Liveable Cities

Launch Event

7th December 2012

Royal Society, London

University of Birmingham · Lancaster University · UCL · University of Southampton

Attendees

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Andrew Dobson (Lancaster City Council)

Tim Embley (Costain)

Jim Fawcett (Isle of Wight Council)

Nick Grayson (Birmingham City Council)

Adrian Gurney (London Sustainable Development Commission)

Terry Hill (Arup Global)

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Andrew Kluth (Emperor)

Lucia Marquart (Lancashire County Council)

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Colin Rowland (Southampton City Council)

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Helen Reeves (BGS)

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Richard Williams (Southampton City Council)

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On the 7th of December 2012

Liveable Cities Expert Panelists gathered for the official launch of the Liveable Cities research programme. The event was an opportunity for the Liveable Cities research team to showcase the programme's aims and ambitions alongside early thoughts and ideas for understanding and creating liveable cities. It also served as a platform for the Expert Panelists to discuss challenges, share best practices and forge relationships.

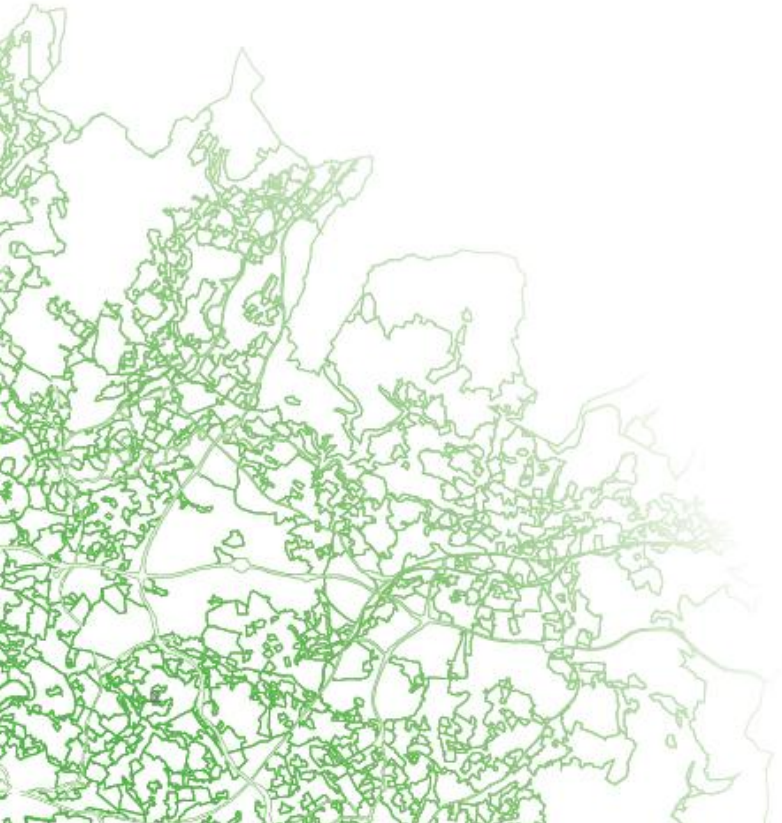
Introduction

The pressures of population growth, finite supplies of resources and food, increasing energy demand and climate change impact on the way we live and work and potentially have a negative effect upon our wellbeing and quality of life. Professor Chris Rogers is principal investigator for the Liveable Cities research programme. He observed that we cannot live as we are whilst scaling back some of our activities without causing further damage to the planet and our quality of life. We need to fundamentally, and radically, reorganise our activities, our approach to living and working and our expectations for our own wellbeing. Such a paradigm shift can't happen overnight, but the urgency for it is also apparent.

Cities play a vital role shifting activities and expectations, with rapid urbanisation expected to increase worldwide and the UK anticipating over 90% of its population soon to be city residents.

The focus of the Liveable Cities programme is to determine how these challenges are met. This report distils the key insights from the programme's launch event, in the hope it will promote further discussion.

