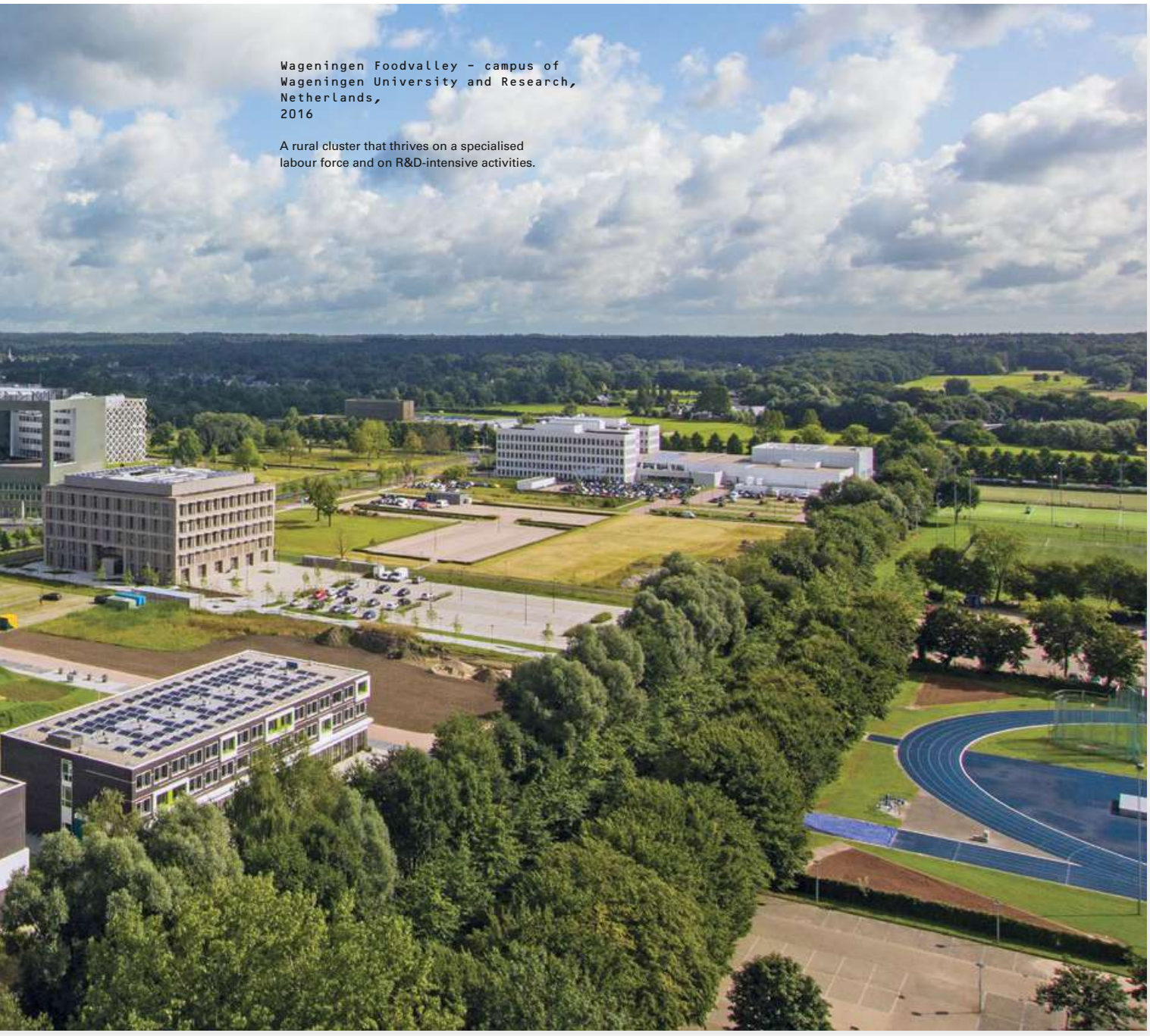
THE NEW INDUSTRIAL URBANISM

Tali Hatuka

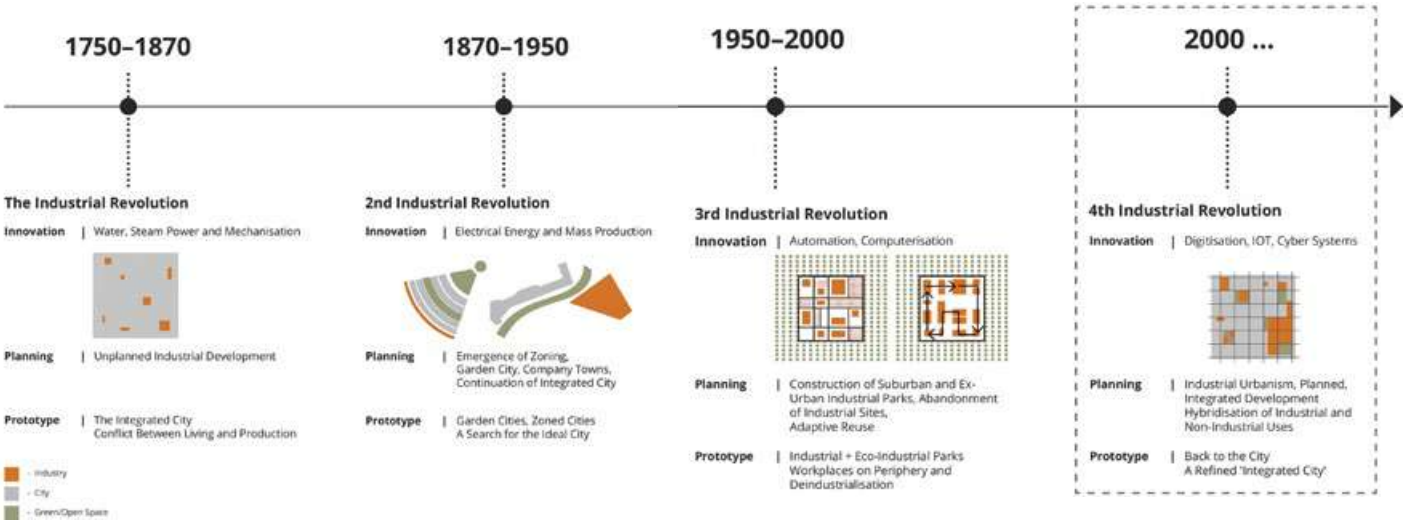
A hybrid, heterogeneous model of urban design, 'New Industrial Urbanism' can facilitate dynamic, innovative and vibrant sectors of the city. Architect and urban planner **Tali Hatuka**, Head of the Laboratory of Contemporary Urban Planning and Design (LCUD) at Tel Aviv University, explores its contemporary societal, economic and technological context. She describes its impact on ideas of localism, skilling up the workforce and cross-disciplinary collaboration.



Wageningen Foodvalley - campus of Wageningen University and Research, Netherlands, 2016

A rural cluster that thrives on a specialised labour force and on R&D-intensive activities.

Forming the basis for new ideas in industrial development, these concepts are complementary, though not often perceived as linked.



Industrialisation is present everywhere, in each product we consume and use. Yet industrial production often takes place elsewhere, distant and detached from our daily routines and living spaces. In fact, industry is something we rarely think about. This physical and perceptual distancing is connected to the way capitalism and planning have radically altered and alienated relationships between workers, products and consumers. But this process of distantiation is gradually changing with the emergence of innovative technologies that cultivate new thinking about the interface between the city and industry.

This new interface is not a radical shift but another phase in an ongoing city–industry dynamic that spans more than a century. The initial phase can be traced back to the First Industrial Revolution when water and steam were used to mechanise production. The mechanisation process changed the social and physical fabric of cities, which functioned as labour pools and logistical hubs. The period of initial industrialisation was characterised by environmental degradation and increased pollution, resulting in the desire to separate industry and manufacturing from housing – an attitude that was further enhanced during the Second Industrial Revolution, with the increased use of electric power to support mass production. Planners, architects and social reformers responded to this dynamic by putting forward propositions for a new model of an ideal industrial city. Towards the end of the 19th century, these models ranged from the design of new mill-towns to the establishment of novel sets of zoning regulations to handle factories' nuisance activities, leading to the establishment of stricter environment laws and regulations. During the mid- to late 20th century, the Third Industrial Revolution, which expanded automated production and the use of electronics and information technology, started a process of deindustrialisation especially in Europe and the US. Countries transformed their industrial activities and utilised urban planning tools to further segregate industry from other land uses. This position of disfavouring manufacturing, coupled with zoning practices that favoured residential development above all other uses (especially manufacturing), led to the development of industrial parks in rural areas and a loss of industrial land in cities.

