Department of Sociology

LANCASTER UNIVERSITY



# *City Visions, Mobility Futures*

**KINGSLEY DENNIS**[1]

*'Inside the city, the best transportation is the least: access by proximity should be the objective'*

Richard Register (author of *Ecocities*)

*'Mankind has not failed to build the right type of automobiles – this is a relatively minor failure – but to build the right type of a system of Man, city and automobile. This is our much greater failure'*

Constantinos Doxiadis (architect and urban planner)

[1] Centre for Mobilities Research (CeMoRe), Lancaster University, Lancaster, LA1 4YL, UK - k.dennis1@lancaster.ac.uk

*'We cannot have an efficient form for our transportation system until we can envisage a better permanent structure for our cities. And the first lesson we have to learn is that the city exists, not for the facile passage of motorcars, but for the care and culture of men'*

Lewis Mumford (1968: 107)

*'Old minds think: How do we stop these bad things from happening? New minds think: How do we make things the way we want them to be?'*

Daniel Quinn (author of 'Beyond Civilization')

*'The future of civilisation will be determined by its cities and in its cities'*

Richard Rogers (architect and urban planner)

## INTRODUCTION: Uncertain City Future(s)

Where once cities were the cradle of 'civilisation' they are now producing disastrous social instabilities and contributing to environmental degradation. The concept of the 'city' now needs its regeneration. With increasing urban development taking place worldwide the opening decades of the twenty-first century will be critical to human and ecological long-term sustainable growth. Great change is both imminent and disruptive, with the human population estimated (in the late 1990s) to be growing by about 900 million per decade, calculated as the largest absolute increase in human history (Gallopin, 1997). This is a rising rate of a quarter of a million people per day, roughly the equivalent of a new London every month (Rogers, 1997: 4). By the end of the twentieth century world population passed 6 billion persons, and at present stands at 6,607,231,402,[2] and is currently growing at 1.2 per cent annually. During the next 45

[2] http://www.census.gov/ipc/www/idb/worldpopinfo.html (data correct as of 11.33 GMT, 24/07/07)

years the population of the world is expected to increase by 2.5 billion, from just over 6.6 billion today to 9.1 billion in 2050 (UN, 2005: 5).

The 2005 Revision of the UN World Urbanization Prospects report described the 20th century as witnessing 'the rapid urbanization of the world's population', as the global proportion of urban population rose dramatically from 13% (220 million) in 1900, to 29% (732 million) in 1950, to 49% (3.2 billion) in 2005. The UN report forecast that '60 per cent of the global population is expected to live in cities by 2030'.[3] At the last count in 2005 the UN report stated that 'urban dwellers numbered 3.2 billion people, 49 per cent of humankind. By 2008, half of the world's population is projected to be urban'.[4] Already some 80% of Europeans live in urban areas, making the notion of global economic growth almost inconceivable without connection with urbanisation (Girardet, 1999: 10). According to some estimates the world has already gone urban. A team of research scientists at North Carolina State University and the University of Georgia, working with United Nations estimates, have predicted that the world will be 51.3 percent urban by 2010, with May 23rd 2007 being the 'transition day' based on the average daily rural and urban population increases from 2005 to 2010.[5]

Already modern cities are the largest structures ever created by humanity, with megacities such as Tokyo and Sao Paulo home to unprecedented numbers of people (Tokyo has over 25 million people; Sao Paulo around 18 million) (Girardet, 2000: 2).

[3] http://www.un.org/esa/population/publications/WUP2005/2005wup.htm
[4] http://www.un.org/esa/population/publications/WUP2005/2005WUP_FS1.pdf
[5] On that day, the researchers claim, a predicted global urban population of 3,303,992,253 will exceed that of 3,303,866,404 rural people. It may be then that as a global species we now inhabit an 'urban planet'.

Herbert Girardet, environmental planning specialist and Chairman of the Schumacher Society notes that:

> humanity is involved in an unprecedented experiment: we are turning ourselves into an urban species. Large cities, not villages and towns, are becoming our main habitat. The cities of the 21st century are where human destiny will be played out, and where the future of the biosphere will be determined. (Girardet, 1999: 9)

A significant aspect of these developments is that in the near future urban increases will be particularly high in developing regions that already have a large population base, such as China, various parts of Africa, and SE Asia. These regions, even in the 1990s, were 'experiencing a surge of urbanization, with over 90 percent of their population growth occurring in urban areas' pointing towards rapid population growth that is 'unavoidable for at least the next two or three decades' as environmental impacts displace larger rural communities (Gallopin, 1997: 17). Much of the flow of population around cities is estimated to come from refugees, and movements of 'people of concern', as designated by the Office of the UN High Commissioner for Refugees (UNHCR). At the end of 2005, the global figure of persons of concern stood at 21 million. By the close of 2006, this figure had increased by 56% to 32.9 million (UN Global Trends: 4).

Rapid urbanisation in developing countries may also contribute to exposing larger populations to urban pollution hazards, such as from shortages of clean drinking water and sanitation as well as rising air pollution and air-born toxins. Already most megacities within developing countries fail to meet World Health Organization standards for air quality, according to an October 2006 report.[6] Along with rising population there are

[6] http://www.who.int/mediacentre/news/releases/2006/pr52/en/index.html (accessed 24/07/07)

foreseeable increases in global consumption of energy and raw materials, leading towards further resource depletion. Architect Richard Rogers stated that 'the survival of society has always depended on safeguarding the equilibrium between the variables of population, resources and environment' (Rogers, 1997: 3).

Although there are various prominent environmental sceptics, such as Bjørn Lomborg (*The Skeptical Environmentalist*) and Julian Simon (*The Ultimate Resource*), the general consensus is that global resource depletion will impact strongly on global trade, finance, national/international stability, and on the quality of life. In a recent popularised work Jared Diamond noted in *Collapse: How Societies Choose to Fail or Succeed* that environmental problems contributed greatly to societal collapse (Diamond, 2005). Specifically, Diamond lists eight factors which have historically contributed to the collapse of past societies:

1. Deforestation and habitat destruction
2. Soil problems (erosion, salinization, and soil fertility losses)
3. Water management problems
4. Overhunting
5. Overfishing
6. Effects of introduced species on native species
7. Human population growth
8. Increased per-capita impact of people

Further, Diamond puts forward four new factors that he claims may contribute to the weakening and collapse of present and future societies:

1. Human-caused climate change
2. Buildup of toxic chemicals in the environment
3. Energy shortages
4. Full human utilization of the Earth's photosynthetic capacity (Diamond, 2005).

The convergence of some of these processes may catalyse the manifestation of complex, non-linear, potentially catastrophic effects that have devastated societies in the past (Tainter, 1988), and may again in the present and near-future as Woodbridge points out in *The Next World War: Tribes, Cities, Nations, and Ecological Decline* (2004).

Similarly, a 1997 report by the *Global Scenario Group* forecasted an either/or future social scenario as *Barbarization* or *Great Transition* (Gallopin, 1997). The Report noted that in the 'Barbarization' camp the 'socio-ecological system veers toward worlds of sharply declining physical amenities and erosion of the social and moral underpinnings of civilization' (Gallopin, 1997: 29) which could lead to a *Fortress World*. The alternative scenario, the 'Great Transition', could open-up a *New Sustainability Paradigm* and a form of *Eco-communalism*.

