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**Cities – a synthesis of literature on the topic,
and the identification of Big Ideas Change
the World opportunities or interventions, by
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This paper is Friends of the Earth's synthesis of literature regarding cities and the future of cities, carried out for the purpose of identifying key opportunities or interventions as part of our Big Ideas Change the World project.

The literature search was conducted through a key word search of Web of Knowledge and Google Scholar, identifying publications by think-tanks, government, and other NGOs, and through eliciting recommended reading from a range of experts in the area.

From the literature review, and following consultations with experts in the field^a, we concluded that the following three interventions were most critical in order to get cities driving positive social, environmental and economic change^b:

1. Providing **enhanced economic and administrative/regulatory autonomy** for cities (defined as functional city regions), adequate for them to innovate, experiment and collaborate (with other

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^b This objective was defined through an earlier consultative scoping process which identified ten key areas for investigation. More information can be found in the project prospectus at http://www.foe.co.uk/resource/briefing_notes/mapping_a_route.pdf

sectors and with other cities) in the delivery of economic, social and environmental goals; and deliver policies and solutions appropriate to their individual history and geography. The emphasis here is on autonomy from the strictures of global competitive markets, but balanced with responsibilities to deliver environmental and social well-being, including for future generations. Among other things this implies respect for collectively agreed social and environmental constraints. Enhanced autonomy is also expected to have a synergistic effect with enhanced participation (see below) in reviving trust in city/region level politics.

2. Enabling **enhanced citizen participation** in urban governance, planning and management, underpinned by strong investments in popular education particularly for disadvantaged communities, so that enhanced participation does not become a means for further dominance by elites and special interests. This is likely to require particular consideration of mechanisms to support the active involvement of women and minority groups in these spheres, and may also include the application of participatory budgeting.
3. Facilitating **sharing of resources and capacities**. Cities are dependent on effective sharing of land and services, and offer the best opportunities to enable resource efficiency through sharing. Modern technologies are rapidly expanding the scope and convenience of shared services and resources. Key provisions to facilitate sharing of resources, services and knowledge might include tax system changes, and support for relevant web-based applications and services and local facilities, for example. These could help steer the development of urban ICT and underpin the development of an innovative and locally strong economy and a broader 'sharing culture' rooted in the unique and exciting dense, interactive, face-to-face spaces of the city.

Further thinking on these interventions is to be published separately and they will be knitted together with interventions identified in other topics within the research project – a number of which will be relevant to cities - to map a route from a planet in peril to a world of wellbeing. These shouldn't therefore be viewed as the only important interventions; for example, interventions to ensure appropriate sharing of wealth to ensure wellbeing for all are expected to emerge from separate topics.

Synthesis of literature

This synthesis covers:

Part one – politics and governance (p4 – p12)

- Power and the city
- City Networks
- The purpose of the City
- Participation
- Conclusion

Part two – environmental impact (p13 – p20)

- Food
- Water
- Transport

- Carbon
- Density – land
- Conclusion

Part three – human and social dimensions (p21 – p24)

- Challenges
- Competition
- Sharing
- Conclusions

The synthesis does not consider the causes of urbanisation (good or ill).

When referring to the ‘city’ in this synthesis we are using this as shorthand for functional city-regions, linked economically, culturally and infrastructurally, rather than any particular administratively bounded territory. Cities are, of course, not single entities but instead are complex social, economic, political and technological interactions.

City types

There are many types of label for 21st Century cities and associated networks forming a rich brew of descriptive, predictive and prescriptive alternatives. Simon Parker has described such labels as a “*fetish for global brand status*” and many of them embody undisclosed ideological perspectives and prejudices. Yet in a world with many competing political concepts, such labels can also function as powerful heuristics (for better or worse) helping create essential effective political narratives for change. In the appendix (p24-25) we summarise and group the key labels and underlying concepts.

Part One - Politics and governance

Power and the city

Parker¹ points out in his book – Cities, Power and Politics - that cities have always been seats of power and status. They have, he says, been a battle-field for power, often run by a self-serving oligarchy, but also the source of ideologies and opposition. Historian Leif Jerram suggests that power has always been in the hands of the wealthy in cities, suggesting that to change this is a herculean and radical task².

Parker states that whilst many cities have transitioned to legal rational states, many are still violent, undemocratic, illiberal, and intolerant places. The wealthy elites running cities in the past were invariably dominated by business interests, and this is often still the case, says Parker, even when participatory democracy and budgeting are instituted³. Jerram suggests that participation alone is not sufficient to create significant change and that a range of factors are necessary, including the status quo no longer being tenable (for example, the wealthy at risk of disease themselves unless they institute sanitation).

Parker says that politics within cities are often characterised by what he calls tribalism and this tribalism is often important for political parties to maintain their base or core vote (so they may take actions to accentuate it), which creates significant challenges for consensus politics and long-term strategic planning which is seen by many to be essential for successful cities.

Castells⁴ and Sassen⁵ see the emergence of a new form of global cities (or even a 'global city') as representing a further consolidation of economic power in the hands of multinational corporations and the ancillary businesses (consulting, ICT, accounting, finance) that they rely upon to run their global operations. In the 'global city' the connections between urban centres are both more numerous and more influential than the connections between each urban centre and its geographically adjacent hinterland.

Curtis⁶ speculates that this presages a redistribution of political power back from nation-states to cities, city-regions or city-leagues as a result of a process in which states themselves, in pursuit of economic growth and globalisation, transfer so much power to cities (and to private institutions, as well as multinational agencies) that they cannot then hold together.

In perhaps early signs of Curtis's predictions, a withering attack on the failure of centralisation in the UK was recently made by Lord Heseltine who made 89 recommendations to the UK Government – ninety per cent of which were accepted⁷ – which he says will turn around a hundred year tide of centralisation and return power to local authorities and cities⁸. He sees much of this new freedom to be directed by Local Enterprise Boards made up predominately by business, academic and local authority representatives in both setting the direction – with a focus on economic growth - and having a significant influence on spending (albeit with the UK Government still controlling the purse strings).

The European Union⁹ identifies the vulnerability of cities that are dependent on direct foreign investment and describes many cities as dependent nodes within multinational corporations' networks and hence vulnerable to the choices made by them.

Donaghy¹⁰ argues that the process of globalisation has led to extremes in specialism that create vulnerability to cities and globally, citing Owens in Illinois producing more than half of the world's food containers.

Together this would suggest the power cities have, and their ability to control their own destiny rather than being at the whim of multinationals' choices, is a critical area for intervention, albeit very challenging, as is adequate and effective participation to prevent domination by business elites.

Paul Romer¹¹ argues for the development of 'charter cities', granting cities autonomy from national rules and norms. He believes that scarce resources or lack of innovation will not hinder progress but a failure to identify new norms and new rules will. He argues that cities like Shenzhen in China, which was set free from other mainland China rules and instead mimicked Hong Kong, was the impetus for growth across China and that simply trying to adapt mainland rules and norms would have not worked. He suggests that existing rules and norms can be hard to change because although some are codified in law others are social norms which often are much harder to change.

In creating change, Romer argues, it is important to change meta-rules that lead to different outcomes, he gives as an example Stockholm's 'try before you buy' approach to congestion charging which, rather than imposing a change – which would have been resisted – allowed the public to try out the scheme and accept it^c.

In effect he argues for 'disruptive cities' that adopt new legal and political strategies and break away from the norm and do something very different, much as disruptive technologies do something very differently or in some firms 'disruptive units' are formed to drive innovation^d.

