Re-imagining the Future of Cities Using Urban Foresight Techniques:

Towards a Smart and Sustainable Reading 2050

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Abstract: *Cities have become a global focus for tackling major climate change and resource depletion issues, and understanding how we can transition to a more sustainable future. However, strategic thinking is needed to overcome potential disconnections between short-term planning horizons and long-term environmental change. Understanding the past, present and future of cities helps us create a 'possibility space' for re-imagining the built/natural environments that can be created/re-imagined in cities. Interdisciplinary-based urban foresight techniques focus on the need to create strategies and scenarios to deal with future changes. They offer the ability to reach consensus around shared 'city visions'; help create innovative thinking and decision-making; promote engagement with city stakeholders; and link technology/innovation with wider socio-economic issues, which affect the urban innovation 'ecosystem'. This paper provides an overview of the evolution of urban foresight thinking, and examines the development of a specific, co-produced city vision: the 'Smart and Sustainable Reading 2050' project (linked to the UK GOS Future of Cities Foresight Programme) and the lessons it holds for built environment practice.*

Introduction

Today a majority of the world's population is urbanized, and this is set to grow substantially over the next 30-40 years (UN, 2014). In the UK, 83 % of our population already lives in cities (World Bank, 2015), and we can see clear evidence of how a city's relationship with its environment and its people create both challenges and opportunities. For example, cities are closely associated with problems of resource depletion, climate change and growing socio-economic disparity, but also provide opportunities for solving the same problems because of economies of scale, and their role as centres of innovation and social learning.

Many cities have struggled to cope, however, with the disconnection that exists between long-term environmental change and shorter-term planning horizons, and this has often meant that cities have taken a relatively short-term view of the future – for example because of political resistance, inertia, lock-in or fragmented decision-making. But things are changing. An increasing number of cities in the UK and internationally have developed visions of how they see their future to 2020, 2050 and beyond (Government Office of Science, 2016a). Apart from increasing urbanisation and the imperative to tackle climate change, part of the drive for this in the UK comes not only from the increasing focus on devolving powers from central government to cities (*Cities and Local Government Devolution Bill* (enacted in 2016)), but also from a real desire for cities to think ahead and develop strategies which will help them in a transition to a more sustainable future. These visions (or shared expectations about a plausible and desirable future) differ in their shape and form, but they are a powerful way of promoting discussion and debate, providing a sense of purpose and mobilising resources so that a city can plan for, and move to, a sustainable future (Eames et al, 2013).

Cities are therefore under pressure to take a long-term perspective. Thinking about the future, for example, opens up a possibility space for discussion and debate, free from the constraints of short-term thinking (Eames et al, 2013). This premise was at the heart of the recent 'urban foresight' Government Office for Science Future of Cities project, which developed an evidence base on the future of UK cities to inform decision-makers, and used evidence and futures analysis, taking a view towards 2065, and considering how people will live, work and interact in our cities 50 years from now (Government Office of Science, 2016a; 2016b; Ravetz and Miles, 2016). Such an 'urban foresight' approach, which is based on a conceptual framework involving a range of forward-looking approaches of informed decision-making, which include considerations and views of the long term (Kubeczko et al, 2011), can therefore help inform current and future decision-making in the urban realm (Eames et al, 2017).

There has also been a move towards co-creation of visions in the UK. In this sense, 'co-creation' in some cities sees universities being positioned as key stakeholders and facilitators in helping to develop a valid city vision. This standpoint recognises the role of the university in its wider urban and regional context (Goddard and Valance, 2013; Hambleton, 2015) and also underpins some of the recent emergent policy and practice in the UK (for example, Leading Places Initiative and SIAs). Taking a longer-term perspective has also found translation through the development of 'urban transition laboratories' (set within the context of an 'experimental city' (Evans et al, 2016), and also opens up possibilities for exhibition spaces or 'urban rooms' promoted by the *Farrell Review* (Farrell, 2014). In a foresight-based approach to developing a city vision, there is therefore a strong sense of partnership and participation, which also has ramifications for built environment disciplines involved in the process of developing city visions.

