Why Public Space Matters:

Research on Economic, Social and Environmental Benefits





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Thematic Session "Placemaking With Communities"

Centre for the Future of Places

KTH (Stockholm) research centre evolving from the Future of Places partnership, a 4-year forum developing key messages for the New Urban Agenda, bringing together over 1,500 researchers, professionals, government leaders and activists from 275 organizations in 100 countries.

The forum's primary focus is on public space as the essential connective framework for healthy urbanization.

Key Messages (excerpt):

"The Future of Places affirms the role of public spaces as the essential connective network on which healthy cities and human settlements grow and prosper. Public spaces enable synergistic interaction and exchange, creativity and delight, and the transfer of knowledge and skills. Public spaces can help residents to improve their prosperity, health, happiness and well-being, and to enrich their social relations and cultural life..."

Developed and approved at Habitat III, October 2016; Adopted by consensus by all 193 countries, December 2016

Several historic UN initiatives in last two years:

- COP21 Climate Negotiations (December 2015)
- Sustainable Development Goals (October 2015)
- Habitat III – defining the "New Urban Agenda" (October 2016)

Public space linkages between documents:

New Urban Agenda:

37. We commit ourselves to promoting ***safe, inclusive, accessible, green and quality public spaces...***

Sustainable Development Goals, Target 11.7:

- *By 2030, provide universal access to* ***safe, inclusive and accessible, green and public spaces...***

New Urban Agenda:

“Compactness and density.... mixed use...”
“walkable”... “prioritizing renewal, regeneration and retrofitting...”
“Well-connected”... “polycentric”… “urban spatial frameworks”...

United Nations A/CONF.226/4*

General Assembly

Draft outcome document of the United Nations Conference on Housing and Sustainable Urban Development (Habitat III)

Note by the secretariat

Public space in the New Urban Agenda:

*37. We commit ourselves to promoting safe, inclusive, accessible, green and quality **public spaces**, including streets, sidewalks and cycling lanes, squares, waterfront areas, gardens and parks, that are multifunctional areas for **social interaction and inclusion, human health and well-being, economic exchange and cultural expression** and dialogue among a wide diversity of people and cultures, and that are designed and managed to ensure human development and build peaceful, inclusive and participatory societies, as well as to promote living together, **connectivity and social inclusion.***

Public space in the New Urban Agenda:

67. We commit ourselves to promoting the creation and maintenance of ***well- connected and well-distributed networks of open, multipurpose, safe, inclusive, accessible, green and quality public spaces****, to improving the* ***resilience of cities to disasters and climate change****, including floods, drought risks and heatwaves, to* ***improving food security and nutrition, physical and mental health, and household and ambient air quality, to reducing noise and promoting attractive and liveable cities****, human settlements and urban landscapes and to* ***prioritizing the conservation of endemic species****.*

(Etc. - 9 paragraphs total)

Polycentrism, Mixed Use, Agglomeration Benefits:

51. We commit ourselves to promoting the development of urban spatial frameworks, including urban planning and design instruments that support sustainable management and use of natural resources and land, ***appropriate compactness and density, polycentrism and mixed uses,*** *through infill or planned urban extension strategies, as applicable, to trigger* ***economies of scale and agglomeration,*** *strengthen food system planning and enhance resource efficiency, urban resilience and environmental sustainability.*

Public space benefits per the New Urban Agenda:

...social interaction and inclusion

...human health and well-being

...economic exchange

...cultural expression

...improving resilience of cities to disasters, climate change

...physical and mental health

...household and ambient air quality, to reducing noise

...promoting attractive and liveable cities [and] human settlements

...prioritizing the conservation of endemic species

(etc)

Database on public space research (KTH)

	Behavior	Main Finding	Key concept	Reference
..	---	Detached single...	Real estate value	Cho, S.-H.,
..	---	Recreation and...	Real estate value	Kovacs, K.
..	Attraction	provision of publ...	Restorative activities	---
..	Play	"The example of...	Restorative activities (entertainment)	Oosterman
..	Play	the child's freed...	Restorative activities (play)	Lennard, H
..	Play	In order to prom...	Restorative activities (Play)	Ergler, C. F
.	Play	1) the duration o...	Restorative activities (Play)	Anastasia
.	Viewing	High visibility an...	Safety	Schroeder,
	Movements	Sense of commu..	Sense of community	---
.	Sense of C...	The described s...	Sense of community	Joines-Nov
	Sense of C...	Results indicate ...	Sense of community	Pendola, R
	---	Spatial distributi...	Sense of community	Talen, E. (2

White Paper

on

Valuing the Benefits of Public Space Systems

Michael W Mehaffy
Structura Naturalis Inc.
Sustasis Foundation

10 July 2015

NOTE: This paper was first prepared for Strelka KB, whose support is gratefully acknowledged.

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Valuing the Benefits of Public Space Systems (Mehaffy, 2015)

EXECUTIVE SUMMARY

Recent research has provided a clearer picture of the importance of interconnected public space systems in cities – that is, the connected systems of streets, plazas and parks, and the private-space systems that adjoin them. Following are key conclusions of the new research:

1. ***Economic benefits.*** The economic interactions of a city are dependent, to a surprising degree, on a well-connected, well-functioning public space system. To the extent this system is degraded or nonexistent, the city's economy will under-perform.

2. ***Transport benefits.*** Well-designed streetscapes can increase walking and public transit use, and help to reduce vehicular traffic congestion (and the cost of building and maintaining expensive vehicular infrastructure). The corollary is that a degraded streetscape system will contribute to induced demand for automobile travel, resulting in greater congestion, infrastructure cost and other negative impacts.

3. ***Social benefits.*** A comfortable, attractive public realm promotes social interaction and formation of social capital, which in turn promotes social resilience.

4. ***Health benefits.*** A walkable public space system promotes activity, exercise and stress reduction.

5. ***Environmental benefits.*** Cities with well-connected, quality public space systems reduce dependence on automobiles, and increase the ability to exploit compact, resource-efficient neighbourhood types that further reduce environmental impacts.

6. ***Benefits for the elderly, children and vulnerable populations.*** A well-connected, safe public space system provides choice of mobility for those who are unable to drive automobiles, and also affords opportunity for exercise, recreation and social interaction.

7. ***Benefits from tourism, and from company/employee relocation.*** A walkable public realm is more attractive to tourists who will more likely return, and are more likely to share their positive experiences with others. Walkable streets with shops provide the number one most popular activity for tourists – shopping – which in turn further benefits the local economy. In addition, companies considering relocation of offices are increasingly responding to preferences of employees who seek (among other amenities) attractive, walkable

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Many of these benefits are systemic, that is, they are fully achieved only when these systems function well as a whole. In addition, there are other factors that contribute to each of these benefits, and it is often difficult to tease out the causative role of the different factors for a given locale.

For both reasons, it is difficult to quantitatively measure the direct effects of specific local changes. Nonetheless it is possible to measure indicators of public space benefits, as we will discuss in the second part of this document.

Walkability Economic Impacts

Name	Description	Measuring Techniques
Accessibility	Degree that walking provides mobility options, particularly for people who are transportation disadvantaged.	Travel modeling, analysis of travel options.
Consumer cost savings	Degree to which walking provides consumer transportation cost savings.	Consumer expenditure surveys
Public cost savings (reduced external costs)	Degree that walking substitutes for vehicle travel and reduces negative impacts.	Determine to what degree walking reduces motor vehicle travel, and the economic savings that result.
Efficient land use	Degree that walking helps reduce the amount of land used for roadway and parking facilities, and helps create more accessible, clustered land use.	Identify the full economic, social and environmental benefits of more pedestrian-oriented land use.
Livability	Degree that walking improves the local environment.	Property values, business activities, consumer preference surveys.
Public fitness and health	Degree that walking provides physical exercise to people who are otherwise sedentary.	Travel and health surveys to determine the number of people who benefit from walking exercise.
Economic development	Degree to which walking makes commercial areas more attractive and shifts consumer expenditures to goods that provide more regional economic activity and employment.	Market surveys and property assessments. Input-output table analysis.
Equity	Degree that walkability helps achieve various equity objectives.	Various indicators of horizontal and vertical equity.

Table of walkability economic impacts and potential indicators (Litman, 2011).

Summary

The recent findings from the sciences show that cities are complex adaptive systems with their own characteristic dynamics, and – if they are going to perform well from a human point of view – they need to be dealt with as such. At their very cores are the public space systems that connect human beings to all their other parts, and ultimately, to one another.

If these public space systems are well-structured and connected, then, as the research demonstrates, the city outperforms relative to baseline. If these public space systems are fragmented, sprawling, privatised, or in poor condition, then the city will under-perform.

This implies that we must place greater value on walkable public space systems, and greater priority on their creation improvement. Among other things, it means we must replace older models of car-dominated planning with newer models of well-connected, multi-modal, pedestrian-centred cities. Indeed, that is a key agenda item for the upcoming Habitat III United Nations conference, for which this author has consulted.

However, to improve these public space systems, we must do more than change our ideas of design. We must re-assess our current systems of planning, building and managing cities—the laws, codes, standards, models, incentives, and disincentives that effectively make up the modern "operating system" for urban growth. To make better cities, we need to shift to an evidence-based approach, able to draw on the best lessons of science and history about the making of well-functioning, good cities, from a human point of view.

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To address our next stage of urbanization:

- We need evidence-based policy and practice
- We need knowledge-sharing platforms
- We need better design models
- We need better economic tools
- We need better laws, codes and standards (the "operating system for growth")

- *But first, we need a better understanding of the nature of cities, and of the urban design problem*

- And we also need clarity of definitions, e.g. *what do we mean by placemaking??*

... markets? ...festivals? ...”pretty places”?

... too many things to too many people?

... causing bad things, like gentrification?

... as some critics say, “rearranging plaza chairs on an urban Titanic?”

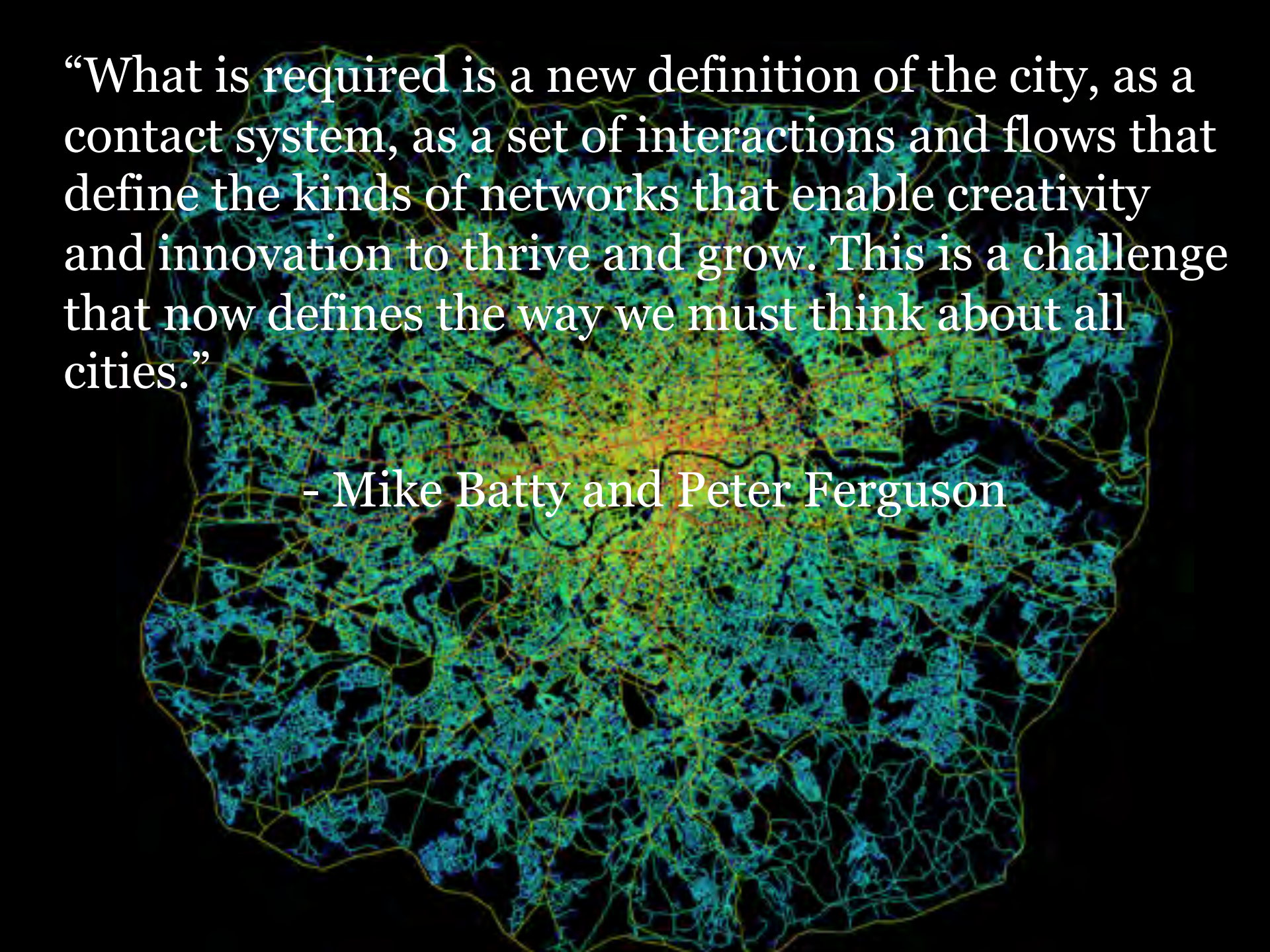
My working definition of *placemaking*:

1. Making places, not just objects

2. Focusing on processes, not just products

3. Moving beyond narrow functional requirements to address human experience

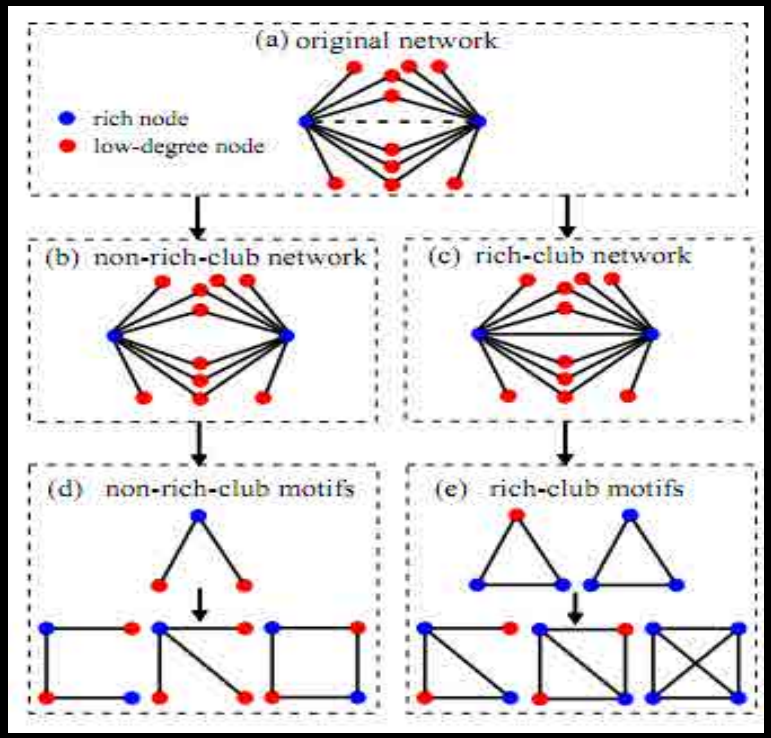
4. Moving beyond elemental models to re-focus on whole-systems phenomena



“What is required is a new definition of the city, as a contact system, as a set of interactions and flows that define the kinds of networks that enable creativity and innovation to thrive and grow. This is a challenge that now defines the way we must think about all cities.”

- Mike Batty and Peter Ferguson

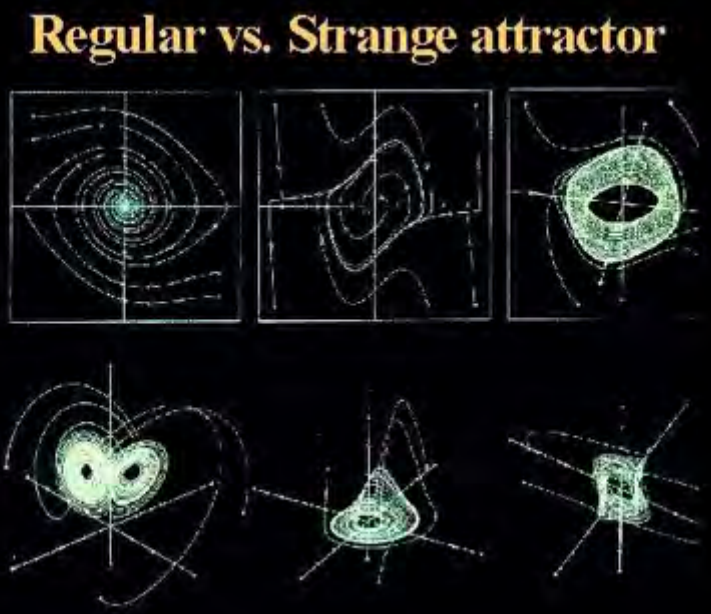
NETWORK THEORY

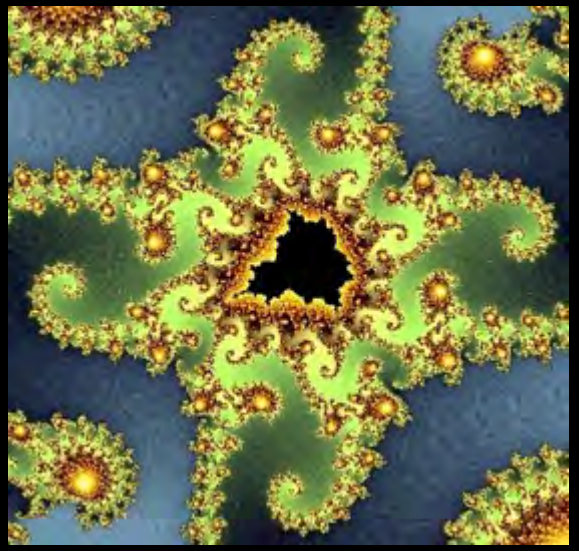


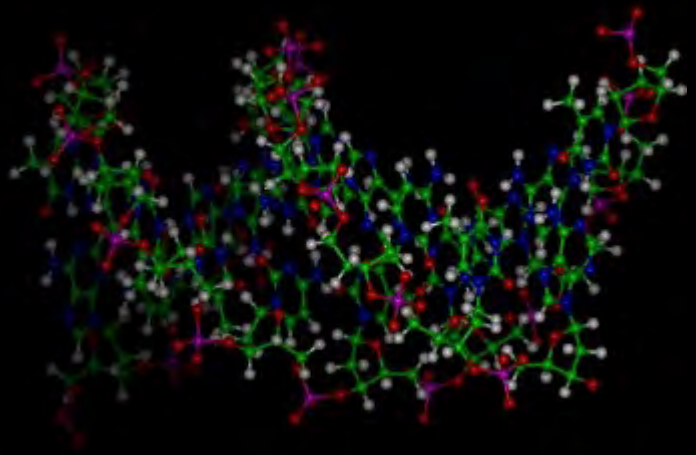
Understanding how a system of connections functions, and transforms over time (e.g. social networks, economic networks, technological networks, ecological networks…

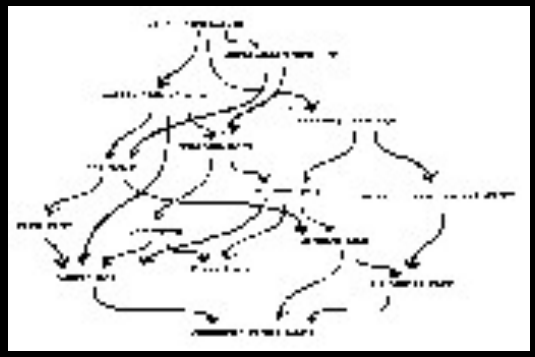
<u>Urban</u> networks… (Built on public space)

Astonishing lessons from the "new sciences"



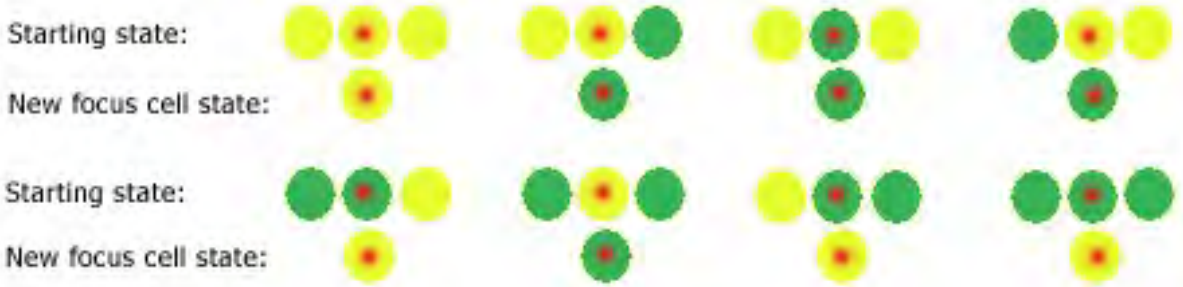


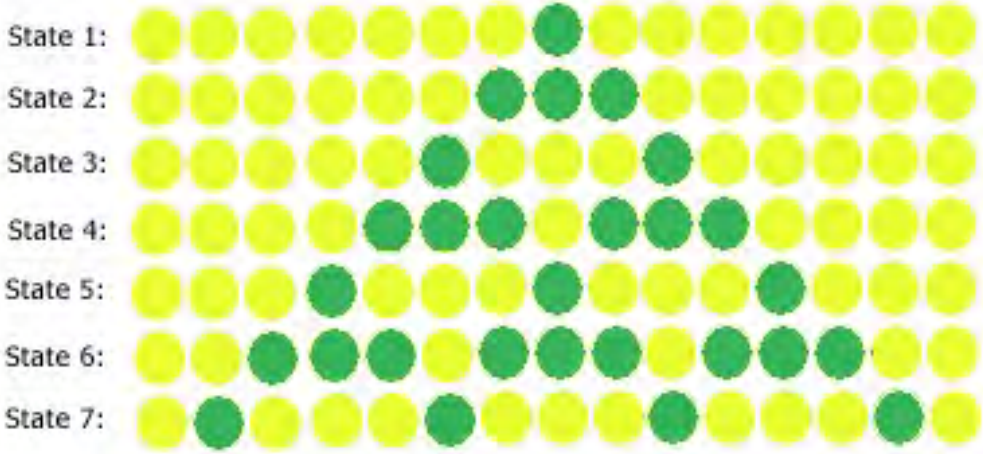




Emergent structures and "Cellular Automata"

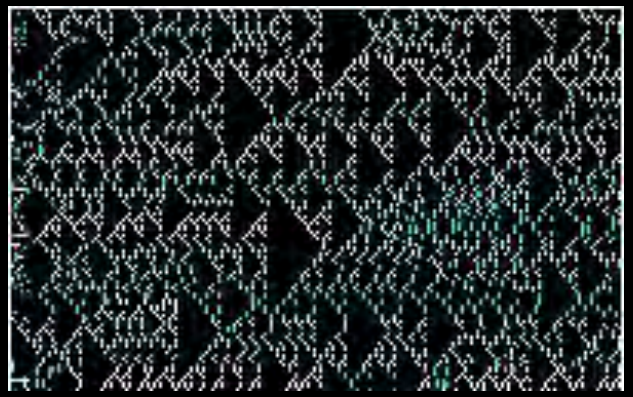
A one-dimensional model of a cellular automata system with two states, yellow and green, where the neighborhood includes one cell on either side of the cell in focus. That cell is marked with a red dot in the state diagram, showing how it changes based on the state of it and its neighbors in the previous cycle.