Significant to these scenarios would be the reaction of powerful global institutions – state alliances, trans-national corporations, international organizations, and the military – that demonstrate a complex set of critical interdependencies. One potential response would be for richer developed nations to break away from the less-industrialised developing nations into a fractured globality of protected enclaves. This scenario is named *Fortress World*:

> the elite retreat to protected enclaves, mostly in historically rich nations, but in favoured enclaves in poor nations, as well… Technology is maintained in the fortresses… Local pollution within the fortress is reduced through increased efficiency and recycling. Pollution is also exported outside the enclaves, contributing to the extreme environmental deterioration induced by the unsustainable practices of the desperately poor and by the extraction of resources for the wealthy (Gallopin, 1997: 34)

This scenario paints a picture reminiscent of earlier tribal 'walled cities' predominant in the rise of city-states and re-enforced during the medieval period to protect against raiders, invaders, and disease. It is clear that this has potential for great geo-political instability, tied very closely to resource wars and energy-management. However, deepening social and environmental tensions, as are presently arising, may facilitate mutually reinforcing social, cultural, and political discourse and action towards re-constructing sustainability practices for the 21st century. This may lead, the Report's authors state, to a 'New Sustainability Paradigm' that could incorporate a form of 'Eco-communalism', which envisions a network of self-reliant (and perhaps also semi-isolated) communities:

> Eco-communalism could emerge from a New Sustainablility Paradigm world if a powerful consensus arose for localism, diversity, and autonomy… Eco-communalism might emerge in the recovery from 'breakdown'. Under conditions of reduced population and a rupture in modern institutions, a network of societies, guided by a "small-is-beautiful" philosophy conceivably could arise (Gallopin, 1997: 35-6)

Breaking away from the Report's pessimism, such a shift towards a sustainability paradigm may not require a 'breakdown' to occur, but rather multiple sites of instability caused through climate change/environmental disruptions, and the resultant social costs. If these geo-social disruptions are critical it could lead to a wave of increasing regionalised social disenchantment against what may be seen as privileged consumerist lifestyles. Within times of rising criticality it might well be that values of community and eco-responsibility are viewed as being more essential than those of consumerism, competition and individualism. Global instances of social and environmental

disturbance/destruction could force planners, politicians, and citizens, towards a redesign of urban centres and neighbourhoods

A combination of increased urbanisation, rising resource depletion, population expansion, and accelerated human-caused climate change are most likely to impact upon not only how future mobilities are socially constructed within public discourse and regulation, but also most probably will affect discourse around how centres of urbanisation are architecturally conceived and constructed. Rapid urbanisation along present lines will further displace natural ecosystems and put increased stress upon local environments, such that 'nowhere is the implementation of "sustainability" more potent and more beneficial than in the city' (Rogers, 1997: 5). Today's cities, it is calculated, are consuming three-quarters of the world's energy and are responsible for around at least three-quarters of global pollution (Rogers, 1997). One of the most ambitious regeneration projects is China's plan to build 400 new cities within the next 20 years,[7] thereby contributing to one of the most extensive migrations in history. Many tens of millions of Chinese are expected to move from rural to urban areas from now to 2050.[8] If such urbanisation plans are to be manageable in the long-term, as well as similar ventures in India and various Middle Eastern territories, then the only viable way forward must come through embracing sustainable development.

The World Commission on Environment and Development (WCED) defined sustainable development as development that 'meets the needs of the present without compromising the ability of future generations to meet their own needs'.[9] The present and evolving

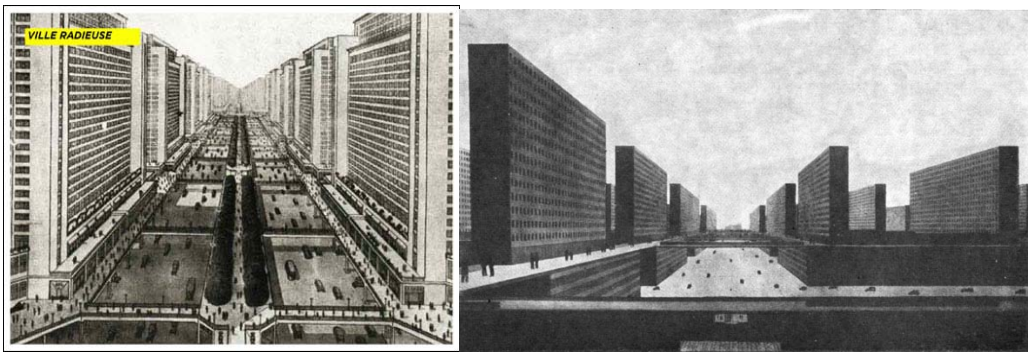
[7] http://www.chinadialogue.net/article/show/single/en/297-Which-way-China-
[8] http://www.iht.com/articles/2007/05/30/asia/letter.php
[9] Full report at http://www.anped.org/media/brundtland-pdf.pdf

world system should be considered as a socio-ecological system, comprised of environmental and human subsystems and their interactions. As Girardet points out, 'there will be no sustainable world without sustainable cities. Can we make a world of cities viable in the long term – environmentally, socially as well as economically?'(Girardet, 1999: 9). A world of modern cities based upon transport tied to the ubiquitous use of fossil fuels can only be detrimental to sustainable futures amid the rising concerns expressed previously. Importantly, the cities that are built and the urban lifestyles that these cities will foster will have enormous impact upon succeeding generations, which will go some way to deciding the long-term outlook of the global environment. Cities, as habitats, determine the mobility of lifestyles; and the modes of mobility most favourable to users will largely determine how urban areas are constructed. Girardet sums this up well by saying:

> Today we don't really live in a civilisation, but in a mobilisation – of natural resources, people and products. Cities are the nodes from which mobility emanates: along roads, railway networks, aircraft routes and telephone lines…They are both the origin and the destination of this mobilisation which has come to define human existence. Modern cities, as centres of mobilisation, have vast environmental impacts. (Girardet, 1999: 12)

In this paper I examine some of the transitions around the modern city, from concepts of the city in modernity to alternative ideas relating to sustainability and eco-design, with a focus on how mobility in the city has been framed, organised, and experienced. The paper then examines a specific eco-city urban design project in China to analyse how this articulates 'sustainable' city transport mobilities for the future, and the implications this will have for re-configuring urban auto-mobilities. The paper concludes by addressing the scenario of possible 'future mobilicities'; that is, the requirements for future mobility within a dense urbanised city environment.

## Modern Cities: Modernity & Mobility




**(i)** **(ii)**

In many respects the 'modern city' has been built upon an architectural modus that consciously incorporated and prioritised modes of mobility; cities as places where 'mobility emanates', in the words of Girardet (1999). Cities were the nodes to an increasing mobilisation of human connectivities and flows, leading Corbusier to remark that 'a city made for speed is made for success' (Corbusier, 1929; 1977). Somewhat paradoxically, Corbusier in his 'The City of Tomorrow' (1929; 1977) wrote that 'the tramway has no right to exist in the heart of the modern city' (:165). Yet such a statement makes sense when it is inferred that it is not the tram but the personal, individualised mobility of the automobile that is envisioned as streaming through the arteries of a westernised city of modernity. Further, the streamlined course of the automobile demanded the development of straight streets for better navigation, as Corbusier noted:

> But a modern city lives by the straight line, inevitably; for the construction of buildings, sewers and tunnels, highways, pavements. The circulation of traffic demands the straight line; it is the proper thing for the heart of a city. The curve is ruinous, difficult and dangerous; it is a paralyzing thing. (Corbusier, 1929; 1977)

The images and visions of a city ‘in modernity’ offered to us through the architectural designs of Le Corbusier and Ludwig Hilberseimer (shown in figures (i) and (ii) above, respectively) show the city as a concrete maze, dissected by sharp walled plinths of buildings that reflect the linear consumption of the modern period. In between the towering tablets of office blocks and bridges run the unmistakable dark lines of regulated traffic, moving in moderated lanes. Hilberseimer’s system, especially, is said to deliberately emphasize the ‘term of affiliation of his project with an emerging tendency in the socioeconomic structure of the modern world toward radical systematization’ (Hays, 1995: 181). It can be seen within ‘rational’ modernity how the machinic impulse for efficiency and innovation placed the city and the automobile within a pre-planned agglomeration, the emergent synergistic outcome being a progressive urbanised metropolis. Girardet (2004) notes how Le Corbusier insisted on purist design without ornamentation and that ‘he was convinced that rationally planned, collective developments offered desirable and healthy housing options. He proposed massive, angular “living machines”’ (:160). It was the intention of the modern architects at the time, such as Le Corbusier, to make the city a permanent and lasting artefact, as unfazed monuments to civilisation’s achievement (Corbusier, 1929; 1977). And yet, like all uneasy relationships, the automobile has come to devour the fabric of such cities like a virulent host.

