Lecture 18

18.1 What are Cities for? Some of the Challenges Ahead

IUS Ch 10

What cities for?

The chief function of the **City** is to convert

power into **form**,
energy into **culture**,
dead matter into the **living symbols** of **art**,
biological reproduction into **social creativity**.

- Lewis Mumford, The city in history, 1962

https://en.wikipedia.org/wiki/The_City_in_History

Recurring Themes in Urban Science

IUS 10.1

and this course

Cost-Benefit Dynamics

In dynamical, heterogeneous, noisy social environments

individuals, households, governments

selects people into situations of
opportunity or disadvantage

cooperation and competition
volatility challenges
clear horizons and growth

Connectivity

poverty as disconnection

prosperity as synergetic connections

diversity of knowledge and behavior, type.

barriers to connectivity = segregation, poverty traps, slums

driven by competition, perception of relative loss

inclusion of strangers is key
public (neutral) institutions
open infrastructure and services
co-existence of languages, cultures, religious

Disconnected/segregated individuals penalized
but also the system as a whole
because of network effects

Information

structural

professions
businesses
neighborhoods
behavior
fashion
pop culture

growth rates

choice
agency
education
migration

The patterns of our lives (life paths):
Open-ended innovation
shared signals and behaviors
social technologies
enduring, spreading knowledge

what drives makes it possible

What it looks like

What it produces

Paying the high costs of connectivity in larger cities

is only worth it in light of greater social productivity and innovation

from deeper divisions of knowledge and labor
the new knowledge and possibilities this process creates and embodies

This presents as a state of interaction **density, diversity, heterogeneity, interdependence and complementarity**

which is **open to newcomers, embeds more information** per capita and **creates fast change**

Large cities have little to offer that is material, **information** is most of what they do

most ‘expensive’, most difficult to create, most enduring.

The Challenges Ahead

IUS 10.2

urban *science* must generalize to entirely new situations

Gigacities

The Challenge of Slums

Shrinking Cities

Sustainable Development

...

Gigacities

We will have the largest cities that ever existed in the next decades: exciting !!

Population projections of the 101 largest cities in the 21st century [edit]

Large urban areas are hubs of economic development and innovation, with larger cities underpinning regional economies and local and global sustainability initiatives. Currently, 757 million people reside in the 101 largest cities;[22] these cities are home to 11% of the world's population.[22] By the end of the century, the world population is projected to grow, with estimates ranging from 6.9 billion to 13.1 billion;[22] the percentage of people residing in the 101 larger cities is estimated to be 15% to 23%.[22]

The 101 cities with the largest population projections for the years 2025, 2050, 2075, and 2100 are listed below.[22]

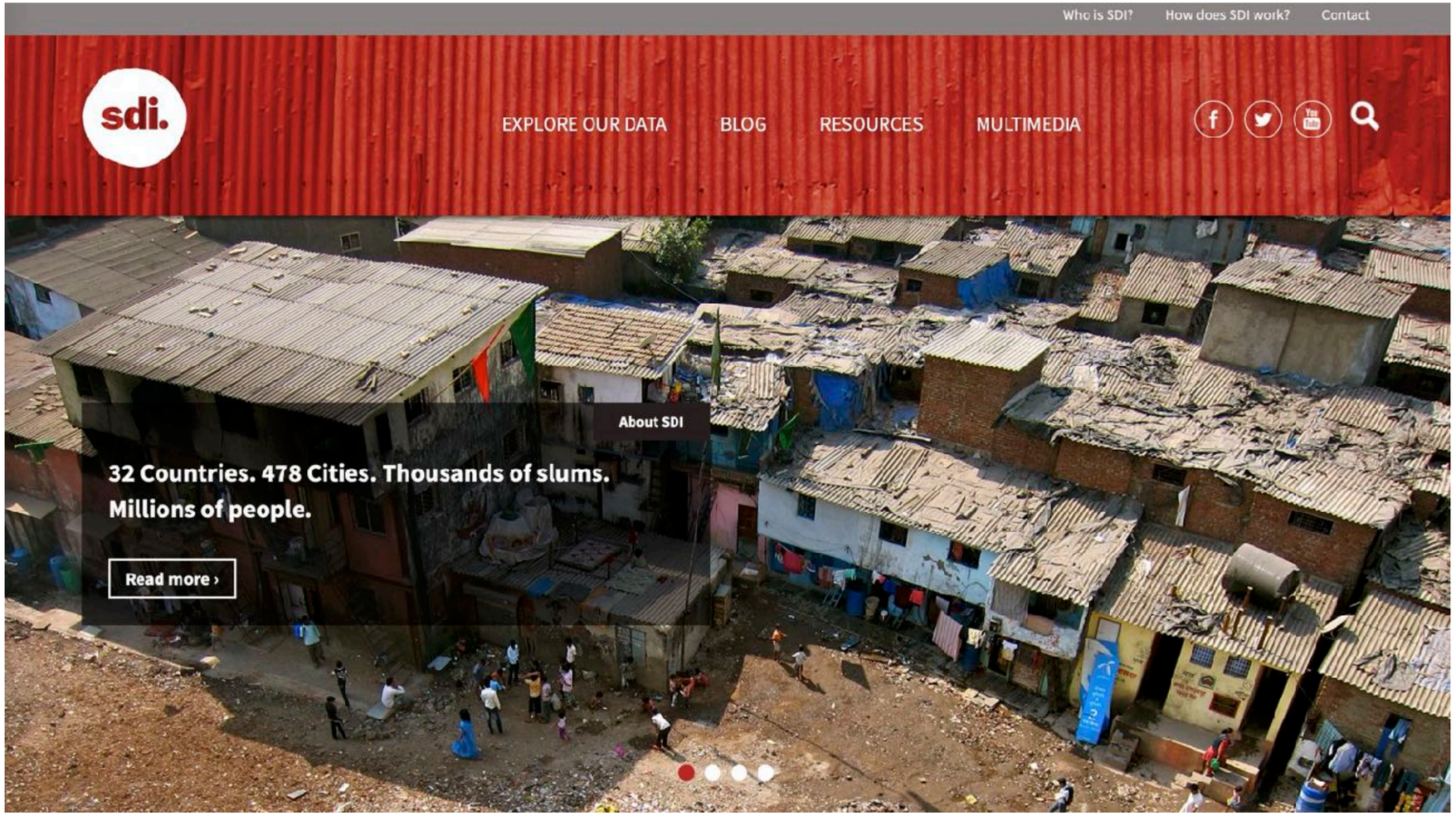
Rank	City	Projected Population (millions) 2025	City	Projected Population (millions) 2050	City	Projected Population (millions) 2075	City	Projected Population (millions) 2100
1	Tokyo	36.40	Mumbai	42.40	Mumbai	57.86	Lagos	76.60
2	Mumbai	26.39	Delhi	36.16	Lagos	55.26	Dar es Salaam	73.68
3	Delhi	22.50	Dhaka	35.19	Kinshasa	54.51	Mumbai	67.24
4	Dhaka	22.02	Kinshasa	35.00	Delhi	49.34	Kinshasa	63.05
5	Sao Paulo	21.43	Kolkata	33.04	Kolkata	45.09	Lilongwe	57.43
6	Mexico City	21.01	Lagos	32.63	Karachi	43.37	Delhi	57.33
7	New York	20.63	Tokyo	32.62	Dhaka	42.45	Blantyre City	56.78
8	Kolkata	20.56	Karachi	31.70	Dar es Salaam	37.49	Khartoum	56.59
9	Shanghai	19.41	New York	24.77	Cairo	33.00	Niamey	55.24
10	Karachi	19.10	Mexico City	24.33	Manila	32.75	Kolkata	52.40
11	Kinshasa	16.76	Cairo	24.04	Kabul	32.67	Kabul	59.27
12	Lagos	15.80	Manila	23.55	Khartoum	30.68	Karachi	49.06
13	Cairo	15.56	Sao Paulo	22.83	Nairobi	28.42	Nairobi	46.66
14	Manila	14.81	Shanghai	21.32	New York	27.19	N'Djamena	41.15
15	Beijing	14.55	Lahore	17.45	Tokyo	24.64	Cairo	40.54

