Abstract: Rapid urbanisation in China, during the first two decades after market reforms, led to many environmental problems that gave reason for the eco-city movement in the 2000-2010 decade. However, most of the important Eco-city ventures were abandoned or reconfigured as conventional developments by 2012, following lack of investor interest, political problems in implementing the schemes and high front-end costs. The first part of the paper is devoted to the reasons for the abandonment of the Eco-city movement. In the present context of a policy gap for sustainable urbanisation, this paper then reviews the more conventional means available to city leaders to retain sustainability objectives, drawing on the recent literature. Those means involve promoting higher densities, the use of more economical building forms, reforming representational planning practices, mixed land use, conserving traditional habitats, and promoting non-motorised transport.

Keywords: sustainable city, eco-city development, China, policy implementation, policy gap.

1. Introduction

It is useful to remember that the emergent concerns with sustainability in the headlong rush to urbanise China and to promote its economic development, have a specific context. Efforts to address the sustainability agenda have largely been unproductive (de Jong et al, 2013), although the specific urbanisation programmes of the last twenty-five years cannot be considered entirely to have resulted in environmentally, economically and socially unsustainable environments. Unforeseen or at least unmanaged negative externalities have attended the rapid growth of cities. For example, in the first decade of the liberalised market, 1980 to 1990, the bicycle became the preferred mechanical means of transport in most of urban China, with modal share increasing into
the early 1990s. For example, Shanghai had 37.8% of vehicular trips by bicycle (SCTRI, 1997) and Tianjin 77.6% (TUPB, 1998). Beijing’s bicycle share of commuting travel was 62.7% in 1986 (BTRC, 2011). But these shares were reduced to half or more by the end of the 1990s with the launch of the car industry as a “pillar industry” (1994), and the subsequent rebuilding of urban road infrastructure to accommodate the exploding car fleet. In Beijing, there were about 200,000 private cars in 1986 and more than 5 million in 2015 (Beijing Statistics Bureau, 2013). These developments called into question the transport planning practices then prevalent in the 1980s but more recently led to attempts to curb car growth and car use, through car license quotas, now applied in all the megacities of China, and in market-driven parking charges. But such attempts at mitigation failed to sufficiently address the emergent issues, lending support to alternative approaches.

The alternative approaches included conceiving new cities congruent with sustainability objectives, while leaving the more complex and unclear problem of the already developed city. The Eco-city movement in particular drew on accumulating practices, especially those in Europe, that described the outlines of a reformed urban environment that could achieve high levels of sustainability—energy-neutral development, near complete recycling of waste and the support of a stable and complex ecosystem. But how was such an agenda to be advanced and implemented in the context of a China gripped by the pre-eminent demand for GDP growth? The answer came in the form of the so-called ‘green economy’, the integration of sustainable practices in the market economy. Local Eco-city projects on not-yet urbanised land were treated as achievements in modernisation and economic development by the local authority. A good example is Guangming New Town in Shenzhen. The creation of a new district with the eponymous name created an administrative unit focussed on carrying out the plan, rather than have its development compete with many other priorities in the much larger Bao’an district. The international competition and subsequent statutory plan incorporated many features that figured prominently on the eco-friendly agenda: a high degree of non-motorisation in internal travel, passenger rail to central Shenzhen and the integration of agriculture within the urbanised territory. The plan failed to elicit private sector investment and remains in 2016, some five years after the planning phase, a project on the drawing boards.

Eco-cities included features that were clearly aimed at building local expertise, in planning but especially in technologies in support of the Eco-city. Examples include energy derived from waste, the recycling of domestic water, and a whole host of efforts surrounding ‘green buildings’. Such expertise could then be expected to reflect the transformation of the local economy to sustainable management of the larger environment while generating scientific innovations and exportable local expertise.