Thinking About our Low-carbon Future



At the start of the event, Chris Rogers outlined the Liveable Cities programme of research: a 5-year programme to identify and test the radical engineering that will lead to low-carbon, resource secure cities in which societal wellbeing is prioritised. This is being achieved through the detailed investigation of a number of research strands that include developing a way of understanding, measuring, monitoring and assessing city performance. These include:

- understanding the relationship between cities and carbon (used as a proxy for damage to the planet), resource security and wellbeing
- developing a detailed understanding of individual and societal wellbeing, aspirations and mobilities
- fully understanding the flows of resources (including their drivers) within and through a city, with a particular focus upon energy, water, waste, food and people
- understanding the economic, political and governance contexts and drivers in cities
- understanding the effects of human activities upon the ecosystem services and biodiversity of cities
- developing future visions for UK cities that meet our carbon reduction targets, maximise our resource security and do not erode our wellbeing
- determining what is stopping us from achieving these visions and how we might overcome the barriers

The Liveable Cities programme is of interest to many observers who wish to understand how the often conflicting agendas of low-carbon, resource security and wellbeing can be brought together to create liveable cities of the future. The research programme is focusing upon UK cities, and will be undertaking detailed investigations of Birmingham, Lancaster and Southampton. At the same time, additional information from other cities such as Singapore; Bogota, Colombia; Nanyuan, China; and Auckland, New Zealand will provide an international context. Conflicting city agendas and priorities (e.g., sustainability, green, smart, low-carbon) are proving difficult to realise with few comprehensive models for their delivery. Liveable Cities hopes to fill this gap through the development of a City Analysis Framework. This framework will be used to guide discussions at the next Expert Panel meeting on the 6th of June 2013.

The City Analysis Framework

A primary output of the Liveable Cities programme is to develop a roadmap to guide the work of cities. As one panelist said of how cities approach their own future development, "we need to move away from the project-based approach". However, the project-based and resource-based approaches (e.g., focusing separately upon water, energy, waste, etc.) prevail, especially in the UK where the national government promotes local decision making over national policy and guidance.

Under the City Analysis Framework, resources and wellbeing will be brought together into a holistic understanding of city resource supply, demand, infrastructure, impacts and drivers. A vision for cities provides the long-term focus, with six underpinning core goals required to achieve that focus.

Each goal has critical dimensions and from these desired outcomes can be identified and strategies for achieving the outcomes developed. Measuring, monitoring and understanding a city's progress is crucial to achieving the city vision, as is an understanding of the external influences (such as climate change) and internal influences (such as the city's legacy and local context) upon the city. The framework is represented in the diagram here.

Spotlight on City Analysis

Participants were asked to consider the following three questions:

1. What methods and measures should we be using to understand low-carbon cities?
2. What impacts will a low-carbon city have on resource security (and how can we quantify them)?
3. How might negative impacts be avoided or mitigated?

Participants discussed how we place value upon aspects of the city. Is money the correct currency? How do we value aspects such as heritage? There are tools for valuing ecological heritage, but not cultural heritage.

Is carbon the correct measure for damage we do to the planet? Would something akin to 'natural resource demand' be more appropriate? Perhaps the answer is not to look for one measure, but a suite of measures.

The participants agreed that we should not try to reinvent the wheel. A number of projects are looking at analysing urban environments and we need to be aware of them. The SUE MoT project developed a database of analysis methods.

How we draw our boundary around the city will, in part, determine how we measure the city. We need to ensure that boundaries are appropriate for the issues being addressed. This means that different issues may have different boundaries. We must also keep in mind that city boundaries are permeable.

How do we identify the basket of activities that will reduce our carbon?

How can we bring the understanding of the impacts of activities down to the individual level? The participants discussed a combined top-down and bottom-up approach. Neither on its own presents the full picture or can lead us to the full solution.

It was agreed that we cannot forecast to the future we want, so we must 'radically' envision it and then back cast to discover how we achieve it.

The main aspects for consideration for a low-carbon future were identified as water, waste, energy, food and people.

Participants emphasised that we must move our cities towards greater equity.