This paper outlines the development of a smart and sustainable 2050 vision (connected to the GOS Future of Cities study) which is being developed for Reading, a major urban area in Berkshire, UK. We explore what is meant by a 'city vision' and we examine some of the urban foresight tools that can be used to develop city visions before focusing on the Reading 2050 vision in more detail. Finally, we draw lessons and reflections from the Reading 2050 work, and what this means for policy and practice in the built environment.

Discussion

What is a city vision?

The best city visions are something more than simply a branding or re-branding exercise. Although a successful city vision only becomes a success when the vision is realised, best practice visions not only clearly link together strategies, plans and actions, but also integrate the vision clearly with climate change, energy, infrastructure, economy and people. Moreover, successful visions need to be politically viable, analytically sound, and participatory so that stakeholders form part of the inclusive process of formulating the vision. In the UK, for example, Bristol's 2020 vision, and its smart city vision, is based on 'people, place and prosperity', a desire to be a 'Global Green Capital', and an aspiration to be a centre for smart city thinking. In Canada, Vancouver aims to be the world's greenest city by 2020, with tough targets set for greenhouse gas emissions and a desire to create a city which is resilient to climate change. In Denmark Copenhagen's vision is based on a target to be carbon-neutral by 2025, underpinned by a highly successful walking/cycling policy agenda and a strong focus on renewables.

More recently, the UK Government Office of Science Foresight programme on Future Cities has placed a strong emphasis on the co-creation of city visions (Government Office of Science, 2016a), and UK cities have engaged in this process in a variety of ways through scenario development, exhibition spaces, and design challenges. To connect with this work, the University of Reading partnered with Barton Willmore and Reading UK CIC (the economic development company for Reading) to develop a Reading 2050 vision.

Why do we need a vision for Reading 2050?

Although Reading is not yet officially a 'city', it forms part of one of the most economically vibrant and connected urban areas in the UK: Reading, as part of a wider Reading/Wokingham urban area (including Arborfield, Woodley, Theale (West Berkshire), Crowthorne, Earley), has a population of 318,000 (2011 figure), and this is set to grow to 362,000 by 2037 (Dixon and Cohen, 2015). This presents big challenges in maintaining its competitive edge and dealing with the important environmental and socio-economic issues arising from its continued economic growth. Developing a Reading 2050 vision which is both 'smart' (making the best use of technology) and 'sustainable' (creating a truly sustainable city) is an important step in supporting longer-term planning and development in Reading.

Understanding Reading's past and its present are vital to understanding Reading as a place. Reading's geographic location at the confluence of the Thames and Kennet rivers, and its location 40 miles west of London explain the ancient origins of its success as a trading centre and centre of commerce and manufacturing. The Reading of today, however, is also very different from the Reading of 40 years ago. Despite its rich history stretching back to the founding of Reading Abbey in 1121, the 'beer, biscuits and bulbs' (and 'bricks'), for which Reading was rightly famous, have long since gone. Moreover, its heritage and culture remain relatively 'invisible' to residents and businesses, despite the fact that Reading is in the top 16% of the country for its overall heritage (according to the RSA's National Heritage Index), and that important Heritage Lottery Funding for Reading Abbey restoration has also recently been won (2016-18).

Reading's strong economic success is based on its physical and virtual networks in an increasingly globalised world (Crampton et al, 2010: Dixon and Montgomery, 2015). It is also a classic example of an 'under-bounded' urban area, where its administrative boundary is smaller than its wider urban footprint. However, vibrant economic activity and a growing population come at a price, and that price is reflected not only in greenhouse gas emissions, but also in outdated and congested infrastructure, pockets areas of deprivation, and a sense that Reading could, and should, be a more liveable place.

Developing the Reading 2050 vision

The starting point for our work was not to develop a masterplan for Reading, but rather a vision. More formally, a vision is a shared expectation about a plausible and desirable future. In futures (or 'foresight') thinking, 'backcasting' is often used to generate a desirable future, and then look backwards from that future to the present in order to strategise and to plan how it could be achieved. In other words, a vision or visions of a desirable future are first defined and then pathways (or roadmaps) to that future are developed (Figure 1).

