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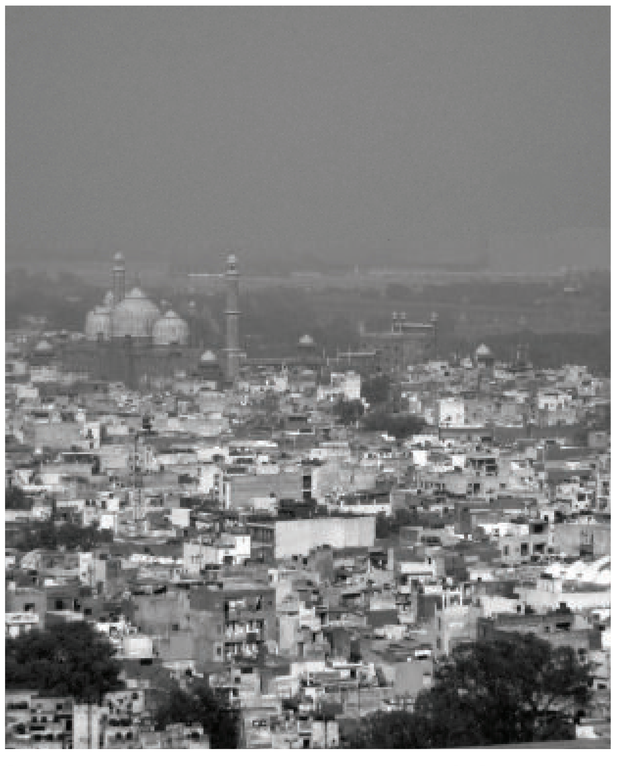
The City is not a Garden

The city of Old Delhi (also called Shahjahanabad) is where I was born and where I spent the first 12 years of my life. It was a small city, where I could walk to school, my father could walk to his shop and my grand mother could walk to the River Yamuna for her bath before sunrise. My father had a nice house with many rooms around a courtyard. His extended family lived in the houses around ours. The houses were connected internally by doors and by a wooden bridge that went over the street. My first school was also built around a courtyard and every few days the whole class walked to the nearby enclosed garden called “Purdah Bagh” for outdoor play. The second school I went to had a larger courtyard as a playground and it was so busy that it worked with two shifts. For annual sports competitions, both schools took us to some larger school, that had a play ground that could be shared. Much of my playtime was spent either in the courtyard or on the terrace of the house. Summers days were hot but our house was comfortable, so we could live without electric fans. During the daytime, doors interconnecting with adjacent houses were opened to let more thermal drafts into the house. Nights were cooler and full of stars. The house had no windows but all rooms opened to the courtyard. It was located in a quiet street, but a minute’s walk would bring us to main bazaar that was just wide enough to allow one car to pass. Apart from the shop my father also had a small manufacturing unit, located across the street from our house. I consider myself an original urban dweller, who grew up in a dense traditional settlement.



Shahajahanabad- the city of Old Delhi

To continue the story, when I was about to finish primary school, my father decided to move out of Old Delhi and built himself a house, in what was to become a very expensive area of South Delhi. This was a house with a garden and the house plots were laid out along a crescent, with a garden in the middle. The whole area was surrounded by greens, the Golf Club and the Lodi Gardens. I could still walk to school but my father had to drive to work and for her bath my grand mother had to use a bucket instead of the Yamuna River. My school was surrounded by several other schools, each with its own football field. Some of our well to do neighbours had air conditioners, but we did not. My family was transformed from urbanite to suburbanite. We could no longer live without electric fans and cars and lots of water. There was one thing common to both Shahjahanabad and New Delhi. They both had places for a wide range of income levels. In Shahjahanabad the rich and the poor lived in close proximity, within their own areas (mohallas). In New Delhi, the rich and poor lived within the same compound!