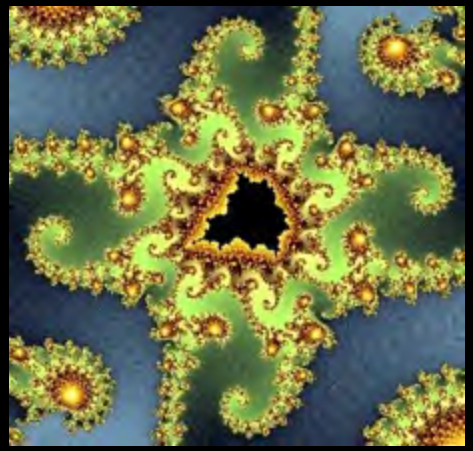




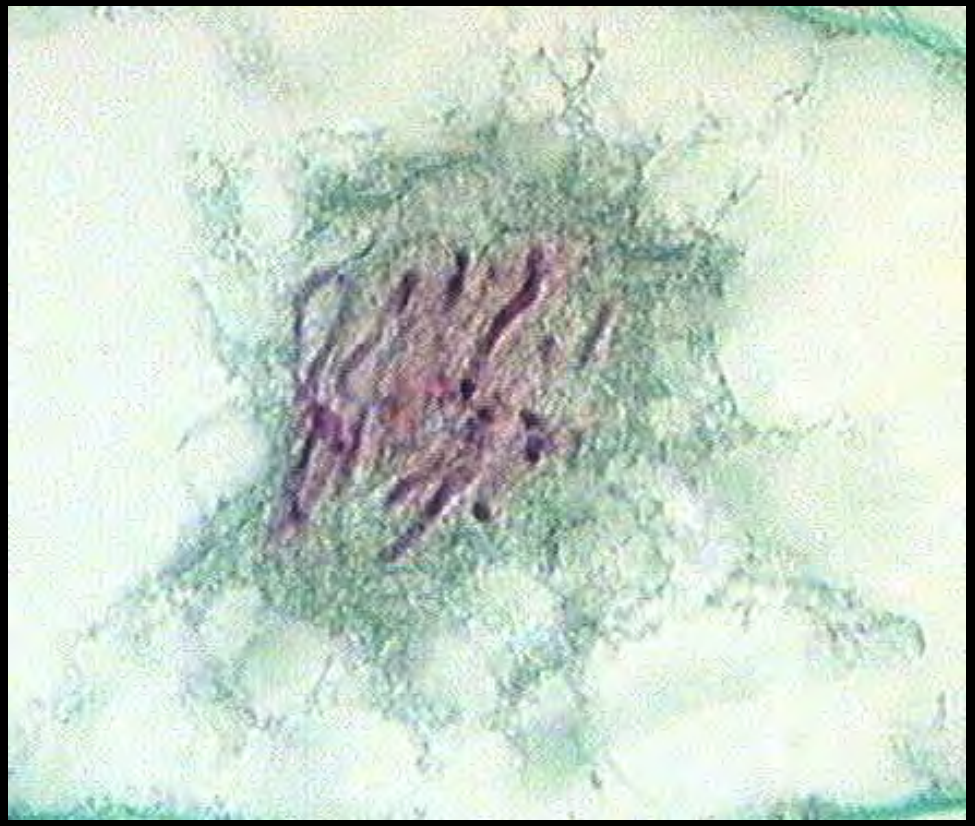
STEPHEN WOLFRAM

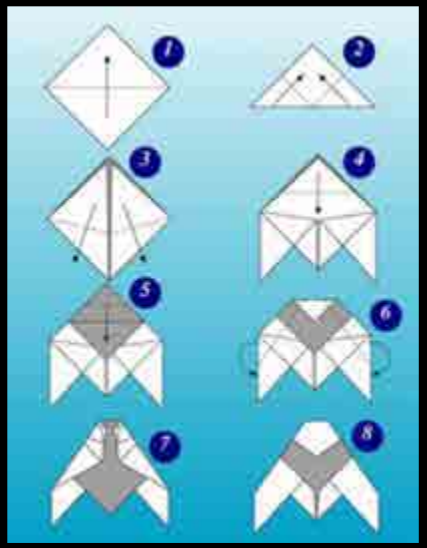
A NEW KIND OF SCIENCE

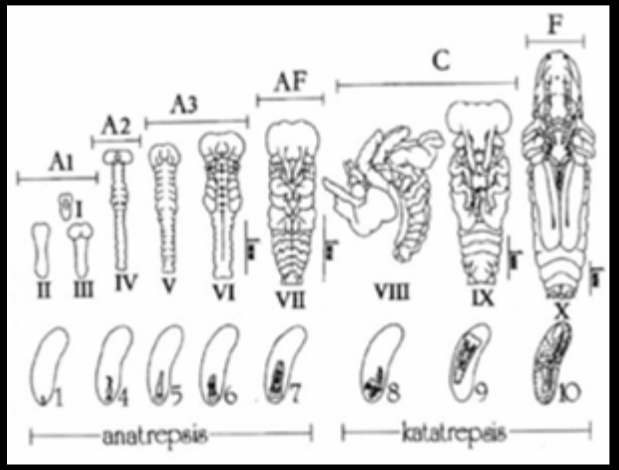




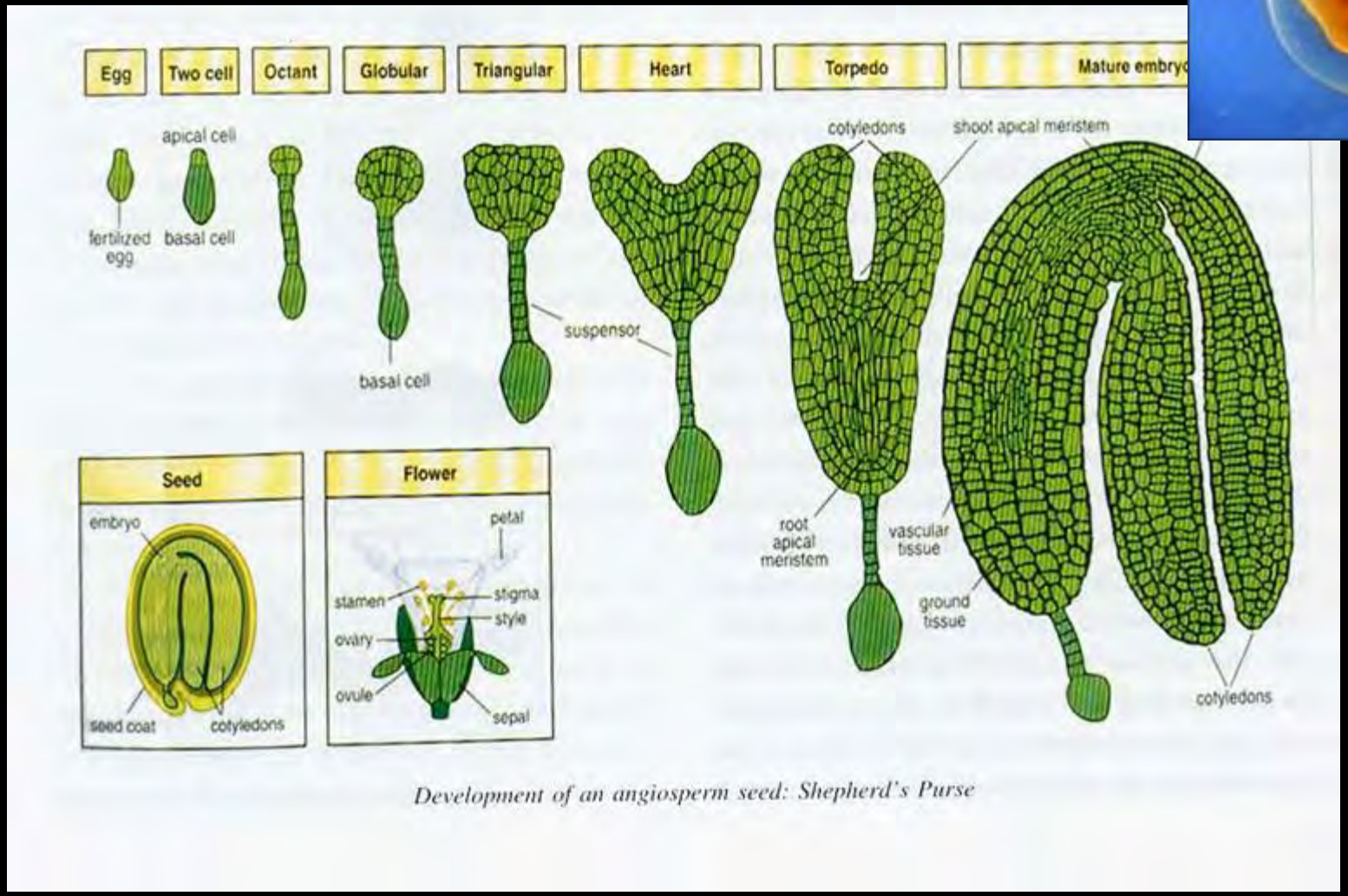
The Genome and the Proteome…





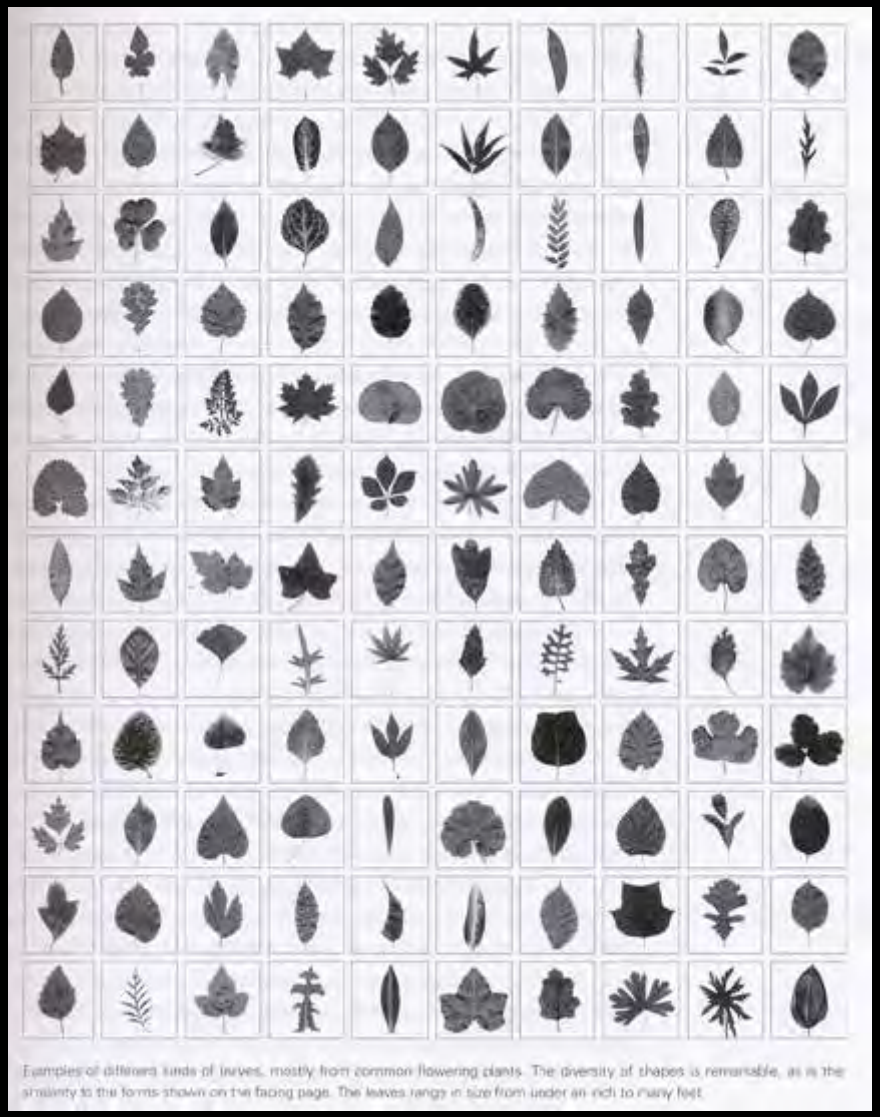


Morphogenesis



Development of an angiosperm seed: Shepherd's Purse

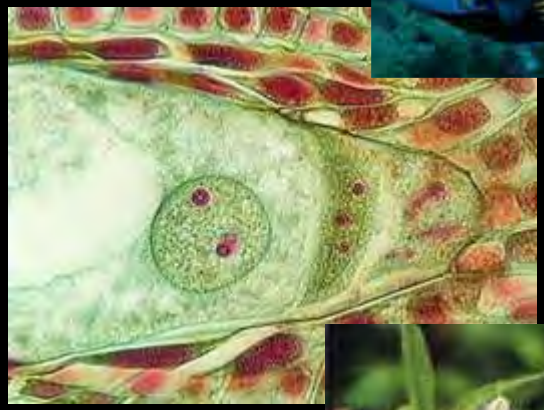
Astonishing Variety



Examples of different kinds of leaves, mostly from common flowering plants. The diversity of shapes is remarkable, as is the similarity to the forms shown on the facing page. The leaves range in size from under an inch to many feet.

Typical examples of pigmentation patterns on animals. Note the many very different animals and up forms remarkably similar ones in





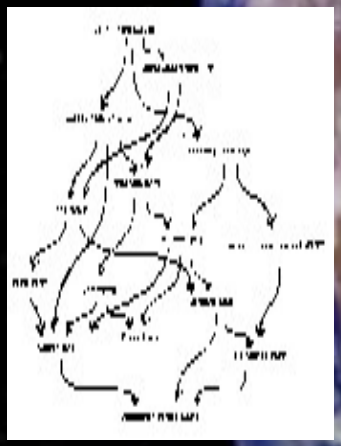
Astonishing Beauty

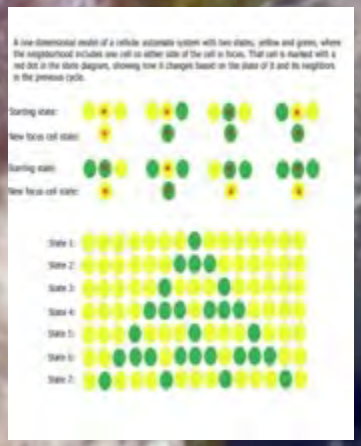


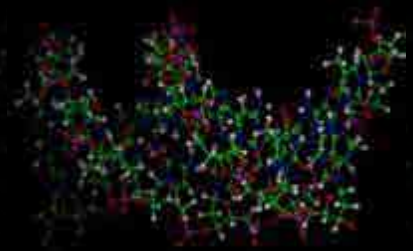




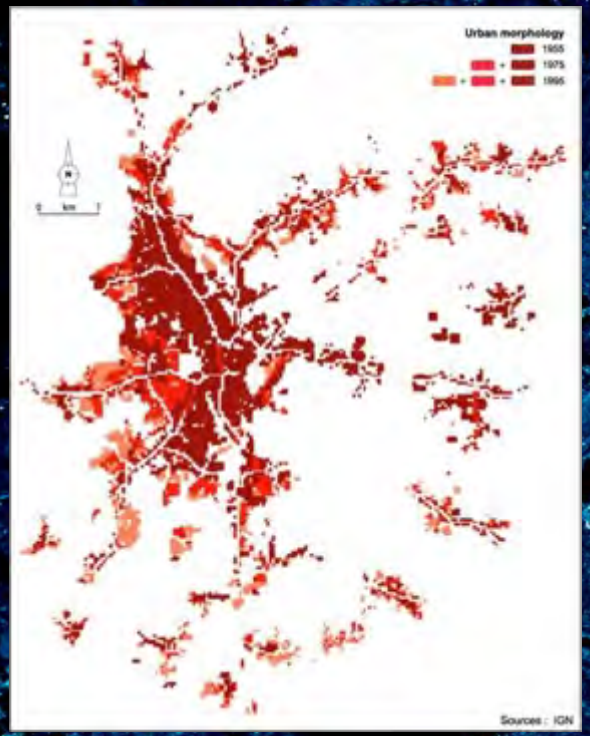
Pointing toward a better understanding of cities, and new ways of acting on them…

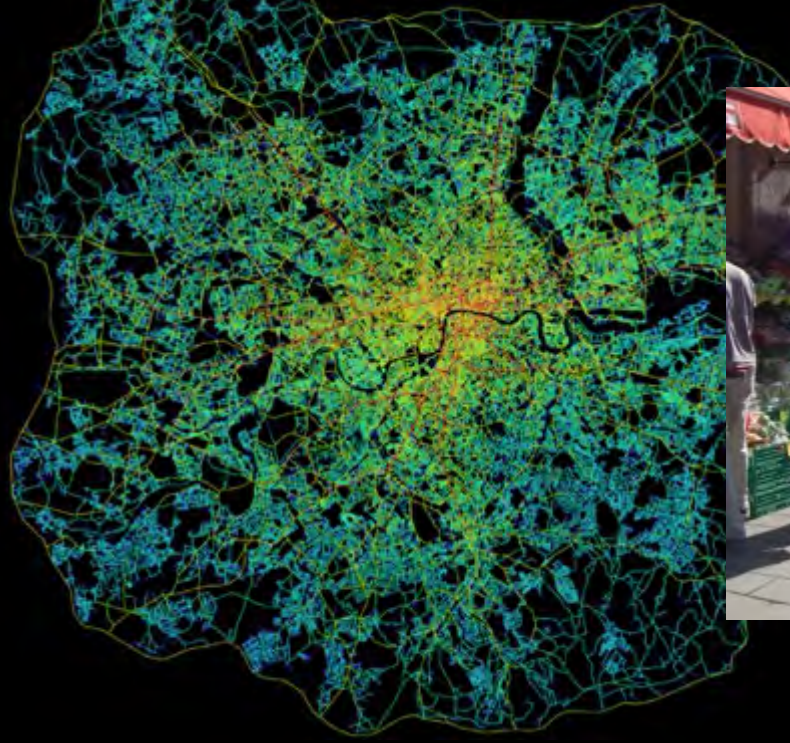






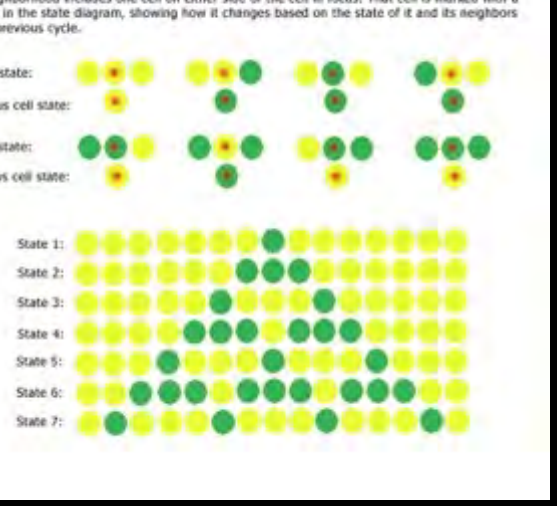
A better understanding of "The kind of problem a city is." (Jacobs)

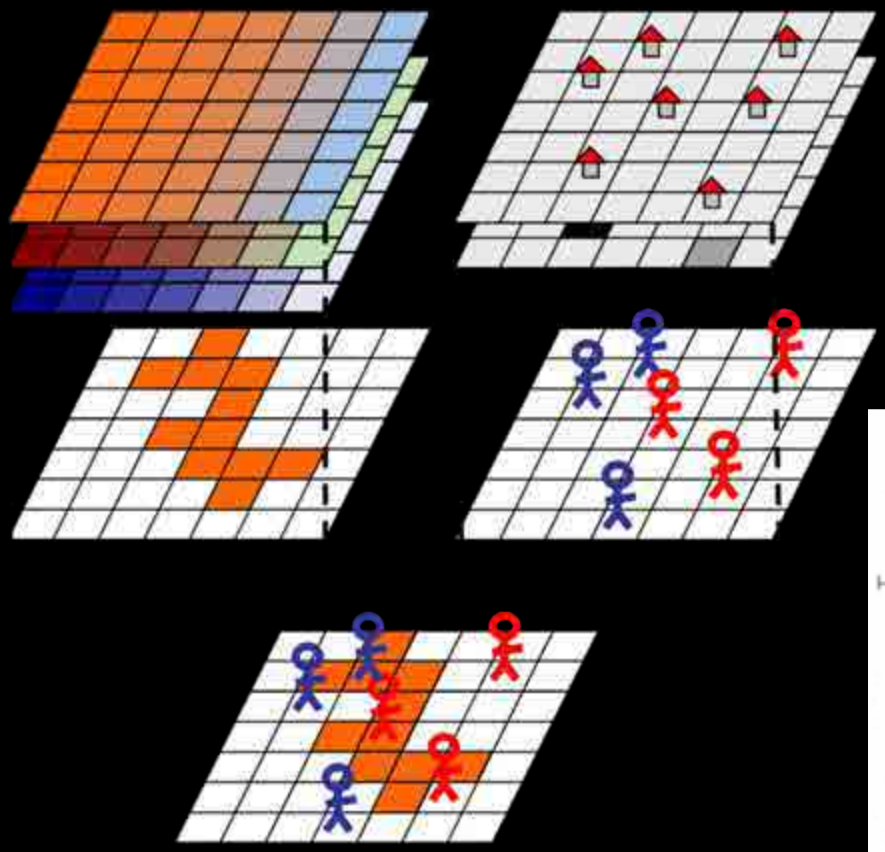


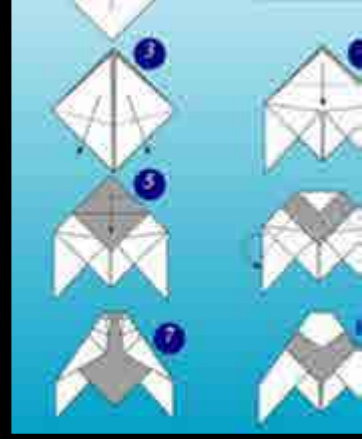


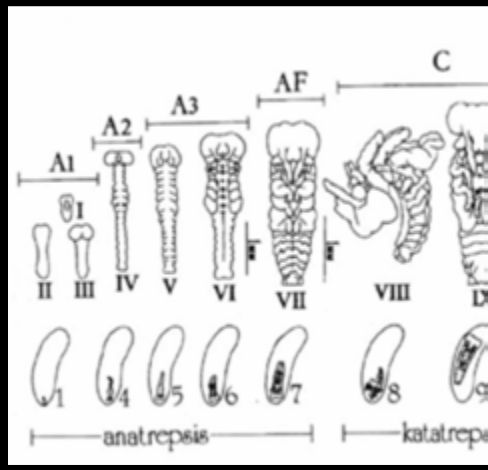
Lessons from network science (applied especially to economics and ecology). *Cities offer us an enormous capacity for creativity and human development, precisely because they are spatial networks that bring us into contact, exchange and creative interaction… The increasing self-optimization of the network also promotes a resource-efficient way of life.*