The case for much greater devolution of power and financial control is also argued for by the Centre for Cities in the UK in a letter to the Chancellor ahead of the autumn 2012 Annual Statement¹². In it they state that there is too much decision-making centralised in Whitehall and that cities needed more control over land, finance and housing. Will Hutton¹³ also argues for greater decentralisation of power, calling for devo-max for cities. He also suggests that affordable housing is critical for successful and socially cohesive cities. The World Bank¹⁴ also says that greater financial decentralisation is important.

Balanced against such arguments for decentralisation and devolution is the need to prevent poorer cities – and indeed rural areas – from being cast adrift through increasing inequalities, which implies a continued strong role for redistribution to enhance poorer cities' capabilities.

Strezer¹⁵ suggests, from a historical perspective that *"the exact relationship between central and local government may well be a crucial one. Imbalances of power in either direction may be counter-productive. Too much power and talent at the centre, as in Britain in the 1830s and 1840s, may result in a counter-productive, one-size-fits-all dictatorial style, undermining the vigour of provincial governments and only eliciting evasion or even rejection in the provinces of initiatives from the centre. Local representative and elected governments which are endowed with genuine*

^c This is in contrast to London's successful imposition, although an extension to the scheme was abandoned and Edinburgh's failed referendum. Arguably a trial allows myths to be shown to be wrong although it could also be criticised as a waste of money if the scheme were closed after the trial.

^d We will look at innovation in greater detail in a later topic.

independence, powers, status and resources, will very likely generate a competitive political forum across the nation of (literally) healthy rivalry among them. The centre may well be able to foster such productive competitiveness through a judicious policy of both financial and honorific carrots and sticks.” He goes on to say *“Relations between centre and periphery are probably optimal when characterised by a diplomatic and mutually respectful relationship based on genuine relative autonomy, rather than by relations of dependence (or complete independence), with the centre both prepared to learn from provincial innovations taken by energetic local authorities and to encourage and incentivise the spread of best practice where initiative is lacking.”* This optimal relationship is probably quite rare.

Tosics¹⁶ argues that functional and administrative governance should be separated, as a result of a perceived geographic inflexibility of current administrative structures. This would allow for emergent and participatory governance at metropolitan area and neighbourhood scales, while retaining administrative (elected) power at city and local council/commune scale. EU (or by extension, national) policy and funding interventions should support informal participatory governance, and ensure interventions to tackle social inequality. Such arguments for equality intervention are primarily economic in the broadest sense, influenced by analysis which finds inequality to undermine economic health (eg Wilkinson and Pickett¹⁷). Tosics’ case studies suggest a strong emphasis on cooperation between municipalities and between sectors, would be required to avoid competition for development and to make it more sustainable.

City Networks

Kern¹⁸ states that international city networks are not a new phenomenon; they have a history dating back to (at least) the 13th century. Ewen¹⁹ talks of a European *“golden age of municipal internationalism”* during the interwar years in the 20th century. Networks are seen as a means to increase capacity through knowledge sharing, accessing finance, providing political support, etc.

Kern and Bulkeley looked at three European networks (Climate alliance, Cities for climate protection, and Energie-cities) which together cover more than 1400 cities. They note that these networks offer opportunities for the European Commission to bypass national government in order to influence outcomes. They conclude that these networks are actively populated by pioneers and network leaders are in effect *“pioneers for pioneers”* with many other cities retaining membership but not particularly active within the networks.

Bulkeley²⁰ sees networks as critical to establish scope and possibilities. She also notes that the new networks go beyond sharing good practice and are overtly political in terms of increasing involvement (C40 cities network), gaining pledges for action^e (Covenant of mayors) and seeking to engage the global south. These networks also do not work in isolation, she says, but they create a new *“web of climate governance”* which *“in many ways ... could be more important than the global climate talks.”*

The C40 network²¹ claims substantial results, with 250 million tonnes of greenhouse gases to be avoided by 2020 (equal to emission of Argentina and Portugal combined) compared to a business as

^e Critical in areas, like climate, where collective action problems are dominant.

usual trajectory. How much of these emission cuts would not have happened without the C40 network is not clear, and possibly impossible to measure.

According to Tranos²² there is a *“growing interaction and interdependence among a selected set of cities, the importance of which emerges in the frame of the post-industrial globalized economy.”* Cities are seen as *“national and international centres of political power”* as well as being centres of trade, banking, insurance, *“advanced professional activity”* and also centres of knowledge and technology, information gathering and diffusion, consumption, arts, culture and entertainment. He argues *“cities climb in the global hierarchy not because of what they contain but rather because of what flows between them. Such flows include everything from trade to foreign direct investments, tourists, knowledge, international students, air passengers and Advanced Producer Services”*. He suggests the networked reality of cities is often over-looked and that *“Emphasis needs to be given to horizontal links between cities of similar rank in the global urban hierarchy as this could result in the formation of urban dyads as a means to compete at a global level. As a means to accommodate this collaboration process, the active participation of cities and city policy-makers in international urban fora is necessary.”* Castells²³ highlights the dangers of such an approach for inequality within cities, and his analysis exposes the risk that such competition can contribute to a global race to the bottom in respect of national level environmental and social protections.

The purpose of the city

At the heart of the debate on politics and the city is the question of the purpose of the city; is it to be globally competitive as suggested by OECD²⁴; or is it to support justice and equality as argued by Fainstein²⁵ and Harvey²⁶; or is it somewhere in between, such as the World Bank’s view which argues for competitiveness but with pro-poor policies, slum improvements in developing countries and better welfare safety nets?

Well-being for all people and the planet, which is Friends of the Earth’s goal, would suggest that cities should have a strong focus on meeting at the very least social minimums for all - employment, housing, education, income, food, health, gender equality, etc ,etc - together with a responsibility to respect planetary limits, as captured by Raworth’s work for Oxfam²⁷.

The EU²⁸ states that *“Social polarisation and segregation are increasing – the recent economic crisis has further amplified the effects of market processes and the gradual retreat of the welfare state in most European countries. In even the richest of our cities, social and spatial segregation are growing problems... An increasing number of 'society dropouts' may lead to a development of closed sub-cultures with fundamentally hostile attitudes to mainstream society in many cities.”*

Affordable housing is seen to be a key issue for cities north and south, for example the World Bank²⁹ states that *“By the mid-2000s, it became clear that the enabling markets approach was far too sanguine about the difficulties in creating well functioning housing markets where everyone is adequately housed for a reasonable share of income on residential land at a reasonable price. The general principles of enabling markets are still valid, but must be combined with sensible policies and pragmatic approaches to urban planning and targeted subsidies for the urban poor”*. Harvey argues against the negative impacts of property ownership as he calls for equal ‘rights to the city’³⁰.

This highlights the potential importance of addressing land value, land rights and tenure issues, ranging from squatters rights to second home taxation in order to enable well-being for all.

Cities in developing countries will face additional challenges to those outlined above. For example, the LSE³¹ points out that while London took over a hundred years to reach 10 million population, some developing country cities face growth rates of 300,000 per annum with the attendant challenges for housing, infrastructure, etc.

Bulkeley³² reports on the diminishing ability of some local authorities and cities to provide services to their populace in the context of reducing carbon emissions. Looking at Germany and the UK she notes that whereas cities were once the providers of electricity, gas, water and transport, these duties are now to a lesser or greater extent liberalised. However she suggests that cities and local authorities can still influence outcomes through regulation, enabling, experimentation and in some cases provision³³; adding that cities operate in tiers, adding complexity and potentially political disputes and that cities are part of a multidimensional governance that can influence (and be influenced) up, down and horizontally.

