If we want density,

is going up the only way?

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Architecture and Density

FOR MOST OF their history, cities have tended to be dense, with relatively tall buildings a key feature. The attacks of 9/11 struck at the notion that density and tall buildings are desirable. In the wake of the collapse of the World Trade Center towers, many people claimed that terrorism spelled the end of the skyscraper. But density is a primary feature of the twenty-first century. The megacities of the global south, from Bombay to São Paulo, are growing ever larger and denser. Density also matters in places with global telecommunications and global networks, whether London or New York City. Today's leading economic sectors need access to "thick" environments; that is,

places that are dense with communications and talent, massive concentrations of buildings, and infrastructure. In such places, tall buildings are both functional and emblematic.

Critics of dense concentrations of high-rise buildings argue that urban density is no longer beneficial for firms and markets, as the existence of global telecommunications and networks has changed the rules of the game. Globalization and information technologies are meant to allow economic activity to happen at a global scale, or in electronic markets that are divorced from specific places. Clicks have replaced bricks.

If these arguments are true, one might wonder about the verticality and density that is still the dominant form of urbanism in many cities around the world. This is the case not only in Shanghai, with its 3,000-plus new high-rise buildings over the last five years, but also in London, where the new "plan," proposed by developers and accepted by the mayor, is to build 70 new tall buildings. The last such massive building program in London took place in the 1960s and early 1970s, with the building of the Telecom Tower, Millbank Tower, Euston Tower, London Bridge Towers, Nat West Tower, and the Barbican. In New York City, even after the September 2001 attacks, vertical development continues. For example, the six World Trade Center reconstruction project finalists all included extremely dense—and tall—buildings. However, skeptics point to the high vacancy rate for office space in Lower Manhattan, which is today about 17 percent, though much of this is not top-quality office space.

It is important to remember that complex cities, like New York City, continuously reinvent themselves to enable new types of leading economic sectors to emerge. The demise of Wall Street has been predicted many times, most recently in the early 1980s, when the departure of large commercial banks and insurance companies—and a devastating financial crisis—convinced many that Lower Manhattan was finished as a financial center. But these departures created room for what were then relatively small financial firms to grow and take over functions from the large banks. Today, the departure of many area firms to Connecticut, New Jersey, and Midtown Manhattan may well make it possible for new sectors to emerge and for new firms to seize the opportunity to move to Lower Manhattan. This has already happened with new media companies, which benefit from the intense proximity to multiple types of expertise and resources (financial, legal, accounting). These firms, which operate in highly speculative and globalized sectors, need thick environments and have thrived in Lower Manhattan. So will a whole new category of firms that cannot even be foreseen at this time because they will be part of new sectors that mix different types of expertise and resources—hybrids that will become the norm in the future. Whatever form the revival of Lower Manhattan takes, there is little doubt that tall buildings will play a major role, because strategic, creative activities—whether economic, cultural, or political—thrive on density.

Figure 1. High-rise, high density, New York City.

Figure 2. High-rise, high density, Hong Kong.

In a global economy, with uncertain markets and changing conditions, the most advanced and speculative sectors need concentrations of resources and talent, dense environments where information does not simply circulate but gets produced. Managing and servicing the global operations of firms and markets takes enormous concentrations of state-of-the-art infrastructure and buildings to house this efficiently.

The geography of the global economy consists of both concentrated nodes—cities—and diffuse networks and electronic markets that span the world. Today, a network of about forty major and minor global cities provide these concentrated nodes. The top tier includes New York City, London, Tokyo, Frankfurt, and Paris. A second large group includes other major European cities as well as Chicago, Los Angeles, and Boston.

There is a considerable division of functions and capabilities among these cities—they are all a bit different in what they offer the global economy. In very general terms, New York City is a major center for innovations in finance and specialized corporate services such as law and accounting. London, a major entrepôt for financial flows from the world over, can absorb even small flows and incorporate them into major flows. New York and London are the leading exporters of corporate services to the world. Paris, through Euronext, has constituted itself as a transterritorial European stock market. Frankfurt is one of the most aggressive innovators in the design of financial markets themselves.