Carbon and the Liveable City

We believe an alternative future with drastically reduced CO_2 emissions is achievable in a socially and planetary acceptable manner. Techno-fixes and renewable resources for a low-carbon society have been known for some time (e.g., low energy appliances, solar energy), but are not always deemed successful, in part because they have not been socially acceptable. Current aspirations for material consumption are driven by social factors and reinforced by social norms, yet meeting these aspirations often does not enhance wellbeing. The challenge we face is to co-evolve the techno-fixes and renewable resources with people's behaviours and aspirations.

Energy, water, waste, food, transport and materials form the backbone of our carbon demand. Attitudes, behaviours and technologies must change rapidly to meet carbon targets, conserve essential resources and preserve quality of life.

Cities are currently said to contribute around 70% of the world's harmful greenhouse gas emissions. Cities and the behaviour patterns of their inhabitants therefore provide the most pressing challenge that needs addressing when faced with our global responsibility to reduce emissions.

Resources and the Liveable City

The supply (and security of supply) of energy, water and food and the production of waste are at the forefront of global debate, being a constant source of uncertainty in planning for the future. Their impacts on wellbeing and economic development are complex due to their interplay with national regulations and internationally negotiated treaties. Our rapidly expanding resource use has created environmental impacts that present us with the most challenging agendas for the 21st century. Proceeding with existing production methods and consumption habits, exacerbated by the ever increasing global engines of growth, will further erode our scarce resources increasing pollution, contributing to and creating global economic instabilities. Hence, transformative solutions to low-carbon resource production combined with demand reductions will need to be at the core of our policies, not only to address resource scarcity but also the impact of our changing climate.

To fully understand how energy, water, waste and food flow within and through our cities we need to consider not only their quantities, but also the reasons for their movement (what is causing their demand), who is paying for them and who controls them. In this way we not only understand how an energy source such as oil moves into, around and out of cities, but also what forms it takes (e.g., gasoline), what those forms are used for and hence how it is consumed (e.g., to power cars) and why the demand for those forms exists (e.g., to travel to work).

We must also understand the need for these resources in the first place, how locally controlled resources increase (or otherwise) resource security, the need for and use of local materials, and alternative paradigms for resource security.

Spotlight on Infrastructure

The purpose of this discussion session was to determine how can we achieve a reduction of 80% in CO_2 (on 1990 levels) when our infrastructure lasts for such a long time.

How can we avoid being 'locked-in' to a high carbon path by decisions made now or in the past?

Participants considered how infrastructure turnover is very slow, but people's habits, behaviour, desires, etc. can change very quickly. We should not be too narrowly focussed on CO_2 targets as this may lead to losing sight of why we want to reduce CO_2 in the first place. Rather, CO_2 should be used as a proxy for sustainability and living within one planet resources.

Participants were optimistic that distributed energy generation can help ease the strain on transmission and distribution infrastructure by increasing capacity without needing new infrastructure, and reducing transmission losses. Micro anaerobic digestion is a technology that links together energy, waste and community involvement. We should not rely too heavily on smart metering as government policy seems to be heading in the opposite direction. Back-of-the-envelope renewables resource assessments can lead to pessimistic resource estimates which may negatively influence renewable energy policy.

Participants were less optimistic about the ability to effect change in domestic properties under private ownership. "You can explain the benefits to homeowners (education) and provide incentives (e.g., give-aways, tax relief), but some people would still rather lose £100 a year on their heating bill than face the thought of clearing out their loft to change their insulation."

Renting is on the increase and may become the norm for young families in cities by 2050. However, in the UK people still want to own their house and current policy is aimed at encouraging this. The participants identified an opportunity to tighten the regulation of private landlords to force them to bring their properties up to standard, and this may prove more politically acceptable than forcing owner-occupiers to upgrade their homes. However, large rent increases might result.

Older people may not want to move out of their homes, even though their house may be large, energy inefficient, inappropriate for their needs and in need of upgrading. The participants thought that politicians do not want to address the problem of who pays for care of the elderly because it is too politically sensitive.

However, there is an opportunity for the refurbishment or replacement of homes when older people leave their homes and enter more appropriate facilities (e.g., bungalows, care facilities), increasing the turnover of housing stock.