Fainstein³⁴ argues that the city approach should be focused on creating a 'Just City'. In this she differs from Romer because her understanding of justice is much wider than the utilitarian one served by growth (on which Romer focuses) also including ecological constraints and social inclusion^f. Her 'Just City' is defined in terms of democracy, equity, diversity, growth, and sustainability. She states *"the emphasis on economic competitiveness that tops every city's list of objectives causes planning to give priority to growth at the expense of all other values, providing additional evidence to the critics who see it as serving developer interests at the expense of everyone else"*³⁵

She notes a 'Chinese box' problem of participation and power, saying *"at the level of the neighbourhood, there is the greatest opportunity for democracy but the least amount of power; as we scale up the amount of decision-making power increases, but the potential of people to affect outcomes diminishes."*^g

Even though coming from a political left perspective she recognises the importance of some conservative values. She states *"Conservative values of order and efficiency may clash with those of equality and diversity. The left dismisses the former as supportive of privilege and legitimated through propaganda. But these are values that enjoy wide popular support and are essential to the functioning of society. Hobbes's argument that maintenance of personal safety is the first duty of the sovereign cannot be dismissed as simply a rationalization for authoritarian rule. We need to find out how to interpret these conservative values in humanitarian ways whereby they do not suppress dissent, produce sterile environments or only benefit the rich, but we cannot simply disregard them."*

She also argues that the values of the Just City cannot be traded off against one another (e.g. a majority vote cannot justifiably lead to inequitable outcomes) but instead must be attained together

^f "I defined the just city in terms of democracy, equity, diversity, growth, and sustainability (philosophers might argue that this is the good city not the just city)."

^g This should not be taken to imply that democratic potential necessarily increases with decreasing size. There is likely to be a fairly large minimum size that allows for effective representation of diverse communities, for example.

(much in the way that sustainable development is simultaneously delivering environmental, social and economic outcomes).

Broadly speaking she argues for: a social movement approach and articulation of just cities to ensure equity is central to politics and urban planning rather than accepting the trend towards marginalisation of these outcomes; a governance regime that is aimed towards simultaneously achieving a Just City; and ownership of assets in the hands of the many not the few (either a property owning democracy or liberal socialism).

Harvey³⁶ argues for a city that is for everyone rather than what he sees at present, capitalist cities with wealth concentrated in the hands of the few and workers reduced to living in expensive poor quality rented homes. He warns of ill-considered decentralisation *“What is so odd in these times is that much of the left agrees with much of the right that decentralization and opposition to all forms of centralized power is the answer. This is why I talk of the “fetishism of organizational forms” that prevails on the contemporary left. The market is, of course, when individualized, the most decentralized decision-making system you can imagine and it is exactly the organization of such a competitive decentralized market that produces, as Marx so clearly proved, highly concentrated capitalist class power. It does so because “there is nothing more unequal than the equal treatment of unequals.”* Although he does go on to say *“There is a lot to be said for a decentralized basis for political action. But, at some point, it has also to jump scales and organize at least at the metropolitan bioregional level to take on those wretched dominant class practices that seem to survive unscathed in the midst of the current plethora of oppositional social movements.”* He also asks how, in a decentralized model, global commons are to be protected^h.

Participation

Goldfrank³⁷ points towards participatory budgeting as a transformative tool based on an analysis from its widespread use in Latin American cities and localities. However he suggests that its success depends on its intent: is it genuine or a sham process? Done well, he argues, it is a form of *“competitive institution building”*, much as Fainstein argues is necessary. Goldfrank cites a body of research that shows that participatory budgeting can redirect public resources towards poor neighbourhoods; extend service provision, spur the creation of new civic associations; and increase transparency and accountability while reducing clientelism and enhancing democratic representation for the formerly excluded.

However he warns that these outcomes are by no means guaranteed by participatory budgeting and that even well-regarded cases show some contradictory results. For example he quotes a study on Porto Alegre that showed that whilst *“education and healthcare improved [after the introduction of participatory budgeting] ... [the] unemployment rate shot up 78%, the number of poor people increased almost 20%, and income inequality rose by 16%.”* He blames these outcomes on external factors. Parker³⁸ points out that at the time Porto Alegre commenced participatory budgeting they also gained the freedom to increase local taxes which increased revenues three-fold (the implication

^h Harvey is also concerned with local commons, such as urban public space. For both local and global commons there is a strong case that governance models from traditional and contemporary commons management might teach us more about governance of resources, and perhaps of cities, than models of privatisation and commercial management.

being that this may have had a greater impact on outcomes than the participatory budgeting process).

Hudson³⁹ suggests, from experience in the UK, that for a participatory process to work effectively requires strong involvement by the local authority, to steer it and avoid control by elites (including civil society elites, such as highly-educated special interest groups).

Strezer⁴⁰ warns that the expansion of democracy *per se* does not automatically lead to better outcomes. He states that *“the 1832 'Great' parliamentary Reform Act, the 1835 Municipal Reform Act gave votes to moderate property holders. Town government passed out of the hands of a narrow wealthy oligarchy and into those of a 'shopocracy' of petty bourgeois ratepayers. The highly restricted borrowing powers of urban corporations were already the source of serious problems, preventing these fast-growing towns from undertaking costly sanitary and environmental infrastructure projects.... For a whole further generation after 1835, while Britain's industrial towns expanded into crowded cities, their petty capitalist ratepayers refused to vote for anything except policies of do-nothing economy... British cities did not really begin to invest in the expensive sanitary works ... until the 1870s, when their electorates began to express support for such measures. This did not happen until after the municipal electorates were substantially extended in 1869. At that point a new generation of urban neo-patricians, led by the industrial magnate Joseph Chamberlain in Birmingham, realised that it was now possible to appeal with a municipal spending programme over the heads of the petty bourgeois to the non-rate-paying but voting working class.”* This is perhaps a historical example warning of the risks of participation that only reaches out to well-educated special interest groups, but also an endorsement of genuinely universal democracy. Strezer goes on to say *“careful attention must be paid to issues of representation, to the local details of franchise extensions and to the precise political means available for the opinion of the poor to be influenced and expressed (issues of public information media and party organisation). The interests of those who are given voting power and how this relates to those other sections of the population (children for instance in today's poor countries) who remain excluded cannot be ignored.”*

The World Bank⁴¹ says that participatory budgeting can slow delivery of infrastructure and suggest that participation needs to occur at the early stages not throughout a project, although this runs counter to most studies of participation and public engagement which agree that – in a wide range of contexts - it normally comes too late, but not that it should *only* be early.

Sintomer et al⁴² explore participatory budgeting within a European contextⁱ and is less effuse about its potential in practice. He says that *“In many cases, participatory budgeting has contributed to improved communications between citizens, the administration and the local political elite”* but *“municipal councils rarely use the citizens' concrete proposals as a 'compass' for their final decisions... This is, among other things, due to the fact that central aspects of the budget are often not discussed in the participatory process.”* He also states that it is rare in a European context to see positive outcomes for social justice from participatory budgeting, perhaps due to low levels of involvement by disadvantaged communities. He does stress however that these are early days for participatory budgeting in Europe. He notes that in the UK New Labour called on every local authority to undertake participatory budgeting but suggested top down imposition was unlikely to

ⁱ The paper has a useful diagram of different approaches taken by different municipalities in Europe.

be effective and that a 'window of opportunity' was necessary in areas before it could properly take hold and be effective.

In a review of 'successful' global cities the Grattan Institute⁴³ in Australia suggested high and sustained participation is necessary to enable tough decisions to be made across political cycles and cross—sector involvement (business, civil society, community) is important. KPMG⁴⁴ in an assessment of Australia's state capitals also suggested community engagement is important as is the development of long-term plans. Historian Katy Layton-Jones suggests that an urban constitution developed through participation would be more successful than the long-term plans as suggested by KPMG and others. Newton⁴⁵ says that "*socio-technical change can only proceed when there is industry, government, and community convergence around the need to embrace a new urban design or urban technology pathway.*" In this he, the Grattan Institute and KPMG differ from Goldfrank and Fainstein who see less of a need for consensus for action and more of a case for a countervailing force demanding change.