Hoornweg & Pope (2014).
Population predictions of the 101 largest cities in the 21st century

Compute the properties of these cities: their innovation rates, their speed of walking, their infrastructure needs and design, their wealth: **They will be amazing !**

Fast Human Development in a Million Neighborhoods

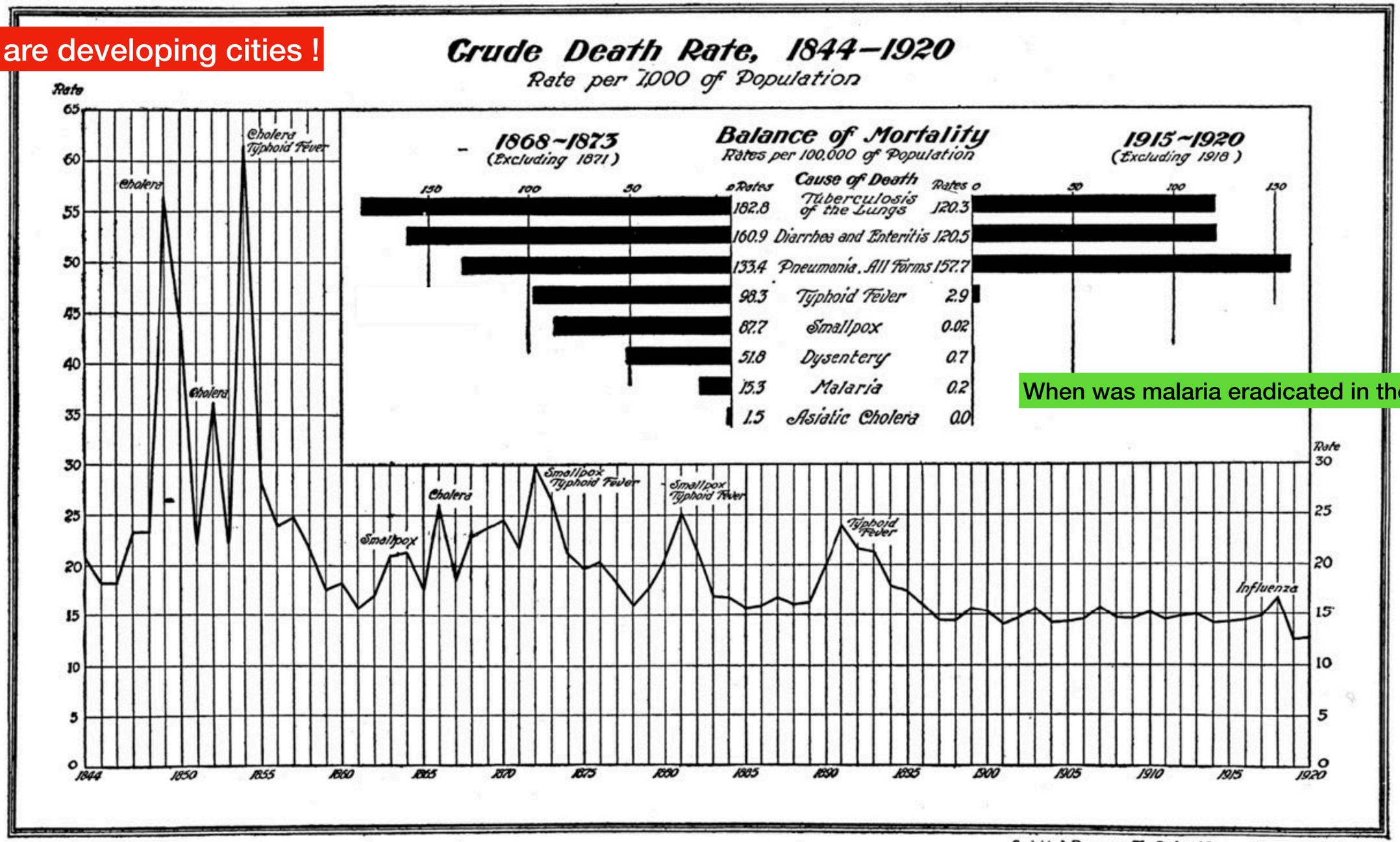
The challenge of slums and accelerating the development of livable cities



Can you create a million great neighborhoods supporting a decent life in one generation?