Changing consumer patterns and internet shopping were seen to be having a negative effect on parts of the high street. Amongst those shops filling the vacated high street stores are charity shops (which pay 80% reduced rates and employ few people) and coffee shops. Coffee shops are interesting as they are providing a meeting and working space (both real and online) where business activities can take place in a pleasant environment. Occasionally the void left by departing department stores is converted to green space (e.g., Southampton). Could this provide a scenario for the future of town and city centres, hollowed out of traditional high street businesses, leaving a cultural and heritage core, interspersed with places for recreation and connecting with other people?

Wellbeing and the Liveable City

In order to transform our cities to deliver individual and societal wellbeing within the context of low-carbon living and resource security, we must take into account the economic, social, and political contexts and systems in which we operate.

This includes a deep understanding of our aspirations, quality of life and everyday mobilities (such as the movement of objects, people and ideas). Some of these factors may be in conflict with what urban designers and engineers are currently developing to promote a low-carbon, resource-secure lifestyle. Their success or otherwise is dependent on society's response and the degrees to which they deliver an acceptable quality of life (within the norms of wellbeing), do not dilute aspirations and do not disrupt the mobilities of people and objects. However, a mere understanding of this context is not enough: for decision-makers to implement ideas it is necessary to translate that understanding into criteria, guidelines, engineering and design briefs. This process of translation is critical to the success of urban design and engineering projects and has been identified as a deficiency in our ability to achieve success in the past, especially in the infrastructure and built environment of our cities.

Therefore, a most urgent challenge for our urban environments is to reconsider how we define cities, neighbourhoods and places, and to embrace an approach that balances conflicting demands.

Spotlight on Wellbeing

Participants discussed the following three questions:

1. What would you need to do differently to create/achieve a low-carbon city?
2. If emphasis is on x, how will this impact on quality of life/wellbeing?
3. What measures should we be using to look at this?

Participants identified the challenge of defining what is 'right' for the city and implementing it successfully (e.g., knowing that a masterplan for a large city is probably not going to work when applied to a small city because of contextual differences). Being low-carbon in smaller, more rural, cities provides particular challenges (e.g., industry has a greater influence in this context). We also need to consider conurbations, single-edge-to-hinterland cities and cities in the wilderness, as they all have different needs and contexts.

Behaviour change was identified as an important part of creating a low-carbon city and it goes hand-in-hand with education to re-focus perception first, then to change behaviour. Behaviour change is not solely of the 'general public', but also of engineers, designers, planners and architects. The participants suggested an awareness campaign to help people get what they need as well as make solutions feasible for those offering them. We need to design for future aspirations, rather than designing just for now.

Behaviour change is only part of the story and must be accompanied by a change in the performance of products.

We need to dramatically reduce our personal consumption; however, technology can help us consume in a more low-carbon way (but it will take some time to do this).

Politics plays a role in creating/achieving a low-carbon city, as does managing change, both incremental and radical/cataclysmic. We need a model to consider risk.

The participants discussed how wellbeing involves both perceived and actual need (and matching both needs), and involves giving people control over (perceived) choice. Four ways of influencing change emerged: cognitive (thoughts), habitual (practice), societal and imperceptible (gradual drift), which are triggered by forced intervention, forced choice and by forced circumstance. Choice may not be a good thing for wellbeing because it means one has to provide for excess capacity, which may lead to scarcity. Is it possible, through planning, to get things good and right, therefore removing choice?

To create/achieve a low-carbon city, we need to bring in a degree of flexibility (i.e., more 'plastic' cities). We need to leave spare capacities in cities so they can adapt; resilience is seen as tough, but cities should be 'springy'. Should we be engineering choice to cope with change/adaptation in cities? And if so how does this work with removing choice by getting the design right in the first place?

This led to a discussion on how to make decisions on low-carbon that are in the best interests of the majority of people when there is so much difference between people. Furthermore, there is often a gulf between what people think would be a good technological innovation and what is actually feasible.

One delegate asked: how can we measure, and do we want to measure, the edginess, culture and vitality of cities? Another asked how we can prototype in cities to discover if interventions, solutions and designs are going to work?

The discussion concluded on the observation that engineering has not been through its 'revolution' yet (e.g., cities being able to create roads at one quarter of the current price). Such an outcome requires radical recasting of infrastructure costs to engineer cities sustainably.