The industrial revolutions dramatically impacted the development of cities and countryside. Each transformation left its spatial mark on the physical fabric, often without eliminating the footprints of the previous phase. This continuum resulted in three key spatial forms of industry–residential relationships: (1) integrated, in which there is a fusion or close proximity of residential and industrial uses; (2) adjacent, in which there is planned segregation between the industrial and residential areas of the city; and (3) autonomous, in which standalone industrial/business parks or large factories are isolated from any existing settlements.[1] Yet industrial changes have not stopped, but continue to have a spatial impact. The Fourth Industrial Revolution is pushing city governments, as well as planners and architects, to reconsider a more integrated city–industry dynamic in what is defined in this article as 'New Industrial Urbanism'.[2]

The Present Phase of City–Industry Dynamic

New Industrial Urbanism refers to a socio-spatial concept in which manufacturing is integrated into or adjacent to the city. It is based on the premise that technological evolution is altering fabrication's physical footprint, its distribution processes and innovation

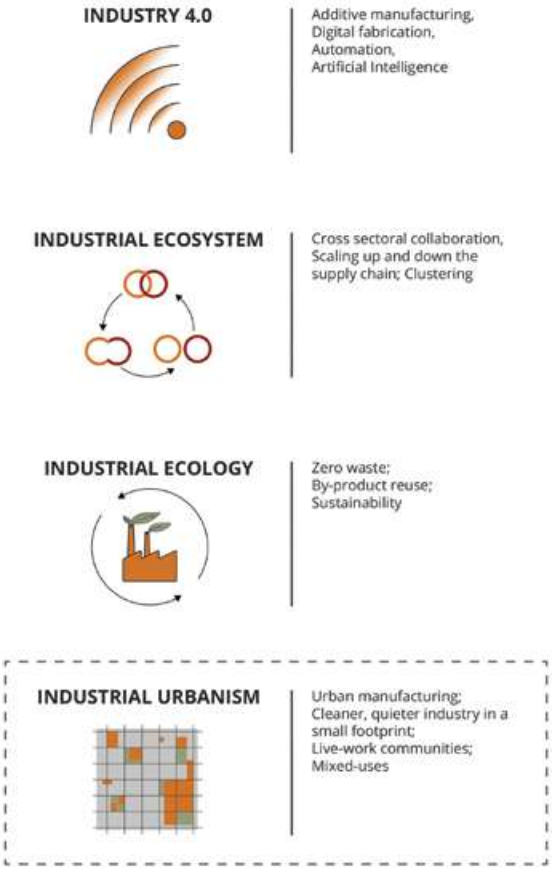
networks, their need for access to transportation, and preference for geographical locations. It is shaping the approach to city planning through the renewed understanding that an urban location carries a competitive advantage thanks to access to skilled labour, educational institutions (centres of research and experimentation) and customers. New Industrial Urbanism emphasises the local economy, and aims to impact the social sphere by empowering small and medium-sized firms and individual entrepreneurs as a mean to buttress localism.

New Industrial Urbanism is linked to three overarching concepts of industrial development: Industry 4.0, industrial ecosystem and industrial ecology. Industry 4.0 refers to digitisation in manufacturing processes and consumer goods. It includes technological innovations ranging from artificial intelligence and autonomous machines to biotechnology, *inter alia*.[3] Industry 4.0 is viewed as a phase in industry that encourages and supports fusion, collaboration and crossovers in learning and knowledge transfer between different types of manufacturers. This type of technological development promises greater energy efficiency and cleaner, quieter industrial processes. An 'industrial ecosystem' encourages relationships and exchanges in the manufacturing sector and perceives it as consisting of one or more ecosystems. One spatial approach for achieving an ecosystem is developing geographical clusters, which may be grouped by product, and include firms that participate in its production at different points up and down the supply chain. This trend views the economy of a region and its manufacturers as a system, and aims to encourage innovation and, in turn, growth through the collaboration of manufacturers, educational institutions (especially universities) and governmental agencies/organisations.[4] In addition, it emphasises the relationships between high-tech and low-tech manufacturers, and considers manufacturer diversity as an important, if not central, component of the system. The third concept, 'industrial ecology', refers to environmental considerations, especially the goals of sustainability, energy efficiency and waste reduction when developing industrial areas. This concept aids economy by increasing efficiency (for example improving energy production and use, water production and use) and establishing more sustainable, closed systems that eliminate waste. Industrial ecology also benefits the environment by reducing industrial waste by establishing a loop in which one manufacturer uses the by-products of another, and so on. Spatially, eco-industry implies the use of green building technologies, generating solar power and using solar power for greater energy efficiency.

These concepts and ideas reconnect both society and space to industry. In terms of society, they depend on social capital and the societal sphere, encouraging (1) cross-sector relationships between academia and industry, government and academia, and government and industry; (2) cross-scale relationships between

Tali Hatuka,
Industrial revolution and development patterns

Planning practices respond to industrial revolutions, which influence societal progress and land-use allocation.



entrepreneurs and established firms, or small and medium firms and large firms; and (3) up- and down-stream relationships between suppliers and producers. In terms of space, these concepts emphasise the role of proximity, integration and improving access to the workplace for employees and nearby institutions that can support their work (universities and research centres), which is considered an advantage for the development of an ecological industrial system.

Integrating, Mixing and Synchronising

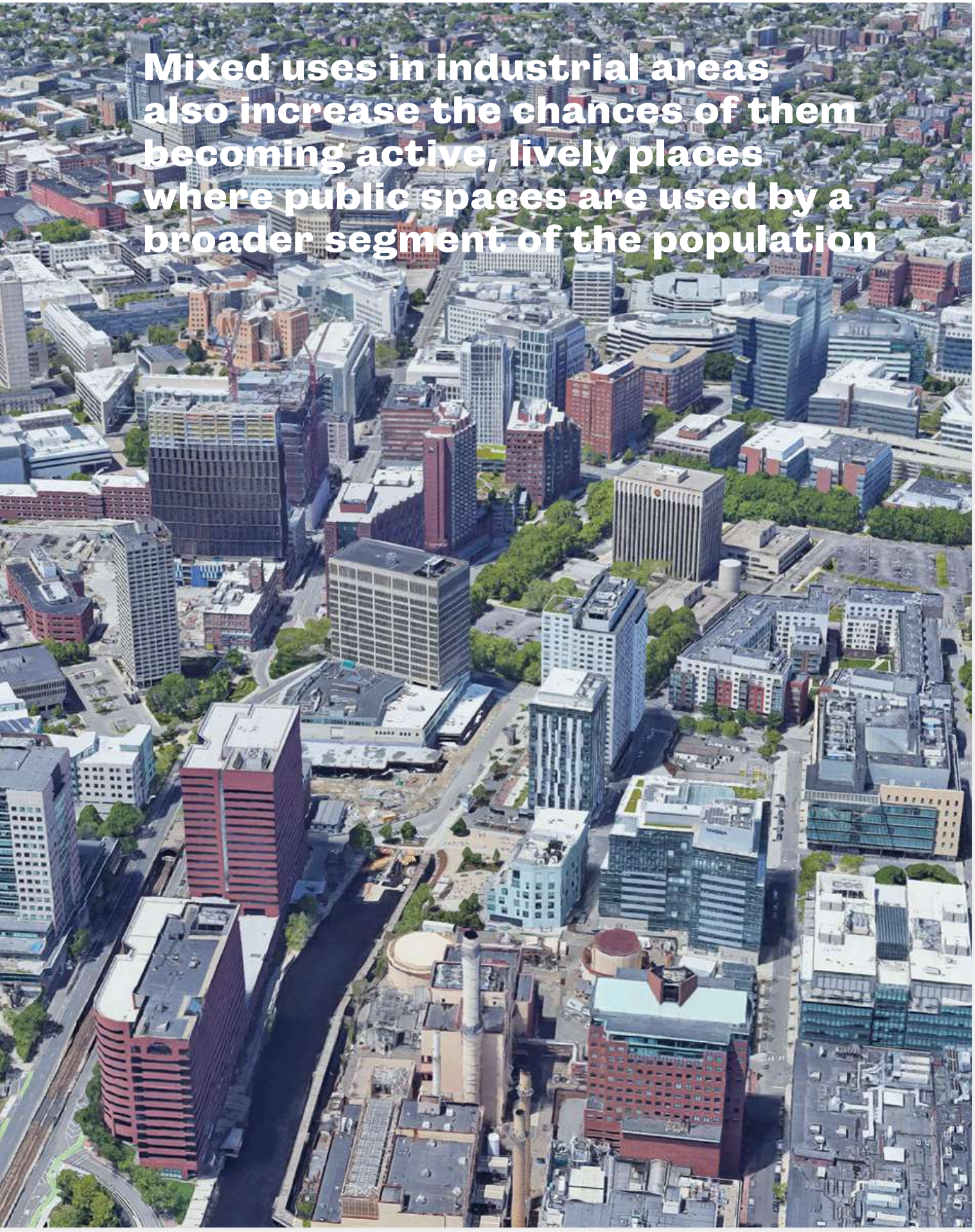
The current phase in the evolution of the city–industry relationship boosts the development of heterogeneous environments that include a variety of industrial activities. One planning approach to this dynamic has been the establishment of industrial urban districts and urban-edge hybrid areas.[5] In these hybrid districts, a mixture of uses (for example employment and commerce), varying both the type of activity (production, R&D) and the type of programme (the size of the lots and the relationships between them), are permitted and incentivised. The approach of combining and varying uses is seen as a response to the different professional abilities and aspirations of local residents, and a way to increase their occupational possibilities.

Mixed uses in industrial areas also increase the chances of them becoming active, lively places where public spaces are used by a broader segment of the population. These uses include, for example, education (vocational education and employee training), health (occupational health clinics) and the welfare of workers (sports centre, day-care centres). One example of an urban area of this type is the Kendall Square district in Cambridge, Massachusetts. Adjacent to the campus of the Massachusetts Institute of Technology (MIT), it has become the home of diverse commercial and retail activities, housing, educational/academic spaces and small incubators for startups, as well as many global technology players and key biotechnology and pharmaceutical companies. Another, more regional-rural example is the Wageningen Foodvalley in the Netherlands. A knowledge-intensive agri-food cluster, it spans eight municipalities in a 10-kilometre (6-mile) radius. Initiated and anchored by Wageningen University and Research, the area is home to a number of science, business and research institutes, all focused on food.

The architectural / urban design approach to the hybrid concept has led to 'synchronic typologies': areas or structures that simultaneously support residential and industrial/employment uses. Synchronisation – unlike mixed use – makes it possible for different uses to exist and function in parallel, in the same built space, without interfering with each other, and sharing resources management, particularly for land and infrastructure. The synchronic typology is based on several principles of integration: optimal management and use of land resources, integration of housing and work (not necessarily by the same users), reducing the daily commute and dependence on private vehicles, and using the built area at all hours of the day. Examples of synchronic typologies include Strathcona Village in Vancouver, Canada (2018), designed by GBL Architects. This project maintains the existing industrial area while increasing the local supply of housing by providing affordable housing necessary for a neighbourhood in which 30 per cent of the population works locally. Another example is 415 Wick Lane in London (due for completion 2022), designed by dRMM Architects. Located in a post-industrial landscape, this project preserves the local manufacturing heritage while promoting high-quality, affordable housing for residents of the area in order to create an employment-oriented place that combines light industry, retail, office and residential spaces, along with the adjacent 'heavy' industrial zone.

3D map of the Kendall Square area, Cambridge, Massachusetts, 2021

The site relies heavily on the human capital of the Massachusetts Institute of Technology (MIT) as an anchor resource, but the business district has grown beyond the university and forms a self-sustaining cluster of dynamic businesses.



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GBL Architects,
Strathcona Village,
Vancouver, Canada,
2018

below: Podium and towers are built of a concrete structure with infill walls clad in corrugated metal panel, a material commonly used on industrial buildings.

opposite: A large loading area is located adjacent to the lane, which is one level below the front street. A freight elevator allows for the movement of goods between the two levels of light industrial flex spaces. The two levels of industrial uses are expressed on the east and lane elevations. Above the industrial uses there are 11 storeys of housing, a mix of market and low-income apartments.

Approaches to urban planning and architecture that are based on mixing and synchronising industrial/ employment and residential environments are gaining momentum around the world

dRMM Architects,
415 Wick Lane,
London,
due for completion 2022

The six separate residential buildings increase the penetration of daylight and landscape views. Public areas serve as leisure space and a transitional area joining the project to the neighbourhood.

The complex includes 175 residential units and approximately 2,500 square metres (27,000 square feet) of work areas. Work/commercial spaces are on the main street level.

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Approaches to urban planning and architecture that are based on mixing and synchronising industrial/employment and residential environments are gaining momentum around the world. They are expected to further develop and expand as manufacturing regains its importance in our thinking about its presence in cities.

Cities in Transition

To be sure, New Industrial Urbanism is not new; the integration of residential and work areas existed prior to the First Industrial Revolution when most people worked in or near the area where they lived. However, the transition to mass production concentrated in factories and their attendant environmental consequences led to developing spatial divisions between residential and employment areas, and the concurrent trend towards commuting. Yet the rapid development of information technologies and accelerated use of digitisation create an unprecedented opportunity and demand for small, home offices and businesses.[6] Furthermore, the Covid-19 pandemic has brought home the realisation that globalisation has also hindered economic localisation. Shortages of critical products and goods exposed the vulnerabilities of the global supply chain and have made clear that to gain a strategic advantage, countries must readdress policies that target the manufacturing sector and supply-chain deficiencies. This renewed emphasis on localised industry demonstrates significant faith being placed in manufacturing as a crucial part in addressing global inequities and building a bridge towards economic recovery. The question, therefore, is not whether the city will be affected by Industry 4.0, but rather to what extent cities will embrace New Industrial Urbanism, and how it will affect society. History teaches us that every phase of industrial revolution has had a dramatic impact on architecture, planning and society as a whole. ⌂

Notes

1. Tali Hatuka and Eran Ben-Joseph, 'Industrial Urbanism: Typologies, Concepts and Prospects', *Built Environment*, 43 (1), 2017, pp 10–24.
2. Tali Hatuka and Eran Ben Joseph, *New Industrial Urbanism: Designing Place of Production*, Routledge, forthcoming. For further reading and publications on the topic, see the website dedicated to the project: www.industrialurbanism.com.
3. Klaus Schwab, 'The Fourth Industrial Revolution: What It Means and How to Respond', *Foreign Affairs*, 12 December 2015: www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution; Elizabeth Reynolds, 'Innovation and Production: Advanced Manufacturing Technologies, Trends and Implications for US Cities and Regions', *Built Environment*, 43 (1), 2017, pp 25–43.
4. Henry Etzkowitz, 'Triple Helix Clusters: Boundary Permeability at University–Industry–Government Interfaces as a Regional Innovation Strategy', *Environment and Planning C*, 30, 2012, pp 766–79.
5. Timothy Love, 'A New Model for Hybrid Building as a Catalyst for the Redevelopment of Urban Industrial Districts', *Built Environment*, 43 (1), 2017, pp 44–57; Nina Rappaport, 'Hybrid Factory | Hybrid City', *Built Environment*, 43 (1), 2017, pp 72–86.
6. See Cutting Edge Planning & Design, *Does Live/Work? Problems and Issues Concerning Live/Work Development in London*, report for the London Borough of Hammersmith & Fulham, 2015: www.lbhf.gov.uk/sites/default/files/section_attachments/livework_final_lowres_tcm21-51146.pdf.