Safdie writes in *The City After the Automobile: An Architect’s Vision* how older cities have since had to adapt their city areas to traffic volumes unimagined at the time they were built (1997). Safdie notes how in newer cities, the ‘patterns of development, land-use, and land coverage were all determined by the requirements and presumptions of car-

dominated transportation from the beginning of their major growth' (1997: 5). As was often the case with the city in modernity the straight streets, interspersed with avenues of public spaces, were shaped for the benefit of the auto-car. To construct more roads to fit the need for increasing car use and increasing individualised mobility shows a weakness in urban planning as it extends an existing problem rather than planning to overcome it. Already over-extended reliance upon car mobility has damaged city living:

> it is the car which has played the critical role in undermining the cohesive social structure of the city…they have eroded the quality of public spaces and have encouraged suburban sprawl… the car has made viable the whole concept of dividing everyday activities into compartments, segregating offices, shops and homes (Rogers, 1997: 35)

The urban segregation of everyday activities appears not to have been solved as current policies, in many industrialised regions at least, favour an increase rather than a decrease in the use of cars. With distances of many miles often separating shopping, working and living locations, and the deterioration of public transport, the car has become indispensable to mobility. This urban arrangement is a significant factor contributing to 'cities that segregate and brutalise rather than emancipate and civilise' (Rogers, 1997: 153). A major alternative to this modern project of cities involved the concept of garden cities and the more general garden city movement.

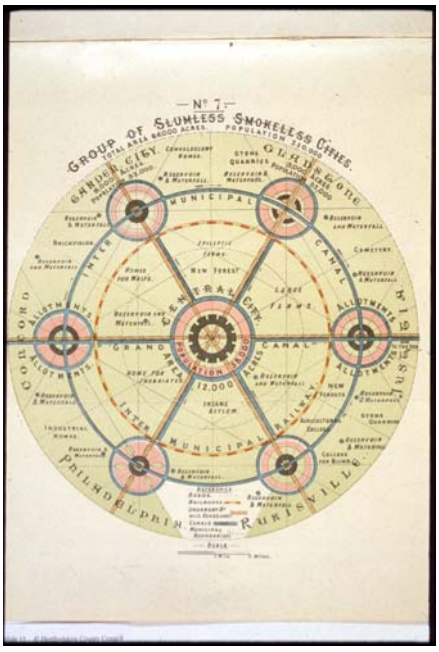
This movement was an approach to urban planning founded in 1898 by Ebenezer Howard in England. Garden cities involved the merging of town and country, of rural partnerships with urban dynamics; self-contained communities containing living, working, and agriculture surrounded by green belts and public spaces (Howard, 1902/1946). In this respect Howard's thinking was ahead of its time in seeing the need for both rural and

urban improvement as a single process. The garden city movement was inspired by Howard's first book on the issue - *To-morrow: a Peaceful Path to Real Reform* (1898) – later reissued in the more well-known format as *Garden Cities of To-morrow* (1902). The Garden City Association was founded in 1899 and lead to two new cities in England being constructed around this design: Letchworth Garden City in 1903 and Welwyn Garden City in 1920 (Howard, 1902/1946). Howard planned his garden cities to be located on around 6,000 acres of land, with 1,000 acres set aside for accommodating up to 32,000 residents, and for an additional 2,000 people on the surrounding agricultural estate. The circular garden city town plan had 120-foot wide radiating tree-lined boulevards, and each city linked to other larger cities by railways (Girardet, 2004). The design for such garden cities even today seems remarkably environmentally aware:

> Howard meticulously separated pedestrian streets and vehicle traffic, and residential and industrial areas. When a garden city had reached its optimal population of 32,000, its growth would be halted and another town of similar size would be built within its own zone of land. But the inhabitants of the one could very quickly reach the other by a rapid transit system, and thus the people of the two towns would really be part of one community. (Girardet, 2004: 158)

The concept of the garden city was also especially influential in the United States with the creation of Pittsburgh's Chatham Village; Sunnyside, Queens; Radburn, New Jersey; Jackson Heights, Queens; the Woodbourne neighbourhood of Boston; Garden City, New York; and Baldwin Hills Village in Los Angeles. In Canada there is the garden city of Walkerville, Ontario, and the first German garden city, Hellerau, a suburb of Dresden, was founded in 1909.[10] Below are two diagrams showing Howard's plans for different aspects of the garden city:

[10] http://en.wikipedia.org/wiki/Garden_city_movement





Howard also believed in citizen participation whereby the town residents could own a share of the city's assets. Even today a 'foundation jointly owned by the citizens of Letchworth controls 5,300 acres of land, including two farms and 118 shops. Every penny earned from these stays in the community and from 1997 to 2003 its assets trebled to £160 million' (Girardet, 2004: 158).

Although garden city planning is not greatly acknowledged in more recent city design plans it inspired contemporary charters such as New Urbanism and Principles of Intelligent Urbanism, as well as concepts of 'high proximity living' as in Roger's ideas of a 'compact city' (1997) to be discussed later. However, the idea of connecting spatial nodes of residence and greenbelts with other nodes through direct train and road links (as above) – a radial concept - has been brought into innovative future city design concepts. An intriguing and original 'futuristic' concept of a 'tomorrow city' was put forward in the 1960s in a revolutionary plan for an experimental community by US media industrialist Walt Disney. The 'Experimental Prototype Community of Tomorrow' (EPCOT) was

developed by Walt Disney near the end of his life to provide an exclusive city environment where astonishingly 'the pedestrian will be the king'.[11] Walt Disney said,

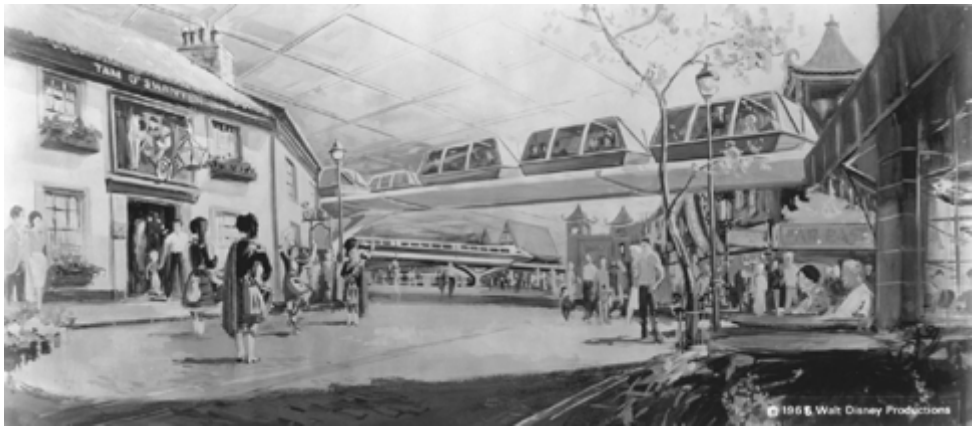
> EPCOT will take its cue from the new ideas and new technologies that are emerging from the forefront of American industry. It will be a community of tomorrow that will never be completed. It will always be showcasing and testing and demonstrating new materials and new systems.[12]

Disney based the EPCOT concept similar to his Disneyland Park layout whereby the city radiates out from a central core in decreasing density. The centre of the city would include a central hotel of over 30 stories that would signify the commercial centre. EPCOT's commercial areas would be located away from the residential areas, completely enclosed to the elements, and heavily pedestrianised. Below is an overall conceptual image of EPCOT:

Surrounding the hotel, inside the commercial district, would have been a range of international shops and restaurants. For personal mobility, a Wedway 'PeopleMover' system would connect shops and streets. The 'PeopleMover' is a mass transport system that never stops, continually running on motors embedded in the track rather than in the vehicles. PeopleMover cars would transport people/residents from the inner commercial