The most acclaimed of the Eco-cities was perhaps Dongtan, on Chongming Island in the northern reaches of Shanghai. The plan was to build a carbon-neutral city that preserved and enhanced the vast agricultural resource of the island while the local economy served as an incubator for
internationally competitive industry related to urban ecologies (Chang et al, 2013). The foregoing discourse marked Shanghai’s promotion of the scheme, although locally the plan was more often seen as a way out of entrenched rural poverty. For new inhabitants, Dongtan resembled a privileged and economically exclusive retreat from the challenging, polluted central city while somehow being accessible to it. The project was more or less permanently shelved in 2007, after the fall from grace of Shanghai’s mayor as well as enduring concerns about the fiscal advantages of the project. Some argued that the project only required sufficient political will to achieve its main goals without compromise, further arguing that the long-term benefits would justify the higher inputs to make it a physical reality. However, such arguments have not yet yielded investor interest sufficient to launch the project.

Caofeidian (CFD), the famed Eco-city of Tangshan on the Bohai Bay of northern China, was another much-discussed nexus of technological innovations when launched in 2007 (Hult, 2013; Joss and Molella, 2013). There were significant challenges from the beginning, not the least the fact that much of the city was built in and around oil and gas extraction fields. Site conditions were also challenging, given that most of the area was salt pans resulting from land subsidence, barren land and polluted water bodies. Major industrial and port facilities were proposed, along with a substantial amount of worker housing, colleges and universities, and high-end business centres. By 2015, most of the innovative, sustainable features of the plan had been abandoned. According to our interviews with the current planning team, here is a summary of the changes: The CFD business centre failed to develop, which the planners attribute to the high costs and difficult planning challenges. While colleges and universities have been attracted to establish local campuses, industry has not entered as expected, so population growth has not met with expectations. The symbiotic relationship proposed with CFD’s hinterland, using water management and integration with the rural environment, has not been achieved. Roads are much wider than originally planned. The planned public transport consisted of monorail, tram, bus, and bus rapid transit (BRT). In 2015, only the BRT has been partially executed, with conventional buses for the rest. The plan foresaw a Science and Education City, to execute and commercialise the R&D work of the universities. So far, only the university campuses exist and without such a base for the commercialisation of academic research. In other words, abandonment of the ecological features of the plan followed lukewarm investor interest.

Finally, it is useful to mention the Tianjin Eco-city because of its high profile in China, due in no small part to the presence of highly visible and vocal Singapore investors. As a footnote, it is worth mentioning that all that is Singapore has certain exchange value in China, since that city is widely recognised in China as successful in urban transport, CBD development, social housing, and commercial development. The plans for this Eco-city of 350,000 inhabitants explicitly called for the development of the ability to make a commercially viable, replicable and scalable exemplar for the sustainable city. In other words, it was intended as an R&D laboratory for the development of exportable expertise. The goals for the Tianjin eco-city were ambitious: for
example, it was proposed that tap water should be potable, green transport—non-motorised and public transport—should constitute 90% of all travel, and more than 50% of domestic water should come from non-traditional sources including recycled waste water. Perhaps most ambitious of all was the goal of keeping carbon emissions below 150 tonne-C per $1millionUSD of productivity. While many of the eco-features of the development could be regarded as high technology, the plan also promoted mixed land use and urban cells linked together by non-motorised transport.

In 2015, it has been difficult to achieve the mixed land use with little investment in the economy. The continuous green corridor with walking and bicycling paths has been achieved but without the promised tram. Most notably, all urban roads are at least 6 lanes with conventional four-way intersections. Although bicycling was supposed to constitute a significant mode in the new community, they are rarely used at present. Two of the urban core areas were built but without public transport and without a dedicated bicycle system. Some of the buildings exhibit green features such as solar collectors. Overall, after 8 years of development, it is difficult to see that Tianjin Eco-city has achieved its planning objectives, while some of the high technology is waiting for further development. In April, 2014, the Working Committee met to further revise the plan and discuss ways to improve the economic viability of the project.

The underachievement and abandonment of the Eco-city in China in 2016 contrasts sharply with the atmosphere of unbridled optimism and cutting edge innovation in the mid-2000s. Clearly without massive public inputs, few of the development goals could be achieved, because of the general reticence of private funding sources to enter into such a protracted business plan, as well as muted enthusiasm for some of the specific projects. While public funds for many infrastructure projects have been a mainstay of urban development, indeed of economic growth, over the past decade, public investment has also not flowed to the innovative infrastructure of the eco-city. The planners at the various cities cite the lack of private interest in inspiring disinterest among local officials, and the concerns of local government that the venture is simply too expensive. It is also undeniable that local officials still rate GDP growth above any other local objective, which investment in sustainable infrastructure cannot deliver in the short-run, or during the mandates of local officials. It then becomes much more attractive to use conventional planning practices to accelerate development even with its attendant environmental and social problems.