Lessons from anthropology and sociology. *There is new understanding of the ways that people interact within public spaces and their adjacent private edges; we need to share this knowledge for practice.*

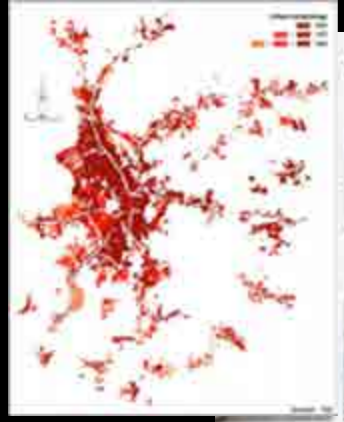


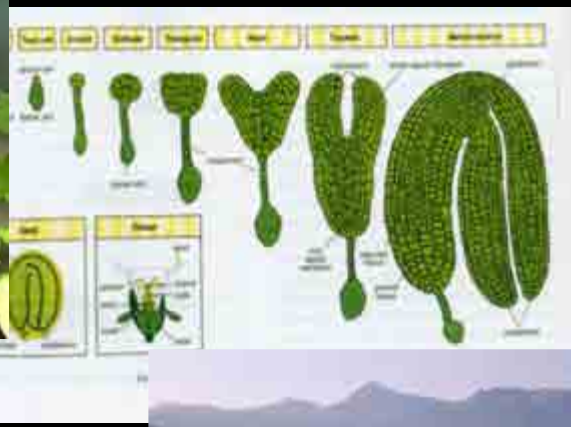






Lessons from mathematics and game theory. *All of us within cities and within the planetary economy are in a "massive multiplayer game." We need to examine the rules, the technologies, the "operating systems for growth"…*





Lessons from evolutionary morphology. *The structure of environments largely results from the processes of form generation, shaped by our systems and "generative" rules… There are important lessons in the ways that natural processes generate form, and the ways they achieve a dynamic (adaptive) complexity.*

Lessons from cognitive, environmental, and social psychology. *The properties that designers regard as important are not necessarily those that promote human well-being and healthy interactions within the built environment. Psychological distance in professionals creates problems for users ("construal level theory").*

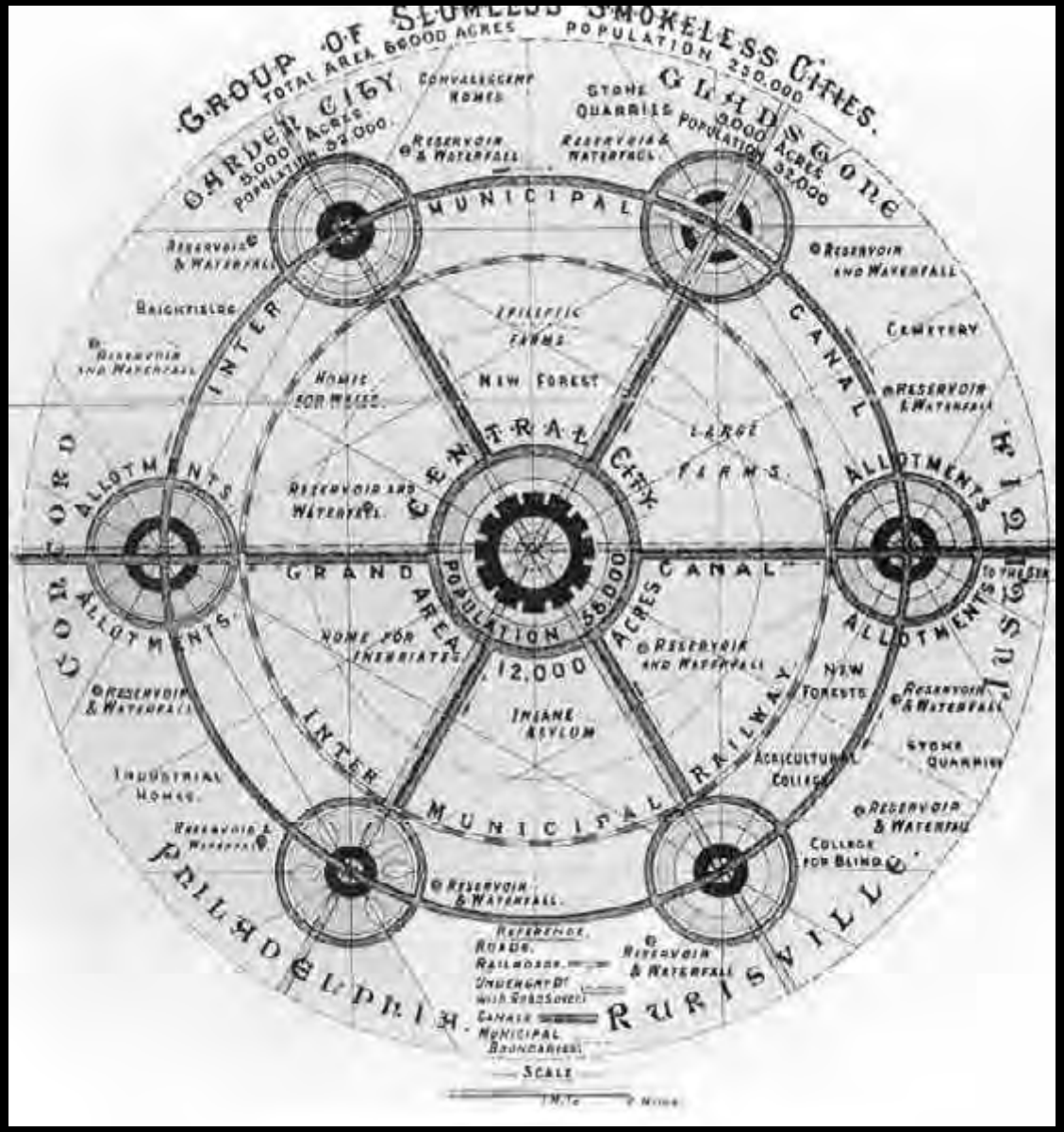
But we are still in the grip of a model that is over a century old…

- *The Triumph of Reason*
- *Political Enlightenment*

- *Technology as Salvation*
- *Romance of the New*

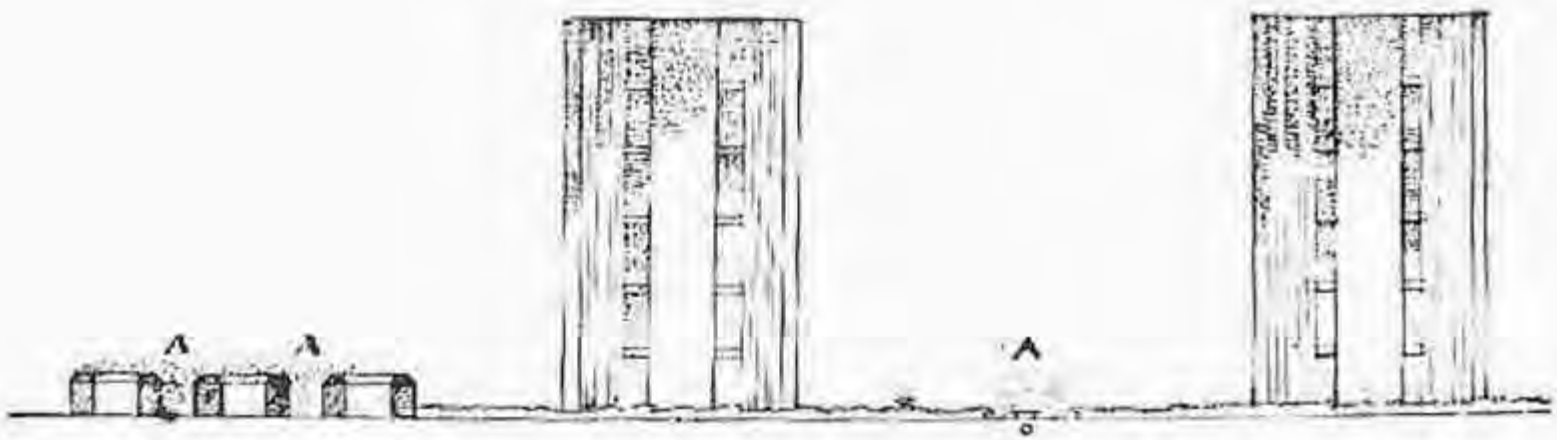
- ***Mechanical Technology as Ordering Idea (Image, Fashion)***

Horrific Conditions of 19th C. Industrialising Cities



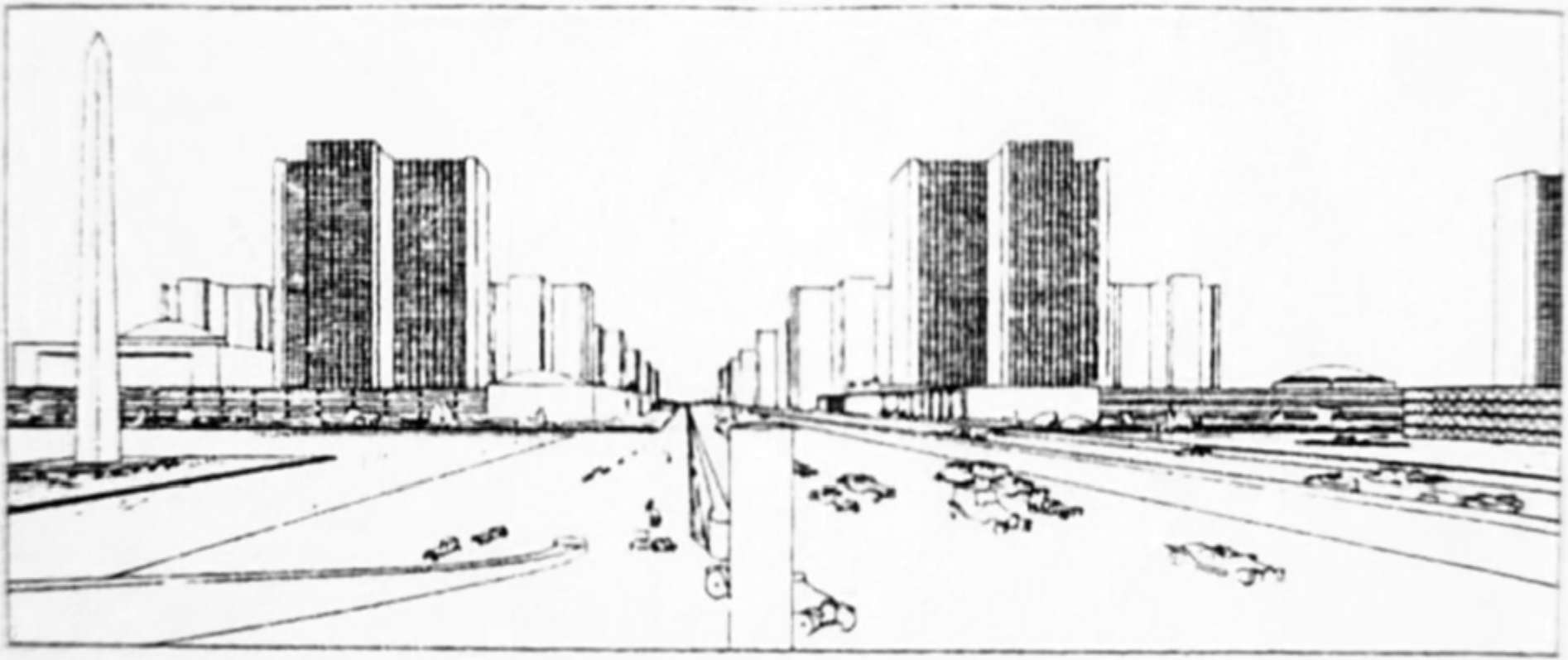
Rationalisation and Segregation

Le Corbusier: "rational segregation" reaches its pinnacle (1923)



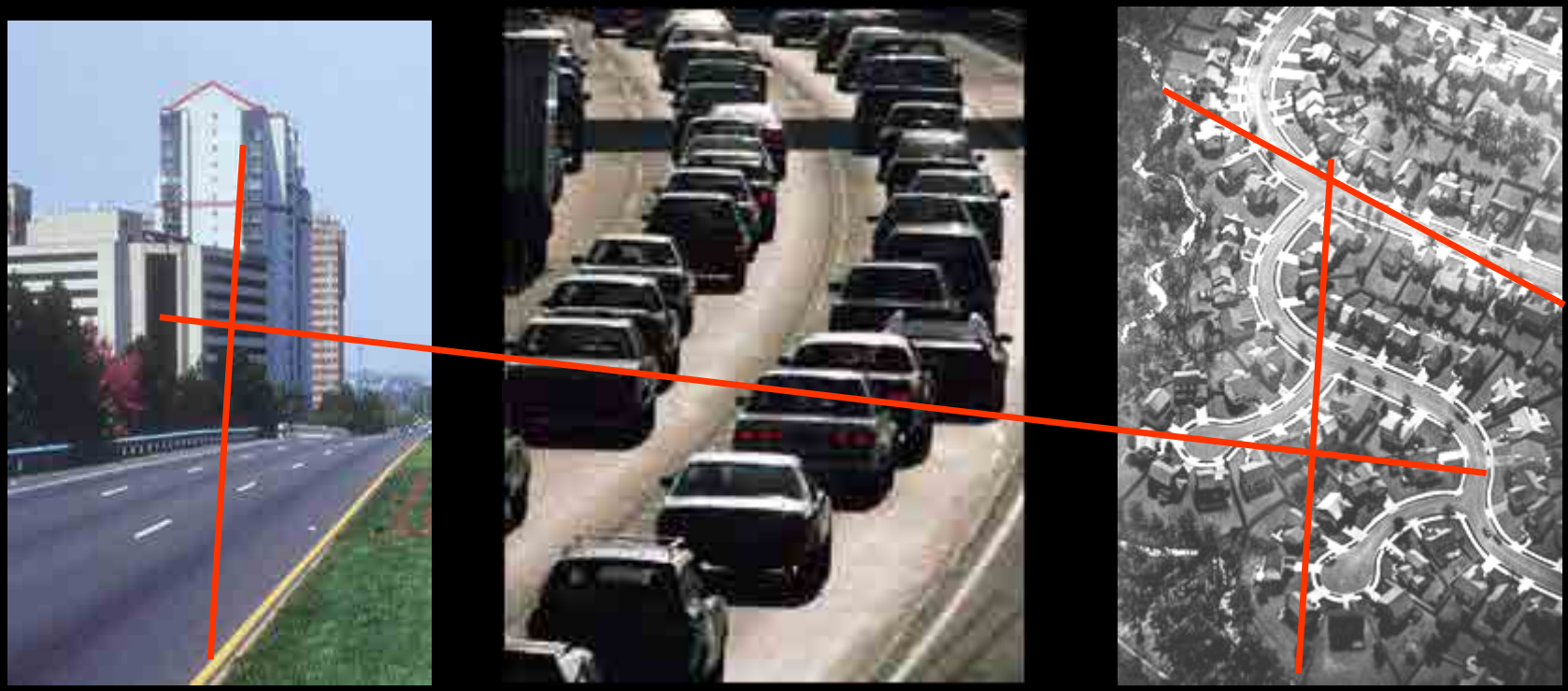
A CITY OF TOWERS

This section shows on the left how dust, smells, and noise stifle our towns of to-day. The towers, on the other hand, are far removed from all this and set in clean air amidst trees and grass. Indeed the whole town is "verdure clad."



1922. The highways and towers of Le Corbusier's City of Tomorrow inspired the urban renewal program in America. *(Courtesy of Artists Rights Society [ARS] / SPADEM, 1995, Paris)*

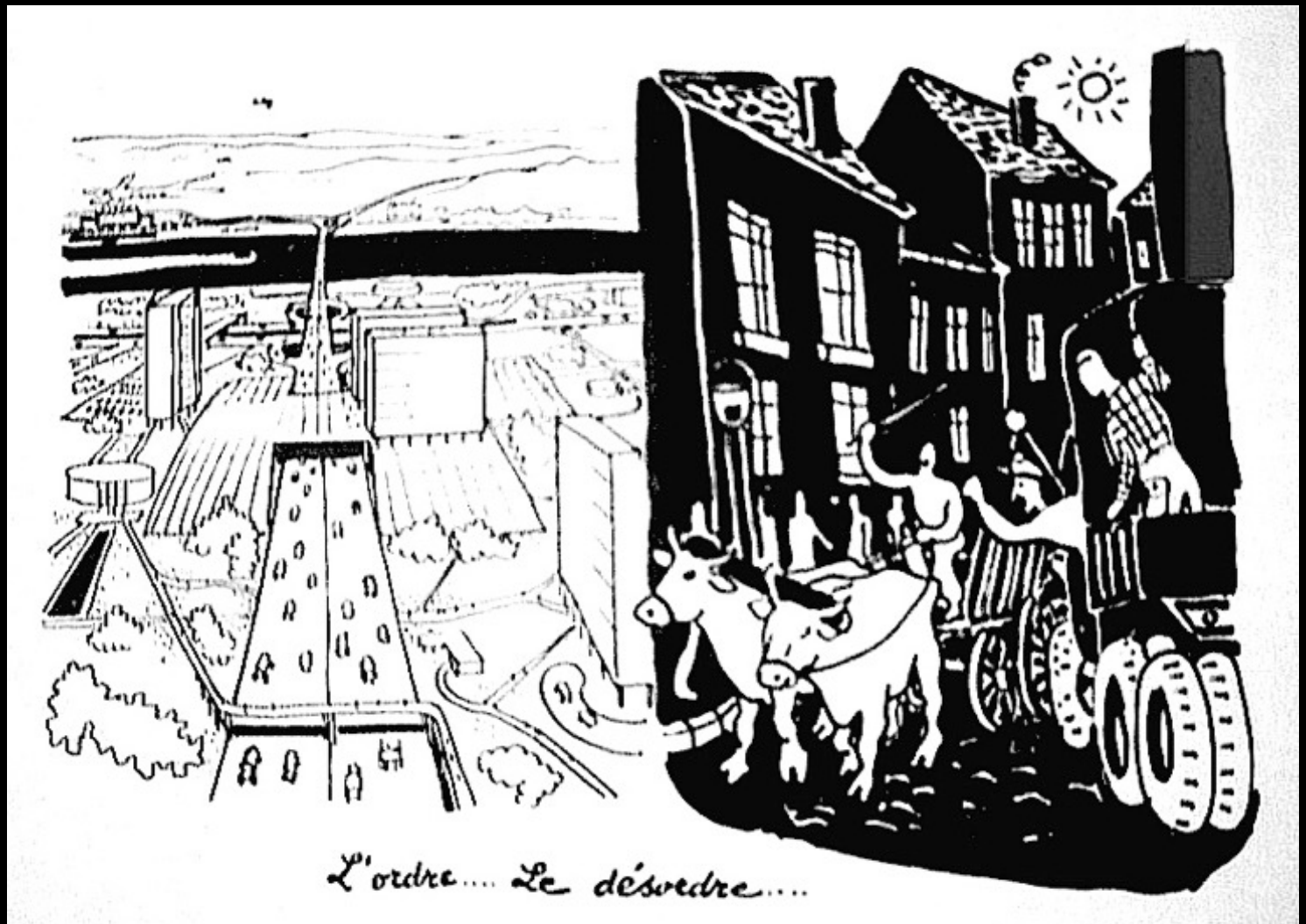
Rationally segregated urban elements: the capsule of home and the capsule of workplace, connected by the capsule of the car – but no public space!