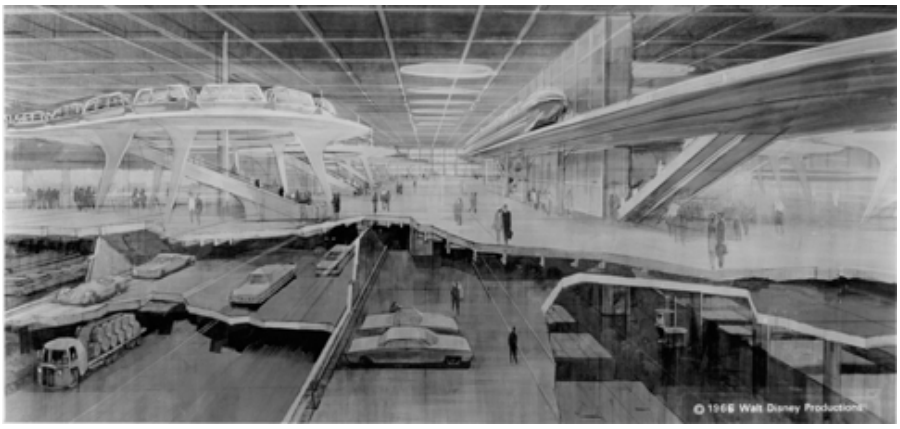
[11] See - http://www.waltopia.com/project_x.html
[12] http://en.wikipedia.org/wiki/Experimental_Prototype_Community_of_Tomorrow_%28concept%29

centre to the outer residential areas.[13] A second form of mass transit – the monorail (first introduced at Disneyland in 1959) - would cut through the centre of the city, connecting both end points of EPCOT. Below is a representation of both the 'PeopleMover' and the monorail (in the background) within the enclosed commercial district:




Disney hoped that both these modes of transportation – the 'PeopleMover' and the monorail – would replace the need for car use, with increased pedestrian areas. In an interesting move, Disney envisioned the road system (for those who required cars and for supply vehicles) to be constructed beneath the city as an underground network. This would both reduce the incidence of risk and accident, as well as screening the supply and delivery vehicles away from residential visibility, ensuring a more family-friendly environment. The two transportation systems would then come together at the EPCOT Transportation Lobby. The Transportation Lobby was designed to be located at ground level away from the road system yet with efficient and easily accessible interconnecting links. In the Lobby passengers would also be able to connect between monorail and the appropriate 'PeopleMover' car (as shown in the image below):

[13] http://www.waltopia.com/florida_film.html




By changing at this transport hub, which incorporates multiple layers of vehicle networks, residents/workers are able to make connections from the central districts towards the rim of the inner city where the high-density residence housing would have been. Radiating out from the high-density housing would be the grass rings of the greenbelt where would be located city services such as parks, playgrounds, community centres, schools and churches.

Radiating out again beyond the greenbelt of EPCOT are the low-density housing areas, located on the perimeter of green circular areas reserved for family recreation. Also inside many of these circular green areas would be situated a 'PeopleMover' station so that local residents would be able to walk to the station from their home and on to work. These plans sought to eliminate as far as possible the need for cars within EPCOT.

According to Disney's promotional film,[14] everyone living in EPCOT would be fully employed, and therefore responsible and self-sufficient, with no retirees allowed. In EPCOT all residents would either have been employed in the Disney 'Magic Kingdom' theme park, the city central corporate and shopping areas, the hotel, the private Disney airport, the Welcome Centre, or the industrial park. Somewhat eerily the promotional

[14] Film transcript available at http://www.waltopia.com/florida_film.html

Disney film[15] states that 'everyone living in EPCOT will have the responsibility to maintain this living blueprint of the future'. However, Walt Disney died before plans for EPCOT could be finalised and so with the original motivation and inspiration behind the project now lost, the city as it had been envisioned was never completed, although parts of it found their way into the larger Disney World resort as the EPCOT centre theme park, opened in 1982. Disney's designs for an 'Experimental Prototype Community of Tomorrow' were radical for their time and represented a visionary attempt to create a sustainable and mobilised city structure, although perhaps too close to the concept of the corporate controlled world as in 'The Truman Show'.[16] Had EPCOT actually been built and become successful it could have influenced a trend of corporate managed cities based upon sustainable planning and close-proximity living and mobility, similar to today's gated-communities. Somewhere in the middle of these is the town of 'Celebration' which is a planned community developed by the Walt Disney Company in the early 1990s on the Florida land originally bought for the EPCOT project.

The town of Celebration has made use of some of the EPCOT ideas, on a lesser scale, yet noticeably absent are the more radical transportation and personal mobility systems. In all other respects the town of Celebration is like many small American towns, only noticeably more organised, clean, and controversial.[17] According to a site dedicated to Celebration, the town is referred to as a 'gated attraction':

> While EPCOT Center was originally planned as an "Experimental Prototype Community of Tomorrow", we all know that financial as well as other considerations dictated that the dream of Walt Disney be changed from a city to a new gated attraction. Celebration will be a true planned community

[15] See film at http://www.waltopia.com/film.html
[16] The film chronicles the life of a man who does not know that his entire life is a constructed reality soap opera, televised 24-hours-a-day to millions across the globe.
[17] For an overview see http://www.slate.com/id/2113107/

> including a downtown, health center, school, post office, town hall, golf course, single family homes, townhouses and apartments. Disney used the services of top-name architects in developing the plans for Celebration. The master plan architects were Cooper, Robertson & Partners and Robert A.M. Stern Architects.[18]

Both EPCOT and Celebration represent an approach to a controlled town/city environment of close-proximity that resembles tribal communities by their enclosed structure and strict admission criteria. For example, EPCOT was open to affluent workers yet closed to non-workers and retirees, thus discriminatory in a way only possible in privatised urban spaces. In some ways the underground routes devised for travel in EPCOT resemble the new growth, in generally wealthy urban centres, of underground networks of streets to aid smooth passage for those people wanting shelter from above ground travel that is open to the elements and to the unpredictability of street life. As an example, Houston, a significant financial hub, boasts an underground network of streets more than 6 miles long beneath its business district – somewhat ironically referred to as the 'connection system' – which is accessible from private entry only, from the lobbies of banks and businesses who have bought access privileges, and not from the street above.[19] This trend resembles a form of privatised urban corridors similar to that described by Graham and Marvin's account of splintering urbanism and networked infrastructures (Graham and Marvin, 2001).

Unique to EPCOT however was the deliberate construction of a cityscape shaped 'beyond the car'. The sentiment Disney represented would be close to eco-city designer Register's view that 'Cars are the dinosaurs of our time. They are destroying the

[18] http://celebration.nm1.net/
[19] For a list of similar underground connection systems see http://en.wikipedia.org/wiki/Underground_cities

reasonable and happy structure of cities, towns and villages. Once communities have been shaped for cars, they remain dependent upon them' (Register, 2006: 2). Urban sprawls of the city in modernity are characterised by the omnipresent car, indicating how cities are built for cars.

The experimental EPCOT project came close in vision to how architect Moshe Safdie regards the city after the automobile, a place where:

> multiple centers of great density integrate work, commerce, culture, residence, and social services. That same city must also have regions of low-density development, expanses of single-family houses, parks, shopping, and other facilities and institutions that support the quality of life associated with the traditional green suburbs. The coexistence of these two very different types of settlement within a single urban region only becomes possible as we rethink all facets of urban transportation as a united system. (Safdie, 1997: 125)

Both these separate visions from different perspectives sought to develop a new prescription for personal mobility; an efficient transfer between different transport nodes, to mesh together mass and individual transit methods that would not infringe the integration of work, leisure, and residential practices but would instead add to their interconnectivities. A major task in configuring mobility within the city - *mobilicity* – is in creating an urban environment that facilitates *meetingness*, interaction, and fluid forms of interconnectivity between places/spaces; a cityscape that is both adaptable yet resilient. In many urban sprawls there are difficulties in moving around, connecting between transport hubs, that re-enforces the need to systematise transport and various forms of physical mobility into sustainable practices of movement benefiting from regulatory processes. Giradet's approach is to manoeuvre cities towards a form of circular metabolism, re-using resources in order to better manage the convergence of human

activities with environmental impacts (Girardet, 1999). Similarly, prominent architect Richard Rogers sees the present as an ideal moment to shift from a city of modernity, built around the mechanisation of form and movement, towards a more environmentally sustainable city that embraces denser proximity rather than distance:

> with the availability of newer and greener technologies, the possibility of cleaner power generation and public transport, and advances in waste systems, the city can operate on denser levels – this means we can reconsider the social advantages of proximity, rediscover the advantages of living in each other's company (Rogers, 1997: 33)

The idea of cities benefiting from closer proximity of people and activities is central to the sustainability paradigm, especially important as climate change concerns increasingly become part of city planning. This paper now examines some current social visions for city and urban planning.