This is not to suggest that the sustainable city is beyond reach of China, but that the eco-city model is badly adapted to the political and fiscal environment of today. The vast coordinated effort required appears out of reach, even for a rigidly top-down planning system (de Jong et al, 2013). Recall that China quickly abandoned traditional sustainable practices in favour of technologies in the 1990s to accompany the rapid urbanisation of the country. The eco-city was intended to address the negative externalities of that technology-driven urbanisation, but failed. It seems sensible in this context to re-examine the fundamental elements of urbanisation to see how other, practical and proven approaches might deliver improved sustainability.
2. Methods

In this study, we examined several of the most lauded examples of sustainable city development in the form of the Eco-city, by reviewing the original planning reports, making site visits and discussing with the planning teams. We then examine the typical wish-list of environmental features in sustainability agendas and consider how the planning agenda could help. To do this, we surveyed the recent literature in these areas of planning providing evidence for the direction of the effect of specific planning approaches. In addition, there are specific parameters attached to some of the planning measures.

The following is a short list of measures that could be taken in new development plans, and with proven results for environmental, economic and social sustainability. The list is not exhaustive but is focussed on widely practiced current planning approaches. Notably, they do not involve high technology and in fact could be regarded as a low-tech agenda.

3. Results

3.1 Higher urban densities

The majority of Chinese cities are experiencing density decline, even as they continue to grow rapidly (The World Bank Group, 2015). This development is out of keeping with the rest of East and South-east Asia where urban density is rising. Densities in the urbanizing countryside are much lower than in the largest cities, a worrying trend as China pursues its plan to urbanise the great majority of the population. In Beijing, 24% of suburban land is occupied by road infrastructure while Beijing’s goal is 20% (Beijing Municipal Commission of Development and Reform, 2011). Traditional areas have about 13% of land area in roads. In general, lower density demands more road infrastructure, not only to account for the greater use of private automobiles but because road loads are heavier due to longer travel distances. The most important gain from higher densities is the preservation of productive agricultural land, much of which is located around existing cities. Food security is especially important in China, where more than half of the food consumed is imported. Moreover, locally grown food reduces the carbon emissions necessary to bring the food to market when it is produced farther away. It is well known that higher densities are associated with lower infrastructure costs (Wenban-Smith, 2006). Utility runs are shorter and there is generally less infrastructure to maintain. High-density cities have less space devoted to car storage and use, and there is generally lower car ownership as well. There is greater potential for the conversion of waste to domestically consumed energy and significant gains in terms of green transport.

More specifically, higher overall density calls for higher residential densities, since residential use is typically the greatest user of urban land. New residential densities average 2.3 net floor-area ratio (FAR) in Beijing, or 1.7 gross density, which is typical for the large cities across China. This is
less than half the gross development density of Hong Kong or Paris, for example. Population density usually ranges more widely than residential unit density because at higher densities, unit sizes tend to be smaller. For example, Paris saw an increase of 6.5% in residential density over the 2000-2010 decade, with some districts reaching 407 persons per hectare (Insee, 2014). In the hutong areas of central Beijing, which already have the highest population density in the entire metropolitan region, densities top out at 336 persons per hectare (Zacharias et al, 2015). Residential densities in the recent developments in the suburbs are about half this population density.

In addition, there is much land waste, especially in the vast industrial estates promoted by the cities for economic development and where land use intensity is especially low. Expressways are planned with broad greenbelts which might be attractive from an environmental perspective – reducing noise and air-borne pollutants – but use enormous amounts of urban land. New university campuses and government complexes are typically sprawling estates with vast open areas between low-rise buildings. Suburban areas have much surface parking and commercial developments, resembling those in the United States.