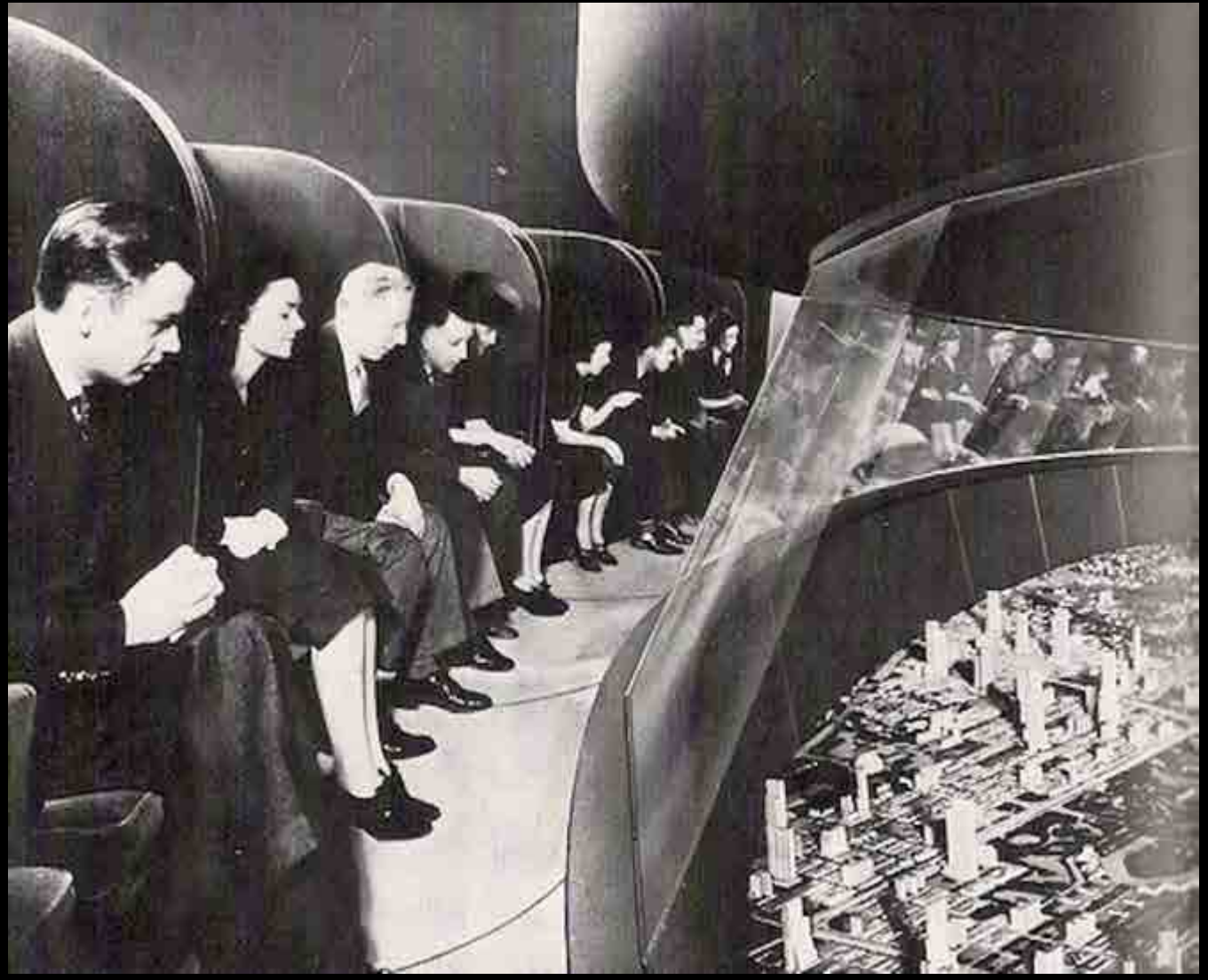


The CIAM Model

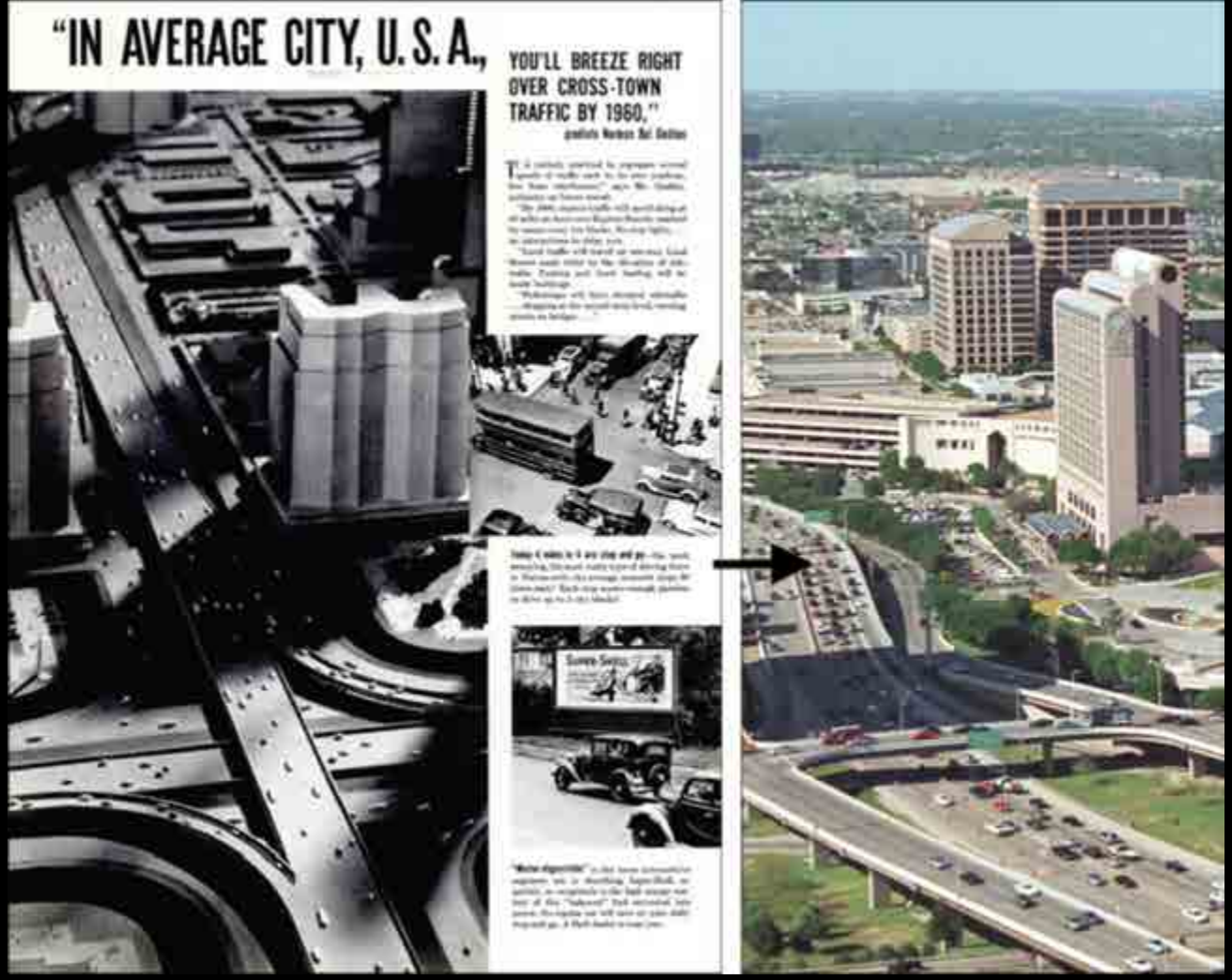
(Congrès Internationaux d'Architecture Moderne)

Note the change in public space, and the death of the street



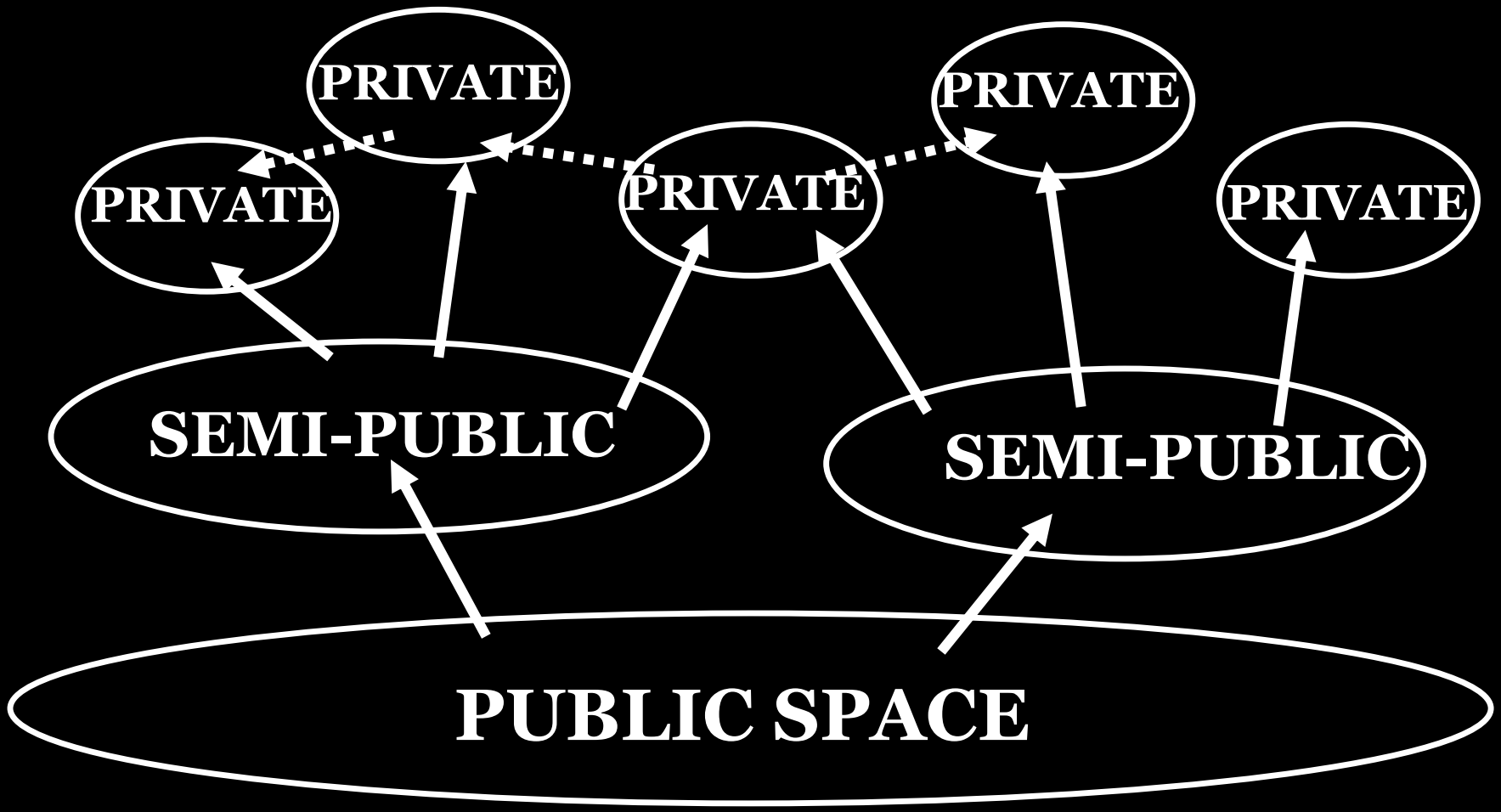


This model of functional segregation was promoted heavily in the early 20th Century – a time of great optimism about the powers of mechanization and modernity.



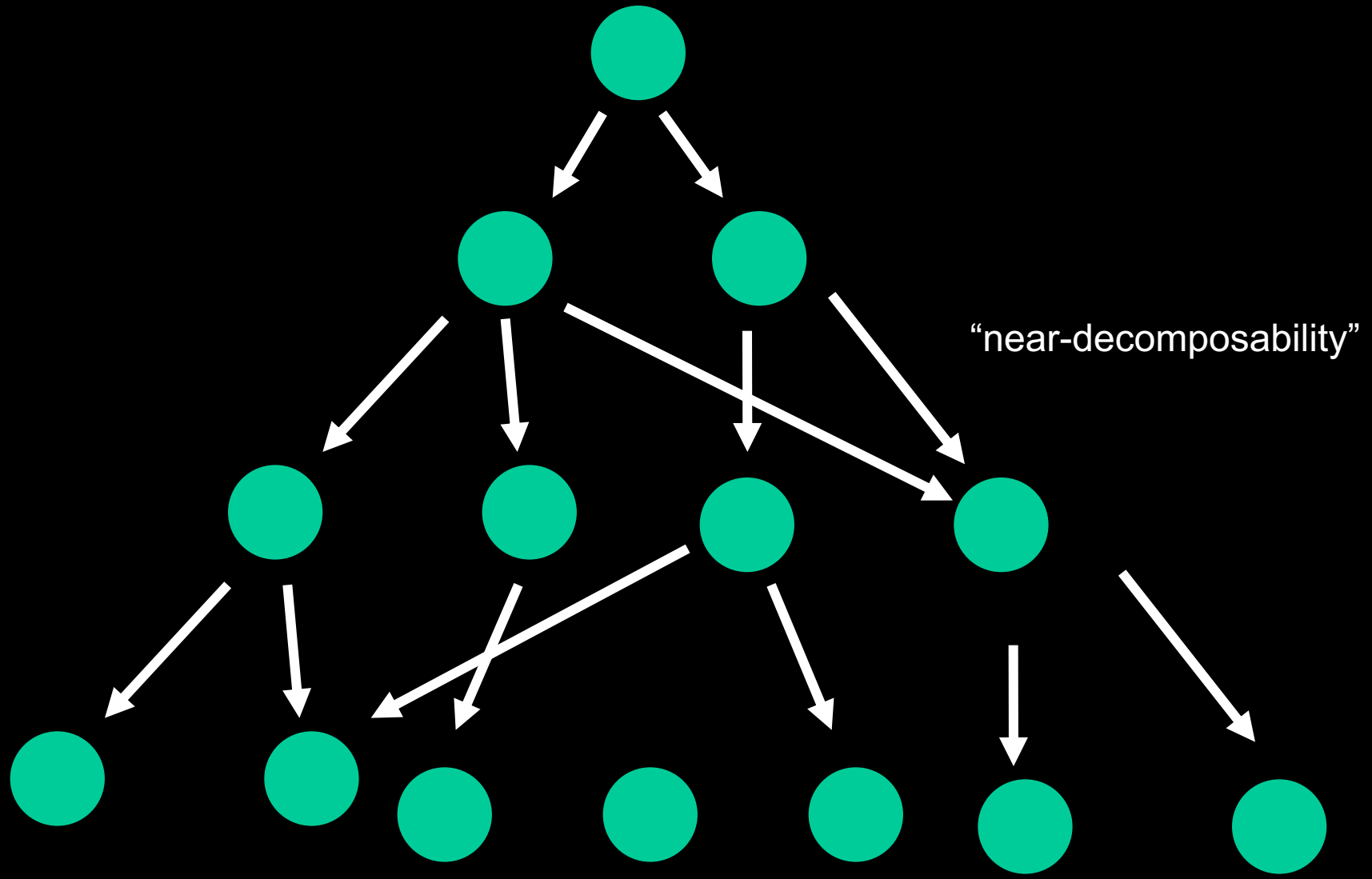
When we segregate uses, and mechanize connections, and destroy the tissue of natural connections – it has profound consequences for how the city works, and how its residents consume resources.

The critical role of public space frameworks

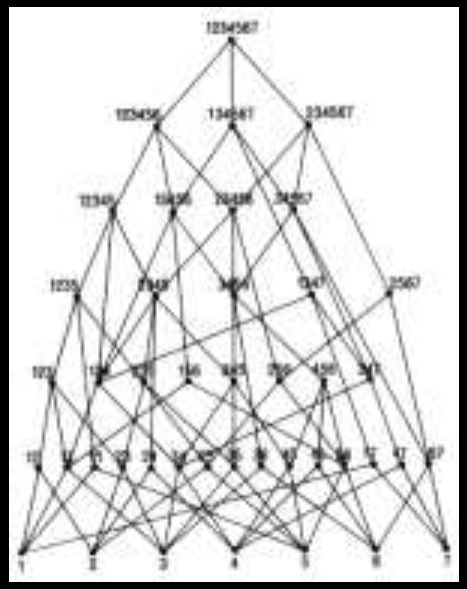


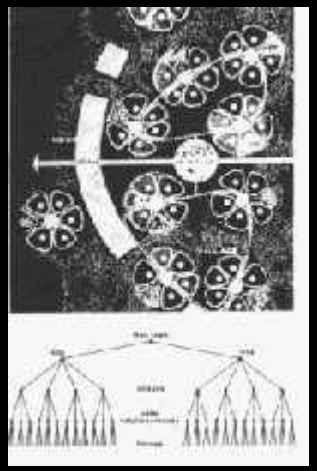
Public spaces – the foundation of urban connectivity

Simon (1962) “The Architecture of Complexity” (“Nearly Decomposable Hierarchies”)

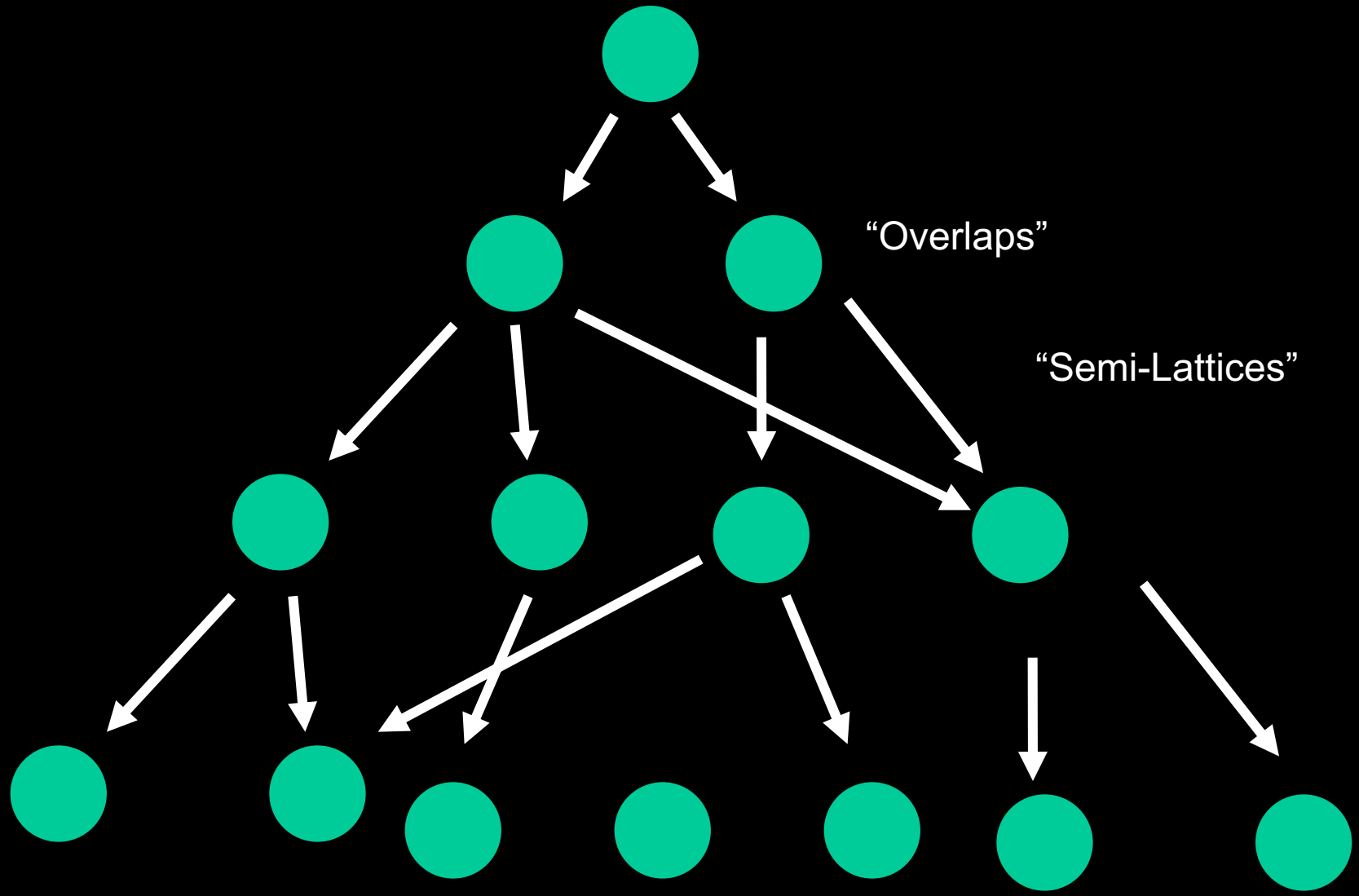


Christopher Alexander, “A City is Not a Tree” (1965)

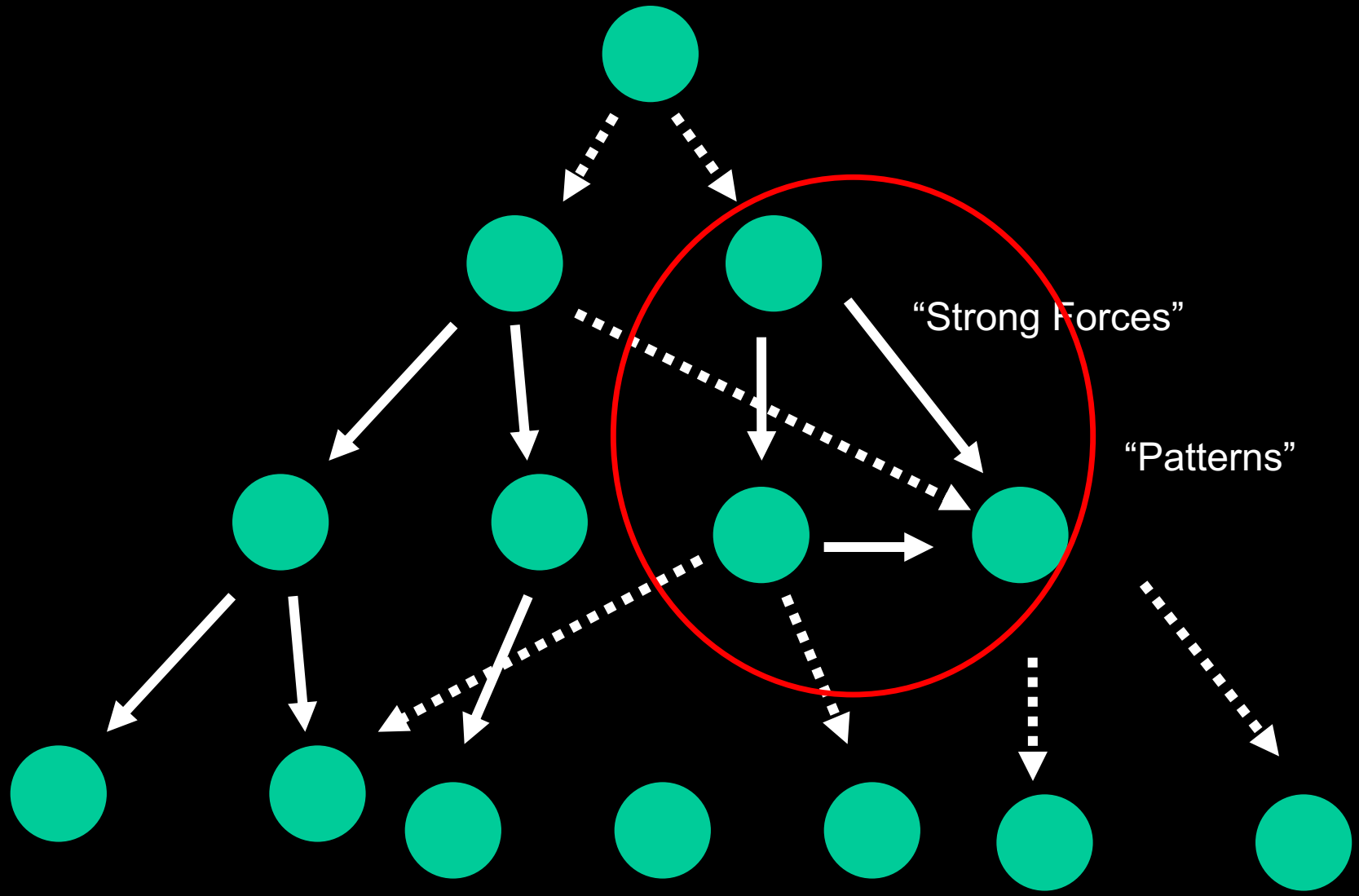




Alexander (1965) “A City is Not a Tree” (“Overlaps” and “Semi-Lattices”)



Alexander (1977) “A Pattern Language” (“Patterns”)



Christopher Alexander, “A City is Not a Tree” (1965)

“It must be emphasized, lest the orderly mind shrink in horror from anything that is not clearly articulated and categorized in tree form, that the idea of overlap, ambiguity, multiplicity of aspect and the semilattice are not less orderly than the rigid tree, but more so. ***They represent a thicker, tougher, more subtle and more complex view of structure.***”

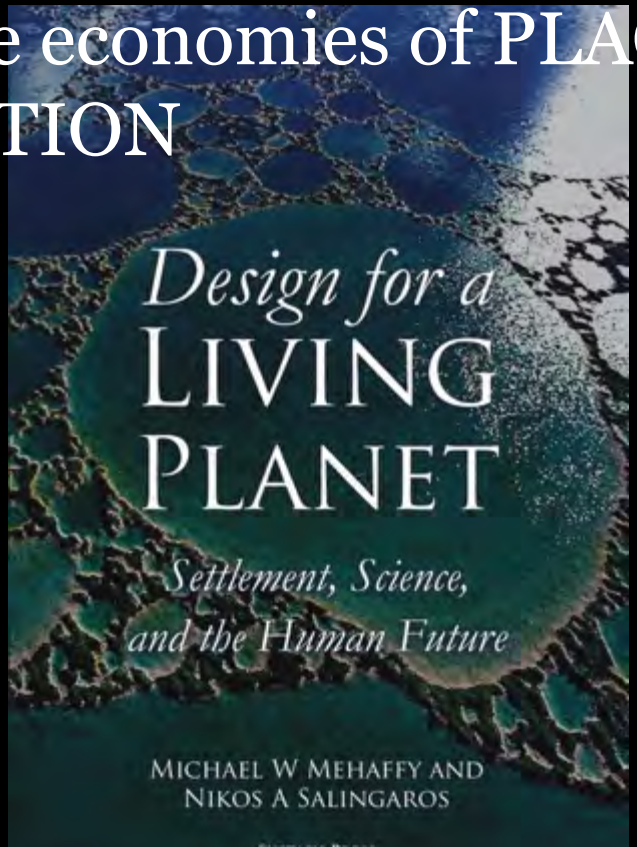
"Lowly, unpurposeful, and random as they may appear, sidewalk contacts are the small change from which a city's wealth of public life may grow."