Mortality of Chicago, Ill.

All cities are developing cities !

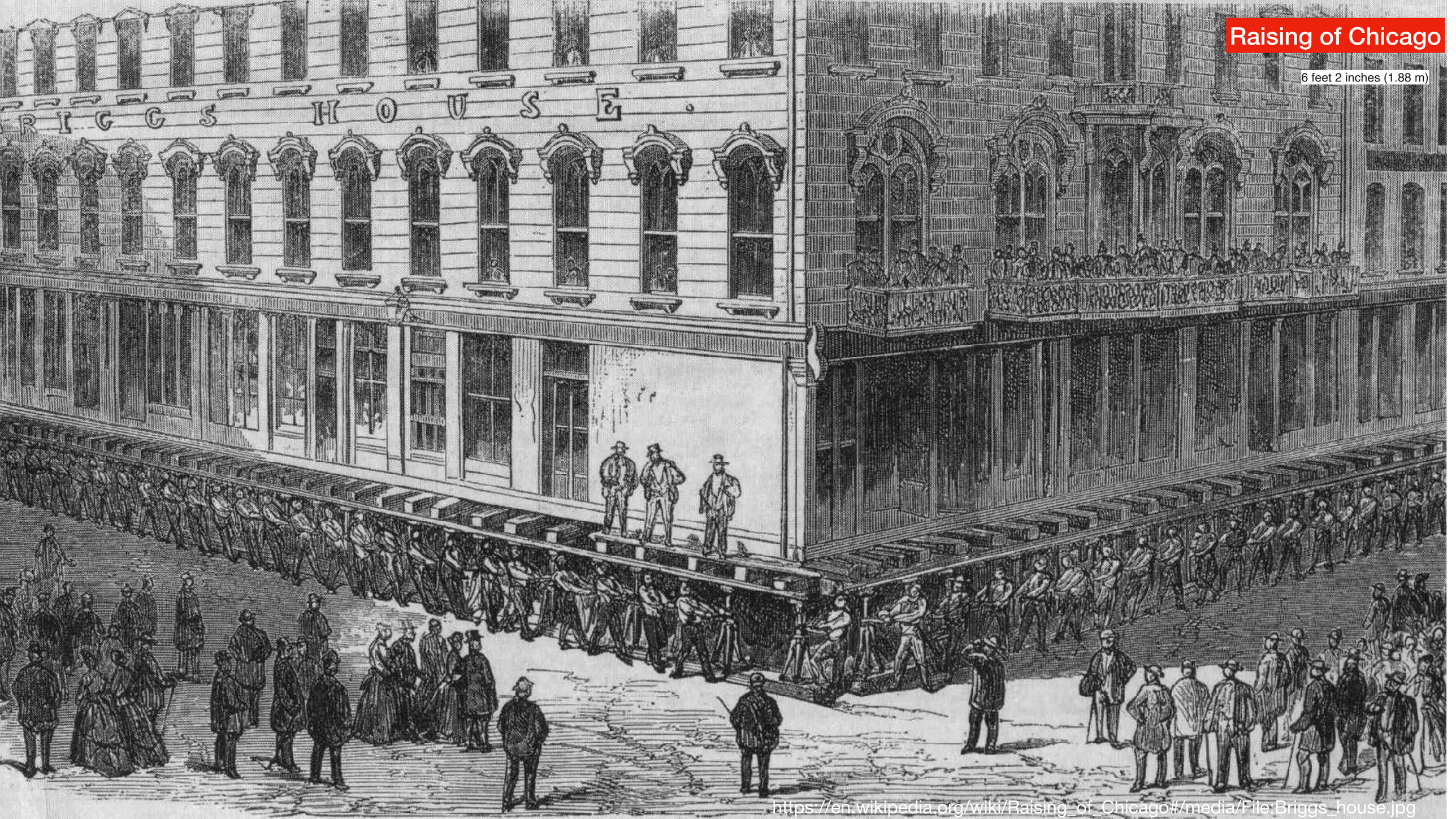


When was malaria eradicated in the US?

Statistician's Department, The Prudential Insurance Company of America

Raising of Chicago

6 feet 2 inches (1.88 m)



https://en.wikipedia.org/wiki/Raising_of_Chicago#/media/File:Briggs_house.jpg

We saw how this is possible and can be achieved fast

Chicago, Near West Side, 1910

The 10 most beautiful streets of Spain

Toledo, Spain

http://www.encyclopedia.chicagohistory.org/pages/3796.html

https://www.ferrerhotels.com/travellost/en/most-beautiful-streets-of-spain/

Shrinking Cities

a critical challenge for the US and many other richer nations, including China

https://www.theguardian.com/cities/gallery/2016/nov/02/global-population-decline-cities-mapped

