A Three Stage Urban Design Charrette for North West Cambridge:
Summary of Findings

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Foreword
The development of North West Cambridge provides a significant, vital and unique opportunity for the University to enhance its facilities and reputation. In the words of the Vice Chancellor: “At North West Cambridge we are determined to create a successful, sustainable, mixed-use community as an extension of the City, with buildings and public space of high quality design.” The Department of Architecture took on the challenge of providing a forum for intellectual and creative reflection of the North West Cambridge development. Through design-based explorations with graduate students, colleagues and visitors, Professor John Ellis led this activity that has enabled a productive dialogue to be stimulated between the Department, the University and other key stakeholders.

John Ellis is our inaugural Sir Arthur Marshall Visiting Professor of Sustainable Urban Design and an eminent and experienced urbanist from the US. He arrives in the Department as it enters its Centenary year and just when the design for North West Cambridge is emerging.

A six-week urban design charrette held over February and March 2012 was an opportunity for the Department of Architecture to play a significant role in the discussions concerning the future plans for North West Cambridge. John Ellis together with Dr Ying Jin from the Department of Architecture arranged a three-stage design studio with the graduate students to examine the urban design for the University’s ambitious plans for the site. A dozen graduate MPhil, PhD and IDBE students participated as a voluntary exercise over several weekends during the Lent Term. The charrette was an opportunity for the students to bring their individual expertise to bear, to learn to work in teams, respond to a set of urban design guidelines and face the many challenges of creating a coherent place that is both part of the University and a new community on the outskirts of the town.

The student design teams took the real programme and guiding principles for the first seven blocks planned for the first phase that have been prepared by AECOM. Each team was given a couple of blocks to design and were required to prepare models to fit into an overall base to demonstrate how their proposals would fit together. The three-stage charrette format has enabled the students, teachers, and reviewers to engage in a productive manner.

Meanwhile progress on the real project has advanced: the University is in the process of selecting different architects for the various sites and has recently announced the shortlisted design teams (http://www.nwcambridge.co.uk/). The results of the charrette have been instructive for both the students as well as the University in confirming the need for strong urban design guidelines and the need for interim review procedures before the various teams get too set in their designs.

This project exemplifies a way that the University can benefit from involving the expertise of its own Department of Architecture, whilst also providing an opportunity for academics and students to engage with real and exciting developments in the University. We hope the recommendations in this report will be of value to the University and to the consultant team.

Professor Koen Steemers, Head of Department
List of Participants

Graduate students and researchers
Peter Armitage, Juls Chen, Steve Denman, Hsintzu Ho, Linda Nkatha Gichuyia, Aaron Gillich, James Kimanzi, Pavni Sahni Kohli, Ranald Lawrence, Victoria Lee, Joshua Mardell, Nicola Mingoti, Xiao Rong, Li Wan, Ye Zhang.

Teaching Staff
John Ellis, Diane Haigh, Ying Jin, Michael Jones, Kiril Stanilov, Liang Zhao.

Reviewers
Nick Bullock, Peter Carolin, Rosanna Law, David Owers, Jonathan Rose, Jeremy Sanders, John Sergeant, Alan Short, Koen Steemers, Roger Taylor, Joanna van Heyningen.

The urban design charrette was directed by John Ellis and Ying Jin.

Cover image¹: Artist’s aerial view of the Stage 3 Urban Design Proposal by Tristan Rees-Roberts.

¹ Note the artist’s images (on the cover and Figure 9) were produced for Charrette Stage 3 design review and they do not include all the design features in the post-review final model (Figure 5).
1. Learning from a Three Staged Charrette Process

Over a six week period during February-March 2012 we worked with a group of graduate students at the Department of Architecture, Cambridge University in an urban design charrette. It took as its starting point the University’s Masterplan for the North West Cambridge development, which proposes to build a mixed-use community as part of a long term, planned expansion of the University and town. The development is located on a 140 hectare University owned site bounded by the M11 Motorway, Madingley Road and Huntingdon Road (Figures 1 and 2). The masterplan aims to create a sustainable community that is both distinct and yet an integral part of the City of Cambridge.

