces of a constantly shifting digital city and in this example image; Liquid architecture makes liquid cities, cities that change at the shift of a value, "where visitors with different backgrounds see different landmarks, where neighbourhoods vary with ideas held in common, and evolve as the ideas mature or dissolve" (Novak 1991 pp 251-252).



CYBER CITY

Figure 70: Zaha Hadid Architects, One North Masterplan, Singapore, 2001-2021.
Courtesy of Zaha Hadid Architects.

This masterplan for a new mixed-used urban business district in Singapore, was the first of a series of radical masterplans by the practice, that led to the concept of parametric urbanism and then to the general concept of ‘parametricism’ (Schumacher, 2009). The proposal seeks to develop a new type of urban architecture through an evolution of the morphology of natural landscape formations. This is achieved using parametric software, which enables the designers to construct ‘deep relationality’ between the various elements of the scheme and across different scales, such as streets, blocks, buildings etc., to produce a combinative, dynamic overall masterplan. The adoption and innovation using this software by Zaha Hadid’s practice is interesting, as it appears to provide a logical extension beyond her earlier, seemingly weightless, Supremacist style paintings.



CYBER CITY

Figure 71: Simon Elvins, Silent Birmingham, 2011, laser etched 270gsm paper. © Simon Elvins.

Elvins inverts Defra sound data to create a typology in which the quiet areas of central Birmingham can be visualised. Elvins is indicative of the increasing number of multi-layered, open access data sets, allowing simulation on a massive scale. This is not without precedent, given Maxis' release of SimCity (1989) in which a series of scenarios are to be achieved by the player through concise urban planning.



CYBER CITY

Figure 72: Environment Agency, Geomatics Group, Olympic Park, Point Cloud Data, October 2013. © Environment Agency copyright 2014. All rights reserved.

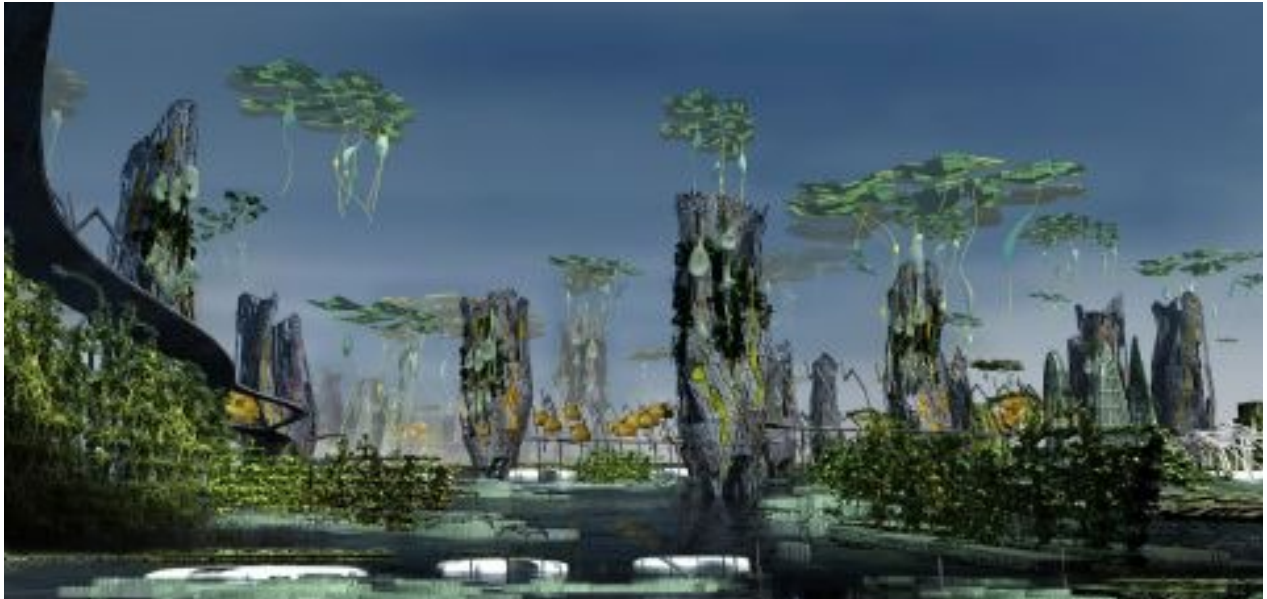
The increasing use of light detecting and ranging tools has developed vast datasets for the UK creating digital surface and digital terrain models. The technique allows scenario planning for flood assessment and defence, civil engineering, landscape planning and many other sectors. Such techniques and models allow scenario planning and physical models through additive manufacture, 3D printing city models.



UNDERGROUND CITY WATER CITY

Figure 73: Bild Architecture, Saturation City, Melbourne, 2010. MGS, Material Thinking, Bild Architecture and Dyskors. Image production: Flood Slicer. © Bild Architecture.

Based on the premise of imagining Australian urban space in 41 years' time, Saturation City projects sea rise for its coastal areas. A hypothesis and response of the sea rises is the densification of urban pattern, so much so that superblocks contain the city.



FLOATING CITY

Figure 74: CRAB Studio (Peter Cook, Gavin Robotham, Lorene Faure), Soak City, East London, 2004.

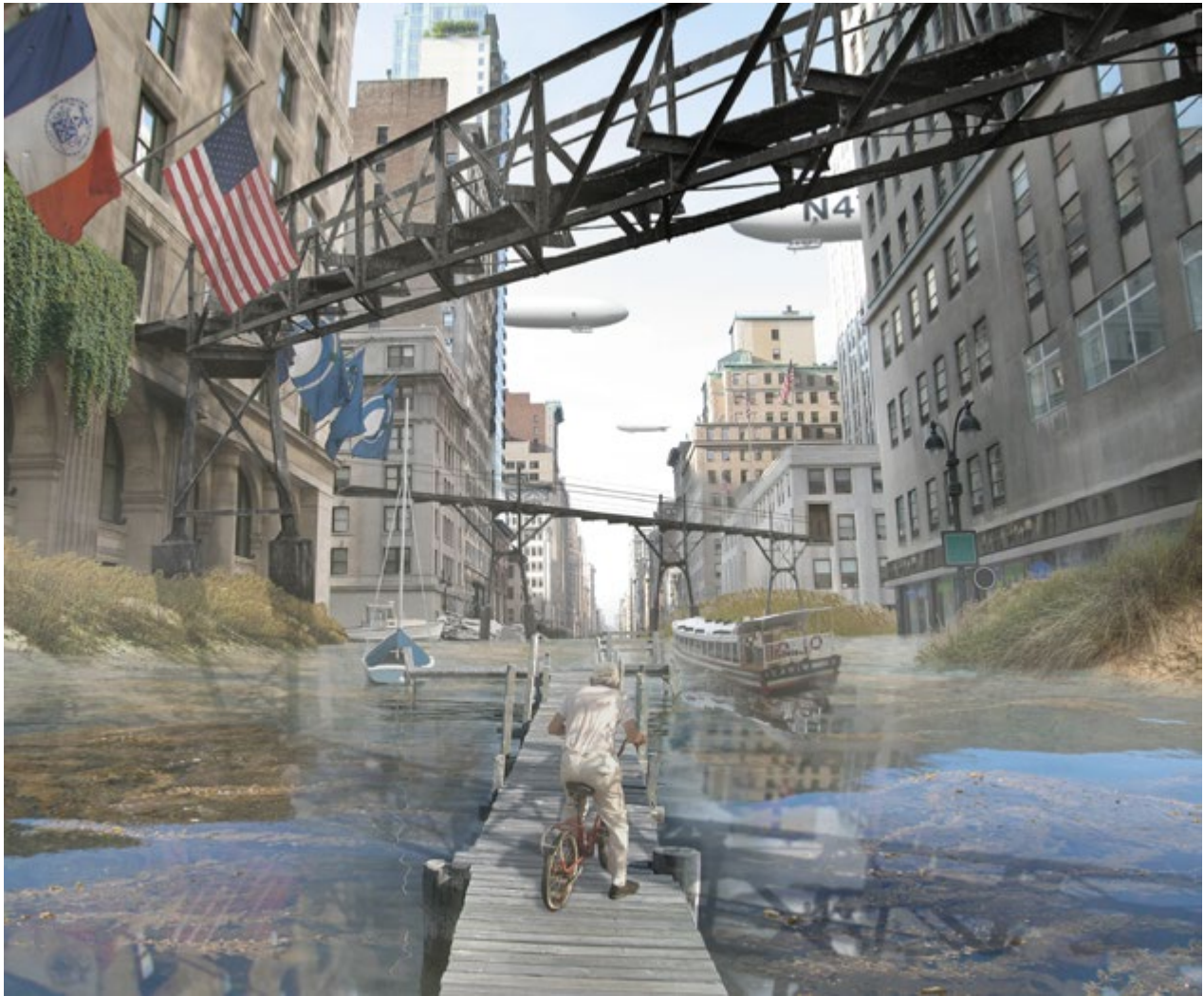
Developing from a sea level rise scenario, Soak City presents east London architectural adaptation through semi-vegetated buildings. Block houses provide a framework for stacks layered from the previous remnants of London.



LAYERED CITY

Figure 75: Plasmastudio & Groundlab, Flowering Gardens, Longgang City, Shenzhen, China 2011. © Plasmastudio & Groundlab.

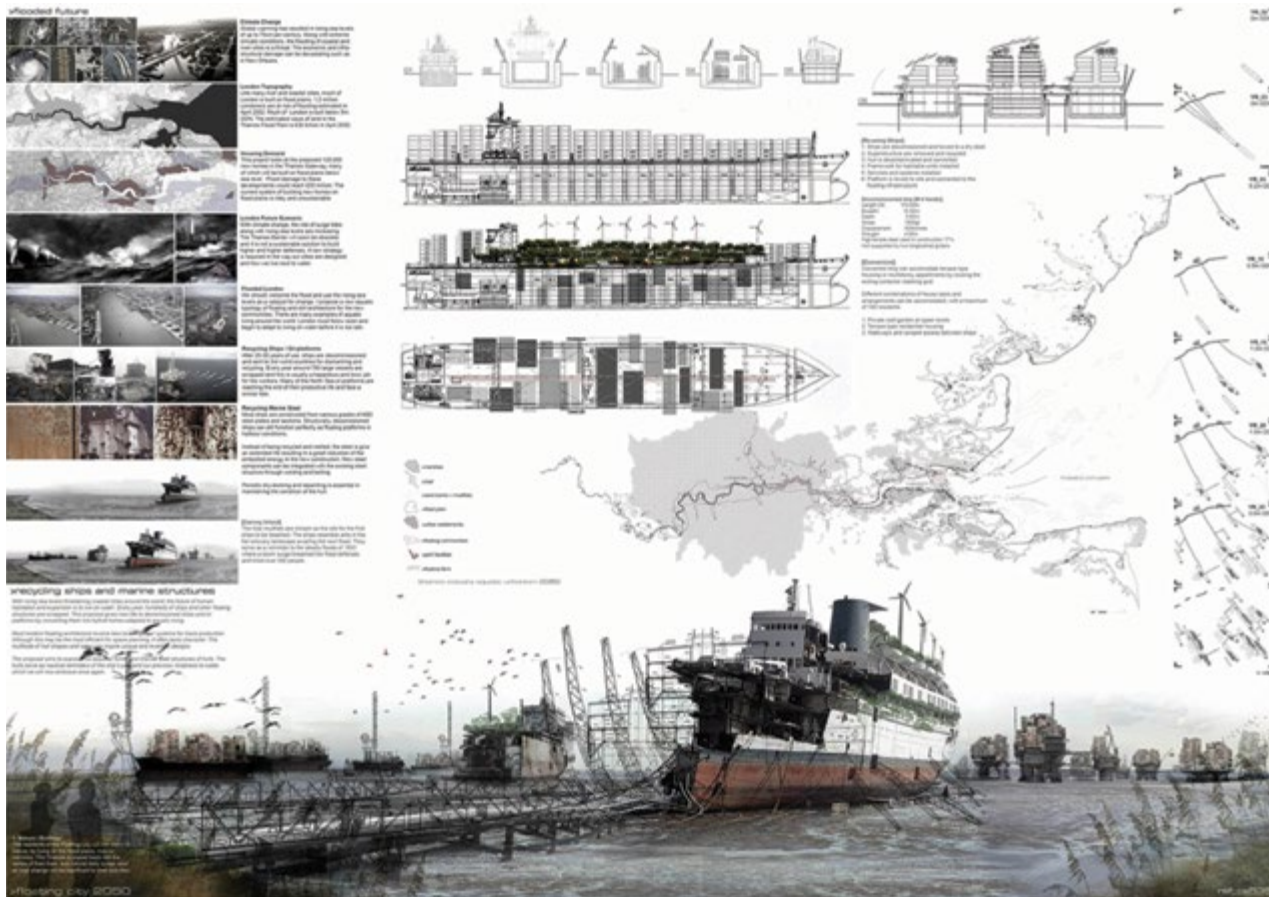
Creating a new master plan for Longgang City, Shenzhen, China Plasma Studio and Groundlab developed the design for the International Horticultural Fair in Xi'an, China—a 37ha landscape design. Considering accessibility and open space allocation for the rapidly developing Shenzhen city, Flowering Gardens' design rests on the idea of chorography and flow. This is thought of as connectivity in city space in line with theories of Landscape Urbanism (Duany, 2013).