Cities have so far expressed little interest in raising urban densities, in part because city revenues derive almost exclusively from the leasing of land. In rural areas where land is relatively abundant and cheap, it becomes attractive to market large tracts for development. Such a trend is also observable in the largest cities where annexation of adjacent rural counties has led to rapid urbanisation and ambitious expansion plans of the central city. The case of Jinan illustrates the trend (figure 1). The traditional central city becomes a fraction of the projected development area of the city to the year 2020. The city itself is then situated in a complex network of regional expressways to improve connections with the hinterland and with nearest city neighbours.
Figure 1. The planned expansion of the city of Jinan, Shandong province, China, to the year 2020.

3.2 A lower-rise city

In the first decade after economic reforms (1978), the vast majority of buildings were conceived consistent with the previous danwei model, itself derived from Modernist proposals and examples developed in Europe in the 1920s. Walk-up slab buildings were laid out in large urban blocks (figure 2). However, following reforms in the housing market at the turn of 2000, the danwei model was abandoned in favour of high-rise buildings in elaborate landscapes. To some extent, this trend was supported by new planning regulations that required a large proportion of development land be devoted to green area, while more space was required between buildings to promote the penetration of sunlight. This regulatory approach internalised some externalities such as car parking, schools and parks, while raising the environmental qualities of the housing. According to these absolute planning criteria, there is little choice but to raise heights in order to reach minimum densities.
One of the consequences of a higher-rise city is much higher building costs. Following the empirical study of building cost in Shanghai conducted by Blackman and Picken (2010), we calculated the number of units that could be built at various building heights on a fixed construction budget. If 100 units could be built at 6 floors, 73 units could be built at 24 floors and just 54 units at 36 floors (figure 3). In a typical sustainability agenda, we would wish to economise on resources in fixed capital projects, so lower-rise building would in general be desirable. In addition, these costs do not entirely account for the much greater amounts of construction material required for higher-rise structures, nor the much greater energy requirements to raise materials into the sky.

It is often argued that high-rise forms are required to meet density goals. However, as we have suggested above, the high-rise model is not producing very high densities, nor are these densities higher than traditional building forms in Beijing and Shanghai, for example. There may well be qualitative reasons why high-rise buildings are built and consumed, but it is clearly unnecessary from a planning standpoint.
3.3 Reform of representational planning practices

Newly planned areas in China typically incorporate much formal landscaping as settings for novel architecture. For example, Zhongguancun, the much-heralded Beijing CBD devoted to digital technologies, has an overall density of just 2.9. Landscaping around office buildings accounts for 34.2% of the total land area while the building footprints occupy just 26%. The new Futian CBD of Shenzhen has a large representational open space in its heart occupying 568,200 m² of land. The Guangzhou version occupies 315,400 m². The Beijing 2008 Olympic facilities in the city include a vast plaza of 630,000 m² between building frontages. It is typical for cities to plan new civic structures, themselves typically the object of international design competitions, in a formal garden setting that is otherwise difficult to access and use (figure 4). The increasing emphasis on representational forms in architecture and landscape in Chinese cities has much to do with the cities’ accession to the globalisation agenda (Ren, 2008). In many instances, the call for such representational landscapes are explicitly related to the post-2002 goal of many cities to position themselves in global terms. Chinese cities have grown simultaneously over a short period of time, replicating the same land use and urban form patterns. While such a process might easily accompany simultaneous urbanisation, it does not produce the distinctiveness needed by localities to attract inward investment. For this reason, among others, it is seen as desirable for cities to promote iconic building forms and to place them within an iconic open space.

Figure 3. The relationship between building height and construction cost.
Figure 4. The planned central open space of the Guangzhou CBD, c2005 (Guangzhou Urban Planning Bureau. Pearl River New City Centre.)

While it might be debatable that vast representational plazas and unusual architecture are essential to cities’ aspirations for global status, the cost in land resources is significant. In the meantime, making cities more distinctive might take other forms that have rarely been explored. For example, the rigorous control of building form over a local area may produce a distinctive
urban landscape (figure 5), similar although using different tools, to those produced by regulation in New York City and Paris, for example.