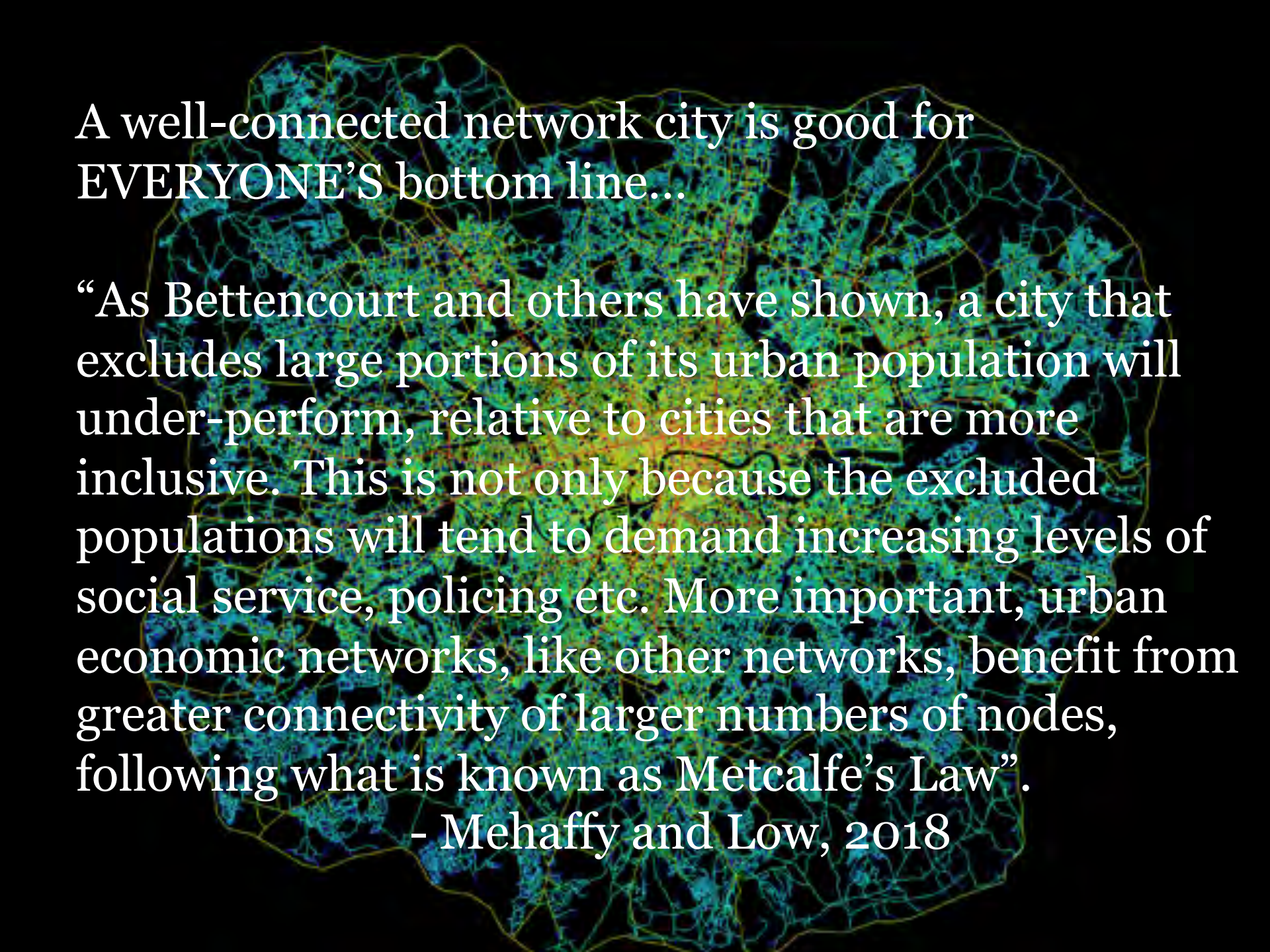
— Jane Jacobs, The Death and Life of Great American Cities

A systems approach…

Moving beyond economies of SCALE and STANDARDISATION…

To also embrace economies of PLACE and DIFFERENTIATION





A well-connected network city is good for EVERYONE'S bottom line…

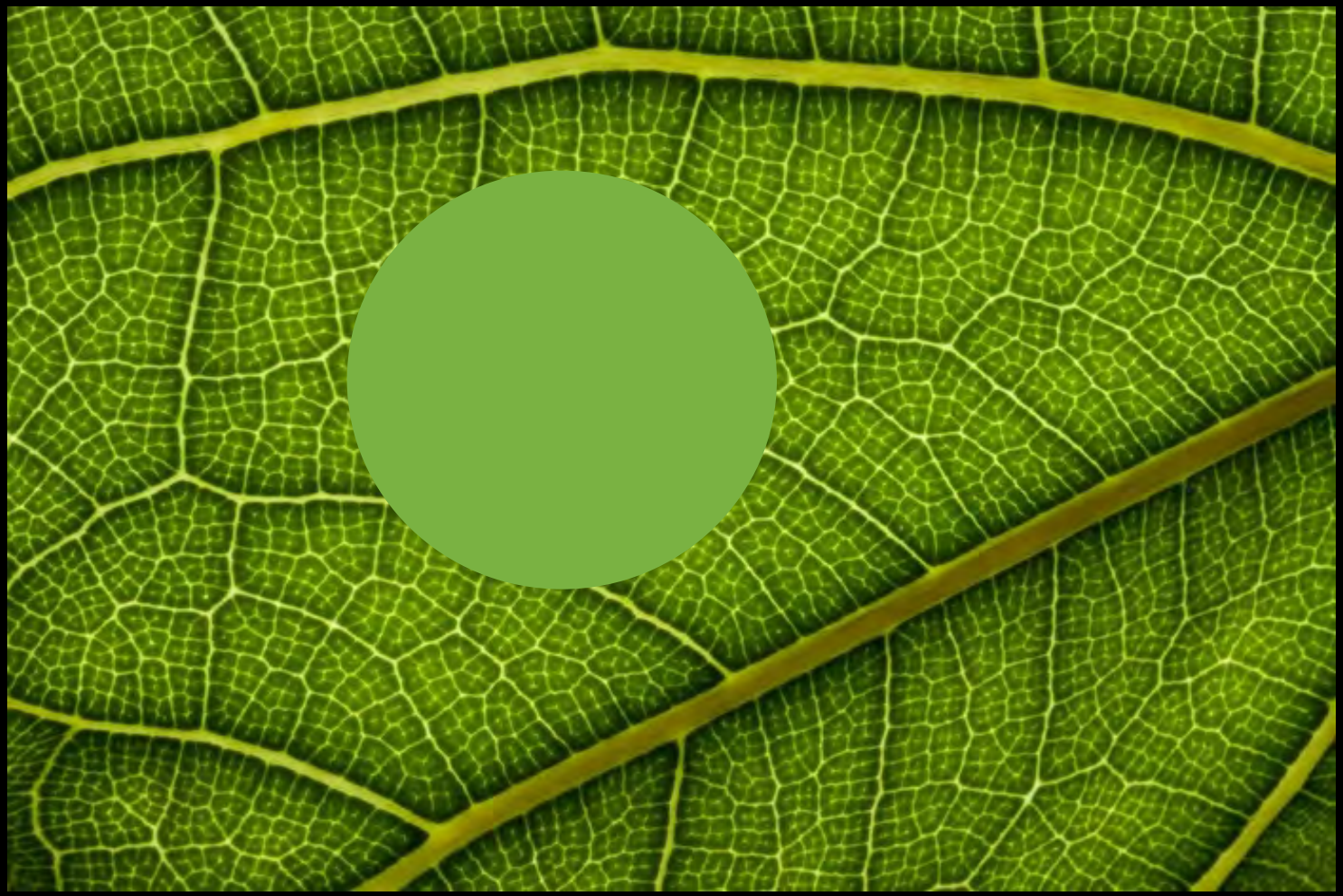
"As Bettencourt and others have shown, a city that excludes large portions of its urban population will under-perform, relative to cities that are more inclusive. This is not only because the excluded populations will tend to demand increasing levels of social service, policing etc. More important, urban economic networks, like other networks, benefit from greater connectivity of larger numbers of nodes, following what is known as Metcalfe's Law".

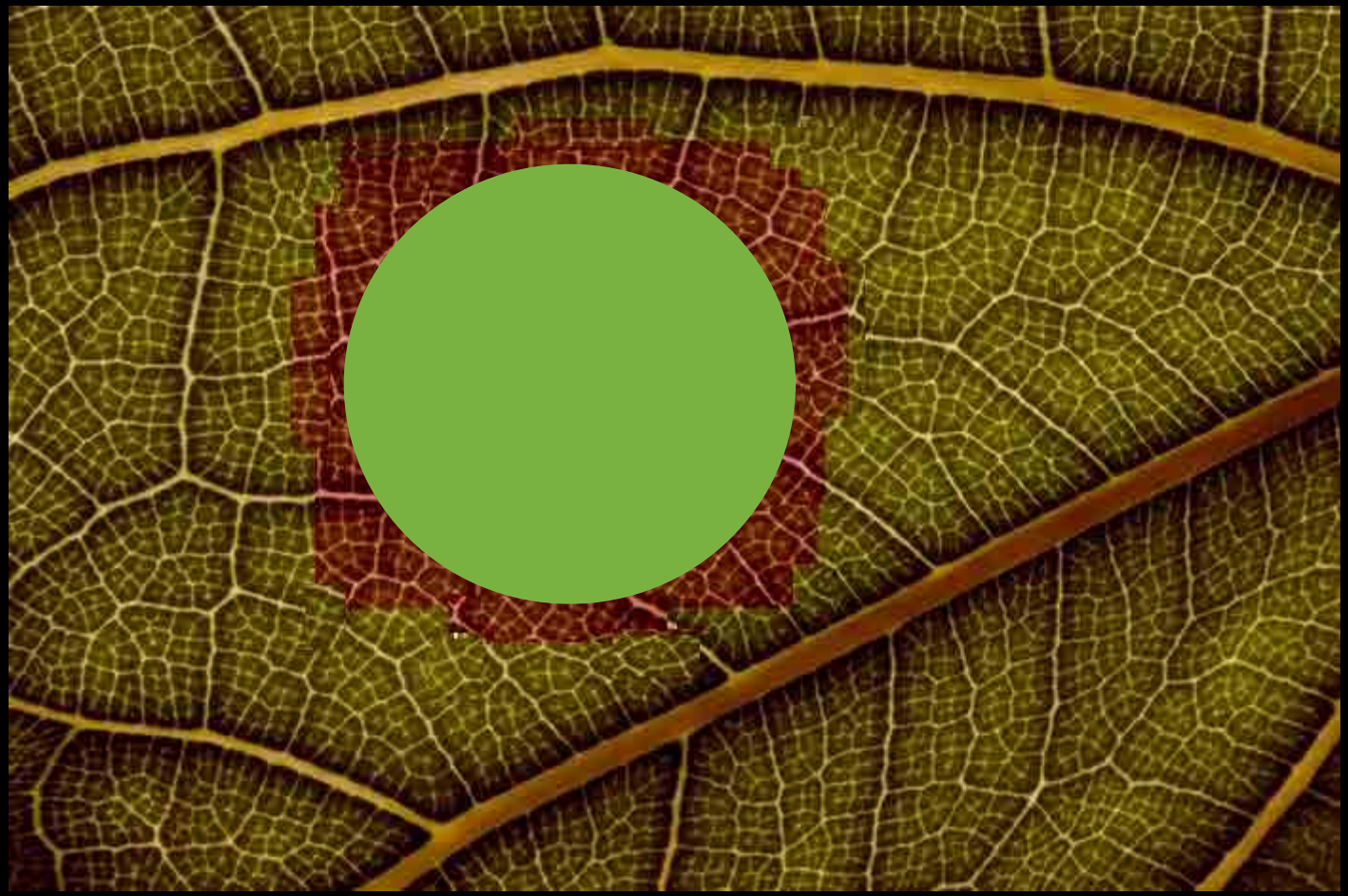
- Mehaffy and Low, 2018

The enormous benefits of public space frameworks

Importance of street network connectivity for economic spillovers and development

Cities as continuously inter-connected networks



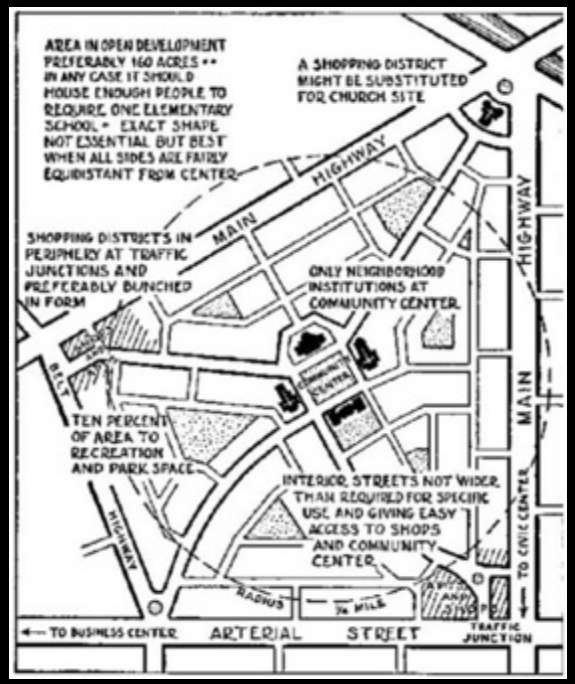


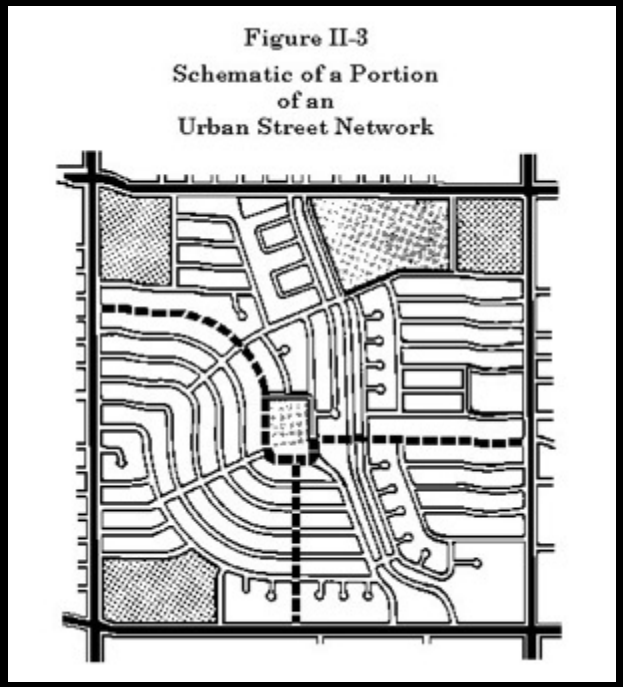
Jacobs' criticism of the "inward-turning neighbourhood":

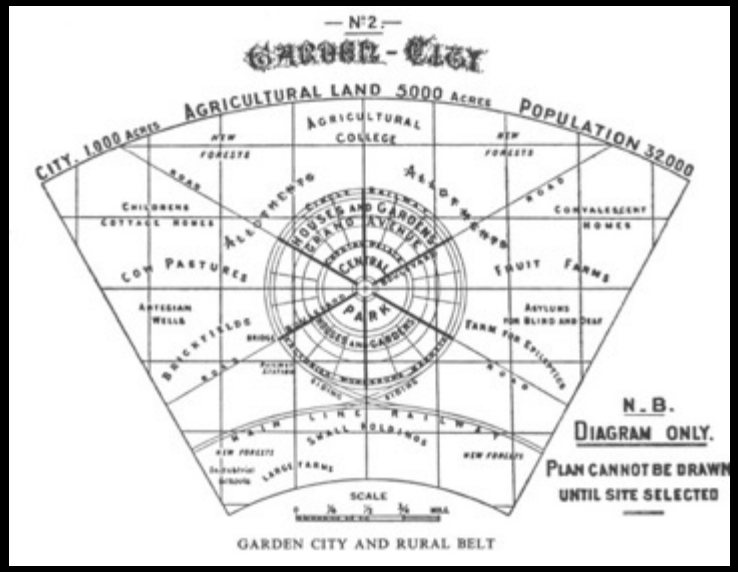
"Wide choice and rich opportunity … is indeed the point of cities. Furthermore, this very **fluidity of use** and choice among city people is precisely the foundation underlying most city cultural activities and special enterprises of all kinds. Because these can draw skills, materials, costumers or clienteles from a great pool, they can exist in extraordinary variety…city enterprises increase, in turn, the choices available to city people for jobs, goods, entertainment, ideas, contacts, services.

- Jane Jacobs, *The Death and Life of Great American Cities*

“Modern” cities – neighborhood are segregated units







GARDEN CITY AND RURAL BELT

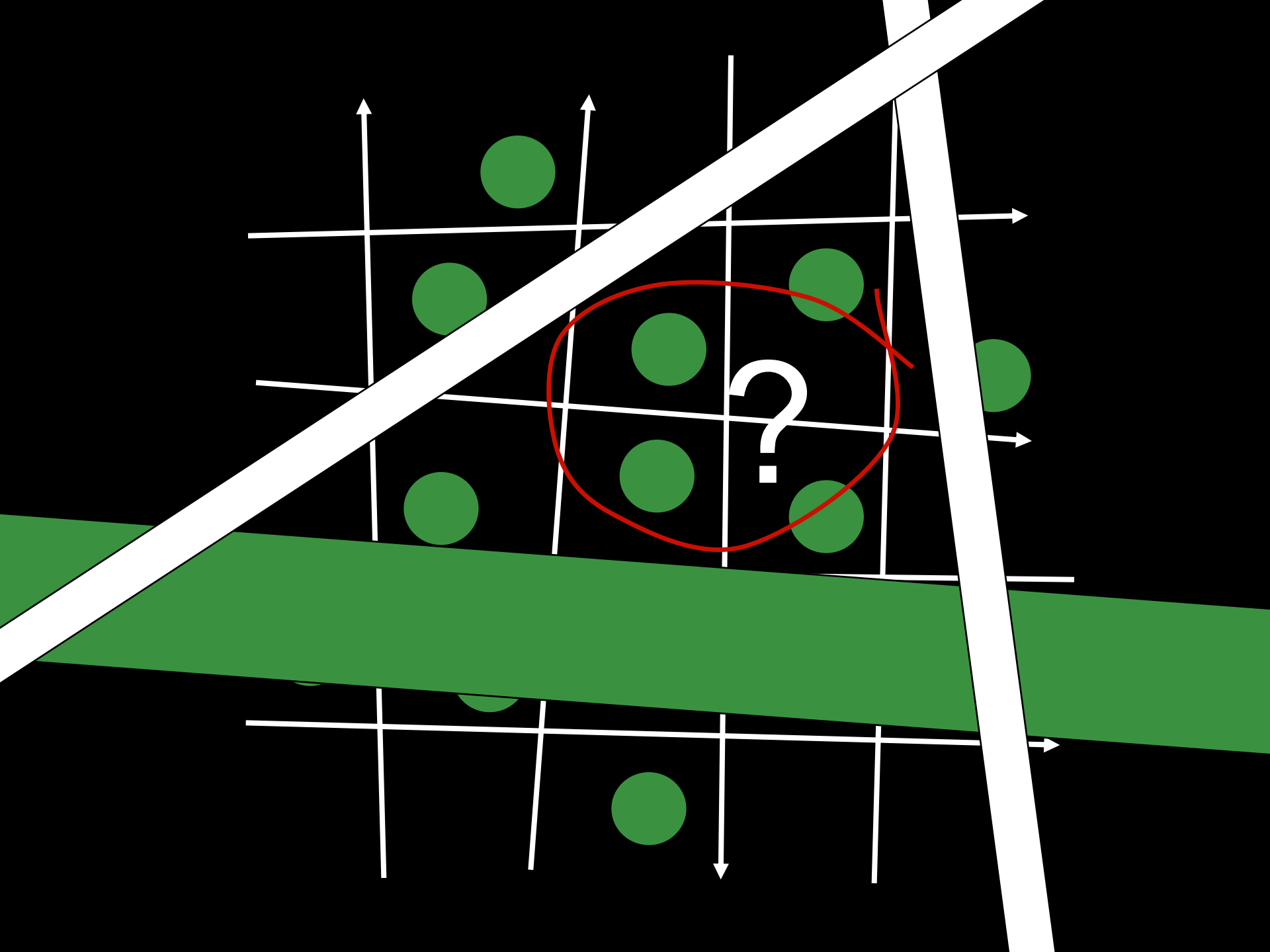
“Border vacuums….”

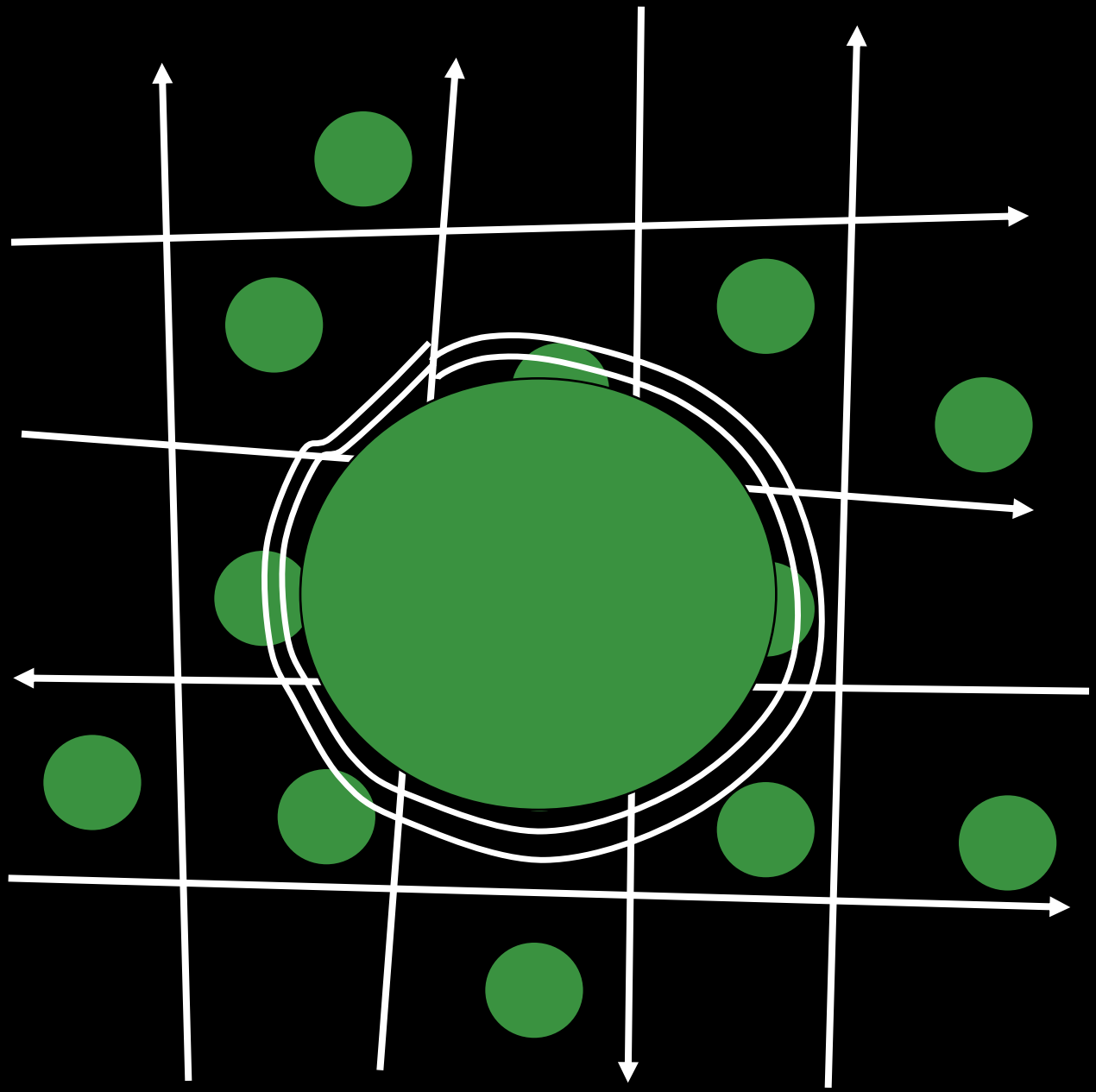
“…The trouble arises when districts are bisected or fragmented by borders so that the neighborhoods sundered are weak fragments and a district of subcity size cannot functionally exist.”