Figure 1 Location of the North West Cambridge Development in the context of Cambridge’s growth since 1880

The purpose of the urban design charrette was to test alternative approaches to urban design and glean from the process insights into key components of specific urban design guidelines. The overall parameters of the Phase 1 development were taken as given. The programme included 1500 dwellings for graduate students, faculty and staff, a 2000 square metre supermarket and other retail spaces, an energy centre, a hotel, a health and community facility and a local primary school. The charrette team benefited from an initial briefing by AECOM, the masterplanning consultant to the University.

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2 For more information on the North West Cambridge development, including on-going development of the Masterplan and architectural competition, see [http://www.nwcambridge.co.uk/](http://www.nwcambridge.co.uk/).
Figure 2  The Phase 1 site location in the North West quarter of Cambridge

Figure 3  The Phase 1 site: Looking from the northern edge southwards with Madingley Road Park & Ride and the West Cambridge Campus in view
The charrette had a unique, iterative structure where different urban design approaches could be tested, with three successive design-feedback sessions where the teams could discuss with the teaching staff and among themselves, and test their ideas with a distinguished panel of reviewers.

The participating students worked in 3 groups, with each team designing a cluster of building complexes as envisaged by the master plan for Phase 1. The design charrette was a voluntary exercise with intensive team work over three long weekends, which were respectively followed by periods of consultation with the reviewers and specialists. It naturally attracted students who are working in the field of urban planning, urban modelling and urban design; it also attracted students from other fields of architecture and engineering. The work was shown in both drawings and physical models in order to compare initial concepts and to allow the interaction between adjoining teams. They worked at a scale of 1:500, which is large enough to show the basic building massing without being distracted by details of architectural design. Owing to the time constraints, the detailed contours of the site’s topography were not considered in model making, and the roads and buildings were laid out assuming a uniformly gentle slope towards the south.

**Stage 1: Design by land parcel without strong design guidelines.** The first stage models showed what could have been expected: talented young designers produced autonomous buildings and building complexes largely unrelated to their surroundings. The result was clearly incoherent, more of a World’s Fair than a Cambridge neighbourhood (Figure 4). A rigorous review of the work suggested it would be necessary to have clear guidelines about building types, streets, public spaces, and the use of appropriate precedents. Urban design guidelines were then produced by teaching staff and discussed at length with the student teams, focusing on the merits of their initial designs. The discussions were supplemented by visits to design precedents in Cambridge, and the Phase 1 site itself.

**Stage 2: Design with a detailed guiding plan.** The following charrette weekend saw apparent changes in the individual designs resulting from a much greater degree of coordination between teams and their adjacent sites (Figure 4).

- Graduate and postdoc housing examples such as Clare Hall were emulated as a prototype for mixing different types of residential accommodation.
- A single public square was proposed in order to create a focal point for the first phase of development.
- In place of a stand-alone University Centre building, its various activities were incorporated into the ground floor of the various buildings facing the square.
- Existing site features such as the ancient hedgerows and trees were incorporated into the site plan through minor changes to the land parcel boundaries.
Stage 3: Distillation of the findings in the wider urban context. Following the second review, a period of two weeks’ lapsed time was allowed for the students and teaching staff to discuss the issues arising from the review and obtain wider feedback. Further adjustments were made to the proposed street and open space layout as well as individual building blocks, taking into consideration the wider urban context. A new physical model was created for the whole development site using identical material and model-making method (Figure 5). The entirety of the development was studied through bird's eye views at increasing levels of geographic coverage and detail (Figures 7-9). The outcome was then reviewed and issues arising discussed.

There are two main findings from the charrette as a process:

First, there is a need for strong urban design guidelines to define the public realm and provide a level of certainty about the form of the urban blocks. The guidelines should determine the street wall build-to-lines, building heights, preferred location of entrances, service areas, access to parking, ground floor uses etc. A common palette of materials could be established to ensure a consistent vocabulary throughout the neighbourhood.

