Land.Arch.Infra. : Synergies between teaching and research
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[SLIDE 1]
Hello. Thank you to the conference organisers for giving us this opportunity to present some or our work. A special thanks to our colleague Laura Sanderson who I know has worked tirelessly to make this happen. I'm Dr Richard Brook and this is Dr Luca Csepley-Knorr, we are both Readers at the Manchester School of Architecture.

Today we will present some of our work from the past five years that has, in various ways, connected the research and the teaching of architecture, landscape and urbanism. The most substantial recent links between research and teaching are through the Research Methods elective for Year 1 Masters of Architecture students, but this is founded on a long lead-in of engaging with digital humanities and web publishing. The combination of digital design methods and digital publishing enables exciting experimentation and wide dissemination on the part of the students involved.

[SLIDE 2] The relationship between research and teaching can manifest in several ways. In his article, *The Link between Research and Teaching in Architecture*, Andrew Roberts uses Healey's model of the *Teaching-Research Nexus* to describe the types of activities in architectural education. **Research-tutored** pedagogy encourages students to "apply or interpret research content and ideas of tutors through their project work". In the course of **Research-based** education, "students use the process of designing as a means to advance and develop knowledge". **Research-oriented** teaching encourages students "to develop research skills and design enquiry and related information gathering skills through focussed teaching", while during units delivered through a **Research-led** methodology, students are learning about research findings of others, through lectures and seminars. (Roberts: 2007, 16.) The Research Methods course that we will come onto uses a combination of these approaches, deployed according to the context and content that staff and students are working within and with at any given time. The confidence to mix these methods and to apply them variously has been built from a range of experiences in research, teaching, publishing and dissemination.

Luca and I share a passion for post-war history and both have a grounding in landscape-urbanism that views the interconnectedness of landscape, architecture, planning, infrastructure and urbanism as vital to understanding political, social, cultural and economic histories. This creates a learning context where design is a vehicle through which to appreciate a broad range of concerns that affect the built environment, founded in historical studies, but with contemporary application.

[SLIDE 3] I have researched Manchester and its post-war circumstances for more than twenty years. My work is a combination of archival study, fieldwork photography, interviews and desktop research, typical of architectural history. In 2004 I began publishing my infrastructural photography online on a purpose-built website called manctransit, designed

in collaboration with Geoff Bretherick. This was launched around the same time as services like Flickr began!

[SLIDE 4] Fieldwork photography is an important part of my research and much of the rest of my work is also led visually – assembling plans and visions chronologically and asking about the decision making and physical changes that variously saw plans unrealised and partially or fully implemented. As such I built up a substantial collection of ephemera that I have digitised. As the utility of manctransit waned and its coding dated, Geoff and I collaborated on a new site - www.mainstreammodern.co.uk. Through mainstreammodern I am able to share some of the archive material I have recovered, but only that which related to buildings that were still standing.

[SLIDE 5] The Manchester School of Architecture Events programme in 2016 presented an opportunity to innovatively engage students and the public with a host of unbuilt visions of Manchester from the 1960s and 1970s through a project called *The Making of Post-War Manchester*. This project helped to establish 'research-tutored' and 'research-based' methods and definitively asserted our periodisation as focussed on 1945-1980. The post-war period makes for fascinating study as its records remain widely accessible, architecture, landscape and urbanism went through huge transformations and presented ambitious schemes, and many who worked in this period are still alive and on the whole very keen to share their experiences. Drawing on the **research-tutored** model, using hordes of my digitised materials, students were asked to work in groups to digitally reconstruct unbuilt masterplans from the 1960s.

[SLIDE 6] They used game engines to make models that were navigable in the first person with game controllers. They were also tasked with making a website that reported the histories of each site, what came before and how the sites were eventually developed. Through **research-oriented** teaching sessions with tutors and historians, the students were shown how to use particular databases and how to access archives. Armed with these skills, the **research-based** design processes began. In order to build the 3D environments, the students had to thoroughly research their given site and use their discrimination over what to include – several sites had more than one masterplan prepared during the period under study. The unbuilt schemes had different levels of resolution and, as such, the students had to research contemporary precedents to inform the mid-century styling of the models of their buildings.