Two kinds of land:

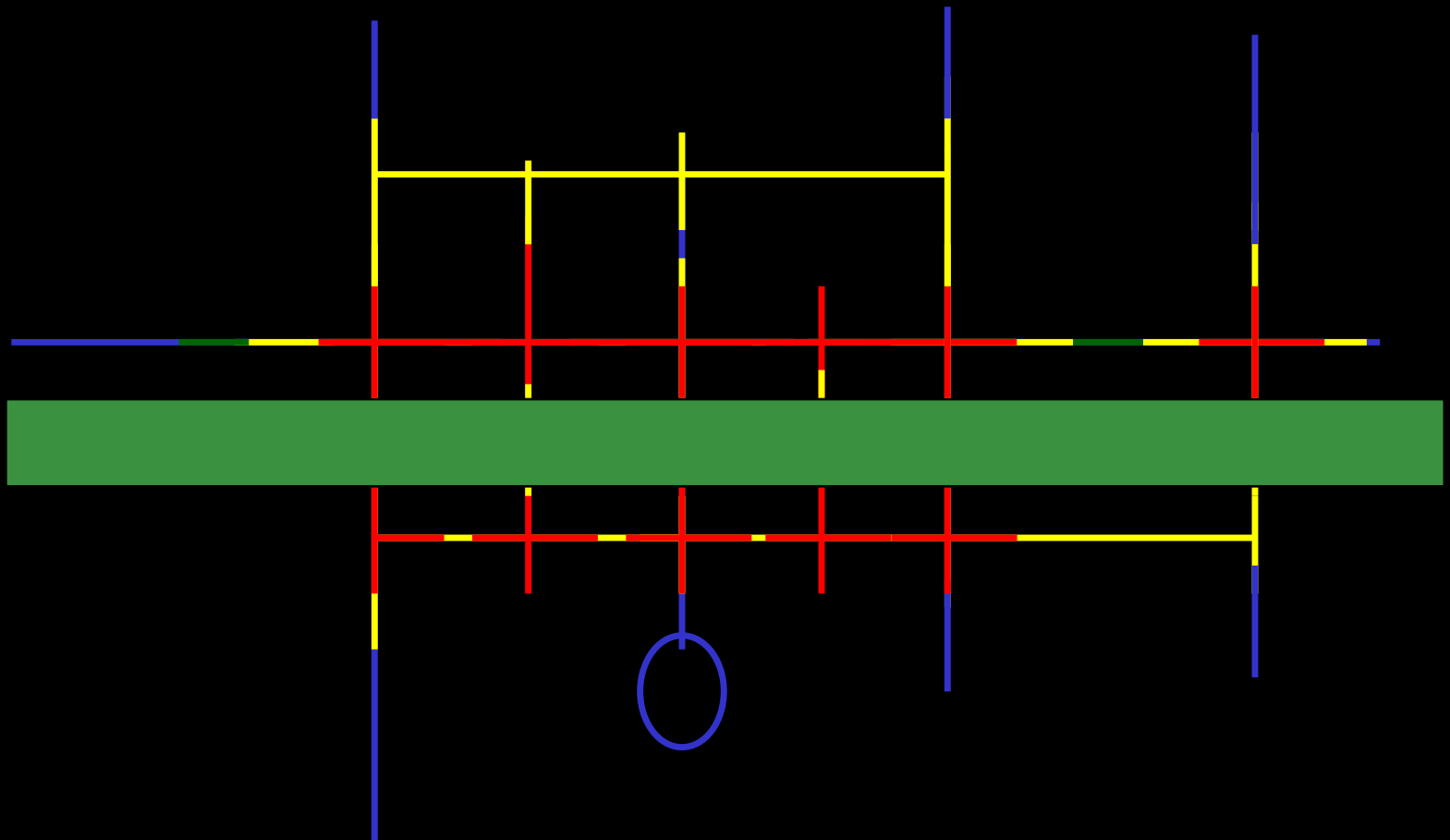
"General land" – people move freely and by choice on foot – streets, small parks, building passages, etc

" Special land" - not commonly used as a thoroughfare by people on foot





The root trouble with borders, as city neighbors, is that they are apt to form dead ends for most users of city streets. They represent, for most people, most of the time, barriers.



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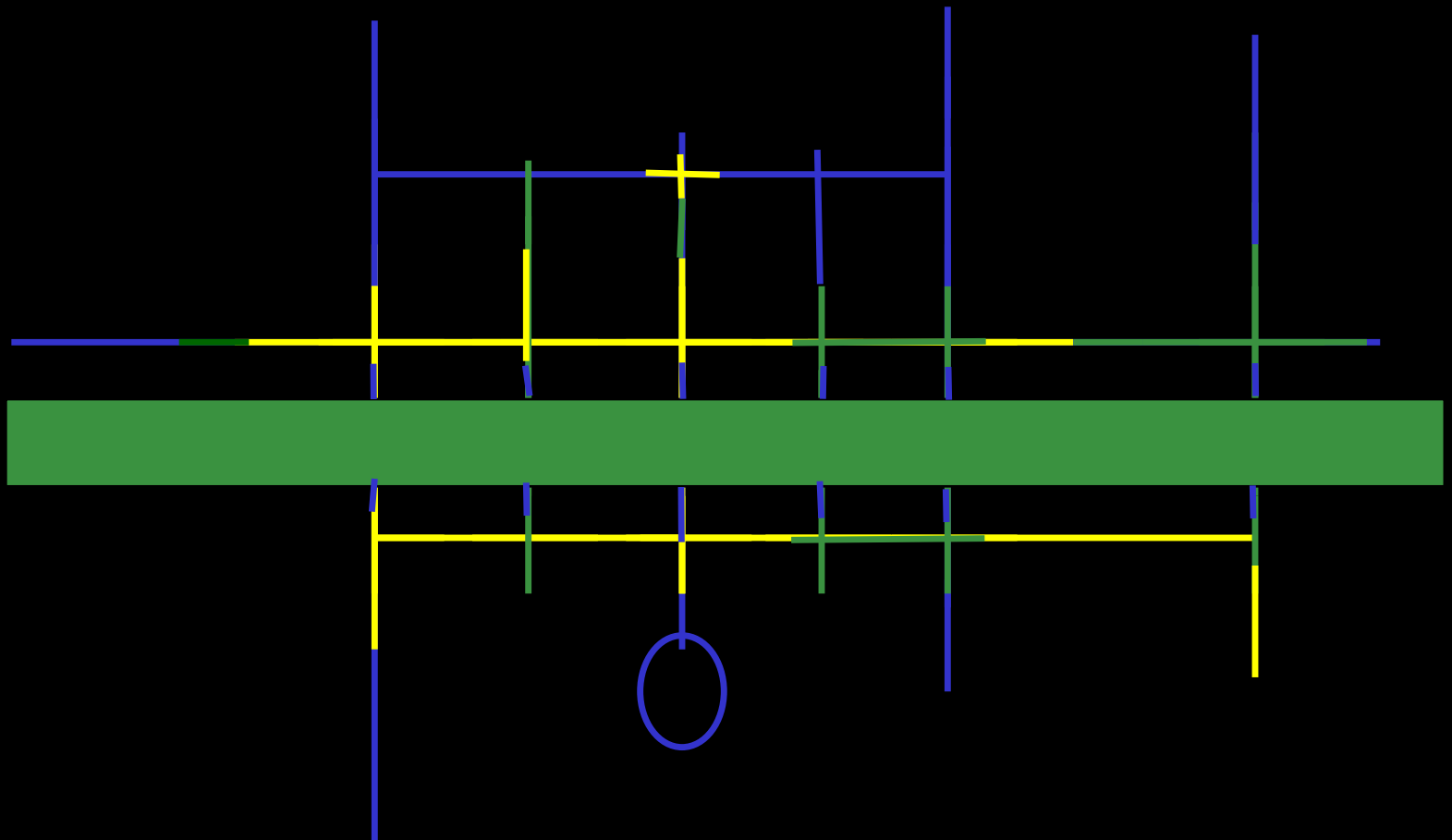
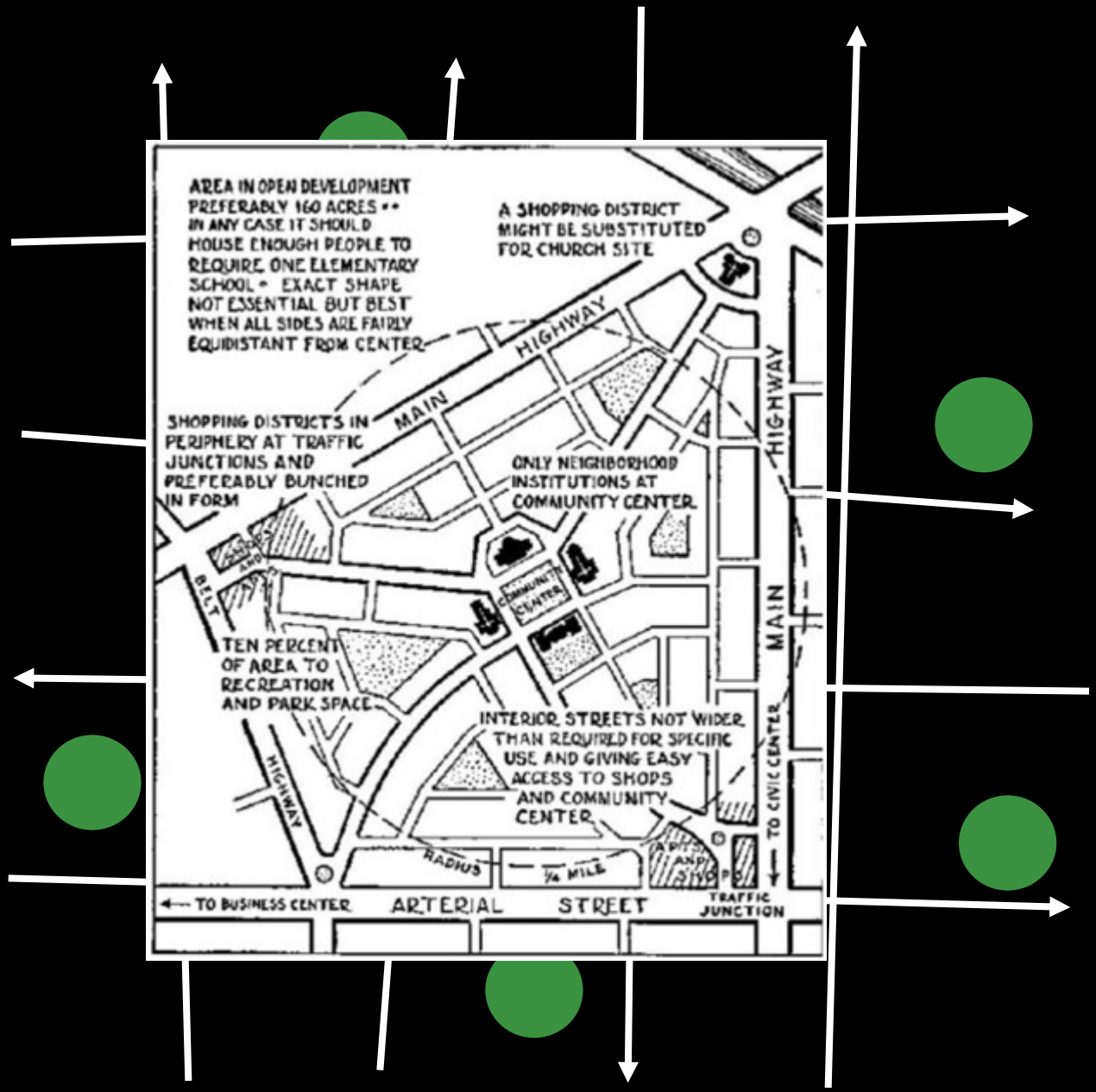
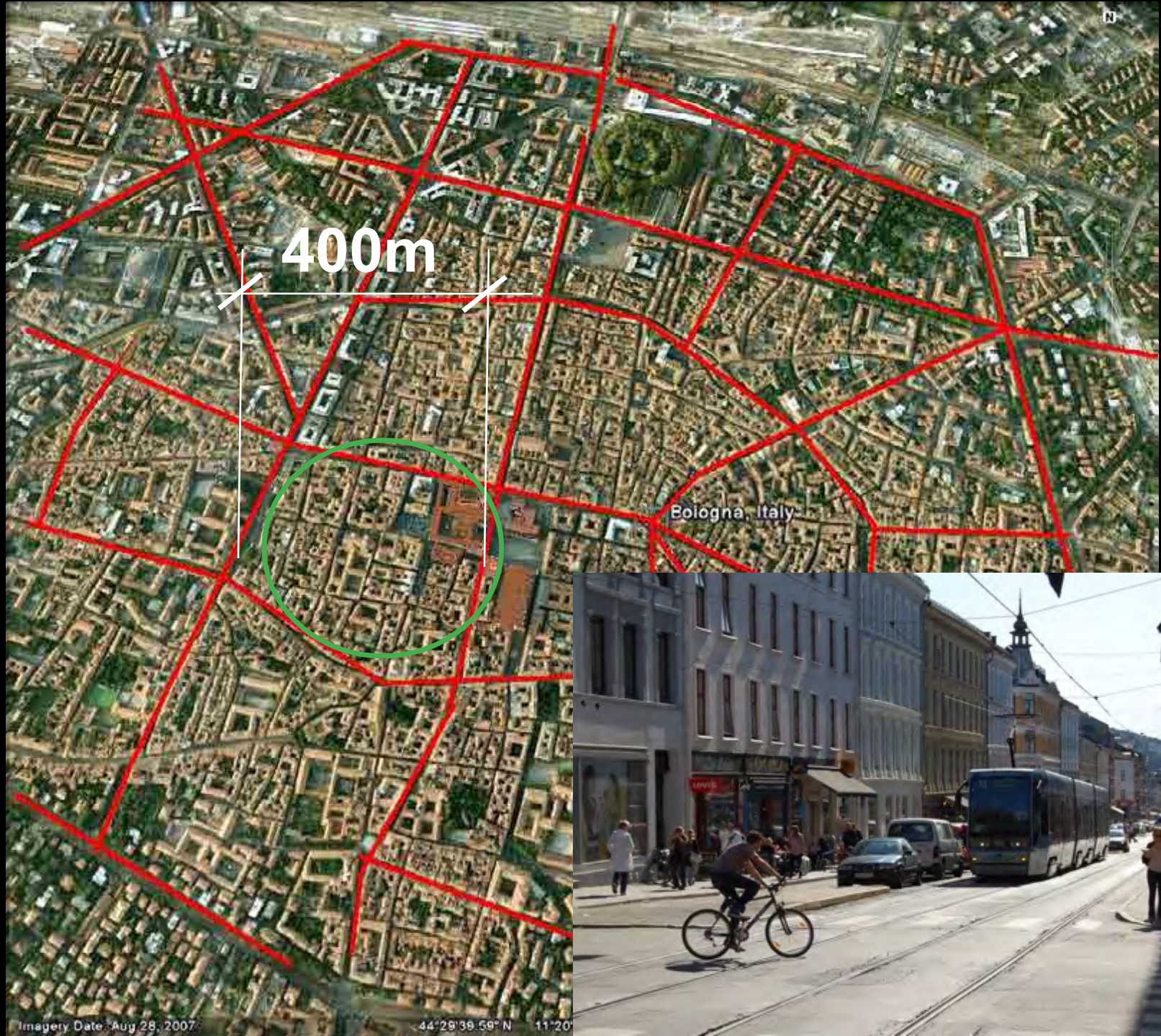
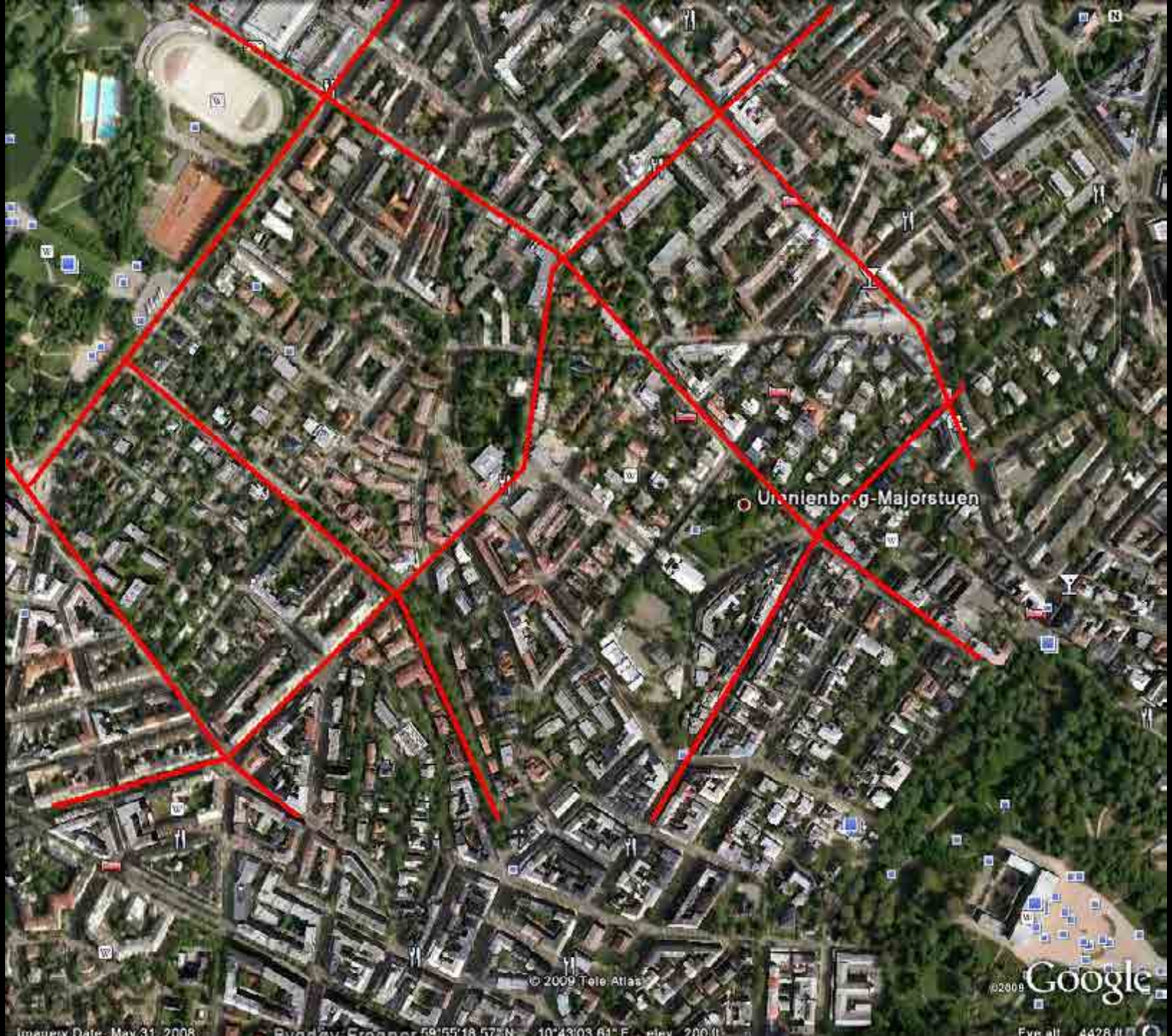



AREA IN OPEN DEVELOPMENT PREFERABLY 160 ACRES ** IN ANY CASE IT SHOULD HOUSE ENOUGH PEOPLE TO REQUIRE ONE ELEMENTARY SCHOOL * EXACT SHAPE NOT ESSENTIAL BUT BEST WHEN ALL SIDES ARE FAIRLY EQUIDISTANT FROM CENTER
A SHOPPING DISTRICT MIGHT BE SUBSTITUTED FOR CHURCH SITE
HIGHWAY
MAIN
SHOPPING DISTRICTS IN PERIPHERY AT TRAFFIC JUNCTIONS AND PREFERABLY BUNCHED IN FORM
ONLY NEIGHBORHOOD INSTITUTIONS AT COMMUNITY CENTER
COMMUNITY CENTER
BELT
TEN PERCENT OF AREA TO RECREATION AND PARK SPACE
INTERIOR STREETS NOT WIDER THAN REQUIRED FOR SPECIFIC USE AND GIVING EASY ACCESS TO SHOPS AND COMMUNITY CENTER
HIGHWAY
MAIN
TO CIVIC CENTER
RADIUS
¼ MILE
TO BUSINESS CENTER
ARTERIAL STREET
TRAFFIC JUNCTION

Victor Gruen's Shopping Mall Invention - Intended to replicate European villages!