## The City in Transition: Alternative Social Visions

The transition of the 'city' towards a 'sustainable paradigm' within current and future discourses of environmentalism and global climate change is far from certain, and often full of ambivalence. Thus, a top climate change official at the UK Foreign Office emphasises that despite China's claim to be planning and building new 'green cities' it is also completing about two coal-fired power stations every week. However, it was also pointed out that much of China's growth in polluting emissions was being driven by consumers in the West demanding, and buying, cheap Chinese goods whilst the

emissions per person in China were still hugely below those in the West.[20] Within this climate of economic growth vs. low-carbon development conflicting future scenarios are being played out. One strategy to deal with this conflict is to re-conceptualise urban areas as being both environmentally and energy sustainable whilst still maintaining various forms of personal mobility. Gallopin, et al. favour urbanscapes that 'place home, work, shops and leisure activity in closer proximity. Automobile dependence is reduced radically, and a sense of community and connectedness is re-established'(Gallopin, 1997: 38). The shift indicated here towards closer physical proximity is similar to the 'Compact City' proposal of global celebrity architect Richard Rogers. The 'Compact City' argument supports increased mobility within dense urban areas with reduced need for individual car use.

Rogers proposes that the creation of the modern Compact City 'demands the rejection of single-function development and the dominance of the car' and questions how to design cities in which 'communities thrive and mobility is increased – how to design for personal mobility without allowing the car to undermine communal life, how to design for and accelerate the use of clean transport systems and re-balance the use of our streets in favour of the pedestrian and the community' (Rogers, 1997: 38). Proximity in this model favours increased mobility without the dominance of the car, and calls for forms of clean-transport to be integrated into city spaces combining with digital communication technologies to better coordinate access, routes, and connections between transport services. Further, Rogers's 'Compact City' demands, similar to the EPCOT model, that home, work, and leisure districts/regions/zones become more densely interrelated and

[20] According to a BBC Report - http://news.bbc.co.uk/1/hi/world/asia-pacific/6769743.stm

overlapped rather than as separated zones. Below is a diagrammatic representation of how Rogers sees the transition towards a 'Compact City' design:

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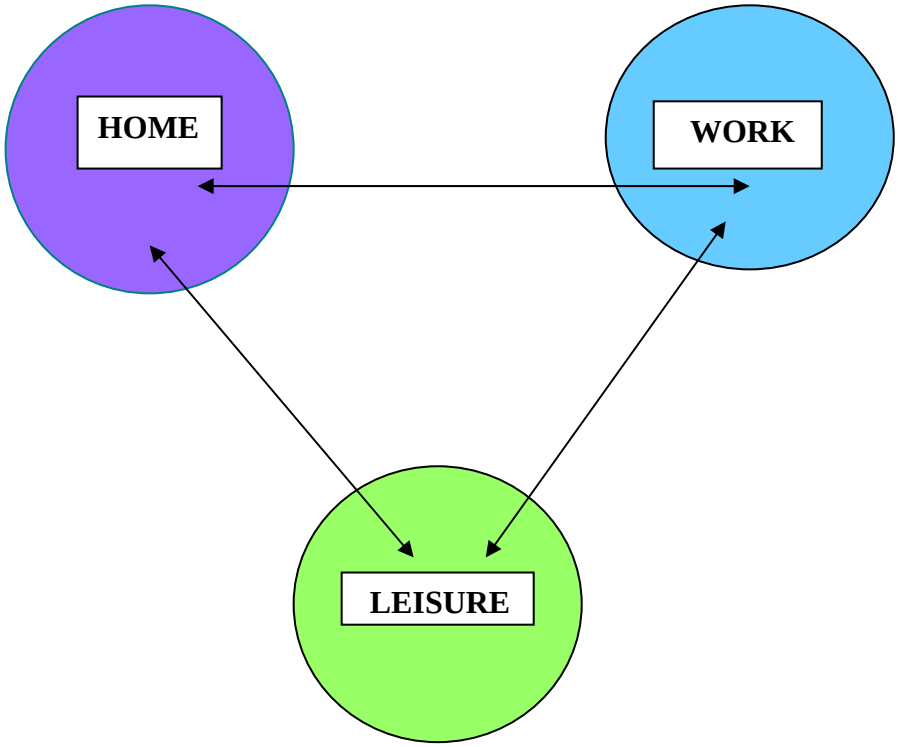


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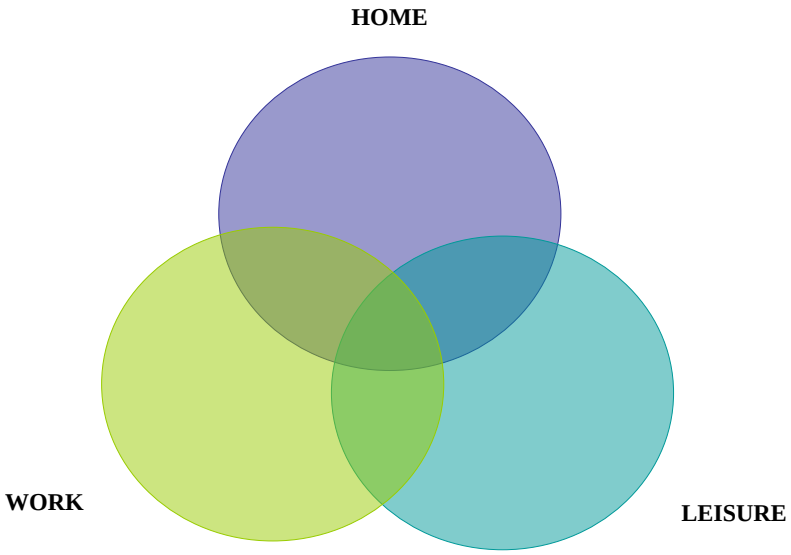


The compact city idea is to increase the density of shared spaces so that not only are there increased proximities of physical co-presence with other city dwellers but that also there is less need for individualised car journeys as compact forms of urban transit, such as Bus Rapid Transport (BRT), can offer more efficient means of mobility. The model also incorporates a metabolic vision of urban processes, similar to that of the principles of intelligent urbanism.

*Principles of Intelligent Urbanism* (PIU) is a theory of urban planning that aims to integrate various environmental, technological, socio-cultural, and mobility needs into urban design, similar to the compact city. As put forward by architect Christopher Charles Benninger (2001), the ten axioms of PIU work towards maximising human

interaction, mobility, and engagement within an environment of sustainable resources.

The ten axioms are paraphrased below at length:

> i) Balance with Nature: this emphasises the balance between utilising resources and exploiting them.
>
> ii) Balance with Tradition: to integrate urban planning alongside existing cultural assets and in consideration of traditional practices.
>
> iii) Appropriate Technology: this promotes building materials, construction techniques, and management practices that are consistent with local people, climate, and local resources.
>
> iv) Conviviality: this axiom promotes social interaction through public spaces and civic life, with emphasis upon neighbourhoods and community. It especially aims to provide walking and pedestrian environments were possible, and to accommodate local shopping areas, green parks, transport nodes and lower density areas.
>
> v) Efficiency: this promotes a balance between the consumption of resources and the sharing of land, roads, facilities, services and infrastructural networks. The design plan also considers using intelligent transportation systems to create transport nodes/hubs along specified urban corridors and networks. The aim is to provide a form of mass public transit that is an alternative to the individualized car.
>
> vi) Human Scale: plans to encourage more ground level, pedestrian oriented urban designs that connect home, work, and leisure. This should then make redundant the need for extensive roads and car park facilities.
>
> vii) Opportunity Matrices: to promote the city itself as a place/space for personal, social, and physical engagement and interaction, with enhanced access to institutions, services and facilities.
>
> viii) Regional Integration: to design cities to be an organic part of the larger environmental, socio-cultural, and economic system as a whole. Further, to also create efficient connections with both external regional and national centres.
>
> ix) Balanced Movement: to design and implement integrated transport systems, consisting of walkways, bus transport systems, rail corridors, and automobile channels. The aim is to provide efficient transport within high density clusters, without infringing upon designated urban spaces.
>
> x) Institutional Integrity: this final axiom recognises that ‘good practices’ need to be accountable, transparent, and to support participatory local

> governance, with a strong emphasis upon civil society. (Benninger, 2001;Benninger, 2004)

The principles of intelligent urbanism have correspondences with both the 'Compact City' scenario and Girardet's concept of urban circular metabolism. What these approaches to urban planning and design offer are ways of integrating mobility practices, urban living, and sustainable environmental concerns. Personal mobility requirements, such as the auto car, need not be conceived as being anti-environmental.