Although the Indian tradition of urban settlements is thousands of years old, it is the medieval towns that are of greatest interest today. These towns in the warm climate of North India were compact settlements, with walking as the predominant mode of transport. The entire Old Delhi (Shahjahanabad) was a walk-able city, although it did have horse carts and cycle rickshaws. It measured about 2.4 km from one end to another. The city of Jaipur that came up a hundred years later also has almost the same size. When New Delhi was planned, the scale changed completely but it was not a city planned for the automobile. That honour goes to Chandigarh which measured something like 5x7 km initially. It was

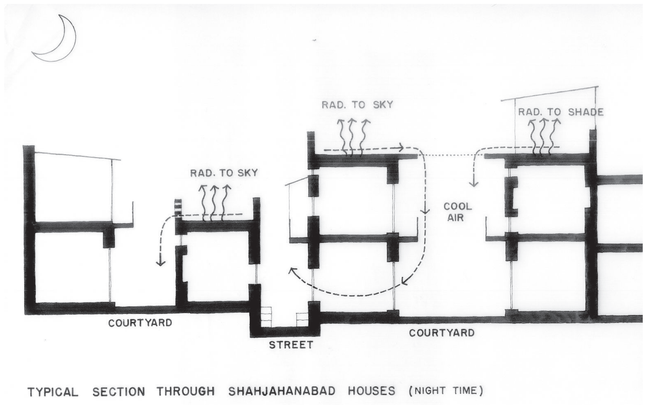
designed for the car and it remains the one city in India that has enough space for cars even today. Unlike traditional Indian cities, both New Delhi and Chandigarh were planned with parks, gardens and plenty of open spaces within the city. Buildings were surrounded by open spaces and buildings could be finally seen individually. Landscape, as we know it today, contains buildings and it is not something that is contained within buildings. The plans for new cities were designed to do away with unhygienic conditions that were associated with the old cities and to allow cars to be used as the major mode of transport. But the low density city designs created two major problems - the buildings and wide streets were far more exposed to the climate and the cities became too big for pedestrian traffic. In spite of extensive tree plantation, the pedestrian could no longer traverse the city in comfort. Buildings too needed mechanical systems of cooling to be comfortable.

New city plans are defined by road and land- use maps. Underground service lines that connect buildings to sources of supply and disposal make the city work. In contemporary cities, buildings are growing taller and vertical service lines have become as important as the underground horizon-tal lines. Even the tallest buildings are small as compared to the horizontal spread of cities but we are at a point in history where single structures are being proposed for the complete city. Arcology by Paolo Soleri is one such scheme and the Bionic City by Cervera and Pioz is another. Both of these designs are dense and tali single structures with no need for cars. People move from one zone to another by elevators. It is hard to produce a map for such a structure as there are no roads and land uses will be mixed throughout the structure.

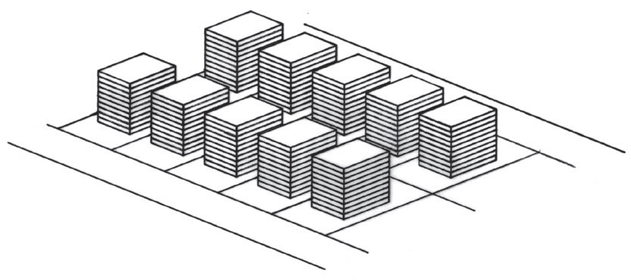
We know that the horizontal spread of cities has made us dependent upon the automobile. But it is not realized that in cities with tall buildings, as important as the roads is the vertical transport system of individual buildings. As cities grow taller, the role of vertical transportation will become increas-ingly more important. To all appearances, vertical transport is free i.e. the user does not pay for it every time he uses it. Roads take up as much as 30% of space on the ground in spread out cities and in very tall buildings as much as 50% of floor space at the lower levels is taken up by vertical transportation. Both the horizontal and vertical transport systems are the subject of transportation efficiency research. Compared to private cars, public transport systems reduce road space and energy requirements. Similarly double decker and triple decker elevators have been planned and used to reduce the space needed for elevator shafts (e.g. Burj Dubai). There are instances of more than one elevator running in one shaft also. But vertical transportation has never been considered as part of the overall urban transportation system.