▲ An abandoned home in St Louis
Photograph: Sid Hastings/Tha Guardian

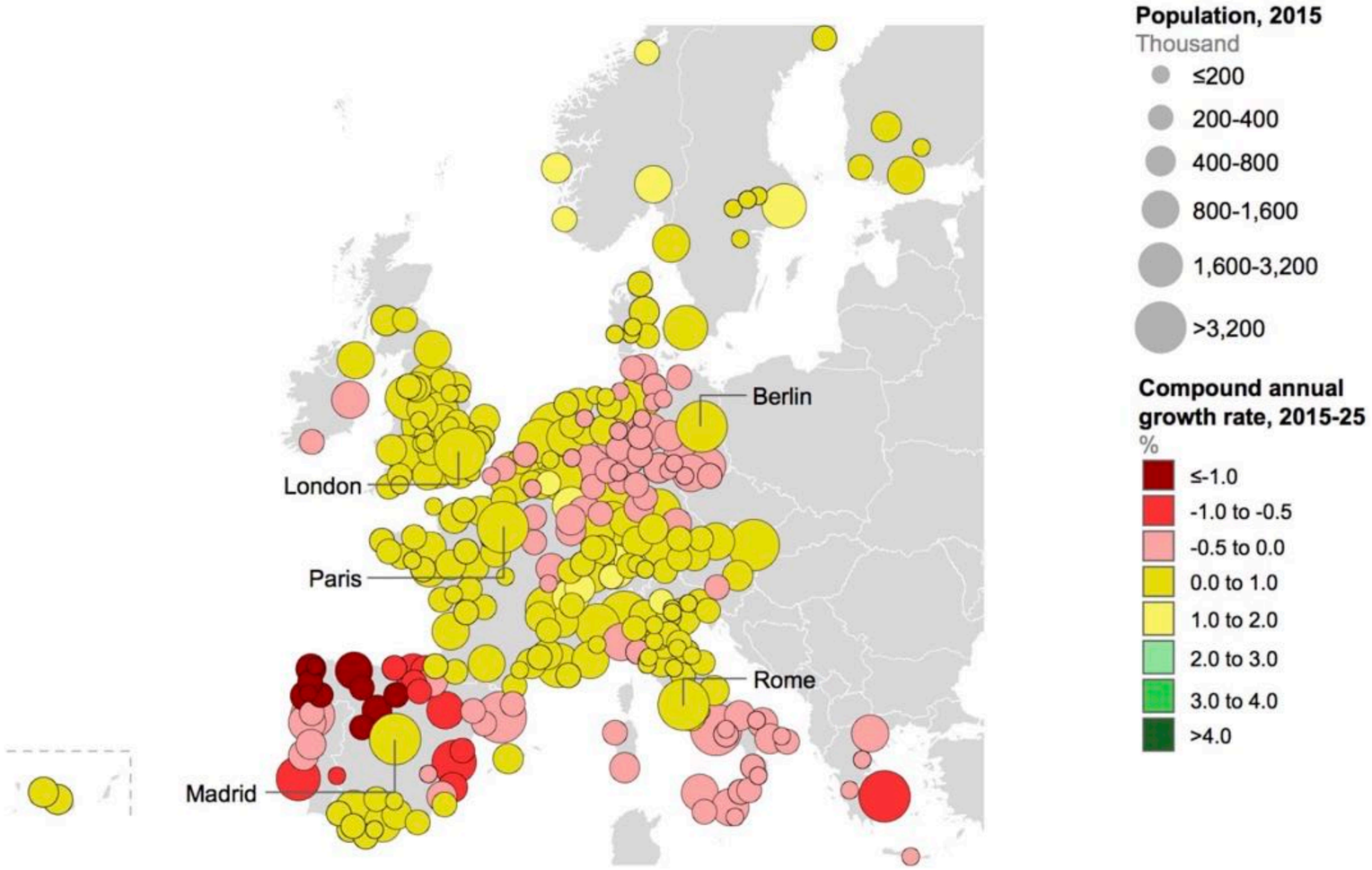
Shrinking cities: the rise and fall of global urban populations – mapped

The world is experiencing rapid urbanisation, but not every city is growing. Population is likely to decline in 17% of large cities in developed regions and 8% of cities across the world from 2015 to 2025, according to a McKinsey report

infrastructure is hard to shrink and creates enormous deficits: can you imagine how to improve this situation?

