SHAPING CITIES

IN AN URBAN AGE

OBSERVATIONS AND ACTIONS

Philipp Rode

In October 2015, the Indian Ministry of Urban Development and Bloomberg Philanthropies co-hosted an event in Delhi that offered a critical insight into contemporary urban practice and thinking. This two-day ideas camp brought together mayors, municipal commissioners and senior officials from the 98 Indian cities that took part in India's Smart City Mission – a national funding programme for urban interventions in selected cities – and urban experts from India, Colombia, Europe, Australia and the United States [See Shah, pp. 361–8]. A cornerstone of the event was an exchange aimed at unpacking several of the central aspirations of the mission, including the increasingly universal objectives of urban compactness, mixed use and walkability.

Far beyond the specific Indian case, this was a telling and instructive event for several reasons. There was the partnership between a national government and a philanthropic organization, the interaction between local city officials and international experts, and the dynamics between cities which were asked to compete with each other for the best ideas in order to access national funding. And, of particular interest here, there was a framework that underpinned the event: the guiding role of concepts and general ideas for urban development. This not only involved the definition of a new paradigm under the elastic 'smart city' banner, somehow loosely hinting at new digital technology, but also positioned physical interventions in cities as the point of departure for socio-economic and environmental sustainability while recognizing the importance of reference cases.

On the one hand this serves as an important reminder that urban planning, policy making and design never really broke with the tradition of operating with preconceived ideas, mostly introduced by professional elites in a top-down fashion [See Castillo, pp. 230–7]. While notions of urban evolution, emergence and accretion with far less directed and intentional interventions remain popular, they continue to struggle to connect with formally developing cities and their strategic infrastructures at scale. Unsurprisingly, the built environment disciplines, above all architecture, planning and engineering, essentially remain structured around concepts of how the city should look rather than pursuing a real transition towards process-orientation, co-creation and convening. As a result, entire professional generations can be identified based on their collective aspiration to create certain end states and final outcome. In that regard, we remain centrally aligned with the Modernist project and its recognition that physical configurations lead to social outcomes. What did change

NGUYEN TRAI ROAD, HANOI, VIETNAM

Intense levels of congestion accompany unplanned growth in most rapidly urbanizing regions of the world. With almost six million personal vehicles, most of them motorcycles, the city of Hanoi is struggling to find a balance the between laissez-faire development and green solutions.


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KUWAIT CITY, KUWAIT

Kuwait's urban area has expanded almost a hundredfold since the discovery of oil. Cheap fuel and a state housing programme, which has subsidized homes for Kuwaiti citizens since 1974, has encouraged low-rise, horizontal expansion by promoting large plots for single-family homes.

is, of course, the desired end result in which 'functional segregation', 'towers in the park' and 'urban motorways' have been replaced by 'functional mix', 'fine grain' and 'human scale'.

On the other hand, if we consider from where these ideas come and how they are negotiated in local contexts, it does indicate a radically different approach. Rather than advancing a theoretical ideal of urban form, contemporary models of urban development are grounded in an empirical understanding of the world. 'Learning from the mistakes of the past' and considering 'what works and what does not' seem to have replaced single-author 'I know best' urbanism. We also seem increasingly to accept that the ways in which people interact with the city are mostly too complex for modelling, too unpredictable for forecasting and too context-dependent to be generalized. And where the Modernists operated with theory and conviction, the currency of today's debate is insights into comparative cases, key precedents, ex-post analysis, best practice, tests and trials.

It is this empirical turn in urbanism that I explore here in the case of compact urban growth, its underlying rationale of resource efficiency and the attempt to operationalize a fairly simple narrative: a finite planet demands resource efficiency as a guiding principle; living closer together creates major efficiencies; and rather than trying to predict futures we need to build liveable, compact cities. This simplified logic involves a fairly radical departure from business-as-usual urban development – currently expected to triple global urban land between 2000 and 2030[1] – and positions spatial development as an input rather than an outcome of socio-economic development and targets the decoupling of future global prosperity from the deterioration of critical natural capital.