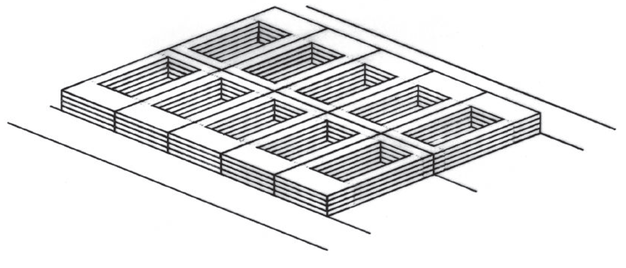
Many questions arise. What is the contribution of vertical transportation to the overall transportation requirements of a city? Is vertical transportation more efficient than horizontal? Can cities be built so that transportation, both vertical and horizontal, is optimized and the city made more compact? What would such cities look like and how big would they be? Would the Bionic Tower be the efficient city or the Ziggurat.

And how will an efficient city structure connect to the world? Today's cities connect with road, rail, boats and airplanes. The desirability of different systems of transport depends upon the fuel effi-ciency, the emissions from them and the land required. Safety and cost



TYPICAL SECTION THROUGH SHAHJAHANABAD HOUSES (NIGHT TIME)

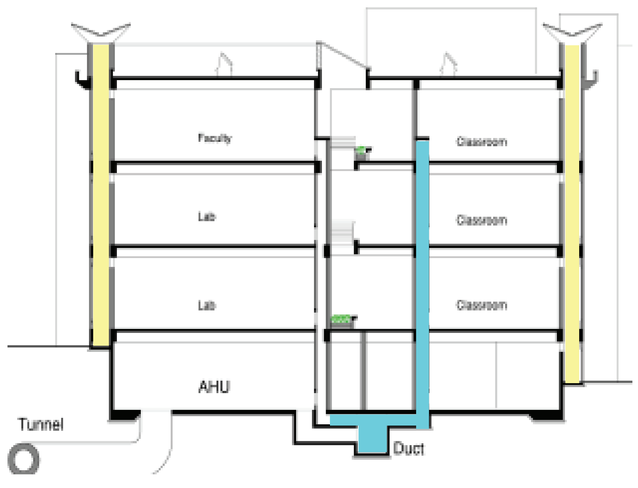




TOP: **Thermal Comfort-Typical section through the houses in Shahajahanabad(night time)**
ABOVE: **Pavilion & Courts- Comparison of low and high coverage developments**

of different systems are also important. Because of the speed associated with aircraft, air transport has become very desirable and airport planners even claim that in terms of efficiency of resource utilization, air transport is better than trains. However, there are many environmental problems associated with air travel as we know it today. Airports require huge chunks of land and they need to be built away from cities due to noise from aircraft landing and taking off. The movement between the city and the airport itself generates huge problems of transportation. The land taken up by an airport is not proportional to the traffic passing through it. The size of airports in India varies between 10 and 20 sq km irrespective of the size of city and therefore air transport is not an efficient system for compact cities of limited size. Airports do not make sense for vertical cities either. Airships (lighter-than-air craft) provide an alternative to the normal heavier-than-air craft and they do not have the problems of pollution and land requirement. They are now poised to be back in fashion and they certainly make connection with cities easier to organize. Lighter-than-air craft may yet offer the most efficient mode of transpor-tation between cities if not between continents. That would mean a big reduction in the land required for transportation.

What will the resource efficient city and the resource conserving region of the future look like? What kind of built environment will be sustainable with ambient energy use? What kind of structures will minimize the production of wastes and pollutants? These issues have been considered individually and a more holistic approach to the built environment may give us a completely different model of the city and the region.