FLOATING CITY

Figure 76: Clouds, Architecture Office, Aqualta, New York, NY / Tokyo, Japan, 2009.
© Clouds Architecture.

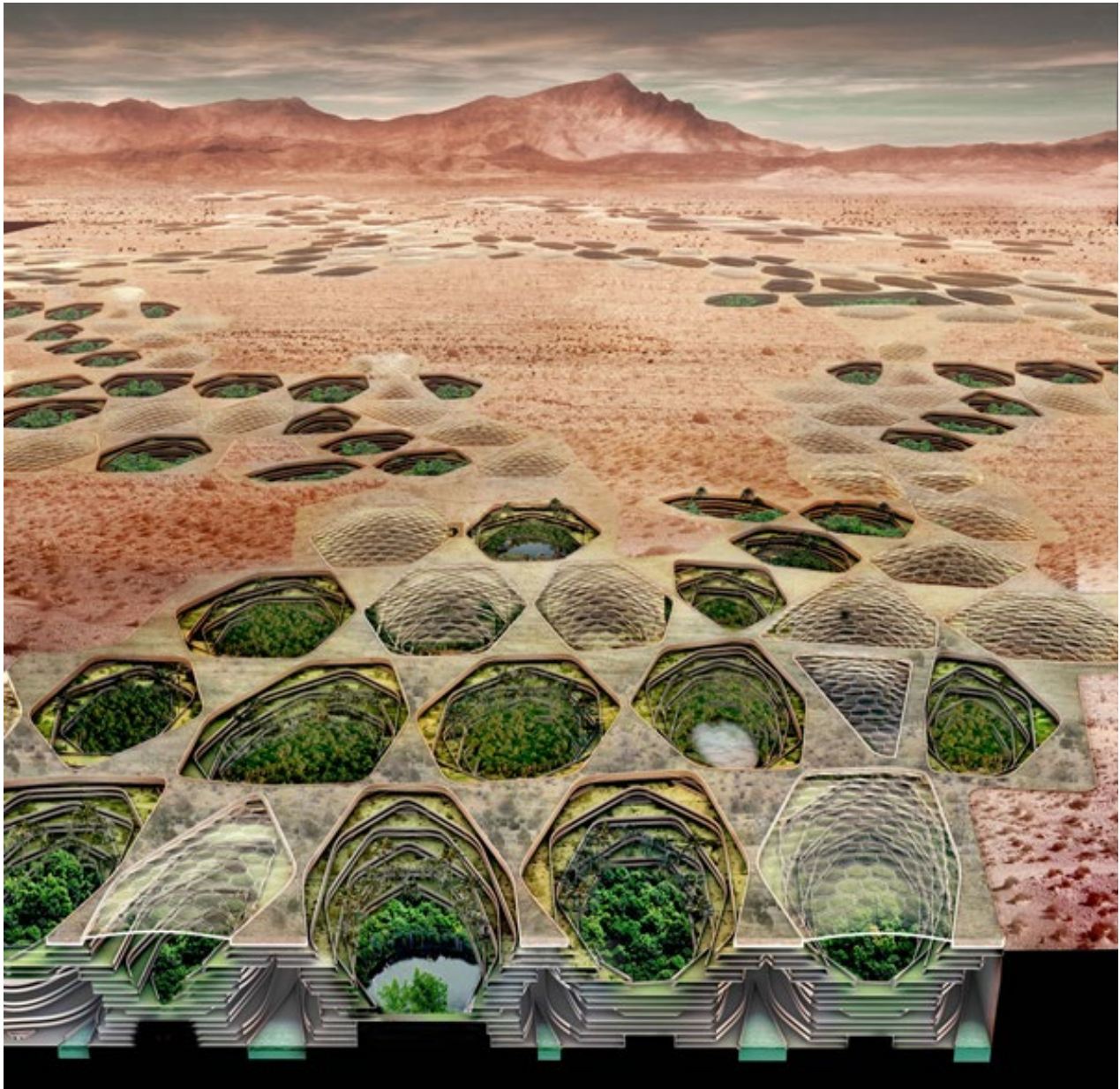
Aqualta is a city scenario in which climatic sea rise affect New York City and render combustion engines obsolete, resulting in quiet spaces. Canals and broad walks reestablish transport routes and dirigibles are used to maintain and construct the city space. A sea wall is proposed which shrouds greater New York.



FLOATING CITY

Figure 77: Anthony Lau, Floating City 2030: Thames Estuary Aquatic Urbanism, Bartlett School of Architecture, 2008.

In Lau's student project digital modelling further develops a mode of projection and simulation also seen in Aqualta, Clouds Architecture Office (2009) (Figure 76) in which various environmental trajectories affect the city.



DESERT CITY

Figure 78: Matsys: Andrew Kudless (Design), Nenad Katic (Visualization), Tan Nguyen, Pia-Jacqlyn Malinis, Jafe Meltesen-Lee, Benjamin Barragan (Model), Sietch, Nevada, 2009.

Inspired by Frank Herbert's *Dune* (1965), Matsys project a desertification scenario in which ground level habitation is all but impossible. Constructing a series of underground biomes, water banking is projected as the most realistic scenario for future urban infrastructure and city living. Vast aquifers and mixed-use caverns form a vast subterranean network utilising a range of symbiotic eco services to sustain it.



Figure 79: R&Sie(n): François Roche, Stéphanie Lavaux, Jean Navarro & Benoît Durandin, I've Heard About It, 2005.

The work of R&Sie(n) characterises a rigorous investigation into the identity of architecture, as generated using new warping technologies to explore highly speculative, biological and genetic process-driven design. Through design mutations including: cloning, grafting and morphing, the project attempts to break down relationships between object and territory.

7. UK characteristics

In the United Kingdom, the Garden City planning system of Howard (1898) has heavily influenced New Town planning, notably in the creation of zones in which everyday life is divided. This can be seen in the plan for Welwyn Garden City (Figure 80). Ideas of neighbourhood units and community were explored by American planners Clarence Perry (1929) and Clarence Stein (1929) who were both proponents of the garden city movement. These ideas ran tangentially in the UK and were at odds to later ideas of the complete separation of town and countryside proposed by Thomas Sharp (1940 & 1968). Such work emerged from wide reactions to Victorian city social conditions best demonstrated in the social and economic survey work of London by Charles Booth.

With the aftermath of the Second World War, London's damaged infrastructure was visualised by the MARS. Group (Figure 81) in which spider web green channels intersperse strings of urban development a Crossing City and Garden City. Abercrombie and Forshaw's London plan designated a series of satellite towns around the periphery of London to safeguard urban sprawl, for London itself the community mix was proposed to be more egalitarian (Figure 82). The UK's South East city form owes much to the visuals and master plan of Abercrombie (Alexander 2009, pp 17–20).

Among the most influential and controversial British architects of the mid-20th century were Alison and Peter Smithson who attacked the dogmatic visions of European counterparts such as Le Corbusier and Walter Gropius at a CIAM conference in 1953 using their competition design for the Golden Lane estate as a vehicle to explain their ideology (Figure 83). In contrast to the view that cities should be designed as a series of specifically programmed zones, the Smithsons argued that different activities should be combined within the same areas to promote belonging and neighbourliness. From their House of the Future exhibited at the Daily Mail Ideal Home Exhibition in 1956, to the early 1970s Robin Hood Gardens, the Smithsons' bold schemes embodied their drive for a progressive society. Indeed, many of these ideas were adopted and revised to inform numerous major housing projects across the UK including Hulme Crescents, Manchester, built in 1972 and demolished in 1994, and Southgate, Runcorn completed in 1977 and razed to the ground by 1992.

The future of UK city transport was heavily influenced by Colin Buchanan in *Traffic in Towns* (Crowther & Buchanan, 1963) (Figure 3). The diagrams espoused building in for future transport and consideration of environmental impact. The centre of Stevenage was designated car free in its original plan (Figure 84) (Alexander, 2009). With the construction of many new towns Fred Pooley and Bill Berrett proposed 'Pooleyville' a concentric city space navigated by monorail (Figure 85). Pooley's plan was succeeded by a new plan, Milton Keynes rendered by Helmut Jacoby, an urban grid system containing twenty percent green space per grid plan square intended as a 'Forest City' (Figure 86) (Walker, 1982).

These visualisations for New Towns contain more eclectic experimentation of urban form. The visualisation of Cumbernauld by Mike Evans, viewed a layered centre space for leisure and recreation (Figure 87). In comparison Cedric Price developed a mobile

architecture to act as a regenerative tool by functioning as a mobile innovation university (Figure 88). Leon Krier's plan for Poundbury utilised New Urbanist theories and was intended for sustainable transport and walkability (Figure 89) (Krier, 2011). Krier utilises visualisations as a critique modernist architecture. Such critique of form was side-lined for the preference of visualising mass housing. The Skarne building construction system delivered a prospect of residences, configuring living to strict honeycomb geometry irrespective of landscape conditions (Figure 90).

The firm Chora, created a gaming scenario of infrastructure stakeholders for the Thames Gateway which could be seen as notational choreography, sequencing the movements of each participant dealing with mitigation and cross organisational partnerships (Figure 91). The visualisation of Aberdeen Gardens by DRSNY creates a central cultural hub acting as a regenerative tool, layered by recreational park space (Figure 92). Kathryn Moore's study uses a map surface in which to configure urban patterns and discover the landscape character surrounding Birmingham to which HS2 could follow (Figure 93).

The exploration of how best to create new Garden Cities in the UK, either by expansion of existing urban development or through entirely new settlements, and how to deliver them in terms of governance and policy, has been examined through the Wolfson Economics Prize competition, where five finalists including URBED (Figure 94) have been identified.

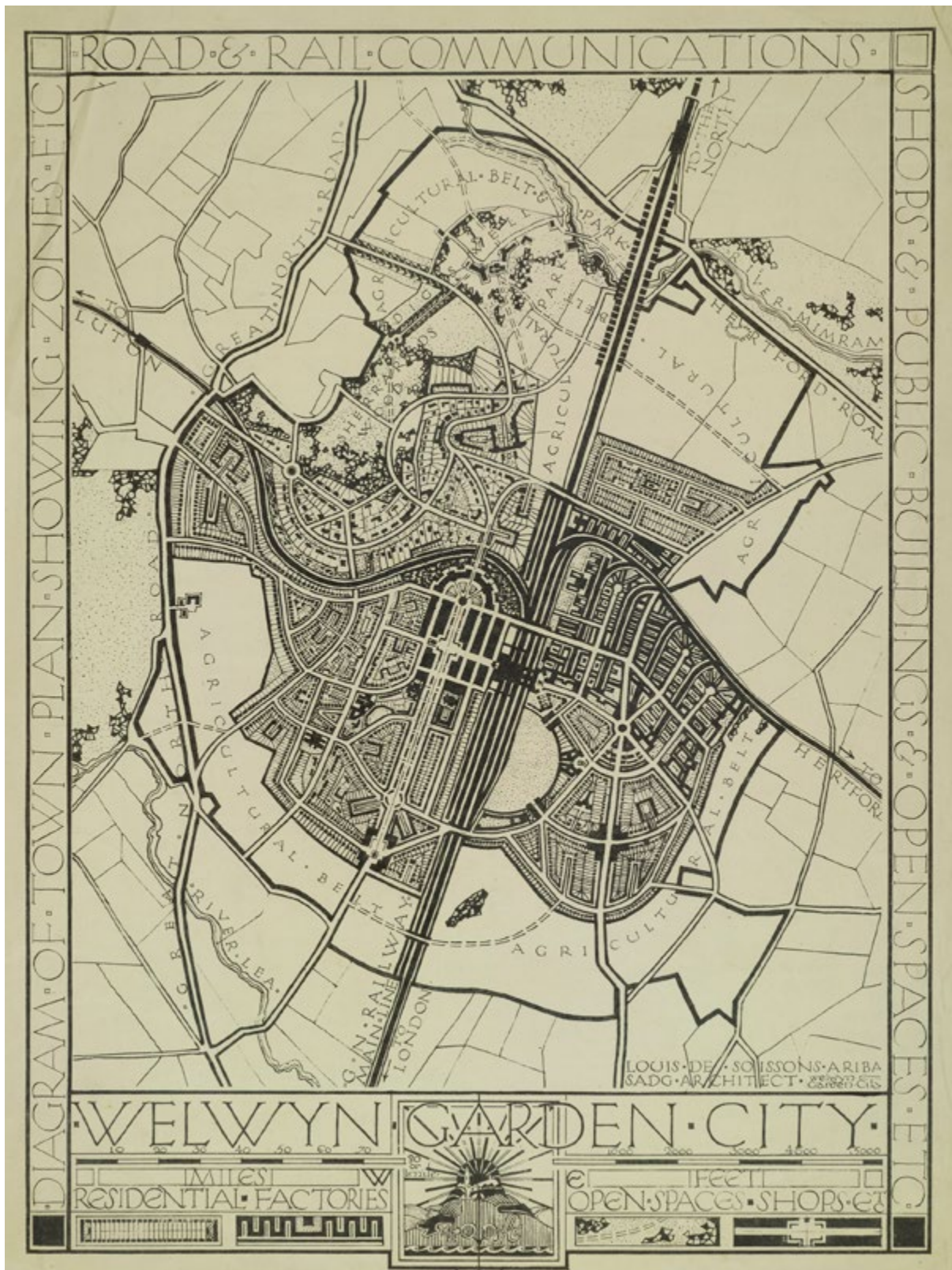
7.1 Summary

UK characteristics in visualisations have continuity in the presentation of the Regulated City and Ecological City paradigms, in which the Garden City category appears. In addition to this, the New Towns programme gave rise to visual experimentation and analysis, with ideas of mobility and superstructure appearing, and thus additional paradigms materialise. Such projects included a separation of transport infrastructure and scenario of rapid growth. The post-war Layered City paradigm gave way to Flexible, Hybrid and Ecological City paradigms.

