



# Our Human World: *Cities, Buildings, Wheels*

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This is not about philanthropy.

—BRUNO LAFONT

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More than half of the people on our planet live in cities, and the percentage, as well as the absolute number, is increasing rapidly. By the middle of the century, about two thirds of the human population, some 6 billion people, will live in cities—a number equivalent to the world’s total population as recently as 2000. Asia and Africa are the places with the most dramatic urbanization. China already is home to the greatest urban migration in history, one that has seen its cities swell from 200 million in 1980 to 700 million today. By 2030, Chinese urbanites will number about 1 billion, more than two thirds of the country’s total population of 1.4 billion. China’s city dwellers alone are more than twice the population of any other single country except India.<sup>1</sup>

Cities can be dystopian nightmares, choking on their own waste—Petri dishes that culture disease and violence as well as tangles of pollution and congestion. Despite these problems, cities keep growing. Their lottery of human encounters promises opportunities that are found nowhere else: chances for poor immigrants from the country and elite professionals alike to advance their careers, to sample different experiences, and to enjoy better health care, better schools for their children, and for the lucky, the arts and culture that cities host.

If we can get our city lives right—especially our buildings and our transportation—we will be well on the way to meeting the challenge of environmental sustainability. More than ever, cities are where the people are, so sustainability efforts must focus on urban areas. Cities also offer efficiencies of scale, meaning that urban initiatives are likely to offer higher payback over shorter periods for investments in green buildings and more energy-efficient transit. “Better cities means resolving issues of housing, density, technology, infrastructure and aesthetics,” says Bruno Lafont, the chairman and CEO of the world’s largest cement company, the Lafarge Group, whose future depends on the growth of cities in Asia. For customers in countries like China and India, cost matters in a way that it does not for the rich world, where people have the money to pay a premium for more environmentally benign products. Lafarge and other leading cement and building materials companies cannot ignore the reality that they are competing in extremely price-sensitive markets, but they simultaneously are trying to take into account the long-term impact their products have on the environment and society. “How can we reduce the cost of construction when we take into account the life cycle of the building and not just the cost of construction?” asks Lafont. “On sustainability, how do we reduce the environmental footprint of the cities?”<sup>2</sup>

These are important questions—and maddeningly complex ones. Think of energy use as a three-legged stool. One leg of the stool is buildings; the energy used to heat, light, and cool buildings accounts for about one third of our total energy consumption. The second leg of the stool is transportation, with cars, trains, trucks, buses, and planes accounting for roughly one third more. The third leg of the stool is manufacturing, mining, and construction. Cities obviously figure prominently in the first two legs, but they are important for this final leg, too. Coal mining uses significant energy; coal in turn is largely used to generate electricity, most of which is used by city dwellers. More efficient buildings reduce the need for coal-fired power plants, and designing buildings to incorporate efficiencies and lengthen their useful lives cuts down on energy use by the construction sector. Each leg of the stool, in other words, affects the others, and the energy-saving opportunities available in a virtuous circle of more efficient buildings, transport, and city design are enormous. But this feedback cycle can work in the opposite direction as well, and large parts of Asia suffer from a vicious circle of inefficient buildings, transportation, and cities.

Asia also has a handful of exemplary cities that are consciously using their density as an advantage in ensuring an environment that is more

pleasant as well as more environmentally and economically viable. Several Japanese cities, including Tokyo, have made good efforts. So, too, has Seoul. But the most striking example is the city-state of Singapore, which has pursued an integrated strategy to meet the challenge of a variety of interrelated issues centered on water and energy. It has established a clear track record that puts it among the global leaders in building a greener and more energy-efficient city. Thanks to an overall focus on sustainability by the nation's leaders, its urban design, building codes, and transportation policies have all been developed and implemented together, multiplying their impact.<sup>3</sup>

That Singapore has done this in a mere half-century since independence, which came at a time when the people of this poor nation struggled to survive, makes its accomplishments even more impressive. The small country's founding father, Lee Kuan Yew, who devotes a chapter of his memoirs to "Greening Singapore," faced lengthy resistance to his cleanup campaigns from Singaporeans who were too caught up with daily survival to worry about the environment. Initially, his was an environmental campaign based on cleanliness and civic order rather than on environmental sustainability. But as the extended discussion of Singapore will show, it has developed into a comprehensive, scientifically based urban sustainability program that encompasses a range of concerns from tree planting and botanical gardens, to water security and water sports, to deliberately high costs for automobiles, to ever-tighter green building requirements.

There are also many new cities that are being built—so-called greenfield projects that give visionary architects and urban planners the luxury of working on a largely unmarked canvas. Although recognizing that the battle for urban sustainability will largely be fought in existing cities, these new cities can serve as laboratories and pacesetters, and they deserve a close look.

Buildings are what define a city. They are also responsible for most of a city's energy consumption. It's particularly important that Asia's many new buildings be designed, constructed, and operated more efficiently. China alone is building more than half of all the floor space in the world, and not surprisingly, it also accounts for over half of global cement production. Today's buildings will last for decades; the more efficiently they are built and operated, the more savings will accrue. Conversely, bad buildings will be a drain on society for many years to come, both costing money and contributing to environmental degradation.

Fortunately, the idea of green buildings in Asia has, in the past decade, moved from an esoteric concept to an increasingly mainstream practice.

Green building councils have been established in most East Asian countries, and stricter standards are being put in place, even if the pace of change—and of implementation—often seems maddeningly slow. Government-mandated building standards are the fastest and best way to effect fundamental change. Indeed, many of the best companies go far beyond mandatory standards and don't even talk about green design anymore. For example, Singapore-based Singbridge simply incorporates more environmentally conscious design principles into all of its massive new city projects as a matter of course.

Urban density makes energy efficiency in transportation possible. Transportation is about far more than cities, but it will be significant progress if more energy-efficient vehicles win broad acceptance in cities. Singapore, which combines a time-of-day road-pricing system and high registration fees for private cars, is a global pioneer in traffic management. But no other cities in Asia have yet been willing to follow Singapore in taking the politically difficult step of making private autos pay their own way.

Public transportation in Asia is good, but there is still room to extend existing networks as well as to build new systems for cities like Jakarta. Asian rail and subway systems are the world's largest and fastest; Hong Kong's MTR is among the best subways in the world, measured by both environmental and operating efficiencies. Public transportation will never replace cars, and every Asian city struggles to manage private car usage because of the congestion and the pollution as well as the greenhouse gas emissions that private automobiles create. Electric cars have struggled to win widespread acceptance among consumers. However, if electric vehicles ever do gain a mass market, it is likely to be in cities. Because of their relatively short travel range between chargings, battery-powered cars are particularly well suited to the shorter distances that city dwellers typically drive.

A recurrent theme in the following three chapters is how necessity drives change. Small countries, particularly Singapore, have been among the most forward-thinking. Countries that are severely resource constrained, such as Japan and South Korea, have acted more quickly than larger, more resource-rich countries. Now, with resource constraints pressing on even the largest countries, China and, to a lesser extent, India are taking the first small steps toward sustainability in the world of cities, buildings, and transportation.

In the next chapter, we'll look at how the challenge of sustainability is being met by various cities—both those that currently exist and are trying to become more sustainable and the new “eco-cities” that are being built

from the ground up with sustainability as a founding principle. The following chapter is devoted specifically to buildings, and the final chapter in this part looks at vehicles—especially the increasing number of cars—that move people around. Although these chapters sketch out the problems, they are, above all, about opportunities, opportunities that are being seized as a way of making a break from business as usual when it comes to urban spaces, buildings, and transportation.