At University at Neemrana, Rajasthan, buildings have been designed to allow in natural light through different means *(TOP)*; **and,** (ABOVE) **Cooled air is brought in by a system of ventilation through vertical shafts**

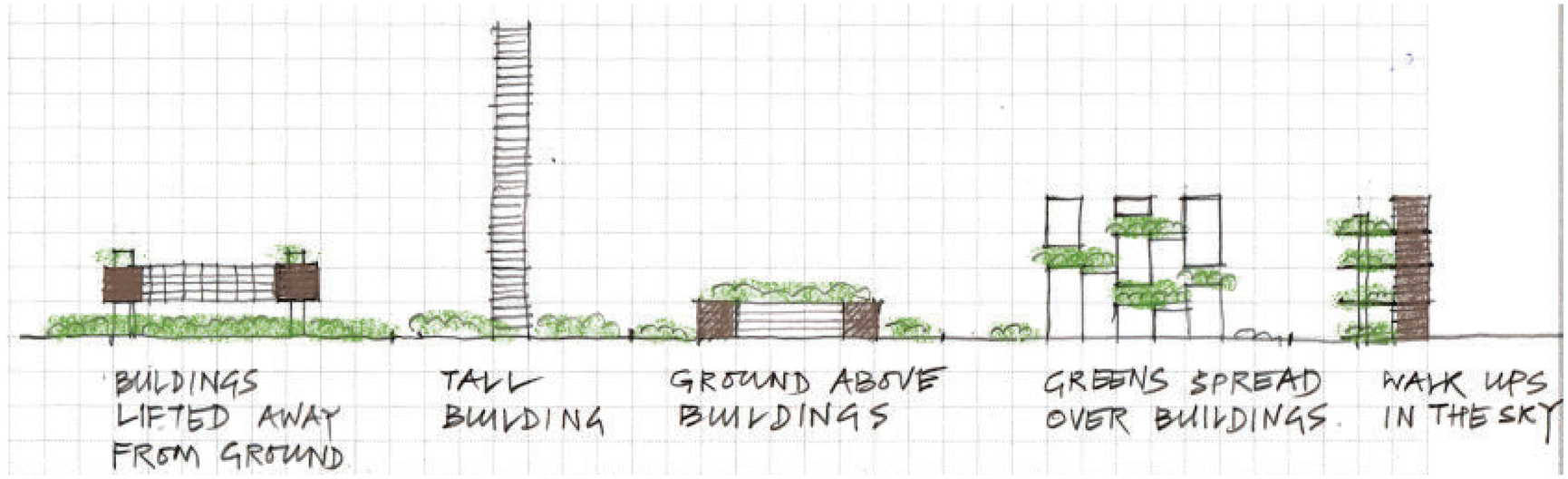
European Sustainable Cities

The movement for making cities sustainable is strong in Europe. There are examples from Scandinavia and England. These consist of efficient residential buildings in an efficient urban matrix. They have little in the nature of work places and nothing by way of factories for production. Europe (and USA) has outsourced the production of goods to China and many of its services to India. So whatever efficiency is achieved in an urban development, it is negated by the fact that huge imports of manufactured goods are necessary to make the cities work. This kind of a system is not going to lead to sustainable development however efficient the individual buildings and the urban matrix are.

Rules for the New Sustainable City

The sustainable city must be able to grow many times its planned size, live on available rain water and energy from the sun, grow its own food, recycle its wastes, produce most of its goods, connect with other places by rail, water and air transport and, last but not the least, must have place for all income levels. The city would have to be structurally stable, resistant to natural disasters, capable of evolving and being built over a period of time and be large enough to have playgrounds.

Recent studies indicate that even though compact cities use transportation more efficiently, this is not enough to ensure urban sustainability. Perhaps the most important issue is how to get to a sustainable future. New cities are being built mainly as extensions of large existing cities, and more often than not, they result in a spread out urban region. One example now being developed is Masdar City in Abu Dhabi, U.A.E. This resource conserving low carbon city has been modeled after the compact cities of the region. It will be dense, low