These visualisations must be understood in context to a wider set of material and planning process, not just as singular artefacts, but as visualisations, inclusive of the previous sub sections on vision, representation, context, socialities, technologies and digital. The examples also evidence the ability of the agency of the image, as these have been translated into built projects, or achieved a high degree of realisation through the planning process. However, UK city visualisations at larger urban scales addressing large territories arguably have declined in line with the demise of the utopian impulse of later modernism, apart from recent infrastructural interventions that hint at a resurgence in the material surveyed.

It should also be noted, that there is no discernible difference between the characteristics of British and non-UK visualisers with regard the composition and content of their portrayal of future cities, with any varying features being typically emblematic of contemporary modes of production and cultural fashions rather than geographic location or origin of the creator.

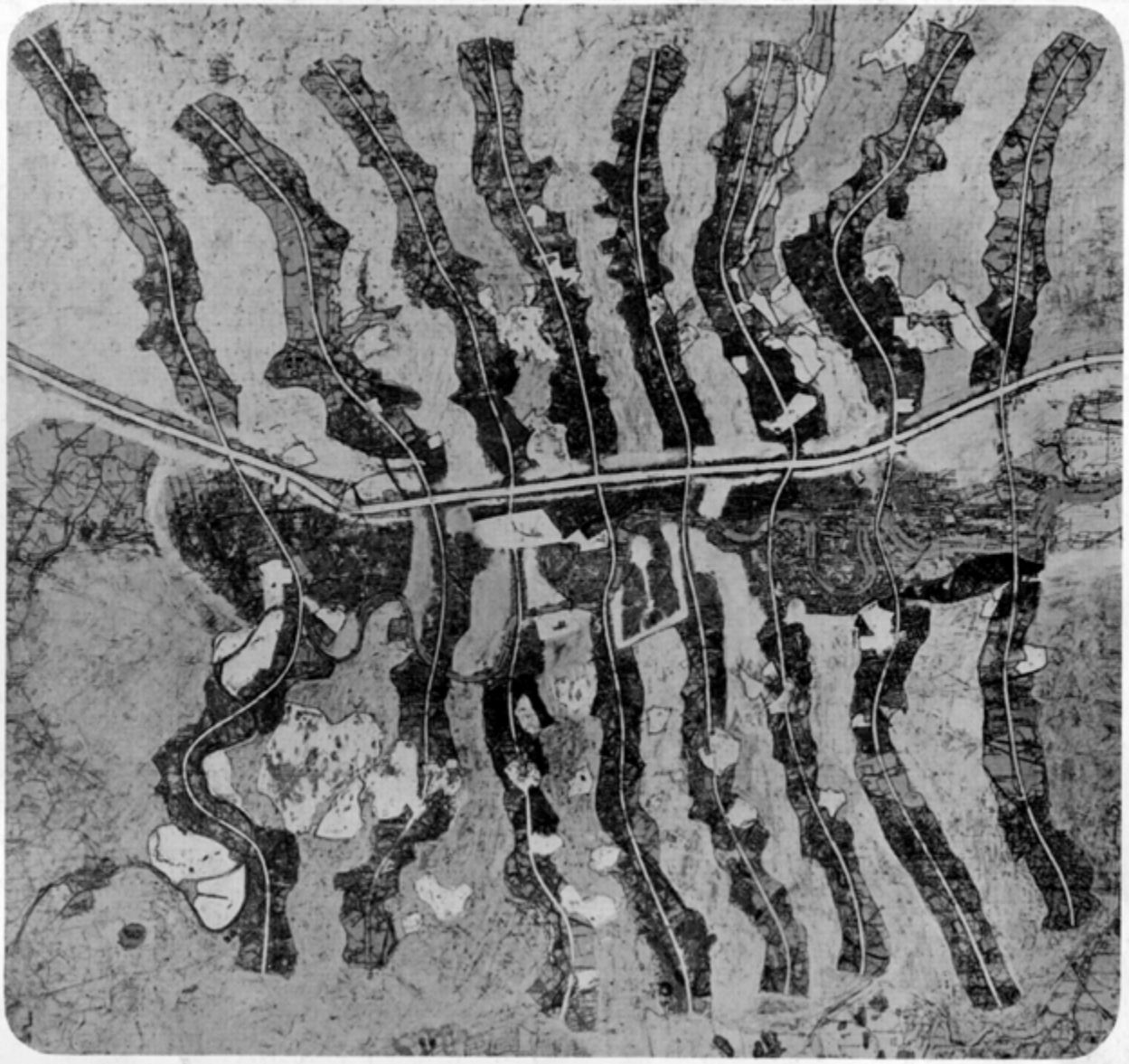
A key theme in the visualisation of UK future cities is their civic nature, often explicit in a description of urban life with human mobility, especially during the first few decades of post-war reconstruction and development. As the timeframe shifts toward the end of the twentieth century and to the present day, the visualisation of UK future cities largely feature more global overtones, with increased generic built forms and urban lifestyles, rather than identifiably British ones. This development is emblematic of wider processes of globalisation and interconnectedness through digital technologies and raises questions on urbanisation, identity and 'place' making and debates of homogenised urbanism (Perez-Gomez & Pelletier, 2000).



GARDEN CITY

Figure 80: Louis de Soissons, illustrated by Francis Nugent Cachemaille-Day, 'Welwyn Garden City, Hertfordshire: town plan indicating zones, road and rail communications, buildings and open spaces', 1920, RIBA Library Drawings Collection.

The second city of the garden city idea, developed by Ebenezer Howard materialised. Welwyn was also be visualised in aerial photograph by Aerofilms Ltd (1919).



CROSSING CITY

Figure 81: MARS Group, 'Master plan for London based on research carried out by the Town Planning Committee of the MARS Group: draft plan giving a rough impression of what the map of London would look like with ribbons of open country penetrating the city', 1942, Photomechanical Print, RIBA Library Photographs Collection.

The Modern Architectural Research Group (MARS) was a think tank devised for New Town and British modernism. The plan for London visualised 'tongues' extending from the Thames. These tongues were configured with rail infrastructure and would house social units similar to principles established by Le Corbusier (Figure 17).



MOVING CITY

LAYERED CITY

Figure 82: Patrick Abercrombie, Forshaw's London Community map, Social Analysis, 1943.

With the devastation of the Second World War, Abercrombie and Forshaw were tasked with producing a London plan, to which a community matrix was established. The aim of the matrix was to blend the various ethnicities and demographics of places into a more egalitarian mix. Notably, Abercrombie also presented new town proposals and infrastructure for the County of London as an urban sprawl control method (Alexander, 2009, pp 17–20).

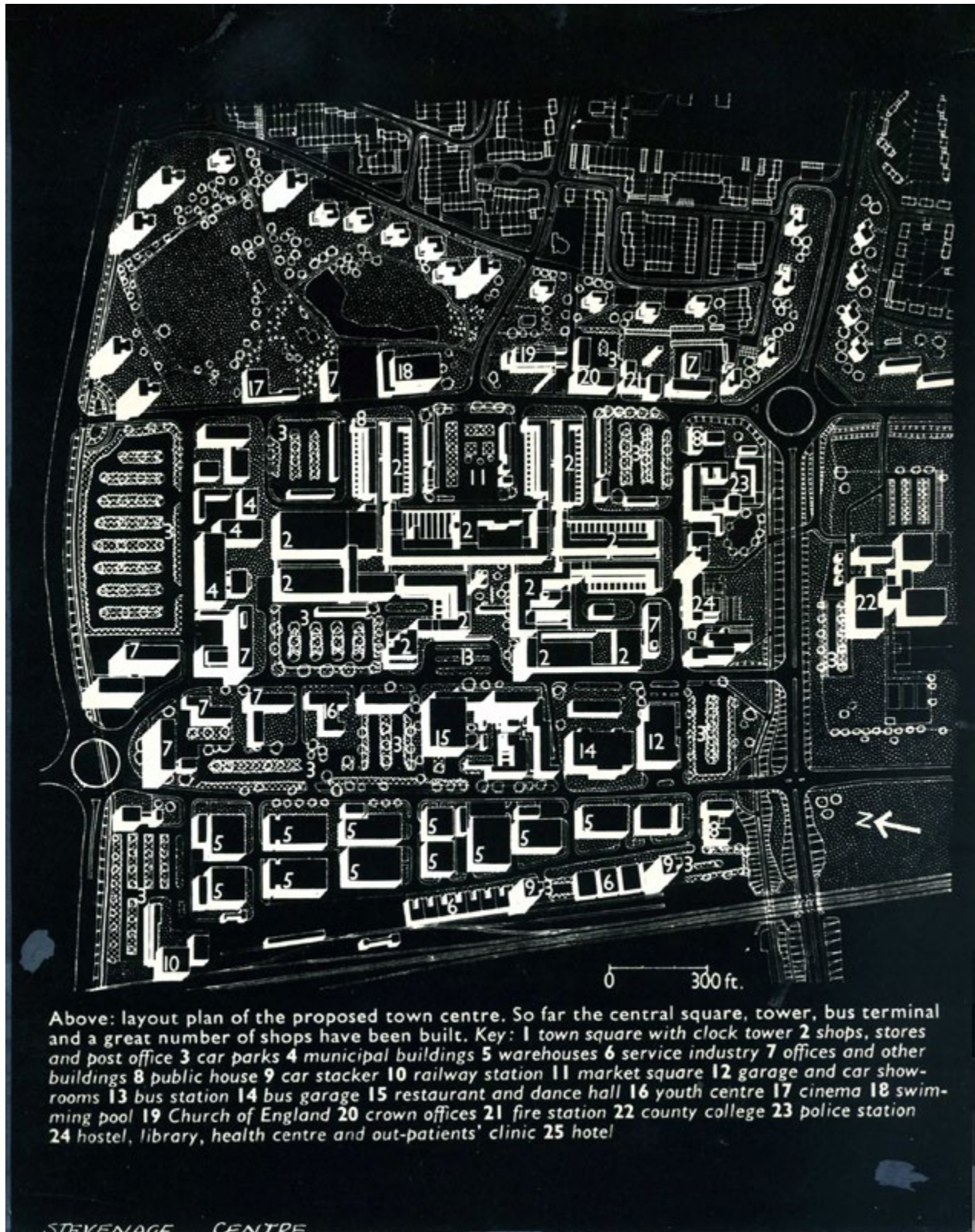


CONTINUOUS CITY

COLLAGE CITY

Figure 83: Alison and Peter Smithson, Collage for Golden Lane, 1952. Photo © Centre Pompidou, MNAM-CCI, Dist. RMN-Grand Palais / Philippe Migéat.

Included as part of a panel in the 1953 CIAM, Urban Re-identification grille. The project proposed large, irregular ten story high blocks, which were to be woven into the existing fabric of London. The intention was to produce a network of buildings linked by 'streets in the sky' as place-making devices, an idea further developed and subsequently constructed in Smith and Lynn's housing scheme at Park Hill, Sheffield, 1961 (Figure 47).

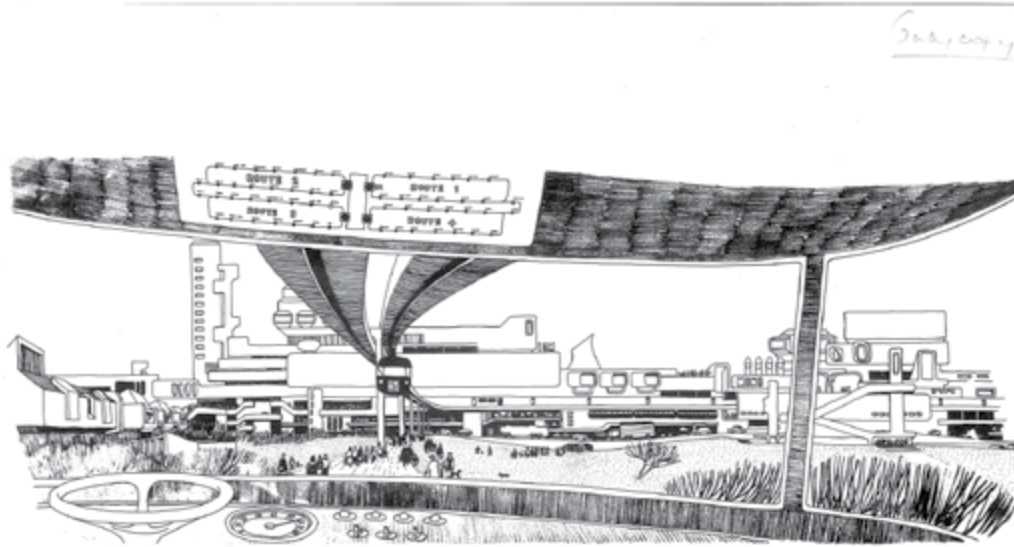


TRADING CITY

Figure 84: Donald & Sylvia Reay, Plan for Stevenage Centre, 1951-55. University of California Regents, held by the Environmental Design Archives.