Secondly, a review process is required to enable the various design teams to present their designs at an early enough stage to enable critical relationships across streets and the public realm to be addressed.
Figure 5  Charrette Stage 3: Final Model produced post review
2 Urban Design Recommendations

The charrette has also produced twelve recommendations as a way to enhance the proposed design for the Phase 1 development. They are intended as a contribution towards moving the urban design considerations to a more detailed level and achieving the overarching aims of the masterplan.

1. **Establish a focal point for welcoming new students/postdocs.** As a new urban quarter the NW Cambridge development will welcome new students, postdocs and other residents regularly and throughout the year. We propose a focal point to the east of a Market Square which will be at the centre of the development. It will combine the main bus stops with a new ‘Porter’s Lodge’ for the entire development, reflecting the traditional way that the Cambridge Colleges welcome new arrivals. Combining this focal point with a Market Square will bring together the activities of the neighbourhood, not dissipate them. The Square will be surrounded by active ground floor uses, including the proposed supermarket and hotel. The square can also accommodate the main bicycle route from Girton through to Storey’s Way, with appropriate traffic design features to ensure safety.

2. **Realign the Ridgeline cycle pathway to retain the existing hedgerow.** The ancient field pattern defined by the hedgerows is an important memory of how the history of the site evolved. The Ridgeline re-alignment is fairly minor and should not materially affect the division of lots for forthcoming architectural design.

3. **Celebrate the existence of the two fine oak trees on site.** These two trees are a major feature of the site and could be at the centre of a new crescent shaped park to the north of the Phase 1 development. The crescent could be lined with a new row of well spaced oak trees to be planted at the commencement of the Phase 1, in keeping with the fine English landscape tradition. When the two existing trees eventually die they can then be replaced by new seedlings, surrounded by oak trees that will have grown up in the park.
4. **Create an urban quarter of a traditional Cambridge character.** The streets in the local centre should be of a similar scale to those in Central Cambridge in order to maintain a familiar urban character, such as exemplified by Trinity Street, Rose Crescent and the old Petty Cury in the historic core. The use of narrow lanes in the award winning Accordia development has proven to be feasible, fully meeting the needs of modern traffic and fire regulations. A mix of uses and a variety of building types will create a distinct local identity that is commensurate with the history and reputation of the University. In addition, through careful design of the streetscape it would be possible to provide an additional 50% of on-street parking compared with the current master plan, which can be used as time-restricted parking on site as well as priority parking (e.g. for the disabled, the elderly and those travelling with young children).

5. **Provide for a variety of housing types and courtyards.** The population of North West Cambridge is likely to include a range of households from individual students, researchers, faculty and staff to families of various sizes and ages. Some developments will resemble colleges, others market housing and some a hybrid of the two. There are many prototypes that can be models for North West Cambridge including graduate housing at Clare Hall, Trinity Hall’s Wychfield and recent housing developments such as Accordia. Traditional Cambridge housing as found in the historic neighbourhoods can also offer lessons on local identity. Cambridge colleges have a variety of courtyard sizes, ranging from the smallest in colleges such as Trinity Hall, Queens’ and Clare to larger courts such as those found at King’s and Trinity. Courtyard sizes should relate to the heights of the surrounding buildings in order to allow for a sense of enclosure and good sunlight access. Courtyards should allow for a variety of uses, both active and passive: for instance, Wolfson Court at Churchill College is an attractive play area for children, whereas most traditional courts have clipped lawns. The courtyard design aims to maximise south-facing spaces to live, work and play in.

6. **Maximize the number of entrances facing streets for security and an active streetscape.** The traditional college pattern has a single gated entry point and staircases facing into the courtyard. In order to create active pedestrian streets we recommended that residential units at ground level have direct entrances from the street in addition to any from the inner courtyard. The double entrance arrangement of the Wychfield buildings for Trinity Hall on Storey’s way is a good precedent for this. This enables the buildings to be part of the city fabric. Eyes and access on the streets help to create a safe and welcoming environment from the start of the development.

7. **Connect North West Cambridge with West Cambridge.** The strong landscape design in the form of double rows of chestnut trees linking Madingley Road with the main spine of West Cambridge should be extended up the main approach road from Madingley Road to North West Cambridge. This will link the two campuses through a safe and attractive route for cycles, pedestrians, joggers, and any shuttle buses between the two.

8. **Refine the layout of the local supermarket facing Market Square.** At present the masterplan proposes a single storey supermarket facing the Market Square with a basement parking garage beneath. The enclosure of the square and the mix of activities of a town centre could be
enhanced if housing or office space were built above the supermarket facing the square. This has become a new trend in planning supermarkets in prosperous urban areas and it can increase the retail footfall. The supermarket building should be designed in such a way that part of the frontage can accommodate individual shops such as a bakery, florist, news agent, which will help to enhance the attractiveness of the Market Square as the development expands. Parking for the supermarket can be accommodated in a basement beneath the store and the Market Square.

9. **Consider increasing the proposed density of the residential development within the local centre.** In order to maximise the potential of the Phase 1 development, we recommended that more floorspace be accommodated within the proposed footprint. The charrette design proposals demonstrate that a 10% increase in net density (up to 65 dwellings per hectare) is achievable. Thus an additional 150 residents could be provided for on top of the proposed 1,500 within the Phase 1 footprint. This has the advantage of locating more people within easy walking distance to the Market Square and the main bus stops. This will not affect the overall population cap for the entire project - accommodating more housing around the local centre will enable some of the outlying areas to remain as open space or to be built out at lower densities.

10. **Provide flexible-use spaces at ground level surrounding the Market Square and on main streets.** Because initially only limited retail will exist, we recommend that the ground level spaces surrounding the square be designed and built to a layout and height that are flexible enough to accommodate a variety of uses through time. These could include research and professional offices, university departments and live/work residential uses. There are successful precedents in prominent US university campuses.

11. **Make NW Cambridge a desirable destination for local activities, ‘town’ as well as ‘gown’.** Efficient and convenient transport links, services and housing are necessary rather than sufficient conditions. NW Cambridge needs a compelling positive image as a distinct and desirable place in Cambridge. This could be greatly helped by the creation of a high-quality Market Square and the Oak Crescent. This may imply that the brief for the hotel should consider accommodating a suitably wide range of service options to cater for high profile events as well as local needs. A landmark observation tower on the Market Square will help way-finding, and more generally, ‘put NW Cambridge on the map’.

12. **Energy Strategy.** The Energy Centre located behind the supermarket can share the same service and delivery area and has the potential of acting as an important icon symbolizing North West Cambridge’s commitment to sustainability and energy efficiency. The denser core will help reduce grid losses on utility runs. Predominantly south facing orientation of the main rooms together with double aspect accommodation and perimeter type urban form maximises the area of passive energy zones in offices and workplaces as well as in housing.
1. A new ‘Porter’s Lodge’
2. To retain the existing hedgerows
3. Celebrate the two fine oak trees on site
4. An urban quarter of the traditional Cambridge character
5. A variety of dwelling types and courtyards
6. Maximise the number of entrances facing streets
7. Connection with West Cambridge
8. Supermarket facing a Square of multiple activities
9. Increase density within Phase 1 development
10. Flexible-use spaces in the centre and on the main streets
11. Create a vantage point for the Cambridge skyline
12. Maximise efficiency in energy delivery and use

Figure 7  A bird’s eye view from the east towards the M11, with a summary of recommendations points 1-6

Figure 8  A bird’s eye view from the west towards Cambridge town centre, with a summary of recommendations points 7-12
Figure 9  Stage 3 urban design proposal\(^3\) – looking east towards the Square and, in the distance, Cambridge’s historic centre (Artist’s impression by Tristan Rees-Roberts)

A more detailed report on the Urban Design Charrette is in preparation which will present the detailed urban design proposals. Meanwhile we together with the student teams would be happy to respond to queries regarding the findings and recommendations.

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\(^3\) Note the artist’s images (on the cover and Figure 9) were produced for Charrette Stage 3 design review and they do not include all the design features in the post-review final model (Figure 5).

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