Rapid urbanization requires that urban mobility be re-conceptualised away from linear models that transport a person between segregated, often tiered zones, towards integrated 'circular' models that operate more efficiently within denser urban spaces yet make more use of available space, perhaps through utilising ground, below-ground, and above-ground systems (metro; tram/bus; monorail). Girardet states that 'Given the vast environmental impacts of urbanisation today, cities would be well advised to remodel their functioning by mimicking natural ecosystems' (Girardet, 2000: 7). For urban transport systems to adopt sustainable practices, not only will cleaner forms of fuel need to be used but also distances travelled should be re-modelled, as well as specific forms of transport for particular areas examined, so that light-residential and leisure zones should not be subjected to the same forms of transport systems as dense inner-city areas. In order to re-conceptualise urban forms of mobility, as in the 'Compact City' model, it may first be necessary to consider the many complex and myriad forms of interrelationships that constitute the 'city'. The real challenge comes first through the need to think differently about actions before newer models may find their appeal. This may come through public and media discourse on global climate change, as long as the issue does not become

politically hijacked to a degree of saturation in the public consciousness. Public acceptance, and participation, may be crucial in shifting towards more 'eco-friendly' practices, alongside new policies and integrative technologies.

Examples of public participation and citizen action can be found in the 'Transition Towns' movement which emerged from Kinsale, Ireland's first 'Transition Town'. Rob Hopkins established the 'Kinsale Energy Descent Action Plan', considered one of the first attempts at designing a timetabled strategy for developing a town away from dependency on fossil fuels. Later, when Hopkins moved to Totnes in Devon the 'Transition Town' network was set-up for individual citizens to form town forums to create strategies for dealing with low-carbon energies in a 'post-peak oil' world; in their words for 'responding to the twin challenges of Peak Oil and Climate Change.[21] The 'Transition Town' network, in its mission statement, aims to

> inspire, inform, support and train communities as they consider, adopt and implement a Transition Initiative. We're building a range of materials, training courses, events, tools & techniques, resources and a general support capability to help these communities… We're hoping that through this work, communities across the UK will unleash their own collective genius and embark on an imaginative and practical range of connected initiatives, leading to a way of life that is more resilient, more fulfilling and more equitable, and that has dramatically lower levels of carbon emissions. [22]

The 'Transition Town' initiative provides an inspiring model for local citizens to engage with their urban environments, including the requirements for low-carbon mobility that inspires increased walking, cycling, and public transport rather than individualised car use. The initiative also strengthens the community and goes some way in promoting car-

[21] See their homepage - http://transitiontowns.org/
[22] See http://transitiontowns.org/

free towns/cities, and to a degree attempts to simulate a rural-urban environment. However, as the name suggests, the movement is largely restricted to operating within towns, where civic engagement and localised sustainable practices from the ground-up have more chance of success. Yet the endeavour is close to what is being defined as a sustainable city: 'a "sustainable city" enables all its citizens to meet their own needs and to enhance their well-being without damaging the natural world or endangering the living conditions of other people, now or in the future' (Girardet, 2000: 8).

Such networks modelled on self-reliant communities underlie the 'eco-communalism' scenario mentioned earlier, and argue for closer-knit communities based around ecological practices that integrate energy and mobility needs. In particular, the discipline of industrial ecology is gaining prominence within urban design circles, as is the integrated resource management system (IRM) (Ewert, Baker and Bissix, 2004). Both methodologies refer to the socio-ecological paradigm of circular metabolism; the urban centre as the living centre. The increased focus on the population density and environmental footprint of the 'city' – the shift to a 'Compact City' - is similar to the future scenario in 2055 of 'Urban Colonies' as was elaborated in the recent UK Foresight report (Foresight, 2006). In the 'Urban Colonies' scenario minimising environmental impact is central to economic and social policies, power generation and resources, urban planning, and the need to construct compact, sustainable cities. Technological investment is directed towards developing cleaner and 'greener' transport systems, based around both localised and national public transport, with individual car use expensive, restrictive, and discouraged. The report proposes that different cities would have developed their own localised public transport, making use of modern electric and other low energy technologies, with linking to national cities in a transport system network more efficient

than today's standards. However, the downside to this hypothesised shift is that rural areas become more isolated; as such they are increasingly used as food and biofuel resource regions for the cities. Further, overall consumption has fallen, and the state tax system has various tax laws for resource management (Foresight, 2006).

The 'Urban Colonies' scenario, and also what has been previously discussed in terms of Roger's 'Compact City' and Girardet's 'circular metabolism', represents a need to utilise emerging technologies for re-conceptualising physical-digital mobility and transport systems within an urban design predicated around environmental sustainability. Further, the emphasis is upon recycling and efficient circular processing of energy production, distribution, and waste coupled with change in such social drivers as consumerism, economics, and general well-being.

However, there are immensely strong forces resisting such a future scenario, especially personal mobility. Elsewhere we argue how automobility is itself a 'system in which everyone is *coerced* into an intense *flexibility*, it also enforces certain relationships of dependence within the temporal, spatial, and geo-physical constraints that it itself generates' (Dennis, Urry, 2007: 19). Certain 'coerced' practices of dependence that fuse together flexibility requirements with time/space constraints will prove difficult to dislodge the premier position of the car within many people's mobile lives. Part of the solution may come in the form of incremental changes in urban car restriction and/or exclusion as in the recent congestion charge schemes in London and Durham, UK (and soon to be in Manchester).

At the beginning of this section I stated that the transition of the 'city' towards a 'sustainable paradigm' within current and future discourses of environmentalism and global climate change is uncertain. However, there are several instances where changes are occurring in that new city urban designs are beginning to adopt the eco-city model. One of these is the newly designed and soon-to-be-built city of Dongtan in China, to which I now turn in more detail.

## Sustainable Eco-Cities: Dongtan, China

China has a history of building great cities; in fact, as far back as the 17th century Beijing was home to some two million people, yet overall China was a vast space given over to agricultural land and farming practices. The People's Republic of China, founded on October 1, 1949 by the Communist Party of China led by Mao Zedong (Chairman Mao), was still largely an under-developed nation. Although notions of agrarian supremacy, collective farms, and local self-sufficiency were championed by Chairman Mao, it was not until after Mao's death in 1978 that reforms targeted extensive marketisation and limited privatisation. The People's Republic of China, under the guidance of Deng Xiaoping, began implementing a series of political and economic reforms that became China's new 'Open Door Policy', shifting focus onto rapid economic growth and investment from the West that eventually formed the foundation for mainland China's rapid economic development starting in the late 1980s, early 1990s. In the last quarter of a century 'China's gross domestic product increased ten-fold, from US$ 147 billion to over US$ 1.4 trillion. Its foreign trade grew more than forty-fold, from US$ 20.5 billion to US$ 850 billion' (Girardet, 2006). One downside to rapid urbanisation and industrialisation, with accelerated growth in Western-style consumerism is that major

pollution problems, already severe, have just become even more severe and especially damaging for the long term. Environmentalist Herbert Girardet, in a recent report, noted that ‘sulfur and nitrogen oxides have turned China’s air into smog, and urban sewage, fertilizer run-off from farms and industrial chemicals are poisoning its rivers’ (Girardet, 2006).