Middleton⁴⁶ and Hickman et al⁴⁷ both stress the necessity of participation in solving transition challenges to sustainable transport within cities.

Satterthwaite⁴⁸ identifies five aspects that help developing country cities be good places for low-income deprived communities (although these five could easily apply to developed country cities as well). These are:

- elected city governments;
- city governments with resources and powers to allow them to act (often linked to decentralization);
- formal and informal avenues to allow civil society to influence what city governments do and hold them to account;
- organized urban poor groups that can work at the level of the city, that are able and willing to interact with city government and to whom city government is prepared to listen (otherwise it can be middle- and upper-income groups who are the key civil society influence on city policies); and
- a rule of law not too biased against low-income groups and their informal economy and informal housing.

The LSE report⁴⁹ on 'green cities' identifies leadership as critical, alongside good management, a good national framework, finance and regulation for innovation (e.g. electric cars). It also stated that competition and first-mover advantage are strong drivers.

Historian Peter Shapely⁵⁰ says that the reorganisation of local government in the 1970 led to corporate management and very little in terms of democracy. He suggests larger local or city region governments need to be balanced with neighbourhood or parish-type assemblies that can have a voice in regional assemblies to increase representative democracy. He also questions whether participation has ever worked in practice and whether it can better good representative democracy. He cites the Skeffington Report in 1969 which aimed to lead to much greater participation in planning decisions but was side-stepped by council officers who saw no benefit from the proposals, only threats to their expert positions.

Tranos⁵¹ talks of the use of e-governance as “*a tool by which the existing structures, processes and practices of government may be improved. The overall aim is to achieve the social inclusion of urban residents in public services*”. There is little in the literature regarding evidence on to the effectiveness of e-governance, and importantly on how it can strengthen civil society, possibly because it is still very early days. Secrett⁵², whilst embracing the smart city, warns of the need for vigilance to prevent the growth of ‘big brother politics’ and erosion of civil liberties (a typical London citizen is photographed 300 times per day and surrounded by thousands of trackable objects).

Conclusions to part one

There is a strong case for enhanced autonomy for cities but care is needed to prevent such autonomy cementing or increasing control by (business) elites. It would appear that there is *potential* for participatory democracy - including participatory budgeting - to ensure all voices are involved in democratic decision-making. To be useful, participatory democracy needs to be done well. Yet detailed understanding of what this might mean in practice is still incomplete, and indeed evidence of its effectiveness is still debated. The pre-conditions would appear to be important – political space, active citizenry, and window of opportunity – as is the scope. There remains the danger that the participatory budgeting process could become co-opted by existing political or business elites and/or well-educated special interest groups which could lead to outcomes less fair than under representative democracy.

Part two – environment impact

Food

Cities demands for food impose a significant footprint on land, and generate significant nutrient pollution. Urban production of food could ameliorate these impacts, to a very limited extent, but not eliminate them.

Billen⁵³ says that for France's Seine catchment it is technically possible to design an agricultural system able to provide all the plant-and animal-based food required by the population of Paris and meet drinking water standards by avoiding nitrogen pollution whilst still exporting a significant proportion of its cereal production, but this would require animal-based foods to be reduced from 69% to 35-40% of the diet. However, despite this potential "*localisation*" he says that from a study of the US food supply chain it was clear that foodstuff transportation is only a minor part of its total carbon imprint with agricultural practices and human diet being much larger. He says the issue of localisation of the food supply "*is not a question of climate impact optimisation but is conditioned by the political will to support local agricultural communities and to restore the link between cities and their rural hinterland*".

Swaney⁵⁴ suggests that food footprints are shaped by geography and that most coastal based trading cities – such as London and New York - have had extensive supply areas as opposed to inland cities which have generally sourced food from their hinterlands (such as Paris). He states that "*By 1840, NYC had transitioned from becoming a net producer to a net consumer of food.*" Per capita food consumption has increased in NYC, although perhaps surprisingly Swaney states that per capita meat consumption has declined slightly since colonial times and that per capita milk consumption peaked in the mid-20th Century. However if all of New York State's agricultural land were dedicated to supplying New York City he calculates that only 2% of its food needs could be met this way.

He points towards net food/feed as "*the dominant source of nitrogen to the region, accounting for over 95% of the total anthropogenic inputs to the five boroughs of the city.*" Although "*sewage lines and municipal sewage treatment have also seen major improvements since the 1980s... the Hudson still receives the largest N load of any US estuary, and as of the 1990s, about half of this was due to effluent from NYC's sewage.*"

Grewel⁵⁵ models how much food the City of Cleveland could produce. The research suggests a significant contribution could be made to its needs, with useful economic benefits flowing from this. Using nearly all available land and 62% of every industrial and commercial rooftop could meet between 46% and 100% of Cleveland's fresh produce need, and 94% of poultry and shell eggs and 100% of honey. This would give a level of self-reliance of 17.7% by weight and 7.3% by expenditure in total food and beverage consumption.

Waggoner⁵⁶ modelled a small (550,000 pop) compact city (65 people per hectare, close to NYC density^j) and found the 550,000 EcoCitizens require 15 times as many hectares of cropland as the 8500 ha within their walls. He stated that "*exaggerated sparing of land by vegetarianism would still require more than 30,000 ha of crops, a multiple of EcoCity's 8500 ha. Even if melons grow in its*

^j NYC is now 270 people per hectare it was 410 in 1910.

streets, pig's root below its windows and radishes sprout on its roofs, EcoCity will have to import food through its gates." This modelling, although crude, usefully points towards the reality that cities are always likely to be significant importers of food.

Drecshel⁵⁷ studies urban farming in Dar es Salaam and identifies that it is a profitable activity, that some locations have seen continuous cropping for 25-50 years whilst others are challenging by competing demands for land. The urban agriculture provides the city with some resilience to failed harvests outside of the city. Zezzi⁵⁸ suggests that *"the potential for urban agriculture to play a substantial role in urban poverty and food insecurity reduction should not be overemphasised, as its share in income and overall agricultural production is often quite limited. On the other hand, though, its role should also not be too easily dismissed, particularly in much of Africa and in all those countries in which agriculture provides a substantial share of income for the urban poor, and for those groups of households to which it constitutes an important source of livelihoods."*

Water

Cities are not immune to problems of water supply, management and sanitation, and can experience concentrated problems in this area. Demands for water can impose impacts on surrounding catchments. However promising management and governance techniques exist.

Swaney⁵⁹ identifies that *"per capita water use continued to increase steadily in New York, from just below 200 m³ per person per year in 1930 to above 250 m³ per person per year in the 1970s but that water consumption in recent years has actually decreased on an absolute and a per capita basis."* He says that in addition to maintaining infrastructure, the city has paid attention to managing its watershed to maintain water quality, and in particular, to meet some demands of the population living within the bounds of the NYC watershed, in exchange for abiding by *"watershed rules and regulations"* to ensure high water quality.

Billen⁶⁰ reports that some cities, such as New York, reserve certain nearby lands for clean drinking water production and exclude agricultural activities. Munich has reportedly reconciled water and food production in the surrounding hinterland, with organic agriculture being promoted through the establishment of a strong public urban market demand. Whereas Athens and Barcelona extend their water supply areas a very long distance.

Shapely⁶¹ says that water supply was a major problem for the new industrial cities in the UK industrial revolution. Some local authorities took control he says. They managed to build a system of reservoirs, for example Manchester and Longendale, Manchester and Thirlmere. They were pumping large amounts of water from large distance. It was fantastic engineering he says; however Liverpool and Birmingham bought land in Wales which they flooded for reservoirs, causing huge destruction and long-standing resentment.