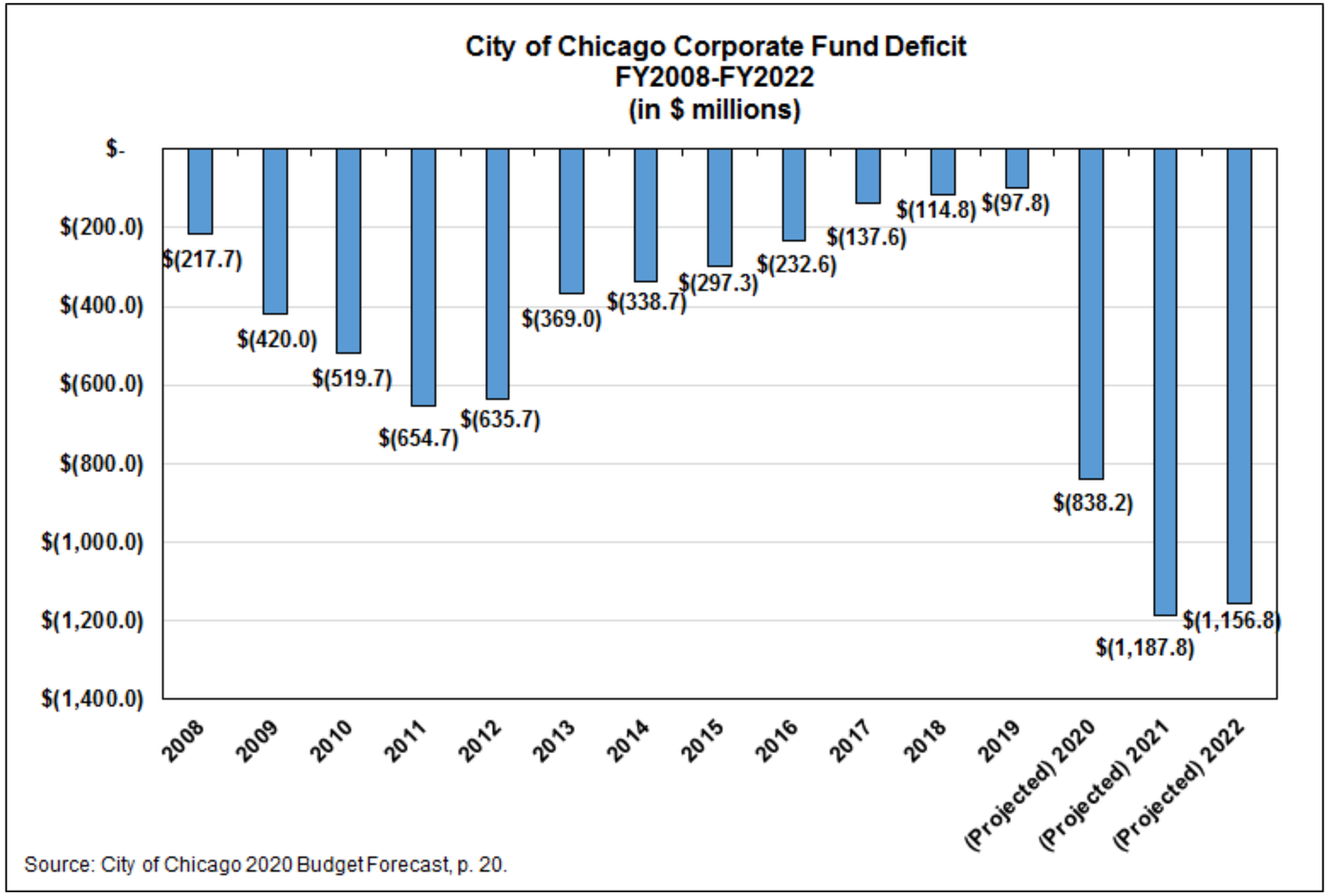
Shrinking Cities

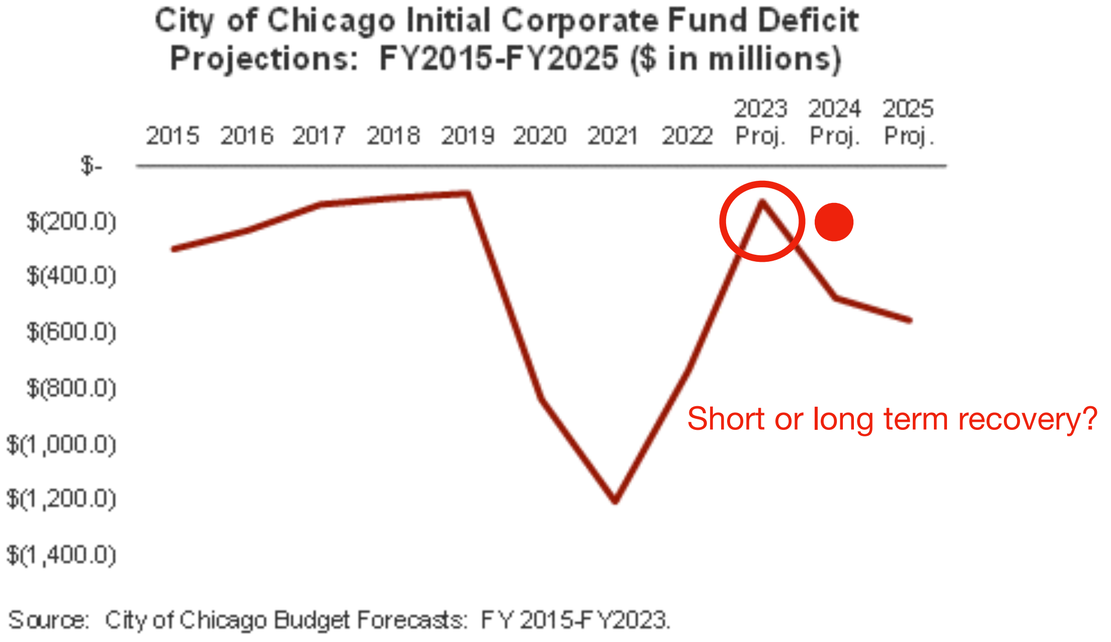
The challenge of slums and accelerating the development of livable cities



infrastructure is hard to shrink and creates enormous stranded costs (and deficits): can you imagine how to improve this situation?

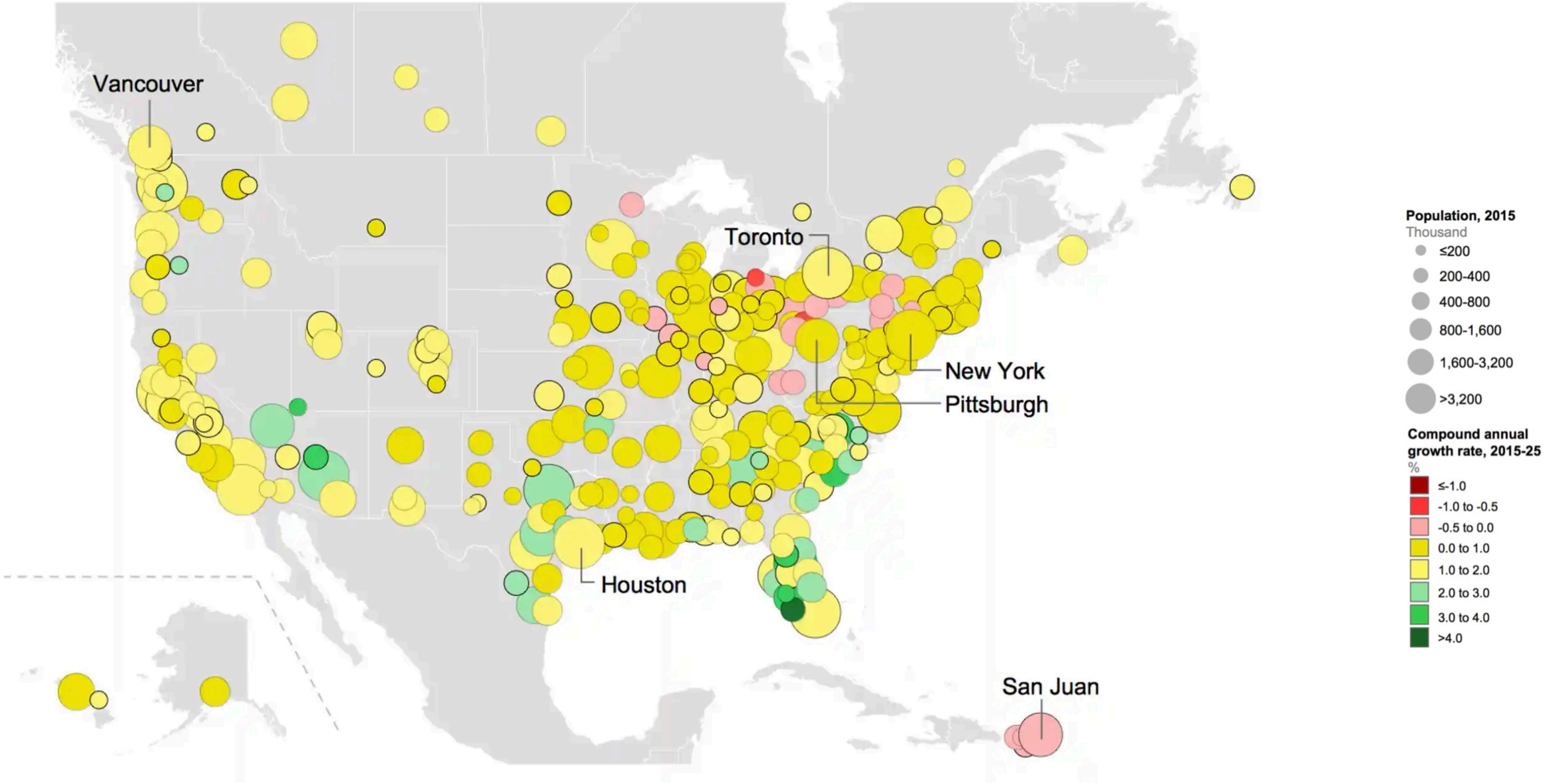
https://www.theguardian.com/cities/gallery/2016/nov/02/global-population-decline-cities-mapped





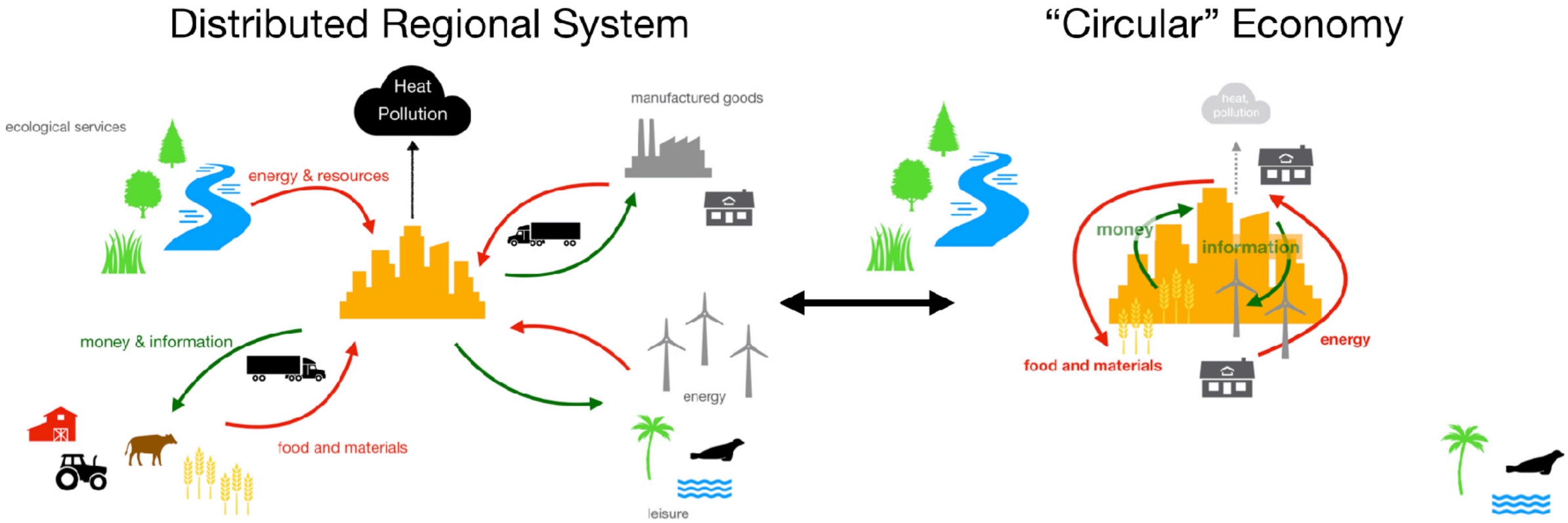
https://www.civicfed.org/civic-federation/blog/city-chicago-projected-budget-deficit-increases-8382-million

https://www.civicfed.org/civic-federation/blog/fy2023-chicago-budget-forecast-signals-short-term-recovery


Vancouver
Toronto
New York
Pittsburgh
Houston
San Juan
Population, 2015
Thousand
≤200
200-400
400-800
800-1,600
1,600-3,200
>3,200
Compound annual growth rate, 2015-25
%
≤-1.0
-1.0 to -0.5
-0.5 to 0.0
0.0 to 1.0
1.0 to 2.0
2.0 to 3.0
3.0 to 4.0
>4.0

Decarbonization and Sustainability

Changing humans' relationship with Nature and the Planet



will change the structure of cities and urban systems: **can you predict how?**

Warm Futures

Kim Stanley Robinson on Cities as a Climate Survival Mechanism

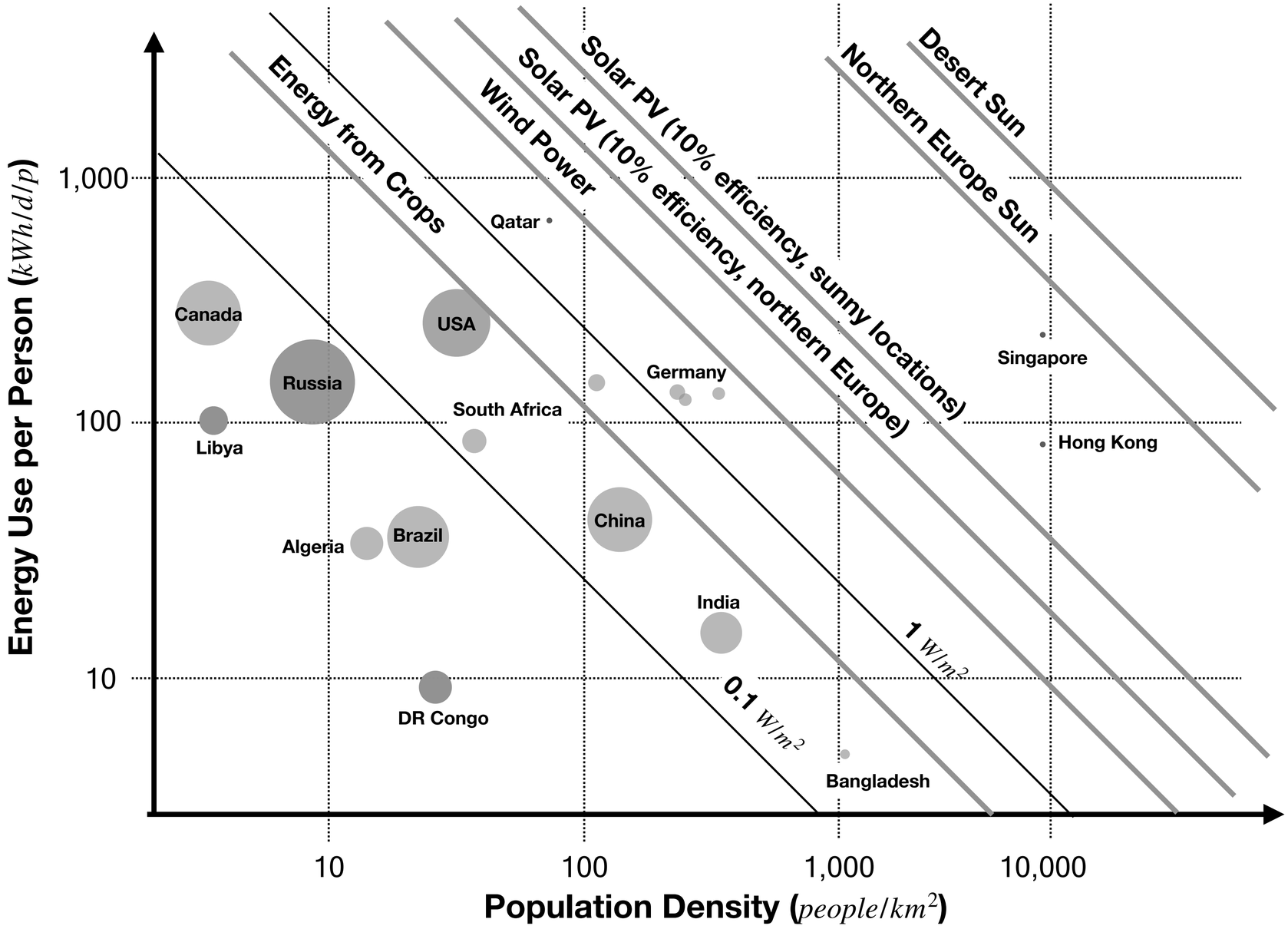
A future with far more cities, and cities that are asked to do far more.

By Kim Stanley Robinson +Follow

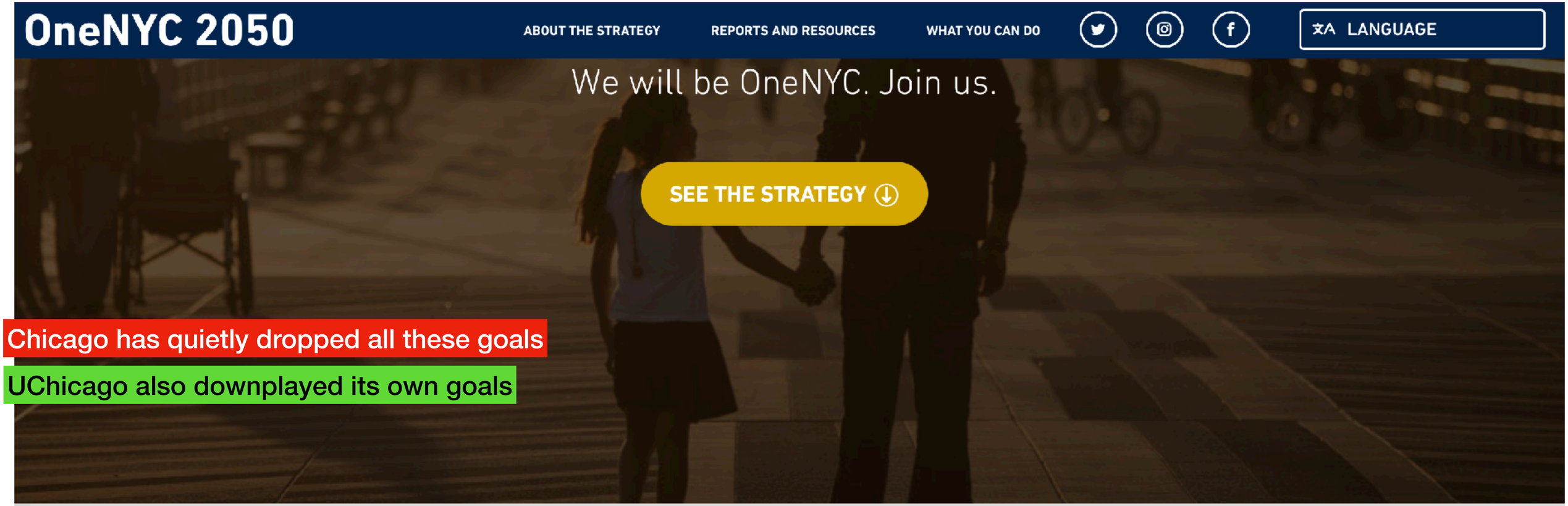
April 17, 2021, 5:00 AM CDT

Illustration: Viktor Hachmang for Bloomberg Green

https://www.bloomberg.com/news/articles/2021-04-17/the-city-as-a-survival-mechanism-kim-stanley-robinson


Energy Use per Person ($kWh/d/p$)
1,000
100
10
Population Density ($people/km^2$)
10
100
1,000
10,000
Energy from Crops
Wind Power
Solar PV (10% efficiency, northern Europe)
Solar PV (10% efficiency, sunny locations)
Northern Europe Sun
Desert Sun
1 W/m^2
0.1 W/m^2
Canada
Russia
Libya
USA
Qatar
South Africa
Germany
Singapore
Hong Kong
China
Algeria
Brazil
India
DR Congo
Bangladesh


1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
THE GLOBAL GOALS
For Sustainable Development
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE AND JUSTICE STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS



Chicago has quietly dropped all these goals

UChicago also downplayed its own goals

OneNYC 2050 is a strategy to secure our city's future against the challenges of today and tomorrow. With bold actions to confront our climate crisis, achieve equity, and strengthen our democracy, we are building a strong and fair city. Join us.

https://onenyc.cityofnewyork.us/

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https://sdgs.un.org/sites/default/files/2020-09/International-Affairs-VLR-2019.pdf

VOLUME 1 OF 9

ONENYC 2050

With bold actions to confront our climate crisis, achieve equity, and strengthen our democracy, we are building a strong and fair city. Join us.

VOLUME 2 OF 9

A VIBRANT DEMOCRACY

New York City will involve every New Yorker in the civic and democratic life of the city, welcoming immigrants, advancing justice, and leading on the global stage.

VOLUME 3 OF 9

AN INCLUSIVE ECONOMY

New York City will grow and diversify its economy so that it creates opportunity for all, safeguards the American dream, and addresses the racial wealth gap.

https://onenyc.cityofnewyork.us/

Sample Indicators for OneNYC

NYC tracks more than 1,000 indicators through a monitoring system it has been developing since the 1970s, which is maintained by the NYC Mayor's Office of Operations and published in the form of the Mayor's Management Report (MMR). A massive data infrastructure sits beneath the top-line indicators, and in many cases also aligns more directly with the SDG indicators. For each SDG, the NYC Mayor's Office for Operations has included top-line OneNYC indicators, and then a sampling of specific indicators, a description, and the source to demonstrate how the City monitors both operational performance and progress toward its goals. The complete set of OneNYC and MMR indicators can be found online.[21] [22]

pioneered climate action plans
voluntary local reviews (UN Agenda 2030)

http://onenyc.cityofnewyork.us

Localizing Sustainable Development in Cities

11 SUSTAINABLE CITIES AND COMMUNITIES

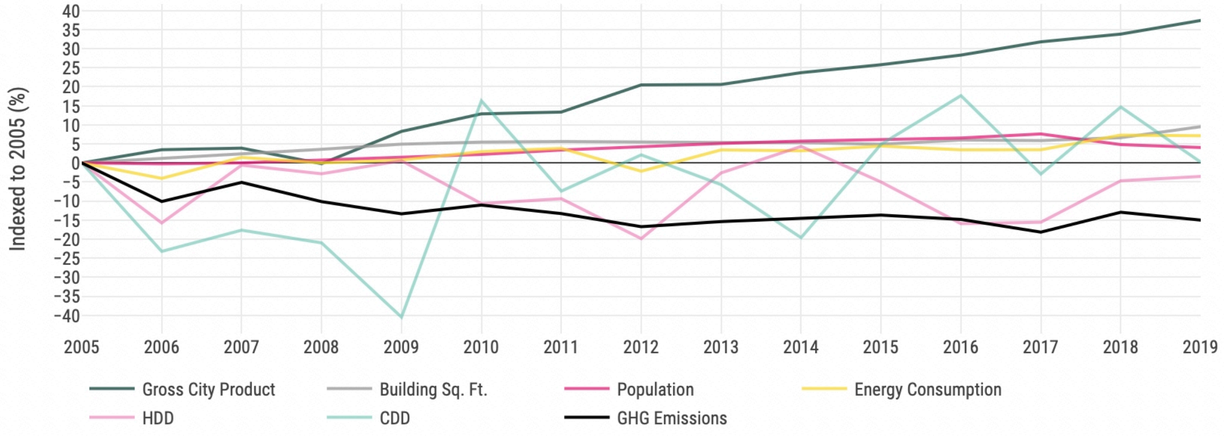
Housing
Thriving Neighborhoods
Culture
Transportation
Infrastructure Planning
Healthy Neighborhoods, Active Living
Vision Zero
Zero Waste
Air Quality
Parks & Natural Resources
Neighborhoods
Infrastructure

Holistic, Complex Systems approach to Goals and Policy

Energy, GHG Emissions, and Economic Indicators

This chart plots NYC's GHG emissions and the trends in factors that can drive emissions, including energy consumption, population, heating degree days, cooling degree days, and building area. This chart also shows the city's Gross City Product, which has risen as emissions have decreased since 2005.

ENERGY, GHG EMISSIONS, AND ECONOMIC INDICATORS TRENDS



Back to News & Insights

New analysis shows world's major cities on track to keep global heating to 1.5°C

This is the way it will being done

PRESS RELEASE December 11, 2020

- 54 cities, representing more than 200 million residents, are on track to help keep global heating below 1.5°C and tackle the climate crisis, per C40 analysis.
- C40 research reveals that city efforts could avert at least 1.9 gigatonnes of GHG emissions between 2020 and 2030, equivalent to half the annual emissions of the European Union.

C40 Cities today released new analysis of climate action plans from 54 cities confirming they will deliver their fair share of greenhouse gas emission reductions to keep global temperatures to the 1.5°C target of the Paris Agreement – the level that scientists agree is needed to tackle the global climate crisis.

https://www.c40.org/news/new-analysis-world-cities-on-track/

New kind of policy

riding on urban processes, revealed by science, with 20-30 year objectives and quantified metrics*

*This also applies to crime, equity in Chicago