Designated the first New Town in 1946, based on Abercrombie's plan (Figure 82),

Stevenage's town centre was proposed as traffic free and was indicative of the separation of transport infrastructure (Orlans, 2013).

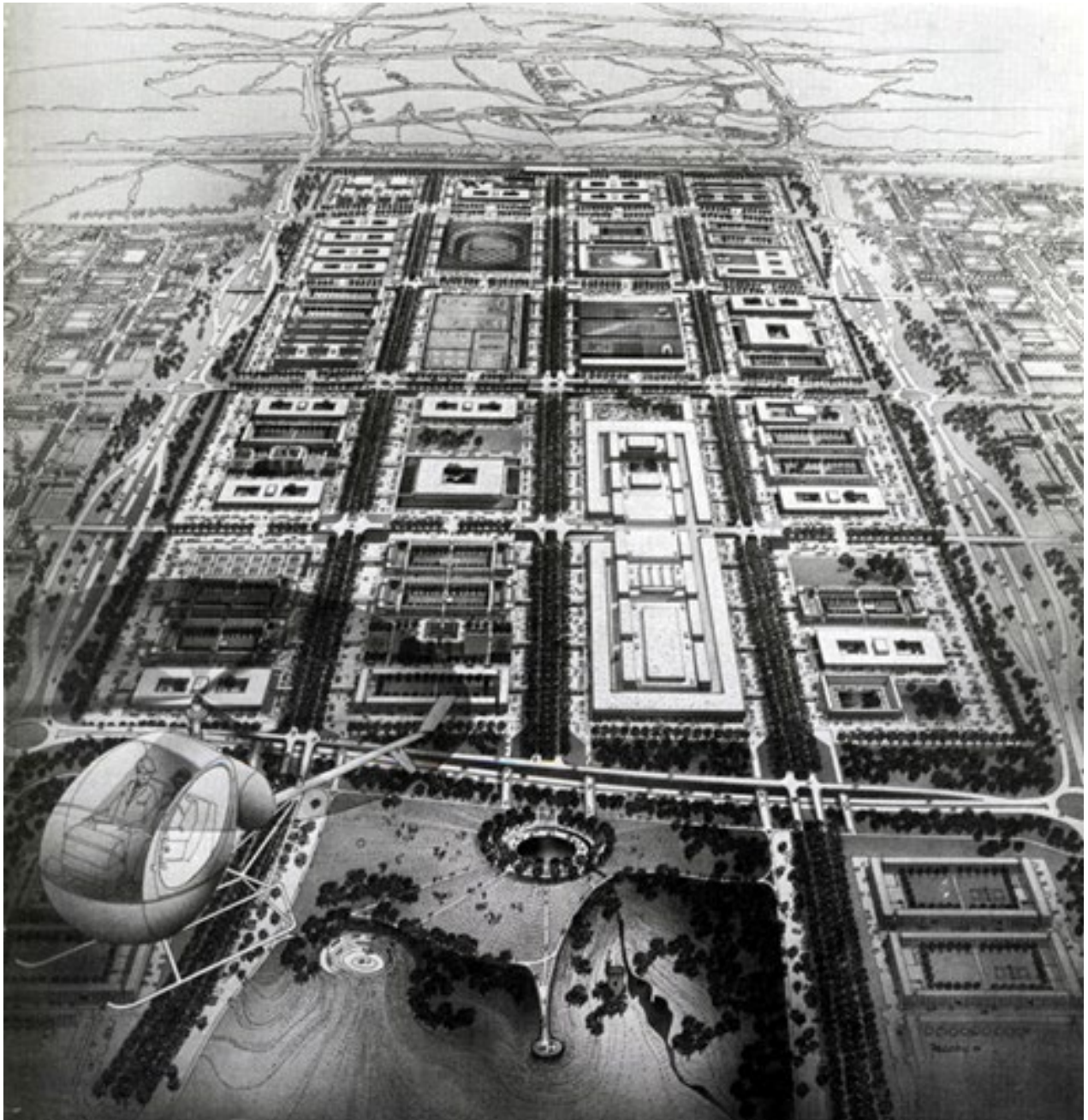


MOVING CITY

CROSSING CITY

Figure 85: Bill Berrett, North Bucks New City, 'Pooleyville', View approaching the City Centre from transit, 1962. © Centre for Buckingham Studies.

Buckinghamshire County's architect and planner, Fred Pooley had worked on a new 'North Bucks New City' between Wolverton and Bletchley, which contained concentric road layouts but utilised a monorail system. Along with MARS plan for London (Figure 81), Pooley's optimistic city matched the drive for new town creation and planning experimentation (See Cumbernauld 1955, Runcorn 1964). Pooleyville was succeeded by the planning and construction of Milton Keynes (1967).



HORIZONTAL CITY GARDEN CITY

Figure 86: Helmut Jacoby, MK in 1990, Aerial Perspective, Graphite, Milton Keynes Main Centre, 1974-1990, 1974. Courtesy of Derek Walker.

Planned as a 34 square mile area, the ‘Forest City’ would incorporate existing towns, Bletchley, Wolverton and Stony Stratford along with another fifteen villages and farmland in between. Milton Keynes using ideas from the planner Melvin Webber, would establish a grid system (0.62mi squares) which distributed both transport and building types and would retain 20% green space. The German architectural draftsman Helmut Jacoby depicted the Central shopping area and Campbell Park (Base of image) showcasing the grid system (Bor, 2013).



MEDIA CITY

LAYERED CITY

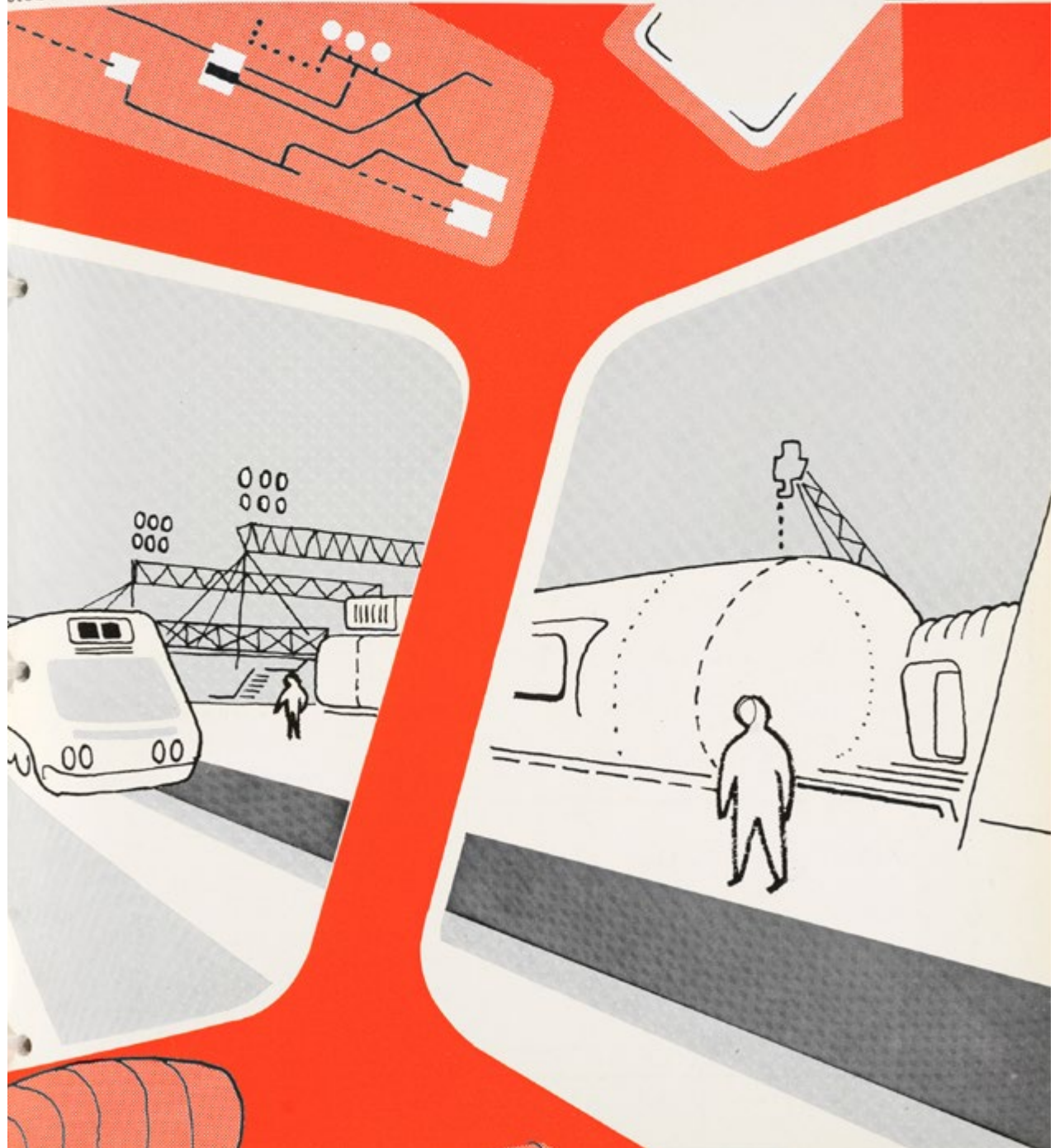
Figure 87: Mike Evans, Cumbernauld Town Centre, 1963, © Courtesy of RCAHMS (Royal Incorporation of Architects in Scotland). Licensor www.rcahms.gov.uk.

The perspective visual was particularly useful in showing Geoffrey Copcutt's design of human scale dynamics of the city and the ideas of Cumbernauld new town nine level megastructure construction. Megastructures also recur in the work of Alison and Peter Smithson (Figure 83).

architectural design

October 1966

Price 5s.

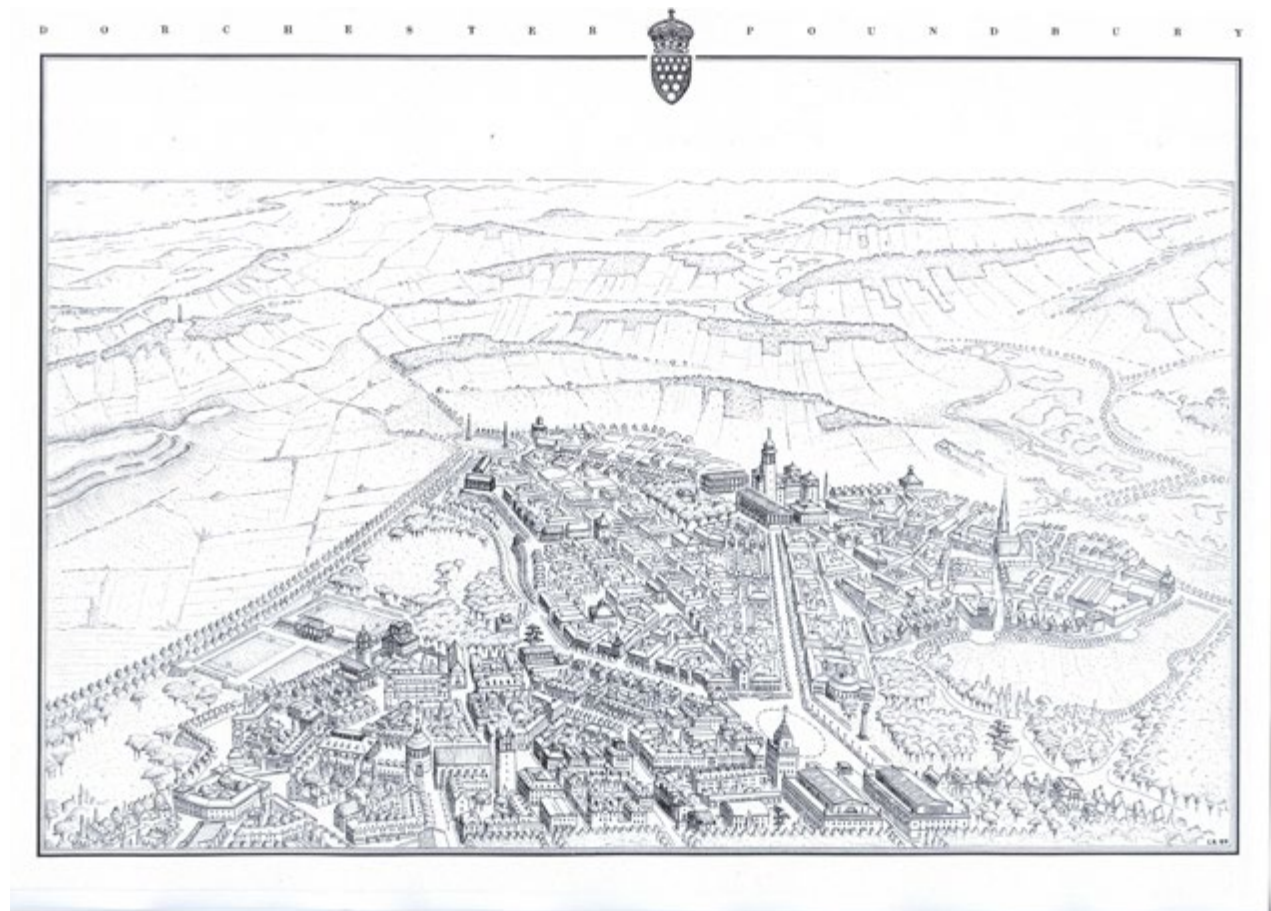


MOVING CITY

MEDIA CITY

Figure 88: Cedric Price, 'Potteries Thinkbelt, North Staffordshire, England: View from a railbus, Longton Faculty Area' in Architectural Design Volume XXXVI, October 1966, cover page London: Standard Catalogue Co. [1966] W.A755. Collection Centre Canadien d'Architecture/ Canadian Centre for Architecture, Montréal.