Although the example from Shenzhen was the result of concerted effort, such examples are rare. Land development proceeds from the statutory plan, which does not spell out form except in terms of numbers and land use categories. Form is negotiated at the level of planning permission, such that a singular vision for urban form is difficult to sustain through multiple projects over time, and with different sets of actors. Introducing comprehensive urban form control would require a reform of the existing statutory control mechanism, which would also reduce the direct involvement of local officials in development negotiations. Such reform is a tall order, even if it is often called for by local officials involved in the process. On the other hand, official expressions of concern over the lack of distinctiveness may be an interesting opening to considering how best to enhance the image of the city, and without profligate use of public funds.

Figure 5. Implementation of controlled urban design in Shenzhen CBD
3.4 Mixed land use

The promotion of mixed land use is closely related to the urban transport agenda, where it is believed that mixed use may reduce urban travel. It is also shown that mixed use promotes more non-motorised transport (Cervero, 1996). In some contexts, mixed land use may simply mean the availability of local services within walking and cycling distance. In other contexts, such as the high density environments of some European and Asian cities, it also promotes a sociable public environment, pride of place for pedestrians and lifestyle lived locally. Overall, it is argued that mixed land use promotes urban sustainability (Evans and Foord, 2007). There are various interpretations of mixed land use that stem from particular contexts. In general, one notes the attention given to the presence of local services in residential environments as one indicator. It is also argued that work-homes balance may reduce travel times if people are able to select home locations in a given city. In addition, it is argued that a mix of jobs and residences improves accessibility to the labour market for a much larger proportion of the population.

While the evidence points strongly in favour of mixed land use, it is relatively difficult to achieve in China. The land use zoning system favours single use zones, which in practical terms enables better control over the direction and intensity of development in a context where development is occurring very rapidly. It is also argued that with the heavy involvement of government officials in the planning approval process, simple and incontrovertible rules make it difficult for officials to manipulate the plans. In essence, their margin of manoeuvre is greatly reduced by specifying the land uses, densities and heights, as is presently done in the land use contract.

A move to smaller land parcels could enable specification of land use at the parcel level, as is done today, but at a much smaller scale. Since the land use contract involves the one-time transfer of funds for the acquisition of the land lease, it is possible to treat these resources in a variety of ways, including reserving part of it for public benefits. It is also imaginable to make the land use contract more complex, a direction that seems inevitable given the attention currently being given to urban renewal. Again, such a reform of practice is challenging because it requires more administrative efforts at the governmental level as well as a clear vision of what the collective results should deliver.

It is also argued in China that the current patterns of development ensure high-quality habitats within the land use contract area. Clearly, there is more scope for the inclusion of a wide range of amenities when the space available is considerable. This is less possible in smaller scale development. Other mechanisms at the government level would need to be introduced to manage collective resources for their eventual implementation in the urban plan. In general today, local governments prefer to consider infrastructure investment and to relegate the provision of collective amenity to the private sector.
3.5 Conservation and investment in traditional urban environments

Traditional environments are of several types. The hutong of Beijing or lilong of Shanghai have densities that approach or equal those of new developments while having much higher population density. The reason for the higher population density is the lower proportion of lands in infrastructure and generally smaller unit sizes in traditional, central areas. Urban villages (chengzhongcun) are a major part of the housing stock in south Chinese cities, those cities south of the Yangtze River.

In the current urban development process, traditional environments are often seen as a resource for land development, for the purposes of extracting value. If the redevelopment were to proceed while the land remained rural in status, and in the hands of the owners, city governments would have great difficulty extracting value from redevelopment. In the present environment, city finances rely very heavily on land transactions. Discussions continue on reforming the city financing structure; for example, with the introduction of property taxation. While this would appear to resolve some of the existing issues with regard to management of the land, it is in contradiction with a constitutional clause declaring all non-rural land to be owned by the state. Is it feasible to tax property that remains in public hands while being used by owners for a fixed period?