Drawing on previous research which had scoped out retrofit visions for Cardiff and Manchester (Dixon et al, 2014) the Reading 2050 project[1] combined elements of a smart city with those of a sustainable city. This was because Reading already has a long-term aspiration to be 'low carbon' by 2050, but also has a strong technology and green technology focus in its existing economy. Moreover, a 2050 time-horizon provides space to think beyond today's immediate problems, and facilitates a greater sense of strategic thinking by identifying desirable as well as undesirable outcomes.
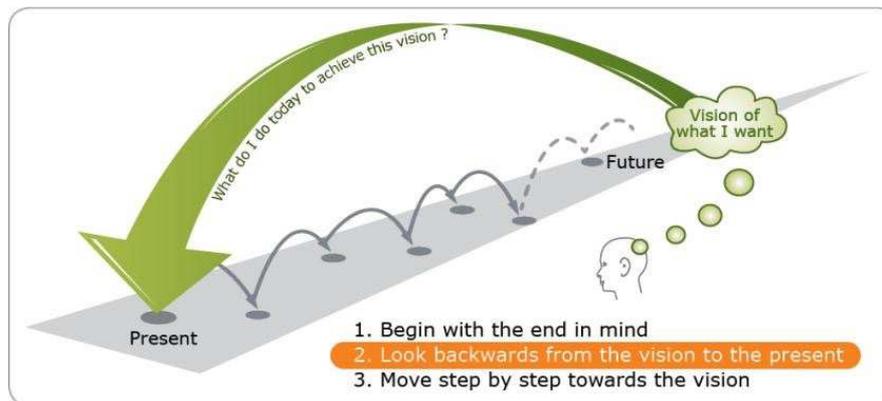
Figure 1 Backcasting (source: Natural Step - Creative Commons - http://www.naturalstep.ca/backcasting)

A 'smart and sustainable' city can be defined as one (ITU, 2014):

'that leverages the ICT infrastructure to:
- *Improve the quality of life of its citizens.*
- *Ensure tangible economic growth for its citizens.*
- *Improve the well-being of its citizens.*
- *Establish an environmentally responsible and sustainable approach to development.*
- *Streamline and improve physical infrastructure.*
- *Reinforce resilience to natural and man-made disasters.*
- *Underpin effective and well-balanced regulatory, compliance and governance mechanisms.'*

This definition provided the starting point for developing a vision for Reading 2050, with the Reading/Wokingham urban area as the primary focus. To develop the vision, we ran three workshops (Table 1) and a major public engagement event (Figure 2). These were supplemented by:

- Engagement event with young people (*Greys and Greens* event) – (November 2014)
- Linking with Reading Museum's *Where's Reading heading? Happy Museums Project*[2]

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[1] www.reading2050.co.uk
[2] http://www.readingmuseum.org.uk/get-involved/projects-consultation/where-s-reading-heading/

- *Drawing the City* event with School of Architecture students (October 2016)

The three workshops focused on three main elements of the vision:

- Identity (people and lifestyle)
- Life (place and environment)
- Work (economy and employment)

Table 1 Visioning events for Reading 2050

Event	Date	Purpose	Attendees
Initial Vision Workshop	December 2014	Kick-off meeting and scoping the vision	56
Follow Up Workshop	December 2015	Developing the vision	41
Urban Design Workshop	January 2016	Picturing the vision	32
'Step Into Reading' Public Engagement	March 2016	Engaging with wider public in Reading	350 surveyed (spoke to personally) 3000 leaflets distributed 21,000 engaged on social media

Each of the workshops used foresight-based techniques to imagine the future of Reading and they were used to develop three main strands of thinking:

***What should a smart and sustainable Reading look like in 2050? (Developing the vision):*** What should Reading look like in 2050, how will it feel, and what will it be like living there? How do we join smart technologies with sustainable thinking in Reading to set it apart, building on the strengths Reading already has?