Price proposed that the North Staffordshire Potteries be turned into a High-Tech University. Creating a series of mobile architectural units, dedicated to ceramic research and innovation, the units function as urban regenerative tools.



TRADING CITY

MECHANICAL CITY

Figure 89: Leon Krier, Aerial of Poundbury, Choice or Fate? 1989. Courtesy of Leon Krier.

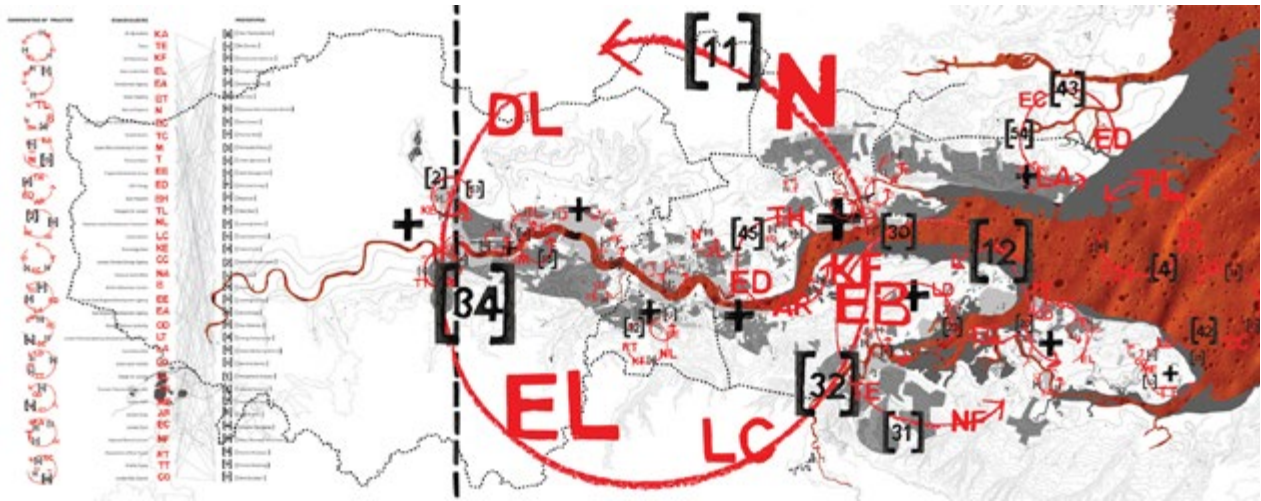
Krier's plan for Poundbury, constructed on land owned by the Duchy of Cornwall founded on New Urbanist ideas of human mobility which preferred more sustainable transport such as walking, cycling, and public transport.



MECHANICAL CITY

Figure 90: Skarne Construction System, Whitfield, Dundee, Angus, Scotland, 1989.
© RCAHMS (Aerial Photography Collection). Licensor www.rcahms.gov.uk.

Skarne was an industrialised building system to create block housing. The system created housing in Gateshead, Newcastle-upon-Tyne and Edinburgh. The building system projected new technological possibilities of architectural modernism and social relations. However, the building system was subsequently demolished due to deterioration and unpopularity with the geometric pattern which was deemed unresponsive to the landscape condition.



TRADING CITY **SMART CITY**

Figure 91: Chora, Thames Gateway, Thames Gateway Map, 380mm x 1400mm, 2004 -2008. Courtesy of Chora.

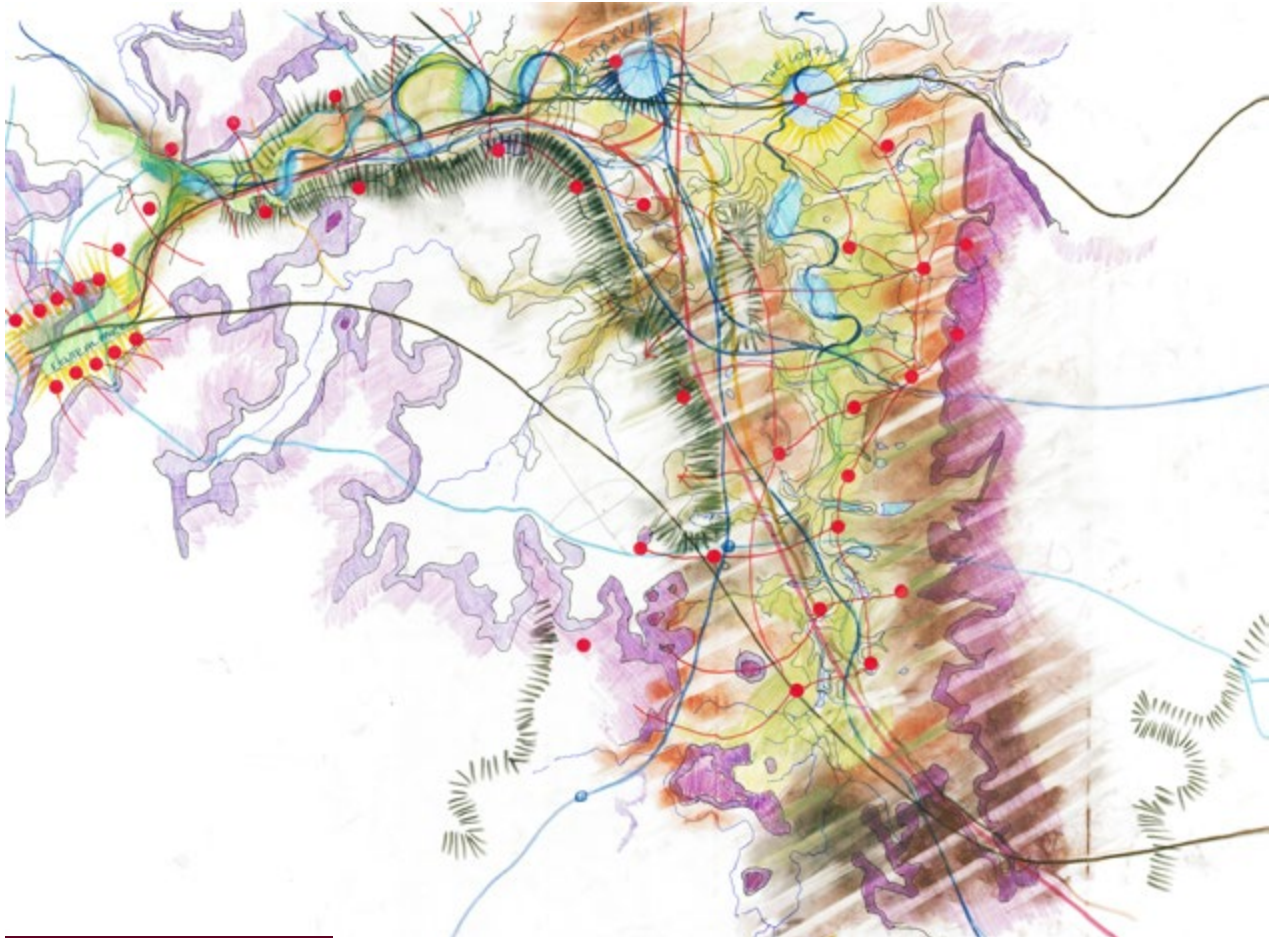
Intended as an urban prototype, a series of managerial fields or clusters were established, to generate a dynamic masterplan (a choreography of the city). The action plan allowed set targets, created tax incentives (like creating a special economic zone or introducing a green lease), and advice on any planning changes required. A workshop manual, akin to DIY architecture, and workshop were also created.



LAYERED CITY

Figure 92: DSRNY, Granite Web: Aberdeen City, 2012. © DSRNY.

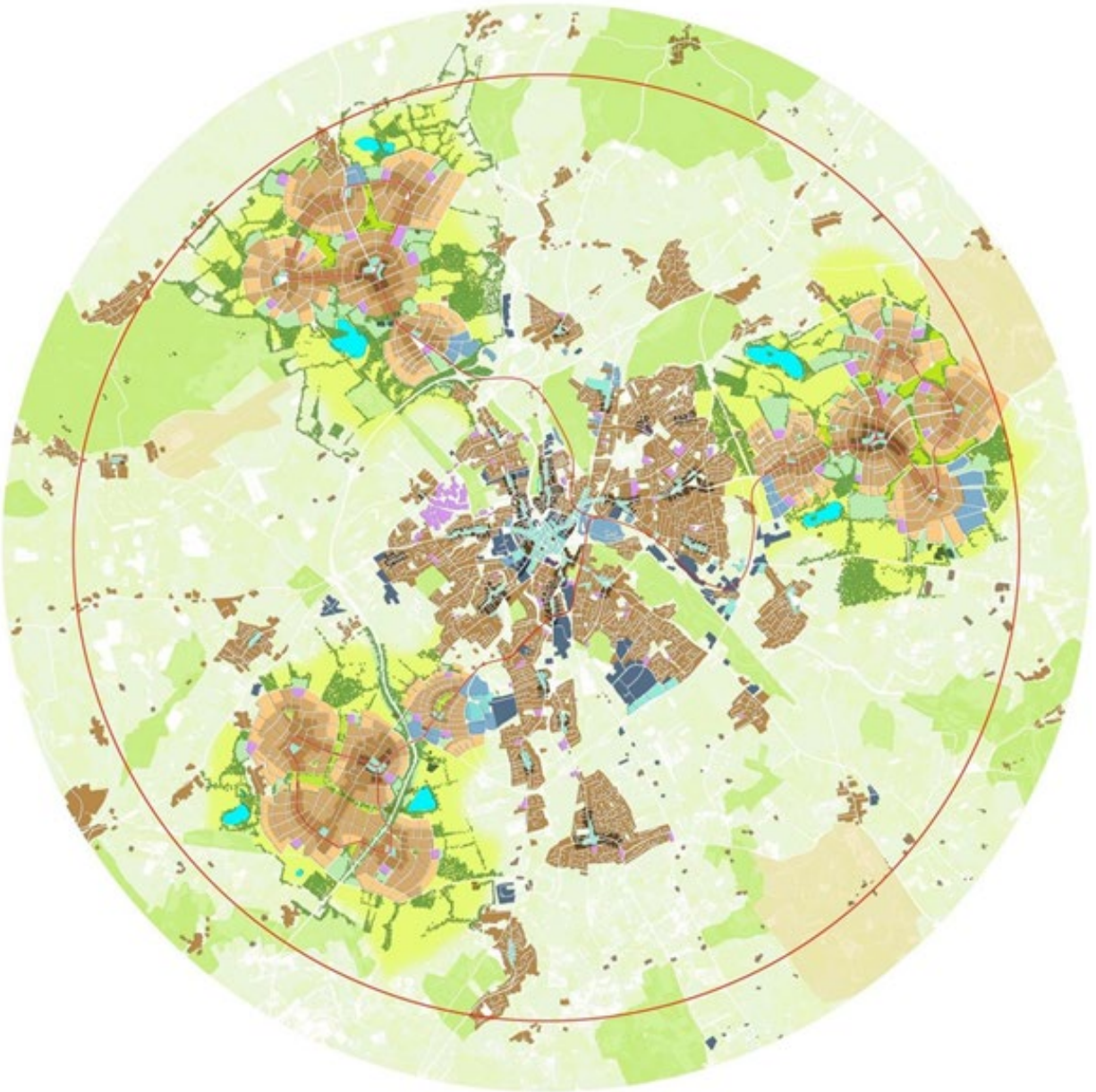
DSRNY proposed a layered garden and cultural space for the centre of Aberdeen. Projected as a renewal programme the Granite Web uses green recreational space and embeds a performance and exhibition venue below.



GARDEN CITY

Figure 93: Kathryn Moore, HS2: A Landscape Vision for Birmingham, Hand Coloured Drawings, Layout Paper, 2012, 841 x 594mm. Courtesy of Kathryn Moore.