Even though density remains a key feature in the business centers of all global cities, it is important to recognize that the need for thick, dense places does not necessarily mean that tall buildings are always profitable. There seems to be no hard evidence regarding profitability, since the relevant information is not public. Tony Travers and the co-authors of the recently published *Tall Buildings: Visions of the Future or Victims of the Past* discuss the case of tall buildings in London: "Tall buildings bring with them certain cost implications. In fact, the taller the building becomes, the greater the costs of construction, servicing and maintenance. Higher floors, however, bring in higher rents—and an increased income that will soon cover the elevated costs of building them. And while the occasional property developer may choose to sacrifice rental potential in the name of aesthetic achievement, it must be assumed that developers in general exist to make a profit."

According to Travers, "while the costs of high-rise building construction have not changed much since 9/11, the disposition of firms and people to move into very high floors has." The reluctance of tenants to occupy the upper floors may further

Figure 3. Medium-rise, high density, London.

reduce the economic viability of very tall buildings. However, there is absolutely no evidence of people abandoning the highest floors of tall buildings; it is the lower floors that have lower rents and are the hardest to lease.

THE ARCHITECTURE OF DENSITY

In the last forty years, architects have shown that density can be achieved in a far broader range of forms than only skyscrapers. In at least four ways, however, public opinion lags what can be built.

First, it remains common to think that horizontal development is more or less incompatible with density. Although metropolitan Los Angeles is the densest overall metropolitan area in the United States (measured according to people/urbanized square mile; see "Measuring Sprawl" in *WRER* Spring 2002), even informed city planners still equate horizontal development with low density and sprawl. In fact, there is no necessary link between horizontal building and "thin," or low-density, environments. Washington, D.C., for example, has set a limit of about ten floors on all buildings, yet it is a very thick environment.

Second, it is generally believed that horizontal development can happen only at ground level. In fact, there are multiple possibilities of creating networked environments high above the ground by connecting the upper floors of buildings. Several of the proposals submitted for the World Trade Center rebuilding competition featured these connections. We see elementary versions of this in extreme

climates. Minneapolis provides upper-floor connections between buildings in the downtown core. But this remains an underexplored and underdeveloped option.

Third, vertical development is usually assumed to mean "going up," but it can also mean "going down." Underground space in New York City does not have a good name, associated as it is with subways. But cities as diverse as Moscow, Tokyo, and Montreal have made good-quality space in underground sites, usually linked to transportation. Underground uses include retail, entertainment, commercial, and parking.

Finally, tall, high-density buildings have become associated with dead public space at ground-level. New York City has plenty of examples of empty and windswept plazas (including the late World Trade Center) built in the 1980s and 1990s. But in the same era, cities such as Frankfurt and San Francisco pioneered lively public spaces at the base of skyscrapers.

Poor-quality architecture reinforces misunderstandings about density. But each of these four elements can be reconceived. Architectural horizontality has taken on a whole new importance at a time when economic, cultural, and political networks—meant to operate horizontally rather than hierarchically—have been recognized as crucial. Today, we can think of networked architecture that produces horizontal spaces capable of high densities far above the ground. With our new technical capabilities, we can imagine verticality and its possibilities for density as stretching downward and creating complex underground spaces for a variety of activities.

Figure 4. Medium-rise, high density, Paris.

Perhaps most challenging is the fourth element: what happens when verticality hits ground-level? We can have vibrant, dense street-level life when there are massive tall buildings in our midst, but the buildings have to be tall in a new way.

The issue of density and vertical design has been studied by the Cities Program at the London School of Economics, which has produced a study now adopted as official policy by the British government. Several key findings are of interest here. One is that there is no tight correlation between height and density. Three thirty-story buildings do the same work as one ninety-story structure; the three-building approach permits more experimenting in form, but also, according to the study, higher rates of economic return. A second finding concerns adaptivity and building bulk. Most recent commercial construction is "fat" building, with giant floor plates. While useful for certain functions, such as trading floors, fat buildings may not be reusable over the long run. Office buildings often find new lives as residential buildings, as recent redevelopment has shown in Lower Manhattan and other American cities. The British study found that thin high-rise office buildings can be much more easily converted to housing, while massive ones cost too much to adapt. According to Richard Burdett, one of the authors of the study, we need to think of buildings as "infrastructure" that can be adapted to whatever the *next* phase in the economy is going to require.