

# Planning Sustainability: The Evolution of Green Urbanism

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A distinct and original cradle of civilisation, Indus Valley societies implemented systematic urban planning as manifested by orthogonal gridding and formal gateways into the city. Urban greening took the form of sophisticated infrastructural innovations in water management that served sanitation and human health.

The evolution of urban planning has been the subject of several recent museum exhibitions,<sup>1</sup> blog posts,<sup>2</sup> books,<sup>3</sup> and infographics. One of the most widely circulated of the latter is by Konstantin von der Schulenburg, an architect with Cantrell and Crowley Architects and Interior Designers (see Image 1). His image has been posted to a variety of engineering, construction, and other public interest websites.

These representations of planning history are useful for a number of reasons. They remind us of where we have been and how we got here. They stimulate spirited debate about the people and ideas chosen for inclusion as well as exclusion. Finally, they promote critical discussion of contemporary planning values, principles, and ambitions. This in turn offers some possibilities for refinement and innovation in how planners and architects practice their craft.

This commentary considers the evolution of urban planning from the standpoint of “Green Urbanism.” It takes a perspective that is archaeological and cross-cultural. Nine significant episodes in green planning history are described. These episodes cover the period of 5000 years ago to the present, and geographies that span the globe. Thus, unlike most other representations (including the one pictured in Image 1), it casts widely across time and space. I close with a consideration of the relevance of this historical and cross-cultural knowledge for dealing with the challenges of 21<sup>st</sup>-century city building.

A few caveats before proceeding. Picking big moments in planning history is an inherently subjective exercise. My choices are geared to the interests of *CITYGREEN* readers. I focus on people and ideas that had broad influence and, for better or worse, a physical impact on cities. My choices would be different if the concern was for another kind of urbanism; for example, one that prioritises social equity. My list is of course inevitably partial. There are many people and ideas to choose from when looking at the history of the green, sustainable city. I present my selected episodes chronologically, but I use the term “evolution” loosely. Each episode has a specific historical context. The nine episodes do not necessarily build on each other in ways that reflect a simple linear trajectory leading from rudimentary to the advanced.



### The Noli Map

**WHEN** 1748

**ARCHITECT** Giambattista Nolli

**GOAL** Nolli's map established the now common practice of portraying entire cities from above without a single focal point.

### Garden City

**WHEN** 1903

**ARCHITECT** Ebenezer Howard

- GOAL**
  - ▶ Howard wanted to design an alternative to the overcrowded and polluted industrial cities of the turn of the century, and his solution centered on creating smaller 'garden cities' (with 32,000 people each)
  - ▶ His scheme included vast open space, with the aim of giving urban slum-dwellers the best of both city and country living.



### The Setback Principle

Typical example in a 1 1/2 times district, for streets 50' to 100' wide

**WHEN** 1916

**ARCHITECT** Hugh Ferriss

**GOAL** As cities came to fill with skyscrapers in the early 20th century, planners turned their interest from the layout and footprint of neighborhoods at street level to the volume of buildings as they rose toward the sky.



1. The Evolution of Urban Planning (Image: Konstantin von der Schulenburg).

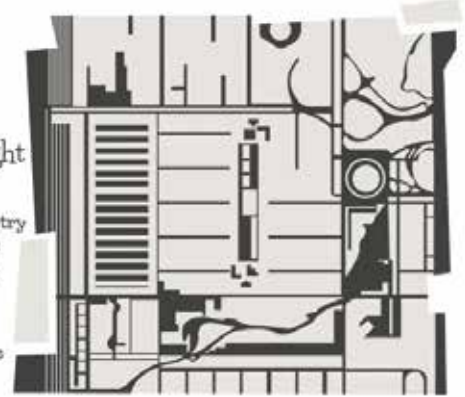
### Broadacre City

**WHEN** 1932

**ARCHITECT** Frank Lloyd Wright

Frank Lloyd Wright took the geometry of this rural grid even further in his vision for a utopia with each family living on an acre of its own.

**GOAL** That level of density would have essentially spread suburbia over the entire country.



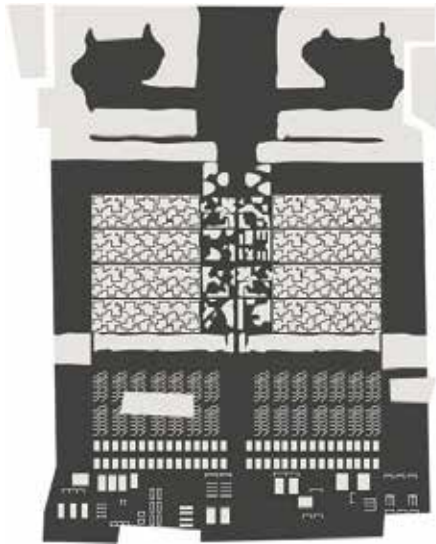
### Radiant City

**WHEN** 1933

**ARCHITECT** Le Corbusier

Le Corbusier was trying to find a fix for the same problems of urban pollution and overcrowding but unlike Howard, he envisioned building up, not out.

**GOAL** His ideas later reappeared in the design of massive public housing projects in the U.S. in the era of urban renewal.



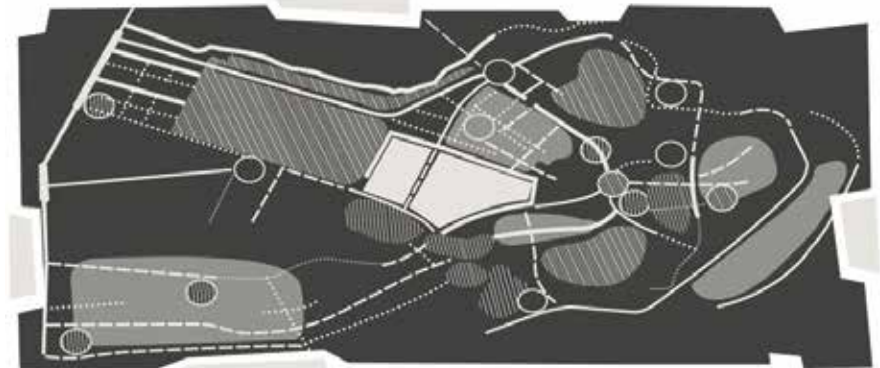
### Psychogeography

**WHEN** 1960

**ARCHITECT** Kevin Lynch

From the 1950s sought to capture the city as it was experienced by actual people, not as it was designed from the top down by architects and planners.

**GOAL** Their approach helped give way to a new emphasis in planning on bottom-up citizen experience and input.



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## The Megaregion

**WHEN** 1961

**ARCHITECT** Jean Gottamn

**GOAL** Planners increasingly talk today about issues involving transportation, the economy and the environment not at the scale of communities or cities, but within whole regions where multiple metros link together.



## The Transect



**WHEN** 2000

**ARCHITECT** Andres Duany

**GOAL** Transsects have been used by planners as a visual tool to divide landscapes into multiple uses.

The rural-to-urban gradation between nature and dense urban zones and has become a popular framework among New Urbanists.

## What The Experts Say

"Space and light and order. Those are the things that men need just as much as they need bread or a place to sleep."

**Le Corbusier**

"Those who can, build. Those who can't, criticise."

**Robert Moses**

"Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will not die, but long after we are gone be a living thing, asserting itself with ever-growing insistence."

**Daniel Burnham**



### Original Urbanism: Mohenjo-daro

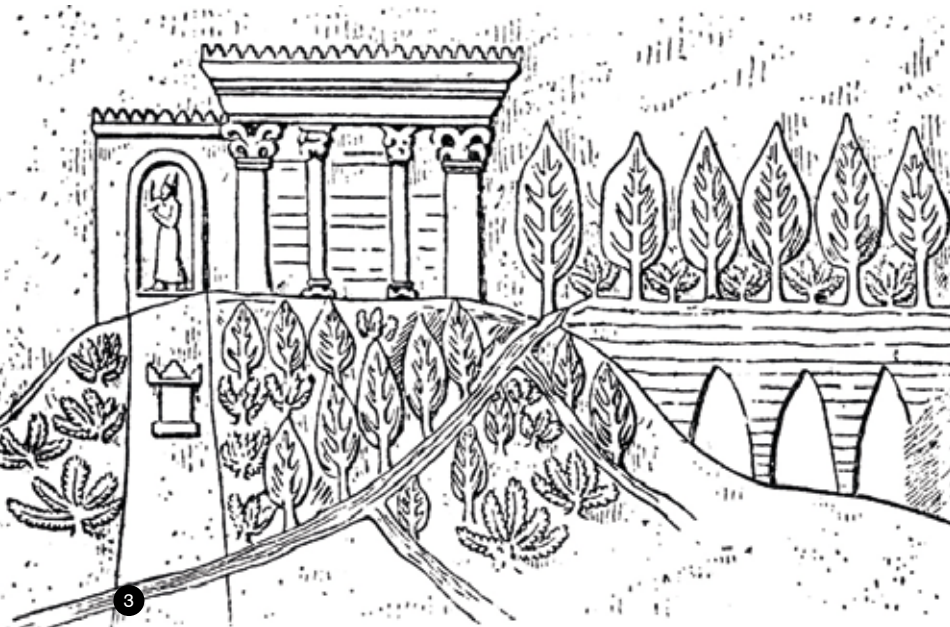
My history starts pretty close to the beginning of urbanisation with the Indus Valley (Pakistan and Western India) cities of 2300 BC. A distinct and original cradle of civilisation, Indus Valley societies implemented systematic urban planning as manifested by orthogonal gridding and formal gateways into the city. Urban greening took the form of sophisticated infrastructural innovations in water management that served sanitation and human health. Mohenjo-daro in Pakistan is an exemplar.<sup>4</sup> Nearly all houses contained bathing facilities, and streets incorporated numerous wells and drains. The latter moved waste out of the city via brick-lined channels. Water management also figured in the architecture of social and religious integration. Mohenjo-daro's central Citadel—an acropolis of fired brick—featured the Great Bath (see Image 2) that likely played a role in public cleansing rituals.

Thus, it is reasonable to regard Mohenjo-daro as our earliest example of the “Eco-City.” Certainly, its system of water management is as historically significant as the 19<sup>th</sup> century infrastructural improvements made in Paris under Baron Georges-Eugène Haussmann—which I will elaborate on below—or in London under Joseph Bazelgette. What is equally if not more striking is that green urbanism at Mohenjo-daro was accomplished under a system of civic governance that combined centralised authority—whose leaders are unknown to us—with strong citizen autonomy at the local neighbourhood level. The latter produced a more irregular, organic pattern of streets and passageways. The whole, however, was bound together by a shared civic ethos.<sup>5</sup>

### Old Urbanism: Sennacherib's Ninevah

Ancient Mesopotamia was the birthplace of cities. Urbanisation occurred here even earlier than the Indus Valley, beginning with Uruk at 3600 BC.<sup>6</sup> Growth was largely organic for the first several millennia, as cities pulled people out of the countryside and into high-density concentrations in major river valleys. Formal planning occasionally broke out in the form of walls, gates, processional ways, and well-ordered ceremonial precincts. However, it is with much later Assyrian cities governed by named rulers that we see concerted investments in urban planning. The most compelling example is Ninevah under the reign of Sennacherib, 704–681 BC. Gwendolyn Leick<sup>7</sup> suggested that Sennacherib's “restless experimentation” with innovative technical solutions to urban problems and his use of “flexible strategies” in urban design make him an unusual ruler and, for sure, a pioneering urbanist. At the time a small and run-down city, Sennacherib widened Ninevah's public squares and straightened her streets to bring in more light. He also undertook a programme of historic preservation, restoring dilapidated temples to previous glory.

Sennacherib's key green technological innovation was the sophisticated hydraulic engineering works that brought water to the city from mountains 80 kilometres away via canals and aqueducts. He expanded the amount of arable land around the city and built parks, orchards, and reed marshes. Innovative water screws brought water to higher levels, creating the “hanging gardens”: trees suspended on terraces watered by an aqueduct (see Image 3). These gardens have long been things of legends, typically associated with the contemporary city of Babylon. However, Stephanie Dalley<sup>8</sup> made a compelling case for locating the Hanging Gardens in Ninevah. These gardens almost certainly served functions comparable to today's “green roofs”: filtering dust, absorbing CO<sub>2</sub>, and reducing heat. But Dalley noted that they also served an ideological function: the “re-creation of paradise, the Garden of Eden.” And most likely a political function: they publicly projected Sennacherib's power in making the arid desert bloom.





### Baroque Urbanism: Haussmann's Paris

The Baron Georges-Eugène Haussmann's renovation of Paris between 1853 and 1870 was precedent setting for its greening of the medieval cities of Europe. Working under Emperor Napoleon III, Haussmann used baroque<sup>13</sup> planning principles—straight, tree-lined boulevards, diagonals, squares, parks, and terminating vistas focused on public monuments and civic buildings—to open up the city to air and light (see Image 4). Like his anonymous predecessors at Mohenjo-daro, Haussmann's public sanitation works—subterranean pipes, sewers, and tunnels—served the cause of improved sanitation, fresh water delivery, and human health. His emphasis on “urban scenography”<sup>14</sup> turned the city into a site of visual spectacle, royal display, and conspicuous consumption.

And therein lies the flip side of “Haussmannisation.” His projects displaced poorer resident populations to outlying areas and gentrified the urban core. Haussmann's wide boulevards made it easier for authorities to quell civic unrest by quickly transporting armies to sites of social disturbance. Breaking popular resistance to autocratic power might not have been Haussmann's first priority, but such were the social effects of his work. There is no doubt about Haussmann's international popularity. “Paris Envy” spread among other European capitals, producing similar forms of urban renewal. In the United States, the star architect Daniel Burnham (“Make no little plans; they have no power to stir men's blood”<sup>15</sup>) re-imagined Chicago as “Paris on the Prairie.” New York's powerful planning czar Robert Moses studied Haussmann's work and applied his tactics in ways that both greened and socially segregated the city.<sup>16</sup>

### Eco-Social Urbanism: Jenné-jeno

The ancient Egyptian city has long been a focus of interest, especially Akhenaten's imperial capital of Amarna dating to 1340 BC.<sup>9</sup> On the other hand, Africa south of the Sahara has always been a blind spot in global histories of cities and urbanisation. The West African (Mali) city of Jenné-jeno, dating to AD 400–800, is important and instructive as an early example of an ecologically *and* socially conscious urbanism. The Jenné-jeno urban complex consists of several mound-based communities distributed within a four-kilometre radius along the margins of the Niger River.<sup>10</sup> Its population totalled up to 40,000 people. The mound centres appear to have been ethnically distinct but functionally interdependent, guided by principles of specialised craft production and the reciprocal exchange of goods and services within a generalised economy. This made great ecological sense in a dynamic and unpredictable environment characterised by high inter-annual variability in subsistence production.

Unlike Ancient Egypt, however, Jenné-jeno lacked strong political stratification. Evidence of a dominating ruling class has never been found. Instead, scholars believe that the Jenné-jeno polity shared power horizontally between corporate groups. This is reflected by the clustered organisation of mound centres. That is, power was organised “heterarchically” rather than hierarchically.<sup>11</sup> It is unlikely that Jenné-jeno's unique “clustered cities” model of urban political economy can be transferred wholesale to today. But the example retains some relevance for imagining how *eco-social interdependence* might be better constructed within contemporary cities. Indeed, we might be seeing reflections of this ethos in the self-organising qualities of the informal urbanism<sup>12</sup> that characterises today's mega-cities of the Global South.

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2. Excavated ruins of Mohenjo-daro, with the Great Bath in the foreground. (Image: Wikimedia Commons/Saqib Qayyum).

3. Garden at Ninevah, drawn from a fragment of relief sculpture now in the British Museum, showing the garden described by Sennacherib, watered by an aqueduct. A corner of Sennacherib's palace is visible top left. (Image: Wikimedia Commons).

4. The tree-lined Avenue de L'Impératrice (now Avenue Foch), designed by Haussmann as the grand entrance to the Bois de Boulogne. (Image: Wikimedia Commons).



Despite an admirable green sensibility, the Garden City concept remains an inducement to urban sprawl and in practice has trouble meeting its social diversity goals.

### Ebenzer Howard's Garden City

Richard Register<sup>17</sup> identified Ebenezer Howard's Garden City<sup>18</sup> as "the moment when the idea of the ecocity appeared and was consciously, if partially, expressed and realised." Howard's proposal was directly stimulated by the pollution, congestion, and social dislocations of the industrial city. It was also influenced by some time he spent on a Nebraska homestead.<sup>19</sup> Howard sought to reunite people and nature, to hybridise "town and country." Planning elements featured in his famous concentric ring diagram (see Image 1) included a central park, radial roads, single-family homes, neighbourhoods, zoning for different land uses, vast open space, and a greenbelt.

Howard's model of the Garden City was a powerful influence in first half of the 20<sup>th</sup> century, spawning "New Town" movements in many countries. His influence faded after World War II, but made a comeback in 1998 on the 100<sup>th</sup> anniversary of the original Garden City formulation through the work of Peter Hall and Colin Ward.<sup>20</sup> Their updating of Howard sought to reimagine cities that fulfilled the Garden City's original aim to house a diverse, mixed income, and self-sufficient citizenry. A recent special issue of the *Journal of Urban Regeneration and Renewal* considers these updated models as applied in Britain and the United States.<sup>21</sup> Despite an admirable green sensibility, the Garden City concept remains an inducement to urban sprawl and in practice has trouble meeting its social diversity goals.<sup>22</sup>

### Le Corbusier's Radiant City

The Swiss architect Le Corbusier drew on the traditions of Haussmann and Howard to originate what we know as "modern" urban planning in the late 1920s and 1930s. Like Haussmann, Le Corbusier proposed opening up the city by eliminating streets in favour of broad arterial roads and increasing parks and open space. Channelling Ebenezer Howard, he imagined an encircling band of Garden Cities on the urban periphery. His city centre would be vertical, distinguished by superblocks containing tall, glass-and-steel towers in green settings. In some sense the entire city was conceptualised as one immense park. "Towers in the Park" would serve as "radiant prisms." The Radiant City's crowds would live in peace and pure air, "where noise is smothered under the foliage of green trees."<sup>23</sup>

The influence of Le Corbusier was considerable in the renewal of American cities in the last half of the 20<sup>th</sup> century. But the overall effect was not quite as intended. In the hands of his fellow modernists, Towers in the Park framed desolate, windswept, and alienating spaces. Diverse neighbourhoods gave way to expressways and residential segregation by race and class. Le Corbusier was thus vilified for killing the city ("urbicide"), but the Radiant City concept continues to have resonance today. The approach is mirrored in the planning of eco-cities in China and elsewhere; e.g., Tianjin Eco-City.<sup>24</sup> And Anthony Flint<sup>25</sup> argued that we can still learn from Le Corbusier's commitment to (1) comprehensive long range planning where it comes to open space and infrastructure and (2) pioneering thinking about efficient housing design (Fig. 5).



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5. The "Corbusierhaus" in Berlin (Unité d'Habitation, type Berlin). Built by Le Corbusier for an international exhibition in 1957. (Image: Wikimedia Commons/ Manfred Brückels).





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### Frank Lloyd Wright's Broadacre City

Like Le Corbusier, the American architect Frank Lloyd Wright was inspired by Howard's Garden City. But Wright radically decentred it. Instead of building up, he proposed building out, expanding across the landscape. Broadacre City lacked a conventional centre; the city was nowhere, yet everywhere.<sup>26</sup> It grew out of the landscape, with an organic architecture that expressed the local environment and responded to the local climate. Wright's famous "Usonian" houses employed native materials, natural light, and passive solar heating. Form and function were united as one.<sup>27</sup>

Broadacre City received immense exposure in the American popular press during the 1930s. It had special appeal because it comported with an American ideology of rugged individualism and an emerging motorcar culture that carried citizens ever outward in search of prosperity. Thus, suburban sprawl must be counted as part of Broadacre's legacy (see Image 1). We've also seen a proliferation of the building types associated with Broadacre: low, horizontal ranch houses, mobile homes, roadside markets, drive-through restaurants, and suburban malls.<sup>28</sup> These abundant artefacts of Broadacre continue to bedevil urban planners seeking a genuinely green and sustainable urbanism.

### North American New Urbanism

New Urbanism and its progeny—smart growth, transit-oriented development—emerged in the 1990s to reintroduce traditional town planning in the United States, using both Garden and Broadacre City principles. New Urbanism broke with Broadacre in calling for clear town centres and edges. But it argued, with Wright, that architecture and landscape design should grow from local history, climate, and building practices. The Charter for the New Urbanism<sup>29</sup> urges compact, mixed-use centres, walkability, human-scaled buildings, tree-lined streets, and adequate green space. Its ecological approach seeks to harmonise neighbourhood and region. Andres Duany's urban to rural transect is New Urbanism's signature image (see Image 1).

New Urbanism has been a commercial success in the United States, and is the country's default setting for urban renewal and regeneration. However, it has also been a victim of its own success. Critiques of New Urbanism are abound; it can be reasonably argued that New Urbanism repackages the basic principles of Old Urbanism as exemplified by cities like Ninevah.<sup>30</sup>

It does not always remedy automobile use or serve the cause of walkability. Its nostalgia for traditional town planning risks ossifying into something that stifles creativity and innovation.<sup>31</sup> And while it is committed to green principles, it has not been effective in accommodating ethnic or income diversity or reducing socio-economic segregation in American cities.<sup>32</sup>

### South American Social Urbanism

My last episode is perhaps the most relevant one for guiding efforts going forward. It draws on the historically neglected Global South and is exemplified by the cities of Curitiba, Bogotá, and Medellín. Here, charismatic mayors drove targeted, experimental interventions in the urban fabric that served both the environment and society.<sup>33</sup> In Curitiba, Jaime Lerner created parkland to control local flooding, planted millions of trees, and recycled just about everything.<sup>34</sup> His Bus Rapid Transit system, with its stylish stations, destigmatised bus travel so that more people would use public transportation. Enrique Peñalosa did the same for Bogotá, pairing his Transmilenio bus system with one of the most extensive networks of bicycle lanes in the world. In Medellín, Sergio Fajardo built iconic libraries in parks (see Image 6) and expanded the Metro cable car system to connect the poorest areas of the city to the urban core.


All three mayors exemplify experimental, flexible, "top-down activism"<sup>35</sup> in the tradition of Sennacherib, but without the autocratic ambitions. Still, Social Urbanism has not been an unalloyed success. Bus systems can be overcrowded, car traffic and congestion are still present, people have been displaced, and gaps between rich and poor remain. But the principles and strategies of Social Urbanism still have promise: replacing the "big plans" of Haussmann, Burnham and Le Corbusier with small urban projects, and using "urban acupuncture" to produce interventions in the built environment that generate greater social equity and prosperity.



6. Biblioteca España, Medellín, Colombia. (Image: Wikimedia Commons).

## Conclusion and Prospectus

My commentary does not directly address today's developing tradition of "eco-urbanism."<sup>36</sup> But it is evident from this history that Eco or Green Urbanism has ancient, cross-cultural roots. Infrastructural development at Mohenjo-daro presages what we see in 19<sup>th</sup> century Paris and London. Sennacherib anticipates Haussmann, Le Corbusier, and the South American mayors who implemented strategies and methods of Social Urbanism. Jenné-jeno's leaders, located off the radar of traditional urban studies, integrated ecological and social concerns into a single, distinctive brand of urbanism. Today's New Urbanism largely replicates what we see in Old Urbanism. Of the better-known people in my history, Ebenezer Howard is being revived, Le Corbusier is still being channelled, and Frank Lloyd Wright continues to cast a long shadow over the art of building organically.

Thus, there are significant lessons from the past that can inform planning for today's green, sustainable city. The past is a deep repository of reference points for considering the do's *and* don'ts of contemporary urbanism. For me, the primary challenge for 21<sup>st</sup> century Green Urbanism is to better connect environmental and social justice goals; to unite the sustainability conversation with the equity conversation. This is a disconnect in many current versions of Eco-urbanism.<sup>37</sup> In so doing we should rethink the urban governance models that can bring us to an effective integration. We might be guided by the wisdom of the civic leaders throughout history who exercised enlightened, top-down activism, shared planning power across corporate groups and coalitions, and supported bottom-up initiatives for change. 

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