Moore's landscape study, and the visualisation of the potential of reinvigorating the Tame and Blythe valleys, creates a map surface which buffers greater Birmingham, Coventry and Solihull urban sprawl. Birmingham's intentions as a Biophillic city reflect in Moore's proposal. Biophillic cities are intended as connectors between health and nature and the city is developing a 'natural capital metric' for assessment of its urban projects



GARDEN CITY

Figure 94: URBED, Uxcester Masterplan, Wolfson Economics Prize, 2014.

URBED's competition entry proposes a model for expanding existing cities in the UK. Using a fictional city of approximately 200,000 residents as a vehicle to demonstrate their ideas, this design incorporates three large urban extensions that both link to the existing city via public transport whilst also providing new accessible green space for the city. A jointly owned Garden City Trust comprising of local authorities, land owners and central government is envisioned to deliver the scheme.

8. Conclusions

(Figures 95, 96 in the next two pages)

Figure 95: Taxonomy for visualisation of future cities, 2014. Having explored various formats and methods of data visualisation, this taxonomy seeks to communicate the complexity of the relationships between the different examples illustrated throughout this report. In this regard, such a visualisation simply raises more questions than it answers since it is evident that the data may be viewed through different lenses (for example: cultural, professional etc.). However, given the specification of the inquiry, this visualisation is arranged in relation to the type and elements of the images themselves. It demonstrates the fluidity of future city visions, which seldom belong to multiple categories of city types. Whilst a systematic organisation of such a broad spectrum of materials is necessarily limited from the outset, it has provided an important part of the authors' process of identifying and understanding underlying characteristics and thematic patterns across the body of work. A recommendation is to be made here that a more flexible and interactive platform for examining the relationships between these visualisations of future cities is developed that would not be suited to a static medium such as this report.

How to read the taxonomy

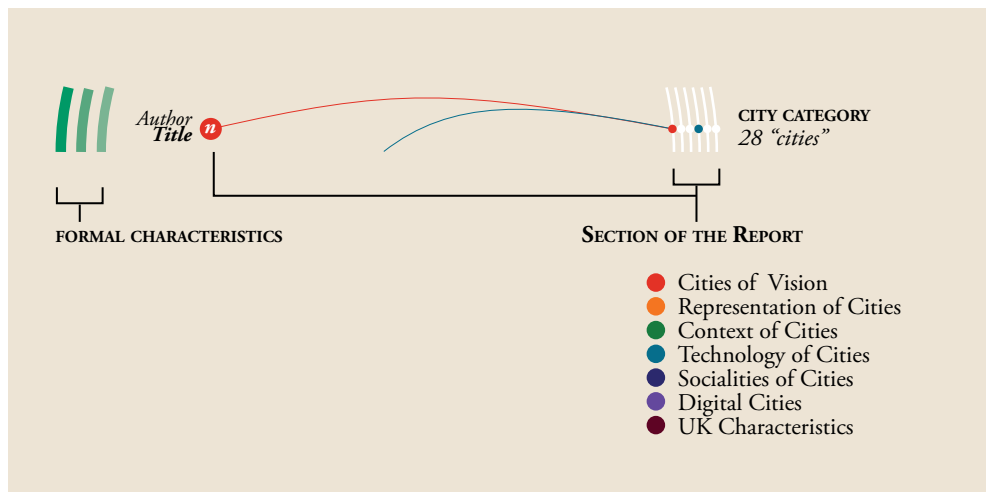
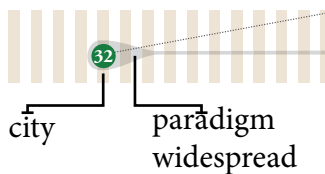
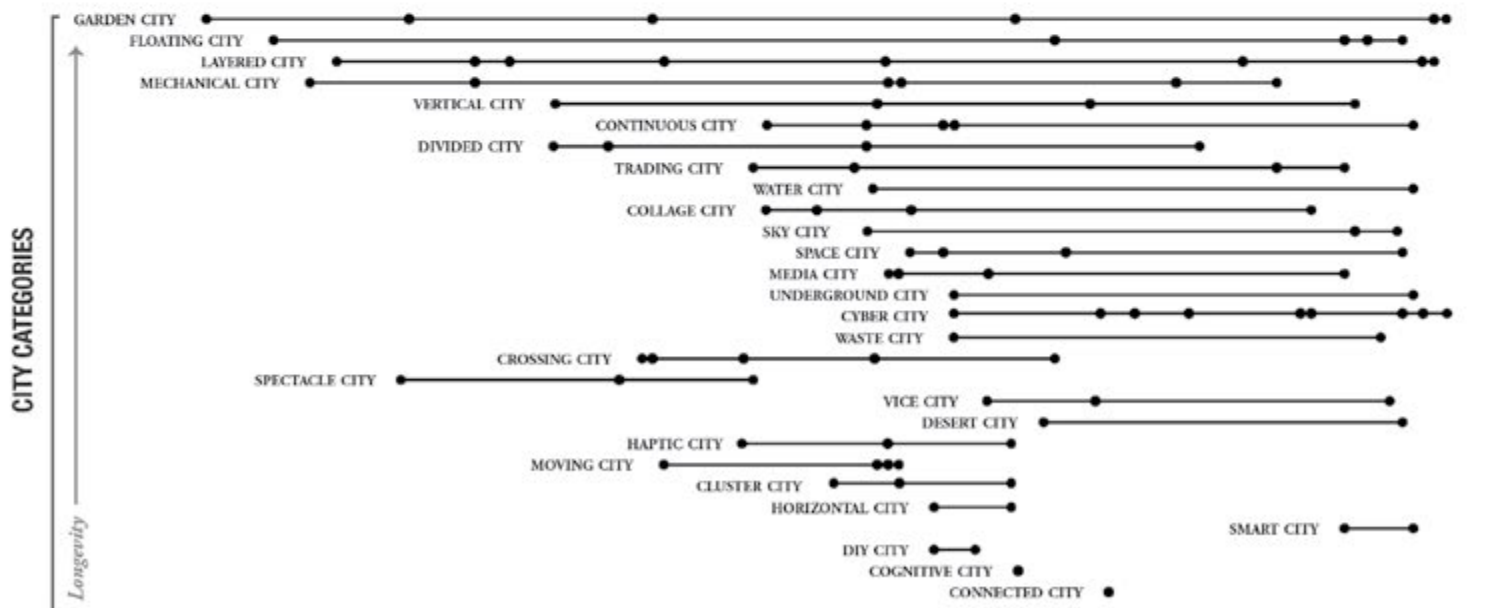
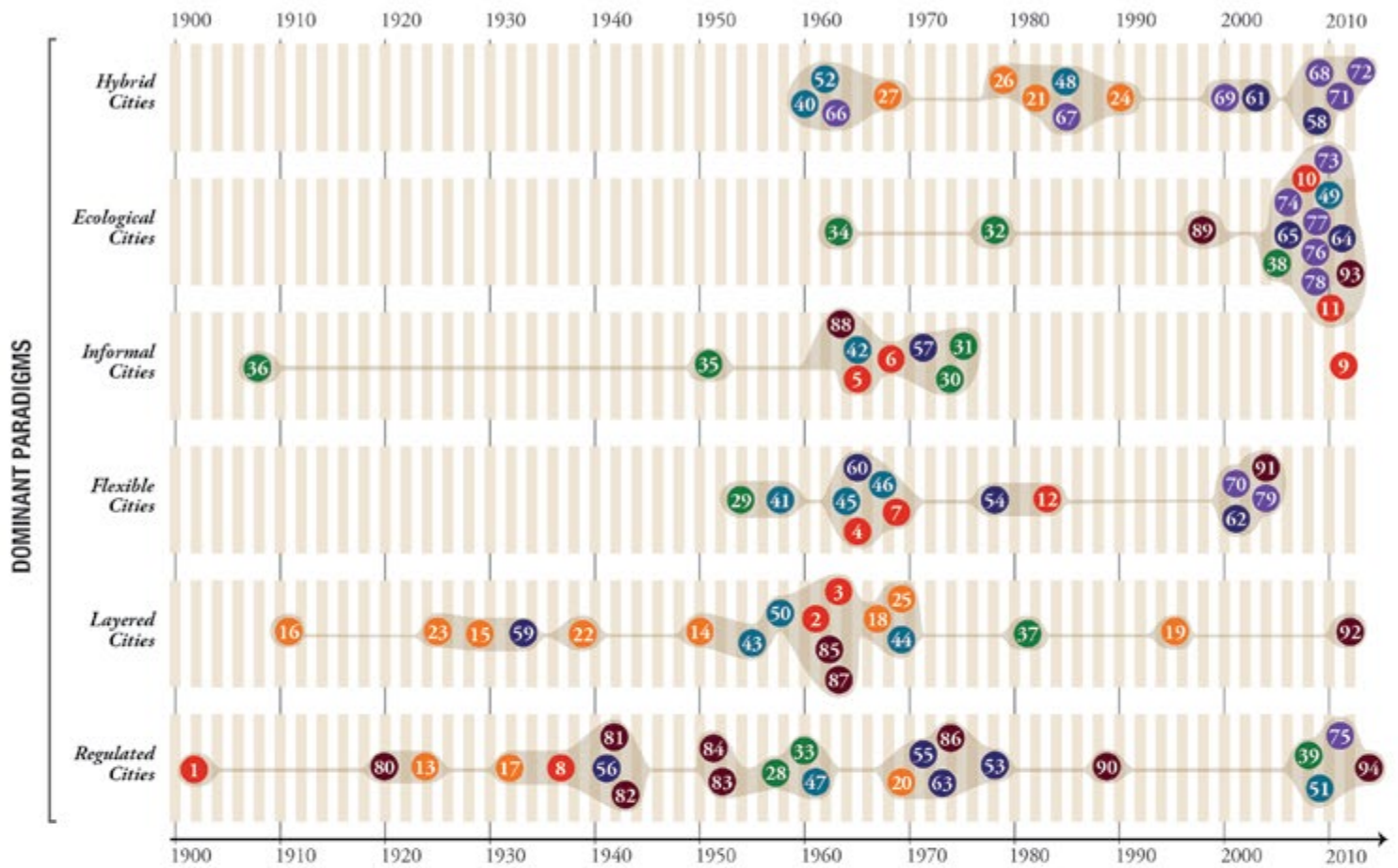


Figure 96: Dominant Visual Paradigms of Future Cities. The dominant paradigms emerge from the categorisation of the major feature of each city image.

How to read the timeline:



Timeline of dominant paradigms and categories



In this paper we have collected and analysed an extensive body of work with regard to the visualisation of future cities in a period spanning from the start of the twentieth century to the present day. Clearly, this is a huge topic and we have needed to be discerning in our approach. Our attempt to categorise the different ways in which future cities have been depicted has enabled us to draw out overarching narratives and thematic patterns for how urban life has been envisaged. Thus a series of future city categories were established and dominant paradigms drawn from these.

Why should this matter? The value of reexamining the histories and visual materials of the past and the manner in which they sought to extrapolate or project toward the future of cities is evident in the increasing body of work related to this endeavour (for e.g. Mami et al., 2011; Brook, 2013; de Witt & Alexander, 2013). In addition, the importance of built work that has been subsequently demolished, or imagined projects that were never realised upon our reading of the future of architecture and cities should not be underestimated as Murphy (2012) has argued. This is a point worth emphasising for the evaluation of where we can be, as it gives scope to competing city forms and their respective challenges. In addition, our relationship with, and, understanding of, the built environment has also radically altered during the timeframe being studied, i.e. 1900-2014. The burgeoning interest in cities as places for happiness (Montgomery, 2013), wealth (Glaeser, 2011), social cohesion (Bauman, 2007), fear (Minton, 2009) or positive transformation (Hollis, 2013) in recent years has cast them to the forefront of public consciousness through direct, everyday experience and mainstream media. Accordingly, the impact of how future cities are visualised and disseminated across various media, especially given the ability for content to go viral across the Internet and echo through social networks (Castells, 2000), means that we cannot and should not underestimate their power upon our thinking and future strategies, whether explicit or subconscious.

This paper has thus accounted for the proliferation and impact of future city visions across a wide range of media. It has sought to identify and establish connections between different characteristics within these visualisations including: method of production, contexts, technologies, socialities, digital features and data, and those aspects that appear to be specific to Britain. This has enabled us to set out six dominant visual paradigms of future cities as outlined below:

1. *Regulated Cities* - urban visions that integrate aspects of rural/country/green living.
2. *Layered Cities* – portrayals that have explicit multiple but fixed levels typically associated with different mobilities.
3. *Flexible Cities* - urban depictions that allow for plug-in and changes but still fixed in some manner to context.
4. *Informal Cities* – present visions that suggest much more itinerant and temporary situations and include walking, nomadic, and non-permanent cities.
5. *Ecological Cities* - illustrations of cities that demonstrate explicit ecological concerns, renewable energies, and low or zero carbon ambitions. .

6. *Hybrid Cities* - urban visions that deliberately explore the blurring between physical place and digital space, including augmented reality and 'smart' cities.