While the policy issues remain to be worked out, there is little doubt that traditional environments represent an ideal in terms of transport, energy consumption and land occupancy. In Beijing’s hutong environments, only 5% of transport is motorised (Zacharias et al, 2015). In the southern cities of Guangzhou and Shenzhen, urban villages are almost entirely non-motorised. They contribute disproportionately to the public transport system in their respective cities, as shown in the Guangzhou case (Zacharias et al, 2013). In that case, the bus rapid transit system (BRT) is the busiest in the world, largely because of the proximity of high-density urban villages. Less need for air conditioning in the built environment in southern cities also means much lower energy consumption.

Social sustainability requires respect for community and social history. While the social composition of urban villages has changed due to huge population flows, the original villagers remain along with their social institutions, festivals and family temples, a legacy of more than 700 years. Work-unit housing and the wave of similar, danwei development in the 1980s also exhibit strong sense of community through engagement with the local space, as in communities in Guangzhou (Zacharias, 2011). It is shown that sharing common facilities and a vigorous public realm are key drivers of a sense of community (McMillan and Chavez, 1986). Moreover, as cities undergo radical transformation, these places are a living reminder of the historical roots of their respective cities and embody a distinctive local culture. This is often noted about the hutong communities of Beijing or the lilong housing of Shanghai.
The urban village in south China houses a substantial proportion of the total urban population. The general trend by government over the past fifteen years is to reduce or eliminate such village space in favour of modern developments, specifically without those local attachments. The villages are an urban form unique to China although they never figure in how cities portray themselves. Locals have quite a different conception of the urban village, however, as attested by the abundance of web sites devoted to consuming urban villages space and culture. Moreover, some such villages such as Shipai in Guangzhou, have the highest pedestrian flows in the central city (Zacharias et al, 2013) and are already important economic players in the larger city.

3.6 Green transport

The headlong rush to motorisation since the mid-1990s has transformed the landscape of the Chinese city. Although it is often suggested that the motorisation model for China is in part the result of perceptions of modernity itself (Seiler, 2012). Various approaches have been proposed for motorisation, including econometric, logistic and disaggregated household models (Ingram and Liu, 1997). A general assumption pervades in this work, namely that development occurs across countries and regions in relation to a common set of factors. The move to green transport has been largely policy-led and prescriptive in nature (Evans, 2011), based on proven successes in various parts of the world. The “natural” progression to a motorised life suggested in the earlier literature contrasts with more prescriptive approaches today. In particular, it is widely accepted today that supply of motorisation services induces demand.

Although the green discourse is widely adopted in China, plans differ greatly from the Western examples. It is often argued in China that the social and economic context is different along with the patterns of urbanisation. There is no consistent approach to green transport in China, and transport plans have been subject to major modification over time as suggested at the outset of this article. Contemporary plans propose eight or more lanes on widely spaced roads. Even the Eco-cities discussed in the first part of this article saw road infrastructure increased substantially to resemble typical urban development everywhere. In addition, cities typically require very high car parking standards in new residential and commercial development. The tax on vehicle sales and various purchase incentives are routinely used as mechanisms for economic growth. Arguably, the transport planning system in China remains mixed, with the promotion of motorisation on the one hand and the promotion of mass urban transit on the other. Road space is devoted to motorised individual transport and public bus, while it is expected that the fastest growing transport sector will be in urban rail. This has already occurred in Beijing, where year-on-year increases have been experienced in use of the metro, such that it is now the busiest system in the world, with about 3.5 billion users annually.

In this process, the bicycle has been sacrificed, along with extensive walking networks. While cities have made some attempts at restoring the role of the bicycle, through public bicycle sharing systems and in creating new, dedicated bicycle lanes, there has been little effort to remake the
comprehensive bicycle pathway network that existed in the 1980s. The Eco-cities proposed large bicycle shares for daily, internal travel. Making the system infrastructure has been much more challenging, however. The bicycle is still seen as a hindrance to the free flow of motorised traffic. Cities that do supply extensive, dedicated bicycle lanes have typically not resolved connectivity issues, or competition for road space with cars. It can be shown, however, that a single lane of urban traffic in the typical Chinese urban context can accommodate a throughput seven times that of the lane devoted exclusively to motor cars. Such a calculation uses parameters available in the Highway Capacity Manual (Transportation Research Board, 2010), Chinese metrics and widely accepted urban bicycling speeds. In Beijing, 44% of recorded daily travel is within 5 km of home or work (BTRC, 2015), a distance that is often considered the upper limit for habitual bicycle travel. At that distance, the bicycle remains competitive in terms of time with public transport (Zacharias, 2005). Although it remains difficult to advocate a policy change in favour of non-motorised modes in China, that option is clearly available within the available road system.