While recognizing the risks of spatial determinism and the limits of spatial fixes for social problems, it is increasingly accepted that this compact urban growth logic needs to inform the current one-off global transition from rural to urban

WAN CHAI, HONG KONG

In Hong Kong, 96 per cent of residents live in high-density apartments. A strong correlation between where people live and work, sustained by an extensive and efficient mass transit system, has resulted in some of the lowest average commuting times for a major global city.

societies during highly uncertain times. In fact, the recent and new recognition of the important role of cities in global development is as much about cities as governance actors as it is about a new commitment to shaping the physicality of cities for desired outcomes of the Anthropocene. This is the logic propagated by the United Nations' New Urban Agenda and 'urban' Sustainable Development Goals and implied by the Paris Agreement on climate change.

So, how did the compact city idea evolve? Rather than offering a historical account of influential narratives and speculating on a related tipping point or critical juncture, I focus here on the shared points of departure that led to its establishment: above all, a recognition of the shortcomings of urban sprawl, an acknowledgement of natural resource constraints and an appreciation of good public life as the ultimate indicator of urban quality. Critically observing the world of cities and urban agglomerations today, and investigating the interdependencies between urban form, social life and the environment, has established the rich empirical account that is increasingly considered to be part of the contemporary urbanism approach.

An obvious starting point for exploring the evidence on how compact urban growth may lead to better outcomes is the urban transport sector, with its underlying objective of maximizing accessibility. Access to people, goods, services and information is the basis of economic development in cities. The better and more efficient this access, the greater the economic benefits through economies of scale, agglomeration effects and networking advantages. The less resource dependent and polluting this access, the better it is for environmental sustainability, mitigating climate change and promoting economic prospects. The more social and equitable this access, the more it provides the basis for a fair, just and well-functioning society.

By contrast, today's urban transport sector is in a critical condition. Around 10 billion trips are made every day in urban areas around the world. Of these, a significant and increasing proportion is undertaken using high-carbon

and energy-intensive private motorized vehicles. The costs of congestion suffocates urban economies, with estimates of up to 2.6 per cent of Gross Domestic Product (GDP) in Mexico City and 3.4 per cent of GDP in Buenos Aires and Dakar.[2] Motorized road transport accidents (which include a considerable urban share) are estimated to account for 1.3 million deaths per year;[3] car use is the single largest contributor to transport carbon emissions globally;[4] motorized transport generates much of the total outdoor air pollution, leading to an estimated 3.2 million deaths a year across the world;[5] and increasing levels of motorization have led to a reduction in total physical activity levels, in turn elevating risks of cardiovascular problems, cancer and diabetes.[6]

In transport studies, the new interest in accessibility in cities departs from focusing on these shortcomings and rests on advances in the empirical analysis of the transport and land-use relationship. The interdependence of fixed structures such as buildings, public space, streets and infrastructure, as well as their uses for moving people, goods and information, is often regarded as a determining factor in shaping the city. It is also a relationship where cause and effect can be identified in both directions: urban form affects transport and transport has an impact on urban form.

For the first direction of causality – urban form affecting transport – a prominent point of reference is the extent to which travel distances (the most relevant factor for transport-related energy demand) and travel times are affected by land use, density, urban design and street layouts. It is evident, for example, that the more co-dependent land uses (residential, workplaces, retail and services) are separated, the longer the journeys between them are. Similarly, modal choice depends on the availability of certain travel options, which are themselves a function of urban form, density and urban design. The comparison in Figure 1 between Kuwait and Hong Kong, two cities with relatively similar population and wealth levels but diverging urban form and transport patterns, illustrates this. After travel distances, modal choice is the second most relevant factor for transport-related energy demand.[7]

In the past, a central criticism of the attribution of travel behaviour to built-environment effects highlighted residential self-selection as distorting research findings. Such effects occur when attitudes of individuals already impact on the choice of residential location, which in turn also determines mobility patterns. However, even when controlling for self-selection, studies have confirmed a significant relationship between urban form and mobility behaviour.[8]

Among various descriptors for urban form, density (most commonly measured by residential density) is usually singled out as the most relevant factor for travel intensity. The United States National Research Council[9] estimates that doubling densities within metropolitan regions can reduce vehicle kilometres travelled (VKT) by up to 25 per cent when also concentrating employment in a region. More detailed research on the density/transport relationship emphasizes that it is what comes with higher densities that affects travel choices.[10] Influential 'density associations' include better public transport, walkability, cycleability and limited parking.[11] For example, a threshold density of 100 people per hectare (2.5 acres) is essential for a good bus service[12] and about 3,000 dwellings per square kilometre (7,700 per square mile) are needed for efficient rapid transit.[13]