These six principal paradigms have been subsequently checked for their integrity and flexibility. The survey of further future cities visualisations, initially collated during the early stages of research for this paper, ensured they could all be accounted for within one or more of the paradigms and can be seen in Figures 95, 96. Understandably, their nomenclature may be open to some level of discussion and further scrutiny. However, they represent discrete and robust types that provide overarching, primary classes within which the twenty-eight categories of cities identified in our paper fit.

For example the early garden city movement, could be read as situated within the dominant paradigm of the Ecological City, though its conceptual base is regulated thus also falling with the Regulated City paradigm. Landscape urbanism and biophilic cities owe much to the Garden City movement, though the associated designs and images each have a nuance and different vector concerned with natural processes and connectivity. These movements can be flexibly categorised within the Ecological Cities dominant paradigm. The Garden City category, which retains a strict moral parameter and planning code, has arguably remained one of the most continuous city categories in the last century. This category, as mentioned, also connects to the Regulated City dominant paradigm, which is the UK's most continuous dominant visualisation paradigm.

However, the latter half of the century has given rise to the establishment of a number of other city paradigms, which provides interesting reading to how cities are conceptualised and visualised. This point is demonstrated by the taxonomy presented in the report wherein the materials have been systematically arranged in relation to the type of representation and elements of the images themselves. This reading is flexible, readers may heavily contend this categorisation of the cited projects, and to an extent this is healthy. Just as the images sought to engage discussion on the cities of the future this paper invites and promotes such activity. It demonstrates the agency and plasticity of visualisations of future cities that typically span multiple categories of city types.

One of the larger growth paradigms to emerge is the Ecological City. The paradigm may have a short timeline (as does the Hybrid City) or morph with others, but environmental concerns and technological possibilities points at a convergence towards city principles of flexibility, hybridity and ecology. Such images of tomorrow may be catalysed by contemporary conditions as we have seen in some of the examples such as Hugh Ferriss (Figure 13). The Ecological City paradigm evidences increasing concern about the longevity of the city, adaptability to climate change, resource management and resilience of changing social dynamics and populations. The paradigm infers a synergy of disciplines with stakes in the city. This paradigm also evidences the agency of the image to maintain this synergy and cross disciplinary working. This is of course a speculative futurological point but given the surveyed visual evidence, signifies this concern and change. The relationship with the city, nature and its ecology has been visualised more prominently, and emerged in principles for the built environment, from zero energy structures through the digital Building Information Modelling (BIM) process or broader theoretically led movements, such as landscape urbanism and biomimicry

architecture (Pawlyn, 2011).

The Foresight Future of Cities programme seeks to address city conditions in 2040 and 2065 predominately, as this timeline falls in a period in which contemporary planning phases, at large scale, would become complete. The image plays a very peculiar role for future cities as we have seen, sometimes the images translate the unreal, the concept, to the real and this involves making ideas of city space readable. This paper, in its ambition hopes to show the reader that the city image is not just a passing spectacle, but an important tool, which invites decoding of the concepts associated with it to provide evidence of the conceptual sphere in which we are thinking of cities of tomorrow.

This development and identification of the growth of the Ecological City paradigm is reflective of the multiple narratives; conditions and styles of urban growth and projection that have evolved during a period of significant events (for e.g. wars, financial collapse, environmental catastrophes etc.); extensive technological advancements, better understanding of health and wellbeing in cities; and wider changes in society. Not least is a general shift toward more performance-orientated design (Hensel, 2013).

To better understand the various ebb and flow of the six principal paradigms, all the cities described in this paper have been organised in a timeline (Figure 96) spanning the period examined. This enables us to read patterns of aggregation and overlap of city categories. It also facilitates less obvious connections between future city visualisations to be discerned. A further exercise would be to undertake a design led comparison of the projected future cities with their built manifestations within particular city categories established in the paper such as Garden Cities emerging from Victorian moral and social reform or Vertical Cities led from the modernist influence of CIAM. This task would involve the examination of the city categories discrepancies and analysing the successful schemes and characteristics, whilst also being able to critically appraise those deemed to have failed (Goodwin & Grant, 1997).

Further conclusive evidence of the Ecological City becoming the designed and predominate paradigm would be qualified in further work interpreting the agency of image to built form in the United Kingdom.

Of the above categories, the dominant form of future city realised in the UK has been the Garden City category, followed very closely or combined with Modernism, which formed and influenced UK New Towns. The history and social repercussions of other British urban development and housing projects have been the subjects of much critical commentary to date (e.g. Hanley, 2007; Grindrod, 2013; Jones & Matthews, 2014). However, an in depth review and scientific account of their legacy is pressing. This is particularly important as Britain recently announced the construction of a new garden city by the Thames Estuary at Ebbsfleet (<http://www.theguardian.com/uk-news/2014/mar/16/george-osborne-garden-city-ebbsfleet-budget>; accessed 20.03.14).

In addition to this, the recent Wolfson Economics prize promoted both visionary and economically viable proposals for a new garden city. This project also demonstrates both the power and agency of images and also their relationship, which is inextricably bound with social, economic and cultural concerns. Comparing the entries also reveals

the flexibility in which the garden city category is interpreted.

Finally, such work also evidences the increasing focus of cities function and form at political and policy level.

In this regard, a foreseeable shift toward more open frameworks that enable decision makers, people and communities to inform adaptable, resilient and sociable urban development seems likely (Campbell, 2011). Such work alongside the Foresight Future of Cities programme forms an important resource for catalysing and rethinking the potential of perspectives on future cities more widely. One of the principal tenets going forward would be the relationship of people and their built environment. As Juhani Pallasmaa (2005: p.40) has poetically observed of this socio-urban relationship “I experience myself in the city, and the city exists through my embodied experience. The city and my body supplement and define each other. I dwell in the city and the city dwells in me.” As identified earlier in this report, the recurrence and growth of more socially engaged future city visions in the early twenty-first century is notable and perhaps reflective of greater societal and global ambitions of ecological and social sustainability, alongside economic and political aspects of urban life. The city contains its past, though such research into the visualisation of cities shows how the image, in all its manifestations, embodies a range of ideas of the cities we have and have had, and the cities we want, need, desire, fear or dream of for our collective future.

Glossary

City Categories

Garden city – Cities based or derived from the theories of Ebenezer Howard.

Divided City – Cities layered or separated through transport, zoning or infrastructure

Mechanical City – Cities which have mechanised functions

DIY City – Cities which involve temporary or mass construction derived from instruction

Space City – Cities which project beyond Earth's atmosphere.

Sky City – Cities which float and drift in the atmosphere.

Continuous City – Cities which continually expand or have no defined boundary.

Spectacle City – Cities which generate memorable consummative events, primarily visual.

Layered City – Cities which sandwich their dynamics through multiple layers.

Horizontal City – Cities focused on landscape aspects and connectivity.

Underground City – Cities developed below ground level.

Vice City – Cities focused on catering of immorality, wrongdoing and misconduct.

Media City – Cities developed through extensive mass media communications.

Moving City – Cities with mobility able to partially or fully reposition.

Cyber City – Cybernetic cities that are digitally response.

Trading City – Cities functioning as trading entities, information and exchange.

Crossing City – Cities functioning as crossings both geographical and virtual.

Waste City – Cities that function through recycling and waste energy capture.

Cluster City – Cities configured as clustered sets and types.

Haptic City – Cities with overtly sensory features.

Desert City – Cities adapted for desert climates.

Collage City – Cities as a collection of montaged and collaged features.

Smart City – Cities interconnected and responsive through supermassive data sets.

Water City – Cities adapted to waterborne environments.

Floating City – Cities that float or become airborne.

Vertical City – Cities concentrated on its vertical properties.

Connected City – Cities connected to other cities in many forms.

Cognitive City – Cities configured for advanced mental processing.

References

- ABERCROMBIE, P. (1933), *Town and Country Planning* (London: Thornton Butterworth).
- ALBRECHT, D. & GEDDES, N.B. (2012), *Norman Bel Geddes designs America* (New York: Harry Ransom Humanities Research Center, Museum of the City of New York).
- ALEXANDER, A. (2009), *Britain's New Towns: Garden Cities to Sustainable Communities* (London: Routledge).
- ALISON, J. ET AL. (2007), *Future City: Experiment and Utopia in Architecture* (London: Thames & Hudson).
- ALLEN, S. (1999), *Points + Lines: Diagrams and Projects for the City* (New York: Princeton Architectural Press).
- APPLETON, J. (1975), *The Experience of Landscape* (London: Wiley).
- ATELIER BOWWOW. (2010), *Behaviorology* (New York: Rizzoli International Publications).
- BALLARD, J. G. (1962), *The Drowned World* (New York: Berkley).
- BALLARD, J. G. (1975), *High Rise* (London: Jonathan Cape).
- BALMORI, D. CONAN, M. (2010), *A Landscape Manifesto* (New Haven, CT: Yale University Press).
- BANHAM, R. (1976), *Megastructure: Urban Futures of the Recent Past* (London: Thames and Hudson).
- BANHAM, R. (1984), *The Architecture of the Well-tempered Environment 2nd Edition* (London: The Architectural Press Ltd.).
- BARBER, S. (2002), *Projected Cities* (London: Reaktion Books).
- BARBROOK, R. (2007), *Imaginary Futures: From Thinking Machines to the Global Village* (London: Pluto Press).
- BASSETT, C., STEINMUELLER, E. & VOSS, G. (2013), *Better Made Up: The Mutual Influence of Science fiction and Innovation* Nesta Working Paper No. 13/07.
- BAUMAN, Z. (2007), *Liquid Times: Living in an Age of Uncertainty* (Cambridge: Polity).
- BELLAMY, E. (1887), *Looking Backward* (Boston, MA: Ticknor and Company).
- BENTLEY, I., ALCOCK, A., MURRAIN, P., MCGLYNN, S. & SMITH, G. (1985) *Responsive Environments: A manual for designers* (Oxford: Architectural Press).

- BERMAN, M. (1983), *All That is Solid Melts into Air* (London: Verso).
- BINGHAM, N. (2013), *100 Years of Architectural Drawing: 1900-2000* (London: Laurence King).
- BISHOP, J. (1984) 'Passing in the Night: Public and Professional Views of Milton Keynes', *Places, Milton Keynes*, 1 (4): 9–16.
- BLOMKAMP, N. (2009), *District 9*. Action, Sci-Fi, Thriller.
- BOR, LLEWELYN-DAVIES WEEKS FORESTIER-WALKER (2013), *The Plan for Milton Keynes* (London: Routledge).
- BOUDINOT, R. (2012), *Blueprints of the Afterlife* (New York: Black Cat, Grove/Atlantic).
- BOYER, M. C. (1996), *CyberCities: Visual Perception in the Age of Electronic Communication* (New York: Princeton Architectural Press).
- BRENNER, N. (2014), *Implosions/Explosions: Towards a Study of Planetary Urbanization* (Berlin: Jovis Verlag).
- BROOK, D. (2013), *A History of Future Cities* (New York: W.W.Norton & Company Inc.).
- BROOK, R. & DUNN, N. (2011), *Urban Maps: instruments of narrative and interpretation in the city* (Farnham: Ashgate).
- BROOKER, P. (2002), *Modernity and Metropolis: writing, film, and urban formations* (New York: Palgrave).
- BRUNO, G. (2002), *Atlas of Emotion: Journeys in Art, Architecture, and Film* (London: Verso).
- BUDER, S. (1990). *Visionaries and Planners the Garden City Movement and the Modern Community* (New York: Oxford University Press).
- BURTON, T. (1989). *Batman*. Action, Fantasy.
- BUSBEA, L. (2007), *Topologies: The Urban Utopia in France, 1960-1970* (Cambridge, MA: The MIT Press).
- CALVINO, I. (1974), *Invisible Cities*. Translated by William Weaver (London: Secker and Warburg).
- CAMPBELL, K. (2011), *Massive Small: The Operating Programme for Smart Urbanism* (London: Urban Exchange).
- CASTELLS, M. (2000), *The Rise of the Network Society*, 2nd Edition. (Oxford: Blackwell Publishing).