Newton⁶² suggests *"urban water balance studies indicate that wastewater and storm-water flows could potentially meet 150 percent of Melbourne's current water needs, and that modelling of alternative scenarios for delivery of future urban water reveal that a decentralized integrated (treated wastewater plus storm-water) urban water system was the most eco-efficient (lowest*

lifecycle cost and least impact on the environment from the perspective of greenhouse gas emissions and nutrient discharge to receiving waters”.

WWF identify the scale of the ‘water problem’ in developing countries, for example, *“Sixty percent of Nairobi’s inhabitants live in informal settlements with inadequate access to quality water and are forced to buy their water at kiosks at a higher price. Additionally, the lack of access to sanitation results in untreated waste and wastewater not only endangering human health, but also deteriorating the river systems.”* And *“more than 50 % of Karachi’s population lives in informal slum settlements and most of them face severe shortage of water as well as the lack of proper sewerage systems.”* They say *“Kolkata is struggling with faecal contamination of municipal water and arsenic pollution of groundwater.”*^k They state rainwater harvesting *“has been used extensively to directly recharge groundwater at rates exceeding natural recharge conditions in India. Reports from international organizations focusing on this area indicate that 11 recent projects across Delhi resulted in groundwater level increases from 5 to 10 metres in just two years. In fact, the application of rainwater management in India is likely to become one of the most modern in the world”.*

Dew harvesting, grey-water reuse and advanced sewage treatment works, in addition to rainwater harvesting, are highlighted in Fred Pearce’s book ‘When the rivers run dry’.

Nanotechnology is being used to develop new approaches to desalination, for example of brackish water or saline aquifers, particularly to reduce energy costs⁶³, although waste disposal of brine is still likely to pose problems, for which other nanotechnology approaches are being explored. And novel approaches to using nanoparticles to enable water to boil in sunlight are also being explored⁶⁴.

IBM, in their Global Innovation Outlook report⁶⁵ on water suggest that without *“an accurate and fair pricing model”* to provide a monetary incentive for infrastructure build and efficiency of use, the issues of wastefulness, pollution and scarcity would never be mitigated. They suggest in some developed country cities 15 to 20 percent of water is lost to leaks whereas in Latin America can lose from 30 to 35 percent of the water that comes into the network. IBM notes the potential use for leak detection and leak repair to reduce these losses^l.

Water footprinting is relatively new, although the Water Footprint Network has produced a manual⁶⁶ setting out a global standard which covers the different components of the water footprint (blue – surface & groundwater); green (rainwater); grey (water needed to accept associated pollutants at a safe level); direct use and indirect use. Water footprints are often applied to products but could also be applied to a city or nation. Waterfootprint.org⁶⁷ suggest consumption of products (including food) is the dominant use of water.

Transport

Transport is both a significant consumer of energy, and source of air pollution in most cities. However cities provide opportunities for modal shift to low carbon modes including walking, cycling

^k In many developing country cities lack of access to water (and other services) is hampered by the lack of legal title in informal housing, which means residents cannot formalise contracts for connection to utilities.

^l However it must be noted that informal – often cooperative - supply models with lower quality infrastructure (and thus higher leakage) can be critical in ensuring high rates of connection in the poorest communities.

and shared transport, especially through effective integration of transport and land-use planning, but also through introduction of smart technologies for sharing and coordination.

Beuhler⁶⁸ reports on Frieberg - which is often touted as an exemplar city for sustainable transportation – and says “*over the last three decades, the number of bicycle trips tripled, public transport ridership doubled, and the share of trips by automobile declined from 38% to 32%*”. This is, he says, against a backdrop of Germany loving its cars and having a strong automobile industry, with Freiburg “*having greater motorization than the rest of Germany*”. Freiburg’s combined 68% share of trips by public transport, bicycling, and walking is higher than in most other cities of similar size: 2 to 10 times higher than in North American cities and 10% to 30% higher than in other German cities. The nearby Swiss cities of Bern (69%) and Basel (73%) have slightly higher “green mode” shares than Freiburg. He says that since the 1970s the city has used a combined carrot-and-stick approach which has been crucial to generating public and political support for sustainable transport. Perhaps most important, he says, car restrictive measures are not viewed as punitive, since car users are offered safe, convenient, and affordable alternatives^m.

The reasons the shift happens, he suggested were important ‘windows of opportunity’: the oil crisis of 1973; and a growth of diverse concern for environmental protection promoted by a campaign against a nearby nuclear power station (an unlikely alliance of leftist students, Catholic and Protestant church leaders, the conservative party, local farmers, and highly respected civic leaders), which led he says to a strong tradition of cooperation, consensus and negotiation.

Hickman⁶⁹ argues for a ‘strategic conversation’ at the city level, using scenario analysis, to discuss the priorities for intervention in delivering low carbon transport futures. A greater focus is required, he says, in developing participatory approaches to decision making, alongside network investments, urban planning, low emission vehicles and wider initiatives he suggests. Whereas Middleton⁷⁰ suggests much individual transportation is habit based and greater attention to fully understand habits is important to achieving shifts in behaviour.

Banister⁷¹ says half of energy consumption in Cape Town, Hong Kong and Mexico City is transport based whereas London and Paris are about a quarter. He says that new mega-cities have extensive urban sprawl and the concept of single-centre cities is becoming less relevant. Strong city governance is essential he says, otherwise the alternative is one of weak governance, where there is no direction and the consequences are huge sprawling divided cities which are inefficient and unsustainable. He suggests that “*empirical research in developed cities has concluded that the key parameters of a sustainable city are that they should be over 50,000 population, with medium densities (over 40 persons per hectare) with mixed use developments, and preference given to developments in public transport accessible corridors and near to highly public transport accessible interchanges where densities would be substantially higher (over 80 persons per hectare)*” Estimates suggest that a doubling on local density reduces car trips by 5% per capita and travel by about the same amount. He says transport should be “*designed out of much of the city*”, and where it is needed, priority should be given to high quality public transport, cycling and walking. He suggests the role of the car in the city may be limited to ultra clean electric or plug-in hybrid vehicles.

^m The paper includes a good timeline of policy interventions

Hickman⁷² suggests that the challenges in reducing carbon from transportation are “huge” and that “there is certainly little public discussion of the magnitude of the changes required”.

Shaheen⁷³ in her work on car-sharingⁿ says that car-sharing operates now in hundreds of cities. She says that cost savings, convenient locations, and guaranteed parking were identified as the most common motivations for car-sharing.

Secrett⁷⁴ points out the potential for the smart city to have smart systems for controlling transport (e.g. flows, parking, automatic vehicle ID), as well as car sharing, and efficient self-driving cars.

Caragliu⁷⁵ suggests smart mobility is critical to attracting creative classes which he argues are critical to successful city economies.

Carbon

City living may be more carbon-efficient in most countries, but there are still major challenges in reducing carbon emissions associated with urban living and practices. Besides transport, energy use in buildings is the major concern. While new zero-carbon buildings are technically practical, large numbers of existing buildings also need to be replaced or retrofitted, and there are significant financial, governance and management challenges involved.

Dodman⁷⁶ quotes UN–HABITAT saying that cities are “...responsible for 75 per cent of global energy consumption and 80 per cent of greenhouse gas emissions” yet he suggests at the same time detailed analyses of urban greenhouse gas emissions for individual cities suggest that – per capita – urban residents tend to generate a substantially smaller volume of greenhouse gas emissions than residents elsewhere in the same country (except perhaps in developing countries where wealth difference between urban and rural are very large). He points out that urban density is one of the most important factors influencing the amount of energy used in private passenger transport.