When President Hu Jintao took over China’s leadership in 2003 policies were publicised with an emphasis on ‘harmony between humanity and nature’ and on ‘building a conservation-oriented and environment-friendly society’ (Girardet, 2006), which appear as a u-turn on previous ideological tenets that stress a markedly Chinese approach to mastering Nature. Although earlier speeches in around 2003-4 emphasised that Chinese economic development ‘must consider its impact on the environment and on society’ (Girardet, 2006), later public/global positionings have taken a firmer stand. In 2007 China unveiled its first national plan for climate change, declaring that environmental sensitivities should not be at the expense of economic development (BBC, 2007). The 62-page report stated China's continuing aim to reduce energy use by a fifth before 2010, whilst increasing the amount of renewable energy it produces, including more wind, nuclear and hydro power. Amidst China’s rapid industrial growth and future goals the leadership stresses that it remains committed to supporting what it terms ‘sustainable development and poverty eradication’. Part of this plan entails shifting a huge number of people from rural areas into both existing and newly constructed cities. China has publicly announced that it plans to build over 400 new cities within the next 20 years, from just over 600 to over 1200 by 2010, with around 300 million people expected to switch from agrarian farming to urban-industrial lifestyles (Girardet, 2000: 1). The

deliberate state-supported migration of millions of people into urbanised settings is an undertaking that will have significant implications for how spaces of proximity are actualised and maintained through infrastructures of work, housing, transport, energy, and environment. Architect Richard Rogers considers this urbanisation project as 'the first phase in the transformation of a communal rural society into a consumerist urban one' (Rogers, 1997: 41). Rogers also notes that many of China's new cities are to be 'planned around motorways rather than public transport', with Shanghai aiming 'to motorise 7 million cyclists by 2000' (Rogers, 1997: 44).

With such high targets for future urbanisation China is aware that not all future cities can be modelled upon existing urban designs. In order to build upon their promise of 'harmony between humanity and nature' the Chinese authorities are planning on constructing various sustainable eco-cities, with the intention of getting as close to a zero-carbon city as is possible, and one of their flagship projects is the development of Dongtan.

The plans for Dongtan are, on paper at least, ambitious and staggering in their innovative and environmental design. Dongtan is to be built on Chongming Island in the Yangtze River Delta on an area the size of Manhattan Island (86 km2). However, the origins of Dongtan are not so environmentally clean: Chongming Island is itself a product of environmental degradation, as in the last 50 years the island has become the world's largest alluvial island, doubling in size from the eroding soil washed down the Yangtze River, a product of deforestation further upstream. From 1950 to 2006 Chongming grew in size from 600 km2 to 1,290 km2 (Girardet, 2006). The development of Dongtan plans

for a city of three villages, to be completed in phases, with the first phase planned for hosting an initial population of roughly 10,000 by 2010, specifically in time for the World Expo in Shanghai. Within the next four to five decades Dongtan is expected to be home for an estimated 500,000 inhabitants. Already a tunnel and bridge linking Chongming Island to Shanghai is under construction, with the intention of showcasing to both Chinese urbanites and to the outside world that an environmentally sustainable city is possible.

The owners of Chongming Island, and thus Dongtan, are the Shanghai Industrial Investment Corporation (SIIC), who have handed over the planning and design of Dongtan to Arup, the global planning, engineering and design consultancy. London-based Arup, founded by Ove Arup in the 1940s, currently has 86 offices in more than 30 countries, including a staff of 1,500 based in China. Peter Head, the man in charge at Arup with the Dongtan project, has stated that 'It is part of a new awareness of the environment by the Chinese government. They realise that with their growing population and economy they have to overcome the problems of environmental pollution and resource depletion' (Kane, 2005). Arup have managed to come up with a design for an ‘eco-city’ that is sensitive to its environmental surroundings; in this case a large wetland area on the southern part of the island which is a migratory reserve for one of the rarest birds in the world – the black-faced spoonbill, a white bird with a long, flat beak. A buffer-zone is planned between the city and the wetland area, with the buffer’s narrowest point being 3.5 kilometres wide. This will result in only about 40% of the land area of Dongtan being built upon, which Arup plans to use for a city that will grow into several towns, all of which are connected by cycle routes and public transport corridors so that

inhabitants will be able to access various parts of the city by tram, bus, bicycle, or by walking. Arup aims to 'ensure that people will take no more than seven minutes to walk from any part of the city to a bus or tram stop. Dongtan's design is based on the principle that all its citizens can be in close contact with green open spaces, lakes and canals' (Girardet, 2006). Central to the planning of Dongtan will be the forms of mobility within the city – or *Mobilicities* – and the proximity convergences of multiple forms of movement.

For example, any cars/vehicles allowed within Dongtan will be expected to run on hydrogen or alternative renewable fuel, with easy access to varied modes of public transport including fuel-celled buses and solar-powered water taxis along canals and lakes. A combination of cycle-paths and pedestrian routes will reduce noise and air pollution, with visitors to Dongtan parking their cars outside of the city and using public transport to enter. In terms of fuel Dongtan will make use of various renewable energy sources such as wind turbines, bio-fuels and from recycling organic material. Further, modern innovative building technologies will be used to create buildings that can reduce energy requirements by up to 70 %, with green roofs being placed on buildings to improve insulation and water filtration (GreenBuildingPress, 2007). Arup hopes that these measures will help to create a city of zero-carbon footprint, or as close to it as is feasibly possible, with a primary focus upon resource efficiency. With such efficiencies in place it may be that future *mobilicities* will not incur detrimental environmental and energy impacts but become sustainable. It is of course important that Dongtan does not become a display city that fails to sustain a living, thriving population, but instead becomes a model for other potential global urban 'hubs' that are calling out for

sustainable growth in an age of accelerated urban expansion. Urban mobility within Dongtan now requires further examination.

Original plans from the SIIC drafted Dongtan along the lines of a US-style suburban estate carved into low-rise housing and geometric lawns (much like the 'Desperate Housewives' studio plot). Arup, though, considered this to be mistaken, because, according to Arup architect Alejandro Gutierrez, 'if neighborhoods are spread out, then people need cars to get around. If population is low, then public transportation is a money loser' (McGray, 2007). The aim was to conceive of a right balance between population numbers and energy efficiency, especially in terms of physical mobility. The population density per head weighed against available space was crucial to understanding how to create sufficient emphasis upon people walking and biking more, as well as making public transit economically feasible. Gutierrez finally estimated that Dongtan's population could absorb up to 500,000 inhabitants, when completed, and still only build upon minimal land space whilst leaving 65% of the land available for wildlife habitat and open spaces. The result was a 'reasonably dense urban middle, with smart breaks for green space, all surrounded by farms, parks, and unspoiled wetland. Instead of sprawling out, the city would grow in a line along a public transit corridor' (McGray, 2007). Also, the plan is for all delivery trucks to park at 'consolidation warehouses' on the edge of Dongtan before having the goods loaded up onto shared, 'zero-emission' delivery trucks and transported into the city.

Using an 'Integrated Resource Model' (IRM) approach the planners at Arup began to calculate how particular inputs would affect the whole system, similar to a systems theory

model yet with finer measurements. For example, if a business park was relocated the IRM software would re-calculate the average walking distances from the residential neighbourhoods, as well as calculating the average number of residents who would require public transit; thus re-calculating the changes in energy demands and consumption. The IRM software would also highlight which processes would create the most recyclable and unusable (non-recyclable) waste. Any waste would then be either recycled or processed into energy, with the captured heat being converted into more power. Using a combination of biomass, wind energy/turbines, and photovoltaic panels, Arup planners estimated that 60% of Dongtan's energy needs could be provided from renewable sources when the city opened in 2010, reaching 100 % within 20 years (McGray, 2007). As a 'smart' means of introducing individual feedback mechanisms into resident energy consumption Arup came up with the idea of placing simple energy meters in visible locations such as the family kitchen or the office, instead of hard-to-find cupboards or in external wall boxes. Not only would this make it easier for all resident users to track their own energy consumption but they could also receive regular reminders over SMS and email informing them when the cheap energy limit had been reached. In this way all aspects of energy consumption, from public transit to household requirements, would be made transparent so that users were aware of their daily energy expenditure.