Spotlight on Mobilities

The aim of this discussion session was to encourage participants to imagine systems of mobilities and transport in 2050.

Much of the discussion focused on the travel of people and food and different means for pursuing cities' decarbonisation in relation to them.

Participants raised concerns about potential limitations related to this task as 'we don't know what life will be like in 2050'. Thus in order to develop potential future low-carbon systems, we need to take into consideration people's goals with regard to physical transport and travel. We have to understand why people travel since that can also provide a basis for creating new low-carbon transport systems.

Travelling goes beyond the satisfaction of functional purposes; it has symbolic meanings that we need to explore and ask: what does travelling mean for different people? When and why do people travel or not travel? In other words, we need to develop a better understanding of aspects of travelling and not travelling. For example, it might be easier to change existing working patterns – e.g., by encouraging people to work from home. However, non-travelling might be more challenging when considering the social, recreational and experiential purposes of it, such as leisure, holidays, etc.

At the same time, we need to take into consideration that, sometimes, people's choices are made at an unconscious level. People don't always know what they need or what influences their wellbeing. Affecting change may thus have to take several forms including a slow process of transformation alongside a process of step changes, soft (behavioural) changes and education (with the media playing an important role).

Participants were optimistic about the potential of developing low-carbon vehicles – electric cars (not burning fossil fuels) or hybrid cars (mix of electric cars burning ethanol, gasoline, bio-diesel, as well as bio-fuels based on food waste). It was hypothesized that the decarbonisation of power could be more easily implemented for travel within cities than for travel between cities.

Innovation is required with regard to post-oil public transport. Barriers include some of the bus companies using their own fuel and what happens to the existing stock of vehicles. This last point impacts private transport and both are influenced by lock-in to the current infrastructure, although existing petrol stations, for example, might shift from providing petrol and diesel to providing other forms of power such as electricity or hydrogen.

Questions were raised about the utilisation or expansion of more community-based means of transport, such as car-clubs and car-sharing. However, one of the participants commented on the existence of such systems and encouraged us to question why they are not more popular.

Participants were encouraged to think of alternative means for people's movement within cities – such as walking and cycling. Political barriers to the expansion of these systems were raised. For example, politicians might be nervous of the consequences of radical change that might include congestion charging, offsetting working hours or compressing the working week.

Technologies – and, in particular, digital and communication technologies – can be significant in moving towards low-carbon mobilities. New means of communication might decrease people's physical movement for socialising purposes, creating or sustaining relationships, working and shopping.

Participants were encouraged to think of the transportation of products within cities. Food was discussed in detail, where sensitivity to local and seasonal food formed part of a potential solution. The participants agreed that more food needs to be grown locally. 'Consumers-as-producers' and 'grow-your-own-food' are existing schemes that have future potential. Urban gardening schemes in Cuba and Argentina were also discussed as existing examples that might provide inspiration for change.

Ecology, Ecosystem Services and the Liveable City

Natural systems are essential to human wellbeing, delivering vital ecosystem goods (e.g., food, water, oxygen) and services (e.g., pollination) as well as those that contribute more generally to quality of life.

Urban living is currently made possible through the goods and services derived from both local and distant natural systems, often subsidised by the extensive use of fossil fuels. For example, crops are typically farmed outside of cities, with fossil fuels underpinning the fertilization of soils, crop harvesting and processing, transport to consumers and the removal of the resulting waste. Urban living is also made more liveable by natural systems within and adjacent to cities. Parks provide accessible recreational space, whilst allotments can facilitate community development. Green spaces have health benefits as well as remove pollutants from the air. Biodiversity underpins many of these benefits and changes to the diversity of natural systems may alter their ability to supply key services.

Transitioning to low-carbon living is likely to affect how key services are supplied, with potential positive and negative impacts on wellbeing. Green areas and parks will potentially increase in importance as they provide cooling (e.g., shading from trees, cooling effects of lakes and fountains) as summers get warmer with climate change.

There is therefore a need to fully understand how ecosystem services and the biodiversity that underpins them are currently delivered to cities; and to explore how these might change in a low-carbon, resource secure future. It is also important to explore how natural systems can play a (vital) role in successfully delivering these future cities.