In the UK the Committee on Climate Change⁷⁷ said local authorities are well placed to drive and influence emissions reductions in their wider areas through the services they deliver, their role as social landlords, trusted community leaders and major employers, and their regulatory and strategic functions. In addition, they says, local authorities can play a part through supporting investment in electric vehicle charging infrastructure, which will result in longer term emissions benefits. They shied away from recommending mandatory carbon budgets (limits) for local authorities, but did state they should draw up carbon plans. Millard⁷⁸ argues, within a USA context, that climate plans typically codify what would probably happen anyway (they result from active citizens and authorities responding to citizen preferences). i.e. they are not a tool that drives change but are instead the codification of a political agreement (which is stronger with greater consensus).

Andy Gouldson⁷⁹ led the development of “a recent city-scale mini-Stern review” that he says “indicate that there is a compelling business case for major scale investments in low carbon options

ⁿ Note: she has published an update on this, not available via York Uni system. It is worth noting that in David Mackay’s Sustainable Energy without the Hot Air he calculates that owning a car (if changed every 15 years) is equivalent to 15 KWhrs of energy per day (a third of consumption based energy use).

at the city scale. The results also suggest that this business case is underpinned by a wider social and economic case that is equally compelling as such investments would reduce energy bills, enhance competitiveness, create employment and reduce fuel poverty.”

In many cities much of the building stock is inefficient in energy use (which contributes to widespread problems of energy poverty). While some authors have argued for significant levels of demolition and renewal to replace inefficient buildings (eg Boardman et al⁸⁰), others (eg Power and Zulauf⁸¹) have made a strong case for retrofitting as both environmentally and socially preferable, once the whole building life cycle is considered. German experience⁸² shows that retrofitting can achieve very low- or even zero-carbon standards on a wide range of building types. Yung⁸³ warns that retrofit of heritage buildings, of which there is a high proportion in many cities, is complex and that *“focusing on building performance alone is not justifiable”*. As yet, carbon strategies have involved little consideration of sharing of buildings and premises.

Secrett⁸⁴ cites the American Council for an Energy Efficiency Economy which claims hundreds of billions of dollars in savings and productivity gains can be delivered by the ‘smart city’, incorporating innovations such as smart networks and appliances that can communicate with the grid and each other.

The EU⁸⁵ provides the case study of Växjö municipality in Southern Sweden It says *“so far, carbon dioxide emissions per inhabitant have fallen by 35 % in 10 years, alongside economic growth of 69 %. Measures have also included ...building a fossil-free fuel district heating and cooling system, constructing multi-storey houses of wood, making buildings more energy efficient and planning eco-friendly traffic. Växjö believes its strategy could be used in similar or smaller size towns.”*

Density and land-use

There is broad consensus that relatively high densities result in efficient land-use, relative carbon efficiency and economic benefits, but that the design and management of high density urban areas is critical if social downsides are to be avoided.

Abel⁸⁶ argues – reflecting factors in the cluster theory of innovation - that there is good evidence to suggest that *“a doubling of density increases [economic] productivity by 2–4 percent.”* He states that *“These patterns are particularly pronounced in industries where the exchange of information and sharing of ideas are important parts of the production process”*. He suggests that *“the close physical proximity of firms and people in dense urban areas facilitates the flow of knowledge by increasing the amount of interaction and face-to-face contact that people experience. Such contact has been shown to enhance productivity when information is imperfect, rapidly changing, or not easily codified—key features of many of the most valuable economic activities today”* and that knowledge spill-overs result in more innovation.

Design for London⁸⁷ propose and define a new ‘super-density’ threshold of 150 homes to the hectare. They say however that *“the industry as a whole - designers, developers, clients and statutory authorities - are caught in a design framework and business model which produce*

superdense developments which are unlikely to prove satisfactory in the long term.“ They suggest a different business model is needed that provides better design and management.

They suggest ‘superdensity’ encourages mixed communities and reduces isolation, brings economies of scale, and reduces carbon footprints. But they also point to downsides – more time spent inside creating tensions in families, less privacy, etc.

Dempsey et al⁸⁸ focus on social exclusion and inequalities issues. Historically she says urban areas developed public parks as a result of ‘over-crowding’. The 1875 Public Health Act enabled local authorities to enforce minimum widths of streets and remove ‘poor quality housing’. This reduced density from the pre-1875 density of 385 dwellings per hectare. In modern times she argues that the removal of the Parker-Morris space standards in 1980 led to house sizes decreasing, a rise in housing density and a decline in popularity of urban living with a demand for suburban and semi-rural development getting ever greater. She says research shows that crime is higher in higher density areas where a sense of anonymity and detachment from activity outside one’s own dwelling may dominate yet neighbourhood density was found to have a positive influence the use of local services and facilities. Shapely⁸⁹ says that there were much greater densities pre-1960 with much lower crime so the picture is more complex than simply density of housing.

A critical factor is the social sustainability of dense communities is seen to be in quality of green space. Dempsey et al say *“formal arrangements for maintaining and managing shared open spaces are more successful than informal collective action on the part of residents”*. She goes on to say, *“in the UK context, the acceptable form might be high-density but not necessarily high-rise... it might also be high-density but with more generous internal space standards than recent urban development has provided ... privacy is important both in the home and in open spaces, to allow users to feel safe and comfortable.”*

The LSE Cities Report⁹⁰ states that *“Compact, relatively densely populated cities, with mixed-use urban form, are more resource-efficient than any other settlement pattern with similar levels of economic output. Integrated design strategies, innovative technologies and policies are available to improve urban transport, the construction of buildings and the development of urban energy, water and waste systems in such a way that they reduce resource and energy consumption and avoid lock-in effects...Relatively high densities are a central feature of green cities, bringing efficiency gains and technological innovation through the proximity of economic activities, while reducing resource and energy consumption. Urban infrastructure including streets, railways, water and sewage systems comes at considerably lower cost per unit as urban density rises.”*

But density can also be done badly, as LSE points out. In Istanbul, the government is building 3 million housing units in 20 years. They state *“all around the millennial city, rows of bland, 20-storey tower blocks surrounded by tarmac are emerging, reminiscent of the most alienating social housing projects built across Europe and the United States in the mid-twentieth century.”* Whereas *“despite a recent slowdown, São Paulo continues its march towards endless sprawl fuelled by a planning ideology that finds four hour commuting patterns acceptable in a city that accepts about one thousand new cars on its streets every day.”*

Banister⁹¹ cites empirical research in developed cities that concludes that the key parameters of a sustainable city are that they should be over 50,000 population, with medium densities (over 40 persons per hectare with mixed use developments, and preference given to developments in public transport accessible corridors and near to highly public transport accessible interchanges where densities would be substantially higher (over 80 persons per hectare).

Conclusions

In food, water and carbon there appears significant potential for cities to reduce their environmental impact. Density, together with quality shared green spaces, would appear to be critical for reducing transport impacts in addition to the use and provision of local services. New technology, especially ICT, would also appear to be critical in facilitating and managing the necessary changes.

Part three - and human & social dimensions

Challenges

The EU⁹² suggests cities are “places where problems such as unemployment, segregation and poverty are concentrated.” And “Demographic change gives rise to a series of challenges that differ from one city to another, such as ageing populations, shrinking cities or intense processes of suburbanisation.” At the extreme they quote “In Romania for example, more than 900 000 people have between 3 and 3.5 square metres – the equivalent of one bed and half a table – to live on. Social integration strategies based on education and training may work in situations of relative poverty but do not function in such situations of extreme poverty and segregation: ‘it is impossible to learn mathematics in a nice school and go back to the shack, sharing the only bed with four other brothers’”.