In terms of impact on policy, one early empirical study by the two Australian researchers Peter Newman and Jeffrey Kenworthy in 1989 may have been the most influential in capturing the principal message outlined above. This study included a diagram of about 30 large cities in advanced economy countries plotted on an axis of urban density and petrol consumption per capita.[14] The strong negative correlation

CONNECTING URBAN FORM TO MOBILITY

Different urban footprints in Hong Kong and Kuwait result in radically different private and public transport patterns of use.

Urban Living Area

Rail Based Public Transport Network

Private Motorized, per cent

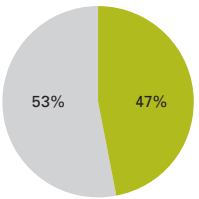
Public Transport Walking and Cycling, per cent

0 10 km

KUWAIT

Population: 4,178,572 pers
Urban Living Area: 424 km²
CO2 Emissions: 25 mt pc

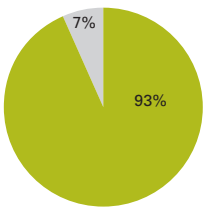
Modal Share within Administrative Boundary



HONG KONG

Population: 7,305,700 pers
Urban Living Area: 247 km²
CO2 Emissions: 6.4 mt pc

Modal Share within Administrative Boundary



between the two conveyed a clear, arguably simplified, message that still resonates today: density equals (resource) efficiency. This study continues to be prominently referenced in urban policy reports worldwide, including, among others, the Urban Task Force report, multiple publications by UN Habitat and the 2014 IPCC report.

But how far do compact growth advantages manifest themselves beyond efficient access? Jenks et al.[15] list as general advantages the conservation of the countryside, more efficient utility and infrastructure provision, and the revitalization and regeneration of inner-urban areas. Many analysts and studies also claim that compact, mixed-use cities can positively impact social inclusion and economic performance.[16] Also, the compact city's emphasis on place making is well positioned to respond to a 'qualitative turn' in the use of space. The latter captures a shift towards urban dwellers demanding a higher quality of their wider living and working environments – the consumption of 'place' rather than 'space'.[17]

Overall, the evidence related to environmental benefits of compact urban development tends to dominate in the literature, in addition to the already mentioned energy, resource and carbon efficiencies related to transport. The potential for energy efficiency at the building level, mainly heating and cooling,[18] as well as for supplying decentralized grid-based green energy, such as combined heat and power, are among the advantages,[19] as is a lower embedded energy demand for urban infrastructure

due to greater utilization.[20] The importance of design quality for the compact city agenda, which includes building composition, orientation and the integration of vegetation and green spaces, further promotes energy efficiency at the building and neighbourhood level.[21] As a result, urban compaction is regarded as a central measure for reducing carbon emissions[22] and increasing energy price resilience.[23]

Urban compaction also involves costs [See Glaeser, pp. 86–93]. A critique of the compact city model is that it ignores negative side effects, and critics claim that potentially negative externalities of higher density levels, such as traffic congestion, increased local air pollution and the urban heat island effect, are not equally considered.[24] Other negative density associations that are frequently highlighted include overcrowding and reduced privacy, an increase in noise and crime, reduced access to nature and loss of open and recreational spaces, as well as increased health hazards and greater vulnerability to natural disasters.[25]

More implementation-oriented costs of compact city policy concern not so much the desired output itself (more dense, mixed use and accessible urban development) but the means by which it is usually achieved. To a significant extent, today's compact city policy relies on regulatory planning mechanisms such as protecting undeveloped land, assigning minimum building densities and a greater balance of floor areas dedicated to housing, retail and working. These are characterized by some economists as 'second best' as they distort markets and lead to a range of negative side effects. For example, research has linked the United Kingdom's broader spatial planning policy to increased house prices and lower housing quality, greater housing market volatility, higher office rents, lower retail productivity and lower levels of employment in small independent retailers.[26] A particular concern has been with policies that involve urban growth boundaries, which aim to limit urban sprawl. Without compensating the resulting constraint on greenfield housing supply with more active promotion of housing construction within the built-up areas of cities, such restrictions can have a regressive impact on housing supply, affordability and housing equity.[27]