Supercampuses and Superblocks


400m
Bologna, Italy
Imagery Date: Aug 28, 2007
44°29'39.59" N
11°20'


Google

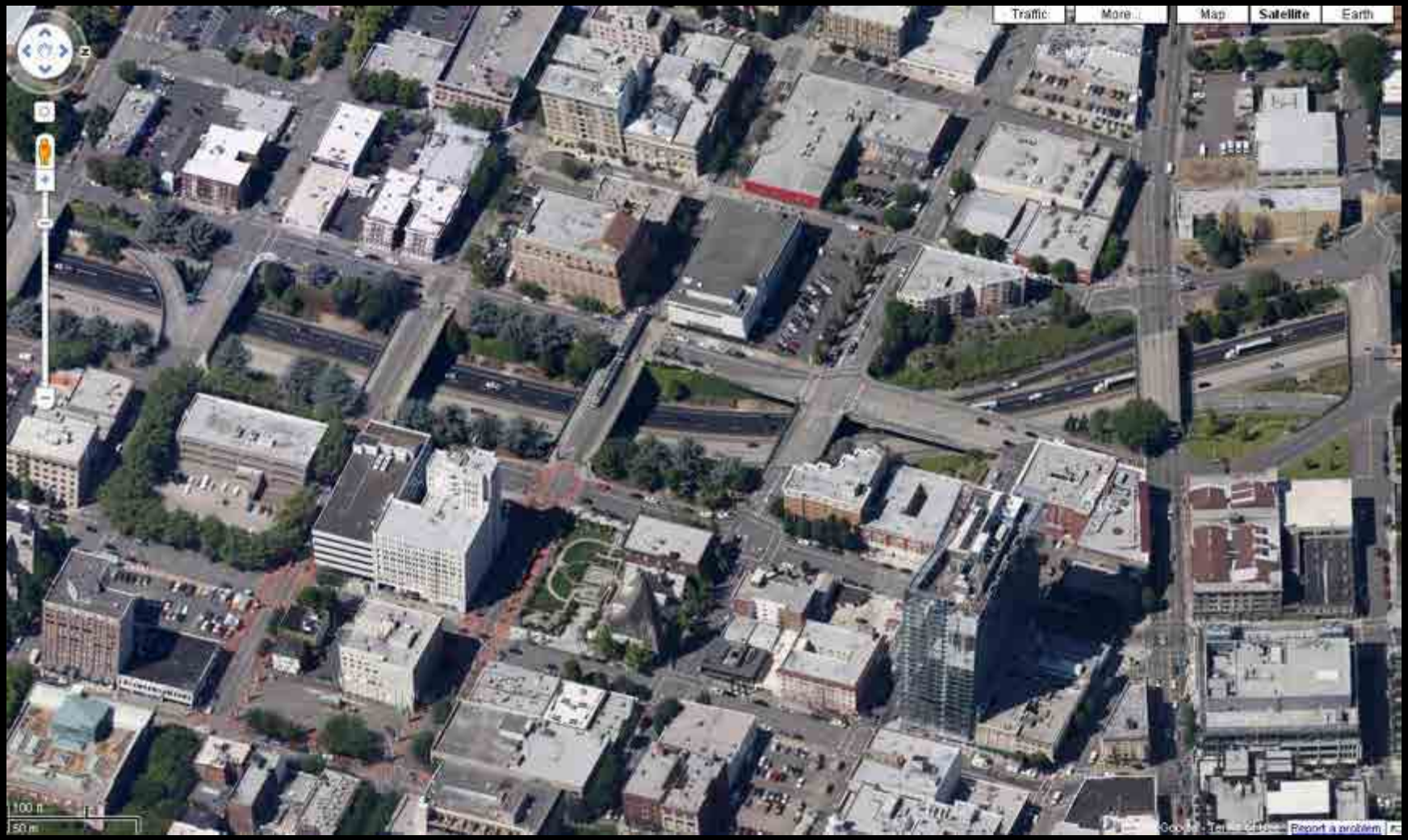

Google

Portland, Oregon, USA

A modern economy built on a walkable network

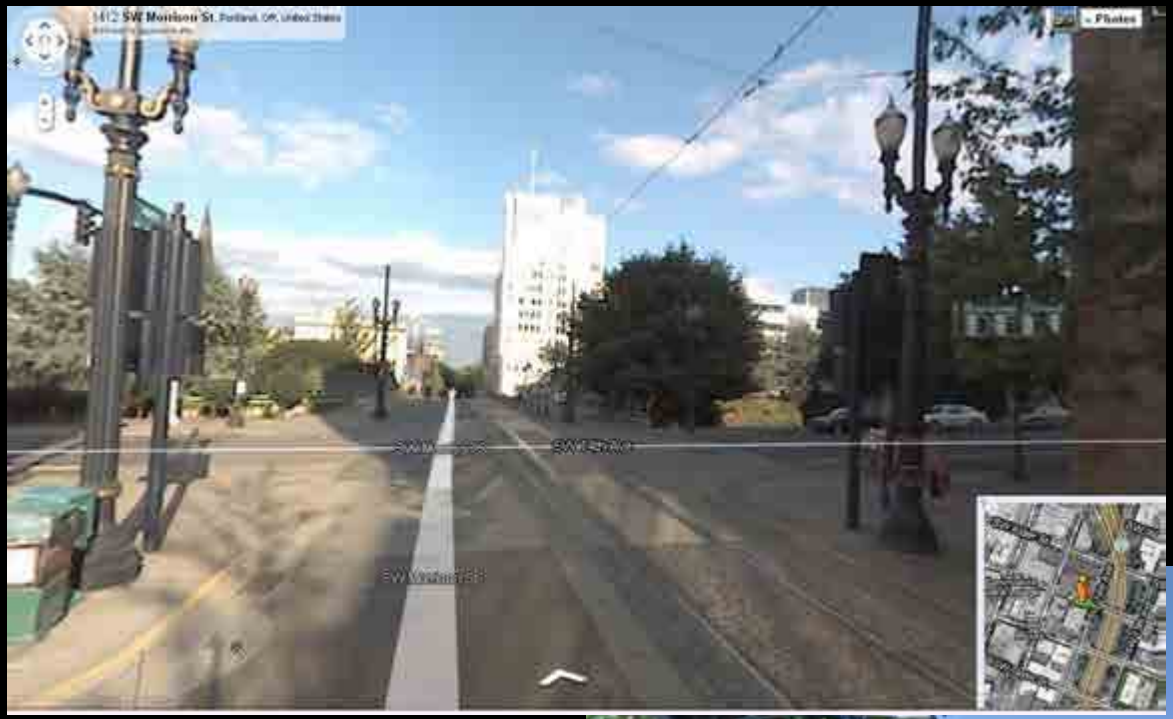
Remarkable example of Portland, Oregon – 400m grid across all “border vacuums”

...Even freeways

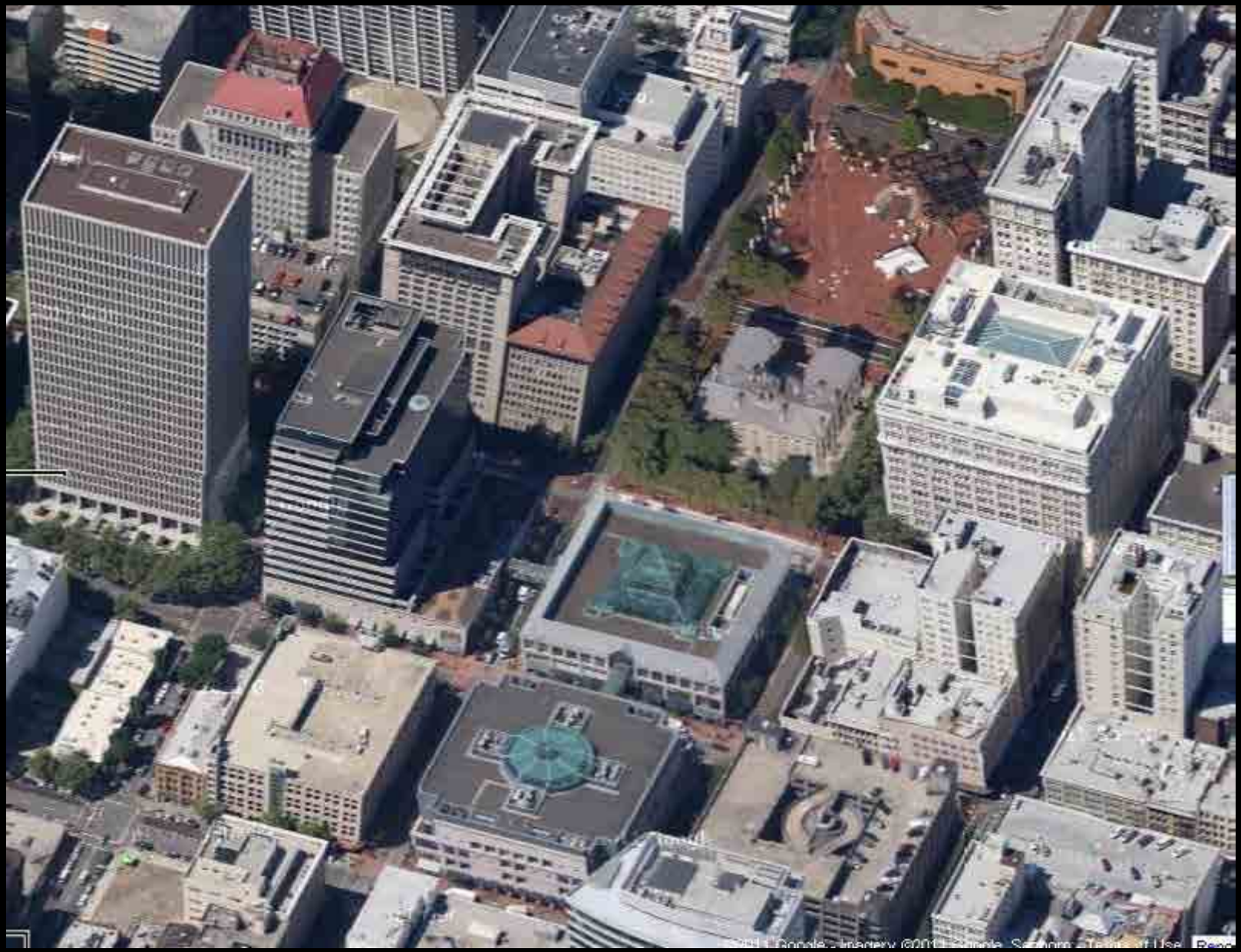


< View from above

View from below
V

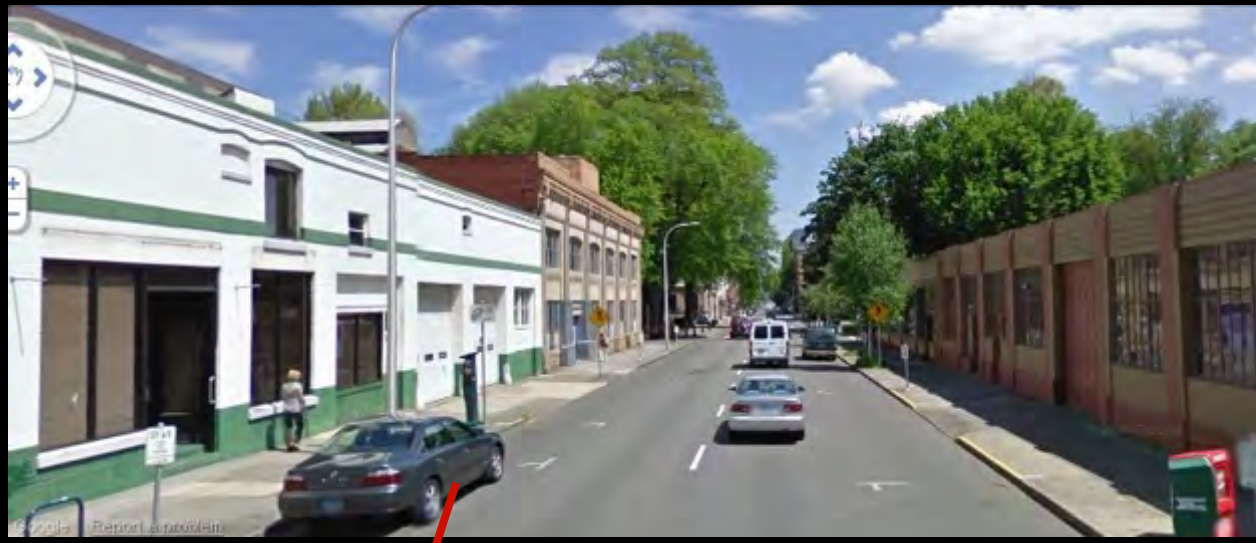


Portland, Oregon – continuous street grod through a shopping mall



Portland, Oregon – continuous street grid through a hospital

Portland, Oregon – Continuous street grid through a (mixed) industrial area



Note the range of sizes, including larger complexes

Portland, Oregon – Continuous street grid through a university

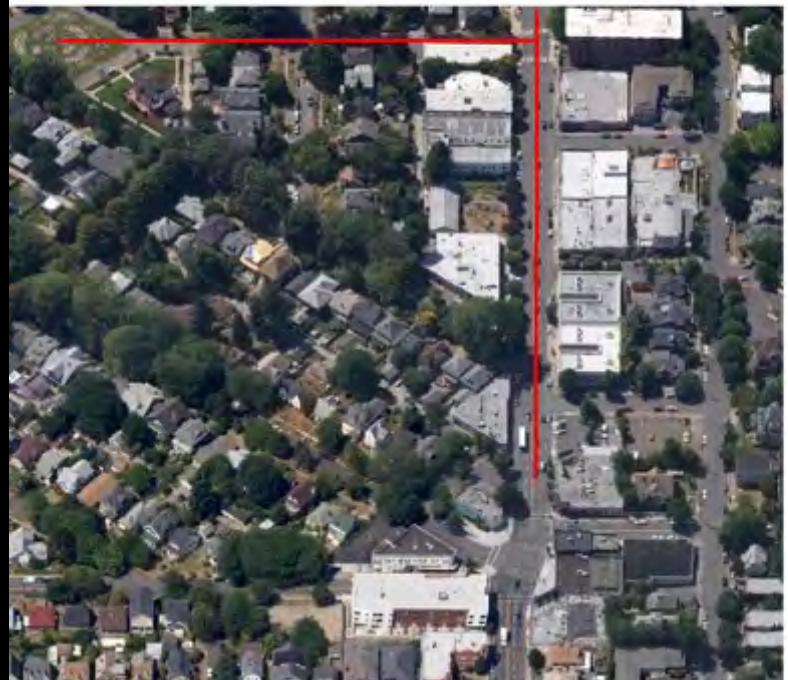
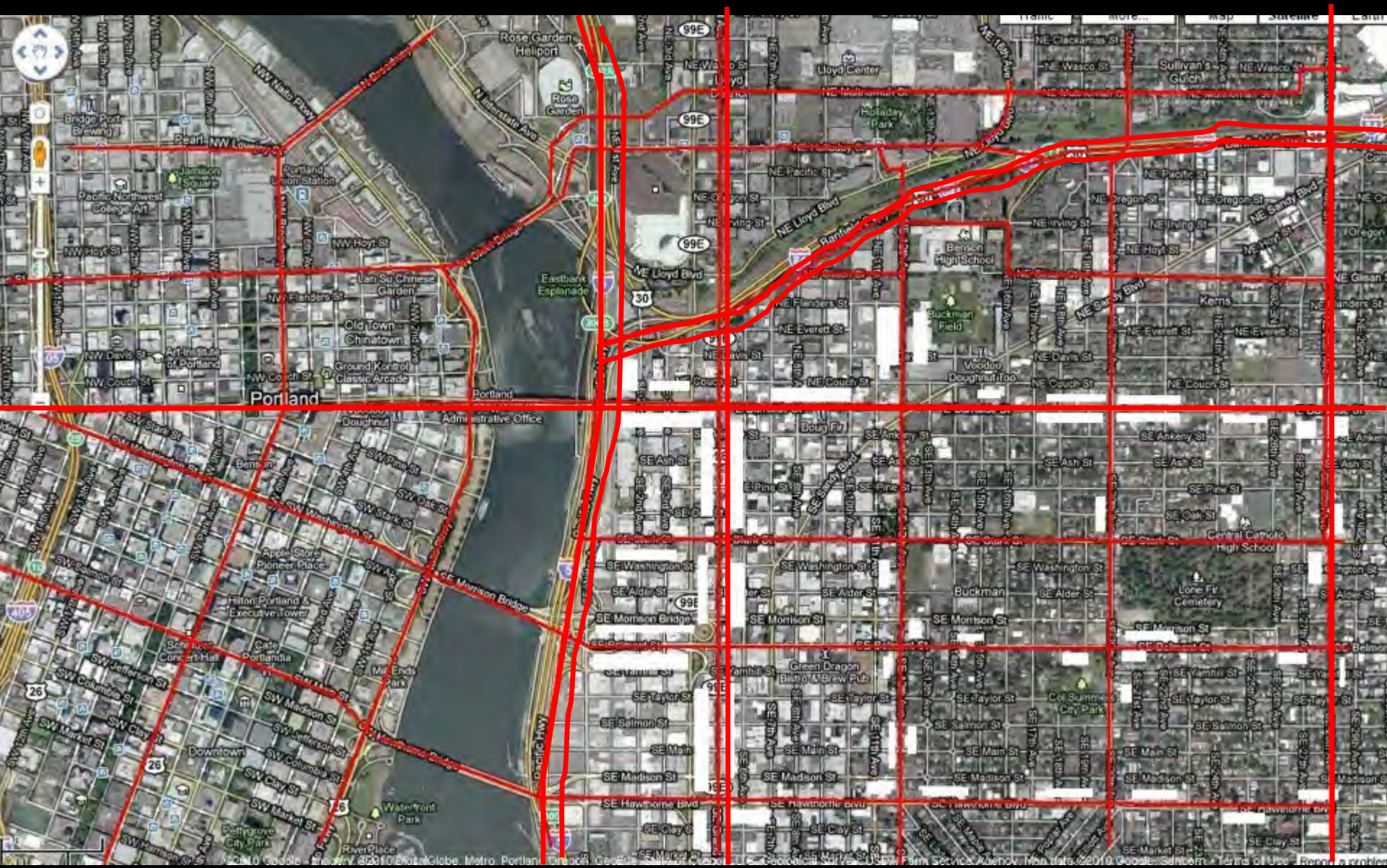


ILLUSTRATION TWO:
HAWTHORNE SCALE
("LEVEL C"
THROUGH STREET)

UP TO 4 TRAVEL LANES
UP TO 2 PARKING LANES

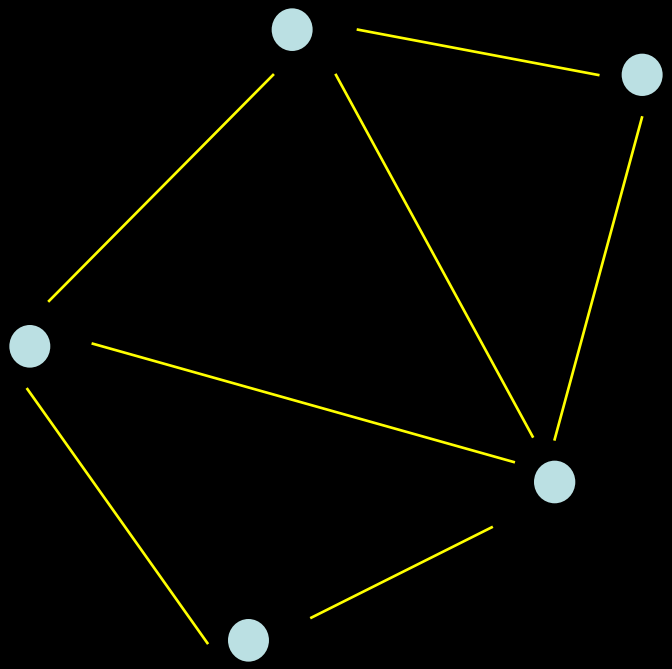
A range of street types, from small to large

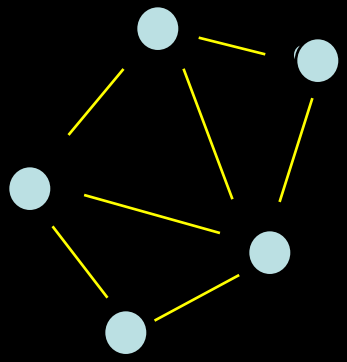


Finally, Some Additional Research Findings On Environmental Benefits…

Key Research Finding:

Urban density is strongly correlated with emissions reductions per capita, and other urban benefits

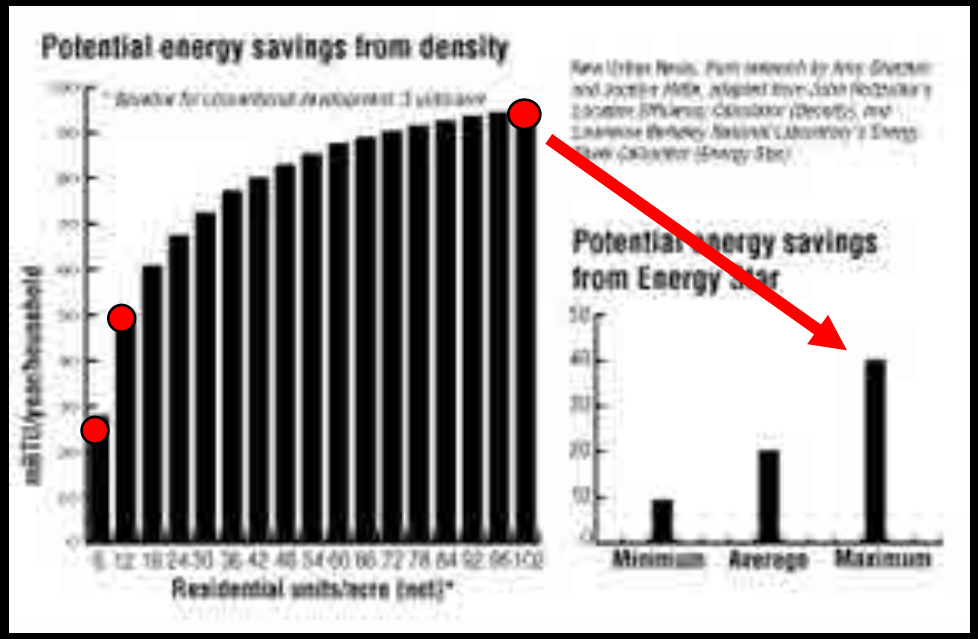


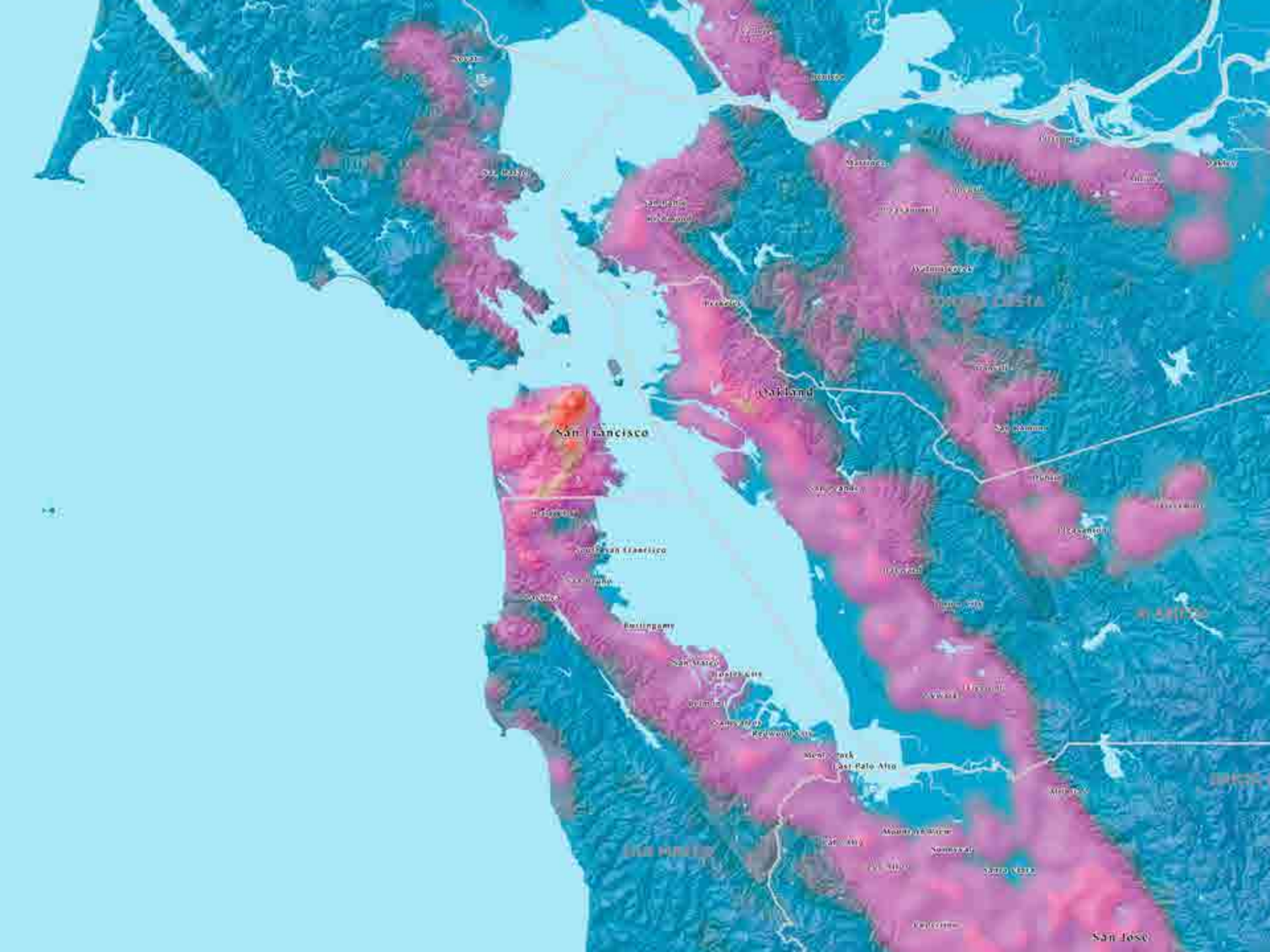


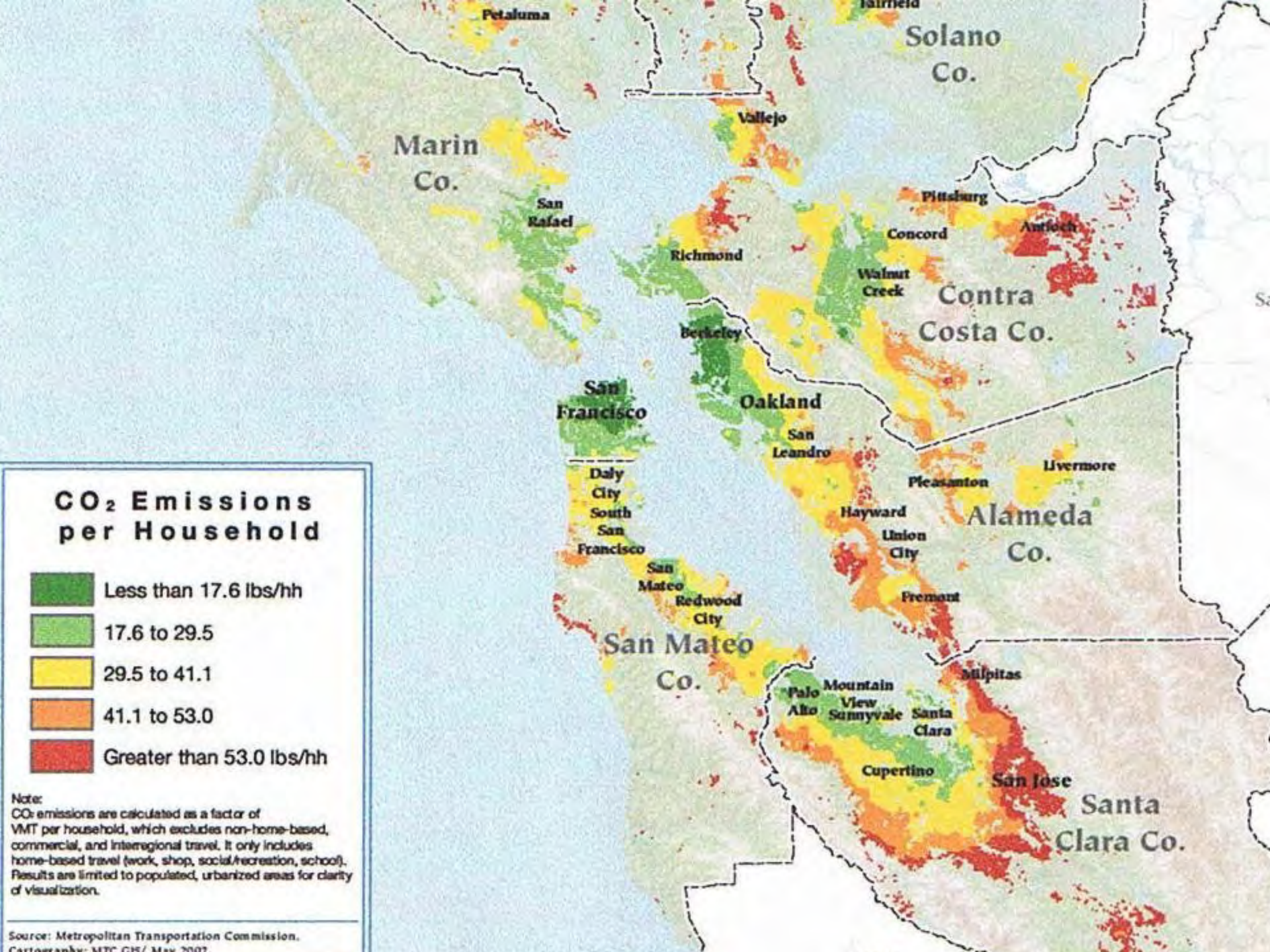
Scenario One - Lower Density

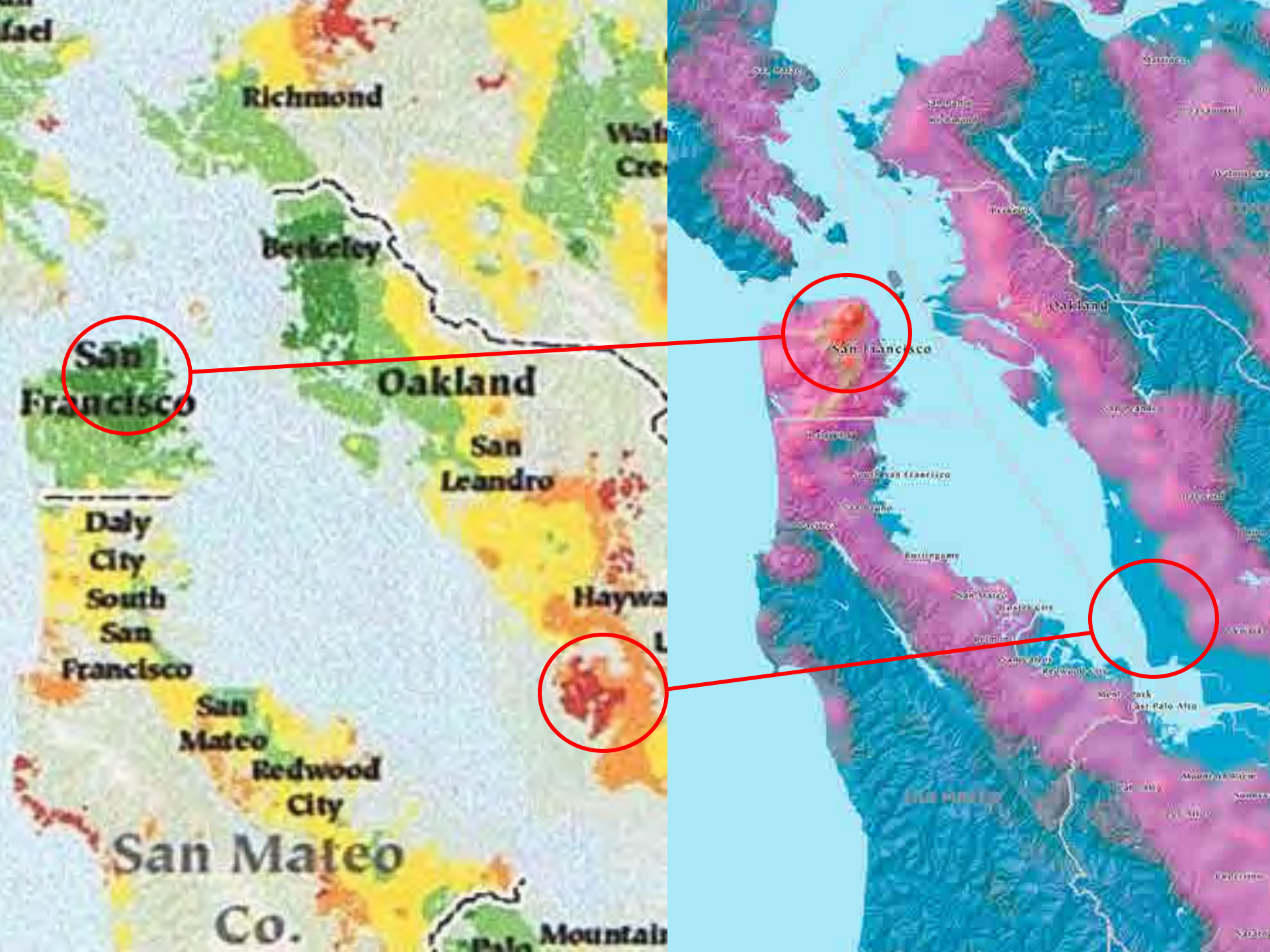
Scenario Two - Higher Density

Savings from density alone exceed savings from a popular US device certification system:




Oakland
San Francisco
San Jose


Petaluma
Fairfield
Solano Co.
Vallejo
Marin Co.
San Rafael
Pittsburg
Antioch
Concord
Richmond
Walnut Creek
Contra Costa Co.
Berkeley
San Francisco
Oakland
San Leandro
Livermore
Pleasanton
Daly City
South San Francisco
Hayward
Union City
Alameda Co.
San Mateo
Redwood City
Fremont
San Mateo Co.
Milpitas
Palo Alto
Mountain View
Sunnyvale
Santa Clara
Cupertino
San Jose
Santa Clara Co.
CO_2 Emissions per Household
Less than 17.6 lbs/hh
17.6 to 29.5
29.5 to 41.1
41.1 to 53.0
Greater than 53.0 lbs/hh
Note:
CO_2 emissions are calculated as a factor of VMT per household, which excludes non-home-based, commercial, and interregional travel. It only includes home-based travel (work, shop, social/recreation, school). Results are limited to populated, urbanized areas for clarity of visualization.
Source: Metropolitan Transportation Commission.


Richmond
Berkeley
San Francisco
Oakland
San Leandro
Daly City
South San Francisco
San Mateo
Redwood City
San Mateo Co.
Oakland
San Francisco

Key Research Finding:

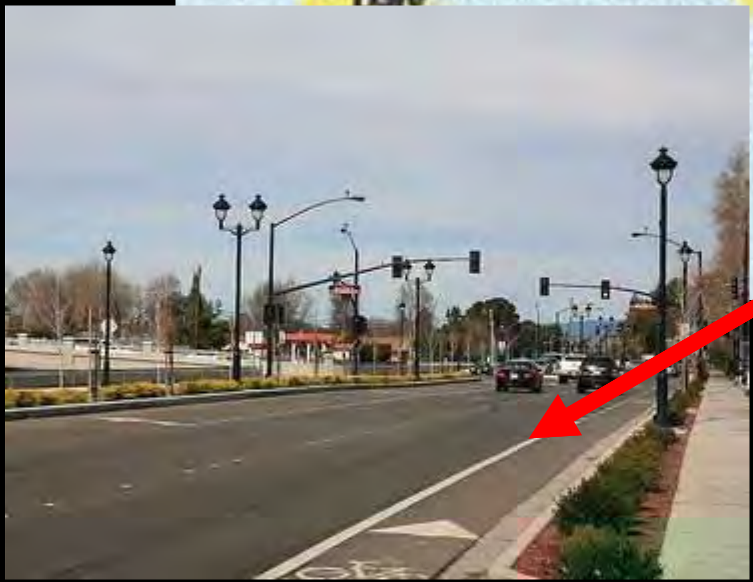
It is not just density, but other factors of urban morphology, that affect performance

(Mix of destinations and uses, connectivity, multi-modal transportation, compact housing, etc…)

C


Francisco
Oakland
San Leandro


680
Sabercat Rd
Pine St
Greenhills Way
Durham Rd

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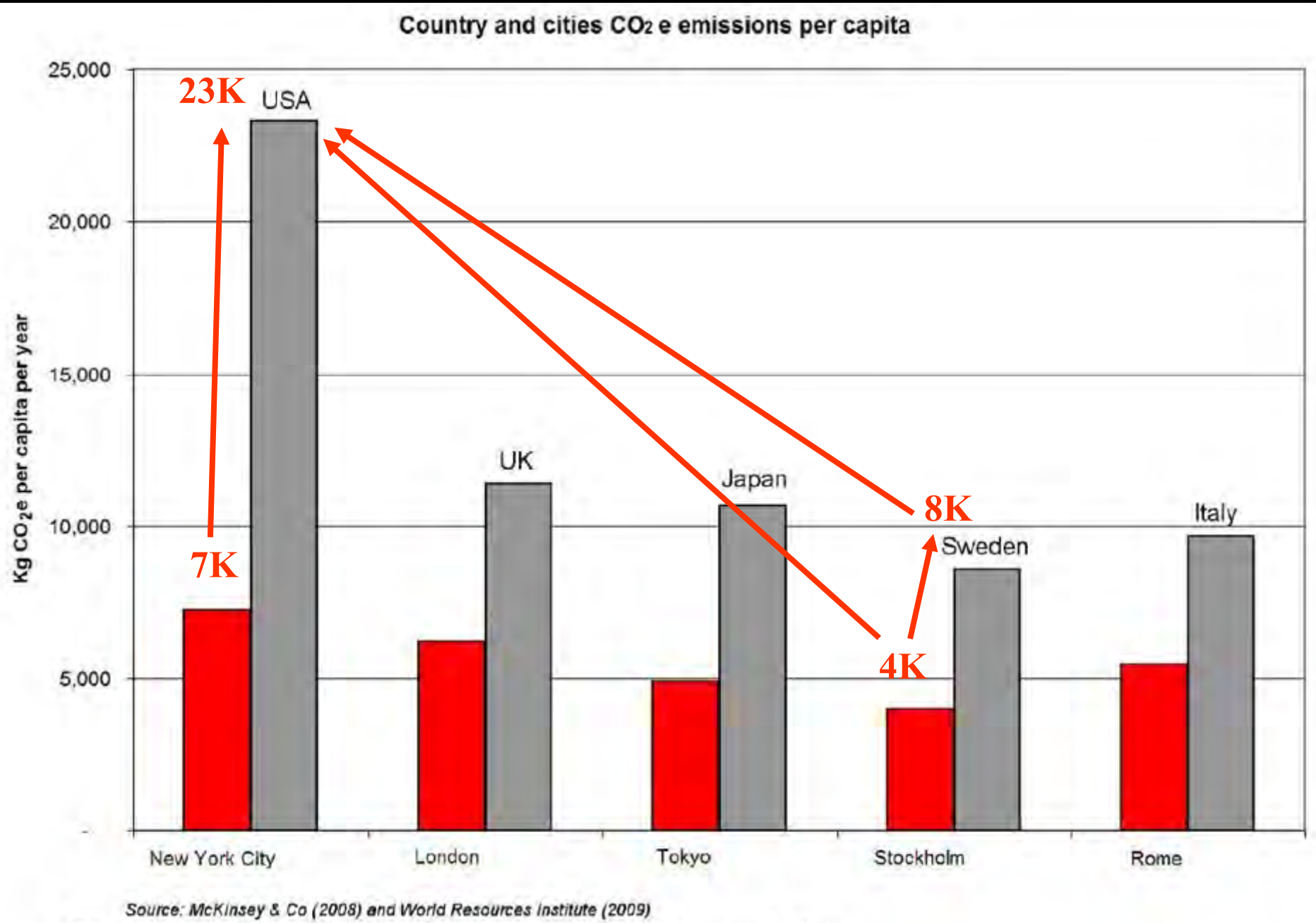
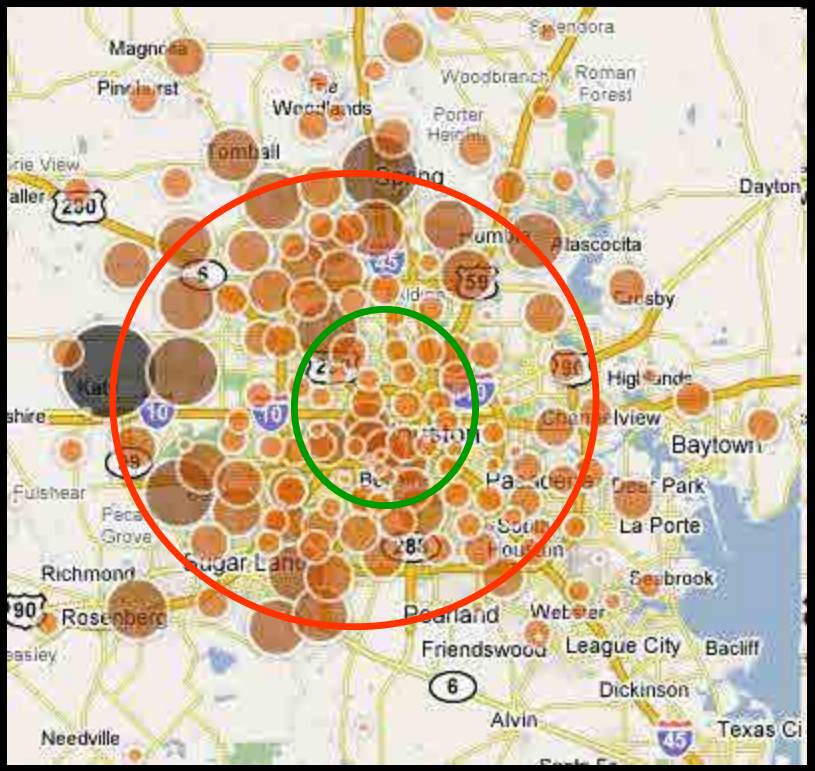


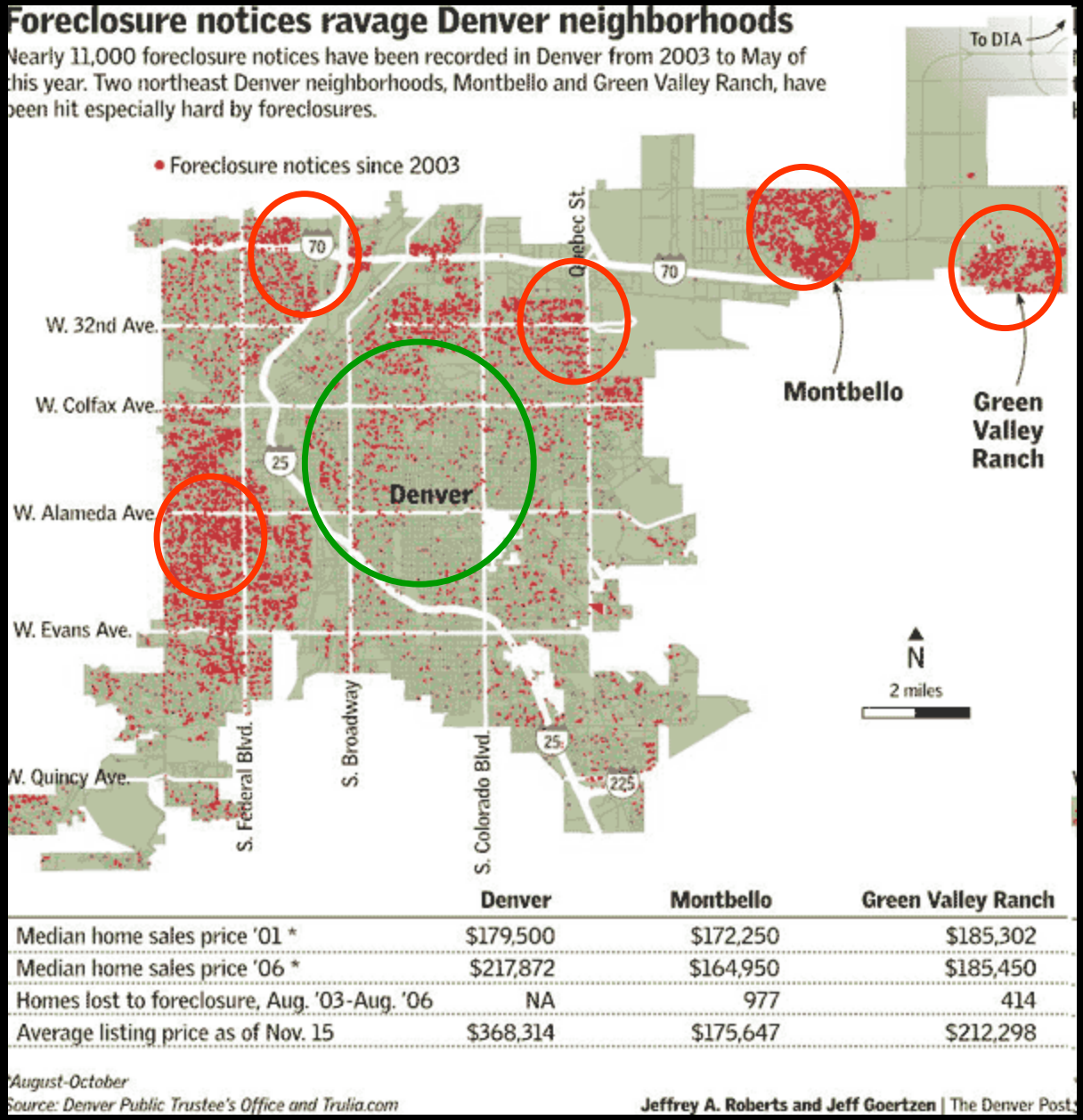
Source: McKinsey & Co (2008) and World Resources Institute (2009)

Figure 1: CO2 emissions in cites compared to countries



Lessons of 2008 recession:

It is not only emissions and other environmental impacts, but also economic impacts



	Denver	Montbello	Green Valley Ranch
Median home sales price '01 *	$179,500	$172,250	$185,302
Median home sales price '06 *	$217,872	$164,950	$185,450
Homes lost to foreclosure, Aug. '03-Aug. '06	NA	977	414
Average listing price as of Nov. 15	$368,314	$175,647	$212,298

*August-October
Source: Denver Public Trustee's Office and Trulia.com

Jeffrey A. Roberts and Jeff Goertzen | The Denver Post

Our urbanization is not only ecologically unsustainable, but also economically unsustainable

Key Research Finding:

What is especially important is the structure of public space, and the ways it allows us to connect easily to one another, and to our own private spaces, in an efficient, low-carbon lifestyle


Thank You!