[SLIDE 7] The students went on to design and make a promotional film, exhibition boards, display cabinets for the computers and a catalogue to go with the show.

[SLIDE 8] We launched with over 100 attendees and a special guest, Johnny Marr of The Smiths fame! Marr is a patron of The Modernist Society, one of our long-term collaborative partners.

[SLIDE 9] The exhibition garnered good press too, with a double page spread in the Guardian newspaper.

[SLIDE 10] The experience with digital design with a range of 3D inputs led on to a funded research project jointly sponsored by the Arts and Humanities Research Council (AHRC) and

the Engineering and Physical Sciences Research Council (EPSRC) – **_The Life of Buildings_**. Working with the same team from Making Post-War Manchester, The Life of Buildings aimed to digitally preserve the physical fabric and social history of a post-war synagogue in central Manchester using a range of survey, recording and modelling techniques. Students only participated as hosts and stewards at the launch of the virtual reality experience, but the award and experience built upon the earlier projects and was a stepping stone to what was to come.

[SLIDE 11] Our post-graduate elective unit, delivered as part of MSA's Master of Architecture Research Methods unit, also uses a mixture of Roberts' approaches to introduce students to the recent histories of British architecture, urbanism and landscape architecture. The overarching aim of the Elective Research Methods units is to introduce a range of approaches for understanding, interrogating and researching the built environment. Within this framework, we focus particularly on the post-war (1945-1980) histories of the various intersections between architecture, urbanism and landscape architecture in Britain. The unit is now in its 3rd year and we have always linked it to our live research projects, in order to give students an insight into a range of research methods and outcomes. Through these live projects we aim to show them the value of historical research in the contemporary context, as well as involving them in various public engagement projects to teach them how to communicate their work effectively.

[SLIDE 12]
In its inaugural year, the students researched 4 power stations as case studies – West Burton, Didcot, Rugeley and Trawsfynydd –, and the results of the projects were exhibited at the aforementioned conference. In its second year, the focus was on New Towns – Redditch, Warrington, Skelmersdale and Telford – and the project involved guest lectures by international expert Janina Gosseye, funded by the Manchester Jean Monnet Centre of Excellence. The results of the project were planned to be exhibited at the Modernist Society's Headquarters in Manchester, which was sadly postponed by COVID-19. This year, the unit's focus is on key sites in the Yorkshire coal field – power stations, collieries, and an ash mound: Eggborough, Ferrybridge, Drax, Kellingley, Gascoigne Wood and Gale Common. The outcomes of the project will be exhibited at the National Coal Mining Museum in June 2021.

[SLIDE 13] The first course ran in parallel to the preparation for our Paul Mellon Centre funded conference '_The Landscape and Architecture of Post-War British Infrastructure_'. The conference was hosted at MMU in February 2019 and was preceded by a two-day international workshop with the same thematic focus. These events brought together academics from a broad range of academic disciplines and, through its two keynote lectures by Elain Harwood (Historic England) and Hal Moggridge (PPLI), aimed to compare the views of the historian with the direct experience of the designer. The conclusion of the conference and the workshop highlighted the necessity of investigating the landscapes of infrastructure for several reasons, and led to our continuing project, that is the current context of this presentation.

Connecting the research with teaching was part of our bid to the Mellon Centre and directly informed the development of the Research Methods elective in both content and approaches. Core to our research are fieldwork and archival study, both of which we are

keen to embed into the teaching, with a view to enable students to recognise some of the unique skills that architectural studies can bring to historical research. Through its **research-led** and **research-tutored** elements, the students benefit from the latest results of our ongoing research projects and up-to-date new results through lectures and seminars, that contain both historical and methodological content.

[SLIDE 14]
The unit relies on archives and archival research as a crucial part of the teaching process. In a normal year we would organise visits to archives, often the first time that students have encountered materials of this nature and in these controlled environments. We have visited and used the archives of the Landscape Institute at the Museum of English Rural Life in Reading and the Frederick Gibberd archives at the Gibberd Garden in Harlow.