Overall, the Organisation for Economic Co-operation and Development (OECD)[28] concludes that 'by and large, [the outcomes of urban compaction] appear to be positive and significant'. This has also been confirmed by a recent review of more than 300 academic papers.[29] But to what degree does compact growth also present an opportunity to address the holy grail of sustainable development: decoupling prosperity and natural resource use in absolute terms? To date, there is little evidence on this as wealth levels – including those in compact cities – continue to be the most prominent predictor for our negative global impact on ecological systems. Some factors of this relationship, such as the consumption of food, clothing and electronics, are spatially neutral, i.e. they occurr fairly independently from the type of spatial organization. But others, as we have seen above, may indeed be linked to urban form, above all resource use linked to transport, heating and cooling, and construction materials. But even those are further complicated by boundary effects on how we measure environmental impact. For example, resource use for daily mobility in compact cities is certainly lower than in sprawling suburbs, but does living in compact cities lead to 'compensating activities', such as more frequent short breaks and flying to destinations further away?

There are indeed opportunities to further improve our empirical insights. First, *the analysis of empirical patterns of change:* as compact city policy matures, there is an expanding opportunity to conduct time-series analysis allowing us to better understand outcomes before and after interventions take place. For example,

this would allow the disaggregation of the contribution of densification and shifts towards public transport to climate action in London, where per capita emissions fell by 40 per cent between 2005 and 2014.[30] Second, a *full integration of environmental costs:* empirical evidence for planning policy tends to be presented around discrete bundles of interest: housing, transport, environment, social exclusion, etc. Future cross-sectoral research will have to make special efforts to incorporate robust data on natural capital values, including biodiversity within and around cities, to account for the real costs of urban expansion. Third, *better disaggregation:* a fuller analysis of socio-economic and environmental outcomes of urban form needs to be more sensitive to the role of different local geographies, types/groups of residents and a city's economic base/industrial composition. Not unrelated, more attention needs to be paid to the current research gap between aggregation and anecdotes. And fourth, *accounting for boundary effects:* the geographic scale at which cities operate is increasingly blurred and certainly beyond the local level. Future analysis needs to better capture the social and environmental consequences of one city's structure on others as well as on wider regional and national patterns of development.

Furthermore, advancing our empirical understanding of *urban governance, policy instruments and planning processes* critically complements the substantive insights above.[31] But besides potentially complementing existing knowledge in the future, this list also reminds us of the limitations of an empirical turn in urbanism: we simply can't produce and therefore rely on 'total evidence'. This is an important reminder at a time when data is increasingly abundant and easier to generate and access. Not only is making sense of this data a considerable research challenge, a retreat to empiricism also risks appearing apolitical when it actually never is. For the foreseeable future, cities will certainly remain too complex to be fully mapped, modelled and scientifically understood. Similarly, the tensions across urban research traditions, such as between diverging economic and political research practices of the city, are here to stay. But these differences may ultimately prove to be an important asset, as this is precisely where the second difference to a Modernist approach becomes relevant: today's urbanism needs to be negotiated and have access to situated knowledge alongside 'global evidence'.

To conclude, efficiency has always been a fundamental raison d'être of cities. 'Doing more with less' underpins the economic and cultural success of cities, helps to explain their appeal as places to live, learn, work and love, and also establishes far-reaching synergies with environmental sustainability. Unsurprisingly, references to the efficiency of cities have become the quintessential point of departure for the work of an unusual coalition of urbanists addressing accessibility, environmentalists concerned with resource efficiency and economists highlighting agglomeration effects. The compact and connected urban growth agenda brings them together.

But what is even more of interest here is the degree to which we seem to accept that ideas about the physical development of cities matter. Irrespective of the critique of Modernism, the rejection of spatial determinism and the healthy scepticism about spatial fixes for social problems, the proactive role of planning and policy in shaping the physical environment with specific outputs in mind is here to stay. This brings me back to the event in Delhi. While this ideas camp operated with a clear set of concepts, reference cases and international input, it also understood its role in negotiating and contextualizing these ideas. Acknowledging both broad concepts for development based on empirical insights and the importance of a local process, is perhaps an approach to urbanism that needs to evolve further.

NOTES

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