- CHRISTALLER, W. (1933), *Die zentralen Orte in Süddeutschland* Translated (in part) by Charlsie W. Baskin (Jena: Gustav Fischer).
- CLARKE, D. B. (ED.) (1997), *The Cinematic City* (London: Routledge).
- COATES, N. (2003), *Ecstacity: guide to ecstacity* (London: Laurence King).
- COLES, A. & ROSSI, C. (EDS) (2013), EP Vol. 1 - *The Italian Avant-Garde: 1968-1976* (Berlin: Sternberg).
- COLQUHOUN, I. (2008), *RIBA Book of British Housing: 1900 to the Present Day* (Oxford: Architectural Press).
- COOK, P. (2008), *Drawing: The Motive Force of Architecture* (London: John Wiley & Sons).
- CORNER, J. (ED.) (1999), *Recovering Landscape: Essays in Contemporary Landscape Architecture* (New York: Princeton Architectural Press).
- CROWTHER, S. G. & BUCHANAN, C. (1963), *Traffic in Towns*, 1st edition (London: Penguin & H.M.S.O).
- CULLEN, G. (1995), *The Concise Townscape* (Butterworth-Heinemann, Oxford; Boston).
- CURETON, P. (2013), 'Videre: Drawing and Evolutionary Architectures', *M.A.D.E. Journal*, October, vol.7), pp. 18-27.
- DE WIT, W. & ALEXANDER, C.J. (2013), *Overdrive: L.A. Constructs the Future 1940-1990* (Los Angeles: Getty Research Institute).
- DEBORD, G. (1955), *Introduction to a Critique of Urban Geography* (Les Lèvres Nues vol.6).
- DUANY, A. (2013), *Landscape Urbanism and Its Discontents* (Gabriola, BC: New Society Publishers).
- DUNN, N. (2013), 'Mapping Interstices' *Once Upon a Place: Architecture and Fiction* edited by Gadanho, P. & Oliveira, S. (Lisbon: Editora Caleidoscópio), pp. 185-195.
- EASTON, R. (2002), *Ideal Cities: Utopianism and the (Un)Built Environment* (London: Thames and Hudson).
- FERRISS, H. (1929), *The Metropolis of Tomorrow* (New York: Ives Washburn).
- FISHMAN, R. (1982), *Urban Utopias in the Twentieth Century* (Cambridge, MA: The MIT Press).
- FORSTER, E. M. (1909), 'The Machine Stops' *Oxford and Cambridge Review*, Vol. 8, November.

- FRAZER, J. (1995), *An Evolutionary Architecture* (London: Architectural Association).
- FULLER, R. B. (1971), *The World Game: Integrative Resource Utilization Planning Tool* (Carbondale, IL: World Resources Inventory, Southern Illinois University).
- FULLER, R. B. (2008), *Operating Manual for Spaceship Earth* (Lars Müller Publishers: Zurich).
- GELL, A. (1998), *Art and Agency: Towards a New Anthropological Theory* (Oxford: Clarendon Press).
- GEORGE, H. (2012), *Progress and Poverty: An Inquiry into the Cause of Industrial Depressions and of Increase of Want with Increase of Wealth : The Remedy* (London: Nabu Press).
- GIBSON, W. (1984), *Neuromancer* (London: Victor Gollancz).
- GLAESER, E. (2011), *Triumph of the City: How our greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier* (London: Penguin).
- GOODMAN, D. (2008), *A History of the Future* (New York: Monacelli Press).
- GOODWIN, J. & GRANT, C. (EDS) (1997) *Built to Last?: Reflections on British Housing Policy* 2nd edition. (London: Roof).
- GRAHAM, S. (2010), *Cities under Siege* (London: Verso).
- GRINDROD, J. (2013), *Concretopia: A Journey Around the Rebuilding of Postwar Britain* (London: Old Street).
- HALL, P. (1988), *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century* (Cambridge, MA: Basil Blackwell).
- HALL, S. (2007), *The Raw Shark Texts* (Edinburgh: Canongate).
- HALPRIN, L. (1963), *Cities* (New York: Reinhold Publishing).
- HALPRIN, L. (1963), *Taking Part Workshop Method* (Cambridge, MA: The MIT Press).
- HALPRIN, L. (1965), 'Motation', *Progressive Architecture*, 46, no. 2, pp126–133.
- HANLEY, L. (2007), *Estates: An Intimate History* (London: Granta).
- HARDY, D. (2011), *From Garden Cities to New Towns: Campaigning for Town and Country Planning 1899-1946* (London: Taylor & Francis).
- HARMON, K. (2003), *You Are Here: Personal Geographies and Other Maps of the Imagination* (New York: Princeton Architectural Press).

- HENSEL, M. (2013), *Performance-Orientated Architecture: Rethinking Architectural Design and the Built Environment* (Chichester: John Wiley & Sons Ltd.)
- HERBERT, F. (1999), *Dune* (London: New English Library [1965]).
- HIGHMORE, B. (2005), *Cityscapes: cultural readings in the material and symbolic city* (Basingstoke: Palgrave Macmillan).
- HOLLIS, L. (2013), *Cities Are Good for You: The Genius of the Metropolis* (London: Bloomsbury).
- HOWARD, E. (2009), *To-morrow: A Peaceful Path to Real Reform* (London: Routledge [1898]).
- HUXLEY, A. (2007), *Brave New World* (London: Vintage Books [1932]).
- INGOLD, T. (2007), *Lines: A Brief History* (London: Routledge).
- JACOBS, J. (2011), *The Death and Life of Great American Cities*. 50th anniversary ed. (London: Random House Inc [1961]).
- JAMESON, F. (2007), *Archaeologies of the Future: The Desire Called Utopia and Other Science Fictions* (London: Verso).
- JELlicoe, S.G. (1961), *Motopia: a Study in the Evolution of Urban Landscape* (London: Jellicoe Studio).
- JONES, A. & MATTHEWS, C. (2014), *Towns in Britain: Jones the Planner* (Nottingham: Five Leaves).
- KLINGMANN, A. (2007), *Brandscapes: architecture in the experience economy* (Cambridge, MA: The MIT Press).
- KNABB, K. (ED.) (2007), *Situationist International Anthology*, Revised ed. (Berkeley CA: Bureau of Public Secrets).
- KOSTOF, S, AND TOBIAS, R. (1999), *The City Shaped: Urban Patterns and Meanings Through History*. New edition. (London: Thames & Hudson).
- KRIER, L. (2011), *The Architecture of Community* (Washington, DC: Island Press).
- KRIER, L., STERN, R. M. A, SPEER, A., LARSSON, L., & SPEER, A. (2013), *Albert Speer: architecture 1932-1942* (New York: Monacelli Press).
- KUBRICK, S., (1964) *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*. Comedy, War.
- LERUP, L. (2000), *After the City* (Cambridge, MA: The MIT Press).

- LEWALLEN, C. M. & SEID, S. (2004), *Ant Farm: 1968-1978* (Oakland, CA: University of California Press).
- LIN, Z. (2010), *Kenzo Tange and the Metabolist movement: urban utopias of modern Japan* (New York: Routledge).
- LYNCH, K. (1960), *The Image of the City* (Cambridge, MA: The MIT Press).
- MAMI ET AL. (2011), *Metabolism, the City of the Future* (Tokyo: Mori Art Museum).
- MANSFIELD, H. (1990), *Cosmopolis: Yesterday's Cities of the Future* (New Brunswick, NJ: Center for Urban Policy Research)
- MARCUS, A. & NEUMANN, D. (EDS) (2007), *Visualizing the City* (Abingdon: Routledge).
- MASSEY, D. (1994), *Space, Place and Gender* (Cambridge: Polity).
- MCDONOUGH, T. (2002), *Guy Debord and the Situationist International: Texts and Documents* (Cambridge, MA: The MIT Press).
- MINTON, A. (2009), *Ground Control: Fear and happiness in the twenty-first-century city* (London: Penguin).
- MITCHELL, W. J. (1995), *City of Bits: Space, Place, and the Infobahn* (Cambridge, MA: The MIT Press).
- MITCHELL, W. J. (2004), *Me++: The Cyborg Self and the Networked City* (Cambridge, MA: The MIT Press).
- MONCHAUX, J. D. (1984), 'Signals and Response: A Reply to 'Passing in the Night'', *Places*, Milton Keynes, 1 (4): 17–25.
- MONTGOMERY, C. (2013), *Happy City: Transforming our lives through urban design* (London: Penguin).
- MUJICA, F. (1930), *History of the Skyscraper* (New York: Archaeology & Architecture Press).
- MURPHY, D. (2012), *The Architecture of Failure* (Winchester: Zero Books).
- MURRAY BELL, L. & GOODWIN, G. (eds) (2012), *Writing Urban Space* (Winchester: Zero Books).
- NEUMANN, D. (ED.) (1996), *Film Architecture: Set Designs from Metropolis to Blade Runner* (Munich: Prestel-Verlag).
- NEWMAN, O. (1973), *Defensible Space; Crime Prevention Through Urban Design* (London, New York: Macmillan Pub Co).

- NORBERG-SCHULZ, C. (1980), *Genius Loci: Towards a Phenomenology of Architecture*. New edition. (New York: Rizzoli International Publications).
- OLDFIELD FORD, L. (2011), *Savage Messiah* (London: Verso).
- ORLANS, H. (2013), *Stevenage: A Sociological Study of a New Town*. Reprint edition. (London: Routledge).
- ORWELL, G. (2013), *Nineteen Eighty-Four* (London: Penguin Books [1949]).
- OSHII, M. (1996), *Ghost in the Shell*. Animation, Action, Mystery.
- PALLASMAA, J. (2005), *The Eyes of the Skin: Architecture and the Senses* (Chichester: John Wiley & Sons Ltd.).
- PAWLYN, M. (2011), *Biomimicry Architecture* (London: RIBA Publishing).
- PEREZ-GOMEZ, A., & PELLETIER, L. (2000) *Architectural Representation and the Perspective Hinge* (Cambridge, MA: The MIT Press).
- PINDER, D. (2005), *Visions of the City: Utopianism, Power and Politics in Twentieth-Century Urbanism* (Edinburgh: Edinburgh University Press).
- PORRITT, J. (2013), *The World We Made* (London: Phaidon).
- PUSHWAGNER, SPIRA, A. & O'DONNELL, N. (2012), *Pushwagner* (London: Art Books Publishing Ltd.).
- RABAN, J. (1974), *Soft City* (London: Hamish Hamilton).
- RUDOLPH, P. (2008), *Writings on architecture* (New Haven, CT: Yale University Press).
- SADLER, S. (1998), *The Situationist City* (Cambridge, MA: The MIT Press).
- SADLER, S. (2005), *Archigram – Architecture without Architecture* (London: The MIT Press).
- SCHWARZER, M. (2004), *Zoomscape: Architecture in Motion and Media* (New York: Princeton Architectural Press).
- SCHUMACHER, P. (2009), 'Parametricism – A New Global Style for Architecture and Urban Design' *Digital Cities AD Architectural Design* edited by Leach, N. & Castle, H., Vol 79, No 4, July/August (Chichester: John Wiley & Sons Ltd.), pp. 14-23.
- SCOLARI, M., ACKERMAN, J.S. & PALANDRI, J.C. (2012), *Oblique Drawing: A History of Anti-Perspective* (Cambridge, MA: The MIT Press).
- SCOTT, R., (1982), *Blade Runner*. Drama, Sci-Fi, Thriller.

SHANE, G. (2004), *'The Emergence of Landscape Urbanism'*, Harvard Design Magazine, vol.19, pp. 1–8.

SHEPARD, M. (ED.) (2011), *Sentient City: Ubiquitous Computing, Architecture, and the Future of Urban Space* (Cambridge, MA: The MIT Press).

SOLERI, P. (1969), *Arcology the City in the Image of Man*, 2nd ed. (Cambridge, MA: The MIT Press).

SOLERI, P. (2001), *The Urban Ideal* (Berkeley CA: Berkeley Hills Books).

TALBOT, B. (2007), *Alice in Sunderland* (London: Jonathan Cape).

THE GUARDIAN (2014), *Budget 2014: George Osborne unveils UK's 'first garden city for 100 years'*. [Online] Available from: <http://www.theguardian.com/uk-news/2014/mar/16/george-osborne-garden-city-ebbsfleet-budget> [Accessed: 20 March 2014].

THIEL, P. (1997), *People, Paths, and Purposes: notations for a participatory envirotecture* (Seattle: University of Washington Press).

THOMPSON, J. B. (1984), *Studies in the Theory of Ideology* (Cambridge: Polity).

THOMSEN, C. W. (1994), *Visionary Architecture: From Babylon to Virtual Reality* (Munich: Prestel Verlag).

THRIFT, N. (1996), *Spatial Formations*. (London: Sage).

VIENNA ARCHITECTURE CONFERENCE, NOEVER, P., GEHRY, F., ÖSTERREICHISCHES MUSUEM FÜR ANGEWANDTE KUNST (VIENNE, AUTRICHE) (1993), *The End of Architecture? Documents and Manifestos: Vienna Architecture Conference*, [MAK, Austrian Museum of Applied Arts, Vienna, June 15, 1992]. (Munich: Prestel Verlag).

WACHSMANN, K. (1961), *Turning Point of Building* (New York: Van Nost Reinhold).

WALDHEIM, C. (ED.) (2006), *The Landscape Urbanism Reader* (New York: Princeton Architectural Press).

WALKER, D. (1982), *The architecture and planning of Milton Keynes* (London: Architectural Press).

WATKINS, P., (1967). *The War Game*. Drama, Sci-Fi, War.

WEBBER, A. & WILSON, E. (EDS) (2008), *Cities in Transition: the moving image and the modern metropolis* (London: Wallflower Press).

WILLIS, C. (1995), *Form Follows Finance* (New York: Princeton Architectural Press).

WINES, J. (1988), *De Architecture*, Illustrated ed. (New York: Rizzoli).

WORK AC. (2009), *49 Cities* (New York: Storefront for Art and Architecture).

ZAMYATIN, Y. (2007), *We Translated by Natasha Randall* (London: Vintage Classics [1921]).

ZUKIN, S. (1996), *Cultures of Cities* (London: Wiley-Blackwell).