Spotlight on Ecosystem Services

Participants discussed how understanding the baselines of ecosystem benefits and the tipping points is crucial. We need to build-in ecosystem services benefits to our analyses of cities, but we should not put a monetary value upon each element. For effective thinking now, we need to work out what are the key performance indicators.

The discussion started with an analysis of what services the ecosystem currently provides that contributes to lowering carbon. This included managing urban forests to provide biomass; geology and soils providing regulating services such as storing carbon and water (e.g., Birmingham sits upon porous sandstone, which is ideal for CO_2 deep storage); borehole abstraction providing storage capacity; and air quality being a good indicator of ecosystem service health.

However, the participants thought that such solutions do not fundamentally alter our approach to one-planet living, they simply push the problem onto future generations.

The participants finished by emphasising that access to green space is not a quantity issue, it is a quality issue.

Economy, Finance and the Liveable City

Cities enjoy unprecedented prospects as hubs of economic opportunity and engines of national growth. However, cities are facing extraordinary challenges.

Among these, the most pressing challenges include: climate change – valuable assets are potentially vulnerable to threats from climate change but they also play a central role in actively combating and adapting to climate change impacts; demographic imbalance – often dramatic and diverse in different countries and continents, from sharp growth prevailing in many emerging economies, to aging and declining populations in several of the richer economies; finally, the current economic turbulence – this is likely to have long-lasting impacts, particularly on the ways we finance urban investment requirements, and determine and evolve policy contexts.

Against this background, we suggest that a comprehensive yet focused strategy is needed if local and central governments, including investors and stakeholders, aim to be effective in their responses to these challenges. The present financial crisis has produced a significant global tightening of credit which has made it more difficult for investors to leverage debt in order to finance sustainable urban investments. As a consequence, high cost considerations may ultimately discourage decision-makers and private investors from investing in innovative systems as the better alternative for urban infrastructure provision.

We need therefore a holistic vision in the analysis of economic, financial and policy challenges and in the design of ways to address these complex challenges. The key element is the necessity to understand that the urban capital assets, including the natural capital assets, are integrated and interdependent elements in the urban context, and therefore we propose the concept of effective management of assets as key for devising a focused response, where “assets” encompass both the material and the immaterial sphere, and “management” refers to both investment to renew and adapt assets and also to the sustainable operation and use of existing resources.

From this perspective, economic viability is a vital contributing factor to creating sustainable, low-carbon, resource secure, liveable environments. However, fully understanding the interactions of these elements eludes us. What is required is a re-envisioning of city financial models that are not constricted by current urban investment silos (e.g., waste, energy, health, education, transport) and that maximise urban capital assets (e.g., human capital, natural capital and fixed capital). Such an urban green portfolio approach goes beyond the simple (and limited) urban returns of investment. Cities must be globally competitive and we need to unlock investment via innovative financial and business models.

Policy, Governance and the Liveable City

Cities are a complex and dynamic interaction between people, systems and resources. The extent to which we choose to make our cities 'liveable' forms the basis of an ever-evolving set of policy decisions, coupled with appropriate governance systems to make sure that those policies are being adhered to and are achieving their intended aim.

We need to fully understand not only the best use of policy in the implementation of well-engineered design solutions, but the extent to which policy itself will need to be re-engineered if it is to be fit for purpose in the context of future city liveability. Many of the structures and accepted norms within policy-making are based on an outdated understanding of cities and the way they work.

Within the sphere of policy-making and city governance, each decision made will be the result of a unique mix of imperatives (including timescales and deadlines), motivations, values, targets and stakeholders. It would be naïve to assume that it is possible to draw all the policies affecting a city into one coherent integrated policy set. A more pragmatic approach is to tease out the underlying values, trajectories and drivers for policy decisions, and use the common ground between them to create a holistic framework on which each policy can be hung, demonstrating synthesis whilst allowing for difference and flexibility.

It is therefore less important to ensure that all activities are aligned in terms of timescale, milestones, boundaries and parameters and more useful to ensure that the majority of activities are contributing to an overarching long-term vision. The quality of this vision – and in particular, the values underlying it – is the primary tool in joined-up policy-making.