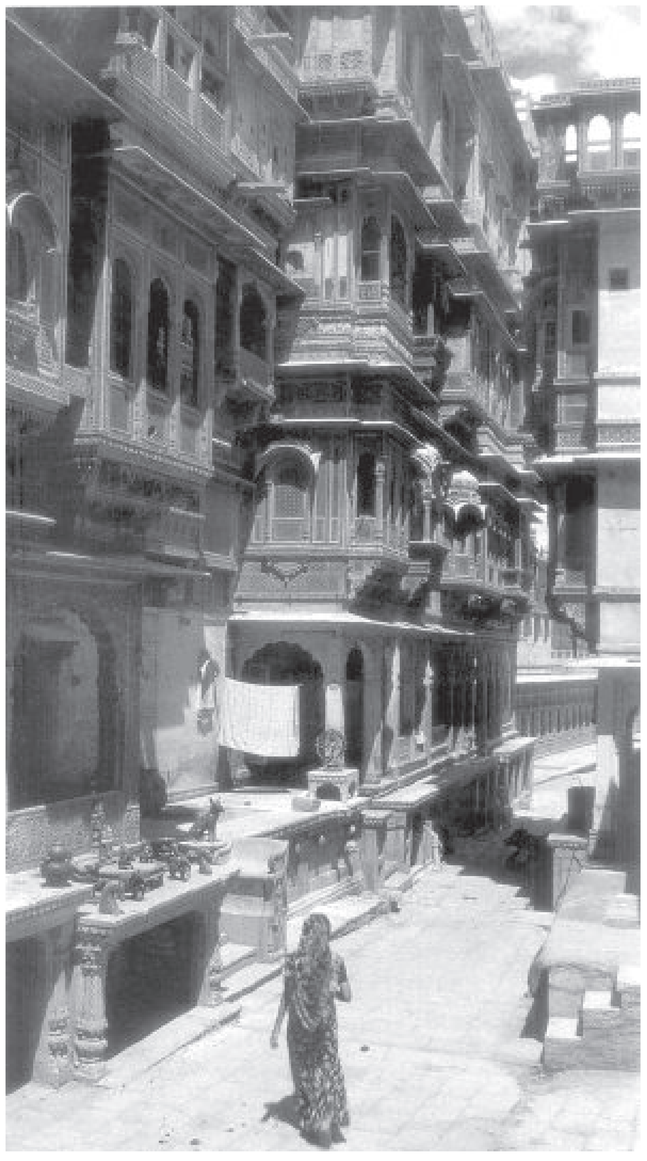
rise, without cars and it will use solar energy for power. But even this walk- able city will be surrounded by an unsustainable infrastructure that will take away many of the benefits of the new development. Cars may not be allowed in Masdar but the city will be surrounded by a large number of parking structures. As Masdar will connect with the rest of UAE by an expressway, people will drive to the city by car. Connections to the rest of the world will necessarily be through Abu Dhabi airport. The entire region of U.A.E. is dependent upon imports of food and industrial goods. The impact of all the low carbon technology will therefore be marginal as far as the total carbon emissions of the city are concerned.

The city of Dongtan near Shanghai, China is perhaps the best example of a city planned for sustainability. Dongtan is being built from scratch and will eventually accommodate 500.000 people with living, working and recreation. It will grow its food in the surrounding countryside. It will be a city free of cars, where people will move by walking, cycling or public transport. The designers (Arup from UK) also talk about the project being socially inclusive. However there has been little progress on the ground even though phase 1 is to be completed by 2010 and it is not certain if the project will ever get built.

The Garden in the City

Even a city like Masdar city will supposedly suffer from urban heat island effect associated with dense cities. Urban heat islands are talked about in the context of big cities and green building rating systems award points for mitigation of this effect by building with reduced ground coverage. In cold climates, buildings emit heat and in dense situations the whole area becomes warm. But buildings are not the only source of heat in urban areas. In an experiment conducted to measure the effect of very high density urban construction, temperatures were measured in and around the town of Jaisalmer in Rajasthan in 1984. There were no automobiles in the town and it functioned mainly with ambient energy. Very little electric energy was used for lighting or ventilation. The result was that during summer, the densely built areas were cooler than sparsely built areas outside the town. They were warmer in winter. Plainly put, the effect of high density urban area was beneficial for the environment. IfJaisalmer used a great deal of energy, it is quite possible that the effect would have been very different.

The idea of the city as a garden has guided town planning for a long time and perhaps the time has now come for us to get away from it enough, at least in warm regions, and re-examine traditional solutions that seem to hold promise for the future.



TOP: **Making most of available land and creating more open space**
ABOVE: **Streets of Jaisalmer, Rajasthan**