Similar to Girardet's model, such dense urban living would begin to resemble an urban circular metabolism with urban mobility shifting from linear models towards 'circular' models where movement between living, work, and leisure areas would be energy regulated and monitored for efficiency. Dongtan's urban mobility designs – integrating

public walkway corridors, canal taxis, energy-efficient public transit – would begin to resemble an ecosystem in that no process would exist separate from another and each would impact upon the overall sustainability of the city. The advantage with Dongtan is that as a city its life begins as a blank slate, and thus free from many of the design imperatives constructed into the global cities of the 19th and 20th centuries. Already there are globally competing cities in China, such as Shanghai, which are mimicking both the grandeur and the legacies of Western metropolises, such as 'spreading out, building up single-family homes, replacing naturally mixed-use neighborhoods with isolated zones for living, shopping, and working, and connecting it all with car travel' (McGray, 2007). The hope with Dongtan is that it will set an example for many future cities to follow.

Dongtan holds the possibility to become a template for sustainable urban development, both in China and elsewhere, as well as demonstrating that physical transportation mobilities within a city can be made more efficient through closer proximity movements than through horizontal sprawl. In the words of Gutierrez, 'we have to make cities, as much as we can, future proof' (McGray, 2007). Proof against an uncertain future, as outlined at the beginning of this paper, asks how we can better visualise, create, and construct our mobilisations – of natural resources, people and products: of mobilities in our cities.

## Future Mobilicities – a Conclusion?

More people now live in urban centres than rural. It seems likely that the cities of the 21st century will be where many of the major human breakthroughs and breakdowns will be played out. As Girardet (1999) has pointed out, many people exist within varying degrees

of *mobilization* rather than the more fixed notion of *civilization*. And cities are both the origin and the destination of this mobilisation which increasingly defines the human experience. More than ever, how people move within physical transport infrastructures will have systemic implications upon energy resources, community relationships, and to varying degrees may involve how 'we' (the people) perceive ourselves within the wider global picture. At the same time most of 'us' (the user) might well feel amputated without the benefit of our individualized and stylized cars. Yet is the solution to 'future mobilities' to build better cars?

Tweaking the 'car' with new fuels is not going to solve the systemic problems inherent in present car-mobilities. What rather is required is going 'beyond the car', to conceptualise and construct a future where 'post-car mobilities' proliferate (Dennis and Urry, 2007). Ironically, the better car may make for a worse city, as

> the more energy-efficient car means people can drive farther for less money, buy homes on cheap farmland, and extend sprawl farther yet. That new sprawl development then promotes more driving, more cars, and more energy consumption – while making people feel good about it. (Register, 2006: 148)

Any future *mobilicities* concerns how physical transport and cars navigate the urban built environment; how such physical travel corridors weave systems and networks of mobility together within energy parameters of consumption and supply. Safdie (1997) notes that if we are to design a future built environment that better suits our emerging needs, then it is necessary to 'join our personalized patterns of car travel with fixed, planned corridors of public transportation so seamlessly as to create a singular system of mobility…Weaving the old and the new into a single organism' (:166).

It is paradoxical that in an age when global societies have never before been more closely connected both physically and electronically, with newly emerging physical/digital technologies, localised urban areas often manifest, and contribute to, rising social separation, angst, and alienation. Urban environments may appear to create proximity, yet these are more often than not measurements of distance, not measurements of communality, efficiency, or contact. After all, urban culture should foster citizenship and public participation. Architect Richard Rogers considers urban mobilicities to be based upon the 'compact city' model whereby 'mixed-use communities should be grouped round public transport hubs with the individual community planned around walking and cycling distances', such that 'the car will be seen as a minor component of a complex and flexible network of transport systems' (Rogers, 1997: 166). Such urban built environments should reflect the functionality of the requirements within it, merging both concrete and digital architectures, to identify 'a coherent configuration of organization, space, and interaction' (Latham and Sassen, 2005: 10). New digital technologies of communication, monitoring, and regulation could play a significant role in how energy-efficient physical transport mobilities are both organised and coordinated.

At the beginning of this paper I addressed some of the resource concerns that may have an impact upon the future viability of urban sustainability. Here I quoted Diamond who, amongst others, posited human-caused climate change, environmental toxic-chemical pollution, and energy shortages, as contributing to the weakening and potential collapse of present and future societies (Diamond, 2005). How physical movements are organised in the local and the present will have increasing impact upon long-term 'movements' and

shifts in the global and the future. Perhaps city-sprawl was a luxury of urban space and distance that can no longer be sustained in balance with our dwindling and increasingly expensive energy resources. If this is the case then the vision of Disney's 'Experimental Prototype Community of Tomorrow' (EPCOT) with its 'PeopleMover', monorail, and underground road systems, may not appear so fanciful and fictitious after all. Likewise, Howard's Garden Cities with their proximities of greenbelt, residential, and transport corridors may deserve reappraisal in light of new architectural technologies. It is clear from some of the research presented here that the principles of intelligent urbanism (PIU) are developing in pockets rather than on a widespread scale. The requirements for urban mobilicities that favour energy-efficient public transit hubs and corridors, that regulate and classify individual automobile movements, should overrule conspirational concerns for corporate gain. But as a way of warning, we can note the following example of harmful corporate opposition.

In the US from 1927-1955 General Motors, Mack Manufacturing (trucks), Standard Oil (now Exxon), Philips Petroleum, Firestone Tire & Rubber, and Greyhound Lines, all came together in violation of anti-trust law to share information, investments, and 'activities' for the sole purpose of eliminating ground transportation competition in the US, especially in terms of rail and streetcar transportation. In order to achieve this each corporation established various front companies in which they invested. These front companies then proceeded to buy up, and then to tear up and destroy, the streetcar lines which they had acquired, leaving the local citizens without transportation alternatives of note other than cars and buses. Finally, in 1955, the conspiracy was 'found out' and the companies were charged with violation of the Sherman Anti-Trust Act and found guilty.

As punishment each company was fined $5,000 plus the court costs of $4, 220.78, and each individual was ordered to pay $1 for 'his role in the conspiracy' (Register, 2006: 93). Apart from its first inception into public consciousness the car, and car mobilities, have never been anything but a deliberately conceived and highly propagandized artifact and activity. Likewise, proximity in the 20th century and after has generally been perceived as relating to a poverty of space and movement, with luxury equating with distance and freedom of movement. Maybe it is time to reverse these roles and public conceptions so that 'distance' becomes an unsustainable 'poverty economy' whilst proximity signifies environmental 'richness'.

The eco-city of Dongtan in China may be a beginning, yet with China also building two new power stations per week (Harrabin, 2007), it is hard to see this as a systemic trend. However, Dongtan does show what might be possible when environment, energy, economy, and mobility are conscientiously merged. A sustainable city has been described as one that is both beautiful and creative; ecological yet diverse; compact and polycentric; and a city of easy contact and mobility (Rogers, 1997: 169). Future mobilicities are already part of the trend in many cities to move to de-privatise cars through car-sharing, cooperative car clubs and smart car-hire schemes (see *inter alia* Hawken, Lovins and Lovins 2002; Motavalli 2000). Even by 2001 six hundred cities in Europe had developed car-sharing schemes involving 50,000 people (Cervero 2001). In Oxford there is the UK's first hire by the hour car club scheme named Avis CARvenience. There are various other car clubs such as CityCarClub, Car Plus and Carshare. Two US car sharing companies are Flexcar and Zipcar, yet in the United States it is estimated that there are just over 1,000 shared cars in all (Rosenthal, 2007). One of the largest single companies, Mobility, is well-placed within Switzerland, and currently

has 60,000 members and 2,400 cars, whilst in the Netherlands Greenwheels is experiencing increasing popularity. Car-sharing clubs usually involve smart-card technology to book and pay, with flat monthly fees and a pay-as-you-drive costing. The ease and flexibility to book a car on the (mobile) Internet will be attractive to many potential users.

Yet as this paper has been at pains to point out, it is not just about re-defining the 'car'; it is about re-conceptualising and re-designing the built environment through which people work, live, and move. It is about how our 'urban species' are now predominantly city-dwellers, and that modern cities, as centres of mobilisation, have vast environmental impacts. Any future mobilisations must necessarily take these impacts into account, as increasingly physical mobility within urban centres will depend more and more on how people are able to construct mobilicities of proximity.

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