How do we achieve a smart and sustainable Reading by 2050? (Developing the roadmaps or pathways to the future): What do we need to do, and by when, to achieve the smart and sustainable vision for Reading? We used structured roadmaps and matrices to identify challenges and opportunities.

'Urban design' scenarios: The workshops scoped out the physical changes which could support the smart and sustainable vision, in the short, medium and long term. Group work examined how specific key developments might emerge and what infrastructure changes were needed. We used 'postcards from the future' and other visual aids to summarise the thinking of groups, and these were at the heart of developing the urban design scenarios

Figure 2: Visioning activities for Reading 2050
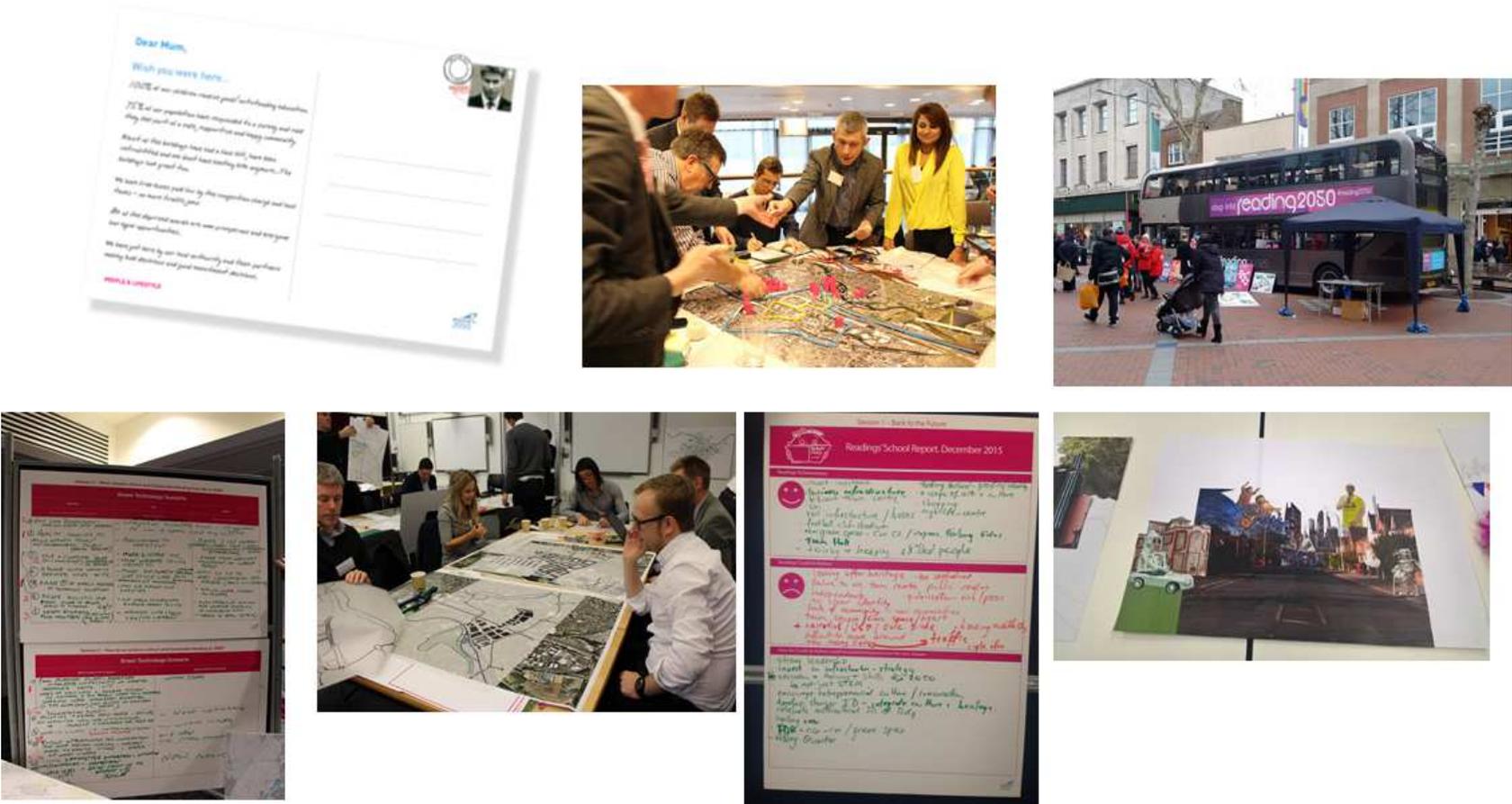
The process of developing the vision is therefore summarised in Figure 3.