A significant challenge for cities is, it states, “to make it attractive for families with children to live in core cities. Good quality, easily accessible childcare and schools are obvious elements in a child-friendly city. Affordable and attractive housing suitable for family needs is also important, as are green areas and playgrounds and child-friendly streets. It must be easy for families to reconcile professional and private life, easy to bring children to childcare on the way to work, easy to buy and bring home food for a family, easy to take children to parks or cycle in the neighbourhood, etc. Such a child-oriented focus would be beneficial for elderly people and the overall attractiveness of cities. It could also be beneficial for overall fertility rates.”

Globally one of the Millennium Development Goals focuses on slums, with a target to improve the life of 100 million slum dwellers. As the LSE points out “Mumbai’s cynical attempts to redevelop Dharavi, India’s largest slum located on valuable land near the centre, with large commercial blocks replacing the fine urban grain of one of the city’s most sustainable communities, raises the spectre of 1960s ‘slum clearance’ programmes that devastated the social life and urban structure of so many European and American cities.” Shapely⁹³ questions whether people really want to live in slums and that rather than slum clearances a phased sensitive redevelopment is necessary. The World Bank⁹⁴ states “There is also an emerging role for the private sector in slum upgrading as businesses realize the potential purchasing power at the base of the economic pyramid. An enabling environment for small private service providers can help to facilitate private sector investments in slums.”

The Joseph Rowntree Foundation⁹⁵ identified three important steps for recovering cities in order to secure jobs and reduce poverty and discrimination. These were: the economy supported new enterprises, reinvestment, new skills and different kinds of jobs; investment in physical infrastructure and urban environments; and tackling problems concentrated in steeply declining inner and outer neighbourhoods where recent immigrants, unemployed former industrial workers and other vulnerable households lived. They stated “The recovery process involved major public investments, which then attracted private partners. As transformational activity took root, so new investors arrived, more jobs were created, and the poorest conditions improved”.

Competition and the 'creative city'

A comprehensive review of the literature of the economics of cities is beyond the scope of this paper. Economic models will be addressed in more detail in a subsequent project. Here we outline some dimensions of debate around economic competition between cities and its implications.

Caragliu⁹⁶ points towards work by Florida on the importance of the 'creative class' in creating competitive wealthy cities. He says that *"the presence of a creative class, the quality of and dedicated attention to the urban environment, the level of education, multimodal accessibility, and the use of ICTs for public administration are all positively correlated with urban wealth."* Florida and Gates⁹⁷ highlight the apparent significance of tolerance and diversity in economic success amongst American cities, finding strong correlation of high technology success with diversity, and especially with high levels of gays and immigrants. The EU⁹⁸ also states that there is a *"positive correlation between diversity and urban wealth, stating that this may be "explained both by immigrants' attraction to economically wealthy cities, and by the economic opportunities created by diversity."*

Caragliu further cites work that states that *"innovation is driven by entrepreneurs who innovate in industries and products"*⁹⁹. He concludes that *"although caveats on the potential risks associated with putting an excessive weight on economic values as the sole driver of urban development may be worth noting the data actually show that business-oriented cities are indeed among those with a satisfactory socio-economic performance."* And that *"While the presence of a creative and skilled workforce does not guarantee urban performance, in a knowledge-intensive, and increasingly, globalized economy, these factors will determine increasingly the success of cities."* He points to the importance of good amenities and transport in attracting the 'creative class', with evidence of transportation and performance.

Tranos⁹⁹ suggests that *"where communities once raced to build seaports, rail depots, airports and highways to attract businesses and create jobs, many now view broadband communications and information technology as the new keys to prosperity"*. He talks of the importance of *"social capital"* in urban development. In the USA, he says, smart communities are transforming cities in relation to new knowledge and technology. *"Smart in this case is more than the mere deployment of technology, but rather about preparing one's community to meet the challenges of a global, knowledge economy. A smart city is a city whose community has to learn, adapt and innovate. Smart human capital is of equal importance and there is a need to compete globally for its attraction."*

Ponzini¹⁰⁰ is very critical of the 'creative city' concept saying that although it is successful in redesigning a more attractive urban realm and thus in attaining its stated goals, it has proved to be more concerned with real estate revitalisation than with issues of social inclusion and life-chance provision. *"It is concluded that the prevailing institutional imperative of networking and collaboration...overemphasises the importance of the politics of association in contemporary urban regeneration processes, while neglecting the relevance of classic goals of socio-spatial justice."* And that *"those benefiting from the creative class policy strategy are essentially the political élites."* It has

⁹⁹ although it should be remembered that innovation is not solely driven for financial purposes, as collaborative on-line problem solving and development demonstrates (e.g. Linux). Nor is the model of entrepreneur-led innovation, as opposed to collaborative innovation, convincing outside a narrow set of circumstances.

an effect of increasing housing prices and improving the liveliness and attractiveness of the neighbourhood, leading to gentrification.

The issue of gentrification (the displacement of poorer elements of the population as an urban area is 'improved') has been a focus for attention for many years. Lees¹⁰¹ says it can be incidental to improvements in the urban fabric (including retrofitting for energy saving) or transport infrastructure, or a deliberate policy to enhance tax yields. He says finding policy tools to ensure that urban enhancements are widely shared is critical, going on to say that European experience suggests that rent regulation and protected tenure are critical if retrofitting is not to result in displacement.

Sharing

Increasing sharing and share-ability is one consequence of the intersection of urban space and cyber-space highlighted by Castells¹⁰². New technologies and new norms from cyberspace are being re-mapped onto the dense interactive arena of urban space, stimulating what appears to be an emergent paradigm of shared resources of all types.

Tapscott and Williams¹⁰³ suggest innovative and potentially transformative ways to improve social and human conditions through sharing enterprises, collaborative consumption, and activities reducing resource use, enhancing social connections and opening up opportunities to those on low incomes. Shareable.net¹⁰⁴ suggests "*scores of new companies have emerged recently to help strangers share a surprisingly wide variety of assets — mostly in cities*". 3D printing is also emerging as a transformative process and one of the actors engaged in this, Fab Lab, has a goal to create "*an entirely commons-based production infrastructure, a network of free and open facilities that utilize only free software and open hardware. This would pave the way to lessening people's dependency on the capitalist market, with commons-based peer production producing more and more of the things that people need.*"

Sharing is of course not new. Shared green spaces in cities have long been seen as critical for health and well-being. Ebenezer Howard published his famous book *Garden Cities, Tomorrow: A peaceful path to real reform* at the close of the 19th century and inspired a movement for garden cities¹⁰⁵. Previous to his work there was the 1833 Select Committee on Public Walks, which considers the environmental, social, and medical case for creating green spaces in cities. In the 21st century green spaces are seen as a means of putting people back in touch with nature. Historian Katy Layton-Jones¹⁰⁶ suggests the Danish model of green infrastructure is a positive example with wilderness parks within city suburbs, as well as more contemporary, designed spaces, and a city council has total control over parks and an unquestioned commitment to funding parks from council budgets, as opposed to volunteers and charities as is currently advocated in the UK and USA. Dempsey et al¹⁰⁷ suggests that a failure of formal arrangements for maintaining shared spaces is more successful and results in more use and lower social problems than informal arrangements. Ken Worpole¹⁰⁸ suggests that the urban park is "*Britain's unique contribution to European town planning and city-building in the 19th and 20th centuries, and its international reputation continues to this day*". He states that over half the population of the UK visit parks and green spaces, totalling 2.5 billion visits a year, and that a number of individual parks are more visited than national museums and galleries. He recommended that parks should be at the centre of all local regeneration strategies.

The shared park illustrates the importance of the active involvement of city authorities in providing shared facilities for the populace and not expecting a private or even community sector to provide all resources. Katy Layton-Jones tells of the historical example of municipalities in the UK having to take over privately managed public spaces, together with the enormous debts, at great cost to the tax-payer (a very early analogy to the bank rescues).