[SLIDE 15]
This year we have had to develop remote working with the Yorkshire Film Archive, local archives, Historic England and **[SLIDE 16]** the National Coal Mining Museum. The YFA have used our work as a means of testing some of their new digital content delivery and, as such, the students' involvement is helping the development of the heritage sector. The NCMM enabled a museum-museum loan through ManMet Special Collections (an accredited museum in its own right) to allow our students to access materials that would otherwise be unavailable due to lockdown – this involved a dash across the country by Richard at short notice!

The collaboration with archives contributes to the **research-oriented** elements of the unit, where students are asked to activate the methodologies – taught through lectures and seminars – in the context of archival research. They are asked to gather historical data from a variety of archives related to chosen case studies. The gathered data is analysed through a variety of design analysis and design research techniques to create new interpretations of the primary sources in a visual format. This analysis and visualisation of archival data and the contextualisation of it within the socio-political context is not just a useful method of analysing the spatial implications of design decisions, but it also helps to depict the complexities of the design and implementation process - crucial knowledge for contemporary professionals.

[SLIDE 17] Physical models based on plans and sections from archives facilitated students to reconstruct now altered landscapes, while virtual models allowed them to reconstruct changes over time. This model about the landscape of Rugeley power station – designed by Brenda Colvin – summarised the design decisions and represented the stage of the landscape at its height.

[SLIDE 18]
The 3D printed model of Trawsfynydd showed both the details of the building and its surrounding landscape and the broader context of Snowdonia National Park.

[SLIDE 19] During their research into the history of Skelmersdale New Town, students identified, that the growth predictions for the New Town, and the actual growth of it were very different. They aimed to uncover whether the fact that the predictions were so out of touch with reality affected the long term sustainability of the plans for, and the actual New

Town itself. Their model explained in a very visual way the projected and actual growth in case, based on the very thorough examination of statistical data. The case study therefore successfully explained and visualised the spatial implications of social predictions – and their limitations caused by different socio-economic contexts.

[SLIDE 20] The group researching Redditch, aimed to assess the 'conventional and unconventional' aspects of development of the New Town – they were intrigued whether there was anything pioneering beyond the traditional looking appearance if its architecture. Their model showed this unique nature of Redditch's urban pattern: while other Mark 2 New Towns zoned their residential and industrial areas on town level in Redditch both zones were included in the neighbourhood level. While the diagrammatic plans show the original 'clean division' of industry and residential areas within the neighbourhood, while the detailed model showed this in reality.

[SLIDE 21]
Telford was distinct from the other examined case studies, because was created from the merger of the smaller existing settlements. The research shed light on a hierarchical system within the New Town: the 3-tier strategy that helped the Development Corporation to incorporate the existing settlements with the new developments. The 3-tier hierarchy across the roads, retail centres and green spaces unites the different areas across the new town. The model de-constructed the complex system of the New Town into the subsections of 'open spaces' 'industry (existing and new)', 'existing settlements', 'new residential settlements', 'main park', 'town centres', 'roads', and communicated the hierarchical system through different heights, widths, materials and linkages.

[SLIDE 22] Interactive models.
An analogue interaction, based on the deconstruction of the design process at Didcot – an outcome of the thorough analysis of archival documents reconstructed the debates and choices made by designers, architect Frederick Gibberd with some input from Henry Moore in his role as advisor via the Royal Fine Arts Commission.

[SLIDE 23]
A digital model of West Burton Power Station, using augmented reality software, where alternative design iterations could be viewed through a screen interface using a base model with a QR code**.**

[SLIDE 24] Visual analysis through the act of drawing and photography created a set of 'then' and 'now' images showing comparisons between the intent of designers and the matured landscapes 50 years later.

In case of West Burton power station, key views created by Lovejoy were compared to their current state through photographic analysis. This highlighted key developments, resulting mostly from the changing ownership of the landscape. The maintenance of planting and the original concept has significantly faded. The changing future of land around West Burton and its approaching decommissioning poses several questions about the future of these carefully designed landscapes that are not always recognised as such. In this way, and connecting with our own dissemination, the student work is informing heritage discourse in the neglected area of twentieth century landscape history.