Figure 3: The Reading 2050 vision process

All the elements of the vision were tested against **six core principles** for developing Reading as a smart and sustainable place to live, work and play by 2050, ensuring that any intervention:

- Improves the quality of life and well-being.
- Ensures tangible economic growth.
- Establishes an environmentally responsible and sustainable approach to development.
- Streamlines and improves existing physical infrastructure.
- Reinforces resilience to natural and man-made disasters.
- Promotes and develops good governance mechanisms.

Reading 2050 Vision

The overall vision is that:

"By 2050, Reading we believe a strong vision will help us to establish ourselves as an internationally recognised and economically successful city region. A city where low carbon living is the norm, and the built environment, technology and innovation have combined to create a dynamic, smart and sustainable city with a high quality of life and equal opportunities for all".

Within this vision, three urban design scenarios were developed, which, in summary, comprised the following (see Figure 4).

Figure 4 Reading 2050 vision: example images for the urban design scenarios

'Green Tech City'

A city that builds upon the established technology focus of our city. It celebrates and encourages diversity through business incubation units, 'Ideas Factories' and a city centre University campus through which to exhibit and test cutting edge ideas and approaches, no matter what discipline they are emerging from. Retrofitting of existing buildings and the development of new iconic architecture will provide some of the greenest accommodation possible for incoming businesses, while a Reading 'Oyster' card, a comprehensive cycle network and Urban Gondolas or a Rapid Transit System connect the city from east to west, and north to south, relieving the town centre of congestion.

'City of Rivers and Parks'

A city that recognises how water has shaped much of Reading would celebrate its waterways, opening them up to offer recreational spaces such as animated parks, a lido, food production opportunities and city centre waterside living. Greening the IDR, through a modal shift in transportation, will create an enhancing green ring around the city, as opposed to the current constricting concrete one, while regular open space and green roofs provide lungs for the city as we seek to increase density and improve sustainability.

'City of Festivals and Culture'

A city that builds on the success of the iconic Reading Festival to deliver arts and culture to people of all ages and ethnicities. Reading would facilitate community interaction and opportunity. The music festival will spill out from the current site, infiltrating the city itself all year round, through the provision of vibrant public gathering spaces and street life, diverse venues and embraced cultural diversity. The city would integrate, enhance and celebrate our heritage, bringing it to life through modern interpretations and uses of space as well as preservation. Comedy, independent retailers and pop up shops, street cafes and markets, art exhibitions, start-up businesses, sporting events, religious and international festivals, could all be celebrated and woven throughout the urban fabric to bring the city to life, intensifying around key nodal points or community hubs throughout our suburbs as well as the city centre.

Conclusions: Lessons and reflections

Creating a coherent vision for a city is a challenging process. It requires resources, a coherent plan and clear leadership. Often the visions for cities that have been developed lack credibility because they fail to connect and link with existing plans and strategies, and may be driven from a narrow perspective, or may simply produce intangible, vague or unmeasurable goals. Sometimes multiple visions for cities have also been developed by different groups, leading to confusion, fragmentation and over-complexity; and resistance to change from vested-interest groups can pose real challenges for co-created visions. Thinking at city scale therefore requires thinking across boundaries and across interest groups, and using imaginative and innovative ways of engaging with communities (Dixon and Cohen, 2015). The Reading 2050 project is very much a continuing journey. The experiences of the Reading 2050 project also carry important lessons for interdisciplinary research, and the way in which city visions are co-created through an urban foresight approach. These include:

- Framings of the problem for transformation: how is the problem framed from the outset? What is the overall ambition or goal of the vision?
- Urban foresight activities—how can these be best developed to include a truly participatory element, and a balance between structured activities and 'blue sky' thinking?
- Ownership and leadership—who is responsible for the leadership of the vision? Who 'owns' the city vision?
- Vision and implementation – how does the city vision link with existing local plans and the aspirations of the city authorities, the public and other stakeholders? To what extent do the city authorities support the vision and its implementation?
- Contrasting partnership ambitions - related to leadership, can the differing ambitions of those creating and leading the vision be reconciled and balanced?
- Structural change and reform (vis a vis environment and design) - what are the wider implications of the vision, for example, in relation to governance structures and city status?
- Interdisciplinary challenges – how can different disciplines and different professionals work with each other, other stakeholders and the public to help develop the vision? Can built environment professionals really think 'longer term' beyond the constraints of the present?

Ultimately, urban foresight techniques are not an alternative to longer term planning, and the more strategic masterplan approach adopted in many cities in continental Europe. Nonetheless, if we are to develop the longer term, unconstrained thinking that is required to move to a more sustainable future, futures-based studies offer us a potentially powerful set of tools to help achieve this, and mobilise resources in the best possible way.

References

Crampton, G., Francis-Brophy, E., Meen, G., Nygaard, C., Pain, K., and Wadeson, N. (2010) *The Reading Diamond: Local Economic Assessment – Building on Strengths, Meeting Challenges.* University of Reading. (Accessed November 2016: www.bracknell-forest.gov.uk/local-economic-assessment-report.pdf)

Dixon, T. and Cohen, K. (2015) 'Towards a smart and sustainable Reading 2050 vision'. *Town and Country Planni*ng, January. pp. 20-27. ISSN 0040-9960

Dixon, T. and Montgomery, J., (2015) *Towards a smart & sustainable Reading UK 2050: full report.* Project Report. Barton Willmore pp54. ISBN 9780993318801

Dixon, T., Eames, M., Lannon, S. and Hunt, M. (2014) (eds.) *Urban Retrofitting for Sustainability: Mapping the Transition to 2050.* Routledge.

Eames, M., Dixon, T, Lannon, S., and Hunt, M. (eds) (2017) *Retrofitting Cities for Tomorrow's World.* Wiley-Blackwell

Eames, M., Dixon, T., May, T. and Hunt, M. (2013) 'City futures: exploring urban retrofit and sustainable transitions'. *Building Research and Information*, 41 (5). pp. 504-516. ISSN 1466-4321 doi: 10.1080/09613218.2013.805063 (Special Issue: Urban retrofitting for the transition to sustainability)

Evans, J., Karvonen, A., and Raven, R. (eds) (2016) *The Experimental City*. Routledge.

Farrell, T. (2014) *Our Future in Place: The Farrell Review of Architecture and the Built Environment.* (Accessed November 2016: http://www.farrellreview.co.uk/)

Goddard, J., and Vallance, P. (2013) *The University and the City*. Routledge.

Government Office of Science (2016a) *Future of Cities: Foresight for Cities*. GOS/Foresight, London (Accessed November 2016 at: https://www.gov.uk/government/publications/future-of-cities-foresight-for-cities)

Government Office of Science (2016b) *Future of Cities : Foresight for Cities*. GOS/Foresight, London (Accessed November 2016 at: https://www.gov.uk/government/publications/future-of-cities-foresight-for-cities)

Hambledon, R. (2015) *Leading the Inclusive City: Place-Based Innovation for a Bounded Planet*. Policy Press.

Kubeczko, K., Ravetz, J., van der Giessen, A and Weber, M. (2011) *Screening Urban Foresights and Studies Supporting Forward Activities: What can we learn for a JPI-Urban Europe 2050+ Foresight.* European Foresight Platform, Brussels.

Ravetz, J., and Miles, I.D. (2016) 'Foresight in cities: on the possibility of a "strategic urban intelligence'', *Foresight*, Vol. 18 Iss: 5, pp.469 – 490

UN (2014) *World Urbanization Prospects*. United Nations.

World Bank (2015) *Urban Population* (Accessed March 2017: http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS)