Linearity

Theoretical research

William Guild

Contents

Foreword

The theoretical component of the thesis project stems from the activities carried out during the Cross Domain seminar. It is built from deductions at every stage of the course and supplemented by an extensive body of literature. From the outset, the aim of this research was to define a position towards the contemporary City. There is no single reading of the city. The modernist utopia of the twentieth century has dissolved and the urban landscape is now a highly complex and diverse patchwork of different ideas and ambitions.

We should not attempt to redefine the City as a whole but rather to look closely at the characteristics of its constituent parts. In these places, we find a richness of activities, movement and habitat that contribute to the singular identity of each fragment. To this end, the focus of this position is to define fragments of 'city-ness', places of natural intensity that may describe a new kind of urban logic. Linearity, the key theme of this thesis, is one such lens through which to look at cities. As urbanisation follows the axes of road and rail infrastructure, patterns of linear development continuously form and reform creating an intricate juxtaposition of human activity.

The **Urban Coral Reefs** are rising. They represent a new space of solidarity and civic pride of the urban. They are organic constructs of our own making, undiscovered wonders of man made ecology.

Introduction

Statement

Medieval communities formed near river banks or busy thoroughfares, stretching linearly along these connections. Rivers were sources of subsidence, wealth, social interaction and information. Today, the expansion and densification of the city occurs along railway lines, arterial roads and fibre optic networks. The process appears to propagate almost organically, clustering to threads of infrastructure like a parasite.

Frustration

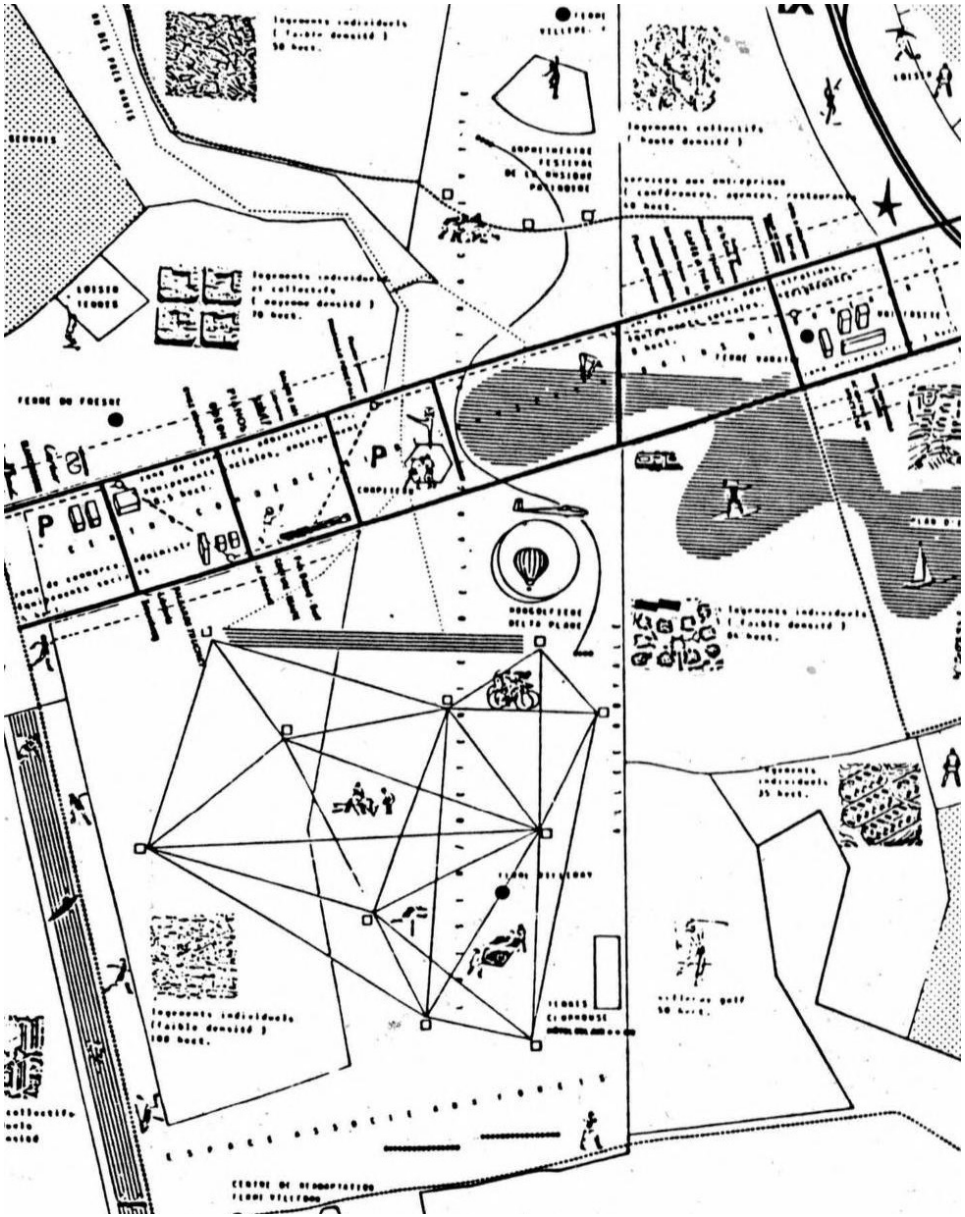
Picon, Antoine. *La Ville Territoire Des Cyborgs*. Tranches De Villes. Besançon: Les Editions de L'Imprimeur, 1998 : 22.

‘The absence of limits participates in the general blurring of ways of reading the urban space, even though this space tends to reproduce itself identically from one country to the next.’

The Sea of Urbanity

Koolhaas, Rem, Bruce Mau, et al. *Small, Medium, Large, Extra-Large : Office for Metropolitan Architecture, Rem Koolhaas, and Bruce Mau.* [in English] 2d ed. New York, N.Y.: Monacelli Press, 1998: 971.

‘We were making sand castles. Now we swim in the sea that swept them away.’



Ville Nouvelle Melun Senart, 1987

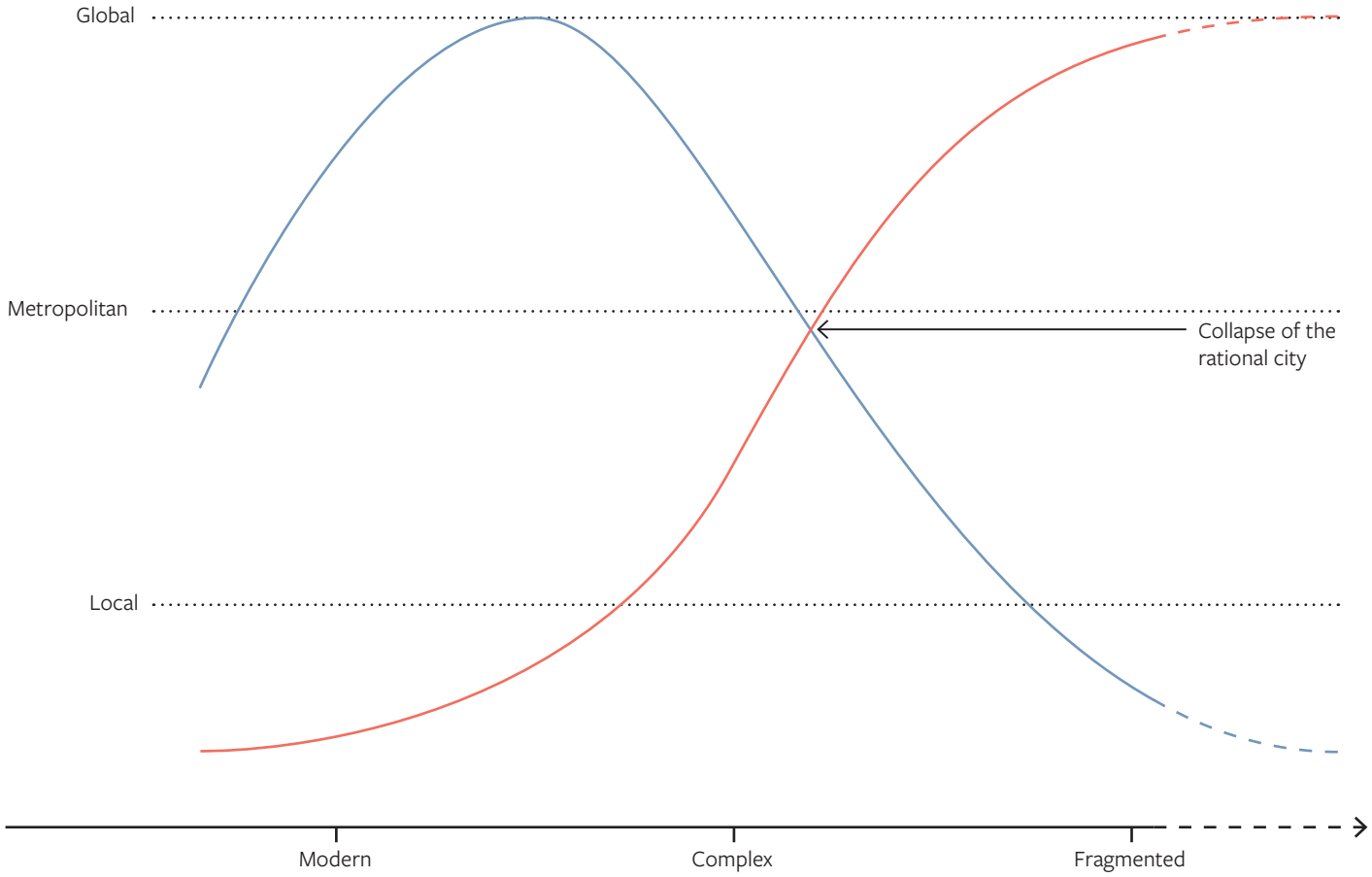
Breaking Point

→ Collapse of the city as a rational object

→ Standardised, comprehensive approach to infrastructure design inadequate to deal 'with globalized political economy.'

→ More localised approach to urban planning; delegating larger infrastructural projects to third parties.

Graham, Stephen, and Simon Marvin. *Splintering Urbanism : Networked Infrastructures, Technological Mobilities and the Urban Condition.* [in English] London: Routledge, 2008. 103



Key

— Scale of Human Interactions
— Scale of Urban Interventions

Topology

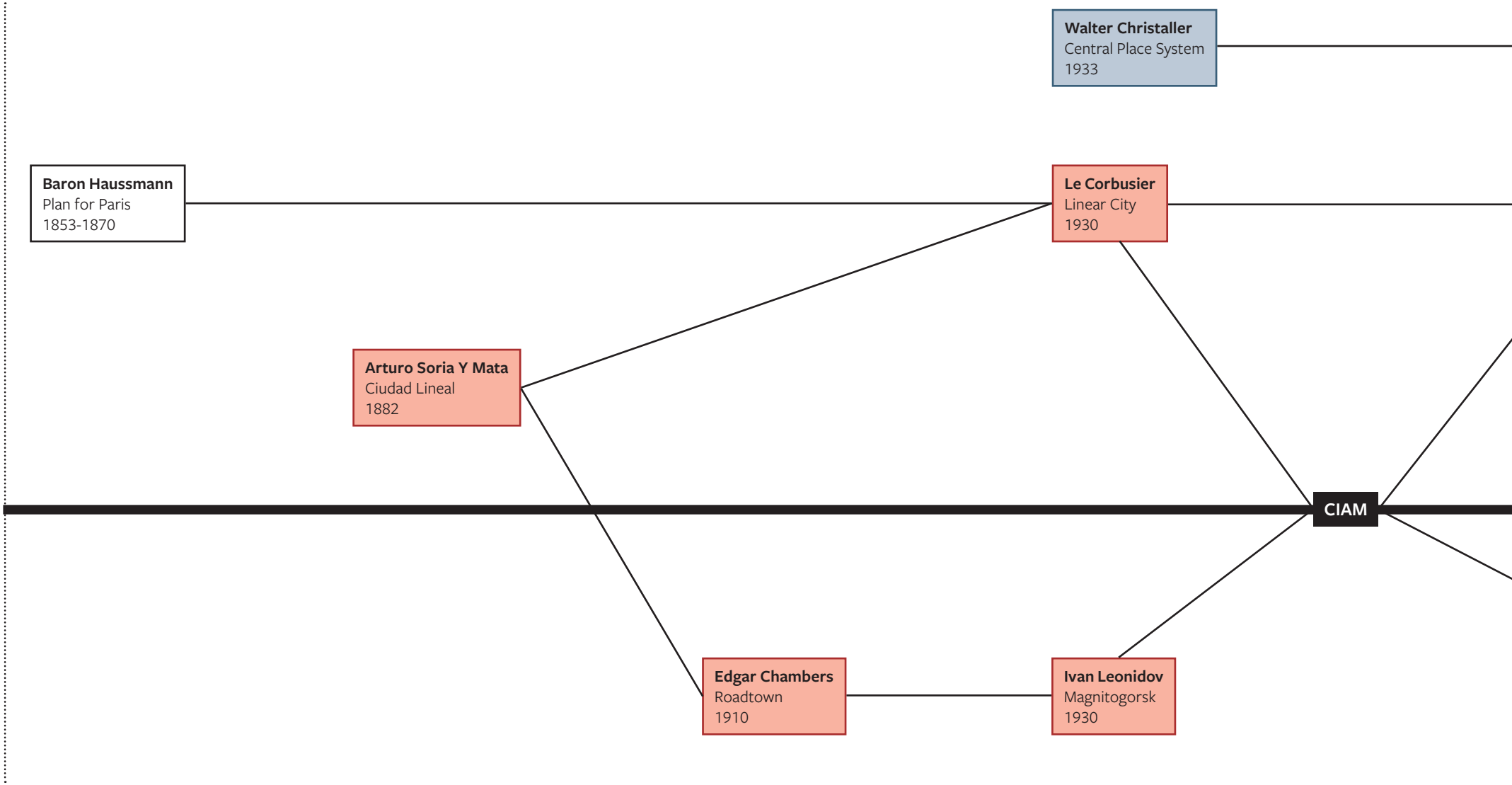
The way the parts of something are organized or connected

Cambridge Dictionary

The **topology** of the city has been eroded beyond recognition.

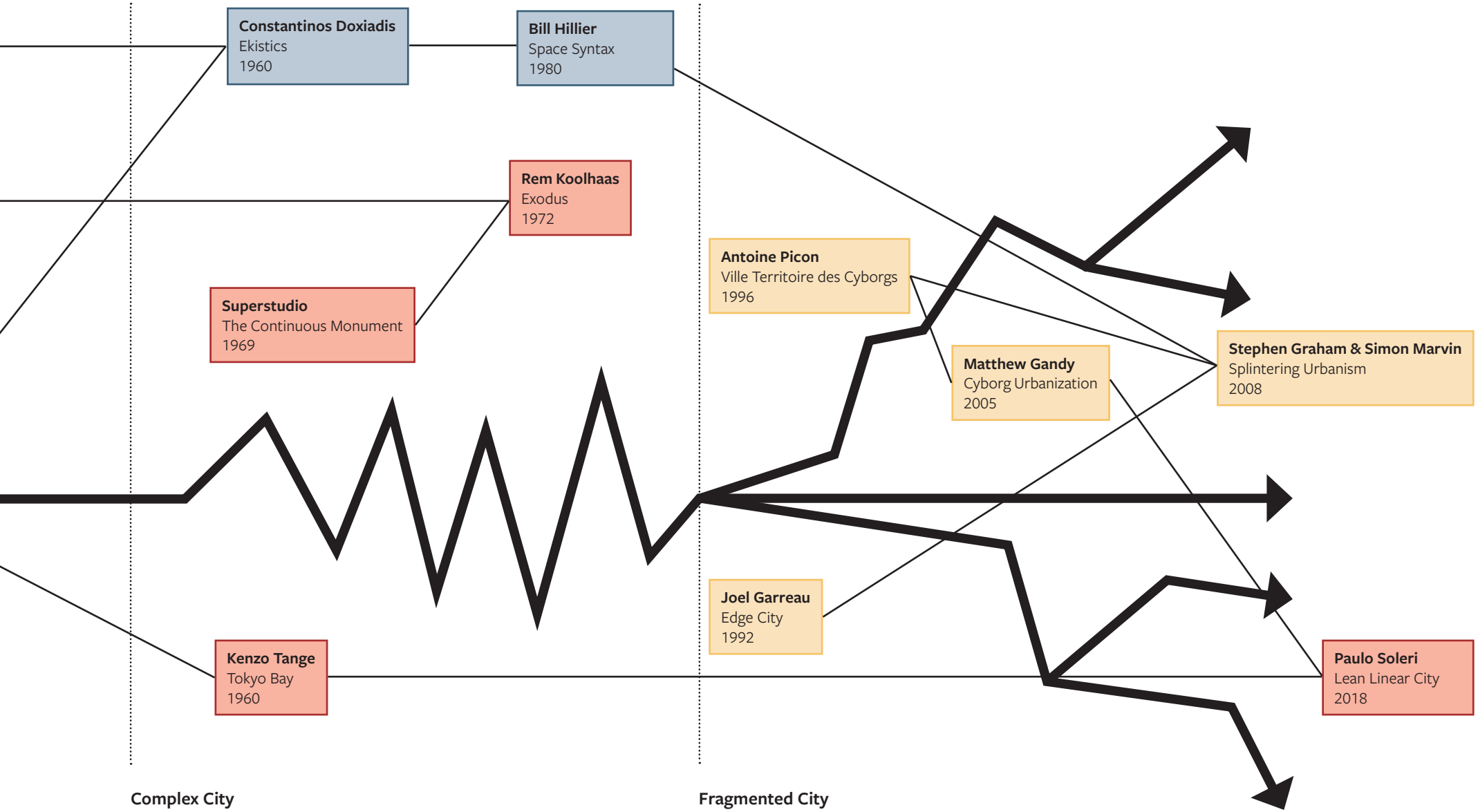
The civic organization of the urban has been undone, which has resulted in a breakdown in our relationship to the city and in the social ties that bind us together.

Line in Time



Modern City

Industrial Revolution



Complex City

Social Revolution

Fragmented City

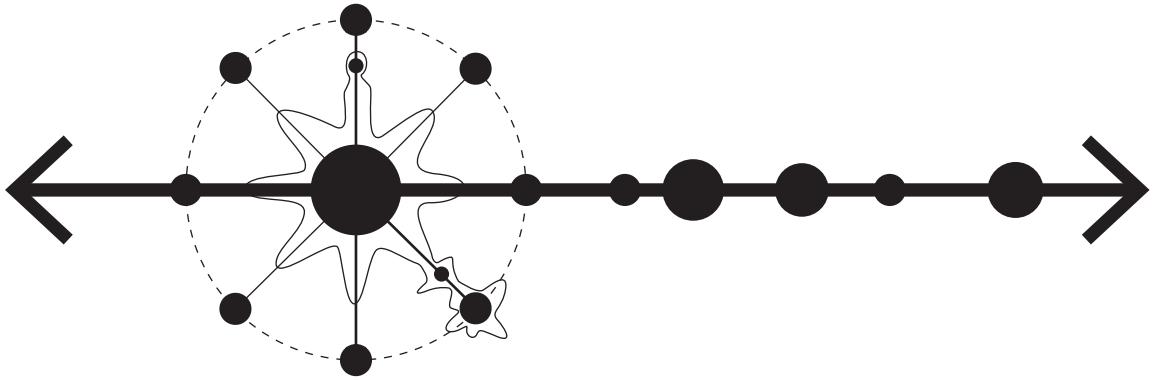
Technological Revolution

Linear Cities: the Evolving Diagram

Open System

Tange, Kenzo. *A Plan for Tokyo, 1960: Toward a Structural Reorganization*. Tokyo: Shikenchikusha, 1961.

‘Now, however, **mass communication has released the city** from the bonds of a closed organization and in the pivotal city of this organization the mobility involved in free, individual communication is assuming a larger and larger scale’



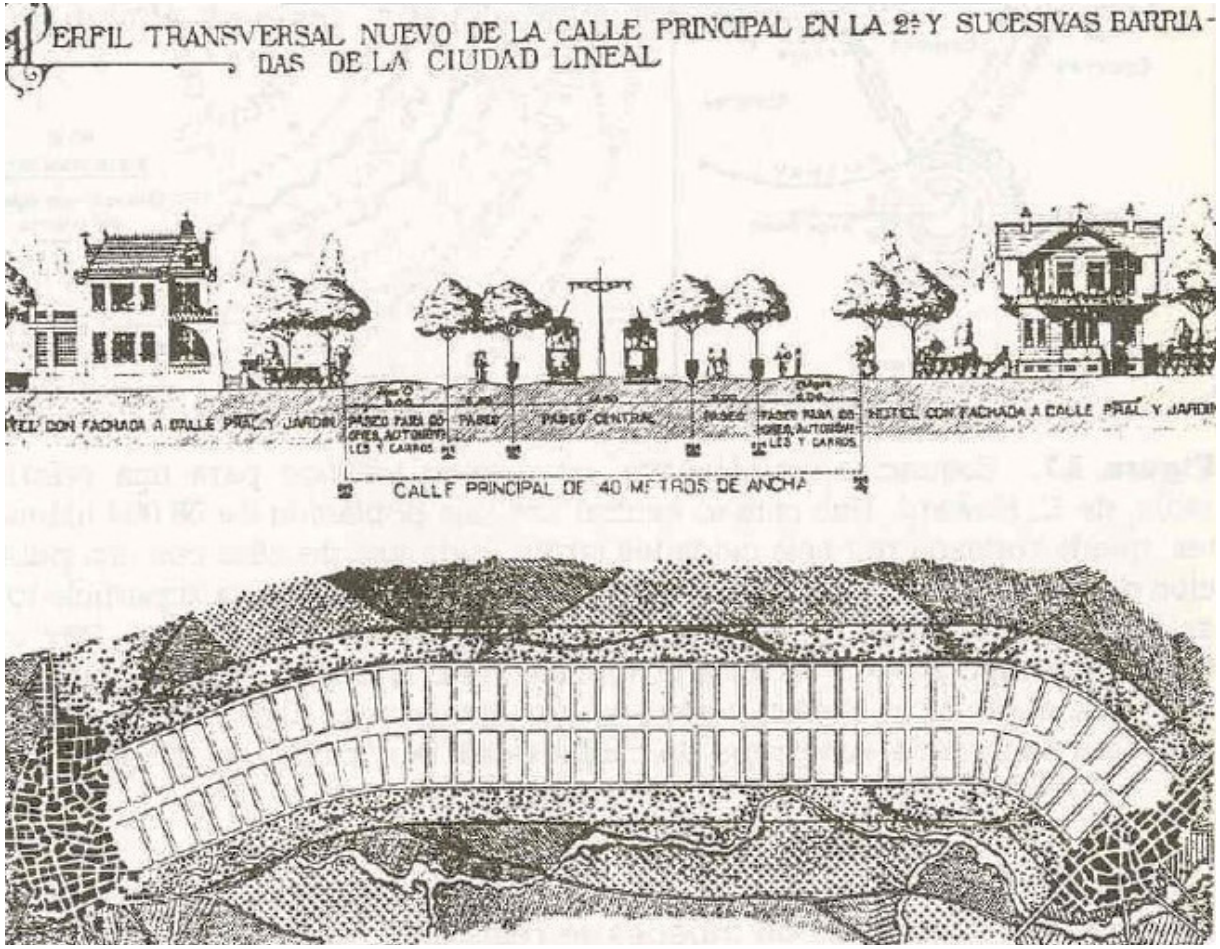
Tange's Civic Axis

Historiography

Viganò, Paola, Steve Piccolo, Luca Ortelli, Jacques Lucan, Martina Barcelloni Corte, and Emily Lundin. *Territories of Urbanism : The Project as Knowledge Producer*. [in English] First edition. ed. Lausanne, Switerland: EPFL Press, 2016.

‘The Linear City is imagined as a tool for the **colonisation and re-population** of under used or abandoned territories across the entire world.’

Arturo Soria y Mata - Ciudad Lineal (1882)



Edgar Chambless - Roadtown (1910)

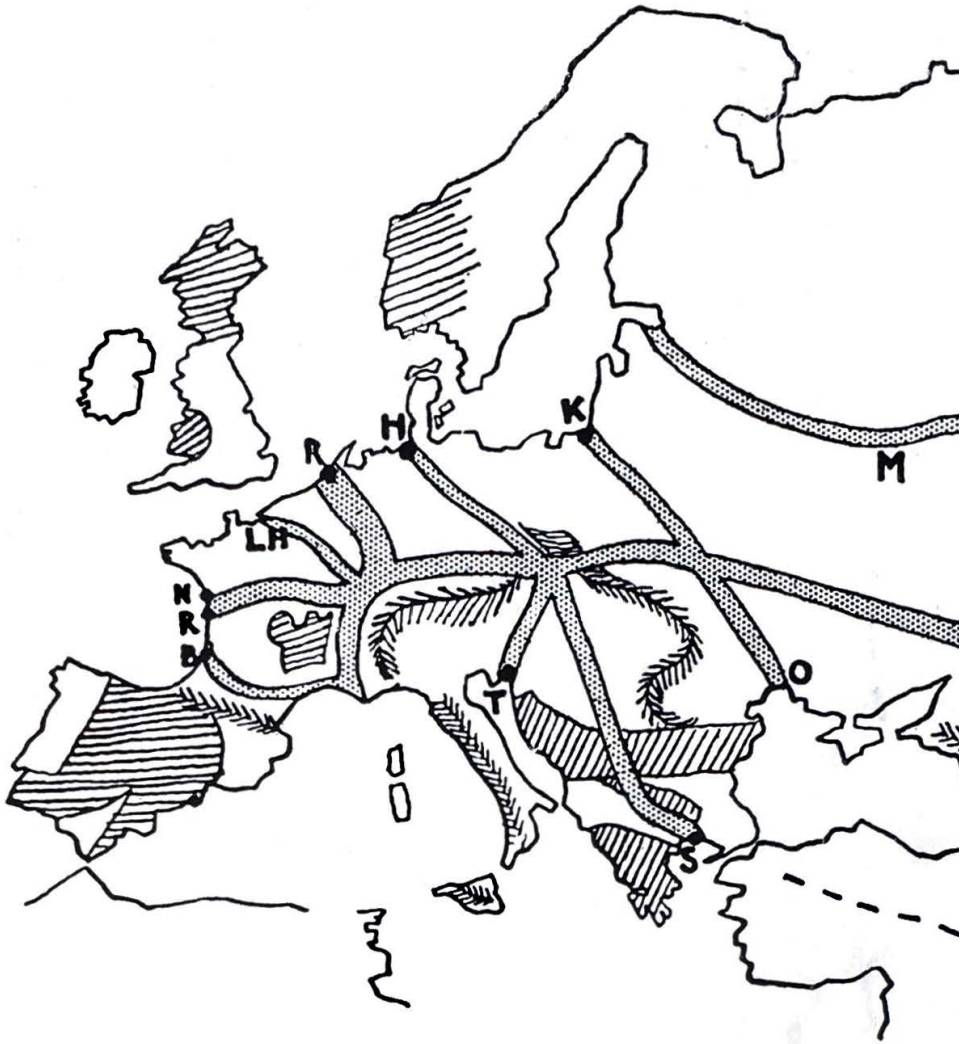
Is This the Railway of the Future?

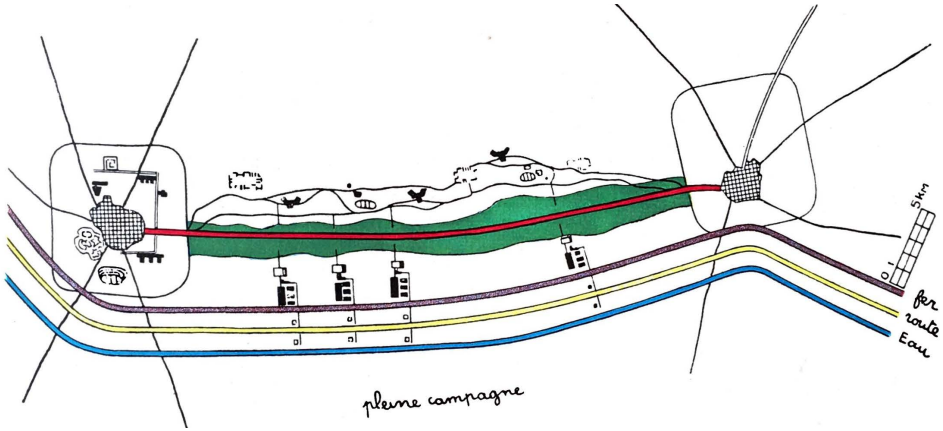
Super-Speedway for Trains, Planes, and Motors

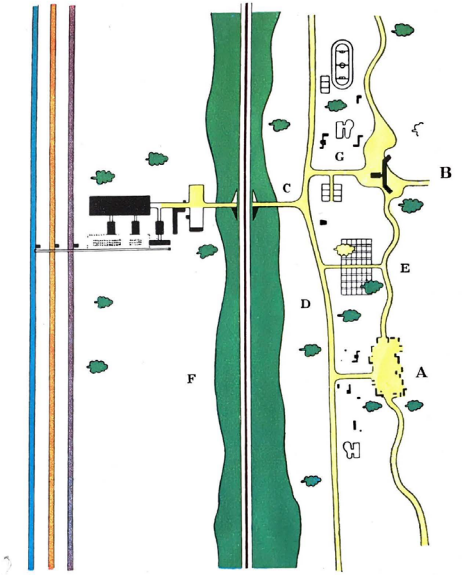
AIRWAYS, highways, and railways are combined in a startling plan of high-speed transportation advanced by Justus W. Fry, railroad and electrical engineer of Seattle, Wash. He proposes to link important cities with a multiple traffic artery in the form of a three-deck elevated viaduct of steel and concrete. The roof of this structure, in a design that he has patented, offers a continuous emergency landing platform for airplanes and airships, and also guides pilots flying overhead. A tier immediately beneath the roof provides a super-speedway for automobiles, always dry and free of cross traffic. Railway tracks occupy the ground level, while high-speed monorail cars with air propellers, making non-stop runs of 300 miles or more along tracks at the side of the structure, provide super-express passenger service. Such a structure, Fry maintains, keeps pace with the growing demand for relief from traffic congestion and for swift cross-country travel. It also has significance from the viewpoint of national defense, since in time of war it would provide a highly efficient military roadway for rapid and secret movements of troops. Railway companies might logically take the initiative in constructing such arteries, according to the designer, since they already own the right-of-way and have established the necessary passenger and freight depots. By expanding their activities to set up a coordinated transit system on his plan, they could, he suggests, offset inroads made into their business by the growing competition of buses, motor trucks, and airplanes. Tolls would be collected from private vehicles, while the railroads themselves could control the bus and trucking services. Initially the unified transit arteries would be built in the most densely populated regions of the country.

This is our artist's conception of the three-decked viaduct designed to carry fast rail and motor traffic between large cities. The roof provides an emergency landing field for aircraft

Le Corbusier - Europe (1930)







Les voies de passage des marchandises

Les établissements industriels

Autoroute (vitesses mécaniques)

Le logis et ses prolongements (marche à pied)

A Le logis familial sous forme de maisonnettes dispersées en cité-jardin horizontale

B Le logis familial sous forme de maisonnettes rassemblées et superposées en une unité bâtie d'un bloc, sorte de cité-jardin verticale

C La route transversale d'accès à l'usine

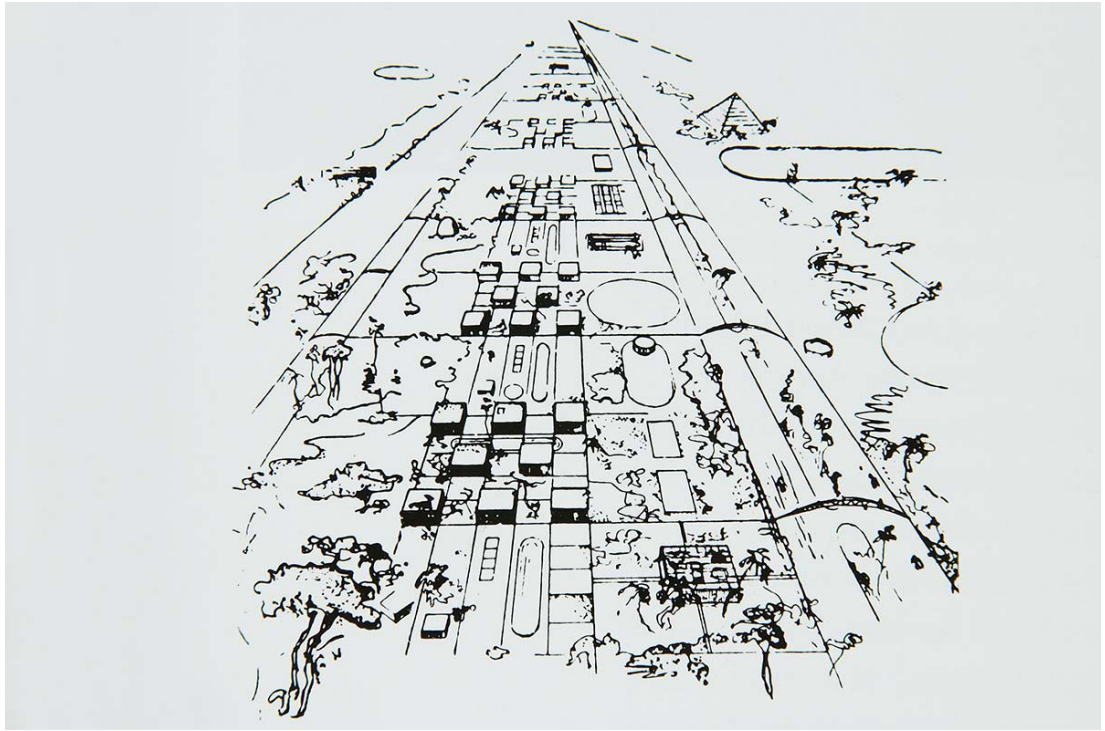
D La route de répartition entre les logis et leurs services communs (accessibles aux voitures)

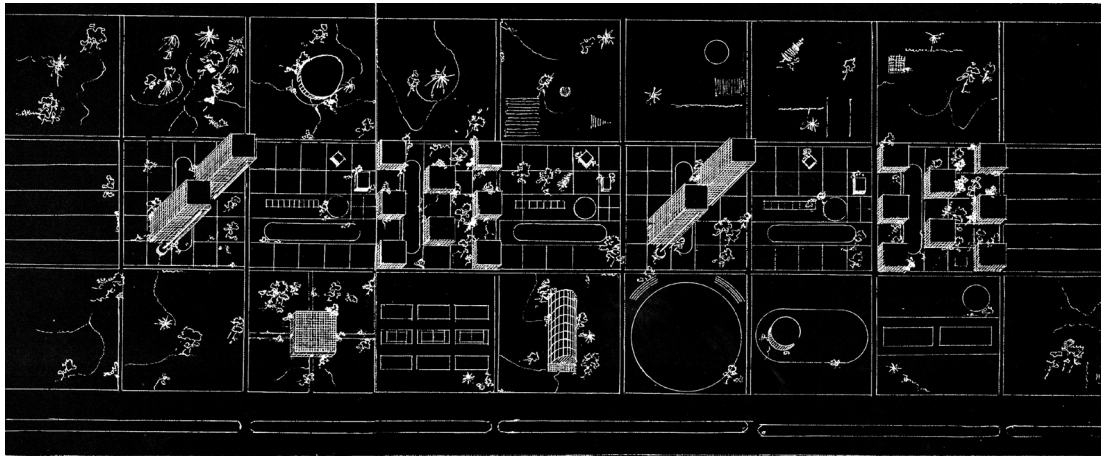
E La route de promenade et de liaison (interdite aux voitures)

F La zone verte de protection séparant l'habitat de l'usine (et contenant l'auto-route longitudinale de la cité linéaire)

G Le secteur des services communs extérieurs au logis: maternelle, écoles primaires, cinémas, bibliothèque, tous les équipements sportifs d'usage quotidien (football, tennis, course, marche, nage, etc.), jeux des enfants, clubs des adolescents, etc., jardinets particuliers (à volonté des preneurs), jardinets à fleurs, à fruits ou potagers

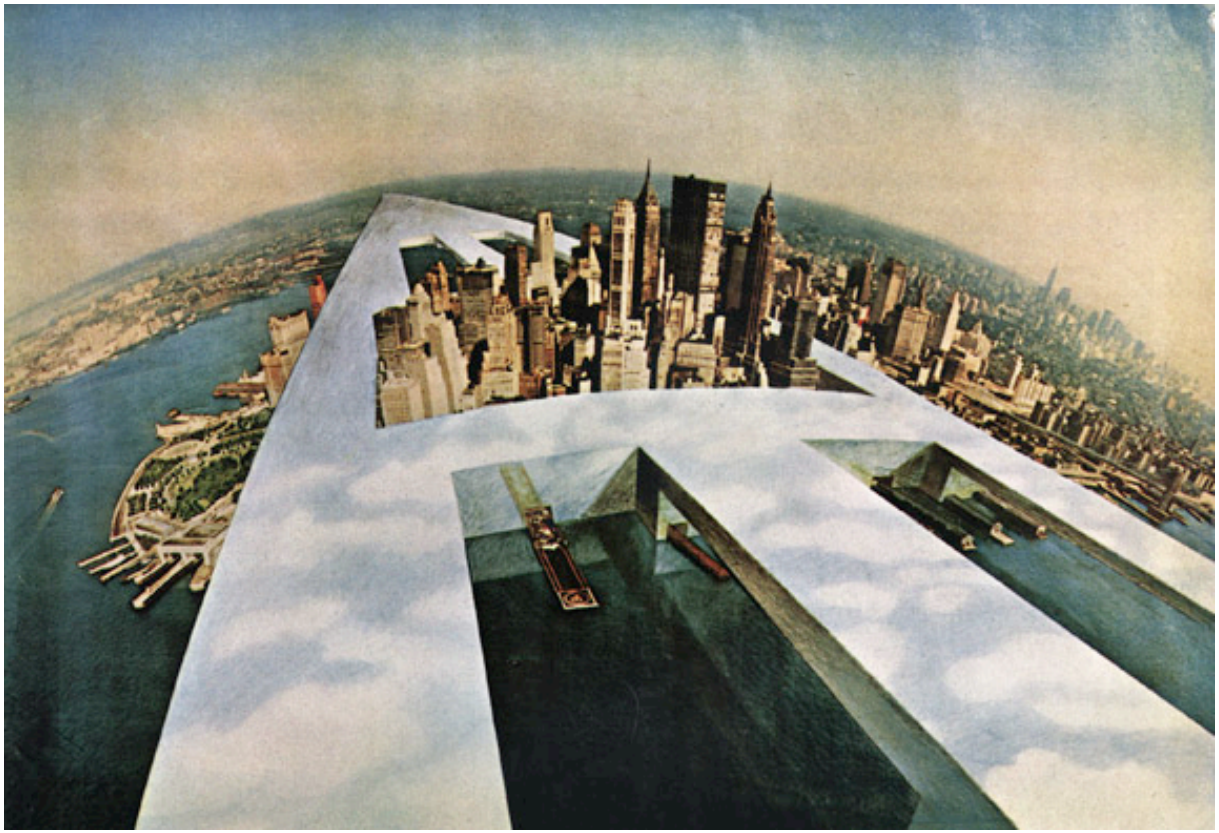
Ivan Leonidov - Magnitogorsk (1930)



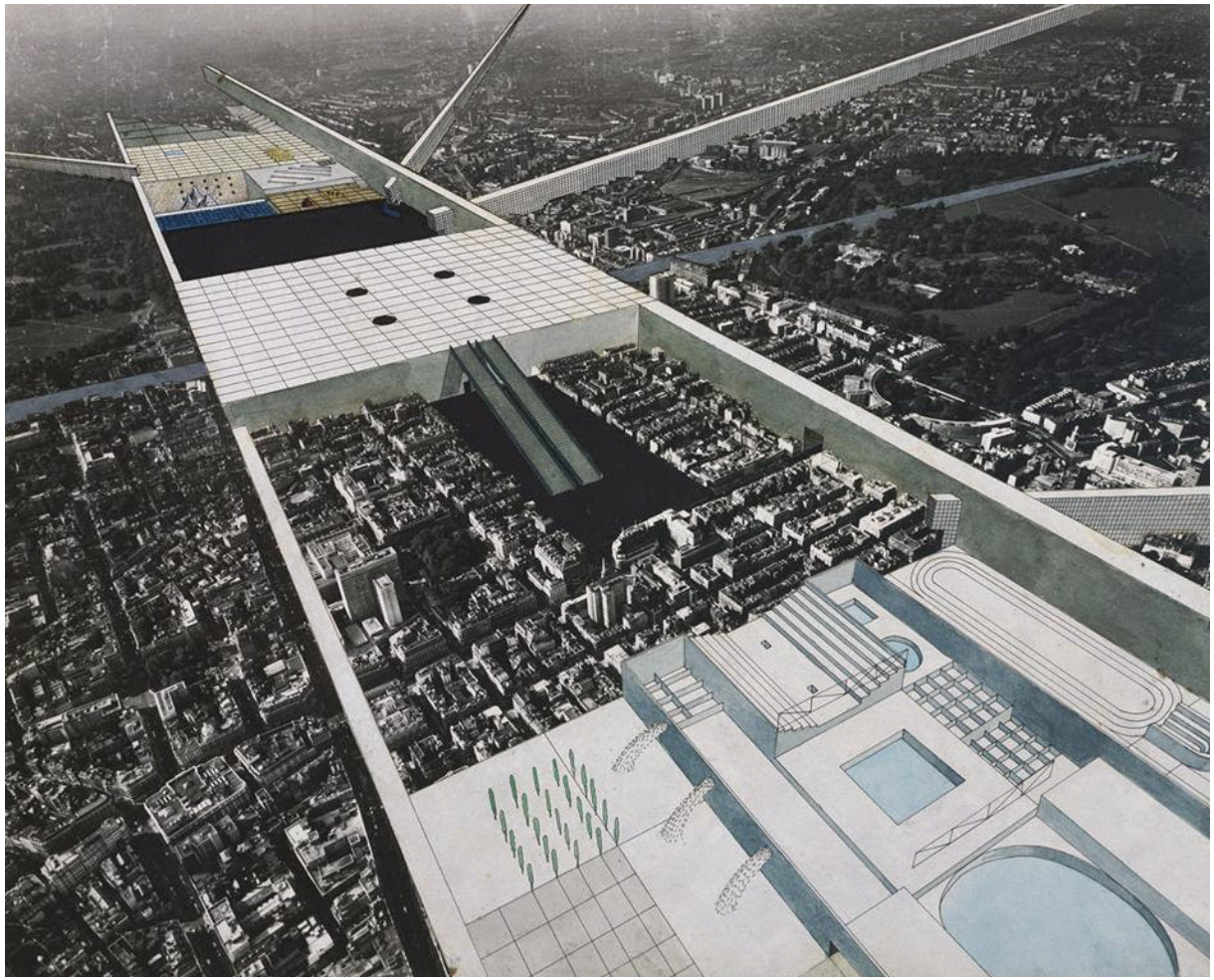


Kenzo Tange - Tokyo Bay(1960)

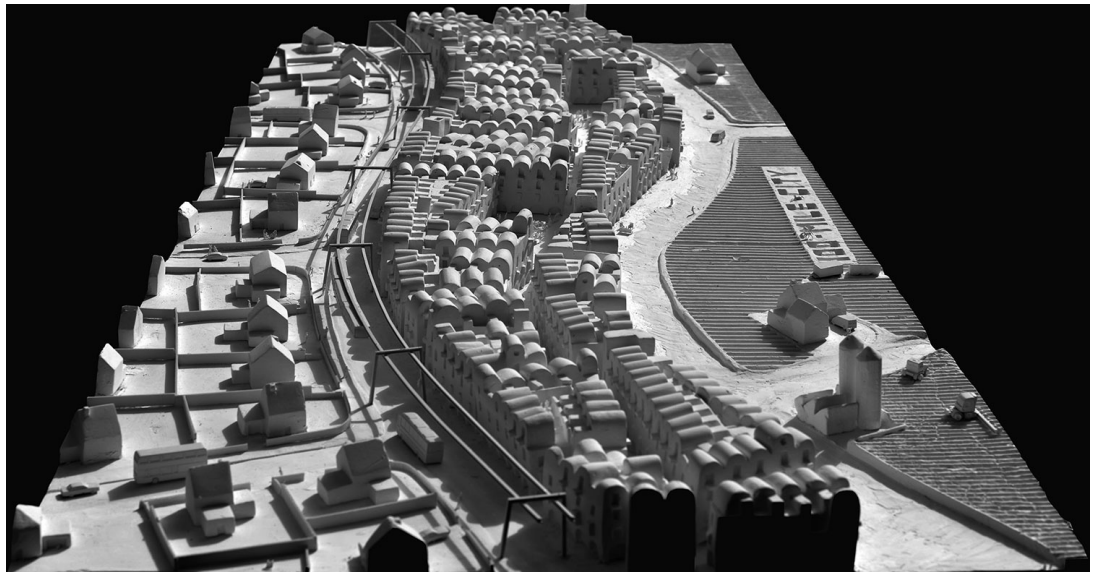
Superstudio - The Continuous Monument (1969)

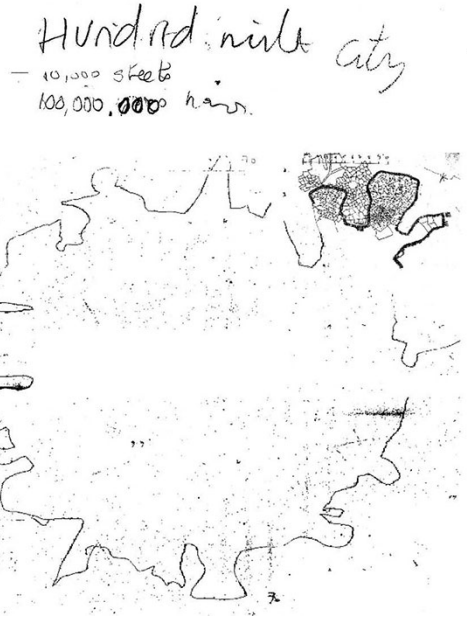


Rem Koolhaas - Exodus (1972)

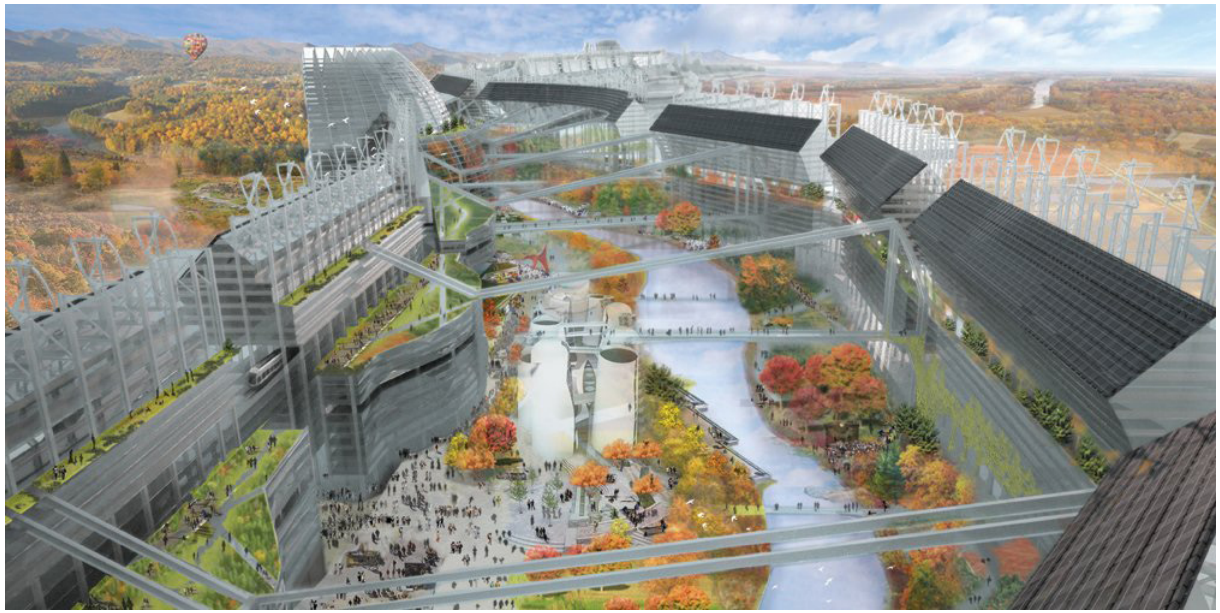


Peter Barber - 100 Mile City (2018)

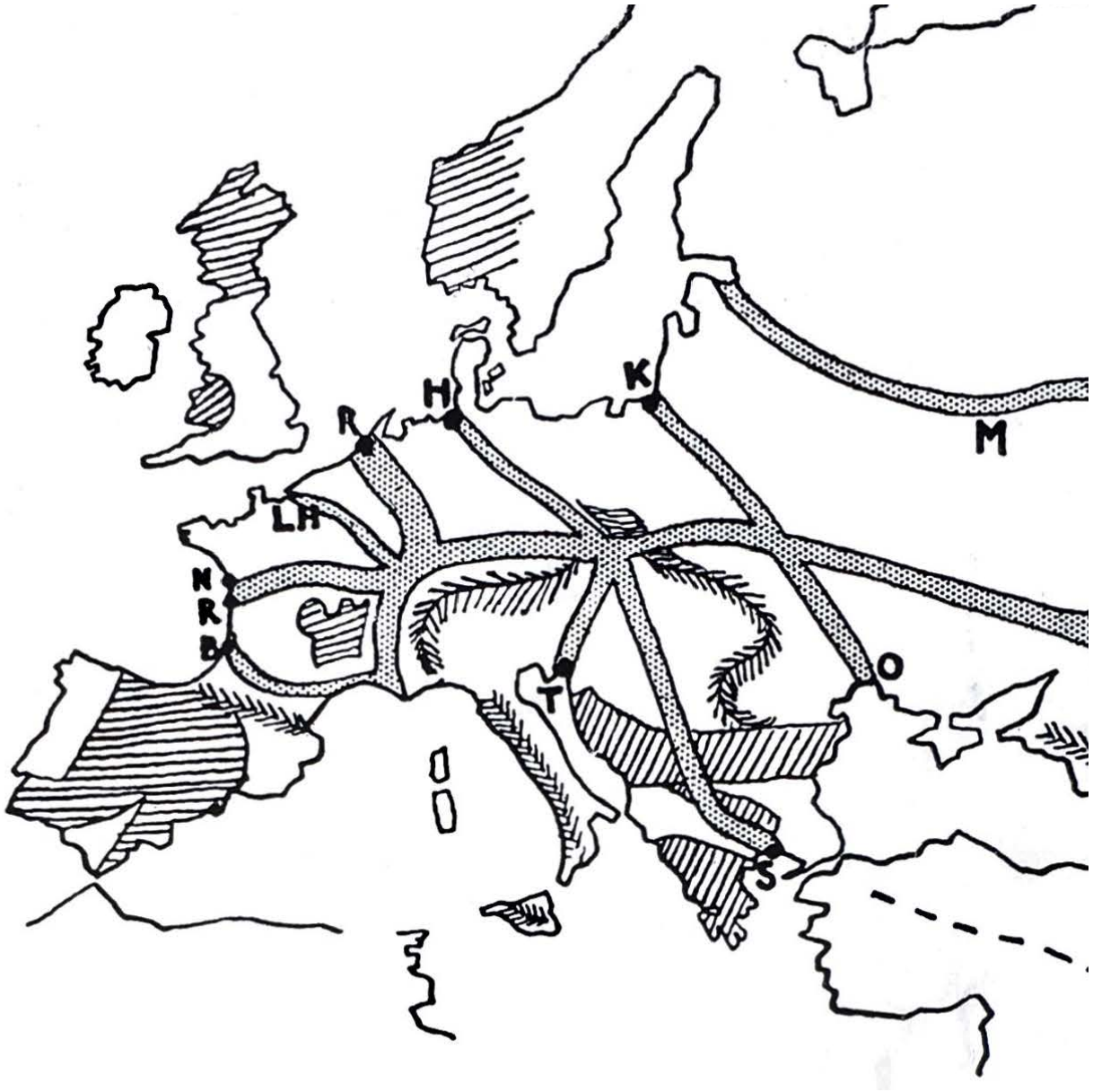




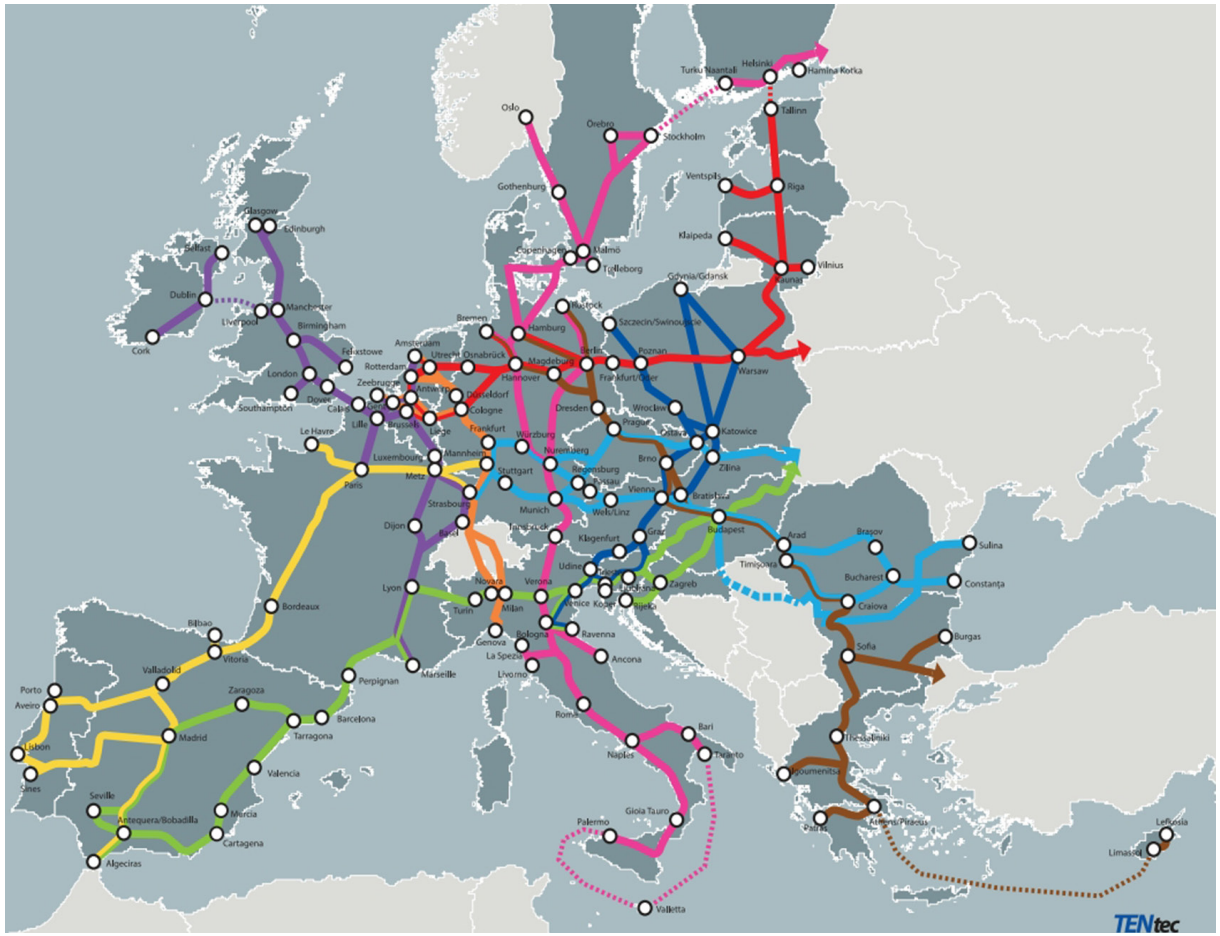
Paolo Soleri - The Lean Linear City (2018)



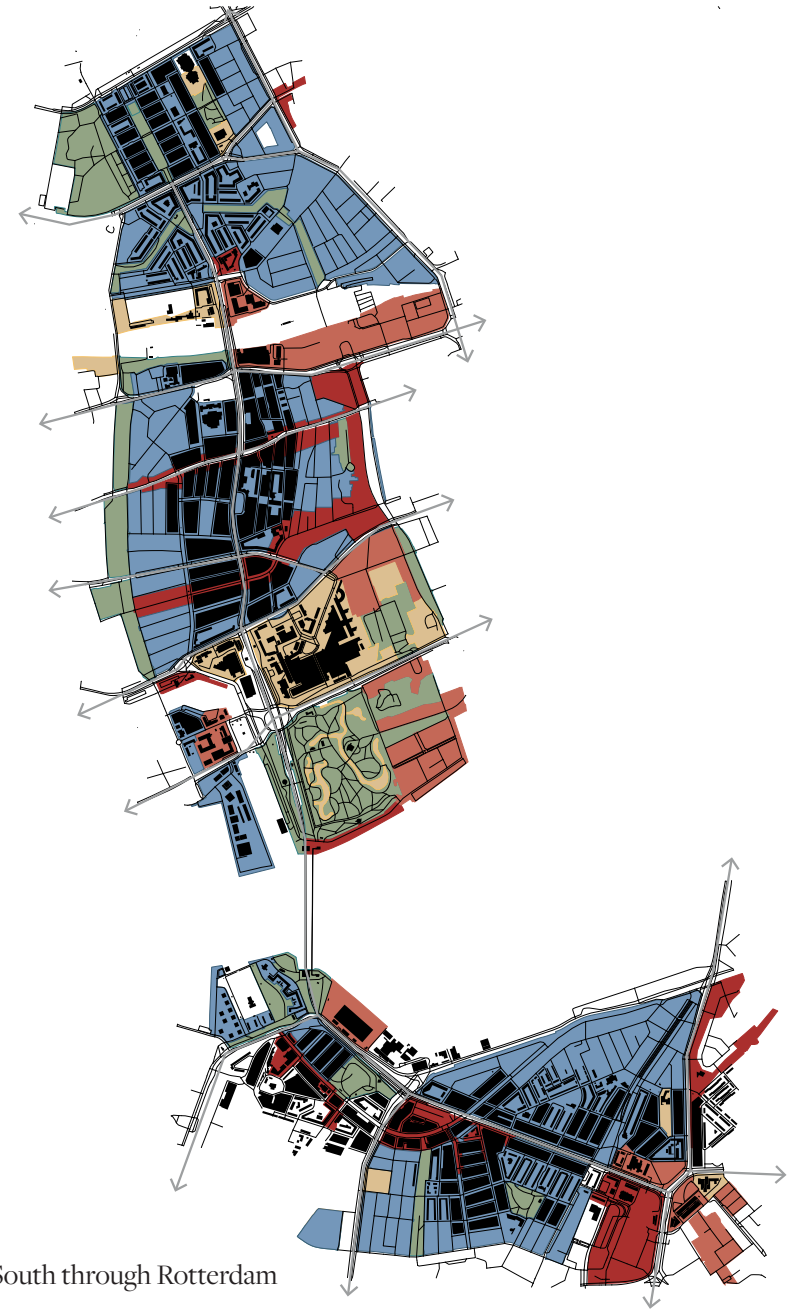
Europe as a Network of Linear Cities



European Commission - Trans-European Transport Network (TENtec) (2013-)



Linear Analysis



Key

- Residential
- Commercial
- Retail
- Socio-Cultural
- Green
- Industrial

Pleinweg - s'Gravendijkwal corridor running North-South through Rotterdam

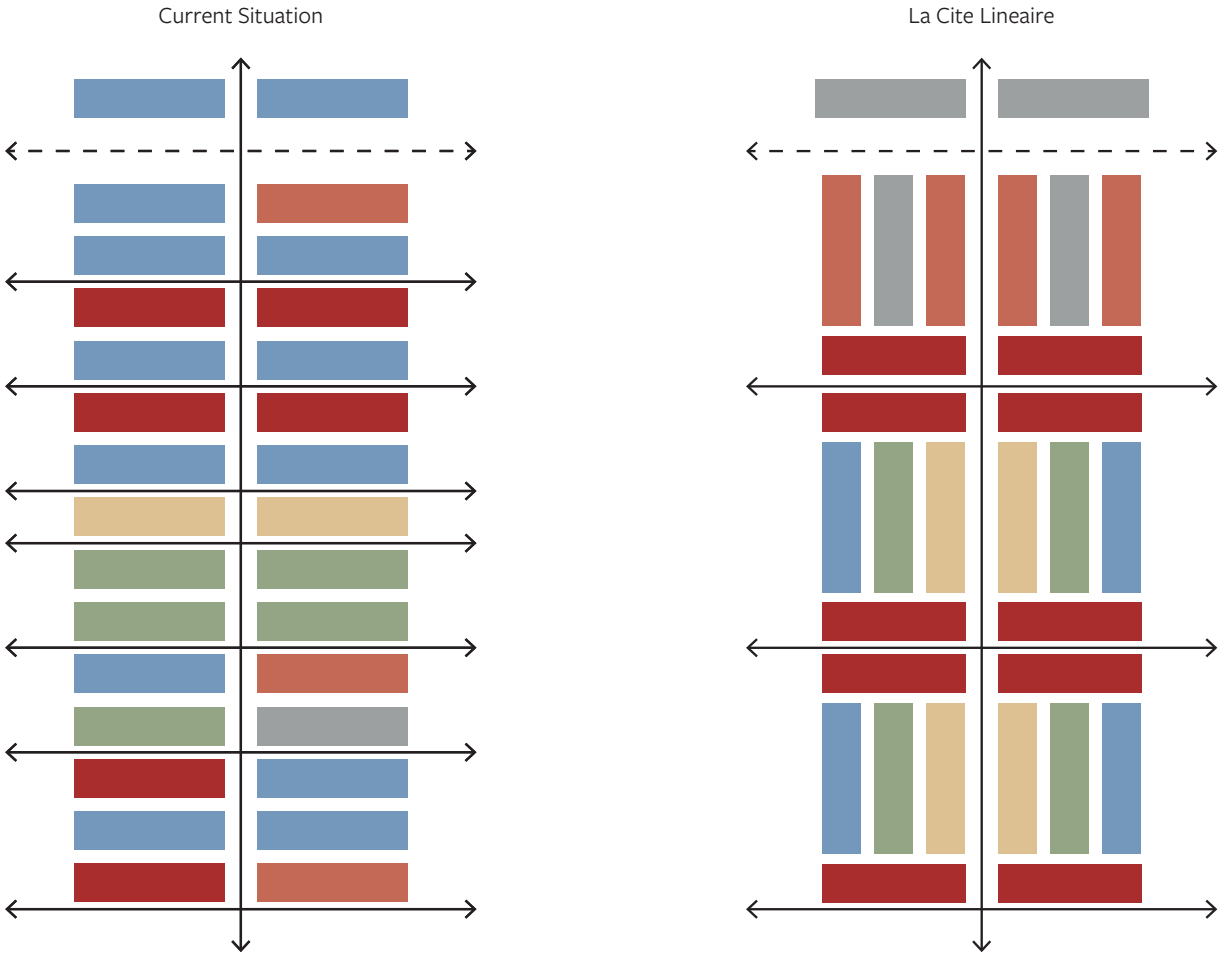
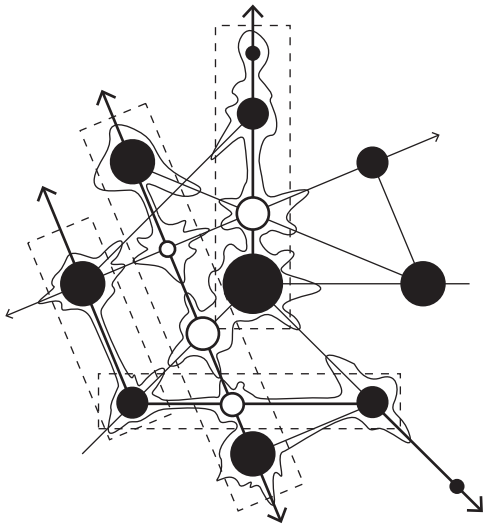


Diagram of functions along s'Gravendijkwal in Rotterdam

Dynapolis

Doxiadis, Constantinos. “On Linear Cities.” In *Urban Structure: Architects Year Book* edited by David Lewis, 49-51. London: Elek Books, 1968.

‘**Dynamic cities** – which are what I propose since we have to deal with dynamic forces – do not have any preconceived form. The “form” is the result of the analysis of their force mobile. [...] If so we can understand, for example, that there can be **linear elements of settlements** but not linear cities, and that there can be linear solutions for small areas; **when all forces with the same one direction are much greater than forces pointing in all other directions.**’



Dynapolis by Constaninos Doxiadis in the case of Rotterdam

Linear Space in a Non-Linear Urbanity

Picon, Antoine. *La Ville Territoire Des Cyborgs*. Tranches De Villes. Besançon: Les Editions de L’Imprimeur, 1998 : 28.

‘**The era of the territorial city** could well spell the end for the anthropomorphic conception of the building and the city, which has persisted since Vitruvius.’

Sprawl of urbanisation outside Tokyo

‘We are left with the urban: neither city in the classical sense of the word, nor country, but an all-devouring monster that is engulfing both city and country and in so doing effectively collapsing the old distinction.’

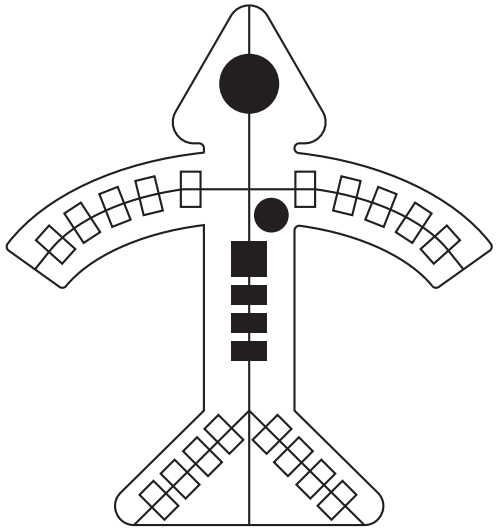
Skeates, Richard. “The Infinite City.” *City 2*, no. 8 (1997): 6.

From Anatomy to Neurology

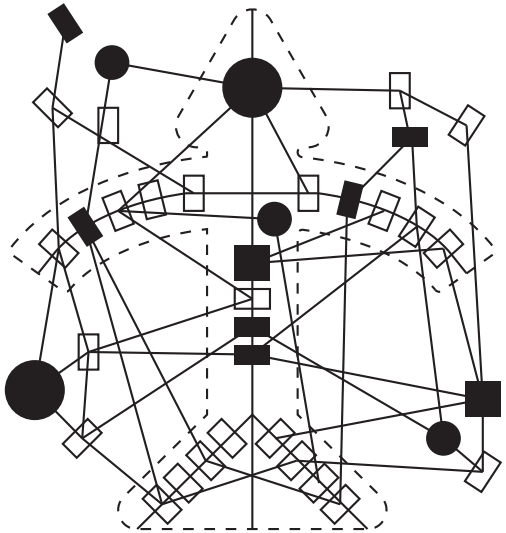
Gandy, Matthew. "Cyborg Urbanization: Complexity and Monstrosity in the Contemporary City." *International Journal of Urban and Regional Research 29*, no. 1 (March 2005): 29.

'In **the neo-organicist city** we encounter a shift of emphasis away from an anatomical conception of space as an assemblage of individual organs towards **a neurological reading of space** as a diffuse and interconnected realm of human interaction.'

1960s



2000s

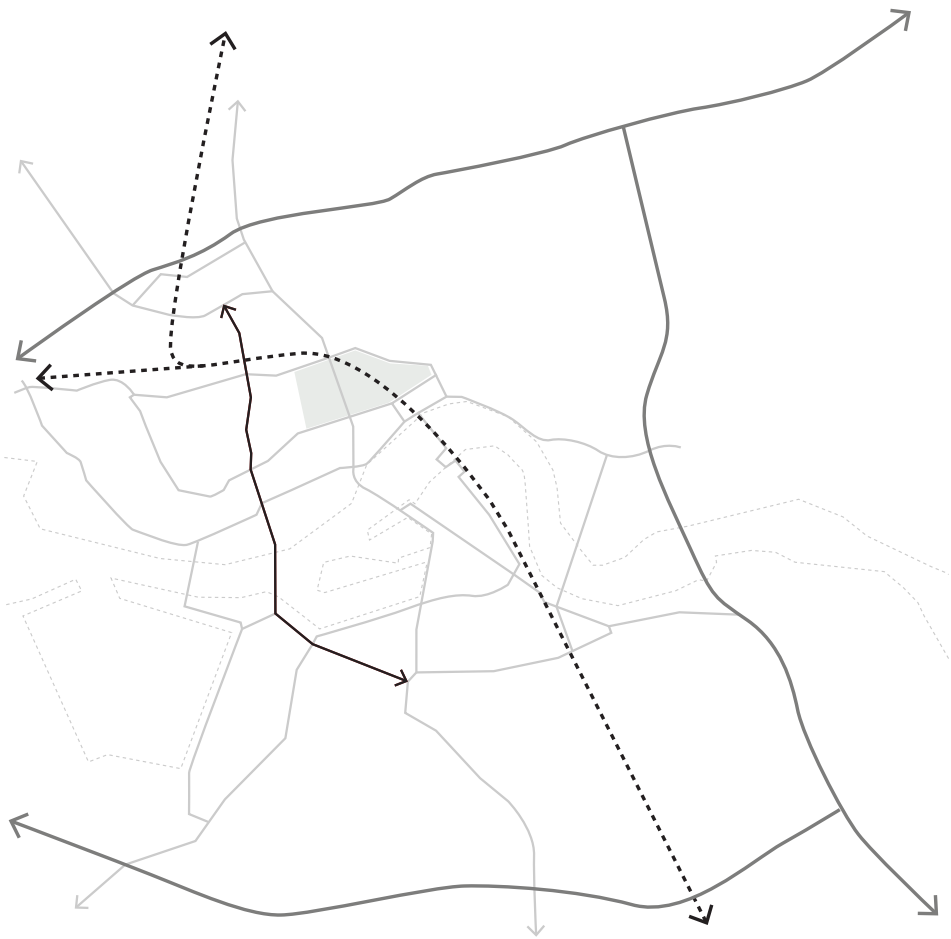


Schematic representation of Brasilia, Brazil according to Gandy's definition

Making City with Infrastructure

'human settlements have always been created by man's moving in space and defining the boundaries of his territorial interest and therefore of his settlements, for which he later created a physical and institutional structure.'

Doxiadis, Constantinos. "Ekistics, the Science of Human Settlements." *Science 170*, no. 3956 (23 October 1970): 393-404.



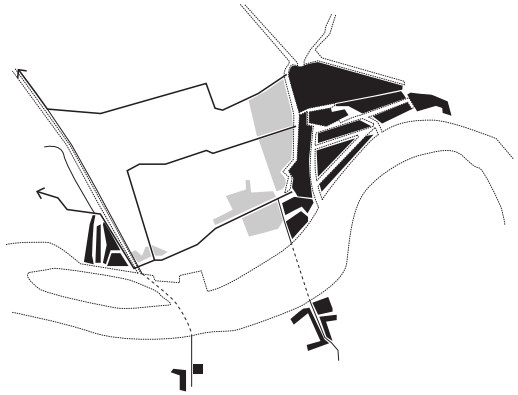
Key

- ↔ Pleinweg-Gravendijkwal
- Highway
- Boulevard
- Railway
- City Centre

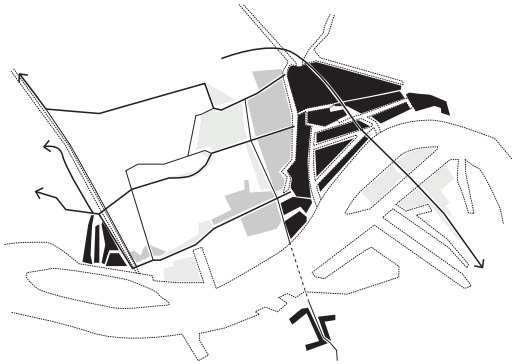
Rotterdam's primary infrastructural corridors

Historic Expansion of Rotterdam

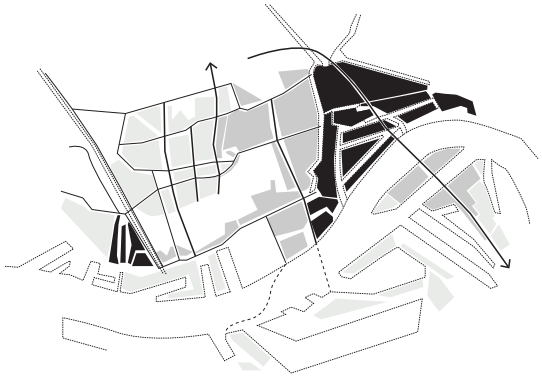
1875



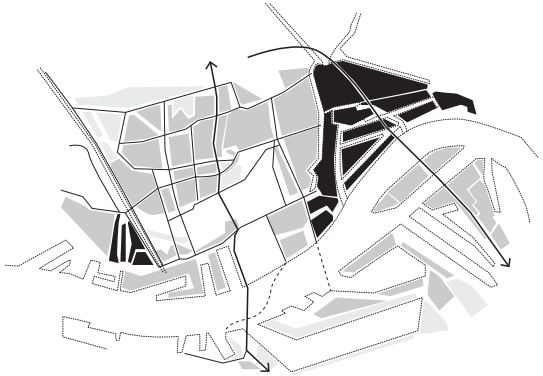
1900



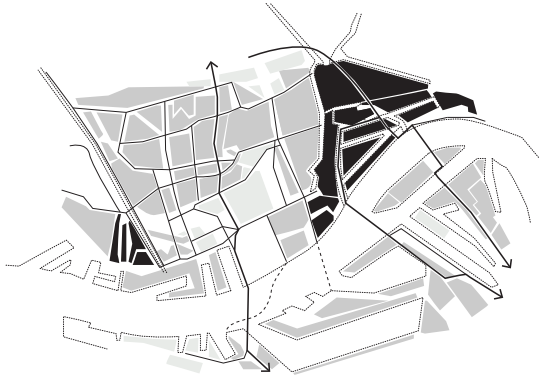
1925



1938



2000



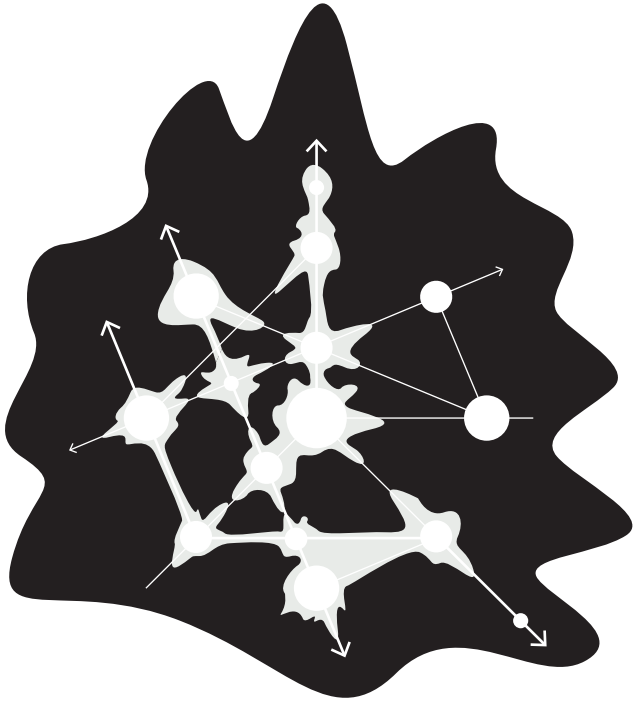
Space Syntax

Hillier, Bill. 2008. “The new science of space and the art of place : toward a space-led paradigm for researching and designing the city.” In *New urbanism and beyond : designing cities for the future*, edited by Tigran Haas. New York: Rizzoli International Publications : 39

‘This, then, is the reasoning behind the space syntax definition of **the city as a network of linked centres at different scales set into a background of residential space.** All cities seem to evolve toward some interpretation of this form if they are allowed to.’

Urban Landscape - Hillier (1980)

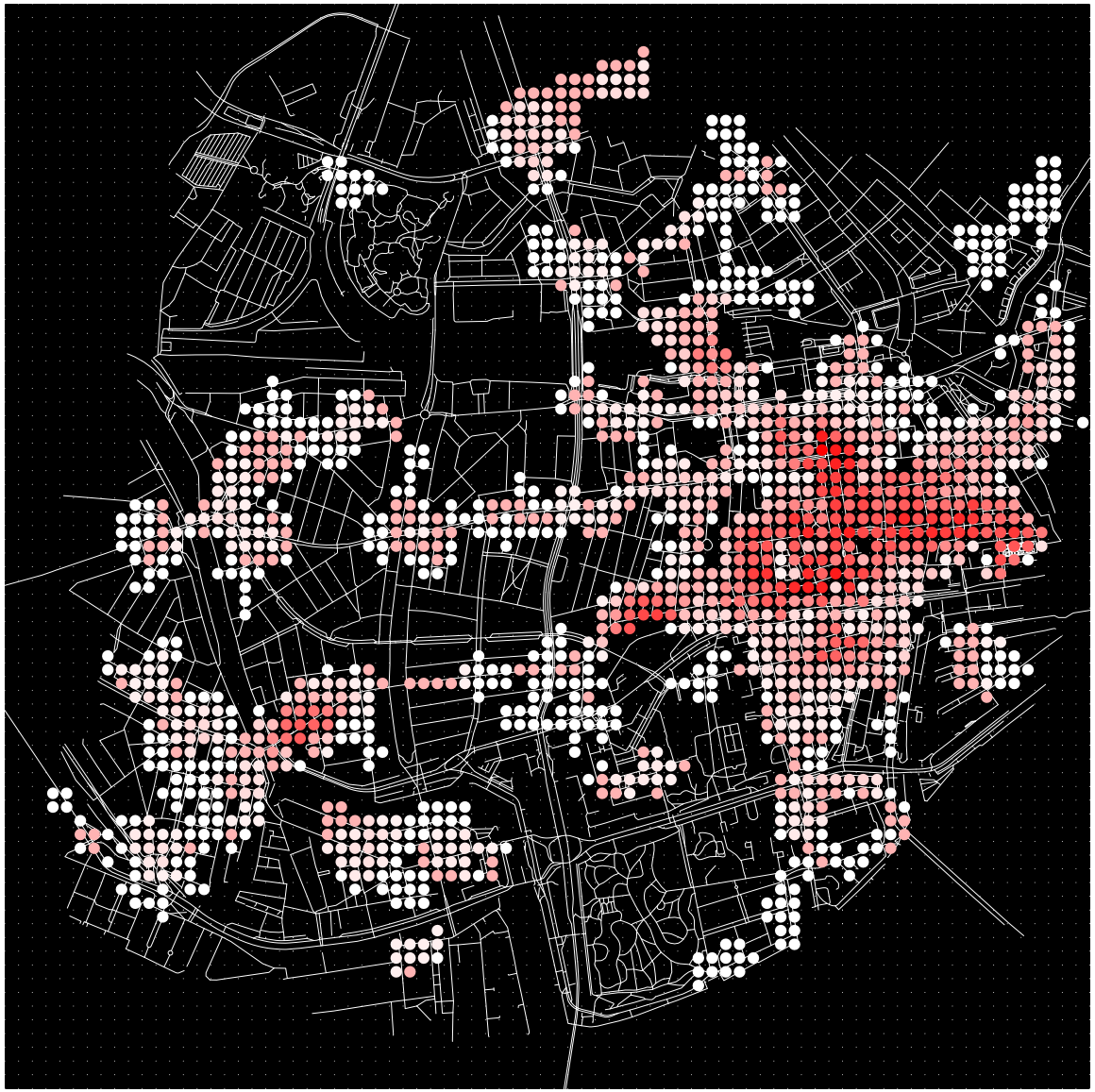
Connected, Blurred, Fragmented



Space syntax definition of the city in the case of Rotterdam

Network Analysis

Intensity of Infrastructural Nodes
Number of stops reached with gravity index for a radius of 150m from any point on the grid.



Intensity of Retail
Number of retail points reached with gravity index for a radius of 150m from any point on the grid.

City of Lines

Vector

Something physical such as a force that has size and direction.

Cambridge Dictionary

‘A City is not a homogeneous surface of urbanisation but the sum of its vectors of infrastructure.’

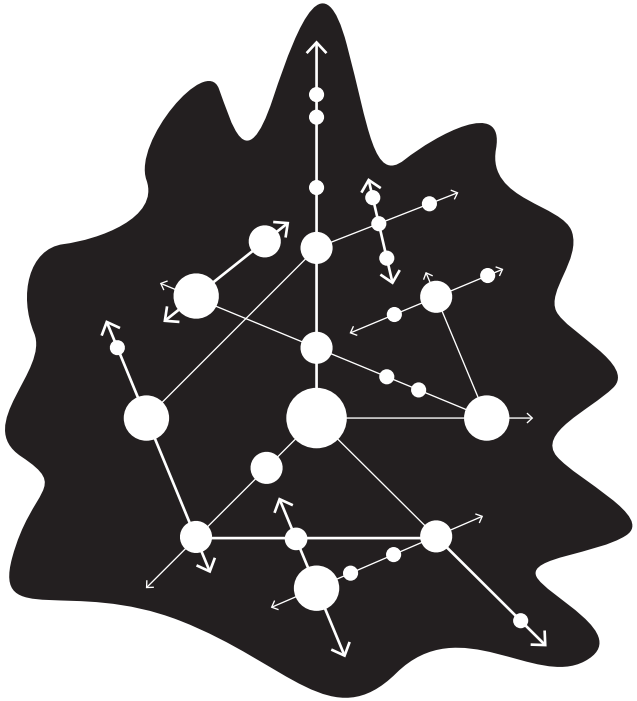


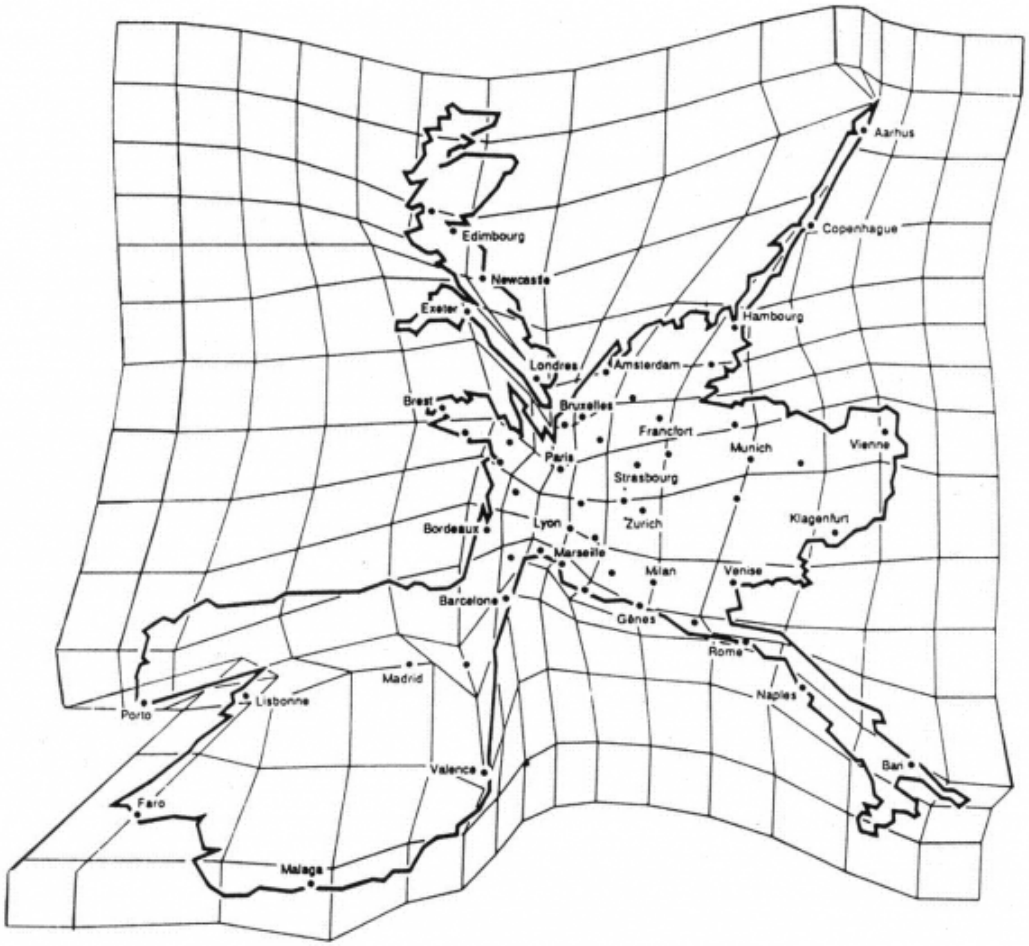
Diagram of Rotterdam as a city of vectors

Commuter Corridor: Time over Distance

Form follows Time

‘Such transition exposes strange urban landscapes where the marginal can be central; centrality can be on the urban margin, and ‘the urban’ expands far into spaces previously considered as countryside.’

Graham, Stephen, and Simon Marvin. *Splintering Urbanism : Networked Infrastructures, Technological Mobilities and the Urban Condition.* [in English] London: Routledge, 2008 : 115.



Time-space distortion map of Europe at the advent of high-speed rail connections

Picon, Antoine. *La Ville Territoire Des Cyborgs*. Tranches De Villes. Besançon: Les Editions de L'Imprimeur, 1998 : 22-23.

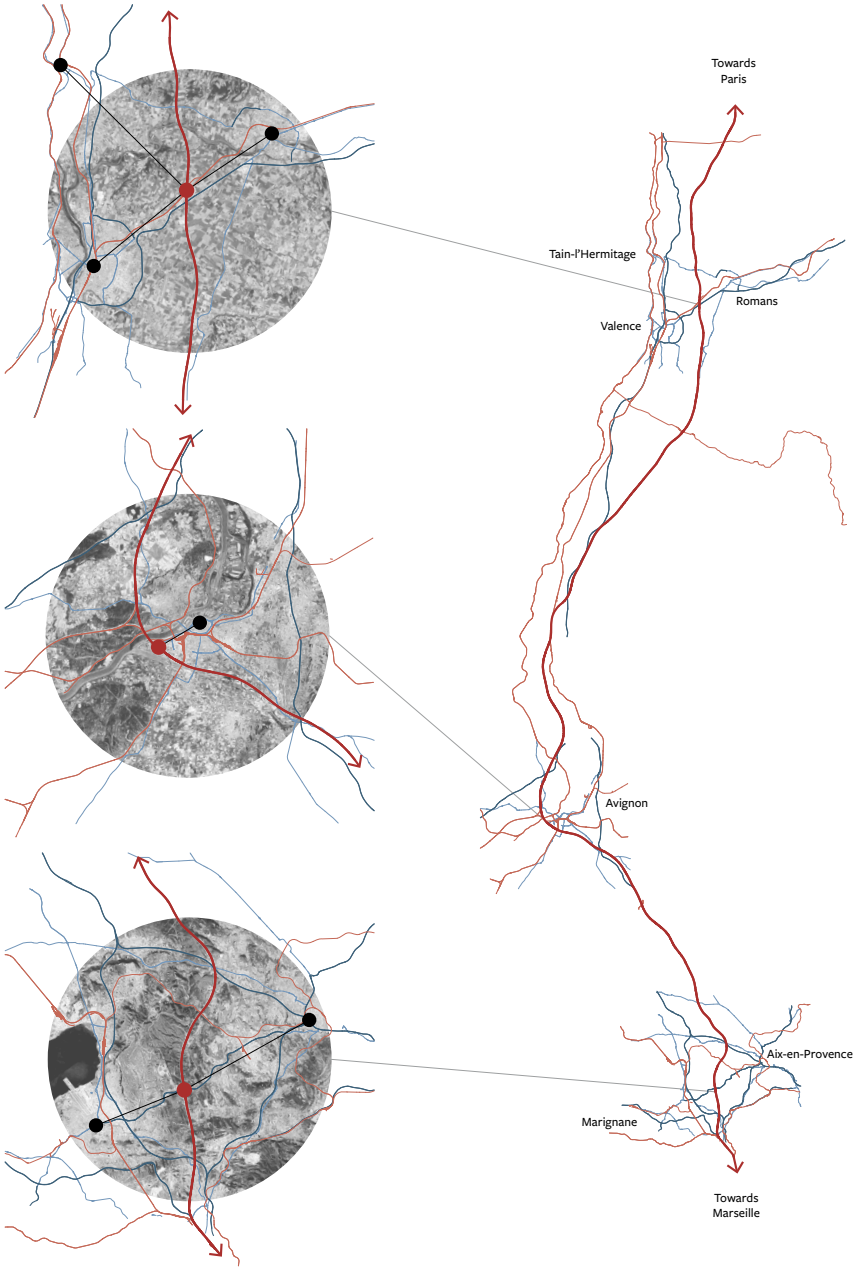
‘The substitution of **the notion of accessibility** to that of distance forces crucial distinctions into a state of crisis, such as that of centre and periphery.’

Case Study: TGV Mediterrannée

‘In this sense, there is a general shift from a single concentration of high-rise development in the easily reached downtown to a rhizoid spread of edge cities along the major infrastructural axes. Such a shift in urban form visibly marks the progression from the accessibility of the well-served central business district, to the more dispersed availability of well-connected hubs.’ (p.15)

‘When superposed on the existing landscape, the network usually spawns development that inevitably combines both global and local features. The merging of these two characteristics is exactly what makes the specificity of the place.’ (p.36)

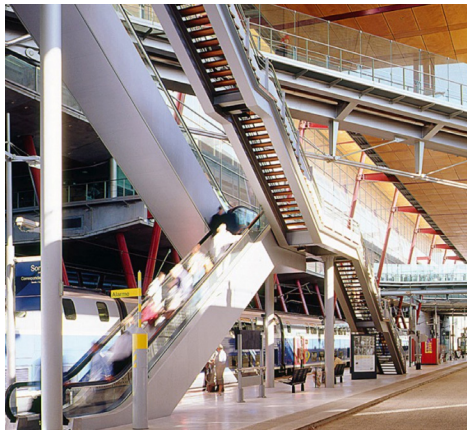
Shannon, Kelly, and Marcel Smets. *The Landscape of Contemporary Infrastructure*. [in English] Rotterdam: nai010 publishers, 2016.



Valence TGV

26300 France

Execution by AREP Group w/ Gares & Connexions
Landscaping by Desvigne et Dalnoky
2001



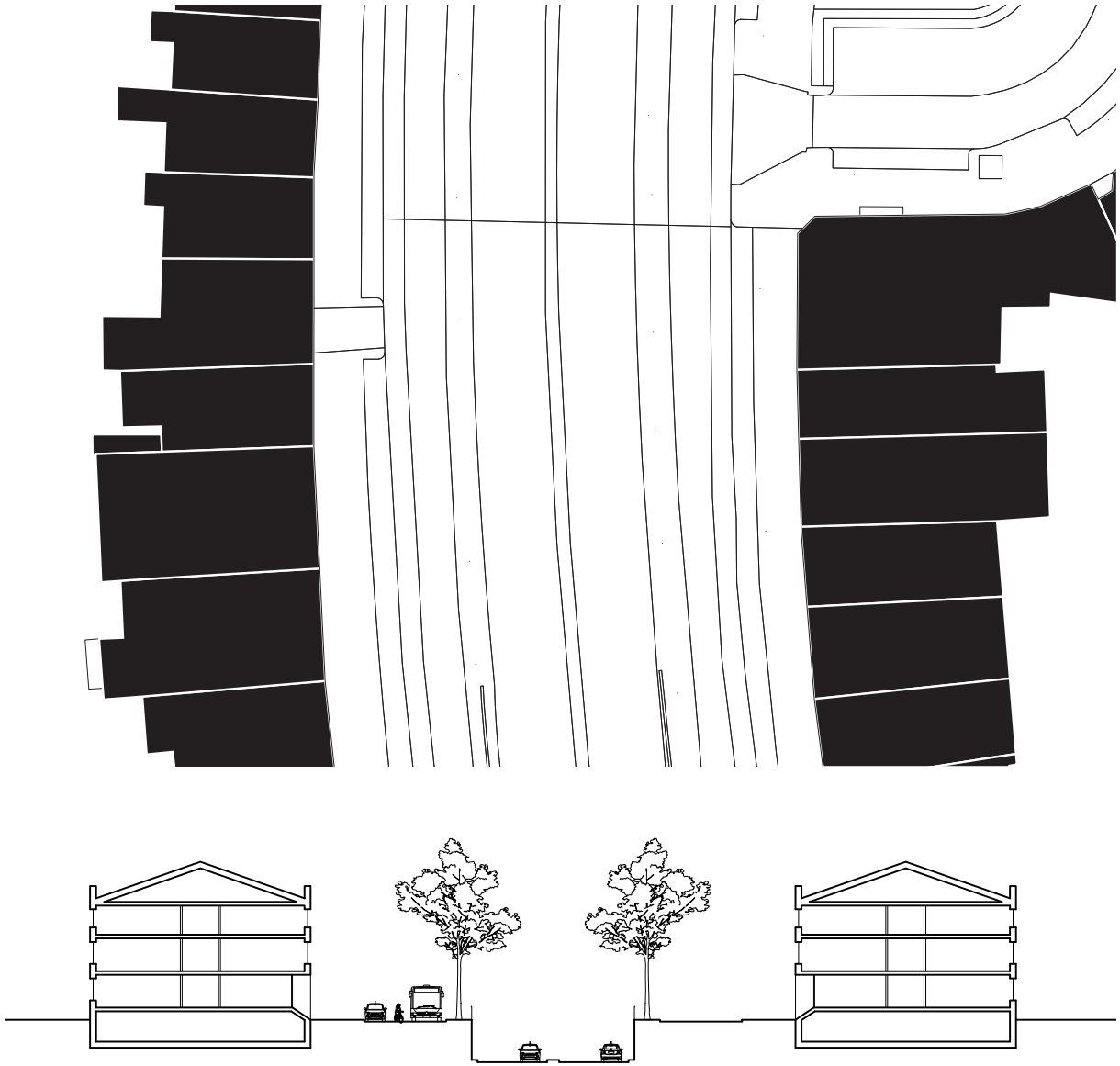
Speed Space

Corridor

‘Latin *currere* - to run, the “corridor” can be somehow considered as “part of a building which runs”, or a “strip of land which runs”’

Furundzic, Danilo, and Bozidar Furundzic. “Infrastructure Corridor as Linear City.” In *1st International Conference on Architecture & Urban Design*, edited by EPOKA University. Albania: EPOKA University, 2012.

s’Gravendijkwal, a roadway artery through the city



Indicative plan and section of s'Gravendijkwal

Masstunnel cycle connection,
an expression of speed and linearity

Maastunnel vent shaft and entrance, a landmark along the river

Splintered Myth

Poly-centrism

‘[...] because malls usually function as the village squares of these new urbs. [...] These new urban agglomerations are such mavericks that everyone who wrestles them to the ground tried to brand them. Their list of titles by now has become marvellous, rich, diverse, and sometimes unpronounceable.’

Garreau, Joel. *Edge City : Life on the New Frontier*. [in English] New York: Anchor Books, 1992 : 4-5

Tyson’s Corner, VA, USA is the largest retail area on the east coast but it is a city without a local civic government.

Shannon, Kelly, and Marcel Smets. *The Landscape of Contemporary Infrastructure.* [in English] Rotterdam: nai010 publishers, 2016 : 16

‘There is a general shift from a single concentration of high-rise development in the easily reached downtown to **a rhizoid spread of edge cities along the major infrastructural axes.** Such a shift in urban form visibly marks the progression from the accessibility of the well-served central business district, to the more dispersed availability of **well-connected hubs.**’

Illegible Space

Picon, Antoine. *La Ville Territoire Des Cyborgs*. Tranches De Villes. Besançon: Les Editions de L'Imprimeur, 1998 : 27.

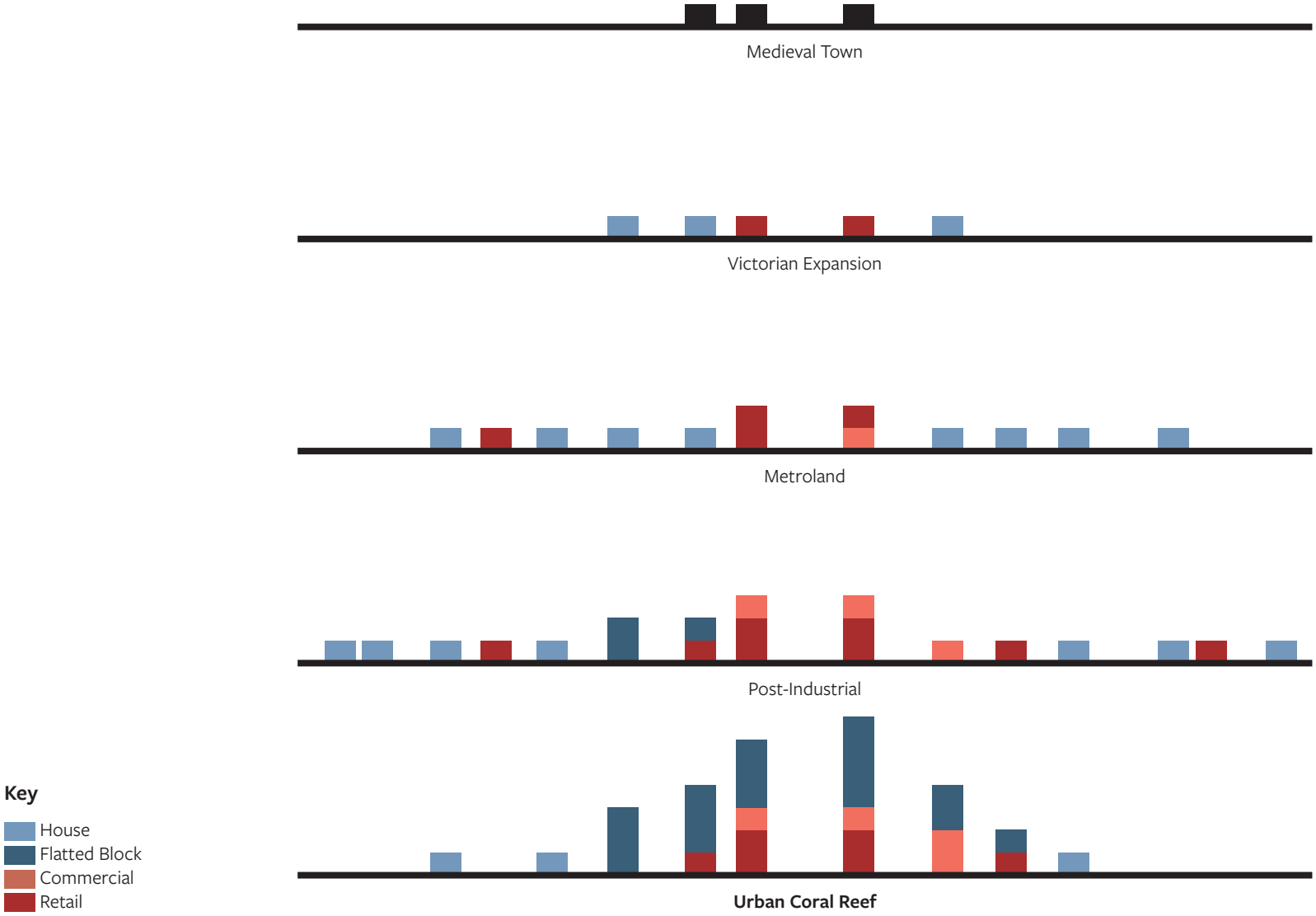
‘No one knows exactly **what is suitable to celebrate** on a public square or along a monumental avenue [...]. Airport terminals, office building patios, supermarkets and other shopping malls could represent **the true public spaces of the territorial city.**’

The Urban Coral Reef

Urban Exodus

Garreau, Joel. Edge City : *Life on the New Frontier*. [in English] New York: Anchor Books, 1992 : 4.

First, we moved our homes out past the traditional idea of what constituted a city. [...]
Then we wearied of returning downtown for the necessities of life, so we moved our marketplaces out to where we lived. [...]
Today, we have moved our means of creating wealth, the essence of urbanism - our jobs - out to where most of us have lived and shopped for two generations.

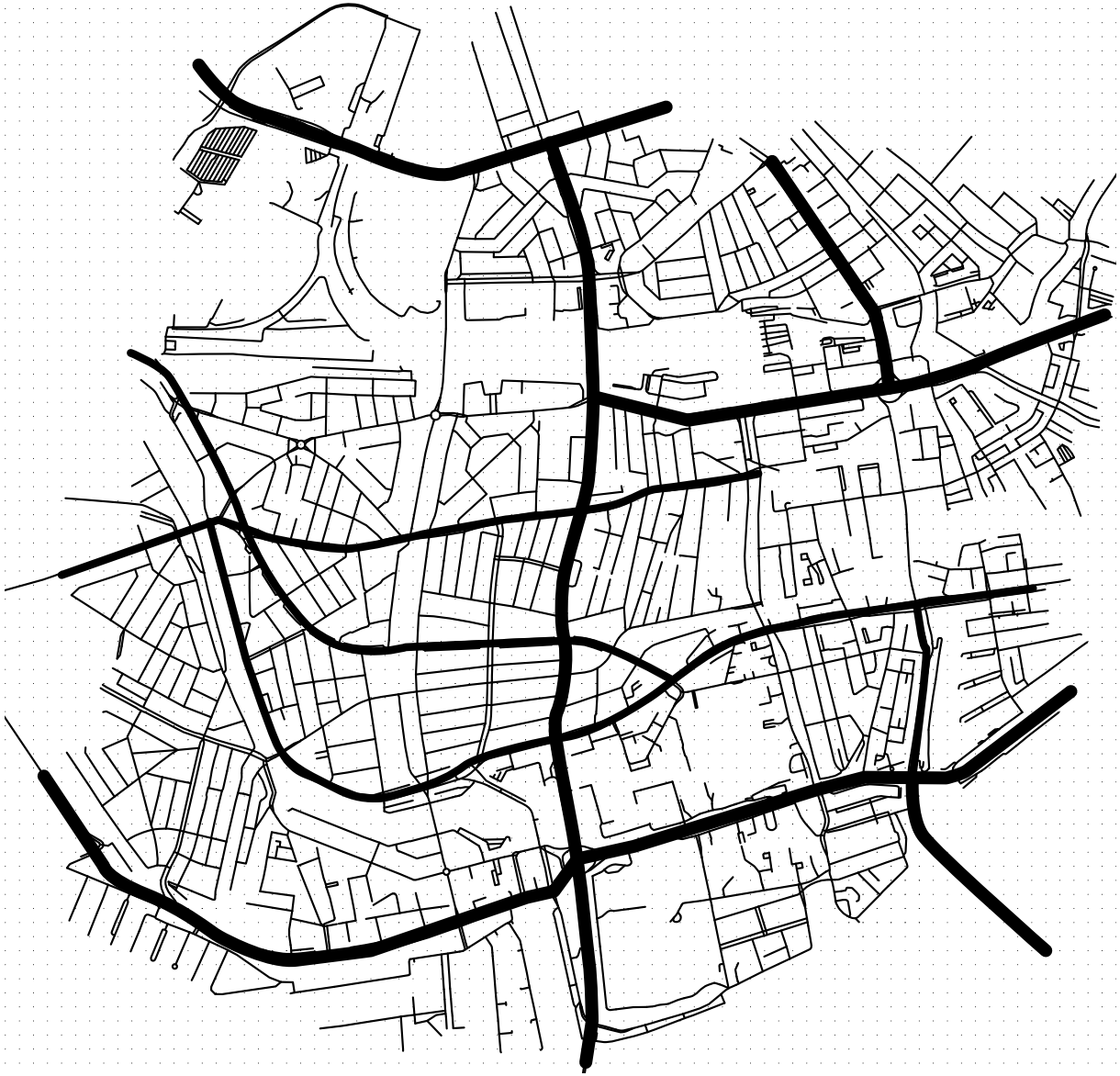


A history of urbanisation according to Joel Garreau, the Urban Coral Reef is the next chapter

Thick infrastructure

Rogers, Susan. "Thick Infrastructure." Cite, *The Architecture and Design Review of Houston* 63 (Fall 2011): 447-50.

'Thick Infrastructure, defined here as the expansion of public works projects to include elements that enhance civic and public spaces or the adaptation of existing, **single-purpose infrastructural landscapes into more robust, multifunctional systems**. This is a new conception of what infrastructure can be, and how decision-making processes can be transformed to **merge public investments with the goal of enriching our diverse communities**.'



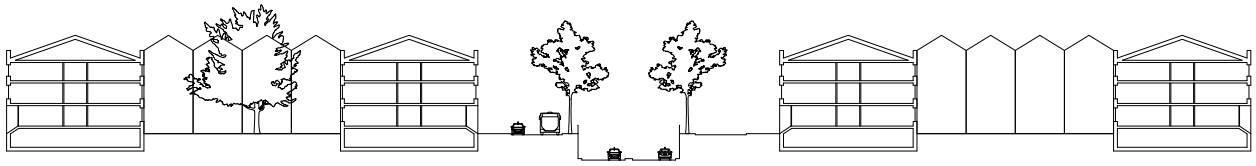
Rotterdam's road infrastructure according to its size and importance, a 'thick space'.

Densification

How can the density of urban development reflect the intensity of its infrastructure? Street profiles provide an insight into the relationship between height and width of streets according.

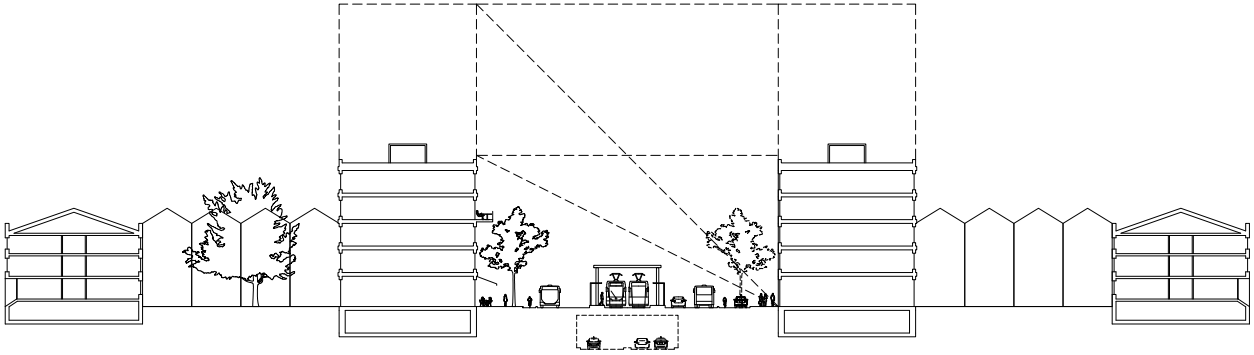
Existing

Street to building height ratio: **4:1**
Walk up + 2 floors
Residential ground floor, inactive street front
Lack of visual or physical continuity
across width of street



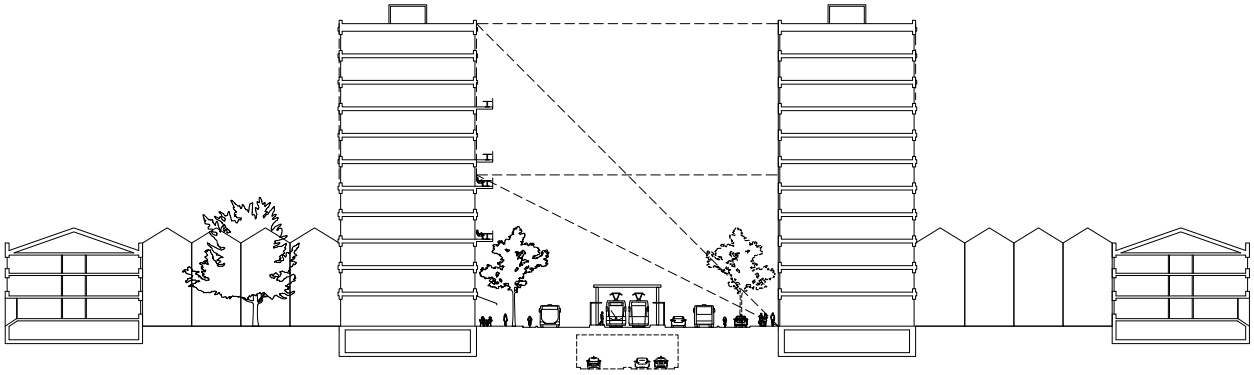
Between nodes

Street to building height ratio: **2:1**
Ground + 4 floors
Active ground floor: cafés, flower shop, book store, co working space
Continuity across width of street



At intersection

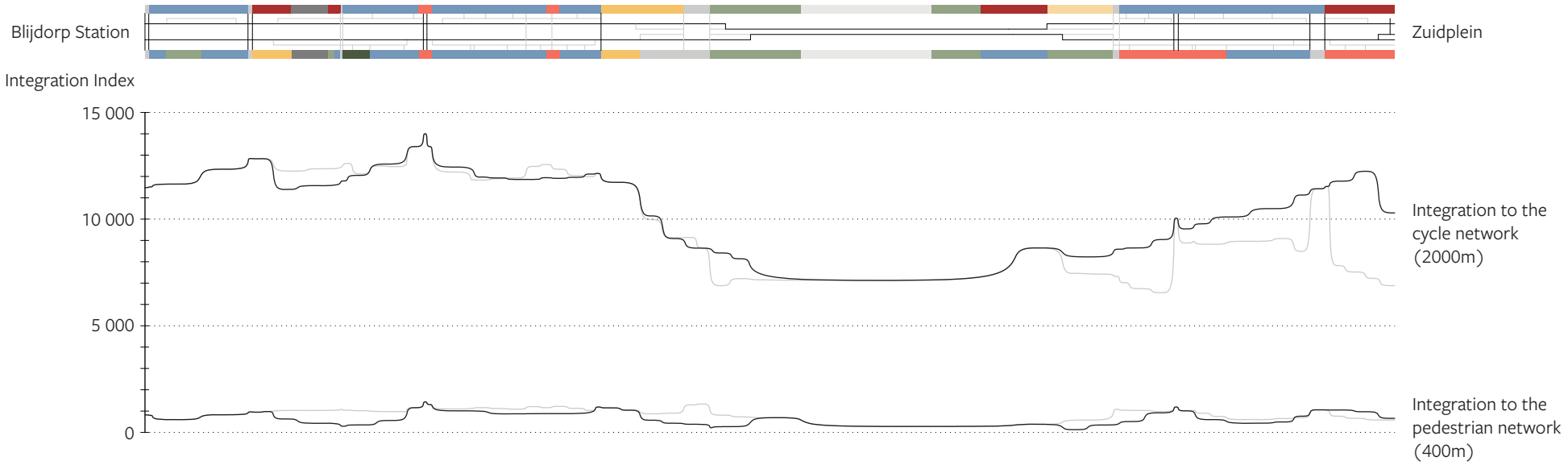
Street to building height ratio: **1:1**
Ground + 10 floors
Active ground floor: supermarket, office lobby, civic space
Bus and tram stops are clearly identifiable and easily accessed



Integrated Intensity

Allen, Stan. 1997. “From Object to Field.”
Architectural Digest 67 (127):24-31.

‘The new institutions of the city will perhaps occur at **moments of intensity** linked to the wider network of the urban field, and marked not by demarcating lines but by **thickened surfaces**.’



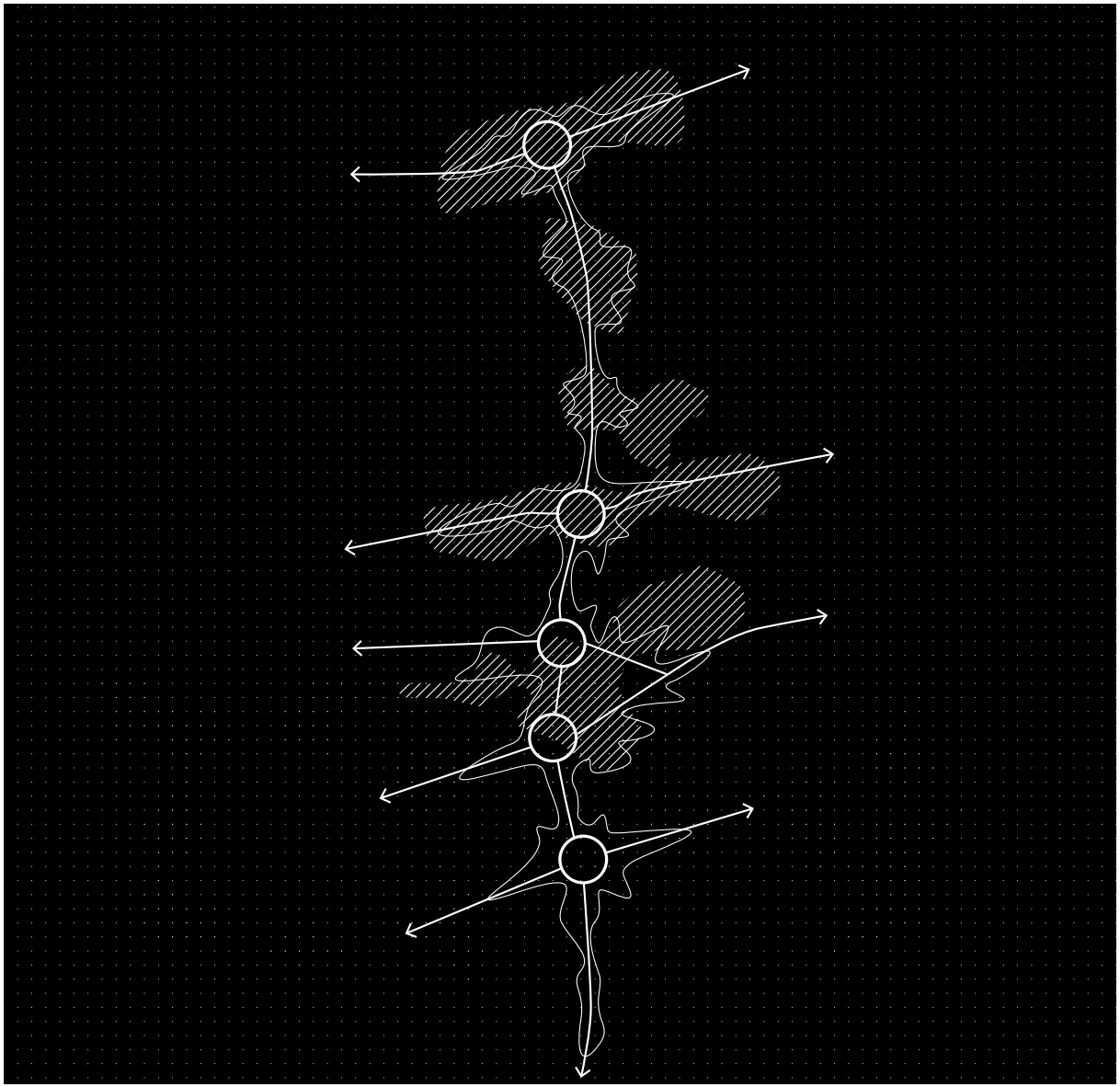
Graph showing the relationship between function and the level of integration of the street to the wider network of the city.

Conclusion

Departure

Picon, Antoine. *La Ville Territoire Des Cyborgs*. Tranches De Villes. Besançon: Les Editions de L'Imprimeur, 1998 : 39.

‘It is time to look at the territorial city of today without too much nostalgia, animated by the hope of detecting the seeds of **a new form of solidarity.**’



s'Gravendijkwal as a space of overlapping fields of intensity.

Ambition

We can reshape such linear spaces into ‘coral reefs’, havens within the chaos of urbanity and provide a renewed sense of legibility for the urbanites who swim here. Using the threads of infrastructural corridors as the vectors of planned, integrated development, we may begin to reconquer the ‘sea’ of our own making.


Theatre
WARNING
SEX OFFENDER
LOYTER
HERE
LADIES
PHARMACY
CHICKEN HOUSE
IL CAFFE
ITALIA 1
HERITAGE
SARA MINI MARKET
361

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