[SLIDE 25] Landscape architect, Dame Sylvia Crowe and architect Sir Basil Spence's collaboration at Trawsfynydd in Snowdonia resulted in an exemplary unity between the nuclear power station and the landscape. By using analytical drawing methods, the student case study uncovered the collaborative approach of the designers and how Crowe's approach influenced both the visual appearance and architectural design of Spence and vice-versa. Combining the drawings of the two designers, both in terms of drawing style and content, created exciting representations of this collaboration. By recreating Crowe's drawings and adding the layer of landscape change to it, the work analysed how the intended strategies, defined by Crowe as 'Design Actions', worked in a mature landscape setting 45 years after it was designed.

[SLIDE 26] Oral history interviews are gaining more importance in architectural and landscape history research. While we have provided training to our students through a collaboration with Lecturer in History Dr Michala Hulme, we let them drive their own research projects and find their own interviewees as we aim to equip them with the methods they need, but make them responsible of their own work.

An in-depth oral history interview with landscape architect Robert Tregay about the design of Warrington New Town directed the focus of the project towards the understanding of the green infrastructure of the town, and its ecologically focussed planting strategy. This in turn informed the visual presentation and the conceptual design for a model.

Increasingly, social media is becoming an incredible tool for historians and our students have found it thus. A great many groups on sites like Facebook are convened for ex-employees of the large sites and organisations of the nationalised state – new town corporations, power stations, coal mines and the like. Students have used these to find subjects for their oral history interviews and, as such, are revealing actors other than those whose memories have been preserved for the national record by the British Library. These cast new light on the working and social lives of the communities around these industries and developments. Occasionally, more than just oral histories are recovered – one former planner of Skelmersdale New Town took home documents that would otherwise have been destroyed and we are in the process of having these acceded to ManMet's Special Collections.

[SLIDE 27] This year's Research Methods course is still underway and will be concluded in January 2021. We have also tied part of our final year undergraduate humanities course to our funded research. Our project *Landscapes of Infrastructure: Culture, Amenity, Heritage and Industry*, supported by the Arts and Humanities Research Council, concerns the ways in which art and humanities research methods can influence landscape decision making. It is part of a much bigger (and more scientific) project, led by the University of Leicester. The Masters students are looking at the community and ecological networks surrounding sites on the Yorkshire coalfield, including power stations, collieries and ash disposal mounds. Their work is drawing on some of the available topographical data provided by Ordnance Survey, including aerial LIDAR scans. They are also making short films.

[SLIDE 28] We are collaborating with film making students who are examining projection mapping onto cooling towers as one way of disseminating the research.

[SLIDE 29] Our undergraduate students are designing games for children that use infrastructure and landscape as a tool for learning. We will eventually use these as a way of gathering feedback from children about their thoughts and perceptions of landscapes, their use and their misuse from social and environmental perspectives. In terms of the developmental process, this situates the **student-as-researcher**, insofar as they are generating the entire construct based only on a thematic instruction. They are designing the games around their own research question – What is it the aim of the game? What should be learned by playing the game? They develop the rules and components based on critical readings and discussions in seminars and lectures – effectively synthesising secondary sources into new research contexts and using the gamification as a means of generating results. This is a novel and experimental approach and is in collaboration with Paul Wake and Matteo Menapace of the Manchester Games Studies Network. We will be assessing the outcomes in January and reflecting on the project through a co-authored journal article in 2021.

[SLIDE 30] Our various professional collaborations with museums and archives have opened up new relationships and the value of having an accredited museum as part of our institution has been instrumental, especially this year. Increasingly, the student work is interwoven with our research context and with each project we become more confident in our capacity to direct useful and relevant research that complements the study of architecture and draws on the unique skill sets that students in such a visio-spatial discipline acquire. Architecture as a profession is currently subject to significant change through AI, automation, off-site manufacture, design for mass assembly and robotics. The range of digital domains within which graduates can operate that require spatial problem solving is shifting and expanding. We believe that exposure to novel digital fields and embracing new modes of learning, sharing and communication are effective ways of preparing our students to be as adaptable as is necessary in the context of contemporary construction.