Most cities are increasing the amount of private parking and car parking associated with commercial uses, in the hope that the parked cars will not find themselves clogging the public environment. Increasing the amount of car parking in development undoubtedly facilitates car ownership. It is not unusual to see new housing developments in suburban areas of the mega-cities with parking-unit ratios of 1.5. The ground space or underground structures required for this parking standard also raises the cost of building such housing.

Impetus to diversify the transport system to include non-motorised modes may come from non-transport issues. Most notably, air quality in many Chinese cities is unhealthy or hazardous for much of the year. In many large cities, the source of dangerous PM2.5 particulates is in majority, motor vehicles. Demands for improvement might be partially satisfied through other measures, but the biggest impact would come from reductions in the amount of driving.

As is strongly suggested by historical precedent and the raft of investigations of urban form and travel mode choice, there is ample room for influencing the transport outcome with urban planning. Given the strength of the results especially from Asia but also from the United States, it is fair to suggest that much more could be achieved through urban planning. Undoubtedly, cities would look quite different if urban planning shifted to this focus.

4. Conclusion and Discussion

In 2016, following the abandonment of many Eco-city projects, there is a considerable policy gap in sustainable city development. The green economy was to be spun off city and corporate initiatives to move toward low-carbon cities that require less material and energy to build, and embody the virtues of social harmony. The specific initiatives involved high technology solutions to age-old problems and substantial inputs for longer range returns. While such initiatives remain
promising but unachieved, the green economy also remains a dream. The uptake of this agenda seems doubtful, especially in the context of economic slowdown.

Cities are left with no clear agenda for achieving the multiple objectives before them. Achieving high GDP growth has the merits of a proven track record over the past twenty-five years of urban development, which is more difficult to observe in reformist urban planning. At the same time, cities are experiencing a drastic decline in environmental quality, in particular air quality, but also in terms of noise pollution and environmental hazards. The approaches to resolution of these serious problems have been tentative or unclear. The regulation of motor vehicle use, the control of emissions from polluting industry, the shift to energy production with reduced or no greenhouse gas emissions are all such measures. Curiously, the city fabric has been left out of this agenda.

The approach taken here is to use existing technologies to reduce energy, material and space to build the city. Building closer to the ground and concentrating on the human scale for spatial development need not mean the reproduction of earlier Modernist built form or its danwei versions, but would certainly shift attention from the monumentality that currently characterizes the civic project for Chinese cities. In the rush to build, there has been little attention to place and community even though official discourse has emphasised its importance over the last several years. The individualism and consumerism that accompanies the present modernisation drive (Wang, 2003) would make room for more communitarian approaches to urban space. That communitarianism can be associated with the singular cultural foundations typical of many small cities and urban villages within the city. They have already become touchstones in a transformed, generic and often unrecognizable urban environment.

A sustainability agenda for urban planning produces substantial success in a number of areas. It could be argued, based on the foregoing, that the contribution to sustainability is quicker and larger than the high-technology agenda that dominated the Eco-city movement. While Eco-city initiatives should not be forgotten, because they might re-emerge after further development, they clearly cannot dominate the sustainability agenda today in China. China has the distinction of having developed a comprehensive planning system with highly structured practices that is a precious asset in the current effort. Although it is suggested that additional tools are likely to be required to achieve the goals mentioned in this paper, the system itself is capable of carrying out such an agenda.

One of the challenges of this planning agenda is the demonstration that it can achieve much of what city leaders currently set as their goals for the exercise of their power. If, at present, planners supply the embodiment of the leaders’ aspirations for city greatness, they could also engage in supplying the alternatives. The mixed economy offers some hope in this regard, as the sponsors of development diversify. It is also reasonable that city governments will adjust their
own expectations and approaches, as public demands for a higher quality environment begin to compete with expectations of a higher standard of living.

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