In a very different example of shared resources, the World Bank¹⁰⁹ states that “*Microfinance has been demonstrated to be a powerful instrument for poverty reduction that enables the poor to build assets, increase incomes, and reduce their vulnerability to economic stress.*” They also state “*Policy based lending aimed at better targeting of subsidies to the poor while enhancing access to mortgage finance for middle-income groups have had positive impacts for the urban poor—and for housing outcomes more generally—in Brazil, India, and Mexico*”. Innovative finance is clearly important, and crowdsourcing funding may assist in this. Although both microfinance and crowd-funding have gathered critics in recent years, their record in supporting socially useful activities could scarcely be exceeded by conventional finance!^p

Conclusions to part three

Part one identified that amongst other purposes of the city is the need to ensure the populace has employment and homes. It may be that a more cooperative approach and creation of sharing economies and cultures could offer a route for not only reducing the environmental impacts described in part two and delivering the purposes identified in Part one, but also greater equality and social cohesion. An alternative approach based in competition risks increasing inequalities and lowering of standards so as to attract inward investment from global corporations. The emerging sharing economy deserves fuller exploration.

^p See, for example, Thomas Dichter and Malcolm Harper (eds) 2007. What's Wrong with Microfinance?

Appendix – City labels

- **Digital / Wired / Smart / Techno-cities:** Several different terms have been used by researchers exploring the potential of ICT to transform the design and functioning of cities. Most concur that this will operate predominantly to reinforce urban concentration and agglomeration, rather than enabling decentralisation. ‘Smart Cities’ has been applied by a range of cities and institutions to describe various initiatives, typically focused on use of ICT to improve competitiveness and thus prosperity. Different actors and initiatives have taken different focuses. For example the Smart Cities INTERREG project (2009-2012) aimed to create an innovation network between governments and academic partners leading to excellence in development, delivery and take-up of e-services^q, particularly empowering local authorities; whereas a more recent EU project (SETIS) applied the term to the promotion of emissions reduction via adoption of ‘smart’ technologies in energy management^r. In the US, Professor Mitchell at MIT led a Smart Cities Group (subsequently subsumed in a broader ‘city science’ project) which pursued sustainability, livability, and social equity through technological and design innovation^s. The term ‘Wired cities’ has also been used by US researchers to create rankings quantitatively comparing rates of broadband connectivity in cities. Imperial College runs a ‘Digital City’ Exchange as part of the RCUK funded digital economies programme. The programme of research focuses on harnessing next generation digital systems to combine and repurpose city data: ultimately, transforming the planning and use of cities^t.
- **Global Cities** (Sassen, Castells) – descriptive of the emergence of digitally interlinked centres of globalised corporate power in renewed high-density cities with economies based in knowledge industries (R&D, ICT, finance, accounting and consultancy), and wide inequality between central business elites and poorly paid service sectors (contributing to the phenomenon of the ‘squeezed middle’).
- **Creative / knowledge cities:** A city following the knowledge city (KC) concept adopts a strategy to encourage and nurture locally focussed innovation, science and creativity within the context of an expanding knowledge economy and society^u. The layers that comprise a KC include the knowledge base (educational institutions and R&D activities); industrial structure; quality of life and urban amenities (necessary to attract knowledge workers); urban diversity and cultural mix; accessibility (for transfer and movement of knowledge); social equity and inclusion; and scale

^q <http://smartcities.info/aim>

^r <http://setis.ec.europa.eu/about-setis/technology-roadmap/european-initiative-on-smart-cities>

^s <http://smartcities.media.mit.edu/>. Mitchell notes “We take the particular perspective that cities are systems of systems, and that there are emerging opportunities to introduce digital nervous systems, intelligent responsiveness, and optimization at every level of system integration – from that of individual devices and appliances to that of buildings, and ultimately to that of complete cities and urban regions. Furthermore, through cross-communication among digital nervous systems – for example those of a city’s mobility systems and its energy systems – it becomes possible to coordinate the operation of different systems to achieve significant efficiencies and sustainability benefits. In designing smart products, buildings, and urban systems we simultaneously consider both their synchronic and diachronic aspects. Synchronic views reveal the more persistent spatial and functional relationships among elements and subsystems. Diachronic views bring into focus supply and removal chains, fabrication processes, assembly and disassembly, actuation and motion, and the choreography of activities and interactions. This approach radically reframes many traditional design problems, and opens up possibilities for new products, services, and business models.”

^t http://www3.imperial.ac.uk/digital-economy-lab/partnernetworks/dce/about_us

^u Yigitcanlar et al 2008. doi:10.1016/j.cities.2008.01.001

(larger KCs tend to offer a greater knowledge pool, greater diversity and wider choice for knowledge workers and businesses)^v. The "**creative city**" concept embodies many similar aspects, with a more intense focus on culture. It was developed by urbanist Charles Landry in the 1980s^w. The idea reflects the changing nature of urban economies and emphasises the importance of a flourishing cultural sector and infrastructure to creativeness and innovation.

- **Just Cities** - Fainstein's normative objective is to combine progressive city planners' earlier focus on equity and material well-being with considerations of diversity and participation so as to foster a better quality of urban life within the context of a global capitalist political economy. She adopts concepts of justice as capabilities from Sen and Nussbaum, and echoes the claims of Wilkinson and Pickett that the economic success of modern capitalism is harmed by inequality.
- **Charter cities**: Advocated by Paul Romer in the form of granting cities autonomy from national rules and norms to enable effective international competition. Such exemptions have been important in the success of some Chinese cities.
- **Eco-cities / Sustainable cities** – used as a very broad concept by bodies such as UN Habitat, UNEP and ICLEI, and by many cities and NGOs. For example between 2007 and 2010 Forum for the Future developed a sustainable cities index of 20 UK cities measuring 13 indicators in three areas: environmental impact – the city's impact in terms of resource use and pollution; quality of life – what the city is like for people to live in; and future-proofing – how well the city is preparing for a sustainable future^x. Many contributors in this space emphasize measures to reduce the environmental or ecological footprint of cities (inhabitants). With '**regenerative cities**'^y, Herbie Girardet goes a step further, conceiving of urban futures in which the design and operation of city functions helps regenerate the ecological capacity of the city's hinterland. This implies a focus on 'retrofitting' cities with renewable energy and the establishment of a circular urban economy with recycling of resources – including biological wastes.
- **Resilient / Adaptive cities**: These labels also capture a diversity of interpretations, with some focused on building the capacity of cities to adapt to climate change and others more broadly concerned with enabling bottom-up adaptation in response to change in its broadest sense, in some cases with an emphasis on citizen action and the use of ICT to enhance the responsiveness of urban management and collaborative planning^z.
- **Retrofit Cities**. Recognising the wide gap between current rates of urban renewal, and the demands of rapid emissions reduction, the on-going EPSRC funded Retrofit 2050 project aims to deliver a step change in current knowledge and capacity for urban sustainability by working with key stakeholders to illuminate realistic social and technological options and pathways for the systemic retrofitting of city-regions^{aa}.

^v ibid

^w Landry, C (2000) *The Creative City: A toolkit for urban innovators*, London, Earthscan

^x <http://www.forumforthefuture.org/project/sustainable-cities-index/overview>

^y http://www.worldfuturecouncil.org/fileadmin/user_upload/papers/WFC_Regenerative_Cities_web_final.pdf

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- **Sharable cities.** An emerging concept promoted by Alex Steffen, based in the recognition that many of the potential benefits of cities arise from the opportunities for sharing resources supported by close physical proximity; whether broadband or wifi systems, public transport, libraries, green space or more novel ideas like bike-sharing, city densities make them easier. Realising this potential could dramatically reduce per capita environmental footprints, as well as enable greater resilience.

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