Along with such clear motivations for re-engineering the machinery of policy-making, it is necessary too to reflect on how individual cities can re-animate their own decision-making machines. With the pre-requisite of a strong and long-term underlying vision, it is obvious that principles, values and beliefs are of crucial importance. These will be intrinsic to a community and are in part a reflection of the character of that community. In more diverse cities, there may be more difference than common ground, so working together will require strong leadership and a high level of investment in communication.

Spotlight on Policy and Governance

This discussion session explored the policy and governance constructs of a city and how these might change for a low-carbon, resource secure, liveable urban environment.

Defining the edges was determined to be of value in understanding the city (e.g., cities and economic activities, external supply chains, included or excluded). We should not push for coterminous boundaries for political or agency jurisdictions as overlap can facilitate co-operation and flexibility. We need to understand adjacencies to any and all pieces of analysis; should not expect work to be holistic or to arrive at the same time; accept structural chaos. We should also not specify technologies, but allow for the unexpected.

Competence is an important factor, which participants identified as being achieved through training and through experience. Are our policy makers highly enough regarded? Are we getting the right calibre of people? A city should have common values, perhaps expressed through a city charter. Can we be smarter about how we use people – thinking of people as a resource (knowledge capital)?

Financing (e.g., state versus private) and taxation play a role, and we want to encourage investment, but does this work in a democracy?

The participants thought there was a need to develop the competence of policy makers, both as civil servants and as elected officials, through effective apprenticeships in policy making on a multi-disciplinary platform. We also need stability of membership and purpose in policy-making teams: common interest as a driver for joined-up policy-making. Management resources should follow and support policy decisions. Forces for effective change include: leadership, resources, education, opportunity, and willingness to change.

Social systems – whether informal or politicised – need to allow the right kinds of change and there need to be channels developed that allow innovation to work. We need to map the critical pathways (e.g., money, power) that help or hinder the attainment of key decisions and outcomes.

Does all transition/transformation cost a lot? The participants considered the Smart Grid as potentially a very expensive way of supporting our 'business as usual' lifestyle. What else could we do? Would it cost less? Investment after cataclysm is often high (e.g., Olympics and East London) while low cost evolution of a community is often not deemed affordable.

The participants felt there was a need to understand and exploit knowledge capital at a local level to reduce the need for high level resources. Our systems and processes should support the inclusion of all relevant appropriate stages with the right information or understanding of what gaps exist. This raises the question: are we investing enough in competence (training and development)?

There currently exists a disconnect between local and national government and how policy impacts both. We need to understand the process system – how it fits together and where to go for information at the right stage. Are the relevant people involved? Could they be the 'wrong' people? How do we get the 'collective mind' to work together as a team with shared values?

Participants also thought that we need to map what we are doing, what we understand is happening and what happens as a result. We also need to demonstrate that 'business as usual' is not an option.

How do we value (and re-value) what gets provided by a city's government: what value is placed on services? For example, the M25 wasn't wanted at the time, was appreciated shortly after completion, and is now considered a travel and financial burden.

Finally, the participants emphasised the need to avoid attrition in areas 'under development' whilst we organise ourselves to make the change to a low-carbon society.

Final Comments

In his closing remarks, Professor Chris Rogers commented on the vast challenge that faces not only the Liveable Cities programme of research, but the UK, Europe and the world. It is now widely understood that climate change is adversely affecting our planet and our lives, and in order to ensure our future we must take action immediately to prevent further climate deterioration. The consumption of resources beyond those that the planet can replenish provides a second, tensioning, imperative. These are the greatest challenges we, as a human race, currently face.

And yet inaction prevails, in our policies, in our businesses and in our personal lives. Part of the problem is that we cannot clearly see where we are heading – that there is no clear vision of our low-carbon resource secure future and thus developing a roadmap to achieve it is impossible. Liveable Cities seeks to change this, by envisioning such a future, back casting from it to our lives today and developing the much-needed roadmap. Liveable Cities is privileged to be working with some of the foremost thinkers in this field, many of whom attended this event, and we look forward to meeting with them again at our next event.

Next Event

6th June 2013

Birmingham